Plus-1 User Guide

Model DP-700 Display

A52/62/62T Boom/Platform/Walkway

Effective 07/2018

INTRODUCTION:

The Plus+1 Control is a microprocessor-based system connected via a CANBUS (Controlled Area Network) Link and radio remote controller(s). The system allows for navigation and parameter checks as well as adjustments incorporated in the display monitor at the Turret 1 station.

SCOPE:

The scope of this manual is to describe how to navigate through the display screens to operate the Plus+1 system. The DP700 display module located at Turret 1 allows the user to select functions and make control systems settings. This manual uses a series of photographs of the displays which will be used to aid in understanding the navigation process as well as adjusting the various functions of the system.

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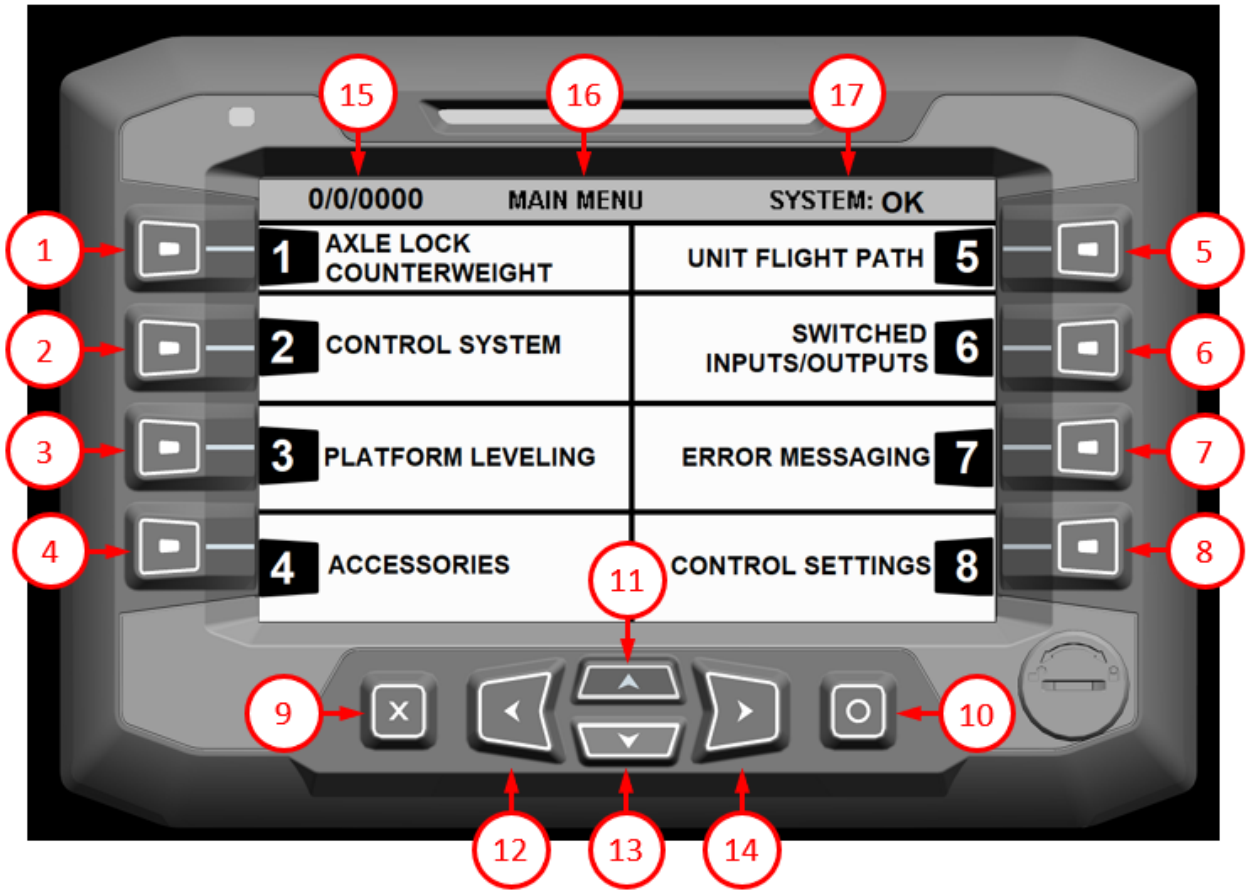
COMPONENTS:

Radio control box and DP700 control at T1 Station

GENERAL INFORMATION:

Listed below is common information that pertains to all display pages.



1) Button 1
2) Button 2
3) Button 3
4) Button 4
5) Button 5
6) Button 6
7) Button 7
8) Button 8
9) Button – ESC (Escape)
10) Button – OK
11) Button – Up Arrow
12) Button – Left Arrow
13) Button – Down Arrow
14) Button – Right Arrow
15) Information – Date
16) Information – Screen Name
17) Information – System Status

The system status will either be displayed as “OK” if there are no issues or “FAULT” if there are any issues or errors.

GETTING STARTED:

When the Unit Power Switch (in the cab) is turned on, a main entry screen will display on DP700 screen. This screen will indicate the truck model as well as the code revision number to each control module in the control system.

Pressing the “OK” button will navigate to the Main Menu screen.

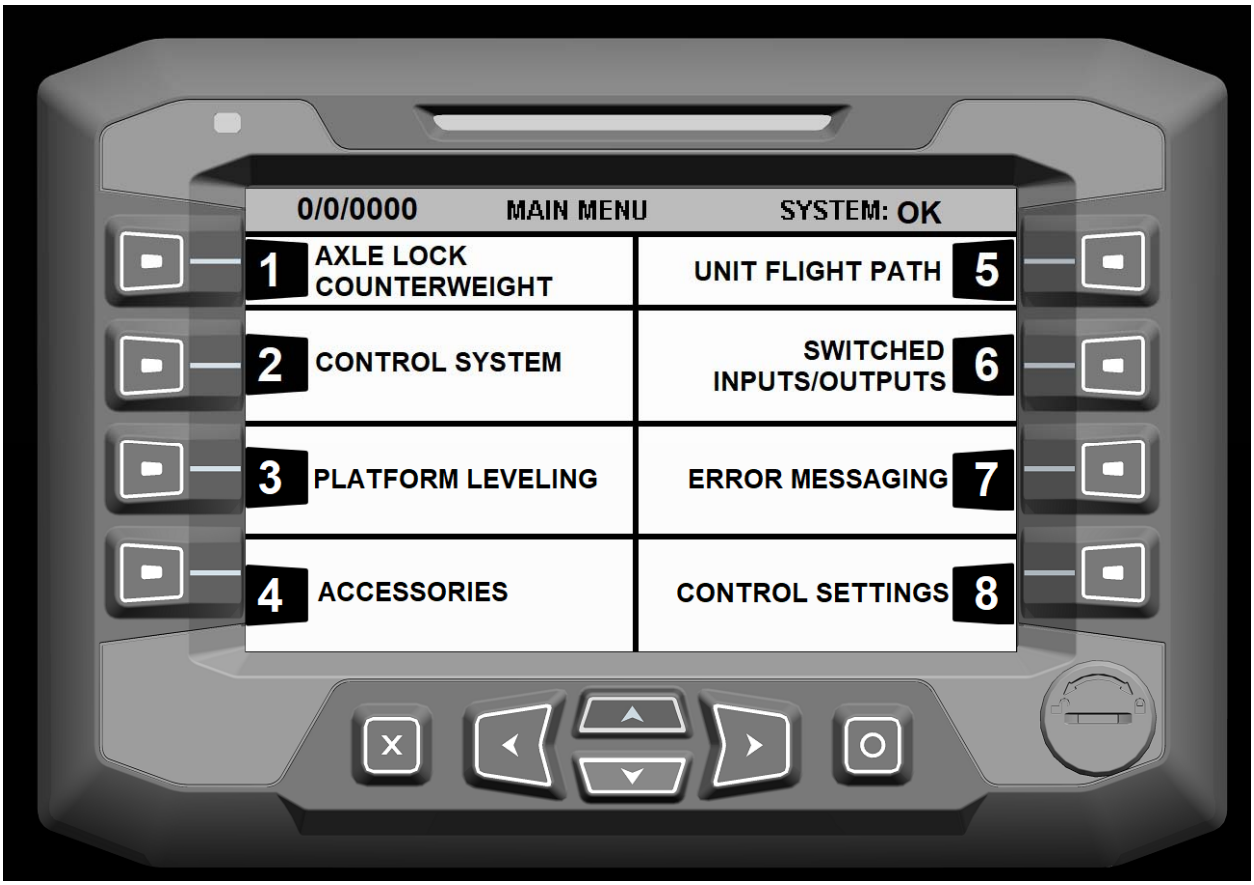
A52 Entrance Screen

A62 Entrance Screen

A62T Entrance Screen

MAIN MENU:

The Main Menu screen is the main screen for navigating through the unit display. Pressing the “ESC” button on any screen will always revert back to the Main Menu screen.



Main Menu Screen

1) Button 1 – Axle Lock/Counterweight screen
    a. Access to Unit/Axle Lock selector switch
    b. Access to engage/disengage the axle locks and deploy/retract the rear counterweight
    c. Axle lock and counterweight position information
2) Button 2 – Control System screen
    a. Access to select ground or platform radio control station
    b. Access to turn the following functions On/Off
        i. Boom-1 Up/Down
        ii. Turret-1 Rotate
        iii. Boom-2 Open/Close
        iv. Boom Leveling In/Out
3) Button 3 – Platform Leveling screen
    a. Access to Platform Leveling Screen

4) Button 4 – Accessories screen
    a. Access to air compressor On/Off
    b. Access to screen brightness
5) Button 5 – Unit Flight Path screen
    a. Access to active system rules
    b. Access to description of all system rules in “Real Time”
    c. Access to unit flight path sensors and switches status
    d. Access to axle lock and counterweight sensor status
6) Button 6 – Switched Inputs/Outputs screen
    a. Access to unit flight path sensors and switches status
    b. Access to axle lock and counterweight sensor status
    c. Access to switched outputs controlled by the Plus+1 control system
7) Button 7 – Error Messaging screen
    a. Access to view input errors to the Plus+1 control system
    b. Access to view output errors to valves
    c. Access to monitor analog voltage inputs from the Platform and Turret-2 level sensors
8) Button 8 – Control Settings screen
    a. Access to adjust date and time
    b. Access to adjust control signals to valves
    c. Access to override certain machine rules
    d. Access to adjust automatic platform and boom leveling controls signals
9) Left Arrow Button – Machine Operation Instructions screen
    a. Access to machine operation information

MACHINE OPERATIONAL INSTRUCTIONS:

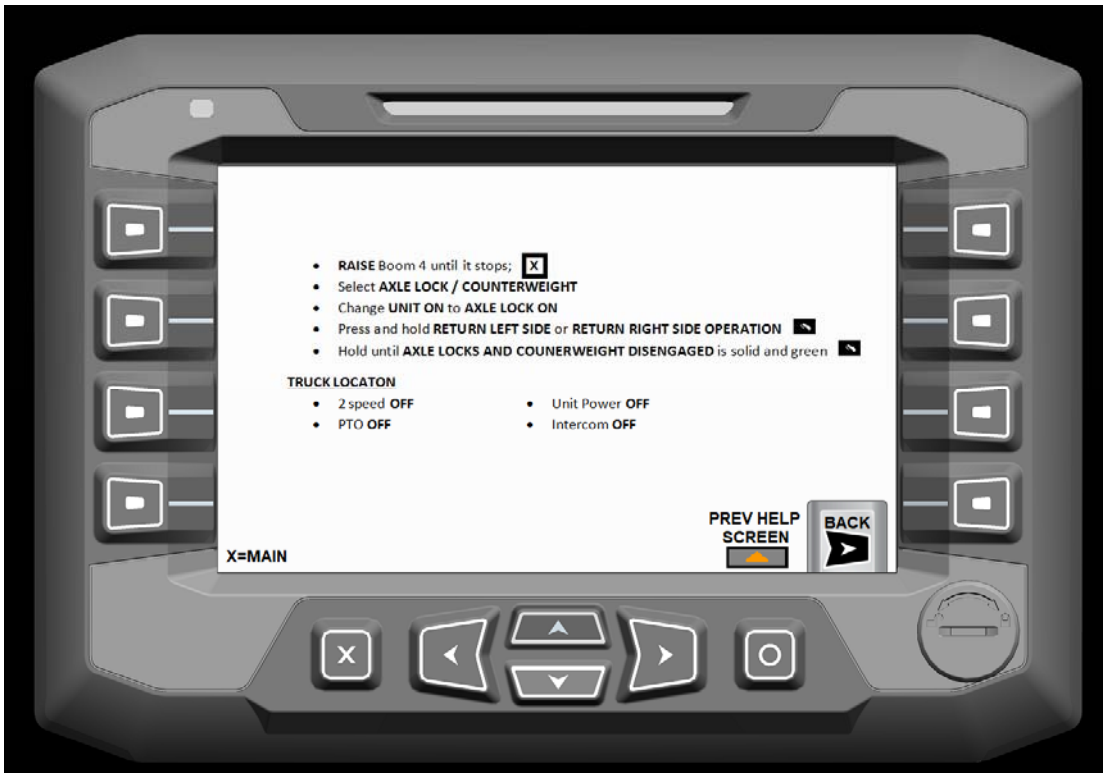
The Machine Operation Instruction screens display basic operation information of the machine. There are three different screens indicating this information.

- Pressing the “Up Arrow” and “Down Arrow” buttons navigate between the screens.
- Pressing the “Right Arrow” button on any screen will return back to the previous screen in use.
- Pressing the “ESC” button on any screen will return back to the Main Menu screen.

Access to the Machine Operation Instruction screen can be done by pressing the “Left Arrow” button from any screen except the Control Setting screen, when a CANBUS fault is present or when making adjustments to machine output signals.

Machine Operation Instruction Screen 1

Machine Operation Instruction Screen 2

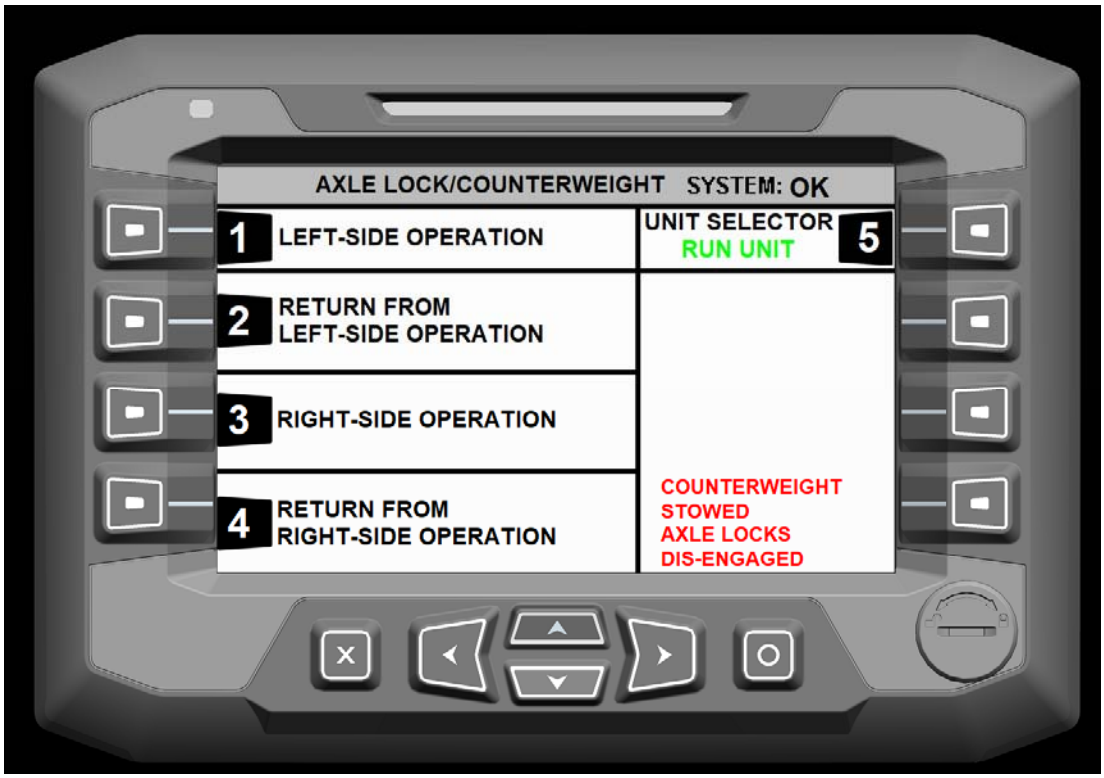


Machine Operation Instruction Screen 3

AXLE LOCK/COUNTERWEIGHT:

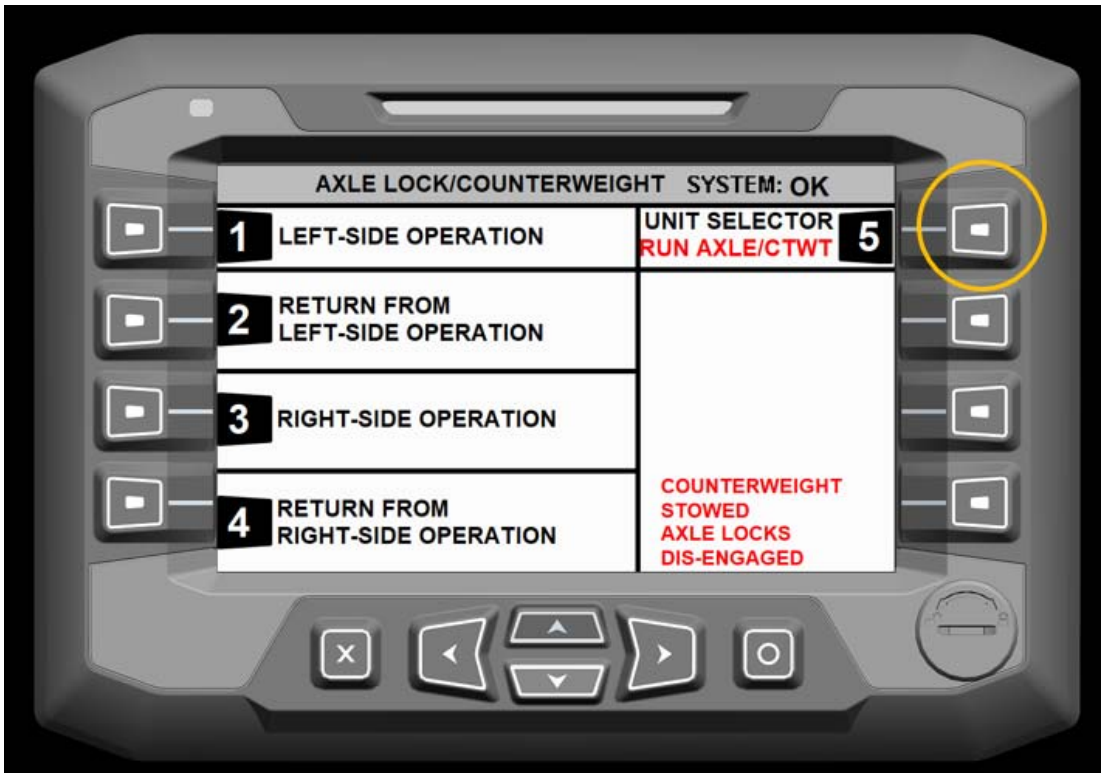
The axle locks and counterweights are operated through the DP700 display from the Axle Lock/Counterweight screen. Pressing “Button 1” from the Main Menu screen allows access to the Axle Lock/Counterweight screen.

Main Menu Screen – Press “Button 1”



Axle Lock/Counterweight Screen

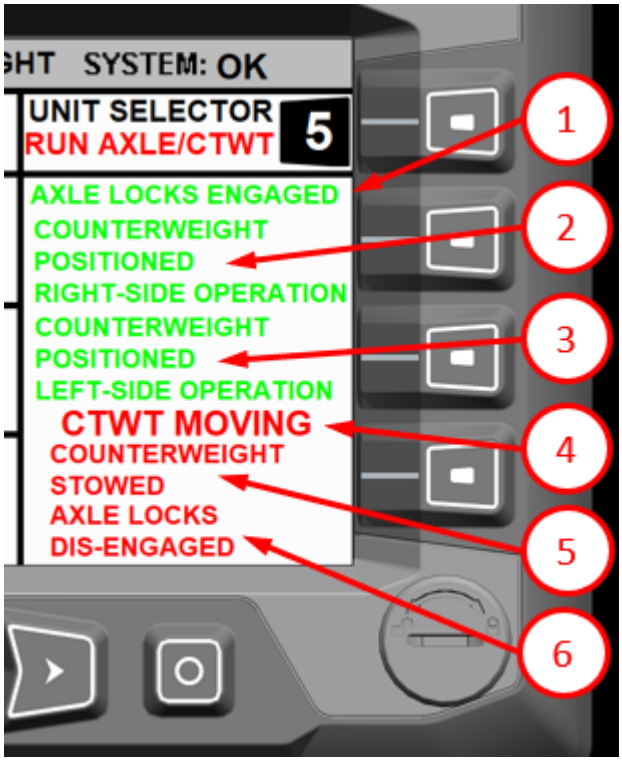
The safety interlock system requires that a selection shall be made between the Axle Lock/CTWT and Unit systems. Pressing “Button 5” will toggle between the Axle Lock/CTWT On and Unit On. The unit will not operate until the Axle Locks are engaged and Counterweight is engaged to the left or right side.



Axle Lock/Counter Weight – Run Axle Lock/CTWT Selected

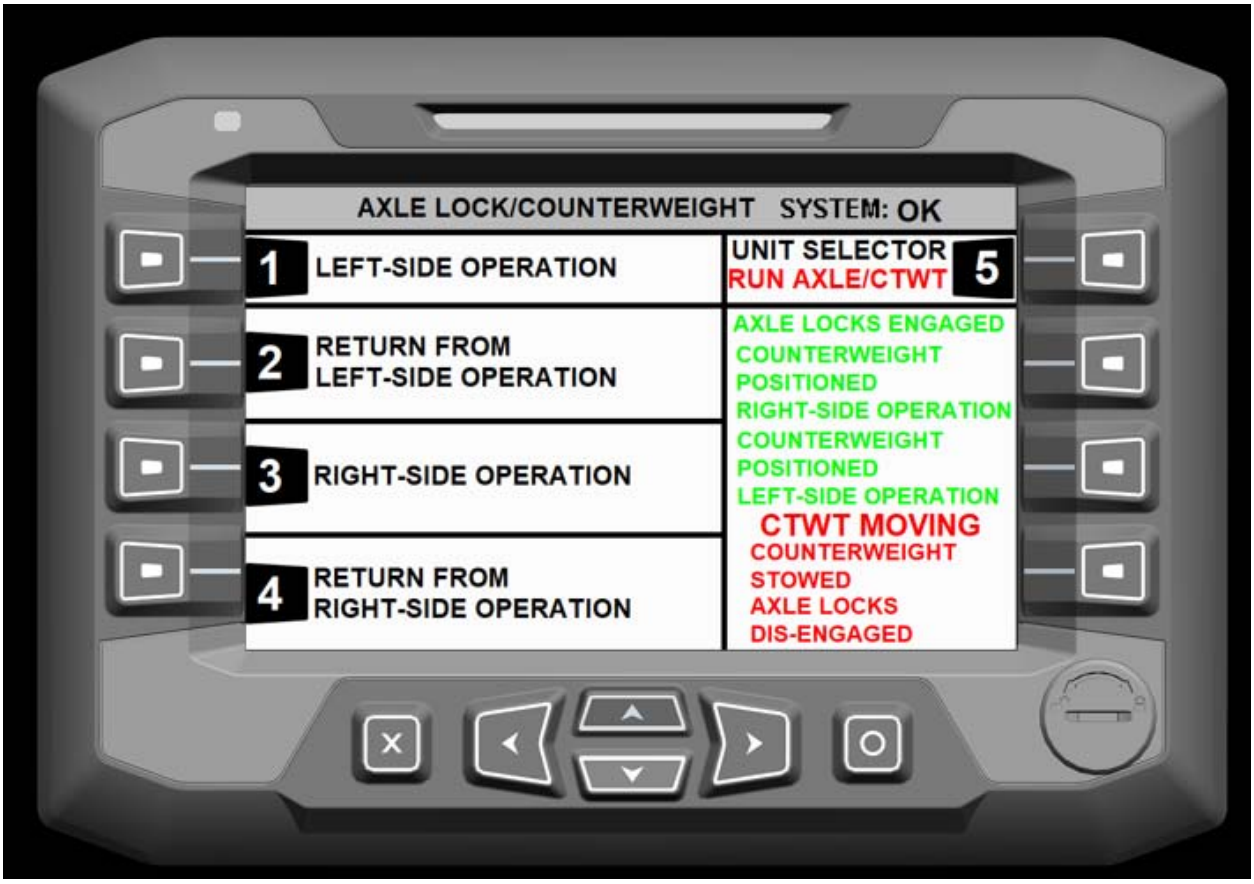
NOTE: WHEN THE AXLE LOCKS ARE BEING OPERATED WHILE USING THE AUXILIARY ENGINE AS A POWER SOURCE IT IS NECESSARY TO DEPRESS THE FOOT SWITCH.

Axle Lock and Counterweight Information:



1) Axle Locks Engaged (Green Text)
    a. Displayed once all of the Axle Locks have been engaged in the locked position
    b. Text will flash when the Axle Locks are moving from the engaged to disengage position to indicate these functions are moving.
2) Counterweight Position Right-Side Operation (Green Text)
    a. Displayed once the Counterweight is in position to operate the unit on the Right-Side of the machine.
3) Counterweight Position Left-Side Operation (Green Text)
    a. Displayed once the Counterweight is in position to operate the unit on the Left-Side of the machine.
4) CWTW Moving (Red Text)
    a. Flashes when the counterweight is in motion from the stowed position to the left or right side, left side to stowed position, or right side to stowed position.
5) Counterweight Stowed (Red Text)
    a. Displayed when the counterweight is in the stowed position
6) Axle Locks Dis-Engaged (Red Text)
    a. Displayed when all of the Axle Locks are in the dis-engaged position
    b. Text will flash when the Axle Locks are moving from the dis-engaged to the engaged position to indicate these functions are moving.

Engaging Axle Locks and Counterweight for Unit Operation:



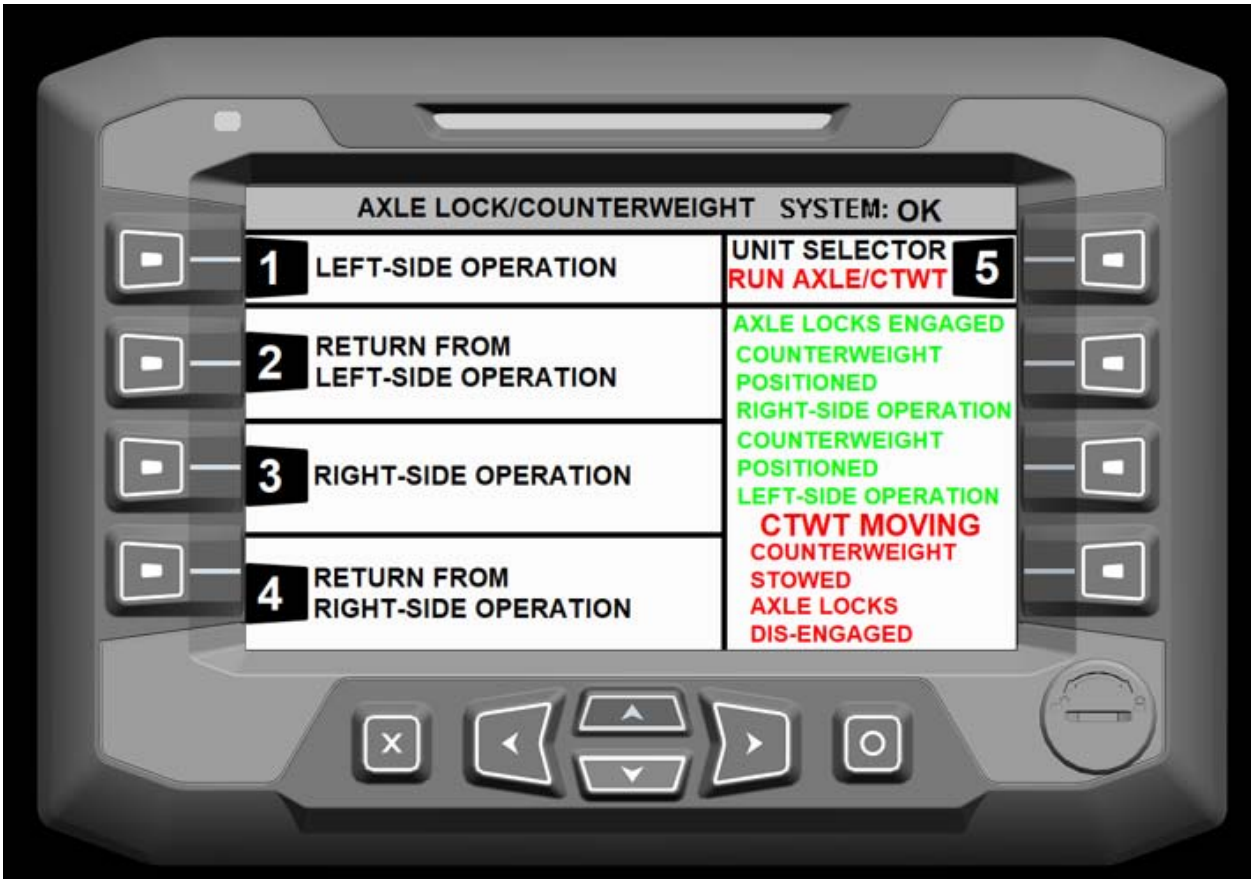
Axle Lock/Counterweight Screen

1) Button 1 – Left-Side Operation
    a. Pressing “Button 1” when Run Axle/CTWT is selected engages the Axle Locks and Counterweight for running the unit off the left side of the machine.
2) Button 3 – Right-Side Operation
    a. Pressing “Button 3” when Run Axle/CTWT is selected engages the Axle Locks and Counterweight for running the unit off the right side of the machine.

Once the Axle Locks and Counterweight are in position to operate the unit, green text will appear indicating that the Axle Locks are engaged and the that the Counterweight is positioned on the Right or Left Side for Operation.

Once the axles are locked and the counterweight is in position, Button 5 can be pressed to select Run Unit to operate the unit.

Dis-Engaging Axle Locks and Counterweight:



Axle Lock/Counterweight Screen

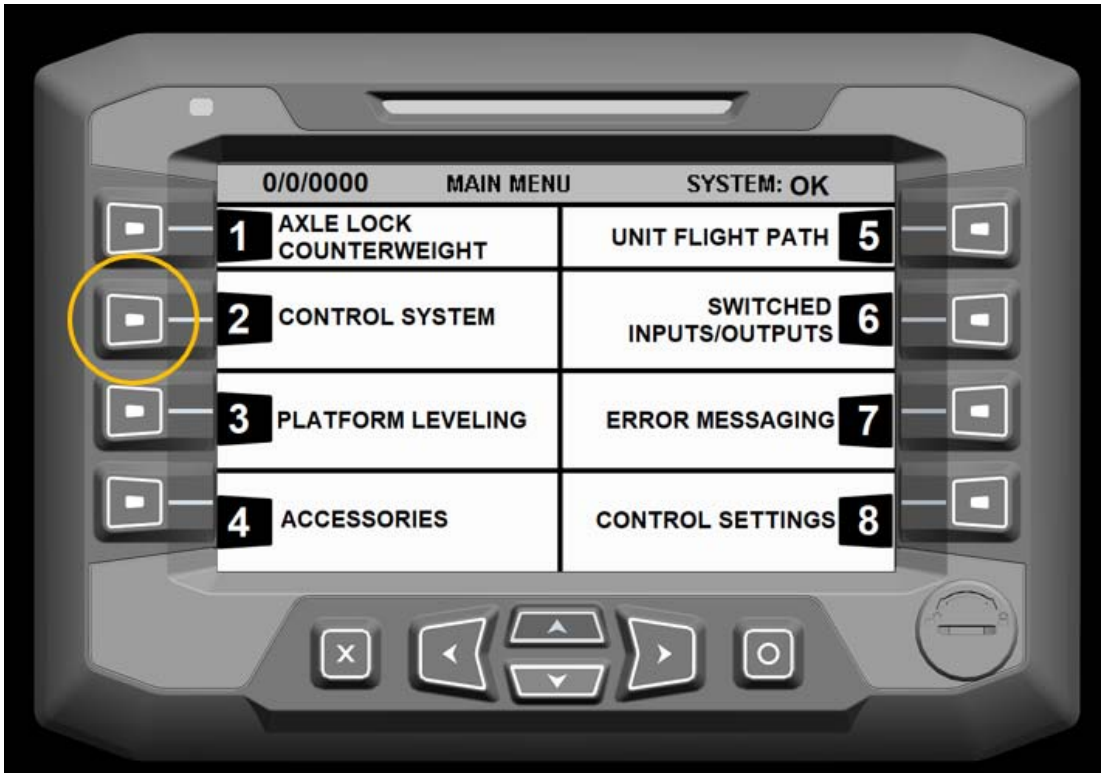
1) Button 2 – Return from Left-Side Operation
    a. Pressing “Button 2” when Run Axle/CTWT is selected dis-engages the Axle Locks and center the Counterweight for mobile truck operation.
2) Button 4 – Return from Right-Side Operation
    a. Pressing “Button 4” when Run Axle/CTWT is selected dis-engages the Axle Locks and center the Counterweight for mobile truck operation.

Once the Axle Locks are dis-engaged and Counterweight centered, red text will appear indicating that the Axle Locks are dis-engaged and the that the Counterweight is stowed.

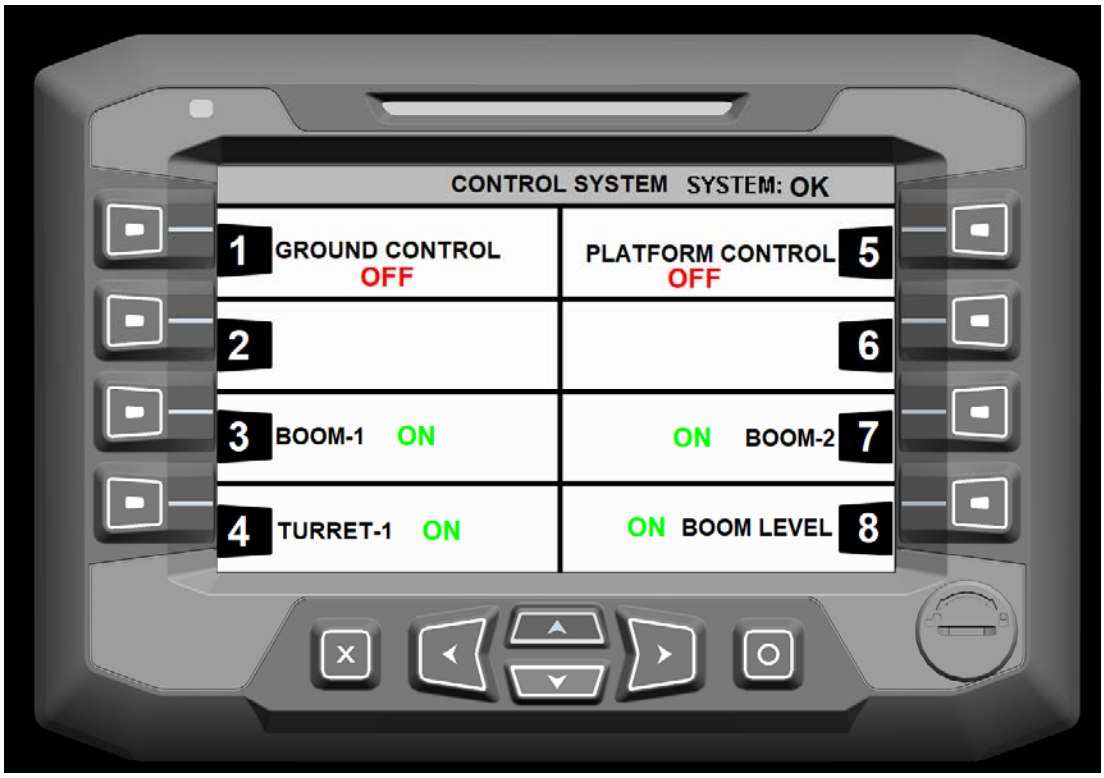
NOTE: WHILE TEXT IS BLINKING THE FUNCTION IS IN MOTION. TEXT STOPS BLINKING WHEN DESIRED AXLE LOCK OR COUNTERWEIGHT HAS COMPLETED MOVEMENT.

CONTROL SYSTEMS:

The Control System screen allows selection of the Ground or Platform control station. It also allows for turning On/Off Boom-1 Up/Down, Turret-1 Rotate, Boom-2 Open/Close, and Boom Level In/Out. Pressing “Button 2” from the Main Menu screen allows access to the Control System screen.



Main Menu Screen – Press “Button 2”



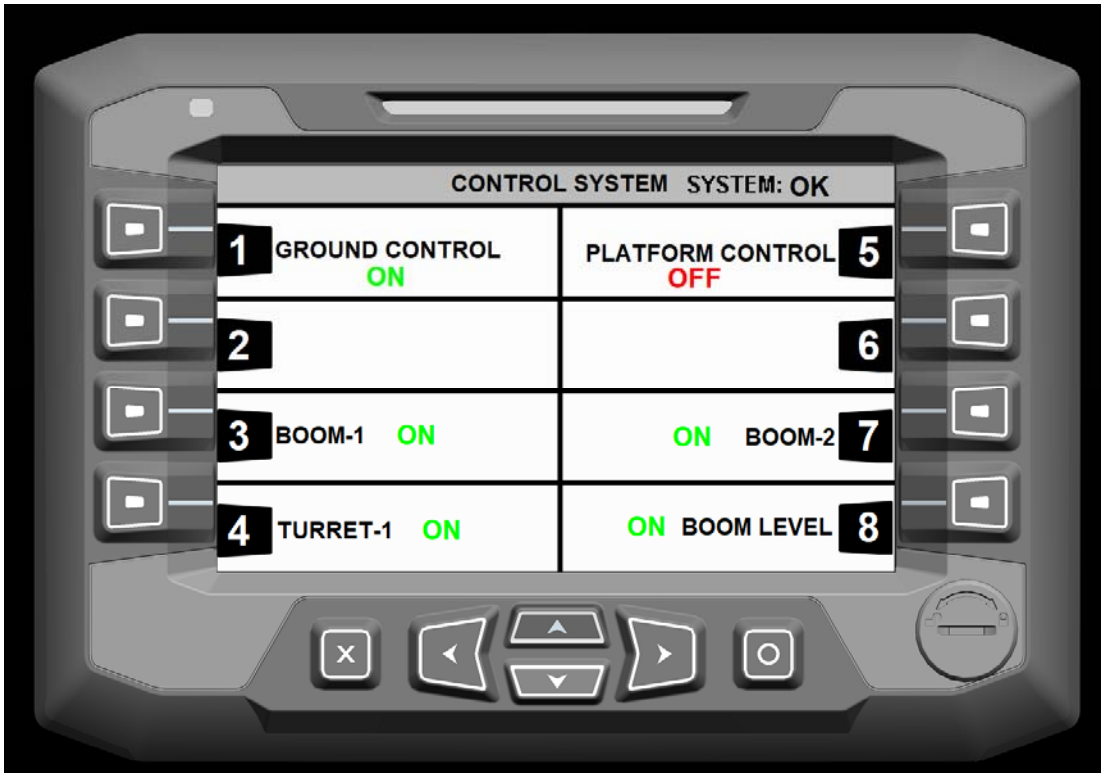
Control System Screen

IMPORTANT NOTE: AFTER ACTIVATION FROM THE DP700 SCREEN THE FOOT SWITCH OR ENABLE BUTTON ON THE CONTROLLER MUST BE DEPRESSED AND HELD BEFORE CONTROLS WILL OPERATE. THE FOOTSWITCH OR ENABLE BUTTON WILL "TIME OUT" AFTER 10 SECONDS IF NO FUNCTION IS OPERATED. SIMPLY DEPRESS AGAIN TO USE CONTROLLER FUNCTION.

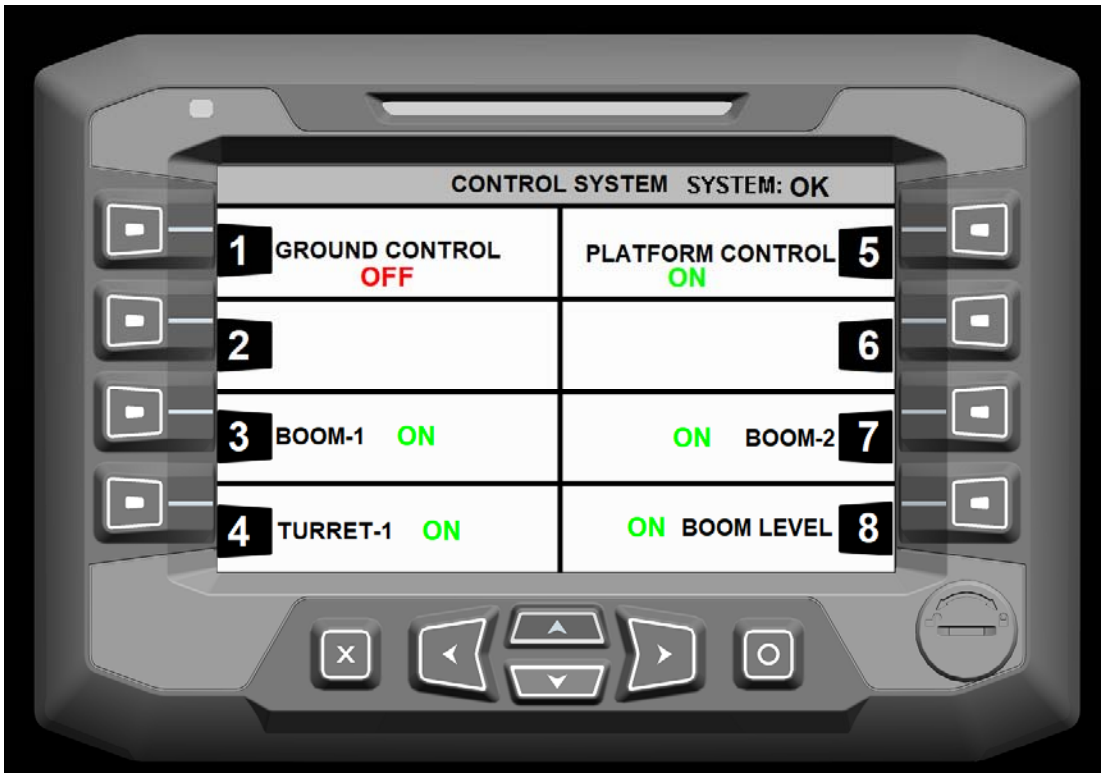
– Note: The default for both controllers is OFF. Only one Radio Controller unit can be active at any given time.

1) Button 1 – Ground Control
    a. Pressing "Button 1" toggles between the Ground Controller On/Off.
    b. Ground Controller can only be **ON** when the Platform Control is **OFF.**
    c. When On, the ground controller operates the unit.
    d. Default setting is Ground Control Off
2) Button 5 – Platform Control
    a. Pressing "Button 5" toggles between the Platform Controller On/Off.
    b. Platform Controller can only be **ON** when the Ground Control is **OFF.**
    c. When On, the platform controller operates the unit.
    d. Default setting is Platform Control Off

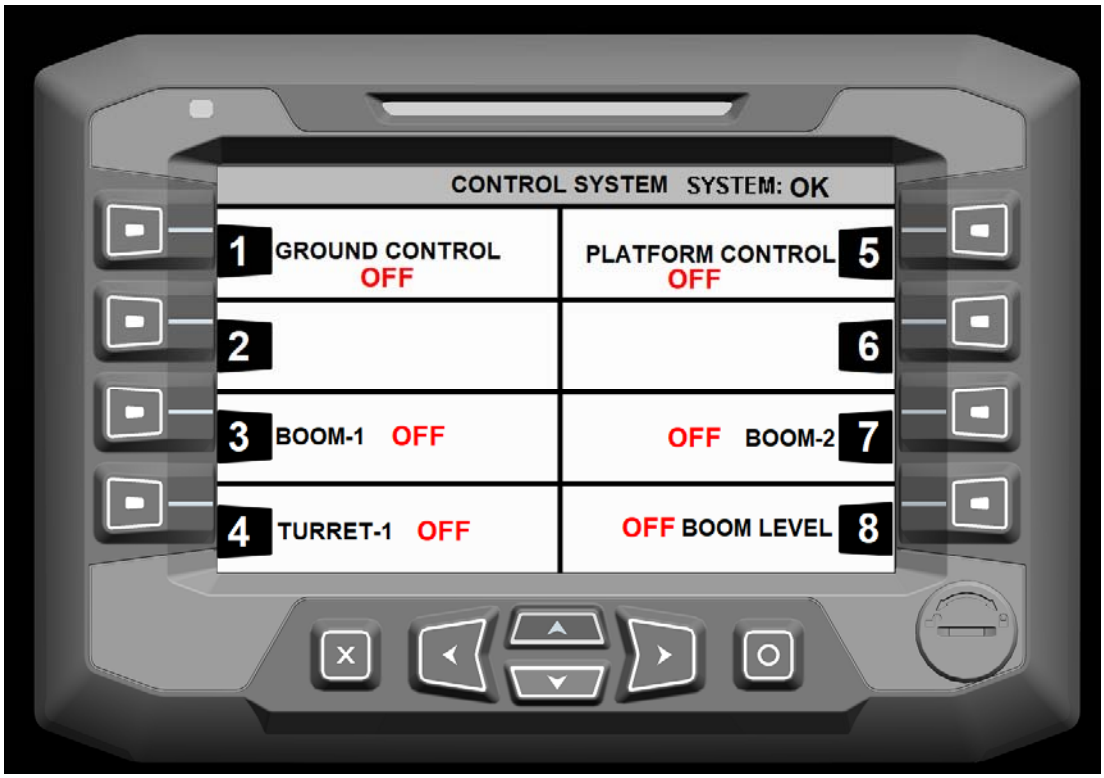
3) Button 3 – Boom-1 (Up/Down)
    a. Pressing “Button 3” toggles between Boom-1 Up/Down control being On (operable) and Off (inoperable).
    b. Default setting is Boom-1 On
4) Button 4 – Turret-1 (Rotate CW/CCW)
    a. Pressing “Button 4” toggles between Turret-1 Rotate control being On (operable) and Off (inoperable).
    b. Default setting is Turret-1 On
5) Button 7 – Boom-2 (Open/Close)
    a. Pressing “Button 7” toggles between Boom-2 In/Out control being On (operable) and Off (inoperable).
    b. Default setting is Boom-2 On
6) Button 8 – Boom Level (Turret-2 In/Out)
    a. Pressing “Button 8” toggles between Boom Level control being On (operable) and Off (inoperable).
    b. Default setting is Boom Level On
7) ESC Button
    a. Returns to Main Menu screen
8) Left Arrow Button – Machine Operation Instructions screen
    a. Access to machine operation information



Control System Screen – Ground Control ON



Control System Screen – Platform Control ON

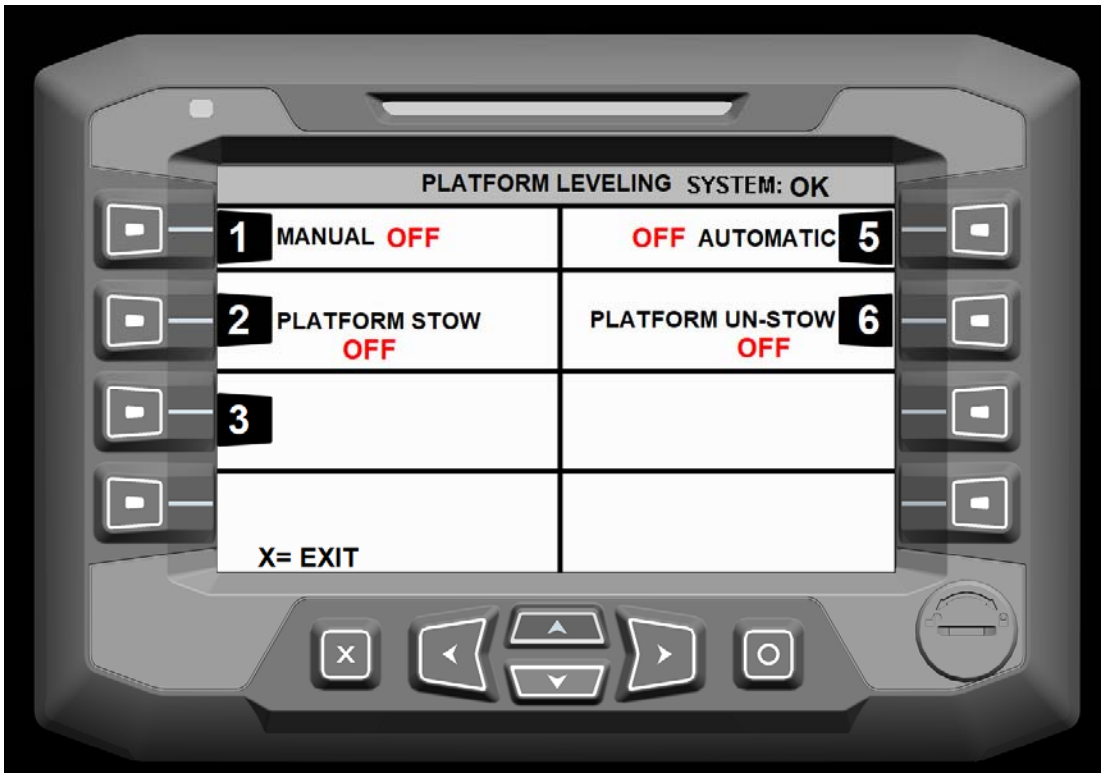


Control System Screen – Functions Off (Disabled)

PLATFORM LEVELING:

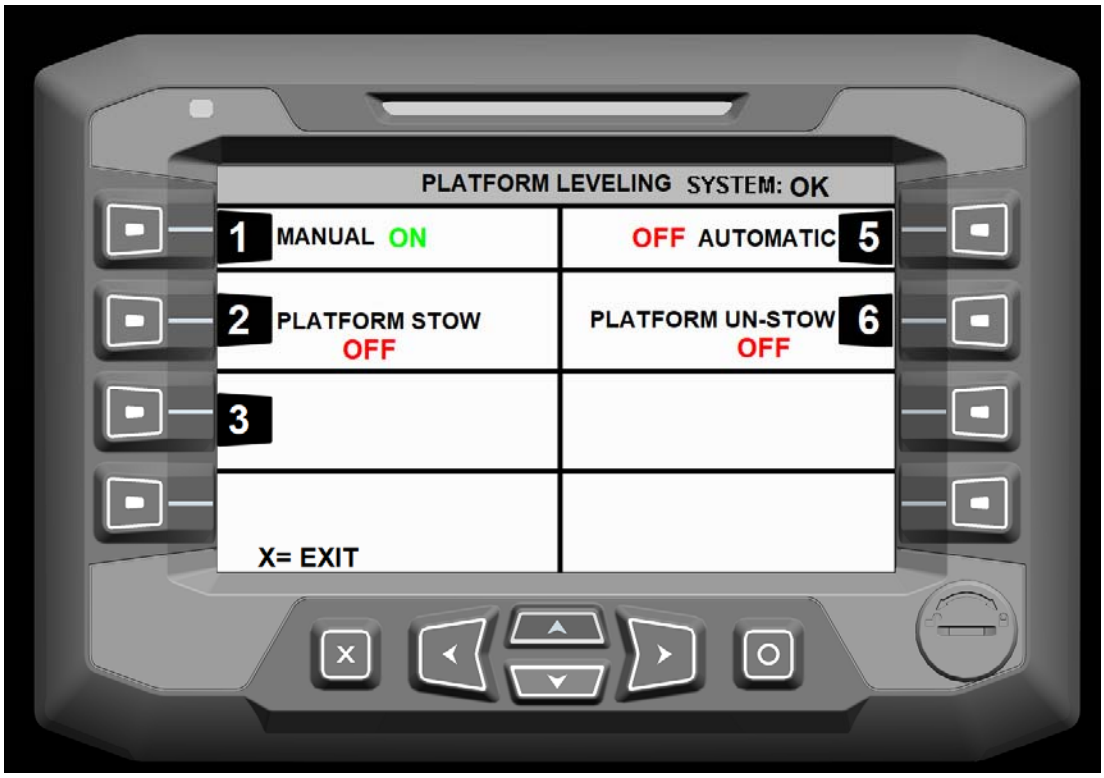
The platform leveling screen is for platform control, un-stowing the platform from the travel position, and stowing the platform to the travel position. Pressing “Button 3” from the Main Menu screen allows access to the Platform Leveling screen.

Main Menu Screen – Press “Button 4”

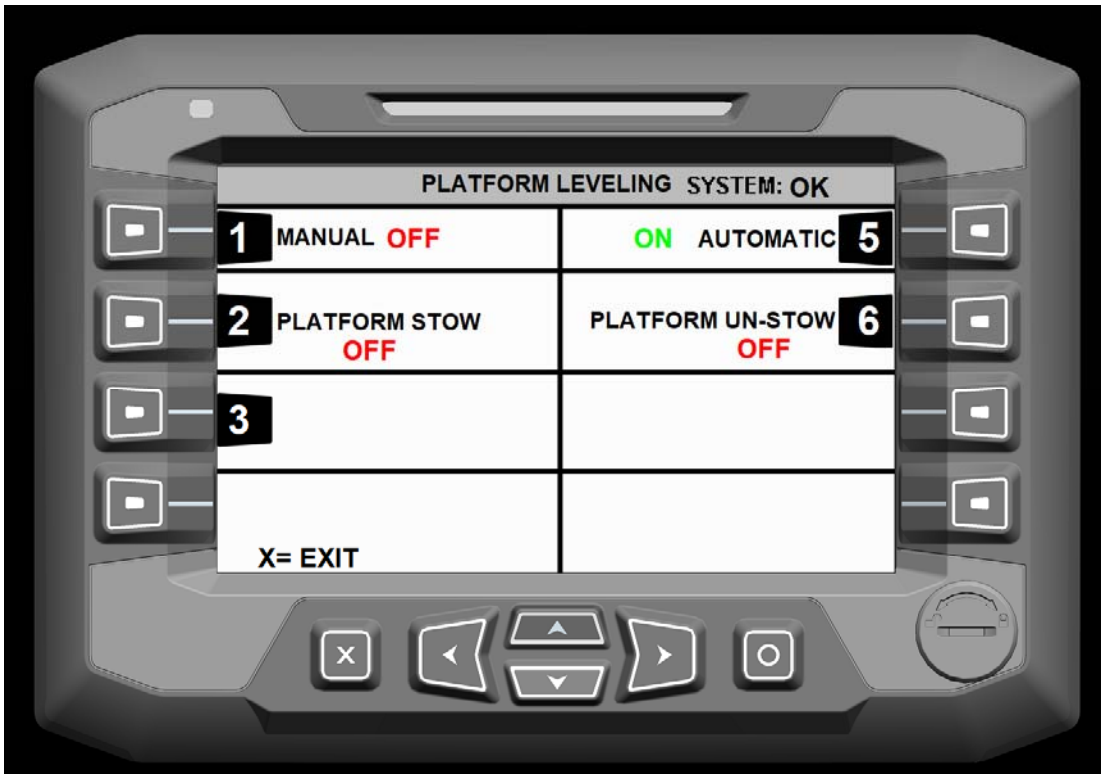


Platform Leveling Screen

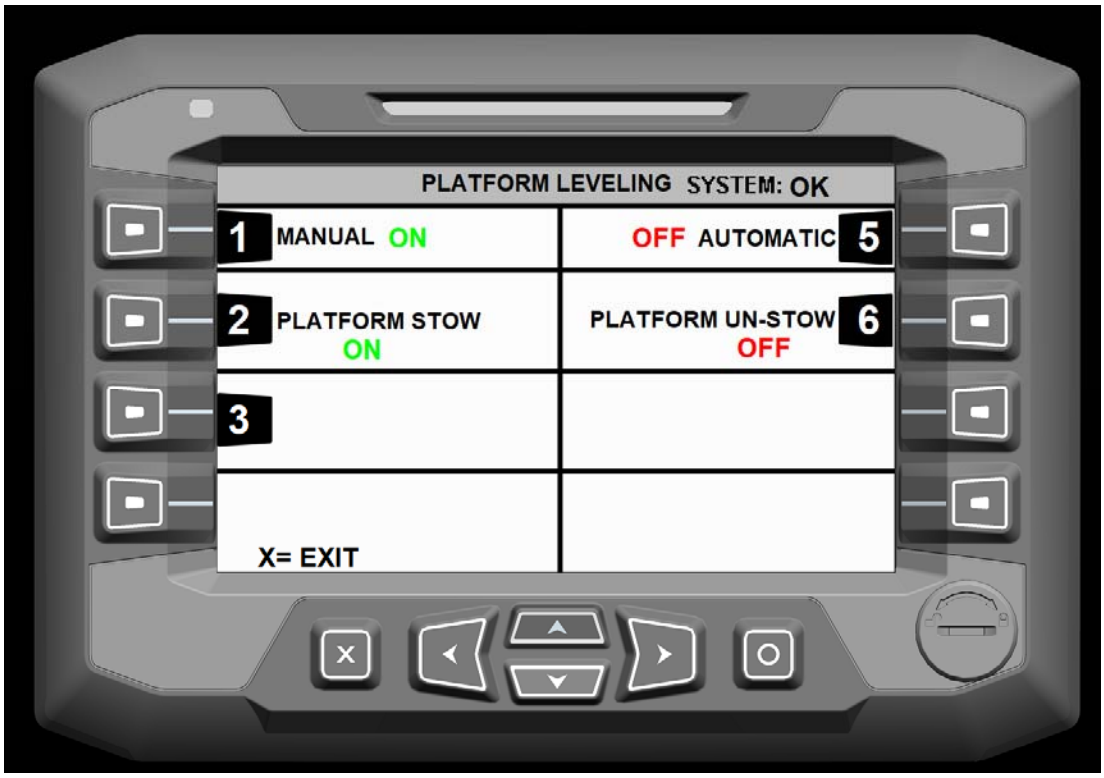
1) Button 1 – Manual Control
    a. Pressing “Button 1” toggles between Manual Control of the platform On/Off.
    b. Manual Control can only be **ON** when the Automatic Control is **OFF.**
    c. When On, Platform Stow and Un-stow can be used. Also, the platform will NOT automatically level.
    d. Default setting is Manual Off
2) Button 5 – Platform Control
    a. Pressing “Button 5” toggles between Automatic Control of the platform On/Off.
    b. Automatic Control can only be **ON** when the Manual Control is **OFF.**
    c. When On, the Platform will automatically level when operating the machine.
    d. Default setting is Automatic Off
3) Button 3 – Platform Stow
    a. Pressing and holding “Button 2” while Manual Platform Leveling is On will stow the platform
4) Button 6 – Platform Un-Stow
    a. Pressing and holding “Button 6” while Manual Platform Leveling is On will un-stow the platform
5) ESC Button
    a. Returns to Main Menu screen
6) Left Arrow Button – Machine Operation Instructions screen
    a. Access to machine operation information



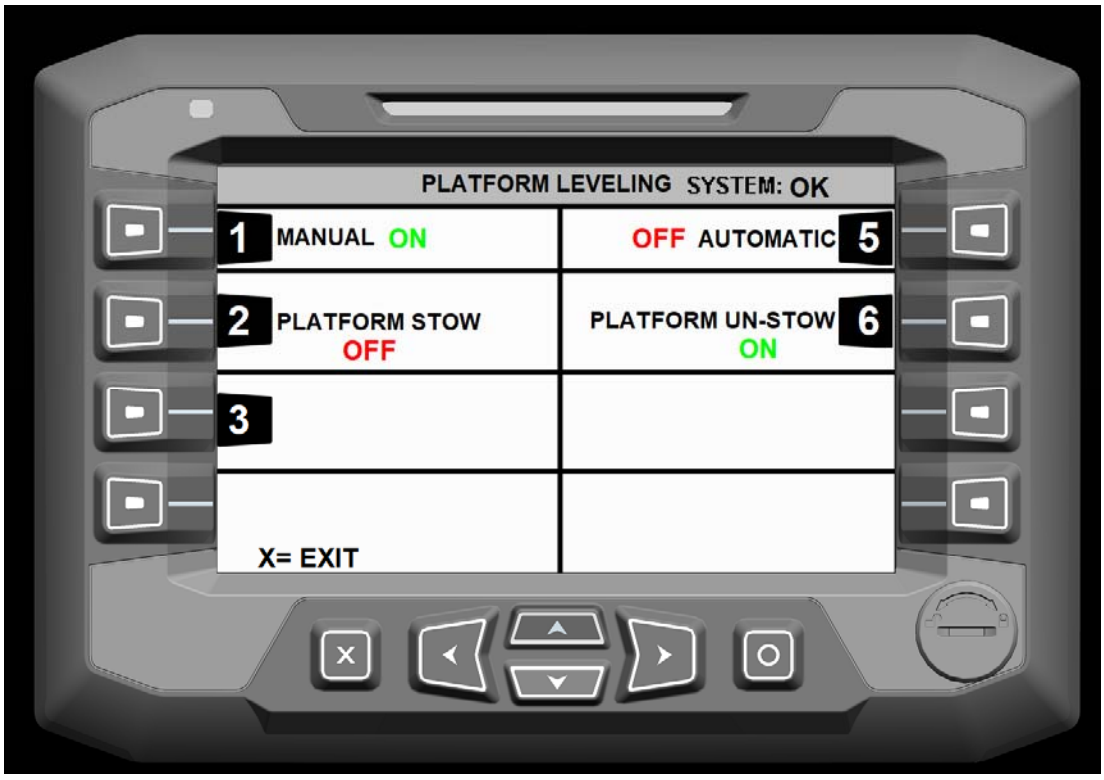
Platform Leveling Screen – Manual On



Platform Leveling Screen – Automatic On



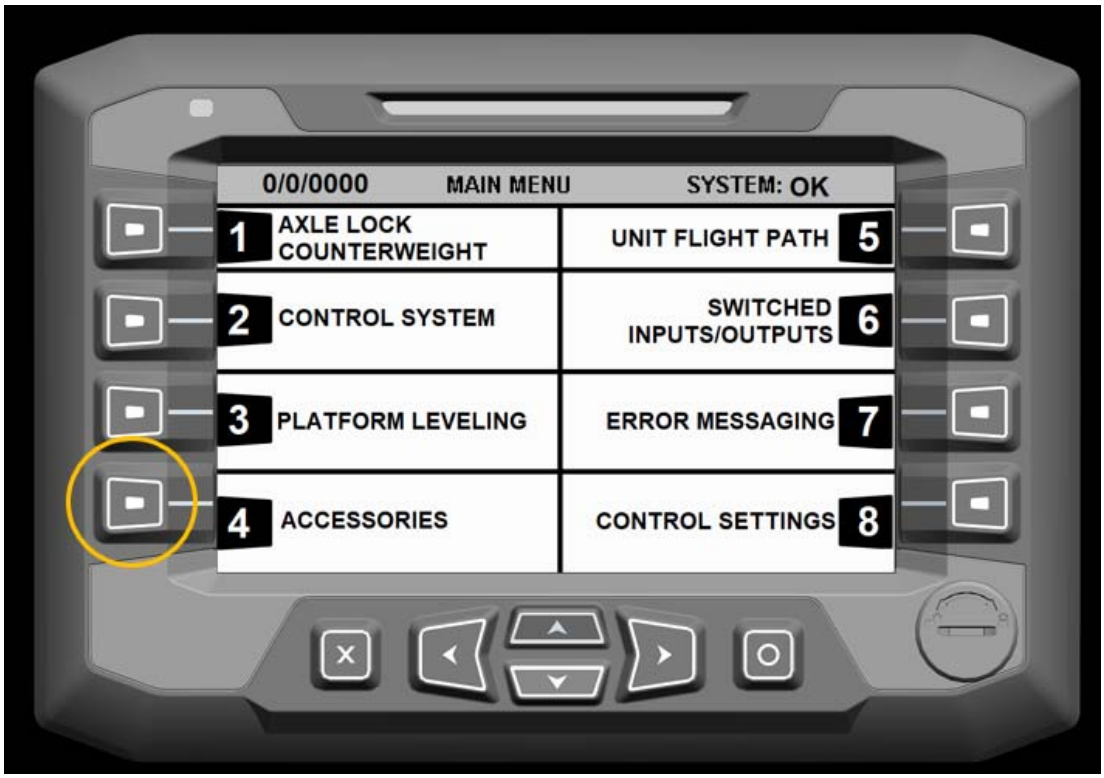
Platform Leveling Screen – Platform Stow On



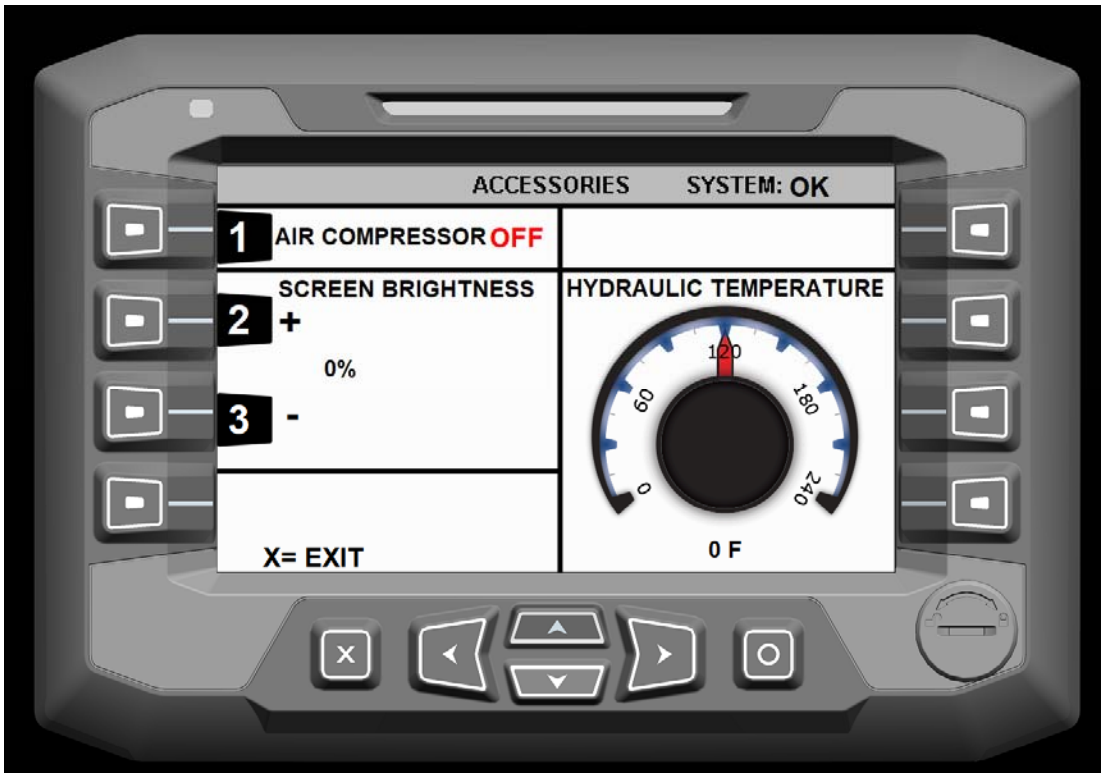
Platform Leveling Screen – Platform Un-Stow On

ACCESSORIES:

The Accessories screen is for the Air Compressor operation, screen brightness, and any special accessories installed. Pressing “Button 4” from the Main Menu screen allows access to the Accessories screen.



Main Menu Screen – Press “Button 4”



Accessories Screen

1) Button 1 – Air Compressor
    a. Pressing “Button 1” toggles between the Air Compressor On/Off.
2) Button 2 – Screen Brightness (Increase)
    a. Pressing “Button 2” increases the screen brightness
3) Button 3 – Screen Brightness (Decrease)
    a. Pressing “Button 3” decreases the screen brightness
4) ESC Button
    a. Returns to Main Menu screen
5) Left Arrow Button – Machine Operation Instructions screen
    a. Access to machine operation information

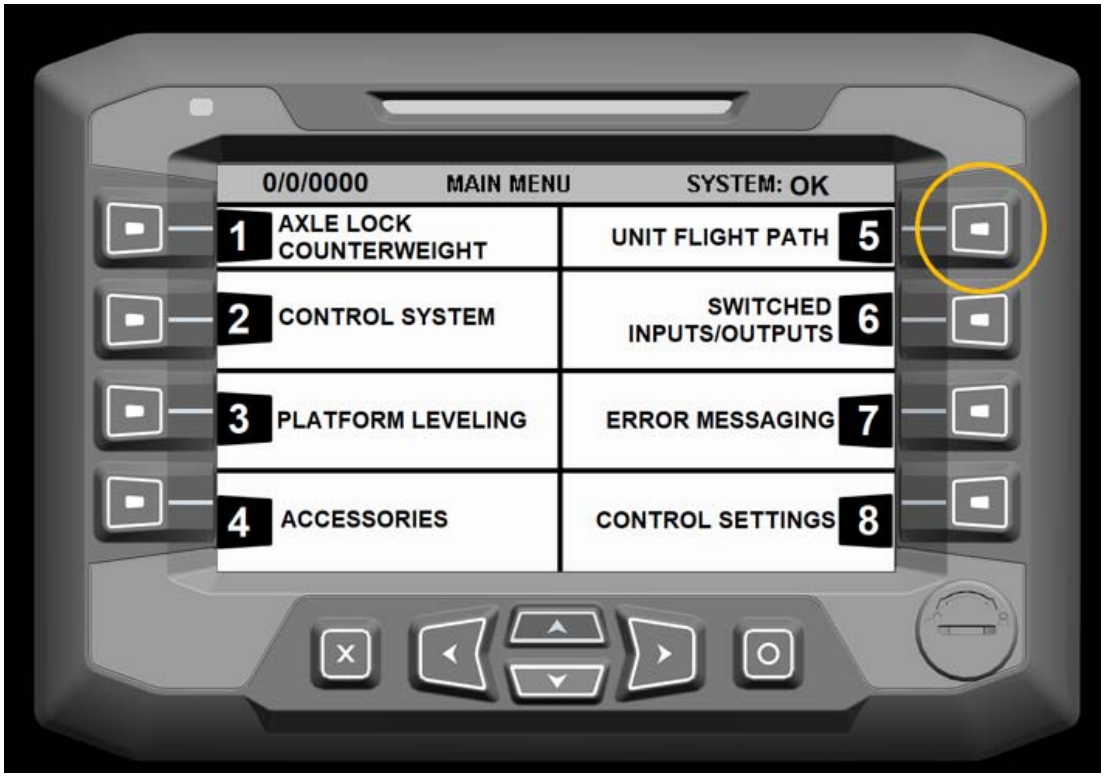
The Hydraulic Temperature gauge is displayed when a hydraulic temp sensor in installed. This gauge indicates the temperature of the hydraulic fluid in the reservoir tank. The maximum operating temperature should not exceed 240 degrees F (115.5 degrees C).

UNIT FLIGHT PATH:

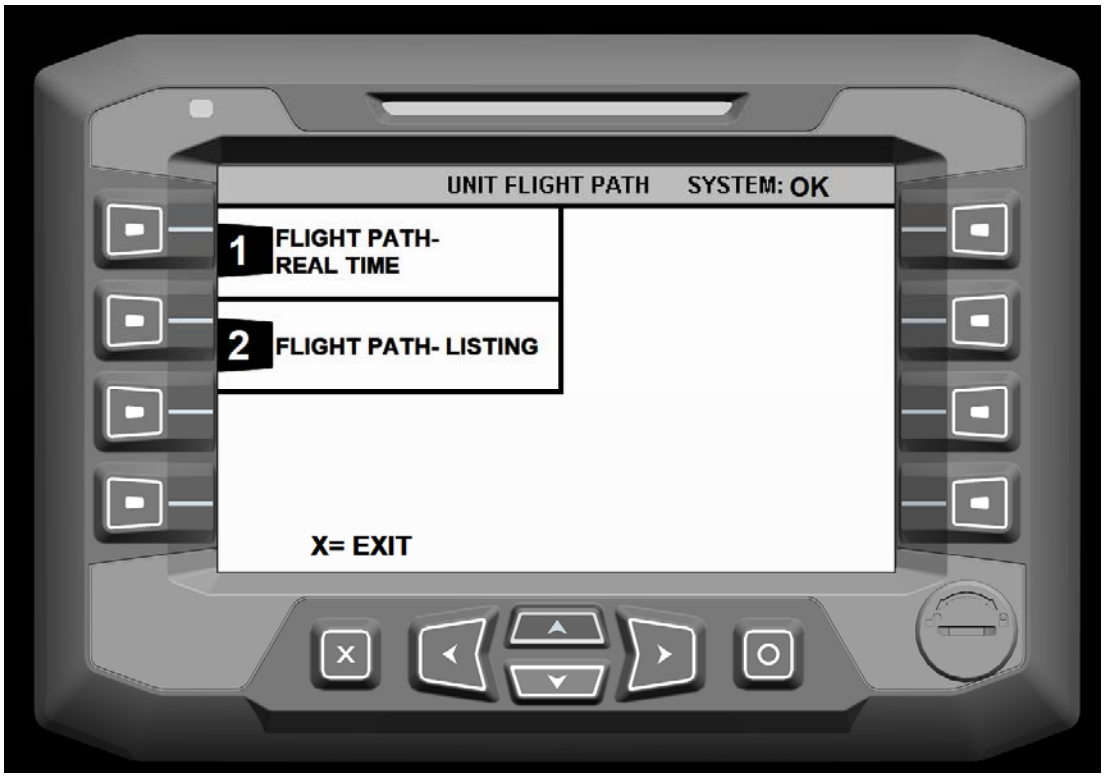
The Unit Flight Path screen allows access to the flight path rules of the machine in two different ways. These displays will help the operator solve a function stoppage caused by a prescribed flight path rule.

This screen also the operator to view switches and sensors that pertain the flight path of the unit as well as the axle lock and counterweight.

Pressing “Button 5” from the Main Menu screen allows access to the Unit Flight Path screen.



Main Menu Screen – Press “Button 5”



Unit Flight Path Screen

1) Button 1 – Flight Path-Real Time
    a. Pressing “Button 1” displays the Flight Path Rules Real Time screen.
2) Button 2 – Screen Brightness (Increase)
    a. Pressing “Button 2” displays the Flight Path List screen
3) ESC Button
    a. Returns to Main Menu screen
4) Left Arrow Button – Machine Operation Instructions screen
    a. Access to machine operation information

Flight Path Rules Real Time Screen:

This screen shows the Flight Path rules in real time as they are active. The left side of the screen indicates the active rule(s) in RED. The right side of the screen indicates the resolution needed in GREEN to reverse the function inactivity caused by the rule.

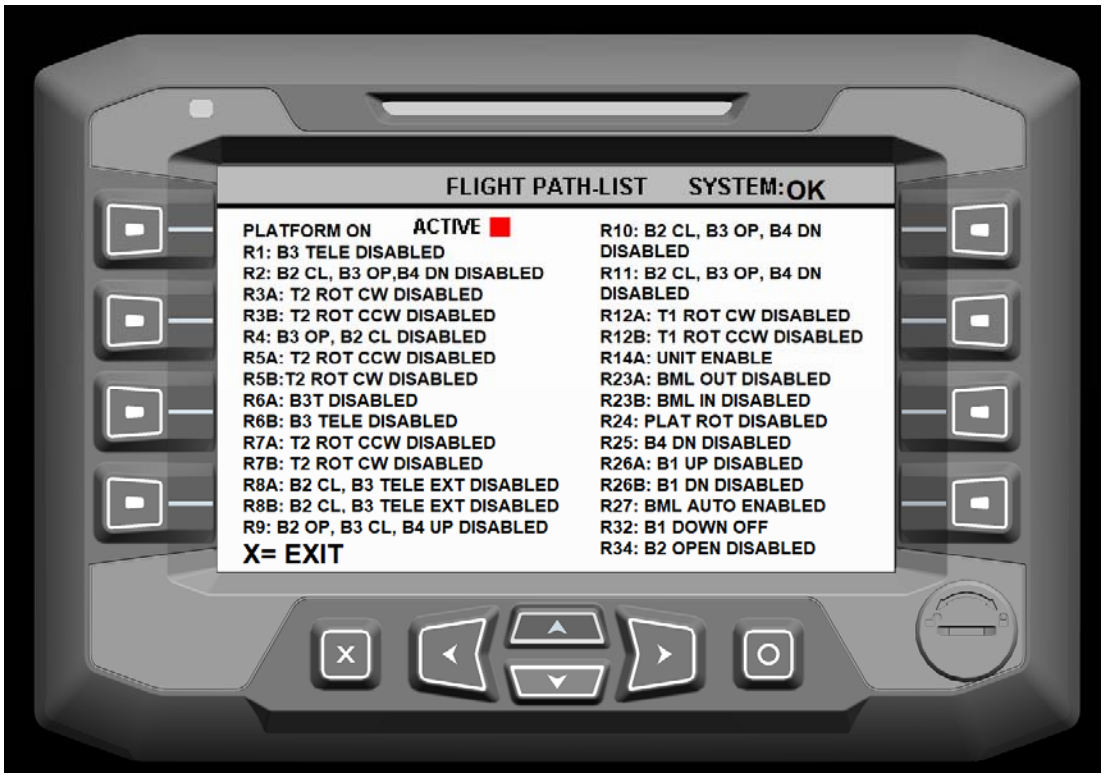
Flight Path Rules Real Time Screen

1) ESC Button
    a. Returns to Main Menu screen
2) Left Arrow Button – Machine Operation Instructions screen
    a. Access to machine operation information

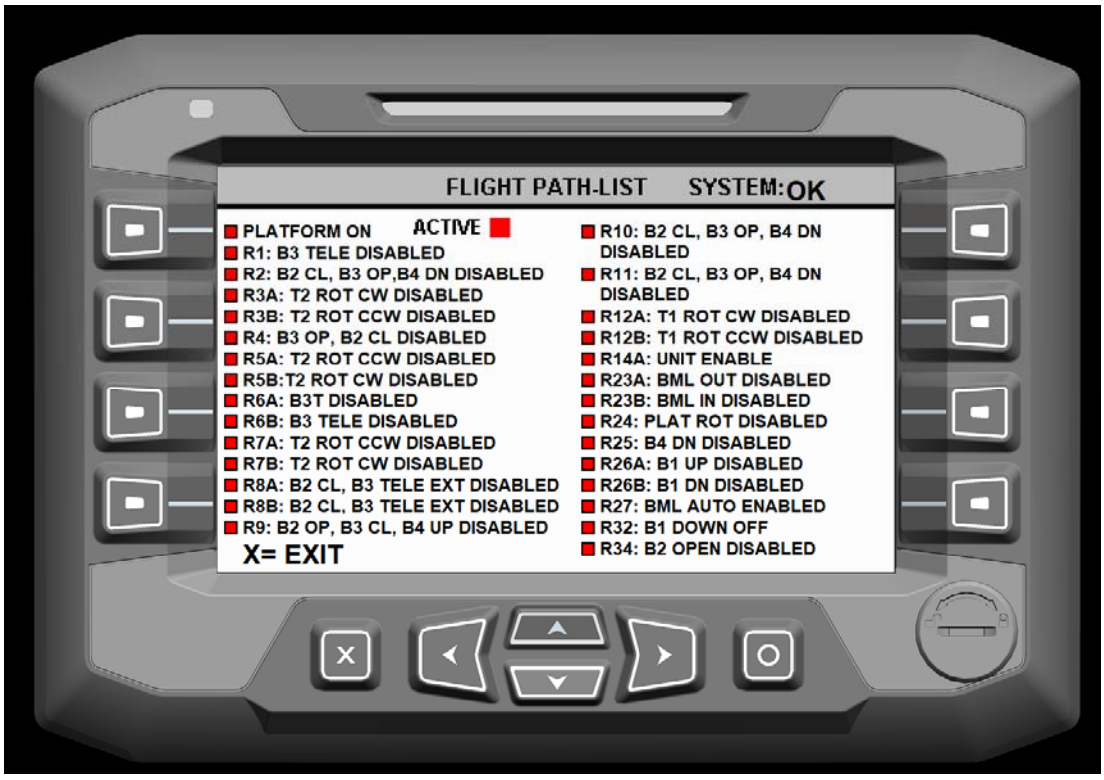
Flight Path Rules Listing Screen:

This screen shows all the Flight Path rule that are applicable to the machine. When a rule is active a red box will appear next to the rule.

1) ESC Button
    a. Returns to Main Menu screen
2) Left Arrow Button – Machine Operation Instructions screen
    a. Access to machine operation information



Flight Path List Screen

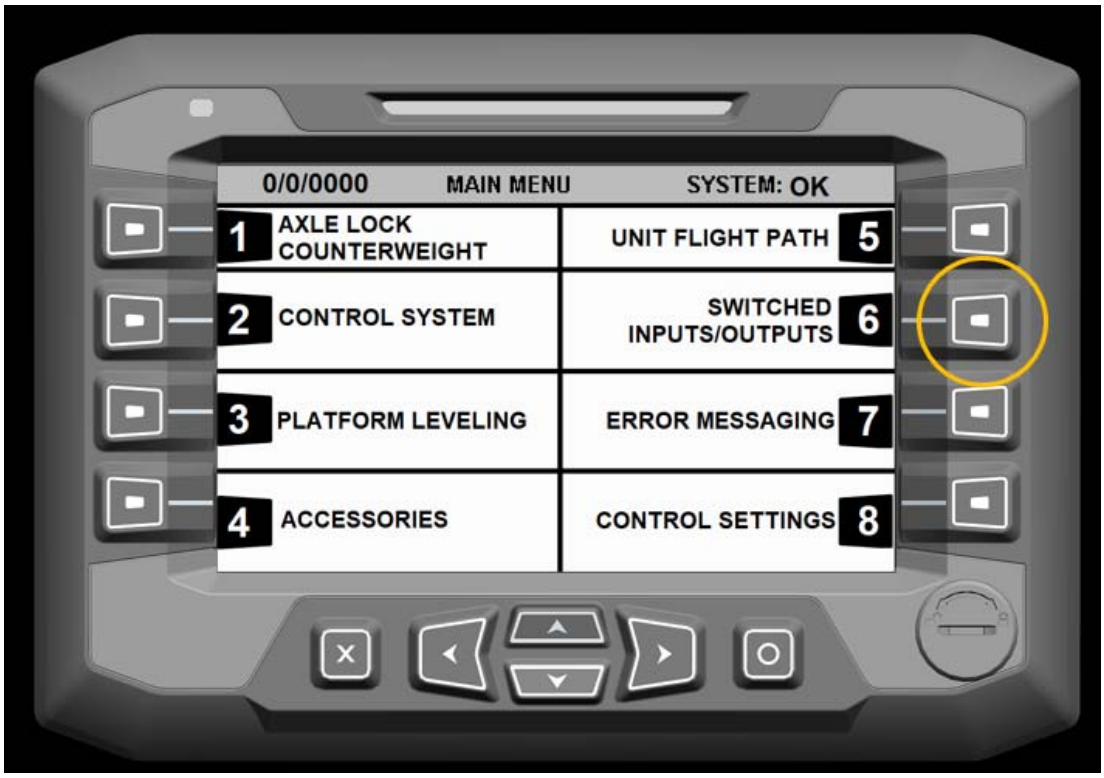


Flight Path List Screen – Red Box Indicates Rule is Active

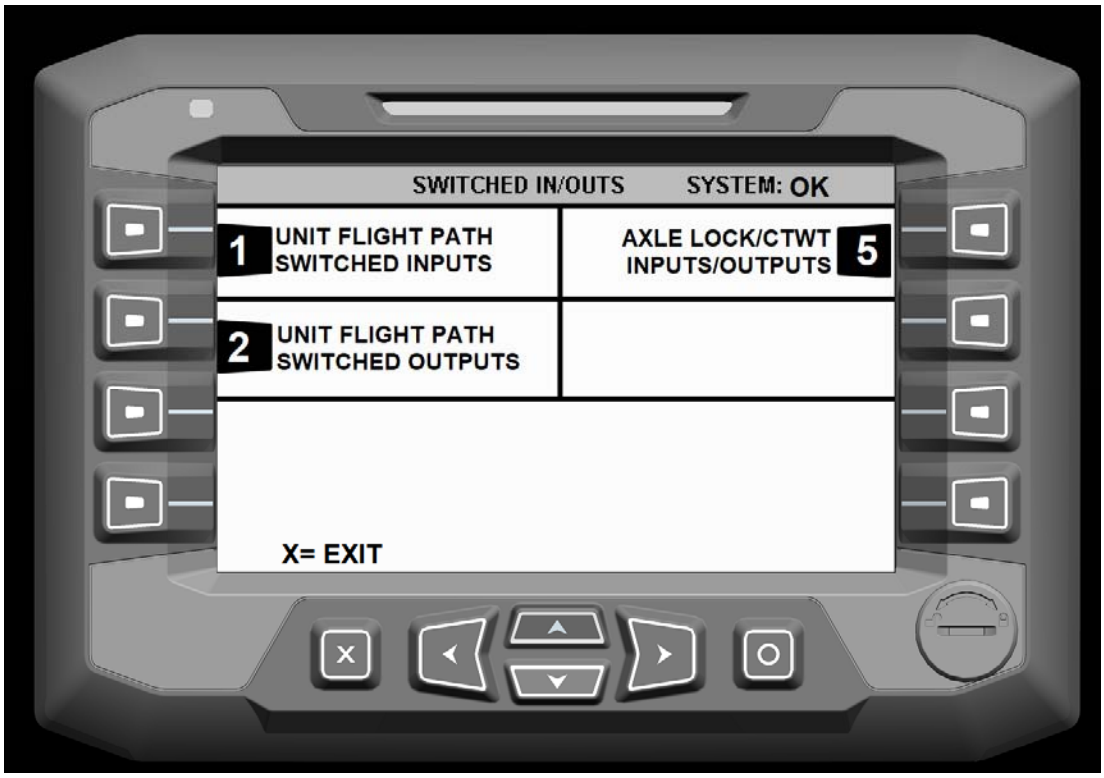
SWITCHED INPUTS/OUTPUTS:

The Switched Inputs/Outputs screen allows viewing of specific information about the switches and controls. This can be helpful to know when a specific switch or sensor is active and sending a signal to Plus-1 system. Observing the switched outputs will determine when a specific component is being signaled to operate.

Pressing “Button 6” from the Main Menu screen allows access to the Control System screen.



Main Menu Screen – Press “Button 6”



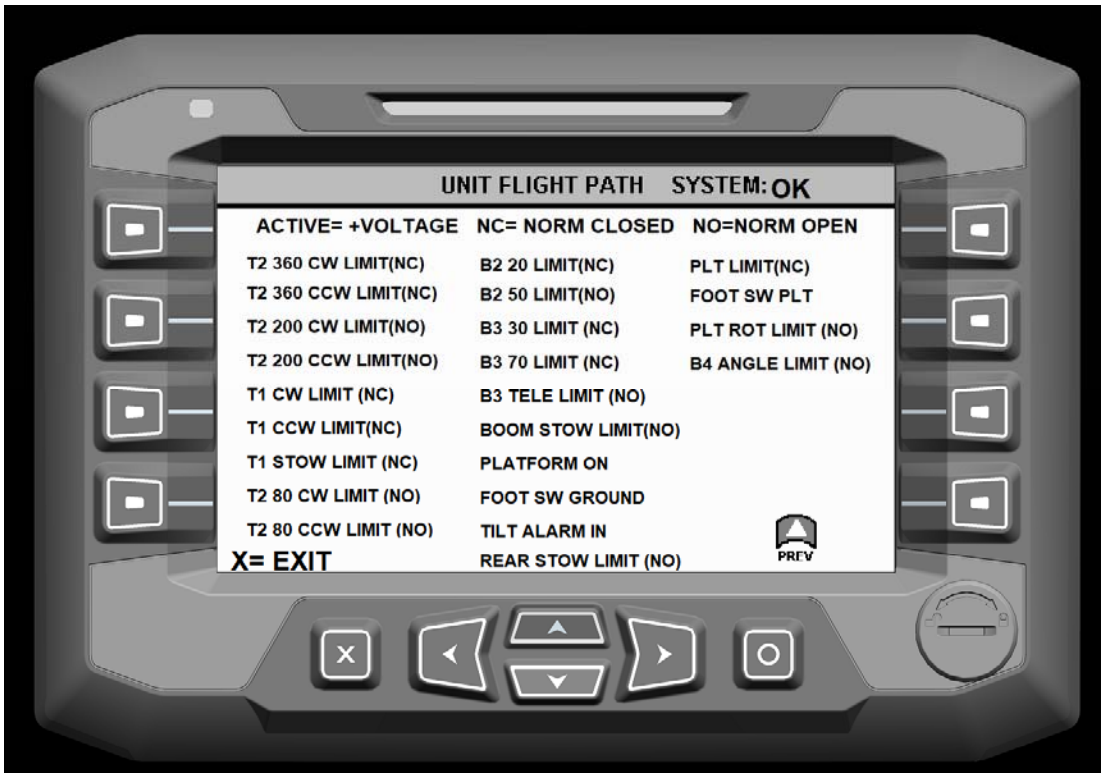
Switched Inputs/Outputs Screen

1) Button 1 – Unit Flight Path Switched Inputs
    a. Pressing “Button 1” displays the Unit Flight Path screen
2) Button 2 – Unit Flight Path Switched Outputs
    a. Pressing “Button 2” displays the Unit Flight Path Switched Outputs screen
3) Button 6 – Axle Lock/CTWT Inputs/Outputs
    a. Pressing “Button 6” displays the Axle Lock/Counterweight screen
4) ESC Button
    a. Returns to Main Menu screen
5) Left Arrow Button – Machine Operation Instructions screen
    a. Access to machine operation information

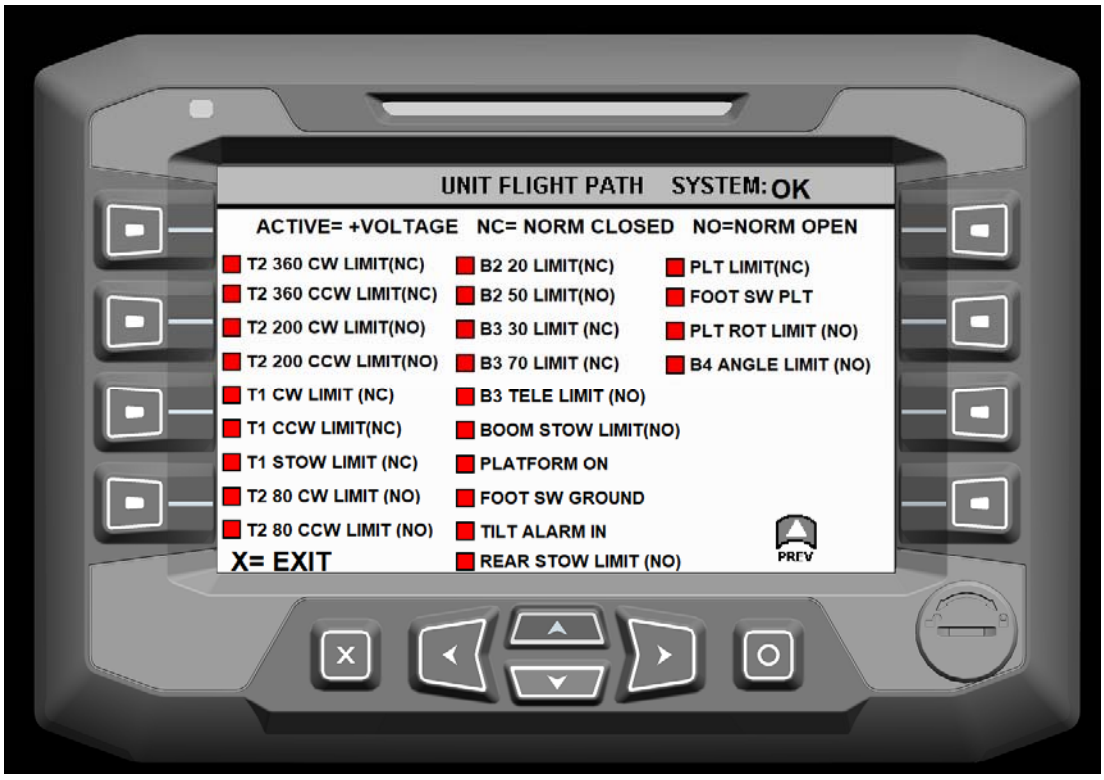
Unit Flight Path Inputs Screen:

This screen shows all of the switches and sensors that are on the machine not including the axle locks or counterweight. When a switch is active, a RED box will appear next to it. This screen will help to determine what switches or sensors are activating certain rules.

1) ESC Button
    a. Returns to Main Menu screen
2) Left Arrow Button – Machine Operation Instructions screen
    a. Access to machine operation information
3) Up Arrow Button
    a. Pressing “Up Arrow” button returns to the Switched Inputs/Outputs screen



Unit Flight Path Inputs Screen

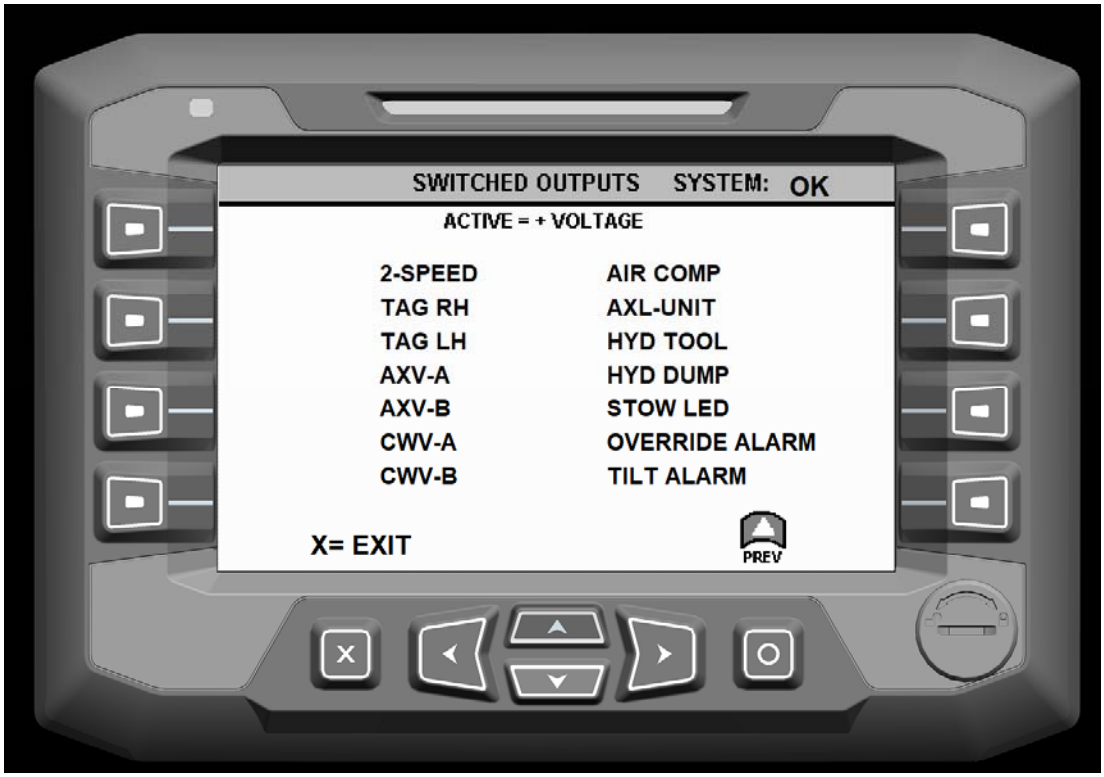


Unit Flight Path Inputs Screen – Red Box Indicates Switch or Sensor is Active

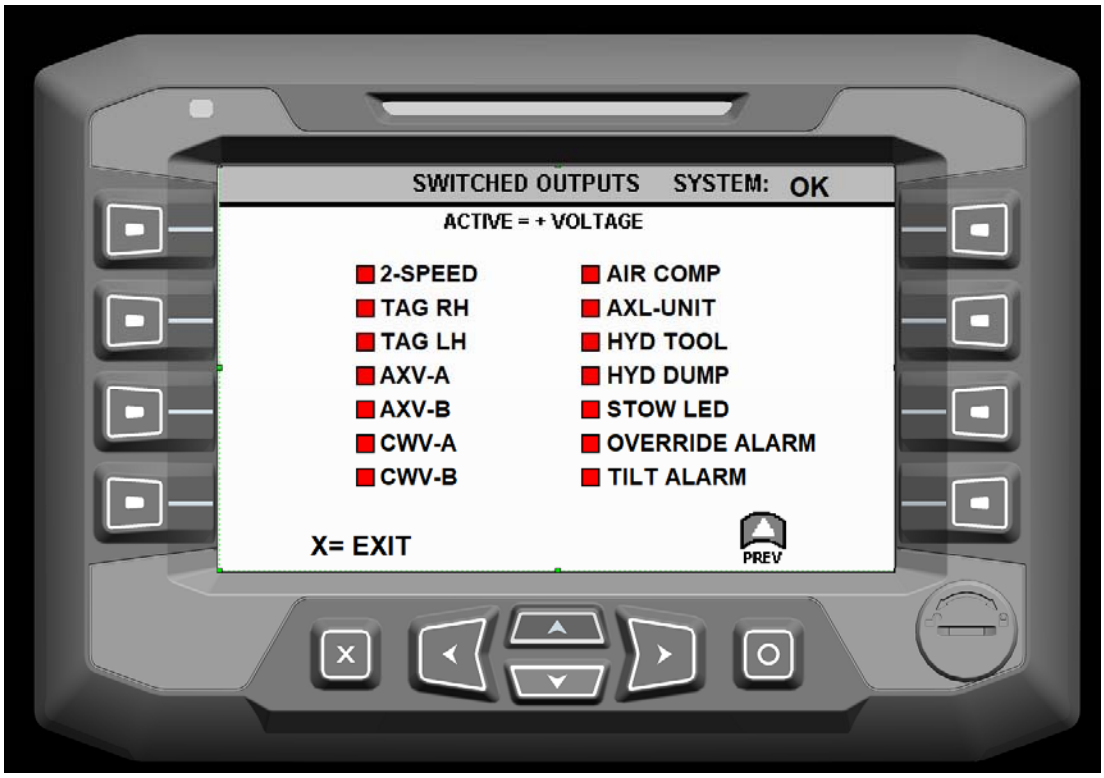
Unit Flight Path Switched Outputs Screen:

This screen shows individual functions that control the machine. When a signal to an output is active, a RED box will appear next to it.

1) ESC Button
    a. Returns to Main Menu screen
2) Left Arrow Button – Machine Operation Instructions screen
    a. Access to machine operation information
3) Up Arrow Button
    a. Pressing “Up Arrow” button returns to the Switched Inputs/Outputs screen



Switched Outputs Screen

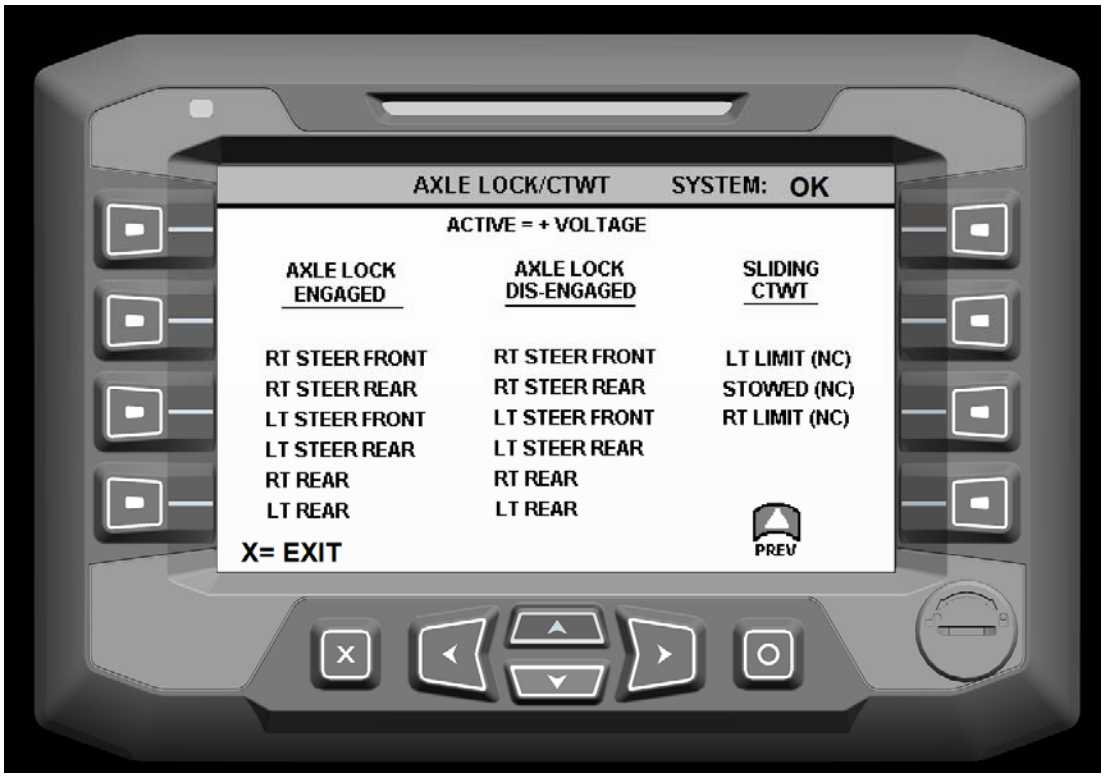


Unit Flight Path Inputs Screen – Red Box Indicates Output Signal is Active

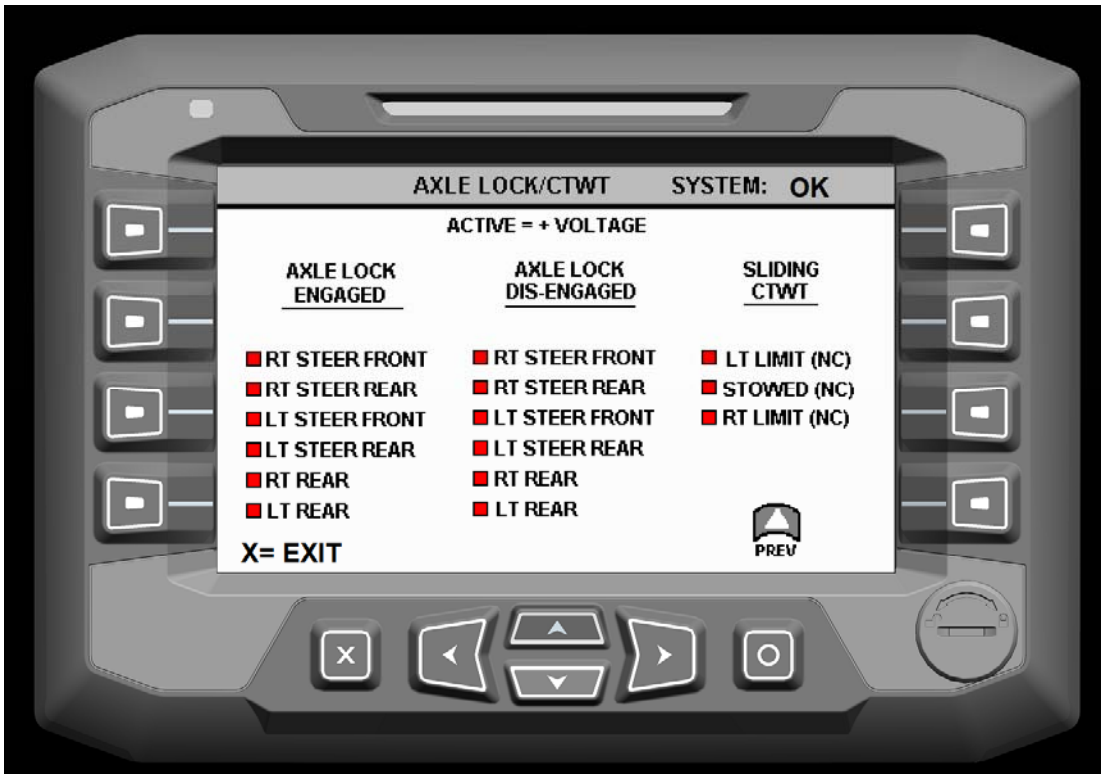
Axle Lock/Counterweight Inputs/Outputs Screen:

This screen shows all of the switches and sensors that are part of the axle lock and counterweight system. When a sensor is active, a RED box will appear next to it.

1) ESC Button
    a. Returns to Main Menu screen
2) Left Arrow Button – Machine Operation Instructions screen
    a. Access to machine operation information
3) Up Arrow Button
    a. Pressing “Up Arrow” button returns to the Switched Inputs/Outputs screen



Axle Lock/Counterweight Screen



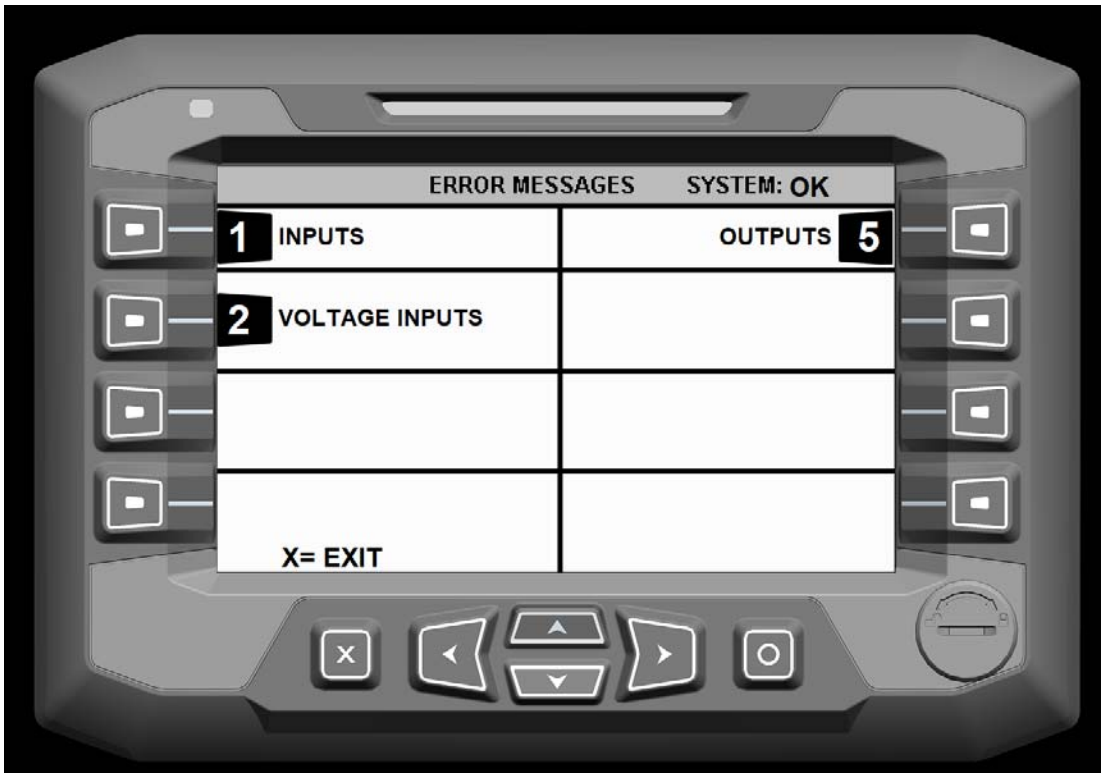
Axle Lock/Counterweight Screen – Red Box Indicates Sensor is Active

ERROR MESSAGING:

The error messaging screens allow the user to look at individual inputs and outputs. Active errors appear in one of the error screens with a red box display next to the function.

Pressing “Button 7” from the Main Menu screen allows access to the Error Messaging screen.

Main Menu Screen – Press “Button 7”



Error Message Screen

1) Button 1 – Inputs
    a. Pressing “Button 1” displays the Input Error screen
2) Button 2 – Voltage Inputs
    a. Pressing “Button 2” displays the Voltage Input screen
3) Button 5 – Outputs
    a. Pressing “Button 5” displays the Output Error screen
4) ESC Button
    a. Returns to Main Menu screen
5) Left Arrow Button – Machine Operation Instructions screen
    a. Access to machine operation information

Input Errors:

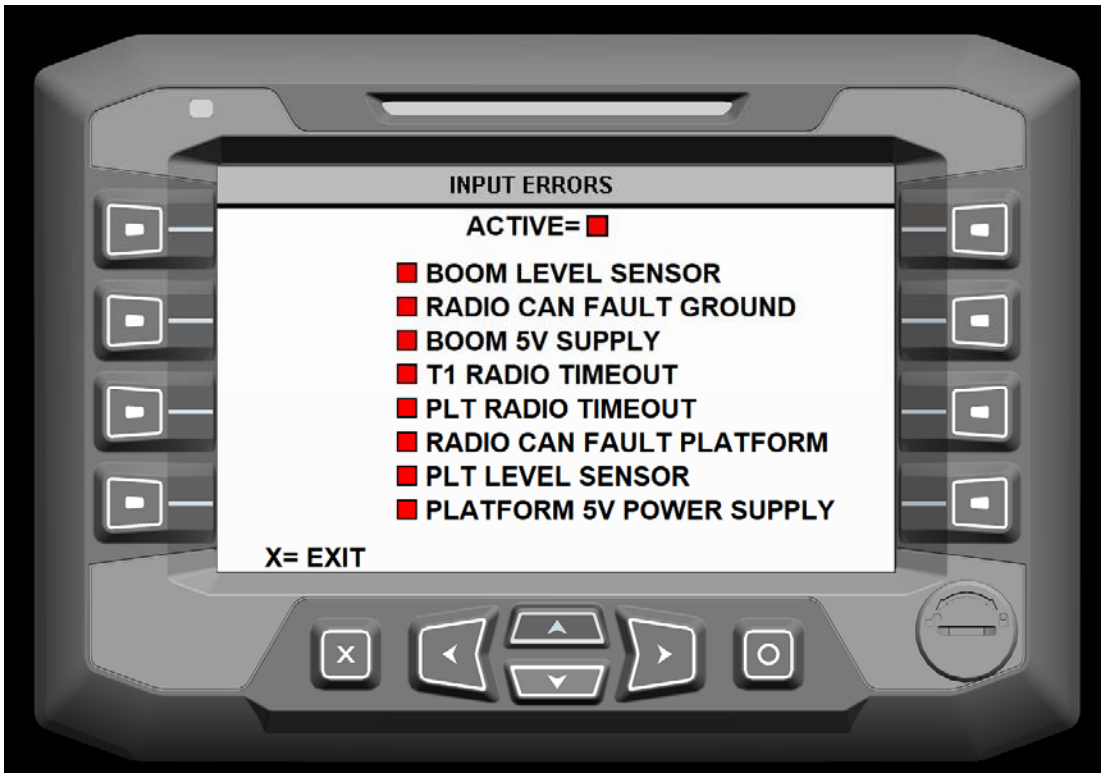
This screen shows various inputs signals to the Plus+1 control system. When an error occurs with one of the inputs a RED box will appear next to it.

Definitions:

- BOOM LEVEL SENSOR - There is some type of problem with the level sensor. It could be power supplying it (5 VDC), ground signal or the output signal from the sensor. The sensor receives its 5-volt power supply from the Plus-1 expansion module located on Boom-2.

- RADIO CAN FAULT – If the radio transmitter selected to use (Ground or Platform) is not turned on within 5 seconds, this Fault will light until the proper radio is turned on.
- BOOM 5V POWER SUPPLY – Indicates an issue with the 5 volt supply to the sensor at T2.
- T1 RADIO TIME OUT / PLTFM RADIO TIME OUT - The footswitch and Enable button found on each controller have a 10 second “timeout”. If the footswitch or enable button is on (depressed) for 10 seconds without moving any of the radio control joysticks, a “FAULT” will occur. Simply remove your foot and reset the switch, the fault should go away.
- The Platform Display also includes a RED light that indicates the footswitch has timed out.

Input Error Screen



Input Error Screen – Red Box Indicates Active Input Error

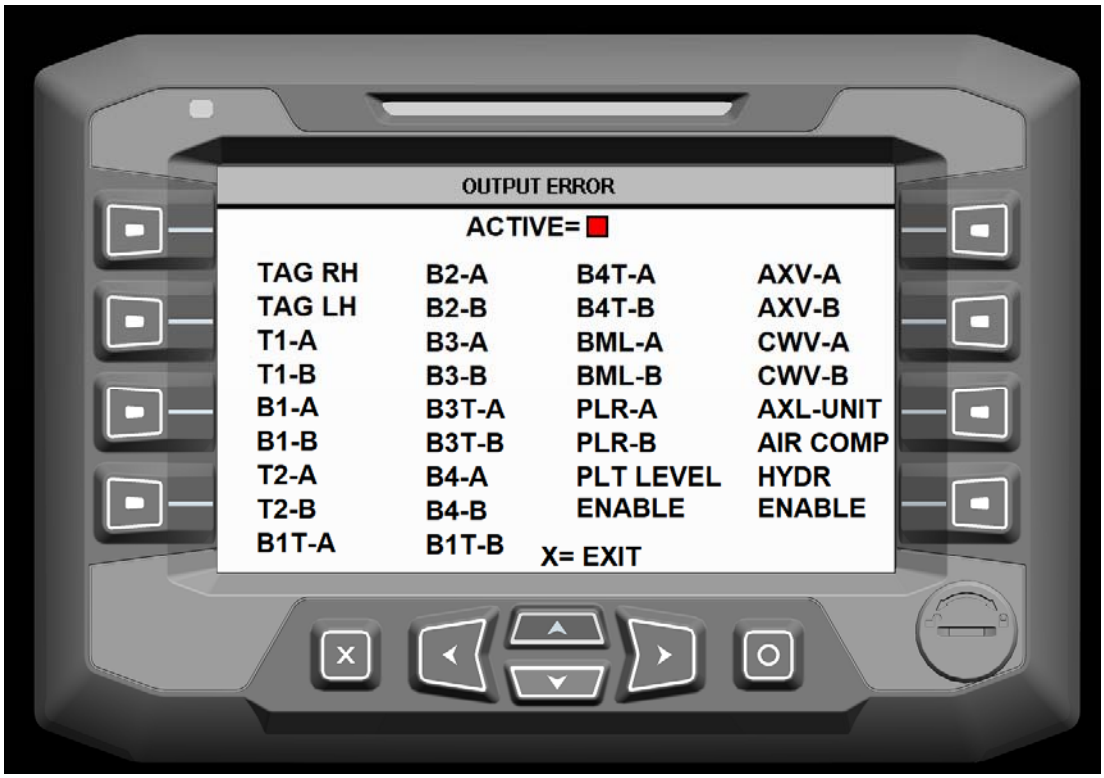
Voltage Inputs:

This screen shows the voltage (mV) output from various analog sensors located on the machine.

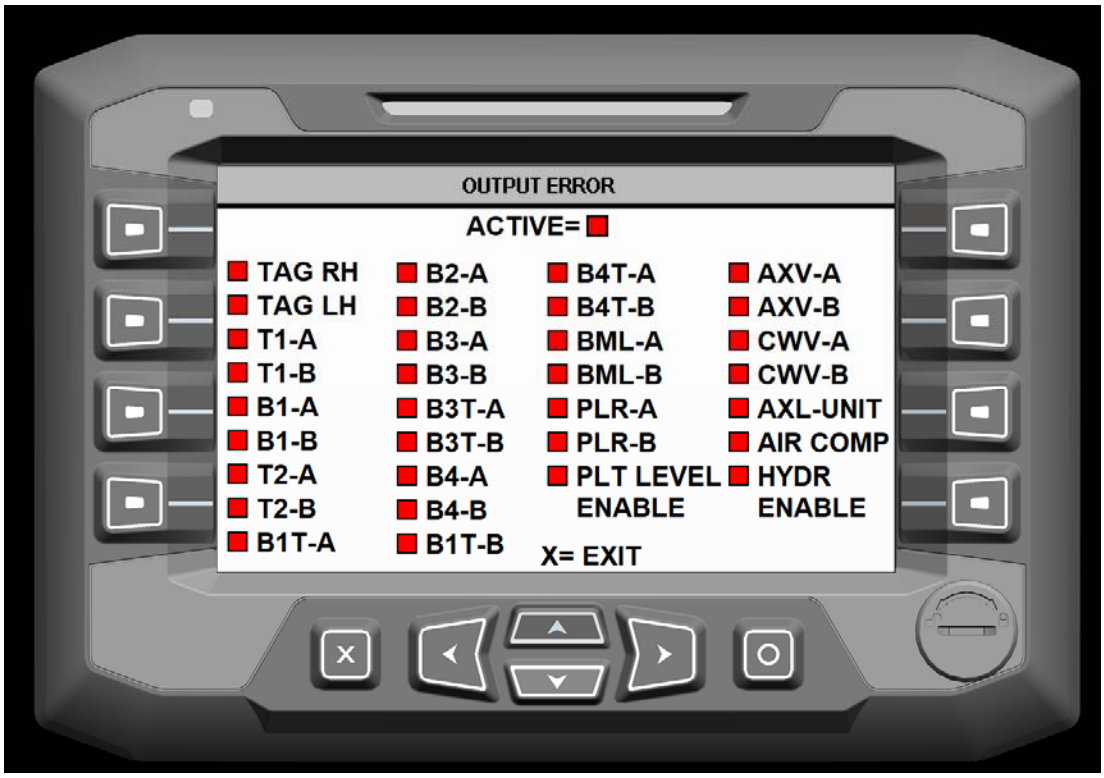
Voltage Inputs Screen

Output Errors:

The errors shown on this display show faults to a particular valve coil or the wiring to the valve coil. When an error occurs with one of the inputs a RED box will appear next to it. Note that the coil on the 10 spool Hawe Valve is dual type. One coil houses both the "A" and "B" side with a common ground.



Output Error Screen



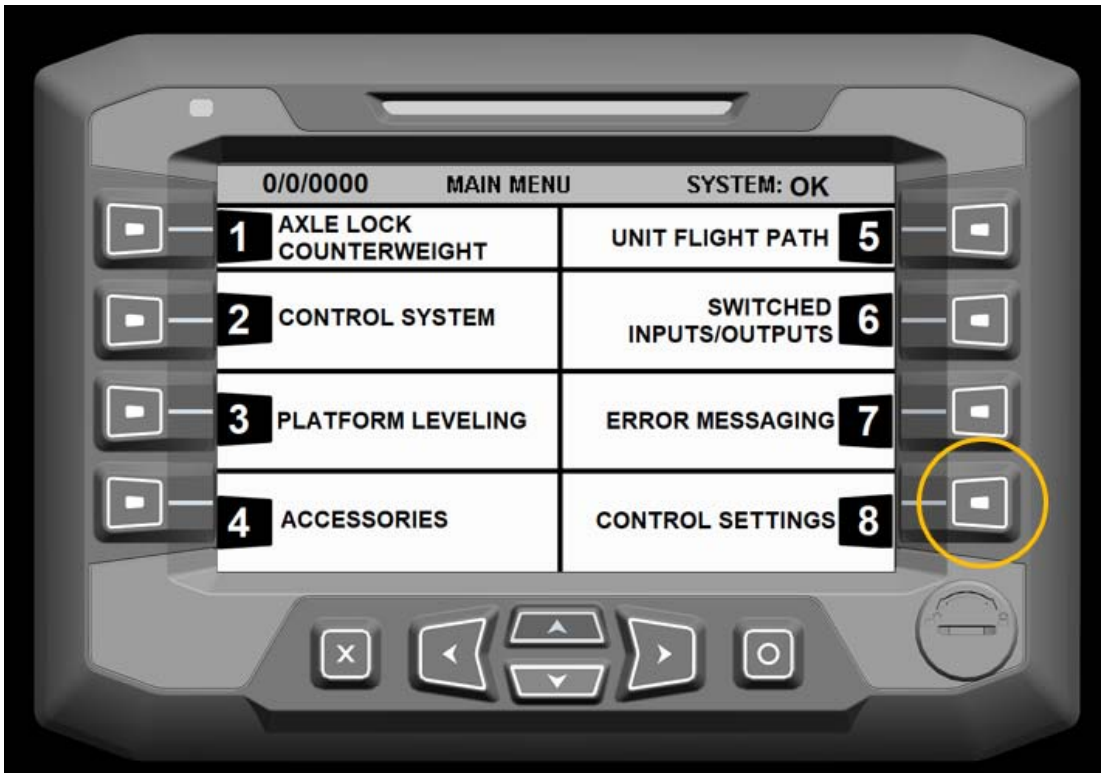
Output Error Screen – Red Box Indicates Active Input Error

CONTROL SETTINGS:

The Control Settings screen allows access to make adjustments to various machine output signals to valves. The leveling sensors operate at 5 volts. The valve solenoids operate at 12 volts. The speed of a function can be determined by the voltage setting for the solenoid.

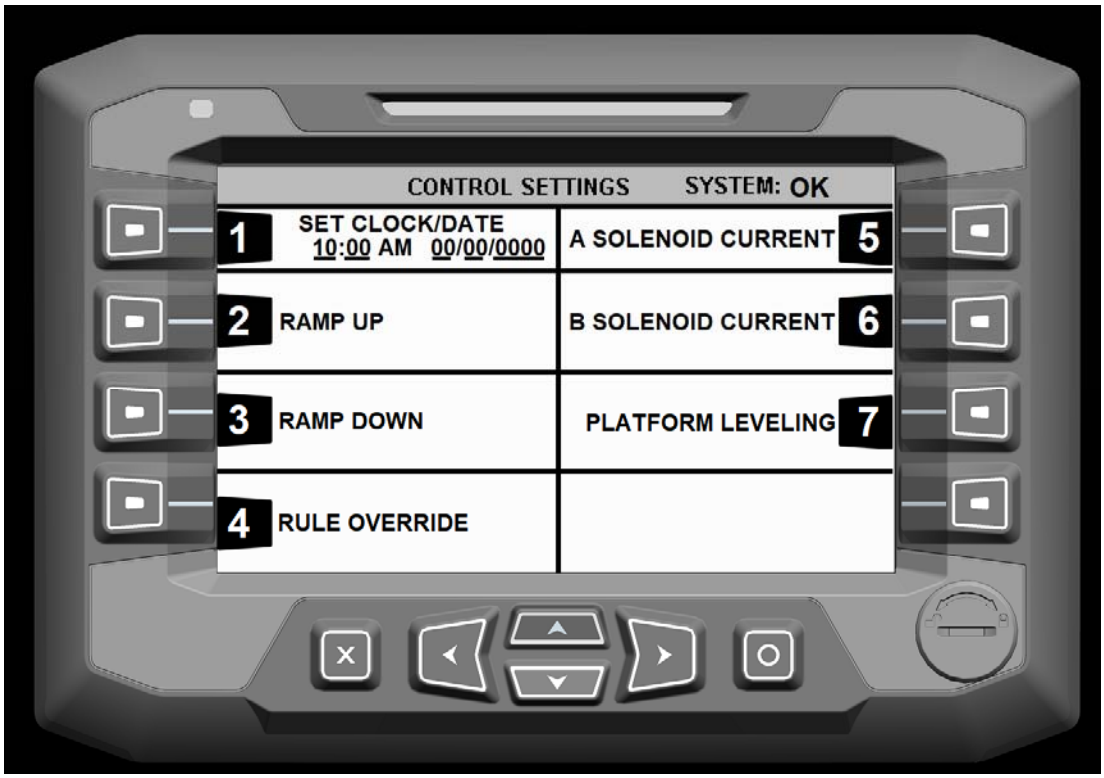
The Control settings screen also allows machine safety features to be overridden. **Overriding these safety features allows the machine to operate in positions that can cause instability. Care must be taken when running the machine with the safety feature overridden.**

Pressing “Button 8” from the Main Menu screen allows access to the Error Messaging screen. Prior to entering the Control Settings screen, a password must be entered.



Main Menu Screen – Press “Button 8”

A Password Must be Entered to Gain Access to the Control Settings Screen



Control Setting Screen

1) Button 1 – Set Clock/Date
    a. Pressing “Button 1” allows adjustment to the Date and Time of the control system
2) Button 2 – Ramp Up
    a. Pressing “Button 2” allows adjustment to Ramp Up for output signals
3) Button 3 – Ramp Down
    a. Pressing “Button 3” allows adjustment to Ramp Down for output signals
4) Button 4 – Rule Override
    a. Pressing “Button 4” displays the Rule Override screen
5) Button 5 – A Solenoid Current
    a. Pressing “Button 5” allows adjustment to the output signal on the A-Side of the valves
6) Button 6 – B Solenoid Current
    a. Pressing “Button 6” allows adjustment to the output signal on the B-Side of the valves
7) Button 7 – Platform Leveling
    a. Pressing “Button 7” allows adjustment to the platform leveling system
8) ESC Button
    a. Returns to Main Menu screen

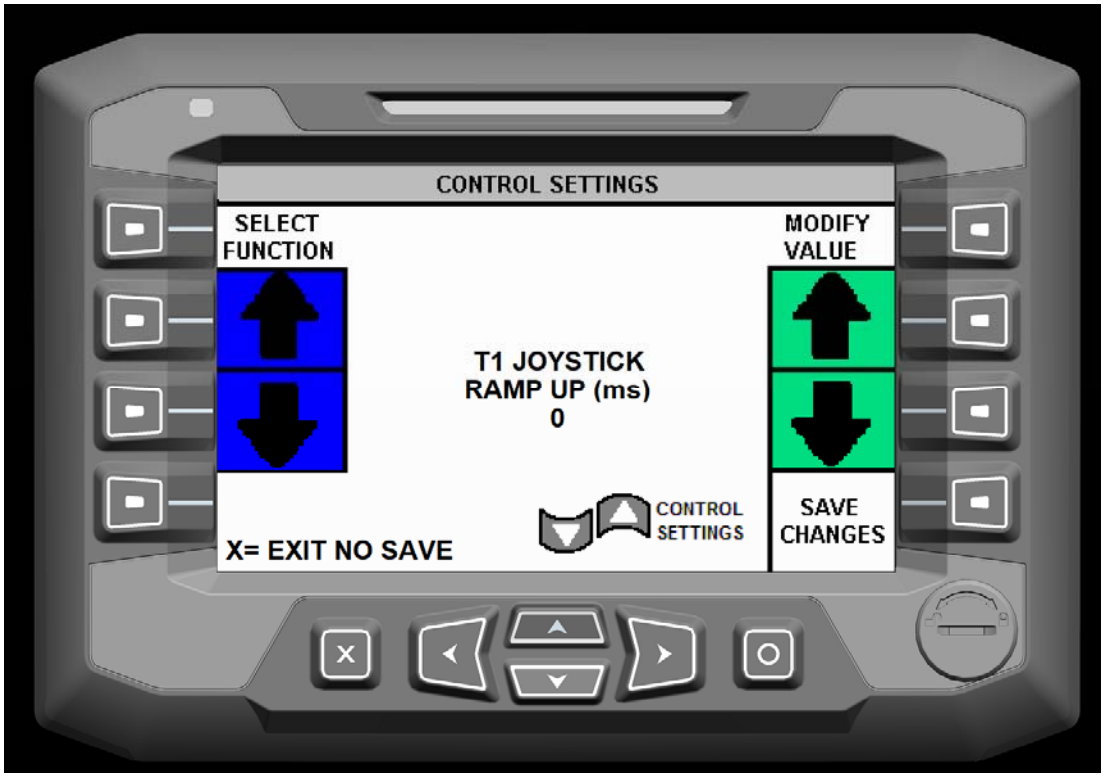
Ramp Up:

Ramp Up is the time it takes the joystick output signal to go from 0% to 100% signal based on an instantaneous input signal from 0% to 100%. A higher ramp up time typically makes for smoother operation while having a slower response. A lower ramp up rate allows for quicker response but may cause jerkiness in the operation.

Example: A ramp rate of 500 ms means that it will take 500 ms for the output signal to go from 0 to full signal based on an instantaneous input signal from 0% to 100%.

The following joysticks signals can be adjusted:

- T1 Joystick
- B1 Joystick
- T2 Joystick
- B2 Joystick
- B3 Joystick
- B3T Joystick
- B4 Joystick
- B4T Joystick
- BML Joystick
- Plat Rot Joystick



Ramp Up Control Settings Screen

1) Button 2 & 3 – Select Function
    a. Pressing “Button 2” and “Button 3” scrolls through the different Joysticks that can be adjusted
2) Button 6 & 7 – Modify Value
    a. Pressing “Button 6” and “Button 7” adjust the Ramp Up time for the displayed Joystick
3) Button 8 – Save Changes

   a. Pressing “Button 8” saves the displayed value for the displayed Joystick
4) ESC Button - Exit
   a. Pressing the “ESC Button” exits the Ramp Up screen without saving the ramp up time
5) Up Arrow
   a. Pressing the “Up Arrow” button returns to the previous screen

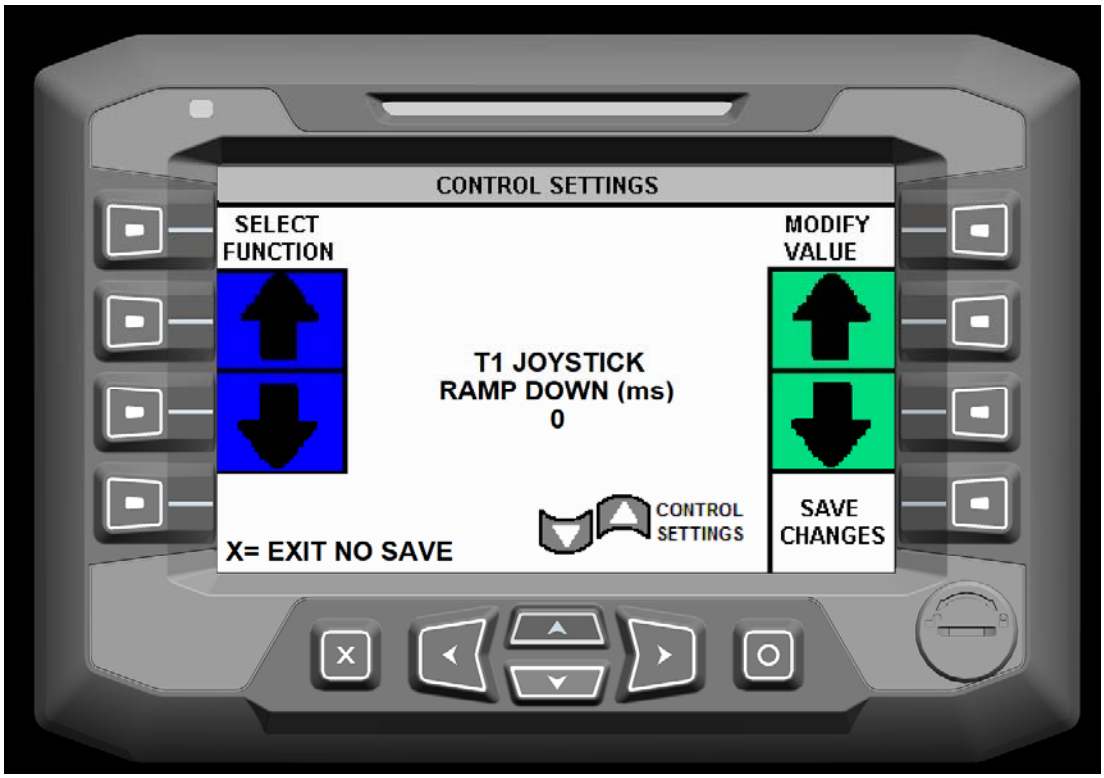
Ramp Down:

Ramp Down is the time it takes the joystick output signal to go from 100% to 0% signal based on an instantaneous input signal from 1000% to 0%. A higher ramp down time typically makes for smoother operation while having a slower response. A lower ramp down rate allows for quicker response but may cause jerkiness in the operation

Example: A ramp rate of 500 ms means that it will take 500 ms for the output signal to go from full signal to 0 signal based on an instantaneous input signal from 100% to 0%.

The following joysticks signals can be adjusted:

- T1 Joystick
- B1 Joystick
- T2 Joystick
- B2 Joystick
- B3 Joystick
- B3T Joystick
- B4 Joystick
- B4T Joystick
- BML Joystick
- Plat Rot Joystick



Ramp Down Control Settings Screen

1) Button 2 & 3 – Select Function
    a. Pressing “Button 2” and “Button 3” scrolls through the different Joysticks that can be adjusted
2) Button 6 & 7 – Modify Value
    a. Pressing “Button 6” and “Button 7” adjust the Ramp Down time for the displayed Joystick
3) Button 8 – Save Changes
    a. Pressing “Button 8” saves the displayed value for the displayed Joystick
4) ESC Button - Exit
    a. Pressing the “ESC Button” exits the Ramp Up screen without saving the ramp up time
5) Up Arrow
    a. Pressing the “Up Arrow” button returns to the previous screen

A Solenoid:

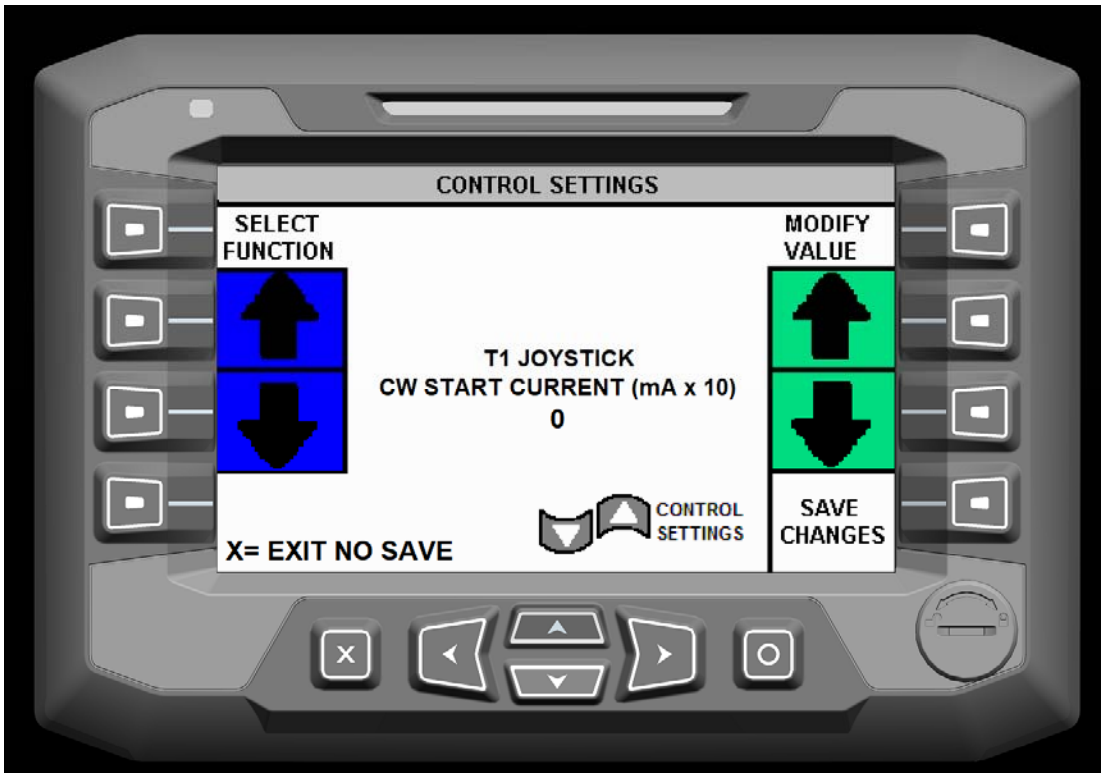
The A Solenoid screen allows adjustments to the start and max output value to valve solenoids on the A-Side.

The start current is the minimum current the solenoid will receive once an input signal has been initiated (not 0). A lower start current can cause deadband as the valve will not react as quickly to initial joystick movements. A higher start current can cause jerkiness as the valve will open to a position higher than what causes initial movement. A start current a few mA less than what is takes to cause movement is the most desired setting.

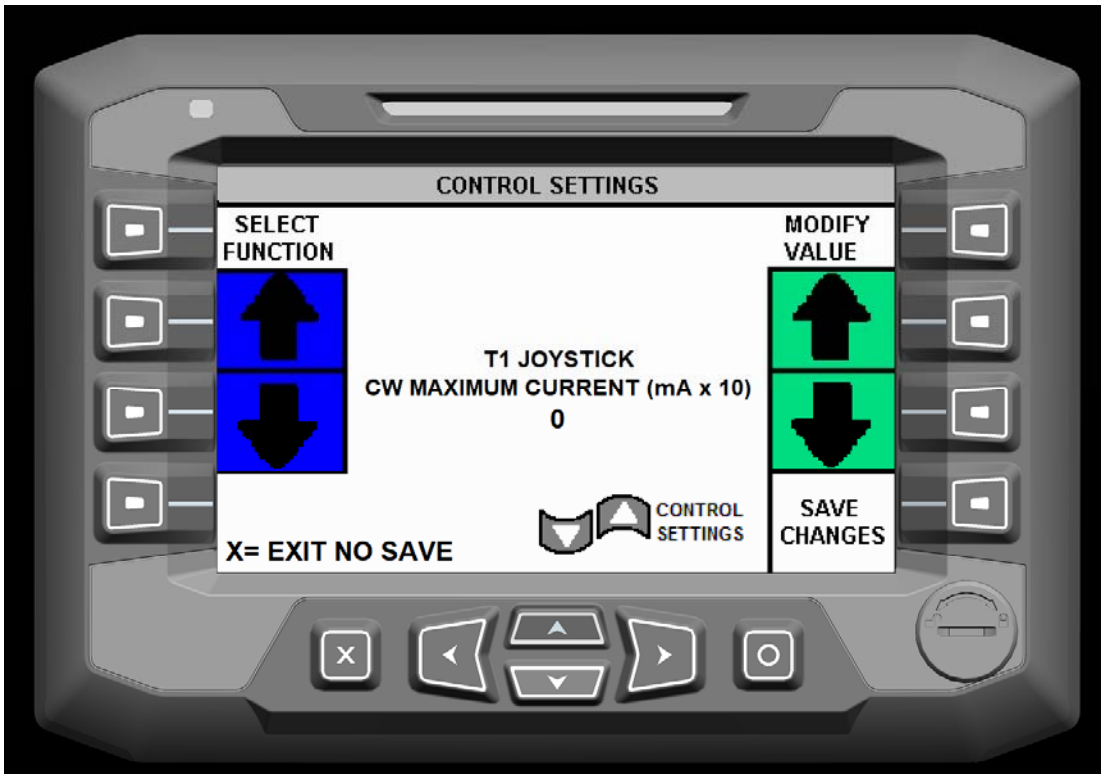
The maximum current is the maximum current a solenoid will receive. A lower max current slows the maximum function speed down. A higher max signal causes deadband in the valve meaning that the max function speed will be reached before the input signal is at 100%. A maximum current a few mA above what it takes to shift the valve completely open is the most desired.

The follow signals can be adjusted for the A-Side of the valve only

- T1 CW
- B1 Up
- T2 CW
- B2 Close
- B3 Close
- B3T Ext
- B4 Up
- B4T Ext
- Boom Level Out
- Plat Rot CW



A Solenoid Control Setting Screen – Start Current



A Solenoid Control Setting Screen – Max Current

1) Button 2 & 3 – Select Function
    a. Pressing “Button 2” and “Button 3” scrolls through the different functions that can be adjusted
2) Button 6 & 7 – Modify Value
    a. Pressing “Button 6” and “Button 7” adjust the Start or Max current for the displayed function
3) Button 8 – Save Changes
    a. Pressing “Button 8” saves the displayed value for the displayed function
4) ESC Button – Exit
    a. Pressing the “ESC Button” exits the Ramp Up screen without saving the ramp up time
5) Up Arrow
    a. Pressing the “Up Arrow” button returns to the previous screen

B Solenoid:

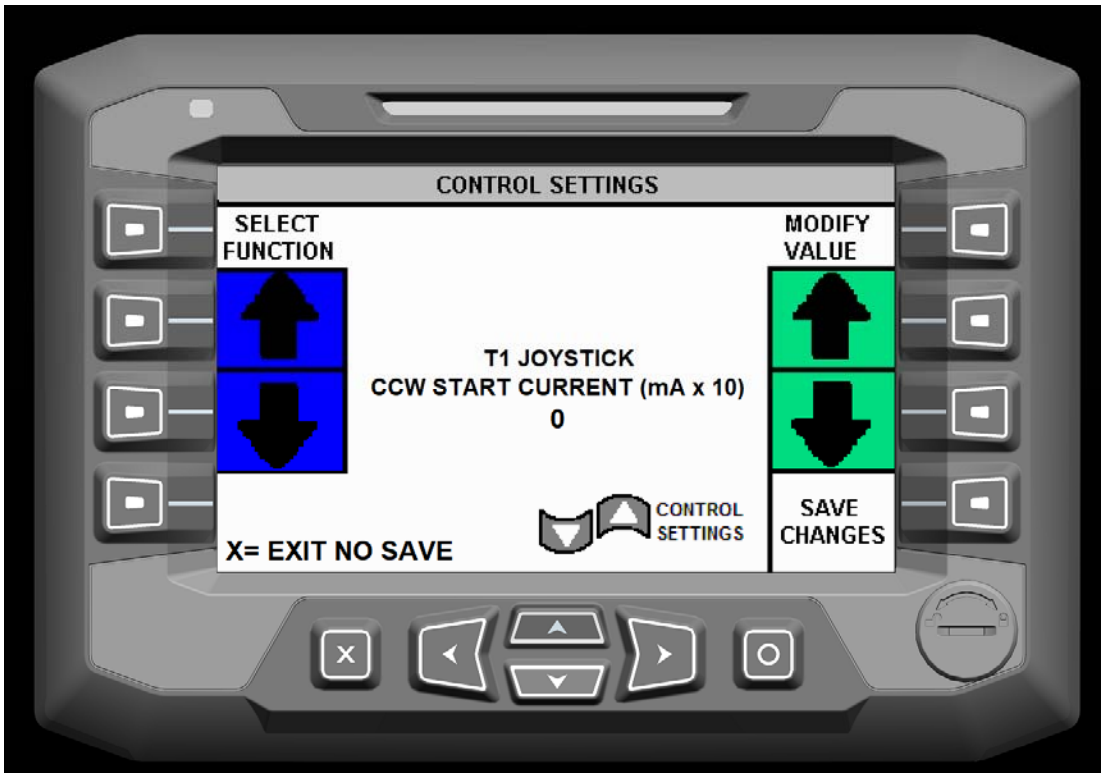
The B Solenoid screen allows adjustments to the start and max output value to valve solenoids on the B-Side.

The start current is the minimum current the solenoid will receive once an input signal has been initiated (not 0). A lower start current can cause deadband as the valve will not react as quickly to initial joystick movements. A higher start current can cause jerkiness as the valve will open to a position higher than what causes initial movement. A start current a few mA less than what is takes to cause movement is the most desired setting.

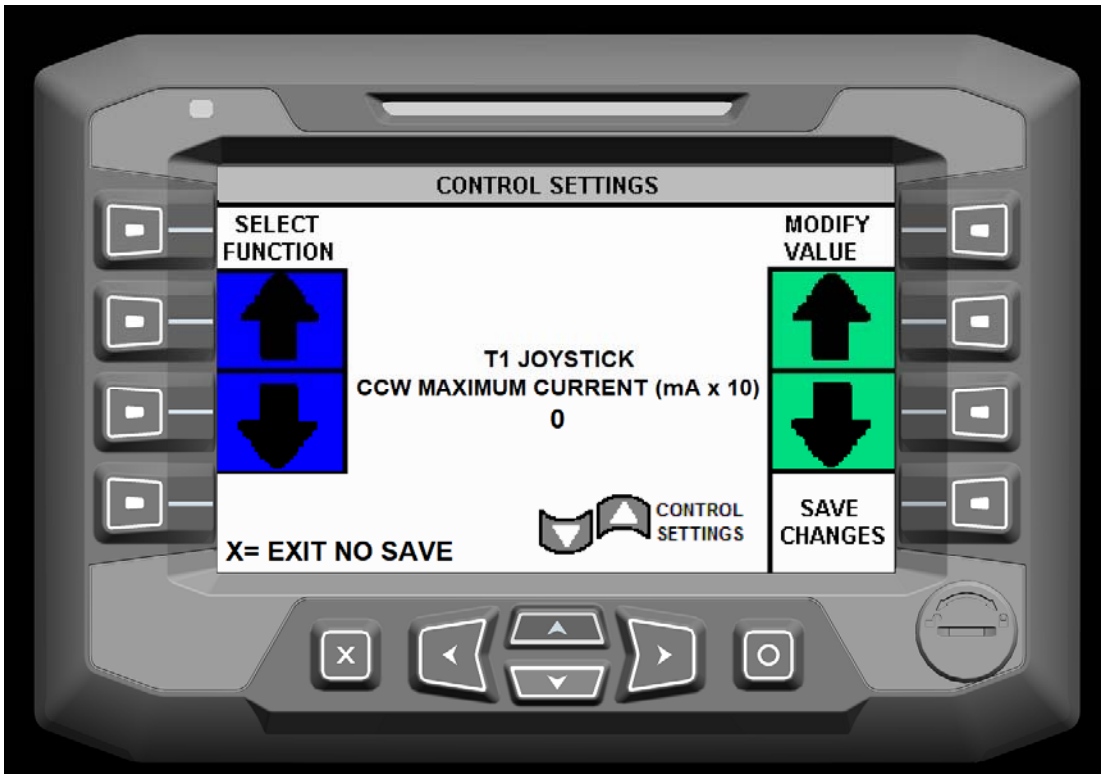
The maximum current is the maximum current a solenoid will receive. A lower max current slows the maximum function speed down. A higher max signal causes deadband in the valve meaning that the max function speed will be reached before the input signal is at 100%. A maximum current a few mA above what it takes to shift the valve completely open is the most desired.

The follow signals can be adjusted for the A-Side of the valve only

- T1 CCW
- B1 Down
- T2 CCW
- B2 Open
- B3 Open
- B3T Ret
- B4 Down
- B4T Ret
- Boom Level In
- Plat Rot CCW



B Solenoid Control Setting Screen – Start Current



B Solenoid Control Setting Screen – Max Current

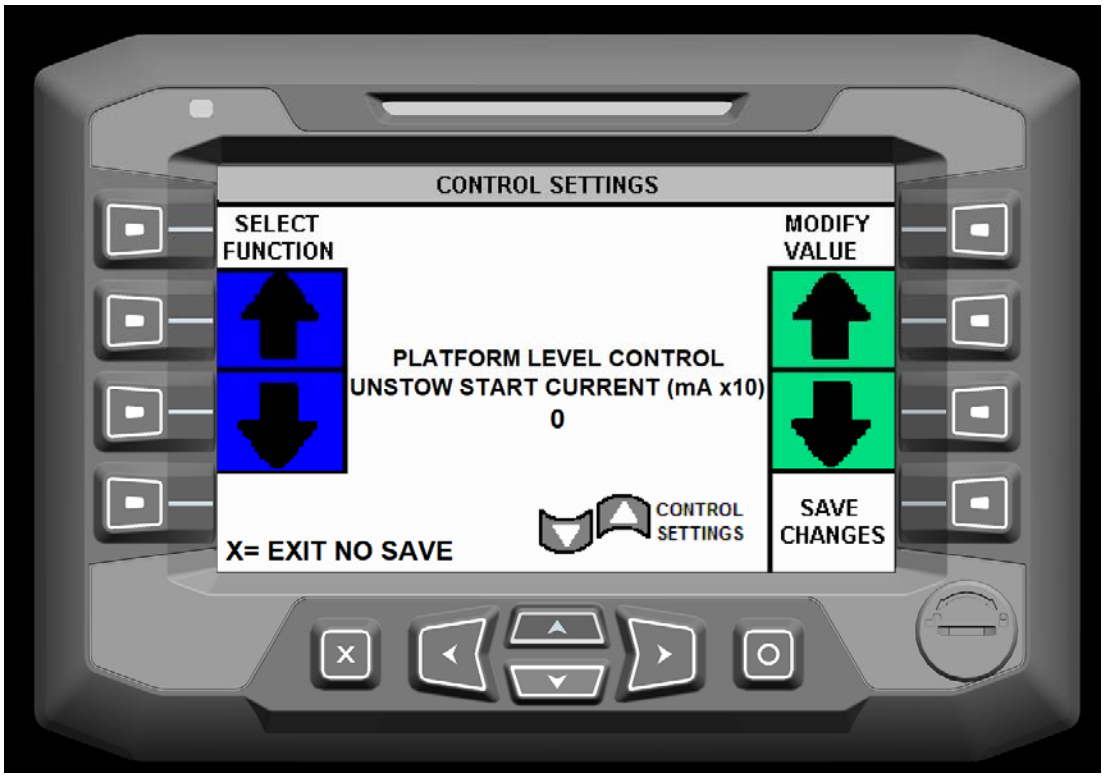
1) Button 2 & 3 – Select Function
    a. Pressing “Button 2” and “Button 3” scrolls through the different functions that can be adjusted
2) Button 6 & 7 – Modify Value
    a. Pressing “Button 6” and “Button 7” adjust the Start or Max current for the displayed function
3) Button 8 – Save Changes
    a. Pressing “Button 8” saves the displayed value for the displayed function
4) ESC Button – Exit
    a. Pressing the “ESC Button” exits the Ramp Up screen without saving the ramp up time
5) Up Arrow
    a. Pressing the “Up Arrow” button returns to the previous screen

Platform Leveling:

The Platform Leveling screen allows adjustments to the ramp up/down, start and max current, and PID controller for the automatic platform leveling system. Caution should be made prior to adjusting any of the value as minor adjustments can have adverse effects to the platform leveling system.

The follow signals can be adjusted for the A-Side of the valve only

- Setpoint
- Max Feedback
- Center Feedback
- Min Feedback
- Unstow Start Current
- Unstow Max Current
- Stow Start Current
- Stow Max Current
- P-Gain A Unstow
- P-Gain B Stow
- I-Gain A Unstow
- I-Gain B Stow
- D-Gain A Unstow
- D-Gain B Stow
- T1-Time A Unstow
- T1-Time B Stow
- Ramp Up
- Ramp Down
- PID Deadband A Unstow
- PID Deadband B Stow
- Level Filter



Platform Leveling Control Setting Screen

1) Button 2 & 3 – Select Function
    a. Pressing “Button 2” and “Button 3” scrolls through the different functions that can be adjusted
2) Button 6 & 7 – Modify Value
    a. Pressing “Button 6” and “Button 7” adjust the Start or Max current for the displayed function
3) Button 8 – Save Changes
    a. Pressing “Button 8” saves the displayed value for the displayed function
4) ESC Button – Exit
    a. Pressing the “ESC Button” exits the Ramp Up screen without saving the ramp up time
5) Up Arrow
    a. Pressing the “Up Arrow” button returns to the previous screen

Rule Override:

The rule override screen allows for overriding all of the machine rules and/or axle locks on the machine. When holding the Override Screen and/or Override Axle Lock buttons an alarm sounds making you aware the system rules are being overridden. If the alarm is not functioning, this override menu is disabled and the “SYSTEM OK” reads “FAULT”.

The Rule Override and Axle Lock Override functions are independent of each other. Pressing “Button 1” for Rule Override will only override the rules of the machine. Pressing “Button 2” for Axle Lock Override will only override the axle lock engaged of the machine. Both buttons can be pressed to override both the Rules and Axle Locks.

WARNING

THIS FEATURE SHOULD ONLY BE USED IN AN EMERGENCY TO RECOVER AND STOW THE UNIT!

CAUTION: OVERRIDING THESE SAFETY FEATURES ALLOWS THE MACHINE TO OPERATE IN POSITIONS THAT CAN CAUSE INSTABILITY. CARE MUST BE TAKEN WHEN RUNNING THE MACHINE WITH THE SAFETY FEATURE OVERRIDDEN.

When the alarm is heard, The FLIGHT PATH REAL TIME screen will display in “RED” to show that all of the system rules are being overridden. Once the override button is released the OVERRIDE SCREEN will timeout (30 seconds) and become inactive by returning to the MAIN MENU screen.

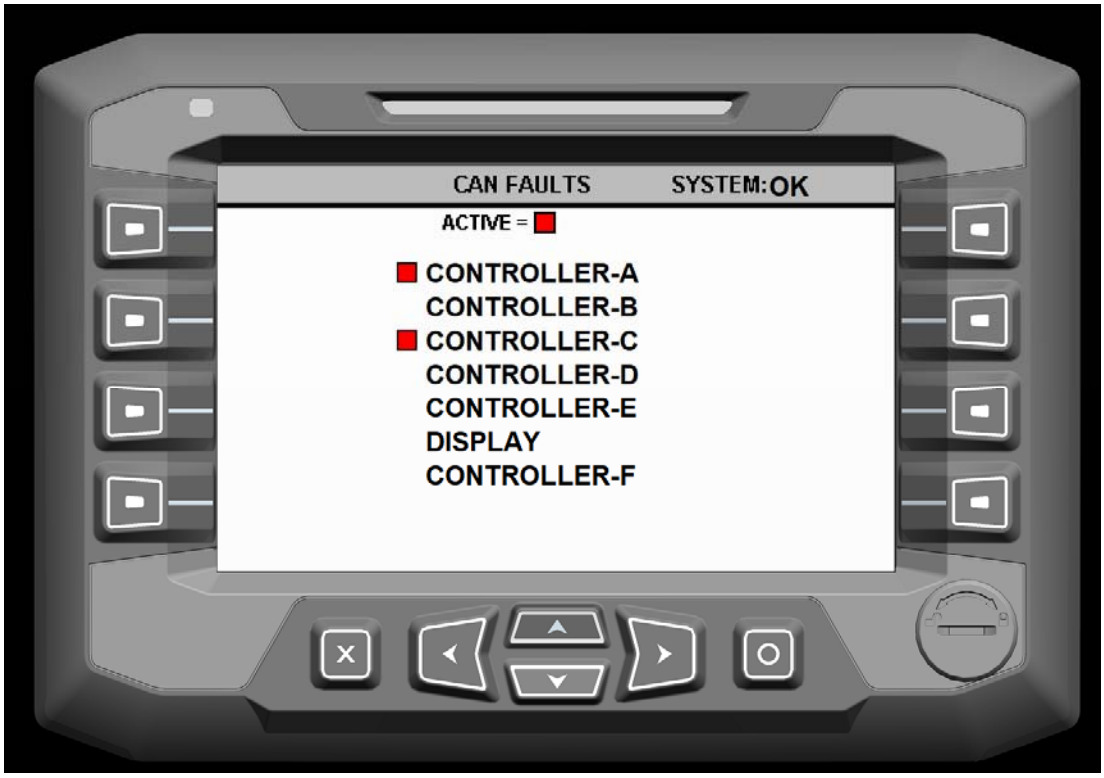
Rule Override Screen

Rule Override Screen – Axle Locks Overridden

Flight Path Screen – Displayed When Rules Overridden

CANBUS FAULTS:

The CAN Fault screen displays when there is no communication between any of the CAN Buses control modules. A RED box will appear next to the control module(s) that are not communicating with the rest of the system. The Plus+1 system will not operate until the fault or faults are resolved.



CAN Faults Screen – Issues with Controller A & C

HYDRAULIC FLUID WARNINGS (OPTIONAL):

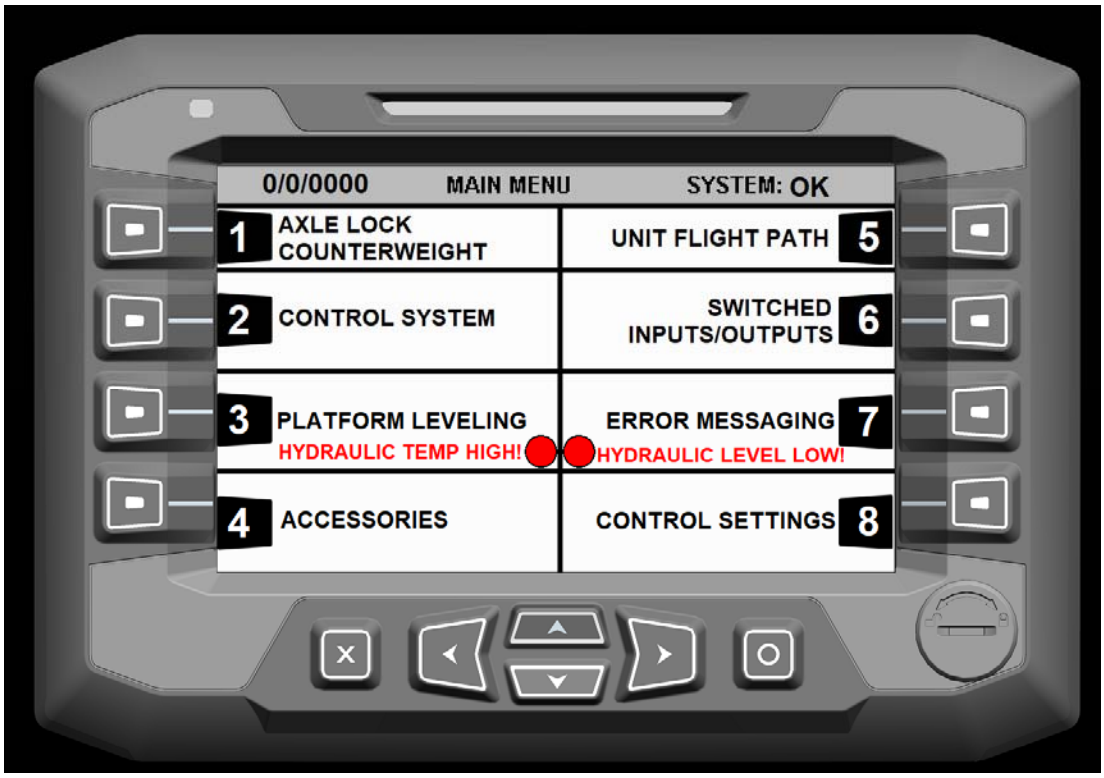
When a machine is equipped with a hydraulic temp sensor and level sensor a warning will appear on the Main Menu screen when the temperature gets to high or the level gets too low.

High Hydraulic Temperature

When the oil reaches the high temperature setting (180 degrees F) in the reservoir, the indicator will blink on the main page of the display as shown below in red "**HYDRAULIC TEMP HIGH**". An alarm at the display will also sound for 2-seconds, every 5 seconds.

Low Hydraulic Fluid

When the oil reaches the low design level in the reservoir, the indicator will blink on the main page of the display as shown below in red "**HYDRAULIC LEVEL LOW**". An alarm at the display will also sound for 2-seconds, every 5 seconds.



Main Menu Screen – Hydraulic Temp and Level Warnings

POWER INTERRUPTION

If the unit power is shutoff while the unit is deployed, the radio controls and platform auto leveling default to OFF. The operator at the ground station (Turret-1) must go to the DP700 Display and turn on the Radio Control that was being used and Automatic Platform leveling.

The BM1- T1- and BM 2 OPEN settings will default to OFF. Other parameters should be checked before resuming operation of the Unit.

DISPLAY AND SCREEN CARE

The Plus 1 system is a durable, well-constructed system. With a minimum of maintenance, both display units will provide reliable operation for your Aspen Aerial Unit.

As with any electronic equipment, avoid using harsh detergents or other solvents on the screen surface. Keep the control station free from oil and dirt. Do not use a high-pressure washer when cleaning either display area. A dust cloth with mild soap is adequate.

Refer to Page 20 for procedure on adjusting the brightness of the display.

During transport or when not in use, protect the control station with provided canvas cover.

Avoid overexposure to harsh environments whenever possible, to assure long life.

Wiring and connection information as well as other related information to the Plus+1 system can be found in the Operator, Service and Parts Manual for your unit.