Single & Dual Zone Heat Trace Control Panel

TABLE OF CONTENTS

SAFETY INFORMATION

Various symbols are used across this User Manual to caution the reader on potential safety hazards and additional operation information. These symbols must be followed to reduce the risk of injury or damage. Below is an index containing definitions of each symbol.

WARNING - Refer to supplemental information listed next to this symbol for details on specific hazard.

ELECTRICAL HAZARD - Hazards referring to electrical conditions such as high voltage. Refer to specific details listed next to symbol.

WARNING! Hazardous voltage can cause severe injury or death. Turn OFF power before servicing the circuit.

WARNING! Maximum total load shall not exceed rated capacity of the panel as listed in the equipment ratings section.

Pre-Start Up Inspection

Before installing the AccuTrace™ panel, take time to check the wiring and connections on the unit. Some components can be affected during shipping by environmental factors, so it is important to inspect the panel before power is applied.

OVERVIEW

ACCUTRACE™

Single & Dual Zone Heat Trace Control Panel

Valin's AccuTrace™ control panel incorporates the latest technology and is packed with features designed to help optimize your heat trace system. The easy-to-use touchscreen and non-incendive internal components allow the panel to be used in hazardous locations (Class I, Division II, groups A, B, C, and D) while providing an easy to use interface.

The AccuTrace™ panel utilizes PID algorithms designed to maintain temperature in the most challenging applications. The panel has 40 amp Solid State Relay controls and a multitude of alarms, including high temp, low temp, high current, low current, sensor failure and Ground Fault Equipment Protection, creating a package of unrivaled performance.

For extreme cold starts and long circuit lengths, the AccuTrace™ panel employs a soft start feature, reducing the inrush current. This helps mitigate potential high current alarms that are a known problem during startups.

The AccuTrace™ has a 7", full color, easy-to-navigate display. It can be programmed in minutes, reducing project commissioning time and bringing the heat trace on line faster. Remain connected with protocols that include Modbus TCP and Modbus 232/485. AccuTrace™ also offers 3 levels of password protection, to further ensure the highest security while allowing quick access in the field, as appropriate.

FEATURES

Input

• Sensor Type 3-wire RTD, 100 Ω PT, 0.00385 Ω/Ω/°C,20 Ω balanced lead wire (-200°C – 850°C)

Output

• SSR Power Switching

• 1 or 2 circuits

• 40 Amps per Circuit

OVERVIEW

Control Modes

- Auto PID
- On/Off-Control mode
  - » Dead band, (˚F) Range: +/- 100˚F
- Manual-Range: 0 – 100%
- Soft Start

Settings

- Alarm Types: Low & High Temperature, Low & High Current, High GFEP, Sensor Failure
- Alarm Relays: 24 VDC, 250 mA
- Alarm Contact State: N.O., closes on alarm
- Output on Sensor Failure: Auto Transfer to Manual Mode, Range: 0–100%
- 3 Levels of password protected security

Display, HMI, Indication

- 7" Full Color Resistive Touch Screen

Alarms

- Temperature (PV) Range: 0˚F to 720˚F (-18˚C to 382˚C)
- Low Temperature Alarm, Range: 0˚F to 720˚F, Off (-18˚C to 382˚C, Off)
- High Temperature Alarm, Range: 0˚F to 720˚F, Off (-18˚C to 382˚C, Off)
- Low Current Alarm, Range: 1A – 40A, Off
- High Current Alarm, Range: 1A – 40A, Off
- GFEP, Range: 20mA – 80mA
- GFEP Alarm Condition, Alarm and Trip at GFEP Setpoint

OVERVIEW

Communications

- Modbus RTU/RS-485 (2 or 4 wire), /RS-422
- Baud Rate, (Hz): 4800, 9600, 192K,38.4K, 57.6K, or 115.2K.
- Parity Range: None, even, and odd
- Modbus ID Range: 1–128
- Data Bits: 7 or 8
- Stop Bits: 1 or 2
- Modbus TCP

Operating & Environmental

- Temperature: -4°F to 104°F
- Power Supply: 100 to 277V 50/60Hz
- Enclosure rating: UL Type 12, 13, 4, 4X Fiberglass (Optional Stainless Steel)
- Approvals: UL/cUL 508A and Class I, Division 2, Groups A, B, C, D Hazardous Locations. (UL File: E503604)

Dimensions and Weight

- Weight: 13.2 lbs (5.9kg)

FRONT

SIDE

TOP
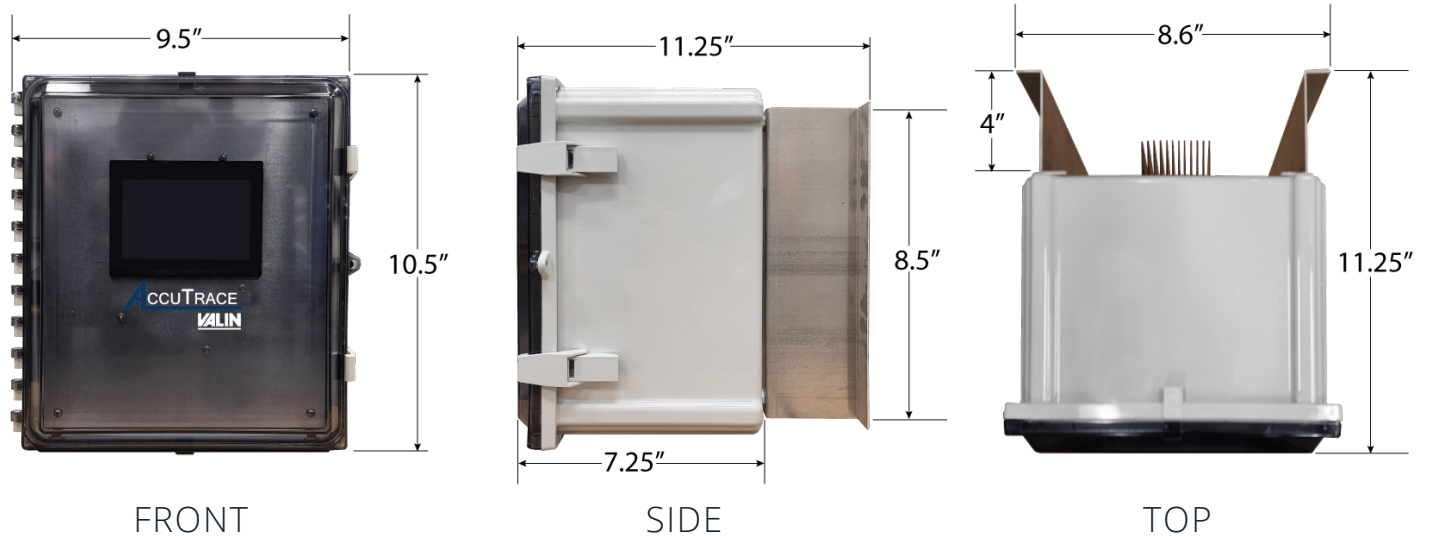
INSTALLATION

⚠ **WARNING!** AccuTrace™ utilizes Solid State Relay (SSR) power switching. To dissipate the heat generated from the SSR's, the heat sink located on the back of the enclosure must be in an upright position. The panel must be mounted vertically as shown below in Figure 2-1 to accomplish proper heat dissipation.

⚠ **WARNING!** Installation of equipment must be performed by qualified and experienced personnel.

Mounting Location

Determine the mounting location based upon the enclosure dimensions shown in the Overview Section. If installed indoors the recommended materials include metal surfaces, concrete, or wood. If mounting on drywall, the construction requirements must be of at least ½" thickness, supported by 2"x4" studs on 16" centers. If installed outdoors, metals must be corrosion resistant and woods must be sealed and treated for outdoor use. Anchors must be capable of supporting at least 100lbs each.

FIG. 2-1 VERTICAL MOUNTING ONLY

INSTALLATION

Conduit

All hubs and fittings shall be of Type 13, 4X to maintain environmental ratings of enclosure. Installer shall use earthing rings or equivalent to provide continuity of grounding between all conduit entries. Installer shall maintain the minimum spacing between conduit centers as noted in **Figure 2-2**. Conduit must be routed through the base of the enclosure as shown in **Figure 2-3** below. The recommended area for entry is shown in **Figure 2-4** below.

Trade Size of Conduit (in.)	Bushing Overall Diameter (in.)
1/2"	1"
3/4"	1-15/64"
1"	1-19/32"
1-1/4"	1-15/16"
1-1/2"	2-13/64"
2"	2-45/64"

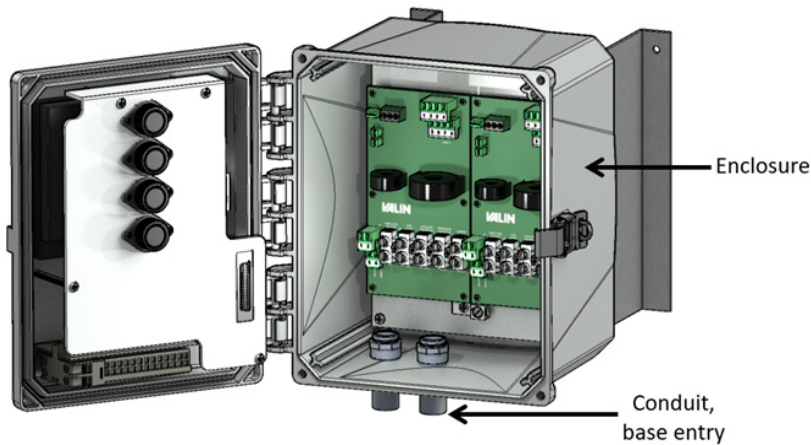FIG. 2-2 CONDUIT SPACING
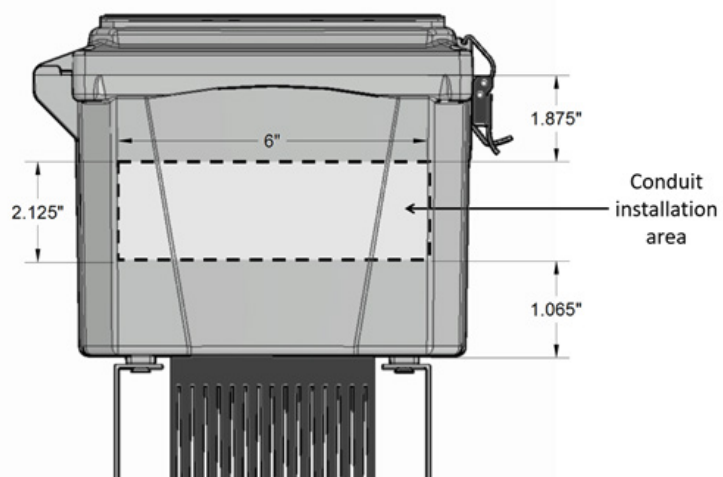

FIG. 2-3 CONDUIT ENTRY OVERVIEW

FIG. 2-4 CONDUIT ENTRY AREA

INSTALLATION

Hardware

The pair of brackets that come with the AccuTrace™ panel are designed to provide the necessary airflow to the heat sink on the back of the enclosure. Ensure that airflow is not blocked or restricted in any way. Maintain at least 12" of clearance above and below the AccuTrace™. Refer to **Figure 2-5** below.

The heat sink must be inspected every season to confirm that no debris or objects are in contact with the heat sink. To dislodge debris, use high pressure blasts of clean air that will not damage the fins.

FIG. 2-5 ACCUTRACE™ CLEARANCES

WARNING! Failure to comply with Valin instructions on proper heat sink clearances or panel mounting can result in impaired panel performance, personal injury, or damage.

INSTALLATION

Customer Wiring

WARNING! Equipment is rated for use in Class I. Div II. Groups A, B, C and D hazardous environments. Install in accordance with the National Electrical Code (NEC) or Canadian Electrical Code (CEC), and any applicable local codes for USL/CNL panels, based on the installation location.

WARNING! Explosion Hazard. Do not disconnect panel while the circuit is live or unless the area is known to be free of ignitable concentrations.

WARNING! Explosion Hazard. Do not remove or replace components unless power has been disconnected or the area is free of ignitable concentrations of flammable gases or vapors.

WARNING! Hazardous voltage. Installation and wiring must be performed by qualified and experienced personnel. All wiring must be in accordance with the all local and National electric Codes. Failure to do so may result in damage to equipment, injury, and/or death.

Equipment Ratings

Voltage Rating	100-277VAC, 50/60 Hz*
Current Rating	40A per circuit
Number of Circuits	1 or 2
Ambient Temperature Rating	-20°F to +104°F
Altitude Rating	Fully rated up to 6,500 Ft (2,000 Meters)
VA consumption rating on electronics	10W**
Maximum RTD output	1.25V, 7mA
Pollution Rating	Degree 2
Over Voltage	Category III

*2 CIRCUIT UNITS MUST HAVE SEPARATE VAC SUPPLY FEEDS

**THE ELECTRONICS ARE PROTECTED BY ½ AMP 600VAC FUSES

INSTALLATION

Refer to **Figure 2-6** below for terminal locations. Each section will have an electrical schematic for specific wiring. Dashed lines signify customer wiring.

RTD Wiring (Figure 2-7)

- Torque value 4.5 lb-In (0.5 Nm).
- Use copper conductors only, 300V min, 75°C min.
- Class 2 control circuit, use class 2 conductors.
- Wire strip length 7.5mm.
- 30-14 AWG.
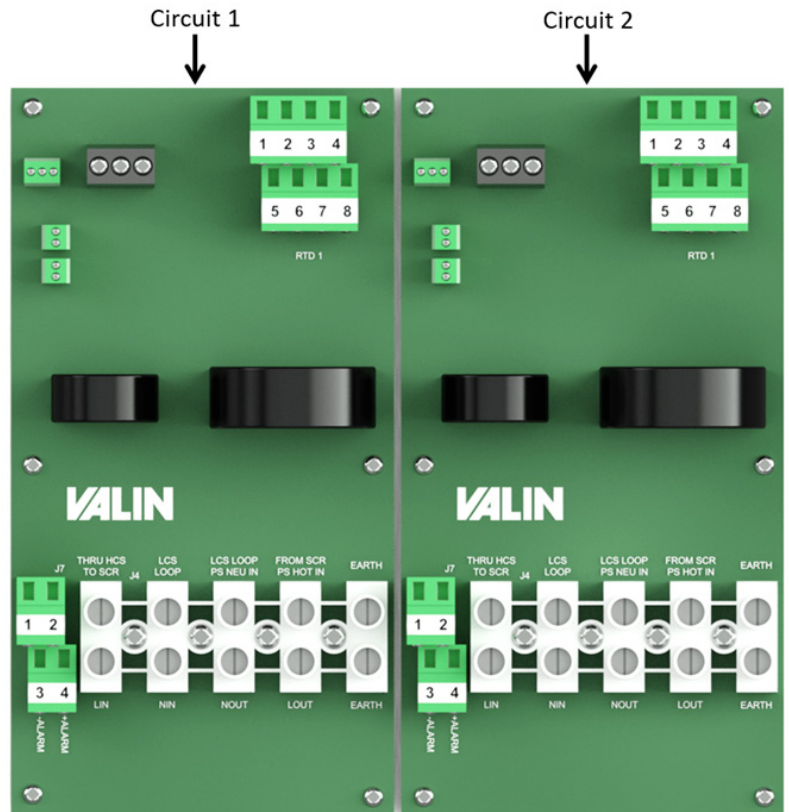- RTD 2 or 3 wire, platinum 100 Ω.
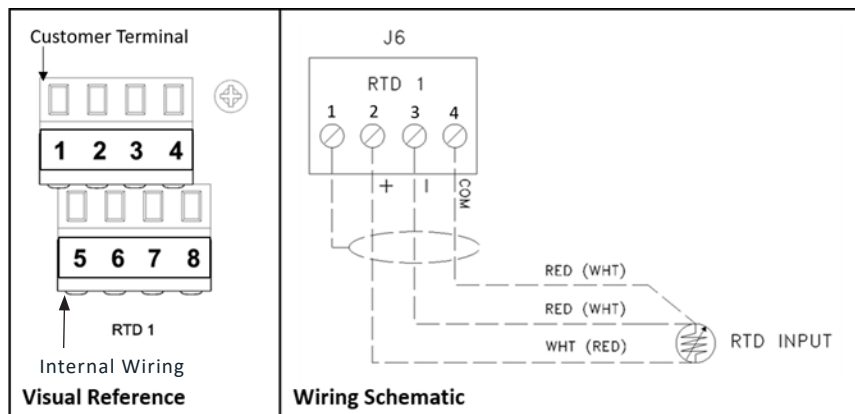

FIG. 2-6 BOARD LAYOUT

FIG. 2-7 RTD TERMINATIONS

INSTALLATION

Supply Power Wiring (Figure 2-8)

- Torque value 17.7 lb-in (2.0 Nm).
- Use copper conductors only, 300V min, 75°C min.
- Wire strip length 8.5mm.
- 14-8 AWG.
- Power Input 100-277VAC.
- Branch circuit protection rating must not exceed 50A per circuit.
- Branch circuit protection shall be provided by installer. Branch circuit protection may be any of the following:
  - » Instantaneous trip MCCB
  - » Adjustable trip MCCB
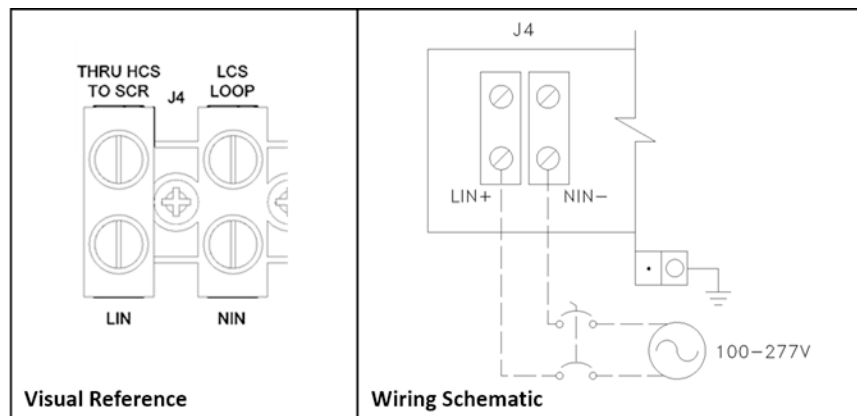 - » Class J or T fusing

FIG. 2-8 SUPPLY POWER TERMINALS

INSTALLATION

Load Wiring (Figure 2-9)

- Torque value 17.7 lb-in (2.0 Nm).
- Use copper conductors only, 300V min, 75°C min.
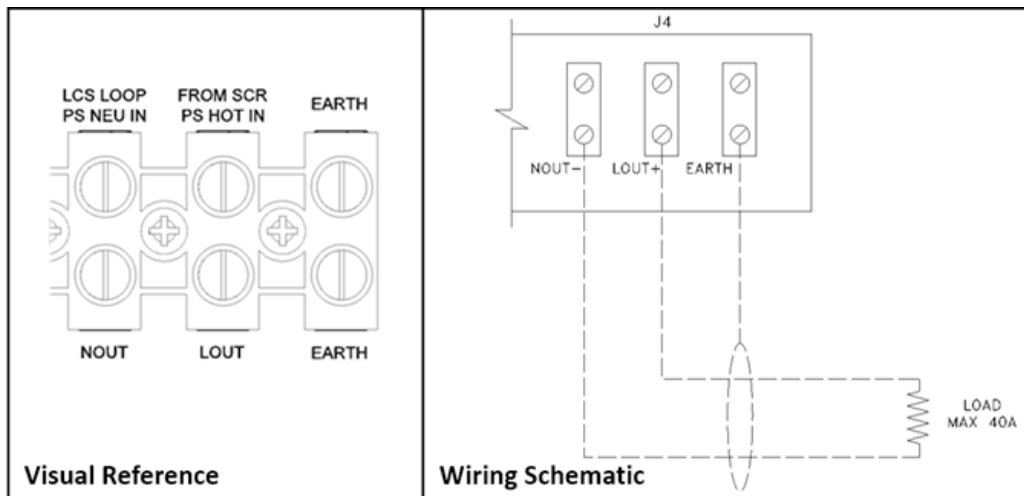- Wire strip length 8.5mm.
- 14-8 AWG

FIG. 2-9 LOAD TERMINALS

INSTALLATION

Alarm Wiring (Figure 2-10)

WARNING!

(-ALARM) terminals for circuit 1 and circuit 2 are internally connected.

Ensure that the polarity is the same on (-ALARM) terminal on both boards to avoid short circuit. See Figures 2-12 and 2-13 for proper wiring.

- Torque value 4.5 lb-In (0.5 Nm)
- Use copper conductors only, 300V min, 75°C min
- May be Class 1 or Class 2 control circuit. Use Class 1 conductors for Class 1 circuits. Use Class 2 conductors for Class 2 circuits.
- Wire strip length 7.5mm
- 30-14 AWG
- Contact rating: 250mA @ 24VDC
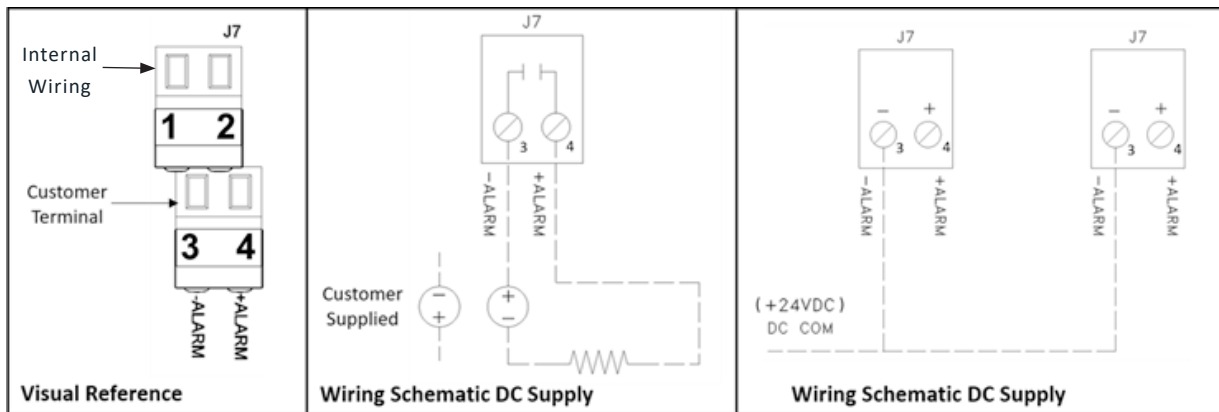- Max voltage supply: 30VDC

FIG. 2-10 ALARM TERMINATIONS

INSTALLATION

- For 2 circuit DC connection, refer to figures 2-11 – 2-13 below:
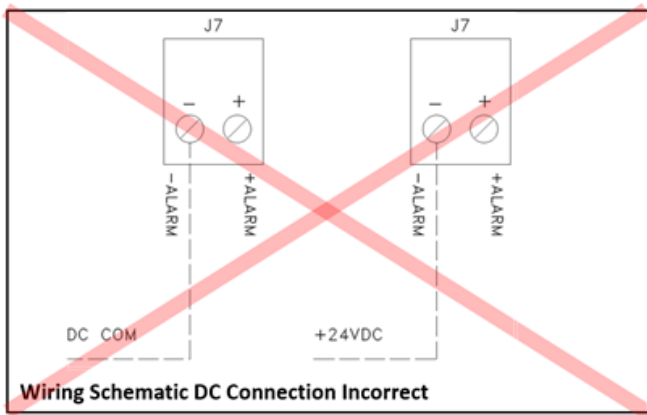

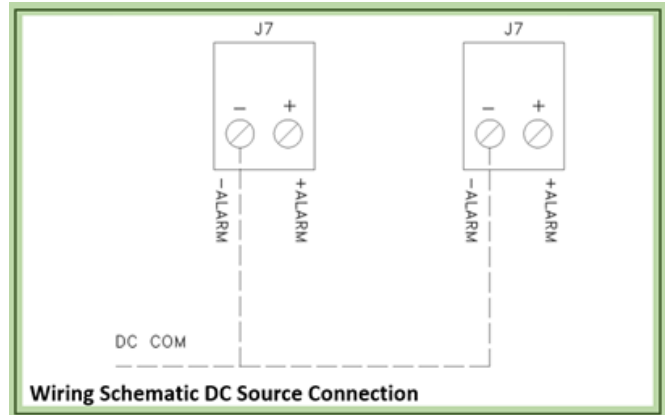FIG. 2-11 ALARM WIRING EXAMPLE 1

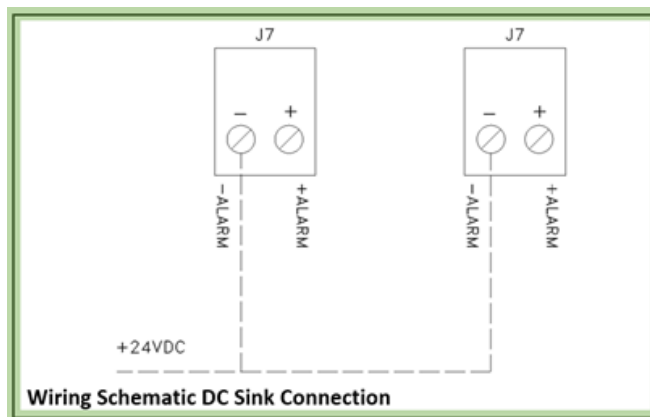FIG. 2-12 ALARM WIRING EXAMPLE 2

FIG. 2-13 ALARM WIRING EXAMPLE 3

INSTALLATION

Serial Communications Wiring (Figure 2-14 - 2-16)

- RS-422/RS-232/RS-485 2Wire/4Wire
- RS422/RS485 max cable length 4000ft
- RS232 max cable length 50ft
- AccuTrace™ port: D-Type 9-pin female connector, standard
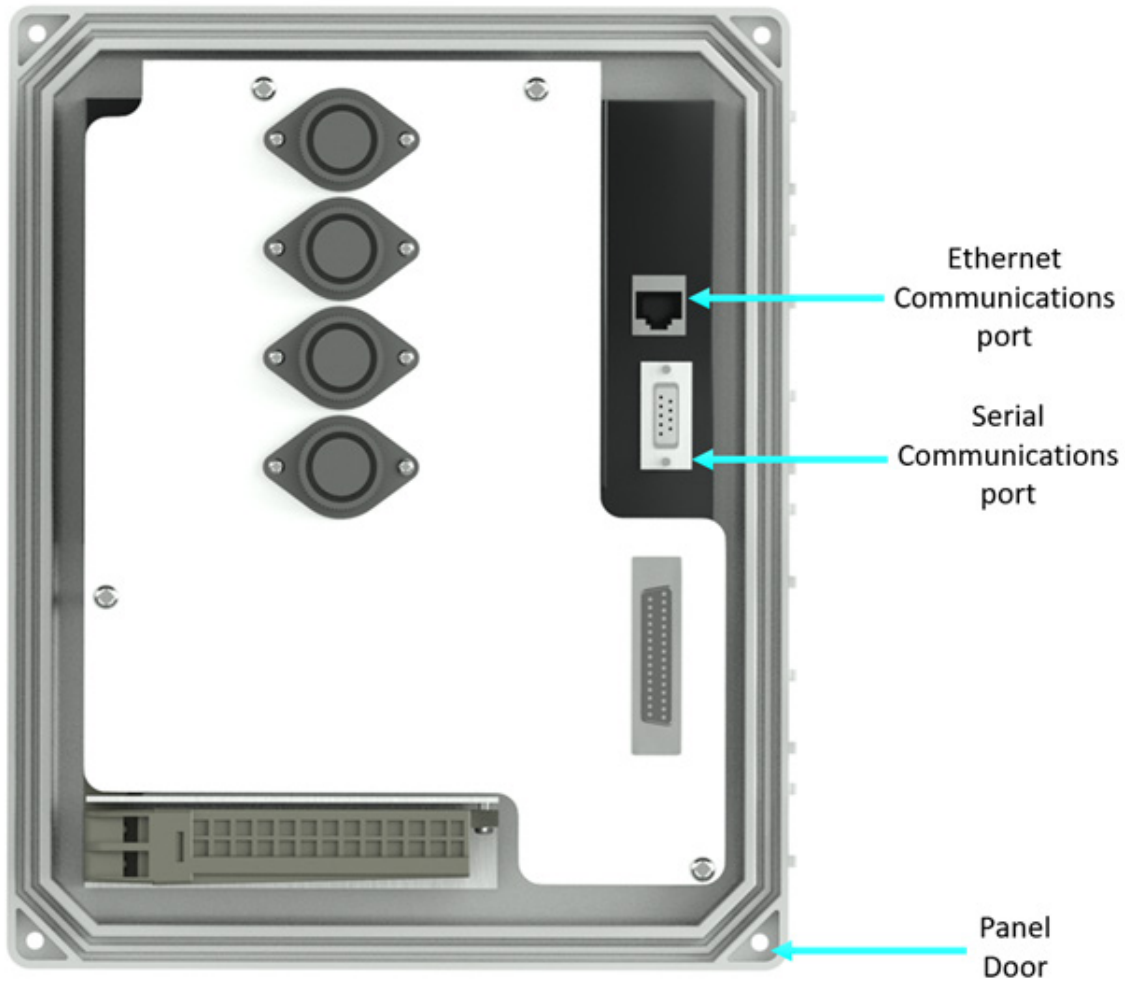
FIG. 2-14 INTERNAL DOOR COMPONENTS

INSTALLATION

RS422/RS485 4 Wire Cable Connections

DB9 Male AccuTrace™ Port		4 Wire RS422/RS485 Cable
Pin #	Signals	Signals
1	TX+	RX+
4	RX+	TX+
5	SG & SHIELD	SG
8	TX-	RX-
9	RX-	TX-
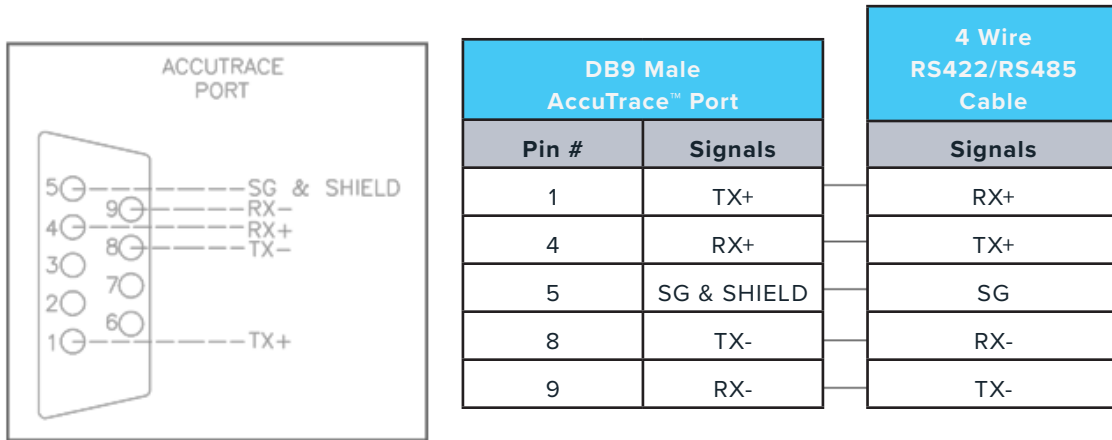
FIG. 2-15 FOUR WIRE CONNECTION

RS485 2 Wire Cable Connections

DB9 Male AccuTrace™ Port		2 Wire RS485 Cable
Pin #	Signals	Pin #
1	TX+	A
4	RX+	
5	SG & SHIELD	SG
8	TX-	B
9	RX-	

FIG. 2-16 TWO WIRE CONNECTION

INSTALLATION

Ethernet Communications (Figure 2-17)

- Fully compliant with IEEE 802.3 / 802.3u standards.
- 10/100 Mbps support.
- Standard shielded connector RJ-45 female jack, with speed and link activity LED indicators.

FIG. 2-17 ETHERNET PORT

OPERATION

Getting Started

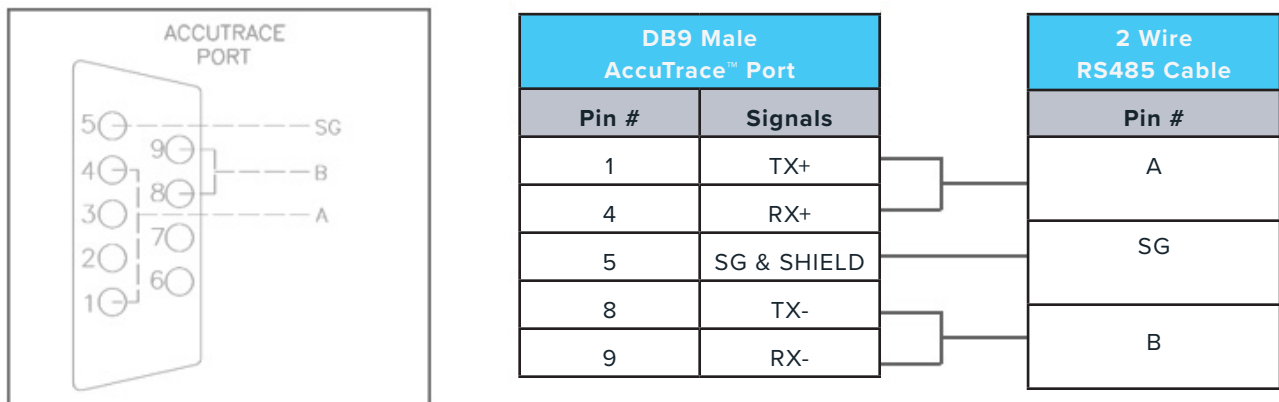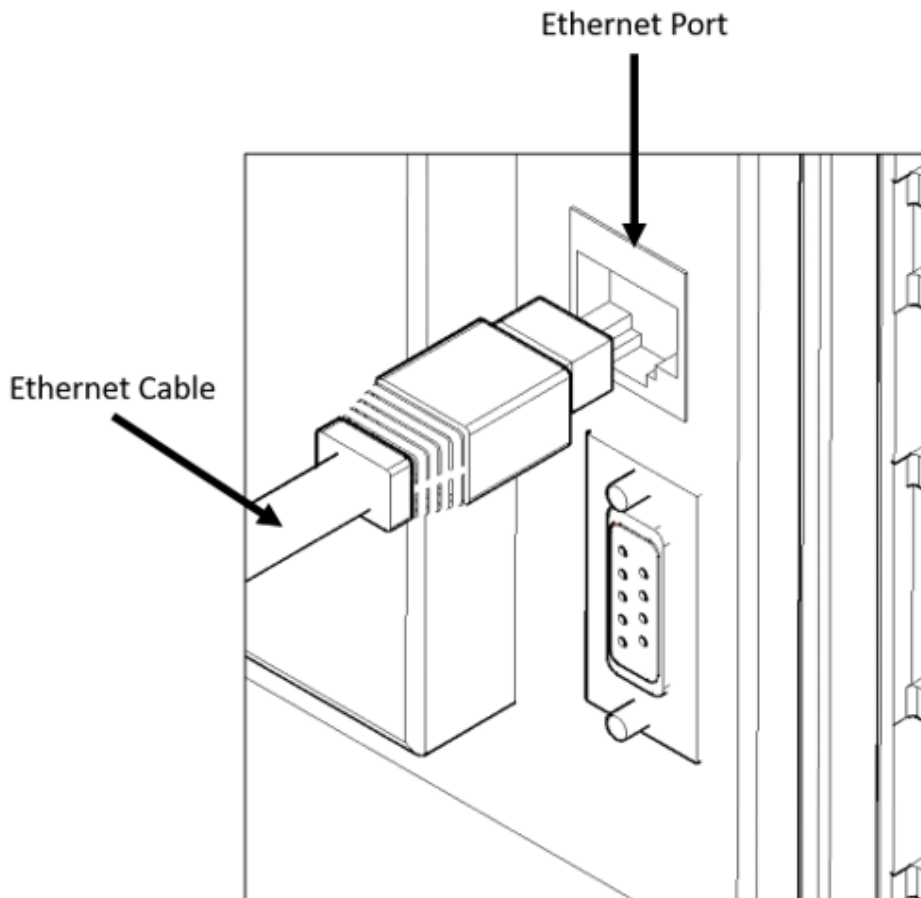Upon powering up, the AccuTrace™ HMI will display a red LED indicator and a splash screen **(Figure 3-1)**. Once initialization is complete, **the Home Screen (Figure 3-2)** will appear.
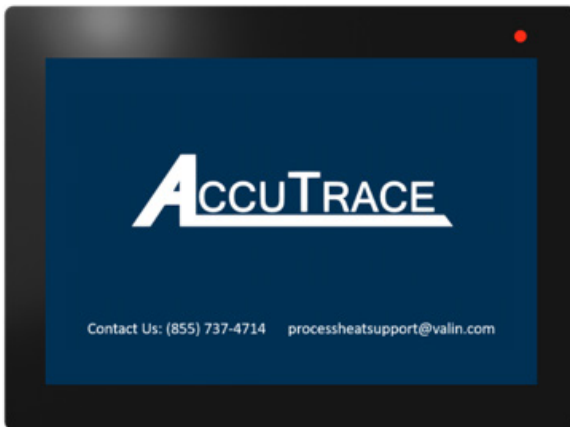
FIG. 3-1 SPLASH SCREEN

FIG. 3-2 HOME SCREEN

Security and Logging In

In order to view or edit the parameters, AccuTrace™ requires a log in based on the personnel accessing it. There are 3 levels of access available. Below is a chart describing the security levels. Only the **Home Screen** may be viewed without logging in.

Security Levels			
Menu	**Administrator**	**Maintenance**	**Operations**
Home Screen	Full access	Full access	Full access
Active Alarms	Full access	Full access	Full access
Modes	Full access	Full access	Full access
Alarm Settings	Full access	Full access	No access
GFEP Test	Full access	Full access	No access
Diagnostics	Full access	Full access	No access
Admin	Full access	No access	No access
System Voltage	Full access	No access	No access
PID Settings	Full access	No access	No access
Network Settings	Full access	No access	No access

OPERATION

1. To log in, press the **"LOG IN"** LOG IN button on the **Home Screen**. This will bring you to the Log In Screen
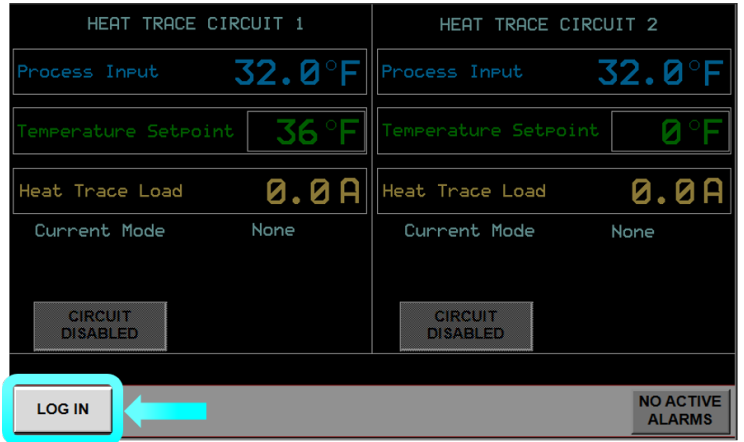
FIG. 3-3 LOGIN SCREEN NAVIGATION

2. Select the entry field in the security level that is being accessed and enter the password.

The default passwords are listed below.

It is recommended that the administrator changes the passwords upon first start up. Refer to Admin Menu section on page 46 for instructions.
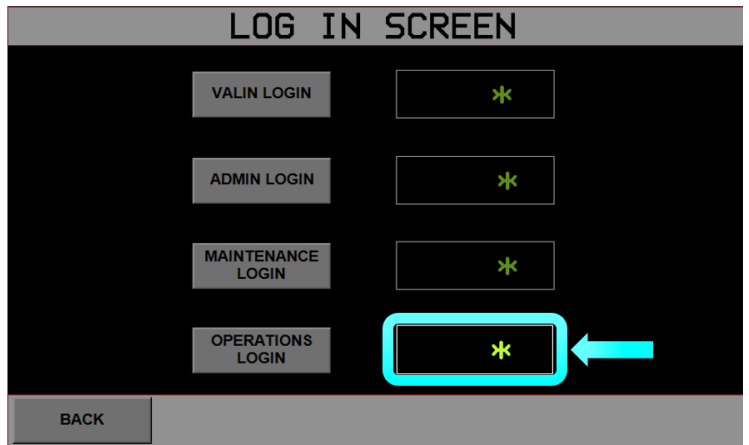
FIG. 3-4 LOGIN SCREEN

Default Passwords

Administration	Ma intenance	Operations
3333	2222	1111

OPERATION

3. Press **"ENT"** on the keypad after the password has been entered.
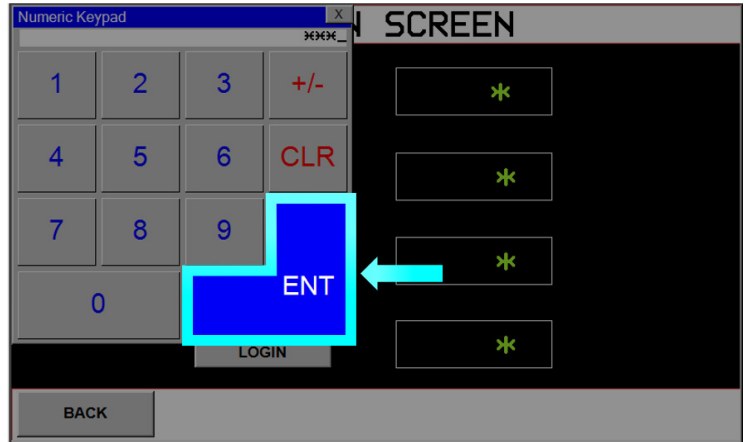
FIG. 3-5 ENTER TO ACCEPT PASSWORD

4. Then press the **"LOGIN"** button next to the entry field with the password. If login is successful, the user will be returned to the **Home Screen**.
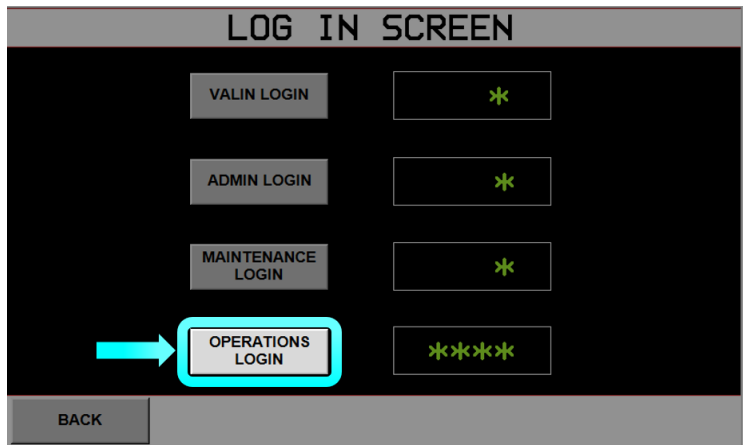
FIG. 3-6 PRESS TO COMPLETE LOGIN

The system will perform an auto-log out and require re-entry of credentials, based on security levels below:

Security Levels		
Admin	**Maintenance**	**Operations**
Log out after 30 minutes	Log out after 5 minutes	Log out after 2 minutes

OPERATION

Menu Hierarchy Figure 3-7

```
                              ┌─────────────────┐
                              │   Home Screen   │
                              └─────────────────┘
                                       │
         ┌─────────────────────────────┼─────────────────────────┐
         │                             │                         │
   ┌───────────┐               ┌───────────────┐           ┌───────────┐
   │   Menu    │               │ Active Alarms │           │  Log In   │
   └───────────┘               └───────────────┘           └───────────┘
```

Alarm Status
- Clear/view alarms

Log In Screen
- Enter credentials

System Settings

GFEP Test

Admin

Modes
- Circuit 1&2 PID, Manual, and On/Off control modes
- Circuit 1&2 enable/disable
- Soft Start

GFEP Test
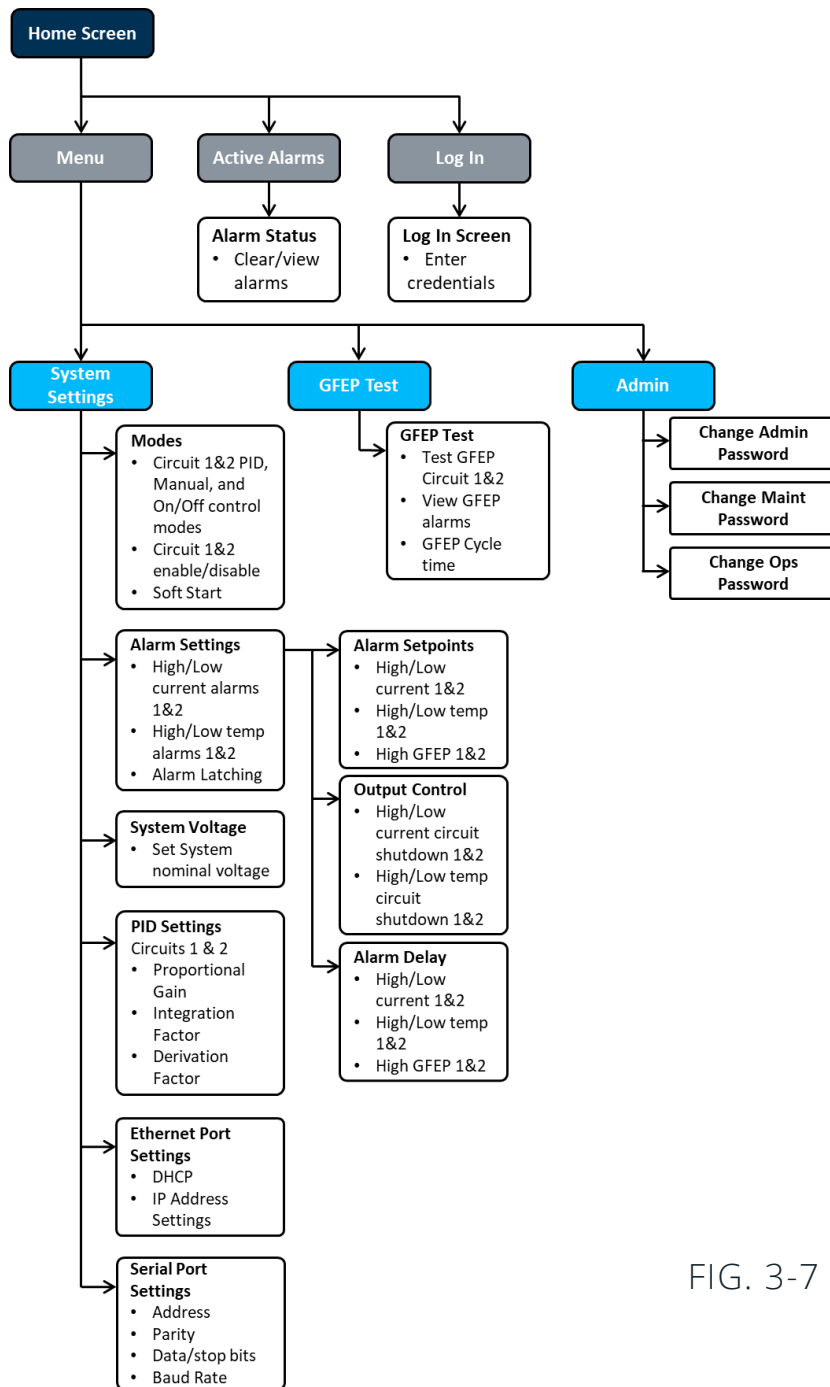- Test GFEP Circuit 1&2
- View GFEP alarms
- GFEP Cycle time

Change Admin Password

Change Maint Password

Change Ops Password

Alarm Settings
- High/Low current alarms 1&2
- High/Low temp alarms 1&2
- Alarm Latching

Alarm Setpoints
- High/Low current 1&2
- High/Low temp 1&2
- High GFEP 1&2

Output Control
- High/Low current circuit shutdown 1&2
- High/Low temp circuit shutdown 1&2

System Voltage
- Set System nominal voltage

PID Settings
Circuits 1 & 2
- Proportional Gain
- Integration Factor
- Derivation Factor

Alarm Delay
- High/Low current 1&2
- High/Low temp 1&2
- High GFEP 1&2

Ethernet Port Settings
- DHCP
- IP Address Settings

Serial Port Settings
- Address
- Parity
- Data/stop bits
- Baud Rate

FIG. 3-7

OPERATION

THE HOME SCREEN

Process Temperature ①
Temperature Setpoint, user input ②
System load in amps ③
Circuit status, user selectable ④
Log out of system ⑤

HEAT TRACE CIRCUIT 1
Process Temp   32.0°F
Temperature Setpoint   0°F
Heat Trace Load   0.0A
Current Mode   PID Auto
Actual Power   0.0 %
CIRCUIT ENABLED

HEAT TRACE CIRCUIT 2
Process Temp   32.0°F
Temperature Setpoint   0°F
Heat Trace Load   0.0A
Current Mode   PID Auto
Actual Power   0.0 %
CIRCUIT ENABLED

LOG OUT   MENU   NO ACTIVE ALARMS

Control mode in use ⑨
Power output ⑧
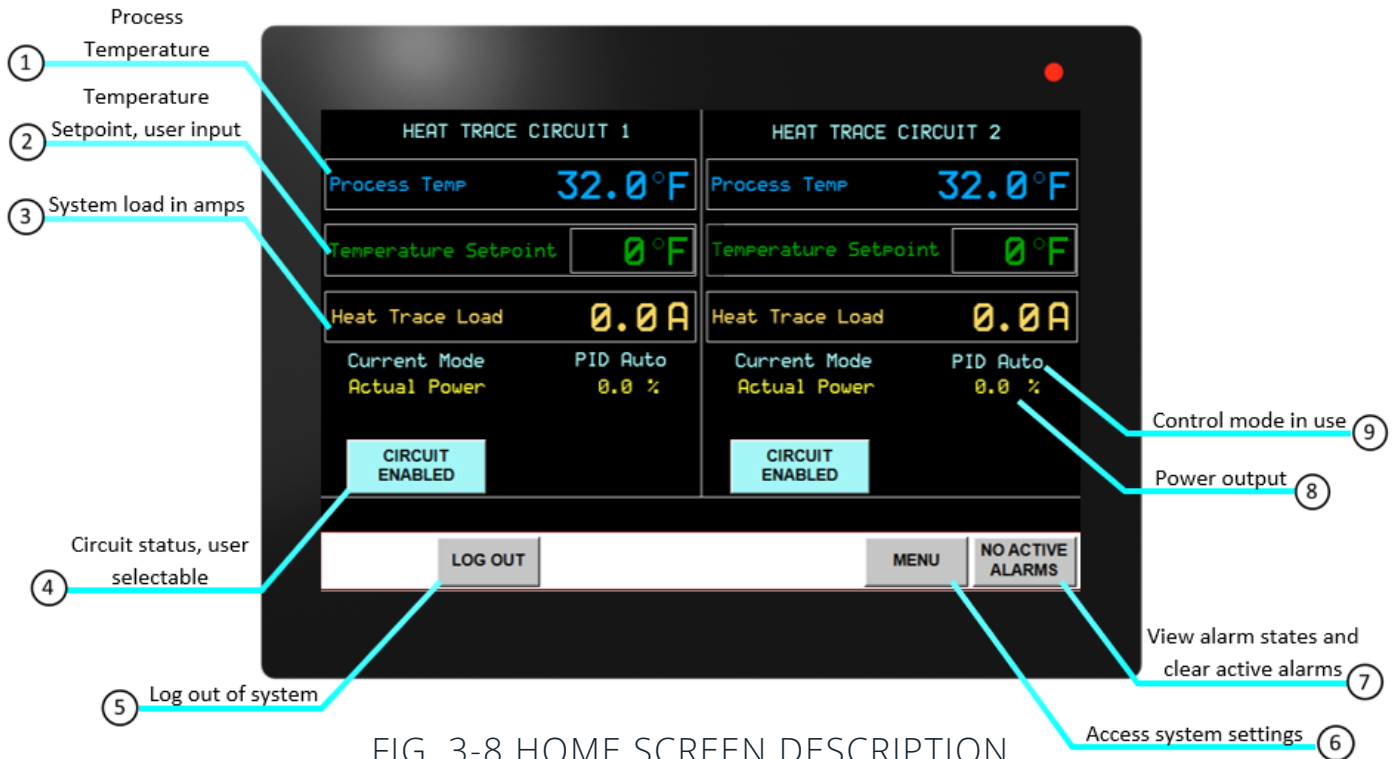View alarm states and clear active alarms ⑦
Access system settings ⑥

FIG. 3-8 HOME SCREEN DESCRIPTION

On the **Home Screen**, a logged in user may set and view process values for circuit 1 & 2. Circuit activity may also be toggled between Enabled and Disabled.

1. **Process Input** - View the process temperature of circuit 1 or 2. This value is displayed in degrees Fahrenheit (°F).

2. **Temperature Setpoint** - Establish the temperature setpoint or circuit 1 or 2. This value is displayed in degrees Fahrenheit (°F).

3. **Heat Trace Load** - View the load of circuit 1 or 2. This value is displayed in amperes (A).

4. **Circuit Enable/Disable** - Toggle the active state of circuit 1 or 2. This may also be changed in the Mode Menu.

5. **Log In/Log Out -** Displays the **Log in Screen** to enter credentials. Logging out will require credential re-entry.

6. **Menu -** Displays the **Main Menu** with access to submenus **System Settings**, **GFEP Test**, and **Admin**

7. **Active Alarms** - Displays the **Active Alarms Screen** where the user may view and reset active alarms.

8. **Actual Power** - Displays the power output for circuit 1 or 2. If **Manual Mode** is selected for control, this will display the user set power output. If on/off mode is selected, this display is not visible.

9. **Current Mode** - Displays the control mode selected in the **Modes Menu** for circuit 1 or 2.

SET UP

Main Menu

Navigate to the **Main Menu** by clicking the **"MENU"** MENU button on the **Home Screen**.
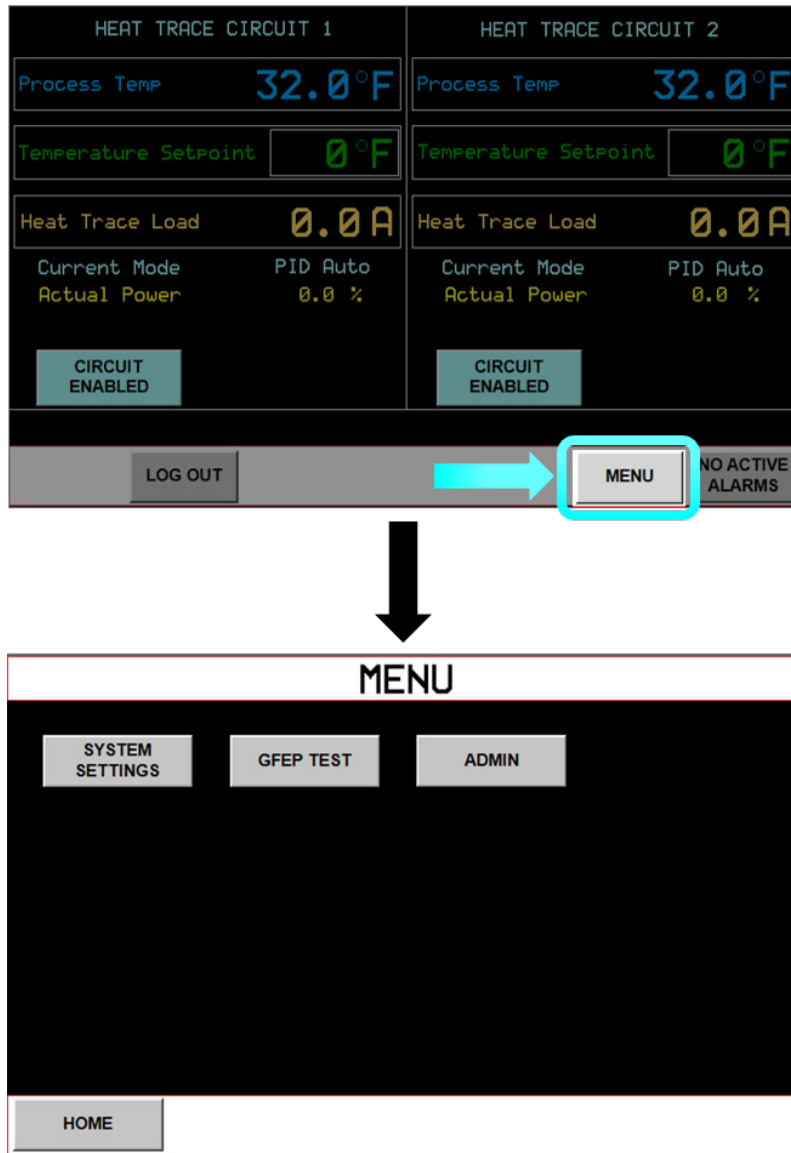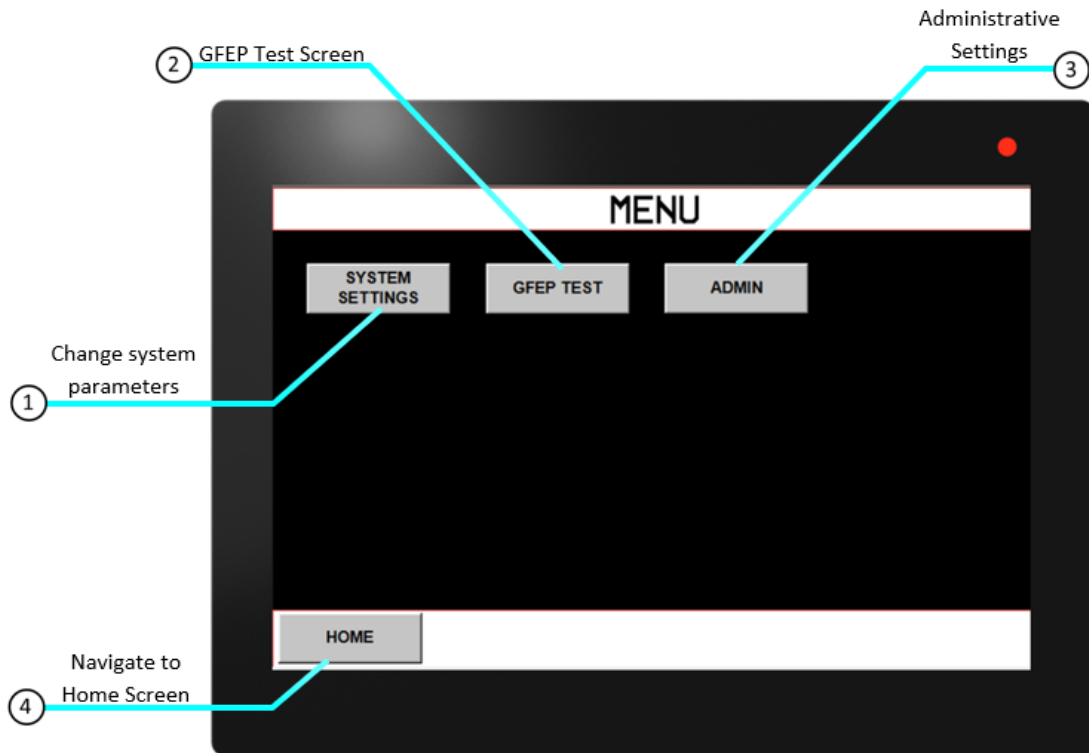

FIG. 4-1 MAIN MENU NAVIGATION

SET UP

FIG. 4-2 MAIN MENU DESCRIPTION

1. **System Settings** - View and establish parameters for system control modes, alarms, and communications settings.

2. **GFEP Test** - Establish the cycle time for the **GFEP Auto Test** feature per circuit. View GFEP status and perform test on command.

3. **Admin** - Change passwords for Administrative, Maintenance, and Operations security levels.

4. **Home** - Return to **Home Screen**.

SET UP

System Settings

Navigate to the **System Settings Menu** from the **Home Screen** by selecting **"MENU"** MENU > **"SYSTEM SETTINGS"** SYSTEM SETTINGS
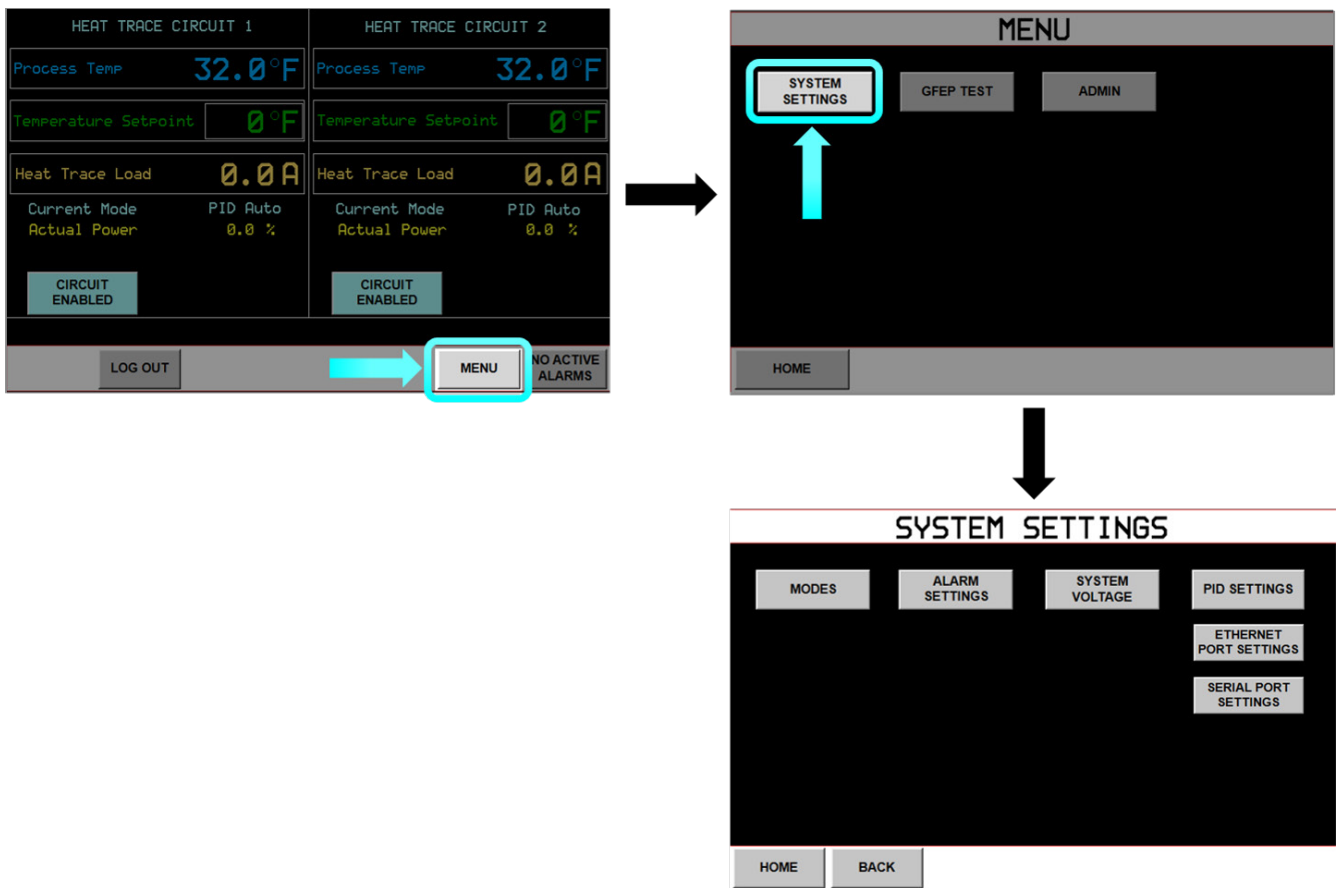

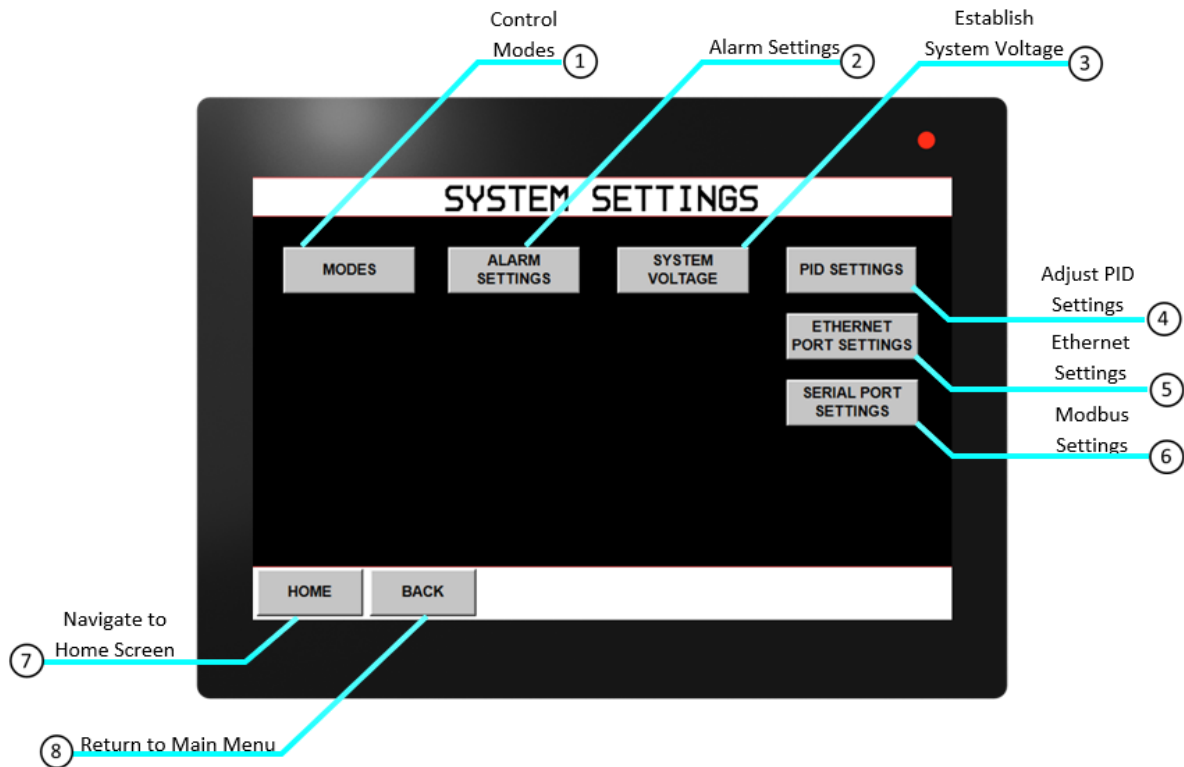FIG. 4-3 SYSTEM SETTINGS NAVIGATION

SET UP

FIG. 4-4 SYSTEM SETTINGS DESCRIPTION

1. **Modes** - Select control mode per circuit and temperature settings, enable or disable circuits, and toggle soft start feature.

2. **Alarm Settings** - Displays **Alarm Settings Menu** where the user may enable or disable alarms, establish alarm setpoints, alarm event outputs, and delay times.

3. **System Voltage** - Displays the **System Voltage Menu** where the user sets the nominal system voltage for use in GFEP testing.

4. **PID Settings** - Displays the **PID Settings Menu**, here the user may adjust PID parameters for use with the Auto PID control mode.

5. **Ethernet Port Settings** - Displays the **Ethernet Parameters Menu**. The user may enter network information for ethernet communications here. See the Communications section for navigation and screen information.

6. **Serial Port Settings** - Displays the **Serial Com Port Menu**. The user may enter network information for Modbus communications here. See the Communications section for navigation and screen information.

7. **Home** - Return to **Home Screen.**

8. **Back** - Return to **Main Menu**.

SET UP

Modes

Navigate to the **Modes Menu** from the **Home Screen** by selecting
"MENU" `MENU` > **"SYSTEM SETTINGS"** `SYSTEM SETTINGS` > **"MODES"** `MODES` .
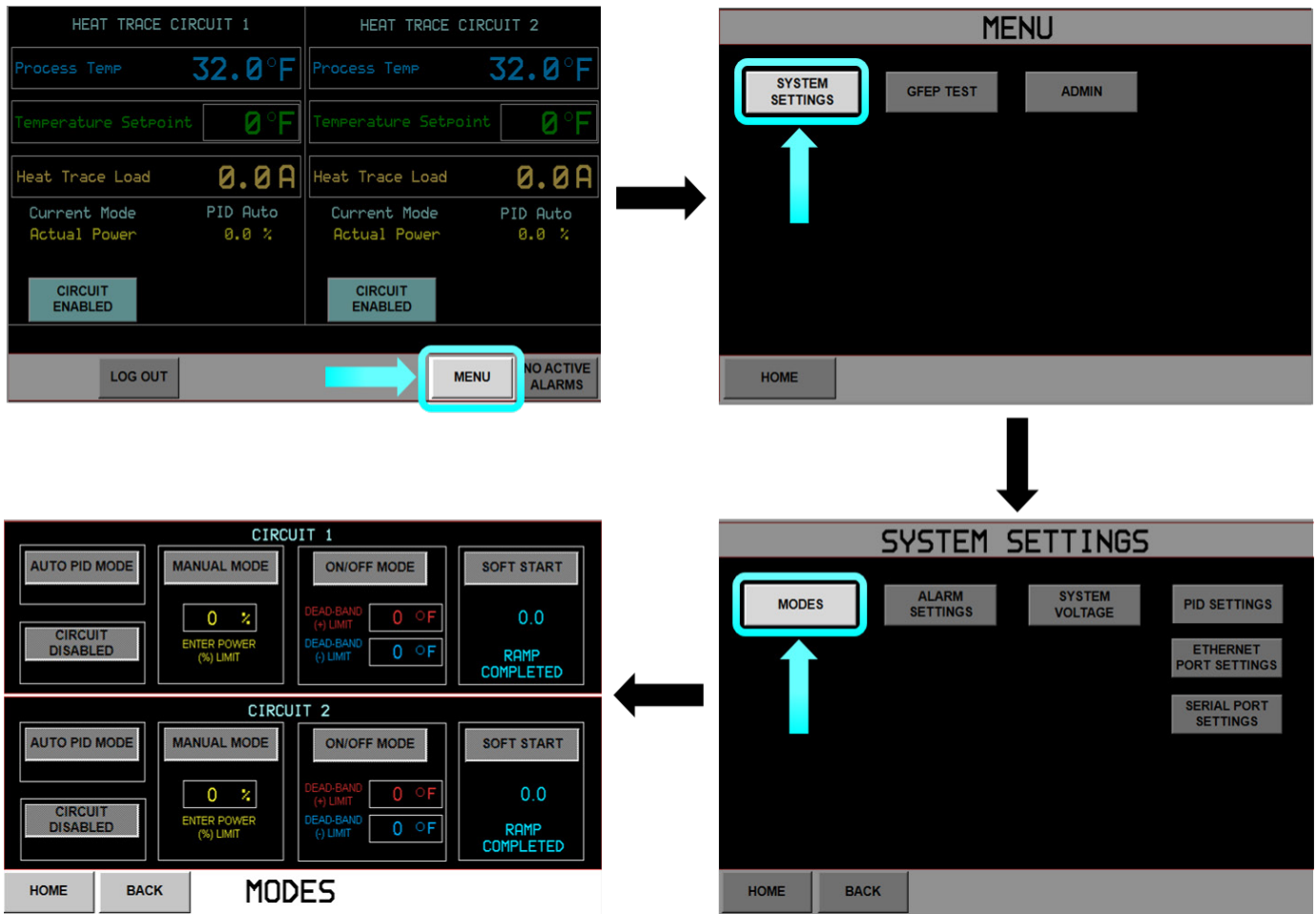

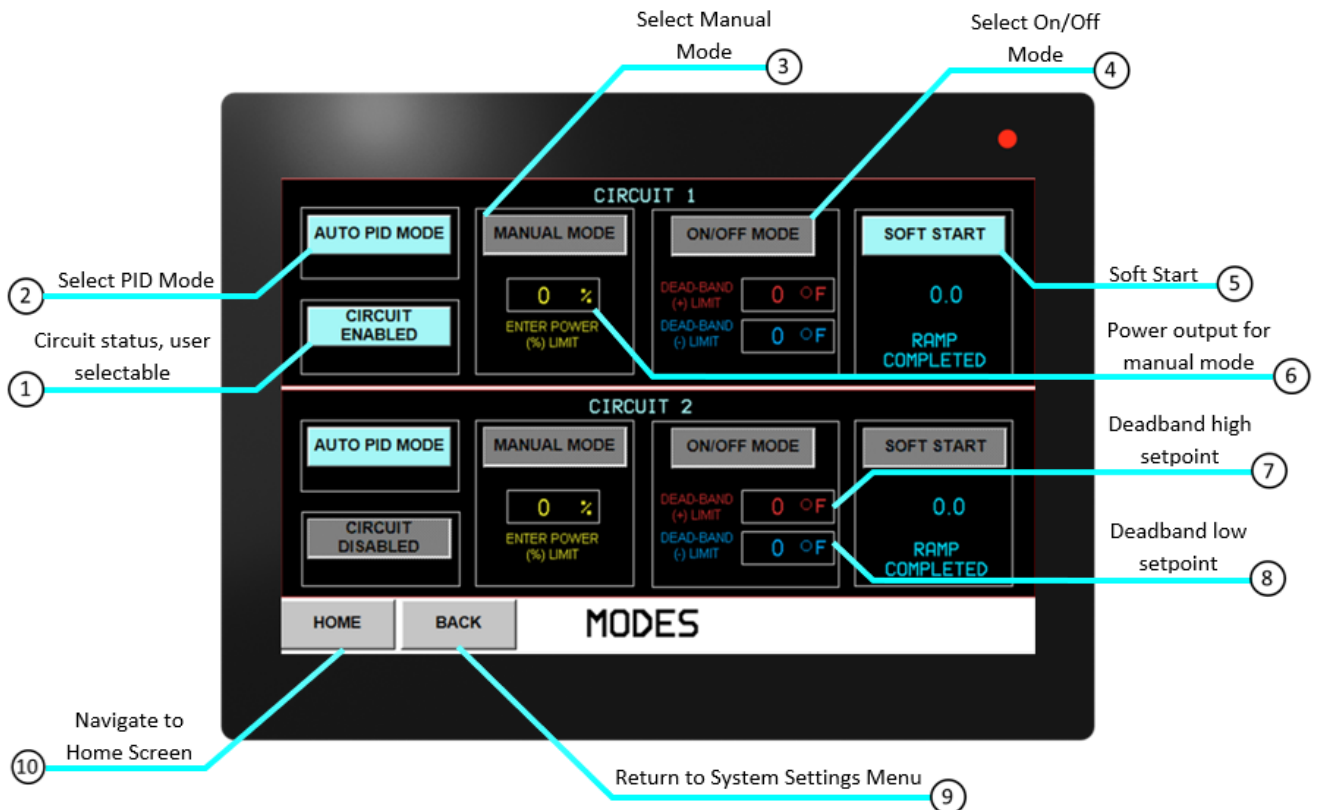FIG. 4-5 MODE CONFIGURATION SCREEN NAVIGATION

SET UP

FIG. 4-6 MODE CONFIGURATION DESCRIPTION

In the **Modes Menu** a user may select a control mode per circuit, enable or disable circuits, and toggle the soft start feature.

1. **Circuit Enable/Disable** - Enable or disable power output to load for specified circuit.

2. **Auto PID Mode** - A closed loop control method that will control the power output based on a PID algorithm. The proportional, integral, and derivative variables can be modified from the **System Settings Menu** under **PID Settings**.

3. **Manual Mode** - An open loop control method that sets the power output to a user-specified percentage. Manual Mode is also the failover mode from Auto PID or On/Off when the temperature sensor fails. **Set the output accordingly for the application range of power limit (%)**.

4. **On/Off Mode** - A closed loop control method that utilizes Deadband hysteresis values to determine the power output. The output will turnoff once the process temperature reaches the deadband's high setpoint and turns on when the process temperature reaches the deadband's low setpoint.

SET UP

5. **Soft Start** - On start-up, in-rush current levels could exceed the nominal load current particularly with self-regulating cable. To manage this potentially harmful occurrence, AccuTrace™ has been designed with a Soft Start feature. **Soft Starting** gradually ramps the output to the circuits during start-up, mitigating high-current events.

6. **Enter Power (%) Limit** - Set power output for **Manual Mode** and failover mode.

7. **Dead band + Limit** - Set the deadband high setpoint. Once the process reaches this setpoint plus this value, the output will turn off, 0% power.

8. **Dead band - Limit** - Set the deadband low setpoint. Once the process reaches the setpoint minus this value, the output will turn on, 100% power.

9. **Back** - Return to **Main Menu.**

10. **Home** - Return to **Home Screen**.

Alarm Settings

Navigate to the **Alarm Settings Menu** from the **Home Screen** by selecting

"MENU"   [MENU]   > **"SYSTEM SETTINGS"**   [SYSTEM SETTINGS]   > **"ALARM SETTINGS"**   [ALARM SETTINGS]
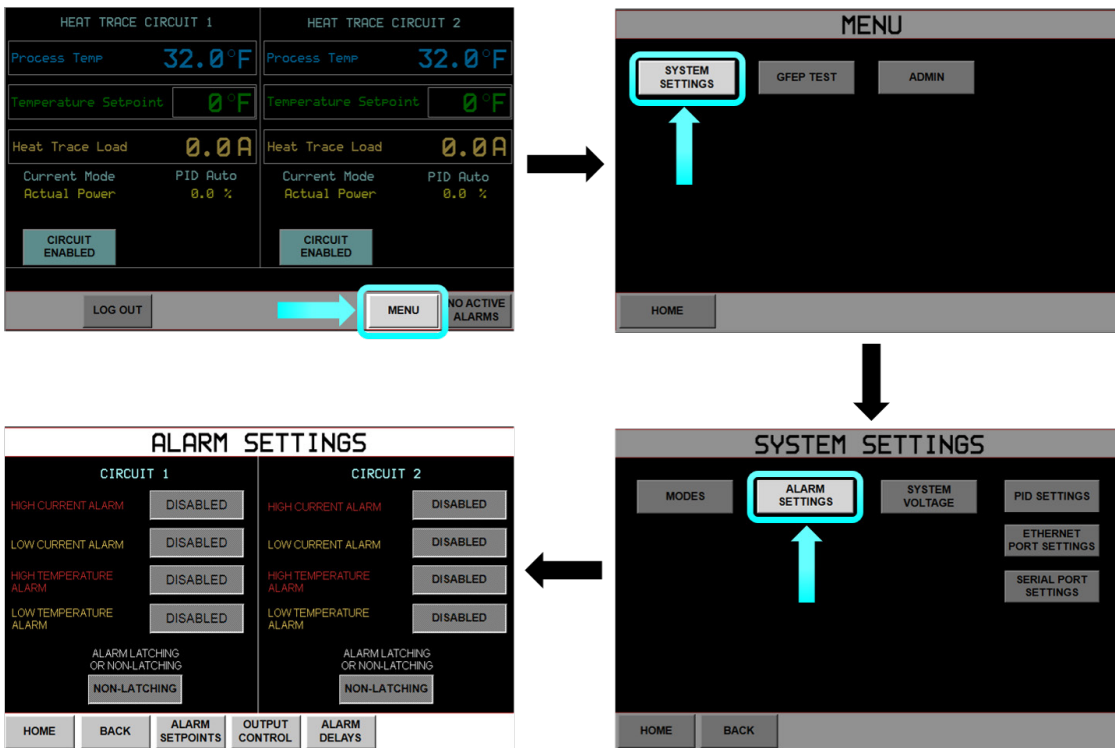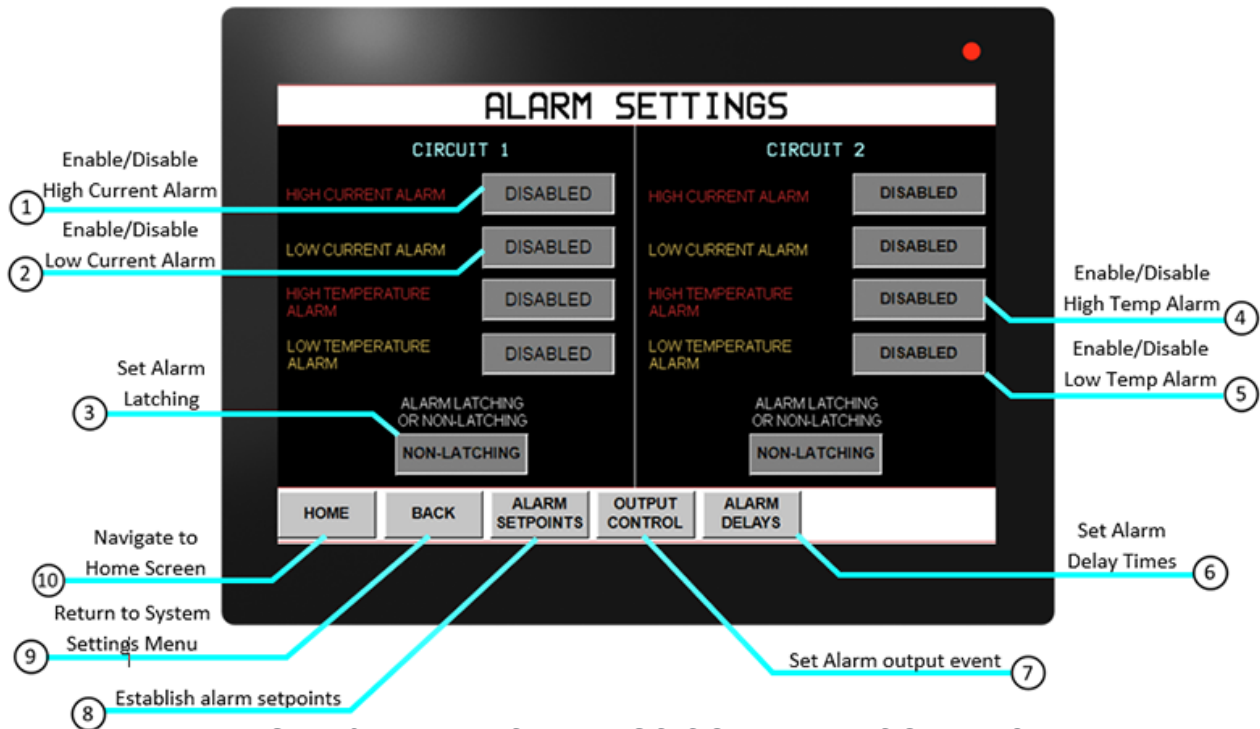

FIG. 4-7 ALARM SETTINGS NAVIGATION

SET UP

FIG. 4-8 ALARM SETTINGS SCREEN DESCRIPTION

The **Alarm Settings** Menu contains alarm configurations including Enabling or Disabling, Latching, Setpoints, Shutdown, and Delays. Active alarm prompts are displayed on the **Home Screen** and can be managed through the **Active Alarms Screen**. Pressing the button next to the indicated alarm will toggle between enablement and disablement. When the button reads **"ENABLED"** the corresponding alarm will be activated based on alarm setpoints and output control action. Default values are disabled.

1. **High Current Alarm** - Occurs when load current exceeds High Current Alarm setpoint for a period of time defined in the **Alarm Delays Menu**.

2. **Low Current Alarm** - Occurs when load current is below Low Current Alarm setpoint for a period of time defined in the **Alarm Delays Menu**.

3. **Alarm Latching** - Toggle alarm latching. This will require manual alarm reset if an alarm event occurs, regardless if the process has returned to set parameters. If set to non-latching the alarm will clear automatically when alarm condition clears.

4. **High Temperature Alarm** - Occurs when the process temperature exceeds High Process Temp Alarm setpoint for a period of time defined in the **Alarm Delays Menu**.

SET UP

5. **Low Temperature Alarm** - Occurs when the process temperature is below the Low Process Temp Alarm setpoint for a period of time defined in the **Alarm Delays Menu**.

6. **Alarm Delays** - Displays **Alarm Delays Menu** where the user may set delay times for alarm annunciation after an alarm state has been triggered.

7. **Output Control** - Displays **Output Control Menu** for the user to toggle circuit shutdown on various alarm conditions.

8. **Alarm Setpoints** - Displays **Alarm Setpoints Menu**, where user can establish setpoints for alarm events.

9. **Back** - Return to **System Settings Menu**.

10. **Home** - Return to **Home Screen**.

SET UP

Alarm Setpoints

Navigate to the **Alarm Setpoints Menu** from the **Home Screen** by selecting
"MENU" [MENU] > **"SYSTEM SETTINGS"** [SYSTEM SETTINGS] > **"ALARM SETTINGS"** [ALARM SETTINGS]
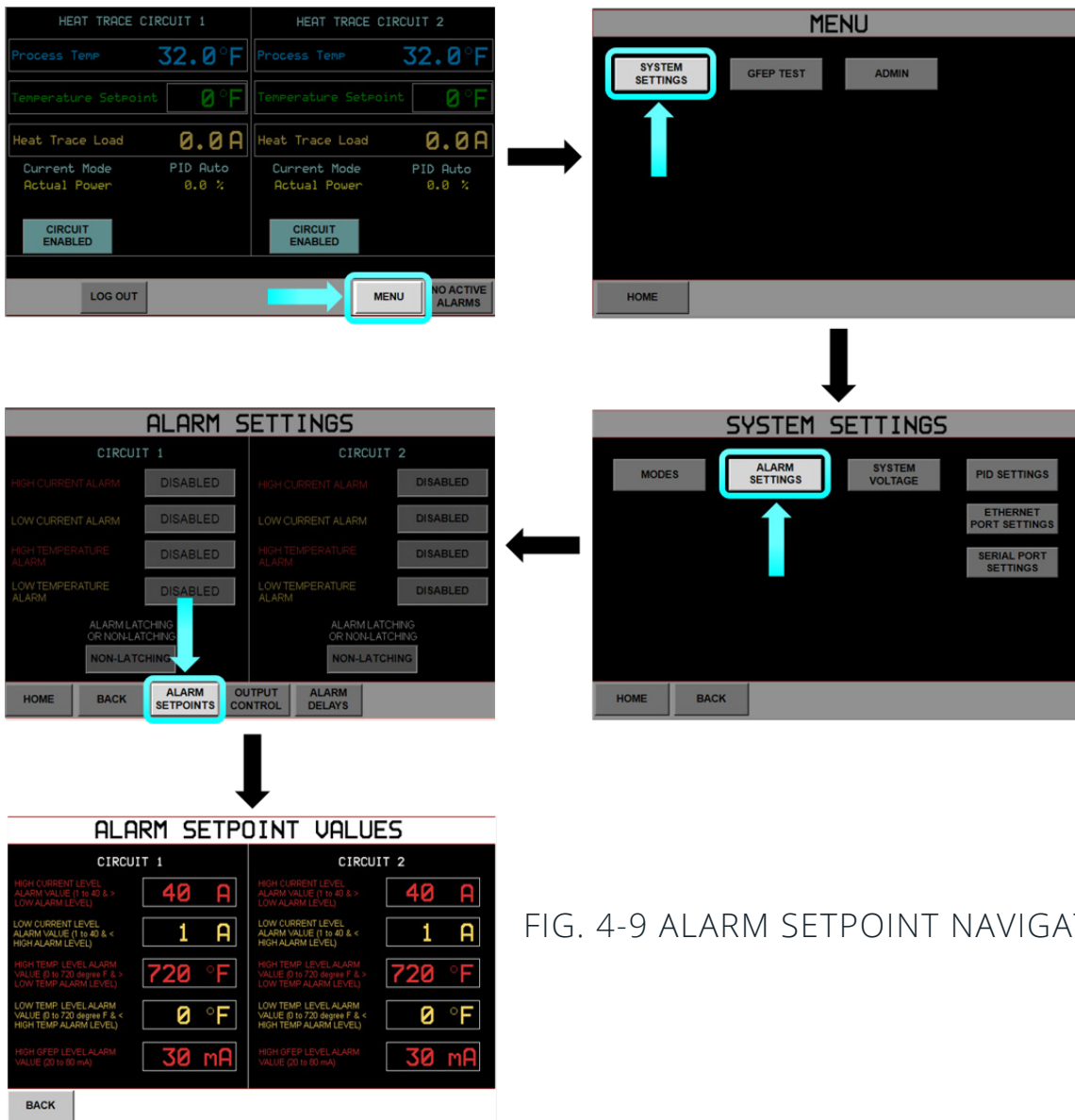>**"ALARM SETPOINTS"** [ALARM SETPOINTS]

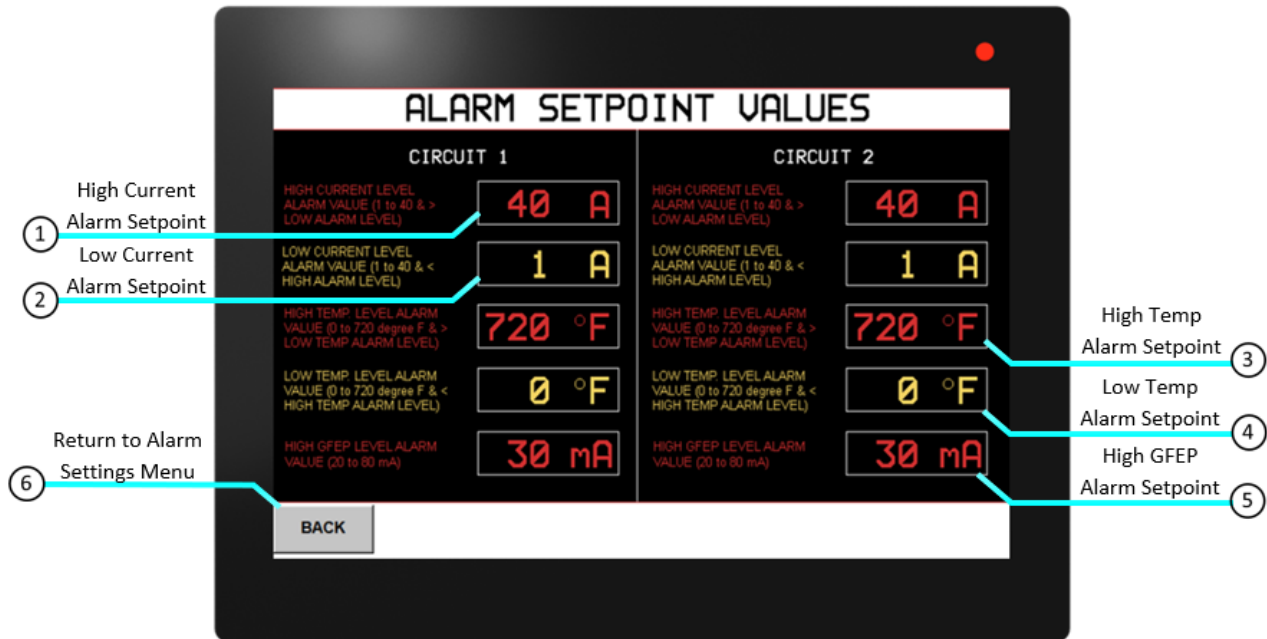FIG. 4-9 ALARM SETPOINT NAVIGATION

SET UP

FIG. 4-10 ALARM SETPOINT DESCRIPTION

Establish alarm values in the **Alarm Setpoints Menu**. These values will determine when an alarm state is triggered. Default values are shown in Figure 4-10.

1. **High Current Alarm Value** - Establish setpoint for High Current Alarm. Range is 1-40A and must be greater than the Low Current Alarm setpoint. This value will trigger the High Current Alarm the process value exceeds the setpoint.

2. **Low Current Alarm Value** - Establish setpoint for Low Current Alarm. Range is 1-40A and must be less than the High Current Alarm setpoint. The value will trigger the Low Current Alarm once the process value is below the setpoint.

3. **High Temperature Alarm Setpoint** - Establish setpoint for High Temperature Alarm. Range is 0-720 °F and must be greater than the Low Temperature Alarm setpoint. This value will trigger the High Temperature Alarm once the process value exceeds the setpoint.

4. **Low Temperature Alarm Setpoint**- Establish setpoint for Low Temperature Alarm. Range is 0-720 °F and must be less than the High Temperature Alarm setpoint. The value will trigger the Low Temperature Alarm once the process value is below the setpoint.

5. **High GFEP Level Alarm**- Establish setpoint for High GFEP Level Alarm. Range is 20-80mA. This value will trigger the High GFEP Level Alarm once the residual current exceeds the setpoint.

6. **Back**- Return to **Alarm Settings Menu**.

SET UP

Alarm Output Control

Navigate to the **Alarm Output Control Menu** from the **Home Screen** by selecting **"MENU"** MENU > **"SYSTEM SETTINGS"** SYSTEM SETTINGS > **"ALARM SETTINGS"** ALARM SETTINGS >**"ALARM OUTPUT CONTROL"** OUTPUT CONTROL
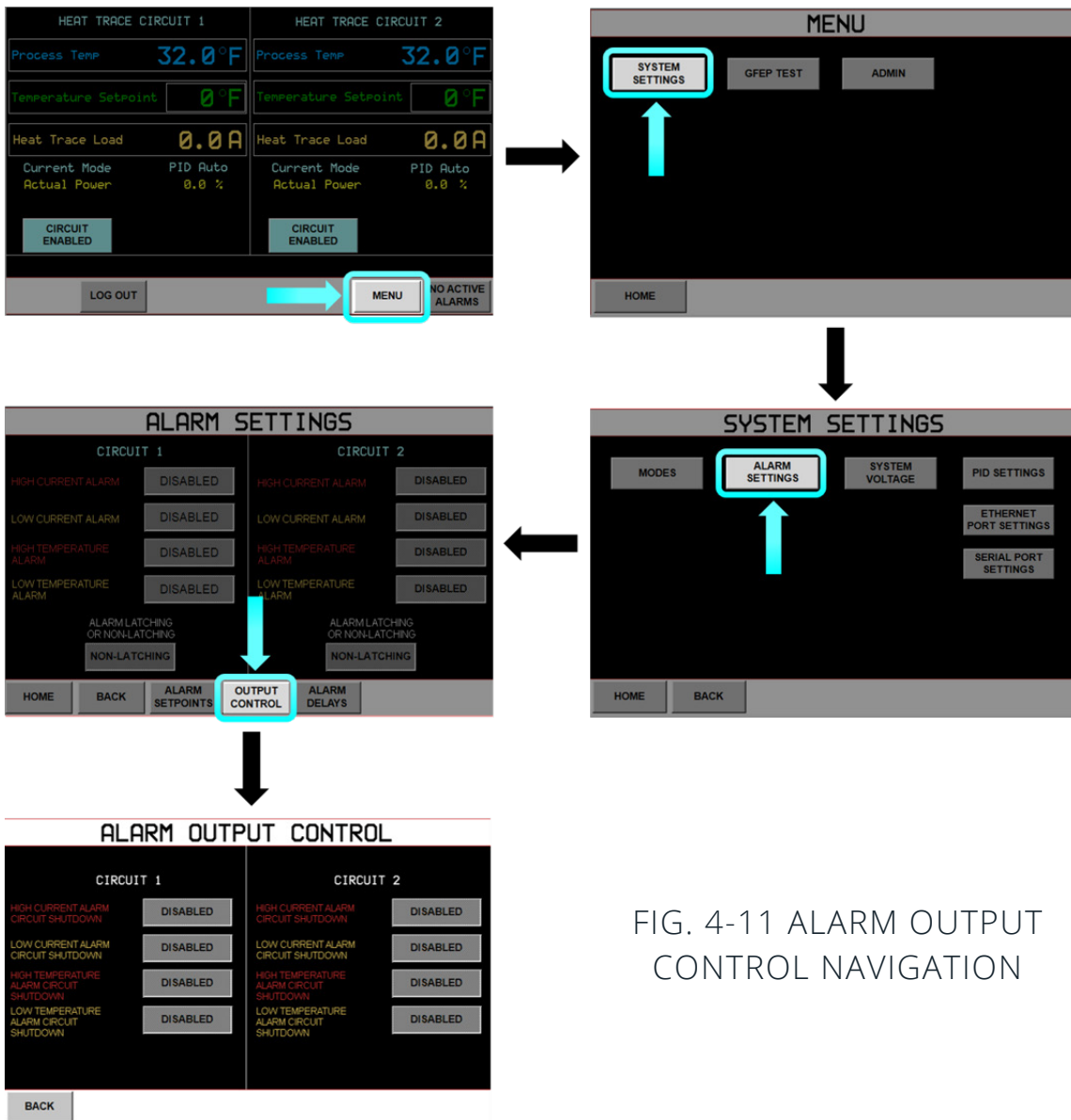

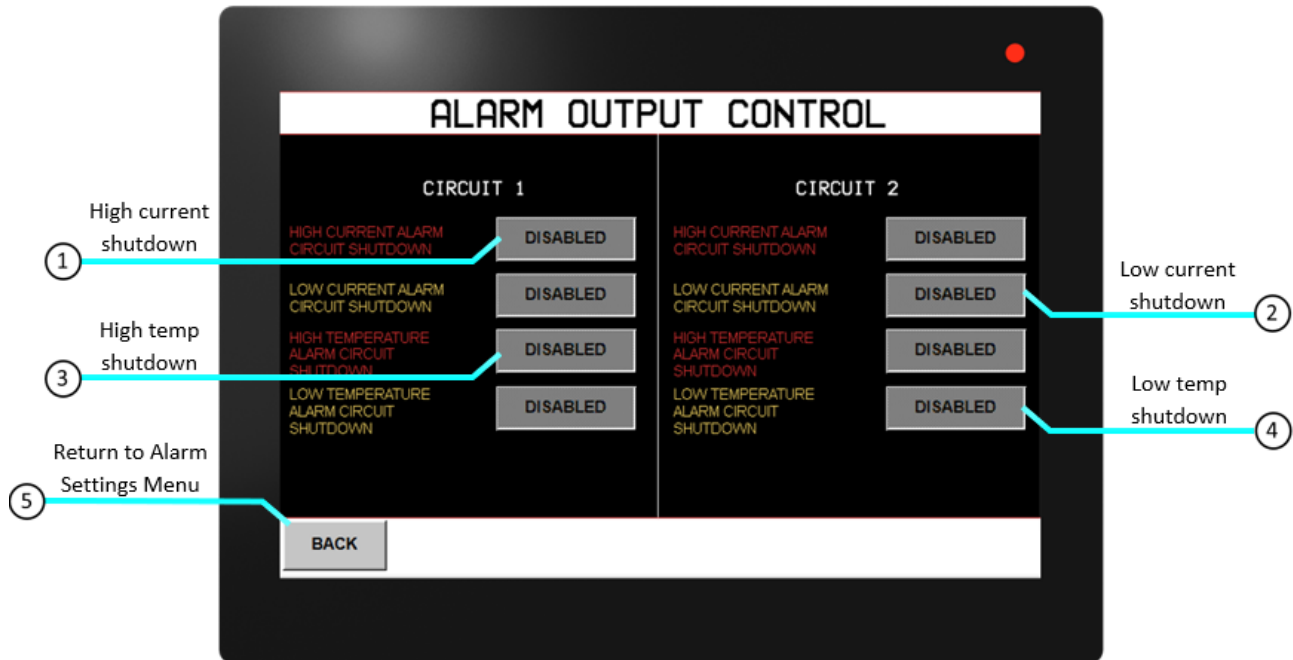FIG. 4-11 ALARM OUTPUT CONTROL NAVIGATION

SET UP

FIG. 4-12 ALARM OUTPUT CONTROL DESCRIPTION

In the Alarm Output Control Menu, the user may enable circuit shutdown upon a specified alarm state. Pressing the button next to the indicated alarm will toggle between enablement and disablement. When the button text reads "**ENABLED**" the output to the load will be turned off when the corresponding alarm is in an alarm state. This will override the expected function of the selected mode. Default values for each are "**DISABLED**".

1. **High Current Alarm Circuit Shutdown**-Enable or disable circuit shutdown in the event of a High Current Alarm. Output to load will be disabled while High Current Alarm is active if button reads **"ENABLED"**.

2. **Low Current Alarm Circuit Shutdown**- Enable or disable circuit shutdown in the event of a Low Current Alarm. Output to load will be disabled while Low Current Alarm is active if button reads **"ENABLED"**.

3. **High Temperature Alarm Circuit Shutdown**- Enable or disable circuit shutdown in the event of a High Temperature Alarm. Output to load will be disabled while High Temperature Alarm is active if button reads **"ENABLED"**.

4. **Low Temperature Alarm Circuit Shutdown**- Enable or disable circuit shutdown in the event of a Low Temperature Alarm. Output to load will be disabled while Low Temperature Alarm is active if button reads **"ENABLED"**.

5. **Back**- Return to **Alarm Settings Menu**.

SET UP

Alarm Delay Settings

Navigate to the **Alarm Delays Menu** from the **Home Screen** by selecting
"MENU"   [MENU]   > **"SYSTEM SETTINGS"**   [SYSTEM SETTINGS]   > **"ALARM SETTINGS"**   [ALARM SETTINGS]
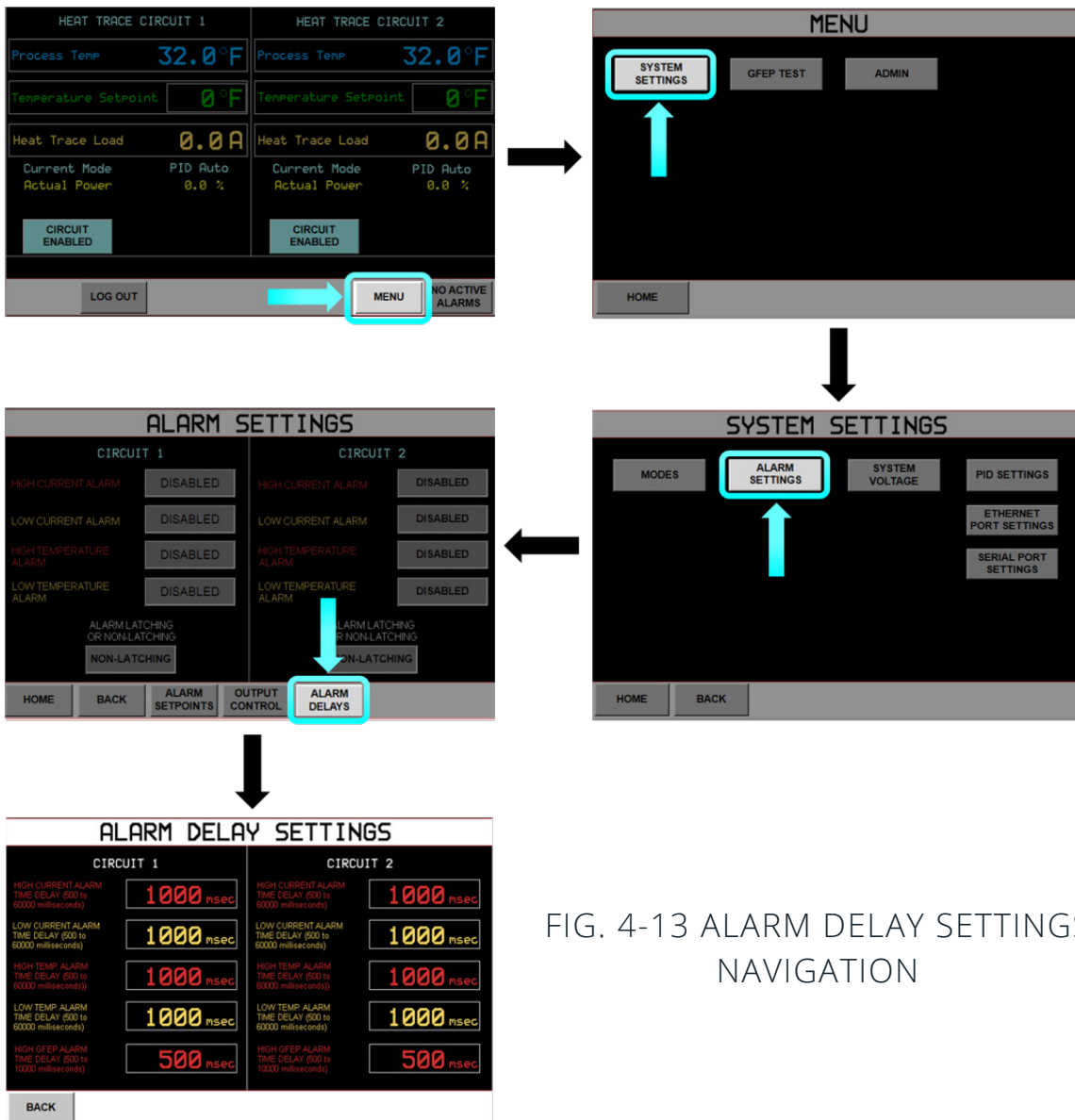>**"ALARM DELAYS"**   [ALARM DELAYS]

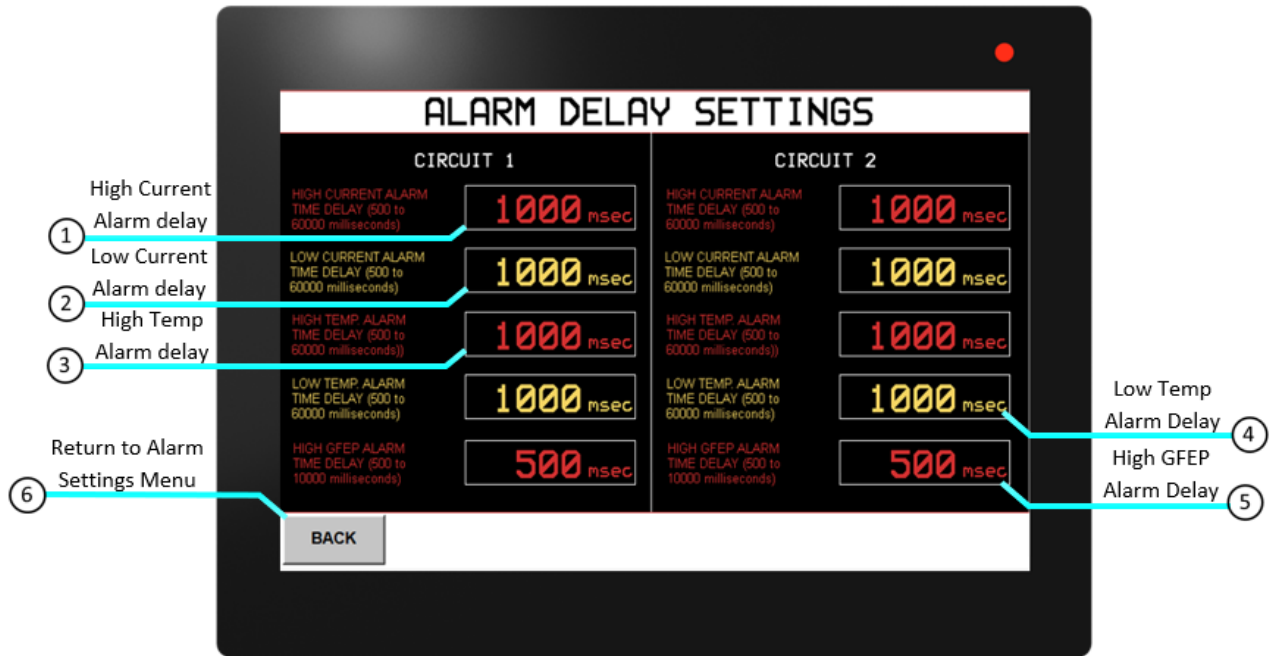FIG. 4-13 ALARM DELAY SETTINGS NAVIGATION

SET UP

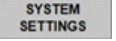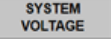FIG. 4-14 ALARM DELAY SETTINGS DESCRIPTION

In the **Alarm Delay Settings Menu**, set the time interval for which an alarm will be activated after an alarm state has been entered. This feature is to prevent nuisance alarms, such as the User Low Temperature Alarm on system start up. If alarm state resolves before the specified time, no alarm events, such as circuit shutdown, will occur. Units of time are in milliseconds.

1. **High Current Alarm Time Delay** - Set the delay time (500-60,000miliseconds) for an alarm to be activated after a High Current alarm state has been entered.

2. **Low Current Alarm Time Delay** - Set the delay time (500-60,000miliseconds) for an alarm to be activated after a Low Current alarm state has been entered.

3. **High Temperature Alarm Time Delay** - Set the delay time (500-60,000miliseconds) for an alarm message to be activated after a High Temperature alarm state has been entered.

4. **Low Temperature Alarm Time Delay** - Set the delay time (500-60,000miliseconds) for an alarm to be activated after a Low Temperature alarm state has been entered.

5. **High GFEP Alarm Time Delay** - Set the delay time (500-10,000miliseconds) for an alarm to be activated after a High GFEP alarm state has been entered.

6. **Back** - Return to **Alarm Settings Menu**.

SET UP

System Voltage

Navigate to the **System Voltage Menu** from the **Home Screen** by selecting
"MENU" [MENU] > **"SYSTEM SETTINGS"** [SYSTEM SETTINGS] > **"SYSTEM VOLTAGE"** [SYSTEM VOLTAGE]

FIG. 4-15 SYSTEM VOLTAGE NAVIGATION

SET UP

FIG. 4-16 SYSTEM VOLTAGE DESCRIPTION
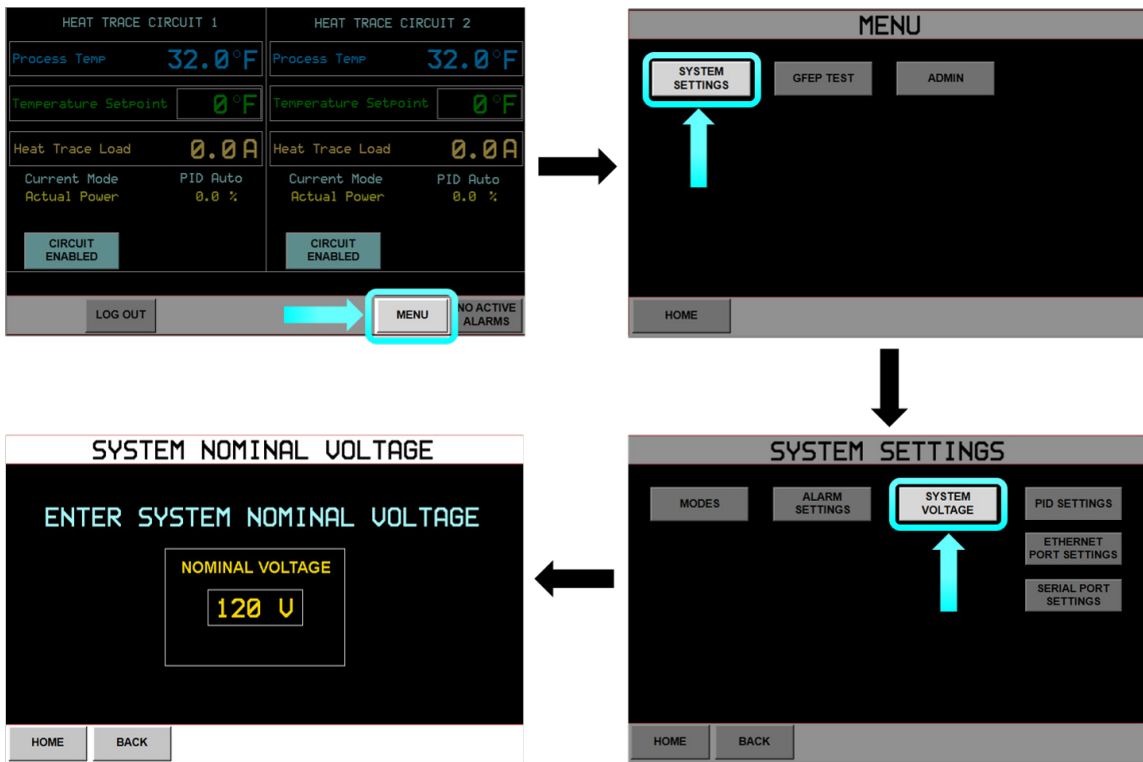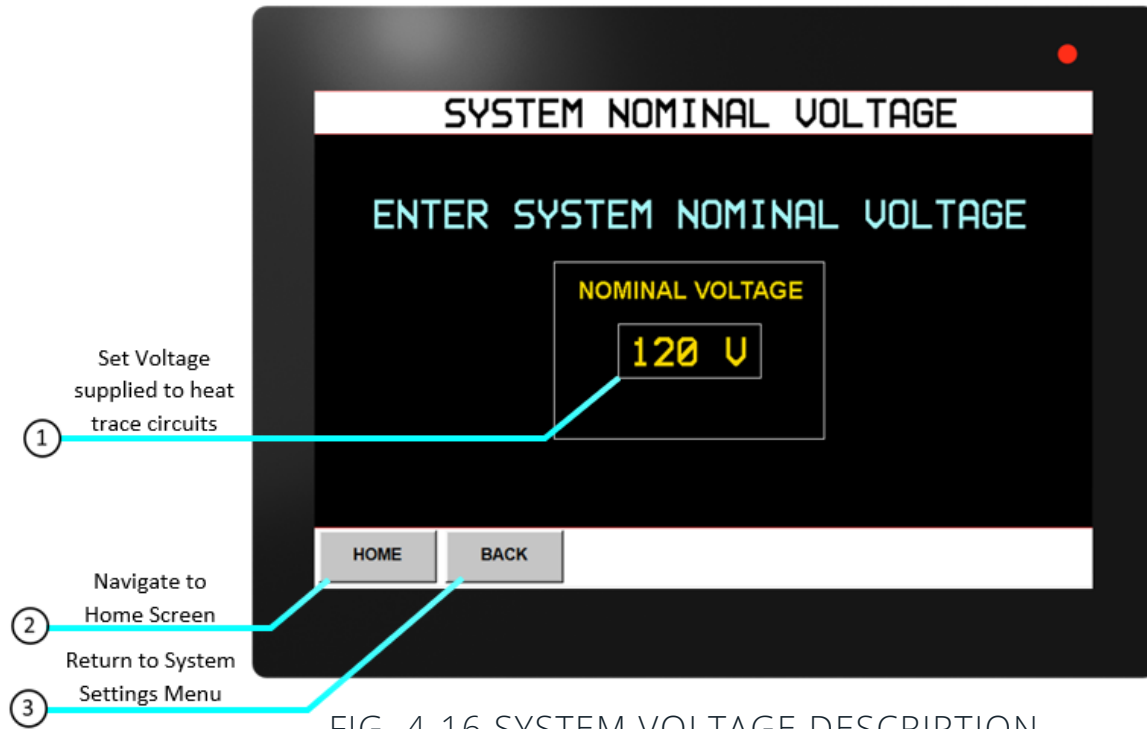
Input the System Nominal Voltage applied to the AccuTrace™. This value will be utilized in the AccuTrace™ GFEP Test feature, in the **GFEP Test Screen**.

1. Enter voltage supplied to the heat trace circuits. This voltage will be used in the **GFEP Current Test** calculation. Range: 110-287V.

2. **Home** - Return to **Home Screen**.

3. **Back** - Return to **System Settings Menu**.

SET UP

PID Settings

Navigate to the **PID Settings Menu** from the **Home Screen** by selecting
"MENU"   `MENU`   > **"SYSTEM SETTINGS"**   `SYSTEM SETTINGS`   > **"PID SETTINGS"**   `PID SETTINGS`
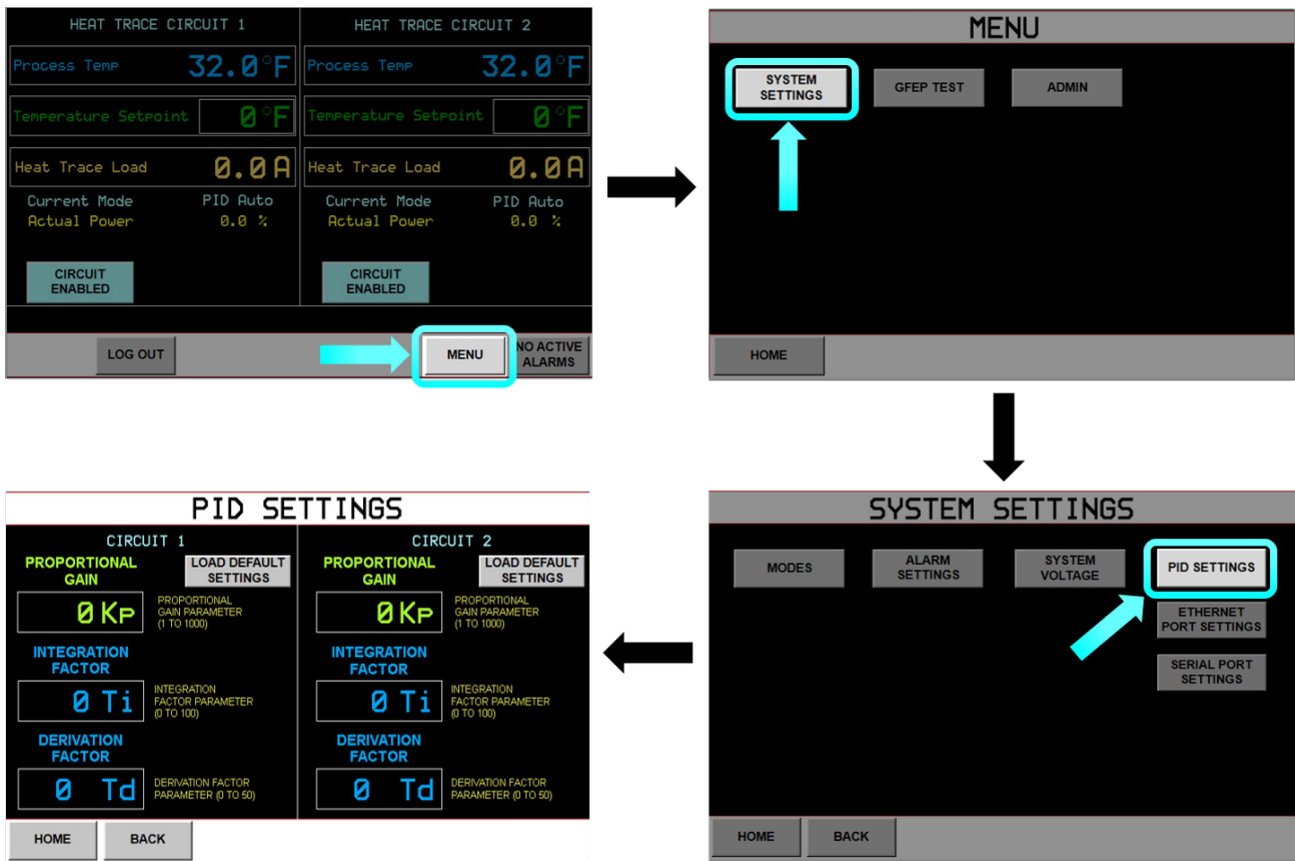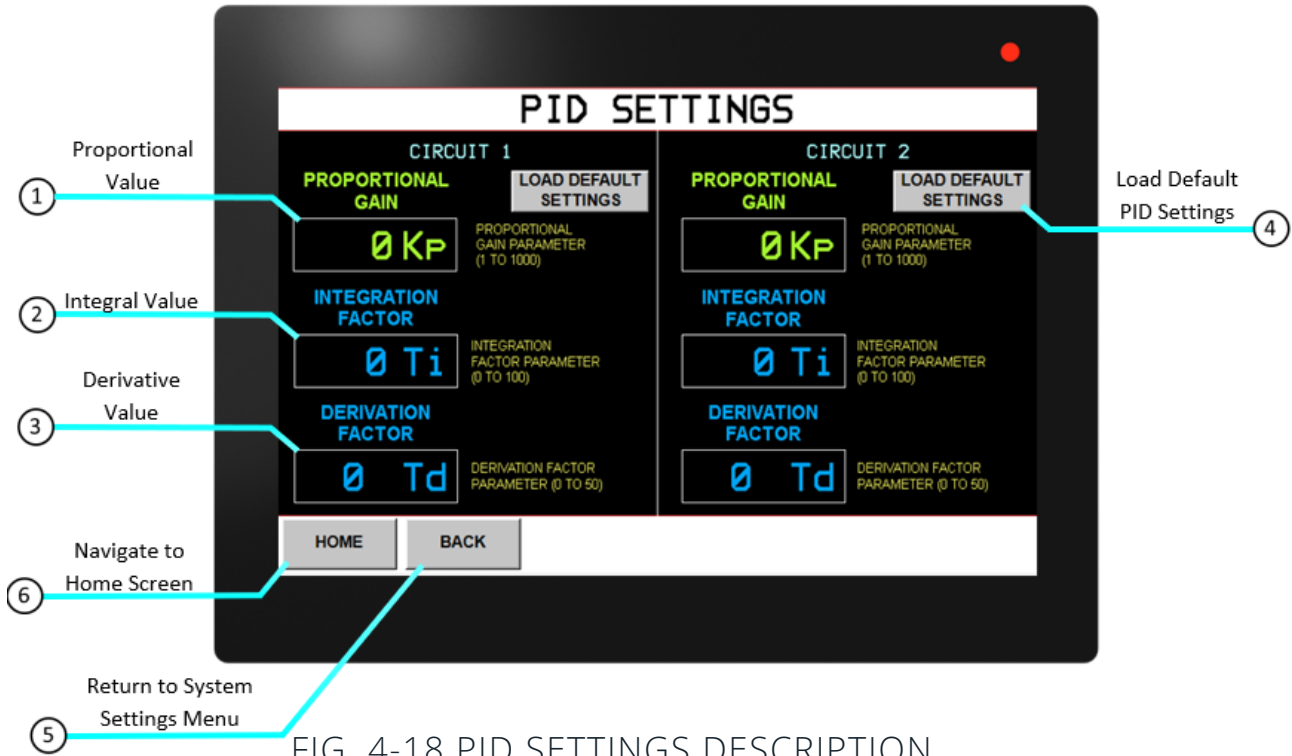

FIG. 4-17 PID SETTINGS NAVIGATION

SET UP

FIG. 4-18 PID SETTINGS DESCRIPTION

Set the PID parameters accordingly to control the process temperature. When the unit is first powered on, all parameters are set to 0. Press the "**LOAD DEFAULT SETTINGS**" button to establish a parameter base. Tune the parameters based on the system reaction.

1. **Proportional Gain** - Set proportional gain (Kp) value, Range: 1-1000. Establishes proportional band hysteresis.

2. **Integration Factor** - Set integration factor (Ti) value, Range: 0-100. Applies integral value to correct error in output curve.

3. **Derivation Factor** - Set derivation factor (Td) value, Range: 0-50. Stabilizes output curve to minimize over-correction from integration factor.

4. **Load Default Settings** - Loads default PID parameters. Tune the parameters based on system reaction.

5. **Back** - Return to **System Settings Menu**.

6. **Home** - Return to **Home Screen**.

SET UP

GFEP Test

Navigate to the GFEP Test Menu from the Home Screen by selecting
"MENU" [MENU] **> "GFEP TEST"** [GFEP TEST]
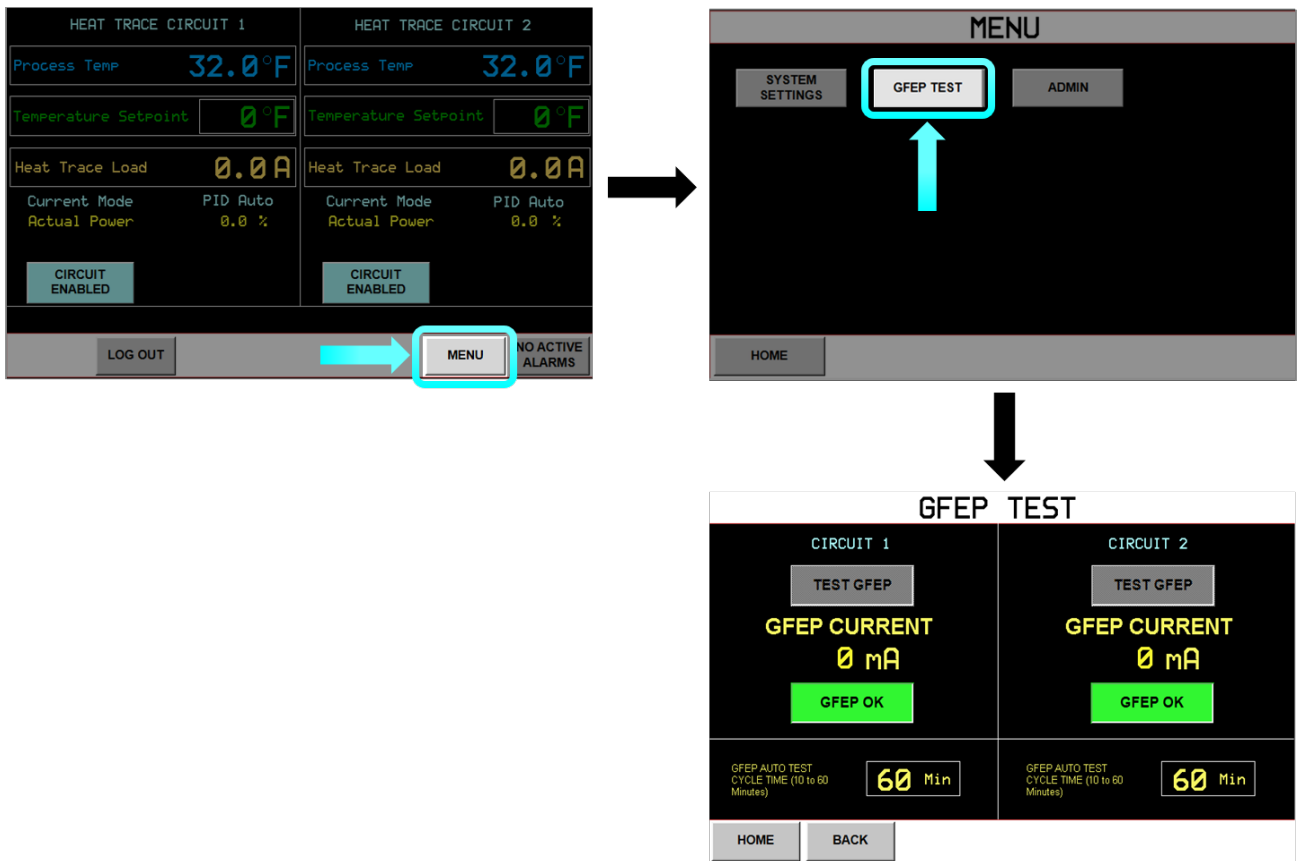
FIG. 4-19 GFEP TEST NAVIGATION

SET UP
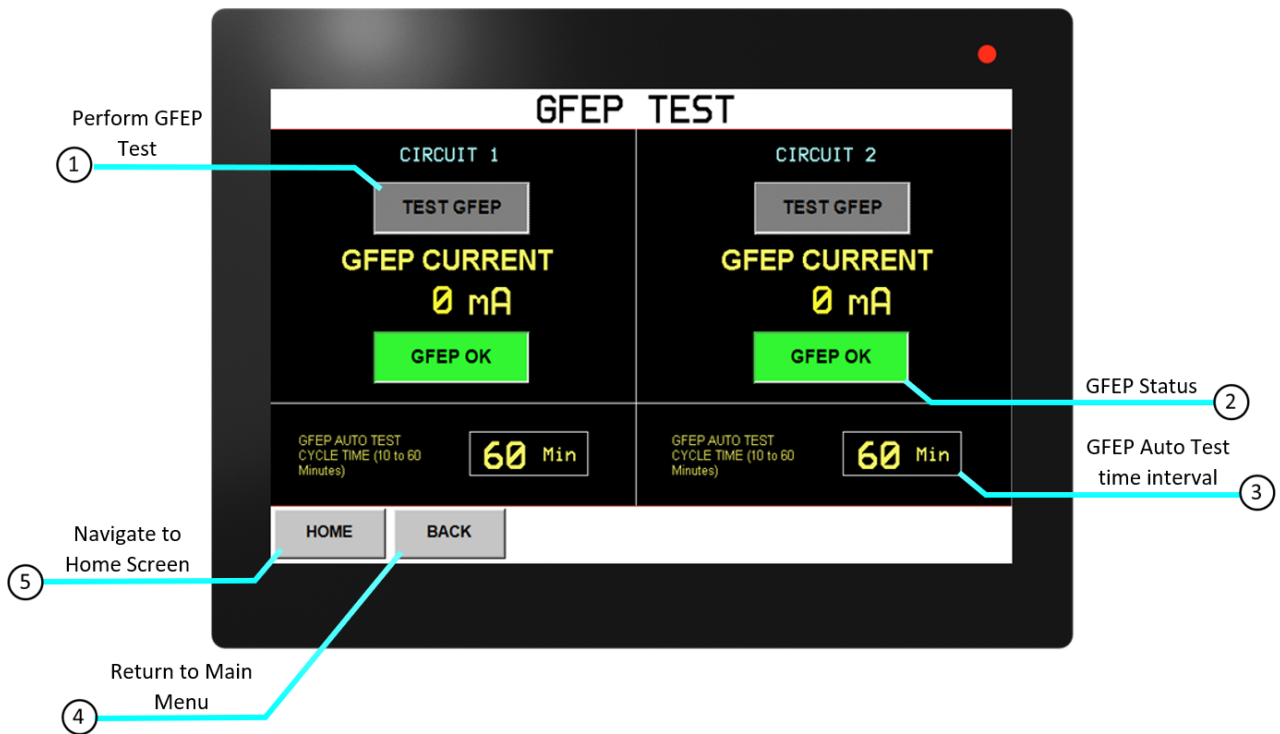
FIG. 4-20 GFEP TEST SCREEN DESCRIPTION

A self-test will be performed periodically based on the cycle time setpoint. The system will apply a test current to the GFEP detection circuit and compare the measured result with the expected result. If the test fails an alarm will be generated. This alarm will not affect the load output and is for information only.

1. **Test GFEP-**Performs an immediate GFEP test upon button press.

2. **GFEP Status-**Displays the result of the auto or immediate GFEP test.

3. **GFEP Auto Test Cycle Time-**Set the time interval that the Auto GFEP Test will occur. Range 10-60 minutes.

4. **Back-**Return to **Main Menu.**

5. **Home-**Return to **Home Screen.**

SET UP

Admin Menu

Navigate to the **Admin Menu** from the **Home Screen** by selecting

"MENU" MENU > **"ADMIN"** ADMIN
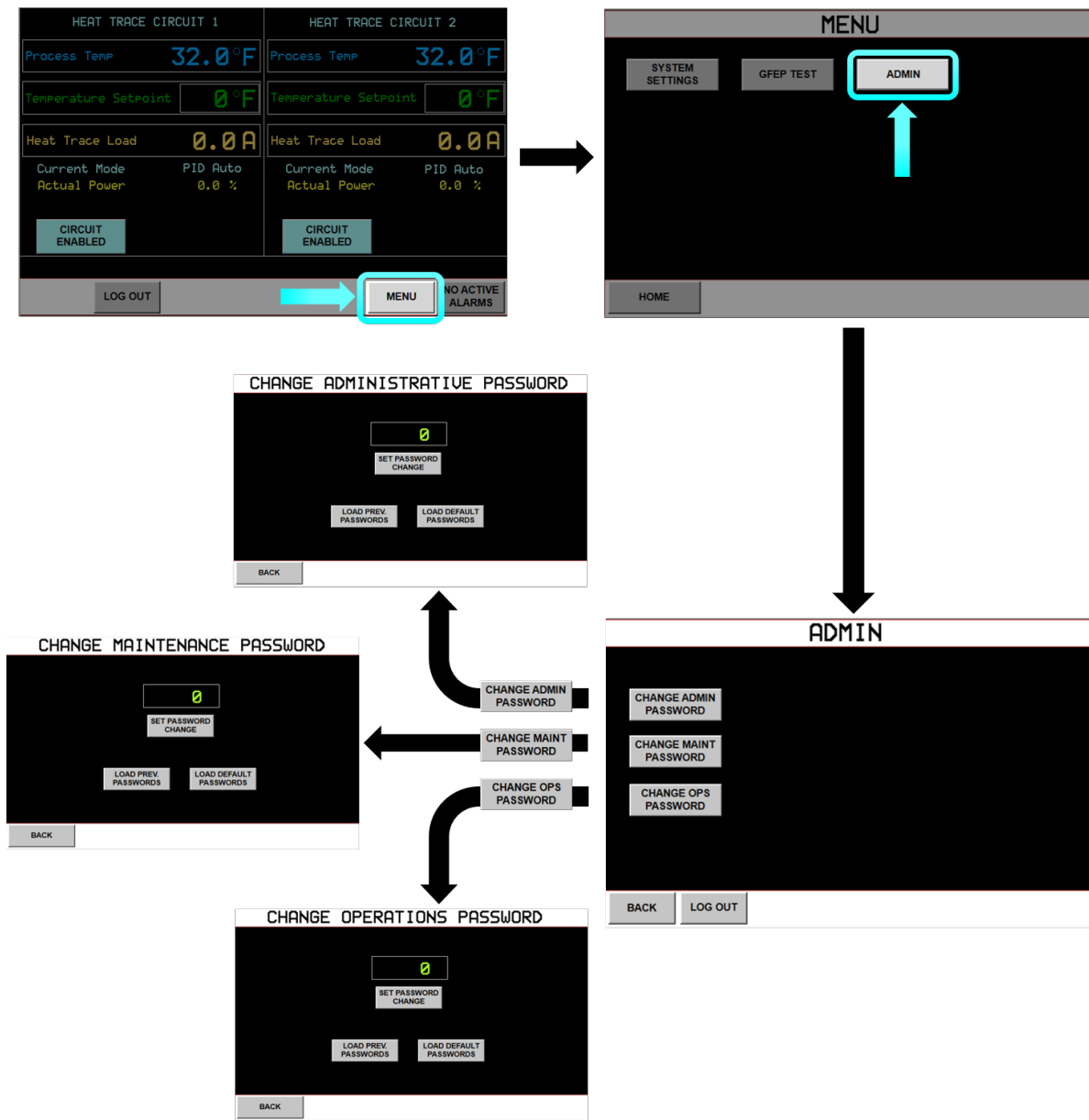
FIG. 4-21 ADMIN MENU NAVIGATION

SET UP

FIG. 4-22 ADMIN MENU DESCRIPTION
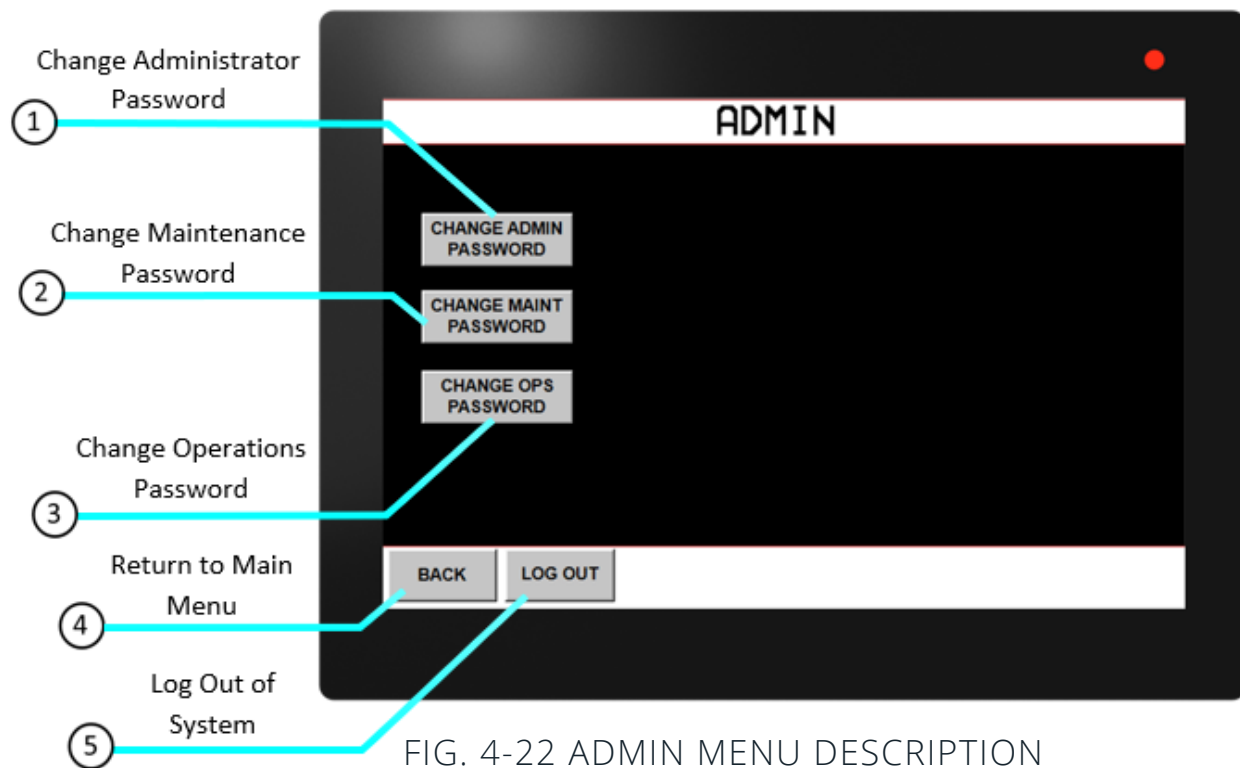
The **Admin Menu** is where the user may change passwords for security levels Admin, Maintenance, and Operations.

1. **Change Admin Password** - Displays Admin Password Screen where the administrator may set a new password for the Administrator security level.
2. **Change Maint Password** - Displays Maint Password Screen where the administrator may set a new password for the Maintenance security level.
3. **Change Ops Password** - Displays Ops Password Screen where the administrator may set a new password for the Operations security level.
4. **Back -** Return to **Main Menu**.
5. **Log Out** - Log out of system.

SET UP
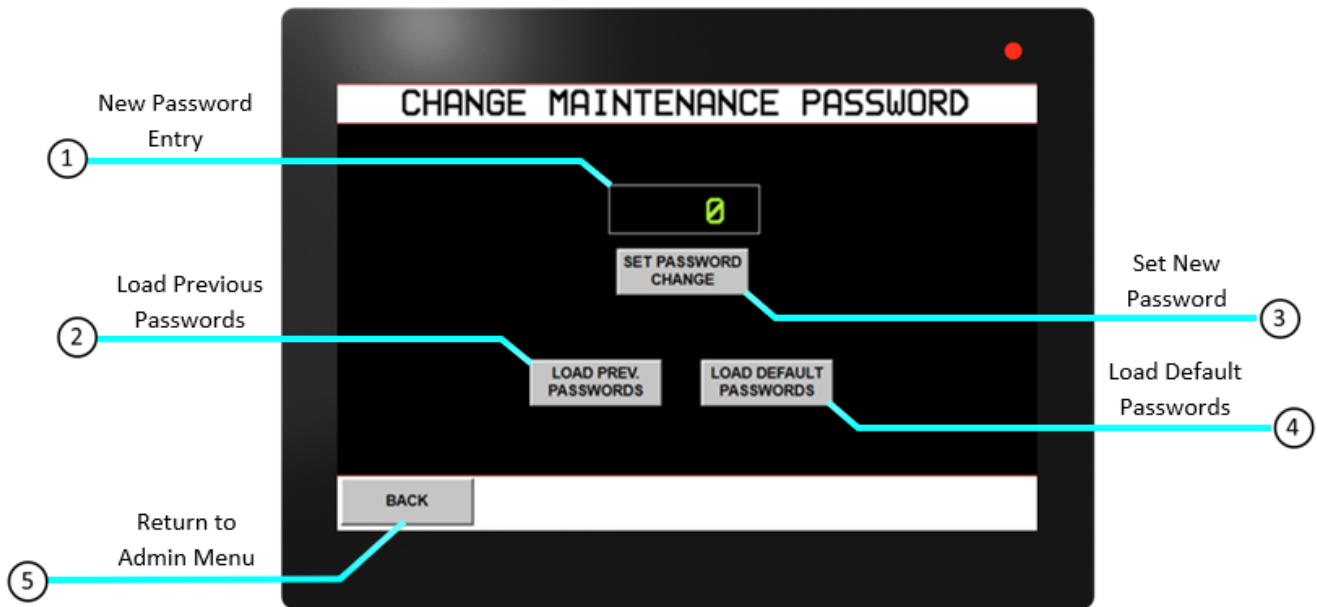
FIG. 4-23 PASSWORD CHANGE DESCRIPTION

1. **New Password Entry Field** - Enter new 4-digit numerical password.
2. **Load Previous Passwords** - Will load the password previous to the current one, in the event the current password has been lost.
3. **Set Password Change** - Sets the password change that was entered in the password entry field.
4. **Load Default Passwords** - Resets password to default value.
5. **Back** - Return to **Admin Menu**.

SET UP

ACCUTRACE™ QUICK START GUIDE

Step 1. Log in (Figures 3-3 – 3-6 for more info)
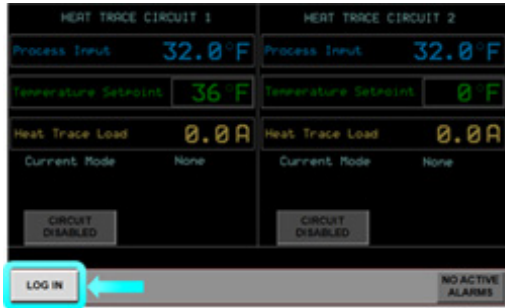
PRESS THE "LOG-IN" BUTTON
ON THE HOME SCREEN
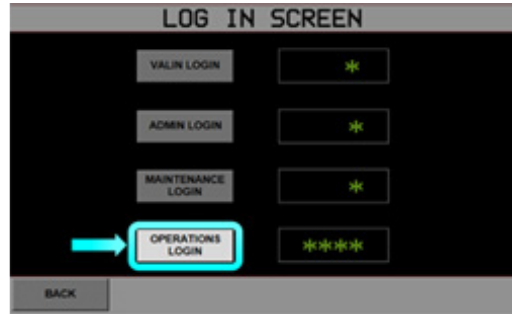
ENTER YOUR PASSWORD AND PRESS THE "LOG-IN" BUTTON NEXT TO THE ENTRY FIELD

Step 2. Modes Menu (Figure 4-1 for more info)

PRESS **"MENU"**

PRESS **"SYSTEM SETTINGS"**
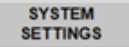
PRESS **"MODES"**
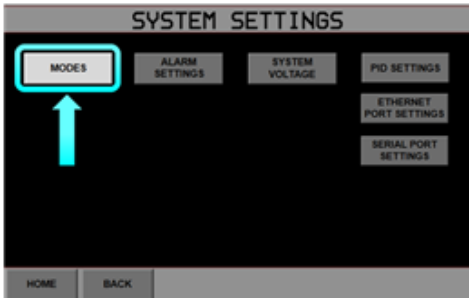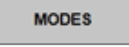
Step 3. Select a Control Mode (Figure 4-6 for more info)

Auto PID - A closed loop control method that will control the power output based on a PID algorithm. The variables can be modified from the **System Settings Menu** under **PID Settings**.
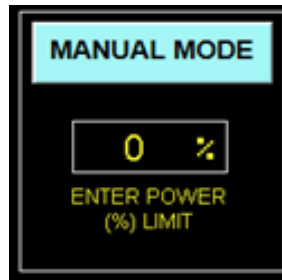
Manual - An open loop control method that sets the power output to a user-specified percentage. Manual Mode is also the failover mode from Auto PID or On/Off when the temperature sensor fails. Set the output accordingly for the application range of power limit (%).

On/Off - A closed loop control method that utilizes Deadband hysteresis values to determine the power output. The output will turn off once the process temperature reaches the deadband's high setpoint and turns on when the process temperature reaches the deadband's low setpoint.

Step 4. Enable the Circuit!

You have completed your Quick Set Up! Press the "HOME" button to view your process.
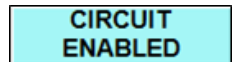
COMMUNICATIONS

Modbus Serial Communications

Navigate to the **Serial Port Settings Menu** from the **Home Screen** by selecting
"MENU" `MENU` > **"SYSTEM SETTINGS"** `SYSTEM SETTINGS` > **"SERIAL PORT SETTINGS"** `SERIAL PORT SETTINGS`
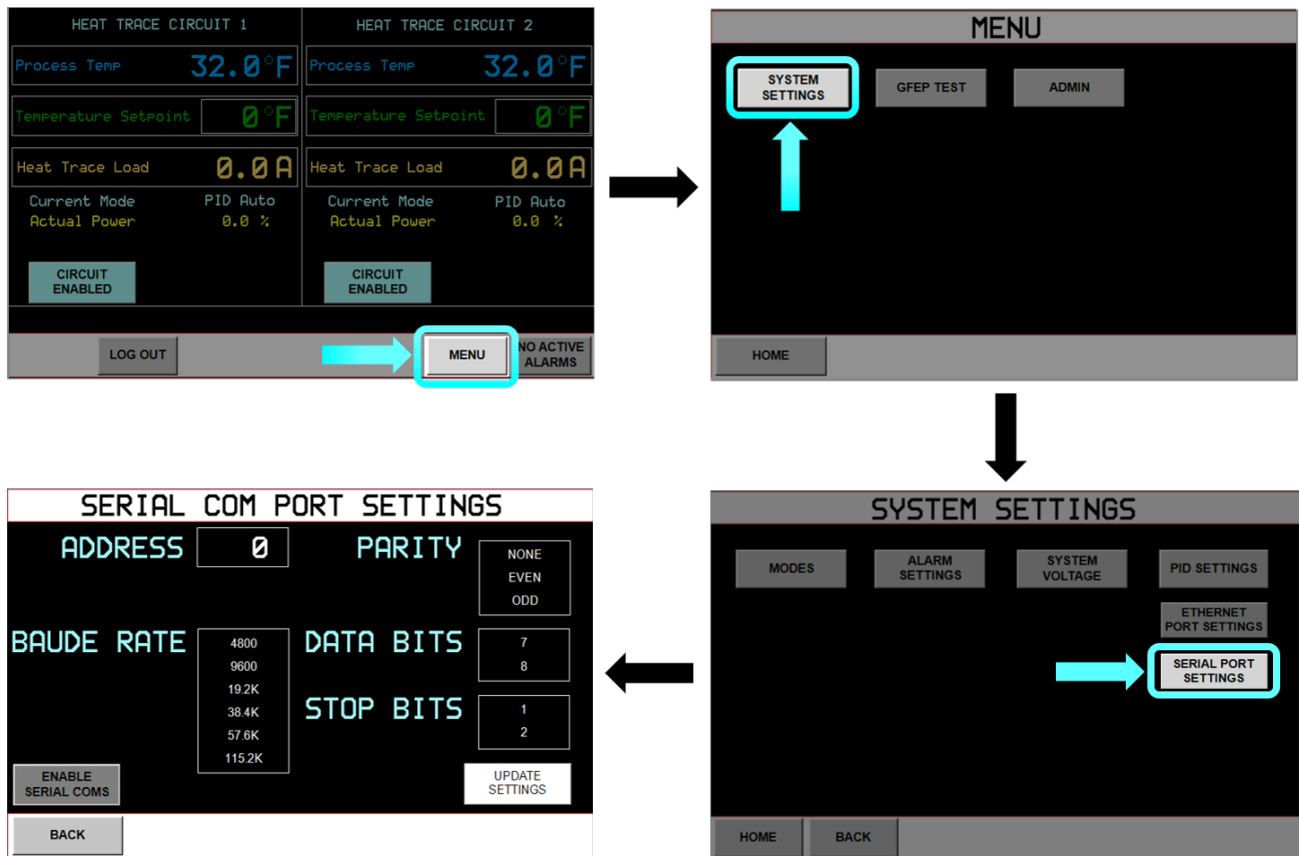
FIG. 5-1 SERIAL PORT SETTINGS NAVIGATION
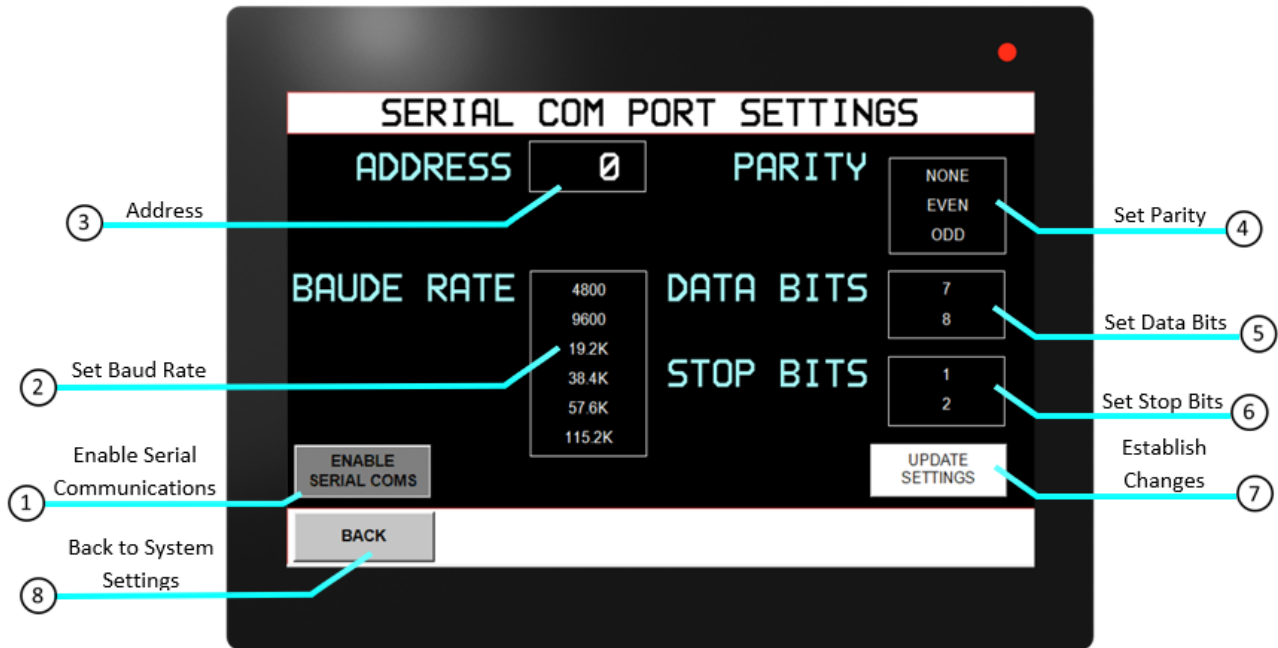
COMMUNICATIONS

FIG. 5-2 SERIAL PORT SETTINGS DESCRIPTION

The AccuTrace™ acts as a modbus server (slave). Be sure to coordinate all settings with the client.

1. **Enable Serial Coms** - This will enable serial communications. Serial communications must be enabled first before settings are updated, otherwise the changes will not be saved. Refer to Figure 5-3 below.

2. **Baud Rate** - Baud Rate is the measure of number of times per second a signal in a communication channel changes state. For AccuTrace™ units, the baud rate may be 4800, 9600, 192K,38.4K, 57.6K, or 115.2K.

3. **Address** - Set a unique node address (1 to 125).

4. **Parity** - Parity bit is included to check that data has been transmitted accurately. For AccuTrace™, parity bits are none, even, or odd.

5. **Data Bits** - Data bits are number of bits used to represent one character of data. AccuTrace™ data bits can be set to 7 or 8.

6. **Stop Bits** - Stop bits are inserted into the data frame to inform the receiving end that the transmission of a byte of data is complete. AccuTrace™ stop bits can be set to 1 or 2.

7. **Update Settings** - Pressing this button saves the changes made. If this is not pressed after the settings have been updated, the changes will not be established.

8. **Back** - Navigate back to System Settings.

COMMUNICATIONS

Changing Serial Communications Settings
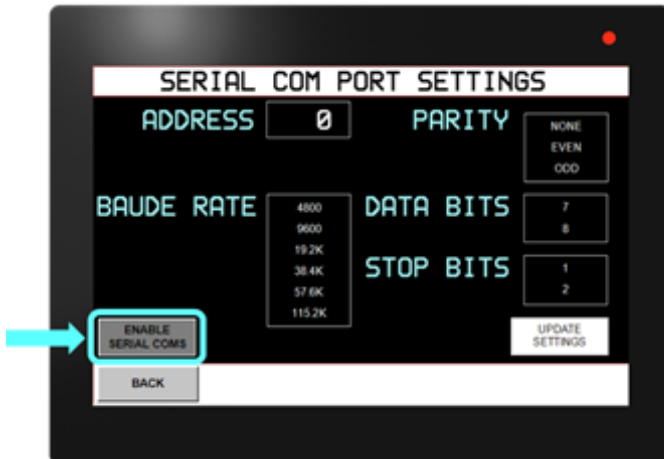
1. Press "**ENABLE SERIAL COMS**" before changing settings. If this is not pressed before updating settings, changes will not be saved.
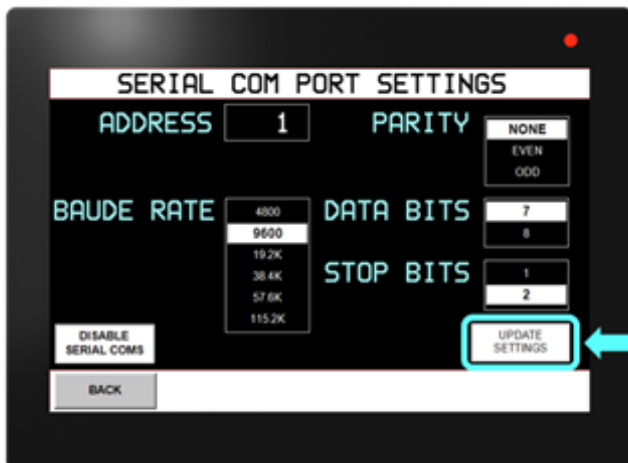
2. Once serial communications are enabled, the settings may be changed. Select the parameters that coincide with the client (master) device. After this is complete, press **"UPDATE SETTINGS"**. If this is not pressed, the changes will not be saved.
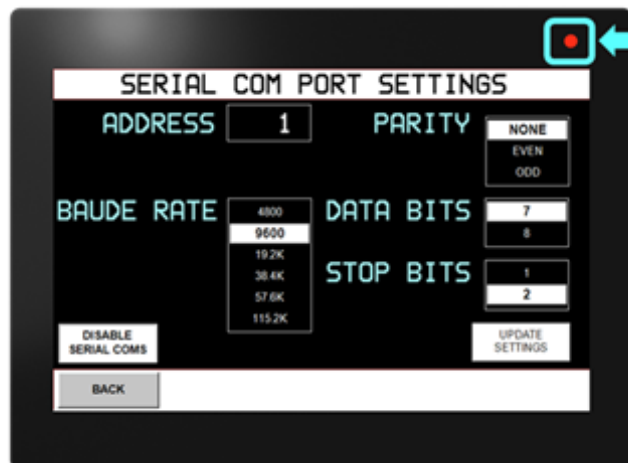
3. Examine the LED Indicator. If it is a steady red, then communications have been established. However, if the LED indicator is flashing, this means that communications have failed. Check settings and wiring if this occurs.

FIG. 5-3 MODIFYING SERIAL PORT SETTINGS

COMMUNICATIONS

Ethernet Port Settings

Navigate to the **Ethernet Port Settings Menu** from the **Home Screen** by selecting
"MENU" `MENU` > **"SYSTEM SETTINGS"** `SYSTEM SETTINGS` > **"ETHERNET PORT SETTINGS"** `ETHERNET PORT SETTINGS`
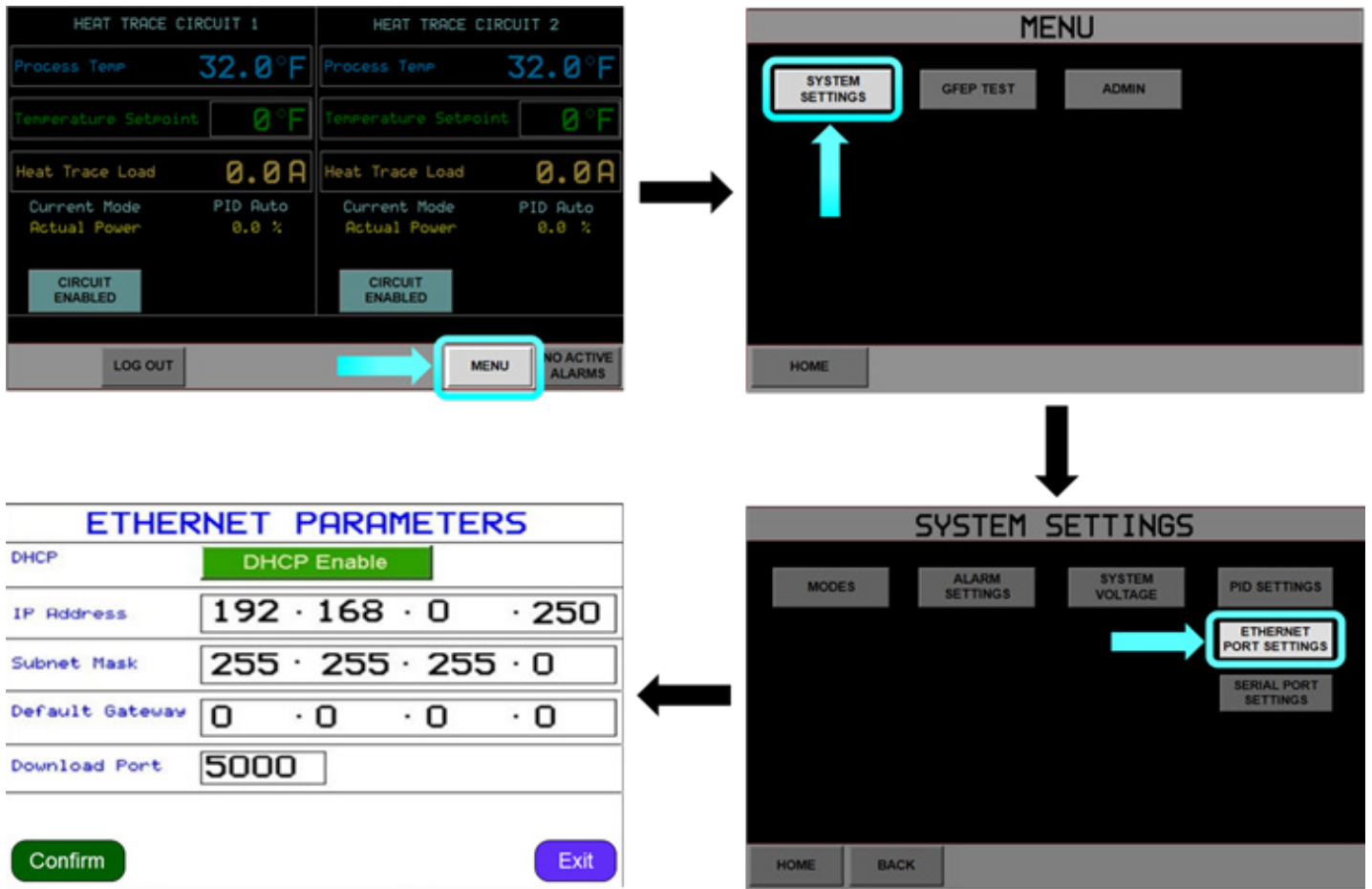
FIG. 5-12 ETHERNET PORT SETTINGS NAVIGATION

COMMUNICATIONS
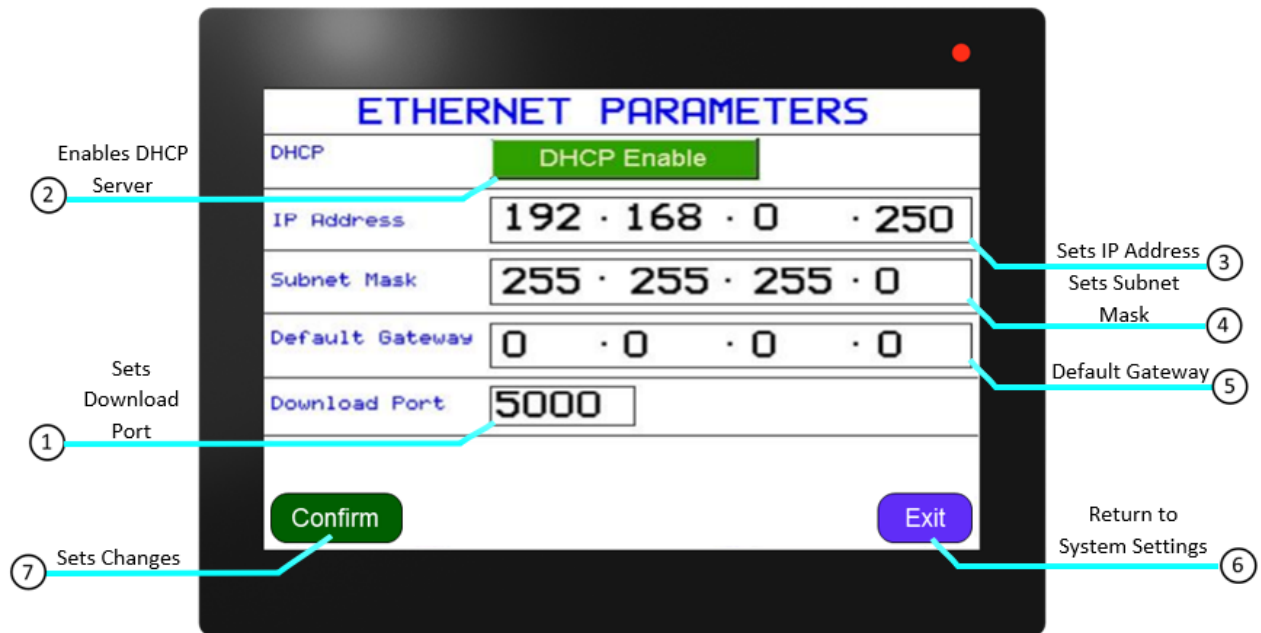
FIG. 5-13 ETHERNET SETTINGS DESCRIPTION

1. **Download Port** - Download Port-The Download port value must remain "5000"

2. **DHCP** - If the DHCP server is enabled, the unit will get an IP address assigned by the server.

3. **IP Address** - Set unique address to the device. If DHCP (Dynamic Host Configuration Protocol) server is not enabled in the network, an IP will be not automatically be assigned to the unit. However, if DHCP server is enabled, the unit will get an IP address assigned by the server. Range: (1-254).(0-255).(0-255).(1-254).

4. **Subnet Mask** - The Subnet mask should be set according to the network configuration. Default Settings: 255.255.255.0. Range: (0-255).(0-255).(0-255).(0-255)

5. **Default Gateway** - The Default Gateway should be set according to the network configuration. Default Settings: 0.0.0.0 , undefined. Range: (1-254).(0-255).(0-255).(1-254)

6. **Exit** - Return to **System Settings Menu**.

7. **Confirm** - Sets the changes made to the settings. This must be pressed for the changes to be saved.

COMMUNICATIONS

Modbus Registers and Descriptions

In Modbus protocol, the master device will send a query to the slave device and read data from its registers (Figure 5-4). The Modbus register tables below are grouped by query range. Ensure that the Modbus master device polls only address in the ranges specified below.

FIG. 5-4 MODBUS DATA EXCHANGE

COMMUNICATIONS

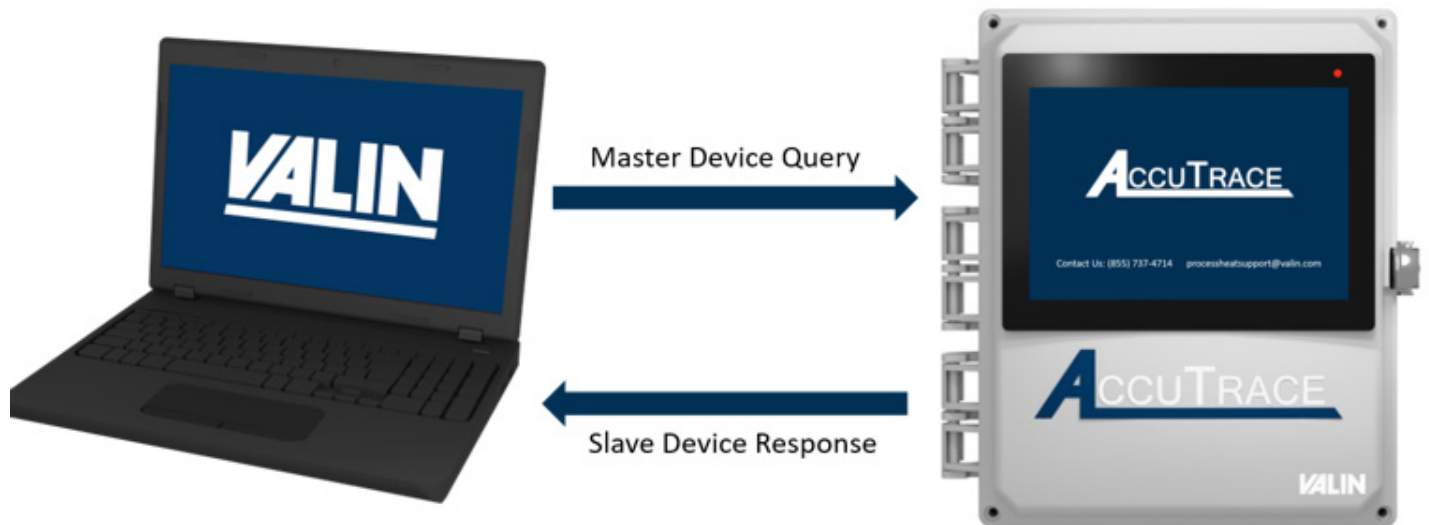| Parameter Name	Description	Range	Modbus Address	Data Type	Access
Circuit 1 Enabled	Circuit 1 Enable/Disable status	0= Disabled 1=Enabled	000101	Bool	Read Only
Circuit 1 High Current Alarm	View High Current Alarm status for Circuit 1	0=OK 1=Alarm	000102	Bool	Read Only
Circuit 1 Low Current Alarm	View Low Current Alarm status for Circuit 1	0=OK 1=Alarm	000103	Bool	Read Only
Circuit 1 High Temp Alarm	View High Temp Alarm status for Circuit 1	0=OK 1=Alarm	000104	Bool	Read Only
Circuit 1 Low Temp Alarm	View Low Temp Alarm status for Circuit 1	0=OK 1=Alarm	000105	Bool	Read Only
Circuit 1 GFEP Alarm	View GFEP Alarm status for Circuit 1	0=OK 1=Alarm	000106	Bool	Read Only
Circuit 1 Over Current Circuit Fault	View HCS Alarm status for Circuit 1	0=OK 1=Alarm	000107	Bool	Read Only
Circuit 1 Under Current Circuit Fault	View LCS Alarm status for Circuit 1	0=OK 1=Alarm	000108	Bool	Read Only
Circuit 1 RTD Error	View RTD Error Alarm status for Circuit 1	0=OK 1=Alarm	000109	Bool	Read Only
Circuit 1 GFEP Test Fail	View GFEP Test status for Circuit 1	0=OK 1=Alarm	000110	Bool	Read Only
Circuit 1 SSR Fail	View SSR status for Circuit 1	0=OK 1=Alarm	000111	Bool	Read Only
Circuit 1 Softstart Enabled	Enable or disable softstart for Circuit 1	0= Disabled 1=Enabled	000112	Bool	Read Only
Circuit 1 Disable Output on High Current Alarm	Enable or Disable Circuit 1 shutdown on High Current Alarm	0= Disabled 1=Enabled	000113	Bool	Read Only
Circuit 1 Disable Output on Low Current Alarm	Enable or Disable Circuit 1 shutdown on Low Current Alarm	0= Disabled 1=Enabled	000114	Bool	Read Only
Circuit 1 Disable Output on High Temp Alarm	Enable or Disable Circuit 1 shutdown on High Temp Alarm	0= Disabled 1=Enabled	000115	Bool	Read Only
Circuit 1 Disable Output on Low Temp Alarm	Enable or Disable Circuit 1 shutdown on Low Temp Alarm	0= Disabled 1=Enabled	000116	Bool	Read Only
Circuit 1 High Current Alarm Enabled	Enable or Disable High Current Alarm for Circuit 1	0= Disabled 1=Enabled	000117	Bool	Read Only
Circuit 1 Low Current Alarm Enabled	Enable or Disable Low Current Alarm for Circuit 1	0= Disabled 1=Enabled	000118	Bool	Read Only
Circuit 1 High Temperature Alarm Enabled	Enable or Disable High Temperature Alarm for Circuit 1	0= Disabled 1=Enabled	000119	Bool	Read Only
Circuit 1 Low Temperature Alarm Enabled	Enable or Disable Low Temperature Alarm for Circuit 1	0= Disabled 1=Enabled	000120	Bool	Read Only
Circuit 1 Alarm Latching	Toggle Latching on or off for Circuit 1. Latching alarms must be turned off by user.	0= Non-latching 1=Latching	000121	Bool	Read Only

FIGURE 5-5 CIRCUIT 1 BOOLEAN VALUES

COMMUNICATIONS

Parameter Name	Description	Range	Modbus Address	Data Type	Access
Circuit 2 Enabled	Circuit 2 Enable/Disable status	0= Disabled 1=Enabled	000201	Bool	Read Only
Circuit 2 High Current Alarm	View High Current Alarm status for Circuit 2	0=OK 1=Alarm	000202	Bool	Read Only
Circuit 2 Low Current Alarm	View Low Current Alarm status for Circuit 2	0=OK 1=Alarm	000203	Bool	Read Only
Circuit 2 High Temp Alarm	View High Temp Alarm status for Circuit 2	0=OK 1=Alarm	000204	Bool	Read Only
Circuit 2 Low Temp Alarm	View Low Temp Alarm status for Circuit 2	0=OK 1=Alarm	000205	Bool	Read Only
Circuit 2 GFEP Alarm	View GFEP Alarm status for Circuit 2	0=OK 1=Alarm	000206	Bool	Read Only
Circuit 2 Over Current Circuit Fault	View HCS Alarm status for Circuit 2	0=OK 1=Alarm	000107	Bool	Read Only
Circuit 2 Under Current Circuit Fault	View LCS Alarm status for Circuit 2	0=OK 1=Alarm	000208	Bool	Read Only
Circuit 2 RTD Error	View RTD Error Alarm status for Circuit 2	0=OK 1=Alarm	000209	Bool	Read Only
Circuit 2 GFEP Test Fail	View GFEP Test status for Circuit 2	0=OK 1=Alarm	000210	Bool	Read Only
Circuit 2 SSR Fail	View SSR status for Circuit 2	0=OK 1=Alarm	000211	Bool	Read Only
Circuit 2 Softstart Enabled	Enable or disable softstart for Circuit 2	0= Disabled 1=Enabled	000212	Bool	Read Only
Circuit 2 Disable Output on High Current Alarm	Enable or Disable Circuit 2 shutdown on High Current Alarm	0= Disabled 1=Enabled	000213	Bool	Read Only
Circuit 2 Disable Output on Low Current Alarm	Enable or Disable Circuit 2 shutdown on Low Current Alarm	0= Disabled 1=Enabled	000214	Bool	Read Only
Circuit 2 Disable Output on High Temp Alarm	Enable or Disable Circuit 2 shutdown on High Temp Alarm	0= Disabled 1=Enabled	000215	Bool	Read Only
Circuit 2 Disable Output on Low Temp Alarm	Enable or Disable Circuit 2 shutdown on Low Temp Alarm	0= Disabled 1=Enabled	000216	Bool	Read Only
Circuit 2 High Current Alarm Enabled	Enable or Disable High Current Alarm for Circuit 2	0= Disabled 1=Enabled	000217	Bool	Read Only
Circuit 2 Low Current Alarm Enabled	Enable or Disable Low Current Alarm for Circuit 2	0= Disabled 1=Enabled	000218	Bool	Read Only
Circuit 2 High Temperature Alarm Enabled	Enable or Disable High Temperature Alarm for Circuit 2	0= Disabled 1=Enabled	000219	Bool	Read Only
Circuit 2 Low Temperature Alarm Enabled	Enable or Disable Low Temperature Alarm for Circuit 2	0= Disabled 1=Enabled	000220	Bool	Read Only
Circuit 2 Alarm Latching	Toggle Latching on or off for Circuit 1. Latching alarms must be turned off by user.	0= Non-latching 1=Latching	000221	Bool	Read Only

FIGURE 5-6 CIRCUIT 2 BOOLEAN VALUES

COMMUNICATIONS

Parameter Name	Description	Range	Modbus Address	Data Type	Access
Circuit 1 Temperature SP	Temperature setpoint of Circuit 1	0-720°F	400101	Unit	Read Only
Circuit 1 Mode	View control mode of Circuit 1	0-3	400102	Unit	Read Only
Circuit 1 Man Mode Power	Power output (%) for Circuit 1	0-100%	400103	Unit	Read Only
Circuit 1 On/Off Mode DB+	Circuit 1 Deadband high range temperature	0-100°F	400104	Unit	Read Only
Circuit 1 On/Off Mode DB-	Circuit 1 Deadband low range temperature	0-100°F	400105	Unit	Read Only
Circuit 1 High Current Alarm SP	Set point for High Current Alarm Circuit 1	1-40 and > than low alarm	400106	Unit	Read Only
Circuit 1 Low Current Alarm SP	Set point for Low Current Alarm Circuit 1	1-40 and < than high alarm	400107	Unit	Read Only
Circuit 1 High Temp Alarm SP	Set point for High Temp Alarm Circuit 1	0-720 and > than low alarm	400108	Unit	Read Only
Circuit 1 Low Temp Alarm SP	Set point for Low Temp Alarm Circuit 1	0-720 and < than high alarm	400109	Unit	Read Only
Circuit 1 GFEP SP	Set point for High GFEP Alarm Circuit 1	20-80mA	400110	Unit	Read Only
Circuit 1 High Current Alarm Time Delay	Set time delay for Circuit 1 High Current Alarm	500-60000msec	400111	Unit	Read Only
Circuit 1 Low Current Alarm Time Delay	Set time delay for Circuit 1 Low Current Alarm	500-60000msec	400112	Unit	Read Only
Circuit 1 High Temperature Alarm Time Delay	Set time delay for Circuit 1 High Temp Alarm	500-60000msec	400113	Unit	Read Only
Circuit 1 Low Temperature Alarm Time Delay	Set time delay for Circuit 1 Low Temp Alarm	500-60000msec	400114	Unit	Read Only
Circuit 1 GFEP Alarm Time Delay	Set time delay for Circuit 1 High GFEP Alarm	500-60000msec	400115	Unit	Read Only
Circuit 1 GFEP Auto Test Cycle Time	Set the Cycle Time for GFEP Auto Test on Circuit 2	10-60 Min	400116	Unit	Read Only
Circuit 1 Proportional Gain	Enable or Disable High Current Alarm for Circuit 1	1-1000	400117	Unit	Read Only
Circuit 1 Integral Factor	Enable or Disable Low Current Alarm for Circuit 1	0-100	400118	Unit	Read Only
Circuit 1 Derivative Factor	Enable or Disable High Temperature Alarm for Circuit 1	0-50	400119	Unit	Read Only

FIGURE 5-7 CIRCUIT 1 INTEGER VALUES

COMMUNICATIONS

Parameter Name	Description	Range	Modbus Address	Data Type	Access
Circuit 2 Temperature SP	Temperature setpoint of Circuit 2	0-720°F	400201	Unit	Read Only
Circuit 2 Mode	View control mode of Circuit 2	0-3	400202	Unit	Read Only
Circuit 2 Man Mode Power	Power output (%) for Circuit 2	0-100%	400203	Unit	Read Only
Circuit 2 On/Off Mode DB+	Circuit 2 Deadband high range temperature	0-100°F	400204	Unit	Read Only
Circuit 2 On/Off Mode DB-	Circuit 2 Deadband low range temperature	0-100°F	400205	Unit	Read Only
Circuit 2 High Current Alarm SP	Set point for High Current Alarm Circuit 2	1-40 and > than low alarm	400206	Unit	Read Only
Circuit 2 Low Current Alarm SP	Set point for Low Current Alarm Circuit 2	1-40 and < than high alarm	400207	Unit	Read Only
Circuit 2 High Temp Alarm SP	Set point for High Temp Alarm Circuit 2	0-720 and > than low alarm	400208	Unit	Read Only
Circuit 2 Low Temp Alarm SP	Set point for Low Temp Alarm Circuit 2	0-720 and < than high alarm	400209	Unit	Read Only
Circuit 2 GFEP SP	Set point for High GFEP Alarm Circuit 2	20-80mA	400210	Unit	Read Only
Circuit 2 High Current Alarm Time Delay	Set time delay for Circuit 2 High Current Alarm	500-60000msec	400211	Unit	Read Only
Circuit 2 Low Current Alarm Time Delay	Set time delay for Circuit 2 Low Current Alarm	500-60000msec	400212	Unit	Read Only
Circuit 2 High Temperature Alarm Time Delay	Set time delay for Circuit 1 High Temp Alarm	500-60000msec	400213	Unit	Read Only
Circuit 2 Low Temperature Alarm Time Delay	Set time delay for Circuit 2 Low Temp Alarm	500-60000msec	400214	Unit	Read Only
Circuit 2 GFEP Alarm Time Delay	Set time delay for Circuit 2 High GFEP Alarm	500-60000msec	400215	Unit	Read Only
Circuit 2 GFEP Auto Test Cycle Time	Set the Cycle Time for GFEP Auto Test on Circuit 2		400216	Unit	Read Only
Circuit 2 Proportional Gain	Enter value for Proportional Gain (Kp) Circuit 2	1-1000	400217	Unit	Read Only
Circuit 2 Integral Factor	Enter value for Integration Factor (Ti) Circuit2	0-100	400218	Unit	Read Only
Circuit 2 Derivative Factor	Enter value for Derivation Factor (Td) Circuit 1	0-50	400219	Unit	Read Only

FIGURE 5-8 CIRCUIT 2 INTEGER VALUES

COMMUNICATIONS

Parameter Name	Description	Range	Modbus Address	Data Type	Access
Circuit 1 Temp	View Process Temperature of Circuit 1	0-720°F	400120	Real	Read Only
Circuit 1 Load	View current (Amps) of Circuit 1	0-40A	400122	Real	Read Only
Circuit 1 Power	View power output of Circuit 1	0-100%	400124	Real	Read Only

FIGURE 5-9 CIRCUIT 1 FLOATING POINT VALUES

Parameter Name	Description	Range	Modbus Address	Data Type	Access
Circuit 2 Temp	View Process Temperature of Circuit 2	0-720°F	400220	Real	Read Only
Circuit 2 Load	View current (Amps) of Circuit 2	0-40A	400222	Real	Read Only
Circuit 2 Power	View power output of Circuit 2	0-100%	400224	Real	Read Only

FIGURE 5-10 CIRCUIT 2 FLOATING POINT VALUES

Parameter Name	Description	Range	Modbus Address	Data Type	Access
System Voltage Set	View status of System Nominal Voltage input	0=Set 1=Not Set	000301	Bool	Read Only
System Voltage Setting	Applied Voltage Setting	110-287V	400301	Unit	Read Only

FIGURE 5-11 SYSTEM VOLTAGE VALUES

TROUBLESHOOTING

Alarm Annunciation

In order to clear alarm messages, you must be logged into the system and the alarm condition must be cleared. If alarms are set to **"NON-LATCHING",** as described in **Figure 4-8** on page 32, the alarm will automatically clear when the trigger condition is resolved.
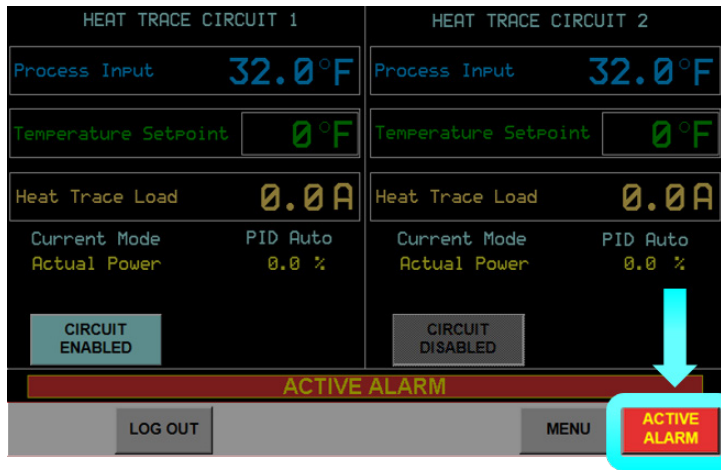

FIGURE 6-1
ALARM SCREEN
NAVIGATION

When an alarm is triggered the **Home Screen** will display an alarm message, shown in **Figure 6-1** above. Clear this by pressing the **"ACTIVE ALARM"** button in the bottom left of the screen. This will display the **Active Alarms Screen** below:
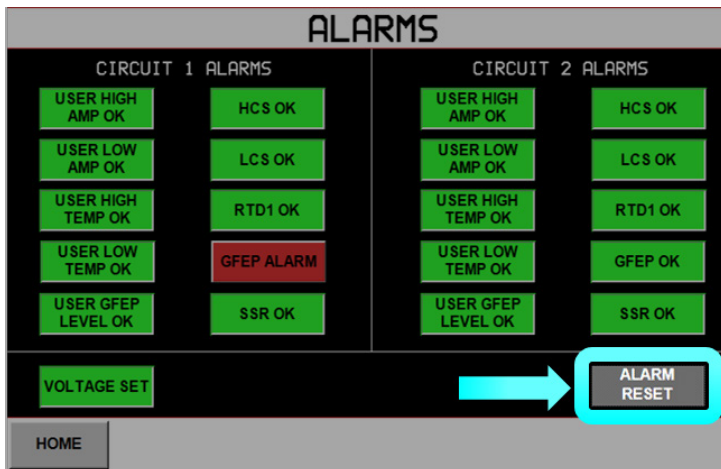

FIGURE 6-2
ALARM SCREEN

The activated alarm will be highlighted in red as shown in **Figure 6-2**. Press the **"ALARM RESET"** button. The process condition must be within set parameters or acceptable range before the active status will be cleared.

TROUBLESHOOTING

Alarm Explanations

Active Alarm	Explanation	Solution
USER HIGH AMP ALARM High Current Alarm	Active when amperage value is above High Current Level Alarm setpoint value.	• Establish correct High Current Level Alarm setpoint Refer to heat trace cable manufacturer maximum current. • Enable Soft Start for cases of in-rush current. This can be identified by repeated alarms at start up. • Increase High Current Level Alarm delay time.
USER LOW AMP ALARM Low Current Alarm	Active when amperage value is below Low Current Level Alarm setpoint value.	• Establish correct Low Current Level Alarm setpoint. Refer to heat trace cable manufacturer maximum current. • Examine heat trace cable for signs of damage. Low current can be indicative of heater failure. • Examine heat trace cable connections for damage or improper installation.
USER HIGH TEMP ALARM High Temp Alarm	Active when process temperature value is above High Temperature Level Alarm setpoint value.	• Establish correct High Temperature Level Alarm setpoint. • If in PID Control Mode: Adjust PID settings. • If in Manual Control Mode: Adjust power output. • If in On/Off Control Mode: Adjust deadband hysteresis. • Examine process for alternate causes of high temperature. • Disable the circuit affected. If the SSR Alarm is active after doing this, the SSR has failed closed. Contact factory.
USER LOW TEMP ALARM Low Temp Alarm	Active when process temperature value is below Low Temperature Level Alarm setpoint value.	• Establish correct Low Temperature Level Alarm setpoint. • If in PID Control Mode: Adjust PID settings. • If in Manual Control Mode: Adjust power output. • If in On/Off Control Mode: Adjust deadband hysteresis. • Examine heat trace cable and connections • Examine process for alternate causes of low temperature. Consider insulation to minimize heat losses.
USER GFEP LEVEL ALARM GFEP Level Alarm	Active when GFEP detects current leakage above High GFEP Level Alarm setpoint.	• Establish correct High GFEP Level Alarm setpoint. • Examine cable connections and verify it is receiving power. • Examine heat trace cable for signs of damage. • Disconnect heat trace from panel and perform megohm testing.
VOLTAGE NOT SET System Voltage Set Alarm	Active when System Nominal Voltage has not been established by user.	• Establish correct System Nominal Voltage in the System Voltage Screen. This screen requires Administrator access.
HCS ALARM Over Current Circuit Fault Alarm	Active when over current fault is detected.	• Examine heat trace cable for signs of damage or fault. • Examine heat trace cable connections for damage or improper installation.
LCS ALARM Under Current Circuit Fault Alarm	Active when under current fault is detected.	• Examine heat trace cable for signs of damage or fault. • Examine heat trace cable connections for damage or improper installation.
RTD1 ALARM RTD Error Alarm	Active when RTD sensor input signal has failed.	• Examine RTD for signs of damage. If necessary, replace sensor. • Examine RTD connections for damage, loose connections, or improper installation.
GFEP ALARM GFEP Test Fail Alarm	Active when Ground Fault Circuit test has failed by reading incorrect amperage based on user set system voltage.	• Establish correct System Nominal Voltage in the System Voltage Screen. This screen requires Administrator access. • Examine power connections for damage or improper installation. • Disable circuit(s) and Contact factory
SSR ALARM SSR Fail Alarm	Active when SSR has failed closed on a disabled circuit.	• Contact factory. Do not enable circuit.

TROUBLESHOOTING

System Frequently Asked Questions

Issue	Explanation	Solution
Alarm message will not clear	Alarm message is displayed even after process is within set parameters.	• If Latching is enabled in the Alarm Settings Menu, Alarms must be reset in the Active Alarms screen. • Disable Latching if Alarm messages may be automatically cleared when process is within set parameters.
Alarm will not reset	Alarm will not reset and Latching is disabled.	• Process must be within set parameters for alarms to be reset. Check the Alarm Setpoints Menu to ensure setpoint values are correct.
Unable to access menu	Menu will not display after being selected.	• Log into security level required for the menu. Refer to Security Levels chart on page 20.
HMI LED Indicator Flashing	The red LED indicator on HMI is flashing	• For serial comms only. If serial communications are disabled, LED will remain off. • Modbus communications have been set up but are unable to be established. Check communications port to verify connection is made. • Review the Communications Error section below for further information.
Serial Communications Error	Cannot connect to AccuTrace™ via Serial communications	• Verify settings in the Serial Port Settings Screen. The address must be unique from other devices connected to PLC/PC. • Verify that serial communications have been enabled. Refer to page 51 for more information. • Examine communications connections. Refer to Communications Wiring section on page 18. • Establish correct communications address on external device. • Set external device to operate at the same baud rate as AccuTrace™. Refer to Communications section page 51. • Route communication wiring separately from power wiring.
Ethernet Communications Error	Cannot connect to AccuTrace™ via Ethernet communications	• Verify that peripheral devices (devices other than AccuTrace™ and PC/PLC) do not have the same IP Address as AccuTrace™. This will create an IP conflict error and re-direct you to the Ethernet Port Settings Screen. • Route communication wiring separately from power wiring. • Establish correct communications port on external device. • Examine communications connections. Refer to Communications Wiring section on page 19.
Lost Password	Password is lost or invalid	• Contact Valin

AGENCY APPROVALS

CONTROL PANEL FOR HAZARDOUS LOCATIONS
E503604

CONTACT US

Valin Corporation Engineering Department: **866-351-4328**