Elmer's
MANUFACTURING

HAULMASTER CONNECT

HAULMASTER PRO

OPERATOR'S MANUAL

ELMER'S MANUFACTURING
HM PRO CONTROLLER

WARRANTY POLICY

Elmer's Mfg. warrants against defects in construction or materials for a period of ONE year. We reserve the right to inspect and decide whether material or construction was faulty or whether abuse or accident voids our guarantee.

Warranty service must be performed by a dealer or service center authorized by Elmer's Mfg. to sell and/or service the type of product involved, which will use only new or re-manufactured parts or components furnished by Elmer's Mfg. Warranty service will be performed without charge to the purchaser for parts or labor based on the Warranty Labor Times schedule. Under no circumstance will allowable labor times extend beyond the maximum hours indicated in the Warranty Labor Times schedule for each warranty procedure. The purchaser will be responsible, however, for any service call and/or transportation of the product to and from the dealer or service center's place of business, for any premium charged for overtime labor requested by the purchaser, and for any service and/or maintenance not directly related to any defect covered under the warranty. Costs associated with equipment rental, product down time, or product disposal are not warrantable and will not be accepted under any circumstance.

Each warranty term begins on the date of product delivery to the purchaser. Under no circumstance will warranty be approved unless the product warranty registration card (attached to the inside of the Operator's Manual) has been properly completed and submitted to the equipment manufacturer. This Warranty is effective only if the warranty registration card is returned within 30 days of purchase. Please note that some countries (example, USA) require these warranty cards to be filled out to prove machine is in fact in the warranty period in order to allow us to perform any warranty work.

This warranty does not cover a component which fails, malfunctions or is damaged as a result of (i) improper modification or repair, (ii) accident, abuse or improper use, (iii) improper or insufficient maintenance, or (iv) normal wear or tear. This is a maintenance item that needs to be checked regularly by the operator. This warranty does not cover products that are previously owned and extends solely to the original purchaser of the product. Should the original purchaser sell or otherwise transfer this product to a third party, this Warranty does not transfer to the third party purchaser in any way. Elmer's Mfg. makes no warranty, express or implied, with respect to tires or other parts or accessories not manufactured by Elmer's Mfg. Warranties for these items, if any, are provided separately by their respective manufacturers. **THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS, IMPLIED OR STATUTORY, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE.**

In no event shall Elmer's Mfg. be liable for special, direct, incidental or consequential damages of any kind. The exclusive remedy under this Warranty shall be repair or replacement of the defective component at Elmer's Mfg's option. This is the entire agreement between Elmer's Mfg. and the Owner about warranty and no Elmer's Mfg. employee or dealer is authorized to make any additional warranty on behalf of Elmer's Mfg. The manufacturer reserves the right to make product design and material changes at any time without notice. They shall not incur any obligation or liability to incorporate such changes and improvements in products previously sold to any customer, nor shall they be obligated or liable for the replacement of previously sold products with products or parts incorporating such changes.

Contact your local Elmer's MFG dealer for any warranty assistance. Claims will be denied if the Warranty Registration Card has not been completed and returned. Warranty registration is also available on the Elmer's Manufacturing website at https://elmersmfg.com/warranty.

WARRANTY VOID IF NOT REGISTERED

TABLE OF CONTENTS

1 INTRODUCTION

Congratulations on your choice of the HM Connect/Pro system to compliment your Haulmaster Grain Cart. This equipment has been designed and manufactured to meet the needs of a discerning buyer for the control, monitoring, setting and operation of your Elmer's Haulmaster Grain Cart.

Safe, efficient and trouble free operation of your Elmer's HM Connect/Pro system requires that you and anyone else who will be operating or maintaining the machine, read and understand the Safety, Operation, Maintenance and Trouble Shooting information contained within the Operator's Manual.

This manual covers the Elmer's HM Connect and HM Pro systems. Use the Table of Contents as a guide to locate required information.

Keep this manual handy for frequent reference and to pass on to new operators or owners. Call your Elmer's Manufacturing distributor or Dealer if you need assistance, information or additional copies of the manuals.

OPERATOR ORIENTATION - The directions left, right, front and rear, as mentioned throughout this manual, are as seen from the tractor driver's seat and facing in the direction of travel.

1.1 CONNECT VS PRO

CONNECT

Haulmaster Connect was developed to be a simplified, grain cart focused, hub and brain of all electronic features. It features a Controller on the cart that connects the Scales, GPS and **Haulmaster PRO** to the operator using the supplied tablet.

FEATURES:

- Setting and data stored on controller.
- Direct connection to scales.
- Detailed load tracking (Crop, Field, Truck, Bin)
- No battery required.
- GPS load taggings.
- Multiple tablet connections (Cart, Truck, Combine).
- Export load data to email or Excel.
- Includes tablet, window mount and charger for turn key solution.
- John Deere Integration.
- Clearable Tare.
- INCLUDES:

PRO

Haulmaster PRO was developed with the vision of allowing the operator to maximize their unload experience without over-complicating the design. The more efficient the operator is at unloading, the quicker they can get to the next combine.

FEATURES:

- Industry leading adaptive auger Fold/Unfold Speed.
- Apply limits to you hydraulic movements for increased operator safety.
- Double tap to Fold/Unfold Auger.
- Joystick with proportional Spout Control.
- 4 way Spout axis movement.
- Auto Spout return to center on Auger Fold.
- Auto Gate close at 5 mph (8 kph).
- Auto Gate close at predefined truck weight.
- Simple connection with 1 hydraulic input and 7 pin plug power.
- Includes Haulmaster Connect.

1.2 HM CONNECT/PRO SYSTEM COMPONENTS

The HM system consists of a joystick (Pro only), tablet, Connect controller, two Merlins and Connect GPS. Each joystick assembly is equipped with a suction cup on its base that is used to mount to a window or flat surface where it is convenient and within the reach of the operator. A frame is provided to hold a tablet or phone with a suction cup on the base for attaching to a window appropriate for easy viewing by the operator.

The joystick is equipped with a power cord that plugs into the wiring harness that extends into the cab. Wi-Fi is used to communicate between the tablet and the Connect controller mounted on the back of the vertical auger frame tube.

a. Joystick (HM Pro Only)

b. Tablet Mount

c. Tablet

d. Connect Controller

e. Connect GPS

f. Joystick Mount (HM Pro Only) (not shown)

g. Two Merlins

FIG. 1 SYSTEM COMPONENTS

2 OPERATION

OPERATING SAFETY

- Read and understand the Operator's Manual and all safety signs before operating, servicing, adjusting, repairing or unplugging.
- This equipment is dangerous to children and persons unfamiliar with its operation. The operator should be a responsible adult familiar with farm machinery and trained in the Grain Cart's operations. Do not allow persons to operate or assemble this unit unless they have developed a thorough understanding of the safety precautions.
- Do not allow riders.
- Install and secure all guards and shields before starting or operating.
- Keep hands, feet, hair and clothing away from all moving and/or rotating parts.
- Place all controls in neutral, stop tractor engine, relieve hydraulic pressure, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
- Be aware of machine width. Use care when operating close to ditches, fences, hillsides and power levels.
- Stay away from overhead power lines when raising vertical auger to prevent electrocution. Electrocution can occur without direct contact.
- Have personnel on the ground outside grain cart when personnel are inside the compartment to assist if required.
- Clear the area of bystanders, especially small children, before starting.
- Keep away from driveline when engine is running. Keep others away.
- Do not enter compartment unless engine is OFF, ignition key removed and pressure in hydraulic system has been relieved.
- Keep all hydraulic lines, fittings and couplers tight and free of leaks before using.
- Clean reflectors, SMV and lights before transporting.
- Use hazard flashers on tractor when transporting.
- Review safety instructions with all operators annually.

2.1 TO THE NEW OPERATOR OR OWNER

The Elmer's HM Controller is designed to set, monitor, control and display all the Haulmaster Grain Cart functions for the operator. Be familiar with the machine before starting.

In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training of personnel involved in the operation, transport, maintenance and storage of equipment.

It is the responsibility of the owner or operator to read this manual and to train all other operators before they start working with the machine. Follow all safety instructions exactly. Safety is everyone's business. By following recommended procedures, a safe working environment is provided for the operator, bystanders and the area around the worksite. Untrained operators are not qualified to operate the machine.

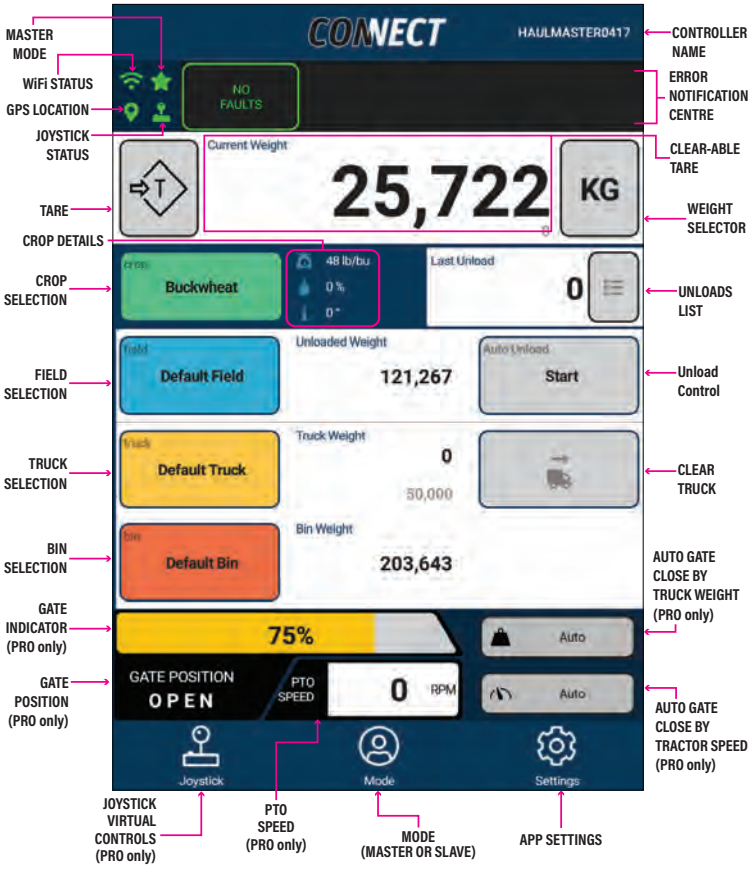
Many features incorporated into this machine are the result of suggestions made by customers like you. Read this manual carefully to learn how to operate the machine safely and how to set it to provide maximum efficiency. By following the operating instructions in conjunction with a good maintenance program, your HM Controller will provide many years of trouble-free service.

2.2 PRE-OPERATION CHECKLIST

Efficient and safe operation of the HM Pro Controller requires that each operator reads and understands the operating procedures and all related safety pre-cautions outlined in this section. A pre-operation checklist is provided for the operator. It is important for both the personal safety and maintaining the good mechanical condition of the HM Pro Controller that this checklist is followed.

Before operating the HM Pro Controller and each time thereafter, the following areas should be checked off:

1. Ensure the tablet has been fully charged.
2. Plug the tablet into a power source in the cab if required.
3. Ensure the joystick, Connect Controller, two Merlins and the GPS Controllers have been plugged into the wiring harness.
4. Ensure the tablet Wi-Fi systems have been enabled.
5. Ensure the tablet Wi-Fi systems have connected to the Connect Controller system on the cart frame.
6. Check that loadcell read outs in Parameter Readings.
7. Verify all Joystick movements are functioning. (**Pro Only**)
8. Verify PTO Speed registers on the app. (**Pro Only**)



2.3 CONTROLS

The HM Pro is a very user-friendly control system that provides a way for an operator to monitor and set the functioning parameters of the Haulmaster Grain Cart. Several position and angle sensors are used to monitor the positions of machine components. Load cells are used to measure the weight of the grain in the bin.

A tablet in the tractor cab is used to interface with the Connect Controller mounted on the back of the vertical auger frame tube. Each controller is powered by the system wiring harness and connects with all the sensors and load cells on the machine. A Connect GPS is mounted on the Grain Cart to provide location information to the system.

Each operator is required to mount the joystick and tablet frame in the cab using the suction cups on their bases to a window or flat surface. Mount in a position that is convenient to the operator during operation. Plug the joystick power cord into the wiring harness that extends into the tractor cab.

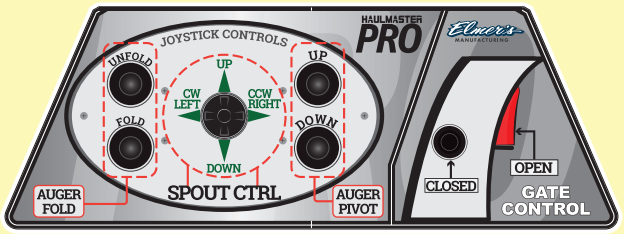
2.3.1 JOYSTICK CONTROL

The joystick control is mounted on a flat surface in the tractor cab in a location convenient to the operator. It is used to set and move all the mechanical parameters of the Grain Cart. Review this section with new operators and as often as required to stay familiar with the operational details. The switch functions are as follows:

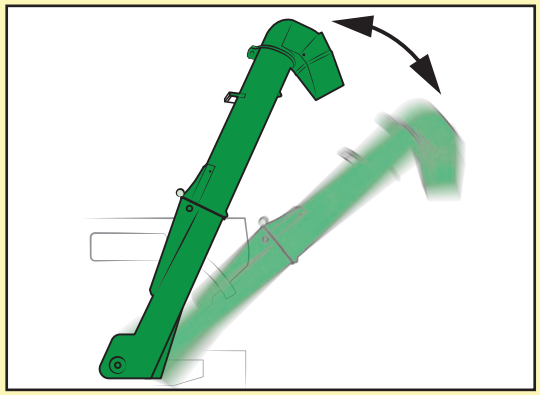
1. **Auger Pivot:**

    a. Depress and hold switch to pivot the vertical auger up. Release the switch and the vertical auger will stop moving.
    b. Depress the switch twice to place the system is in auto pivot up. Auto pivot up movement can be cancelled by a single press to pivot up or down joystick buttons. Disconnecting the joystick will cancel the movement in 0.5 seconds.
    c. Pivot down will stop when Min Pivot Down is reached.
    d. There is no Auto Pivot Down when the switch is double pressed for safety to the equipment.
    e. Pivot may also be activated by Auto Fold and Unfold if Pivot with Auto Fold and Unfold is enabled.
    f. See Limits for more details on Min Pivot and Auto Pivot.
    g. See Outputs to set Pivot hydraulic flow.

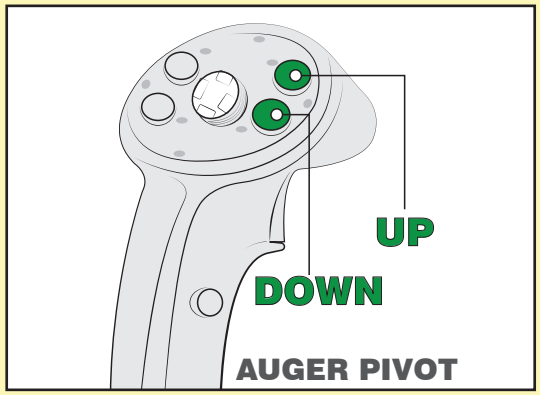
IMPORTANT



Joystick Controls Information Decal located on top of the Joystick



Pivot



Switches

FIG. 2 AUGER PIVOT

2. **Auger Unfold: Unfold will not work when the PTO Sensor detects speeds above 300 RPM:**

   a. Depress and hold the Unfold switch to raise auger into its unloading configuration. Release the switch and the unloading auger will stop moving.
   b. Depress the switch twice to place the system into its automatic mode and the unloading auger will move into its unloading configuration without the need to hold the switch. Automatic mode movement can be canceled by a single press to the Fold or Unfold joystick buttons. Disconnecting the Joystick will cancel the movement in 0.5 seconds.
   c. Pivot with Auto Fold and Unfold will affect double press movements.
   d. See Outputs to set hydraulics flow on Fold and Unfold.

3. **Auger Fold:** Folding will not work when PTO Sensor detects Speeds above 300 RPM. Auger Fold will move Z Spout to it's storage position before it will fold. If the Spout Z will not go into the storage position try Angle Sensor Calibration:

   a. Depress and hold Fold switch to lower auger into its stored configuration. Release the switch and the unloading auger will stop moving.
   b. Depress the switch twice to place the system into its automatic mode and the unloading auger will move into its stored configuration without the need to hold the switch. Automatic mode movement can be canceled by a single press to the Fold or Unfold joystick buttons. Disconnecting the Joystick will cancel the movement in 0.5 seconds.
   c. Pivot with Auto Fold and Unfold will affect double press movement. After completing the fold movements Pivot will move to it's Home Position. See Limits for details.
   d. See Outputs to set hydraulics flow on fold and unfold.

Auger Fold/Unfold Manual Override

In the event that joystick control is non-functional, manual control is available for folding and unfolding the auger. A manual valve control is located on the manifold block which is situated just behind the lower part of the auger between the auger and the tank. (Figure 3a).
WARNING. Due to the proximity of the valve to the auger, caution must be used to avoid pinch points. Always be aware of the movement of the auger when using the manual override.

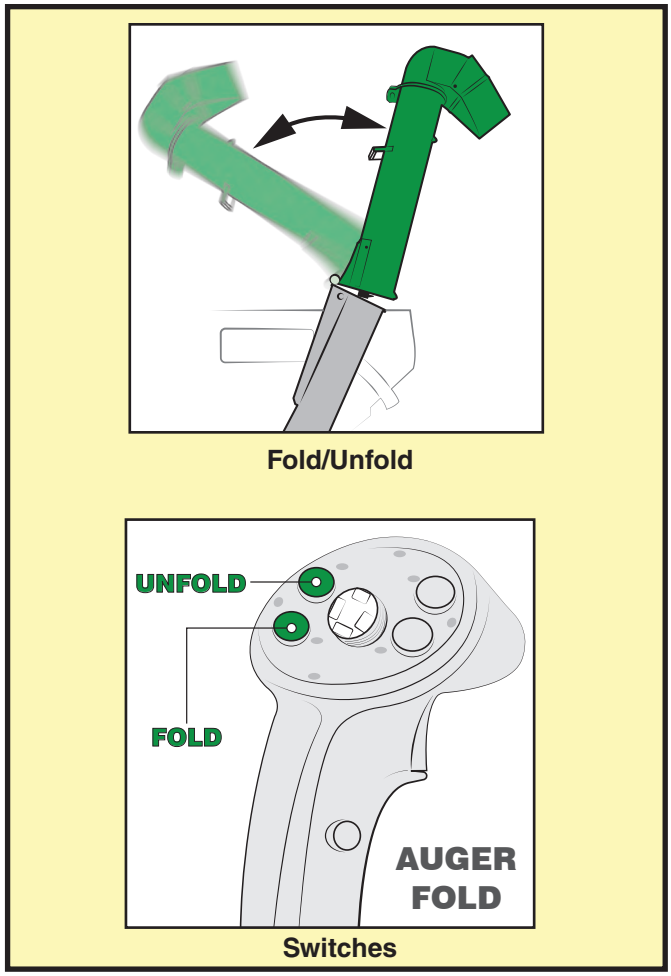


FIG. 3 UNLOADING AUGER FOLD/UNFOLD

FIG. 3a Manual Auger Fold/Unfold Valve

4. **Spout Position:**
This multi-switch control moves the spout on the end of the vertical auger to the operator's desired position. Spout Z control will only be active above 85% of auger unfolded position and auger fold or unfold have stopped. Z Spout will unlock in limp mode conditions. (**See 4.4.2 Limp Mode**)

a. Move and hold to the right side of the control to move the spout counter-clockwise.

b. Move and hold to the left side of the control to move the spout clockwise.

c. Move and hold to the top of the control to move the spout up.

d. Move and hold to the bottom of the control to move the spout down.

e. See Outputs to set hydraulic flow of the spout for regular movements and for spout home.

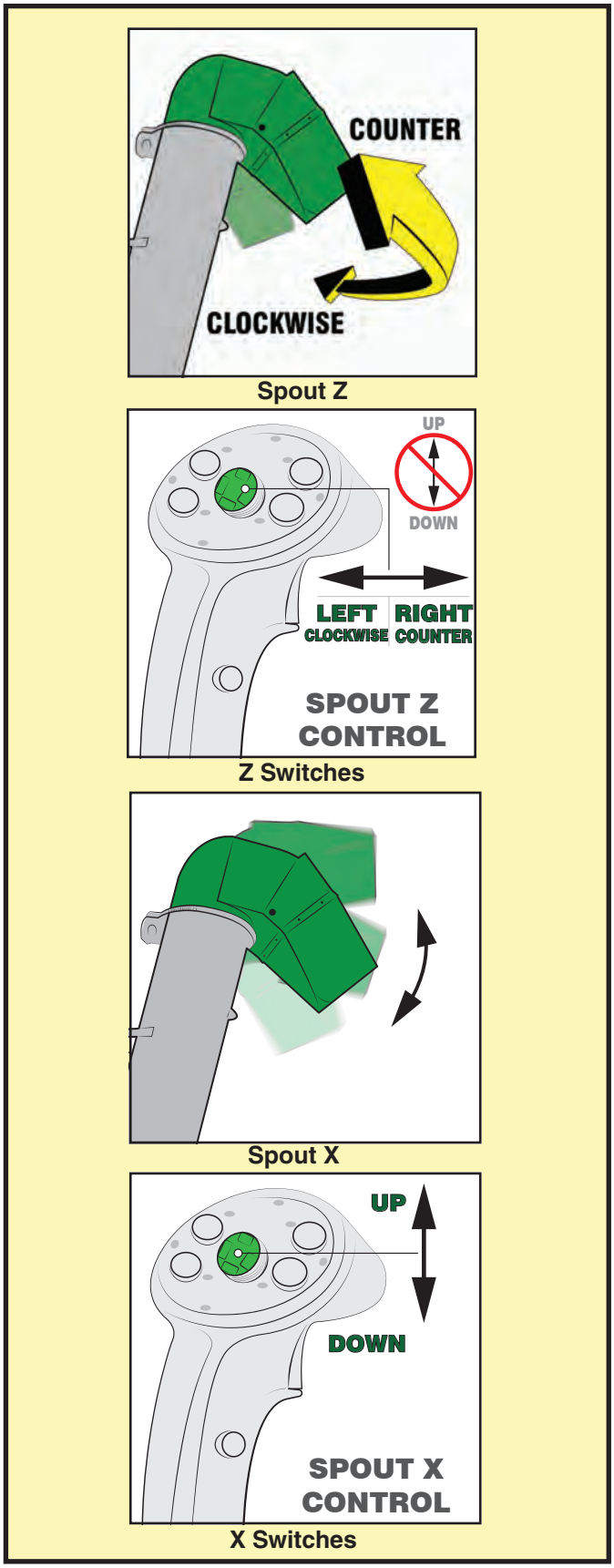


FIG. 4 SPOUT POSITION

5. **Gate Control:**
   This joystick is designed with 2 switches used to open and close the gate over the horizontal auger that removes grain from the compartment.

   a. Use your index finger to depress the switch on the front of the hand grip to open the gate. Opening the gate continues as long as the switch is depressed. Best results are obtained when the gate is opened slowly to avoid overloading the system. Watch the pointer on the front of the vertical auger to monitor gate position while unloading.

   b. Gate open will be limited by Max Gate Open. See Limits for more details.

   c. Depress and hold the switch on the side of the hand grip to close the gate. Always completely close the gate when the compartment is empty and before loading again.

   d. See Outputs to set hydraulic flow of the Gate.

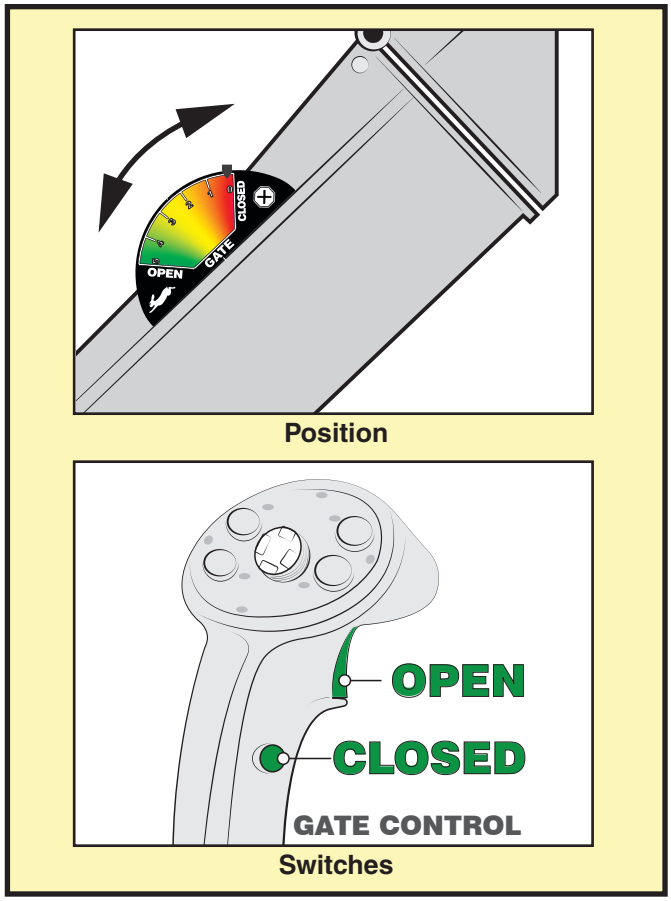


FIG. 5 GATE CONTROL

4.4.2 LIMP MODE

In limp mode the auger fold function will continue to work at a reduced speed. Warning Z storage is also disabled and Z can be moved in any position. Auto Unfold and Fold are disabled. This limp mode is provided as a means to have full control of the auger to be put into a travel position if an error happens. Limp mode will occur under the following conditions:

a. Angle Sensor Calibration not completed. If calibration is not completed the system cannot be operated safely.

b. Fold sensor is disconnected or damaged.

c. Z Sensor is disconnected or damaged.

OPERATING SAFETY

- Read and understand the Operator's Manual and all safety signs before operating, servicing, adjusting, repairing or unplugging.
- This equipment is dangerous to children and persons unfamiliar with its operation. The operator should be a responsible adult familiar with farm machinery and trained in the Grain Cart's operations. Do not allow persons to operate or assemble this unit unless they have developed a thorough understanding of the safety precautions.
- Do not allow riders.
- Install and secure all guards and shields before starting or operating.
- Keep hands, feet, hair and clothing away from all moving and/or rotating parts.
- Place all controls in neutral, stop tractor engine, relieve hydraulic pressure, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
- Be aware of machine width. Use care when operating close to ditches, fences, hillsides and power levels.
- Stay away from overhead power lines when raising vertical auger to prevent electrocution. Electrocution can occur without direct contact.
- Have personnel on the ground outside grain cart when personnel are inside the compartment to assist if required.
- Clear the area of bystanders, especially small children, before starting.
- Keep away from driveline when engine is running. Keep others away.
- Do not enter compartment unless engine is OFF, ignition key removed and pressure in hydraulic system has been relieved.
- Keep all hydraulic lines, fittings and couplers tight and free of leaks before using.
- Clean reflectors, SMV and lights before transporting.
- Use hazard flashers on tractor when transporting.
- Review safety instructions with all operators annually.

3.1 HM CONNECT

This section is compiled to identify the differences between **Haulmaster PRO** and **Connect**.

1. Haulmaster Connect doesn't have:

    a. Angle Sensors.
    b. Wheel Speed Sensor.
    c. PTO Speed Sensor.
    d. Joystick.

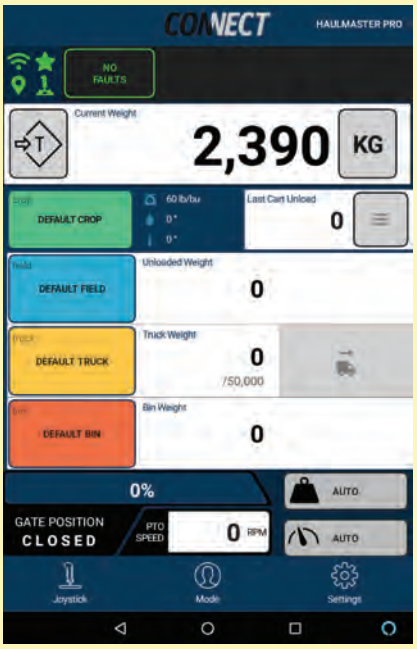


FIG. 6 HM PRO DASHBOARD

2. These items work the same:

    a. Tare function.
    b. Clearable tare.
    c. Crop.
    d. Last cart unload.
    e. Field.
    f. Truck.
    g. Bin.

FIG. 7 HM CONNECT DASHBOARD

3. If you try to go to joystick controls, this window appears explaining joystick is only available with HM Pro.

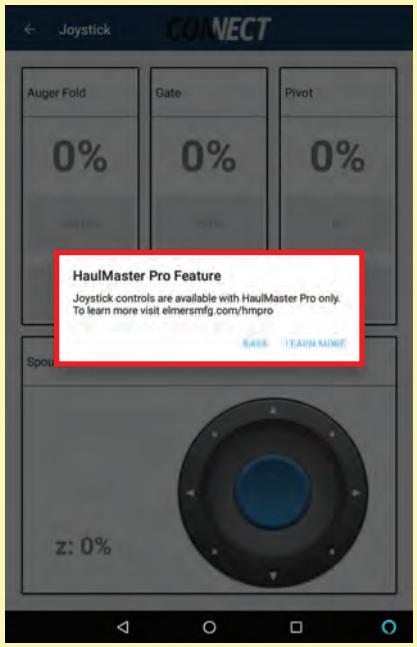


FIG. 8 JOYSTICK ALERT

4. Touch Learn More and you will be directed to the website elmersmfg.com/hmpro

FIG. 9 WEBSITE

5. Under Settings, Calibration, Angle Sensor Calibration is still accessible, but has no function for the HM Connect system.

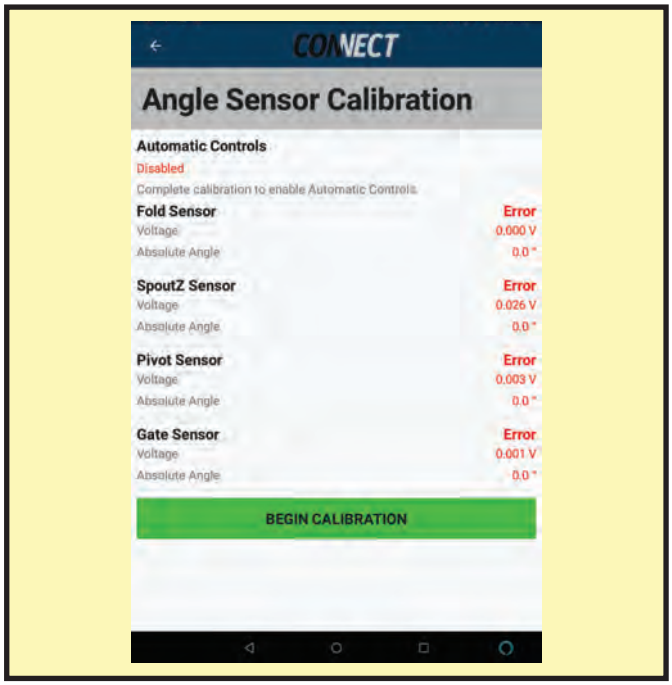


FIG. 10 ANGLE SENSOR CALIBRATION

6. From Settings page, go into Diagnostics, Parameters Readings. The following is visible, but not used by HM Connect.

   a. Wheel Speed.
   b. Odometer.
   c. PTO Speed.
   d. Machine Sensor Readings.
   e. Joystick Readings.

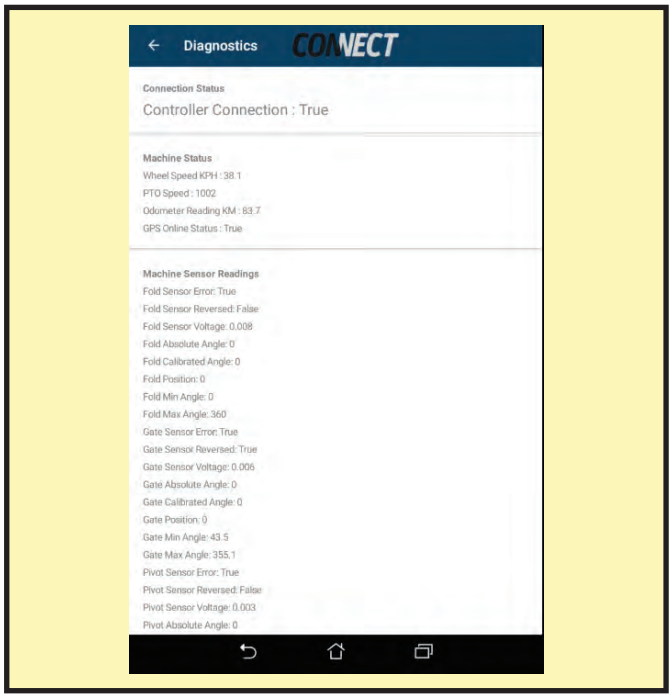


FIG. 11 DIAGNOSTICS

NOTE:
All auger arm operations will be done by individual hydraulic hoses to the tractor and not the Controller.

3.2 INITIALIZING A RESET CONTROLER

This describes the procedure to follow when first connecting to the HM system:

1. Mount tablet in the holder provided.
2. Turn tablet ON.
3. Open the HM Connect APP and you will see you are not connected to the Wi-Fi on the Controller.

FIG. 13 DASHBOARD - NOT CONNECTED

4. Swipe down from the top of the screen and go to Wi-Fi settings.

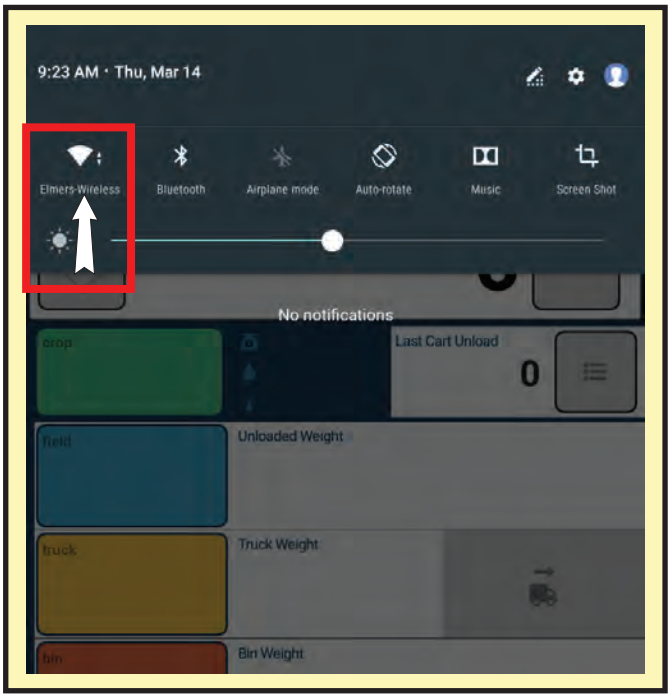


FIG. 12 WI-FI SETTINGS

5. The Wi-Fi selection screen will appear.

6. Touch the Haulmaster connection.

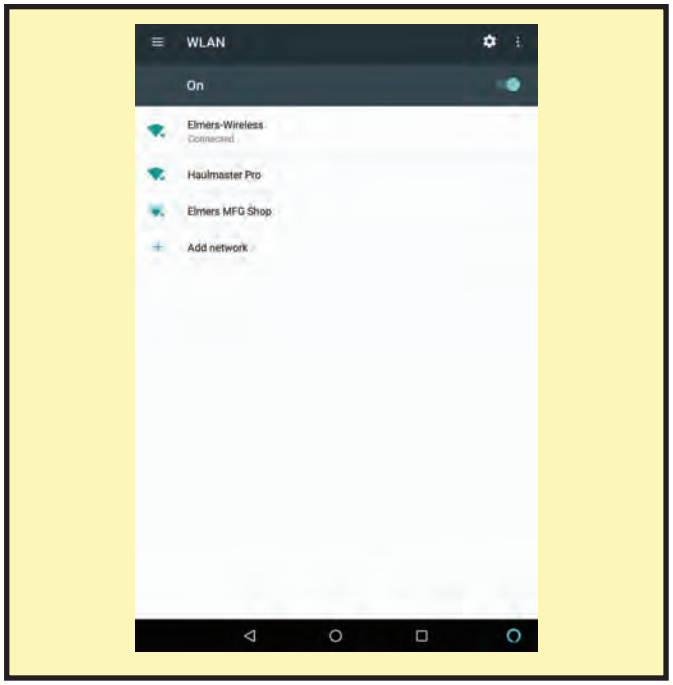


FIG. 14 WI-FI SELECTION

7. The Haulmaster system password screen and keyboard will appear. Enter the default password at this time: **haulmaster123** with the keyboard. Change to your password at your convenience later from settings in the HM Connect App.

8. Connect to the **HaulMaster- ###**. The connection will be made in a few seconds.

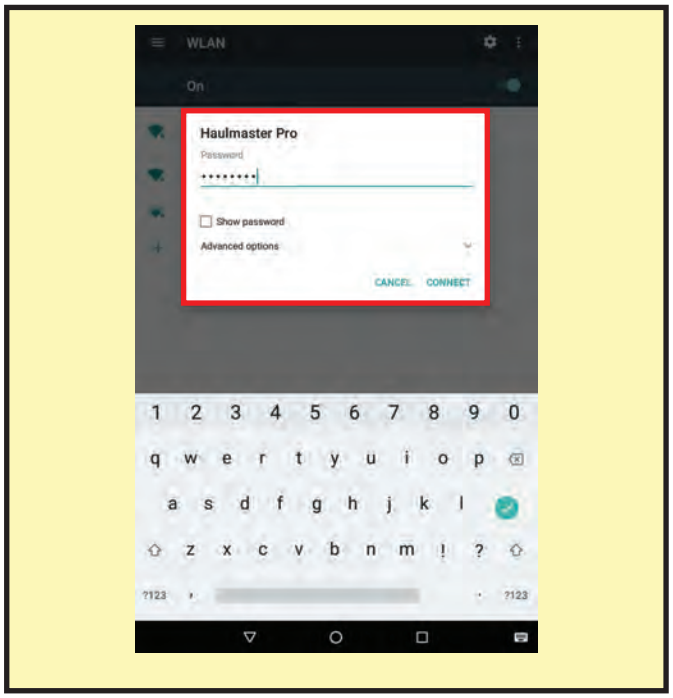


FIG. 15 PASSWORD

9. Go back to the App page and you will be prompted that the controller needs to be initialized.

10. Touch the Restore Page to go to next page.

If not connected as master you will be notified to take master control. Go to mode then request master connection. After getting master mode the prompt taking you to the restore page will appear.

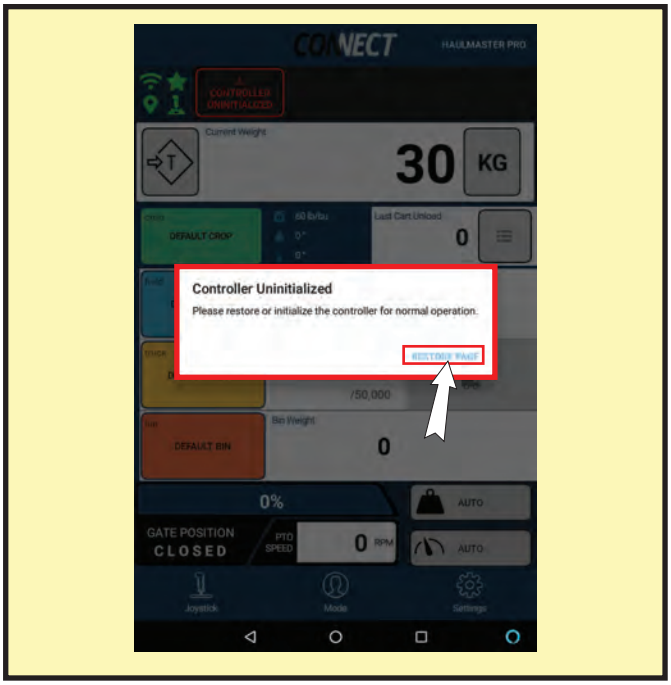


FIG. 16 APP PAGE - UNINITIALIZED

11. Touch the **INITIALIZE CONTROLLER** button.

12. Screen will inform you when the controller is initialized with "**Controller is already initialized**" and the green notification "**Initialize Success!**".

13. Save the Restore Data.

FIG. 17 RESTORE PAGE

14. Screen will inform user when Restore information has been saved with the green notification **"Restore Data Saved!"**

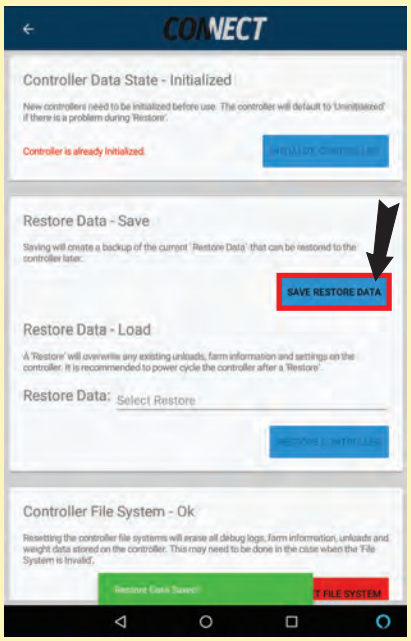


FIG. 18 RESTORE DATA SAVED

15. Touch **Select Restore** to view all the backup data including when you started and what you just saved.

16. Return to the Dashboard. This completes your first connection to the **HM Pro Controller**.

> **Note:**
> Controllers will come initialized and backed up from factory.

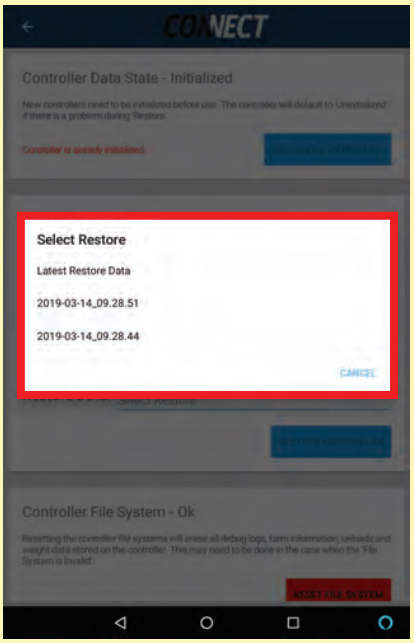


FIG. 19 SELECT RESTORE

3.3 DASHBOARD MISCELLANEOUS

This section will cover details of the Dashboard screen that hasn't been covered in other records:

1. Start with the Dashboard screen.

2. Bottom left corner is Gate Position. Numbers in the box indicate % opened. When fully opened, box will read 100% and box turns green. Any reading above 0% will read gate open and read gate closed at 0 %. The bar will incrementally fill in yellow.

3. The PTO Speed will display the PTO shaft speed recorded by the PTO Sensor.

4. The error notification center shows normal operation **No Faults** in green.

FIG. 20 DASHBOARD SENSOR DISPLAYS

5. When auger is unfolded, the error notification center would show Auger Unfolded in red. This alerts the operator that the auger is not properly folded if preparing for transport.

6. Another alert that can appear in the error notification center includes **Overload Front** or **Overload Rear**. When the weight on the hitch exceeds +/- 2,000 kg from the Tare hitch weight these warnings will appear.

FIG. 21 AUGER UNFOLDED, OVERLOADED

7. The red Controller Not Found message will appear in the error notification centre and the Wi-Fi antenna is red when the tablet is not connected to the HM Controller.

8. All readings that were displayed before disconnecting from controller will remain.

FIG. 22 CONTROLLER NOT FOUND

3.4 WEIGHT SETTINGS

To change the weight units, weight resolution and Tare the cart, follow these instructions:

1. From the Dashboard screen see that the weight is displayed in kilograms (**KG**).

2. Touch the square box (weight selector) with the **KG** in it. It can be changed to bushels (**BU**), tonnes (**T**) or pounds (**LBS**).

3. Touch settings in lower right corner to access the Settings screen.

FIG. 23 DASHBOARD

4. Touch **General** to access the General screen.

FIG. 24 SETTINGS

5. Touch the **Units** line to access a screen with the choice of units or step to select weight resolution.

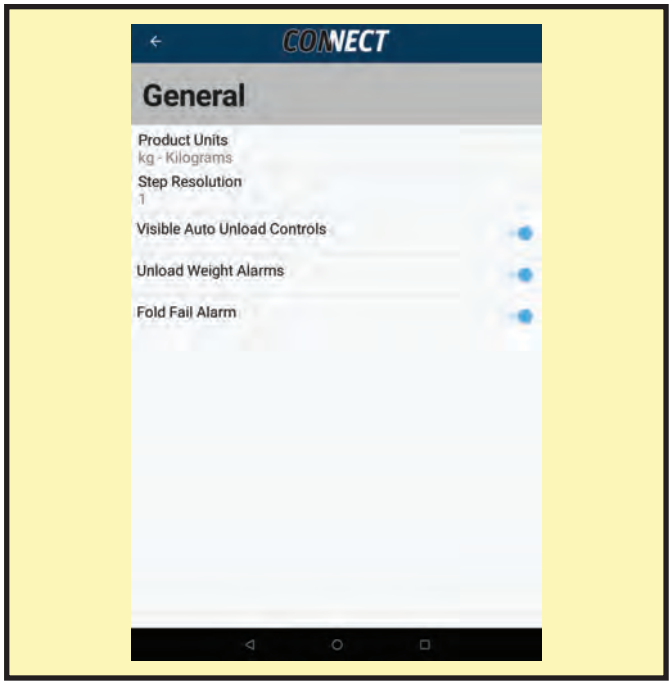


FIG. 25 GENERAL

6. Just like the dashboard you can select whether your weights are displayed in kilograms (**kg**), pounds (**lbs**), bushels (**bu**) or tonnes (**t**) by touching your desired weight unit.

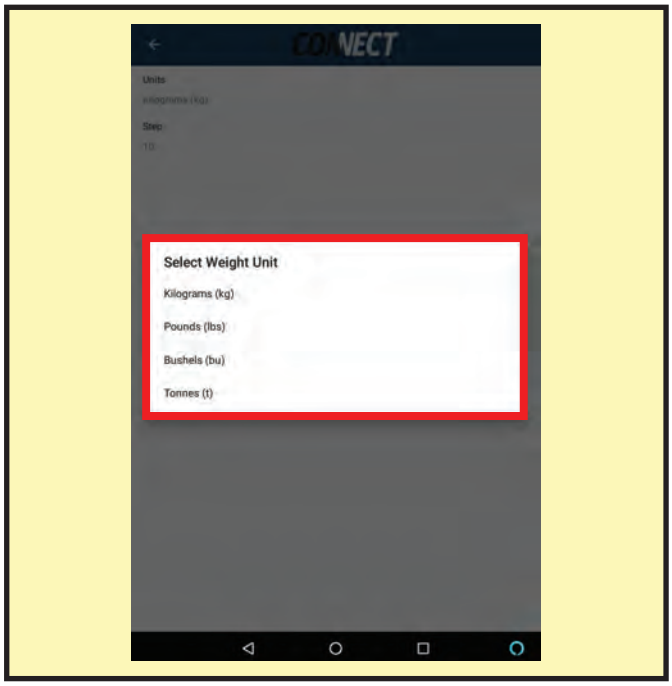


FIG. 26 WEIGHT UNITS

7. On weight settings screen, the step function can be selected to allow user to choose the accuracy of the units displayed.

8. Resolutions of 1, 10, 20, 50 and 100 can be chosen for kilograms and pounds. Bushels and tonnes are locked to a resolution of 1. A resolution of 1 for kg and lbs would mean the weight changes more because of its increased sensitivity to weight fluctuation.

FIG. 27 WEIGHT RESOLUTION

9. Touch the Tare to zero out any residual weight in the system

10. The system will ask if you are sure you would like to tare the current weight.

11. Cancel or Tare as appropriate.

12. When Tare is touched the Dashboard display will show a 0 weight. The Tare button is the saved set point for the cart.

13. Clearable Tare can be set by touching anywhere in the weight display. This tare will display a temporary tare point with the cart tare displayed in gray just beneath it.

14. Touch the weight display again to revert to the cart weight set point.

FIG. 28 TARE

3.5 CROP

This section will explain how to add, edit or delete crops:

1. Start with the Dashboard screen.

2. Touch the Crop button and the Select a Crop screen will appear.

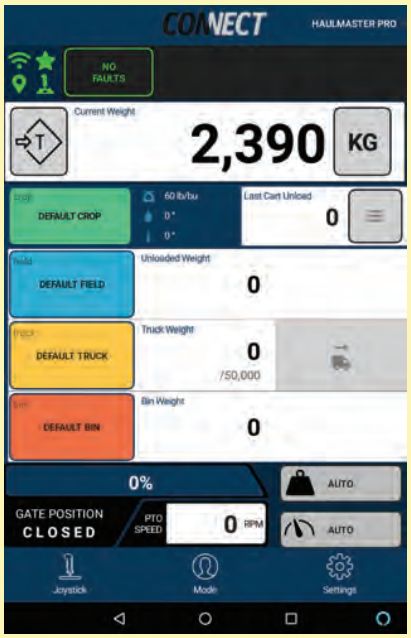


FIG. 29 DASHBOARD

3. Touch the **+** button and the New Crop screen will appear.

FIG. 30 SELECT A CROP

4. Touch the center of the Name box and the Enter New Crop Name and keyboard will appear.

FIG. 31 NEW CROP

5. Enter a crop name using the keyboard.

6. Touch Cancel or Save as appropriate.

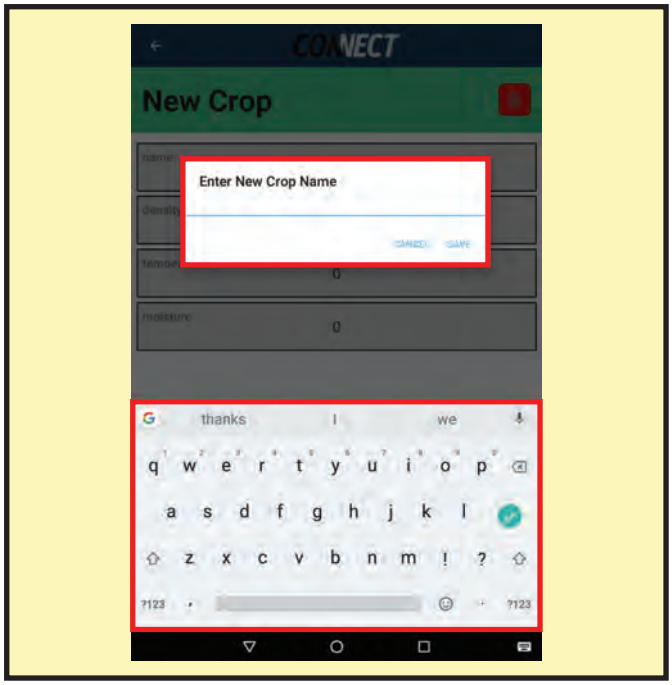


FIG. 32 ENTER NEW CROP NAME

7. Touch Density to display the Enter New Crop Density and keyboard screen.

8. Enter a density between 0.1 and 99. Density is in lb/bu and can have one decimal point accuracy.

9. Both Temperature and Moisture must be entered (each between 0 and 99) before New Crop information can be saved.

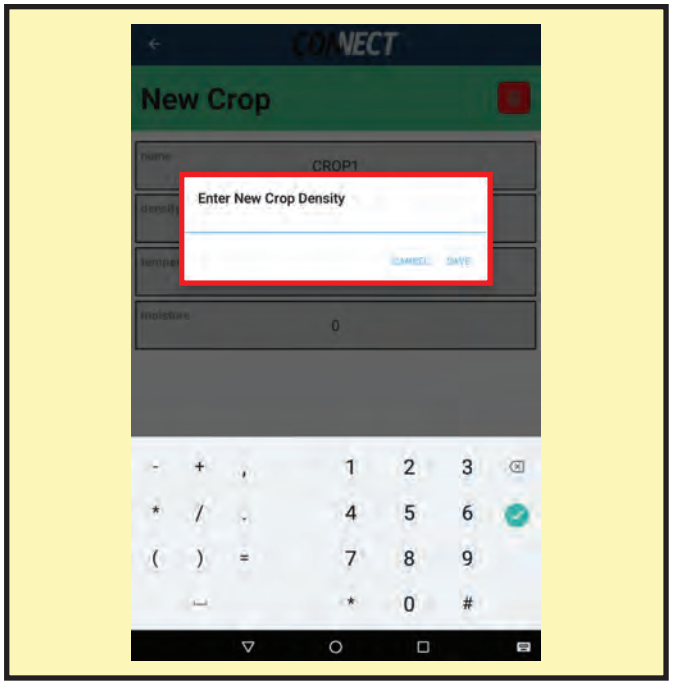


FIG. 33 ENTER CROP DENSITY

10. When the 4 lines are filled, touch Cancel or Save as appropriate.

11. If Cancel is touched, it will be as if nothing was done.

12. When Save is touched, information will be added to the Select a Crop list.

FIG. 34 NEW CROP

13. Scroll down the page and the New Crop and details will appear.

14. If you want to make the New Crop the active crop, touch the crop to highlight it and then touch Confirm Selection.

15. The Dashboard screen will appear, and the selected crop will be displayed.

16. From Select a Crop screen you can edit crop information.

17. Touch the green box on the right end of the line and the Edit Crop screen will appear.

FIG. 35 SELECT A CROP CONFIRMATION

18. Touch Name, Density, Temperature and Moisture lines to edit their values.

19. Cancel or Save as appropriate.

20. Touch the trash can to the right of Edit Crop line to delete the crop.

21. A prompt appears asking if you want to delete the Crop.

22. Cancel or Delete as appropriate.

23. Any of the pre-loaded crops cannot be deleted and their names cannot be edited, but you can edit their density, temperature and moisture.

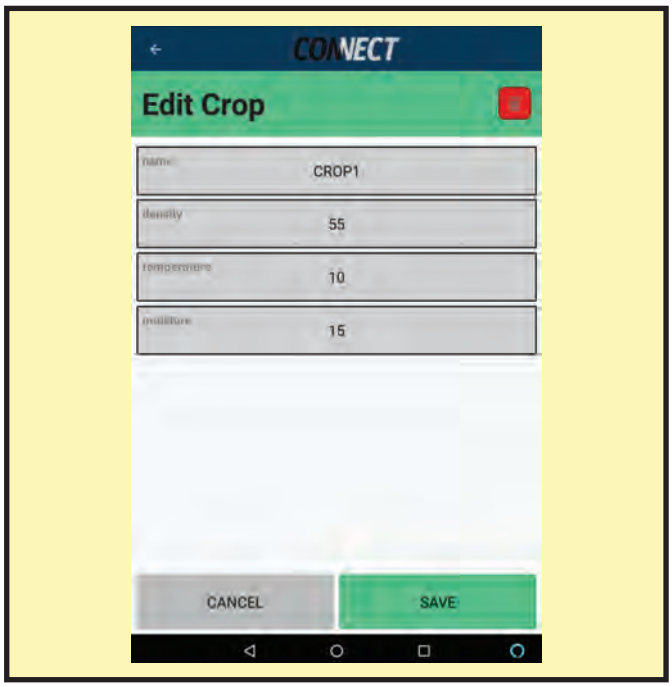


FIG. 36 EDIT CROP

3.6 FIELD

To add, edit or delete a field, follow this procedure:

1. Start with the Dashboard screen.
2. Touch the Field button and the Clients Farms Fields screen will appear.

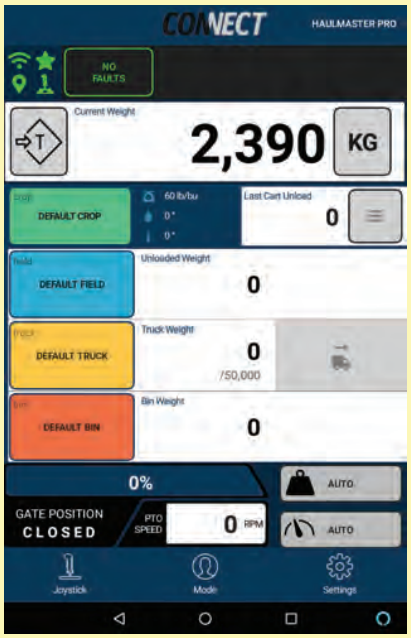


FIG. 37 DASHBOARD

3.6.1 CLIENT

1. Touch Client and the client list will appear.
2. Touch **+** button and the New Client screen will appear.

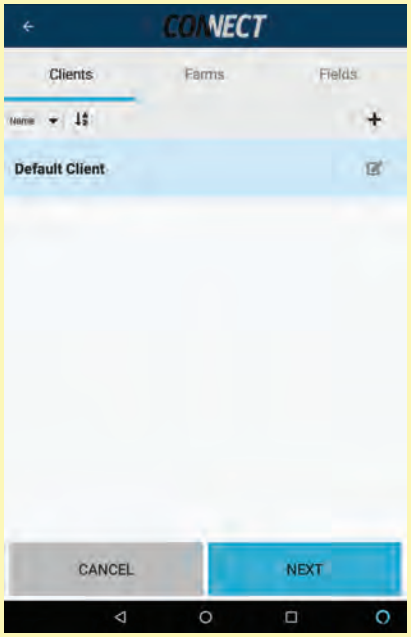


FIG. 38 CLIENT LIST

3. Touch the center of the Name box and the Enter New Client Name and keyboard will appear.

4. Enter a client name using the keyboard.

5. Touch Cancel or Save as appropriate.

6. When Save is touched, the New Client will be added to the Client list.

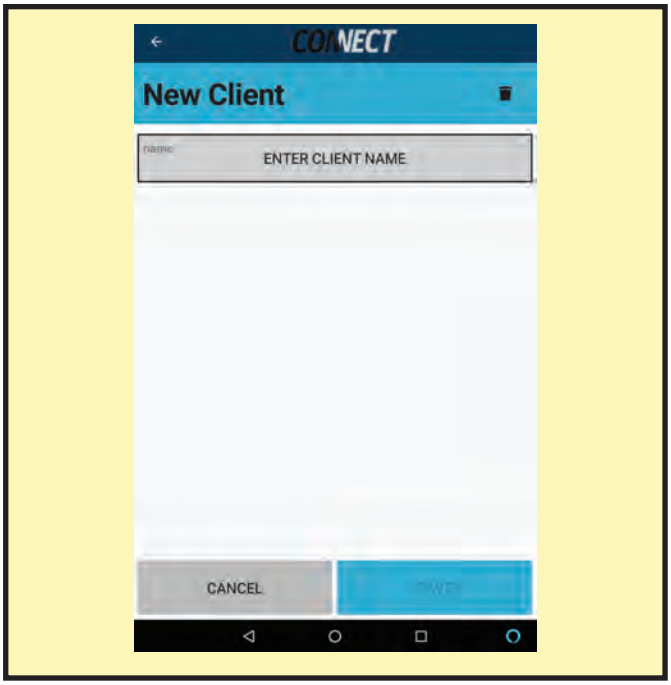


FIG. 39 NEW CLIENT

7. From the Client list you can edit the client name.

8. Touch the box with a crayon on the right end of the line and the Edit Client screen will appear.

9. Touch Name to edit the client name

10. Cancel or Save as appropriate.

11. Touch the trash can to the right of Edit Client to delete the client.

12. A prompt appears asking if you want to delete the client.

13. Cancel or Delete as appropriate.

14. If a farm references the client a prompt appears Cannot Delete Client. Farm exists that belong to this client. Move or delete these farms in order to delete this client.

FIG. 40 EDIT CLIENT

3.6.2 FARM

1. Touch Farm and the Farm list of the chosen client will appear.

2. Touch **+** button and the New Farm screen will appear.

FIG. 41 FARM LIST

3. Touch the center of the Name box and the Enter Farm Name and keyboard will appear.

4. Enter a Farm name using the keyboard.

5. Touch Cancel or Save as appropriate.

FIG. 42 NEW FARM

6. Touch the center of the Client box and a dropdown list of all created clients will appear. A farm is a sub category to the client in the hierarchy of Client, Farm, Field.

7. When Save is touched, the new farm will be added to the Farm list of the chosen client.

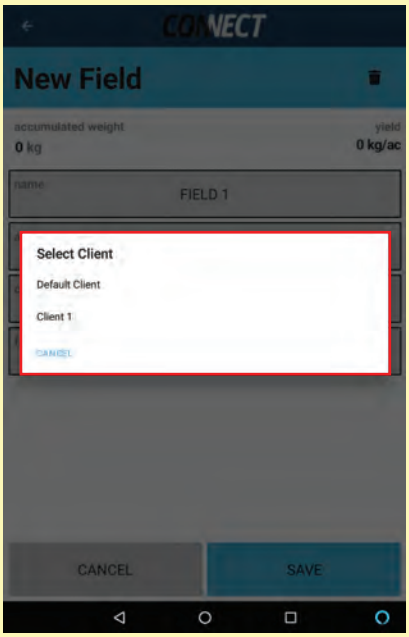


FIG. 43 FARM CLIENT SELECTION

8. From the Farm list you can edit the farm.

9. Touch the crayon on the right end of the line and the Edit Farm screen will appear.

10. Touch Name to edit the farm name.

11. Touch Client to choose another client the farm belongs to.

12. Cancel or Save as appropriate.

13. Touch the trash can to the right of Edit Client to delete the Farm

14. A prompt appears asking if you want to delete the farm.

15. Cancel or Delete as appropriate.

16. If a field references the farm a prompt appears Cannot Delete Farm. Field exists that belong to this Farm. Move or delete these fields in order to delete this farm.

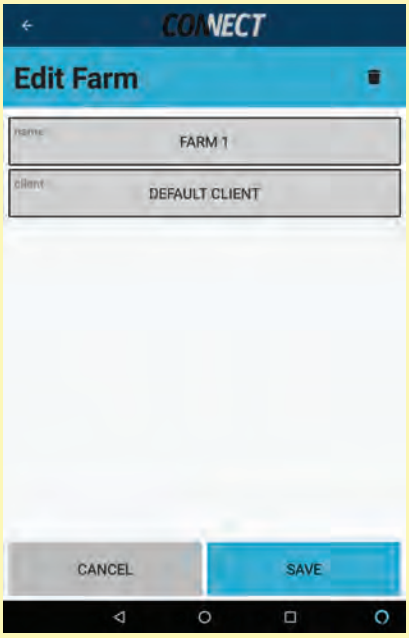


FIG. 44 EDIT FARM

3.6.3 FIELD

1. Touch Field and the Field list for the chosen farm will appear.

2. Touch **+** button and the New Field screen will appear.

FIG. 45 FIELD LIST

3. Touch the center of the Name box and the Enter Field Name and keyboard will appear.

4. Enter a field name using the keyboard.

5. Touch Cancel or Save as appropriate.

6. Touch the center of the Area box and enter the acreage of the field. Acreage is used to calculate the field yield based on accumulated weight from unloads.

7. Touch the center of the Client box and a dropdown list of all created clients will appear.

8. Touch the center of the Farm box and a dropdown list of all created farms for the chosen client will appear.

9. A field is a sub category to the farm in the hierarchy of Client, Farm, Field.

10. When Save is touched, the New Field will be added to the field list of the chosen farm.

11. From the Field list you can edit the field.

FIG. 46 NEW FIELD

12. Touch the square box with a crayon on the right end of the line and the Edit Field screen will appear.

13. Touch Name to edit the field name.

14. Touch Client or Farm to choose another client or farm the field belongs to.

15. Cancel or Save as appropriate.

16. Touch the trash can to the right of Edit Field to delete the field

17. A prompt appears asking if you want to delete the field.

18. Cancel or Delete as appropriate.

FIG. 47 EDIT FIELD

19. From the Dashboard selecting Field will bring you to the Client, Farm, Field Screen.

20. Starting at the Client list touch your desired Client box to highlight it and touch next.

21. Touch your desired Farm to highlight it and touch next.

22. Touch your desired Field to highlight it and confirm the selection box on the bottom.

23. Dashboard screen will appear and shows the selected field to be the active field. Return to this page and select the List button to view all Unloads pertaining to the field.

FIG. 48 SELECT A FIELD

3.7 TRUCK

This segment will address the truck topic and instruct on how you can add, edit or delete trucks and see a truck load summary.

1. Start with the Dashboard screen.

2. Touch the yellow Truck box to access the Select a Truck screen.

FIG. 49 DASHBOARD

3. Touch **+** button to access the New Truck screen.

FIG. 50 SELECT A TRUCK

4. Touch the center of the New Truck Name line to access Enter New Truck Name and keyboard screen.

5. Enter a truck name and touch save to return to New Truck screen where the truck name is entered in the name line.

6. Touch the center of the weight capacity box to enter their weight and volume. Weight units are based on the dashboard weight selector. Volume will be automatically calculated based on the weight capacity and the active crop density.

7. Touch Save to return to New Truck screen where the truck capacity is entered in the capacity line.

8. If you desire an audible and visual notification when an unload has surpassed a given value, enter the values for Weight Alarm 1-4. A value of 0 is ignored and no alarm will sound at 0. See General section where you can also silence the alarms for the device.

9. An accurate truck capacity is important if you are using Auto Gate Weight feature on HM Pro. Volume will not affect the Auto Gate Close by truck weight.

10. Touch Save at the bottom right corner of screen to return to Select a Truck screen and see the new truck has been added.

11. If you want to make the New Truck the active truck, touch the truck to highlight it and Confirm Selection.

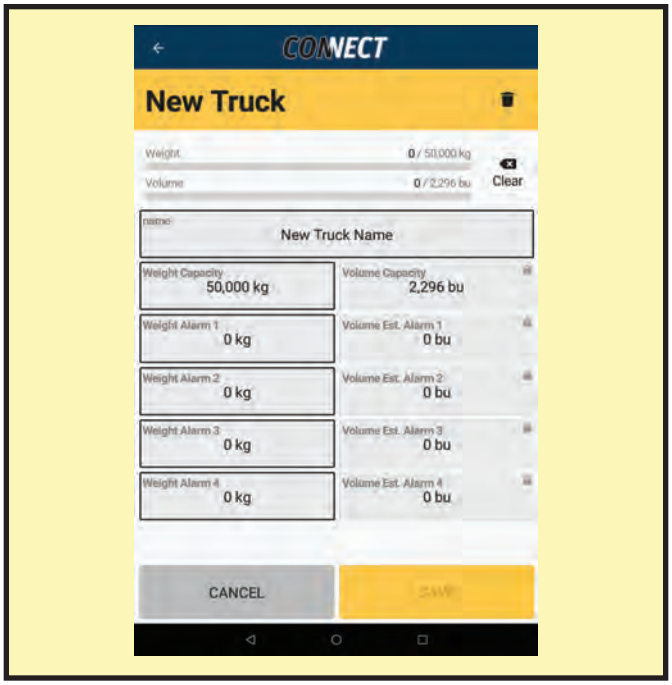


FIG. 51 NEW TRUCK

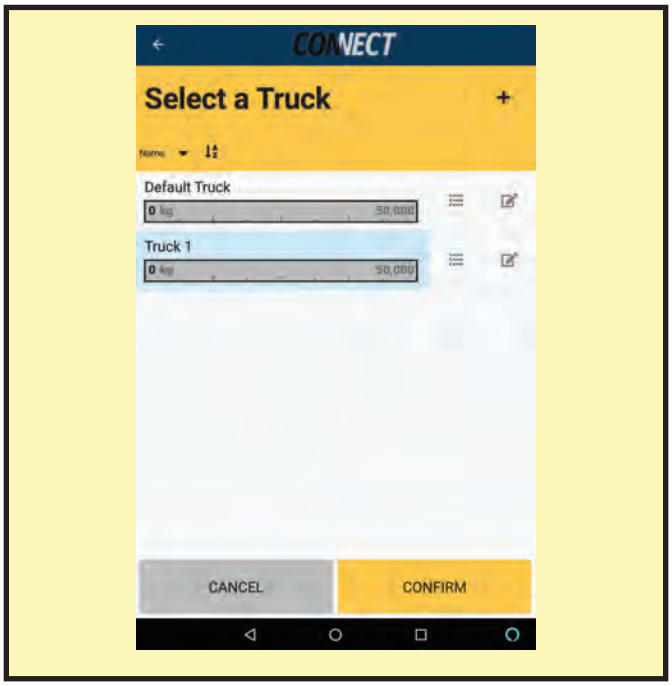


FIG. 52 SELECT A TRUCK CONFIRMATION

12. The Dashboard screen will appear, and the selected truck will be displayed.

13. From Select a Truck Screen touch the box with a crayon at the right end of the line to edit it and access the Edit Truck screen.

14. Touch Clear if you want to clear accumulated weight. The Clear Weight caption will appear asking if you are sure you want to clear the accumulated amounts.

15. Touch Cancel or Clear Truck as appropriate.

16. Touching Clear Weight will return your truck weight line to 0.

17. Touch Name, Capacity or Weight Alarms to edit their values.

18. Cancel or Save as appropriate.

19. Touch trash can to delete the truck.

20. The Delete Truck caption screen asking if you want to delete the truck will appear.

21. Touch Cancel or Delete Truck as appropriate.

22. From the Select a Truck screen press the list symbol between the weight bar and edit symbol to access the Truckloads screen.

FIG. 53 EDIT TRUCK

FIG. 54 SELECT A TRUCK

23. Touch the drop down arrow next to the truck name to select the desired truck.

24. The Truckload list provides a summary of all unloads into that truck.

FIG. 55 TRUCKLOADS

25. Truck weight can also be cleared by selecting a new truck in the same manner as select a truck confirmation or from the dashboard by tapping the Clear Truck symbol.

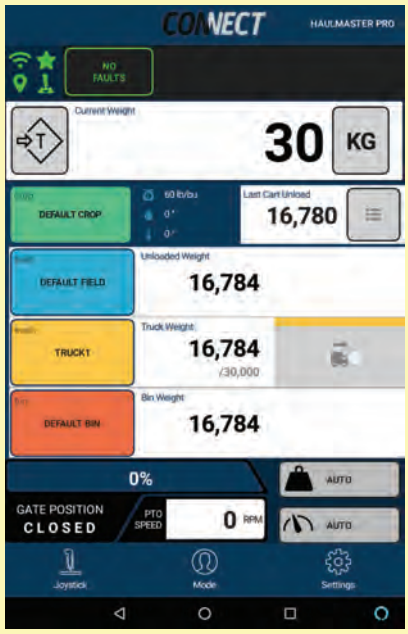


FIG. 56 DASHBOARD CLEAR TRUCK WEIGHT

3.8 BINS

This feature will explain how to add, edit or delete bins and bin transfers:

1. Start with the Dashboard screen.

2. Touch the orange Bin box to access the Select a Bin screen.

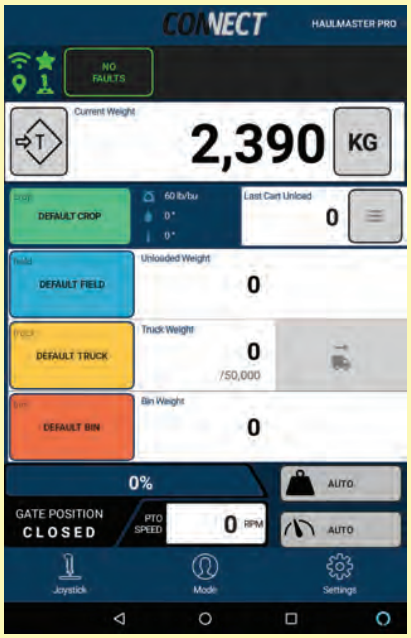


FIG. 57 DASHBOARD

3. Touch the **+** button to access the New Bin screen.

FIG. 58 SELECT A BIN

4. Touch the center of the New Bin Name line to access Enter New Bin Name and keyboard screen.

5. Enter a bin name and touch save to return to New Bin screen where the bin name is entered in name line.

6. Touch the center of the capacity boxes to enter their weight and volume. Weight units are based on the dashboard weight selector.

7. Enter the bin capacities and touch Save to return to New Bin screen where the bin capacity is entered in the capacity line.

8. Touch Save at the bottom right corner of screen to return to Select a Bin screen and see the new bin has been added.

FIG. 59 NEW BIN

9. If you want to make the New Bin the active bin, touch the bin to highlight it and Confirm Selection.

10. The Dashboard screen will appear, and the selected bin will be displayed.

FIG. 60 SELECT A BIN CONFIRMATION

11. From Select a Bin Screen touch the box with a crayon at the right end of the line to edit it and access the Edit Bin screen.

12. Touch Name or Capacities to edit their values.

13. Cancel or Save as appropriate.

14. Touch the trash can to delete the bin.

15. The Delete Bin caption screen asking if you want to delete the bin will appear.

16. Touch Cancel or Delete the bin as appropriate.

FIG. 61 EDIT BIN

17. From the Select a Bin screen press the arrows pointing left and right symbol to access the Bin Transfers screen.

FIG. 62 SELECT A BIN

18. Touch the drop-down arrow to filter transfers by incoming, outgoing or all.

19. Touch **+** button to access the New Transfer screen.

FIG. 63 BIN TRANSFERS

20. Touch the source bin box displayed as Default Bin in the figure, to access the Select a Bin screen to select the source bin.

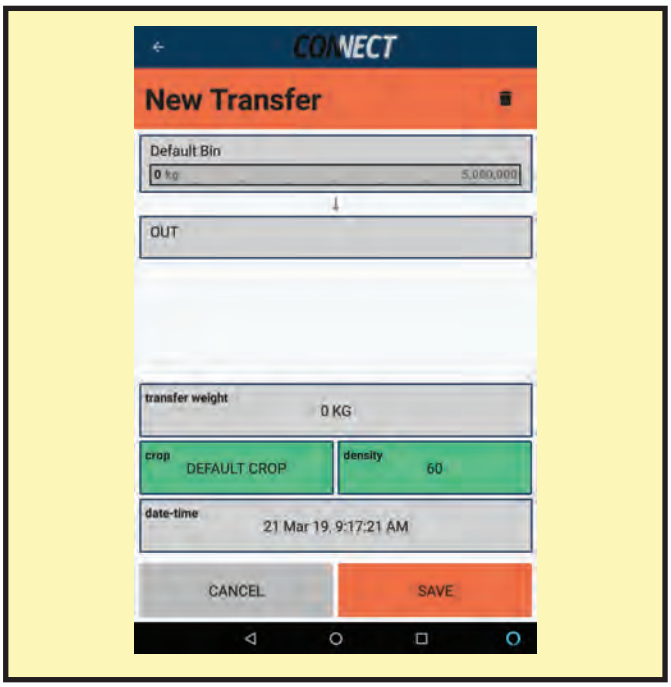


FIG. 64 NEW TRANSFER

21. Touch the desired source bin to highlight it and touch Confirm Selection.

22. The source bin will change to the selected bin in the New Transfers screen.

23. Repeat for the destination bin.

24. The OUT bin is a non-accumulating destination or source. OUT is not available to be used as an active bin on the Dashboard.

FIG. 65 TRANSFERS SELECT A BIN

25. Touch the Transfer Weight box to access the Enter Transfer Weight and keyboard screen. Units are based on the Dashboard selected unit.

26. Enter the weight being transferred.

27. Touch Cancel or Ok as appropriate.

28. Touch the Crop box to access the Select a Crop list.

29. Touch the crop to highlight it and Confirm Selection.

30. Touch density to edit the crop density, this will only edit density for this transfer.

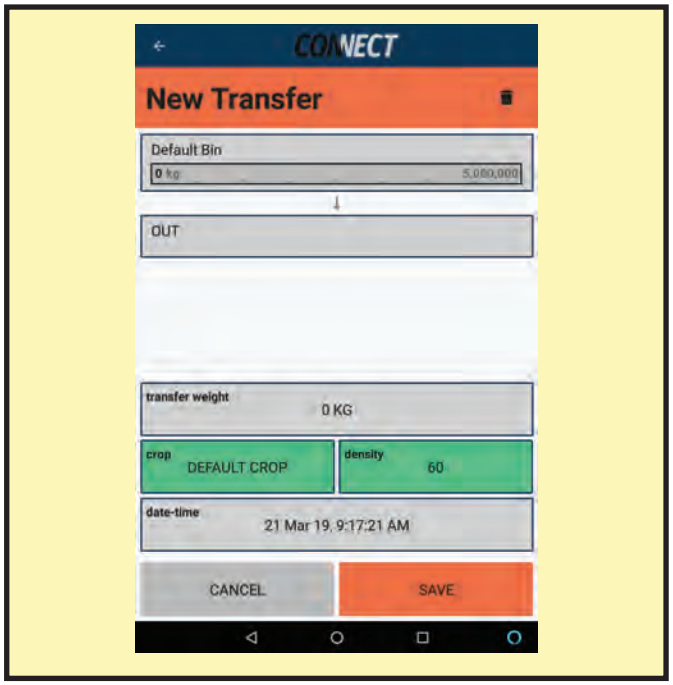


FIG. 66 NEW TRANSFER

31. Touch Date-Time to access Select Transfer Date Calendar.

32. Touch the left or right arrow to scroll by month and touch the desired day. They selected date will highlighted yellow.

33. Touch Cancel or OK as appropriate.

FIG. 67 TRANSFER DATE

34. Touching OK will access the Select Transfer Time clock.

35. Touch or scroll the clock hand to the desired hour. Releasing the hour hand will move the time to the minute hand.

36. Touch or scroll the clock hand to the desired minute.

37. Touch the number for the hour to return to the hour hand.

38. Touch **AM** or **PM** for the desired 12-hour period.

39. Touch Cancel or OK as appropriate.

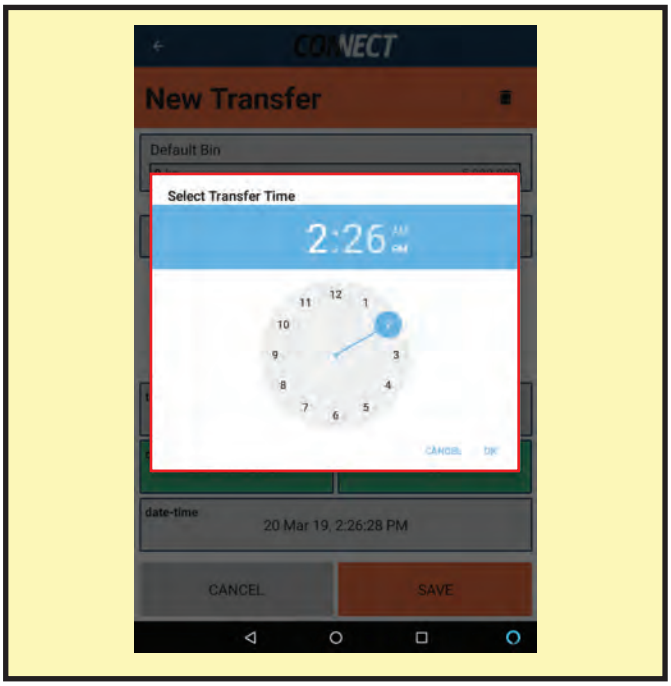


FIG. 68 TRANSFER TIME

40. Touch Save on the New Transfer screen to access the Transfer Summary screen.

41. Touching the back arrow in the top left corner will return you to the New Transfer screen if changes are needed before confirming.

42. Touch Cancel or Confirm as appropriate.

43. This will return you to the Transfer list of the originally chosen bin.

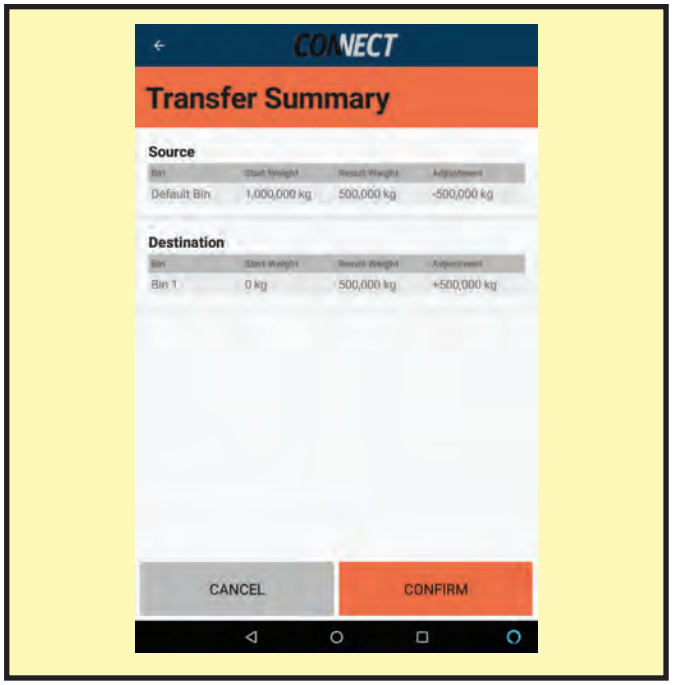


FIG. 69 TRANSFER SUMMARY

44. From the Bin Transfer screen touch the box with a crayon at the right end of the line to edit it and access Edit Transfer screen.

45. Touch the source bin, destination bin, transfer weight, crop, density or date-time to edit their values.

46. Cancel or Save as appropriate.

47. Touch the trash can to delete the transfer.

48. This will bring you to the Transfer Summary screen to show you the resulting weights of deleting the transfer.

49. Touch Cancel or Confirm as appropriate.

50. The Delete Transfer caption screen asking if you want to delete the bin will appear.

51. Touch Cancel or Delete as appropriate.

FIG. 70 EDIT TRANSFER

3.9 UNLOAD LIST

This feature will explain how to add, edit or delete unloads.

> **NOTE:**
> Unloads are automatically detected by weight detection methods. The unloads will log the crop, moisture, temperature, client, farm, field, truck, bin, start time, end time, GPS coordinates and calibration factor when an unload is detected.

1. Start with the Dashboard screen.

2. Touch the List button to the right of the Last Cart Unload and the Unloads screen will appear.

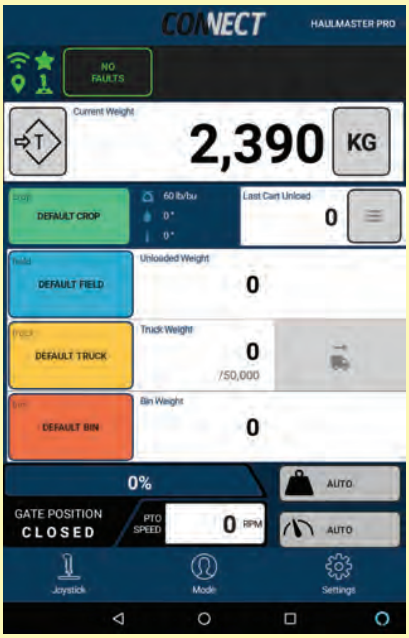


FIG. 71 DASHBOARD

3. Touch the **+** button and the New Unload screen will appear.

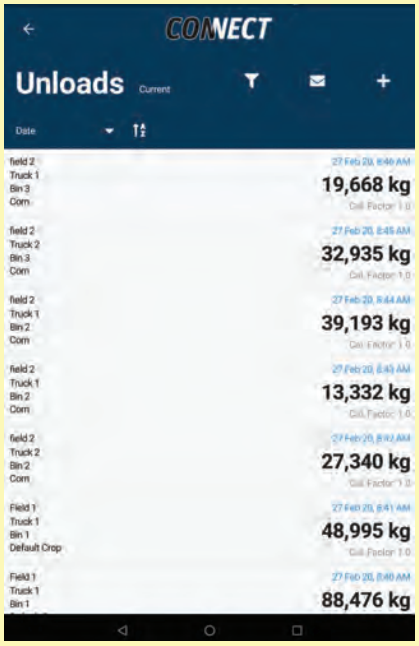


FIG. 72 UNLOADS

4. Touch the center of the Unload Weight box to enter the desired unload weight.

5. Touch **Cancel** or **Ok** as appropriate.

6. Touch the center of the Crop to access Select a Crop. See "3.5 CROP" for crop instructions.

7. Density, temperature and moisture will update to the selected crop. Touch any of the three parameters to edit their values. This edit will only affect this unload.

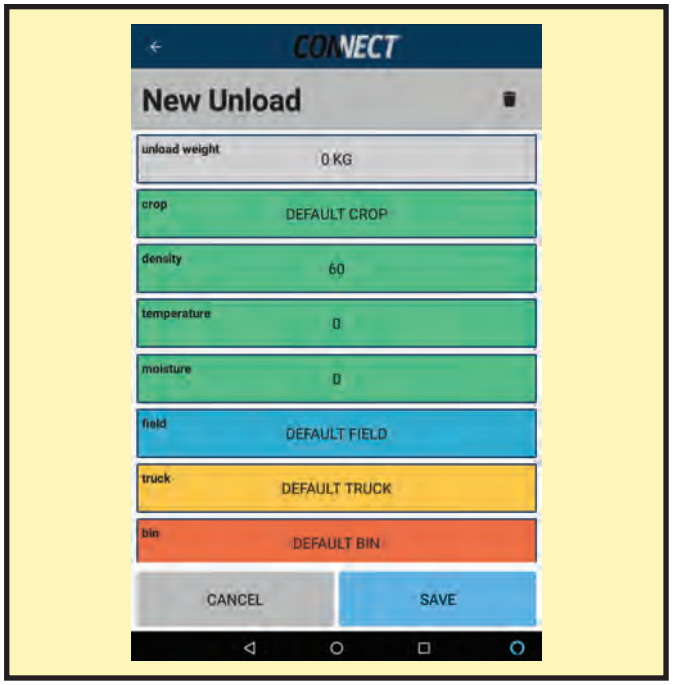


FIG. 73 NEW UNLOAD TOP

8. Touch Field, Truck and Bin to select your desired parameters. See "3.6 FIELD","3.7 TRUCK","3.8 BINS" for their respective instructions.

9. Touch Start Date-Time and End Date-Time to edit their times. See **"FIG. 67 Transfer Date"** and "**FIG. 68 Transfer Time**" for date-time instructions.

10. GPS is based on the Thrasher GPS location. If not connected to the cart Coordinates will be 0.

11. For manual unload entries calibration factor will be 0. This is a good identifier for manually added unloads in the Unloads screen.

12. Touch **Cancel** or **Save** as appropriate.

FIG. 74 NEW UNLOAD BOTTOM

13. Touch any unload in the Unload screen to access Edit Unload screen.

14. Follow the same procedure as New Unload for any edits to the Unload.

> **NOTE:**
> GPS and Calibration Factor cannot be edited. If the unload is automatically detected the calibration factor will reflect the cart's calibration factor at the time of the unload.

15. Touch the trash can to delete the unload.

16. The Delete Unload caption asking if you want to delete the unload will appear.

17. Touch Cancel or Delete Unload as appropriate.

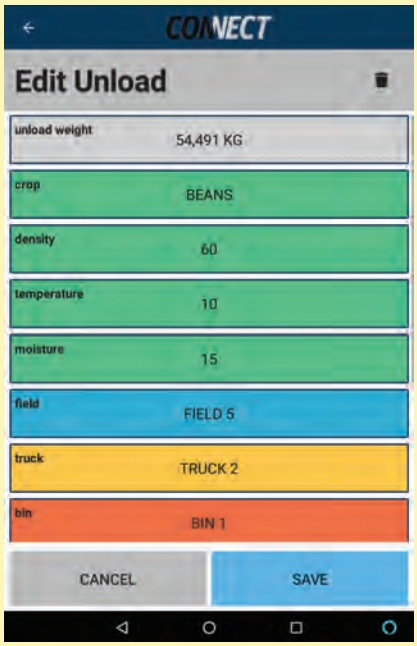


FIG. 75 EDIT UNLOAD

18. Touch the drop down arrow next to Date to sort the unload list by Date, Bins, Trucks or Fields.

19. Touch the AZ icon to swap the alphanumeric order the unloads are sorted by.

20. Touch the filter icon to the right of Unloads to access the Client/Farm Selection screen.

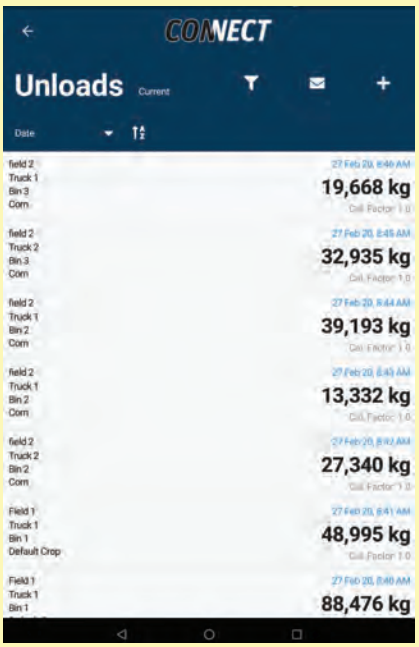


FIG. 76 UNLOADS

21. Touch All next to Client to select a client from the list.

22. Touch All next to Farm to select a farm from the list.

23. Touch All next to Field to select a field from the list.

24. Touch All next to Crop to select a crop from the list.

FIG. 77 CLIENT FARM SELECTION

25. Disconnect from the Haulmaster Wi-fi and connect the tablet to a Wi-fi or Hotspot with an internet connection.

26. Touch the Mail symbol on the Unloads screen to email the unload list in comma separated values (CSV) format to an email address.

27. Enter your email address using the keyboard and select ok.

28. Check your email for an email from **noreply-logs@emlersmfg.com**. Don't forget to check your email junk box.

29. The email will contain two files, **Unload.csv** and **Transfer.csv.**

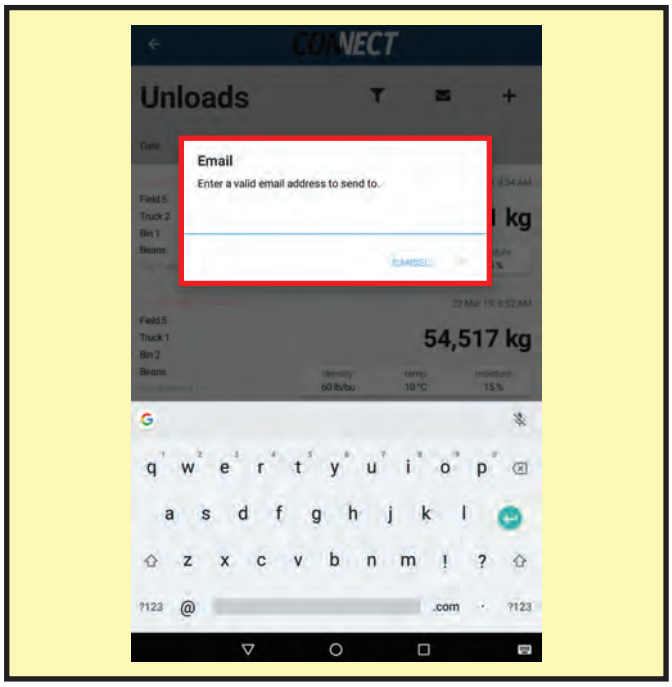


FIG. 78 EMAIL UNLOADS

3.10 AUTO GATE

This is the Auto Gate function:

> **NOTE:**
> Tractor hydraulics to the HM PRO system must be turned on, Angle Sensor Calibration must be complete with auto controls enabled, and the gate sensor must be in working condition, for this feature to function.

1. Start with the Dashboard screen.
2. Turn on Auto Gate Weight by touching the Gray box with the weight symbol in it and the word Auto.
3. They symbol will turn green to indicate Auto Gate Weight is turned on.
4. Based on the defined truck weight and its current weight, as you begin the unload, it will close the gate when Truck capacity is reached. **Warning this function is based on your truck weight capacity and not the volume capacity, the gate will not close based on the BU capacity**.
5. If this feature is disabled, it is up to the operator to close the gate when appropriate.
6. Touch the Auto Gate Weight box, it turns gray and the system is disabled.

"Auto Gate Close based on weight" is in beta status. Use this feature at your own risk. Elmer's Manufacturing will not be held responsible for any discrepancies between the target weight and the actual unloaded weight by this feature.

7. Touch the box with the dial and Auto in it to activate the Auto Gate Speed system.
8. When the Auto Gate Speed is activated, the system will close the gate whenever the cart speed exceeds 8 km/hr.
9. These 2 auto features can't be selected when in the View Only mode - or when your tablet is not the Master.

FIG. 79 AUTO GATE WEIGHT

FIG. 80 AUTO GATE SPEED

3.11 JOYSTICK

In this segment, we will discuss the APP Joystick:

> **NOTE:**
> Tractor hydraulics to the HM Pro system must be turned on for this feature to function.

1. See "2 OPERATION" before operating the joystick screen.

2. Start with the Dashboard screen.

3. The Joystick icon in the top left corner of the screen is green indicating the joystick is connected to the wiring harness system.

FIG. 81 DASHBOARD

4. Touch the Joystick icon in the lower left corner of the screen to access the caption screen informing you Manual Joystick Detected and the need to disconnect Joystick to use App Joystick.

5. Touch **OK**, dismiss the popup, then touch the back arrow to return to the Dashboard.

6. Disconnect Joystick from wiring harness and Joystick icon in top left corner of the Dashboard screen will turn red.

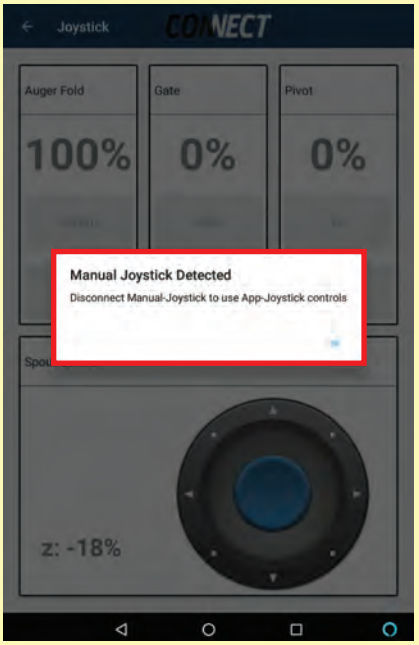


FIG. 82 MANUAL JOYSTICK DETECTED

7. Touch Joystick icon in lower part of the Dashboard screen to access Joystick screen.

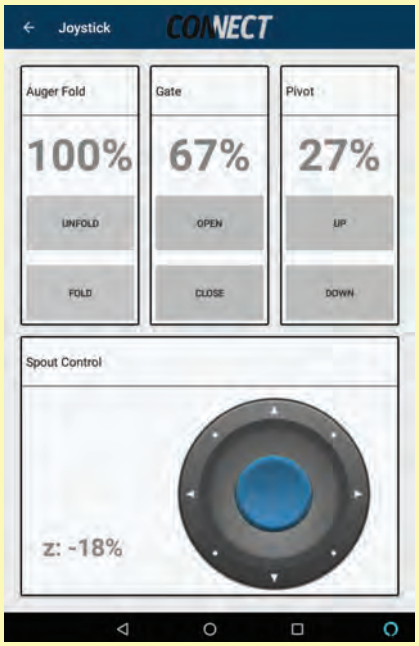


FIG. 83 JOYSTICK

8. Touch and hold the Unfold, Fold, Open, Close, Up, Down boxes required to move auger and gate position. % will increase and decrease reflecting their physical movements. Double tap for Unfold, Fold and Up will work the same way as the joystick. If double tapped the movement will begin an auto-movement.

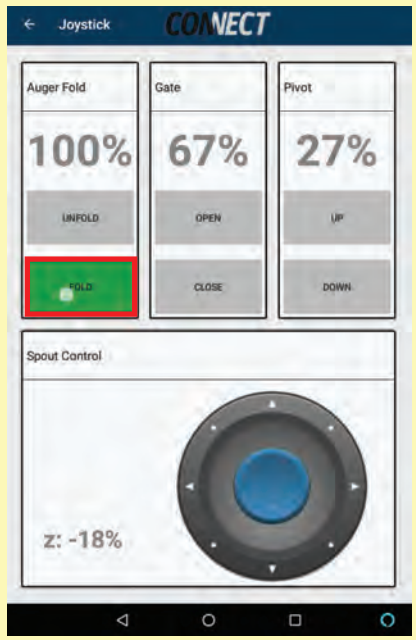


FIG. 84 AUGER AND GATE MOVEMENTS

9. Touch and hold the blue button in the center of the circle in the Spout Control box and drag it to the left to move the spout to the clockwise or right to move it counterclockwise as seen by Z %.

10. Touch and hold the blue button and drag it up or down to move the spout up or down as desired.

11. If the Joystick is plugged back in, all the boxes will be grayed out and the App Joystick cannot control the hydraulics.

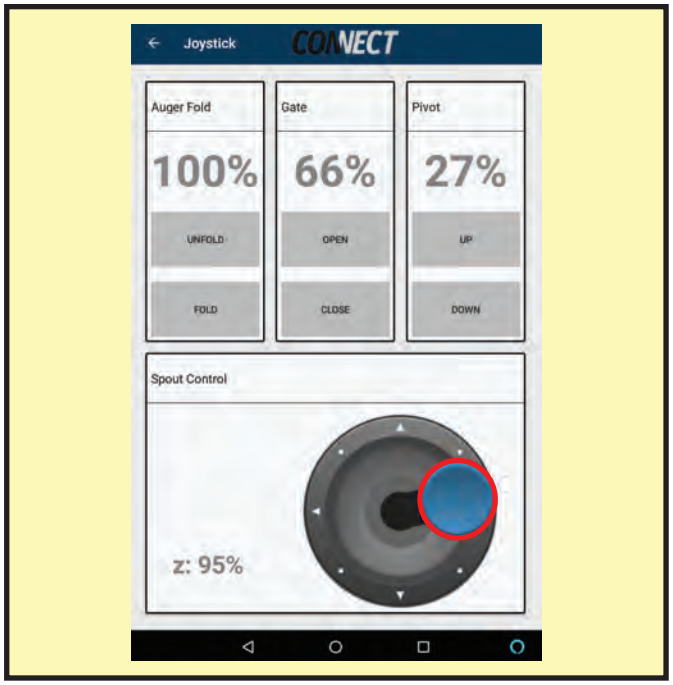


FIG. 85 SPOUT MOVEMENTS

3.12 MODE

In this segment, we will discuss the differences between the Monitor and Master Modes.

1. Start from the Dashboard screen.

2. Observe that the star in the upper left corner is green and indicates that this tablet is in the Master mode.

3. In the Master mode, we have control over everything in the tablet as described in other sections of this manual.

4. This can mean changing the crop, field, truck or bin, adding, deleting or editing unloads as well as taking control of the joystick.

5. Touch the Mode icon in the bottom center of screen to access Operator screen.

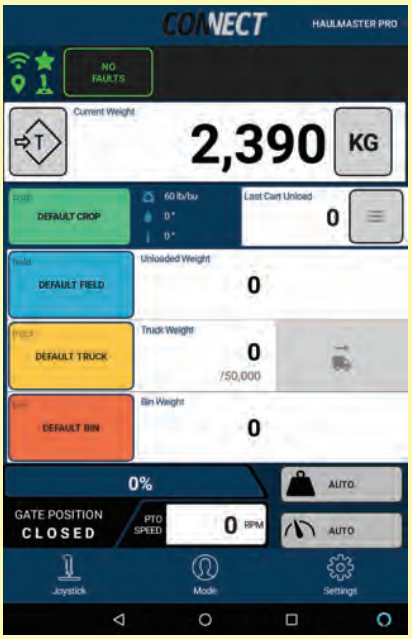


FIG. 86 DASHBOARD

6. Operator screen indicates you are the Master tablet.

7. Touch the red Surrender Master Connection to change to Monitor mode that appears in the top left corner.

8. The star in top left corner of the dashboard has been grayed out indicating you are in Monitor mode not Master.

FIG. 87 MASTER MODE OPERATOR

9. Touch Mode icon to access Operator screen.

10. Touch blue Request Master Connection box to return to Master status.

> **NOTE:**
> This will only work if another tablet doesn't have Master status.

11. Monitor mode doesn't have:

    a. Joystick controls.
    b. Auto Gate Controls.
    c. Tare.
    d. Calibrations.
    e. Wi-fi Setup
    f. Restore.

FIG. 88 MONITOR MODE OPERATOR

12. Touch Settings icon to access Settings screen showing a reduced Settings page of Pending Commands, Diagnostics, Units, Seasons, About and Imports.

13. Seasons cannot be closed, but access to old seasons closed by this tablet is still granted.

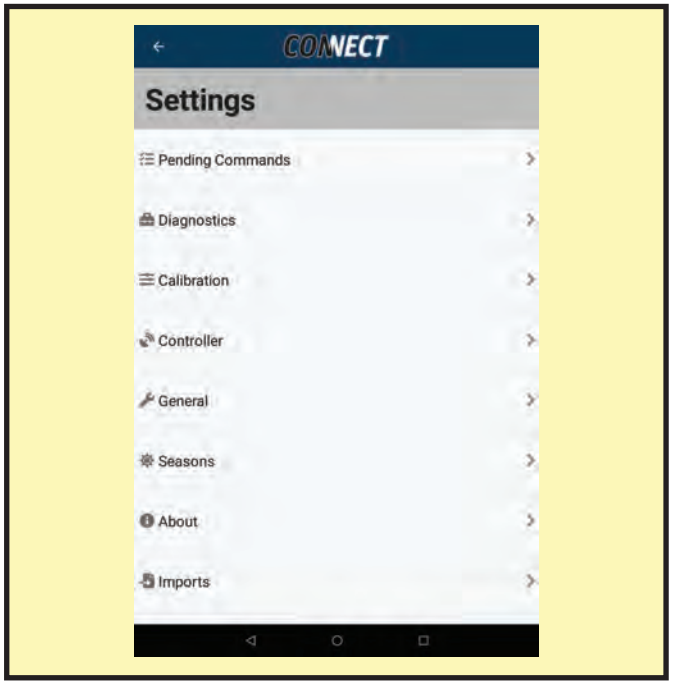


FIG. 89 SETTINGS

14. Edits to Crops, Field, Trucks, Bins, Unloads will be queued. A caption informing you that all edits will be queued and applied when this tablet is Master again will appear after your first edit.

15. Edits in the queue can be viewed in pending operations. Edits will not be reflected anywhere in the App except in Pending Operations until Master Mode is taken, and Pending Operations are Executed.

16. See "3.13 PENDING OPERATIONS" for instructions on Pending Operations.

FIG. 90 PENDING OPERATIONS

3.13 PENDING OPERATIONS

In this segment, we'll be going over Pending Operations:

1. Pending Operations can be accessed through the Settings Screen.

2. All edits to Crops, Field, Trucks, Bins, Unloads will be queued and a caption informing you that all edits will be queued and applied when this tablet is Master again will appear after your first edit.

3. Edits are put into Pending Operations when in Monitor Mode or you are not connected to the HM Pro Controller.

> **NOTE**:
> This situation could occur if a foreman on the side of the field is connected as Master and the operator is connected as Monitor.

FIG. 91 SETTINGS

4. Touch Pending Commands to access Pending Operations screen where present information shows all queued edits.

5. Touch individual operations. The operation title will highlight red. Alternatively touch the list button to select or deselect all items

6. Touch the trash can to delete all selected queued information.

7. A caption screen of Clear Pending Operations will appear and will ask if you are sure you want to delete all pending operations.

8. Touch Cancel or Clear Operations as appropriate.

9. When you retake master mode a Execute Pending Operations prompt will appear.

10. Touch View Pending Operations to access Pending Operations screen.

11. Touch Execute for edits to be pushed to the controller and take effect throughout the App.

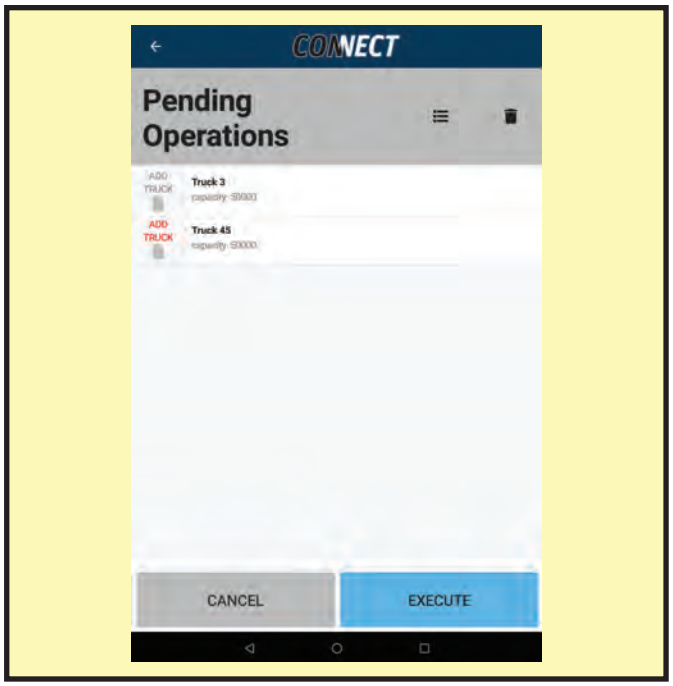


FIG. 92 PENDING OPERATIONS

3.14 LIVE UNLOAD

In this segment, we will review the Live Unload screen.

1. Start with the Dashboard screen.
2. Touch Settings to access the Settings screen.
3. Touch Diagnostics then Live Unloading line to access Cart Unload Weight Status screen.
4. This screen gives you the live graphing of the readings from the Smart Filter and Live Readout.
5. The red line is the direct weight reading from the load cells and the blue line is from the Smart Filter.
6. The Smart Filter blue line is used to detect unloads.
7. In the real world, the weight can vary a couple of thousand kgs when traveling over rough terrain.
8. Since the Smart Filter system is designed to detect an unload when the system drops 350 kg, the Smart Filter is designed to ignore spikes.
9. When the red line starts moving down as the unloading proceeds and the blue line follows down.
10. When the unloading weight exceeds 350 kg, the red box appears. The top of the red box remains at the start weight of the unload and grows around the reading.
11. The red box stops growing when the unload is complete.
12. When the unload stops, the box turns green and a number appears that indicates the actual unload reading.

NOTE:
If the operator didn't properly Tare the cart, the screen will not show negative weights.

FIG. 93 UNLOADING

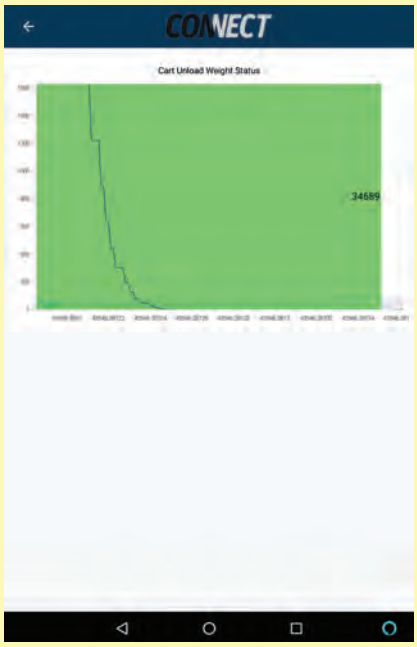


FIG. 94 UNLOADING COMPLETE

3.15 WEIGHT CALIBRATION

In this segment, we will review the Weight Calibration screen. Instructions for weight calibration can be found by pressing the "**?**" icon next to Calibration Factor.

1. Start with the Dashboard screen.

2. Touch Settings to access the Settings screen.

3. Touch Calibration then Weight Calibration to ac¬cess the Weight Calibration screen.

4. Certified Scale Weight is your ticket weight of the product from the weigh station.

5. Grain Cart Weight is the start weight subtracted by the end weight taken manually from the Dashboard screen. It is not recommended to use Last Cart Unload for calibration.

6. Log the start weight when the cart is stationary before unloading into the truck.

7. Log the end weight after the unload when the cart is stationary.

> **NOTE:**
> For the most accurate results it is rec¬ommended that 3 full capacity cart loads are used for your calibrations.

8. Touch Certified Scale Weight to enter the ticket weight.

9. Touch Grain Cart Weight to enter the cart weight difference. Alternatively, you can toggle Unloads from the unload list that will sum together in the Grain Cart Weight.

> **NOTE:**
> Only unloads registered by an actual unload are shown. Manually added unloads are filtered from the list to prevent inaccurate calibrations..

10. Touch Calibrate and the calibration ratio will update. If you toggled unloads from the list, you will be given the option to update the weights to the new calibration.

$$\textit{New Calibration Ratio} = \frac{\text{Certified Scale Weight}}{\text{Grain Cart Weight}} \textit{ X Calibration Ratio}$$

11. After calibrating you can Toggle any unloads you want to reflect the new calibration factor. The center column reflects the current unload while the third column shows the outcome if toggled and Adjust Unload is selected.

12. If you wish to restart fresh touch Reset Calibration to set the calibration ratio back to 1.

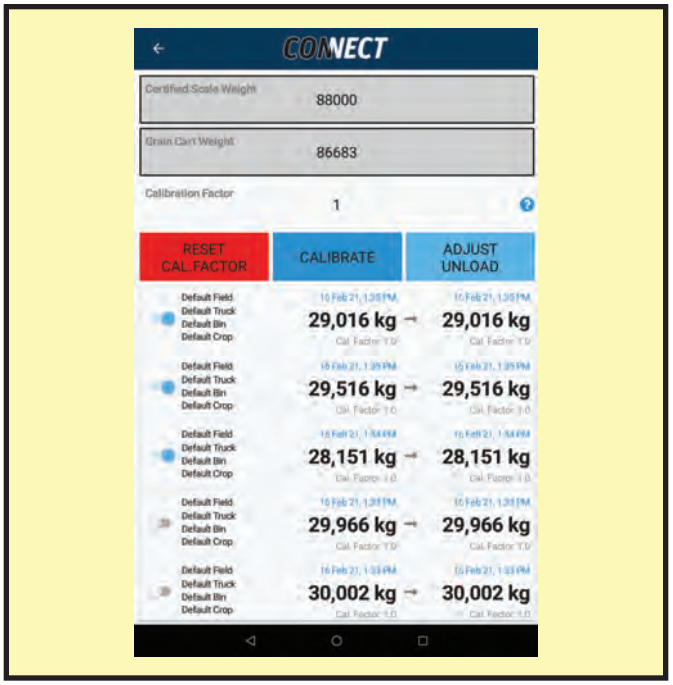


FIG. 95 WEIGHT CALIBRATION

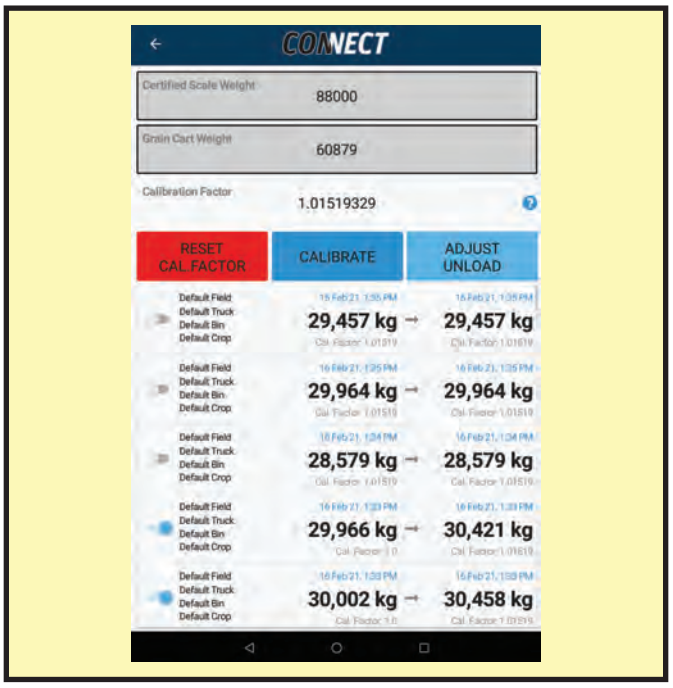


FIG. 96 ADJUST UNLOAD

3.16 ANGLE SENSOR CALIBRATION

In this segment, we will review the Angle Sensor Calibration area.

1. Start with the Dashboard screen.

2. Touch Settings to access Settings screen.

3. Touch Calibration then Angle Sensor Calibration to access the Automatic Controls screen.

> **NOTE:**
> Normally the unit will come from the factory as Automatic Controls enabled.

4. Observe that all sensors are OK and we can proceed.

> **NOTE:**
> If any one of the sensors is not OK, you will not be able to re-enable the Automatic Controls.

5. Touch the Disable box to access Disable Automatic Control caption screen informing user automatic controls will be disabled during calibration. They will be only re-enbled after calibration if no errors are found.

6. Touch Cancel or Disable Auto Controls as appropriate.

> **NOTE:**
> Disabling Auto Control will turn OFF the double press auger fold and unfold, PID control which means fold/unfold will move at a slower and steady rate. PID control allows for shorter fold/unfold times by driving the auger faster through the center of the range and slowing down towards the end.
>
> It also disables the spoutZ lockout. Presently spoutZ is locked out unless the auger is between 85% and 100% in its extended position. After that, the spout can move in the Z plane. Restricting the spout movement in this way prevents moving the spout and hitting the cart when folding. This gives spout position control to the user.
>
> Other than fold and unfold all other movment speeds are still controlled by Outputs hydraulic flow rates. If a movement is not operational verify that Outputs are turned up.

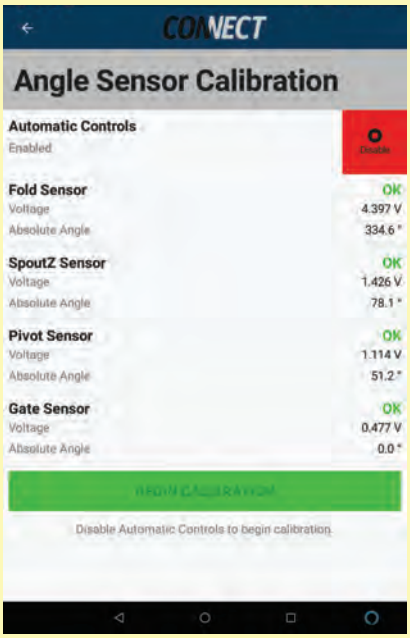


FIG. 97 ANGLE SENSOR CALIBRATION

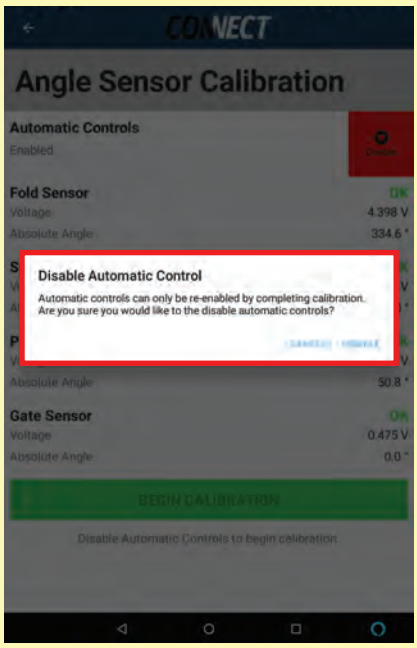


FIG. 98 DISABLE AUTOMATIC CONTROLS

7. Touch Begin Calibration to access the Fold Sensor Safety Warning screen.

8. Every hydraulic function will follow the same procedure described here.

9. User will be instructed about overhead power line electrocution hazard, pinch point hazard and spout contacting cart or truck hazards. Specific hazards are addressed for each sensor.

10. Touch OK to access the Instruction screen. More detailed instructions and pictures are provided in "2 OPERATION" to show the meaning of the instructions for each hydraulic function.

11. Touch OK to access Sensor Calibration Settings screen.

12. Touch the blue circle with a question mark inside to return to the specific Sensor Instruction screen to review the instructions again if required.

13. The screen indicates status of the Sensor with a green OK, Voltage, Absolute Angle and Position as a %. Absolute Angles are used for the minimum and maximum values of the sensors.

14. Every Sensor system is designed with a way to reverse the Angle Sensor if required.

15. Touch Reverse Angle Sensor circle slider to reverse the system. Absolute Angle readings will reverse in reference to the change in Voltage. Absolute Angle: **360.0**° will now be **0**°.

> **NOTE:**
> This feature accommodates clockwise and counterclockwise sensor operation if the user installs a replacement sensor incorrectly.

16. When you've moved the hydraulic function to its desired position hit Set to save the angle.

FIG. 99 FOLD SENSOR CALIBRATION

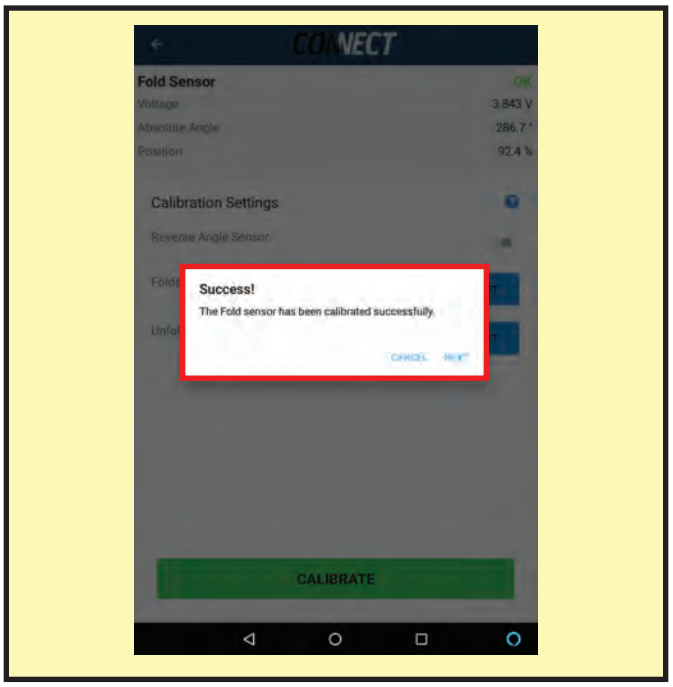


FIG. 100 SUCCESSFUL SENSOR CALIBRATION

17. Touch Calibrate to calibrate system and Success caption screen will appear informing user of your success.

18. Touch Next tab to access SpoutZ Sensor screen. Pivot Sensor and Gate Sensor screens can be calibrated using the same procedures. Each system will be covered in the following sub-sections.

19. Touch the appropriate box to proceed through the screens until the Automatic Control screen appears. It informs the user if all sensor systems are OK (green), Automatic Controls are still Disabled and where you set every sensor.

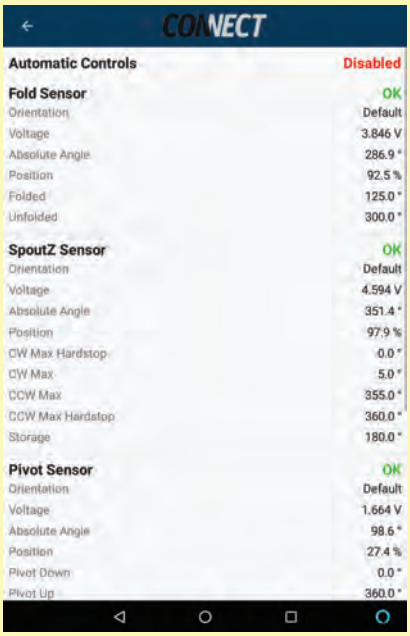


FIG. 101 ANGLE SENSOR REVIEW

20. Scroll down and touch Complete Calibration at the bottom of screen to access the Enable Automatic Control caption screen which informs the user calibration is complete, no sensor errors found and it's safe to enable automatic controls.

21. Touch **Cancel** or **Enable** as appropriate.

22. Touch **Enable** to access Calibration Successful caption.

23. Touch **OK** to access Dashboard.

NOTE:
If there are any sensor errors you will still be able to complete the calibration. Warnings specific to the affected sensor will appear to inform the user of the affected movements.

FIG. 102 COMPLETE CALIBRATION

3.16.1 FOLD SENSOR CALIBRATION

This section covers the Fold Sensor Calibration which is a segment of the Angle Calibration. ***READ ALL SAFETY AND FOLD INSTRUCTIONS!***

1. Fold Sensor Safety Warning screen is where the user will be instructed about overhead power line electrocution hazard, pinch point hazard, overhead hazard and spout contacting cart or truck hazards.

2. Touch **OK** to access the Fold Sensor Fold Instruction screen.

3. Touch **OK** to access the Fold Sensor Calibration Setting screen.

4. Touch the question mark in the blue circle to return to the Fold Instruction screen if required.

5. Travel to the Folded position and touch Set to the right of Folded. Movement can be accomplished with the virtual Fold button or the joystick. If the joystick is plugged in the virtual button will be grayed out and inaccessible.

6. Travel to the Unfolded position and touch Set to the right of Unfolded. Movement can be accomplished with the virtual Unfold button or the joystick. If the joystick is plugged in the virtual button will be grayed out and inaccessible.

7. If the user sets the Folded Angle larger than the Unfolded angle, the Invalid (Folded/Unfolded) Values caption screen will appear informing user the Unfolded value is less than Folded value.

8. If unfolding results in the Absolute Angle decreasing toggle Reverse Angle Sensor and try again.

9. If the angles are set at less than **10**° from each other Invalid (Fold/Unfold) Values caption screen appears informing the user, the (Fold/Unfold) range is too small. Increase the range and try again.

10. If the previous conditions are met touch Calibrate.

11. Success screen will appear informing user the Fold Sensor has been successfully calibrated.

12. Touch Next and the system will move on to the SpoutZ Sensor screen.

FIG. 103 FOLD SENSOR CALIBRATION

3.16.2 SPOUTZ CALIBRATION

This section covers the SpoutZ Sensor Calibration which is a segment of the Angle calibration system. ***READ ALL SAFETY AND SPOUTZ INSTRUCTIONS!***

1. The SpoutZ Sensor Safety Warning screen is where the user will be instructed about the spout area being free of obstructions and away from cart plus needing the auger to be unfolded. Fully unfolding is required to prevent contacting the cart.

2. Touch **OK** to access the spoutZ Sensor SpoutZ Instruction screen where operational instructions are given.

3. The system is designed with a mechanical and software stops for the spout movement. It is recommended that the **CW** Max and **CCW** Max values be set 5° to 10° away from their physical end Hardstops to eliminate the system shock of stopping when hitting the physical stops. User can't move the spout further than the software Hardstops.

4. When **CW** Max and **CCW** Max are set at too small of a value touch Reset, Hardstop values will return to 0.0 and 360°. The user now has the ability to move spout through its full range and can hit the physical stops.

5. Travel to the **CW** Max position and touch Set to the right of **CW** Max Hardstop. Movement can be accomplished with the virtual **CW** Max button or the joystick. If the joystick is plugged in the virtual button will be grayed out and inaccessible.

6. Travel to the **CCW** Max position and touch Set to the right of **CCW** Max Hardstop. Movement can be accomplished with the virtual **CCW** Max button or the joystick. If the joystick is plugged in the virtual button will be grayed out and inaccessible.

7. If the user sets the **CW** Max larger than the **CCW** Max angle the Invalid (**CW** Max/**CCW** Max) Values caption screen appears instructing to be sure **CW** Max value is less than **CCW** Max value.

8. If traveling toward **CCW** position results in the Absolute Angle decreasing toggle Reverse Angle Sensor and try again.

9. Invalid Storage Value caption will appear instructing SpoutZ Storage value must be between (**CW** Max and **CCW** Max) value range. The Storage value is where spout homes when auger folds into its storage position.

FIG. 104 SPOUTZ SENSOR CALIBRATION

10. Touch Calibrate to access Success caption screen informing user sensor has been successfully calibrated.

11. Touch Next and the Pivot Sensor screen appears.

3.16.3 PIVOT SENSOR CALIBRATION

This section covers the Pivot Sensor Calibration which is a segment of the Angle Calibration. ***READ ALL SAFETY AND PIVOT INSTRUCTIONS!***

1. The Pivot Sensor Safety Warning screen is where safety instructions are provided. Clear the area of people, stay away from obstructions and overhead power lines, stay away from pinch points and be sure there is sufficient clearance.

2. Touch **OK** to access the Pivot Sensor Pivot Instruction screen.

3. Touch **OK** to access the Pivot Sensor Calibration Setting screen.

4. Touch the question mark in the blue circle to return to the Pivot Instruction screen if required.

5. Travel to the Pivot Down position and touch Set to the right of Pivot Down. Movement can be accomplished with the virtual Down button or the joystick. If the joystick is plugged in the virtual button will be grayed out and inaccessible.

6. Travel to the Pivot Up position and touch Set to the right of Pivot Up. Movement can be accomplished with the virtual Up button or the joystick. If the joystick is plugged in the virtual button will be grayed out and inaccessible.

7. If the user sets the Pivot Down Angle larger than the Pivot up angle, the Invalid (Pivot Down /Pivot Down) Values caption screen will appear informing user Pivot Up value is less than Pivot Down value.

8. If Pivot Up results in the Absolute Angle decreasing toggle Reverse Angle Sensor and try again.

9. If the angles are set at less than 10° from each other Invalid (Pivot Down / Pivot Up) Values caption screen appears informing the user, the (Pivot Down /Pivot Down) range is too small. Increase range and try again.

10. If the previous conditions are met touch Calibrate.

11. The Success screen will appear informing user Pivot Sensor has been successfully calibrated.

12. Touch Next and the system will move on to the Gate Sensor screen.

FIG. 105 PIVOT SENSOR CALIBRATION

3.16.4 GATE SENSOR

This section covers the Gate Sensor Calibration which is a segment of the Angle Calibration. ***READ ALL SAFETY AND GATE INSTRUCTIONS!***

1. Touch Gate Sensor to access Gate Sensor Safety Warning screen where user is instructed to ensure cart is empty to avoid flooding the auger.

2. Touch **OK** to access the Gate Sensor Gate Instruction screen.

3. Touch **OK** to access the Gate Sensor Calibration Setting screen.

4. Touch the question mark in the blue circle to return to the Gate Instruction screen if required.

5. Travel to the Gate Close position and touch Set to the right of Gate Close. Movement can be accomplished with the virtual Close button or the joystick. If the joystick is plugged in the virtual button will be grayed out and inaccessible.

6. Travel to the Gate Open position and touch Set to the right of Gate Open. Movement can be accomplished with the virtual Open button on the screen or the joystick. If the joystick is plugged in the virtual button will be grayed out and inaccessible.

7. If Closed Angle is larger than Open Angle and Calibrate is touched, Invalid (Closed/Open) Values caption screen appears instructing to be sure Closed is less than Open value.

8. If Gate Open results in the Absolute Angle decreasing toggle Reverse Angle Sensor and try again.

9. If Closed value is within 10° of Open value and user touches Calibrate, Invalid (Closed/Open) Values caption screen will appear informing user range is too small. Increase range and try again.

10. If the previous conditions are met touch Calibrate.

11. The Success screen will appear informing the user Gate Sensor has been successfully calibrated.

12. Touch Next and the system will move on to the Complete Calibration screen.

FIG. 106 GATE SENSOR CALIBRATION

3.17 WI-FI SETUP

To name the Wi-Fi network and set the password, follow this procedure.

WARNING:
Changing the SSID name without knowing your current password will leave you unable to access your system without a technician visit. Default password is **haulmaster123**. If you do not know your password but are connected to the system, it is recommended you change your password first.

1. Start with the Dashboard. Wi-Fi name is displayed in the top right hand corner of the Dashboard screen.
2. Touch Settings to go to the Settings screen.
3. Touch Controller then Wi-Fi Setup to go to the Wi-Fi screen. Set New SSID and Set New Password can be selected.
4. Touch Set New SSID box to access Enter a new Wifi SSID and keyboard screen to rename the network.
5. Enter a new network name, touch Set and a caption informing you the SSID would be changed from the old name to your new name appears. This information means you are no longer set up on that network.
6. Go to your tablet settings, touch WLAN and select your new network name.
7. Enter your password. If you have never changed the password the default password is **haulmaster123**.
8. Touch **OK**.
9. Go back to our App and return to Dashboard to see the name has changed to your new name in the top right corner.

FIG. 107 HAULMASTER WI-FI

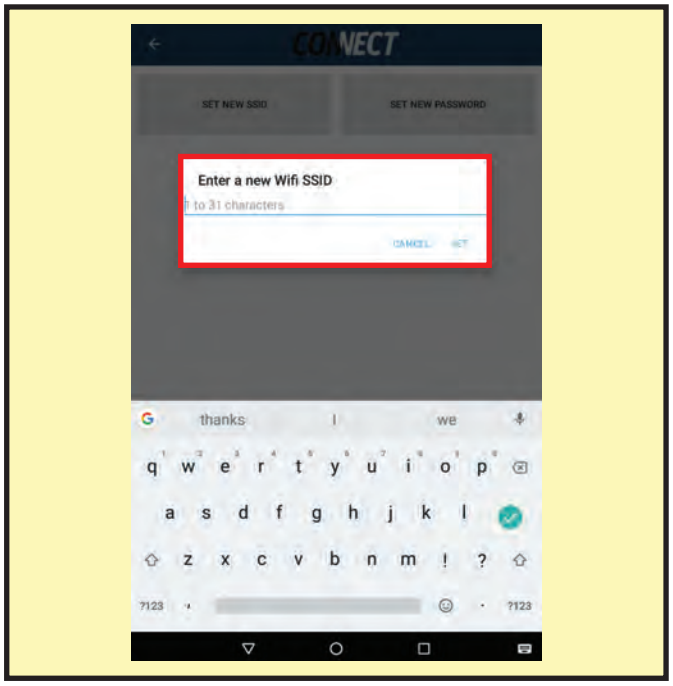


FIG. 108 NEW SSID

10. Touch Settings tab to return to Settings screen and touch Controller then Wi-Fi Setup.

11. Touch Set New Password and enter a new Wifi password and keyboard screen will appear.

12. Enter your new password.

13. Touch Set.

14. Enter new password again and touch Confirm.

15. Caption will appear informing you your password has been set and that tablet connections need new connection settings since you have a new password.

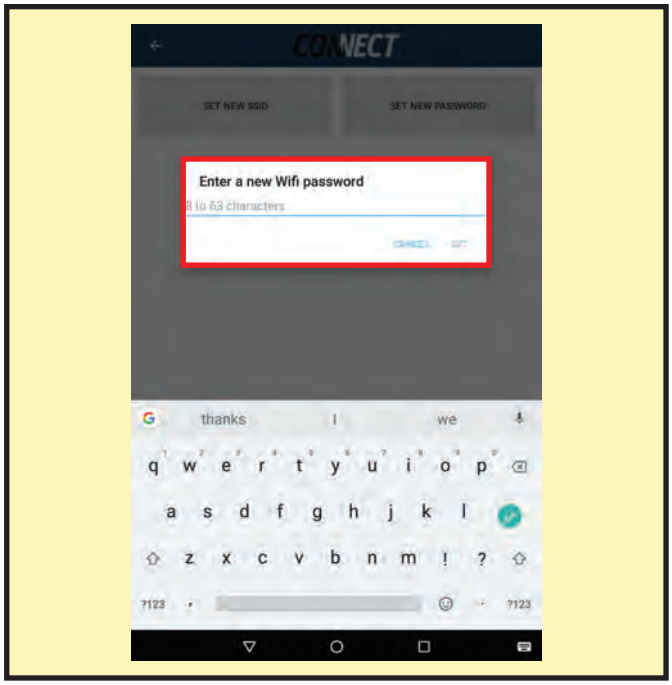


FIG. 109 NEW PASSWORD

16. Go to your tablet settings, touch WLAN and select your network name.

17. Touch Forget on your network.

18. Touch the network name again and enter your new password.

19. Go back to the App and return to Dashboard to see that the tablet connects with the controller.

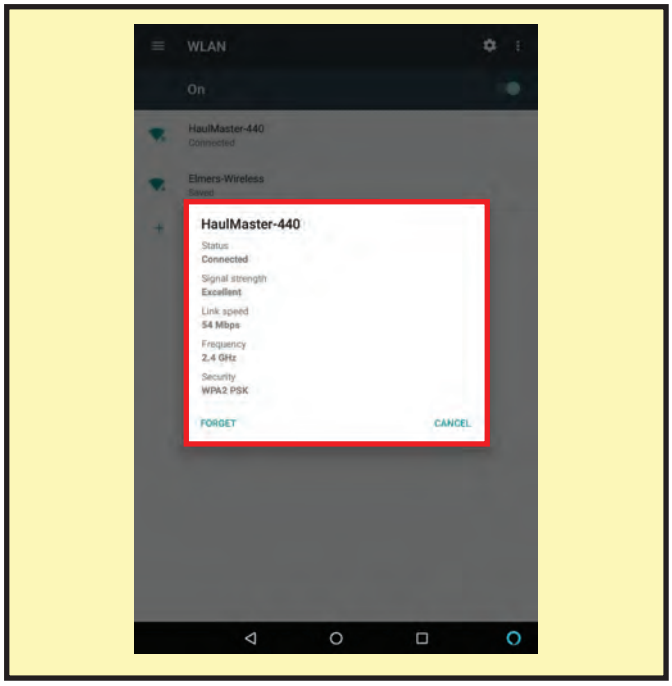


FIG. 110 FORGET NETWORK

20. Touch Settings tab to return to Settings screen and touch Controller then Wi-Fi Setup.

21. Touch Set New Channel box to access Enter a new Wi-Fi Channel and keyboard screen to change the network channel.

22. Enter a new network channel, touch Set and a cap¬tion informing you the channel would be changed from the old channel to your new channel appears.

23. Go to your tablet settings, touch WLAN, and select your network name.

24. Go back to the App and return to Dashboard to see that the tablet connects with the controller.

NOTE:

It should only be necessary to change your Wi-Fi Channel if you are experiencing interference with another Wi-Fi networks. If there is a Thrasher network in your WLAN list, you can see the Reprogramming Controller section of the manual to reprogram the Thrasher. The newest Thrasher firmware (GPS Controller) turns off the Thrasher Wi-Fi network.

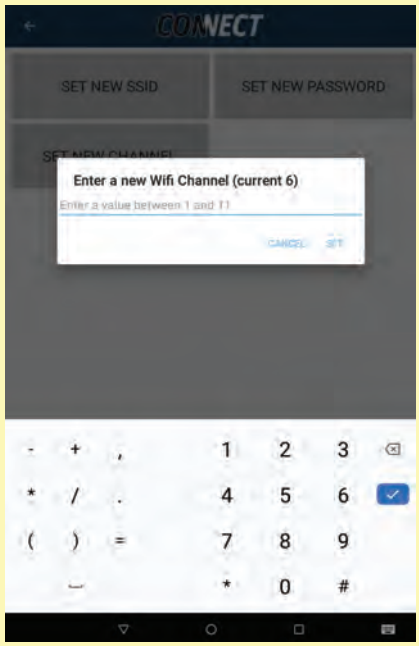


FIG. 111 NEW CHANNEL

DIAGNOSTICS

3.18 DIAGNOSTICS

This is a summary of the information available from the Diagnostic feature:

1. Start with the Dashboard and touch Settings to go to the Settings screen.

2. Touch the Diagnostic then Parameter Readings to access Diagnostics

3. Information on:

   a. **Connection status.**
   b. **Operation Mode.**
   c. **Machine Status.**
   d. **Machine Hours.**
   e. **Machine Sensor readings.**
   f. **Merlin Weight readings.**
   g. **Current Farm Information.**
   h. **Joystick Readings.**
   i. **Unload weight Change Status.**
   j. **Smart Filter Result.**
   k. **Master File Status.**
   l. **Master Data Sync Machine Status.**
   m. **Controller Date.**

4. Refer to the following pages for more information on all these items.

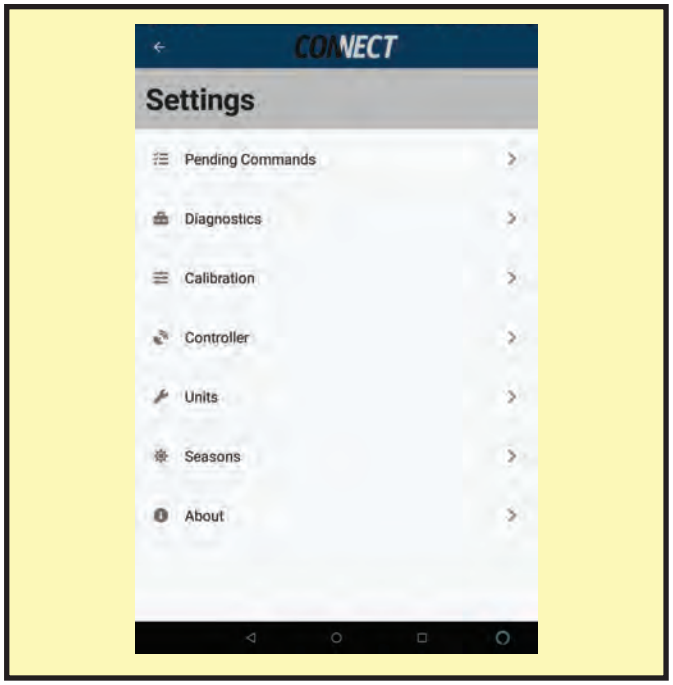


FIG. 112 SETTINGS

FIG. 113 DIAGNOSTICS

Connection Status		
Readings	**States**	**Logic**
Controller Connection	True / False	True = Tablet connected to Wifi of the controller. False = Tablet not connected to Wifi of the controller.
Operation Mode		
Master Key	10 digit #	Current tablets key
Controller Stored Key	10 digit #	Key of the tablet with master control
Is Connected As Master	True / False	**True** = This tablet has master control **False** = This tablet does not have master controll
Mode	MASTER/ MONITOR/ UNCONNECTED	**Master** = Full App capability **Monitor** = View only capability **Unconnected** = No controller connection
Machine Status		
Wheel Speed	0 - 6553.5	Wheel Speed based of Wheel speed sensor mounted on Starboard front rim
PTO Speed	0 - 6553.5	PTO Shaft Speed based of PTO Sensor
Odometer Reading		Total cart distance travelled based on **Wheel Speed Sensor**
GPS Online Status	True / False	GPS unit is online. Not indicative of GPS lock
Machine Hours		
Powered	0 - 429M	Hours Controller is keyed on
Traveled	0 - 429M	Hours wheel speed movement is detected
Auger	0 - 429M	Hours PTO speed movement is detected
Machine Sensor Readings		
Fold Sensor Error	True / False	True = Sensor or wires are damaged or disconnected. Fold Sensor Voltage outside 0.5 volts to 4.5 volts is an error. False= Operational, Fold Sensor Voltage is between 0.5 volts to 4.5 volts.
Fold Sensor Reversed	True / False	True= Reverse Angle Sensor switch in Angle Sensor Calibration is turned on. False= Reverse Angle Sensor switch in Angle Sensor Calibration is turned off.
Fold Sensor Voltage	0-24 volts	Sensor operates from 0 to 5 volts. Anything outside of 0.5 volts to 4.5 volts is in the sensor dead zone. Everything above 5 volts indicates incorrect supply voltage. Anything above 24 volts will damage the system.
Fold Absolute Angle	0-360 Degrees	Based on Fold Sensor Voltage If Fold Sensor Reversed is false 0 degrees = 0.5 volts, 360 degrees = 4.5 volts If Fold Sensor Reversed is true 0 degrees = 4.5 volts, 360 degrees = 0.5 volts
Fold Calibrated Angle	0-360 Degrees	= Fold Absolute Angle - Fold Min Angle

Fold Position	0-100%	= (Fold Calibrated Angle / (Fold Max Angle-Fold Min Angle))*100
Fold Min Angle	0-360 Degrees	Saved as Min Fold Angle in Angle Sensor Calibration
Fold Max Angle	0-360 Degrees	Saved as Maximum Fold Angle in Angle Sensor Calibration
Gate Sensor Error	True / False	True = Sensor or wires are damaged or disconnected. Gate Sensor Voltage outside 0.5 volts to 4.5 volts is an error. False= Operational, Gate Sensor Voltage is between 0.5 volts to 4.5 volts.
Gate Sensor Reversed	True / False	True= Reverse Angle Sensor switch in Angle Sensor Calibration is turned on. False= Reverse Angle Sensor switch in Angle Sensor Calibration is turned off.
Gate Sensor Voltage	0-24 volts	Sensor operates from 0 to 5 volts. Anything outside of 0.5 volts to 4.5 volts is in the sensor dead zone. Everything above 5 volts indicates incorrect supply voltage. Anything above 24 volts will damage the system.
Gate Absolute Angle	0-360 Degrees	Based on Gate Sensor Voltage If Gate Sensor Reversed is false 0 degrees = 0.5 volts, 360 degrees = 4.5 volts If Gate Sensor Reversed is true 0 degrees = 4.5 volts, 360 degrees = 0.5 volts
Gate Calibrated Angle	0-360 Degrees	= Gate Absolute Angle - Gate Min Angle
Gate Position	0-100%	= (Gate Calibrated Angle / (Gate Max Angle-Gate Min Angle))*100
Gate Min Angle	0-360 Degrees	Saved as Min Gate Angle in Angle Sensor Calibration
Gate Max Angle	0-360 Degrees	Saved as Maximum Gate Angle in Angle Sensor Calibration
Pivot Sensor Error	True / False	True = Sensor or wire are damaged or disconnected. Pivot Sensor Voltage outside 0.5 volts to 4.5 volts is an error. False= Operational, Pivot Sensor Voltage is between 0.5 volts to 4.5 volts
Pivot Sensor Reversed	True / False	True= Reverse Angle Sensor switch in Angle Sensor Calibration is turned on. False= Reverse Angle Sensor switch in Angle Sensor Calibration is turned off.
Pivot Sensor Voltage	0-24 volts	Sensor operates from 0 to 5 volts. Anything outside of 0.5 volts to 4.5 volts is in the sensor dead zone. Everything above 5 volts indicates incorrect supply voltage. Anything above 24 volts will damage the system.

Pivot Absolute Angle	0-360 Degrees	Based on Pivot Sensor Voltage If Pivot Sensor Reversed is false 0 degrees = 0.5 volts, 360 degrees = 4.5 volts If Pivot Sensor Reversed is true 0 degrees = 4.5 volts, 360 degrees = 0.5 volts
Pivot Calibrated Angle	0-360 Degrees	= Pivot Absolute Angle-Pivot Min Angle
Pivot Position	0-100%	= (Pivot Calibrated Angle / (Pivot Max Angle-Pivot Min Angle))*100
Pivot Min Angle	0-360 Degrees	Saved as Min Pivot Angle in Angle Sensor Calibration
Pivot Max Angle	0-360 Degrees	Saved as Maximum Pivot Angle in Angle Sensor Calibration
SpoutZ Sensor Error	True / False	True = Sensor or wires are damaged or disconnected. SpoutZ Sensor Voltage outside 0.5 volts to 4.5 volts is an error. False= Operational, SpoutZ Sensor Voltage is between 0.5 volts to 4.5 volts.
SpoutZ Sensor Reversed	True / False	True= Reverse Angle Sensor switch in Angle Sensor Calibration is turned on. False= Reverse Angle Sensor switch in Angle Sensor Calibration is turned off.
SpoutZ Sensor Voltage	0-24 volts	Sensor operates from 0 to 5 volts. Anything outside of 0.5 volts to 4.5 volts is in the sensor dead zone. Everything above 5 volts indicates incorrect supply voltage. Anything above 24 volts will damage the system.
SpoutZ Absolute Angle	0-360 Degrees	Based on SpoutZ Sensor Voltage If SpoutZ Sensor Reversed is false 0 degrees = 0.5 volts, 360 degrees = 4.5 volts If SpoutZ Sensor Reversed is true 0 degrees = 4.5 volts, 360 degrees = 0.5 volts.
SpoutZ Calibrated Angle	+/-180 Degrees	= SpoutZ Absolute Angle- ((SpoutZ Max Angle + SpoutZ Min Angle)/2);
SpoutZ Position	+/-100%	= (SpoutZ Calibrated Angle / ((SpoutZ Max Angle- SpoutZ Min Angle)/2))*100
SpoutZ Min Angle	0-360 Degrees	Saved as CW Max Angle in Angle Sensor Calibration
SpoutZ Max Angle	0-360 Degrees	Saved as CCW Max Angle in Angle Sensor Calibration
SpoutZ Stored Angle	0-360 Degrees	Saved Position for spout storage on Fold
Merlin Weight Readings		
Cart Weight	+/- 2147483.648 (Kg)	Sum of all loadcells (1-5)
Axle Weight	+/- 2147483.648 (Kg)	Sum of all axle loadcells (1-4)
Loadcell 1 Weight	+/- 2147483.648 (Kg)	Loadcell 1 reading
Loadcell 2 Weight	+/- 2147483.648 (Kg)	Loadcell 2 reading
Loadcell 3 Weight	+/- 2147483.648 (Kg)	Loadcell 3 reading
Loadcell 4 Weight	+/- 2147483.648 (Kg)	Loadcell 4 reading
Loadcell 5 Weight	+/- 2147483.648 (Kg)	Loadcell 5 reading (Hitch Loadcell)
Last Unload Weight	2147483.648 (Kg)	Last detected unload (-Δw>350Kg)
Last Unload Weight	2147483.648 (Kg)	Last detected unload (-Δw>350Kg)

Last Unload Time	n/a	n/a
Merlin 1 Online	True / False	True= Merlin 1 connected: Loadcells 1-4 use Merlin 1 False= Merlin 1 not found.
Merlin 2 Online	True / False	True= Merlin 2 connected: Loadcells 5 uses Merlin 2 False= Merlin 2 not found.
Load Balance	n/a	n/a
Overloaded State	BACK_OVERLOADED/ BALANCED/FRONT_ OVERLOADED	BACK_OVERLOADED=Hitch Weight =< -2000 Kg BALANCED= -2000 Kg< Hitch Weight<5000 Kg FRONT_OVERLOADED= Hitch Weight >= 5000 Kg
Current Farm Info		
Cart Id	#	Connected Cart ID #
Crop Id	#	Active crop ID generated at creation
Crop Name	31 Characters	Active crop displayed on dashboard
Crop Density	0.1 - 99	Active crop density displayed on dashboard
Crop Moisture	1 - 99	Active crop moisture displayed on dash-board
Crop Temperature	1 - 99	Active crop temperature displayed on dash-board
Field Id	#	Active field ID generated at field creation
Field Name	31 Characters	Active field displayed on dashboard
Field Weight		Active field accumulated weight (kg)
Field Vol		Active field accumulated volume (bu)
Field Acres	0-10000	Active field acres
Truck Id	#	Active truck ID generated at truck creation
Truck Load Id	#	Active truck load ID generate on truck clear or truck change
Truck Name	31 Characters	Active truck displayed on dashboard
Truck Weight Capacity	0-100000	Active truck weight capacity displayed on dashboard (kg)
Truck Vol. Capacity	0-10000	Active truck volume capacity displayed on dashboard (bu)
Truck Weight		Active truck load accumulated weight (kg)
Truck Volume		Active truck load accumulated volume (bu)
Bin Id	#	Bin ID generated at creation
Bin Name	31 Characters	Active bin displayed on dashboard
Bin Weight Capacity	0-10 M	Active bin capacity displayed on dashboard (kg)
Bin Vol. Capacity	0-1 M	Active bin capacity displayed on dashboard (bu)
Bin Weight		Active bin accumulated weight (kg)
Bin Vol.		Active bin accumulated volume (bu)

Joystick Readings		
Joystick Error	True/False	True= No joystick connected False= Joystick connected
App Joystick Active	True	Tablet with Master control, permission to move hydraulics from within the app.
Spoutz	+/-100	Thumb joystick X axis position
Spoutx	+/-100	Thumb joystick Y axis position
Unfold	Released/Pressed	Released= Unfold button not pressed Pressed= Unfold button pressed
Fold	Released/Pressed	Released= Fold button not pressed Pressed= Fold button pressed
Gate Open	Released/Pressed	Released= Gate open button not pressed Pressed= Gate open button pressed
Gate Close	Released/Pressed	Released= Gate close button not pressed Pressed= Gate close button pressed
Pivot Up	Released/Pressed	Released= Pivot up button not pressed Pressed= Pivot up button pressed
Pivot Down	Released/Pressed	Released= Pivot down button not pressed Pressed= Pivot down button pressed
Unload Weight Change Status		
Weight Change State	Increasing/Same/Decreasing	Same= Smart filter and live weight are the same. Decreasing= Smart filter and live weight matching point is decreasing increasing= Smart filter and live weight matching point is increasing
Unload Event Mode	Hold/ Block/ Unloading	Hold= Weight is maintained at the same level Block= Loadcells are noisy Unloading= Unload detected
Filtered Weight	+/- 2147483.648 (Kg)	Smart filter weight
Top Threshold Weight	+/- 2147483.648 (Kg)	Top weight captured for unload reference
Unload Start Weight	+/- 2147483.648 (Kg)	Weight at the start of the last unload event. Updated when unload detection begins.
Unload End Weight	+/- 2147483.648 (Kg)	Weight at the end of the last unload event. Updated when unload detection ends.
Weight Unloading	2147483.648 (Kg)	Δ Unload Start Weight and Smart Filtered weight during an unload event.
Unload Total Weight	+/- 2147483.648 (Kg)	Δ Unload Start Weight and Unload End Weight from last unload event.
Smart Filter Results		
Envelope Top	+/- 2147483.648 (Kg)	Top weight from live weight
Envelope Bottom	+/- 2147483.648 (Kg)	Bottom weight from live weight
Noise Envelope Magnitude	+/- 2147483.648 (Kg)	Δ Envelope Top and Envelope Bottom
Confidence	0-100	Smart filter confidence
Smart Filtered Weight	+/- 2147483.648 (Kg)	Smart filter weight

Master File Status		
Farminfo.bin CRC Failed	True/ False	Transmission verification that all data was properly transmitted from the Tablet to the Controller. True means there was a data transfer error. False indicates all is fine. Farminfo contains all your crops, fields, trucks, and bins information.
unloads.bin CRC Failed	True/ False	Transmission verification that all data was properly transmitted from the Tablet to the Controller. True means there was a data transfer error. False indicates all is fine. Unloads contains your unloads and edited unloads information.
transfer.bin CRC Failed	True/ False	Transmission verification that all data was properly transmitted from the Tablet to the Controller. True means there was a data transfer error. False indicates all is fine. Transfers contains all you bin transfers information.
Master Data Sync Machine Status		
Machine State	16 possible states	These states indicate what stage the master date state machine of the tablet and controller are in.
Controller Date		
Time:	1/1/0001 12:00:00 am and forward	Current date and time saved on the controller used to tag unloads. The date time is translated from UTC to the devices time zone.

3.19 SEND DIAGNOSTICS

In this section we will discuss Send Diagnostics. Send Diagnostics can be utilized by our product support team to help investigate the cause of an issue.

1. Start with the Dashboard Screen.
2. Touch Settings to access the Settings screen.
3. Touch Diagnostics then Send Diagnostics to access the Send Diagnostics Screen.
4. Touch, Debug, Unloads, Weights, Auger, Drive or Generic depending on what is required by product support.
5. Wait for it complete the download. These buttons download files saved on the controller and store them on your device.

WARNING:

Some logs will have a larger file history and can take multiple minutes to download.

6. You should see the Last Controller Download Start for this Cart update for the specific log you downloaded.
7. After you complete downloading all the desired logs connect to Wi-Fi network with an internet connection.
8. Return to the Send Diagnostics Screen.
9. Touch the EMAIL buttons which will be available when you are connected to the Internet.

WARNING:

This email will be sent directly our Elmer's Team and will include any logs you downloaded as well as any Elmer's Haulmaster App data residing on the device. If you did not download any logs the EMAIL button will still send the Elmer's Haulmaster App Data.

FIG. 114 DOWNLOAD LOGS

FIG. 115 SEND DIAGNOSTICS

3.20 REPROGRAMMING CONTROLLER

In this segment, we will go over reprogramming the controller:

1. Start with the Dashboard screen.

2. Touch Settings to go to the Settings screen.

3. Touch Controller then Reprogramming to access the Reprogram screen.

> **NOTE:**
> Information displayed includes Controller name, Serial number and Software Version.

4. When you download the App, a controller software update comes with it.

5. Touch the gray box to access Select Controller. If you updated the App and received a pop up to reprogram the controller select the Falcon. If you installed a digital display and the display isn't showing weights or you want to turn off the Thrasher Wi-Fi network select the Thrasher.

6. Touch the gray box to access Select Version of the software for the controller.

7. Touch select version to return to the Reprogram screen.

8. Touch the Start Reprogram box to start reprogramming.

9. A loading animation will appear next to Reprogram, Reboot, Reformat, Transfer and Finalize during the process.

10. When each line is completed, a small green circle with a check mark appears next to the line.

11. When completed, a Reprogramming Success box will appear instructing you to restart the Controller.

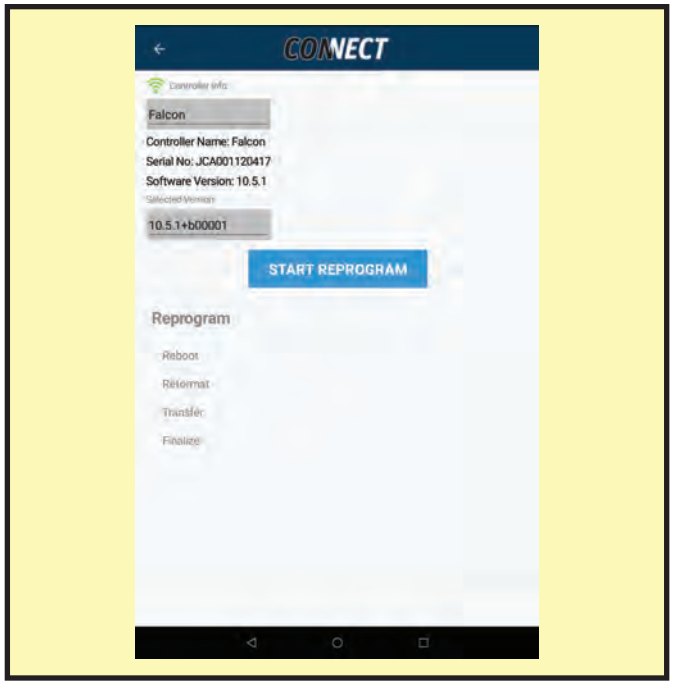


FIG. 116 REPROGRAM

FIG. 117 REPROGRAMMING

3.21 CONTROLLER DATE TIME

This section will cover setting the Date and Time on the controller. This can be useful if you notice unload times no longer match their expected values. Over time the controller time can drift.

1. Start with Dashboard screen.

2. Touch Settings to access the Settings screen.

3. Touch Controller then Update Controller Date/ Time to access the Controller Date screen.

4. Current Controller Date will be the date and time stored on the Controller that unloads will reference when they are registered on the system. Current Tablet Date is the date and time set in the tablet settings. If these two times do not match or are out of sync by enough time that it is a concern for accurate records touch Set Time.

5. Verify the two times now match each other.

NOTE:
If Current Tablet Date is inaccurate reference the user manual for your device to set the date and time on the device.

FIG. 118 DATE - TIME

3.22 RESTORE

In this segment, the Restore function will be discussed:

1. Start with Dashboard screen.
2. Touch Setting to access Settings Screen.
3. Touch Controller then Restore to access Restore screen.
4. The top space indicates if the Controller has been initialized.
5. If you have all of your fields and unloads entered and you want to make those numbers the restore point, touch the Save Restore Data box and the green Restore Data Saved box will appear.

NOTE:
Data corruption can occur if the power to the Falcon is turned off during data writing to the Controller. This is an unlikely occurrence, but for safety this feature has been provided.

6. If files on the controller become corrupted, a prompt screen appears informing you of the situation.
7. Go to Restore screen and touch the red Reset File System box.
8. Confirm Reset screen will appear asking if you want to reset the file system on the controller.
9. Touch Confirm Reset and controller will reset.
10. A prompt screen will appear instructing to reconnect and restore Controller file data.
11. Reconnect to the controller.
12. A prompt page will appear instructing to restore or initialize the Controller.
13. Touch Restore Page box to return to Restore screen.
14. Touch Initialize Controller box and a green box informing you Initialize Success when completed.

FIG. 119 RESTORE SCREEN

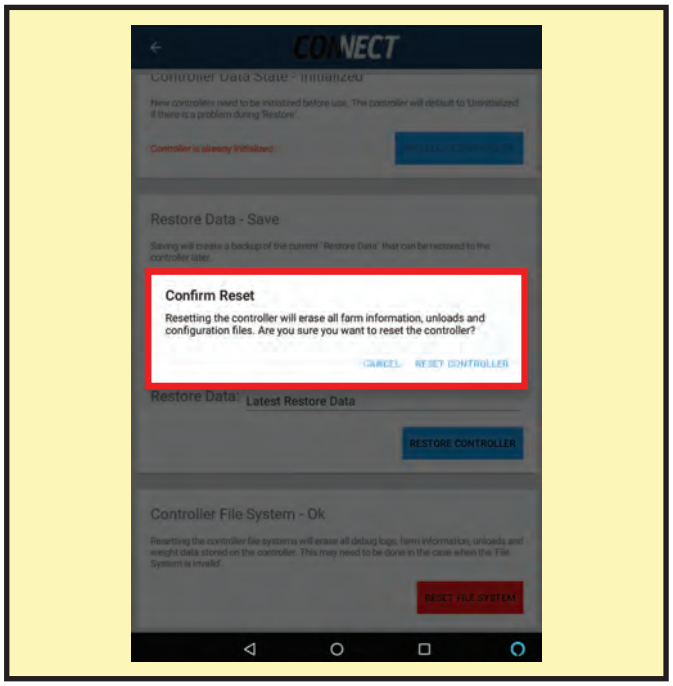


FIG. 120 CONFIRM RESET

15. Touch Restore Data box to go to Select Restore screen where you can select the appropriate restore line.

16. Touch Restore Controller and a green Restore Files Pushed box will appear informing you all old files have been restored.

17. Restore action disconnects the controller so the tablet must be reconnected.

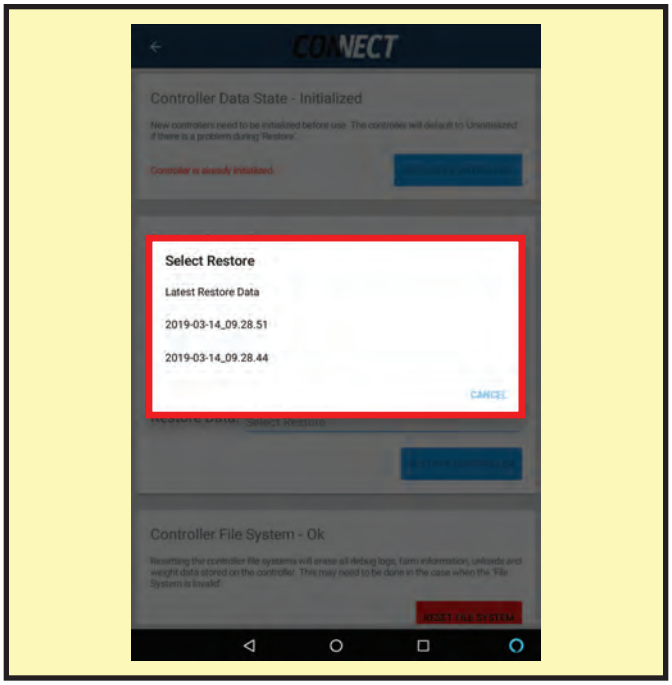


FIG. 121 SELECT RESTORE

3.23 SEASONS

This segment will discuss the Seasons function.

1. Start with the Dashboard.
2. Touch Settings to go to the Settings screen.
3. Touch Seasons line to go to the Seasons screen.
4. Touch Close in the top right corner to close the Season.

WARNING:
Closing a season will remove all Unload data from the controller. Your tablet will now be responsible for all archived files. It is recommended you email your unload data for a backup.

FIG. 122 SEASONS

5. The prompt Close Season will appear explaining Unloads, transactions and accumulated-weights will be archived and reset for the current season. An empty season will also be created.
6. Closing a season will keep all your crops, fields, trucks bins, but reset all their weights and unloads. You will not be able to reactivate the closed season.
7. Touch **Cancel** or **CloseSeason** as appropriate.

WARNING:
Any previously connected tablets will be requested to load the new season when they reconnect. This will remove last season information from secondary tablets. Newly connected devices will also be requested to Load New Season. Load New Season only downloads current season information to the tablet, all data on the controller will remain.

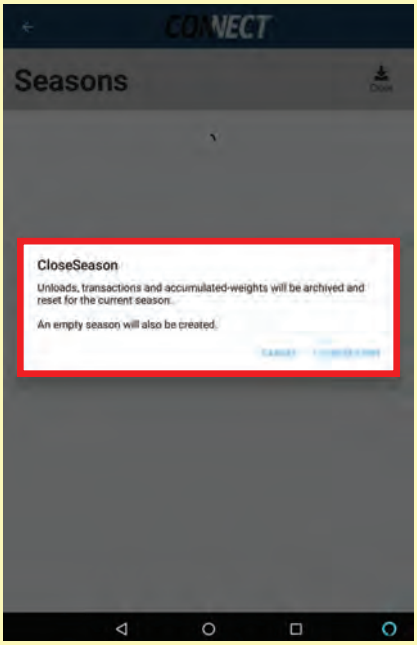


FIG. 123 CLOSE SEASON

8. Once the season is closed you can select it from the Seasons screen for review and editing.

9. See "3.9 UNLOAD LIST" for Unloads.

10. See "3.8 BINS" for Transfers.

FIG. 124 REVIEW CLOSED SEASON

11. Touch Weights to access the Weights Screen

12. From the weights screen you can see the accumulated weights for all fields, trucks and bins.

13. Touch the Filter button in the top right corner to filter the list by Client or Farm.

14. Touch the drop down arrow to sort by client, farm, field, truck or bin.

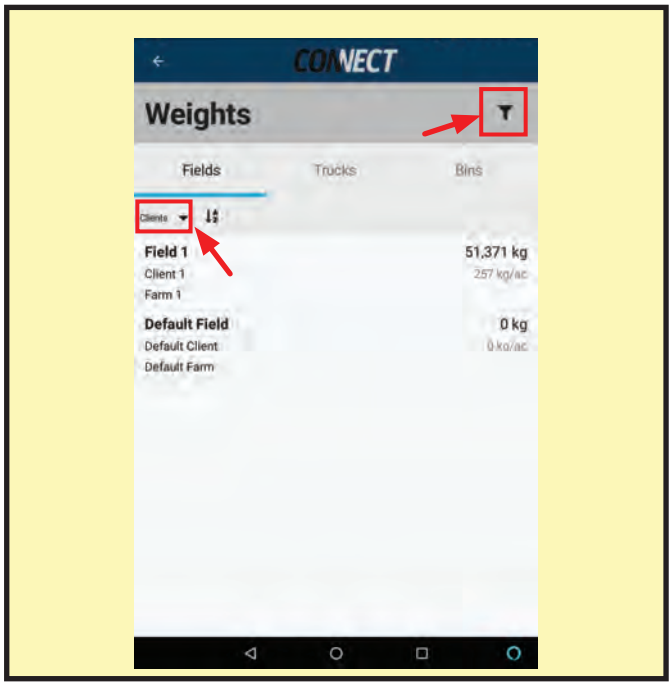


FIG. 125 WEIGHTS

3.24 TANDEM STEERING

This section is for **In-Line Tandem Carts Only**. The functionality in this section will not affect other types of carts.

1. Start with the Dashboard Screen.

2. Touch Settings to access the Settings screen.

3. Touch Calibration then Tandem Steering to access the Tandem Steering Page.

4. Cart speed will display the current speed in km/h.

5. Cart Travel Direction will display if the cart is traveling in forward or reverse. When stationary it will display the last registered direction.

6. Tandem steering mode will display the currently user selected steering mode which can be Locked, Manual or Automatic.

7. Steering state machine will display the current state. When in Locked mode it will read LockSteeing, in Manual mode it will read ManualSteering and Automatic mode it can be in AutoLockSteeringForReverse, AutoFloatSteering or AutoLockSteeringForHighSpee.

8. Touch Lock Steering to put the steering into LockSteering. Locks the wheels from steering.

9. Touch Manual Steering to put the steering into ManualSteering. Gives the operator control of the tire's steering using the tractor's hydraulics. This mode operates identically to a cart without Steering-Lock System and is used for phasing of the steering.

10. Touch Automatic Steering to put the steering into one of the Automatic states. It automatically selects the appropriate float or locked steering state. When traveling forward at field speeds, the float state is automatically selected to allow the cart's tires to steer. When traveling in reverse, or forward at a speed greater than Auto Lock Threshold, the locked state is automatically selected. It is recommended that automatic mode be used for daily cart operation. Actuation of the Tractor's hydraulics will not affect the cart's steering when in Automatic Mode.

11. Touch the –, + or slider to adjust the Auto Lock Threshold then hit set to save it.

FIG. 126 TANDEM STEERING

NOTE:
See the Haulmaster Operators Manual, Steerable Inline Tandem section for more information on operation and Tire Alignment Procedure.

3.25 OUTPUTS

In this segment we'll be going over Outputs. All hydraulic flows can be controlled though this screen. The only unavailable hydraulic flow is the limp speed of the auger fold and unfold. This is limited to 35% to prevent damage in a limp mode scenario.

1. Start with the dashboard screen.
2. Touch Setting to access Setting Screen.
3. Touch Calibration then Outputs.

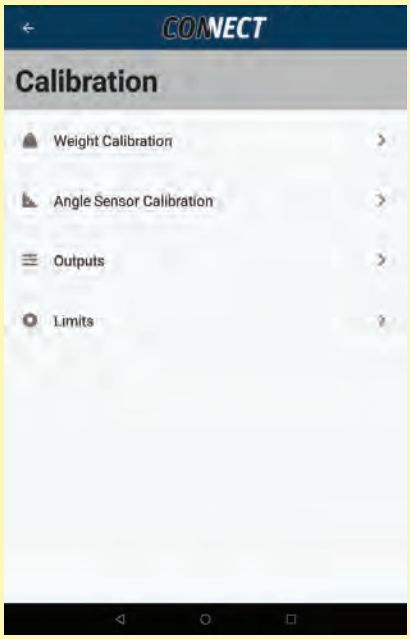


FIG. 127 CALIBRATION

4. Each output displays its current hydraulic flow percentage in gray. The percentage in black will be the user configurable flow rate.
5. The configurable rate can be controlled by the + and – symbols by predefined step amounts. Alternatively, the user can use the slider to change the setting.
6. When a desired flow rate is reached touch set next to the setting.
7. The hydraulic flows rate in gray will update to indicate a successful change in flow rate. Test the function to see if the desired flow rate is set.

> **Note**: 20% is typically the lowest value before hydraulics will cease to move.

8. **Gate Max Duty Cycle:** This setting controls the speed of the gate function. It is the percentage of the flow rate provided by the tractor hydraulics that well be passed to the gate mechanism. Some users find the gate speed to be too fast when they trigger open. For greater control over the gate opening turn down the Gate Max Duty Cycle

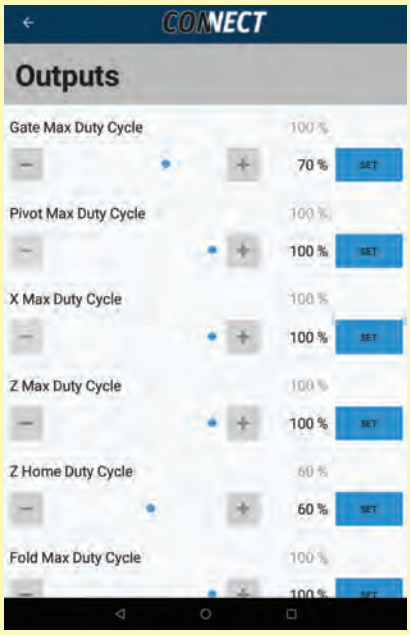


FIG. 128 OUTPUTS TOP

9. **Pivot Max Duty Cycle:** This setting controls the speed of the pivot function. It is the percentage of the flow rate provided by the tractor hydraulics that will be passed to the pivot mechanism.

10. **X Max Duty Cycle**: This setting controls the speed of the X spout function. It is the percentage of the flow rate provided by the tractor hydraulics that will be passed to the SpoutX mechanism. The thumb stick drives the X spout proportionally to this max flow rate and the amount the thumb stick is moved away from center. If max speed of X is too fast when the thumb stick is fully moved up or down reduce this flow rate.

11. **Z Max Duty Cycle:** This setting controls the speed of the Z spout function. It is the percentage of the flow rate provided by the tractor hydraulics that will be passed to the spoutZ mechanism. The thumb stick drives the Z spout proportionally to this max flow rate and the amount the thumb stick is moved away from center. If max speed of Z is too fast when the thumb stick is fully moved left or right reduce this flow rate.

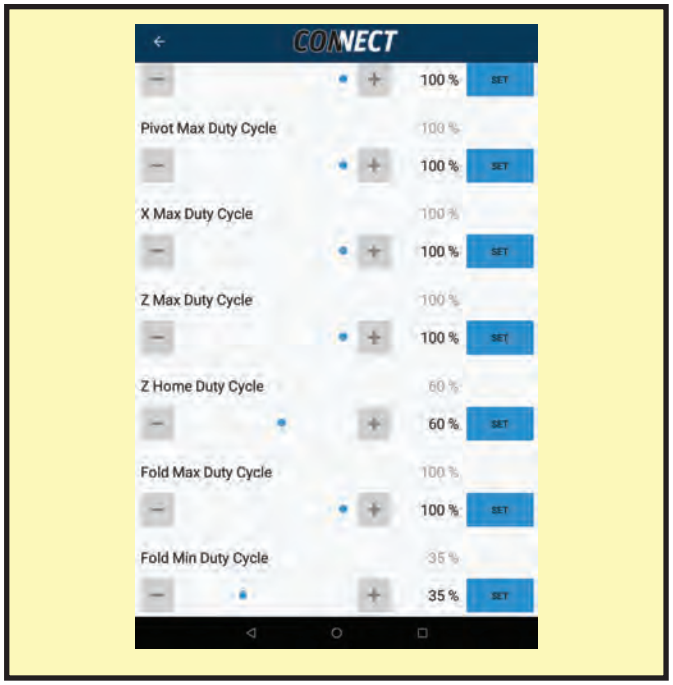


FIG. 129 OUTPUTS BOTTOM

12. **Z Home Duty Cycle:** This setting controls the speed of the Z spout when it is automatically moving to its storage position prior to the auger folding. It is the percentage of the flow rate provided by the tractor hydraulics that will be passed to the spoutZ mechanism. If the Z spout won't move or return to home increase this duty cycle to compensate for added resistance on the spout. If the Z spout is overshooting center and canceling the fold sequence you can reduce this setting to correct it. This setting is typically 60% when leaving the factory.

13. **Fold Max Duty Cycle:** This setting controls the maximum speed the fold and unfold function can travel. It is the max percentage of the flow rate provided by the tractor hydraulics that will be passed to the fold mechanism when PID control is used. While the fast fold and unfold time is desirable by most some have found the maximum speed of the auger to be overwhelming. If you prefer to move your equipment in a more leisurely fashion turn down this setting for a more relaxed folding and unfolding time. This setting cannot be less than your Fold Min Duty Cycle, the software will warn you if you try to set this lower than Fold Min Duty Cycle.

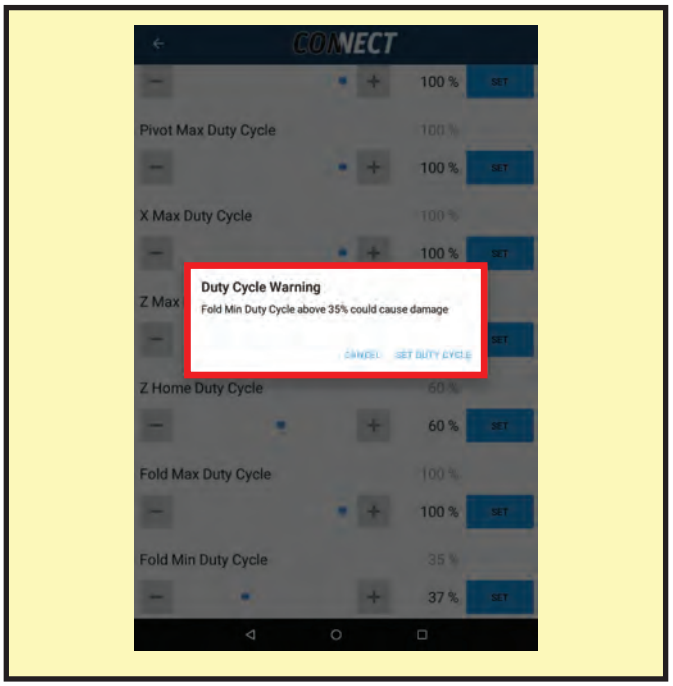


FIG. 130 DUTY CYCLE WARNING

14. **Fold Min Duty Cycle:** This setting controls the minimum speed of the fold and unfold function will move at. This is the speed the auger will land and seal the rest or sealing against the upper auger. It is the min percentage of the flow rate provided by the tractor hydraulics that will be passed to the fold mechanism when PID control is used. If you find these movements are landing too hard on the equipment turn down this setting. Alternatively, if you find these movements aren't completing their seal turn up this duty cycle. Typically, small changes of 1% is all that is needed. For most tractors it is not recommended this setting go above 35%. A warning will display when this setting goes above 35% to warn you about the potential damage to your equipment.

3.26 LIMITS

In this segment we'll be going over Limits.

1. Start with the Dashboard screen.
2. Touch Setting to access Setting Screen.
3. Touch Calibration then Limits.
4. Each limit displays a Live reading of the current functions position, current setting percentage in gray and the percentage in black will be the user configurable limit.
5. The configurable Limit can be controlled by the + and – symbols by predefined step amounts. Alternatively, the user can use the slider to change the setting.
6. When a desired limit is reached touch Set next to the setting.
7. The current limit in gray will update to indicate a successful change of the limit. Test the function to see if the desired limit is set.
8. **Max Gate Open:** When the gate reaches this percentage, it will stop driving the gate open function. If you are overshooting the max gate open, see Outputs, Max Gate Duty Cycle and reduce the speed of the gate function.
9. **Min Pivot Down:** When the Pivot reaches this minimum percentage, it will stop driving the pivot down function. This setting is to help prevent damaging truck by limiting how low the pivot can be driven.
10. **Pivot Home:** This limit is a home setting. When Pivot with Auto Fold and Unfold is turned on Pivot Home will be used by the auto fold function. With a double press action on the fold movement the spout will first move home, the auger will fold then the pivot will move to the Pivot Home position. The hope is that you can set the auger in a way to make the product windows visible or alternatively move pivot to a position ready for highway travel.

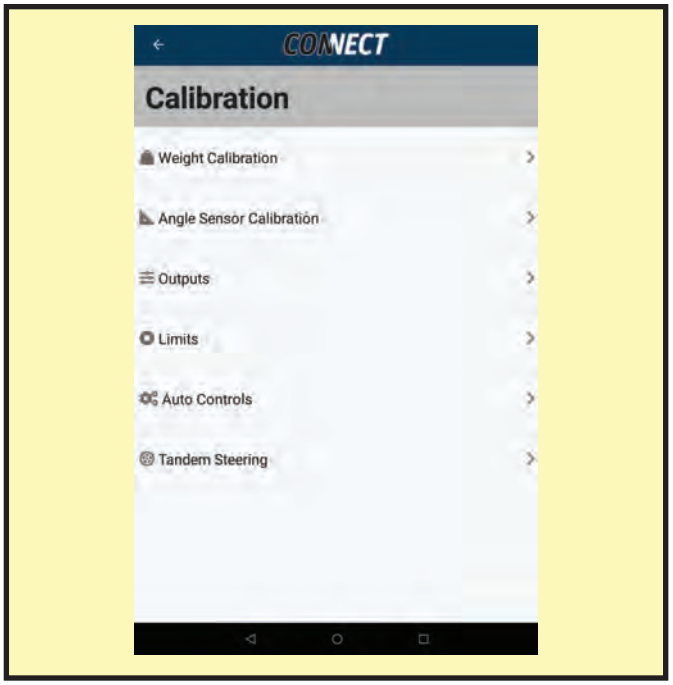


FIG. 131 CALIBRATION

FIG. 132 LIMITS

3.27 OFFLINE CARTS

This section will discuss accessing Offline Carts that you have previously connected too.

1. Disconnect from the Cart controller.
2. Start with the Dashboard screen.
3. Touch Settings to access the Settings screen.
4. Touch Select Offline Cart.
5. You will see a list of previously connected carts.
6. **Folder ID:** This is the folder name the specific cart data is stored under.
7. **Cart S/N:** This will be your Grain Cart Serial Number.
8. **Controller:** This is your HM Connect Controller (Falcon) Serial Number.
9. **SSID:** This is the Wi-Fi Network Name of the cart that is displayed on the Dashboard. The date and time are the last time the device fully synced all the information with the cart
10. Select the desired cart.
11. Return to the Dashboard and the cart's SSID should be displayed in the top right of the Dashboard.
12. You can now make offline edits or view closed seasons, unloads, crops, fields, trucks, and bins for this specific cart.

FIG. 133 OFFLINE CARTS

3.28 DIGITAL DISPLAY

The display will match the units and resolution of the Master or last Master connected device. View the Weight Settings section to see how the user can change units and resolution. The weight shown on the digital display will be our smart filter weight. This weight is filtered differently from the average filter weight seen in the App. The weight will be more resistant to noise and may have a longer delay. Clear-able Tare is not displayed on the Digital Display.

If you are performing a retrofitted install of the digital display, you will need to update the Thrasher to version 1.3.1 for the digital display to work. See Reprogramming Controller for information on how to reprogram the Thrasher.

3.29 AUTO CONTROLS

In this segment we'll be going over Auto Controls which only applies to HM PRO.

1. Start with the Dashboard screen.

2. Touch Settings to access the Settings Screen.

3. Touch Calibration then Auto Controls.

4. Master Automatic Controls can be disabled from this screen as well angle sensor calibration screen. If disabled, you will have to go through Angle Sensor Calibration to re-enable. All other auto controls will be disabled but retain their settings for when Master Automatic Controls is re-enabled. You will be unable to change the states of the other Auto Controls when Master Automatic Controls is disabled.

5. Auto Gate Close Based on Speed can be enabled or disabled from this screen or the dashboard. Only very small devices will be unable to access this setting on the dashboard.

6. Auto Gate Close Based on Weight can be enabled or disabled from this screen or the dashboard. Only very small devices will be unable to access this setting on the dashboard.

7. Pivot with Auto Fold and Unfold: When enabling this function both auto fold and unfold will now have pivot movements added to their functionality.

   • **Auto Fold:** Spout will move home, auger will fold, pivot will move to Pivot Home position.

   • **Auto Unfold:** Pivot will travel all the way up, auger will unfold.

NOTE:
Pivot with Auto Fold and Unfold will not automatically move the pivot when manual fold and unfold is being used.

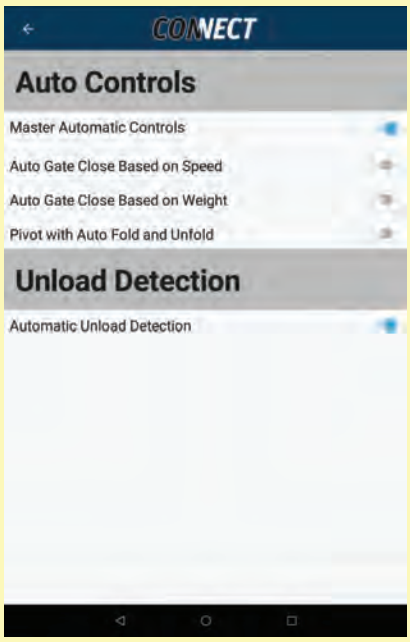


FIG. 134 AUTO CONTROLS

3.30 IMPORTS

IMPORT FROM CSV FILE

In this segment we'll be going over how to import clients, farms and fields from a CSV file. This can speed up the process of creating all your farm information. A simple way to create this file is to use excel.

1. Your file must have headers with the following spelling:

Client Name	Farm Name	Field Name	Area (ac)

2. Fill in your client, farm, field and acre amount. Make sure your spelling remains the same for each unique client and farm unless you want multiples of the same object created. The following is a small example list.

Client Name	Farm Name	Field Name	Area (ac)
Elmers	Altona Farms	NW Field	300
Elmers	Altona Farms	49 South	400
Elmers	Perch Farms	SE Field	220
Elmers	Perch Farms	NE Field	150
Haulmaster	Souther Farms	BackLot	300

3. The same can be accomplished in note pad with the following structure:
   Client Name,Farm Name,Field Name,Area (ac)
   Elmers,Altona Farms,NW Field,300
   Elmers,Altona Farms ,49 South,400
   Elmers,Perch Farms,SE Field,220
   Elmers,Perch Farms,NE Field,150
   Haulmaster,Southern Farms,BackLot,300

Note: This example only creates one Elmers client, one Altona Farms and one Perch Farms.

4. Save the file as CSV.

5. Transfer the file onto the tablet.

6. Start with the Dashboard screen.

7. Touch Settings to access the Settings screen.

8. Touch Imports then Import from CSV File.

FIG. 135 LIMITS

9. Select Pick File in the top right corner of Import from CSV File.

10. Select the appropriate CSV.

FIG. 136 SELECT CSV FILE

11. Deselect any items you do not want to import.

12. Touch Save. A prompt notifying you the pending operations have been created will appear.

13. Select **OK**.

14. If you have yet to push any information you will have to go to pending operation and select execute. If you have already executed an operation in this session all items will automatically be pushed to the controller

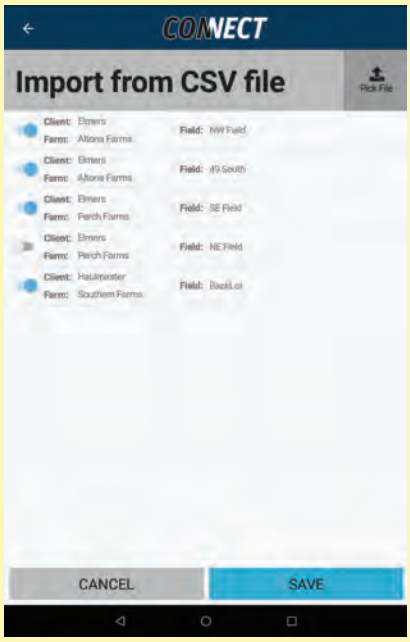


FIG. 137 IMPORT FROM CSV FILE

3.31 IMPORT DATA FROM JOHN DEERE

In this segment we'll be going over how to import clients, farms and fields from John Deere Operation Center. This can speed up the process of creating all your farm information.

1. After having connected to your cart once, connect the tablet to an internet connection through a home Wi-Fi network or hotspot.

   Note: The cart Wi-Fi does not have internet capabilities.

2. Touch Settings to access the Settings screen.

3. Touch Imports then Import data from John Deere.

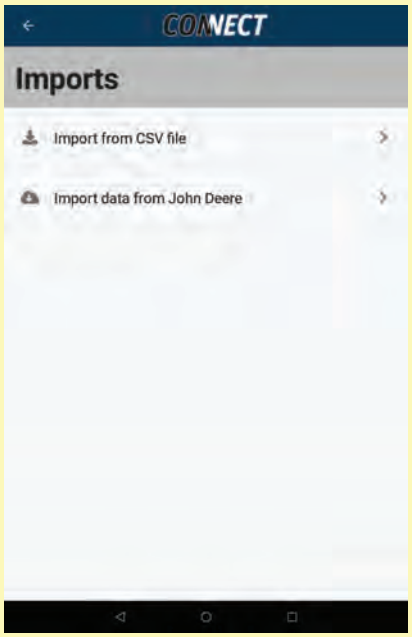


FIG. 138 IMPORTS

4. If connected to the internet you will be brought to John Deere Sign in. If you weren't connected to the internet a Failure notifying you to connect to the internet will appear.

5. Sign into John Deere using your John Deere credentials.

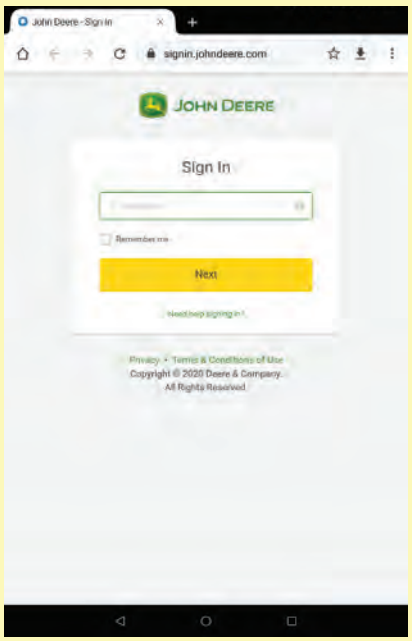


FIG. 139 JOHN DEERE SIGN IN

6. Touch the down arrow next to All to select whether you want to import All, Archived or Available Fields.

7. Touch Retrieve Fields from John Deere.

8. Your new fields and their associated clients and farms will appear.

9. Toggle the blue switch to deselect any fields you do not want imported.

10. Touch **Save**.

11. A success notification will appear, Touch **OK**.

12. Connect to the Cart Wifi.

13. If you have yet to push any information you will have to go to pending operation and select execute. If you have already executed an operation in this session all items will automatically be pushed to the controller.

FIG. 140 IMPORT DATA FROM JOHN DEERE

3.32 UPDATING THE APP

Instructions to update the application will be made available on our website at elmersmfg.com/connect/

The App can now be found in the Play Store for Android and the App Store for iOS devices.

A link to the website is also included in the App, which can be found by following these steps:

1. Connect to the Internet with your device.
2. Start with the Dashboard Screen.
3. Touch Setting to access Setting Screen.
4. Touch Calibration then About.
5. Touch App Update to be taken to our website.
6. Follow the instructions or video on the website.

FIG. 141 ABOUT

5.33 UNLOAD DETECTION

In this segment we will discuss the two options available for unload detection: automatic unload detection and manual unload detection.

AUTOMATIC UNLOAD DETECTION

When using automatic unload detection, the dashboard will display the Auto Unload button. Automatic unload detection will detect unloads using an algorithm, the user does not need to do anything to record their unloads. If the user is experiencing large delays, they can use the Auto Unload button to speed up the unload detection algorithm. In automatic unload detection, pressing start and stop does not change the unload start or end weight but speeds up the filter and increases the filter confidence giving a quicker result.

1. Start with the Dashboard screen.
2. Touch Settings to access the Settings screen.
3. Touch Calibration then Auto Controls to access the Auto Controls screen.
4. Under Unload Detection toggle the switch next to Automatic Unload Detection so its blue.
5. Return to the dashboard and verify the unload button is Auto Unload Start.
6. If a live unload weight is taking too long to display press **Start**. Alternatively, you can press **Start** before starting the Unload for it to respond quicker when the unload begins. The filter will return to normal behavior after 15 seconds of not detecting an unload.
7. Perform the Unload.
8. If unload times are taking too long to register press Stop at the end of the unload to speed up the unload confirmation.
9. The unload will be added to the unload list and accumulated weights.

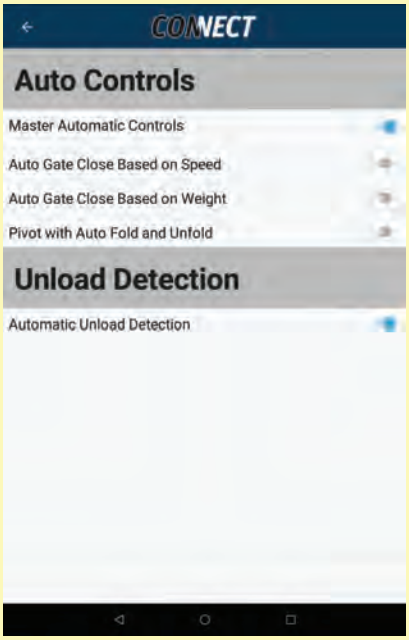


FIG. 142 AUTO CONTROLS

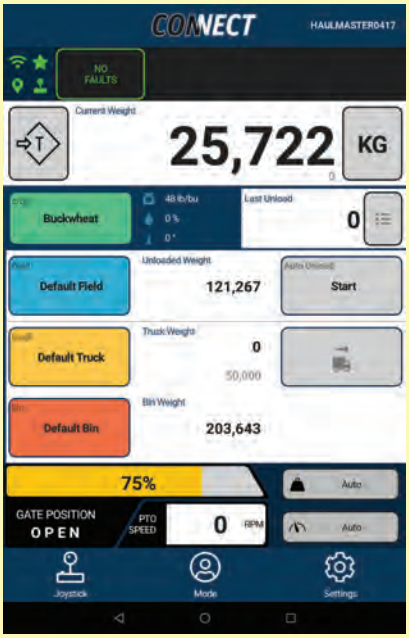


FIG. 143 AUTO START

If you do not want to use the Auto Unload Start/Stop buttons, you can hide them by following these steps.

1. Start with the Dashboard screen.
2. Touch Settings to access the Settings screen.
3. Touch General to access the General screen.
4. Toggle Visible Auto Unload Controls so it is gray.

NOTE:
The start stop button will only be hidden for this device. Start, Stop cannot be hidden in Manual Unload Detection mode

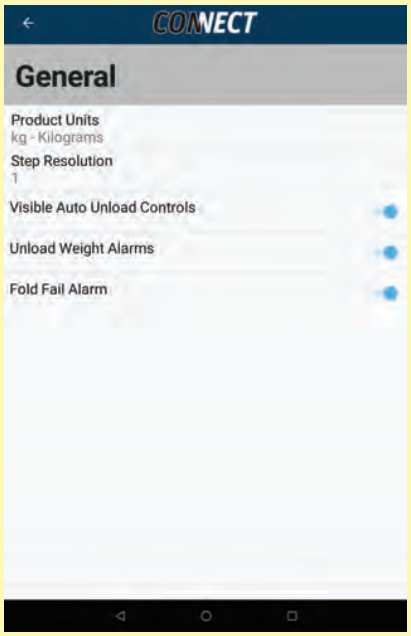


FIG. 144 GENERAL

MANUAL UNLOAD DETECTION

When using manual unload detection, the dashboard will display the Manual Unload button. Manual unload detection is completely dependent on the user to start and stop the unload. The start and stop weight will be taken at the time the button is pressed with a light filter applied to the weight. With the light filter there will be less than a second delay on changing weights, but the weight readings will vary more because they are subject to more noise. It is recommended to come to a complete stop when starting or stopping manual unload detection. Unload detection method can only be altered with a Master mode.

1. Start with the Dashboard screen.
2. Touch Settings to access the Settings screen.
3. Touch Calibration then Auto Controls to ac¬cess the Auto Controls screen.
4. Under Unload Detection toggle the switch next to Automatic Unload Detection so it is gray.

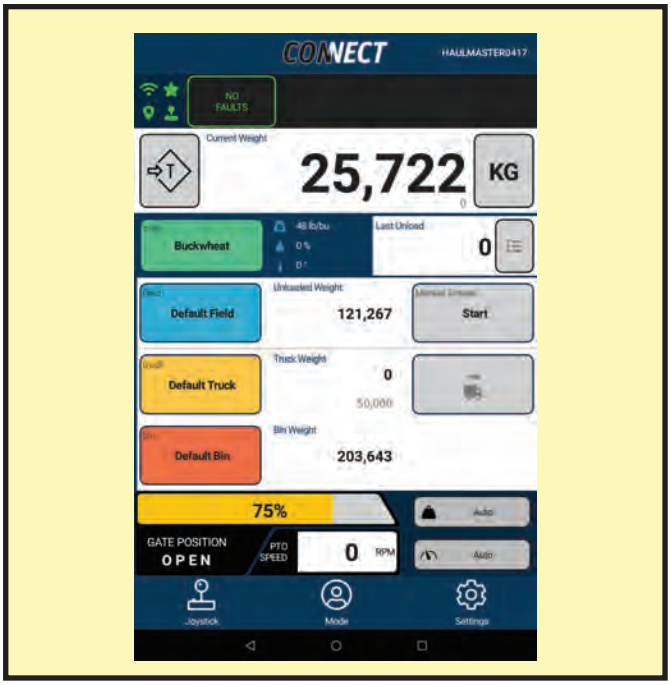


FIG. 145 MANUAL START

5. Return to the dashboard and verify the unload button is Manual Unload Start.
6. Before unloading press Start when the cart is stopped.
7. Perform the unload and come to a stop.
8. Press Stop.
9. The unload will be added to the unload list and accumulated weights.

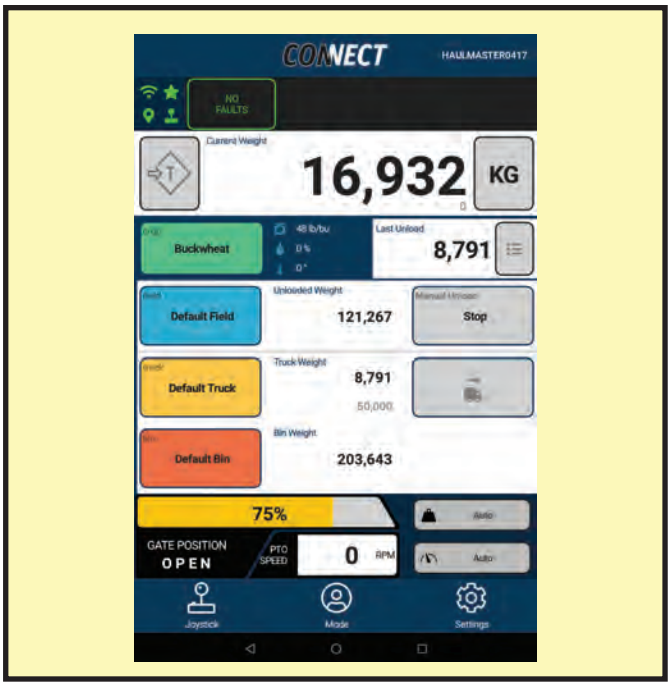


FIG. 146 MANUAL START

5.34 GENERAL

This section will cover the General Settings Page. This section has been partially covered in the Weight Settings section.

1. Start with the Dashboard screen.

2. Touch Settings to access the Settings screen.

3. Touch General to access the General Page.

4. Just like the dashboard you can select whether your weights are displayed in kilograms (kg), pounds (lbs), bushels (bu) or tonnes (t) by touching your desired weight unit.

5. On General screen, the step resolution can be selected to allow user to choose the accuracy of the units displayed.

6. Resolutions of 1, 10, 20, 50 and 100 can be chosen for kilograms and pounds. Bushels and tonnes are locked to a resolution of 1. A resolution of 1 for kg and lbs would mean the weight changes more because of its increased sensitivity to weight fluctuation.

7. Toggle Visible Auto Unload Controls to hide the Start/ Stop button on the dashboard when in Automatic Unload Detection.

8. Toggle Unload Weight Alarms to silence truck weight alarms from ringing when target weights are reached.

9. Toggle Fold Fail Alarm to silence the Fold Fail Alarm whenever the auger auto fold or unfold fails to complete its cycle after being initiated.

NOTE:
All these settings are only for the specific device they are set on and will not affect other devices.

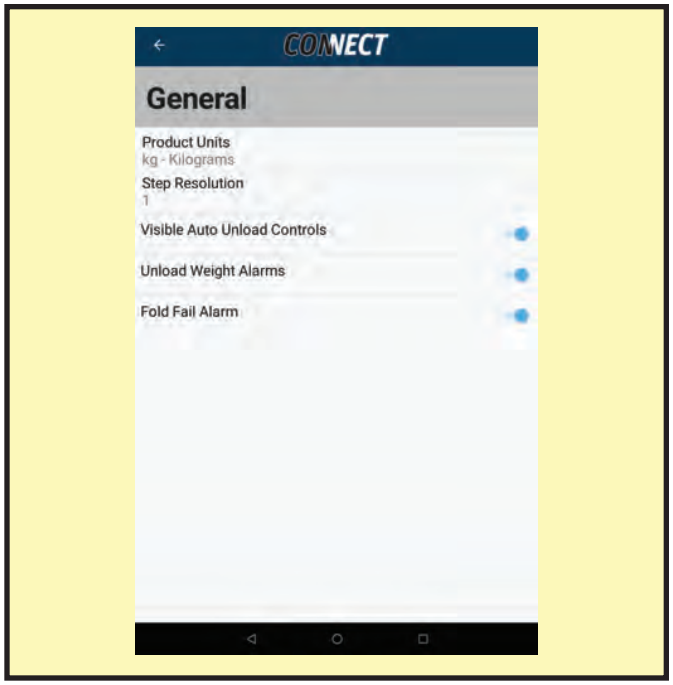


FIG. 147 GENERAL

TROUBLESHOOTING GUIDE

4 TROUBLESHOOTING GUIDE

We strive to constantly improve the user's experience. Please check our website www.elmersmfg.com/connect to verify you are using our latest software that may address your issues.

1. PTO Sensor not reading value

Problem	Cause	Solution
Sensor light is always on when shaft is rotated by hand.	Sensor is mounted too close to the PTO collar.	Take off the PTO shaft from the gearbox back away the sensor to 5 mm from the closest edge of the PTO collar.
Sensor light never comes on	Sensor is mounted too far to from the PTO collar.	Take off the PTO shaft from the gearbox close the gap from the sensor to 5 mm from the closest edge of the PTO collar
Sensor light never comes on when shaft is rotated by hand.	Sensor does not have power. The Harness B Aux 12V is not connected to Harness C Aux 12V	Trace Harness B 6 inches from the Connect controller to find Aux 12V. Connect this to Aux 12V on Harness C in the same area.
Sensor light never comes on when shaft is rotated by hand.	Sensor does not have power. The Harness B Aux 12V is not connected to Harness C Aux 12V	Test Harness C Aux 12v for 12 volts DC. Plug Harness B Aux 12V to Harness C Aux 12V. Test the connect that plugs into the sensor for 12 volts DC between pins 1 and 2. If voltage was present at Harness C and not at the sensor replace Harness B.
Sensor light never comes on when sensor has metal placed in front of it.	Faulty sensor	If the sensor has 12 volts DC at pins 1 and 2, but the sensor never lights up when the sensor end is placed against a metallic surface, replace the sensor.
Sensor is functioning as intended, but there is no reading on the tablet.	Harness B is not fully inserted into the Connect Controller.	Ensure Harness B is fully inserted in the HM Connect Controller. If it is fully inserted Harness B is faulty.

2. Auto gate close - speed not working

Problem	Cause	Solution
Speed dial on the dashboard won't turn on or off.	Not currently the master tablet.	Surrender master mode from master tablet. Request master mode from your current tablet. With master control (green star on the dashboard), you should now be able to select or deselect the speed dial next to the RPM display.
Speed dial is on, tractor is moving faster than 8 km/hr., but the gate won't close.	Hydraulics aren't turned on or turned up enough.	Turn on the hydraulics and test the gate functionality with the Joystick. If the gate operates in the intended directions labeled on the joystick, try driving forward again. Ensure under settings, calibration, outputs that gate max duty cycle is turned up.
Speed dial is on, tractor is moving faster than 8 km/hr. Gate functions with joystick.	Wheel speed sensor is not working.	Under settings, diagnostics, parameter readings under the machine status heading, look at wheel speed. Drive forward and verify the wheel speed is approximately the same as the tractor. If no wheel speed, see "Wheel speed sensor not working"
Gate opens instead of closing.	Solenoid outputs are swapped.	See "Joystick movements are different from joystick".

3. Wheel Speed sensor not working

Problem	Cause	Solution
Wheel Speed displays as 0 km/h in diagnostics, parameter readings while travelling.	Sensor spacing is incorrect.	Adjust the sensor distance to 5 mm from the studs. See "PTO sensor not reading value" for all other trouble shooting tips.

4. Auto gate close - weight not working

Problem	Cause	Solution
Auto gate close- weight on the dashboard won't turn on or off.	Not currently the master tablet.	Surrender master mode from master tablet. Request master mode from your current tablet. With master control (green star on the dashboard), you should now be able to select or deselect the weight button next to the RPM display.
Auto gate close -Weight button is on; the truck weight is greater than the truck capacity on the dashboard, but the gate won't close.	Hydraulics aren't turned on or turned up enough.	Turn on the hydraulics and test the gate functionality with the Joystick. If the gate operates in the intended directions labeled on the joystick, try again. Ensure under settings, calibration, outputs that gate max duty cycle is turned up.
Gate opens instead of closing.	Solenoid outputs are swapped.	See "Joystick movements are different from joystick".
Gate doesn't close when BU capacity is reached	Software	Auto-Gate close only works for the truck weight capacity and not it's BU capacity in current software releases.

5. Angle sensor error

Problem	Cause	Solution
Sensor only reads 0 volts through the whole hydraulic movement.	Sensor is disconnected.	If all sensors are reading 0 volts, ensure Harness D is connected to the HM Connect controller. If only one sensor is reading 0 verify the sensor is plugged in.
Sensor only reads 0 volts through the whole hydraulic movement. Sensor disconnected is verified.	Sensor, harness damaged or magnet is missing.	If the magnet is present and it's 5.5 mm edge is placed on the sensor with no reading the sensor or harness is damaged.
Sensor reads below 0.5 volts or above 4.5 volts	Sensor magnet orientation is wrong.	Flip the magnet 180 degrees on its North, South axis  

6. Spout moved during travel

Problem	Cause	Solution
Highway transport caused the spout to turn toward the cart tank.	Wind forces were strong enough that the hydraulic motor allowed the spout to move.	Unplug the spout sensor to put the cart into limp mode. Plug in the cart power, hydraulics and joystick to move the spout back into a safe position. Plug the spout sensor back in. Alternatively, connect the tablet to the cart. Go to settings, calibration, angle sensor calibration. Disable auto controls. This will put the cart into limp mode. Move the spout to a safe position. Complete angle sensor calibration to re-enable auto controls.

7. Joystick not working

Problem	Cause	Solution
Joystick won't move any cart movements.	Hydraulics are not connected and turned on.	Verify HM Pro hydraulics are turned on and connected with proper flow direction.
Specific joystick movements won't work.	Duty Cycle is too low	Verify under settings, calibration, outputs that the appropriate duty cycle is turned up and try again.
Specific joystick movements won't work.	Limits	Verify under settings, calibration, limits that your gate limit is 100% for full movement, Min pivot is 0% for full movement.
Joystick is connected, but the tablet shows a red joystick symbol.	Joystick extension damaged.	Try connecting the joystick without the extension to the cart. If the joystick works replace the joystick extension. The joystick in the app can be temporarily used while waiting for your replacement.
Joystick is connected without the joystick extension, but the tablet shows a red joystick symbol.	Harness C or the Joystick is damaged.	Use the in-app joystick and replace the joystick of the Harness C. Harness C- JS connector should have 12 volts DC between pins 3 and 4. Pin 3 to pin 1 should have about 2.5 volts DC and the same for Pins 3 to 2. If all this is present replace the joystick. If any of these are incorrect you will have to repair or replace Harness C.
Joystick is not working, GPS not working, and load cell malfunction is displayed in the app.	CAN network is damaged.	Repair or replace Harness C.
Joystick is not working through the app or physical joystick. Hydraulics are on.	Harness A Aux 12V_A is not connected to Harness B Aux 12V_A	In the first 20 centimeters from the HM Controller there should be connectors labeled Aux 12V_A from both Harness A and Harness B, make sure these are connected. Harness B Aux 12V_A should have 12 volts DC, if not verify Aux 12V is connected between Harness B and Harness C.

8. **Joystick movements are different from Joystick**

Problem	Cause	Solution
The movement described in the app or on the joystick moves a different hydraulic function.	Solenoid inputs are incorrect.	Press the movement on the joystick and note which function moves. Go to the hydraulic block and swap the movements to their correct solenoid. Each electrical output on the harness will be marked with one of the following: ***Aug- Fold: Folds in the auger*** ***Aug- Unfold: Unfolds the auger*** ***GT-Open: Opens the gate*** ***GT- Close: Closes the gate*** ***Piv-Up: Tilts the auger up*** ***Piv-Down: Tilts the auger down*** ***Aug-ZBack: moves the spout head clockwise.*** ***Aug-ZFwd: Moves the spout head counterclockwise.*** ***Aug-XFwd: Moves the spout head up.*** ***Aug-XBack: Moves the spout head down.***

9. Fold not working

Problem	Cause	Solution
Auger won't fold or unfold.	PTO is on.	Turn off the PTO. The PTO locks out auger fold and unfold.
Auger is unfolded but won't fold.	Spout Z won't go to its storage position.	When Auto-controls are enabled Z-spout must move to its home position first. This is automated. Under settings, diagnostics, parameter readings verify the SpoutZ absolute angle is within 10 degrees of the SpoutZ Stored angle, folding is possible under this condition. If out of the range, verify the spout is operational with the joystick when unfolded. If spout Z is not functional see "Spout movements not working"
Fold or unfold movement is very slow, only work when holding button, no automatic movement. Fold Limp Mode Warning in Error Notification Centre.	Limp home mode.	Under setting go to calibration, angle sensor calibration. Verify automatic controls are enabled. If disabled complete the calibration. Verify no angle sensors are reading an error see "Angle sensor error"
Fold movement is jerking	Z Spout on edge of tolerance. Sensor noise brings it over the edge of the tolerance. Fold goes back and forth between automatic movement and limp mode.	Update software to version 9 or higher. A software patch compensates for spout to travel home then have a wider tolerance for folding.

10. Hauimaster PRO displayed as Connect

Problem	Cause	Solution
Dashboard is displayed as Connect. No PTO Speed or gate angle displayed.	Damaged Harness A.	**Version 9** and earlier. Verify Harness A Aux 12V_A is plugged into Harness B Aux 12V_A. This should be within 20 centimeters of the HM Connect controller. Harness B should Aux 12v_A should have 12 volts DC. Disconnect harness A from the HM Connect Controller and test for 12 volts on pin 1 of the harness. Harness B Aux 12V_B pin 2 can be used for ground reference. If there is no 12 volts on pin one, replace harness A. Power cycle the cart, the PRO features are detected at startup. **Version 10** and later: Verify Harness D. The System needs to detect only one functioning sensor to enable HM-Pro . If HM Pro is not detected there is either a short on one of the sensor's wires connected to Pin 1 or 2 (Red and Black), or the Harness D connector is not plugged into the controller. Damage to wires on pin 9(red) and 11(black) on the 12 pin connector.

11. Fold / Unfold movement is slamming

Problem	Cause	Solution
When folding or unfolding the auger slams at one end or the other.	Improper calibration.	Go to setting, calibration, angle sensor calibration. Complete the calibration.
Angle sensor doesn't change position angle when folding or unfolding	Seized fold pin/ Loose locking bolts.	Verify the auger fold pin is moving with the fold movement. The bolts should be lined up and tightened unto flat edges of the pin. For better control during this process go into settings, calibration, angle sensor calibration and disable the automatic controls to put the cart into limp mode, this will remove Spout Z home and move the auger fold/ unfold at a minimal speed.

12. Auto Fold / Unfold not working

Problem	Cause	Solution
Double tapping fold or unfold doesn't automatically fold or unfold. Holding fold or unfold still functions. Auto Controls Disabled and Fold Limp Mode in Error Notifications Centre.	Automatics controls disabled.	Go to settings, calibration, angle sensor calibration and complete the calibration.
Double tapping fold or unfold doesn't automatically fold or unfold. Holding fold or unfold still functions. Fold Sensor Error, ZSpout Sensor Error or Sensor Harness Error and Fold Limp Mode in Error Notification Centre.	Angles sensor Error.	If the fold sensor or spout Z sensor are reading an error the cart goes into limp mode, see "Angle sensor error".

13. Gate too fast

Problem	Cause	Solution
Closing or opening the gate is happening too fast.	Hydraulic flow is too high.	Go to settings, calibration, outputs and reduce gate max duty cycle. Alternatively turn down the hydraulic flow on the tractor.

14. Spout movements not working

Problem	Cause	Solution
Spout movement won't work.	Auger is not unfolded.	Under settings, diagnostics, parameter readings, fold position should be above 85% before the spout movement is allowed. If fully unfolded, perform angle sensor calibration.
Spout Z won't go to its storage position.	Duty Cycle is too low.	Under setting, calibration, outputs increase Z Home Duty Cycle.
Spout Z won't go to its storage position.	Duty Cycle is too high	Under setting, calibration, outputs decrease Z Home Duty Cycle.

15. Gate keeps closing

Problem	Cause	Solution
Open gate keeps closing or won't open.	Auto-Gate close for weight or Speed is triggered.	Turn off Auto-Gate Close features. If using only Auto-Gate close for weight, clear the truck weight in the app on dashboard or turn off the feature, weight symbol next to gate position should be gray when off. Auto-Gate close for speed will stop closing the gate when wheel speed is below 8 km/h or the speed dial button next to PTO Speed is gray.

16. Haulmaster network not available

Problem	Cause	Solution
Haulmaster-### Wi-Fi network isn't on.	The HM Connect Controller does not have power.	Plug in the 7 pin Ag connector to the tractor. Pin 7, the center pin needs to be powered from the tractor by key on, and pin 1 needs to be properly grounded to the tractor chassis. If not resolved verify under the main frame front right-side that the AUX 12V from the power harness is connected to PWR-IN on the braided HM Connect harness. Power on is indicated by the GPS controller and HM Connect controller LEDs being on.
Haulmaster-### Wi-Fi Network isn't on.	The CAN Network wires are shorted.	Under certain circumstances it is possible that the Wi-Fi is unavailable with a damaged can network. Unplug the merlins, thrasher extension and joystick extension. Verify if the network is now available. Plug back in one item at a time to locate the cause.
Haulmaster-#### Wi-Fi Network isn't on, but the Thrasher GPS network is available.	Connector C is disconnected from the HM Connect Controller	The verify HM Connect Harness is fully inserted into the HM Connect Controller. If connector was properly seated, verify voltage on connector C pin 5 and 12 is 12 volts DC, pin 9 to pin 12 should also be 12 volts DC. If one is 12 volts and the other is 0 the harness is damaged and needs to be replaced or repaired.

17. Loadcell malfunction

Problem	Cause	Solution
Dashboard displays the error Load cell malfunctions.	Unplugged Merlin	Verify both Merlins are fully plugged in.
Dashboard displays the error Load cell malfunctions.	Damaged CAN Network.	Unplug the Thrasher Extension and the Joystick extension to try and isolate the problem.
Loadcells 2 to 4 are not displaying proper values when loaded	Merlin 1 and 2 are not connected to the proper connector on the harness	Under setting, diagnostics, parameter readings, scroll to Merlin 1 Online and Merlin 2 Online. Unplug MRLN2-A. Merlin 2 should go from true to false. Make sure MRLN2-A and MRLN2-B are plugged in that merlin. Merlin 1 should go false when MRLN1-A is unplugged. If Merlin 2 goes false when MRLN1-A is unplugged, swap the MRLN1-A with MRLN2-A. MRLN1-A and MRLN1-B should be connected to the same Merlin.
Loadcell weight are changing by thousands of KG	Loose EX+ and EX- wire in a cable to loadcell.	Shake individual loadcell connector connected to the HM Pro system, when one loadcell visibly affect the weight of all other load cells in diagnostics, open the connectors and look for a loose black or red wire.
Loadcell is reading 0 or amount larger than 2 million.	Signal wire is shorted to ground or EX+ is shorted to ground.	Open the connectors on the loadcell reporting a steady 0 and look for wire threads touching another wire.

18. False gate open

Problem	Cause	Solution
Dashboard gate position flickers back and forth between open and closed.	Gate sensor is at the junctions between the two states.	Calibrate the gate angle sensor.

19. Master control not active

Problem	Cause	Solution
The dashboard star is gray, not allowing for full control of the app.	Not the Master Tablet	Press mode in the bottom center of the app. In the mode screen request master connection. If Master mode request is timed out another tablet is master and needs to surrender master control from this screen. If there is no other tablet in the vicinity with master control, try a power cycle of the cart power and restart the app and try to request master mode again.

20. Farm information not being added

Problem	Cause	Solution
New crop, farm, truck, bin or unload are not being added in the app.	Not connected as master to the Connect controller.	Under settings, pending you should be able to all your edits in this screen waiting for master connection. Ensure the tablet is connected to the HM Connect controller and is also in master mode.

21. App Joystick isn't working

Problem	Cause	Solution
App Joystick functions are not moving any of the cart movements.	Hydraulics are not connected/ turned on.	Turn on the hydraulics to the cart. Try reversing the direction of hydraulic flow if it is still not working.
Buttons are grayed out.	The physical joystick was plugged in after the app joystick page was entered.	Unplug the physical joystick.
Can't access the app joystick screen.	The physical joystick is plugged in.	Unplug the physical joystick. A prompt should notify you about this.
Can't access the app joystick screen.	Using HM Connect version.	Upgrade to the HM Pro version. A prompt should notify you about this.

22. GPS not working

Problem	Cause	Solution
GPS map marker is red on the dashboard.	GPS controller is disconnected	Plug in the GPS controller or the Thrasher Extension harness.
GPS map marker is red on the dashboard.	Damaged CAN Network	See “Haulmaster network not available” Damaged CAN Network.

23. Unknown SSID

Problem	Cause	Solution
Dashboard displays Unknown SSID	Software Bug	Update App software. Version 7 or higher.

24. Weight Calibration

Problem	Cause	Solution
Calibration number ratio number is different than the known weight/ uncertified weight ratio.	Pre-existing calibration ratio	The formula for the calibration ratio equal to known weight divided uncertified weight, times the existing calibration ratio. Pressing calibrate will continually change the calibration ratio based on this formula. Hit reset calibration to start over from one.

25. Can't E-mail unload list

Problem	Cause	Solution
Emailing unload list gets Check Connection prompt.	Not connected to the internet.	Disconnect the tablet from the HM Connect controller since it does not have an internet connection. Connect the tablet to a Hotspot or Wi-fi connection with an internet connection and try again.

26. Can't see last season's information

Problem	Cause	Solution
Closed season not on second tablet.	Close season stores all information on the tablet from the closed season and is removed from the controller.	Use the tablet that closed the season to view old information. It is suggested you email closed seasons to yourself in case the tablet is lost or damaged.

27. Last Unload

Problem	Cause	Solution
Last Unload doesn't update immediately.	Loadcell noise from bumpy driving.	If you require the last unload to update quicker, it is recommended you stop to let the current weight to settle for a couple seconds. This will increase the reaction time to capture an unload. Alternatively visit the Unload Detection section to see how you can use automatic unload detection start and stop or take full control with manual unload detection.
Last unload restarted on the same load.	Software	Last unload times out if the weight stops decreasing for 5 seconds. Try unloading in a more fluid motion rather than starting and stopping.

28. App crash

Problem	Cause	Solution
App crashing, app unusable.	Software bug	Update App software. Version 7 or higher.

29. Calibration

Problem	Cause	Solution
Cart weight calibration keeps drifting.	Software bug.	Update App software. Version 7 or higher.

30. File Operation Error

Problem	Cause	Solution
Communication Error with the cart.	Bad file transfer between cart and the tablet.	Update the APP Software. Version 9 or higher. Power cycle the controller. Reconnect the tablet and open the APP. If this does not solve the file Operation, please contact HM Connect / PRO Support.

31. File Operation Error

Problem	Cause	Solution
Constant Wi-Fi interference with another network.	Multiple local networks such as Wi-Fi cameras.	Use a Wi-Fi Analyser app to determine other network channels. See Wi-Fi Setup Section to change the controller Wi-Fi channel to something as far from the other networks as possible, See Reprogram section to turn off the Thrasher Wi-Fi network.

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