AccuPro 6000-TS™

Operator Manual

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1 Introduction

The AccuPro 6000-TS™ is a weight and volume measurement system offering single/dual-channel support. Its real-time measurement allows for precise monitoring during the process of filling or emptying a chemical substance container.

1.1 Scope

This operator manual describes the specifications, assembly, and operation for the control panel portion of the AccuPro 6000-TS™ Measurement System.

1.2 Acronyms and Abbreviations

- ***PLC*** Programmable Logic Controller
- ***HMI*** Human Machine Interface
- ***LCA*** Load Cell Amplifier
- ***PSU*** Power Supply
- ***AWG*** American Wire Gauge
- ***CH*** Channel
- ***N/O*** Normally Open
- ***N/C*** Normally Closed
- ***COM*** Common
- ***SPDT*** Single Pole Double Throw
- ***SCADA*** Supervisory Control and Data Acquisition
- ***AC*** Alternating Current
- ***DC*** Direct Current
- ***V*** Volts
- ***A*** Amps
- ***mA*** Milliamps
- ***W*** Watts

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1.3 Definitions

- **Channel:** a base that can be monitored by the system
- **Gross Weight:** defined as the total weight (real weight) on the scale base. Determined by net weight plus (+) tare weight
- **Load Cell Amplifier:** amplifies the millivolt signal generated from the scale base into a 4-20mA signal for the PLC
- **Measurement System:** describes a complete AccuPro 6000-TS™
- **Net Weight:** the actual weight of material without the presence of a tank or container. Determined by gross weight minus (-) tare weight
- **Scale-Base:** the physical platform where material is weighed and where the load cell(s) is/are located
- **Weight Setpoint:** a user-defined net weight value that when reached (low/high) will trigger a corresponding relay
- **Tare:** a user-adjustable amount of weight subtracted from the gross weight to display the actual weight of material without the presence of a tank or container

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2 Hardware and Specifications

System	
Main Power	Supply Voltage: 120/240 VAC +/- 10%, 50/60 Hz Wattage: 35 W (maximum) Fuse: 1.0A (1 ¼" x 1/4", type slow-blow) Connector: Sealed
Power Supply	Output: 24 VDC Current: 1.1 Amp Wattage: 27 W
Operational Temperature	0 °C to 60 °C (32 °F to 140 °F)
Operational Altitude	2000 meters (maximum)
Operational Relative Humidity	20% to 90% non-condensing
Enclosure	Nominal Size: 8 x 8 x 4 Inches (LxWxD) with hinged cover Weight: 6 lbs. (approx. maximum) Material: Opaque Polycarbonate, UL Listed Type 4X NEMA Location Recommendation: The enclosure should not be in an area with extreme weather conditions or heavy amounts of liquid soaking. If operating the system indoors, it is recommended to mount the enclosure in an area that protects against chemical splashes and wash-down areas, while still being easily accessible. If operating the system outdoors, it is recommended that a covering be used to protect the indicator from the elements.
Channels	Supports single or dual-channel configuration. Each channel is independently controlled and operated.

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Measurement	Display Range: 6 digits (maximum). 5 integer / 1 decimal point (user selectable) Working Capacity: determined, in part, by factory limits and scale base specifications. Reference scale base documentation. Units: user-defined units of pounds, kilograms, gallons, and liters. Averaging: user-defined (standard/high) weight averaging. Bar Graph: graphical display of net weight. Performance: 0.1% to 0.25% full scale accuracy.
Display	Size: 4.3” Resolution: 480 x 272 pixels Color: 65k Brightness: 350 nits
Alarms	Internal: audible buzzer, 3.4 kHz, 78 dB (maximum) External: Support for a user-supplied alarm. An alarm relay is available with SPDT contact configuration (NO-COM-NC). Switching capacity of 3A (maximum) @ 250 VAC or 30 VDC. Inductive loads are not recommended.
Controls	Control Type: touchscreen

2.1 Load Cell Amplifier Specifications

Load Cell Amplifier	
Load Cells	Supports up to (4) 350-ohm load cells in parallel
Excitation Voltage	10 VDC

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2.2 Analog Output Specifications

Analog Output	
Signal	Type: 4-20 mA Connection: self-powered
Configuration	Output Range: user-adjustable 4mA and 20mA net weight ranges. The analog output will scale its 4-20mA output signal based on the configured 4mA and 20mA net weight points.

2.3 Relay Specifications

Relays	
Relay Count (User Selectable)	Weight Setpoints: 2 or 4 relays per channel External Buzzer: 1 Alarm Active Relay: 1 Weight Setpoint Active: 1 Max Net Weight Active: 1 Leak Detector Input: 1
Contact Configuration	Normally Open (NO), Common (COM), Normally Closed (NC)
Maximum Switching Capacity	250VAC/3A, 30VDC/3A
Relay Configuration Options	Latch: When alarm “latch” is enabled, an alarm that is triggered will remain on until it is acknowledged. Trigger Alarm: When weight setpoint setting “trigger alarm” is active, a weight setpoint will trigger an alarm when active

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2.4 Modbus Specifications

Modbus	
Communication	Protocol: Modbus TCP through Ethernet, Modbus RTU RS-232, Modbus RTU RS-485 Type: Slave
Ch 1 Modbus Address Map	Net Weight: HR: 414000 Gross Weight: HR: 414002 Net Weight Percentage: HR 414004 (outputs 0-100) Gross Weight Percentage: HR: 414006 (outputs 0-100) Display Unit: HR: 414008 Tare: HR: 414010 Error Active: C: 6500 Alarm Active: C: 6501 Weight Setpoint (s) Active: C:6502
Ch 2 Modbus Address Map	Net Weight: HR: 414012 Gross Weight: HR: 414014 Net Weight Percentage: HR 414016 (outputs 0-100) Gross Weight Percentage: HR: 414018 (outputs 0-100) Display Unit: HR: 414020 Tare: HR: 414022 Error Active: C: 6503 Alarm Active: C: 6504 Weight Setpoint (s) Active: C:6505
Network Configuration	IP Address: User defined Net Mask: User defined Gateway: User defined

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3 System Assembly

The AccuPro 6000-TS uses a multi-layered design approach. The bottom main plate contains the power supply, fuse, and load cell amplifiers. The amplifiers are housed in a metal casing that aids in EMI shielding. No user connections are made at the bottom main plate. The top plate contains all relay modules (dependent on user configuration) and terminal block strip connections to be made by the user. Connections from the PLC are made through shielded cable to aid in EMI shielding.

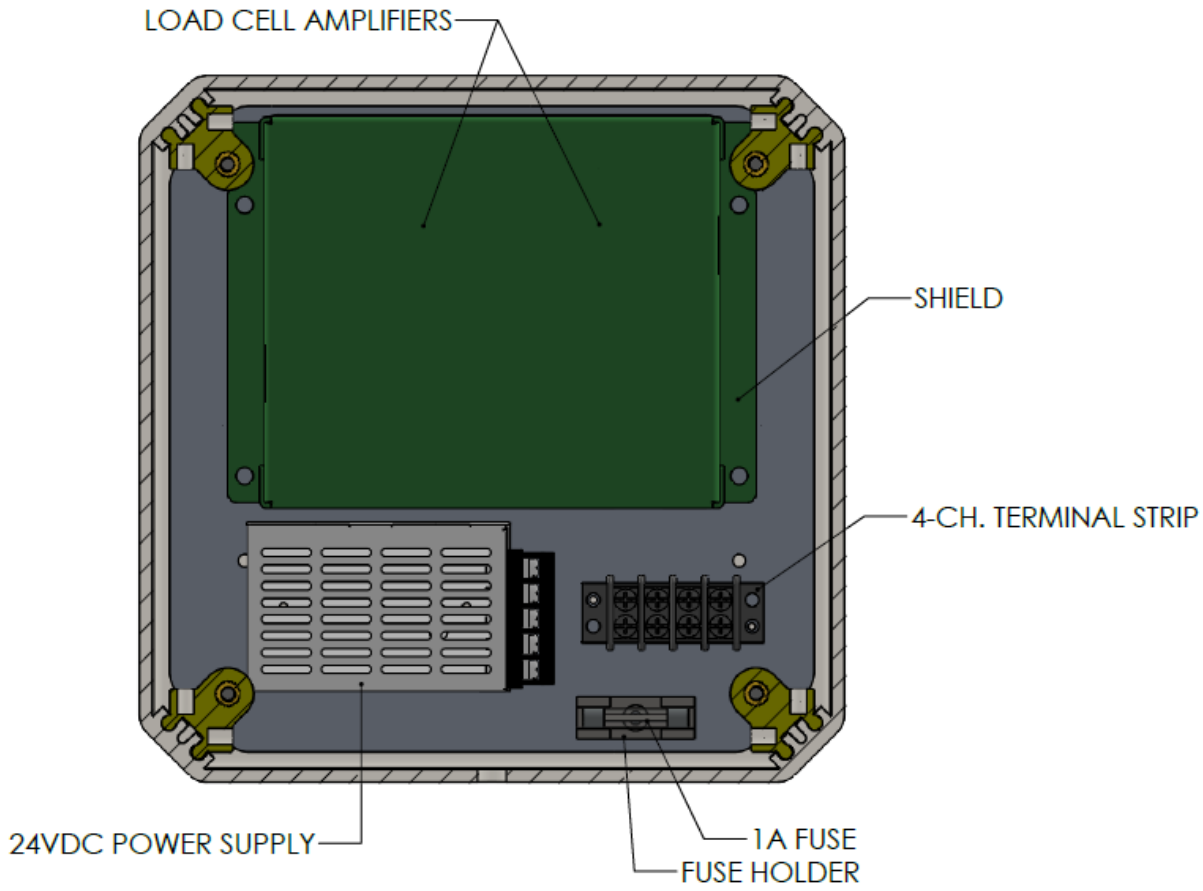

Figure 1: ***Bottom Main Plate***
Contains the power supply, fuse, and load cell amplifiers

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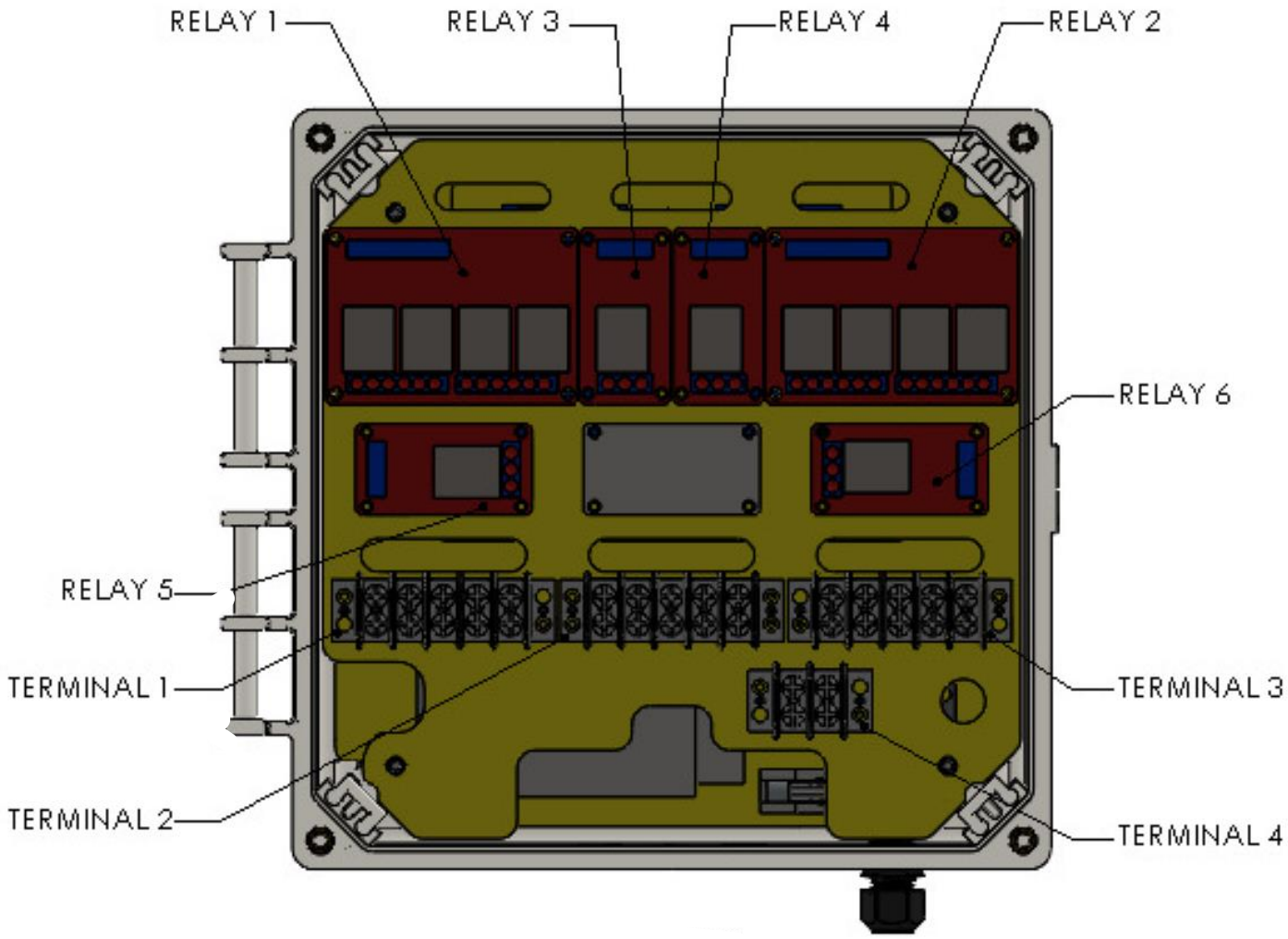

Figure 2: ***Top Plate (Color)***
Contains all relay modules (dependent on user configuration) and terminal block strips

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It is imperative that you read the instructions in this manual. The Control-Panel is fully tested and programmed to the corresponding Scale-Base at the factory. If you experience a problem with this equipment, please disconnect all accessories to this equipment to isolate the problem. Scaletron has taken great care to be sure the equipment is fully functional within factory specifications before it leaves our facility. It is best to familiarize yourself with this manual for set-up and operation procedures before you begin using this equipment. All safety precautions need to be observed for its safe operation. Failure to operate this equipment as instructed can result in damage to the equipment and can possibly cause injury. Damage caused to equipment due to improper operation will not be considered for warranty coverage.

3.1 Factory Configuration

Before you begin, please notice the configuration sheet that is supplied with this manual. The sheet lists the factory-programmed parameters for the AccuPro 6000-TS™ based on ordering information. If there is a need to change any parameters, please reference this manual for options and instructions on how to proceed. Both the settings and calibration menus must be properly set for correct operation. Please record any configuration changes made before contacting customer assistance for technical help.

3.2 Control Panel Preparation and Mounting

The Control Panel is shipped with a factory-installed power cord which utilizes a liquid-tight fitting. Do not modify nor restrict the ability to disconnect the power cord from an outlet. All other user connections to the Control Panel must be made in the field per specific needs. With power to the Control Panel OFF, access its interior by following the procedure described in section titled Servicing the Control Panel. Take time to identify the optimal location for all additional fittings or conduit. Be careful when drilling holes to avoid any damage to internal components or cabling. All drilled holes MUST be sealed to prevent both liquids and gasses from penetrating the enclosure and damaging the electronics. Avoid using fittings that do not provide a tight seal. It is recommended that all fittings be liquid-tight and 4X NEMA rated. If there is a gap or opening in the enclosure's wall that isn't sealed by the connector design, use a silicon caulk to seal the opening and eliminate exposure. The Control Panel is intended to be mounted to a wall using the four holes in the corner flanges of the enclosure. It should be mounted at operational level and away from the floor. Though the enclosure is 4X NEMA rated, it is not designed to withstand wash-down procedures nor chemical contact beyond accidental exposure. Avoid direct contact with chemicals or regular soaking of water as it may cause substantial damage to the electronics. Any damage resulting from non-adherence to these requirements will not be considered for warranty repair.

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3.3 User Connections and Wiring

Before making external connections, it is recommended that the control-panel first be connected to a power source to confirm normal operation. If all is functioning properly, you should see the home screen (see figure 6).

Be sure to disconnect power to the control-panel before making any wiring connections. In addition, anti-static precautions must be followed whenever accessing the control-panel's interior electronics or else permanent damage may result.

Connect channel 1 scale base to terminal 1 and connect channel 2 scale base to terminal 2 (if applicable). Scale baes color code is as follows: red = excitation (+), green = signal (+), white = signal (-), black = excitation (-), violet = shield. *(SEE FIGURE 3, 4, AND 5 FOR CONNECTION INFORMATION)*

Connect applicable wires to terminal 3 for channel 1 and channel 2 net weight 4-20 mA out signal. *(SEE FIGURE 3, 4, AND 5 FOR CONNECTION INFORMATION)*

Connect applicable wires (20AWG recommended) to relays 1 and 2 (if applicable) for channel 1 and channel 2 weight setpoints. *(SEE FIGURE 3, 4, AND 5 FOR CONNECTION INFORMATION)*

Connect applicable wires (20AWG recommended) to relay 3 (if applicable) for external buzzer relay. *(SEE FIGURE 3, 4, AND 5 FOR CONNECTION INFORMATION)*

Connect applicable wires (20AWG recommended) to relay 4 (if applicable) for alarm active relay. *(SEE FIGURE 3, 4, AND 5 FOR CONNECTION INFORMATION)*

Connect applicable wires (20AWG recommended) to relay 5 (if applicable) for weight setpoint active relay. *(SEE FIGURE 3, 4, AND 5 FOR CONNECTION INFORMATION)*

Connect applicable wires (20AWG recommended) to relay 6 (if applicable) for max net weight active relay. *(SEE FIGURE 3, 4, AND 5 FOR CONNECTION INFORMATION)*

Connect applicable wires (20AWG recommended) to terminal 4 (if applicable) for leak detector input. *(SEE FIGURE 3, 4, AND 5 FOR CONNECTION INFORMATION)*

When all external wire connections are complete, close the panel's door, secure its latch, and re-install the four screws (optional).

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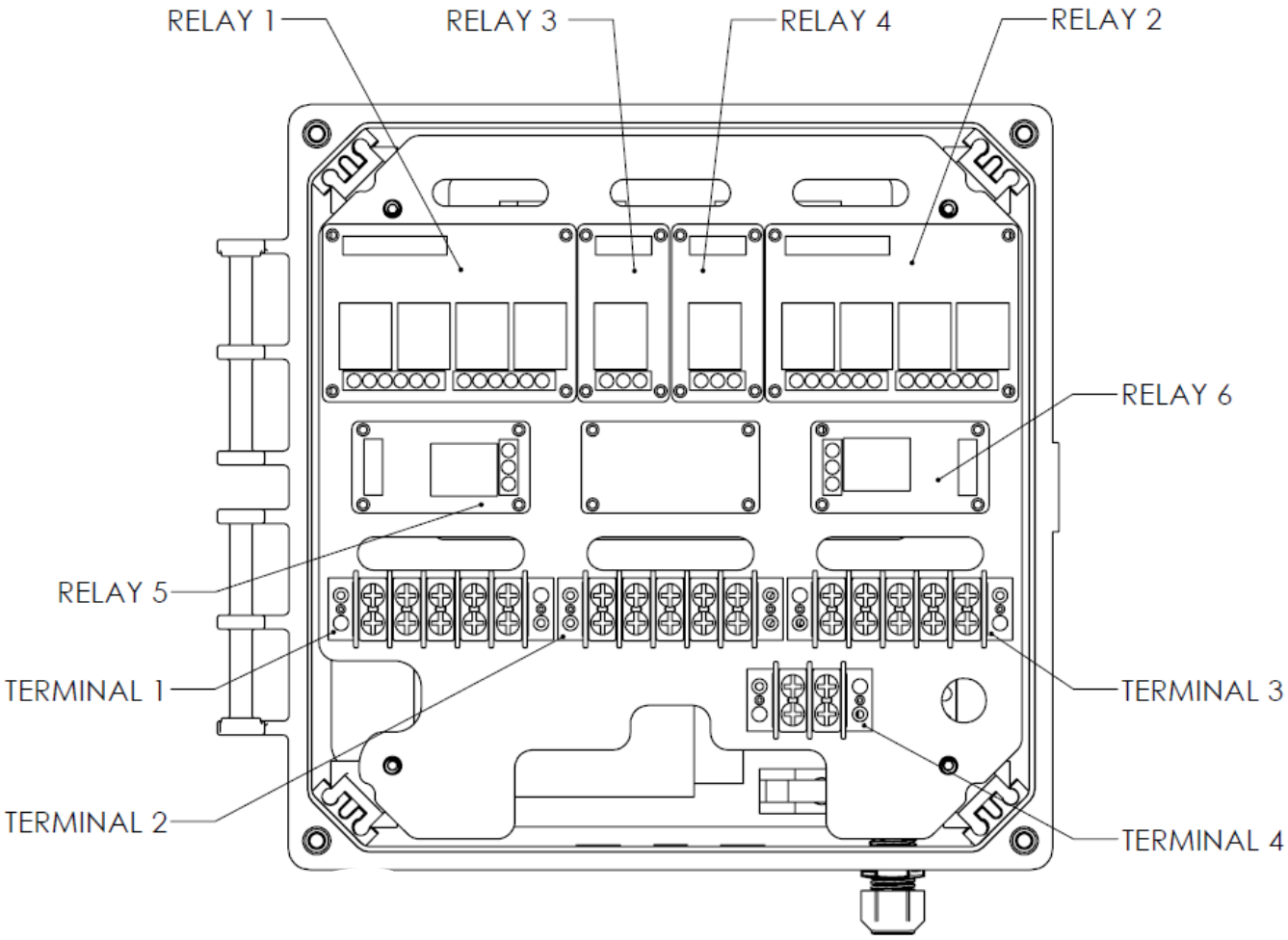

Figure 3: ***Top Plate (Draft)***
Contains all relay modules (dependent on user configuration) and terminal block strips
T = Terminal Strip, R = Relay Module

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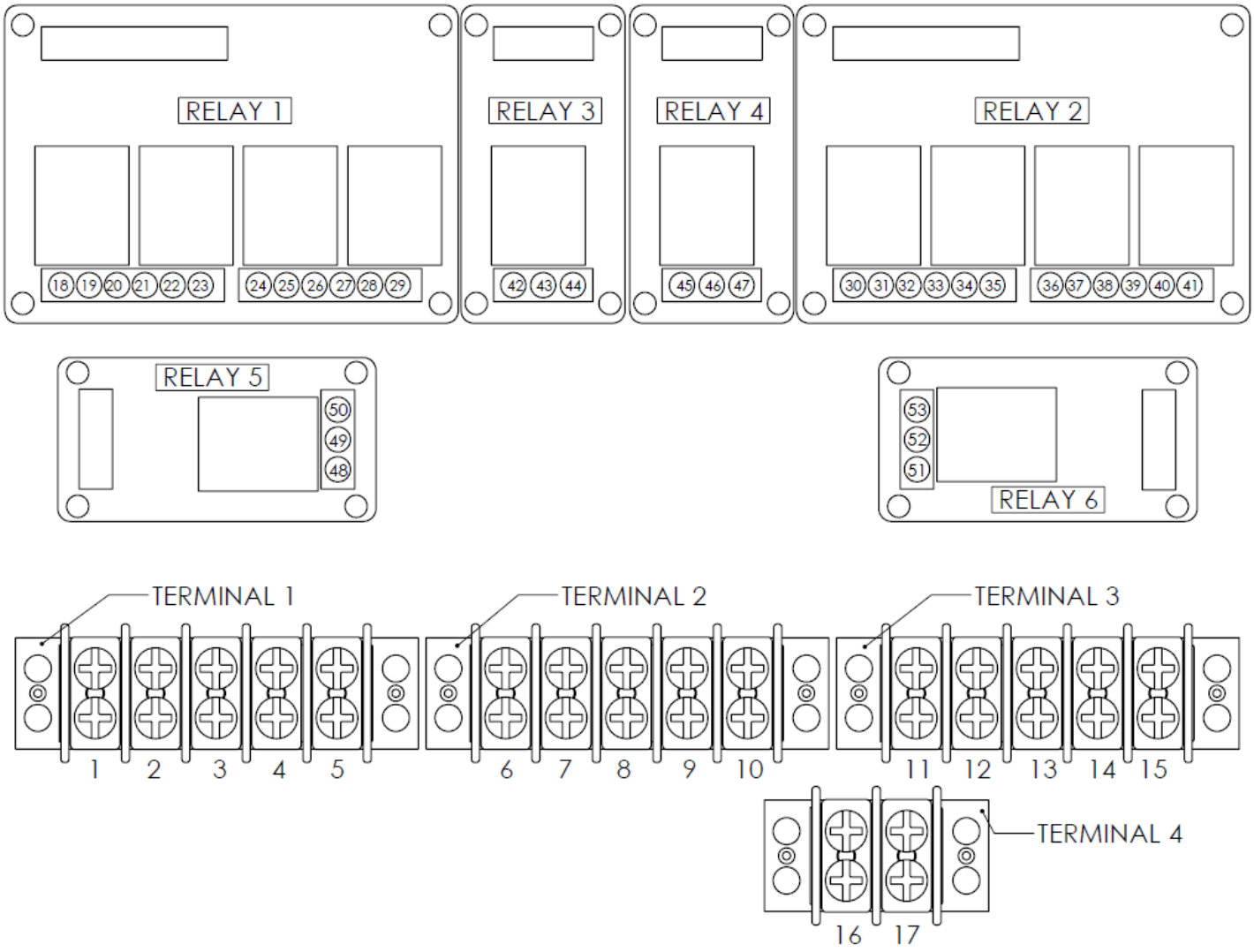

Figure 4: ***User Connection Diagram***

Contains all relay modules (dependent on user configuration) and terminal block strip connections to be made by the user. Contains a number for each connection point. Use figure 5 for more information about terminal strip and relay module descriptions.

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Terminal 1	4-20 mA Out	Outputs
1	S+	CH1 Net Wt (+)
2	S-	CH1 Net Wt (-)
3	S+	CH2 Net Wt (+)
4	S-	CH2 Net Wt (-)
5		
Terminal 2	**Ch1 Base**	**Inputs**
6	E+	Excitation (+)
7	S+	Signal (+)
8	S-	Signal (-)
9	E-	Excitation (-)
10	SHD	Shield
Terminal 3	**Ch2 Base**	**Inputs**
11	E+	Excitation (+)
12	S+	Signal (+)
13	S-	Signal (-)
14	E+	Excitation (-)
15	SHD	Shield
Terminal 4	**Leak Detector**	**Inputs**
16	In 1	COM
17	In 2	NO

Relay 3	External Buzzer
42	NC
43	COM
44	NO
Relay 4	**Alarm Active Relay**
45	NC
46	COM
47	NO
Relay 5	**Weight SP Active**
48	NC
49	COM
50	NO
Relay 6	**Max Net Weight**
51	NO
52	COM
53	NC

Relay 1	CH1 Wt Setpoints	SP #
29	NC1	1
28	COM1	1
27	NO1	1
26	NC2	2
25	COM2	2
24	NO2	2
23	NC3	3
22	COM3	3
21	NO3	3
20	NC4	4
19	COM4	4
18	NO4	4
Relay 2	**CH2 Wt Setpoints**	**SP #**
41	NC1	1
40	COM1	1
39	NO1	1
38	NC2	2
37	COM2	2
36	NO2	2
35	NC3	3
34	COM3	3
33	NO3	3
32	NC4	4
31	COM4	4
30	NO4	4

Figure 5: ***User Connection Numbering Legend***

Contains information about each user connection point. The number on the left of a table corresponds to the value given in figure 4

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4 System Operation

The AccuPro 6000-TS allows the user to monitor chemicals by weight or volume in pounds, kilograms, gallons, or liters. The indicator can display net weight value, net weight graph, gross weight value, gross weight graph, 4-20mA out signal, tare value, and weight setpoints depending on the display selected. The user can view weight displays, adjust tare value, configure settings, view settings and calibration, check status of indicator, view indicator information, and load factory restore point. System operation varies based on how the indicator is configured. The user will be prompted to select channel 1 or channel 2 when entering a channel-specific screen or configuration menu while the second channel is enabled.

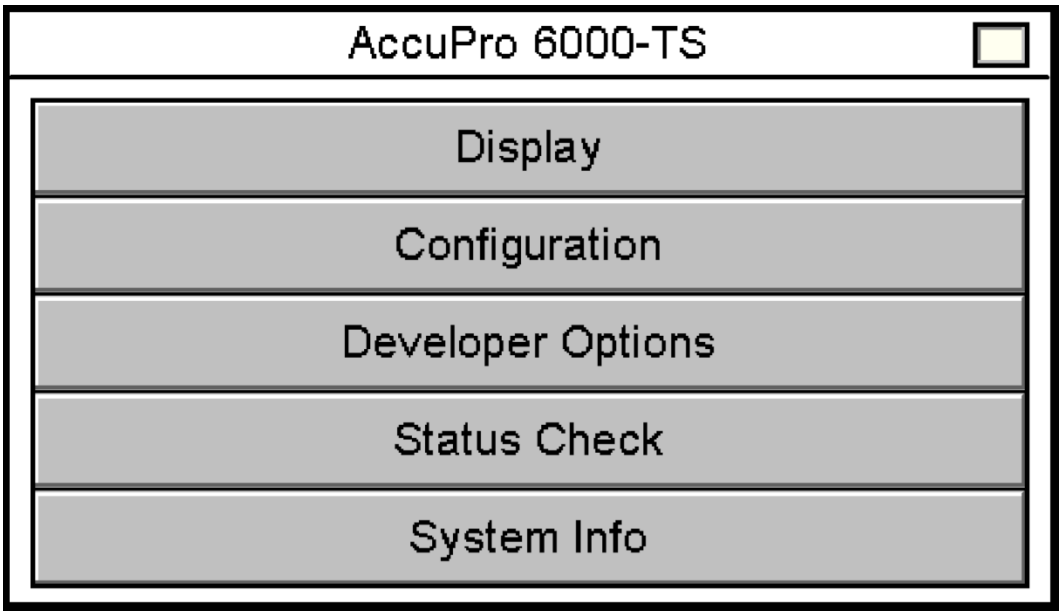

Figure 6: ***Home Screen***

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4.1 Display

The user can access the display screens by pressing the “Display” button on the home screen. If the second channel is enabled and the user presses the “Display” button, they will be prompted to select which channel to display. For individual channel displays, there are a total of 9 screens the user can view by pressing the "Next Display" or “Previous Display" button on any display. If weight setpoints are enabled, the total number of screens is increased to 11. Each display varies in complexity. For dual channel displays, there are a total of 4 screens the user can view by pressing the "Next" or "Back" button on any display. If weight setpoints are enabled, the total number of screens is increased to 5. Each display varies in complexity. While in any display, the user can access tare adjustment by pressing the "Tare" button. While in any display, the user can select the display unit by pressing the "Unit" button. If either the calibration is not complete or there is an analog input limit, all values will be forced to zero.

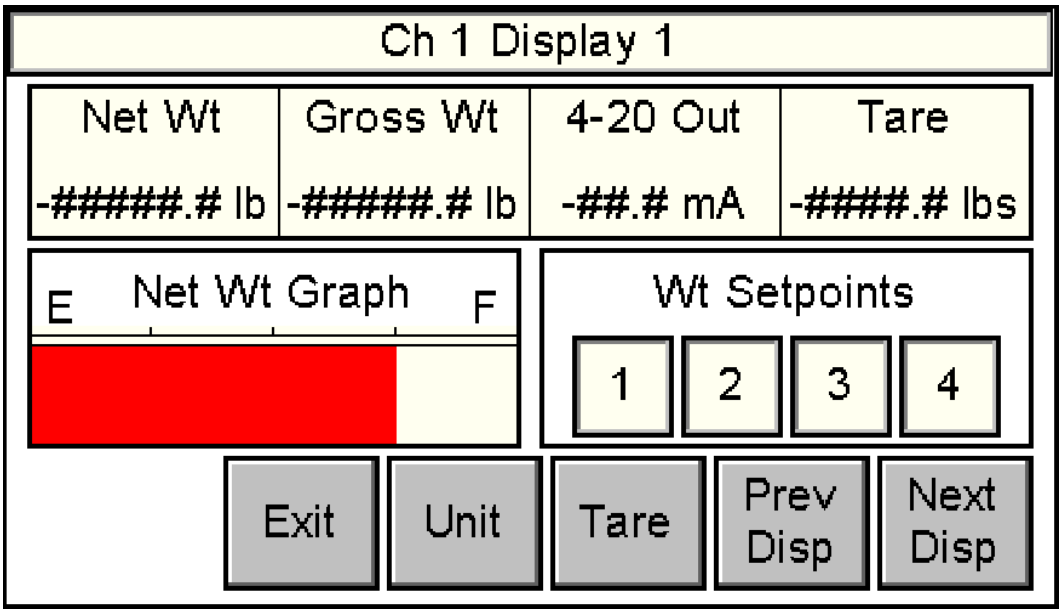

Figure 7: ***Single Channel Display 1***

Displays net weight, gross weight, 4-20mA out, tare, net weight graph, and weight setpoints

NOTE: Only available when weight setpoints are enabled

NOTE: The amount of weight setpoints displayed will vary based on configuration

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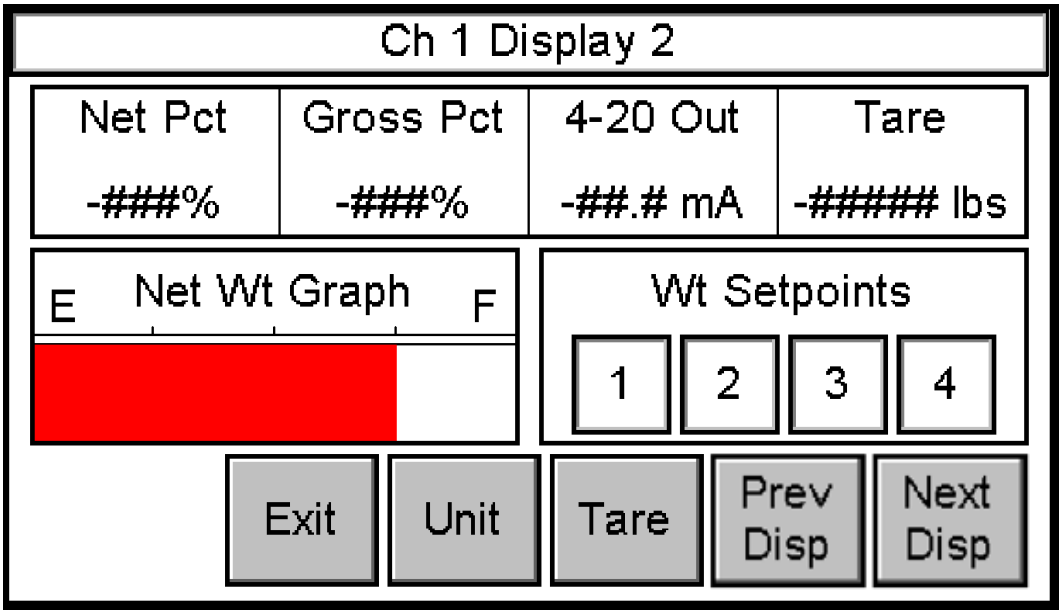

Figure 8: ***Single Channel Display*** **2**
Displays net percent, gross percent, 4-20mA out, tare, net weight graph, and weight setpoints

NOTE: Only available when weight setpoints are enabled

NOTE: The amount of weight setpoints displayed will vary based on configuration

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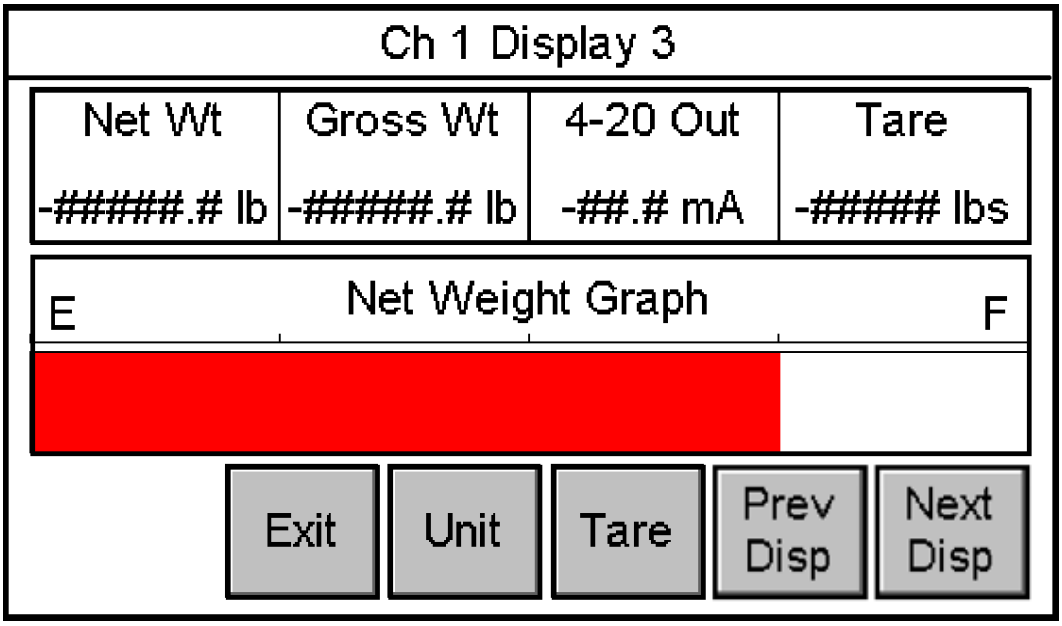

Figure 9: ***Single Channel Display* 3**
Displays net percent, gross percent, 4-20mA out, tare, and net weight graph

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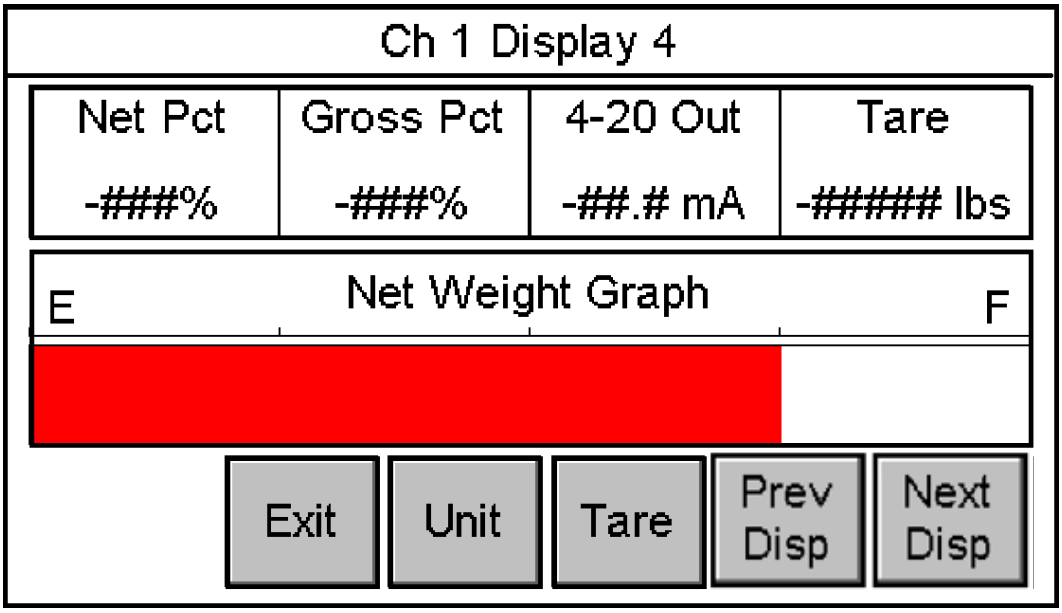

Figure 10: ***Single Channel Display 4***
Displays net percent, gross percent, 4-20mA out, tare, and net weight graph

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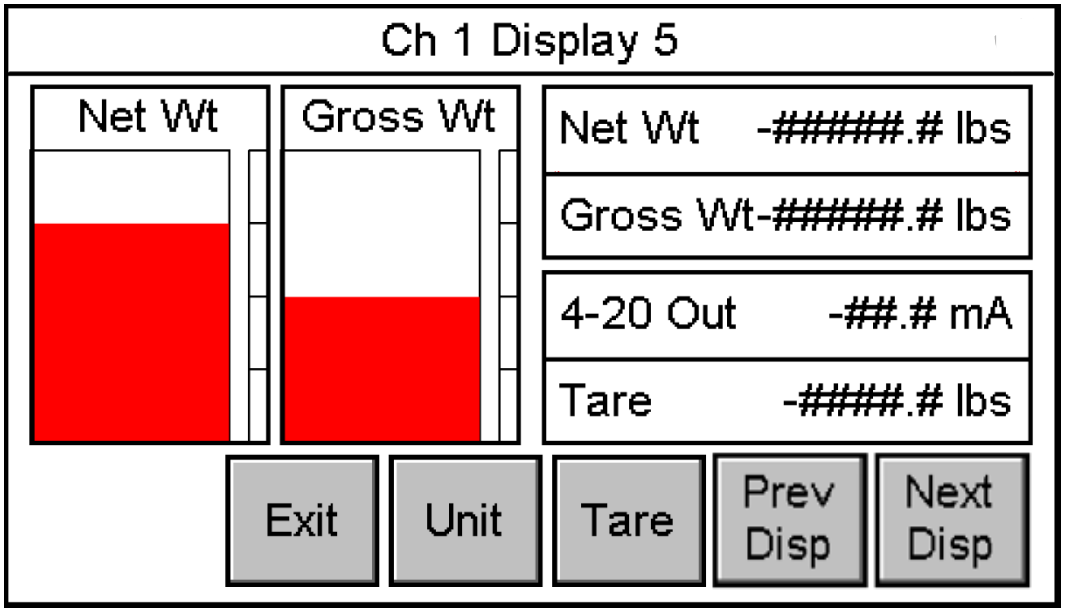

Figure 11: ***Single Channel Display 5***
Displays net weight graph, gross weight graph, net weight, gross weight, 4-20mA out, and tare

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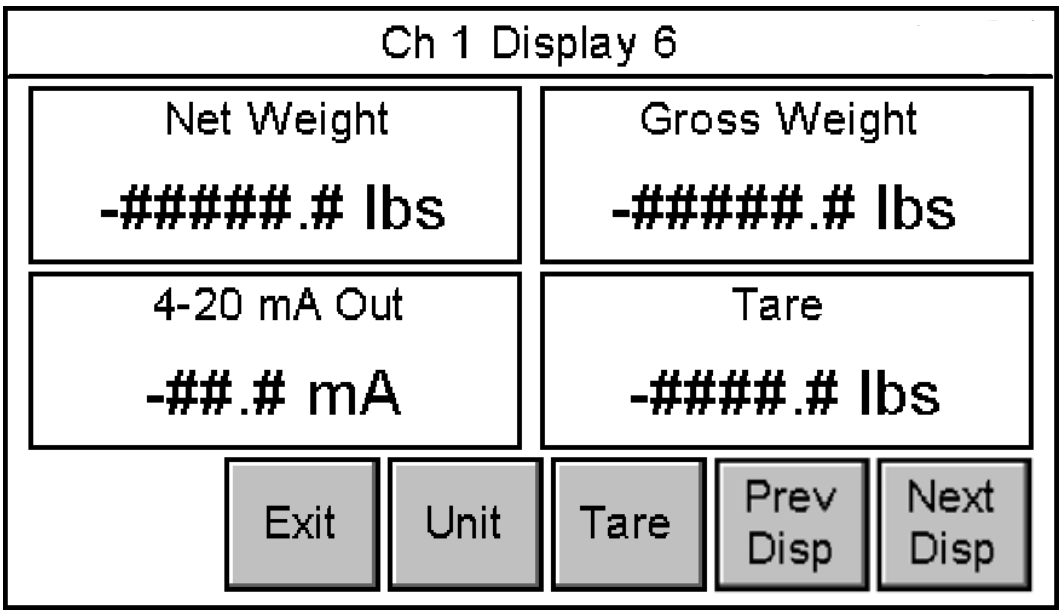

Figure 12: ***Single Channel Display 6***
Displays net weight, gross weight, 4-20mA out, and tare

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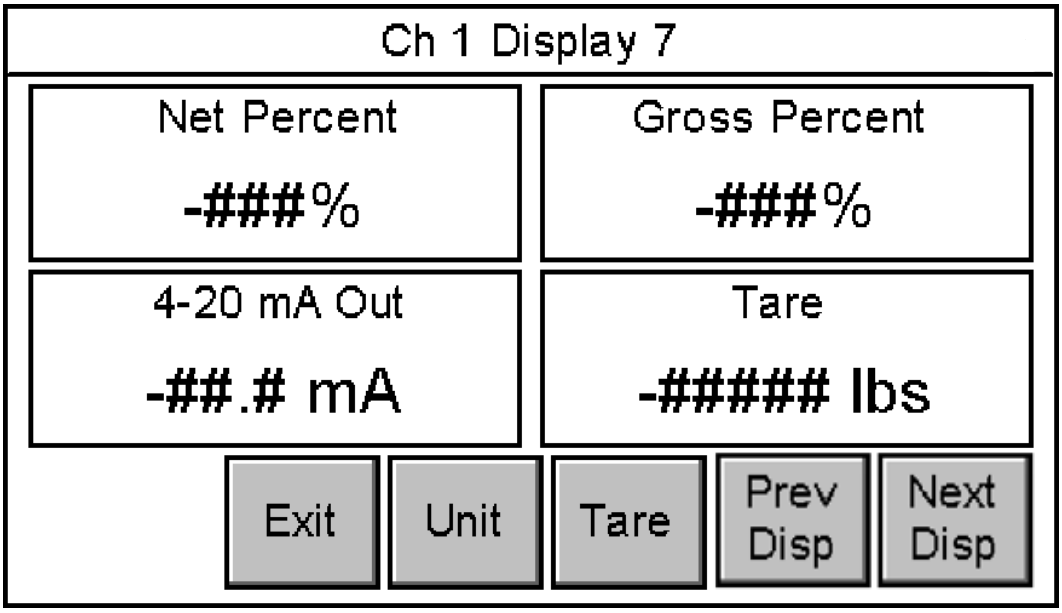

Figure 13: ***Single Channel Display 7***
Displays net percent, gross percent, 4-20mA out, and tare

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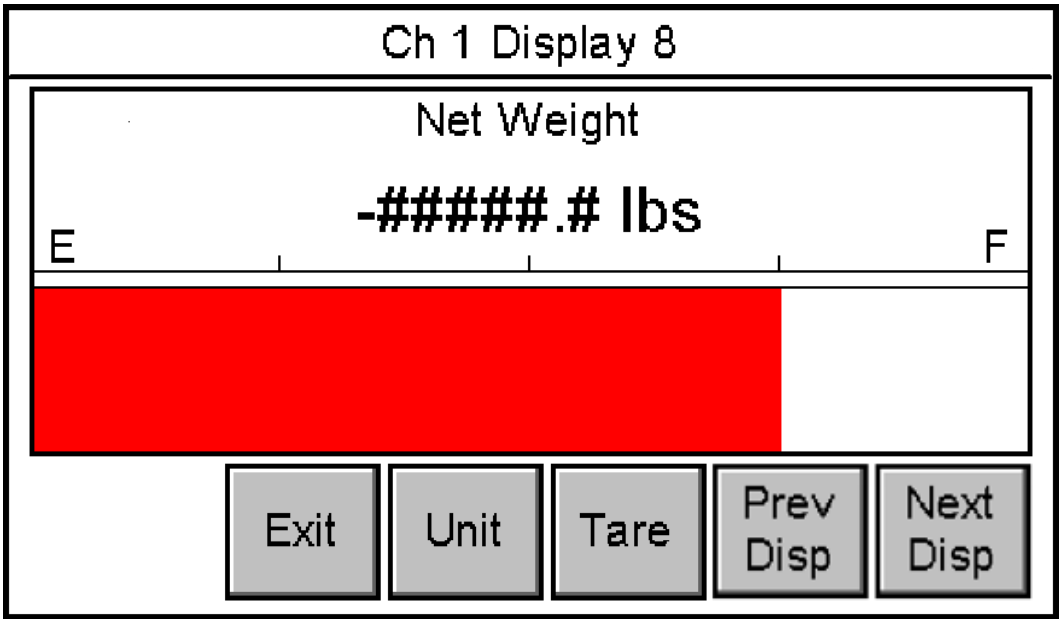

Figure 14: ***Single Channel Display 8***
Displays net weight and net weight graph

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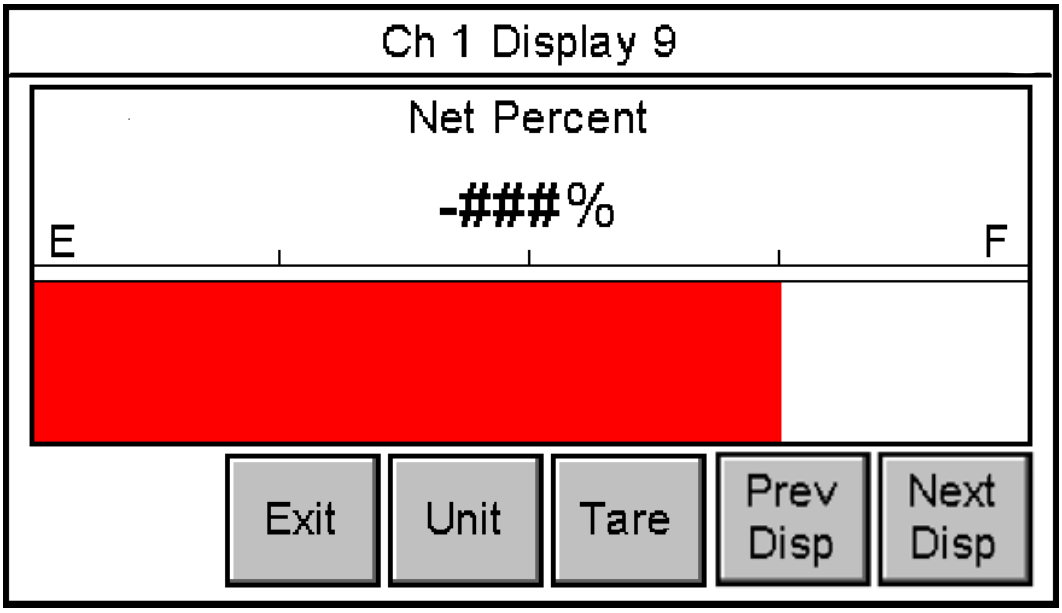

Figure 15: ***Single Channel Display 9***
Displays net percent and net weight graph

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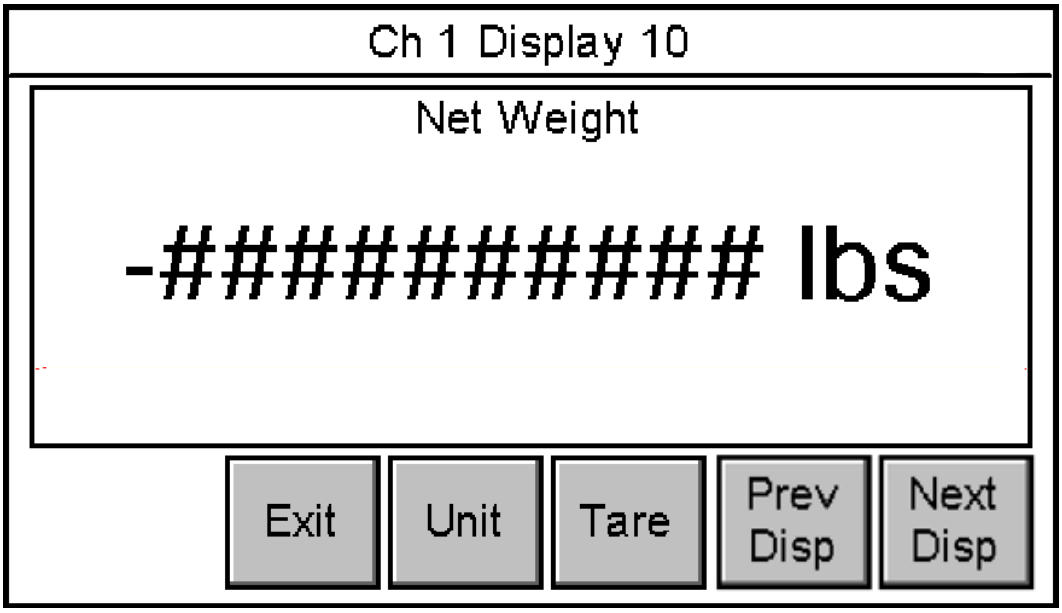

Figure 16: ***Single Channel Display 10***
Displays net weight

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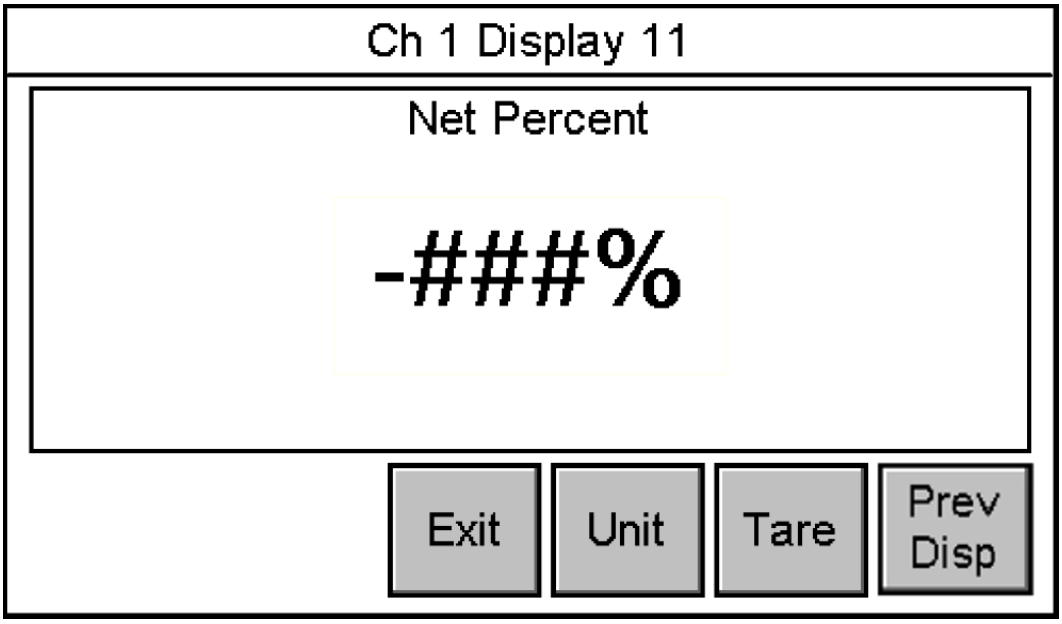

Figure 17: ***Single Channel Display 11***
Displays net percent

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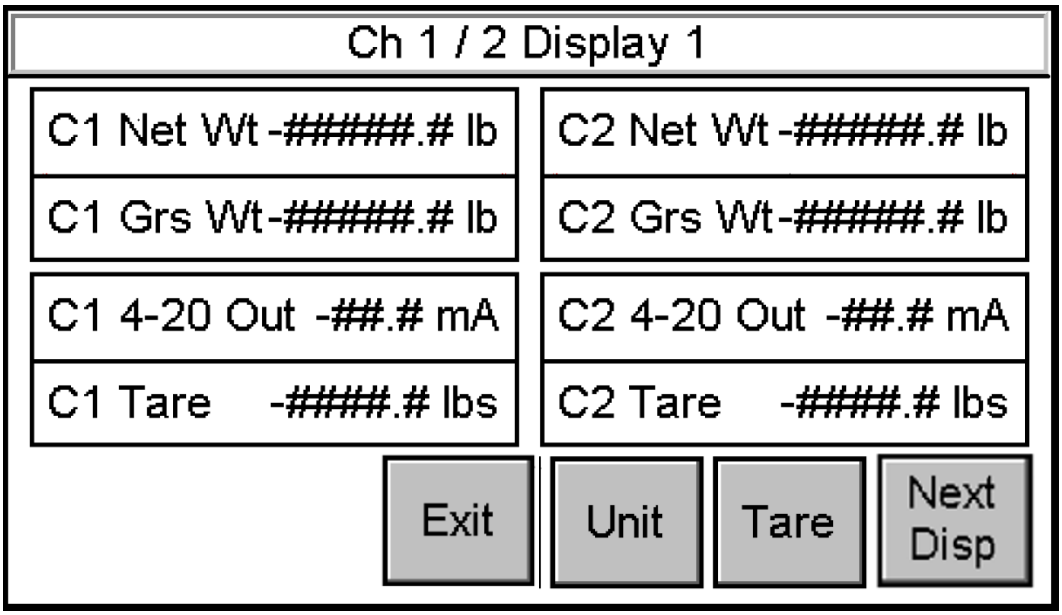

Figure 18: ***Dual Channel Display 1***

Displays Ch 1 net weight, Ch 1 gross weight, Ch 1 4-20mA out, Ch 1 tare, Ch 2 net weight, Ch 2 gross weight, Ch 2 4-20mA out, and Ch 2 tare

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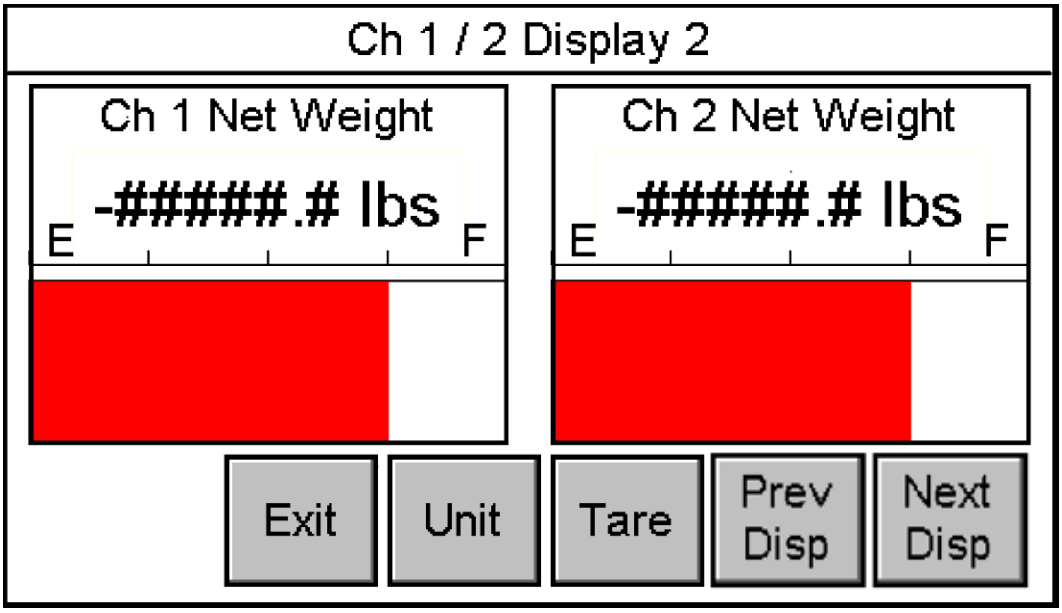

Figure 19: ***Dual Channel Display 2***

Displays Ch 1 net percent, Ch 1 net weight graph, Ch 2 net percent, and Ch 2 net weight graph

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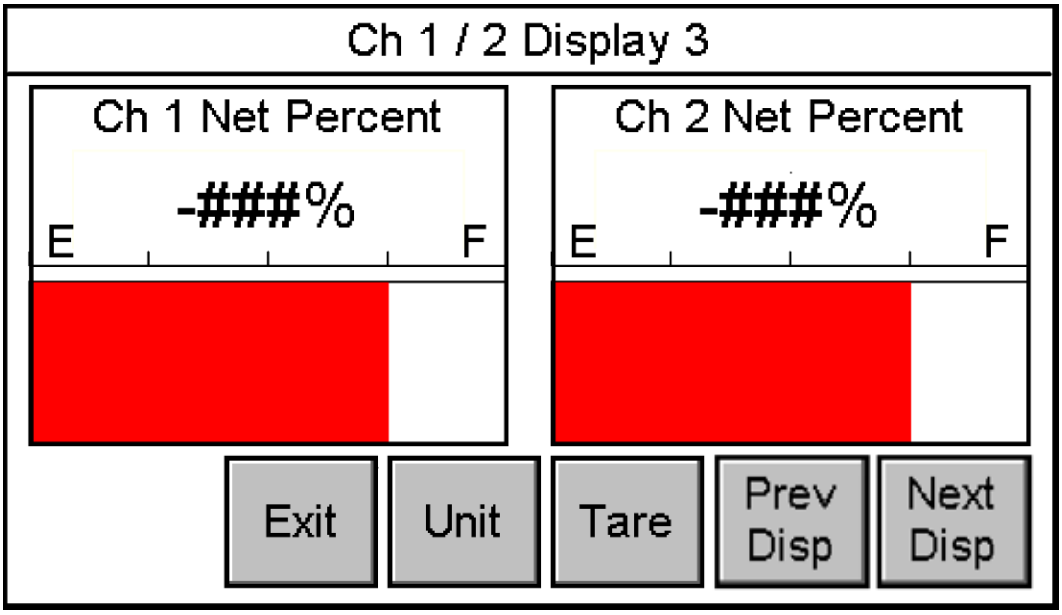

Figure 20: ***Dual Channel Display 3***
Displays Ch 1 net percent, Ch 2 net percent, Ch 1 net weight graph, and Ch 2 net weight graph

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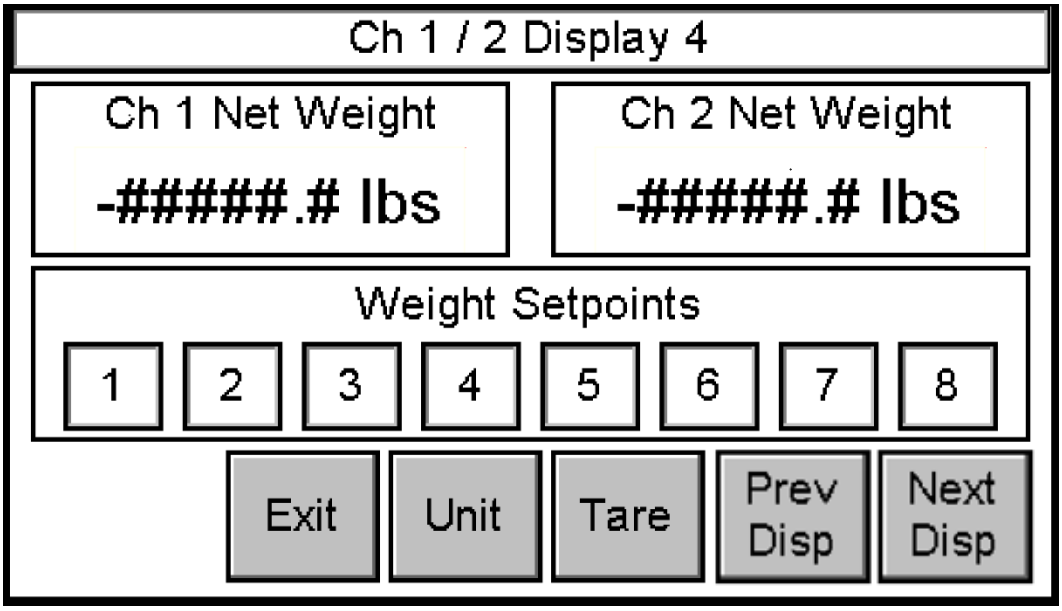

Figure 21: ***Dual Channel Display 4***
Displays Ch 1 net weight, Ch 2 net weight, and weight setpoints

NOTE: Only available when weight setpoints are enabled

NOTE: The amount of weight setpoints displayed will vary based on configuration

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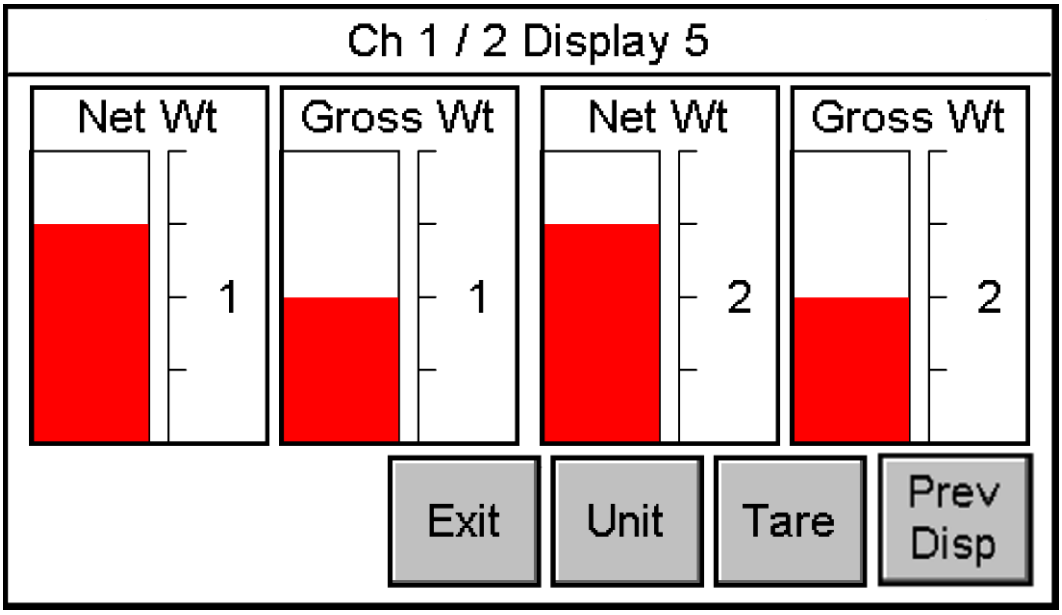

Figure 22: ***Dual Channel Display 5***

Displays Ch 1 net weight graph, Ch 1 gross weight graph, Ch 2 net weight graph, and Ch 2 gross weight graph

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4.2 Unit Selection

The user can access the single channel unit screen by pressing the “Unit” button on any single channel display or tare screen. The user can access the dual channel unit screen by pressing the “Unit” button on a dual channel display. The selected unit affects net weight, gross weight, and tare. When gallons or liters are selected, specific gravity will be included in conversion calculations.

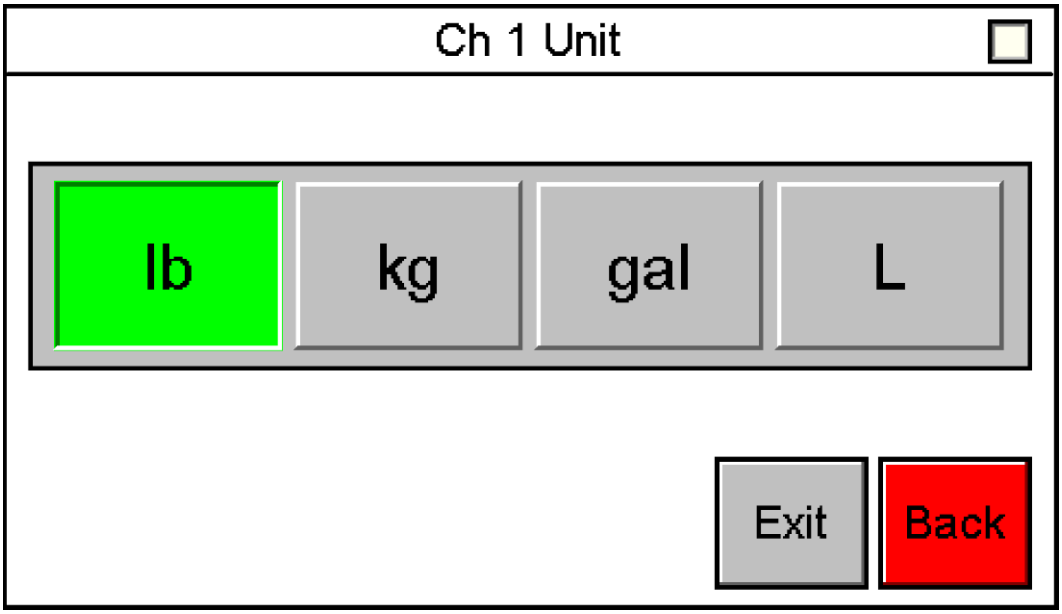

Figure 23: ***Individual Channel Unit Selection***

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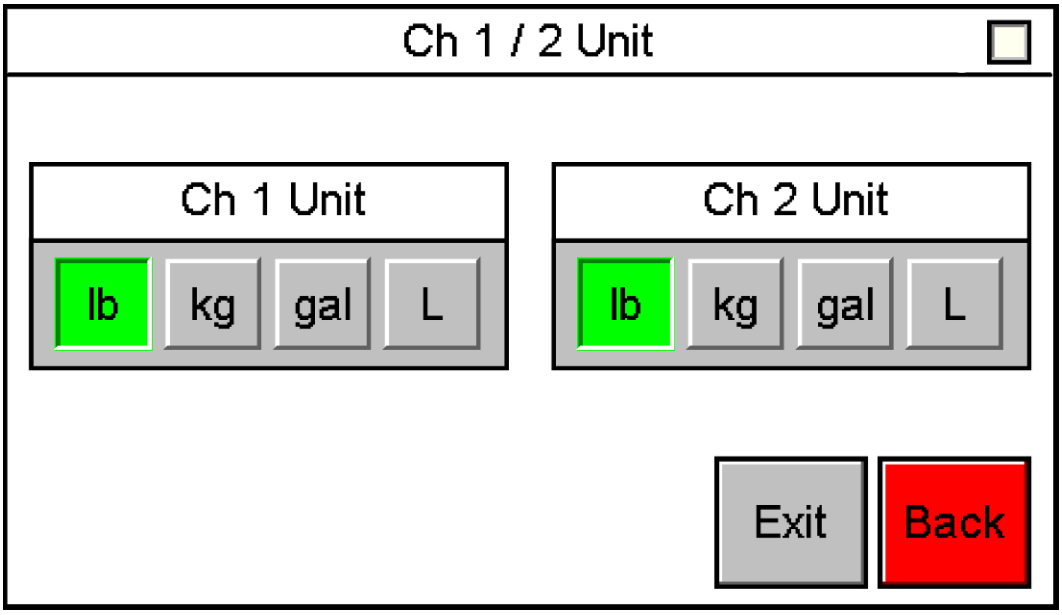

Figure 24: ***Dual Channel Unit Selection***

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4.3 Tare Adjustment

The user can access the tare adjustment screen by pressing the “Tare” button on any display. If the user presses the “Tare” button in a dual channel display, they will be prompted to select which channel. While in the tare adjustment screen, the user can manually adjust tare by using the add and subtract buttons. A single press will add or subtract “0.1” of the value. Holding the button will gradually increase add or subtract speed. By pressing the “Unit” button, the user can select the display and adjustment unit (see figure 23). By pressing the “Auto” button, the user can automatically tare all weight on the base. By pressing the “Reset” button, the user can reset the tare value to zero. Tare will be forced to zero and cannot be adjusted if either the calibration is not complete or there is an analog input limit.

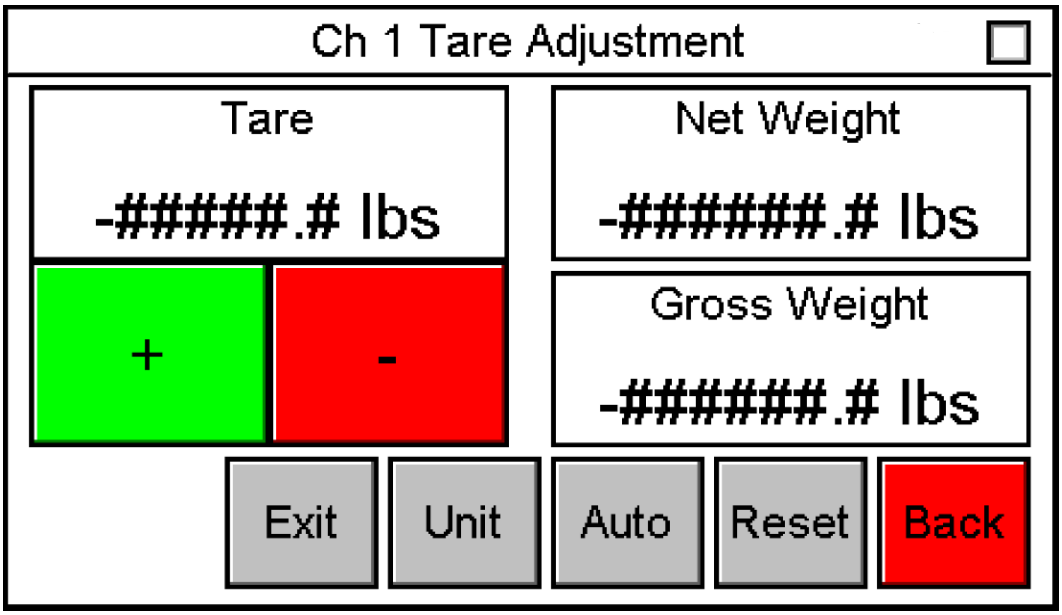

Figure 25: ***Tare Adjustment***
Displays tare, net weight, and gross weight

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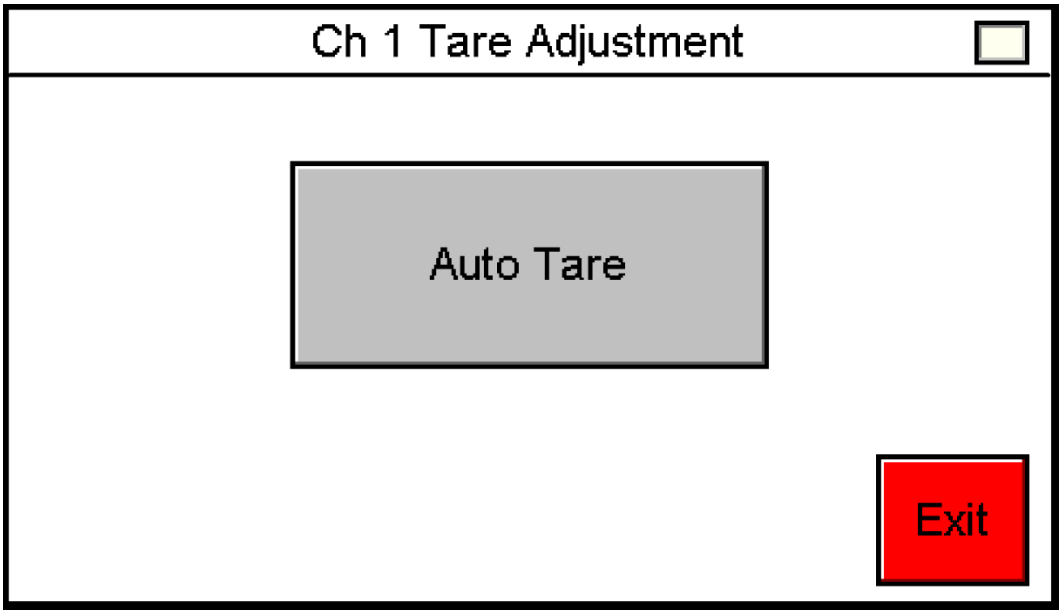

Figure 26: ***Auto Tare***

The user can access this screen by pressing the "Auto" button on the tare adjustment screen (see figure 25). The user can automatically tare all the weight on the base by pressing "Auto Tare". A confirmation screen will be shown after the user presses "Auto Tare"

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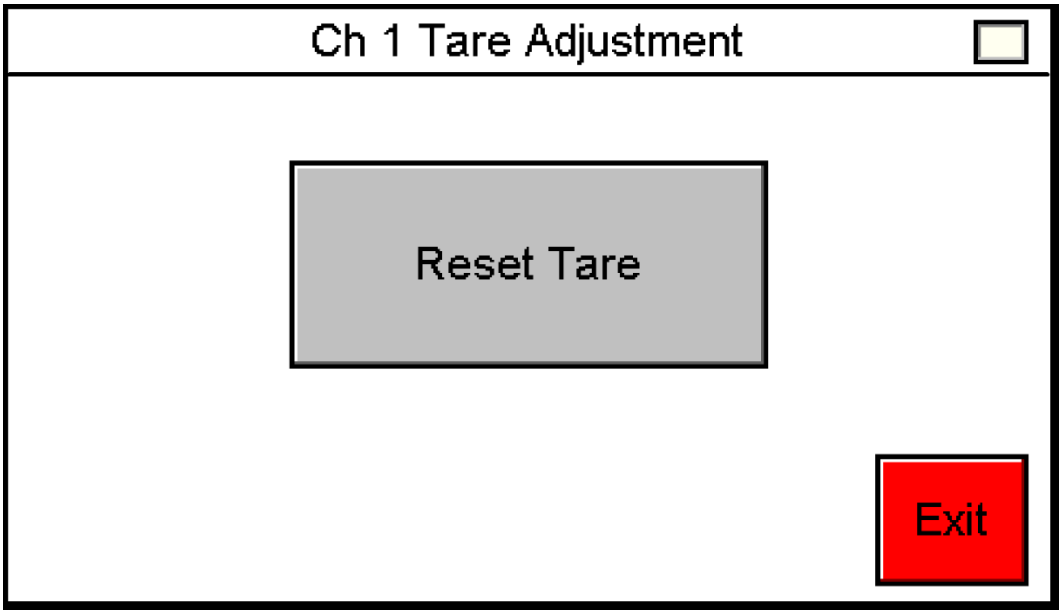

Figure 27: ***Reset Tare***

The user can access this screen by pressing the “Reset” button on the tare adjustment screen (see figure 25). The user can reset the tare value by pressing “Reset Tare”. A confirmation screen will be shown after the user presses “Reset Tare”

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5 System Configuration

The user can access the settings by pressing the “Settings” button on the configuration screen. The user can access the configuration screen by pressing the “Configuration” button on the home screen. The user can select weight averaging type, display format, specific gravity, 4-20mA output scale, weight setpoint trigger value and level (if applicable), and weight setpoint options (if applicable). In the configuration screen the user can also view the current settings by pressing the “View” button under the “Settings” button. The user can also reset the settings by pressing the “Reset” button under the “Settings” button.

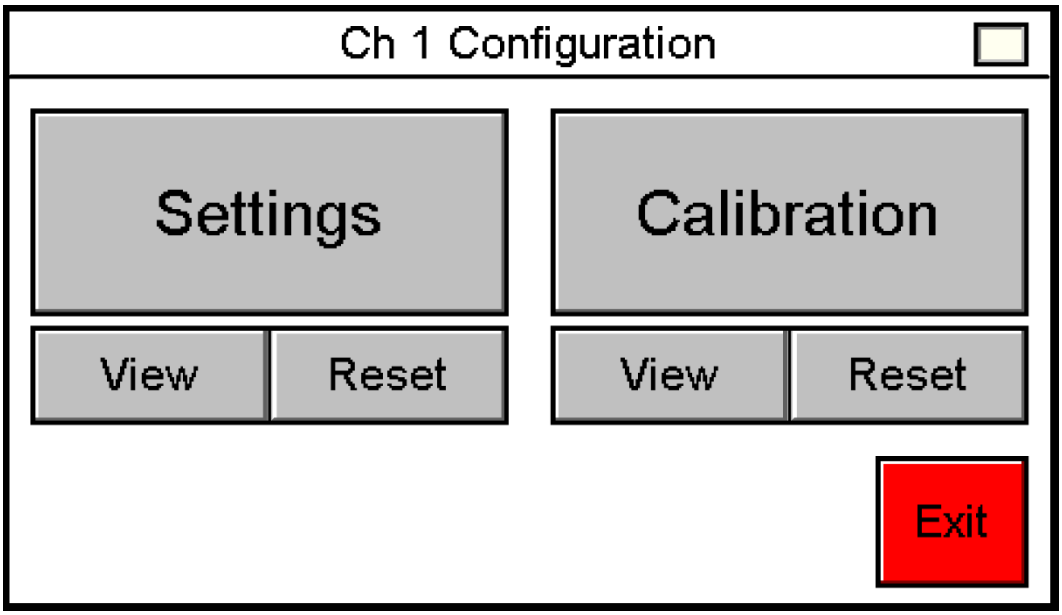

Figure 28: ***Configuration***

NOTE: Calibration configuration and calibration reset require a password when passwords are enabled in developer options

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5.1 Settings: Decimal

The decimal selection affects the precision of net weight, gross weight, and tare. “No” selection will result in no decimal (1). “Yes” selection will result in a decimal (1.0).

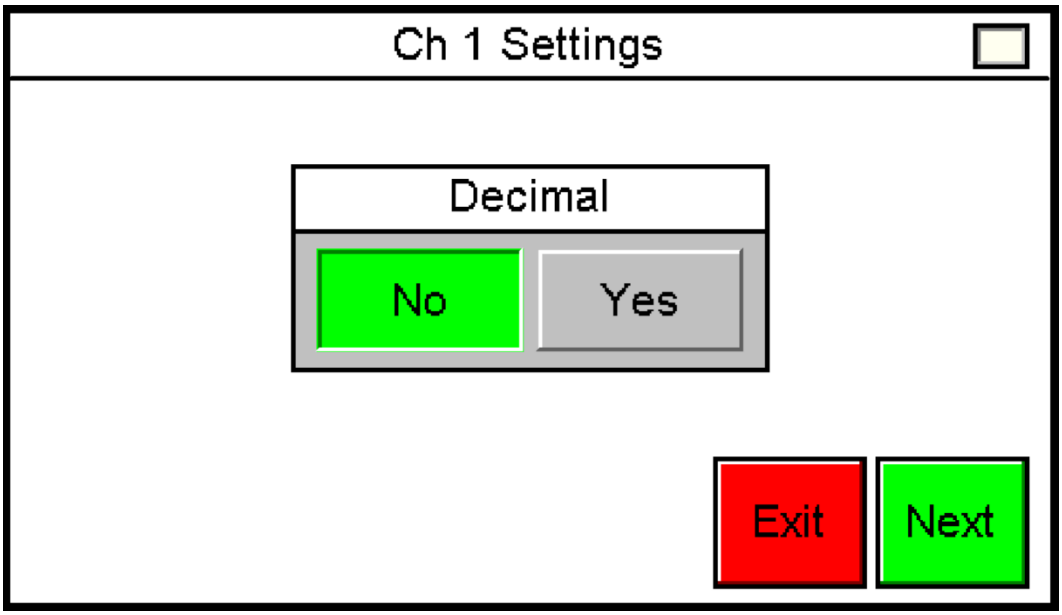

Figure 29: ***Settings: Decimal***

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5.2 Settings: Specific Gravity

Specific gravity affects units of volume (gallons and liters). Default specific gravity is 1.000. A gallon of water has a specific gravity of 1.000 which weighs roughly 8.35 lbs. The specific gravity acts as a multiplier to the value 8.35.

EXAMPLE: If the user enters a specific gravity of 1.500, the weight of a gallon would increase to 12.5 lbs (8.35 * 1.500 = 12.5).

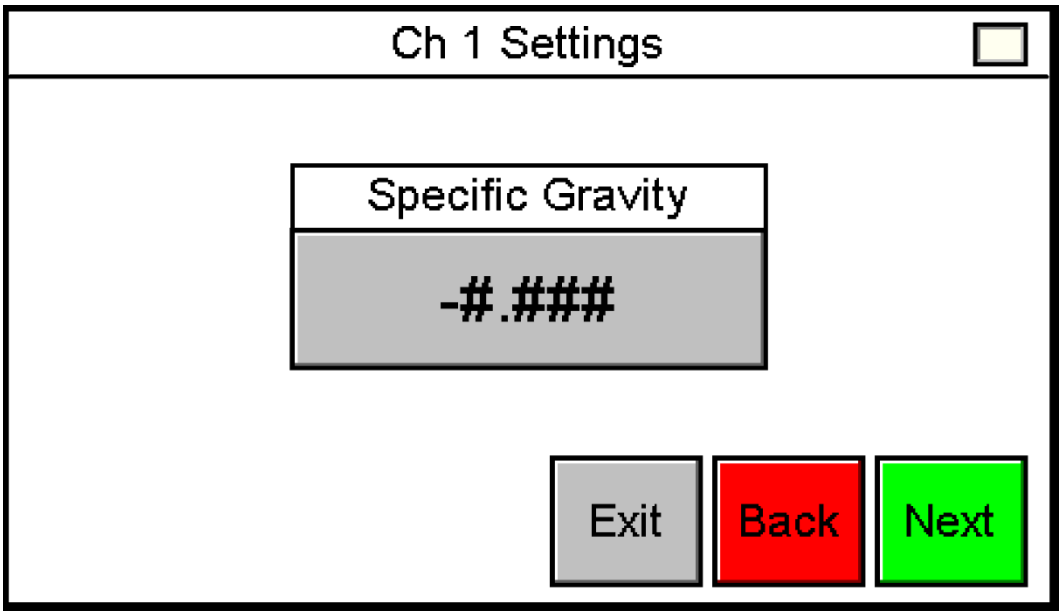

Figure 30: ***Settings: Specific Gravity***

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5.3 Settings: 4-20 mA Net Weight Output

The 4 mA weight is the weight in which the indicator will output 4 mA's. The 20 mA weight is the weight in which the program will output 20 mA's. Any weight value in between the configured 4 mA weight and 20 mA weight will scale the output signal accordingly. The user can use the output signal to remotely determine net weight.

EXAMPLE: If the user enters a 4 mA weight of 0 lbs, and a 20 mA weight of 100 lbs, the indicator will output 8 mA's when net weight is equal to 25 lbs.

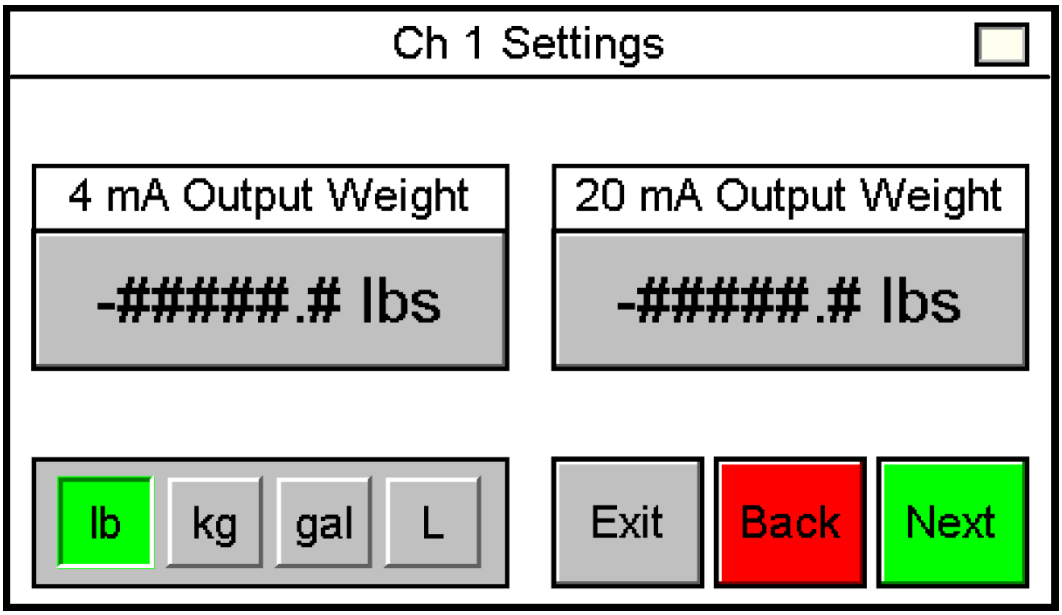

Figure 31: ***Settings: 4-20 mA Net Weight Output***

NOTE: When weight setpoints are not enabled, this screen is the last of the settings. When the user presses the "Next" button when weight setpoints are not enabled, they will be brought to the settings confirmation screen (see figure 34)

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5.4 Settings: Weight Setpoints

The corresponding setpoint output will turn on when the net weight is above or below (trigger level depends on low/high selection) the setpoint value. The user can select the unit for the setpoint value. If extra weight setpoints are enabled, pressing the "Next" button will bring the user to the screen, "Ch 1 Settings: Extra Weight Setpoints" which enables the user to configure the extra setpoints. The user can exit, go back to the previous screen, or go to the next screen.

EXAMPLE: If the user enters a weight setpoint 1 weight of 50 lbs and the setpoint is set to low selection, weight setpoint output 1 will be on when the net weight is less than 50 lbs.

SETPOINT CONFIGURATION MAP:
- Single channel with weight setpoints enabled, 2 setpoints total, 2 per channel
- Single channel with extra weight setpoints enabled, 4 setpoints total, 4 per channel
- Dual channel with weight setpoints enabled, 4 setpoints total, 2 per channel
- Dual channel with extra weight setpoints enabled, 8 setpoints total, 4 per channel

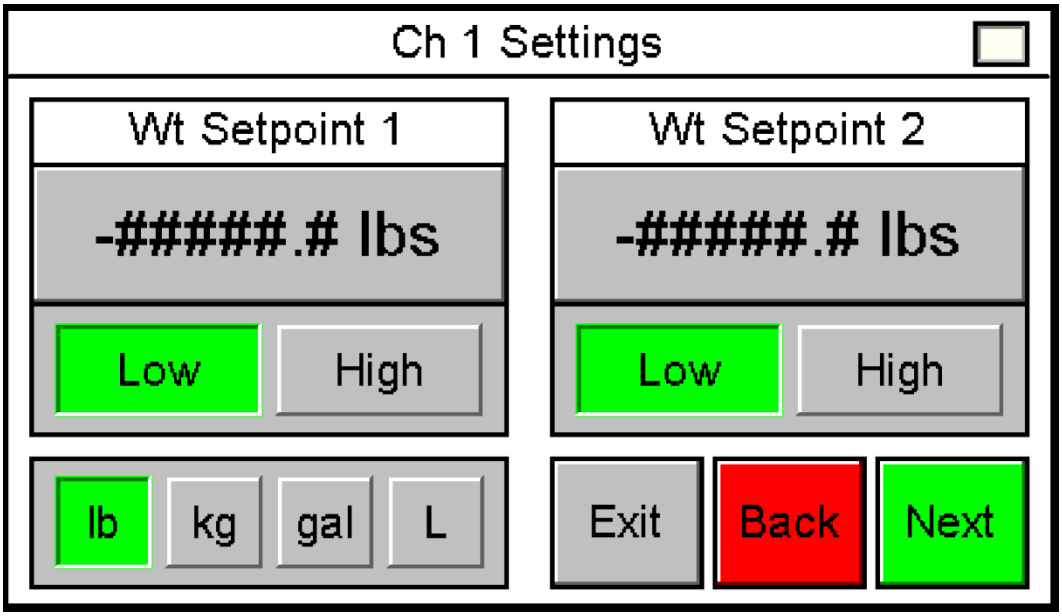

*Figure 32: **Settings: Weight Setpoints***

NOTE: Only available when weight setpoints are enabled

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5.5 Settings: Weight Setpoints Options

"Latch" and "Alarm" affect how weight setpoints function. Only one of these options may be selected at a time. When latch is enabled, weight setpoints will be latched the moment it is triggered. When a weight setpoint is latched, the setpoint will remain on until it is acknowledged by the user. To acknowledge the setpoint, the user must press the "Acknowledge" button on the weight setpoints status check screen. When alarm is enabled, weight setpoints will function as an alarm trigger and will be added to the alarm's status check screen. The user can exit, go back to the previous screen, or go to the next screen.

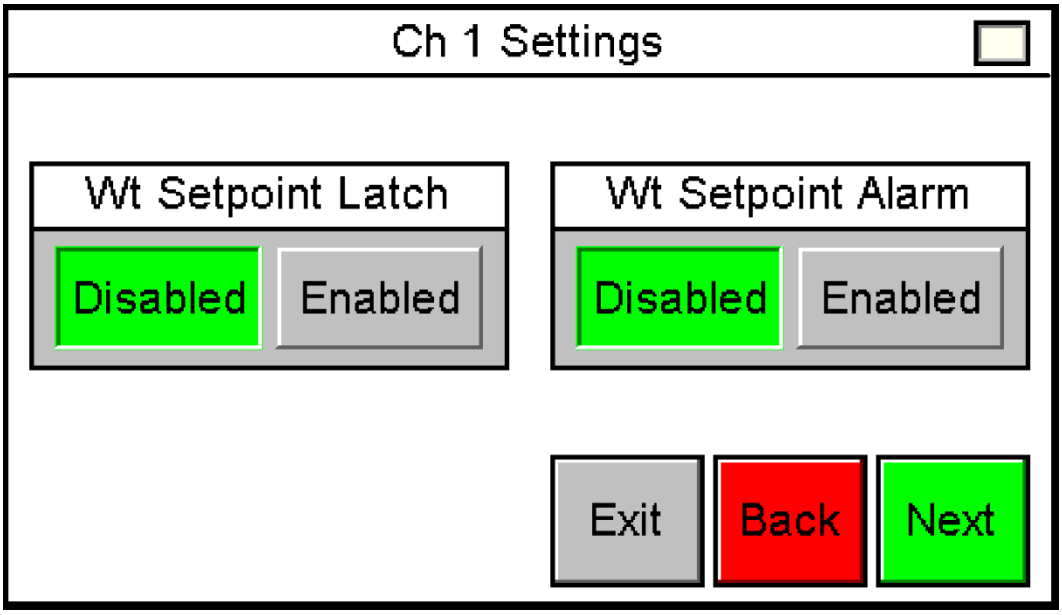

Figure 33: ***Settings: Weight Setpoints Options***

NOTE: When weight setpoints are enabled this screen is the last of the settings

NOTE: Only available when weight setpoints are enabled

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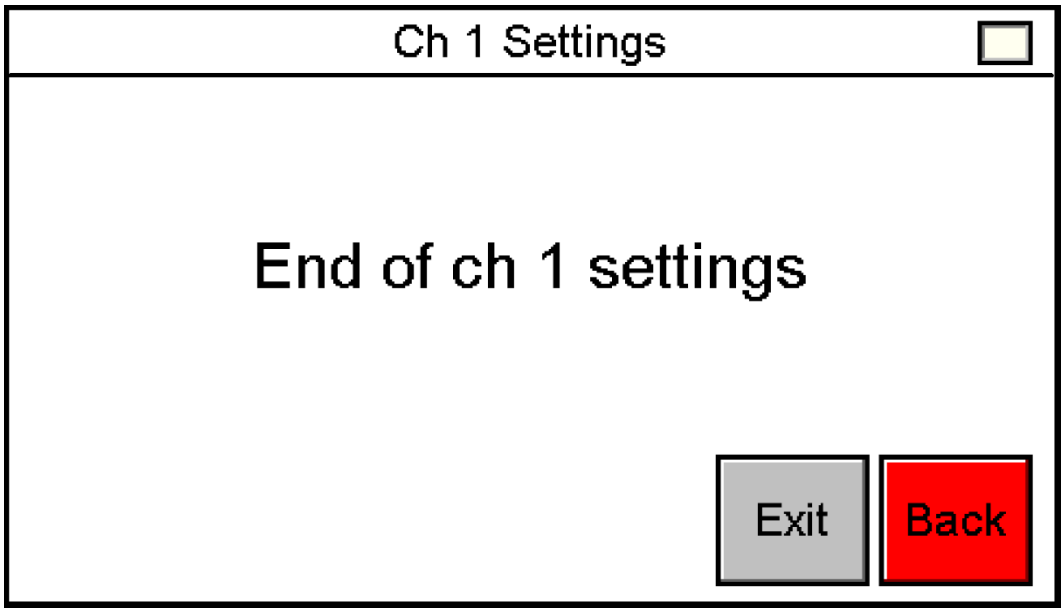

Figure 34: ***Settings: Ending Confirmation***

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5.6 Settings View

The user can access the settings view screens by pressing the “View” button on the configuration screen (see figure 28). The user can view all current settings at a quick glance.

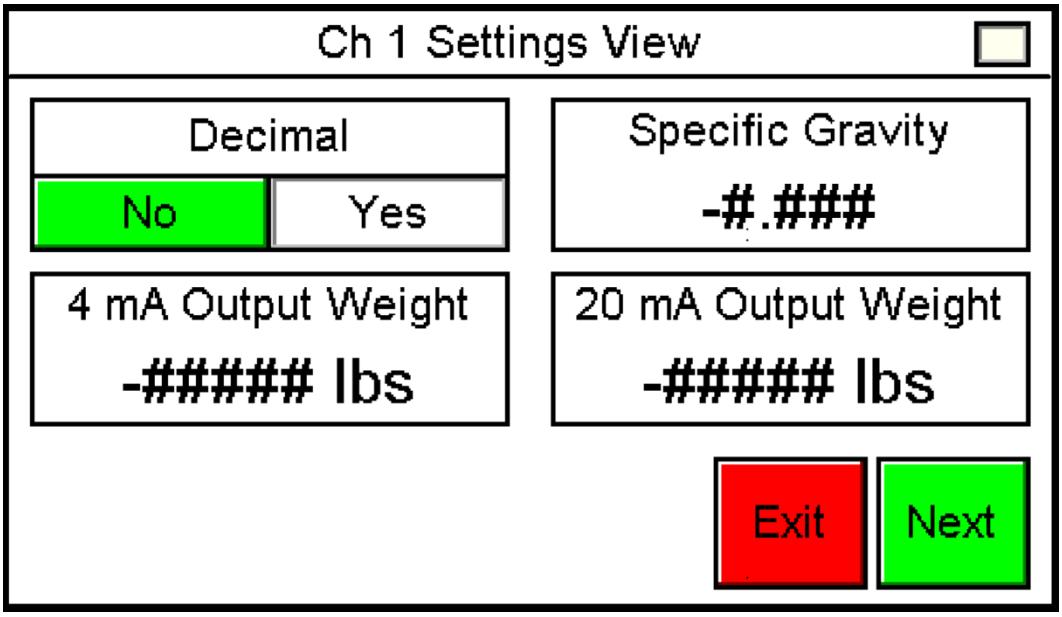

Figure 35: ***Settings View 1***

Displays average type, display format, specific gravity, 4 mA output, and 20 mA output

NOTE: When weight setpoints are not enabled, this screen is the only settings view screen

NOTE: When weight setpoints are enabled, an additional screen is added

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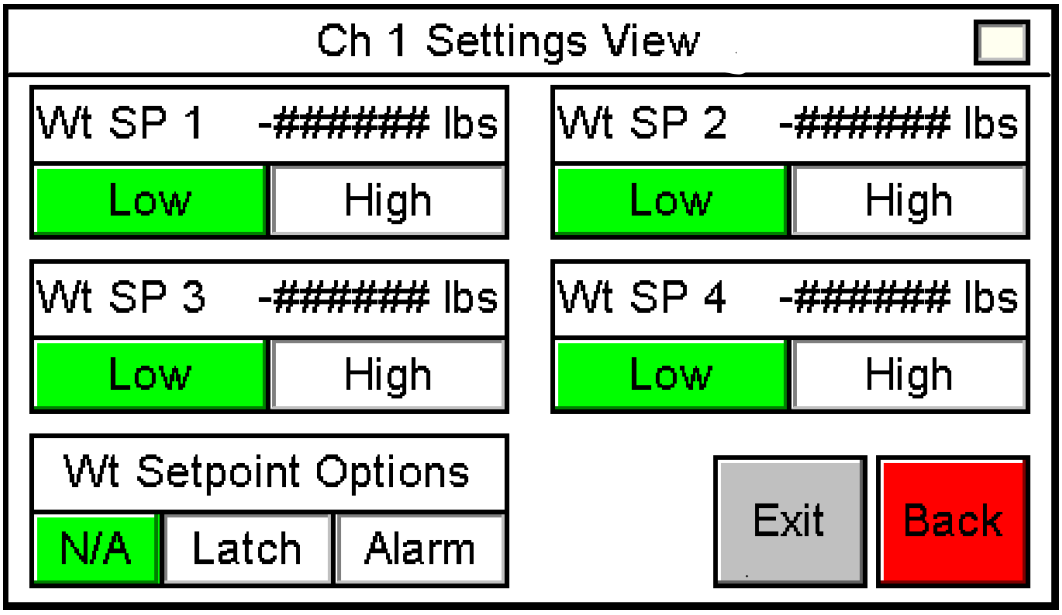

Figure 36: ***Settings View 2***
Displays weight setpoint values, level selection, and options

NOTE: Only available when weight setpoints are enabled

NOTE: The amount of weight setpoints displayed will vary based on configuration

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5.7 Reset Settings

The user can access this screen by pressing the “Reset” button on the configuration screen (see figure 28). The user can reset the settings by pressing “Reset Settings”. A confirmation screen will be shown after the user presses “Reset Settings”.

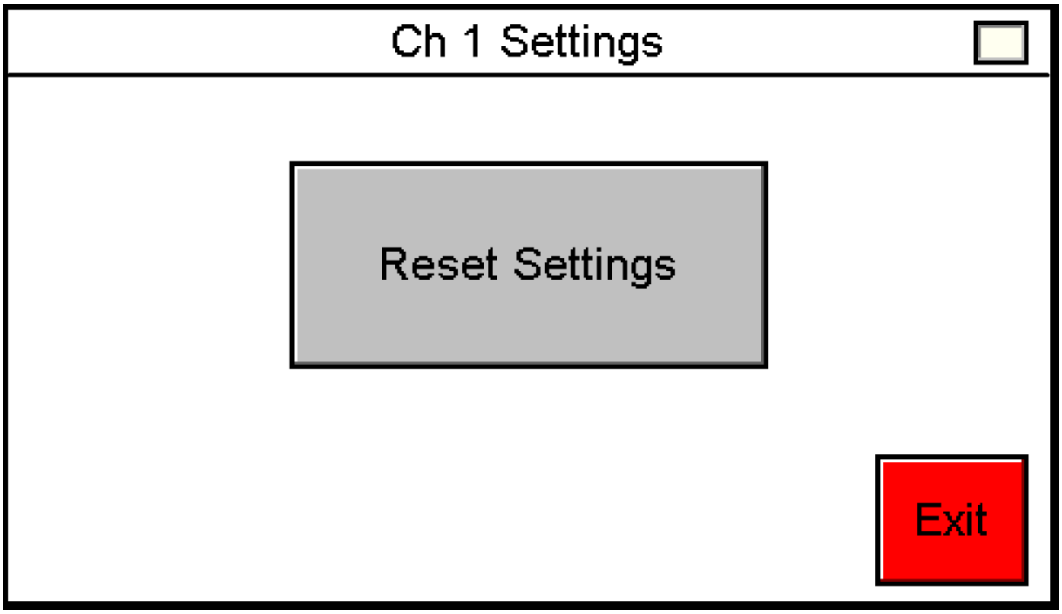

Figure 37: ***Reset Settings***

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6 Calibration

The user can access calibration by pressing the “Calibration” button on the configuration screen (see figure 28). The user can select standard or data entry calibration. Standard calibration allows the user to get dead load and calibration weight samples, enter calibration weight value, enter max net weight for indicator, and enter max gross weight for scale base. When taking dead load or calibration weight samples, the program checks to ensure a stable base during calibration. An unstable base during calibration will disregard the calibration value and prompt the user to attempt calibration again. An error will be present whenever a base is unstable during calibration. Data entry calibration allows the user to enter a dead load and weight bit value, enter calibration weight value, enter max net weight for indicator, and enter max gross weight for scale base.

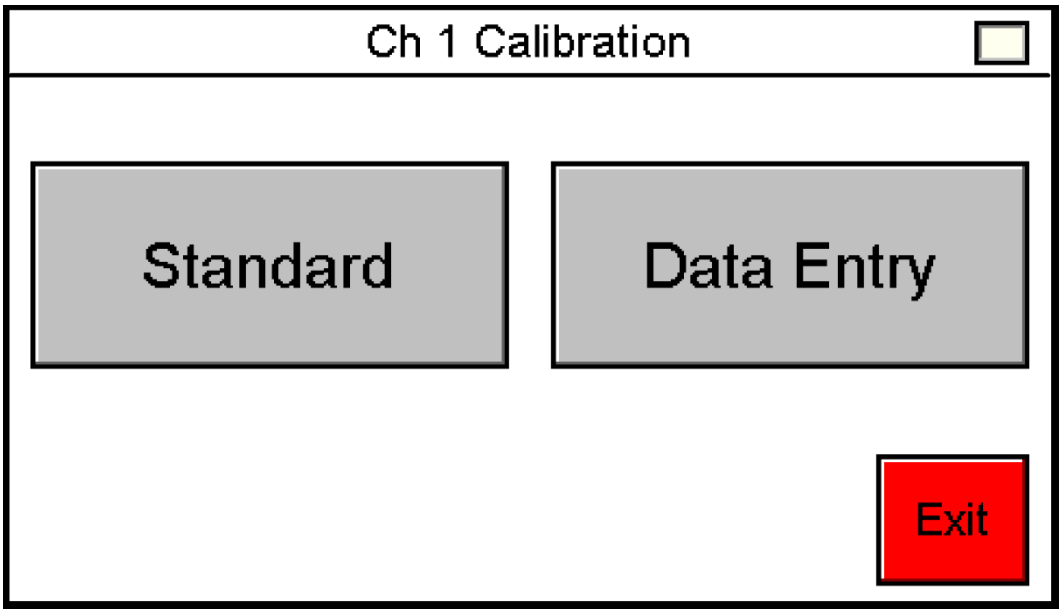

Figure 38: ***Calibration Type Select***

NOTE: Standard and data entry calibration menus require a password when passwords are enabled

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6.1 Standard Calibration: Dead Load

The user can access the standard calibration screens by pressing the “standard” button on the calibration type select screen (see figure 38). The user can press “Enter” to start the dead load calibration sample. The user can also view the analog input bit value, and the current dead load bit value.

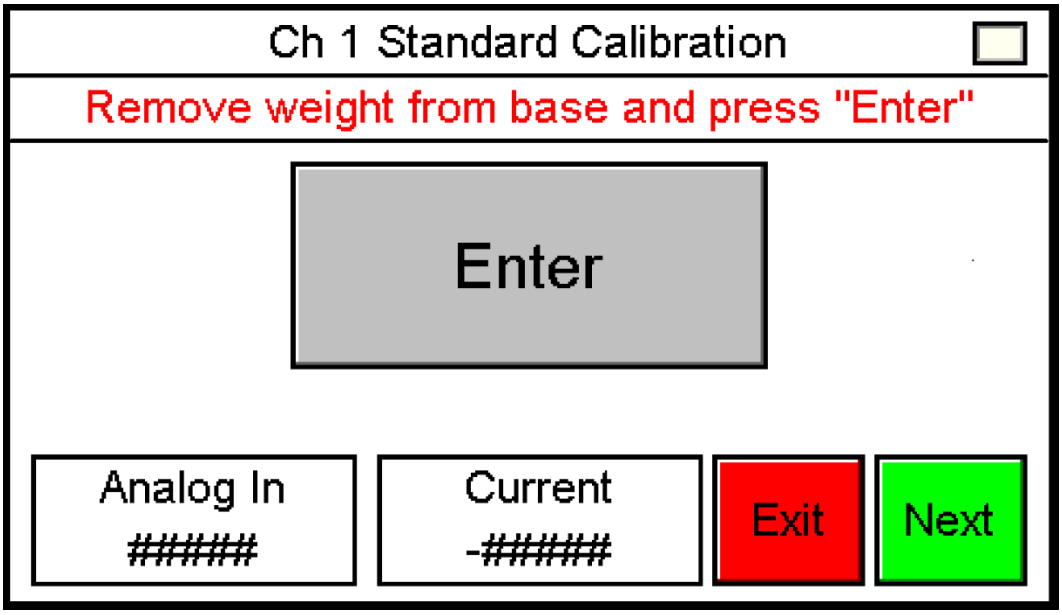

Figure 39: ***Standard Calibration: Dead Load***

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6.2 Standard Calibration: Dead Load Sample

Shows the time remaining of the dead load sample. Sample total length is 10 seconds. 2 samples are taken each second and are averaged at the end to get the resulting dead load bit. A check is run on the dead load calibration to ensure stability. If the base was unstable during calibration, the user will be brought to an error screen (see figure 42). If no error was detected, the user will be brought to a screen displaying the new dead load bit value (see figure 41). The user can press "Cancel" to stop the dead load sample and return to the previous screen.

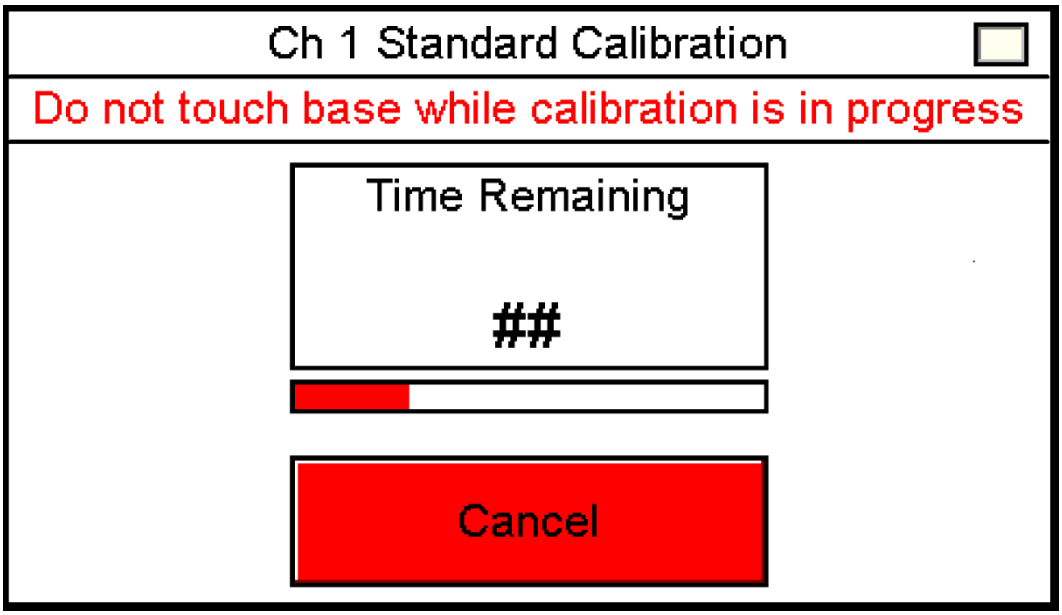

Figure 40: ***Standard Calibration: Dead Load Sample***

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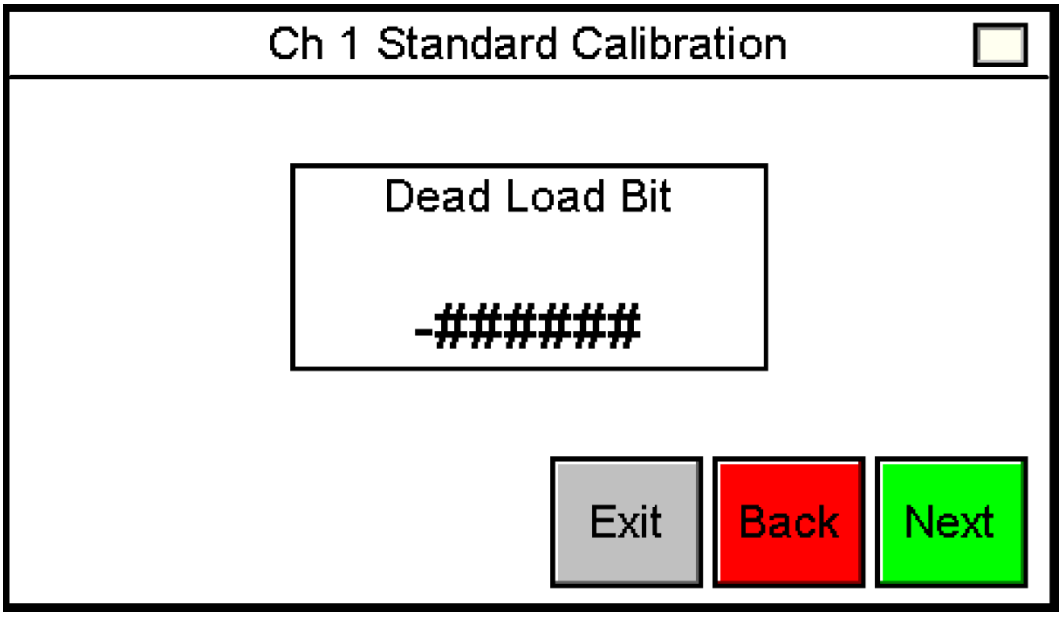

Figure 41: ***Standard Calibration: Dead Load Sample Success***
Displays the resulting dead load bit from the dead load calibration sample

NOTE: Only will display after a stable dead load sample

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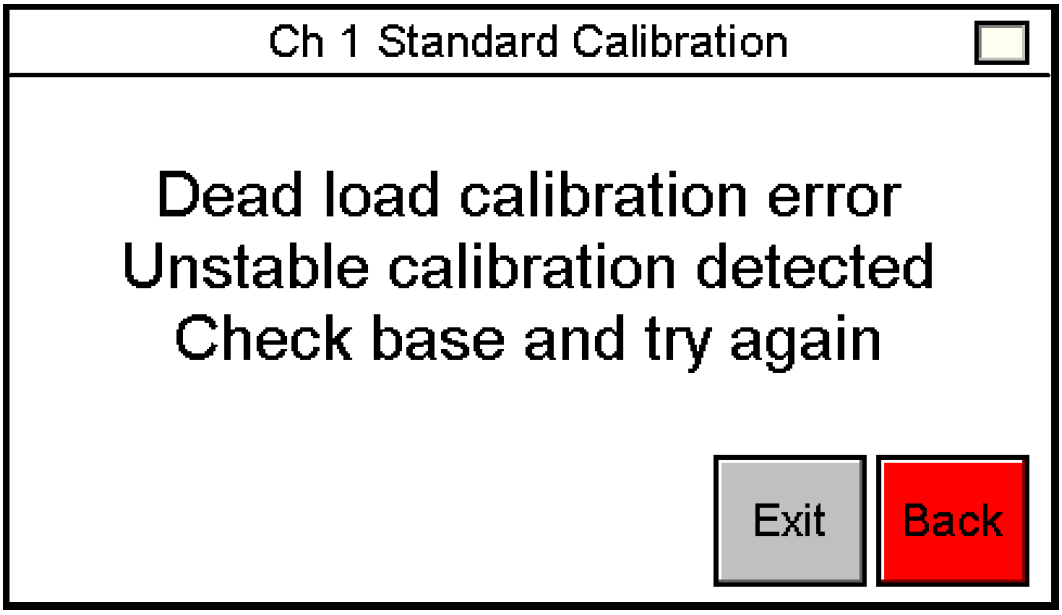

Figure 42: ***Standard Calibration: Dead Load Sample Error***

Displays the dead load calibration error. The dead load calibration error will occur when the analog input varies more than 10 bits during the sample

NOTE: Only will display after an unstable dead load sample

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6.3 Standard Calibration: Calibration Weight

The user can press “Enter” to start the calibration weight sample. The user can also view the analog input bit value, and the current calibration weight bit value.

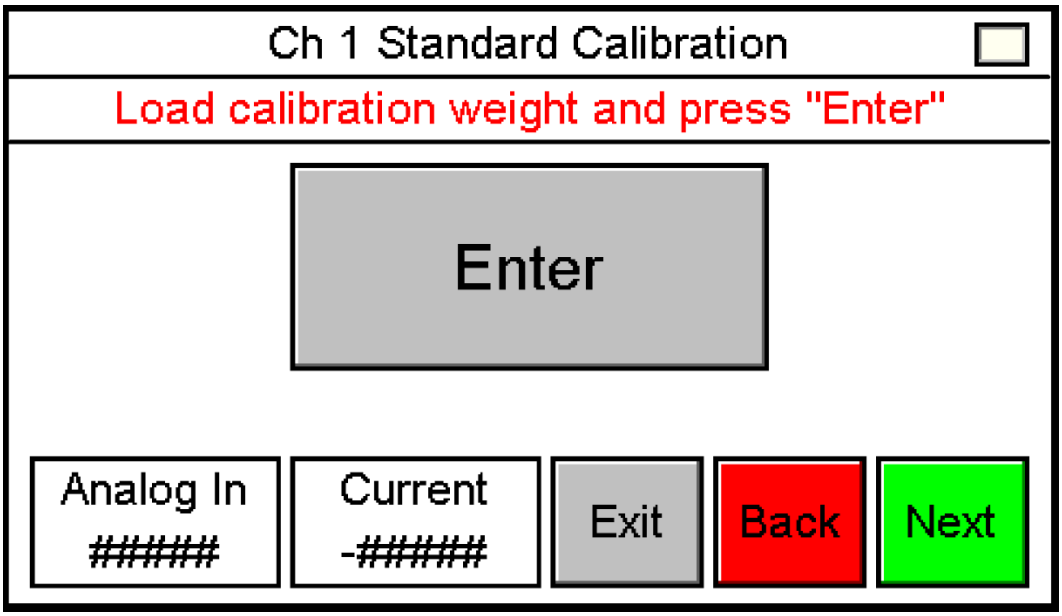

*Figure 43: **Standard Calibration: Calibration Weight***

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6.4 Standard Calibration: Calibration Weight Sample

Shows the time remaining of the calibration weight sample. Sample total length is 10 seconds. 2 samples are taken each second and are averaged at the end to get the resulting calibration weight sample bit. A check is run on the calibration weight sample to ensure stability. If the base was unstable during calibration, the user will be brought to an error screen (see figure 46). If no error was detected, the user will be brought to a screen displaying the new calibration weight sample bit value (see figure 45). The user can press “Cancel” to stop the calibration weight sample and return to the previous screen.

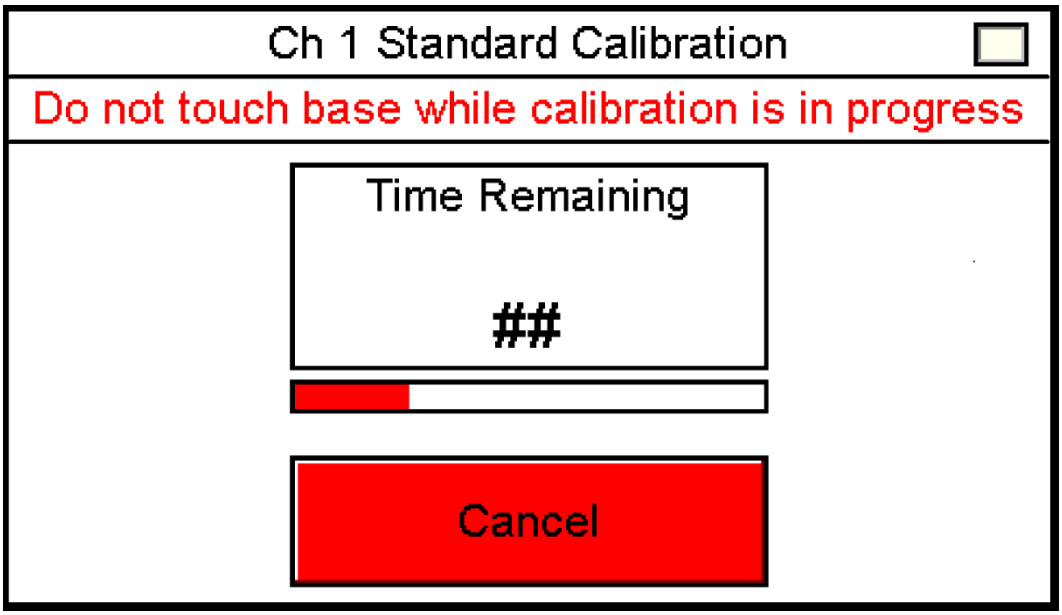

*Figure 44: **Standard Calibration: Calibration Weight Sample***

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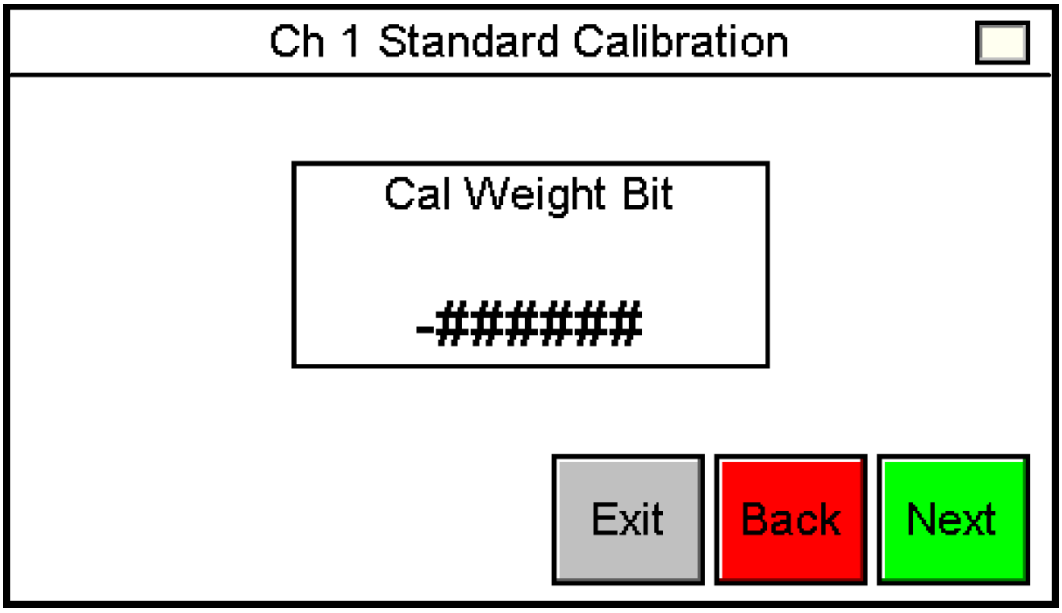

Figure 45: ***Standard Calibration: Calibration Weight Sample Success***
Displays the resulting calibration weight bit from the calibration weight sample

NOTE: Only will display after a stable calibration weight sample

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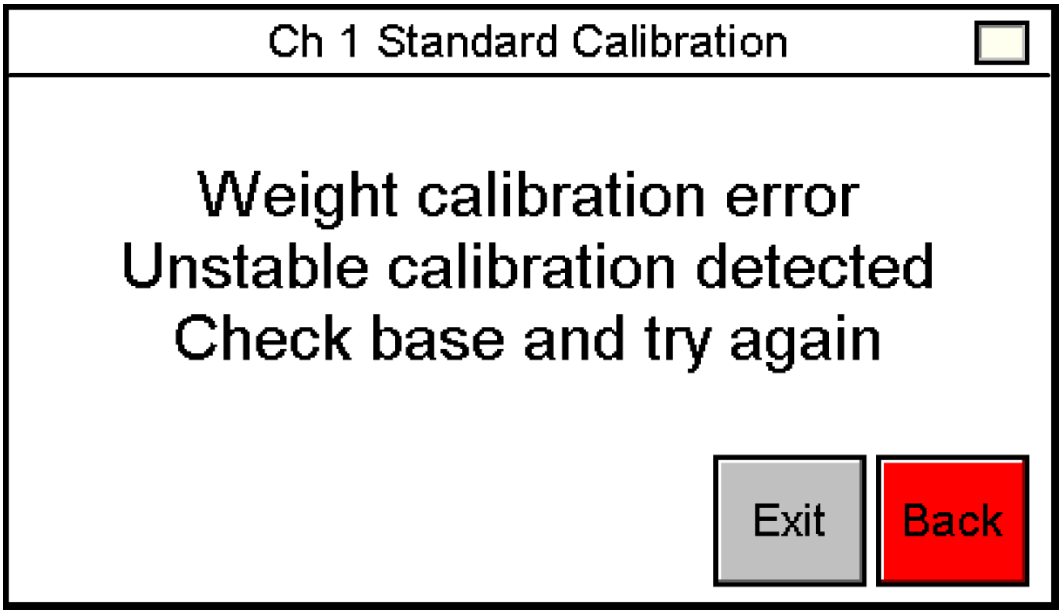

Figure 46: ***Standard Calibration: Calibration Weight Sample Error***

Displays the calibration weight sample error. The calibration weight sample error will occur when the analog input varies more than 10 bits during the sample

NOTE: Only will display after an unstable calibration weight sample

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6.5 Standard Calibration: Calibration Weight Value

Prompts the user to enter the weight value used for calibration. The user can exit, go back to the previous display, or go to the next display.

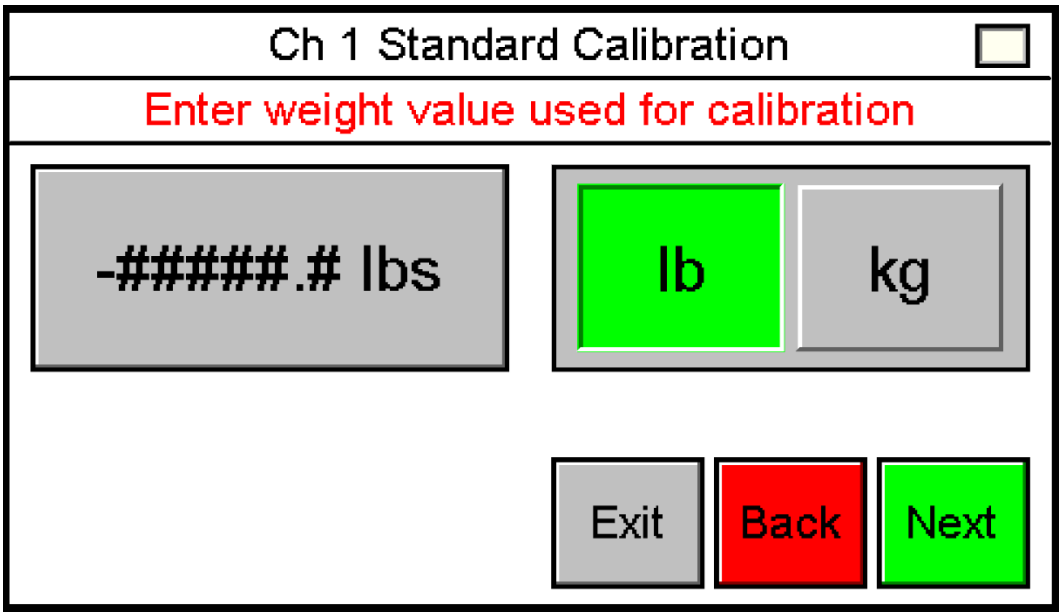

*Figure 47: **Standard Calibration: Calibration Weight Value***

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6.6 Standard Calibration: Max Net Weight

Prompts the user to enter the max net weight for indicator. The max net weight will be used for scaling functions and alarms.

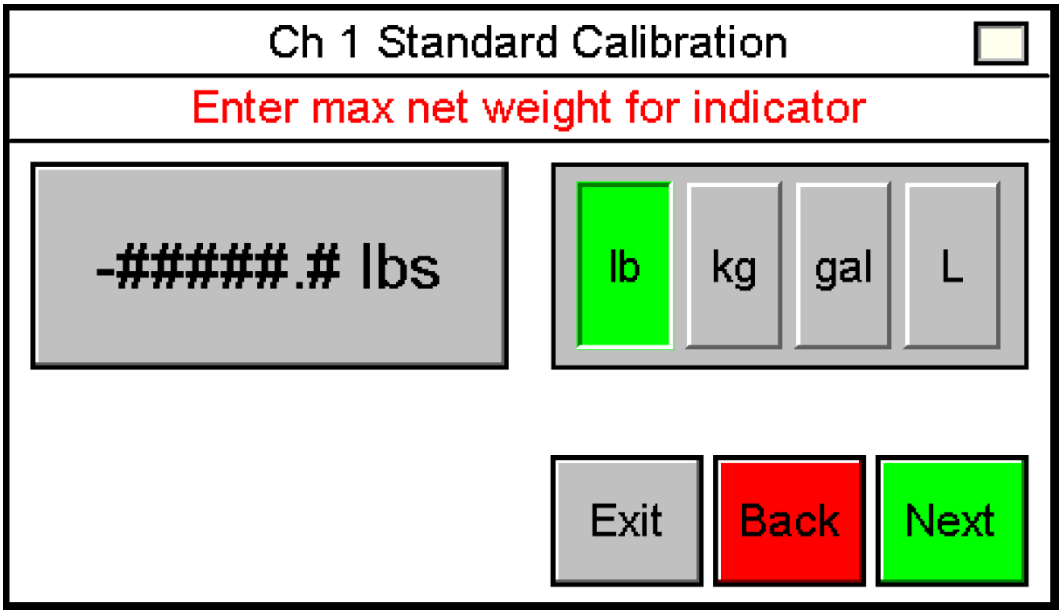

Figure 48: ***Standard Calibration: Max Net Weight***

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6.7 Standard Calibration: Max Gross Weight

Prompts the user to enter the max gross weight for scale base. The max gross weight will be used for scaling functions and alarms.

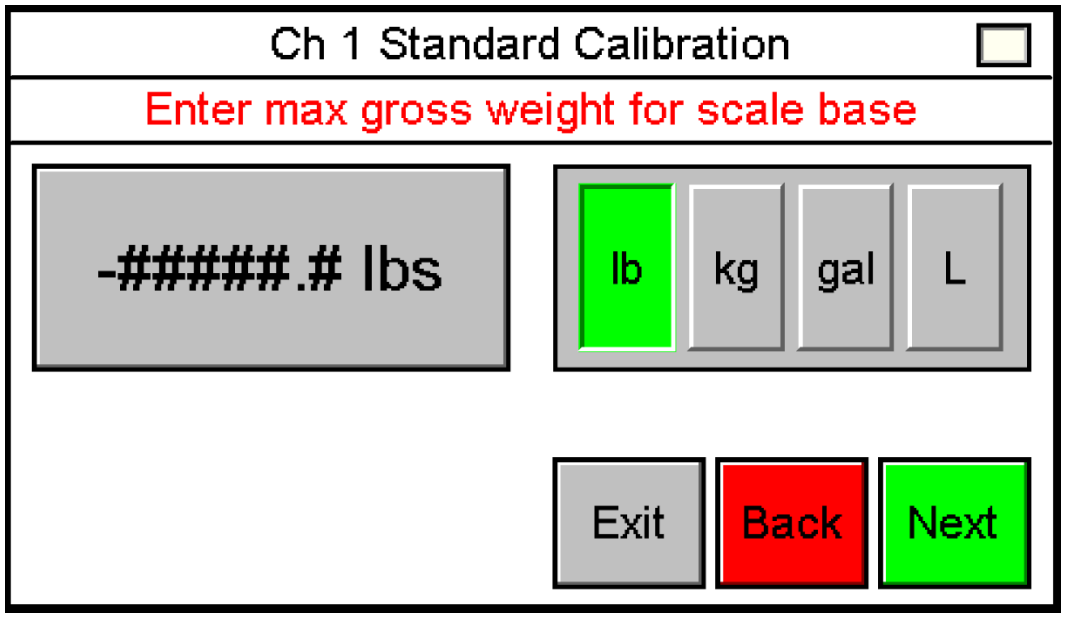

*Figure 49: **Standard Calibration: Max Gross Weight***

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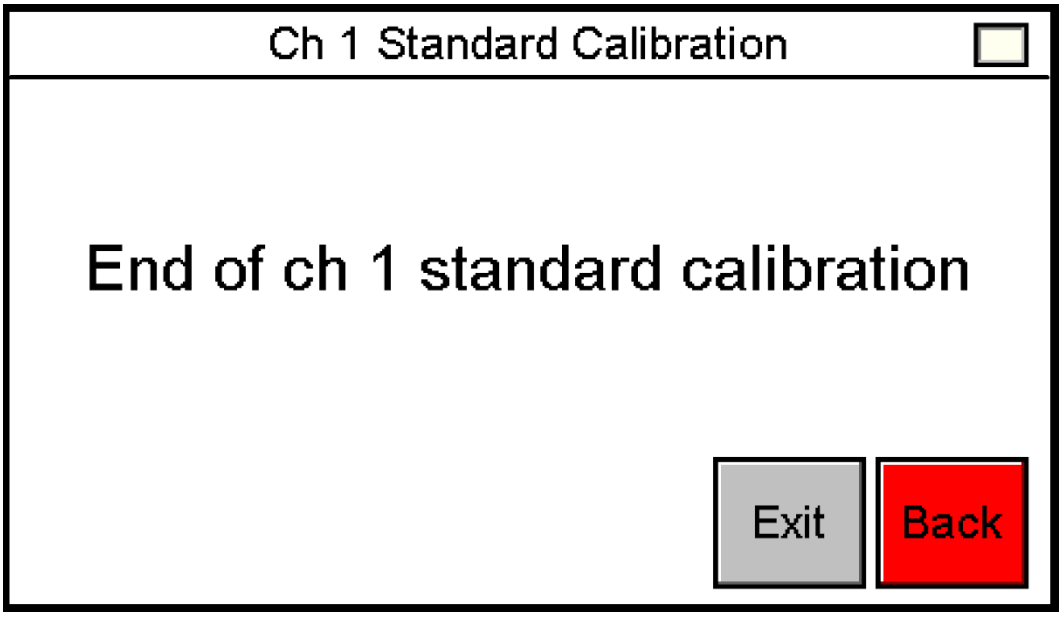

Figure 50: ***Standard Calibration: Ending Confirmation***

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6.8 Data Entry Calibration: Dead Load

The user can access the data entry calibration screens by pressing the “Data Entry” button on the calibration type select screen (see figure 38). Prompts the user to enter the dead load bit value. The program will use this bit value as 0 pounds.

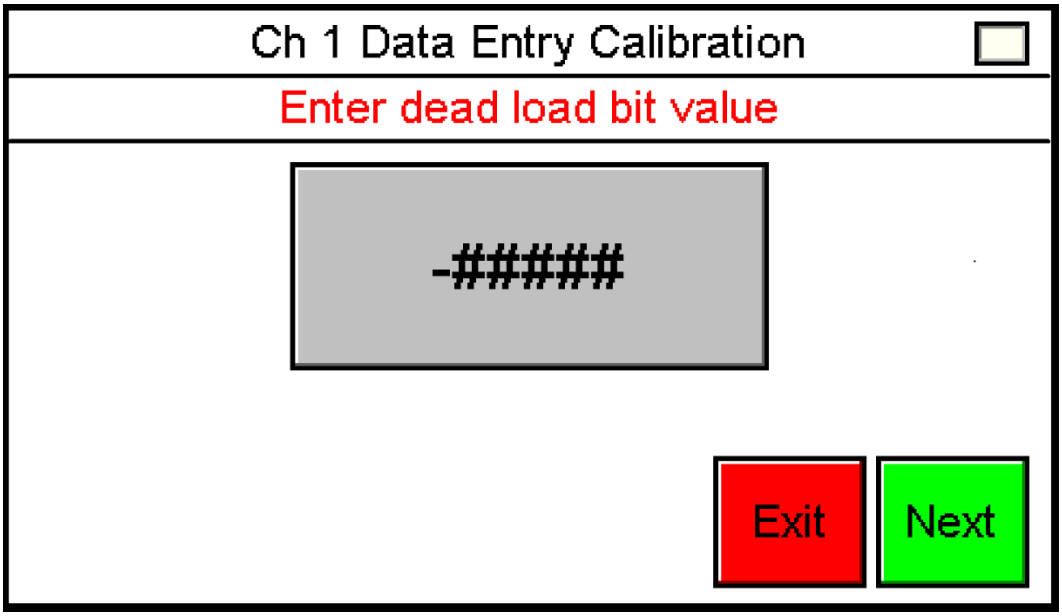

Figure 51: ***Data Entry Calibration: Dead Load***

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6.9 Data Entry Calibration: Calibration Weight

Prompts the user to enter the calibration weight bit value

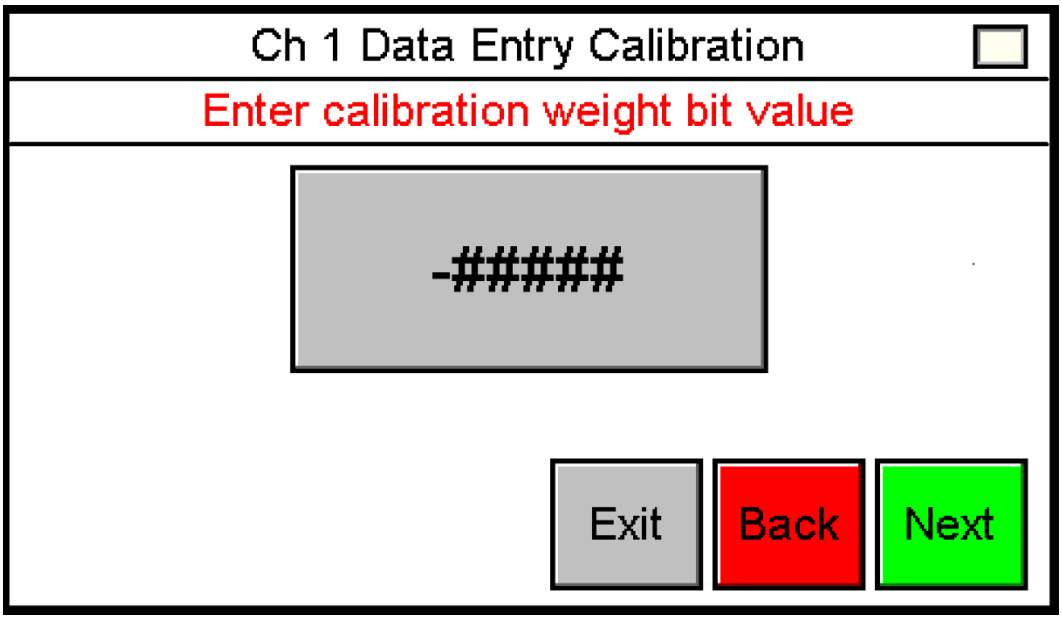

Figure 52: ***Data Entry Calibration: Calibration Weight***

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6.10 Data Entry Calibration: Calibration Weight Value

Prompts the user to enter the weight value used for calibration.

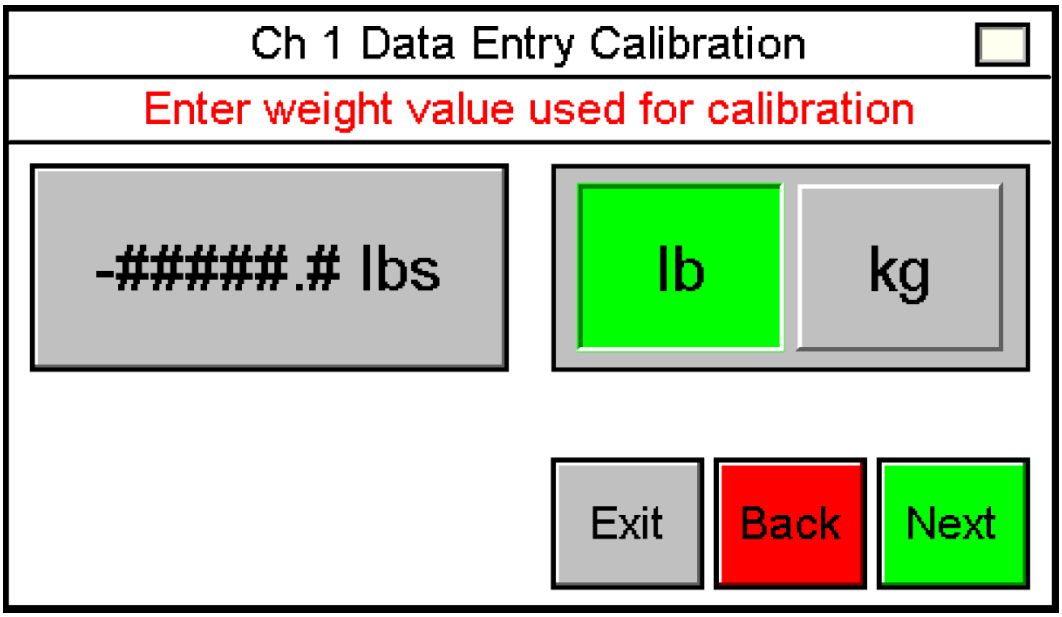

*Figure 53: **Data Entry Calibration: Calibration Weight Value***

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6.11 Data Entry Calibration: Max Net Weight

Prompts the user to enter the max net weight for indicator. The max net weight will be used for scaling functions and alarms.

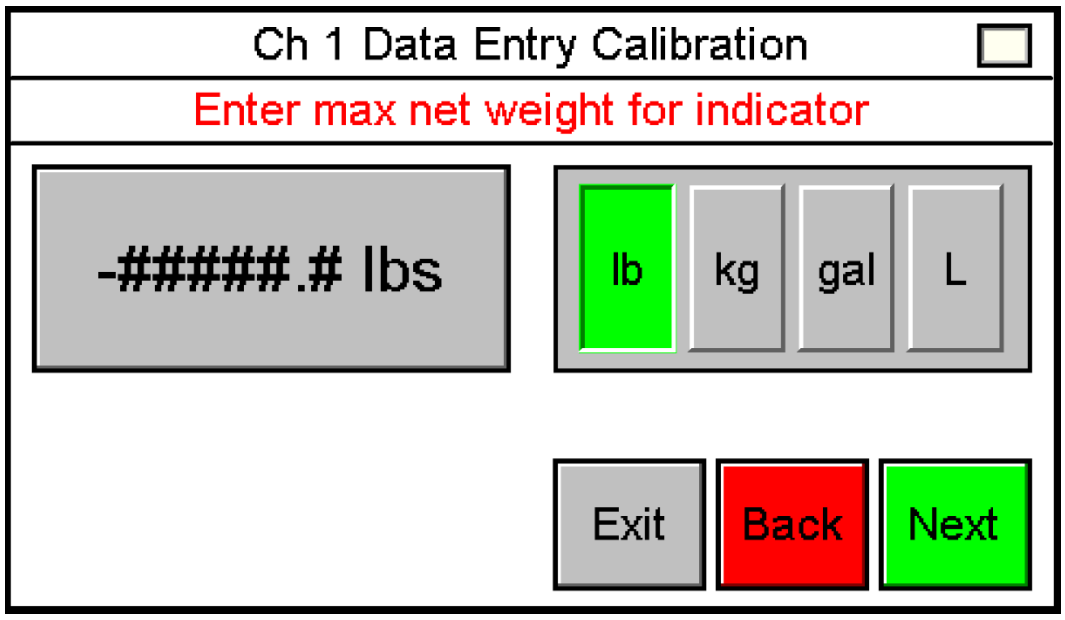

Figure 54: ***Data Entry Calibration: Max Net Weight***

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6.12 Data Entry Calibration: Max Gross Weight

Prompts the user to enter the max gross weight for scale base. The max gross weight will be used for scaling functions and alarms.

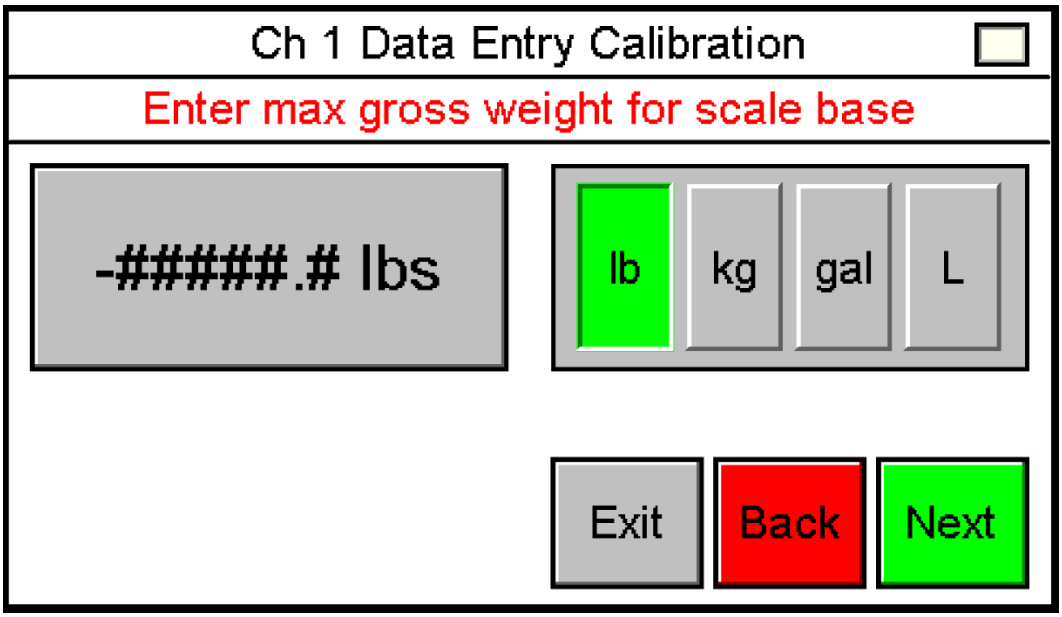

Figure 55: ***Data Entry Calibration: Max Gross Weight***

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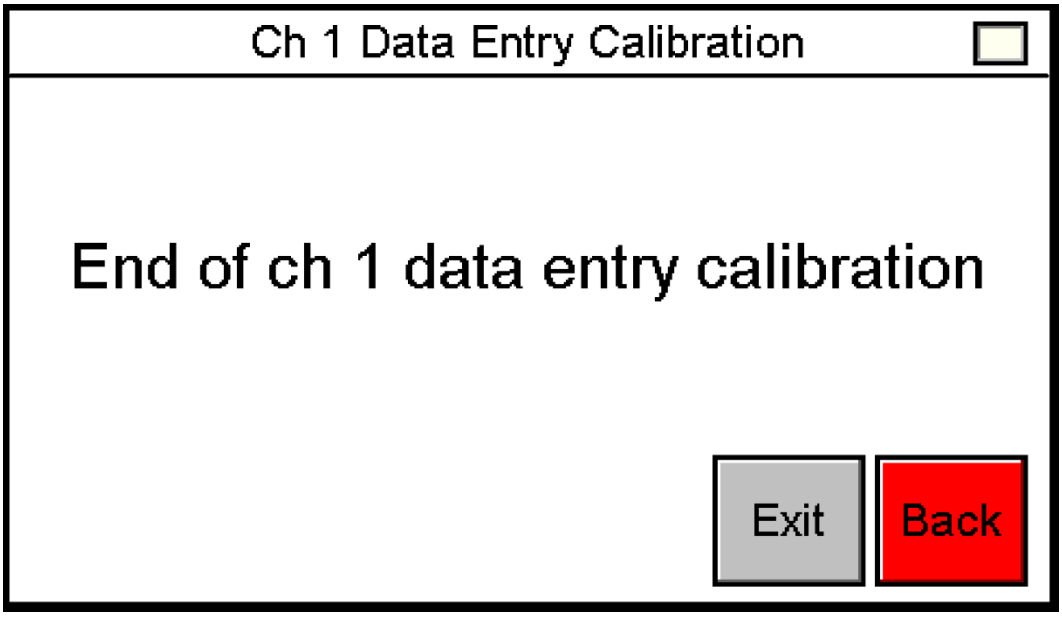

Figure 56: ***Data Entry Calibration: Ending Confirmation***

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6.13 Calibration View

The user can access calibration view by pressing the “View” button under the “Calibration” button on the configuration screen (see figure 28). The user can view dead load bit, weight calibration bit, calibration weight value, max net weight, and max gross weight.

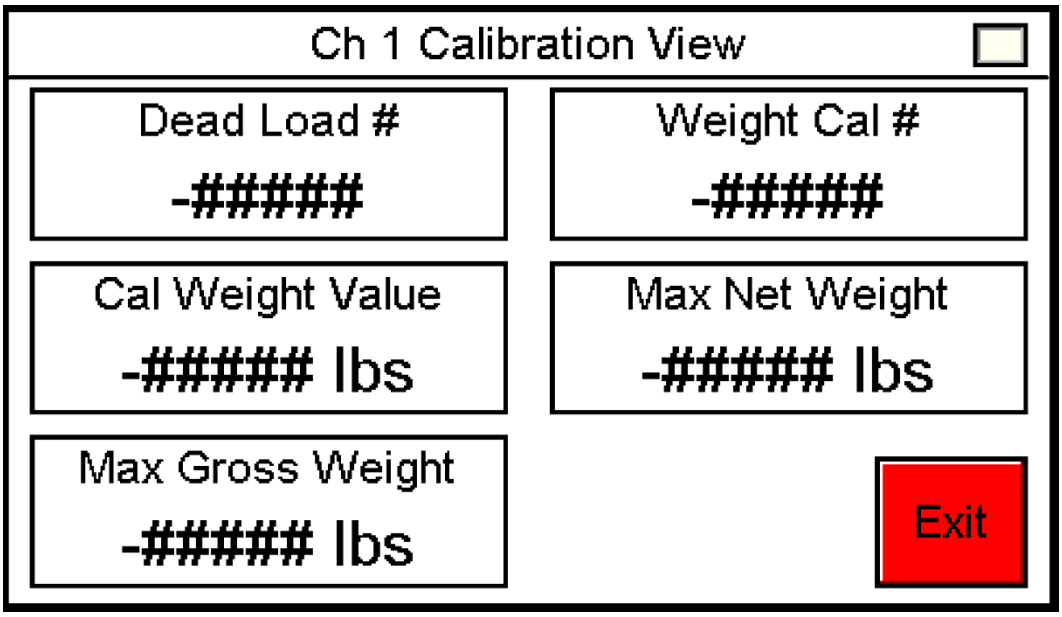

Figure 57: ***Calibration View***

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6.14 Reset Calibration

The user can access this screen by pressing the “Reset” button under the “Calibration” button on the configuration screen (see figure 28). The user can reset the calibration by pressing “Reset Calibration”. A confirmation screen will be shown after the user presses “Reset Calibration”.

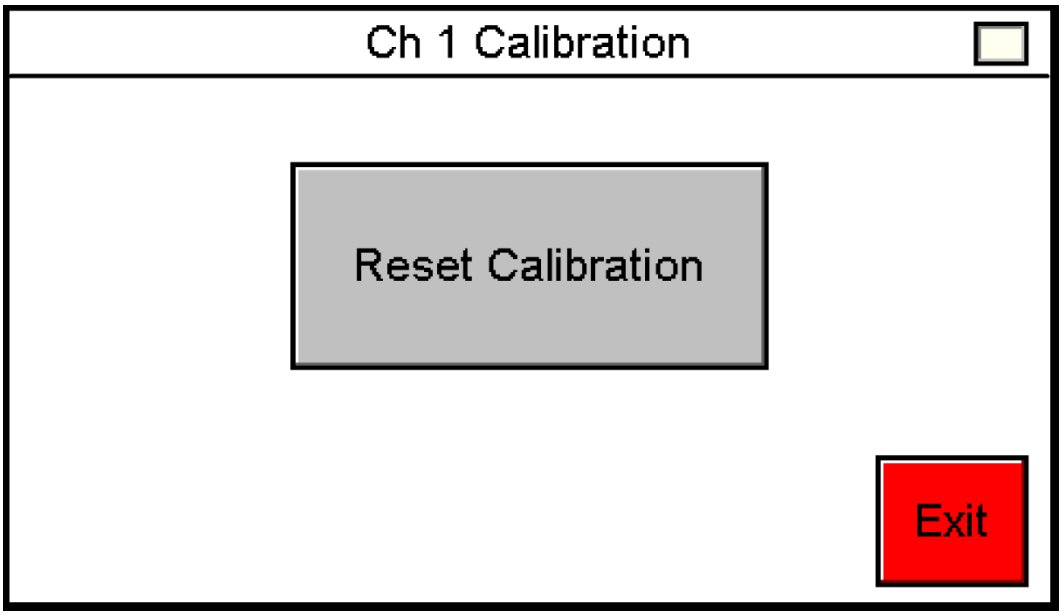

Figure 58: ***Reset Calibration***

NOTE: Requires a password when passwords are enabled

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7 Developer Options

The user can access the developer options by pressing the “Developer Options” button on the home screen (see figure 6). The user can enable channel 2, enable weight setpoints, enable alarm buzzer, enable alarm latch, enable leak detector, enable Modbus, enable passwords, enter serial number, create a restore point, and delete all data. The user will be required to enter a password to access the developer options menu even when passwords are disabled.

7.1 Developer Options: Channel 2

The user can enable or disable channel 2 operation. When channel 2 is enabled, the user will be prompted to select a channel before entering any channel-specific display or menu.

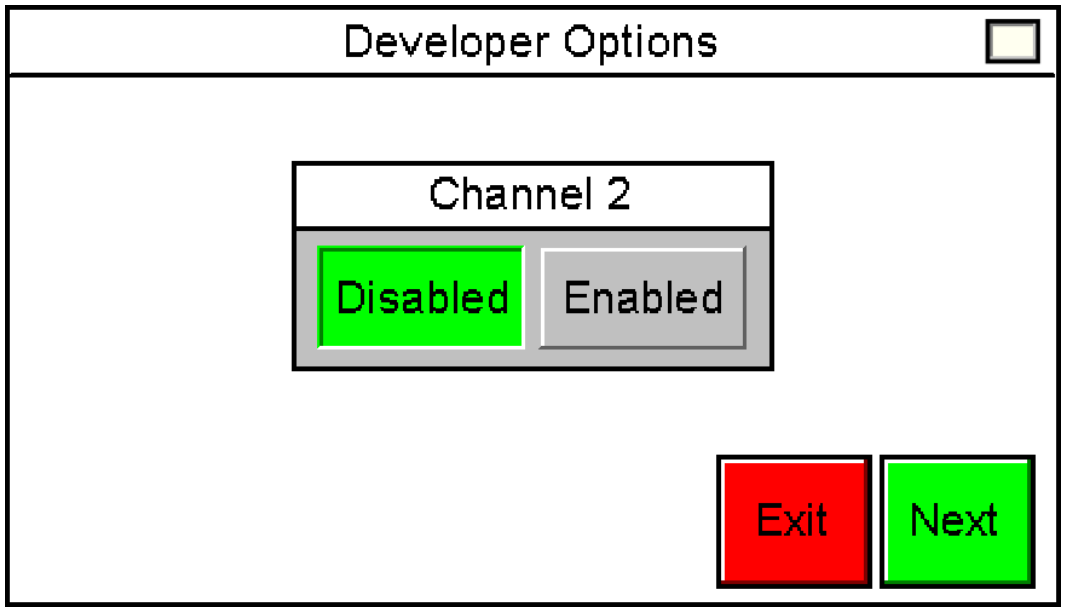

Figure 59: ***Developer Options: Channel 2***

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7.2 Developer Options: Weight Setpoints

The user can enable or disable weight setpoints. When enabled, the extra weight setpoints selector will appear and additional screens are added to settings, settings view, display, and status check.

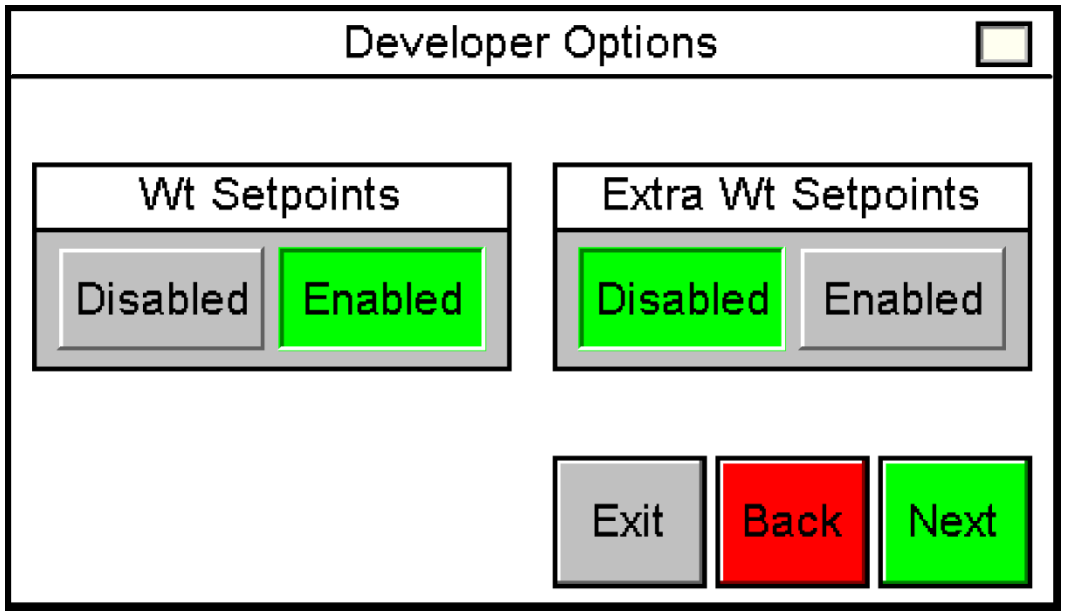

Figure 60: ***Developer Options: Weight Setpoints***

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7.3 Developer Options: Alarm Buzzer

The user can enable or disable the internal alarm buzzer and external alarm buzzer. When the internal alarm buzzer is enabled, an internal buzzer will sound whenever an alarm is active. When the external alarm buzzer is enabled, a relay will activate whenever an alarm is active.

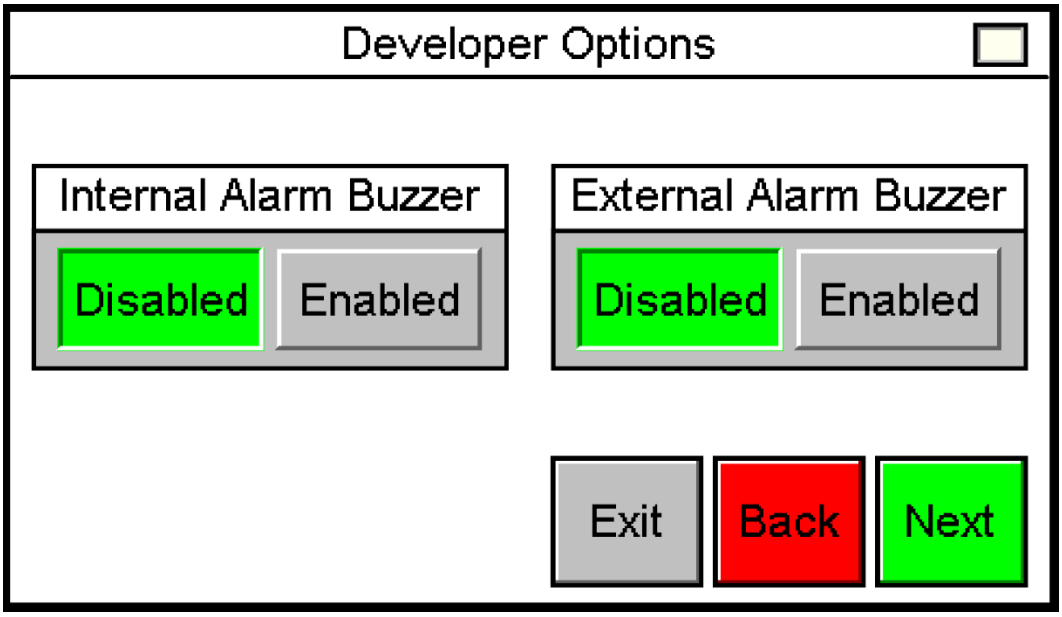

Figure 61: ***Developer Options: Alarm Buzzer***

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7.4 Developer Options: Alarm Latch

The user can enable or disable alarm latch. When alarm latch is enabled as soon as an alarm is triggered it will remain on (latched state). The alarm will not turn off until the user acknowledges the alarm in the "Alarms" section of the status check menu. When alarm latch is disabled, an alarm is only active when it is currently being triggered.

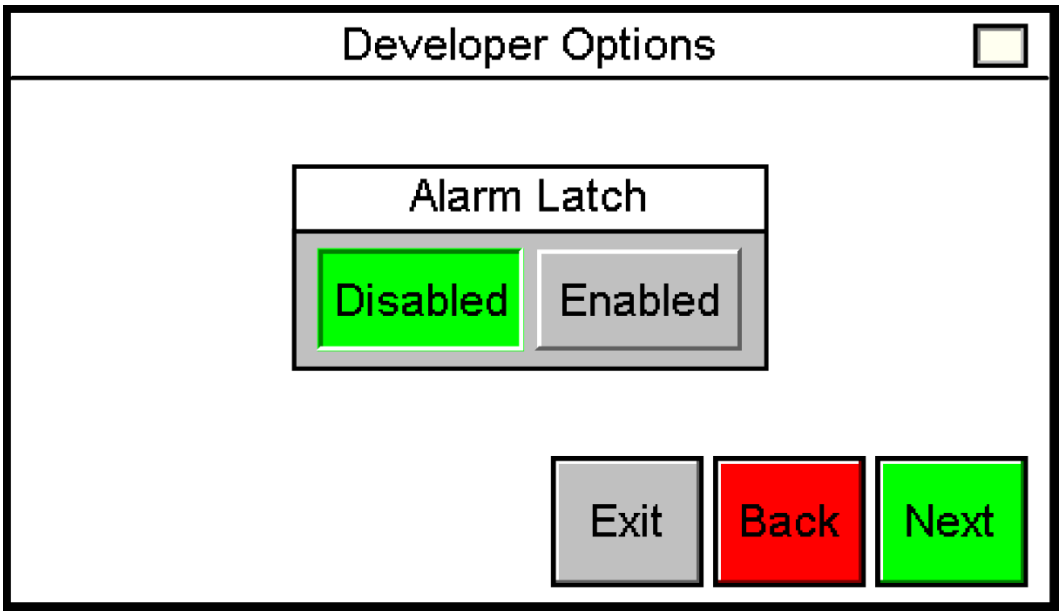

Figure 62: ***Developer Options: Alarm Latch***

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7.5 Developer Options: Modbus

The user can enable or disable Modbus operations. When Modbus is enabled the Modbus configuration will be available in the system info menu.

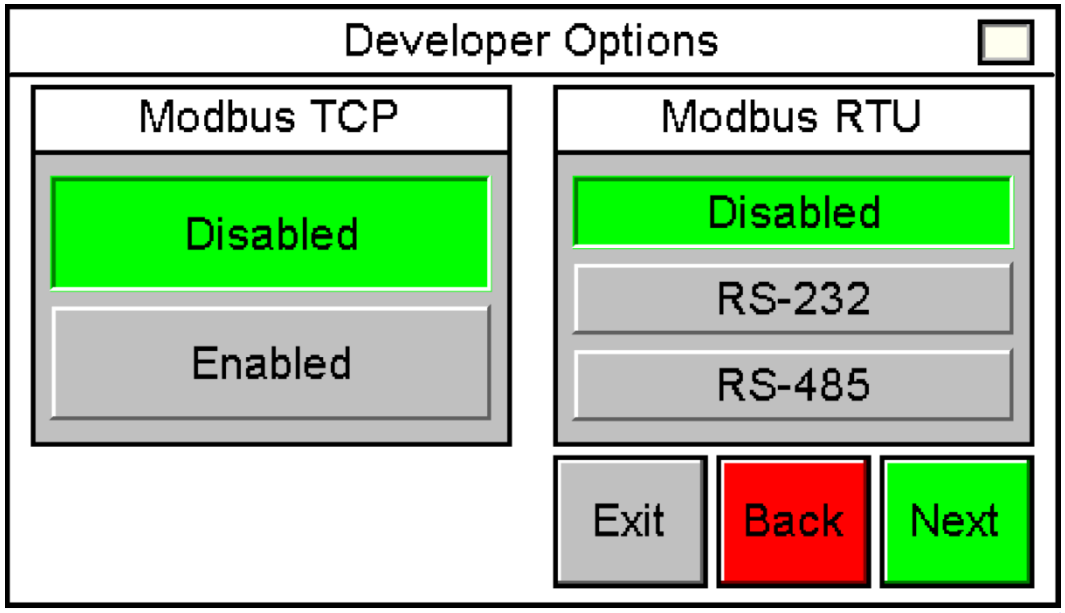

Figure 63: ***Developer Options: Modbus***

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7.6 Developer Options: Calibration Password

The user can enter a calibration password for the indicator. This password will be required when passwords are enabled for access into calibration menus or when attempting to reset calibration.

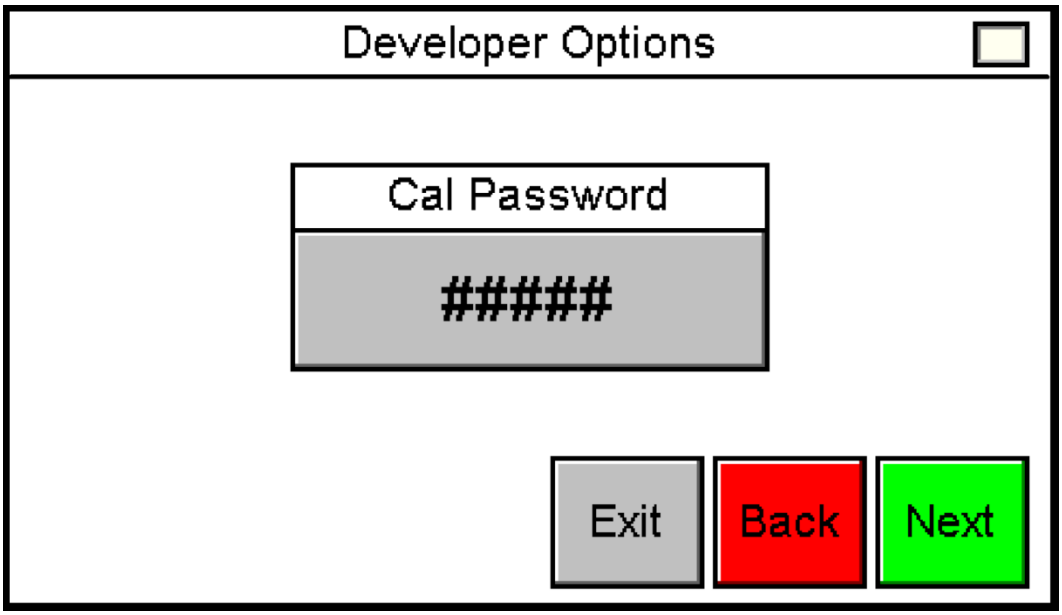

Figure 64: ***Developer Options: Passwords***

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7.7 Developer Options: Passwords

The user can enable or disable Modbus operations. When Modbus is enabled, the serial port will be live and Modbus configuration will be available in the about menu.

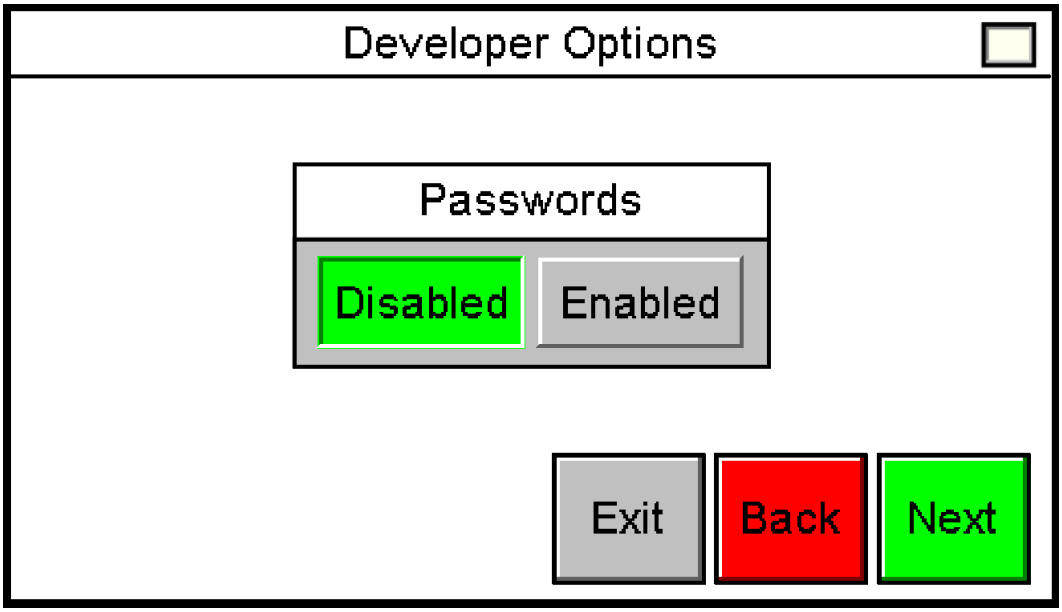

Figure 65: ***Developer Options: Passwords***

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7.8 Developer Options: Serial Number

The user can enter a serial number for the indicator.

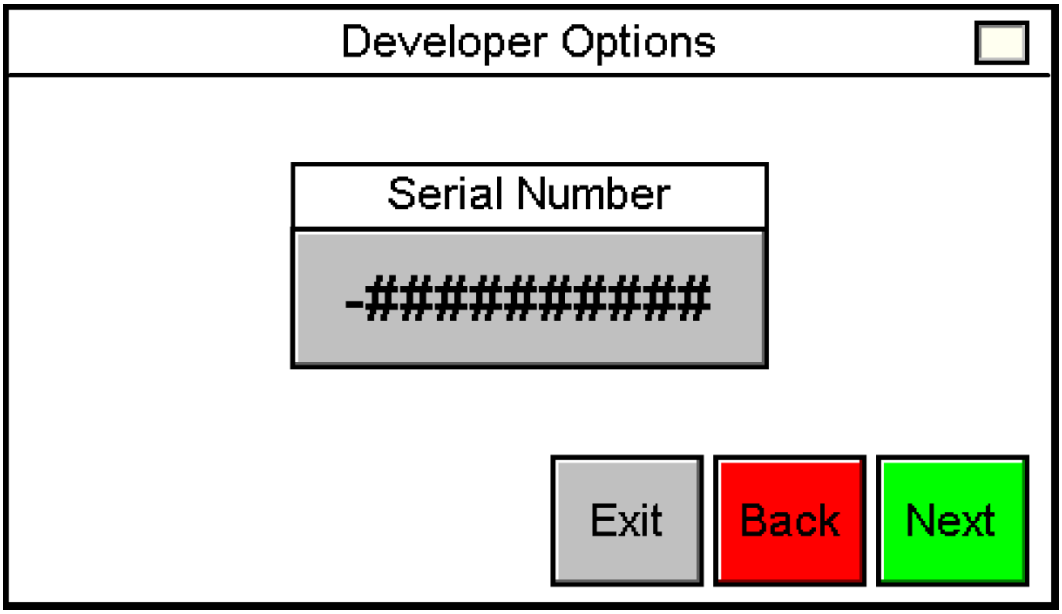

Figure 66: ***Developer Options: Serial Number***

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7.9 Developer Options: Restore Point

The user can create (overwrite) a restore point, load the restore point, or delete the current restore point. A restore point writes all the indicator's data in memory.

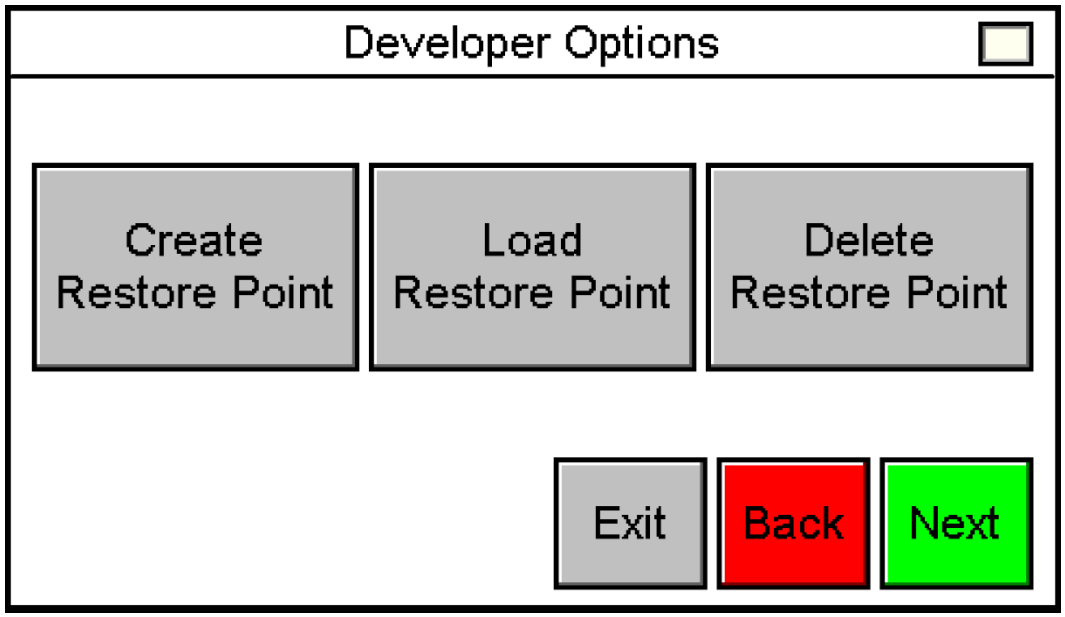

Figure 67: ***Developer Options: Restore Point***

NOTE: When no restore point has been created, the user will only see the option to create a restore point

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7.10 Developer Options: Erase Memory

The user can erase indicator memory. When the user presses “Erase Memory” they will be brought to an acknowledgement screen. Once the user acknowledges a warning, they will be brought to a screen where you must hold “Erase Memory” for 1 second for the operation to be carried out. Erasing the indicator’s memory will reset any configuration and selection done by the user. Erase memory function will not erase the restore point.

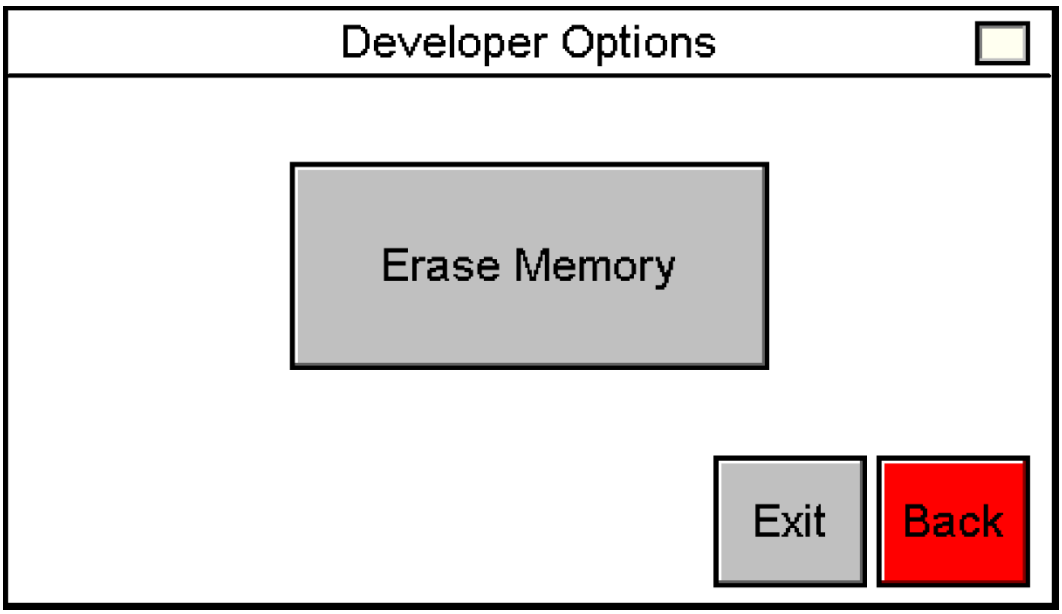

Figure 68: ***Developer Options: Erase Memory***

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8 Status Check

The user can access the status check menu by pressing the “Status Check” button on the home screen (see figure 6). If the user presses the “Status Check” button when the second channel is enabled, they will be prompted to select which channel before continuing. The user can view errors, alarms, perform a load cell (s) check, view weight setpoints (if applicable), view the analog input, and test outputs. While viewing errors or alarms the user can press “Info” under any error or alarm for more information. The user can only perform the load cell (s) check when the channel is calibrated, and no alarms are present. If alarm latch in developer options is enabled, the user can acknowledge alarms by pressing the “Acknowledge” button in the “Alarms” screen. If weight setpoints are enabled and weight setpoint latch is enabled, the user can acknowledge the setpoints by pressing the “Acknowledge” button in the “Weight Setpoints” screen.

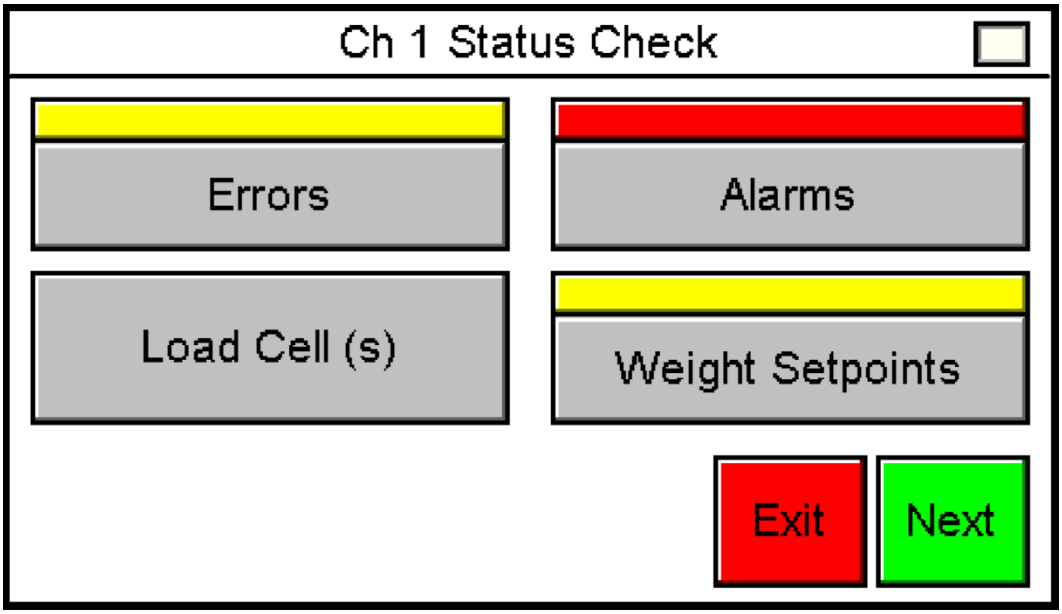

Figure 69: ***Status Check 1***

NOTE: The “Weight Setpoints” button and indicator will only be visible when weight setpoints are enabled

NOTE: All indicators are shown active

NOTE: The weight setpoints indicator will be red when active if weight setpoints are configured to be an alarm through settings

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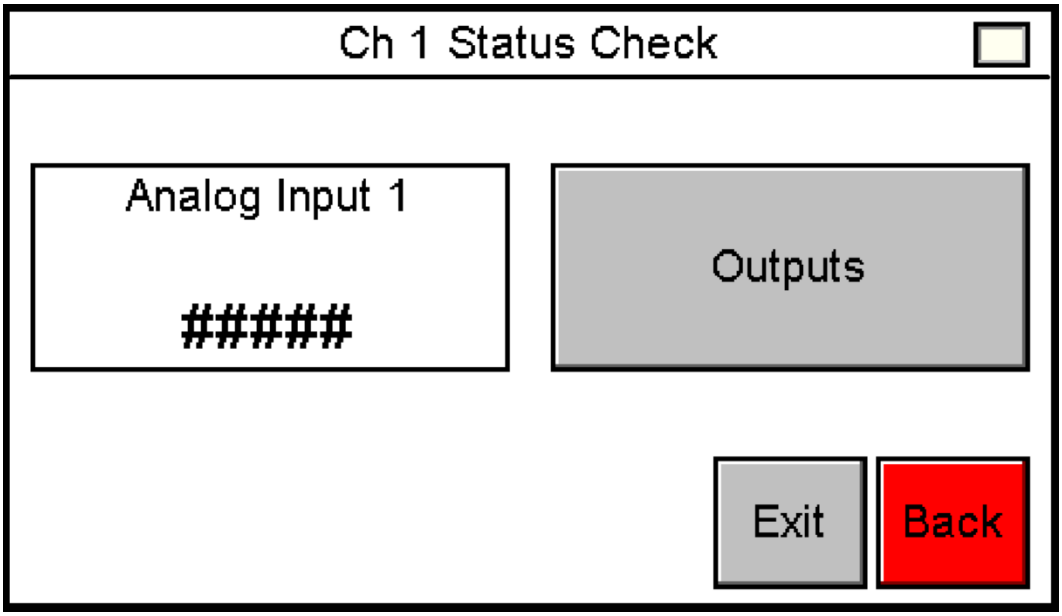

Figure 70: ***Status Check 2***

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8.1 Indicator Light

The AccuPro 6000-TS has a tri-colored status light located in the top right of every screen. For any display screen, the indicator light is located across the entire title portion of the screen for greater visibility. A solid green light means that there are no errors or alarms present in any channels. A blinking yellow light is called an error. An error is active whenever there is a problem with the configuration of at least one channel or a weight setpoint is active. A blinking red light is called an alarm. An alarm is active whenever there is a critical status present in at least one channel.

RED (ALARM)	YELLOW (ERROR)	GREEN (READY)
• Analog Input Limit • Max Net Weight • Max Gross Weight • Leak Detected • Weight Setpoint Active (Optional Configuration)	• Settings Not Configured • Calibration Not Complete • Dead Load Calibration Unstable • Weight Calibration Unstable • Improper Calibration (1) • Improper Calibration (2) • Weight Setpoint Active (Optional Configuration)	• No errors or alarms active in either channel 1 or 2

Figure 71: ***Indicator Light Table***

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8.2 Status Check: Errors

The user can access errors by pressing “Errors” on the status check screen (see figure 69). The user can view all possible errors. Any error that is active will blink yellow. The user can view more information on any error by pressing the “Info” button underneath an indicator.

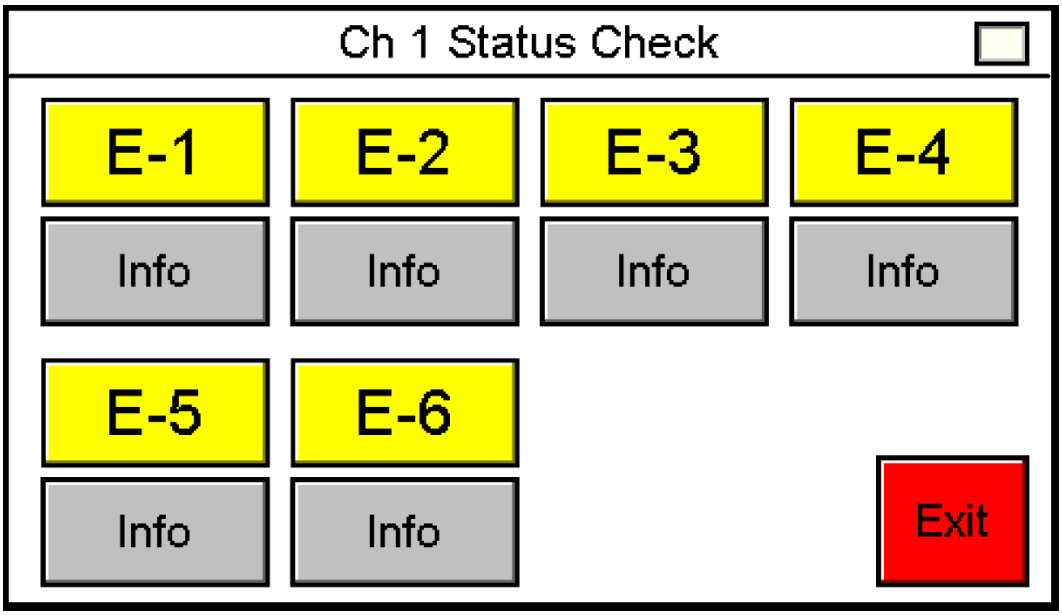

Figure 72: ***Status Check: Errors***

NOTE: All indicators are shown active

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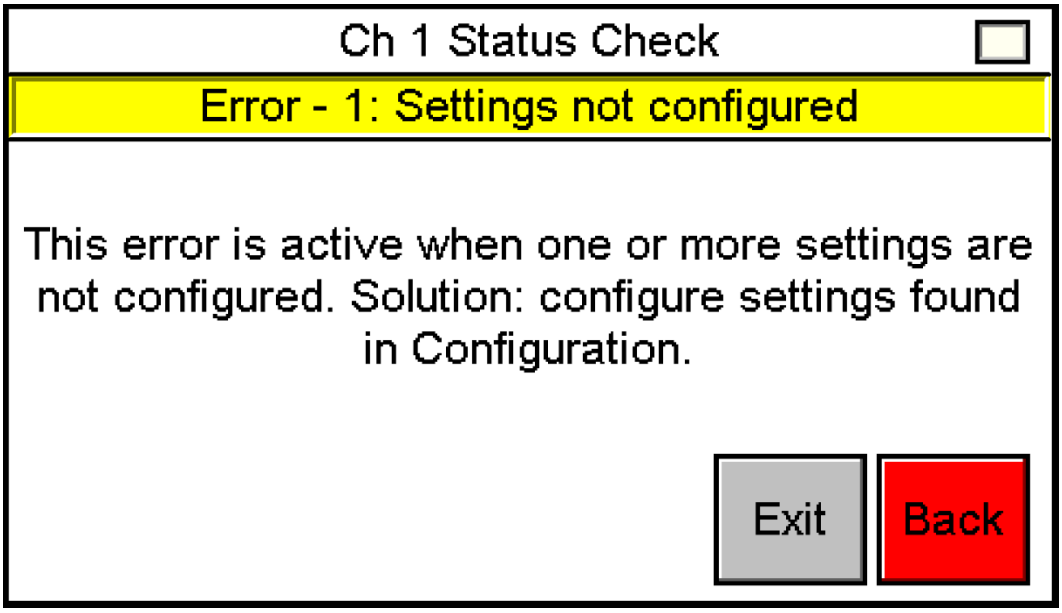

Figure 73: ***Status Check: Error 1, Settings Not Configured***

NOTE: Error 1 is shown active

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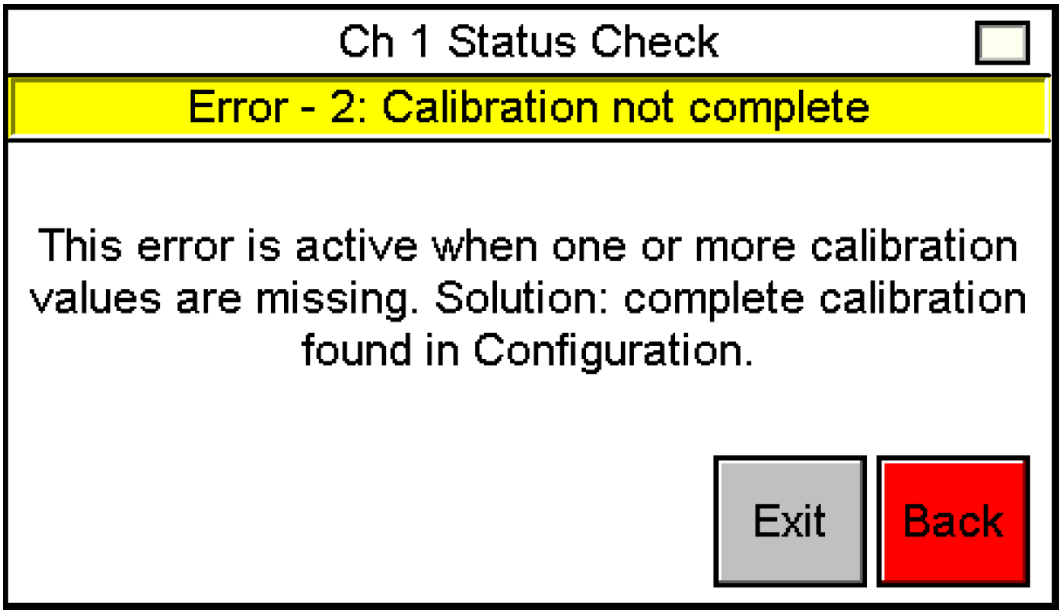

Figure 74: ***Status Check: Error 2, Calibration Not Complete***

NOTE: Error 2 is shown active

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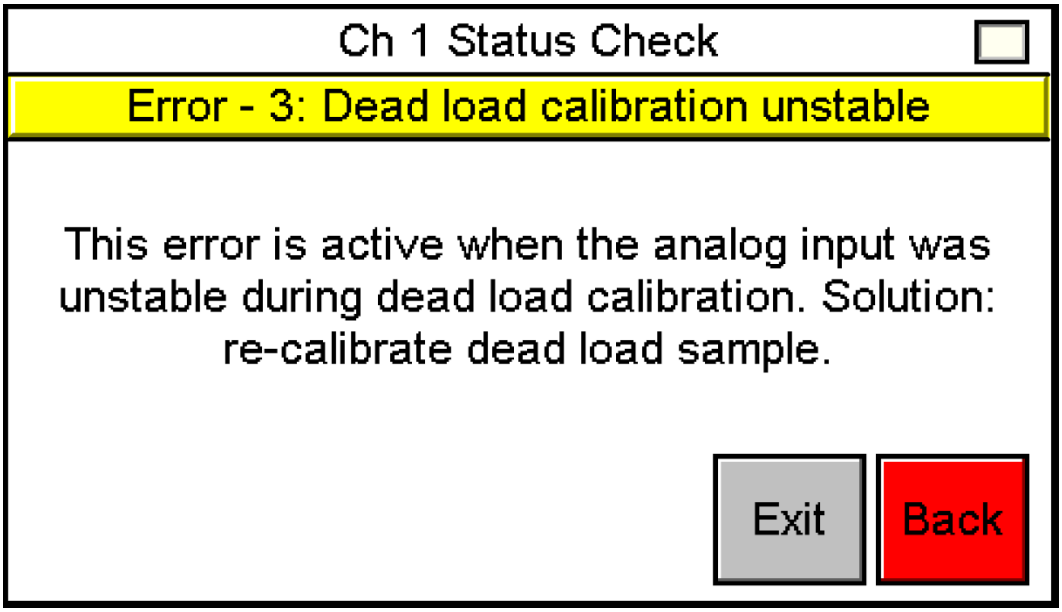

Figure 75: ***Status Check: Error 3, Dead Load Calibration Unstable***

NOTE: Error 3 is shown active

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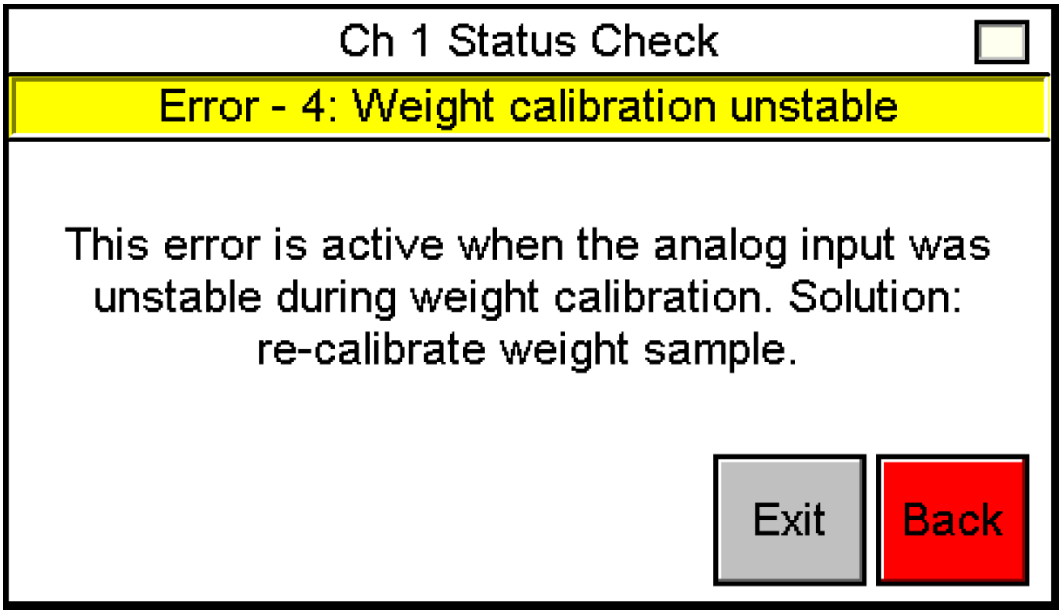

Figure 76: ***Status Check: Error 4, Weight Calibration Unstable***

NOTE: Error 4 is shown active

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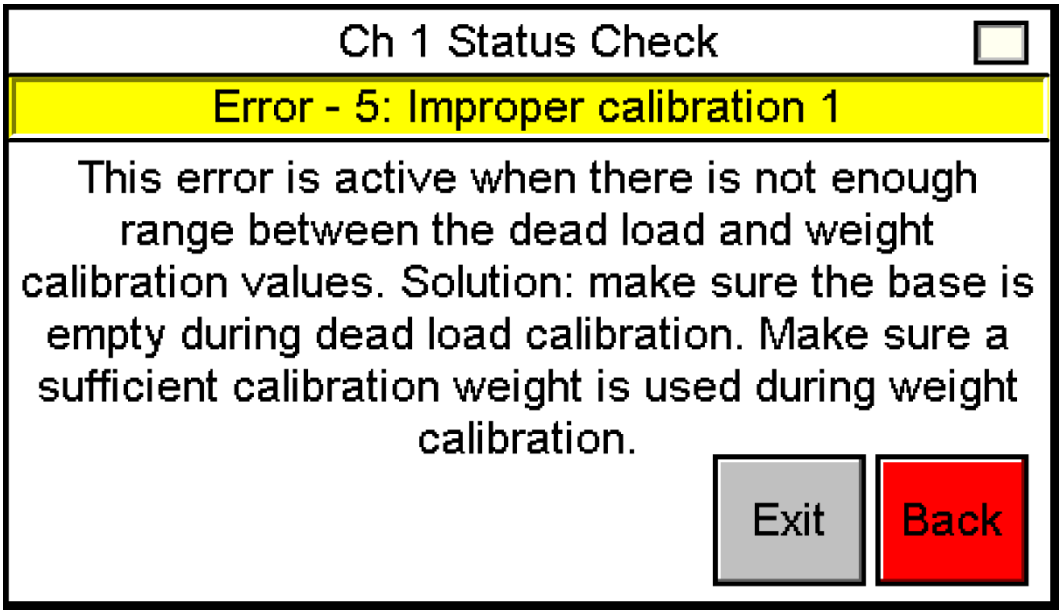

Figure 77: ***Status Check: Error 5, Improper Calibration 1***

NOTE: Error 5 is shown active

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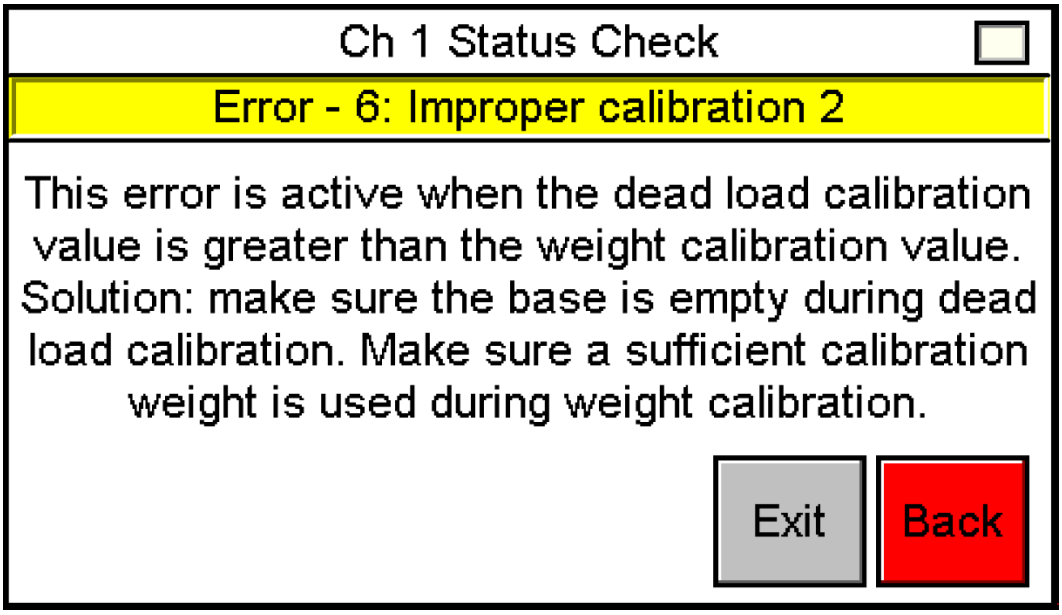

Figure 78: ***Status Check: Error 6, Improper Calibration 2***

NOTE: Error 6 is shown active

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8.3 Status Check: Alarms

The user can access alarms by pressing “Alarms” on the status check screen (see figure 69). The user can view all possible alarms. Any alarm that is active will blink red. The user can view more information on any alarm by pressing the “Info” button underneath an indicator. The user can acknowledge latched alarms by pressing the “Acknowledge” button. Any active alarm will signal the alarm output.

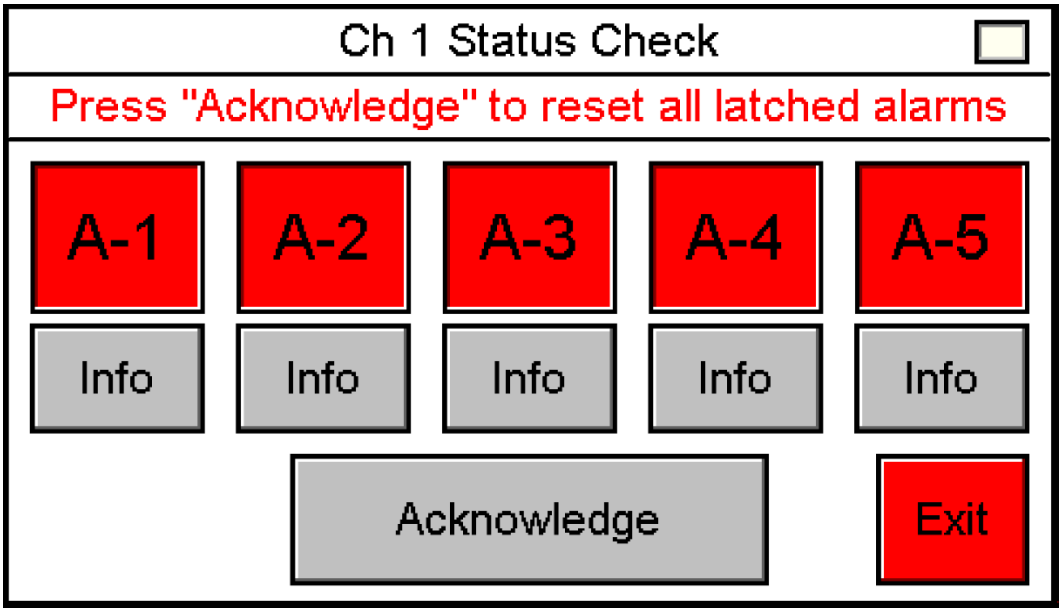

Figure 79: ***Status Check: Alarms***

NOTE: All indicators are shown active

NOTE: Alarm count will vary depending on user configuration

NOTE: Display is shown with alarm latch enabled

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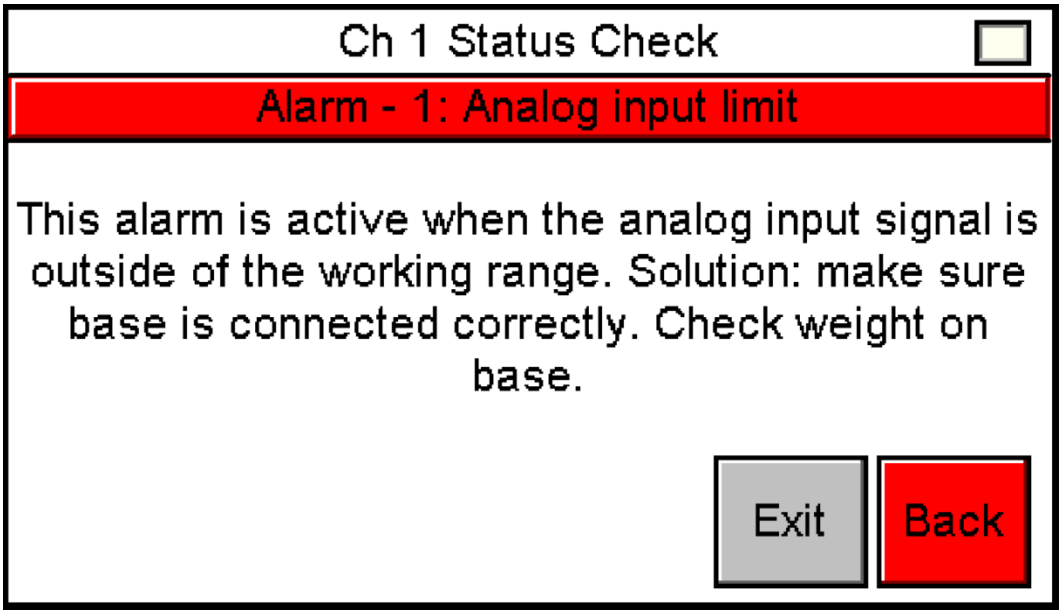

Figure 80: ***Status Check: Alarm 1, Analog Input Limit***

NOTE: Display is shown with alarm latch disabled

NOTE: Display text will vary depending on alarm latch state

NOTE: Alarm 1 is shown active

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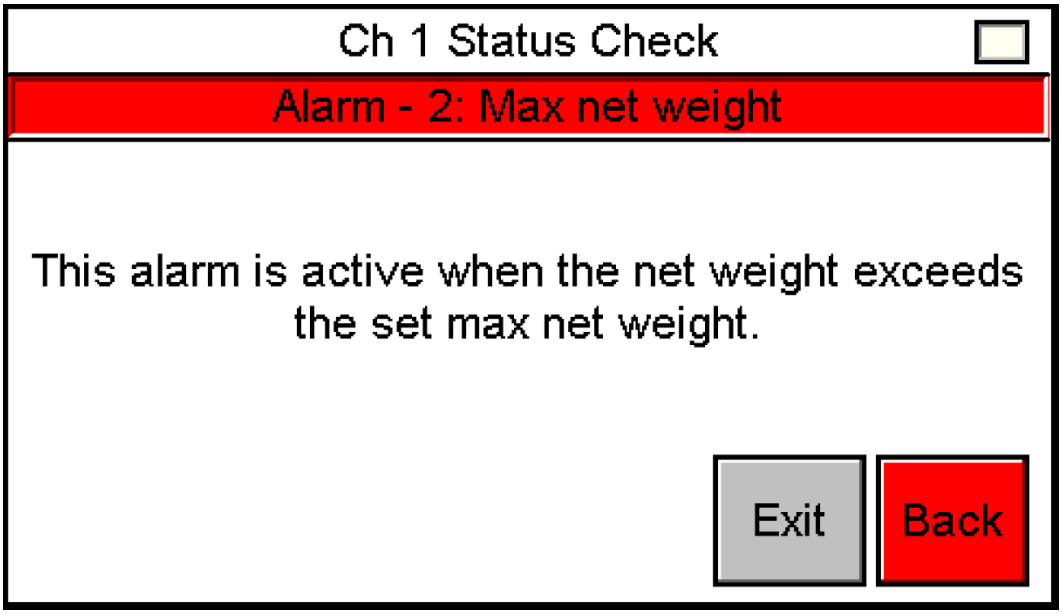

Figure 81: ***Status Check: Alarm 2, Max Net Weight***

NOTE: Display is shown with alarm latch disabled

NOTE: Display text will vary depending on "Alarm Latch" state

NOTE: Alarm 2 is shown active

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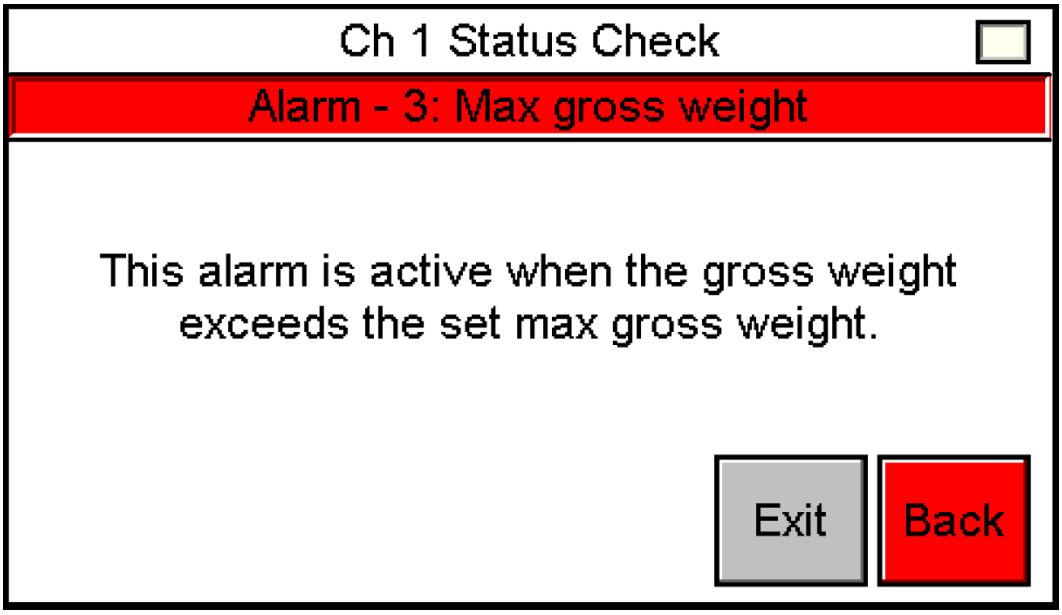

Figure 82: ***Status Check: Alarm 3, Max Gross Weight***

NOTE: Display is shown with alarm latch disabled

NOTE: Display text will vary depending on "Alarm Latch" state

NOTE: Alarm 3 is shown active

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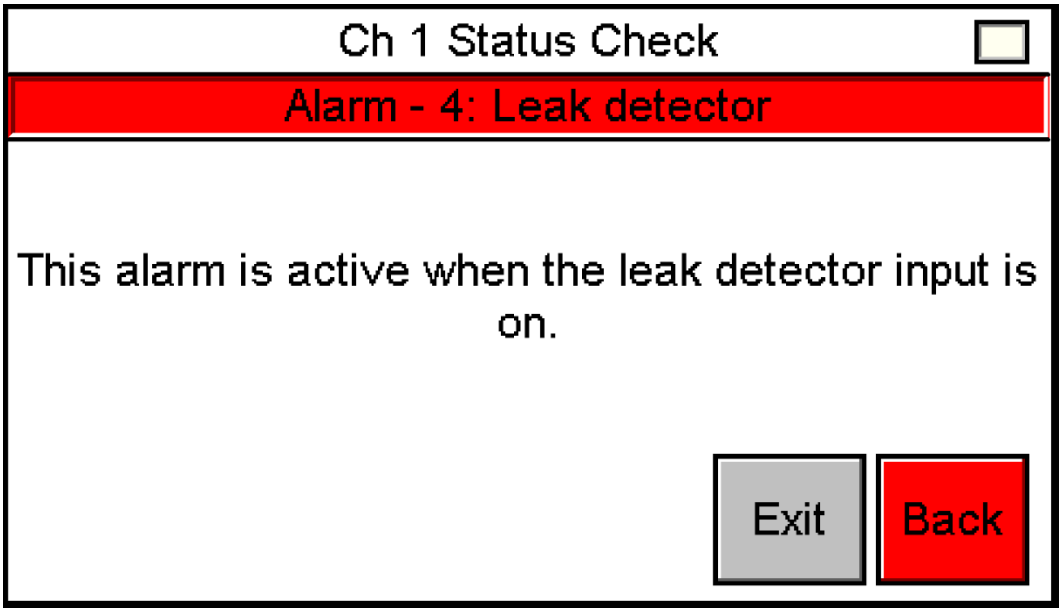

Figure 83: ***Status Check: Alarm 4, Leak Detector***

NOTE: Display is shown with alarm latch disabled

NOTE: Display text will vary depending on “Alarm Latch” state

NOTE: Alarm 4 is only visible when developer option “Leak Detector” is enabled

NOTE: Alarm 4 is shown active

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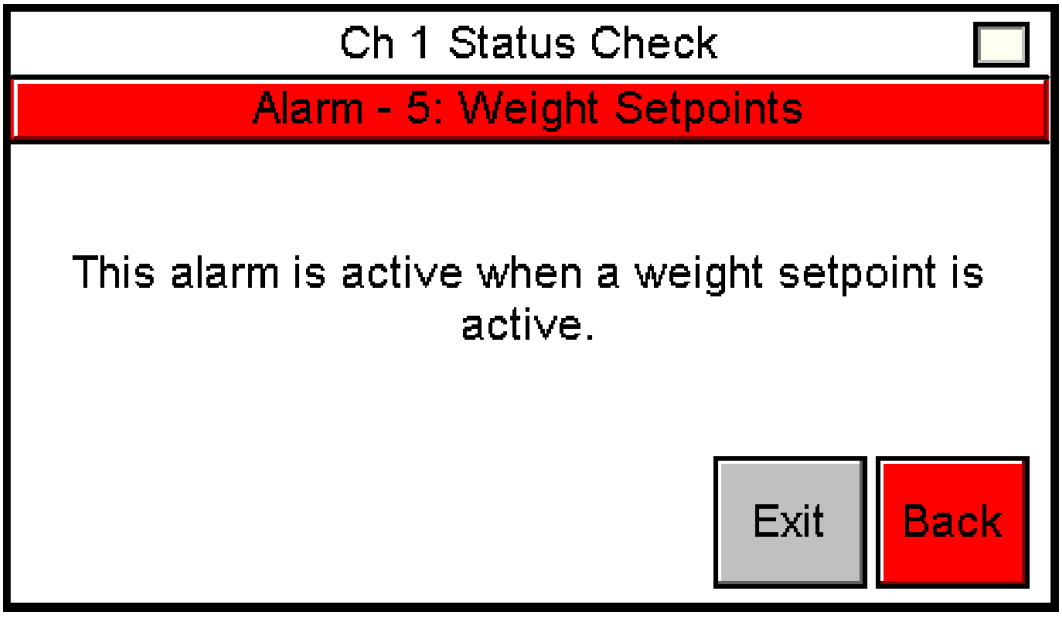

Figure 84: ***Status Check: Alarm 5, Weight Setpoints***

NOTE: Display is shown with alarm latch disabled

NOTE: Display text will vary depending on “Alarm Latch” state

NOTE: Alarm 5 is only visible when settings option “Weight Setpoint Alarm” is enabled

NOTE: If developer option “Leak Detector” is disabled, alarm 5 will be renamed as alarm 4

NOTE: Alarm 5 is shown active

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8.4 Status Check: Load Cell (s)

The user can access this screen by pressing “Load Cell (s)” on the status check screen (see figure 69). The user can check status of the load cell (s) by comparing the factory set dead load bit value to the current dead load bit value. The channel must be calibrated, and no alarms must be present to perform the load cell (s) check. When the user presses “Enter” they will be brought to a status screen (see figure 86 and figure 87) which displays the status of the load cells.

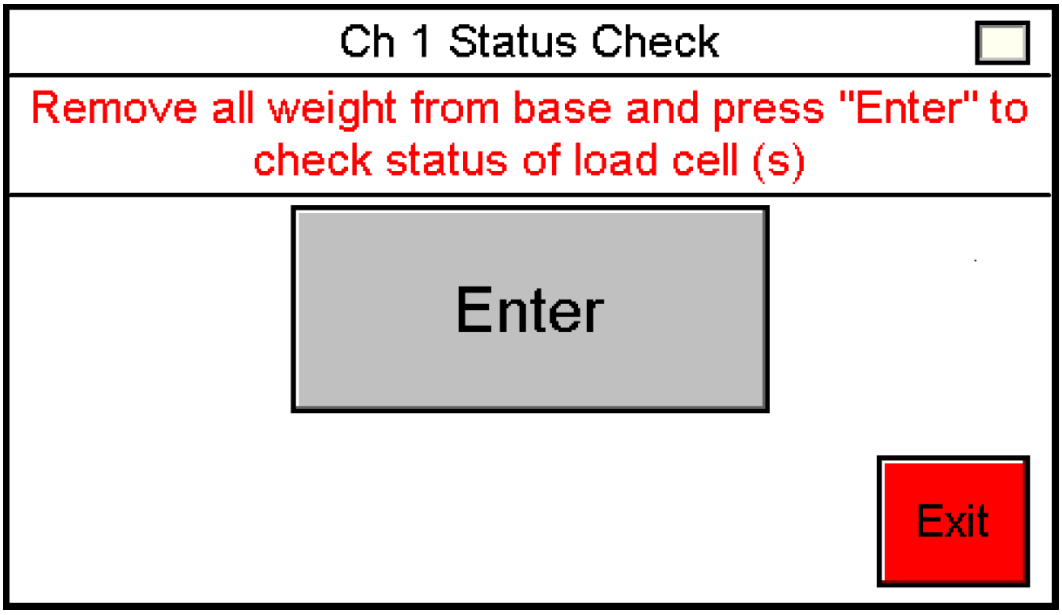

Figure 85: ***Status Check: Load Cell (s)***

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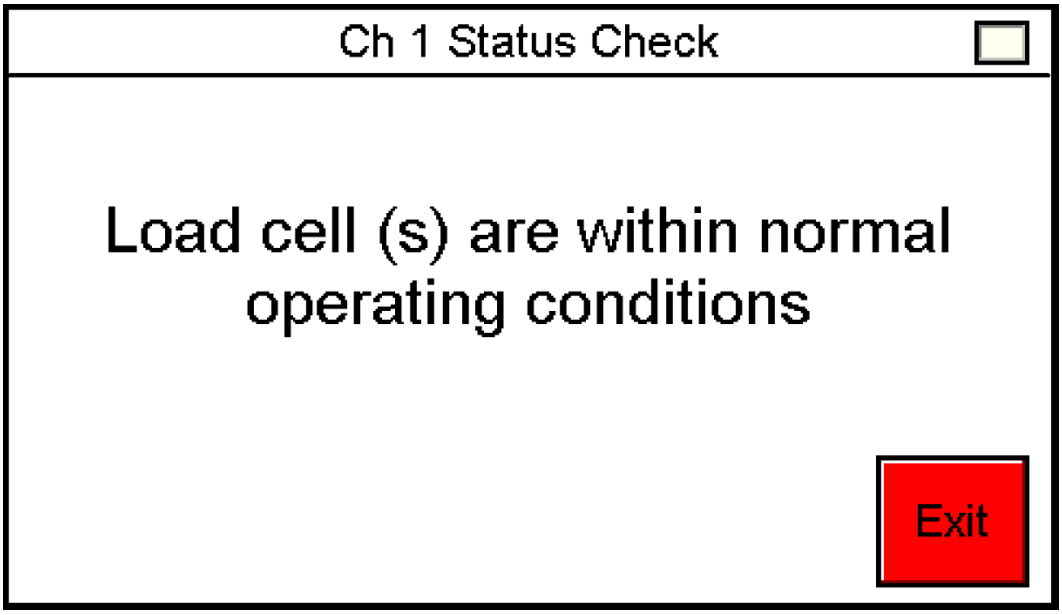

Figure 86: ***Status Check: Load Cell (s) Normal***

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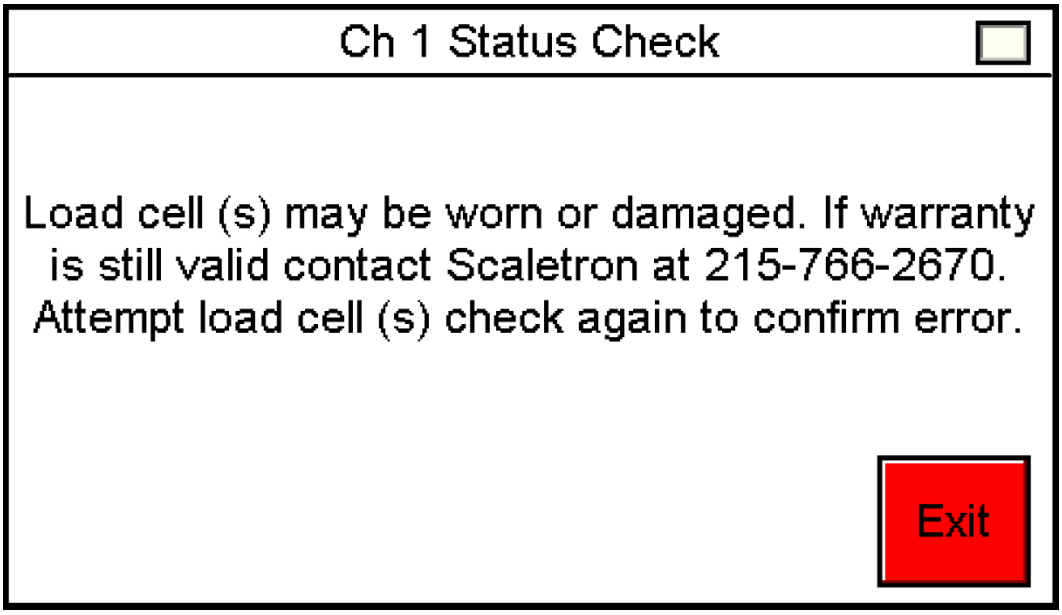

Figure 87: ***Status Check: Load Cell (s) Error***

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8.5 Status Check: Weight Setpoints

The user can access this screen by pressing “Weight Setpoints” on the status check screen (see figure 69). The user can view all weight setpoints per channel. Any setpoint that is active will blink red. The user can acknowledge latched weight setpoints by pressing the “Acknowledge” button.

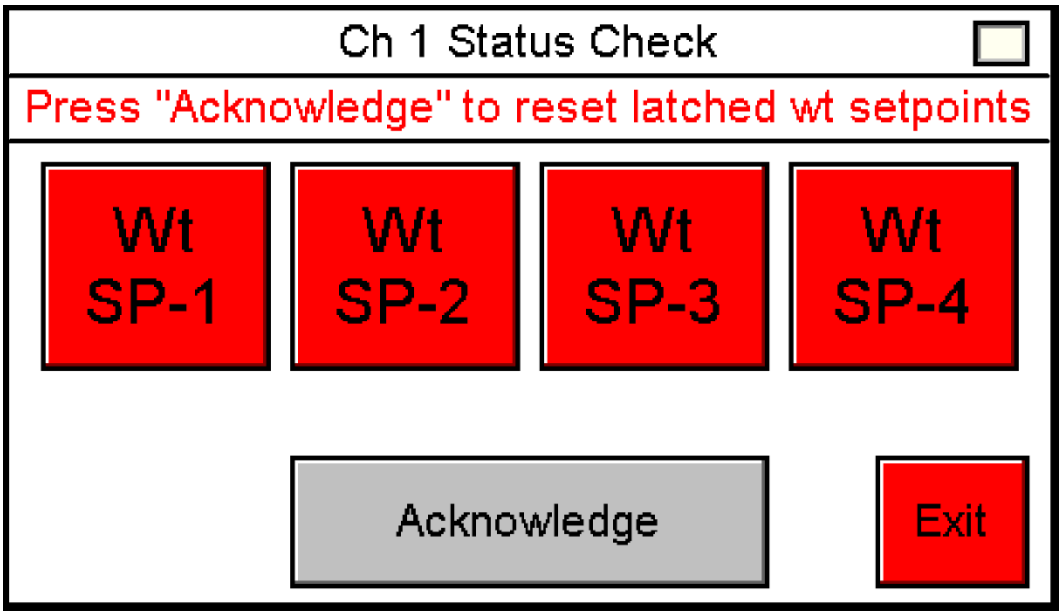

Figure 88: ***Status Check: Weight Setpoints***

NOTE: All indicators are shown active

NOTE: Weight setpoint count will vary depending on user configuration

NOTE: Display is shown with weight setpoint latch enabled

NOTE: Display will only be available when weight setpoints are enabled

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8.6 Status Check: Outputs

The user can access this screen by pressing “Outputs” on the status check screen (see figure 70). The user can turn on all output setpoints for testing. When all setpoints are active, the indicator will be green.

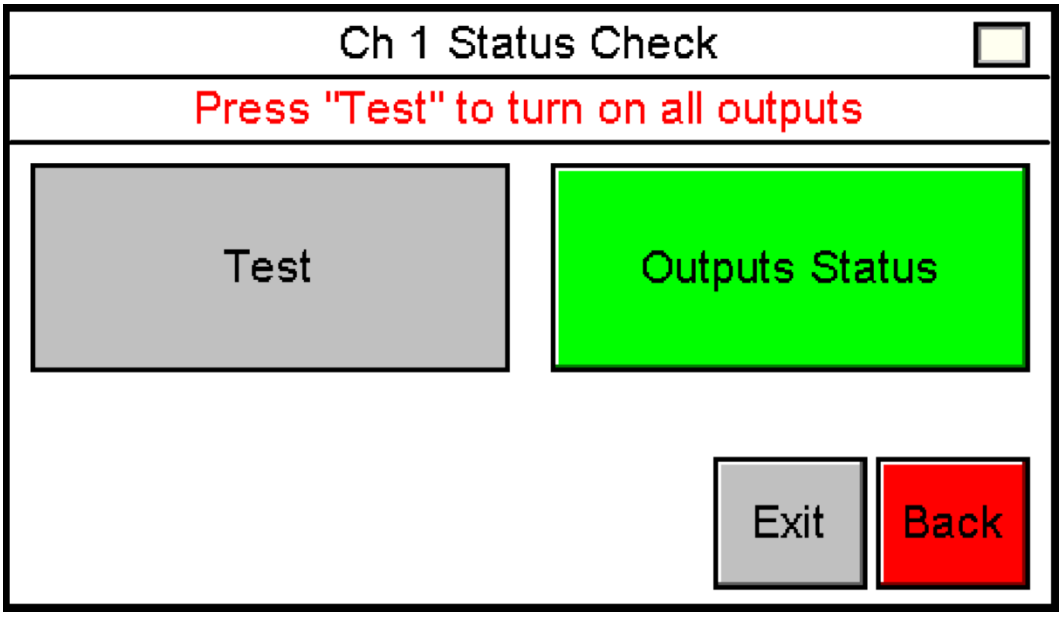

Figure 89: ***Status Check: Outputs***

NOTE: All indicators are shown active

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9 System Info

The user can access system info by pressing the "System Info" button on the home screen (see figure 6). The user can adjust the weight averaging speed, adjust the display brightness, configure Modbus settings, configure temperature adjustment, view Scaletron's contact information, restore factory configuration, and view indicator's software version and serial number.

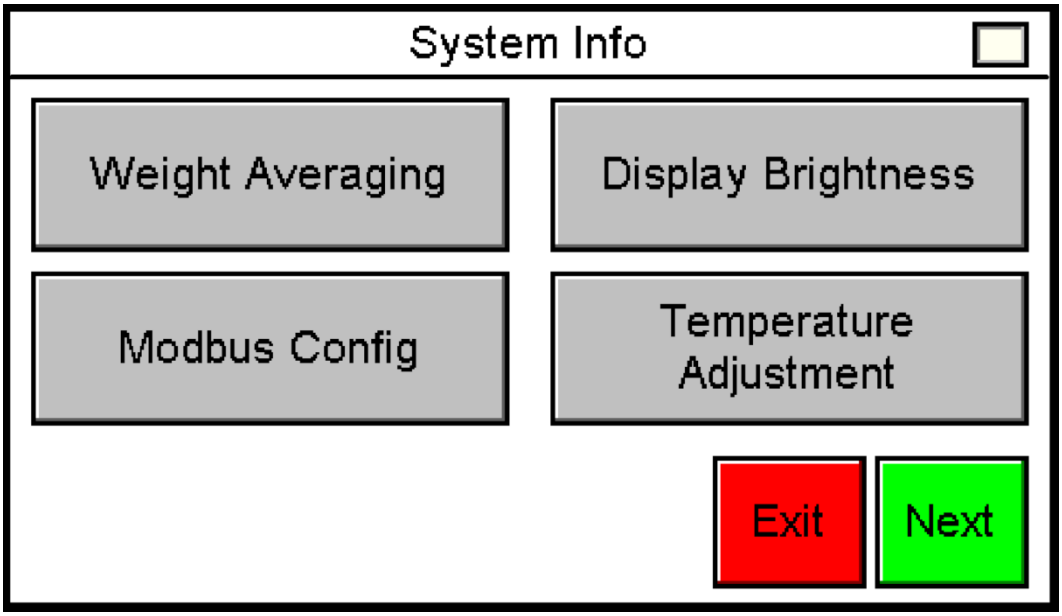

Figure 90: ***System Info 1***

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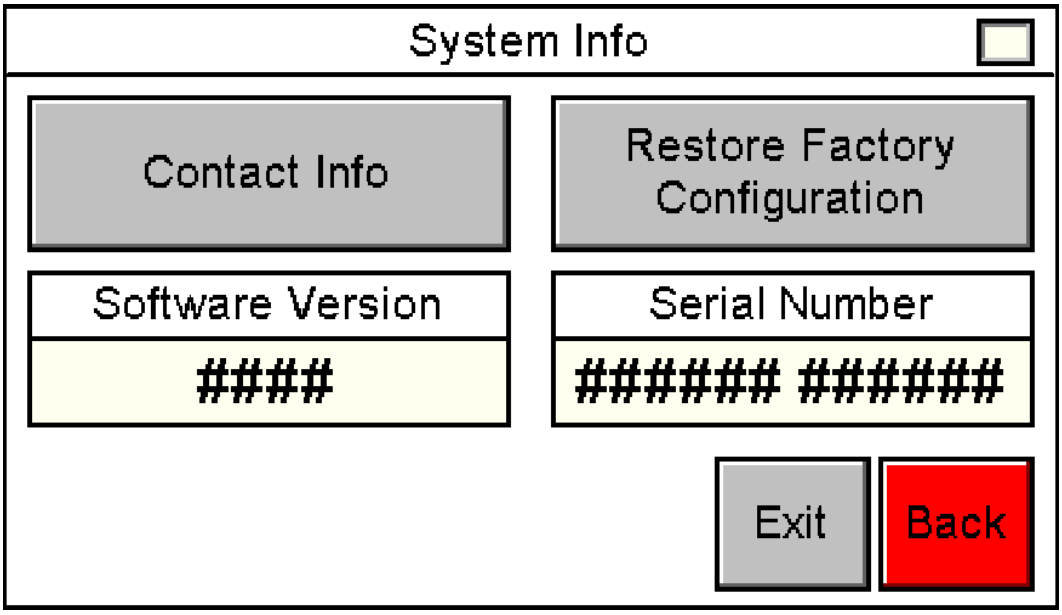

Figure 91: System Info 2

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9.1 System Info: Weight Averaging

The user can access weight averaging by pressing the “Weight Averaging” button on the system info menu screen (see figure 90). The user can choose between standard and high weight averaging. “Standard” contains no analog input internal filtering for maximum speed. “High” contains analog input internal filtering for maximum accuracy and precision. “Standard” averaging is recommended for applications where update rate is critical. “High” averaging is recommended for applictions seeking the greatest possible accuracy that does not require a fast update rate. When the weight averaging speed is changed to “High”, the net weight will hold the previous value for a length of thirty (30) seconds before the new averaging speed will be active.

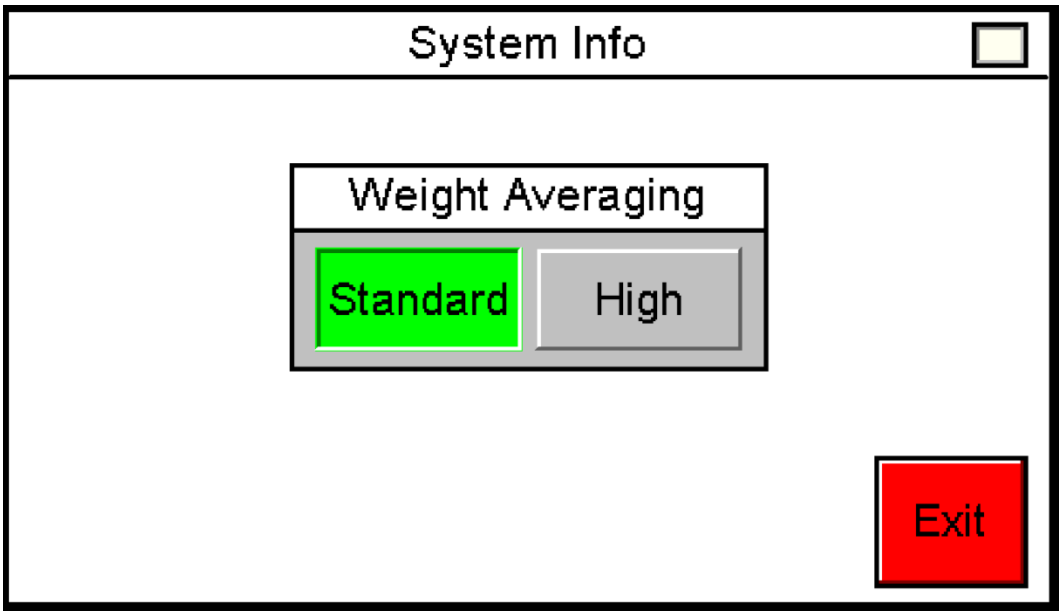

*Figure 92: **System Info: Weight Averaging***

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9.2 System Info: Display Brightness

The user can access display brightness by pressing the “Display Brightness” button on the system info menu screen (see figure 90). The user can adjust the display brightness from a range of 20% to 100%.

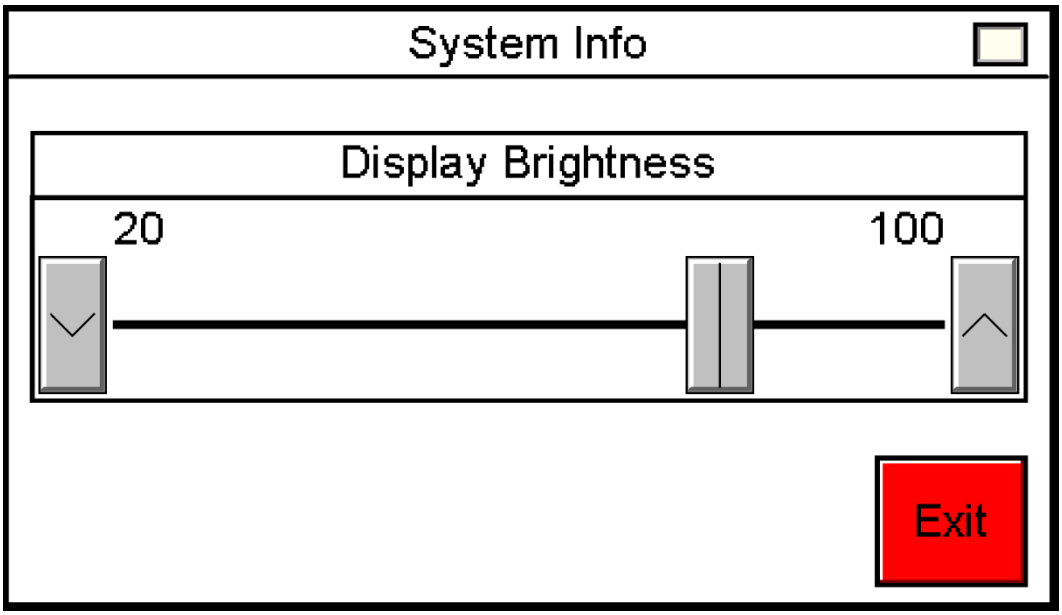

*Figure 93: **System Info: Display Brightness***

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9.3 System Info: Modbus

The user can access Modbus by pressing the “Modbus Config” button on the system info menu screen (see figure 90). The user can configure the indicator’s network addresses by pressing “Network Configuration”. The user can also view the Modbus address map by pressing “Address Map”. The user is able to configure the indicator’s IP address, net mask, and gateway through the network configuration. The user is able to view all reserved outputs for Modbus through the address map.

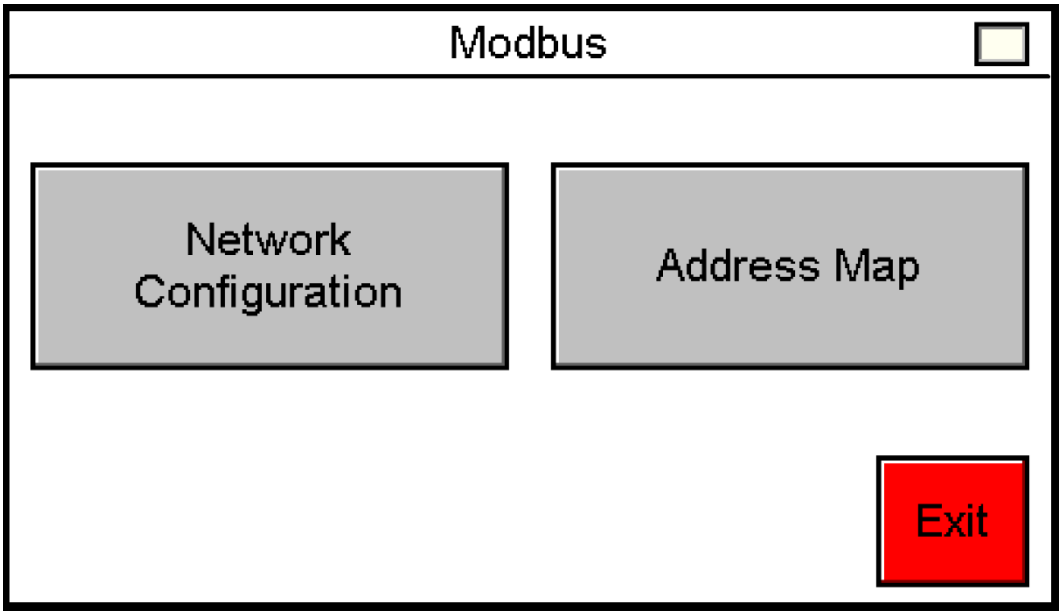

*Figure 94: **System Info: Modbus***

NOTE: Only available when Modbus is enabled

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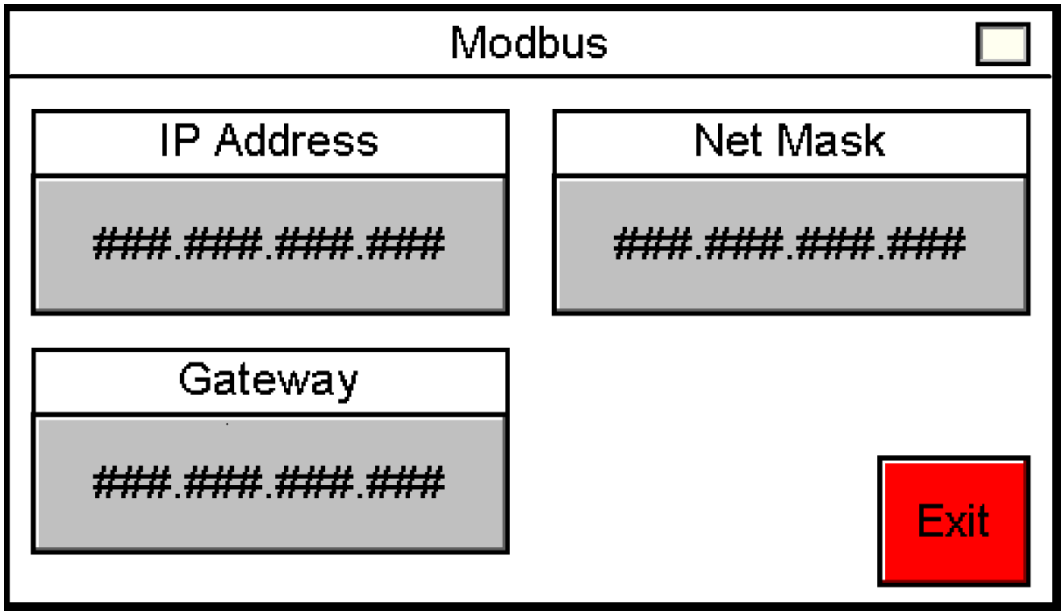

Figure 95: System Info: Modbus Network Configuration

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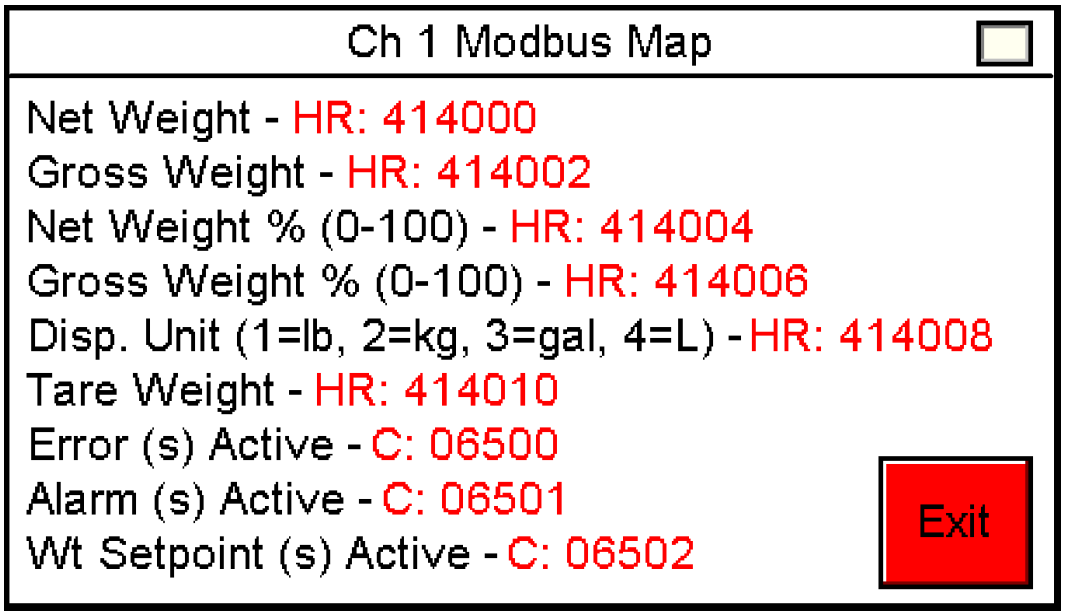

Figure 96: System Info: Modbus Address Map

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9.4 System Info: Temperature Adjustment

The user can access temperature adjustment by pressing the “Temperature Adjustment” button on the system info menu screen (see figure 90). The user can add or subtract bits from the analog input to offset the difference caused by temperature fluctuations.

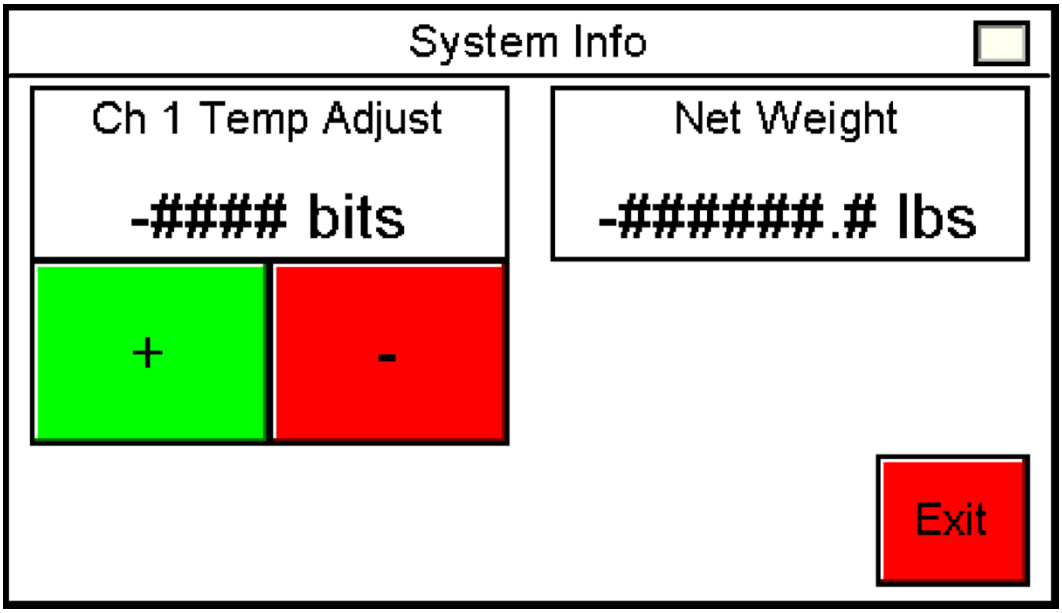

Figure 97: System Info: Temperature Adjustment

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9.5 System Info: Contact Information

The user can access contact information by pressing the “Contact Info” button on the system info menu screen (see figure 91). The user can view Scaletron’s website, toll free, international, fax, email, and address.

Figure 98: System Info: Contact Information 1

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Figure 99: ***System Info: Contact Information 2***

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9.6 System Info: Restore Factory Configuration

The user can access factory restore by pressing the “Restore Factory Configuration” button on the system info menu screen (see figure 91). The user can restore the indicator to the default configuration setup by pressing the “Restore” button. Any changes made to the indicator outside of the factory will be lost.

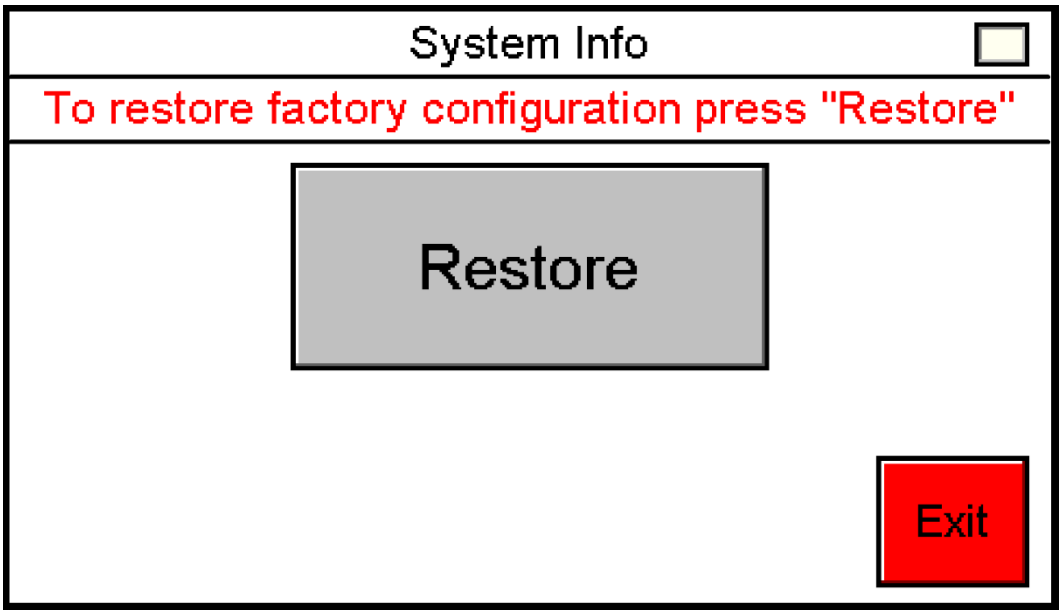

*Figure 100: **System Info: Restore Factory Configuration***

NOTE: Only available when a restore point has been made

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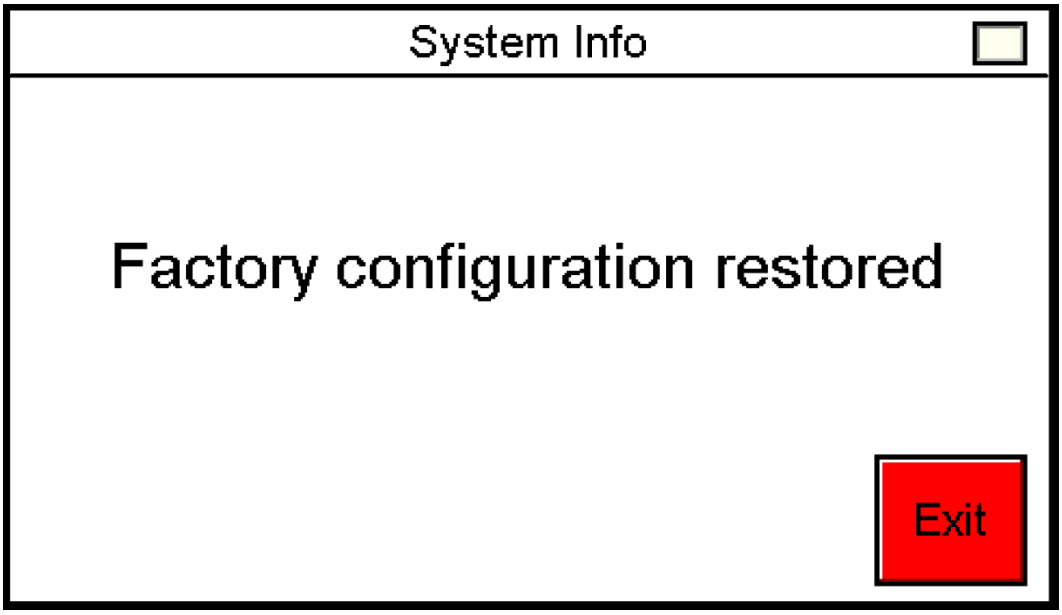

Figure 101: System Info: Restore Factory Configuration Confirmation

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