1st Edition
Revision 1.0R

JB485K-2P WING CONTROL BOX Technical Manual

PENGWYN
2550 W. FIFTH AVENUE
COLUMBUS, OH 43204

PENGWYN
CENTRAL HYDRAULIC SYSTEMS
LS485-75cc-1-JB-LH CONTROL BOX

PENGWYN
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Customer support: Phone 800.233.7568 • Fax 614.488.0019
www.pengwyn.com

CAUTION

- **DO NOT** OVER TIGHTEN SOLENOID COIL NUTS. THE COIL SPINDLES ARE HOLLOW AND CAN BE DAMAGED. BE CAREFUL NOT TO PINCH WIRES UNDER COILS WHEN INSTALLING. THIS CAN CAUSE COILS NOT TO FUNCTION PROPERLY OR WORK AT ALL.

- **TURN** THE PENGWYN CONTROL CONSOLE **POWER SWITCH OFF** BEFORE CONNECTING AND DISCONNECTING BATTERY CABLES, BATTERY CHARGERS, OR JUMPING THE TRUCK BATTERY. NOT DOING SO CAN DAMAGE CIRCUIT CARDS.

- **DO NOT** DRILL HOLES IN OR MOUNT AUXILIARY SWITCHES TO THE PENGWYN CONTROL CONSOLE. THIS WILL VOID THE WARRANTY AND RISK PERSONAL INJURY. USE THE CONTROL CONSOLE MOUNTING BRACKET FOR THIS PURPOSE.

- **DO NOT** EXPOSE THE PENGWYN CONTROL BOX TO LIQUIDS, THIS INCLUDES PRESSURE WASHING INSIDE THE CAB. THIS **WILL** VOID THE WARRANTY. WATER AND OTHER LIQUIDS CAN CAUSE CIRCUIT BOARDS TO FUNCTION ERRATICLY AND LEAD TO INJURY OR DEATH.

Table of Contents

Introduction

Thank you for choosing our ground-oriented central hydraulics system. Our goal has always been to provide great customer service and a safe, reliable product that emphasizes:

- **Simplicity of operation**
- **Operator safety**
- **Management control**
- **Reduced operating costs**
- **Year round usage**

In order to reach our goal of reliability, all PENGWYN's feature patented binary hydraulic flow control, using poppet-style solenoid cartridge valves. Poppet valves are bang-bang devices, which are either on or off. They are reliable, dirt tolerant, and are not effected by long periods of sitting idle.

The use of a binary flow control is the basis for achieving consistent flow rates for the life of the system without calibration. For example using a 4 valve binary:

Valve 1	flows	**1 GPM**	of Hydraulic Fluid.
Valve 2	flows	**2 GPM**	of Hydraulic Fluid.
Valve 3	flows	**4 GPM**	of Hydraulic Fluid.
Valve 4	flows	**8 GPM**	of Hydraulic Fluid.

The proper combination of these valves then allows a flow output of all values from **one** to **fifteen GPM** without feedback sensors and without calibration for the life of the truck.

PENGWYN systems allow management to secure programming of spreader constants which reduces de-icing material usage.

Please look to this manual for information on the major features, calibration of the system, and troubleshooting guidelines. This manual will help you operate and maintain your system. PENGWYN does offer training. We are available by calling 1-800-233-7568. Please call if you have a problem.

Control Box Layout
LS485-75cc-1-JB-LH

Primary System Controls

POWER

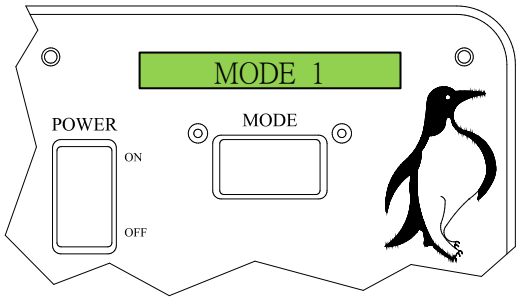
When the Power Switch is first flipped to the ON position, the panel will light up and the display will come on. The system will initialize and run several communication checks with the valve driver board. The display will briefly show the system number and then switch to Miles/Hr readout. If your Control Console does not complete this sequence, have the system checked by a qualified technician.

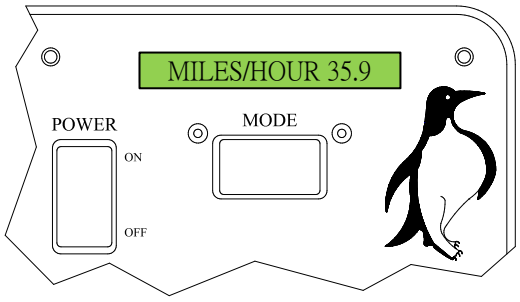
MODE

The Mode Selection Switch is centered under the display window. The switch is a 3 position momentary type that allows the user to "scroll" through the available display modes. As you scroll through the available modes, the display will briefly read "**MODE XX**", where "XX" is the corresponding mode number. The Mode information will then be displayed.

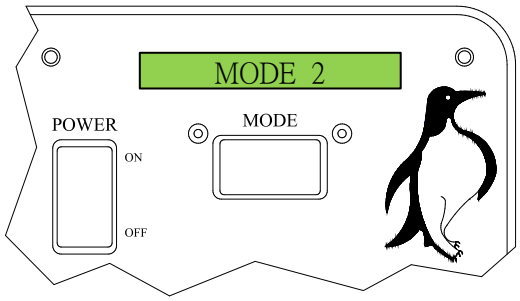
Display Modes

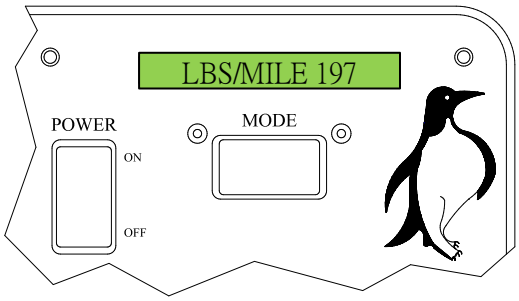
Continues through Page 11



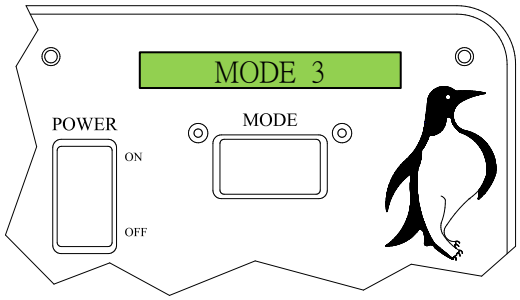


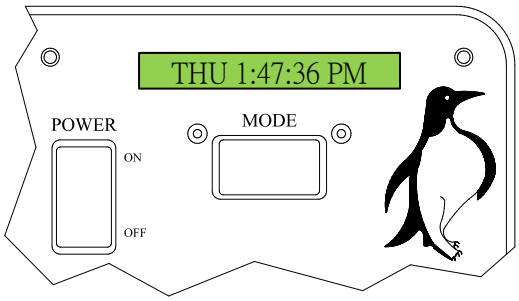
Displays the current speed of the truck in miles per hour.



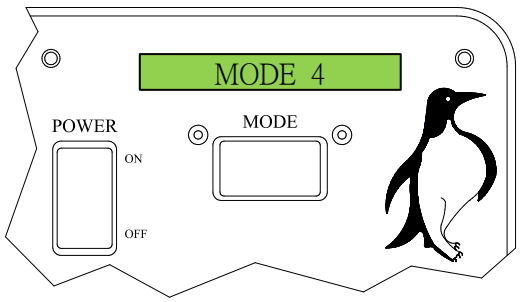


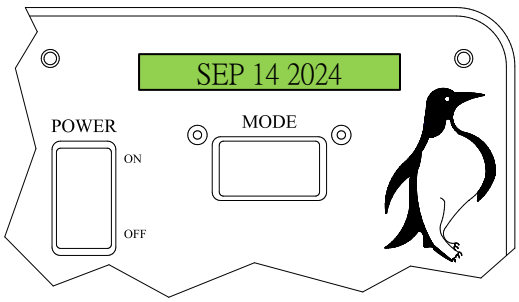
Displays the current spreading rate of the truck in lbs. of material per mile.



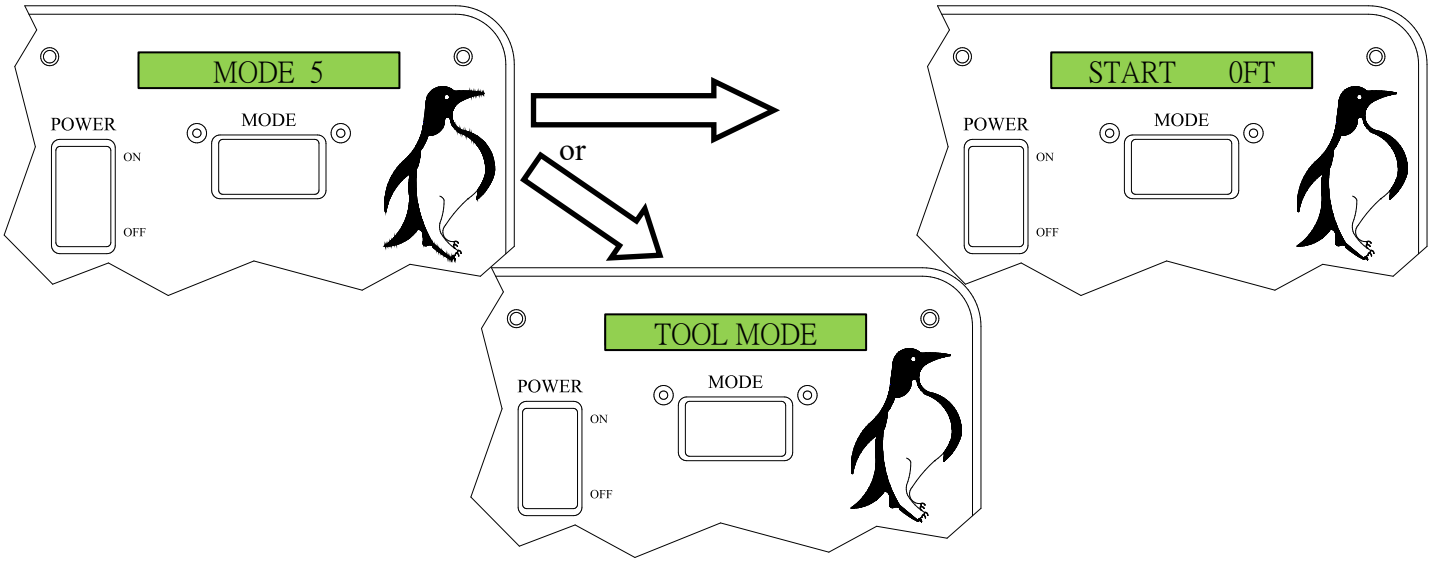


Displays the day of the week and the time of day.

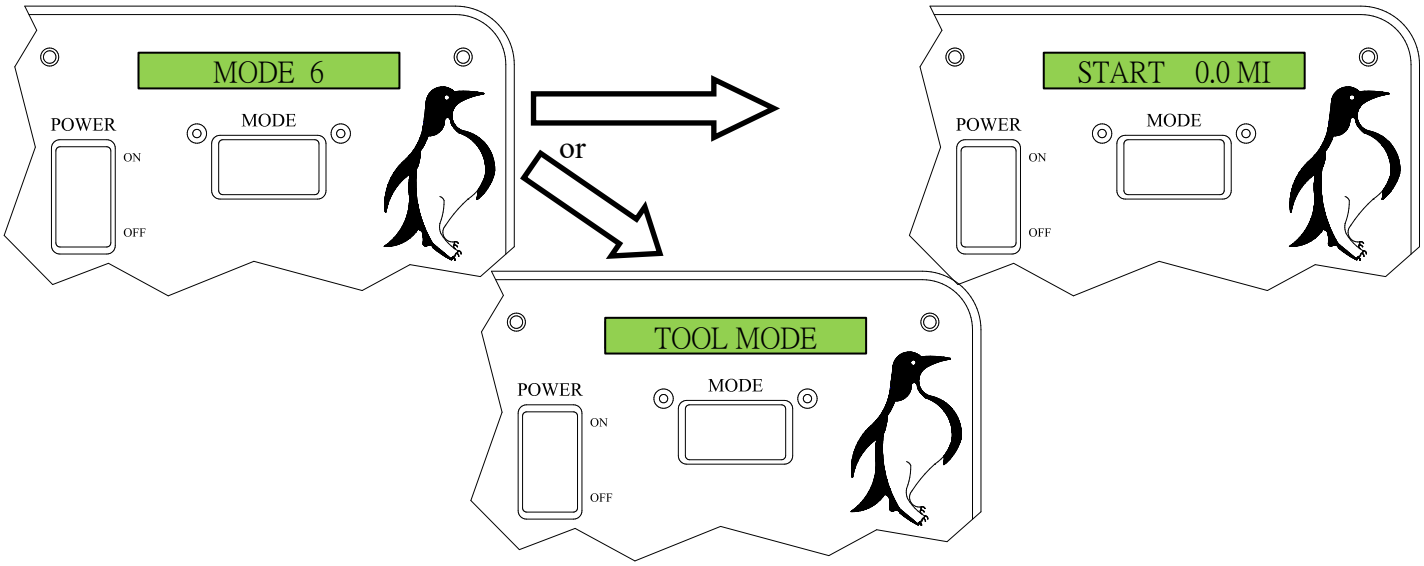




Displays the calendar information.

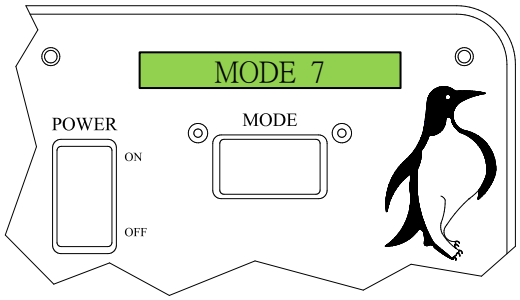


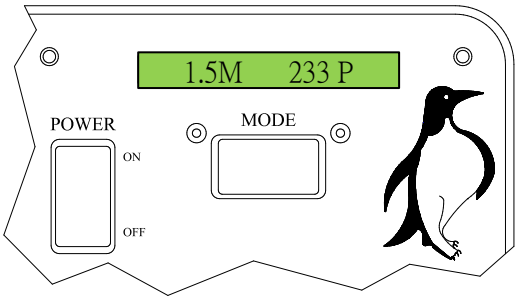
This mode differs based on the Spreader Setting. In Manual this is "TOOL MODE", allowing hydraulic tool to be run off the PENGWYN manifold without nuisance temperature and pressure alarms. This is described in detail below. With Spread in Automatic, there is no applicable function. If Spread is switched OFF, this mode may be used for the distance measuring feature in **feet**. Use the Blast Button to Start/Stop measuring.



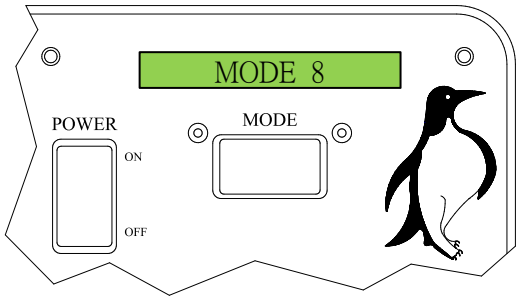
This position differs based on the Spread Setting. In Manual this is "TOOL MODE", allowing hydraulic tools to be run off the PENGWYN manifold without nuisance temperature and pressure alarms. This is described in detail below: With Spread in Automatic, this is no applicable function. If Spread is switched OFF, this mode may be used for distance measuring feature in **miles**. Use the Blast Button to Start/Stop measuring.

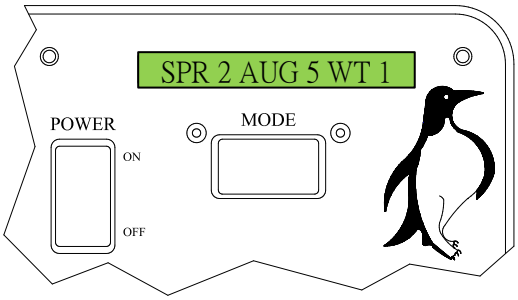
NOTE: In order to run tools off the LS485, you must connect the pressure hose of the tool to the pressure side of the spreader circuit and the return hose of the tool to the return side of the spinner circuit. Manual Mode must be enabled and "TOOL MODE" must be displayed. Bring the truck engine speed up to approximately 1,000 RPM. The knob labeled "SPREADER" will allow you to select the gallons per minute needed for the tool. Each setting is equal to the gallons per minute. Therefore, position 1 gives one gallon per minute of flow and so on. Keep in mind that alarms are deactivated in "TOOL MODE". In order to run tools with the LS485, the Spreader circuit can be used as plumbed for normal Spreader operation.



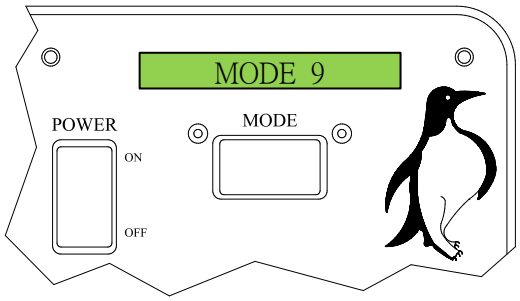


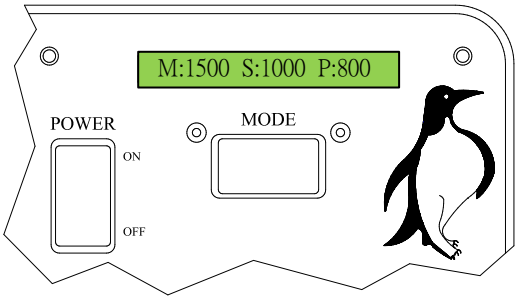
Displays the distance traveled in miles and material usage in pounds, for each trip. It can be reset by turning the Spread Switch OFF and hitting the Blast Button.





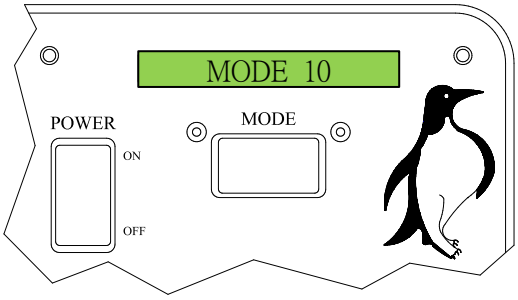
Displays the current setting for the Spinner, Spreader, and Wetting motors.

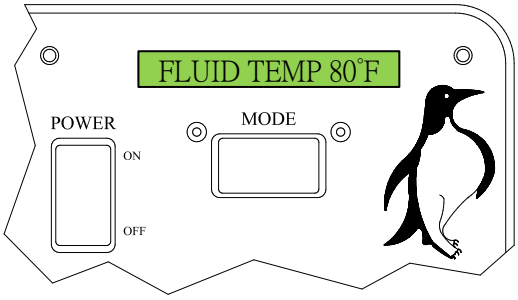




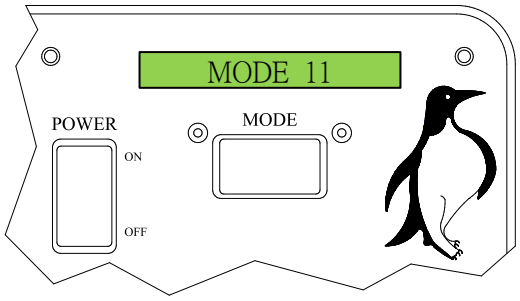
Displays the hydraulic pressure in pounds per square inch (PSI). High pressure sensor readings are on the LEFT, while a differential pressure reading is on the RIGHT (Main Pressure—pressure after spreader/conveyor motor).

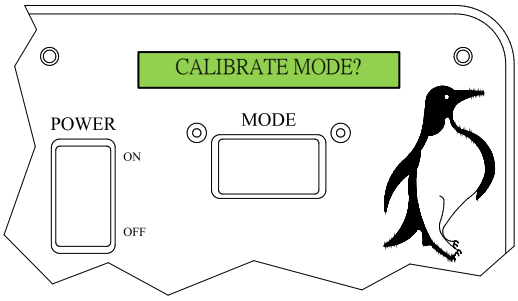
NOTE: Max pressure is 2,715 PSI. Any pressure higher than this PSI OFF SCALE **message in this mode, and cause an** OVER PRESSURE **alarm in all other modes.**





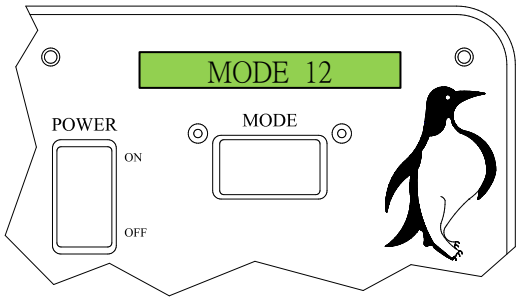
Displays the hydraulic fluid temperature in degrees Fahrenheit.

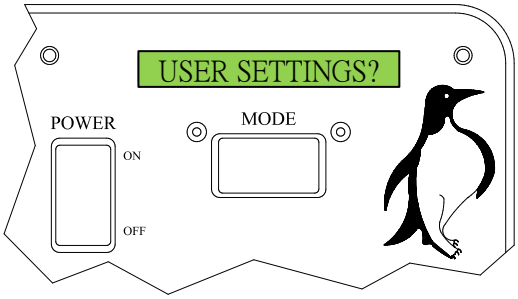




Used for gaining access to the Calibrations. Access by pressing the Blast Button while the Spread Switch is in the OFF position, enter the 4 digit pass code using the Plow Switch, then press the Blast Button again.

NOTE: If passcode has been lost, please contact PENGWYN technical assistance.





Used for gaining access to settings that do not require a passcode. These settings include turning ON/ OFF Counterbalance and Broom Mode. It also has the option to turn ON Speed Simulation from 0-60 MPH in 5 MPH increments. This can be used to simulate Automatic while the truck sits still. There is also Maintenance Mode, which can be used to record regular use without a load and Run Speed Cal to calibrate the speed. Press the Blast Button to enter User Settings and also use Blast To Exit and save any changes.

NOTE: Be sure these options are set according to your organizations guidelines. These settings are intended to provide quick access to commonly needed operator functions for troubleshooting and truck setup. For calibration questions, please contact PENGWYN for technical assistance.

Spreader Controls

SPREAD Switch

The Spread Switch has three positions: **AUTO**, **MAN**, and **OFF**. **MAN** position is only active if the Manual Setting is enabled in Calibrate Mode. When in **AUTO** Mode, hydraulic flow to the Spreader motor is ground oriented. If Spread is switched **OFF**, no motors receive hydraulic flow. For more information on these settings, refer to the Spreader Operation section of this manual. .

SPREADER, WETTING, & SPINNER Rate Knobs

These momentary knobs are used to change the rate for the motor you wish to control. When turning these knobs, increase or decrease the rate of the hydraulic motor printed above the knob.

BLAST Switch

The Blast Switch is a YELLOW push button mounted on the Joystick face (left center). This button is used to override the setting of Spread in any mode of operation. When activated, the Blast Switch energizes all the Spreader and/or Wetting valves, sending maximum hydraulic flow to the Spreader drive motor and/or Wetting pump, putting out maximum material. When released, the switch returns to its **OFF** position and Spread returns to the previous output setting. This is only intended to be used sparingly when going through intersections, over bridges, or wherever a higher application rate may be needed.

NOTE: Blast can also be used for "Spot" salting, where material is required only in certain parts of the roadway. To do this, set Spinner to desired setting, Wetting and Spreader to 0, and turn SPREAD to Manual or Auto. Press Blast wherever material is required.

Spreader Operation

Very Cold Temperature Operation

During extremely cold weather with Spread OFF, the hydraulic fluid viscosity may become so thick that hydraulic functions become very sluggish. To remedy this, two procedures will help:

1. Set the SPREADER to **0,** the SPINNER to **2**, and the SPREAD **Switch** to AUTO. This will allow continuous circulation of the pump with Spread OFF.
2. If more rapid hydraulic fluid warming is desired, hold the Plow Switch **UP,** dead heading the plow cylinder and forcing the oil over the plow relief valve. This will warm the oil approximately five to ten degrees per minute.

SPREADER

The Spreader has 15 settings. If the Spread Switch is on MAN, and Manual Mode is enabled**,** each numerical setting provides a fixed flow to the Spreader circuit. Setting **1** will provide **1** GPM of hydraulic oil to the Spreader circuit, Setting **2** provides **2** GPM, and so on, up to Setting **15** which is the maximum of **15** GPM. Flow to the Spreader circuit in Manual Mode is constant and not ground oriented.

NOTE: Truck RPM controls pump output at 1 GPM per 100 RPM engine speed. Any test requiring hydraulic flow of 15 GPM requires engine RPM of 1500 or greater.

If the Spread Switch is in AUTO the positions will output preprogrammed values in pounds per mile (lbs/Mi). This is ground oriented, flowing more with higher truck speed. Setting **1** will output the amount that is programmed into it, such as **100**lbs of material per mile. Setting **2** may be set for **200**lbs of material per mile, and so on, up to Setting **15**. The PENGWYN increases/decreases hydraulic flow to the Spreader so the operator will have an even spread rate throughout the whole speed range of the truck and maintain the output of lbs/Mi that the operator has selected. When the truck is stopped, the Spreader will also stop.

SPINNER

The Spinner has **7** settings. If the Spread Switch is on MAN and Manual Mode is enabled, each numerical setting provides a fixed flow to the Spinner circuit. Setting **1** will provide **1** GPM of hydraulic oil to the Spinner circuit and so on, up to **7** GPM at Setting **7**. The flow rate is always the same as the setting number. Flow to the Spinner circuit in MAN is constant and not ground oriented.

In AUTO, Spinner Settings **1** through **7** operate just as in MAN. The flow is not ground oriented and the Spinner will continue to turn even when the truck stops.

Wetting Control

WETTING **Rate Knob**

This momentary knob is used to change the rate for the motor you wish to control. When turning this knob, will increase or decrease the rate of the hydraulic motor printed above the switch.

Wetting Operation

WETTING

Liquid Wetting (calcium chloride or salt brine) is pumped from an on-board storage tank onto the granular material at the Spinner or directly onto the road surface. When operating in Auto, the setting numbers correspond to the amount of hydraulic flow in percentage from 0 to 100%. This setting will be reached at 40MPH. For example: if Wetting is set to 50%, when the truck is traveling at 40MPH, 50% of the wetting valves will be open. With the same settings at 20MPH, 25% of the valves will be open, and so on.

Bed/Plow Controls

Plow Thumb Control

The LS485-75cc-1-JB-LH has a Plow Thumb Control mounted on the top of the Bed Joystick. In order to operate the plow or bed cylinders, the enable switch (located on the back of the Joystick handle) must be held closed. The Thumb Control controls: raising (push down) and lowering (push up) the plow, as well as plow angle functions.

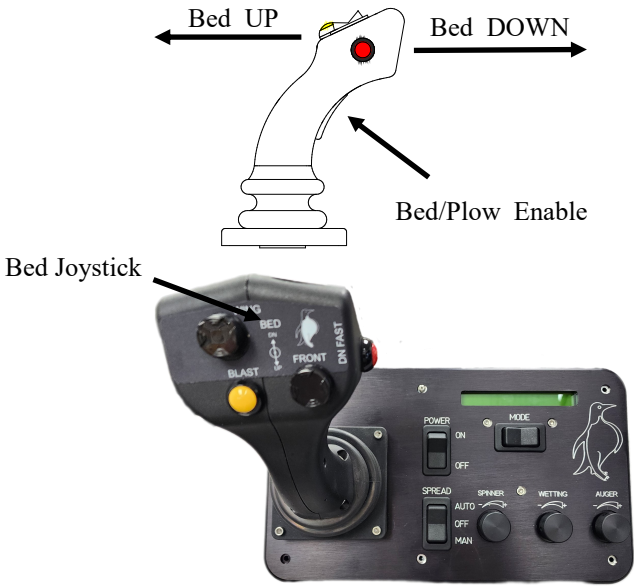
WING Plow Thumb Control

The Wing Plow Thumb Controller is located in the top right of the Control Box (Left Thumb Controller). The Thumb Controller directs the Wing Plow movement up and down as well as the plow angle.

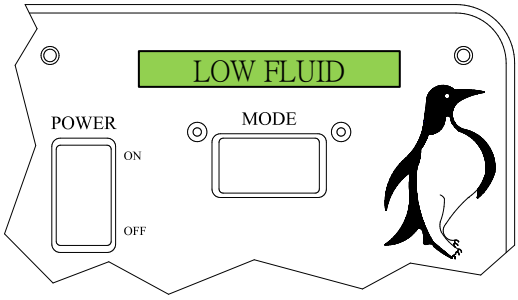
Bed Joystick

The Bed Joystick is located on the Control Box face (right side). The Joystick directs bed movement up and down at normal speed. To lower the bed at a faster rate push the Joystick forward and press the Down Fast Button (**RED** push button on the right side of the Joystick) at the same time.

NOTE: Cylinder functions will not operate unless the enable switch (located on the front of the Joystick) is pressed at the same time as the Control Switches/Joystick.

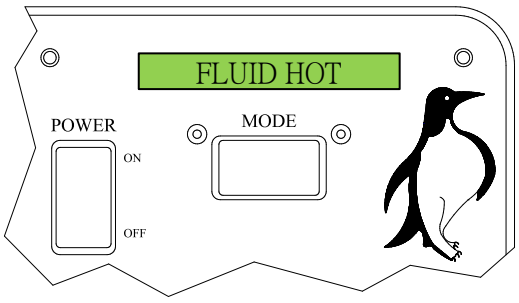


Alarms



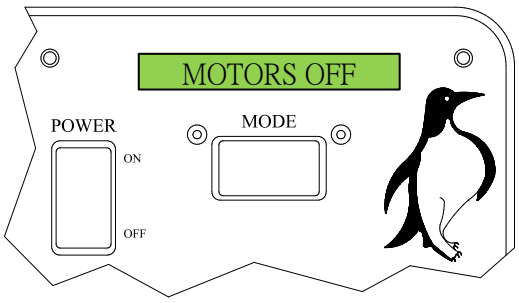
This warning indicates that the hydraulic fluid in the reservoir tank is low. The display will flash "**LOW FLUID**" and create an audible beep. Also, all Spreader functions will be disabled. The Bed and Plow functions will remain in operation as long as there is some fluid in the tank. If the fluid level is low, immediate maintenance is recommended. To override a faulty Low Oil Alarm and enable Spreader functions, turn to **MODE 8** with Spread Switch OFF and hit the Blast Switch.

WILL SHOW ON SCREEN!



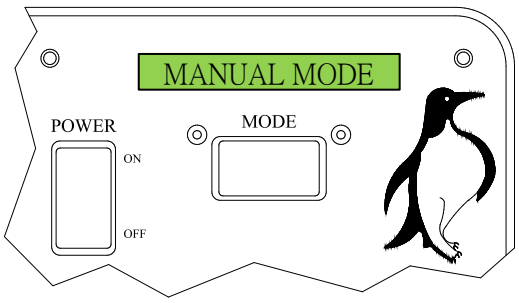
This warning indicates that the temperature has exceeded the maximum recommended operating temperature (default is 150°F). The Control Box will produce an audible beep and the display will flash "FLUID HOT". The current hydraulic fluid temperature can be displayed by scrolling to **LCD MODE 10** on the main menu. Immediate maintenance of the truck is recommended.

WILL SHOW ON SCREEN!



If the fluid temperature goes above a factory set, non-adjustable limit of 160° F: pumps are shut down, an alarm sounds, "MOTORS OFF XXX°F" is displayed (where XXX is the oil temperature), and valve control is suspended. Once hydraulic oil temperature falls below 160°F, function can be regained by turning Spread Switch to the OFF position. Immediate maintenance of the truck is recommended.

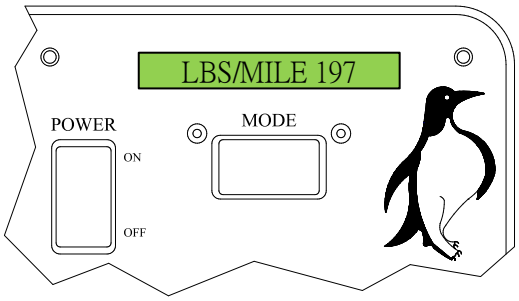
WILL SHOW ON SCREEN!



This warning indicates that Manual Mode has been selected with the Spread Switch, while Manual Mode is disabled in the Calibration menu. The factory default is Manual Mode ON, to enable/disable Manual Mode see "Calibration Settings" section of this manual.

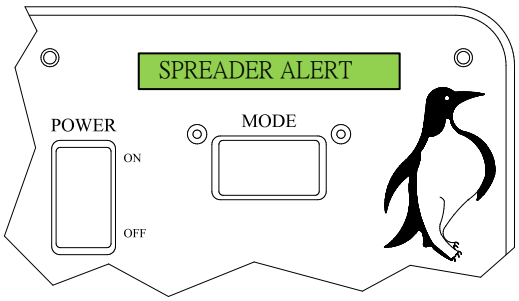
WILL SHOW ON SCREEN!

Alarms Continued...



This warning indicates that Manual Mode has been selected with the Spread Switch while Manual Mode is disabled in the Calibration menu. The factory default is Manual Mode ON, to enable/disable Manual Mode see “Calibration Settings” section of this manual.

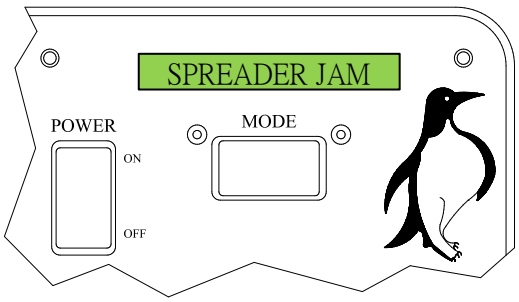
WILL SHOW ON SCREEN!



If there is an audible beep and the Control Box display flashes "SPREADER ALERT", material load on the Spreader has dropped below the preset minimum (set during calibration). If automatic vibrator connection is installed it will be triggered as well. Spreader Alert indicates that there has been a reduction of the load on the hydraulic drive motor. Generally, this is caused when the Spreader is running out of material. Other causes include:

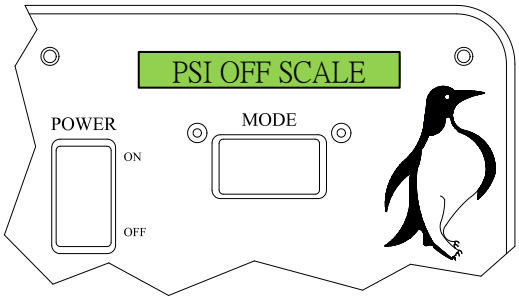
- Tunneling/bridging of the material
- A broken mechanical connection between the drive motor and the Spreader/conveyor
- Blown hose on the Spreader/conveyor drive motor

WILL SHOW ON SCREEN!



Spreader Jam will cause an audible beep and the Control Box will flash “SPREADER JAM”. This indicates that hydraulic pressure has exceeded the maximum (default is 2500PSI), and no material is being ejected by the Spreader. It may be caused by a material jam at the Spreader/conveyor or a quick disconnect to any of the drive motors may not be connected.

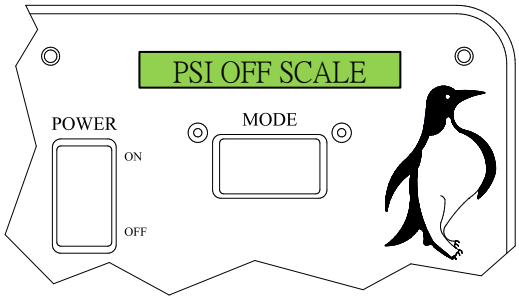
WILL SHOW ON SCREEN!



This warning indicates that hydraulic pressure has exceeded the maximum measurable pressure (2715 PSI), while hydraulic motors are not engaged (i.e. Spread Switch is in the OFF position, or in AUTO at 0MPH). This condition can occur when a hydraulic pump controlled by a Manual Switch is put into a deadhead condition.

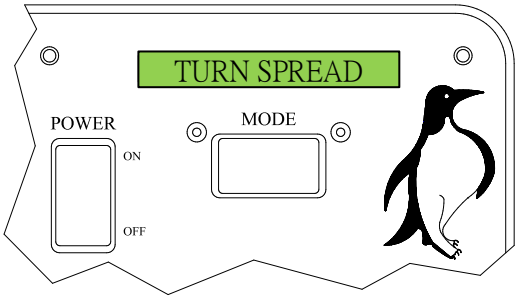
WILL SHOW ON SCREEN!

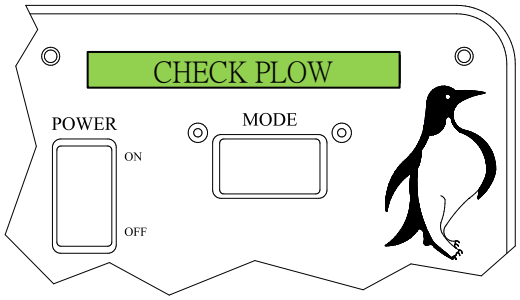
Alarms Continued...

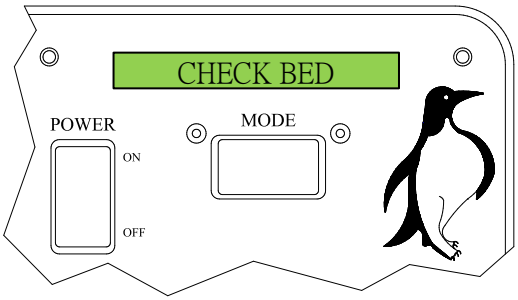


This warning indicates that hydraulic pressure has exceeded the maximum measurable pressure (2715PSI) while in **MODE 9**.

If any Spreader or Cylinder function Switches are active when box is turned ON, one of these alerts will be displayed, and boot up will halt.







If condition cannot be remedied by releasing or resetting a switch, Control Box will need to be serviced by a qualified technician.

Troubleshooting Chart

PROBLEM	CAUSE	SOLUTION
Stops at FET check	485 cable has a poor connection	Repair/replace cable
	FET Board Error	Try with a known good FET Board/ Repair/Replace FET Board
Display has 8 blocks, everything works	Display has a poor connection	Repair connection/replace Display
Will not hold date/time at all	Software is corrupted	Reprogram
	Clock crystal and/or date chip failing	Replace crystal and/or date chip
Will not hold date/time with the power off	Battery back up is failing	Replace battery
Won't initialize, lights up with a blank screen	No program	Reprogram
	Not communicating with Valve Driver Board	Repair Valve Driver Board
Can't change Spreader/Spinner rate	Control box is in 'Broom Mode'	Remove from Broom Mode
Nothing energizes, driver board relay constantly resets	Poor ground connection	Repair ground connection
Auger, spinner, wetting, will not come on. Box reads low fluid when it is not low	Sensor wires shorted	Check wiring
	Low level sensor failing	Replace low level sensor
Manual Mode does not work	Manual shut off in Calibration Mode	Turn Manual Mode on in Calibration Mode
Box reads Spreader Jam even with the truck off	Pressure transducer failing	Check transducer wiring, repair/replace
Spreader alert keeps going off	Box needs calibrated with the truck	Run spreader fault calibration/ Maintenance Mode
Fluid hot always on	Thermistor failing	Check thermistor connections, repair/replace

NOTES:

PENGWYN
CENTRAL HYDRAULIC SYSTEMS
LS485-75cc-1-JB-LH CONTROL BOXES

PENGWYN
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Customer support: Phone 800.233.7568 or 614.488.2861 • Fax 614.488.0019
www.pengwyn.com

Limited Warranty

PENGWYN warrants 485 Series components to be free of defects in material and workmanship, under normal use and service for a period of two (2) years from date of shipment. PENGWYN's obligation under this warranty is limited to repairing or replacing at its factory, or other location designated by PENGWYN, any part or parts thereof which are returned within thirty (30) days of the date when failure occurs or defect is noted, with transportation charges prepaid, and which upon examination appears to PENGWYN's satisfaction to have been defective. **Such free repair or replacement does not include transportation charges, or the cost of installing the new part or any other expense incident thereto. PENGWYN will not be liable for other loss, damage, or expense directly or indirectly arising from the use of its products, nor will PENGWYN be liable for special, incidental or consequential damages.**

Ordinary wear and tear, and damage from abuse, misuse, neglect or alteration are not covered by this warranty. PENGWYN assumes no liability for expenses incurred or repairs made outside PENGWYN's factory except by written consent. PENGWYN's warranty also does not cover the requirement of control box programming. All control box programming is to be performed by the end user with the use of the technical manual. This warranty is null and void if instructions and operating procedures are not followed.

Equipment or parts not manufactured by this company, but which are furnished in connection with PENGWYN products, are covered directly by the warranty of the manufacturer supplying them. However, PENGWYN will assist in obtaining adjustment on such equipment or parts when necessary.

It is recommended that spare parts be purchased for critical items to allow continued operation of equipment during the inspection, evaluation, or repair/replacement process.

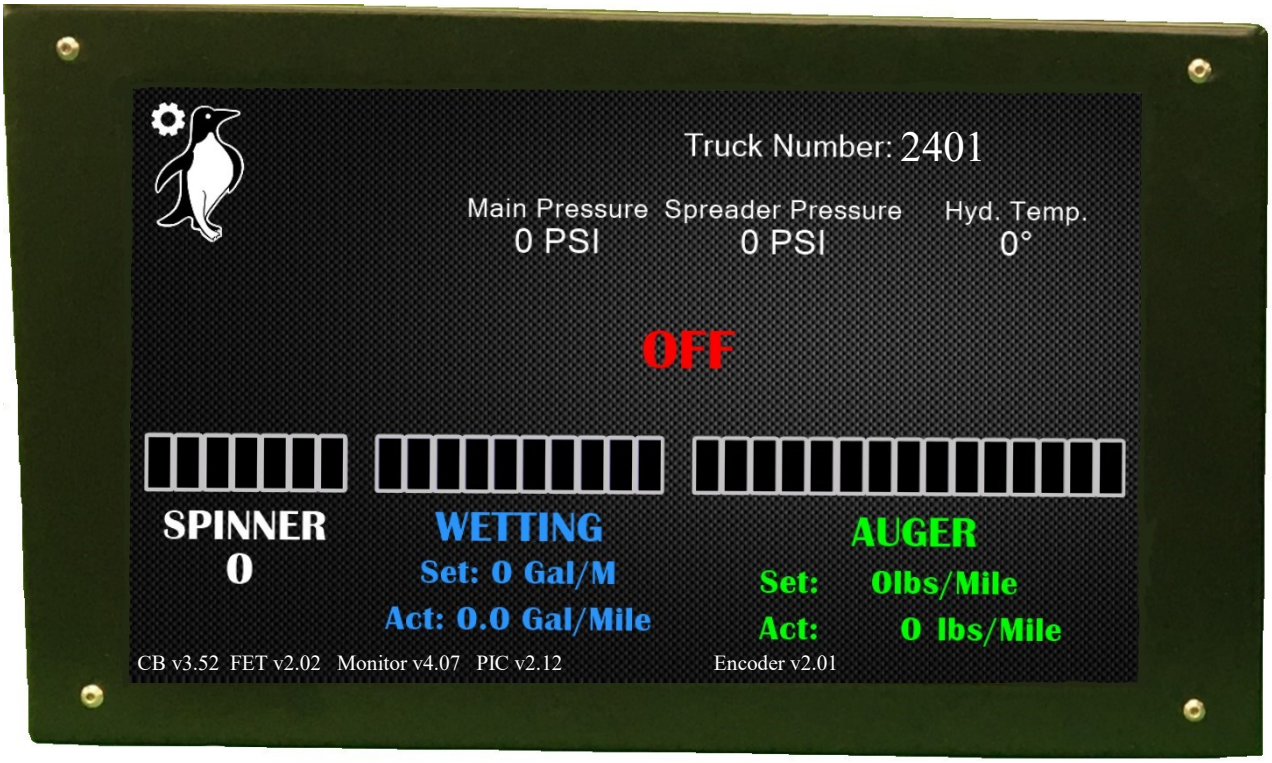
THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND OF ANY OTHER OBLIGATION OR LIABILITY OF PENGWYN.

PRODUCT IMPROVEMENT LIABILITY DISCLAIMER

PENGWYN reserves the right to make any changes in or improvements on its products without incurring any liability or obligation whatever and without being required to make any corresponding changes or improvements in products previously manufactured or sold.

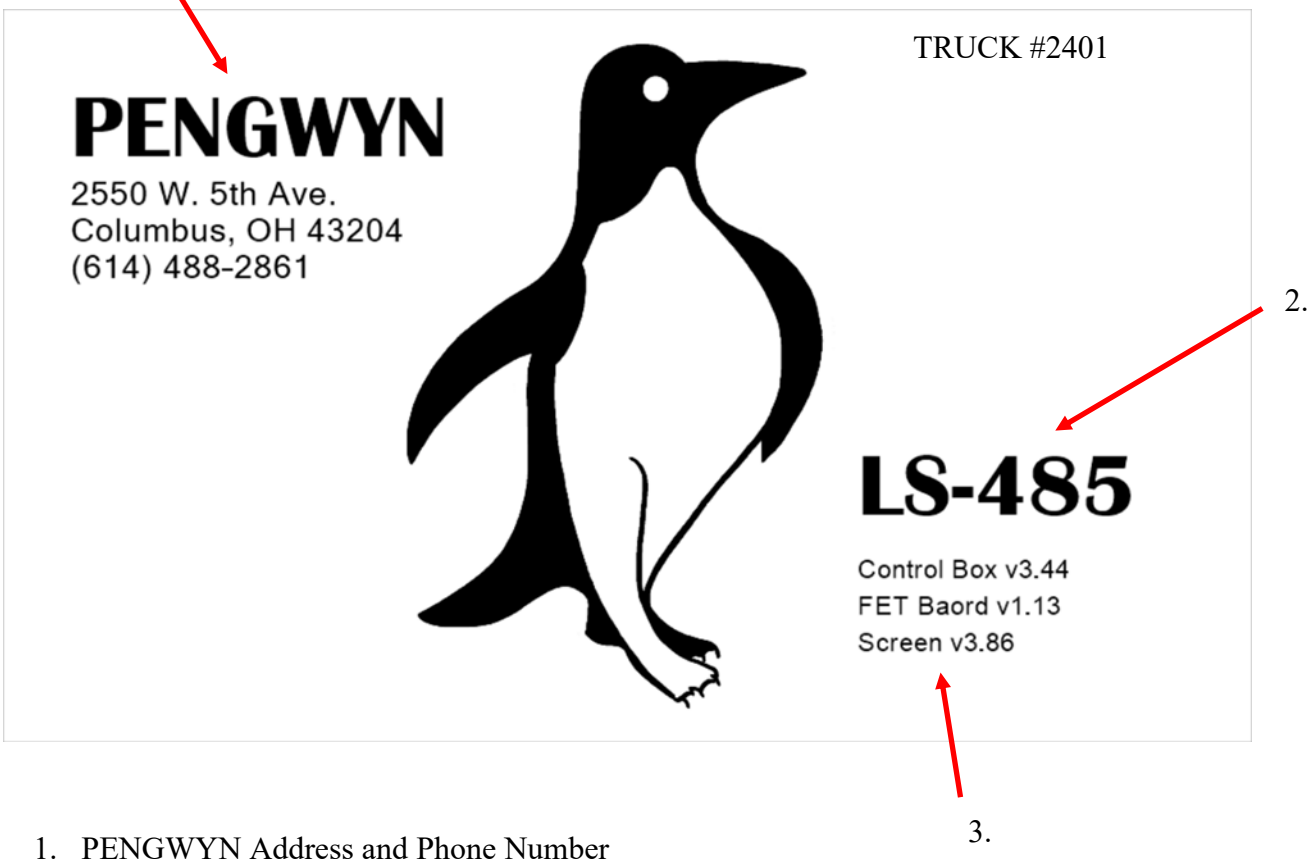
PENGWYN

10.1” System Monitor Manual



Startup

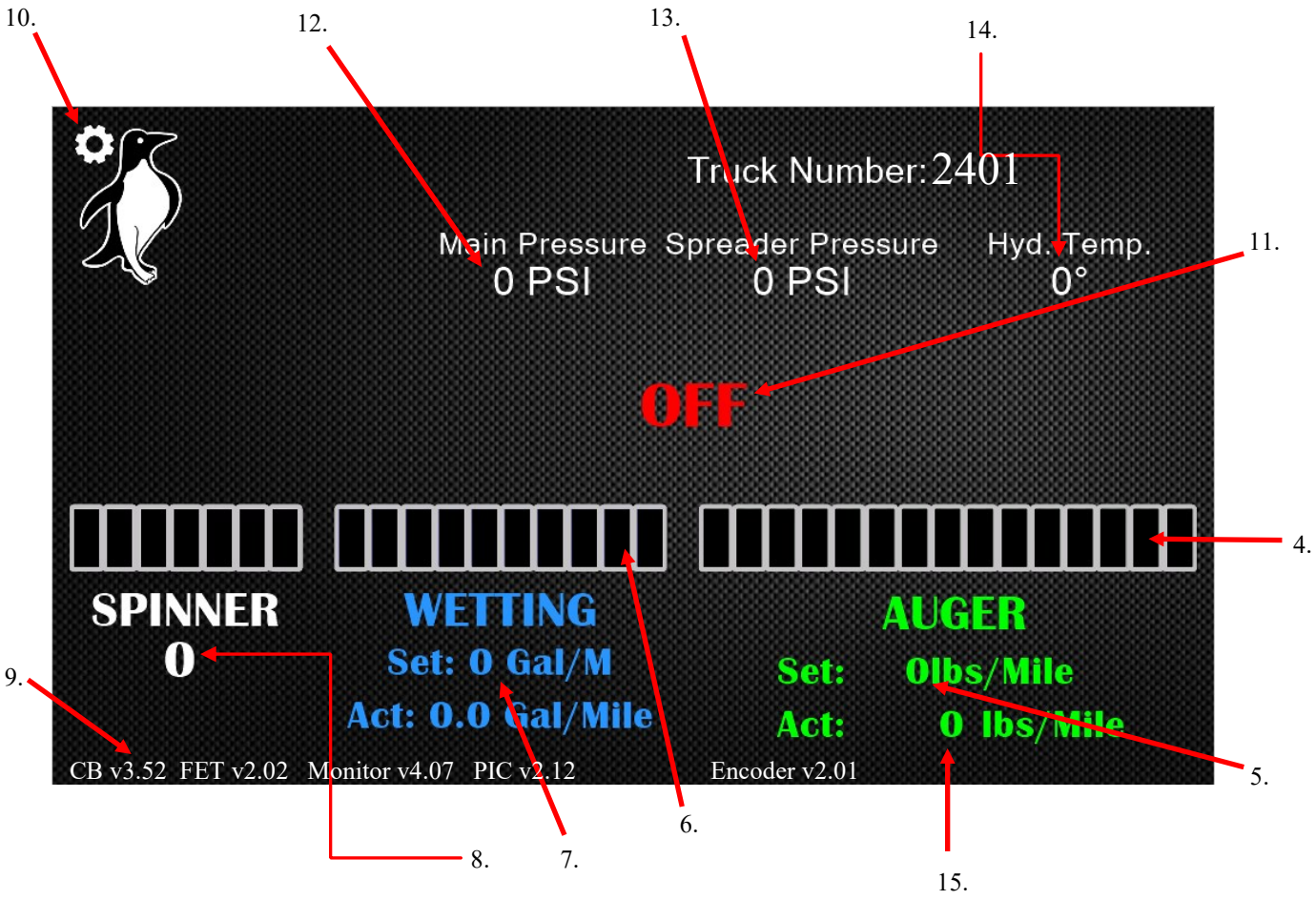
The Startup “Splash Screen” shows for several seconds each time the Control Box is powered ON. The Monitor waits for a signal from the Control Box to move on to the driver display.



1. PENGWYN Address and Phone Number
2. Manifold Type
3. Software Versions

Driver Display

This is the operator display for the PENGWYN hydraulic system.

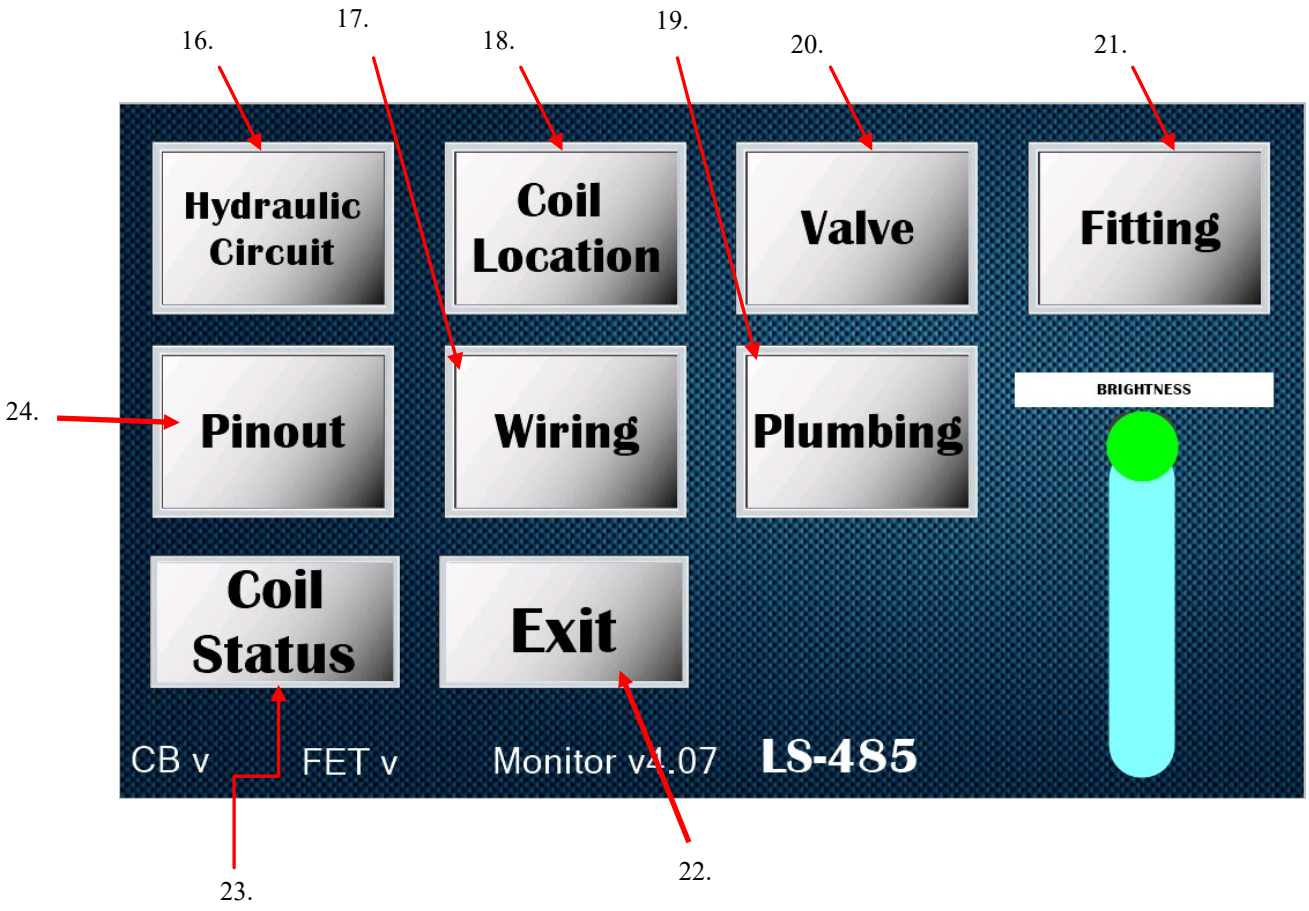


4. Spreader Target Setting (1-15)
5. Spreader Target in lbs/Mile
6. Wetting Target Setting (1-10 in Auto)
7. Wetting Setting in Gal/Mile (Auto Only)
8. Spinner Setting
9. Software Versions EXPANDED
10. Brightness Settings & Troubleshooting Diagrams
11. Mode Selection (OFF, AUTO, or MANUAL)
12. Main/System Pressure
13. Spreader Pressure
14. Hydraulic Oil Temperature
15. Actual Material Spread (INSTANTANEOUS) in lbs/Mile

NOTE: Material spread is calculated in Manual or Auto modes when speed is greater than 0MPH. @0MPH in Manual actual reads "9999"

Mechanics Diagram Index

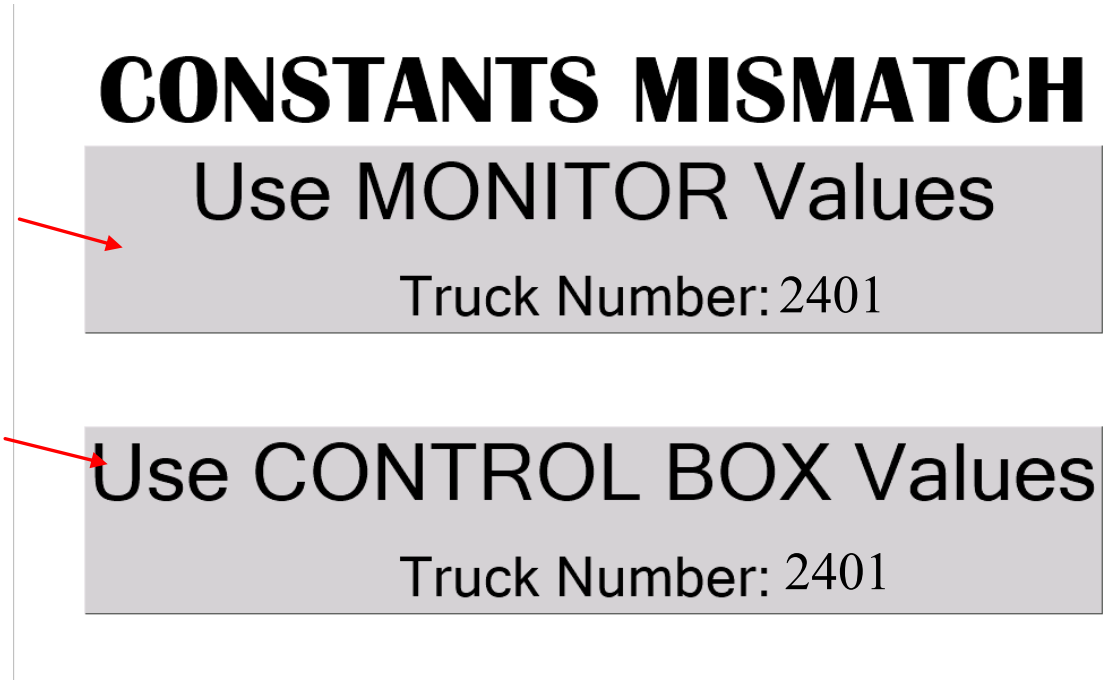
This index contains technical data and troubleshooting diagrams and the Monitor brightness setting.



16. Hydraulic Circuit Diagram
17. Wiring Diagram
18. Coil Location & Wire Color Diagram
19. Hydraulic Plumbing Diagram
20. Valve Location & Part Number Diagram
21. Fitting Diagram
22. Return to Drive Display
23. Coil Activation (see below for details)
24. Wiring Harness Pinout

Constants/Calibration Mismatch

At startup the PENGWYN Control Box checks to see if a System Monitor is attached, and that the Calibration data stored in it matches that stored in the Control Box. If they match, it continues on to the main operator display. If they don't match, the "Constants Mismatch" prompt is displayed. Calibration data can be loaded from: 1.) the Monitor, 2.) the Control Box, 3.) Factory Defaults (contained in the Control Box). The data loaded will be used until power is cycled on the Control Box, and will only be saved if Calibration is run and the proper Save Location is selected (see below). "Constants Mismatch" will be displayed on the driver display while operating using mismatched calibration data.



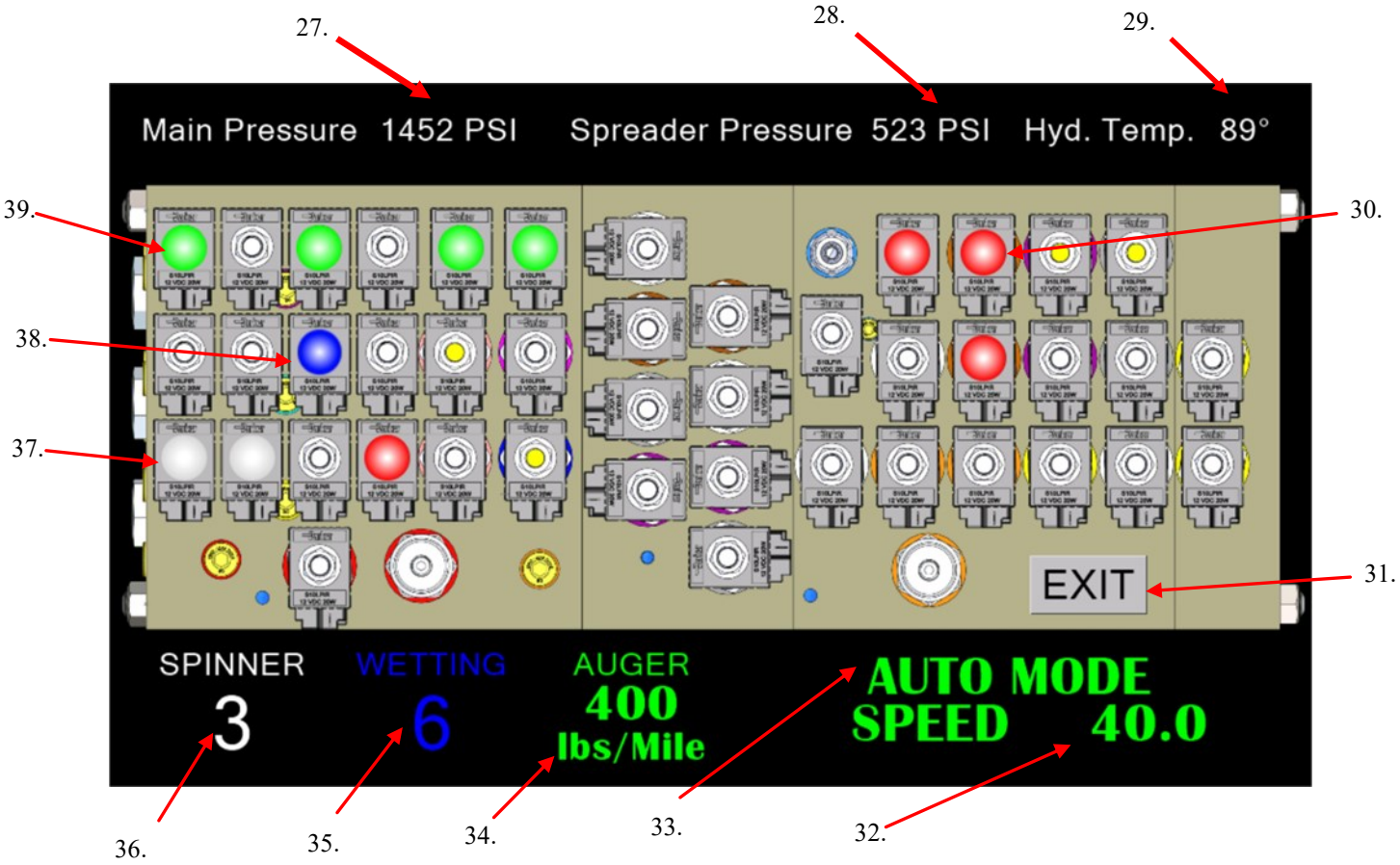
25. Use Calibration values stored in Monitor memory

26. Use Calibration values stored in Control Box memory

NOTE: Selection of Calibration values on this page will not eliminate the Constants Mismatch. User input will be required upon each startup until constants are saved in Calibration (explained in "Calibration" section below).

Coil Energization Display

The Coil Energization Display is a troubleshooting aid. It displays which valves are energized for any function (in Manual and Auto modes). To troubleshoot in Auto Mode, Speed can be set with the "Speed SIM" function in the Control Box, calculations are made, and resulting valve combinations are indicated. This is especially useful to verify the proper coils are energizing when Manual Mode is disabled.

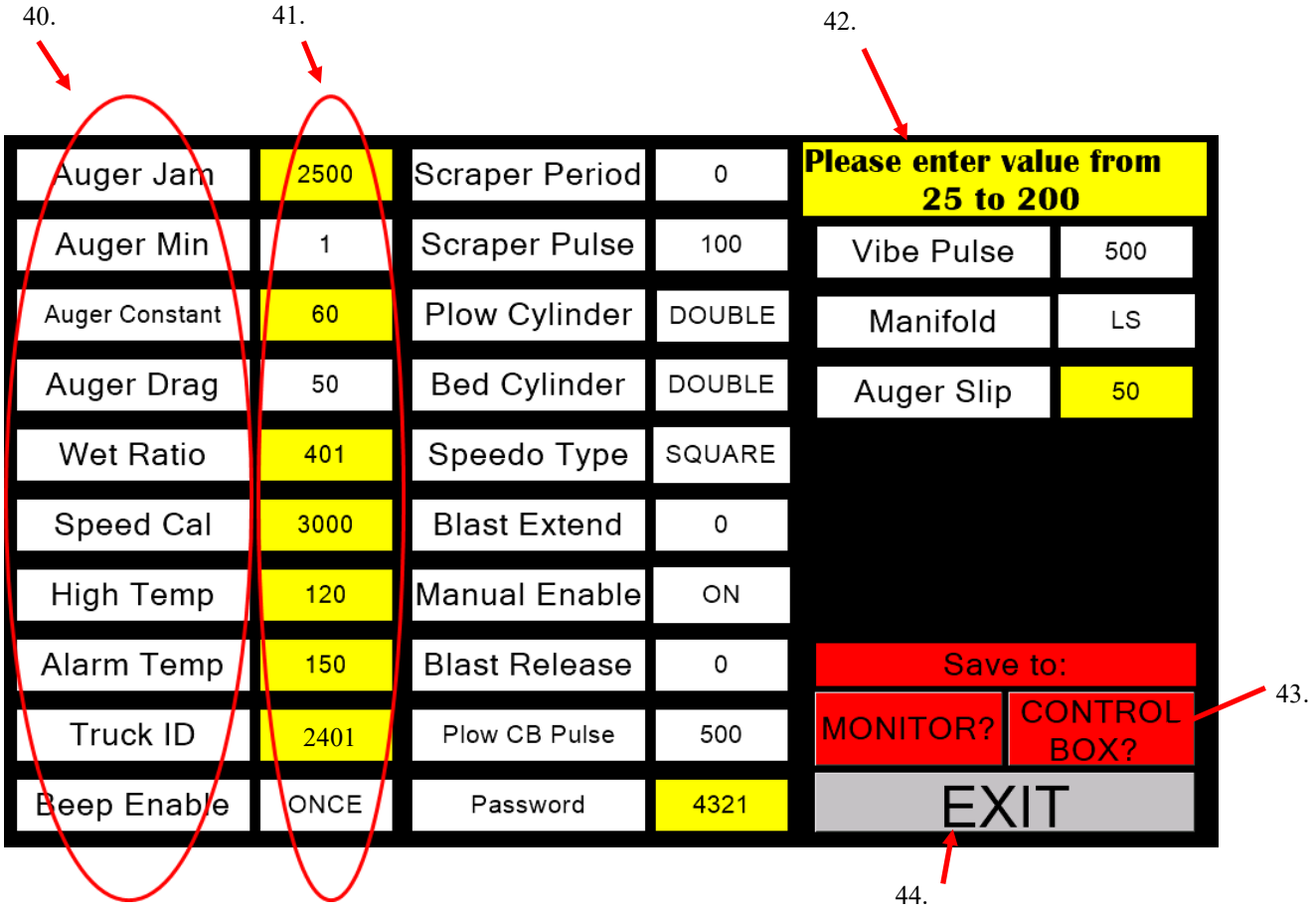


27. Main Pressure
28. Spreader Pressure
29. Hydraulic Oil Temperature
30. Cylinder Coil energized when lit (**RED**)
31. Exit to Mechanics Diagram Index
32. Speed when in Auto Mode
33. Mode Indicator
34. Target lbs/Mile (Auto Mode Only)
35. Wetting Setting
36. Spinner Setting
37. Spinner Coil Energization (White)
38. Wetting Coil Energization (**BLUE**)
39. Spreader Coil Energization (**GREEN**)

NOTE: While in the "Coil Energization Display" the hydraulic system is active, motors and Cylinders WILL move when engine is running. Be sure to follow all safety precautions while operating!

Calibration Display

Enter Calibration using the Control Box Mode Switch to move to LCD **MODE 11**. Press BLAST Button, enter passcode, and the following information will load:



40. Calibration Setting

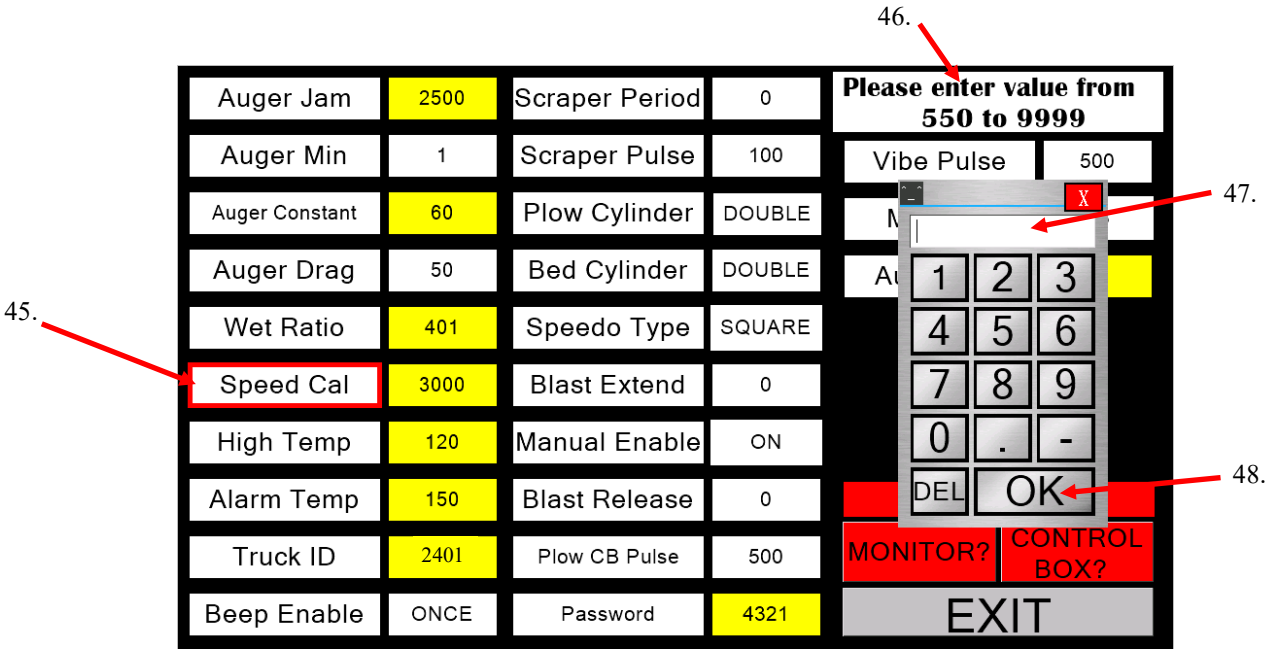
41. Adjustable Value

42. Variable Information (visible when variable is selected for adjustment)

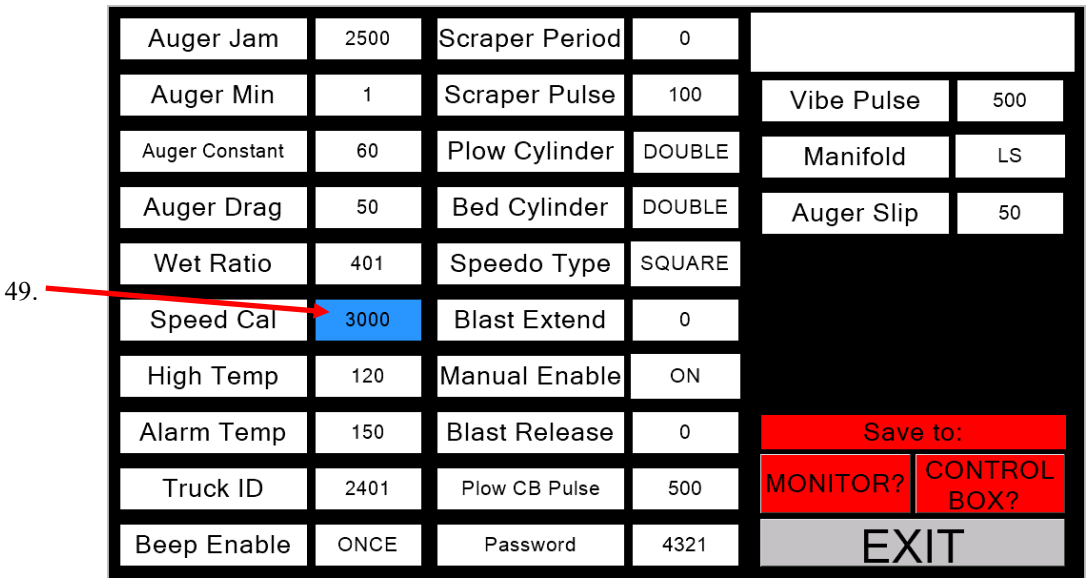
43. Save Options (System Monitor and/or Control Box memory locations)

44. Exit to Driver Display. Values will be saved to selected locations, prompt will verify data discard if no memory location has been selected.

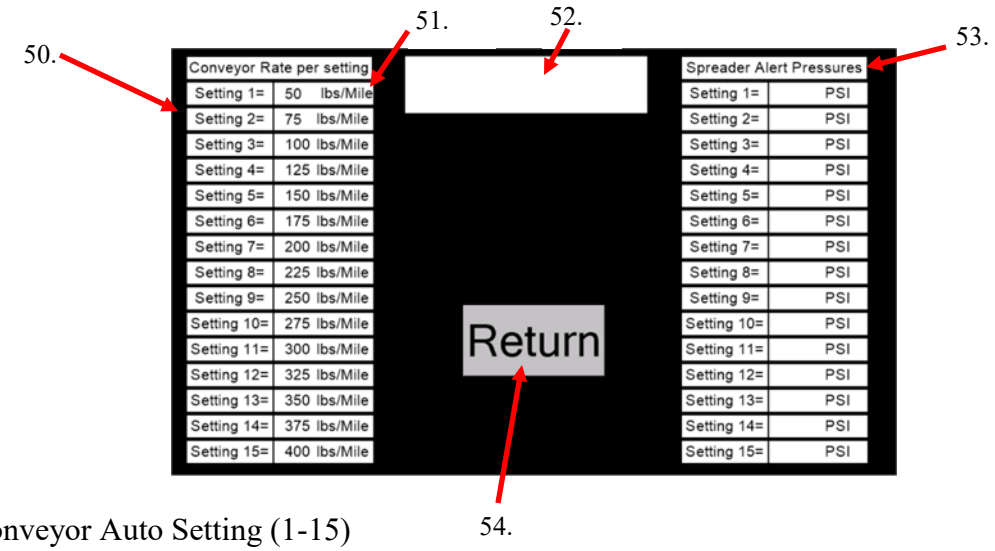
Values can be selected for adjustment if numerical, or toggled between settings.



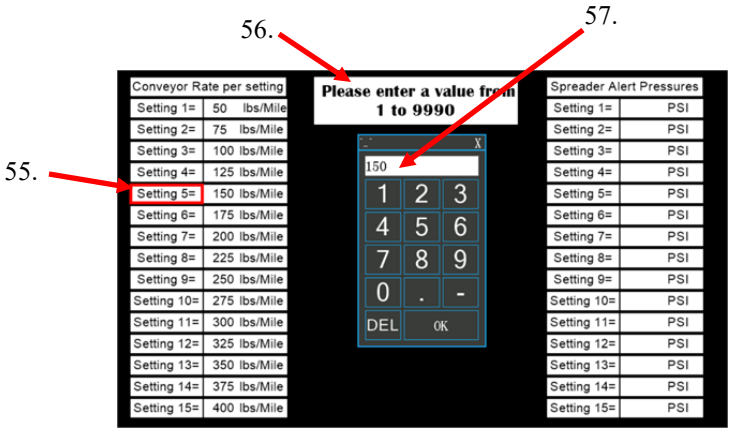
45. Selected Constant
46. Limits for acceptable settings
47. Data Entry Pad
48. Puts entered number into Calibration field
49. Modified Value (color changes once “OK” on Keypad is pressed)

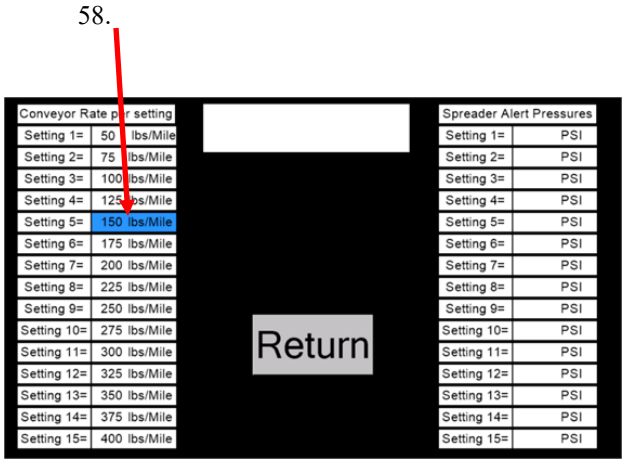


Conveyor Rate Setting



50. Conveyor Auto Setting (1-15)
51. Adjustable lbs/Mile
52. Variable Limits (visible when variable is selected for adjustment)
53. Spreader Alert Pressures (Maintenance Mode must be run to set these values)
54. Return to Calibration (no data is saved until Save Locations are selected and "EXIT" is pressed in Calibration)





55. Selected Conveyor Rate Setting
56. Input Limits/Instructions
57. Entered Value
58. Changed Value (background changes to **BLUE** once "OK" is pressed on Keypad)

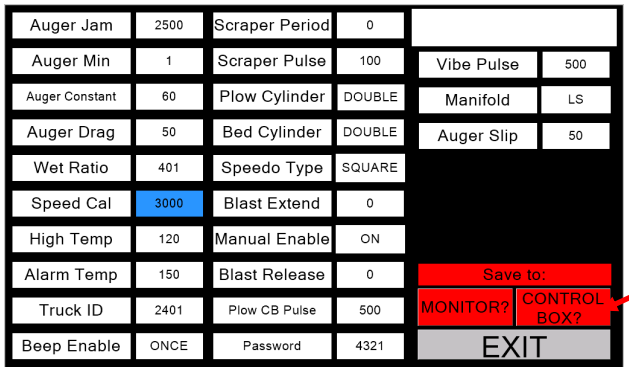
NOTE: Values are not saved until save location is selected in Calibration and "Exit" is pressed.

Save Locations

There are two (2) possible Save Locations: 1.) the Monitor, and 2.) the Control Box. Either option saves to permanent memory. Constants can be saved to either the Monitor, the Control Box, or **BOTH**. If Calibration is being saved to eliminate a Constants Mismatch, it is important to know which constants were loaded at startup to ensure desired constants are preserved. For example: if a repaired box needs to have the truck specific constants reloaded and saved:

1. Load constants from the Monitor (because the Monitor has remained with the truck).
2. Go to Calibration.
3. Without changing any values, save constants to the Control Box.
4. Since the Monitor constants were loaded and saved to the Control Box, they now match.

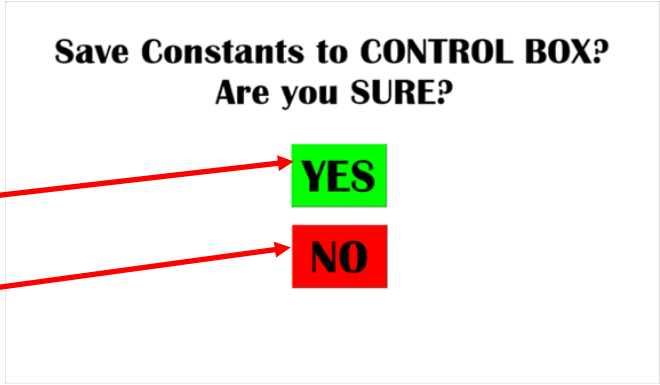
NOTE: Saving constants to **BOTH** locations will also eliminate a Constants Mismatch, and is required to avoid a mismatch if any constant values have been changed.

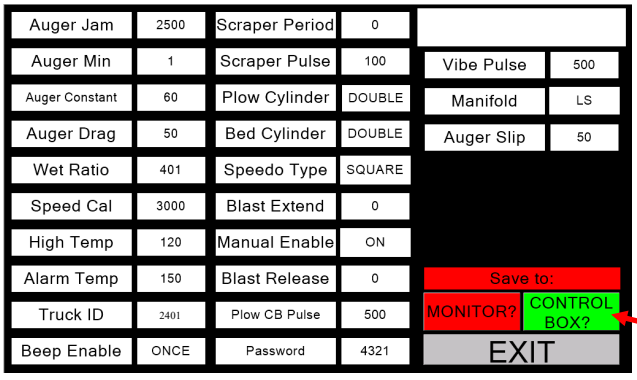


59. "Control Box?" Button brings up Save Confirmation.

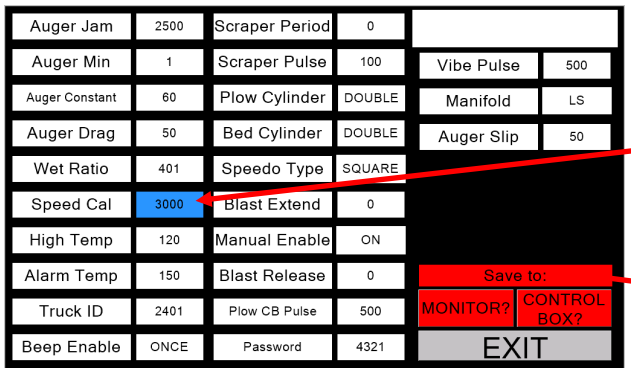
60. "YES" sets Save = "YES" & Returns to Calibration.

61. "NO" sets Save = "NO" & Returns to Calibration .



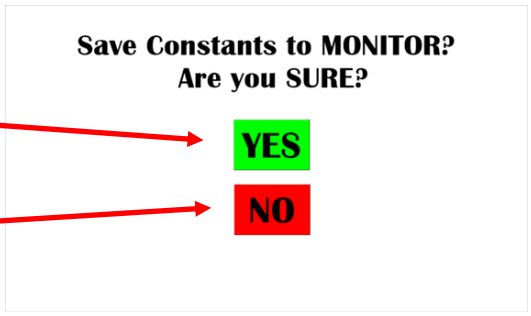


62. **GREEN** highlights location to be saved on "EXIT".



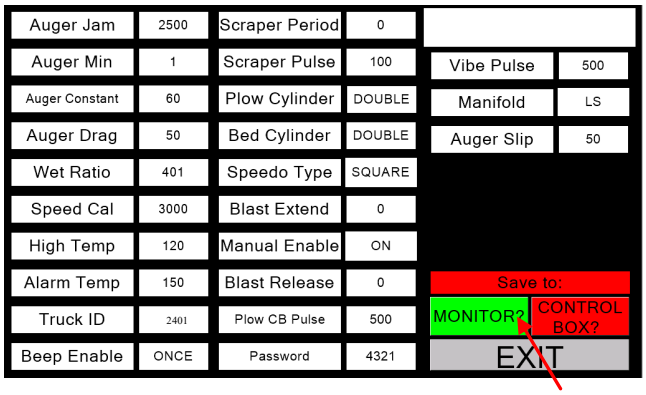
63. Changed Value in **BLUE**

64. Brings up Monitor Save Confirmation



65. "NO" sets Save = "NO" & Returns to Calibration.

66. "YES" sets Save = "YES" & Return to Calibration.



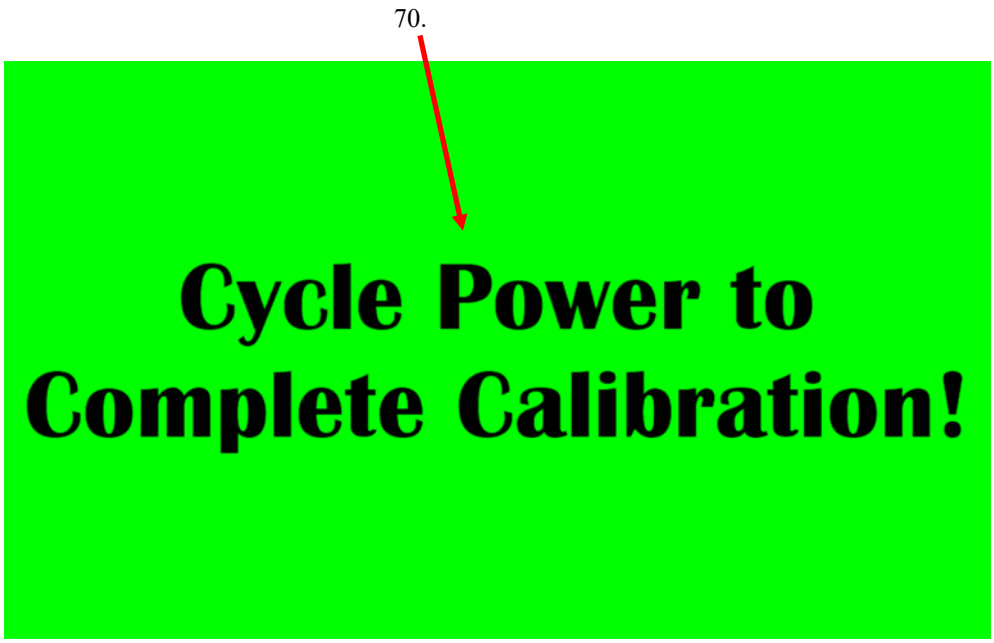
67. When Save = "YES" "Monitor?" button turns **GREEN** and values will be saved to Monitor upon exit.

NOTE: If "Monitor?" button is pressed again, and "NO" is selected in confirmation display, button will return to **RED** and constants will not be saved to Monitor.

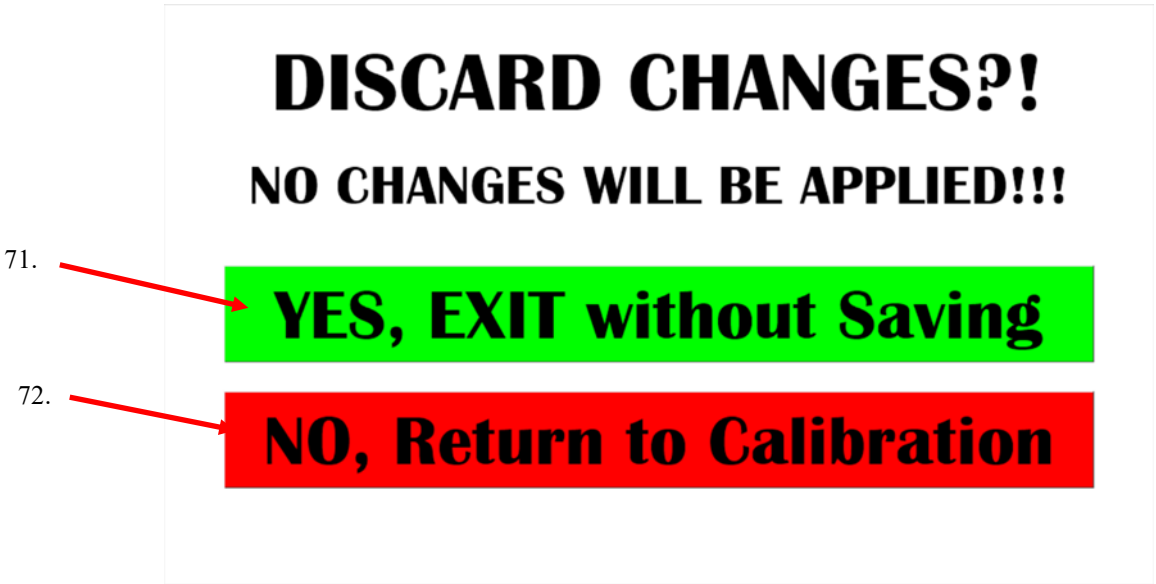
68. If both Save Locations are selected, both are **GREEN.**

69. Exit Saves Values to selected locations.

70. Power must be cycled to complete saving and reloading of constants.



If no Save Location is selected “Discard Changes” screen is displayed.



71. “YES” discards ALL changes, and returns to normal system operation.
72. “NO” returns to the Calibration Screen, allowing for Save Location selection and/or further constant changes.