

Temperonic Hog Sorter Control Unit



Operators Manual

22-Sep-2017

Version H.1

Controller Features:

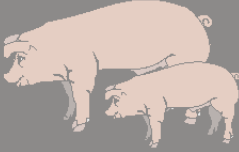
- Direct Connection of 1 or 2 Load Cells
- Retains up to 4000 Weight Records
- 2, 3 or 4 Way Sorting Possible
- Up to 8 Groups
- As many as 3 Paints
- Activate Air Blast to Clear Gate
- Manual and Automatic Modes
- Can Adjust Settings while Sorting
- Computer Interface for Recording Data
- Compatible with All Sorting Gates
- 12V Outputs to Relays
- Simple User Interface and Settings
- Complete Pen Capacity Control

Table of Contents.

Controller Features	1
Display Mode	3
Standard Settings	6
Hidden Settings	10
Mounting Instructions	20
Wiring Diagrams	21
Warranty	24

Controller Features

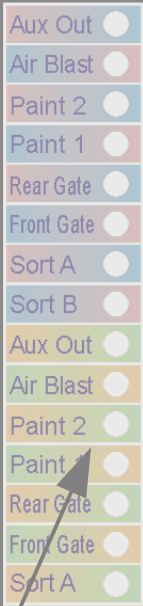
Status Indicators.
Indicators flash to warn of
unusual conditions.



Hog Weighing and Sorting Control System



LCD Display for
showing detailed
information



Output indicators
show when inlets or
output stages are
active.



HS0912







Temperature 

6 Buttons used to easily
modify and save
parameters. Use the
buttons to scroll through
display information.




Control Operation

Under normal operating conditions, the control will show the current weight and sorting system status.

The  button can be used to change from display mode to settings mode or even hidden settings mode.

The  and  buttons will scroll through the various display mode values. The  and  buttons will display additional information. The  button is used to modify or save changes to Parameters.

Factory Settings

At times, it may be necessary to completely reset a control to the factory settings. This is accomplished by holding down the 3 buttons ,  and  as the power is turned on to the control.

The buttons must be held down until the display shows


Settings Written

which indicates that the EEPROM settings have been loaded with the factory default values.

Alarms

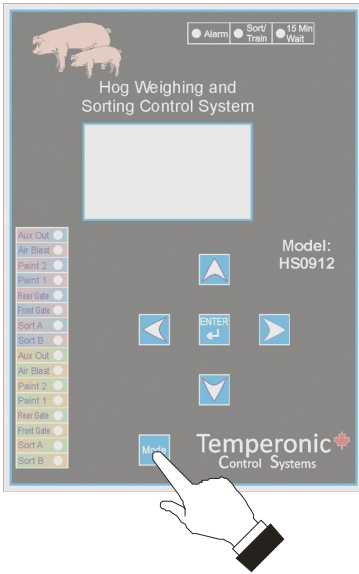
When the control encounters an alarm condition, an alarm indicator will flash. If an external alarm is connected, it will be activated.

When the alarm condition has been cleared, the

 button will reset the alarm. Be sure to view the history list to determine the cause of the alarm.

Display Mode:

To return to the default display mode:



Press the **Mode** Button. If the display shows a list of settings starting with **101->Operation Mode=Manual**

then press the mode button again. The display will then show the current weight and some additional information.

NOTE: The control will automatically return to the default display mode if no buttons have been pressed and the display dims as per Parameter 252.

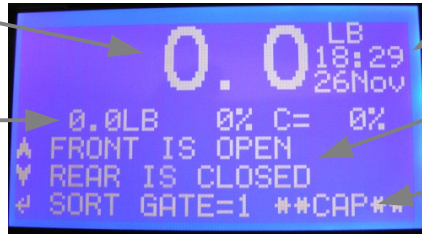
From the default display mode, use the select arrows **←** and **→** to display various values. These values are described in the following sections.

Default Display

The default display screen shows the following information.

Current Weight is displayed in large numbers

Most-recent sort result. Weight recorded, Noise level, C=confidence



Units
Time
Date

Status based on operation MODE


Capacity Limit reached indicator

Operation Mode can be Open, Manual, Train, Sort, Closed and this causes the lower 3 lines on the default to display differently, based on the Mode. Above, we see the Manual Mode. In this mode, the **▲** button will toggle the front gate open / closed. the **▼** button will toggle the rear gate open / closed and the **ENTER** button will cycle through the sort gate positions.

In Open, Closed and Train mode, the name of the mode is displayed. Sort mode shows the following information.





this shows how many hogs were sorted to each of the sort gates and how many hogs were sorted into each of the groups. Use **ENTER** to toggle back and forth between the data for gates 1,2 groups 1-4 and gates 3,4 groups 5-8.



Press  to advance to the next display screen (**Count Summary**).


This display shows how many hogs were sorted to each group and what the average weight was in each group and what the current weight range is for each group.

```

COUNTS A+V=Clear
1: <100= 2, 181.2
2: <185= 10, 182.7
3: <200= 0, 0.0
=: TOT = 12, 182.5
    
```

Pressing both the  and  at the same time will reset the readings. **Use with caution.** It also clears the entire history (see next 2 screens)

If there are more than 5 groups, use the  and  to scroll to see the rest.


Press  to advance to the next display screen (**Error Summary**).





This display shows how many Over Weight events there were (likely 2 hogs on the scale at once), Weigh Fail where an accurate weight could not be calculated and Capacity where a hog should have gone to a gate that had already reached its capacity limit.

```

ERROR COUNTS
OVERWEIGHT = 0
WEIGH FAIL = 4
*CAPACITY* = 0
    
```


The previous display screen can be used to clear these counts. Use with caution as this will clear the history list (next display)

Press  to advance to the next display screen (**History List**).

This screen displays the history list. Use the  and  to scroll through the list. Pressing both  and  will jump to the bottom of the list. There can be up to 4095 Records.

```

Record 1 / 22
26>15:40 SORT 181 99
26 15:41 WEIGH FAIL
26 15:41 SORT 181 0
26 15:42 WEIGH FAIL
26 15:42 SORT 181 22
26 17:43 POWER UP
    
```

Pressing  will show the details of the history record. See below for Sort Record Details.

CONF = Confidence (percentage). A low number indicates there was a lot of movement during the weighing.
 TIME = how many seconds the weighing process took.
 GROUP = weight group
 PAINT = which pain was dispensed.

```

Record 10 / 22
26-Nov-2009 17:49:17
WT= 183.3LB POS= 56
CONF= 79 CNT= 20
TIME= 19 CLEAR= 0
GROUP= 2 GATE= 2
PAINT= 0 OGATE= 2
    
```

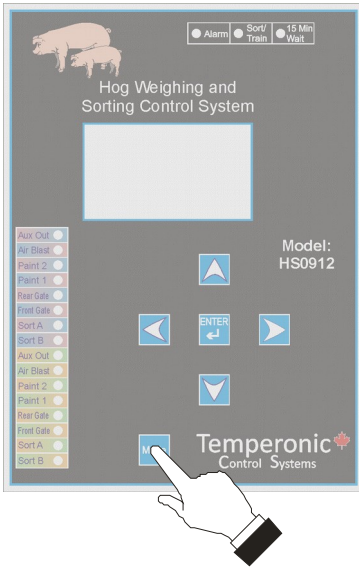
POS = position where the hog was on the scale when weighing took place.
 CNT = how many weight samples were averaged.
 CLEAR = always 0 for now.
 GATE = the gate the hog was sorted to.
 OGATE = the gate the hog should have gone to. This will be different if capacity limits prevent the desired sorting.

Press  to advance to the next display screen (**Version Information**).



Standard Settings:

To view or modify Standard Settings,

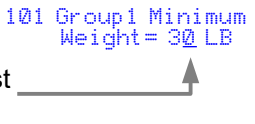


Press the **Mode** Button. If the display shows a list of settings starting with **100→Operation Mode=Manual** then Standard Settings have been selected.

To Modify A Parameter

Press the **ENTER** button. The → will disappear and an underscore **_** will appear below the digit to be changed.

Use the **←** and **→** to select the digit and the **↑** and **↓** arrows to adjust the value.



Press the **ENTER** button to save the changed value. Pressing the **Mode** button will cancel the change and return the original value.

NOTE: Control will automatically return to the default display mode if no buttons are pressed for the time specified in Parameter 252 (Dim Display). The display will dim at the same time.

NOTE: Unlike most other sorting scales, this unit will continue to operate while settings are being modified. It may be necessary to place the scale in Manual Mode prior to changing settings. If only minor adjustments are being made, there is no need to take the gate out of Sort Mode.

100 Operation Mode

This parameter is used to set the gate in one of 5 operation modes.

Open = The Rear and Front Gates will open, allowing hogs to walk through the gate. Note that the sorting gate is not affected and will stay in its current position.

Manual = Once the Operation Mode is Set to Manual, return to the Default Display Mode (Press the **Mode** button once) and then the gates can be manually adjusted.

Pressing **↑** will toggle the front gate open / closed.

To toggle the rear gate open / closed, press the **↓** button.

The sort gate will cycle through all positions by pressing the **ENTER** button.

Some sorters do not have a front gate. In this case, the sorting gate will be in the closed position when the front gate reads as closed and the sort gate **ENTER** button will have no effect unless the front gate is set to open.

Train = In training mode, the gate operates similar to an actual Sort but instead of sorting the hogs based on weight values, the gate simply changes position on each sort so that the hogs become accustomed to leaving in different directions. Note that capacity limits still apply so it is possible for the gate to shut down in Train mode. No Paint will be applied during Train Mode.

Sort = This is the normal Sorting Mode where the gate will sort and paint hogs based on their weight. The gate will automatically change to Manual Mode when the pen capacities have been reached. (See Parameters 131, 132 ... for more information on Capacities)

Closed = Both Front and Rear Gates will be placed in the closed position.

101 Group 1 Minimum Weight

This weight is used to trigger the scale to close the rear gate. It should be set to a value that is just slightly below the weight of the lightest hog in the group being sorted. If the gate is equipped with an electric eye, the rear gate will close when a hog is detected by the eye or the weight reading exceeds the value specified here. If this value is set too low, the rear gate will attempt to close when a hog has only its front 2 feet on the scale and the hog will usually back out of the gate. If it is set too high, it is possible for a very small hog to stand in the scale and not be recognized. It is quite possible that a second pig will attempt to enter the gate.

102 Group 1 Max Weight

This is the first Parameter that is used to define the groups. It is possible to have up to 8 different groups (see Hidden Parameter 205 – Number of Sorting Groups). Group 1 must be the lowest weight and each group must then increase in weight. Depending on the group that the hog fits into, it is possible to select a specific paint and a sort gate. Be sure to select weight units (Parameter 202) and then Zero and Tare (Parameter 207) the scale before spending too much time setting up weight groups.

103 Group 2 Max Weight

to

109 Group 8 Max Weight

These Parameters are used to specify the weight ranges of all the groups. Note that some of these parameters will remain hidden if Parameter 205 is set to a value of less than 8.

110 Gate Empty Below Weight

When the scale reads a weight below the value specified by this Parameter, the scale assumes the gate is empty. This weight is used to detect when a hog has left the sorting gate and it is time to close the front gate. Usually, this value is set to a fairly low value like 10lbs or 5kg. If the rear gate closes and a pig somehow manages to back out of the scale, a weight reading below the value specified in this Parameter will instruct the gate to simply open the rear gate and wait for the next hog

111 Group 1 Sort Gate

When the weight of a hog indicates that it belongs to group 1, the hog will be sorted to a gate based on the value of this Parameter.

112 Group 1 Sort Gate

to

118 Group 8 Sort Gate

As with Parameter 111, these parameters specify how to sort the hogs based on the weight group the hog belongs to. Note that Parameter 205 will cause some of these Parameters to remain hidden and Parameter 210 will limit the values that are allowed in these Parameters.

121 Group 1 Paint Spray

When the weight of a hog indicates that it belongs to group 1, the hog will be painted by the paint colour specified here. A value of 0 means **do not paint**. The number of different paints available is set with Parameter 240.

122 Group 2 Paint Spray

to

128 Group 8 Paint Spray

As with Parameter 121, these parameters specify how to paint the hogs based on the sort group.

131 Gate 1 Pen Capacity

When the gate is sorting, it is very, very important to make sure that the gate does not attempt to cram more hogs into a pen than the pen has room for. Doing so will result in severe over-crowding and death.

This Parameter specifies how many hogs can be sorted to Gate 1. Gate 1 is the only gate that allows a value of "infi" (Infinity) to be specified (by running the capacity down to 0). Only use the infi setting if Gate 1 sorts hogs into the pen that leads back to the rear of the sorting gate. If the hogs have no way of leaving the pen that Gate 1 sorts to, then it is very important that Parameter 131 is set to a value that will cause the sorter to halt before over-crowding occurs.

132 Gate 2 Pen Capacity

to

138 Gate 8 Pen Capacity

As with Parameter 131, these parameters specify how many hogs each of the pens can hold. Some of these settings will be hidden if Parameter 210 is set to the typical 2 or 3 sorting gates. **Again, setting pen capacities is very important if you wish to avoid over-crowding conditions that will lead to loss of hogs.** Gates 2 to 8 can not be set to infi since the sorter assumes the operator must manually empty these pens and can then use the second screen of the Display Mode to clear all the pen counts.

139 At Cap Action

This selects how the scale is to respond when all of the sort pens have reached capacity. Normally, this parameter is set to **Close** so, the control switches to manual with front gate open and rear gate closed. When set to **Open**, once all capacities have been reached in the pens, the gate will sort to Pen 1 and both the front and rear gates will be open. This will only happen if the Capacity for Pen 1 is set to infinity, otherwise, the rear gate will be closed.

How the Sorter Responds to Pen Capacities:

It is important to know how the sorter will respond to pen capacities. There is a big difference to the way things work if Gate 1 has an infinite (infi) capacity or if it is limited. Please consider the 2 different cases:

Case 1: Gate 1 has Infinite Capacity (hogs can return to the rear gate of the sorting gate).

Example: When Gate 1 is set to infi, the gate will sort hogs until all of the other Gates are full (have reached their capacity limits). The best example for this is a 3-way gate. Let's assume Gate 1 Capacity is unlimited (infi) and Gate 2 has a capacity of 10 and Gate 3 has a capacity of 15. Let's assume 17 hogs have been sorted and that 3 went back to Gate 1 (fairly light hogs) and 10 went to Gate 2 and the remaining 4 went to Gate 3. The capacity for Gate 2 would now have been reached so the sorter will no longer allow hogs to be sorted to Gate 2. Any hog that should go to Gate 2 will be routed to Gate 1 instead. A "Capacity" error will be recorded and the entry in the history table will show this. It is also possible to look at the details to see that the hog should have gone to Gate 2 but went to Gate 1 instead. This will continue until another 11 hogs get sorted to Gate 3 in which case it, too, will have reached capacity. There is no longer any point in sorting hogs so the gate will switch to manual mode with the front gate open and the rear gate closed and the ****CAP**** indicator will be displayed in the lower right of the screen. A 2-way sorter will normally just switch to manual as soon as Gate 2 has reached capacity if Gate 1 has unlimited capacity.

Case 2: Gate 1 has Limited Capacity.

Example: When Gate 1 is set to a limiting value, the gate will stop sorting hogs as soon as any one of the capacity limits has been reached. Let's again consider a 3 way gate. This time, the capacity of Gate 1 is 10, Gate 2 is 10 and Gate 3 is 15. If 3 light hogs were sorted to Gate 1, 10 medium weight hogs to Gate 2 and 4 heavy hogs to Gate 3 then the Capacity of Gate 2 would have been reached. Because the next hog to enter the gate could be one that should go to Gate 2, the sorter must shut down in order to prevent putting hogs into the wrong gate by weight.

140 Time

Set the Time using this Parameter. Use 24 hour time (1:00pm to 11:00pm are set to 13:00 to 23:00. Midnight would be 0:00)

141 Date

Set the Date using this Parameter.

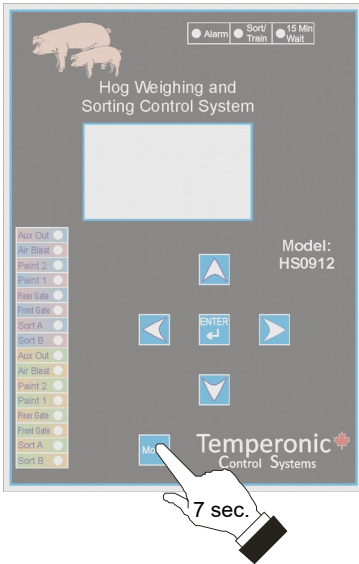
Hidden Settings:

To view or modify Hidden Settings,

Press and hold the **Mode** Button until the display shows the settings that begin with 200.

202→Weight Units=LB

See Page 6 for instructions on how to change Parameter values.



202 Weight Units

Use this Parameter to specify the weight units in either LB or KG. Note that this setting does not perform any conversion at all. It only changes the indicator to show LB or KG. All weight values will need to be entered based on the use of LB or KG. The user must determine which units to work in prior to performing the Zero and Tare operation. It is very important to perform the Tare operation using a known weight in LBS if LBS are the units to be used and if KG are the desired unit of measure, the Tare operation must be completed using a weight in KG. To change units, it will be necessary to re-tare the scale.

203 Animal Presence Sensor Input

Some scales are equipped with an animal presence sensor. If the scale has one, indicate which input the sensor has been wired to. The scale will then use the sensor to determine when the rear gate must be closed. If there is no such sensor or the sensor fails to function, this Parameter should be set to 0. When a sensor is present and working, the rear gate will close to begin the weighing process when the sensor detects an animal **or** when the scale reads a weight above the value in Parameter 101.

205 Number of Sorting Groups

Up to 8 sorting groups can be specified for this sort controller. Each group will define a specific weight range (as per Parameters 102 to 109). Once the groups are defined, the sorter can be instructed what to do with each group. This is best illustrated using an example.


Assume we wish to sort our hogs as follows: A very light hog is to be painted

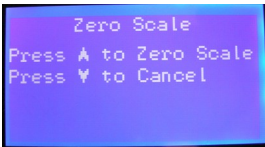
and sent to Gate 1 so we can put them on a special high-gain diet. Another set of hogs that are a bit heavier are to go to Gate 1 but not be painted. Near-market-weight hogs are to go to Gate 2 and at-market-weight hogs are to go to gate 2 and be painted. We would also like to paint over-weight hogs a different colour and send them to Gate 2. This is essentially 5 groups. 2 lighter groups that go to Gate 1 and 3 heavier groups to go to Gate 2. We paint 1 of the lighter groups with Paint 1, 1 of the heavier groups with Paint 1 and another heavy group with Paint 2. For this example, we would set Parameter 205 to 5.

206 Number of Load Cells


This sorter control can read 1 or 2 load cells independently. Since many models of gates have 2 load cells, it is advantageous to eliminate a summation / averaging circuit board and just wire the load cells both directly into the control unit. This has that added advantage of allowing the control to detect if the hog is near the rear load cell or front load cell. Use this parameter to specify how many load cells have been directly wired into the control unit. Note that the Tare operation for 2 load cells does require the weights to be placed near the rear of the sort gate and tare operation 1 completed. Then the weights will need to be moved to the front of the gate and the tare 2 operation completed.


207 Perform ZERO and TARE


Once the control has been wired up and is ready to go, the first process to take place must be a Zero and Tare. At this point, it is necessary to decide to use LB or KG as the unit of measure. The set of weights to be used must be known in the units of measure that is to be used for the sorting operation. Once the mass of the Tare Weight is known with some degree of accuracy, enter the value in Parameter 208. Begin by placing the sort gate into manual mode and then open the front and rear gates. Select Zero and press the  button at Parameter 207. The following screen will appear.

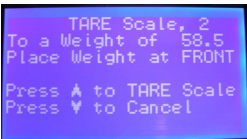


```
Zero Scale
Press ^ to Zero Scale
Press v to Cancel
```


Ensure that the scale is clear of animals and dirt. Also ensure that the scale will not be disturbed during the zero or tare process (keep the hogs well away from the scale so it won't be bumped or moved at all). Then press the  button and the zero process will take place.

After the zero is complete, place the Tare weight at the rear of the sort platform if the system is using 2 load cells or in the centre if using only 1 load cell. Select Parameter 207 and adjust the setting to Tare 1 and press the  button.

Ensure that the weights are on the scale platform and press the  button to begin the Tare process. As with the zero process, make sure the scale is not bumped or subject to any movement during the Tare process. With a 2 load-cell system, the following display will appear after the first Tare process takes place:



```
TARE Scale, 2
To a Weight of 58.5
Place Weight at FRONT
Press ^ to TARE Scale
Press v to Cancel
```

It is now necessary to move the weights from the rear of the platform to the front. Once the weights have been moved, press the  button to perform the second Taring operation.

Note that this sort control requires 2 Tare measurements in order to determine how to read the 2 separate load cells. It may seem at first that it would be

necessary to make sure all of the weight is on either the rear or front load cell in order for this to work properly. This is not the case however. As long as the 2 measurements are performed with the weights at 2 different locations, the control is able to determine the gain values needed for each of the 2 load cells. The more distance between each of the 2 measurements, the better but exactly where the weights are located doesn't really matter much as long as the weight is put in 2 different locations for each tare operation.

In the even that the Tare 1 operation is successful and then times out (2 minutes are allowed between Tare 1 and Tare 2), it is possible to go to Parameter 207 and Select Tare 2 to perform the second Tare operation at a later time.

Be sure to verify that the scale is reading weights reliably after the zero and tare operations.

208 TARE Weight

Accurately Determine the mass of the Tare weight to be used and enter it here. Make sure the tare weight has been entered using the weight units under which the scale is to operate. Changing units of measure will require the scale to be re-tared.

209 Specify Gate Out Relays

Since this sorting system can drive up to 8 Gates, it is necessary to define which of the outputs will be used for Sort Gate Selection. Place a 1 in each of the positions that represent a Sort Gate Output. The Outputs correspond with the Red LEDs on the left of the display panel. The left most digit is the upper most LED and the right most digit is the 8th LED down. LEDs 9-16 are copies of LEDs 1-8 (see the wiring diagram for more information). The following chart can help in determining which digit matches with which LED and wiring output. Since Gate Select outputs are Select A and Select B, Parameter 209 is normally set to **00000011**.

Parameter	LED	Digit	Output
	Aux	10000000	RLY1
249	Air Blast	01000000	RLY2
243	Paint 2	00100000	RLY3
241	Paint 1	00010000	RLY4
230	Front Gate	00001000	RLY5
234	Rear Gate	00000100	RLY6
209, 211, 213	Select A	00000010	RLY7
209, 211, 213	Select B	00000001	RLY8

210 Number of Sort Gates

Normally, this will be set to 2 or 3. 2 if this is a 2-way gate, 3 if it is a 3-way. The control will support up to 8 sort gates if someone comes up with a way to make this work mechanically. Changing this Parameter can cause a number of Parameters to be hidden or revealed.

211 Sort Gate 1 Relays

This parameter is in the same format as Parameter 209. Each of the '1's in Parameter 209 can be set to a 0 or a 1 for each of the different Sort Gates. In theory, all 8 possible Sort Gate selections could be made with just 3 digits. Normally, for a 2-way gate, Parameter 211 would be **00000000**. Since Gate 1 would be selected if all of the Gate Select Solenoids are off.

212 Sort Gate 1 Move Time

Specify how many seconds it takes for the Gate 1 Sort Gate to move into position. After the control sets the output to select Gate 1, it will pause for the amount of time specified here before opening the Front Gate.

213 Sort Gate 2 Relays

See Parameter 211 for some details on this setting. For a normal 2-way gate, this Parameter will usually be set to `00000001`. Since Gate 1 would be selected if the single Gate Select Output is turned on. It is always possible to swap what is found in Parameter 211 and 213 if the Sort Gate is going the wrong way. (remember only Gate 1 can be set to unlimited capacity [infi]),

214 Sort Gate 2 Move Time

Specify how many seconds it takes for the Gate 2 Sort Gate to move into position.

215 Sort Gate 3 Relays

216 Sort Gate 3 Move Time

to

225 Sort Gate 8 Relays

226 Sort Gate 8 Move Time

If enabled (via Parameter 210), it is possible to set the times and relays for up to 8 gates. Keep in mind that it is certainly possible to have some of these relay outputs set up to activate more than 1 relay at a time (eg. `00000011`)

230 Front Gate Relay

Indicate which of the output relays will cause the Front Gate to move open and closed. Normally, this will be set to `00001000`. So that output Relay 5 (or 13) will be used to activate the Front Gate. Note that some gates do not have a front gate but use the Sort Gate to provide sorting options as well as a closed condition. In such a case, be sure to set this Parameter to all 0's and the control system will adjust operation to use the sort gate for sorting and blocking exit from the gate. The system will assume that setting all Sort Gate Outputs (Parameter 209 to 0's will result in a closed front condition). If setting all Sort Gate Outputs to 0 does not properly select the closed condition or if the front gate is working backward (open when it should be closed), use Parameter 270 and 271 to invert output bits until the front gate closed condition works properly.

231 Front Gate Move Time

Specify how long it take for the front gate to move fully open or fully closed. Specify the longer of the 2 times. After moving the front gate in either direction, the control will wait for the amount of time specified in the Parameter before any other actions take place.

234 Rear Gate Relay

Indicate which of the output relays will cause the Rear Gate to move open and closed. Normally, this will be set to `00000100`. So that output Relay 6 (or 14) will be used to activate the Rear Gate. Again, Parameter 270 and 271 can be used to invert this output if the Rear Gate is operating in reverse (closed when it should be open).

235 Rear Gate Move Time

Specify how long it take for the rear gate to move fully open or fully closed.

236 Rear Gate Input Sensor Chan

Indicate which input has been used to detect a rear gate close condition. Some gates do not have a sensor on the rear gate. In this case, set this Parameter to 0 and the control will not attempt to check if the rear gate has closed properly. When set to a value 1..8, the control will attempt to close the rear gate for the time specified in Parameter 235. If the gate closes within that time, the control will carry on. If the gate does not close, it would indicate that an animal is likely stuck in the gate and the gate will re-open and then attempt to close again up to 3 times.

238 Front Gate Close Delay

This Parameter actually does something. After a weigh sequence and the scale reads a weight less than that of Parameter 110, the sort system will wait for the amount of time specified here before attempting to close the Front Gate. This gives the animal a bit of time to get clear of the Front Gate before it attempts to close.

240 Number of Paints

This control unit will support up to 4 different paints. Indicate with this Parameter how many paints will be used on this particular Sorting Gate.

241 Paint 1 Relay

This control unit will support up to 4 different paints. Indicate which output is used to apply Paint 1. A value of 0 will prevent the control from attempting to dispense Paint 1. Note that this value does match with RLY1..RLY8 as found in the chart for Parameter 209.

242 Paint 1 Time

Use this Parameter to define how long the Paint Output is activated for. If more paint is desired, increase the dispensing time. If less is needed, decrease the dispensing time.

243 Paint 2 Relay

244 Paint 2 Time

to

247 Paint 4 Relay

248 Paint 4 Time

Specify the Relays and Paint times for each of the Paint Outputs. Keep in mind that some of these parameter may not be visible (see Parameter 240).

249 Air Blast Relay

The sort control will encourage a hog to leave the gate once the Front Gate has been opened by activating the Output Relay specified here. The control waits about 3 seconds after opening the Front Gate. If the hog has not left the gate after 3 seconds, this output will be activated for about 0.5 seconds in an attempt to have the hog move along. This output could provide a blast of air. Just about anything could be connected to this output to encourage the hog to leave. If the gate is not equipped with any device designed to encourage the hog to leave, enter a value of 0 in this Parameter.

250 Scale Number

When connected to a PC for communication, the scale control will be identified by this number. If several scales are connected to the same communication loop, each scale must have a unique number.

252 Dim Display

This parameter specifies how many minutes the control will keep the display at full brightness. If no buttons are pressed for the length of time specified here, then the display will go dim and the control will return to the default display mode.

253 Display Contrast

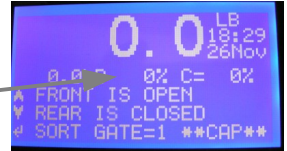
The LCD display on this control may be difficult to read at times. Adjusting the value in this parameter will change the contrast. Use some care in changing the value of this parameter since it can cause the display to be unreadable. Restoring Factory Settings will usually restore a readable display.

254 Number of Samples to Average

This control reads the load cells at about 30 times per second. When this Parameter is set to 24, weight readings are taken just a bit faster than once per second. If faster updates are desired, this Parameter can be set to a lower value like 12 or 8. Keep in mind that this allows for less-accurate readings and reduces the ability to detect noise in the weight readings but the scale will be able to respond a bit more quickly to weight changes. It is unlikely that this Parameter will need to be changed to something other than the factory value of 24.

255 Noise Calculation Divider

This control carefully tracks how noisy the weight readings are (the difference between the highest and lowest readings). On the display in display mode, noise is displayed in the centre of the second line



When a hog enters the gate and is moving around a fair bit, you would expect to see this noise value in the range of 10 to 50%. If an animal is in the gate (or you shake it yourself – mildly) and this value stays relatively low, decrease the value of Parameter 255 to $\frac{1}{2}$ to $\frac{1}{4}$ of what it was previously. If, on the other hand, the value reads 100% most of the time or readings are typically above 30 to 40%, increase the value in Parameter 255 (double or triple it) so that the readings are in the 20 to 40% range when an animal is moving around quite a bit. Some experimentation is required to ensure the control comes up with a reasonable value for Noise %. It is important to get this right because “noisy” weight readings are rejected from the averaging calculation and it will take the scale longer to come up with an acceptable weight if the noise % is reading too high. On the other hand, if noise readings are too low, the scale will come up with a weight reading quite quickly but it may not be very accurate. This Parameter is critical in reaching a balance between accuracy and weighing time.

256 Minimum Weighings to Avg

Normally, the control will wait till there are 4 good weighings before it will attempt to calculate the weight of a hog. This Parameter allows the minimum number of good weighings to be changed. A larger number will cause the weighing process to take longer but it will increase the accuracy of the weighing process. Normally, the value of 4 will work well but it is possible to experiment with this to attempt to find a balance between weighing speed and accuracy.

257 Zero

This Parameter works with the next 2 Parameters to define how the control system will automatically zero. When this Parameter is set to “Use Tared”, then the control will never attempt to re-zero the scale. This will work well as long as the operator checks the scale from time-to-time and performs a Zero using Parameter 207 when dirt or other factors cause the zero to drift. It is also a good idea to Tare the scale after significant changes (like moving the scale). When this Parameter is set to “Automatic” then the scale will have a quick look at the weight reading right after the Front Gate closes after a weighing event. If the weight of what should be an empty scale is beyond + or - the value in Parameter 258, then the scale will attempt a “Quick Zero” by taking readings for about 2 to 3 seconds. If the readings are low in noise (below Parameter 260) and don't shift around too much (below Parameter 261), then the scale will automatically adopt a new zero value. If the readings are too noisy or would cause a shift of more than the value in Parameter 259 from the latest Parameter 207 Zero Operation then the quick zero will be rejected and the scale will continue to use the current Zero data.

258 Do Zero When Beyond

When Parameter 257 is set to Automatic and the weight reading after the Front Gate closes is off by +/- the value of this Parameter, then a Quick Zero will be attempted. If successful, a Quick Zero history record will be recorded and the scale will use the new zero data.

259 Sort Zero Max Weight Shift

If the Quick Zero process comes up with an acceptable set of Zero data, the control will quickly calculate how much of a difference this represents in terms of LBS or KG from the last Zero that was performed using Parameter 207. If the weight shift exceeds the value specified by this Parameter 259, then the shift will be considered to be too extreme and the Quick Zero will be ignored. A Quick Zero Failed Record will be recorded in the History List.

260 Sort Zero Max Noise Allowed

When performing a Quick Zero, any weighings that have noise values above this Parameter will be rejected and not included in the Quick Zero Calculation.

261 Zero Max Dev. Allowed

When performing the Zero function from Parameter 207, this Parameter is used to determine the maximum allowable deviation in weight measurements. If the deviation is exceeded, then the zero process will fail.

262 Major Zero Max Noise Allowed

When performing a Zero from Parameter 207, any weighings that have noise values above this Parameter will be rejected and not included in the Zero Calculation.

264 Tare Max Dev. Allowed

When performing the Tare function from Parameter 207, this Parameter is used to determine the maximum allowable deviation in weight measurements. If the deviation is exceeded, then the tare process will fail.

265 Weighing Max Noise Allowed

When weighing a hog, any weighings that have noise values above this Parameter will be rejected and not included in the Weight Calculation. If this value is set too low, the weights will be inaccurate. If this value is set too high, a somewhat active hog will be kept in the sorting gate for a long time (up to the value of Parameter 267) and the weighing process will be considered to have failed. The noise levels are responsible for 50% of the confidence calculation when weighing takes place.

266 Weigh Max Dev. Allowed

When weighing a hog, the variation in weights will be compared to the value in this parameter and used to come up with a confidence calculation. 50% of the confidence value comes from the amount of variation between the weights. If this value is too high (more than 5.0) then deviations in the weighings will not

have much effect on the confidence calculation. If this value is too low (less than 1.5) then the confidence calculation will often be quite low due to a bit of deviation in the weight readings.

267 Weigh Fail Time-Out

A hog can not be kept in the sort gate indefinitely so this Parameter specifies the maximum number of seconds the scale will attempt to come up with a weight for a hog. After the amount of time specified here, the 32 readings stored in memory will all be averaged regardless of how much noise content there is and this will be used as the weight for the hog. A confidence of 0 will be used and the Weigh Fail counter will be increased.

268 Confidence Level Need

As indicated in Parameter 265 and 266, noise levels and weight deviations are used in a calculation to come up with a confidence value. When the sorter is “confident” of the accuracy of the weight based on these factors, the calculated weight will be used and the hog will be sorted. This Parameter indicate the level of confidence needed in order to perform the sort. Usually a value of 90 to 95% would be a good starting point. The next Parameter allows the Confidence Level to be reduced the longer the hog remains in the gate.

269 Confidence Reduction Factor

If Parameter 254 is set to 24, the control will take a weighing just a bit more often than once per second. The value in Parameter 269 will be subtracted from the Confidence Level Needed (Parameter 268) at each weighing so that the sort control will accept a “less confident” value as time goes on in order to sort the hog in the gate. A value of 0 in this Parameter will require the sorter to reach the confidence value in Parameter 267 before the hog will be sorted. A value of 1 will reduce the Confidence value about about 1% per second so if we start with a confidence level of 90%, after 30 seconds a value of 60% would allow the hog to be sorted. The confidence value calculated is stored with each sort record so it is possible to review the records and get an idea of what kind of confidence values are being calculated for the sorted hogs.

270 Invert Output 1-8 Relays

Equipment connected to the 5V signal-level outputs RLY1 to RLY8 may be operating opposite of what is needed (eg. Front Gate is open when it should be closed). Placing a 1 in the proper position in this Parameter will invert the output. See the chart at Parameter 209 to determine which bits to change.

271 Invert Output 9-16 Relays

This is identical to Parameter 270 except it applies to the equipment connected to the 12V relay or solenoid outputs RLY9 – RLY16.

272 Invert Input 1-8 Inputs

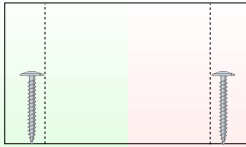
Animal presence sensors or the rear gate sensor wired up the inputs 1..4 may be presenting a signal which is not being registered correctly with the control. Placing a 1 in the proper place in this Parameter will cause the input signal to be inverted.

273 Diagnostics Level

When set to 0, few diagnostic messages will be recorded in the History List. When set to 4, all diagnostic messages will be recorded in the History List.

Control Mounting Instructions

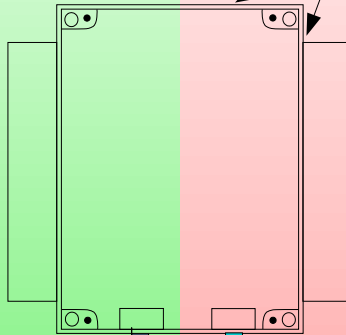
Mount to a flat, inside wall.



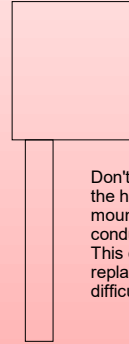
Don't Mount to an uneven wall. It will cause the box to warp and it will not seal well.
Don't Mount on an outside wall, the cool temperature can cause water to form inside the enclosure.



Don't drill holes in the top or side of the enclosure.



Leave at least 10" of space on the heat-sink side of the control.



Don't block access to the heat sink by mounting too close to conduit or boxes. This can make board replacements very difficult.

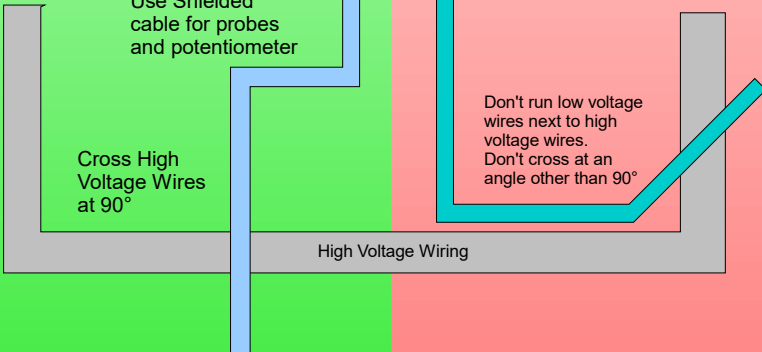
All Wiring Enters the Bottom of the Enclosure

Use Shielded cable for probes and potentiometer

Cross High Voltage Wires at 90°

Don't run low voltage wires next to high voltage wires. Don't cross at an angle other than 90°

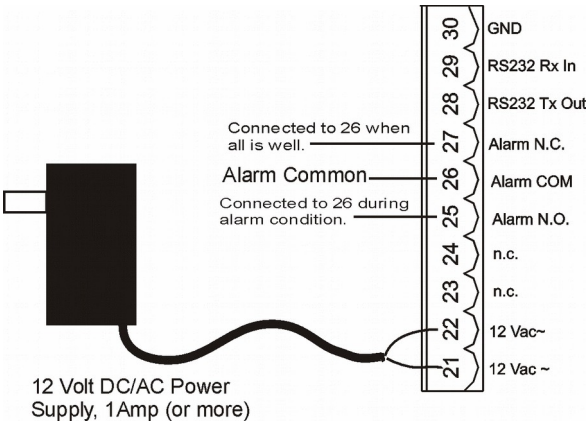
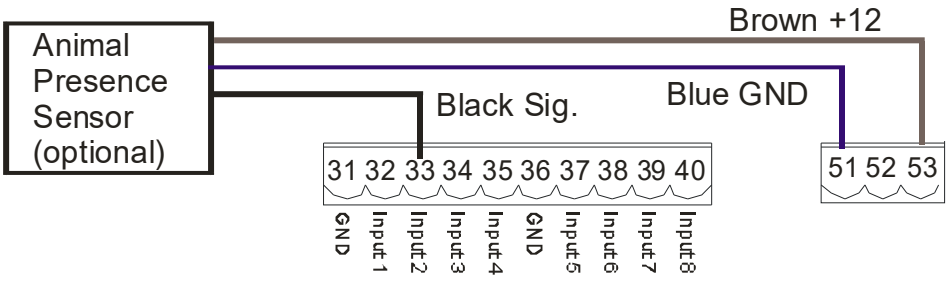
High Voltage Wiring



Do

Don't

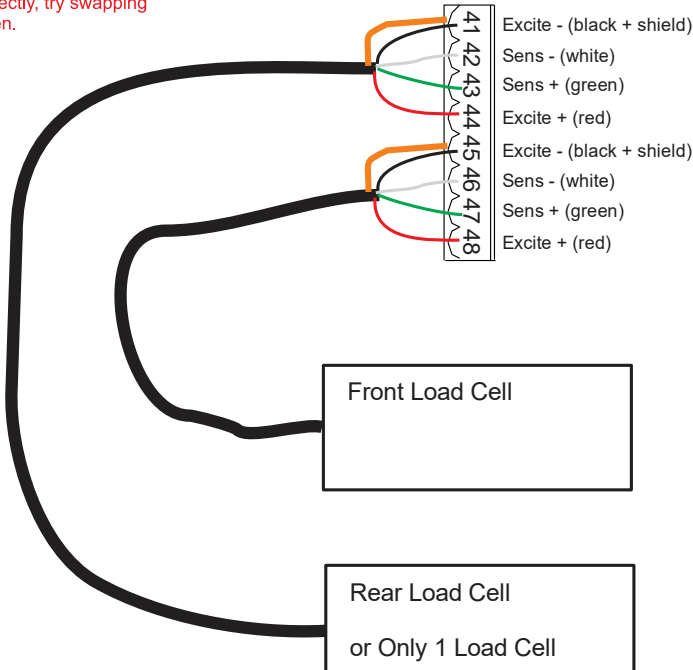
Wiring Diagrams



Load Cell Wiring

Some Load cells have a different colour sequence. If the load cell is not working correctly, try swapping red and green.

Load Cell Terminals 41 - 4



Computer Board viewed from back.

12V Relay Level
Output Connector
Terminals 11-20



12V Relay Level
Output Connector
Terminals 1-10



Load Cell
Terminals 41 - 48



Power and Alarm
Connector
Terminals 21-30



I/O Connector
Terminals 31 - 40



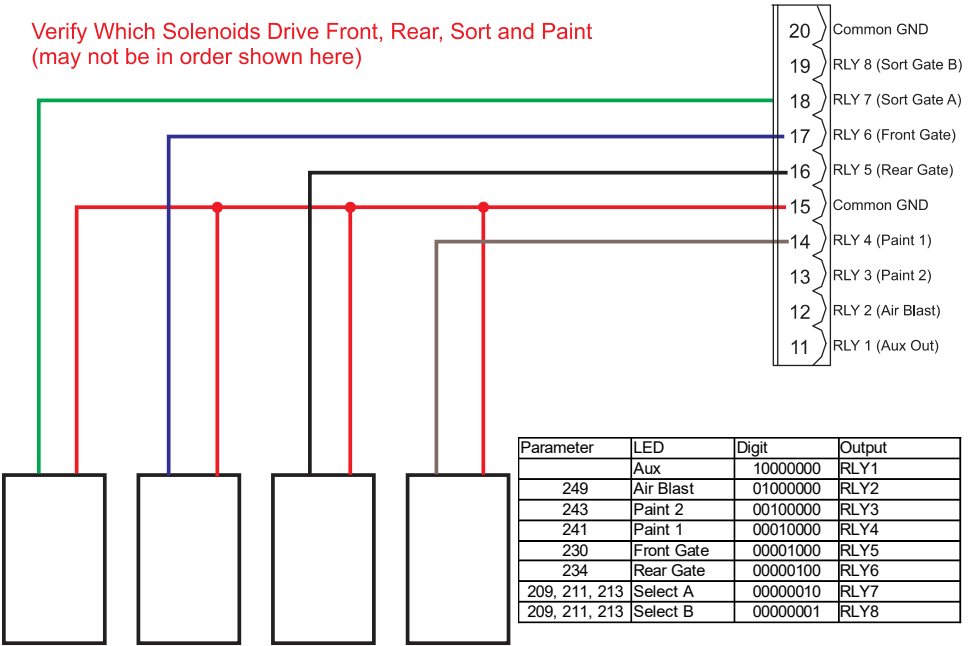
12V & 5V
Power



HS0912 WIRING DIAGRAM 12V Relay Outputs

- E, L, -

Verify Which Solenoids Drive Front, Rear, Sort and Paint
(may not be in order shown here)



Limited Warranty

Veldhuis Digital Engineering Ltd. hereby warrants that should this unit prove defective, Veldhuis Digital Engineering Ltd. will repair the unit free of charge but subject to the following conditions and a time period of 1 year at 100% coverage of parts and labour to repair or replace the unit as determined by Veldhuis Digital Engineering Ltd.. Veldhuis Digital Engineering Ltd. assumes no responsibility for losses resulting directly or indirectly from the use of this control unit beyond the replacement or repair of the control unit.

1. The unit must have been installed in accordance with the installation instructions contained in this manual, such that the contents of the control are protected from moisture and dust using liquid tight connections on all wiring into the control housing. Any holes cut into top or side of control enclosure void warranty of controller.
2. No modification of the control has been done by anyone other than qualified Veldhuis Digital Engineering Ltd. personnel.
3. The control unit must not have been subject to abuse, misuse or accident or operated other than as specified in this manual. Any decision on this condition by Veldhuis Digital Engineering Ltd. will be final.
4. Warranty will only be provided to the original purchaser of this product and proof of purchase must be provided at the time of a warranty request. Warranty period begins at date of manufacture as found on the control unit unless date of sale and serial numbers are clearly indicated on proof of purchase documents.
5. This warranty is only applicable to control unit HS0912
6. All shipping charges are the responsibility of the purchaser.
7. For best warranty service, return a defective control unit to your local dealer along with proof of purchase of the unit.

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