HAULMASTER PRO

USER MANUAL

HAULMASTER CONNECT

Elmer's MANUFACTURING

ELMERSMFG.COM

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 downtime, 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 the 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 (for example, USA) require these warranty cards to be filled out to prove machine is in fact in the warranty period 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 the 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

1.1 FEATURES

Congratulations on your choice of the HM Connect/Pro system to complement 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 reliable operation of your Elmer’s HM Connect/Pro system depends on all operators and service personnel reading and understanding the Safety, Operation, Maintenance, and Troubleshooting sections of the Operator’s Manual.

This manual covers 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.

1.2 CONNECT VS. PRO

CONNECT

Haulmaster Connect *was developed to be a grain cart control that puts many features into one simplified app. The Connect app uses Wi-Fi to receive information from a cart controller. It collects weight and GPS data and has a system to track and store loads.*

FEATURES:

- *Detailed load tracking (Crop, Field, Truck, Bin)*
- *Instant Weight Display from Scales*
- *Automatic Unload Detection*
- *Simple Weigh System Calibration*
- *Clearable Tare*
- *GPS load tagging*
- *Hitch weight balance indicator*
- *Multiple iPad connections (Cart, Truck, Combine)*
- *Easy-to-use Menus and Home Screen*
- *Diagnostic Warning, Fault, and Status display*
- *Diagnostic Information Collection System*
- *Integrated Help menus*
- *Updates the Controller through the App*
- *SteerLock Steering System on Inline Tandem*
- *Settings and data stored on the controller*
- *Information Archive System*
- *Haulmaster Connect Cloud Sync*
- *John Deere Integration and Import*
- *Export load data to Email and Excel*
- *Powered by Tractor*
- *Includes iPad, Ram mount window mount, and charger for a turnkey solution*

PRO

Haulmaster PRO *was developed with the vision of allowing the operator to maximize their unload experience and have simple controls. Its automatic controls allow for fast and efficient unloading to get to the next combine quicker.*

FEATURES:

- *Includes Haulmaster Connect features*
- *Auto Fold/Unfold system that automatically moves the Auger and Spout to Saved Storage and Unload Positions*
- *Industry-leading adaptive and adjustable auger Fold/Unfold Speed*
- *Apply limits to your hydraulic movements for increased operator Safety*
- *Joystick with proportional 4-way Spout Control, Auger Fold, Auger Pivot, and Gate Control*
- *Virtual Joystick to control from an iPad or another Device*
- *Auto Gate Close at 5 mph (8 kph)*
- *Auto Gate Close at predefined truck weight*
- *PTO speed indicator*
- *Gate position indicator*
- *Simple connection with 1 hydraulic input and 7-pin plug power*

1.3 HM CONNECT/PRO SYSTEM COMPONENTS

The HM system consists of a joystick (Pro only), iPad, the Connect controller, two Merlin's, and Connect GPS. Each joystick assembly is equipped with a suction cup on its base, used to mount it to a window or flat surface where it is convenient and within the operator's reach. A frame is provided to hold an iPad, with a suction cup on the base for attaching to a window, enabling 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 iPad and the Connect controller mounted on the back of the vertical auger frame.

a. **Joystick (HM Pro Only)**

b. **iPad Mount**

c. **iPad**

d. **Connect Controller**

e. **Connect GPS**

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

g. **Two Merlins**

Figure 1 System Components

1.4 FOR MORE INFORMATION

For more information, go to https://elmersmfg.com/haulmaster-connect/

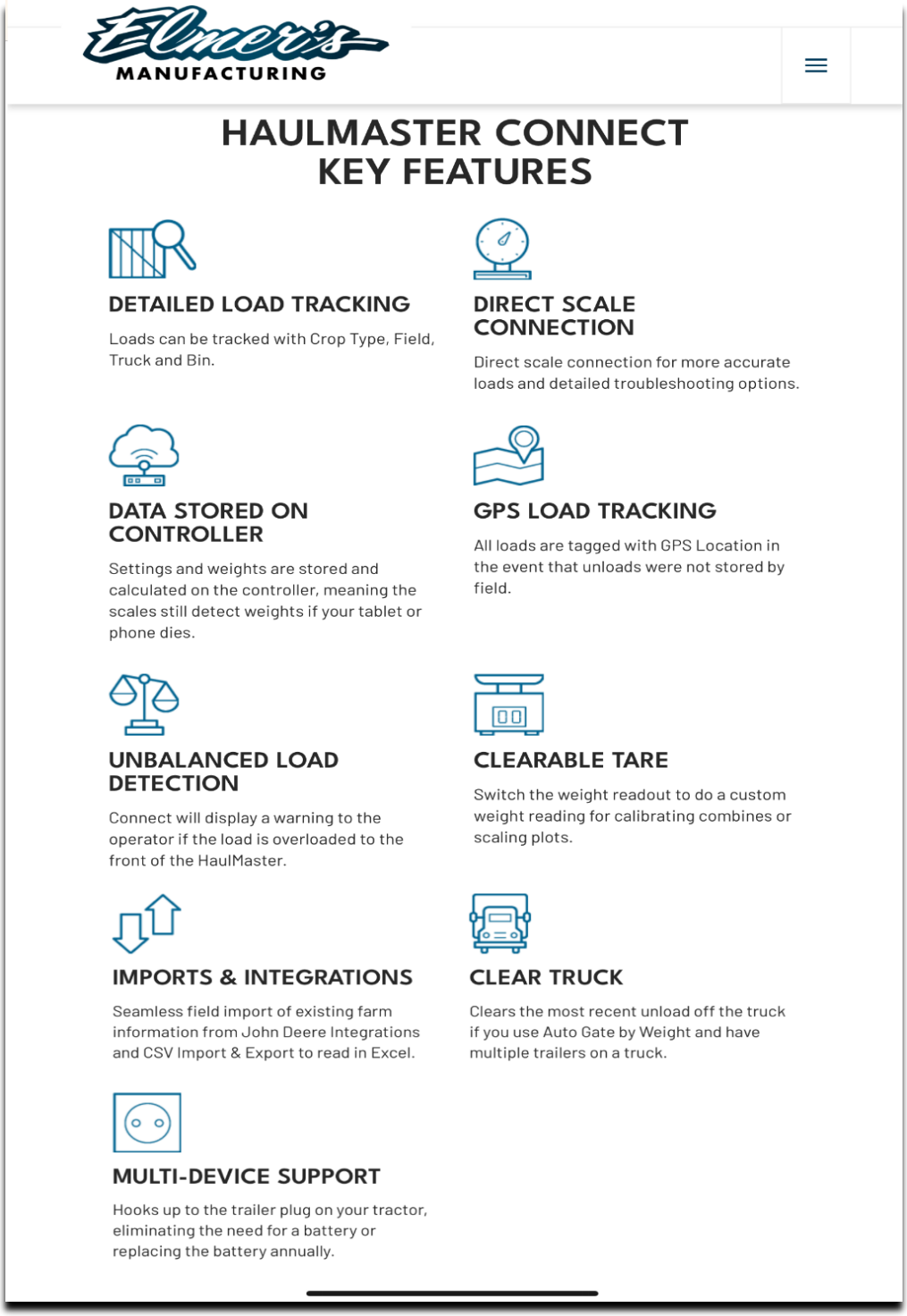


Figure 2 Connect App Features

2 CART OPERATION

2.1 OPERATIONAL 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 the tractor engine, relieve hydraulic pressure, set the 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 lines.
- Stay away from overhead power lines when raising the vertical auger to prevent electrocution. Electrocution can occur without direct contact.
- Have personnel on the ground outside the 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 the driveline when the engine is running. Keep others away.
- Do not enter the compartment unless the engine is OFF, the ignition key is removed, and pressure in the 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 the tractor when transporting.
- Review safety instructions with all operators annually.

2.2 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 should not 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.

2.3 PRE-OPERATIONAL CHECKLIST

The efficient and safe operation of the HM Pro Controller requires that each operator read and understand the operating procedures and all related safety precautions outlined in this section. A pre-operation checklist is provided for the operator. It is important for both 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 iPad has been fully charged.

2. Plug the iPad into a power source in the cab if required.

3. Ensure the iPad **Wi-Fi is connected** to the cart and the **Bluetooth** is **disabled**. Swipe down on the top right of the iPad to access.

4. Ensure the iPad Wi-Fi systems are connected to the Connect Controller system on the cart frame.

5. Check that the loadcell readouts in the Connect app Parameter readings. **Calibration>Load Cells,** See Figure 3.

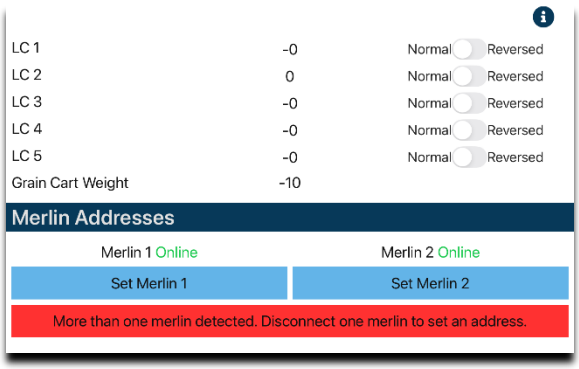


Figure 3 Merlin Weight Readings

Make sure the numbers are not jumping around too much. It is normal for the **cart's weight** to jump around 20-30kg when stationary.

6. Ensure the joystick is **plugged in** and verify all Joystick movements are functioning. (Pro Only)

7. Verify **PTO Speed** registers on the app. (Pro Only)

Figure 4 iPad in Tractor

2.4 CONNECTING iPad TO CART WI-FI

All communication between the **Connect app** and the **controller** is done through **Wi-Fi.**

Connecting the iPad to the controller's Wi-Fi:
(Procedure slightly varies between different devices)

1. With the iPad **home screen** open, **swipe down** from the top right corner to go to Wi-Fi settings.

2. Press and hold the Wi-Fi symbol for a few seconds.

Figure 6 Wi-Fi On

3. Press the button again. (Make sure Bluetooth is turned off)

Figure 5 Wi-Fi

4. Select your **cart's** Wi-Fi.

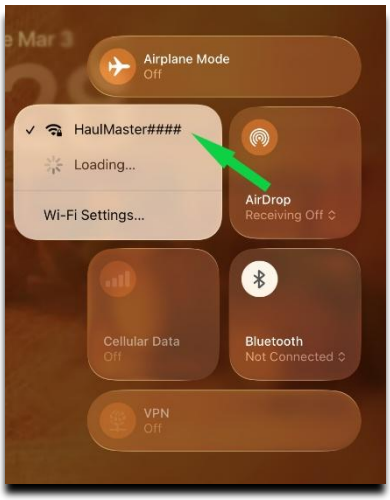


Figure 7 Password

5. If not previously connected, **enter the password**; the default password is haulmaster123.

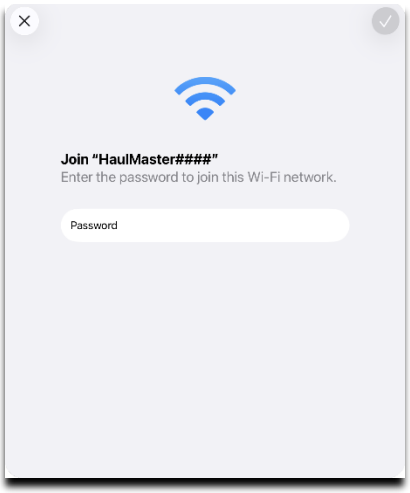


Figure 8 Select Carts Wi-Fi

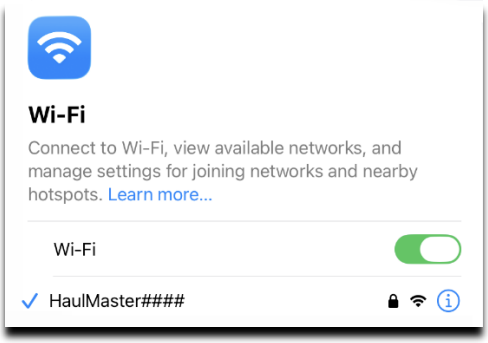


Figure 9 Connected

6. Open your Haulmaster Connect App.

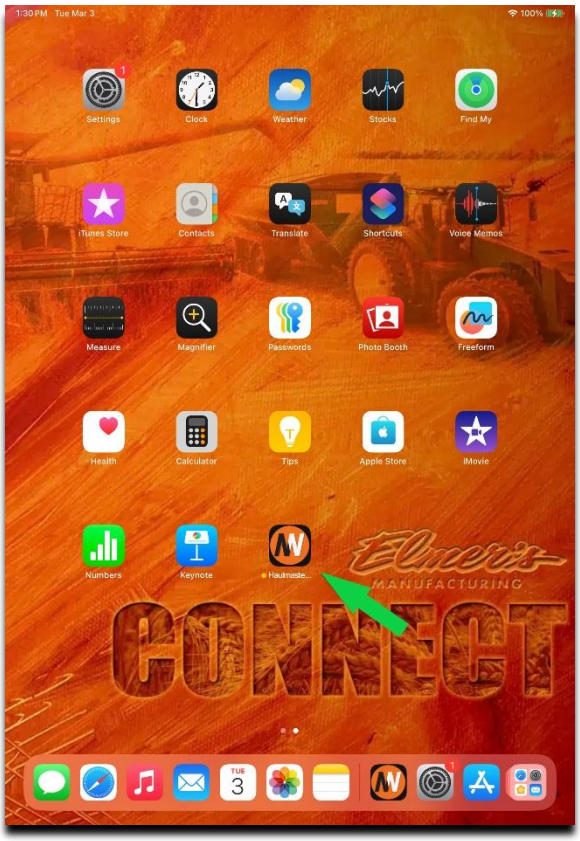


Figure 10 Open App

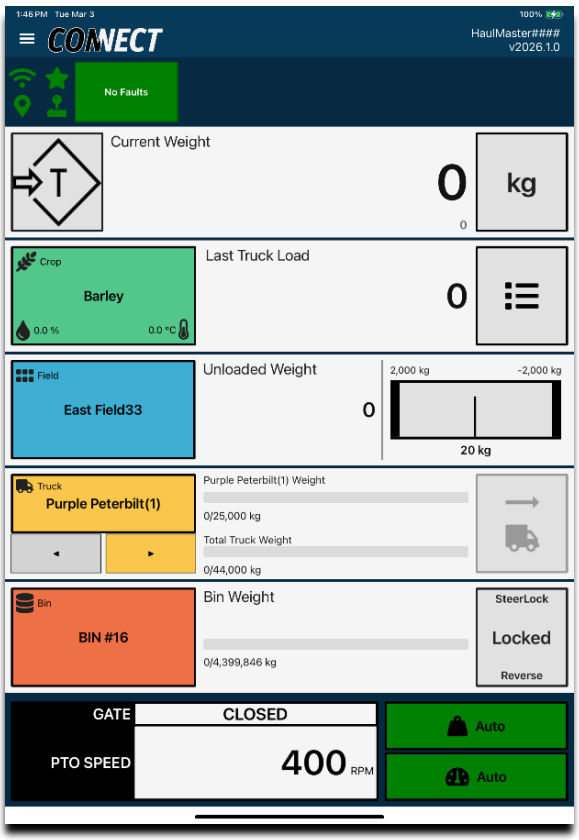


Figure 11 Haulmaster Connect App

2.5 CONTROLLING YOUR HAULMASTER (PRO ONLY)

2.5.1 DESCRIPTION

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 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.

An iPad in the tractor cab is used to interface with the Connect Controller mounted on the back of the vertical auger frame tube. The system wiring harness powers each controller and connects with all the sensors and load cells of the machine. The Connect GPS is mounted on the top front of the cart to provide location information to the system.

Each operator is required to mount the joystick and iPad mount in the cab. This is using suction mounts that attach to the window. Mount it 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.

You also have the option to use the Connect app virtual joystick if the joystick is not plugged in. See Figure 13.

Figure 12 Joystick

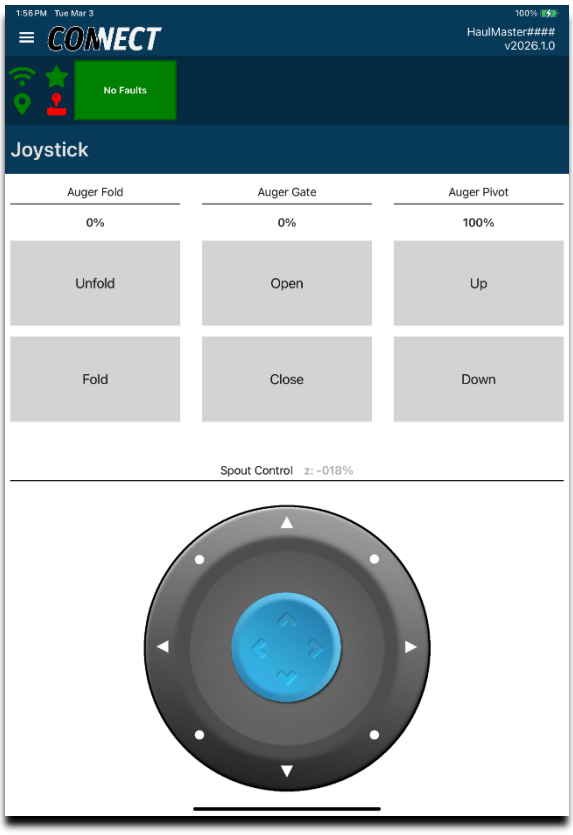
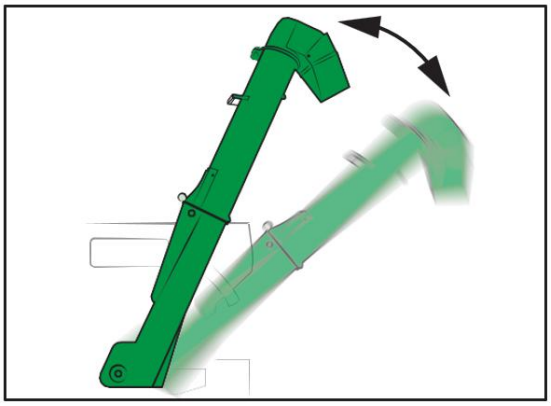


Figure 13 Virtual Joystick

2.5.2 JOYSTICK & CONTROL (PRO ONLY)

The joystick control should be mounted on a flat surface in the tractor cab in a location convenient for 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:



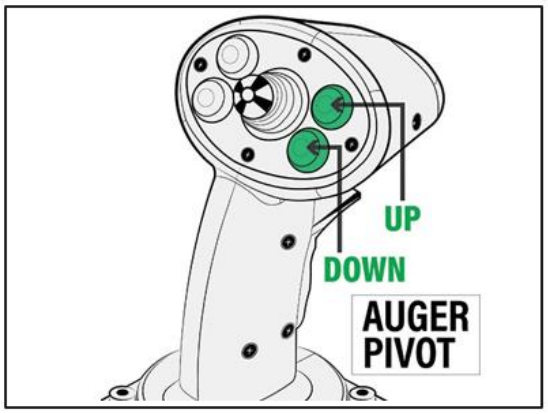


Figure 14 Auger Pivot

1. **Auger Pivot:**

a. Press and hold the **Auger Pivot Up button** to pivot the auger up. Release the switch, and the vertical auger will stop moving.

The Next steps are for the **Auto** functions that automatically move the auger pivot all the way up.

b. **Double-press the Pivot Up** to activate auto pivot up.

The **Auto pivot-up** movement can be **cancelled by a single press** of the pivot-up or down joystick buttons. Disconnecting the joystick will cancel the movement in 0.5 seconds.

c. Press and hold the **Auto Pivot down** button. It will stop when **Minimum Pivot Down** is reached, or the button is released.

d. There is **no Auto Pivot Down** feature when the down switch is double-pressed. This helps to ensure the safety of the equipment.

e. **Pivot will activate** by Auto Fold and Unfold if Pivot with the **Auto Fold** and **Unfold** feature is enabled. It can be enabled on the **Auto Controls** screen.

Menu>Calibration>Auto Controls>

f. See **3.6.4 Limits** for more details on Min Pivot and Auto Pivot.

g. **See 3.6.3 Outputs** to set Pivot hydraulic flow.

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

a. Double-press the **Unfold** switch to raise the auger into its unloading configuration automatically.

b. Automatic mode movement can be **cancelled by a single press** of the Fold or Unfold joystick buttons. Disconnecting the Joystick will cancel the movement in 0.5 seconds.

c. If the hydraulic speed needs adjusting, **see 3.6.3 Outputs** to set the hydraulic flow duty cycle for Fold and Unfold.

3. Auger Fold: Folding will not work when the PTO Sensor detects speeds **above 300 RPM**. Auger Fold will move the Spout to its storage position before it folds. If the Spout will not go into the storage position, try Angle Sensor Calibration:

a. **Press the Fold** button to lower the auger towards its stored configuration. **Release** the switch, and the unloading auger will **stop** moving.

b. **Double-press the fold** button to **automatically** move the auger into its stored position. Automatic mode movement can be **cancelled** by a **single press** of the **Fold or Unfold** joystick buttons. Disconnecting the Joystick will cancel the movement in 0.5 seconds.

c. The **pivot** with the Auto Fold and Unfold setting will affect the double-press movement. **Menu>Calibration>Auto Controls>**

After completing the fold movements, the **pivot** will move to its **home position**. **See 3.6.4 Limits** for details.

d. To set the hydraulic flow for fold and unfold, go to **Menu>Calibration> Outputs**. See section **3.6.3**.

Field Rest

When on the field, keep the **field-rest up** so the auger will rest tight against it. **Auto fold** should be calibrated to rest on the field rest.

When **just transporting** the cart, the field rest can be put down, and the auger can rest all the way down. **Holding the Fold** button down will take the auger past the field rest and all the way **down.** This can make the cart narrower and safer on the road.

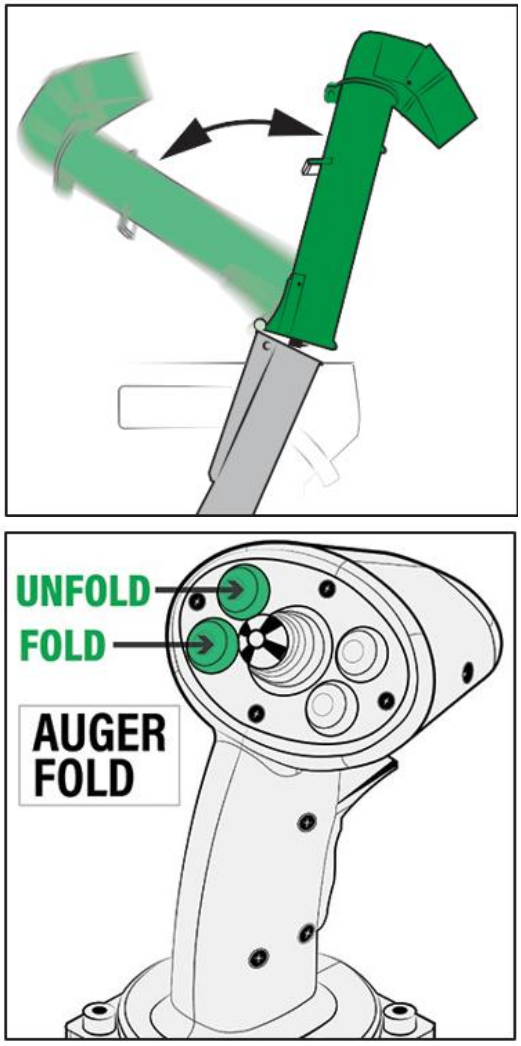


Figure 15 Auger Fold/Unfold

Figure 16 Field Rest

Auger Fold/Unfold Manual Override

If 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. See Figure 17.

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.
CAUTION: Be aware of the spout's position when using the manual override to avoid damaging the cart or injuring workers. Make sure the spout is positioned to avoid striking the cart and anyone who is working.

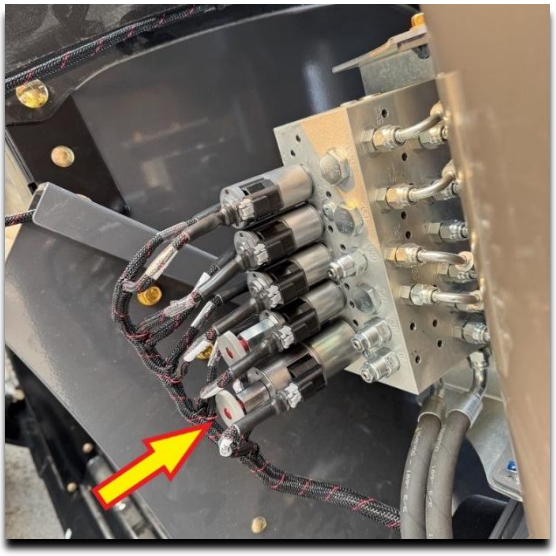


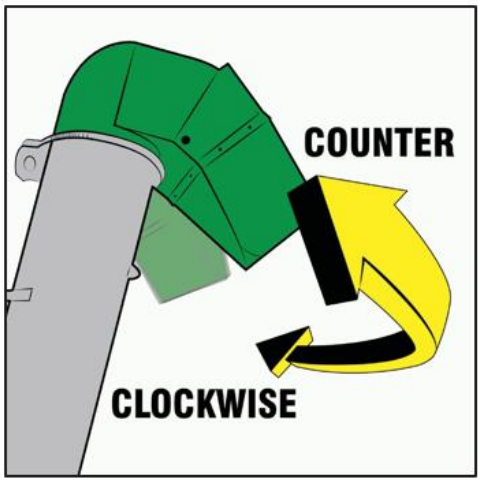
Figure 17 Auger Fold/Unfold Manual Valve

4. Spout Position:

This multi-switch control moves the spout on the end of the vertical auger to the operator's desired position. The spout Z clockwise and counterclockwise movements are only allowed to move when the auger is nearing the fully unfolded position. Spout Z will unlock in limp mode conditions. (**See 2.5.3 Limp Mode**)

a. Move and hold the control to the right side to move the spout **counterclockwise.**

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



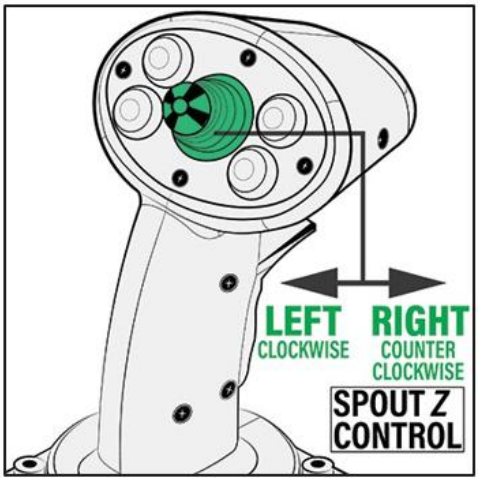


Figure 18 Spout Z

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

d. **Move and hold** the control to the bottom to move the **spout down**. See Fix 19 Spout X.

e. **See 3.6.3 Outputs** to set the hydraulic flow rate by adjusting the duty cycle of the different movements.

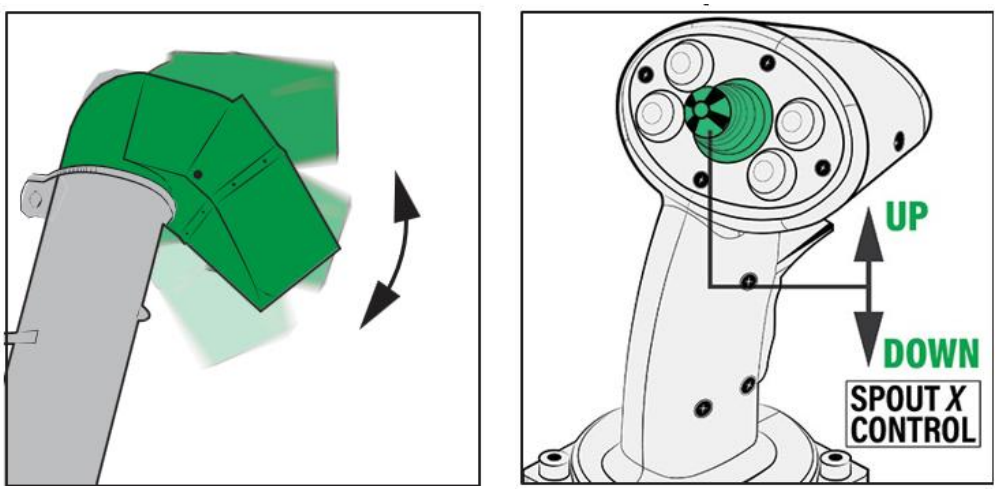
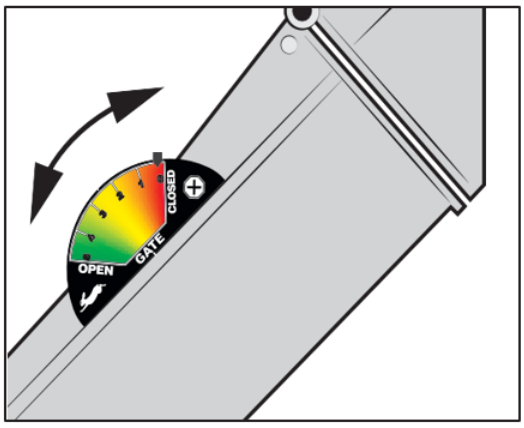


Figure 19 Spout X

5. Gate Control:

This joystick has 2 switches used to open and close the gate inside the cart. This gate feeds the internal auger that unloads the cart. The gate has an external dial to view its position.



a. Use your index finger to **press the trigger button on the front** of the hand grip to **open** the gate. Opening the gate continues if the switch is held. The 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. Max Gate Open will limit the opening of the gate. **See 3.6.4 Limits** for more details.

c. Hold the **paddle on the lower front** of the hand grip to **close** the gate. Always completely close the gate when the compartment is empty and before loading again.

d. **See 3.6.3 Outputs** to set the hydraulic flow of the Gate.

e. The gate will also **auto-close** on **speed** or **weight** if these features are turned on. See **3.6.5 AUTO CONTROLS** or go to **Menu>Calibration>Auto Controls** to turn these functions on.

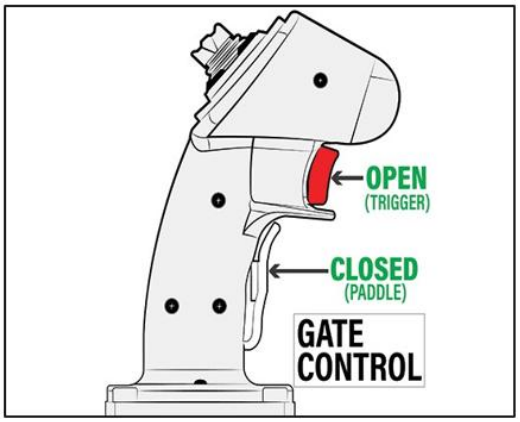


Figure 20 Gate Control

Gate Open/Closed Manual Override

In case the joystick is not functioning, the **gate also has a manual override** on the valve manifold. See Figure 21.

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.

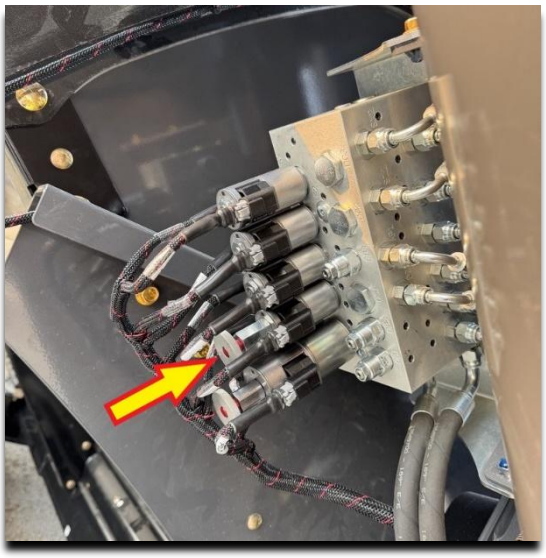


Figure 21 Gate Manual Override

2.5.3 LIMP MODE (PRO ONLY)

In limp mode, the auger fold function will continue to work at a reduced speed. **Warning:** Z storage is also disabled, and the spout Z can be moved in any position. Auto Unfold and Fold are disabled. This limp mode is provided 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. No Angle Sensor Calibration. If calibration is not completed, the system cannot be operated safely.
b. The fold sensor is disconnected or damaged.
c. Z Sensor is disconnected or damaged.

2.6 STEERLOCK (INLINE TANDEM ONLY)

SteerLock is a system designed to enhance the stability and maneuverability of the Grain cart. The inline tandem has automatic steering that can be set to prevent the cart from steering at speeds above a set speed and when travelling in reverse.
Instructions for setting up **SteerLock** are in **section 3.6.6.**

3 HAULMASTER CONNECT APP AND MENUS

3.1 HOME SCREEN OVERVIEW

3.1.1 HOME SCREEN

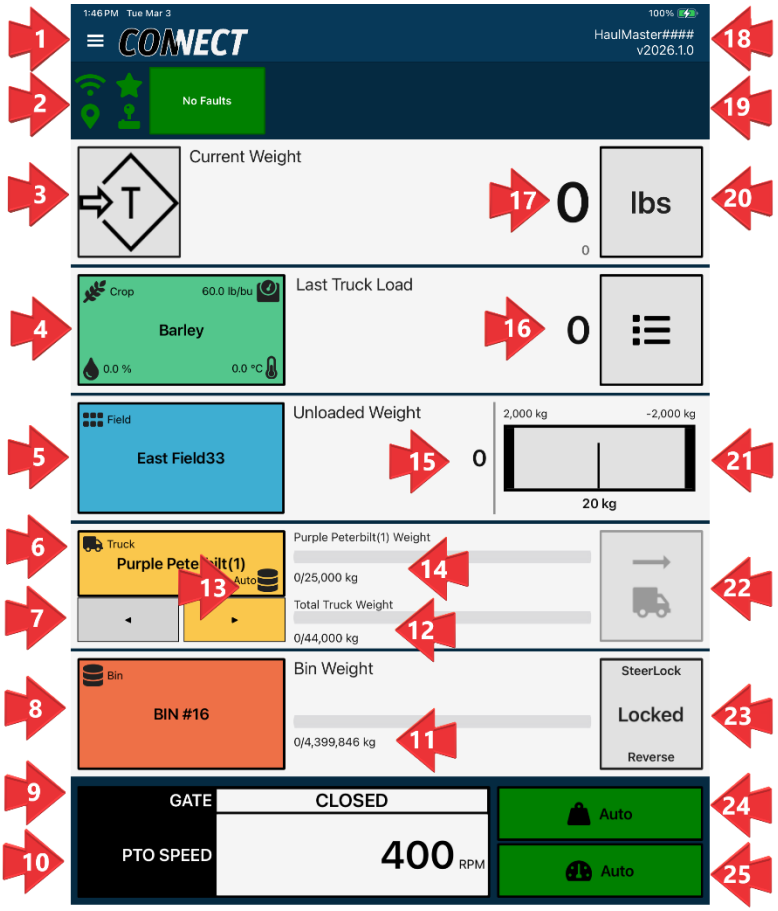


Figure 22 Home Screen

1. Opens a drop-down **menu** that can access any function and setting

2. Displays the status of the **Wi-Fi, GPS, Master Mode**, and **Joystick**. Green is on, and red is off

3. The tare button tares the cart to zero when not greyed out

4. Current crop

5. Current field

6. Current truck

7. Compartment selector

8. Current bin

9. Displays the gate position and status **(Pro Only)**

10. Displays the PTO RPM **(Pro Only)**

11. Displays the crop weight in the bin

12. Displays the weight in the selected truck compartment

13. Displays if an Auto bin is selected

14. Displays the weight in the truck

15. Displays weight of unloads in that field

16. Displays the last unload

17. Displays the current cart weight. Pressing the weight number creates a **temporary tare** that can return to its original weight when pressed again. The smaller number below is the original weight.

18. Displays the Wi-Fi name of the cart connected and the Connect app version.

19. Displays the status of the cart, including warnings and faults.

20. Displays the units. Pressing will change the unit.

21. Weight balance shows if the front or back is heavier. Requires being enabled in the General menu.

22. Empty Truck. Greyed out when and not functional when the weight is not stabilized.

23. State of the **SteerLock** system. Requires being enabled in the General menu. **(Inline Tandem Only)**

24. Auto gate closed based on cart weight. Press to toggle between enable and disable. **(Pro Only)**

25. Auto gate closed on cart speed. Press to toggle between enable and disable. **(Pro Only)**

3.1.2 HOME SCREEN SHORTCUTS

Several hidden buttons are shortcuts to other screens.

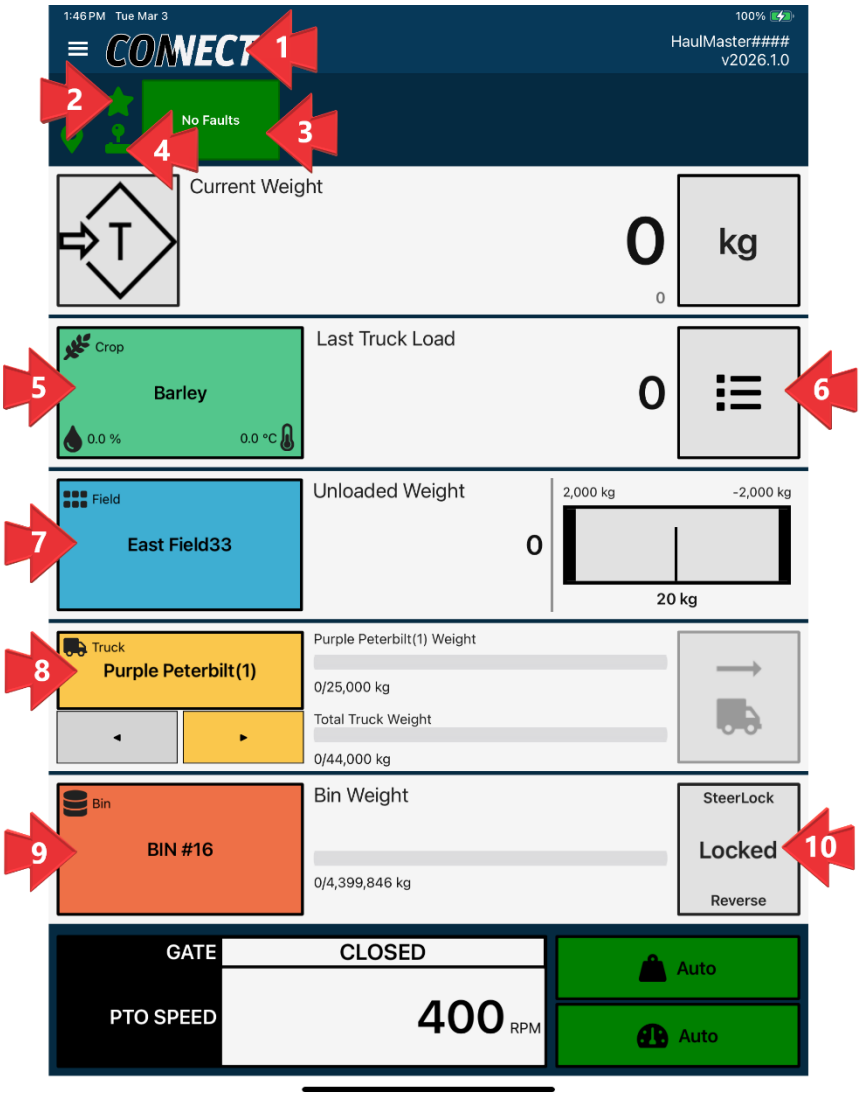


Figure 23 Shortcuts

1. Returns to **Home** screen

2. Goes to **Operator Mode** screen

3. Gives a **fault or warning description** and solution link when pressed.

4. Goes to the **Virtual Joystick** screen

5. Short press goes to the **Select Crop** screen
Long-press goes to the **Edit Crop** screen

6. Goes to **Unloads** screen

7. Short press goes to the **Select Field** screen
Long-press goes to the **Edit Field** screen

8. Goes to the **Select a Truck** screen
Long-press goes to the **Edit Truck** screen

9. Goes to the **Select a Bin** screen
Long-press goes to **Edit Bin** screen

10. Goes to **SteerLock** options menu

3.1.3 HAULMASTER CONNECT MENU

The Haulmaster Connect menu is a drop-down menu that gives access to functions and settings of the Haulmaster controller.

Figure 24 Menu Button

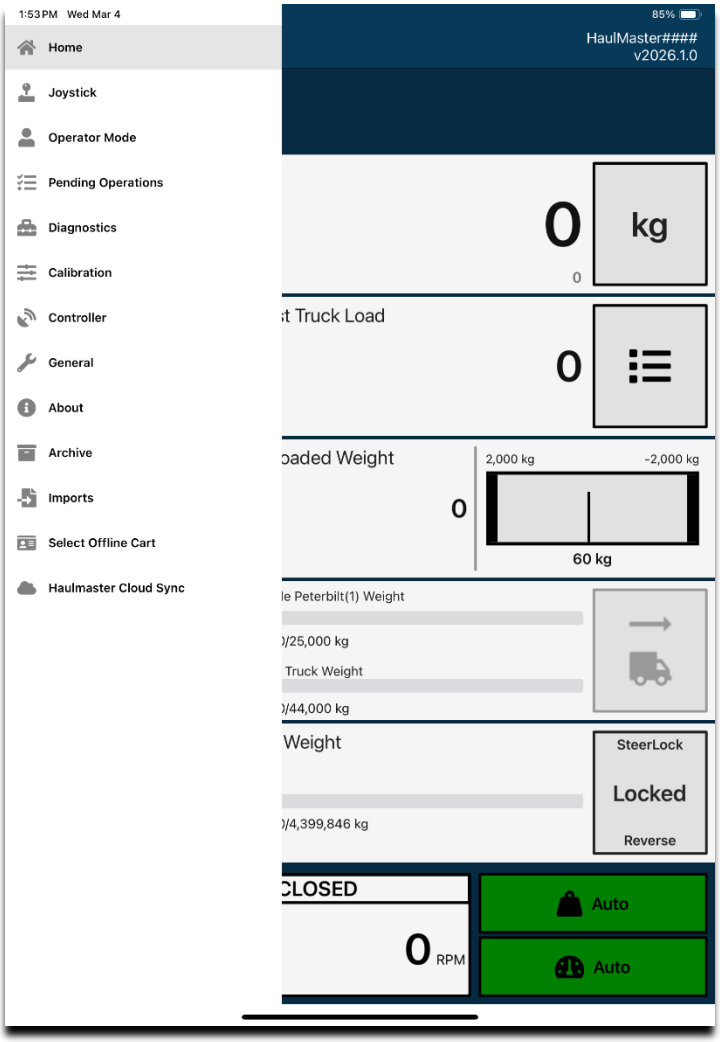


Figure 25 Menu Options

1. **Home** – Home screen
2. **Joystick** – Virtual joystick controls
3. **Operator Mode** – For selecting Master or Monitor mode
4. **Pending Operations** – Operations not finished by the controller
5. **Diagnostics** – Diagnostics information
6. **Calibration** – Calibration and settings
7. **Controller** – Controller setup
8. **General** – App settings
9. **About** – App information and updates
10. **Archive** – Archiving your season
11. **Imports** – Importing farming information
12. **Select Offline Cart** – Viewing and changing offline cart farming information
13. **Haulmaster Cloud Sync** – Sync information with cloud account

3.1.4 HAULMASTER WEIGHING AND DATA COLLECTION

The Haulmaster uses amplifiers to read values from 5 load cells, 4 on the axles, and 1 on the hitch. These readings are sent to the controller, where they are filtered, and a total cart weight is created.

Using this weight, the controller determines when an unload event has occurred and calculates the amount unloaded.

The value of the unload is then stored in an **unload list**, and depending on the operator's settings, can be stored under various crops, clients, farms, trucks, and bins, and added to their total values. The controller also records GPS data with each unload event, allowing the unloads to be tracked by location.

The controller saves **weight totals** for use by the Connect app. When Wi-Fi is available, the app can be used to store **weight information** on the **Haulmaster Connect Cloud.** The Cloud can also receive data from John Deere and other sources, where they can be synced with the iPad and the Haulmaster Connect controller.

3.2 JOYSTICK SCREEN (HM Pro Only)

Included with the HM Pro is a virtual joystick that can be used when the physical joystick is not plugged in.

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

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

2. The App joystick screen can be accessed by pressing the joystick icon on the home screen or by selecting **Menu>Joystick>.**

3. If the joystick icon in the top left corner of the screen is **green,** it indicates the joystick is **connected** to the wiring harness and is operational.

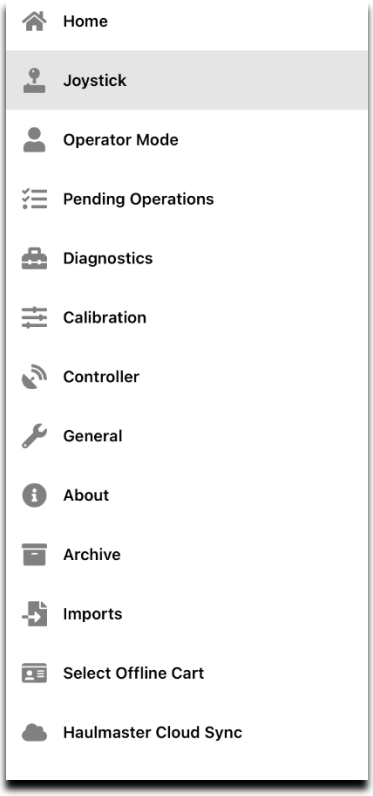


Figure 26 Home Screen

4. If you enter the joystick screen while a **joystick is connected,** you will get a **warning** telling you to disconnect the external joystick.

5. If you hit **OK,** none of the functions will work on this screen, but the angles and button indicators can still be viewed.

6. To use the **app joystick,** the physical joystick must be **unplugged** from the harness.

Figure 27 Manual Joystick Detection

7. **Disconnect** the joystick from the **wiring harness,** and the joystick icon in the top left corner of the home screen will turn red. The app joystick will now work.

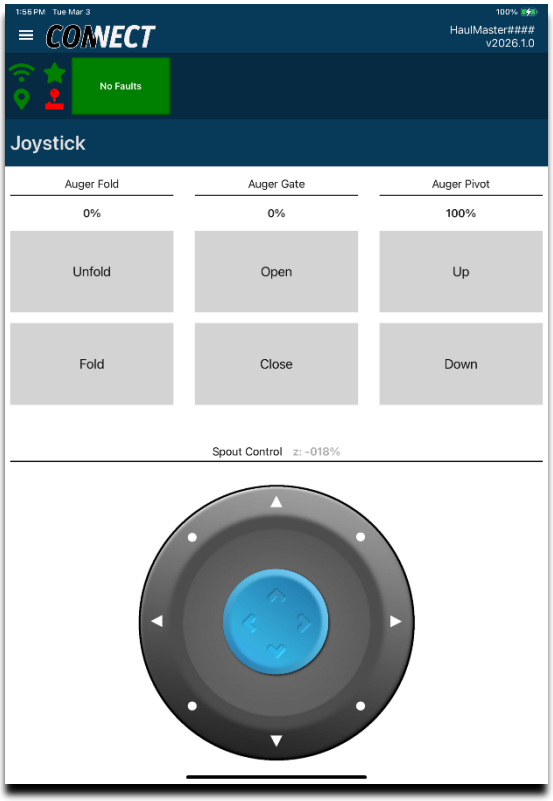


Figure 28 Joystick Display

8. Touch and hold the Unfold, Fold, Open, Close, Up, and Down boxes required to move the auger and gate position. The percentage (%) will increase and decrease reflecting their physical movements. Double-tapping the Unfold works the same as the joystick. **Double-tapping** the **Unfold** button initiates an automatic sequence, aligning the spout and unfolding the system on its own.

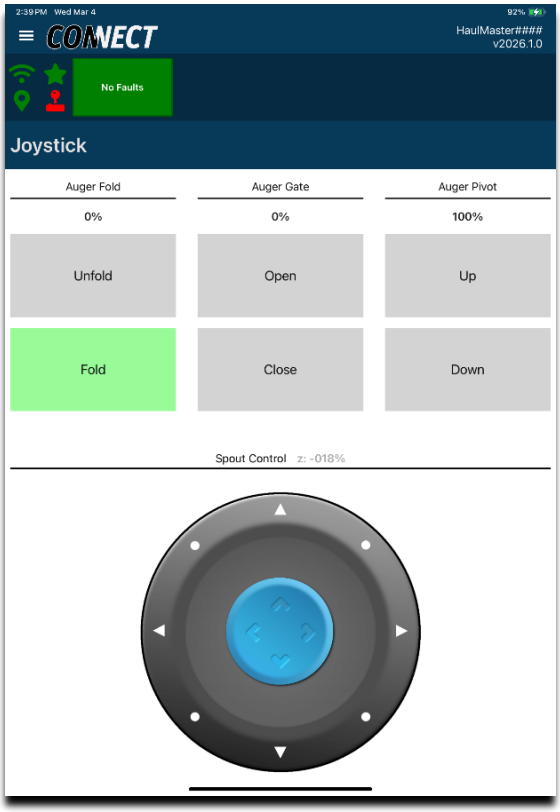


Figure 29 Auger and Gate Movements

9. Touch and hold the blue button in the center of the Circle. Drag it to the **left** to **move** the spout clockwise or to the r**ight** to **move** it **counterclockwise.** The Z% shows the percentage of movement in that direction.

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 **greyed** out, and the App Joystick won't function.

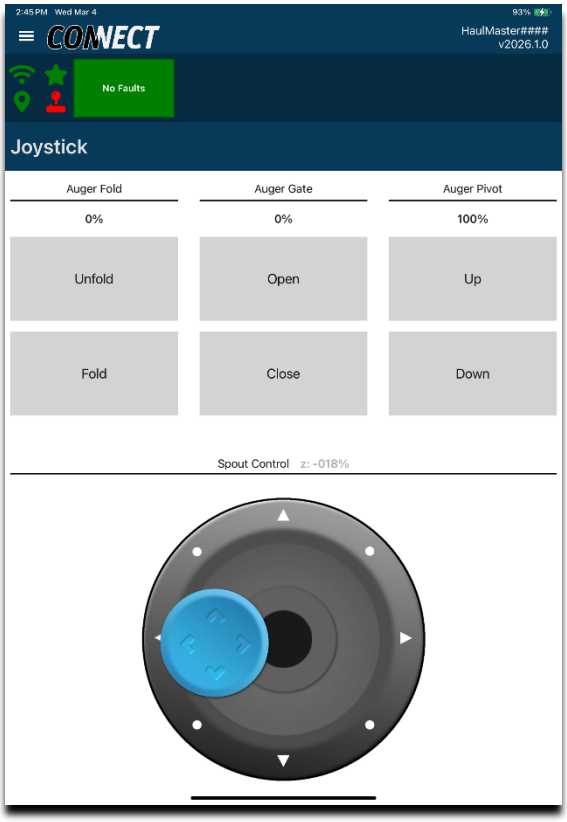


Figure 30 Spout Movements

3.3 OPERATOR MODE SCREEN

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

1. Start from the home screen.

2. Confirm that the star in the upper-left corner is green, indicating the iPad is in Master mode.

3. In the **master mode**, we have control over everything in the iPad as described in other sections of this manual.

4. This means **changi**ng the crop, field, truck, or bin. It also means adding, deleting, or editing unloads as well as taking control of the virtual joystick.

Figure 31 Master Mode

Figure 32 Monitor Mode

5. Press and hold the star or use the drop-down menu to access the **Operator Mode** screen.

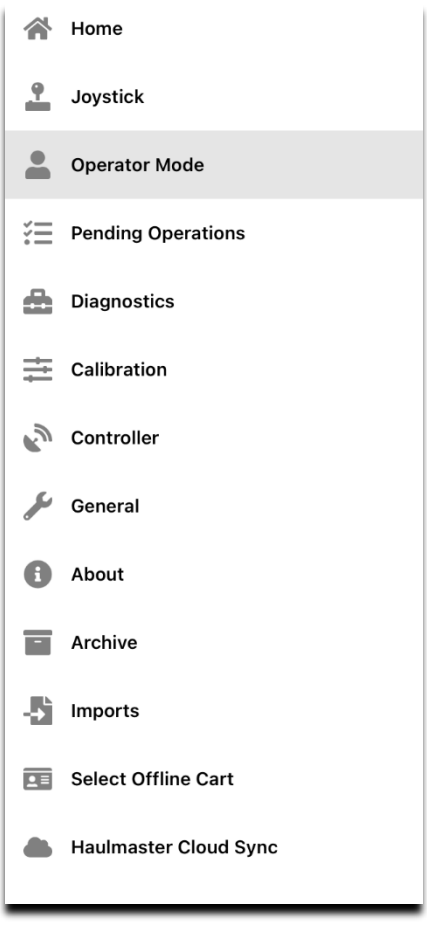


Figure 33 Drop-down Menu

6. The operator mode screen indicates whether you are the **master** device.

7. Touch the red **Surrender Master** Connection to change to Monitor mode.

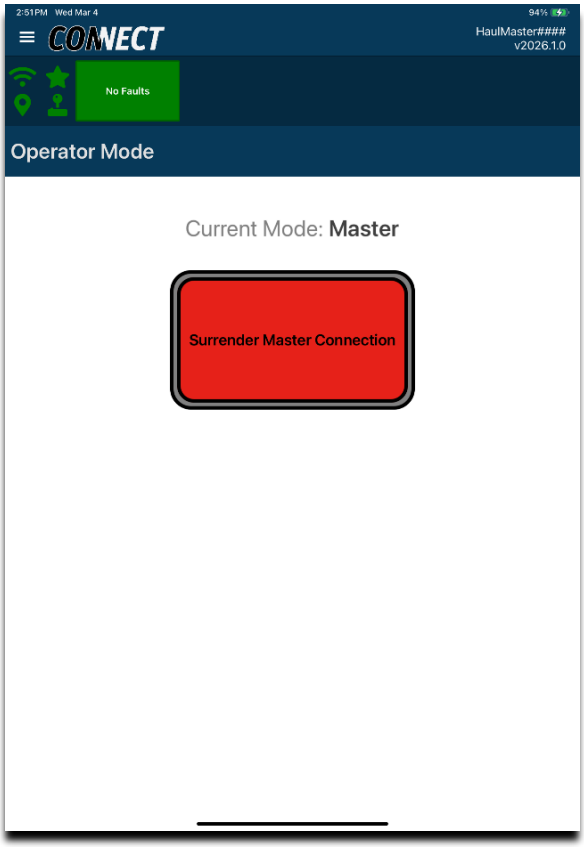


Figure 34 Master Mode

The star in the top-left corner of the home screen has been greyed out, indicating you are in **Monitor** mode, not **Master**.

8. Press the green **Request Master** Connection box to return to Master status.

NOTE:
This will only work if another device doesn't have Master status.

9. Monitor mode doesn't have:
   a. JOYSTICK CONTROLS (Pro Only)
   b. AUTO GATE CONTROLS
   c. TARE
   d. CALIBRATIONS
   e. WI-FI SETUP
   f. RESTORE

10. Changes that can't be made in **Monitor** mode will not be sent to the controller but will be put into **Pending Operations**. These operations will be executed once the iPad has a master connection again. See **3.4 PENDING OPERATIONS SCREEN**

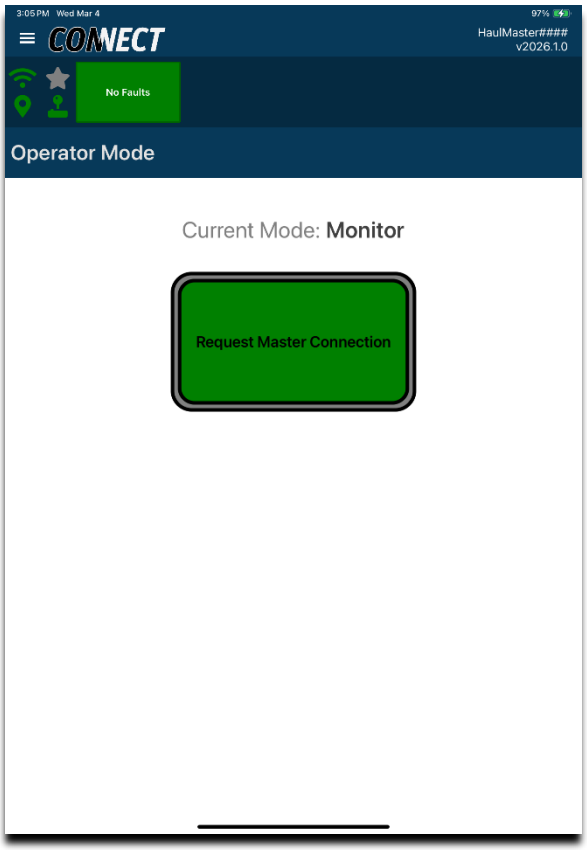


Figure 35 Monitor Mode

3.4 PENDING OPERATIONS SCREEN

Pending operations exist if the device is not in Master mode or connected to the controller when changes are made.

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.

1. **Pending Operations** can be accessed through the drop-down **menu**, seen in Figure 36.

It can also be accessed by pressing Pending Operations in the **Notification Centre.**

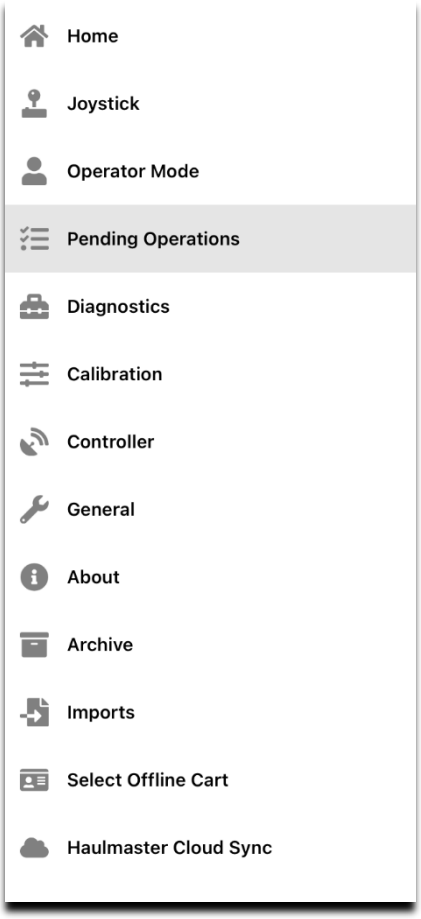


Figure 36 Pending Operations

2. All edits to Crops, Field, Trucks, Bins, and Unloads will be queued when not connected to the HM Pro controller as Master. A caption asking you to save to pending operations will pop up. Click **Save to Pending Operations** to apply the changes later when connected to the cart. See Figure 37.

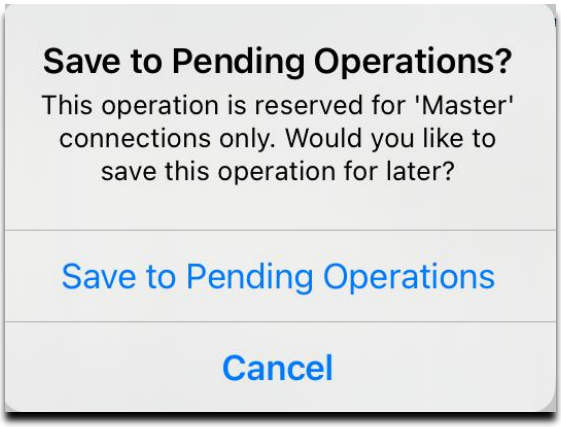


Figure 37 Save to Pending

3. Press **Pending Operations** to access the Pending Operations screen, where it shows all queued changes.

4. Press the **individual operations**. The operation title will be highlighted in red. Alternatively, touch the list button to select or deselect all items.

5. Press the trash can to delete all selected queued information. A confirmation screen for **Clear Pending Operations** will appear, asking if you are sure you want to delete all pending operations.

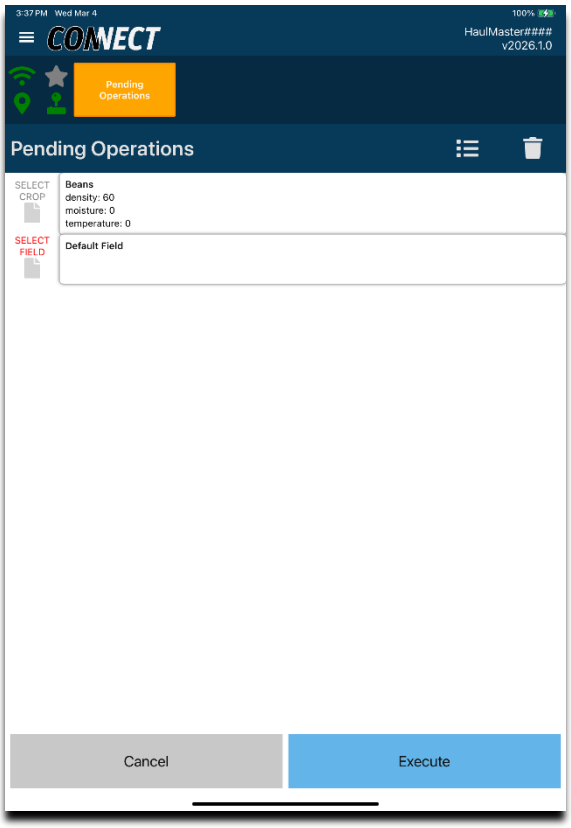
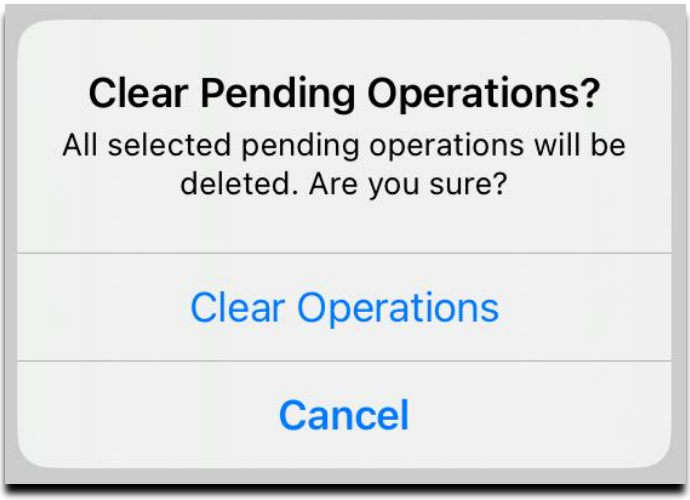


Figure 38 Execute

6. Press **Cancel or Clear** Operations as needed.



7. When you retake master mode, an **Execute Pending Operations** prompt may appear; otherwise, they will automatically execute. Touch Pending Operation to access the Pending Operations screen, where the present information shows all queued edits.

8. Press **Execute** for pending operations to be sent to the controller.

3.5 DIAGNOSTICS SCREEN

3.5.1 DESCRIPTION

The diagnostics screen contains live information from the controller and allows for diagnostic log files to be downloaded and sent for analysis.

The diagnostic screen can be accessed from the drop-down menu. **Menu>Diagnostics>**

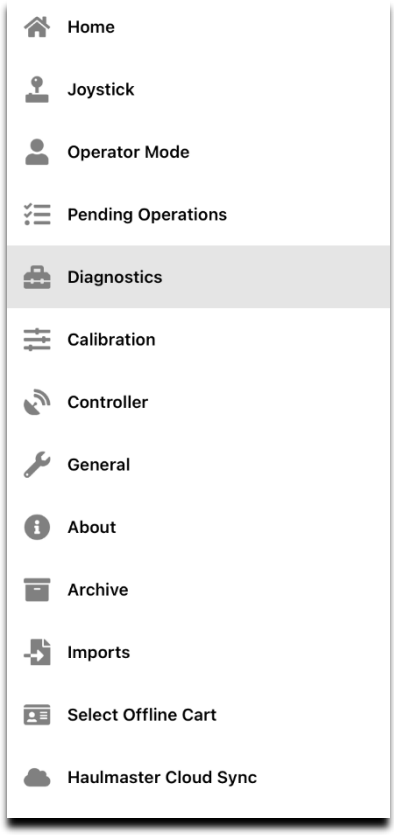


Figure 39 Drop-down Menu

Here you will find **Parameter Readings** and **Send Diagnostics.**

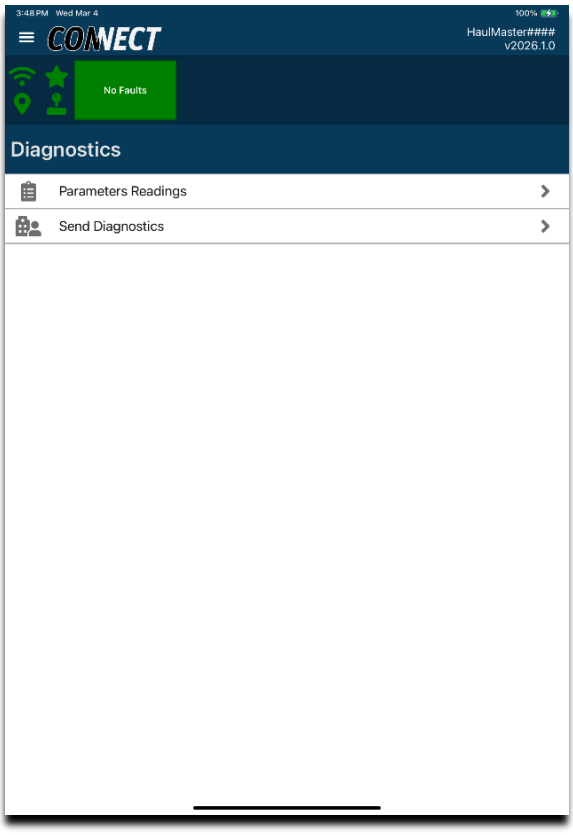


Figure 40 Diagnostics Menu

3.5.2 PARAMETER READINGS

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

1. Press **Menu>Diagnostics>Parameter Readings**.

2. Press the Diagnostic, then Parameter Readings to access **Diagnostics**.

This page shows all the parameters available

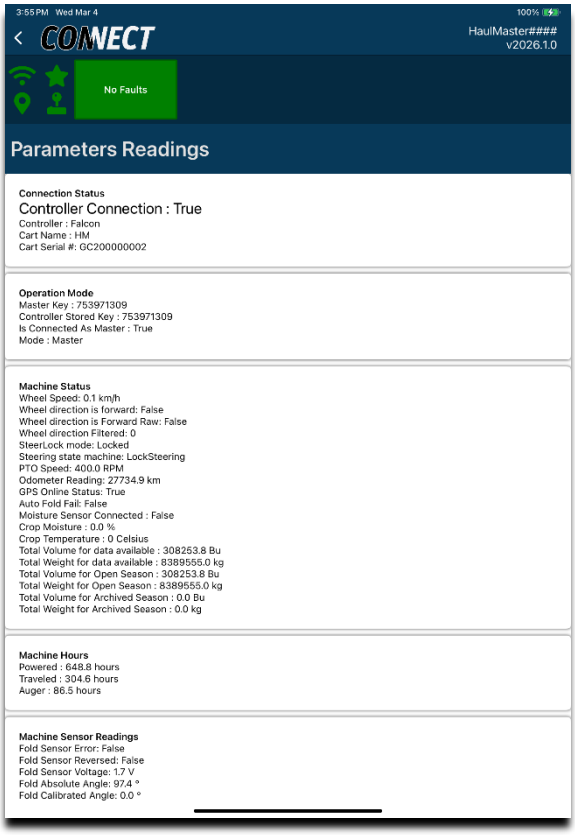


Figure 41 Parameter Readings

Machine Sensor Readings
Fold Sensor Error: False
Fold Sensor Reversed: False
Fold Sensor Voltage: 1.7 V
Fold Absolute Angle: 97.5 °
Fold Calibrated Angle: 0.1 °
Fold Position: 0.1 %
Fold Min Angle: 97.4 °
Fold Max Angle: 288.1 °
Gate Sensor Error: False
Gate Sensor Reversed: False
Gate Sensor Voltage: 2.0 V
Gate Absolute Angle: 127.1 °
Gate Calibrated Angle: -0.1 °
Gate Position: 0.0 %
Gate Min Angle: 127.2 °
Gate Max Angle: 220.2 °
Pivot Sensor Error: False
Pivot Sensor Reversed: False
Pivot Sensor Voltage: 1.9 V
Pivot Absolute Angle: 116.6 °
Pivot Calibrated Angle: 76.7 °
Pivot Position: 99.9 %
Pivot Min Angle: 39.9 °
Pivot Max Angle: 116.7 °
Spoutz Sensor Error: False
Spoutz Sensor Reversed: False
Spoutz Sensor Voltage: 2.6 V
Spoutz Absolute Angle: 179.4 °
Spoutz Calibrated Angle: -8.8 °
Spoutz Position: -18.8 %
Spoutz Min Angle: 141.4 °
Spoutz Max Angle: 234.9 °
Spoutz Stored Angle: 179.5 °
Wheel Speed Pulses per Revolution: 10
Wheel Radius: 48
PTO Shaft Pulses per Revolution: 3

Merlin Weight Readings
Cart Weight : 60.4 kg
Exponential Moving Avg Weight : 63.0 kg
Zero Point Value : 0.0 kg
Axle Weight : -15.1 kg
Loadcell 1 Weight : -0.1 kg
Loadcell 2 Weight : -17.9 kg
Loadcell 3 Weight : 4.4 kg
Loadcell 4 Weight : -1.6 kg
Loadcell 5 Weight : 75.5 kg
Last Unload Weight : 351.0 kg
Last Unload Time : 0
Merlin 1 Online : True
Merlin 2 Online : True
Loadcell 1 Reversed : False
Loadcell 2 Reversed : False
Loadcell 3 Reversed : False
Loadcell 4 Reversed : False
Loadcell 5 Reversed : False
Load Balance : 0.30000000000000004
Overloaded State : BALANCED
Loadcell 1 Error : NONE
Loadcell 2 Error : NONE
Loadcell 3 Error : NONE
Loadcell 4 Error : NONE
Loadcell 5 Error : NONE

Current Farm Info
Cart Id : 233625456
Active Data Container Id : db496084-66a6-41ea-b432-15db490d2027
Crop Id : 00000000-0000-0000-0000-000000000002
Crop Name : Barley
Crop Density : 48.5 lb/bu
Crop Moisture : 0.0 %
Crop Temperature : 0.0 °
Field Id : 302c1b42-2ba5-4993-96f7-67bbc51973df
Field Name : East Field33
Field Weight : 1092.0 kg
Field Vol. : 49.638 bu
Field Area Acres : 1100 ac
Truck Id : 7bfbbbe8-22a2-41aa-8c54-637fabf3f907
Truck Truckload Id: 4675086b-19a8-4505-8923-662067b6071c
Truck Name : Purple Peterbilt(1)
Truck Weight Capacity : 25000.0 kg
Truck Weight : 1092.0 kg
Truck Vol. : 49.638 bu
Bin Id : 48d8b52a-c618-4e45-86ad-f38c8076092e
Bin Name : BIN #16
Bin Vol. Capacity : 200000 bu
Bin Weight : 1092.0 kg
Bin Vol. : 49.638 bu
Parent Truck Truckload Id: 76f0d890-f522-4729-9265-bccdb5c16e00
Parent Truck Id: 774ed0c2-8b49-4d99-93e3-5a092aba4c70

Joystick Readings
Joystick Error: False
App Joystick Connected: True
Spoutz: 0
Spoutx: 0
Unfold: Released
Fold: Released
Gate Open: Released
Gate Close: Released
Pivot Up: Released
Pivot Down: Released

Unload Weight Change Status
Weight Change State : Same
Unload Event Mode : Hold
Filtered Weight : 60.0 kg
Top Threshold Weight : 335.0 kg
Unload Start Weight : -16.0 kg
Unload End Weight : -367.0 kg
Weight Unloading : 344.4 kg
Unload Total Weight : 351.0 kg
Residual Weight Estimate : 0.0 kg

Smart Filter Result
Envelope Top : 0.0 kg
Envelope Bottom : 0.0 kg
Noise Envelope Magnitude : 0.0 kg
Confidence : 0
Smart Filtered Weight : 0.0 kg

Master File Status
farmInfo.bin CRC Failed : False
unloads###.bin CRC Failed : False
transfers.bin CRC Failed : False

Master Data Sync Machine Status
Machine State : Hold

Cloud Settings
Api Base URL : https://fawkes.elmersmfg.com/api
Live Communication URL : reverb.elmersmfg.com

Update Base URL

Controller Date
Time : 2026-03-04 3:55:54 PM

3.5.3 SEND DIAGNOSTICS

The Send Diagnostics page is used to retrieve information and log files from the controller and download them to the iPad. Using an internet connection, this information can then be transmitted to Elmer's Manufacturing support team for analysis.

1. Press **Menu>Diagnostics>Send Diagnostics**.

2. By default, many of the controller **log files** are turned **off** and must be turned **on** to start collecting information from the controller. Once log files are enabled, they must run long enough to collect sufficient data for analysis before being sent.

Note: Log files should only be turned on when recommended by **Product Support**.

The Debug log files are always on and collecting information.

3. To turn on the controller logs so data can be collected, go to **Menu>Controller>Enable/Disable Logs>.** see **3.7.4 ENABLE / DISABLE LOGS**.
4. Back at the **Send Diagnostics screen,** press **Debug, Unloads, Weights, Auger, Drive, Generic, or All** depending on what is required by product support. This will upload them to the iPad.

5. **Wait for it to complete** the download.

Note: Some of the larger log files will take several minutes to retrieve from the controller.

It will show an **indication screen** that it is pulling information from the controller. The screen in Figure 43 will go away when downloads are complete.

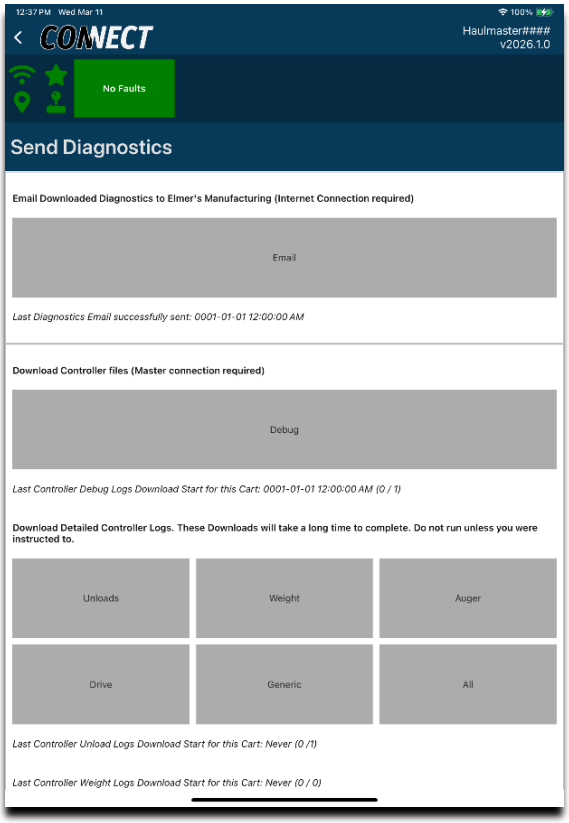


Figure 42 Select Log Files

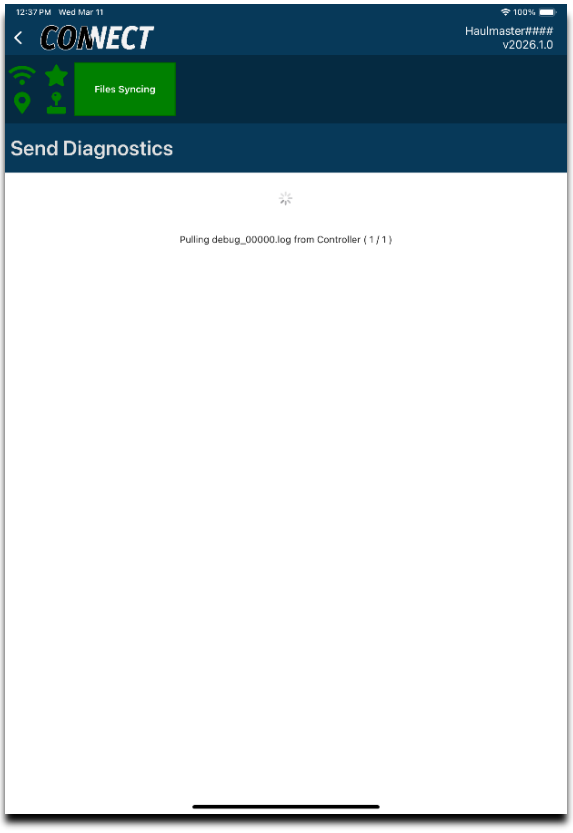


Figure 43 Downloading to iPad

6. After you have completed downloading all the desired logs, connect to a **Wi-Fi** network with an internet connection.

7. Return to the Send Diagnostics Screen.

8. Press the **Email** button, which will be available when you are connected to the Internet.

9. If your cart **serial number** is not programmed, you will need to enter a valid serial number before being able to send an email. Your serial number can be found in the front driver 's-side corner of the cart.

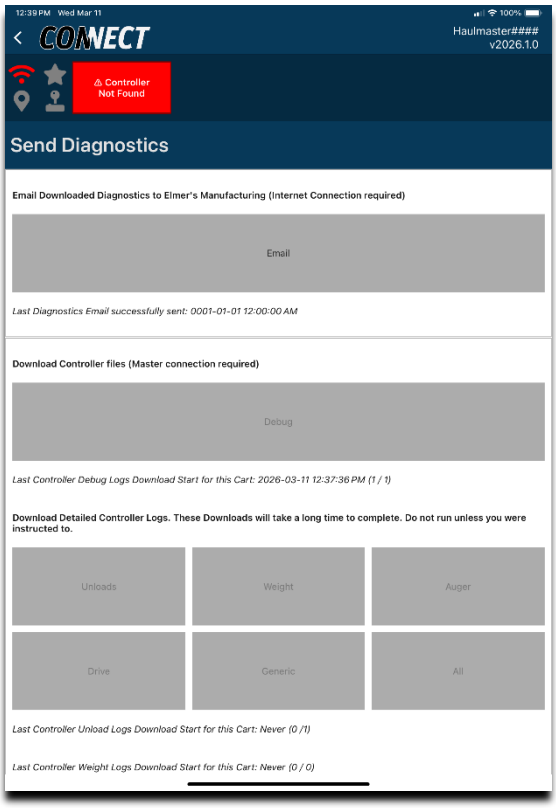


Figure 44 Email Log Files

10. You will be prompted to enter a **description** of the issue. If you have a contact that you are dealing with at Elmer's, please refer to them by name so we can help you more efficiently.

Note: This email will be **sent directly** to 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.

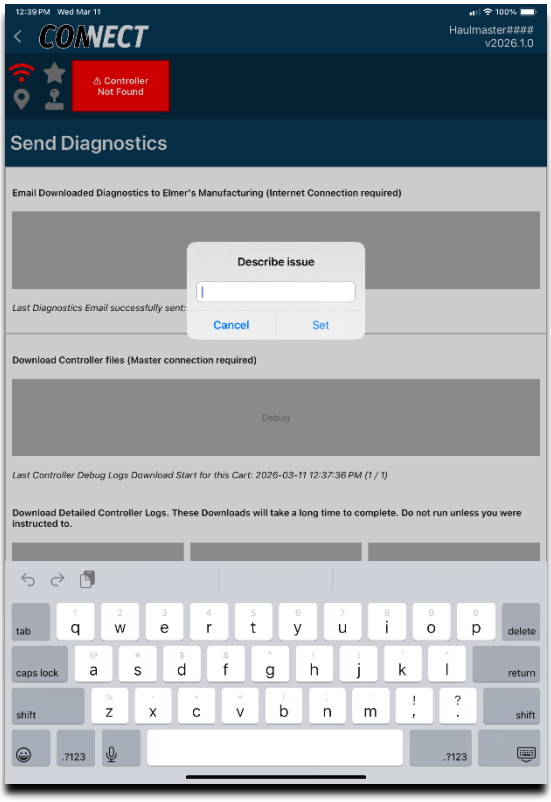


Figure 45 Email Description

3.6 CALIBRATION

The calibration menu includes several screens to configure each function of the cart.

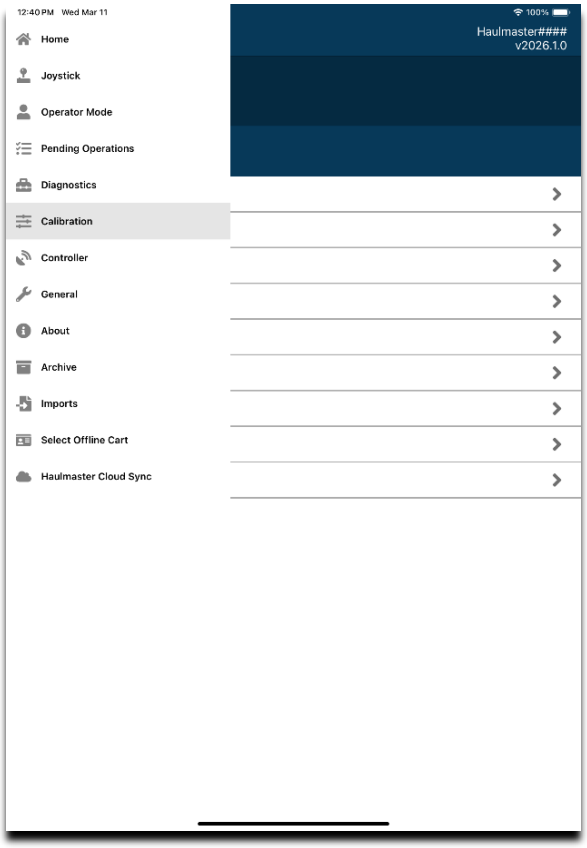


Figure 46 Calibration in Drop-down

A. WEIGHT CALIBRATION
B. ANGLE SENSOR CALIBRATION
C. OUTPUTS
D. LIMITS
E. AUTO CONTROLS
F. STEERLOCK
G. LOAD CELLS
H. WHEEL CALIBRATION
I. PTO CALIBRATION

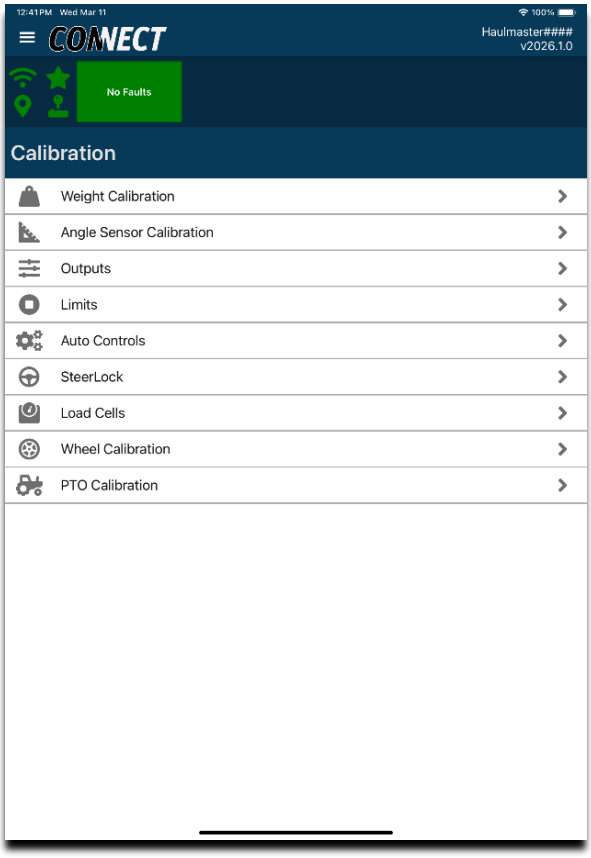


Figure 47 Calibration Menu

3.6.1 WEIGHT CALIBRATION

The **Connect** app comes with a **weight calibration** screen to fine-tune the cart's weight. Instructions for weight calibration can be found by pressing the "**?**" icon below Calibration Factor.

1. From the drop-down menu, press **Calibration>Weight Calibration.**

2. **Certified Scale Weight** is the ticket weight of the product from the weigh station. Enter the Certified Scale Weight.

3. Select the unloads from the unload list that were combined to make that certified weight. The selected unloads will be highlighted in blue, and their total will be added to the **Grain Cart Weight**. Number 6 of Figure 48.

4. Touch the truck symbol if you want to group unloads by truckload.
Note: Manually entered and modified unloads will not be shown.

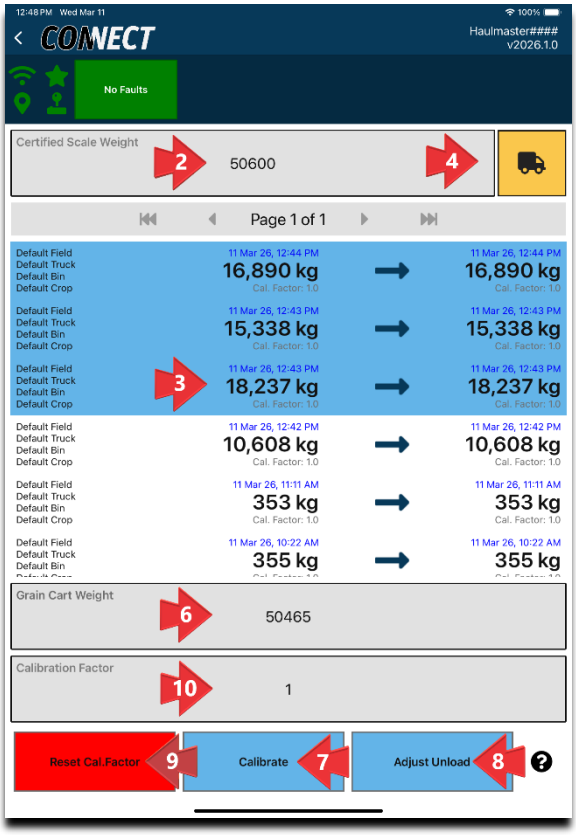


Figure 48 Weight Calibration

Press the **help** button at any time for detailed information about weight calibration.

5. If all selected unloads do not have the same calibration factor, a calibration **mismatch warning** will pop up. Choose to proceed or cancel, then select new unloads or manually enter the weight.

6. If you already have the **Grain Cart Weight** calculated elsewhere, you can manually enter the weight.

7. After entering, press **Calibrate**. The Calibration Factor should change using the following formula.

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

8. To convert any existing unloads to a new weight using the new calibration factor, select the unload and then press the **Adjust Unload** button.

9. If you need to start from scratch and set the calibration factor to 1, press **Reset Calibration Factor**.

10. Press **Calibration Factor** to manually input a known calibration factor between 0.1 and 2.

Note: This procedure can be repeated multiple times to fine-tune the weight calibration factor.

A weight can also be entered manually. Using full and empty weights from a **stationary** cart can be used to get an **accurate** amount.

Three full cart weights are recommended to get an accurate calibration factor.

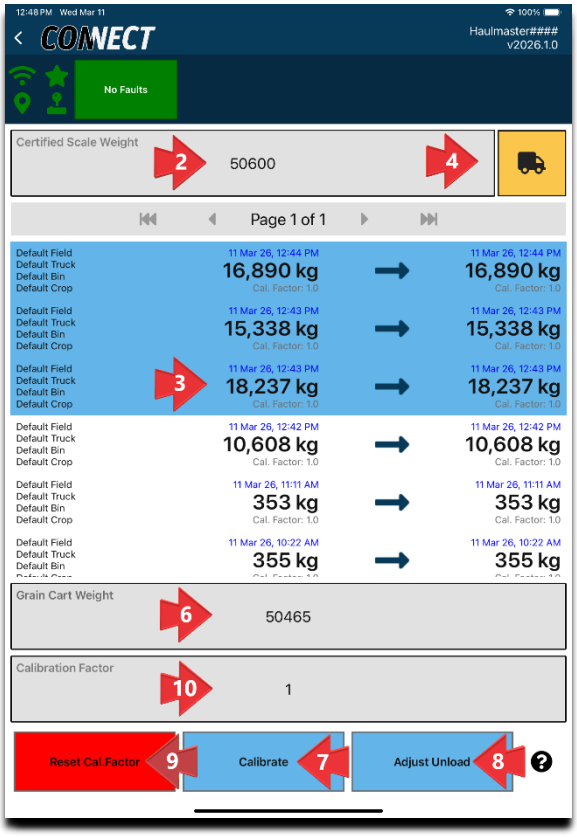


Figure 49 Weight Calibration

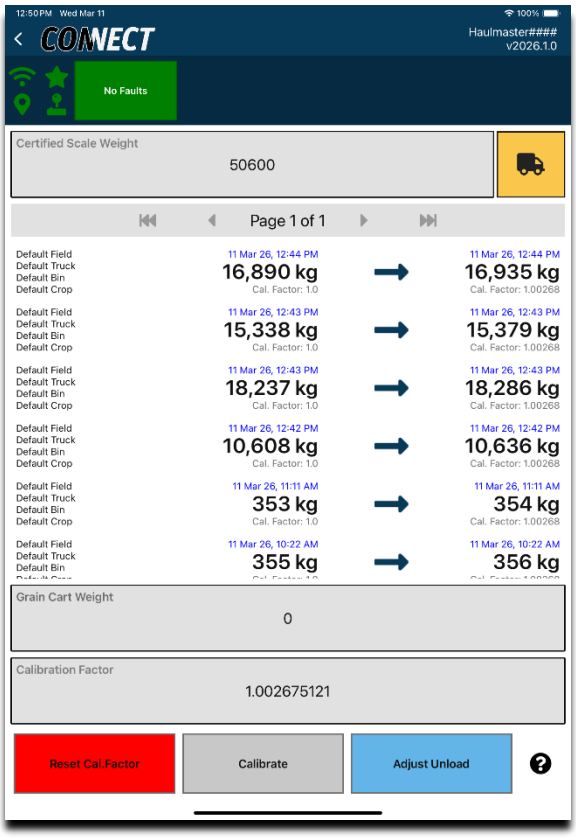


Figure 50 Calibration Result

3.6.2 ANGLE SENSOR CALIBRATION (PRO ONLY)

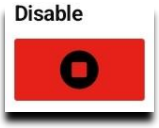
3.6.2a Overview

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

1. From the drop-down menu, press **Calibration>Angle Sensor Calibration**

2. **Observe** that all sensors are **OK** before you proceed.

3. Press the **"Disable"** box to disable the automatic control and enter the calibration screens.



WARNING:
Disabling Auto Control will turn off the automatic auger fold and unfold functions and reduce the speed of all operations. The **spout movement safeties** will also be **disabled,** allowing the spout to be moved in any situation. Caution must be used to ensure the spout doesn't hit the cart.

The speeds are still governed by a minimum hydraulic speed. If a function doesn't move, turn that minimum speed up in the Outputs screen.

4. A Disable Automatic Control box will pop up. Press **Disable** to continue.

5. Press the fold sensor line on the angle calibration screen to access the **Fold Sensor Calibration.**

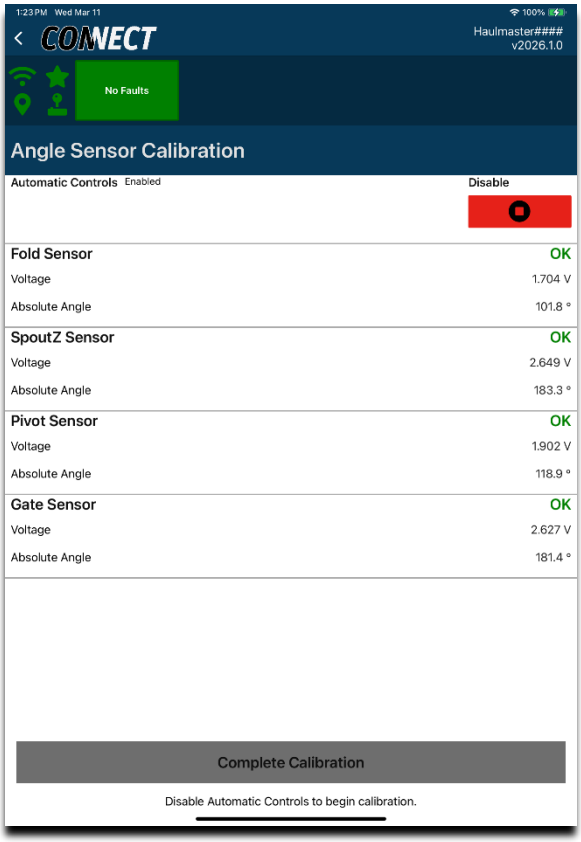


Figure 51 Angle Sensor Calibration

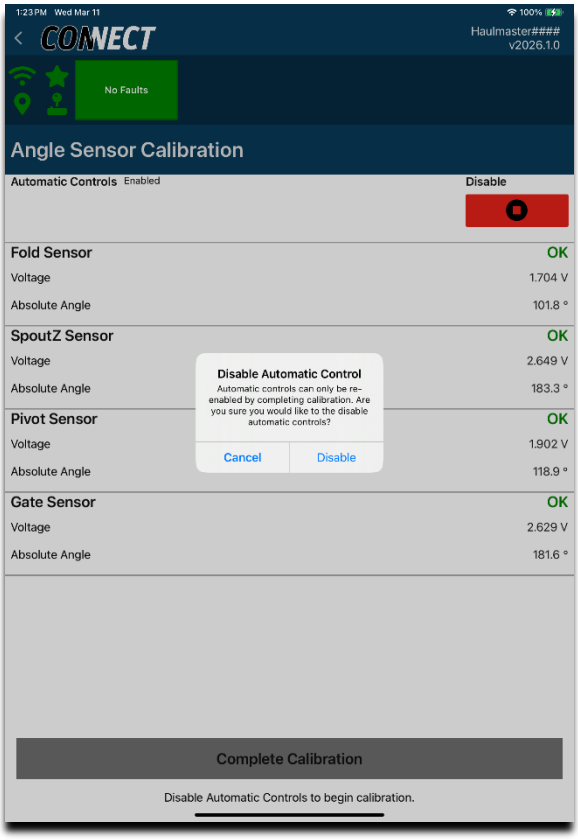
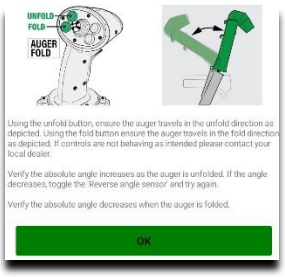


Figure 52 Disable Automatic Controls

6. A **Safety Warning** screen will appear. See Figure 53. After reading the safety warning, hit **OK** to acknowledge that you understand the warning. Each sensor will have its own set of safety warnings.

Note: Every angle sensor will follow the same procedure described here.

7. Instructions will then appear to show how to move each function to calibrate it. **See section "2 CART OPERATION"** to get a more detailed understanding of each function in the calibration screen.



8. Press **OK** to access the Sensor Calibration Settings screen.

9. **To return** to the specific sensor instruction screen, touch the blue circle with a question mark inside

10. The screen indicates the status of the sensor with a **green OK.** It also has **Voltage, Absolute Angle**, and **Position as a %.** The **Absolute Angle** is the current angle of the sensor and stores the minimum and maximum values of the sensor.

11. Every sensor direction can be reversed by pressing the **Reverse Angle Sensor** slider. 360.0° will be swapped with 0°

Note: This feature accommodates clockwise and counterclockwise sensor operation, or if the user installs a replacement sensor in the wrong direction.

12. Each function can be moved using the joystick to the ends and setpoint positions. Pressing the **Set** button will save that value for that position. **For example**: Keep holding the fold button until the auger finishes folding, then press the **Set** button to the right of it.

13. Once all the positions of that function are set, the **Calibrate** button can be hit to complete the calibration of that function.

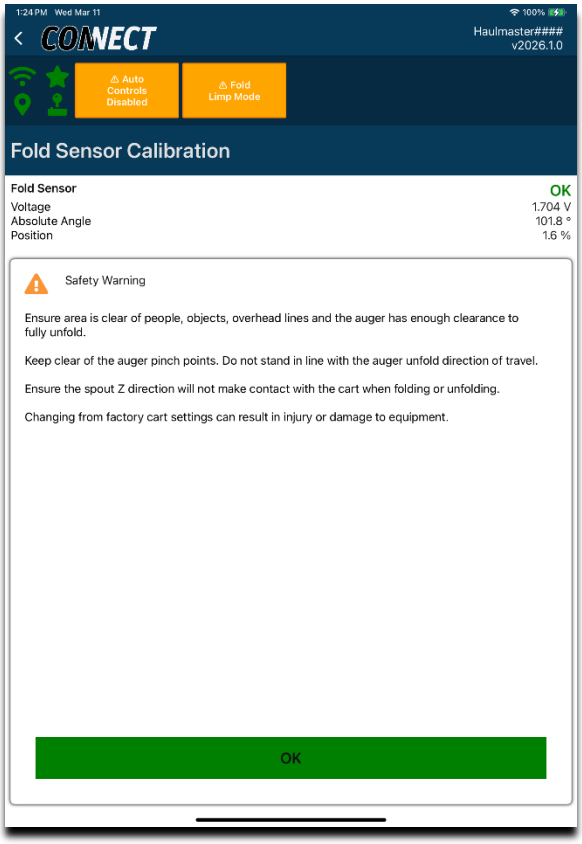


Figure 53 Safety Warning

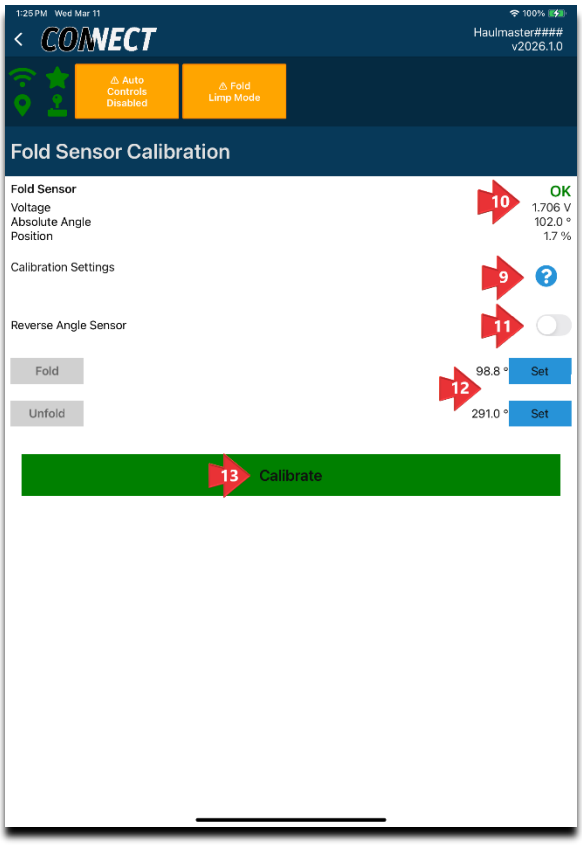


Figure 54 Fold Sensor Calibration

14. A **“Success!”** screen will appear. Press **Next** to continue.

15. This will take you back to the Angle Sensor Calibration screen, where a **correctly calibrated** function will **show up Green**.

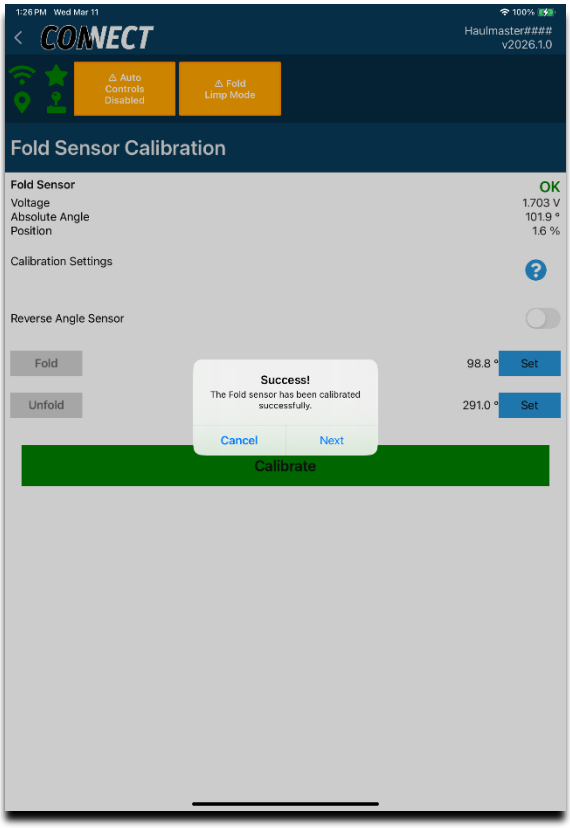
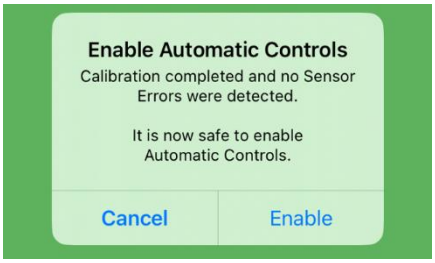


Figure 55 Successful Calibration

16. Once all desired sensor calibrations are completed, press **Complete Calibration.**

17. A calibration summary screen will appear, showing all the calibration information. Press **Confirm Calibration**. See the bottom of Figure 56.



18. Press **Enable** on the pop-up to verify you want to enable auto controls.

19. **Calibration successfully!** Will pop up. Press **Ok**.

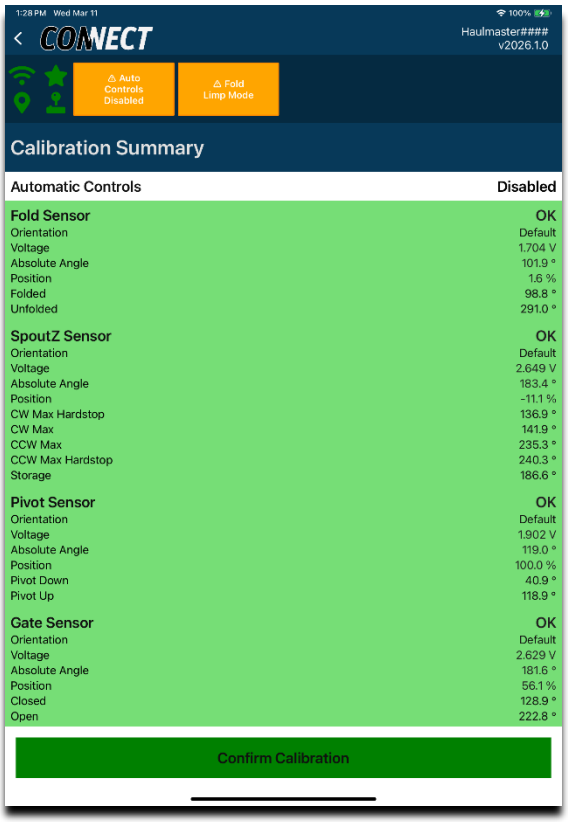


Figure 56 Confirm Calibration

3.6.2.b. FOLD SENSOR CALIBRATION

First, read section 3.6.2. to understand the calibration procedure.

1. Before the fold calibration can be done, the **field rest** should be **up**. Ensure the auger rests on the field rest during fold-position calibration. See Figure 57 to the right.

Figure 57 Field Rest Up

Figure 58 DANGER

2. If not in the calibration screen, go to **Menu> Calibration>Angle Sensor Calibration,** Disable Automatic Controls, and then press **Fold Sensor**.

A Fold Sensor Safety Warning and **Fold Instructions** screen will appear. **READ ALL SAFETY AND FOLD INSTRUCTIONS** before hitting **OK**. See Figures 59 & 60.

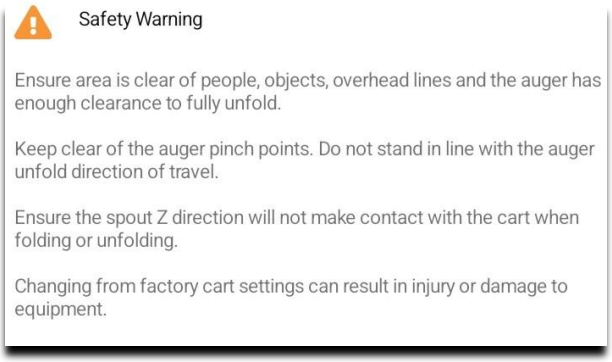


Figure 59 Safety Warning

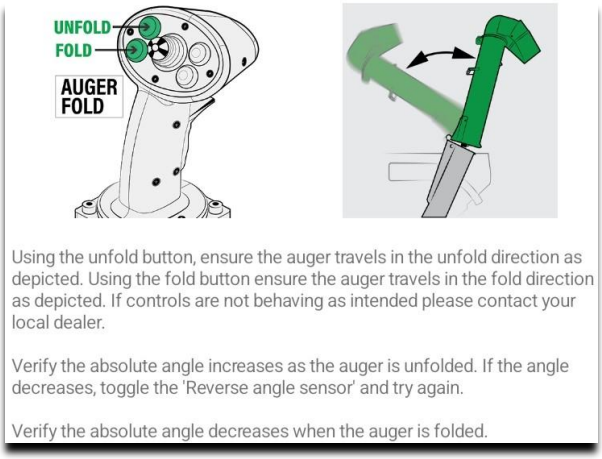


Figure 60 Fold Instructions

3. Move the auger to the fold position using the joystick if connected, and if unplugged, use the iPad **Fold** button. Press the **Set** button next to Fold. To redisplay the instructions, press '?'.

Note: The fold position should be calibrated to be just **on the field rest;** otherwise, it will slam down when the field rest is up. During transport, the field rest can be folded down, and the auger can be manually folded down for safe transport. See **Auger Fold/Unfold Manual Override in section 2.5.2.** Folding manually prevents the need to recalibrate the folded position when moving between transport and the field**.**

4. Move the auger to the **unfolded** position. Press the **Set** button next to **Unfold.**

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

6. If unfolding results in the **Absolute Angle** decreasing, press the **Reverse Angle Sensor** slider and try steps 4 and 5 again.

7. Angles that are set at **less than 10°** apart will also result in an **error.** Attempt again to confirm that the range of motion has expanded.

8. If all setpoints are set correctly without errors, press **Calibrate**.

9. After successful, press the **Next** button to continue.

10. This should **take you back** to the calibration screen, where you can **calibrate another** sensor or complete the calibration.

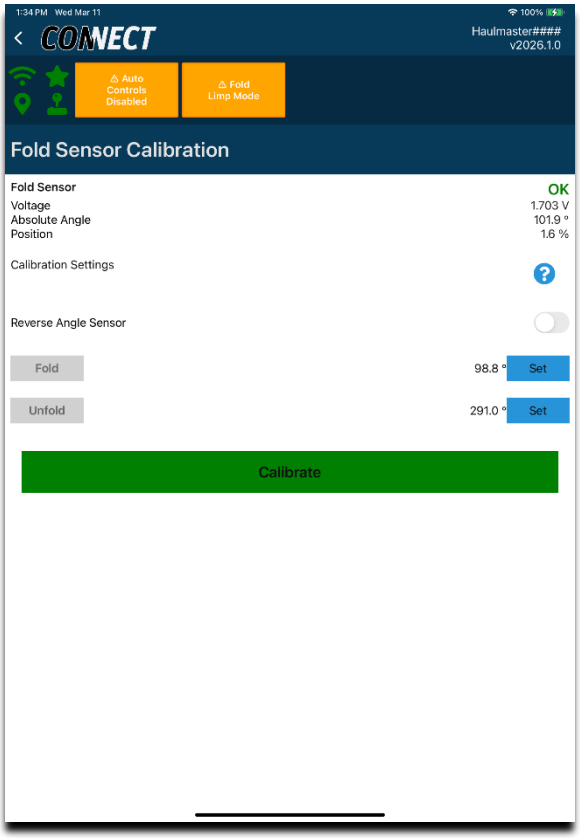


Figure 61 Fold Sensor Calibration

3.6.2.c. SPOUTZ SENSOR CALIBRATION

First, read section 3.6.2.to understand the calibration procedure.

1. If not in the calibration screen, go to **Menu> Calibration>Angle Sensor Calibration,** Disable Automatic Controls, and then press **SpoutZ Sensor.**

Figure 62 DANGER

A **SpoutZ Sensor Safety Warning** and **Spout Z Instructions** screen will appear. **READ ALL SAFETY AND SPOUT Z INSTRUCTIONS** before hitting **OK**.

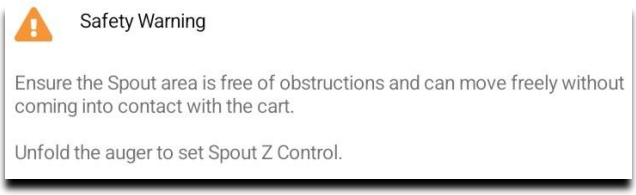


Figure 63 Safety Warning

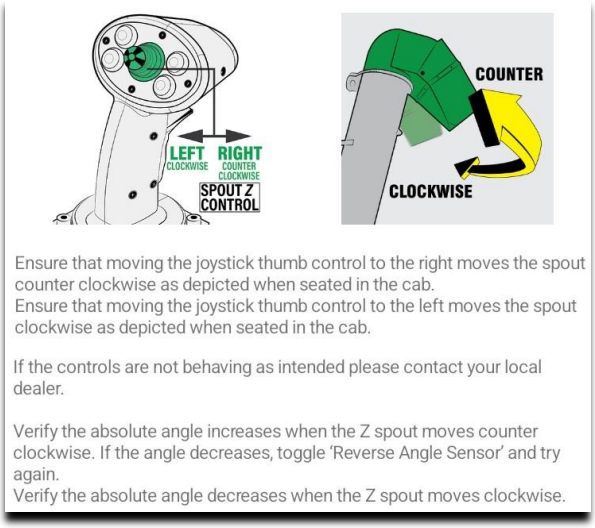


Figure 64 Spout Z Operation

2. The system is designed with 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 hard stops. Users can't move the spout further than the software's hard stops.

3. Move the spout to **CW Max** position using the joystick if connected, and if unplugged, use the iPad **CW Max** button. Press the **Set** button next to CW Max. To redisplay the instructions, press '?'.

4. If travelling toward the **CCW** position results in the Absolute Angle decreasing, toggle **Reverse** Angle Sensor and try again.

5. If the **CW Max** and **CCW Max** are set too close together, it may not let you move far enough to the desired position. Press **Reset** to set the stops to 0 and 360°, allowing the spout to move as far as needed.

6. Travel to the **CCW** Max position and press **Set** to the right of **CCW** Max.

7. Move the spout to the **Storage** position, which is halfway between the **CW** and **CCW Max**. In this position, the spout should be facing straight out in line with the auger. This position should allow for the safe movement of the auger without contacting the cart. Once in the desired correct storage position, press the **Set** button to the right of the word **Storage**.

8. If the user sets the **CW Max** larger than the **CCW Max** angle, the **Invalid (CW Max/CCW Max) Values** caption screen appears, instructing the user to be sure the CW Max value is less than the CCW Max value. Likewise, if the **Storage** position is set outside the **CW** and **CCW Max** angle, an error will also occur. Re-check the set values and correct them as needed.

9. If all setpoints are set correctly, press **Calibrate** and then press **Next** on the Calibration successful pop-up.

10. This should **take you back** to the calibration screen, where you can **calibrate another** sensor or complete the calibration.

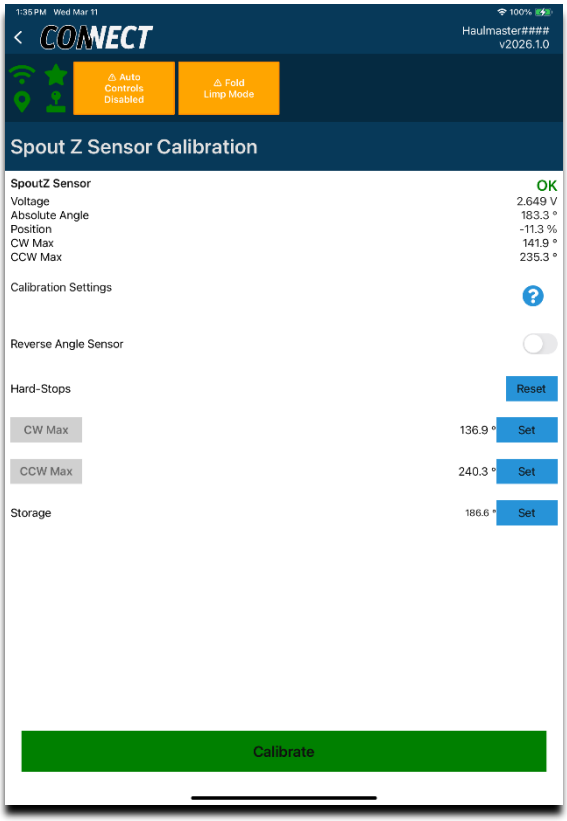


Figure 65 Spout Z Sensor Calibration

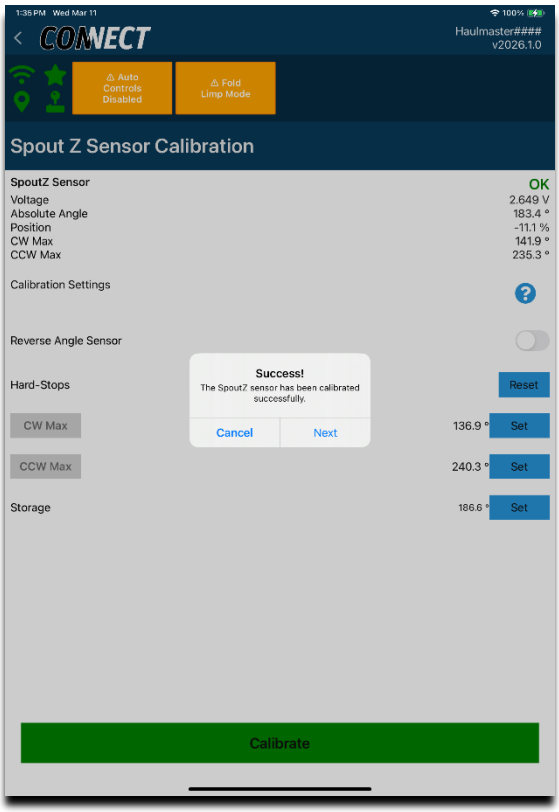


Figure 66 Success!

3.6.2.d. PIVOT SENSOR CALIBRATION

First, read section 3.6.2. to understand the calibration procedure.

1. If not in the calibration screen, go to **Menu> Calibration>Angle Sensor Calibration,** Disable Automatic Controls, and then press **Pivot Sensor.**

Figure 67 Danger

A **Pivot Sensor Safety Warning** and **Pivot Instructions** screen will appear. **READ ALL SAFETY AND PIVOT INSTRUCTIONS** before hitting **OK**.

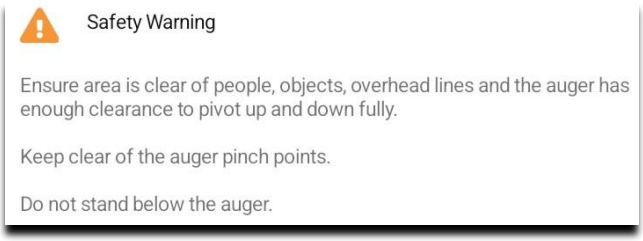


Figure 68 Safety Warning

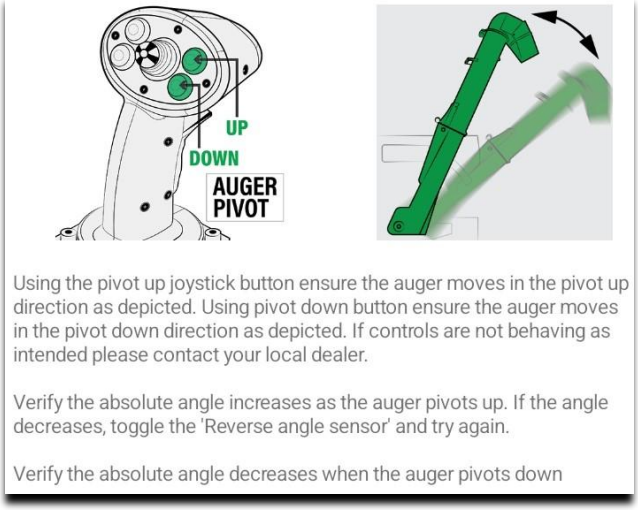


Figure 69 Safety Warning and Operation

2. Move the pivot to the **Down** position and touch **Set** to the right of the Down button. Movement can be accomplished with the virtual Down button or the joystick. To redisplay the instructions, press '?'.

3. If pressing Pivot Up results in the Absolute Angle decreasing, toggle **Reverse Angle Sensor** and try again.

4. Move the pivot to the **Up** position and touch **Set** to the right of the Up button. Movement can be accomplished with the virtual Down button or the joystick.

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

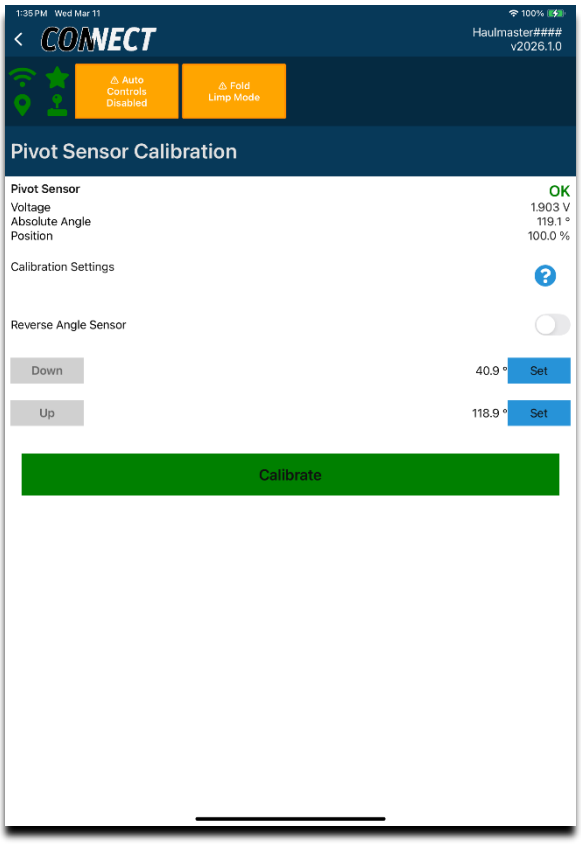


Figure 70 Pivot Sensor Calibration

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

7. If all setpoints are set correctly, press **Calibrate** and then press **Next** on the Calibration successful pop-up.

8. This should **take you back** to the calibration screen, where you can **calibrate another** sensor or complete the calibration.

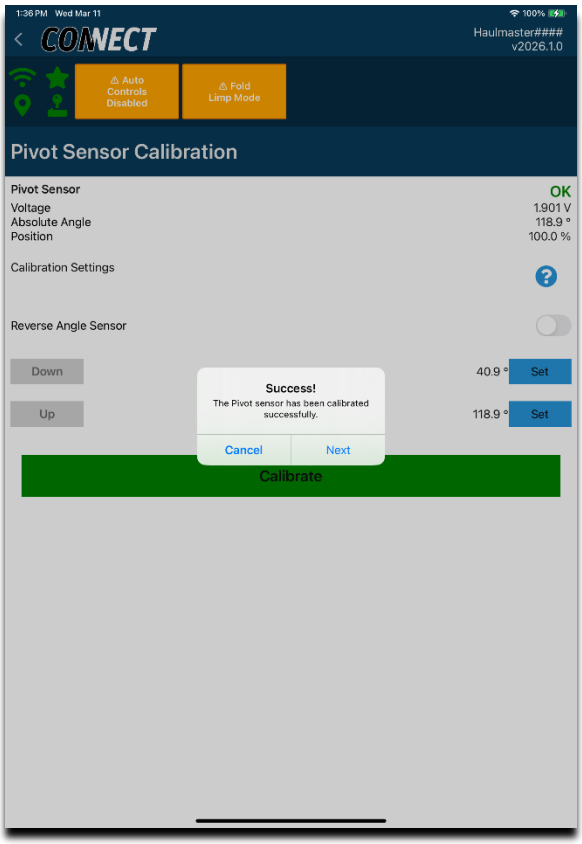


Figure 71 Success!

3.6.2.e. GATE SENSOR CALIBRATION

First, read section 3.6.2. to understand the calibration procedure.

1. If not in the calibration screen, go to **Menu> Calibration>Angle Sensor Calibration,** Disable Automatic Controls, and then press **Gate Sensor.**

A **Gate Sensor Safety Warning** and **Gate Instructions** screen will appear. **READ ALL SAFETY AND GATE INSTRUCTIONS** before hitting **OK**.

2. Move the **Gate** to the **Close** position and touch **Set** to the right of the **Close** button. Movement can be accomplished with the virtual Close button or the joystick. To redisplay the instructions, press '?'.

3. If pressing **Close** results in the Absolute Angle increasing, toggle **Reverse Angle Sensor** and try again.

4. Move the Gate to the **Open** position and touch **Set** to the right of the **Open** button. Movement can be accomplished with the virtual **Open** button or the joystick.

5. Press the **Calibrate** button when all the positions are set.

6. If the user sets the **Close** angle larger than the **Open** angle, the **Invalid (Closed/Open) Values** caption screen will appear, informing the user that the Open value is less than the Closed value.

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

8. If all setpoints are set correctly, press **Calibrate** and then press **Next** on the Calibration successful pop-up.

9. This should **take you back** to the calibration screen, where you can **calibrate another** sensor or complete the calibration.

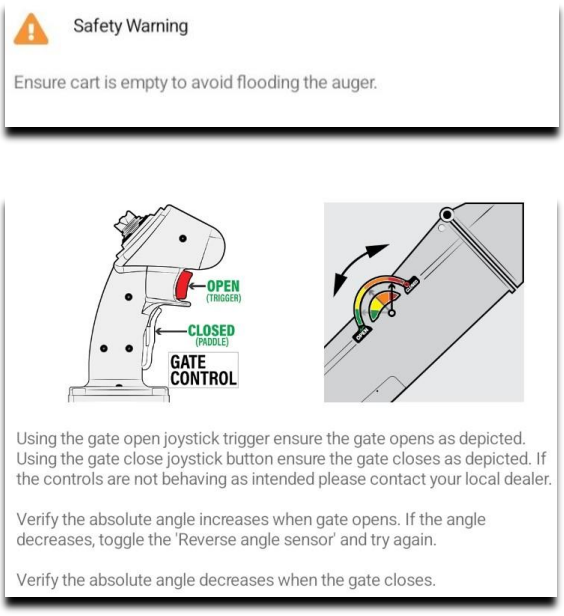


Figure 72 Safety Warning and Operation

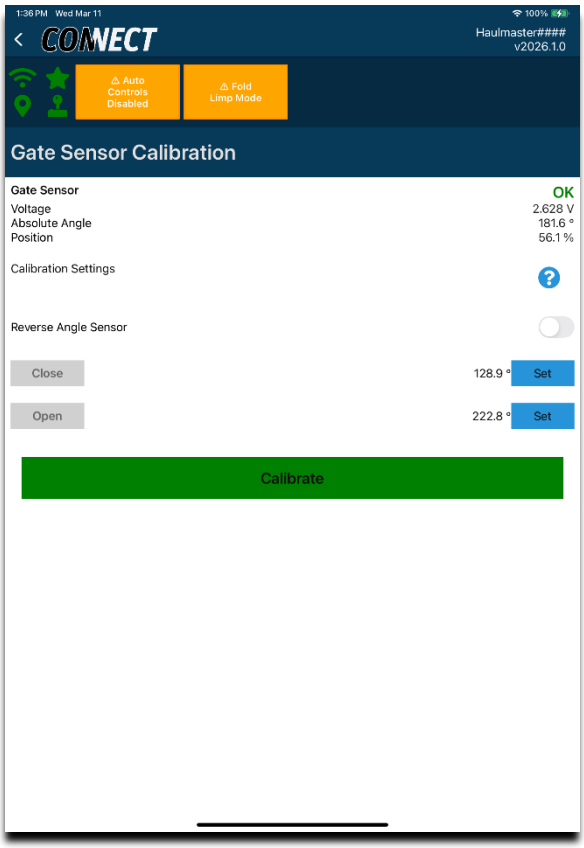


Figure 73 Gate Sensor Calibration

3.6.3. OUTPUTS (PRO ONLY)

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

Note: Controlling these outputs is also dependent on the hydraulic rate of the tractor. Make sure the tractor flow is correct before modifying these outputs.

1. From the drop-down menu, press **Calibration> Outputs**.

2. Each output displays its **current hydraulic flow** percentage in grey. The percentage in blue will be the user-configured flow rate.

3. The adjustable rate can be controlled by the + & − symbols by predefined step amounts. Alternatively, the user can use the slider to change the setting.

4. When a desired flow rate is reached, touch the **set** button next to the setting.

5. The **hydraulic flow rate in grey** will be updated to indicate a successful change in flow rate. Test the function to see if the desired flow rate is set.

6. **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 will be passed to the gate mechanism. Some users find the gate speed too fast when they trigger it to open. For greater control over the gate opening, turn down the Gate Max Duty Cycle

7. **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.

8. **Spout X Max Duty Cycle**: This setting controls the speed of the Spout X function. It is the percentage of the flow rate provided by the tractor hydraulics that will be passed to the Spout X mechanism. The thumb stick **variably** drives spout X in proportion to this max

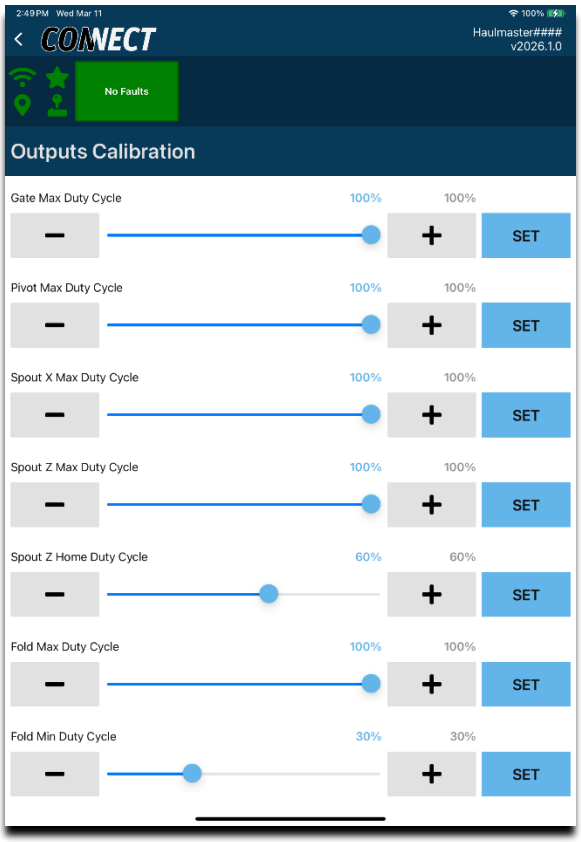


Figure 74 Output Calibration

flow rate. Reduce this flow rate if the max speed of X is too fast when the thumb stick is fully moved up or down.

9. **Spout 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 spout Z mechanism. The thumb stick variably drives spout Z in proportion to this max percentage. Reduce this flow rate if the max speed of Z is too fast when the thumb stick is fully moved left or right.

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

11. **Fold Max Duty Cycle:** This setting controls the maximum speed the fold and unfold function can travel. It is the maximum percentage of the flow rate provided by the tractor hydraulics that will be passed to the fold mechanism. While a faster 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 slowly, 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.

12. **Fold Min Duty Cycle:** This setting controls the minimum speed of the fold, and the unfold function will move. This is the speed at which the auger will land and seat against the upper auger. It is the minimum percentage of the flow rate provided by the tractor hydraulics for the fold mechanism. 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% are all that are needed. For most tractors, it is not recommended that this setting go above 35%. A warning will be displayed when this setting goes above 35% to warn you about the potential damage to your equipment.

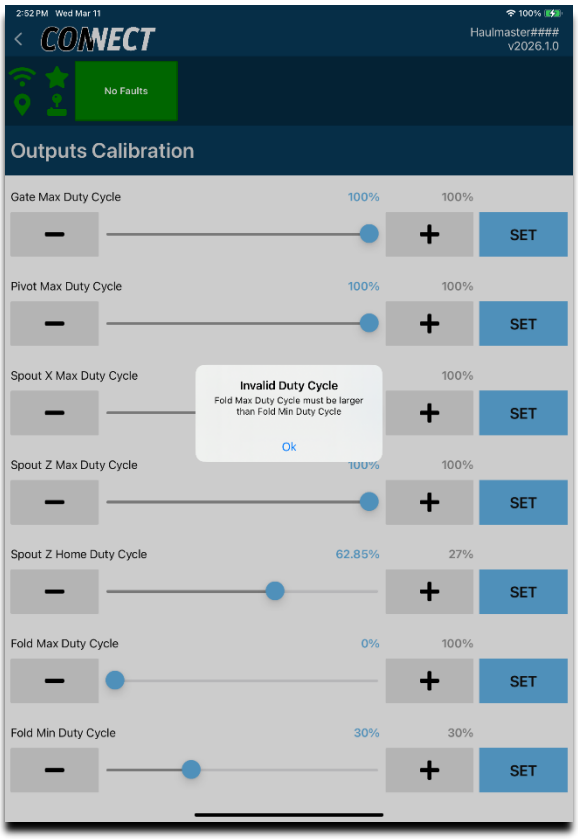


Figure 75 Invalid Duty Cycle

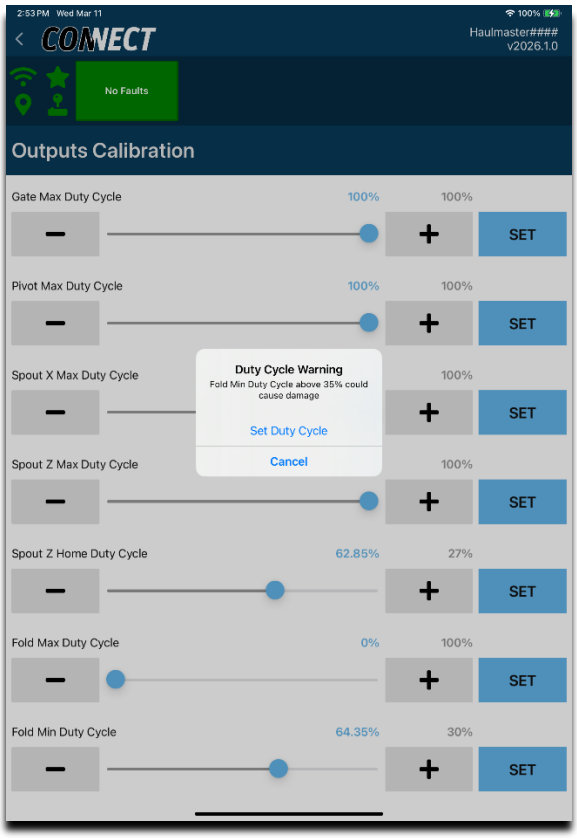


Figure 76 Duty Cycle Warning

3.6.4 LIMITS (PRO ONLY)

The maximum and minimum gate positions, as well as the pivot home position, can be set here.

1. From the drop-down menu, press **Calibration>Limits.**

2. Each limit displays a **Live reading** of the current function's position, current setting percentage in grey, and the percentage in black will be the user-configurable limit.

3. The adjustable **limit** can be set by the **+** & **−** symbols by predefined step amounts. Alternatively, you can use the slider to change the setting.

4. When the desired limit is reached, touch the **SET** next to the setting.

5. The **current limit in grey** will be updated to indicate a successful change of the limit. Test the function to see if the desired limit is set.

6. **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 3.6.3 **Outputs, Max Gate Duty Cycle,** and reduce the gate function speed.

7. **Min Pivot Down:** When the Pivot reaches this minimum percentage, it will stop driving the Pivot down function. This setting is to help prevent possible damage to trucks by limiting how low the pivot can be driven.

8. **Pivot Home:** This limit is a home position. 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 view window visible or move the Pivot to a position ready for highway travel.

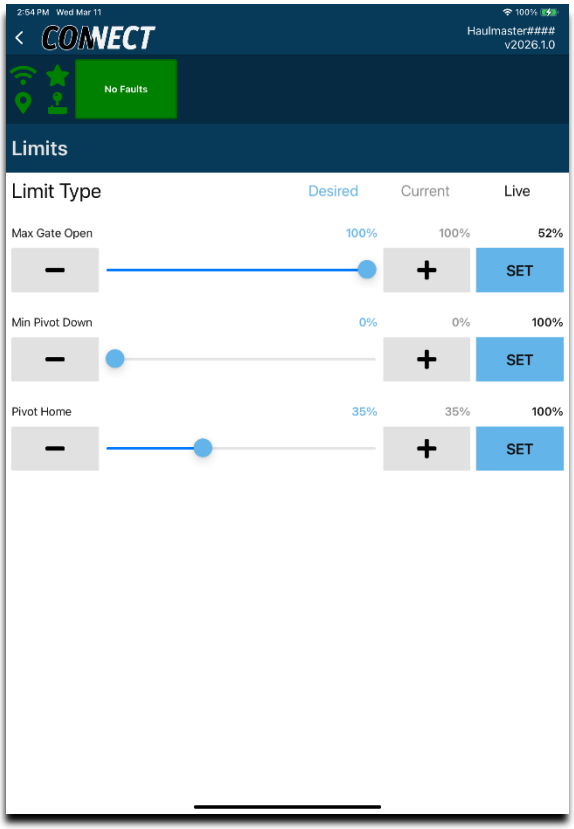


Figure 77 Limit Types

3.6.5 AUTO CONTROLS (PRO ONLY)

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

1. From the drop-down menu, press **Calibration>Auto Controls.**

2. **Master Automatic Controls;** Can be disabled from this screen as well as the 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.

3**. Auto Gate Close Based on Speed;** Can be enabled or disabled from this screen or the home screen. Note that very small devices may not be able to access this setting on the home screen due to screen size, so this setting will then need to be changed on this screen. You can toggle this function on the **home page** as well.

4. **Auto Gate Close Based on Weight**; Can be enabled or disabled from this screen or the home screen. The **gate** will **close** based on the weight unloaded into the **truck** and the truck's weight settings.

5. **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 completely up, and the auger will unfold.

Note: The "Pivot with Auto Fold and Unfold" feature will not automatically move the pivot when manual fold and unfold are being used.

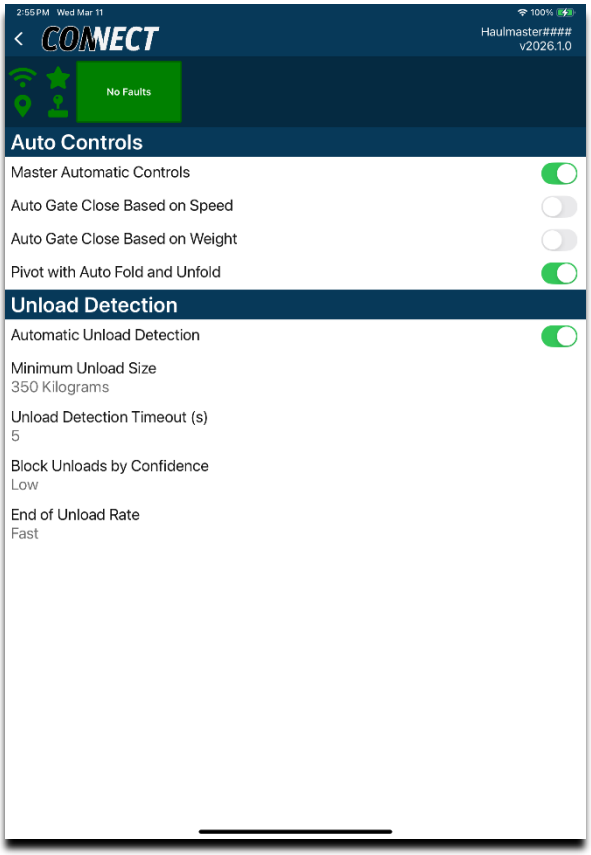


Figure 78 Auto Controls Screen

Unload Detection

6. **Automatic Unload detection:** When enabled allows for the controller to automatically decide when an unload is made.

7. **Minimum Unload Size:** Sets the minimum unload size allowed to be automatically created. Prevents false unload detections

8. **Unload Detection Timeout:** This time sets how long before the controller confirms the unload.

9. **Block Unload by Confidence:** A confidence level is calculated and can be used to determine if an unload is valid. Can also be used to prevent false unloads.

10. **End of Unload Rate:** How fast the end of the unload is recognized.

3.6.6 STEERLOCK (INLINE TANDEM ONLY)

The SteerLock system allows the tires to lock in the straight position when the cart is in reverse or above a certain speed.

1. From the drop-down menu, press **Calibration> SteerLock.**

2. Cart speed will **display** the current speed in **km/h** or **mph.**

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

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

5. **Steering action** displays the state of the steering. When in Locked mode, it will read **LockSteering**. In Manual mode, it will read **ManualSteering.**

In automatic mode, there are 3 states:
AutoLockSteeringForReverse – locks the steering straight when going in reverse**.**
AutoFloatSteering – allows the steering to turn naturally when steering and travelling forward.
AutoLockSteeringFor HighSpeed – locks the steering above the set higher speed.

6. Press Lock steering to put the steering into **LockSteering**. Locks the wheels from steering.

7. Press **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 the **SteerLock** system and is used for phasing of the steering.

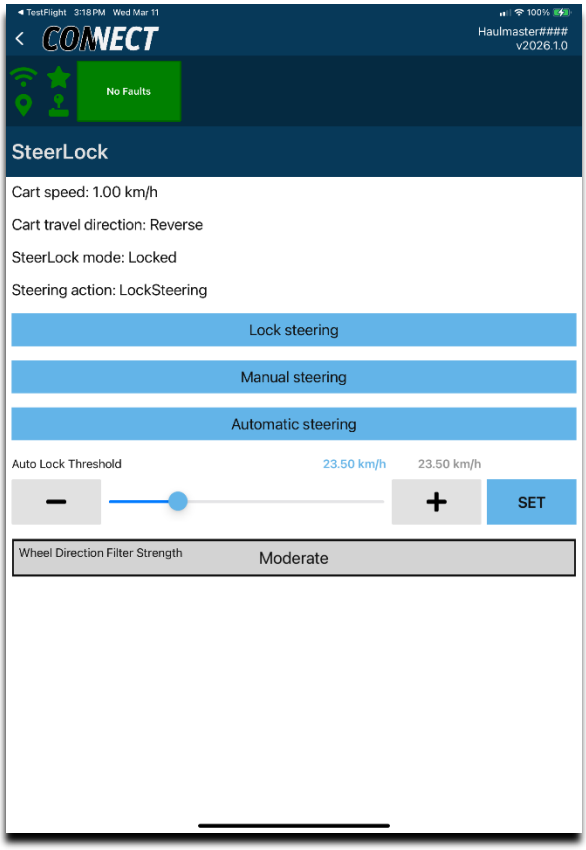


Figure 79 SteerLock Screen

8. Press **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.

9. Press the **–**, +, or **slider** to adjust the **Auto Lock Threshold** speed, then hit **SET** to save it.

10. For quick access to Tandem Steering Mode, go to Settings, General, and turn on Visible **Tandem Steering Controls**. The Tandem Steering Mode control will now be visible on the **home screen.**

Pressing the SteerLock button allows you to change to **Locked, Manual, and Automatic**.

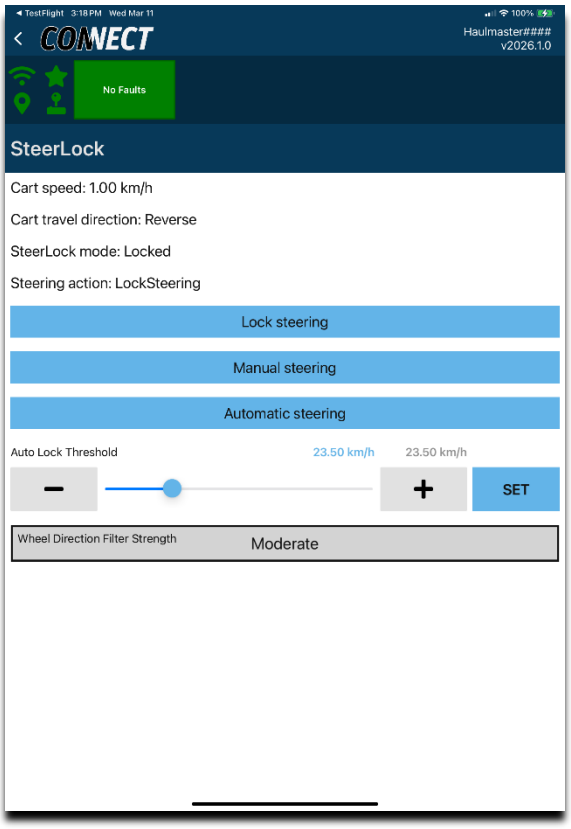


Figure 80 SteerLock Screen

11. It is possible that barely moving speeds might briefly change the direction the sensor is reading. A **filter** is used to average and **remove any false readings** in the direction.

The filter can be set by pressing the **Wheel Direction Filter Strength** button. The filter level can be set to None, Light, Moderate, Heavy, and Laden as shown in Figure 81.

12. The **speed units** can be changed from **km/h** and **mph** in the **3.8 General** settings. **Menu>General>.**

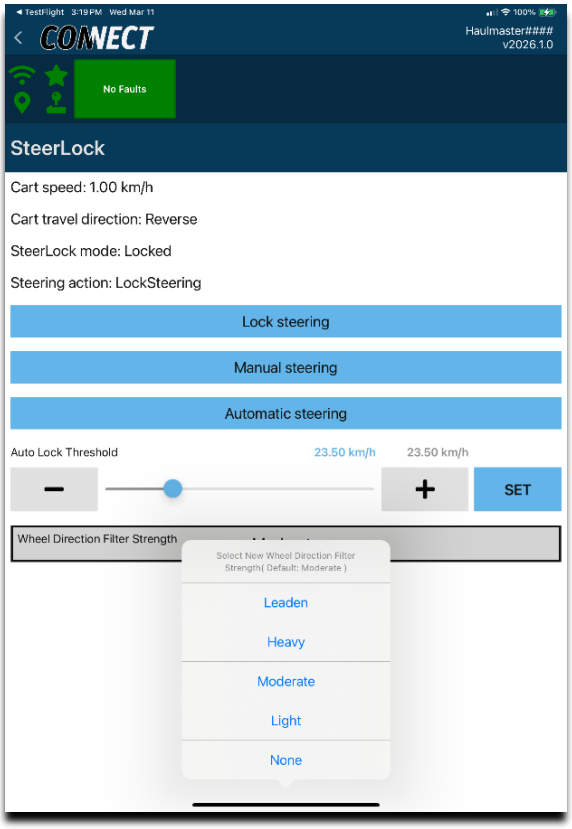


Figure 81 Filter Strength

3.6.7 LOAD CELLS

This section will cover the Loadcell Polarities Page. Here you will be able to reverse loadcell polarities and set the addresses for each Merlin.

1. From the drop-down menu, press **Calibration>Load Cells.**

2. Under Load Cell Polarities, you can toggle to reverse any of the five load cells. Toggling the load cell will report the weight applied to the load cell in the opposite direction. This will allow load cells installed in the **opposite direction** or load cells that have **reversed signal wires** to be changed in software instead of physically altering the load cell.

3. The **total** grain cart weight shows the total weight of **all five** load cells.

4. If you receive a new Merlin or your current Merlin has lost its address, you will be able to set the **Merlin address** using these controls.

5. It is important that **only one Merlin** is connected when setting the address. Failing to disconnect the other Merlin will change the address of both Merlins instead of just the required Merlin.

6. Disconnect Merlin 1 so that only Merlin 2 is connected. The red bar message "**More than one Merlin detected**. **Disconnect one Merlin to set an address"** will turn to the green message **"Ready to set Merlin Address."**

7. Press **Set Merlin 2.** It should now say **Merlin 2 Online.**

8. Unplug **Merlin 2** and Plug in **Merlin 1.**

9. Press **Set Merlin 1.** It should now say **Merlin 1 Online.**

10. Plug in both Merlins, **Merlin 1 Set** and **Merlin 2 Set,** should now be Online. The bottom bar will go **red** as in Figure 82 above.

Gives an image of a cart with a load cell location.

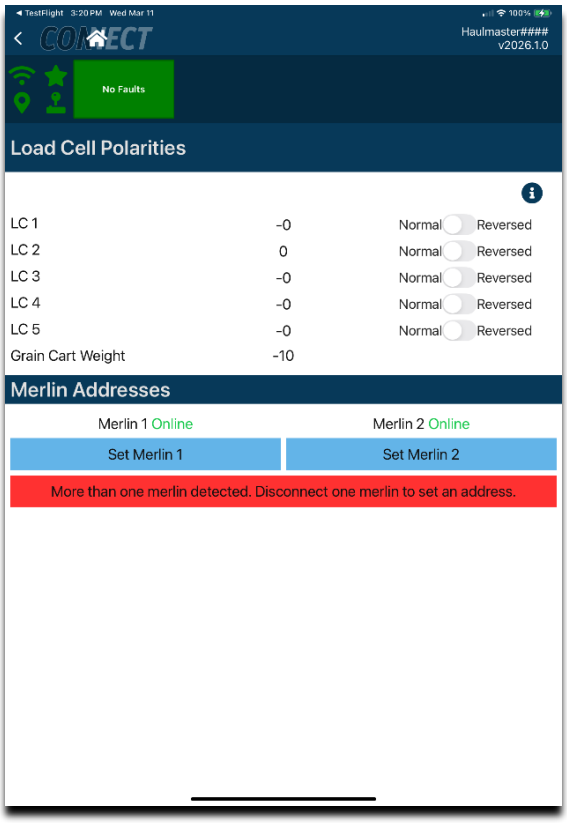


Figure 82 Load Cell Polarities

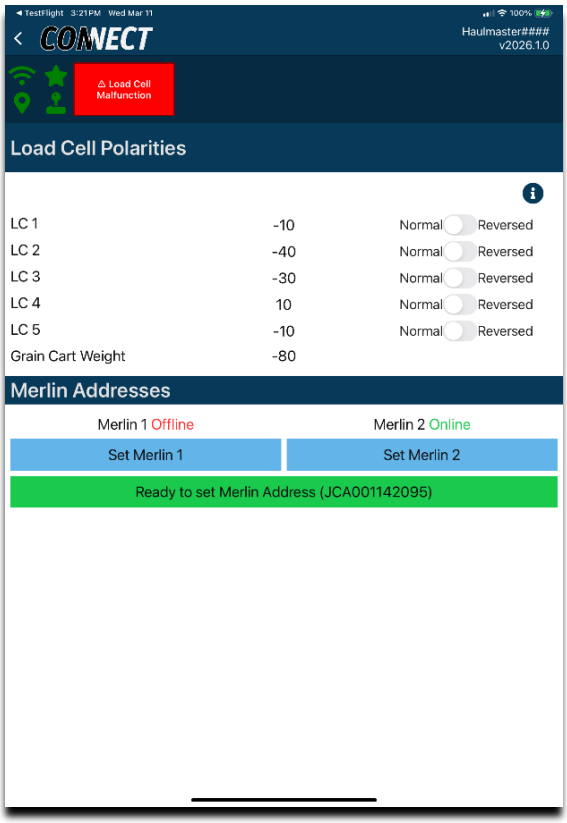


Figure 83 Merlin Addresses

3.6.8 WHEEL CALIBRATION (PRO ONLY)

The cart needs **pulses per revolution** and the **wheel radius** to calculate its speed. The table below displays the values for the pulses and the radius for our standard wheels and tracks.

If a nonstandard wheel is used, the radius can be found from the tire specifications or by measuring the tire. If in inches, multiply by 2.54 to get centimetres.

1. From the drop-down menu, press **Calibration> Wheel Calibration.**

2. Find the **pulses per revolution** and the radius of the wheel.

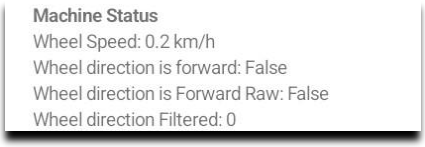
3. Under Wheel Speed Pulses Per Revolution, **enter** the **number of pulses**.

4. Under Wheel Radius, enter the **radius** in centimetres **(cm)**.

5. Follow the operator **safety procedures** for the tractor.

6. Drive the **tractor forward**. Verify that the wheel speed displayed in the app aligns closely with the speed shown on the tractor.

7. The wheel speed can be seen in **Menu>Diagnostics>Parameter Readings**.



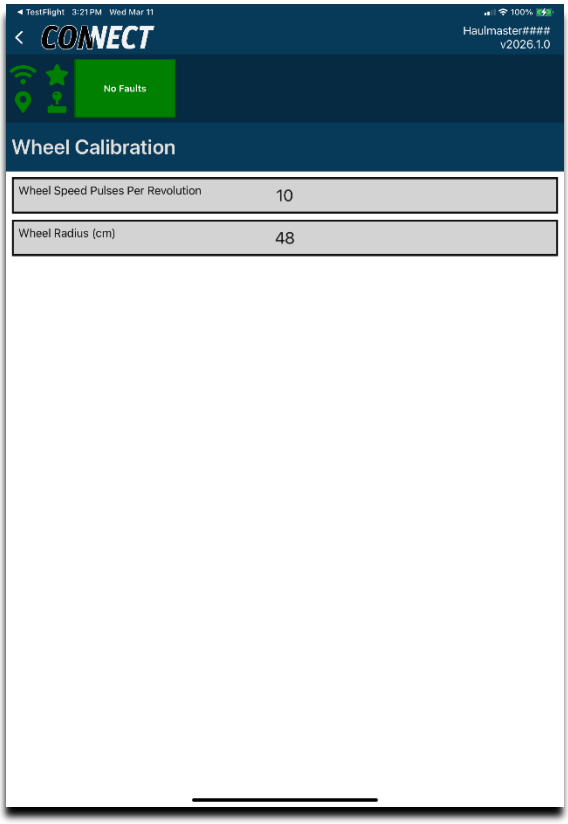


Figure 84 Wheel Calibration Settings

Table 1 Wheel Calibration Values

Cart Type	Large Tracks	Transfer Tracks	Row Crop	Inline Tandem/ LARGE ILT	1250	TERRAWAVE
Wheel Speed Pulses Per Revolution	10	10	10	60	12	4
Wheel Radius (cm)	54	64	92	81	99	16

3.6.9 PTO CALIBRATION (PRO ONLY)

When the RPM exceeds 300, the auger is prevented from folding or unfolding to avoid damage. The PTO RPM is calculated using the pulses per revolution from the speed sensor.

Note: Without the sensor working, the PTO can still be operated successfully.

This sensor is located on the Haulmaster gearbox, near the PTO shaft connection.

1. From the drop-down menu, press **Calibration>PTO Calibration.**

2. **Set the PTO** Shaft Pulses Per Revolution to the number of times the sensor activates during one rotation of the Haulmaster gearbox shaft. The default value is 3, and under normal operating conditions, it should not have to be changed.

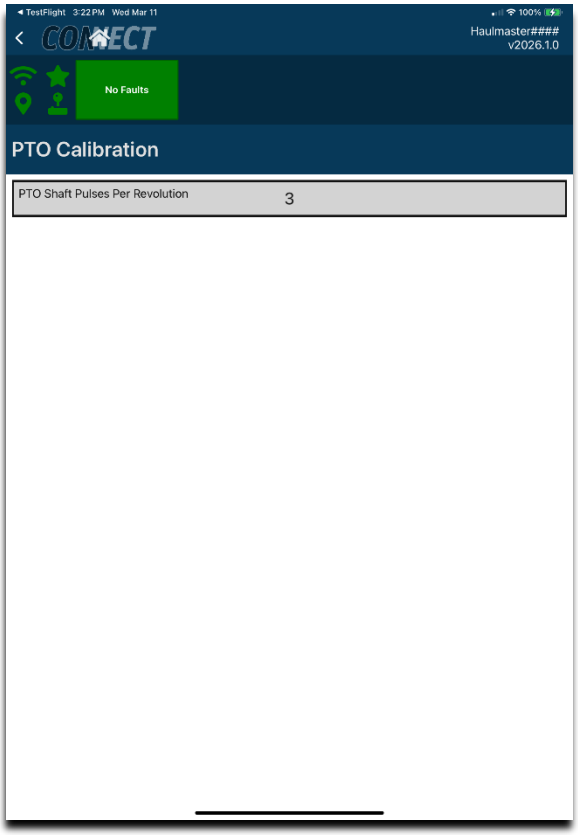


Figure 85 PTO Calibration

3.7 CONTROLLER

The controller menu contains settings for the controller's basic operation, programming, and functionality.

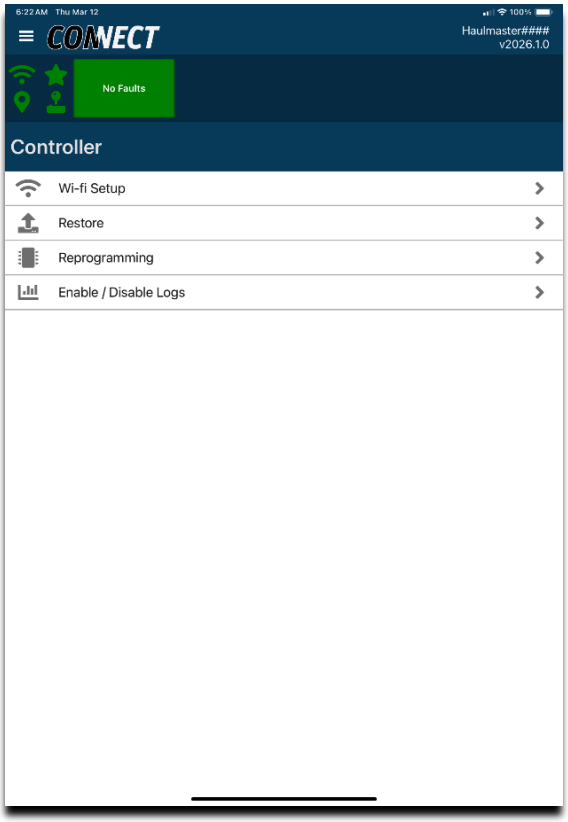


Figure 86 Controller Settings

3.7.1 WI-FI SETUP

This section provides instructions for setting the controller's password and Wi-Fi name.

WARNING:

Changing the SSID name without knowing your current password will leave you unable to access your system without a technician's visit. The default password is "**haulmaster123**". If you do not know your password but are connected to the system, it is recommended that you change your password first.

The **Wi-Fi name** is displayed in the top right-hand corner of the screen. Figure 87 shows the Wi-Fi name Haulmaster#### in the top right corner.

From the drop-down menu, press **Controller>Wi-Fi Setup.** This will take you to the screen in Figure 88.

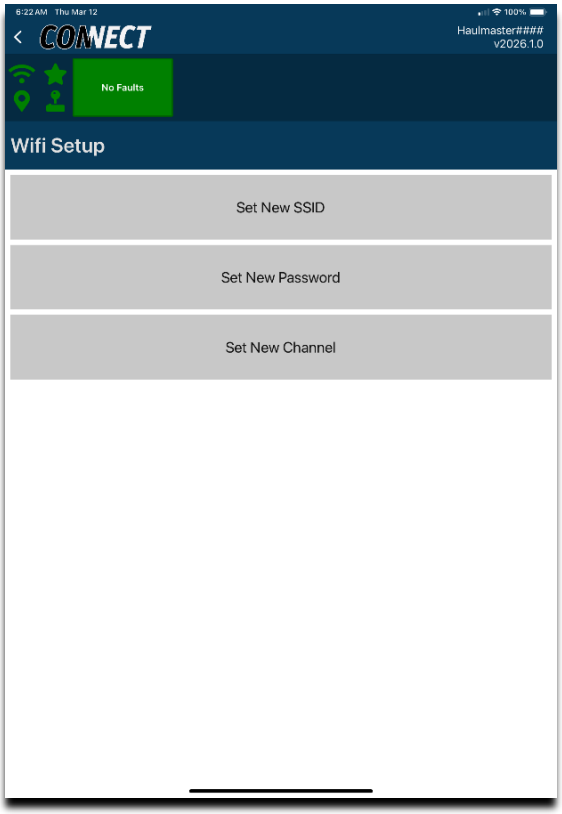


Figure 87 Wi-Fi Setup

CHANGING THE SSID

1. Press **Set New SSID**.

2. Enter a new network name, touch **Set.** A caption will inform you that you are about to change the SSID. Hit **Set**.

3. The iPad will no longer be connected to the Wi-Fi of the controller. The iPad will have to be reconnected to the Wi-Fi under the **new name** you entered. Refer **to 2.4 CONNECTED iPad TO CART WI-FI.**

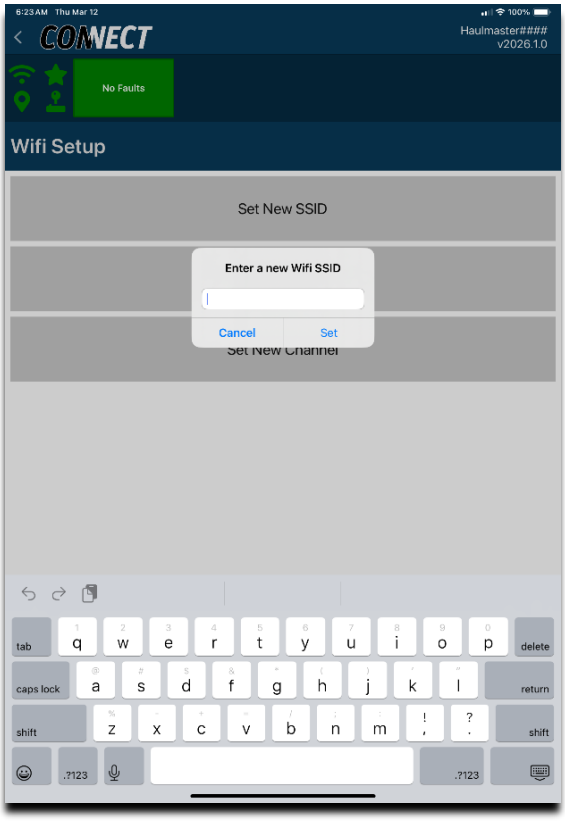


Figure 88 Enter SSID

CHANGING PASSWORD

1. Press **Set New Password**.

2. Enter the new Wi-Fi password and press **Set.** See Figure 89.

3. A prompt will appear to confirm the new password. Re-enter the password and hit **Confirm.**

4. A prompt will appear saying password set. Press **Set.**

5. The iPad will no longer be connected to the Wi-Fi of the controller. You will need to **reconnect** the iPad to the Wi-Fi with the **new password**.

6. To do this, **swipe down** the top right corner of the screen.

7. **Press** the **Wi-Fi symbol** until the Wi-Fi screen appears.

8. Press **Wi-Fi Settings** at the bottom of the pop-up.

Figure 90 Wi-Fi Settings

9. **Press** the name of your Wi-Fi connection, Haulmaster####.

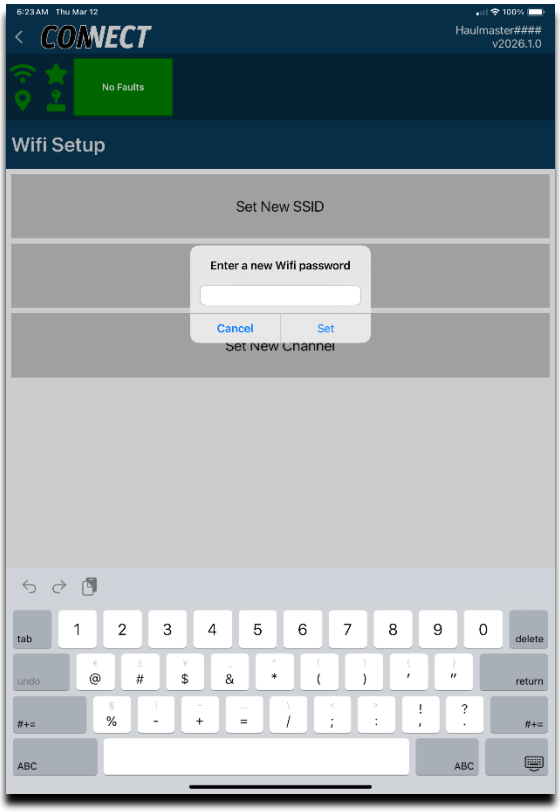


Figure 89 New Wi-Fi Password

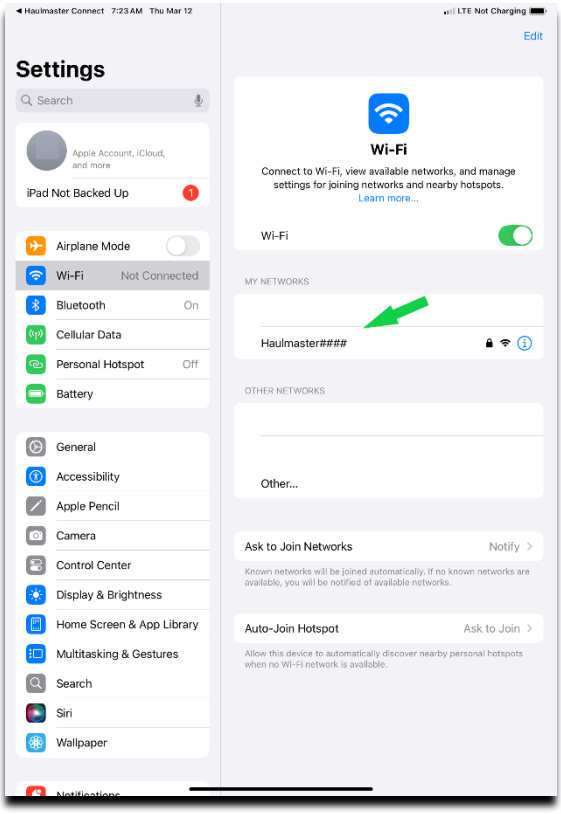
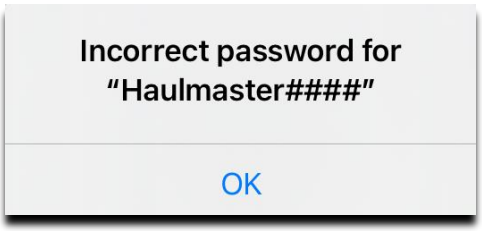


Figure 91 Select Controller Wi-Fi

10. After a few moments, a pop-up will appear saying **“Incorrect Password.”** Press **OK.**



11. Enter the **new password.**

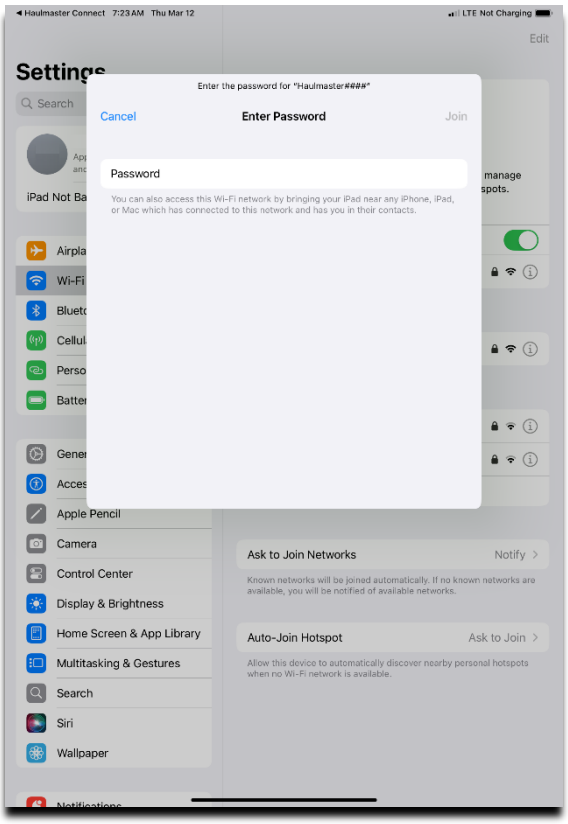


Figure 92 Enter Password

SET NEW CHANNEL

If nearby Wi-Fi connections cause interference, changing the Wi-Fi channel may help. A network analyzer app can be useful for identifying which channels are already in use.

1. From the **Wi-Fi Setup** screen, press **Set New Channel**.

2. Enter a new network channel between 1 and 11 and touch **Set,** and a caption informing you that the channel will be changed from the old channel to your new channel appears.

3. **Wait** a minute or so for the iPad to automatically connect to the new channel.

4. If it **doesn’t connect,** turn your Wi-Fi **off** and then back **on** to reconnect.

Our website includes a download link for an Android Wi-Fi **Analyzer**. https://elmersmfg.com/firmware/

It can help you choose an unused channel.

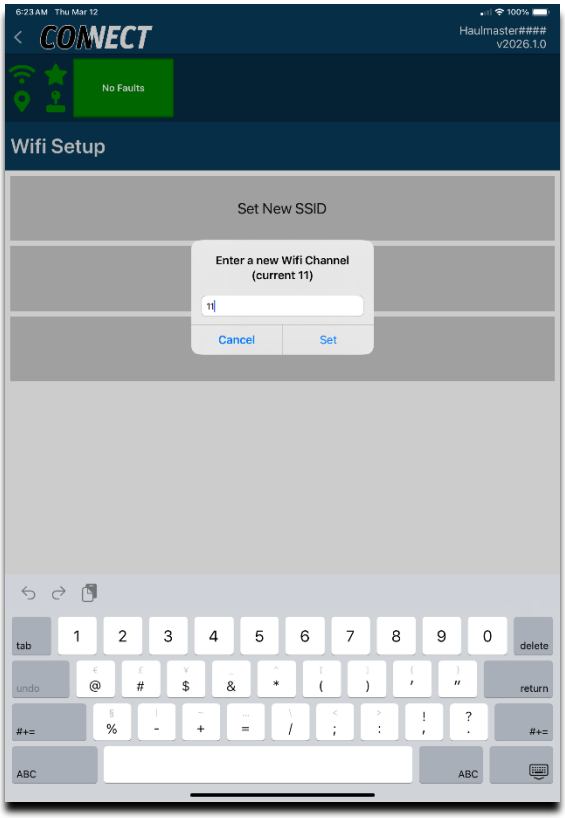


Figure 93 Enter Wi-Fi Channel

3.7.2 RESTORE

The restore menu allows the user to **initialize** the controller after an update, **save restore** data, **restore** from that restore data, and **reset the file system**.

From the drop-down menu, press **Controller>Restore.**

INITIALIZE CONTROLLER

Once the update is complete and the system has restarted, the app will prompt you to initialize the controller. You will then be directed to the screen in Figure 94 to complete the initialization. Press **Initialize Controller.**

SAVE RESTORE DATA

Pressing this button will save the data later used to restore the controller to the point you saved it. Pressing this button will **create a restore point**.

RESTORE CONTROLLER

This feature restores the controller to the chosen restore point.

1. First, select the restore data from a point you want to restore, or leave it on the **Latest Restore Data.**

2. Press **Restore Controller.**

3. Wait for the restore process to be completed. A green pop-up will appear at the bottom of the screen, stating, “Restore Files Pushed!” when the process is complete.

4. The iPad will disconnect and then reconnect to the controller. If the **Wi-Fi doesn’t automatically** connect, reconnect the iPad Wi-Fi to the controller manually. **See section 2.4 CONNECTING iPad TO CART WI-FI.**

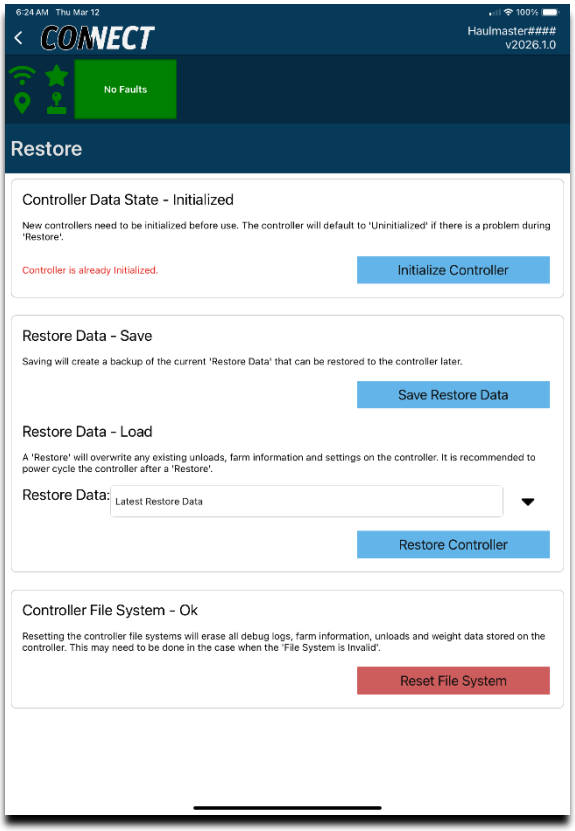


Figure 94 Restore Screen

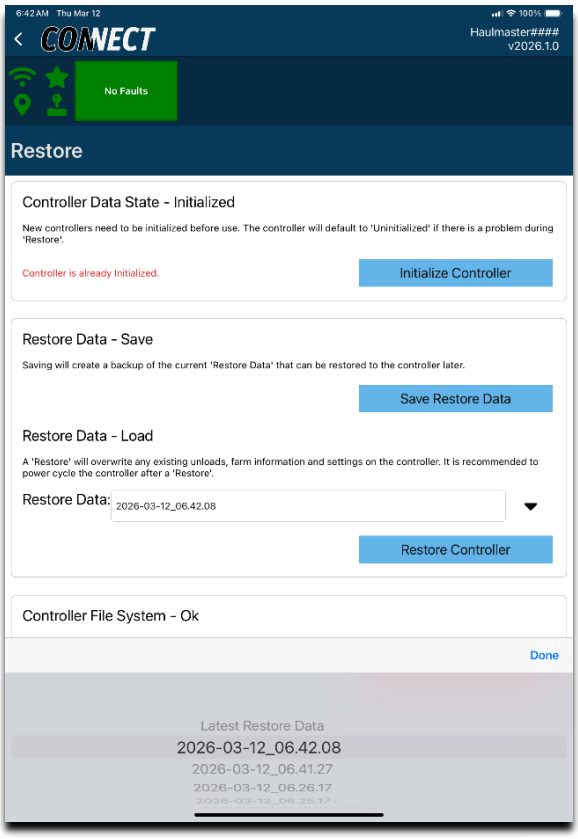


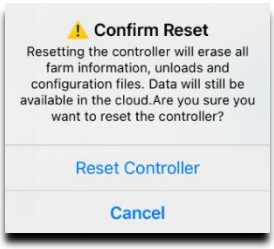
Figure 95 Select Restore Point

3.7.3 RESET FILE SYSTEM

Resetting the file system will erase all logs, farm information, unloads, and weight data stored on the controller. This is done in certain cases where the data needs to be removed from the controller, for example, removing data before transferring ownership. Cart calibrations will remain unchanged.

1. From **Menu>Controller>Restore** screen, press the **Reset File** button.

2. A confirm reset pop-up will appear. Press the **Reset Controller** to continue. The controller will reset itself.



3. The controller will say **Resetting File Data**. Press **Ok**.
4. If you want to make sure all data is gone:
    a. Power off the controller and close the app.
    b. Uninstall the app **without** keeping the data.
    c. Reinstall the app and reopen it.
    d. Apply power to the controller.
    e. Connect the iPad to the controller via Wi-Fi.
5. Once completed, a **Controller uninitialized** warning and pop-up will appear. Press **Ok** on the pop-up.
6. If not in master **mode,** press the star in the top left, then press "**Request Master Connection**."
7. Press the **Controller Uninitialized** button, then press **Take me there**, and it will take you to the **Restore** screen, Figure 96.

8. Enter the **Cart Serial Number** when asked and press **Set.**
9. Press **Initialize Controller** for the system to start initializing.
10. **Initialize Success!** will show up at the bottom when complete.

The previously selected clients, farms, fields, trucks, and bins may still be displayed. Once you select and change them, they will disappear from the controller.

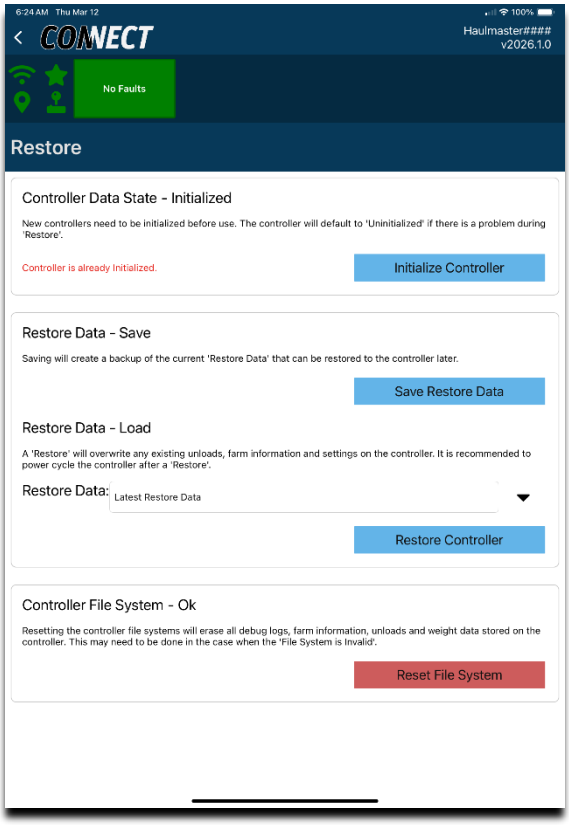


Figure 96 Restore Screen

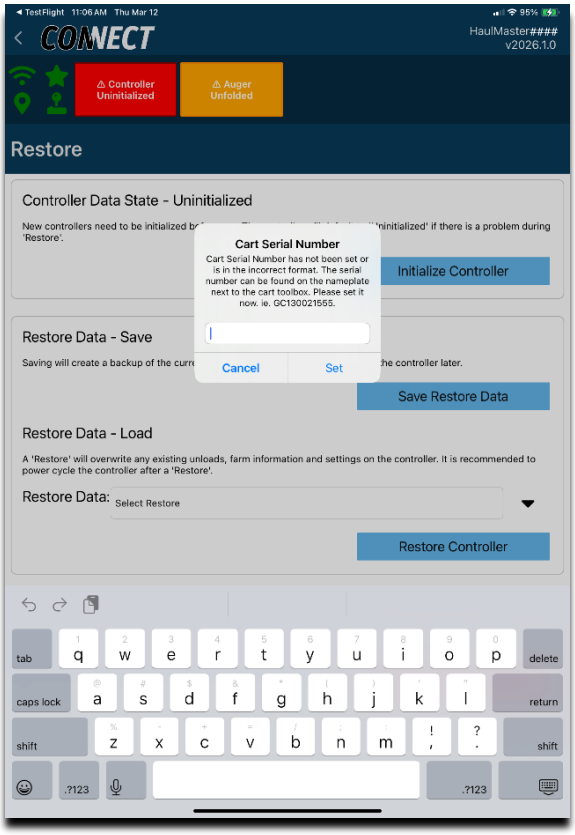


Figure 97 Serial Number

3.7.4 REPROGRAMMING

When an app update is available, the controller often must be reprogrammed. The app will notify you when the controller requires reprogramming.
The Thrasher GPS unit may also need reprogramming when an external display is installed.

1. Pressing the red Controller Uninitialized warning or the drop-down menu **Controller>Reprogramming** will take you to the Reprogramming screen.

2. Press the top grey box to access **Select Controller**.
If you updated the app and received a pop-up to reprogram the controller, select **Falcon**.

Note: There is an option to select and reprogram the **Thrasher.** If you recently installed an **external display** and it is not working, the Thrasher may need to be reprogrammed here.

3. Press the grey box to access the **Select Version** of the software for the controller. Select the version of software you are installing.

4. Press the **Start Reprogram** button to start reprogramming.

5. A loading animation will appear showing Reprogram, Reboot, Reformat, Transfer, and Finalize during the process.

6. When completed, a **Reprogramming Success** box will appear, instructing you to restart the Controller. Press **Ok**.

7. It is **recommended** to **power off** the controller for several seconds and then **turn the power on** again.

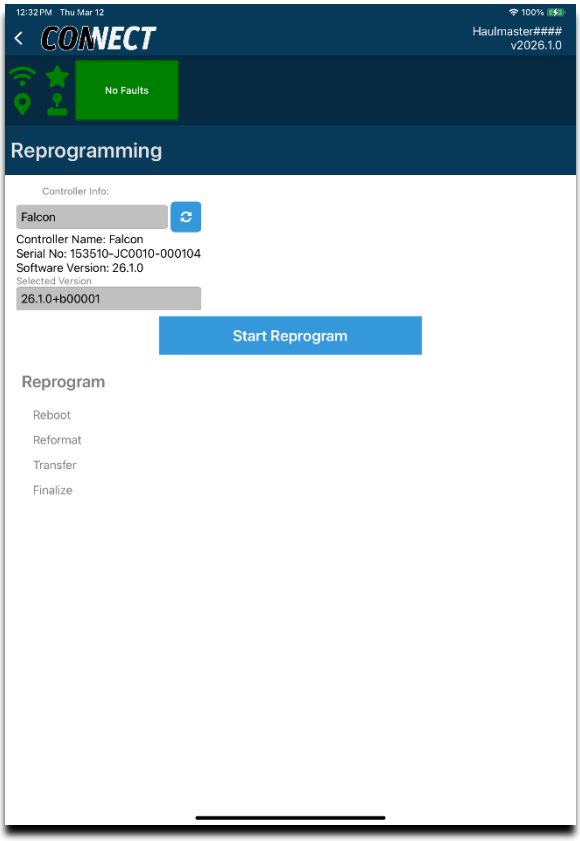


Figure 98 Reprogramming Screen

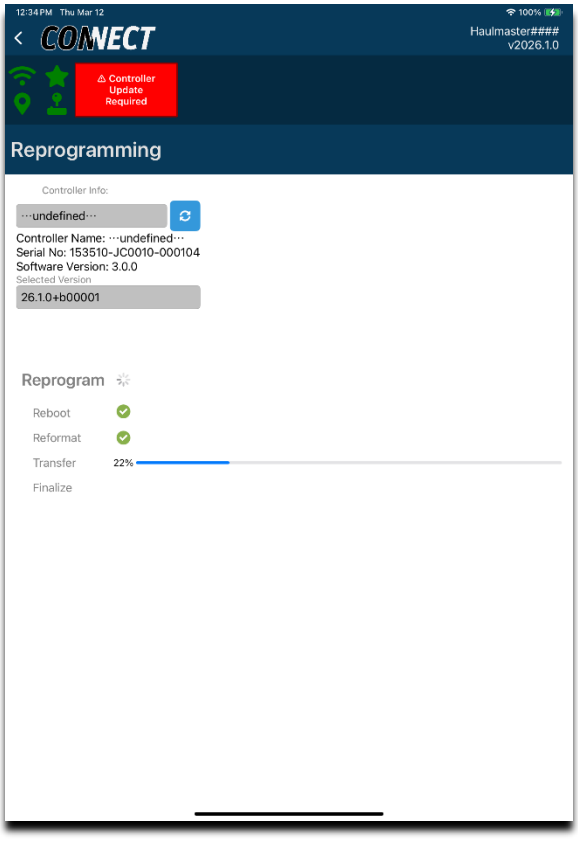


Figure 99 Reprogram Controller

3.7.5 ENABLE / DISABLE LOGS

During troubleshooting or if data logs are not needed, enabling or disabling certain logs may be helpful. Leaving logs **disabled is recommended** unless product support requires them.

1. From the drop-down menu, press **Controller > Enable >Disable Logs.**

2. You can **enable** or **disable** Generic, Weight, Drive, Auger, and Load Logs from this screen.

Note: The data logs will only start collecting information when these logs are enabled.

3. **Remove Old Controller Logs** can be pressed to clear up memory and allow only newer logs in the memory.

4. When the **logs are on**, a notification message will be displayed at the top of the screen.

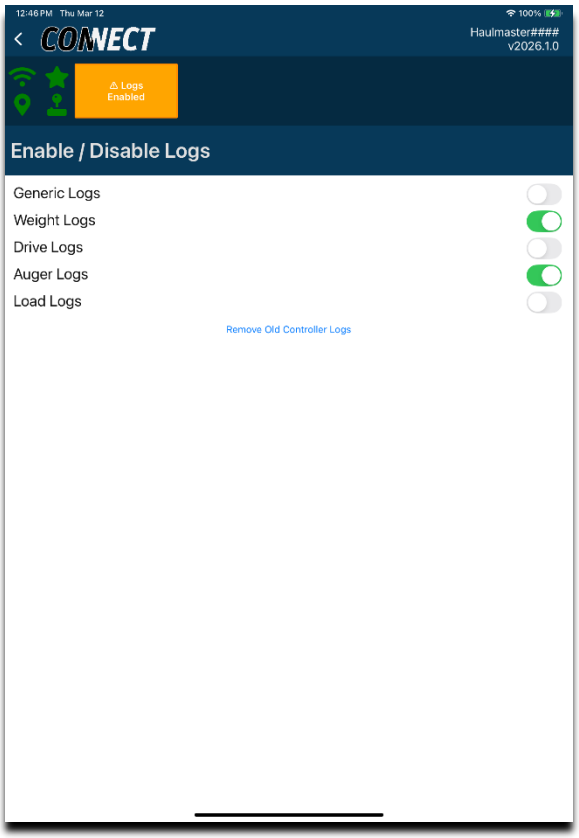


Figure 100 Enable / Disable Logs

Generic logs - GPS Latitude, GPS Longitude, Accelerometer Y-Axis, Wheel Speed, PTO Speed, Auger Fold Position, Auger Gate Position, Auger Pivot Percentage, Auger Spout Z Position, all 5 Load Cell Readings.
Weight logs - Total cart weight.
Drive logs - Wheel Speed, Odometer Reading, GPS Speed Over Ground, GPS Latitude, GPS Longitude, and all 5 Load Cell readings.
Auger logs – Auger Gate Position, PTO Speed, Total cart weight, Unload State, Smart Filter Confidence, Smart Filter Weight, and Weight Calibration Factor.
Load logs - Last Unload Weight, Unload Start Weight, Unload End Weight, GPS Has Fix, GPS Latitude, GPS Longitude, Weight Calibration Factor, Field Name, and Crop Name.

3.8 GENERAL

There are several settings that the cart needs to operate and display the information you want.

1. From the drop-down menu, press **General.**

2. **Selected Unit Type** will select whether to display in Volume or Weight.

3. **Truck Unit Type Override** will override the selected Unit Type for the **Truck** display.

4. **Bin Unit Type Override** will override the selected unit Type for the **Bin** display.

5. **Weight Unit** will allow you to select the weight unit types: kilograms, pounds, or tonnes. If your unit type is volume, this will still affect weight-specific settings such as minimum unload size and truck alarms.

6. **Volume Unit** will allow you to select the volume unit types, bu or m^3. If your unit type is weight, this will still affect volume-specific settings such as bin capacity.

7. **Density Unit** can be lb/bu, kg/bu, lb/m^3, or kg/m^3, which is used for your crop density.

8. **Area Unit** set to **acres** or **hectares**. Used to enter field size and calculate field yield.

9. **Temperature Units** can be Celsius or Fahrenheit; this is used for crop temperature.

10. **Speed Unit** sets the speed units to km/h or mph.

11. **Step Resolution** can be selected to allow the user to choose the accuracy of the units displayed. Resolutions of 1, 10, 20, 50, and 100 can be chosen for kilograms and pounds. Tonnes and m^3 will use 1 = 0.001, 10 = 0.01, 20 = 0.02, 50 = 0.05, and 100 = 0.1 resolution. Bushels are locked to a resolution of 1.

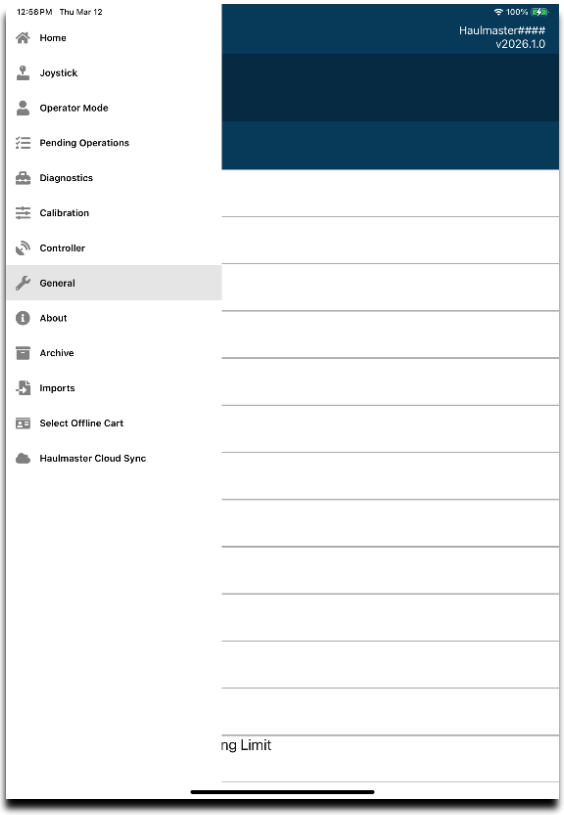


Figure 101 General in Menu

Figure 102 General Settings

12. **Weight Filter Strength** will change how heavily the app's live weight and External Digital Display weight are filtered on the display. **None** will show you the exact reading, but it will be prone to large fluctuations when driving through the field. **Leaden** will heavily filter the weight, give a nice, consistent weight while moving through the field, but will have large delays when weight changes.

13. **Display Type** will only affect customers with an external digital display.

14. The **Set Remaining Bin Volume Warning Limit** can be set to control when the bin full warning limit comes on.

15. **Unload Weight Alarms.** Turn off the truck weight alarms from ringing when target weights are reached.

16. **Fold Fail Alarm.** Turning off silences the Fold Fail Alarm whenever the auger auto fold or unfold fails to complete its cycle after being initiated.

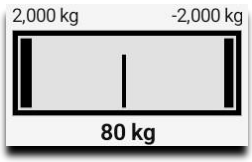
17. **Auger Unfolded Alarm**. Turn off to silence the alarm and beep for the auger unfolded safety alarm. This alarm is activated when the cart is over 12km/h or 7mph, and the auger is unfolded.

18. **SteerLock Controls.** Turn on to display the SteerLock Tandem Steering Controls on the home screen. See **3.6.6 STEERLOCK** for more details.

19. **Group Unloads by Truckload** in the unload list. Turn on to sort the unloads into amounts by each truck.

20. **Truck Selection Clears Previous Truck**. Turn on to allow the truck to clear when a new truck is selected.

21. **Show Cart balance Indicator**. Turn on to display a cart balance indicator on the home screen. The balance indicator shows the hitch weight relative to the hitch weight when empty. An empty level cart should be close to 0. **See section 6.2.**



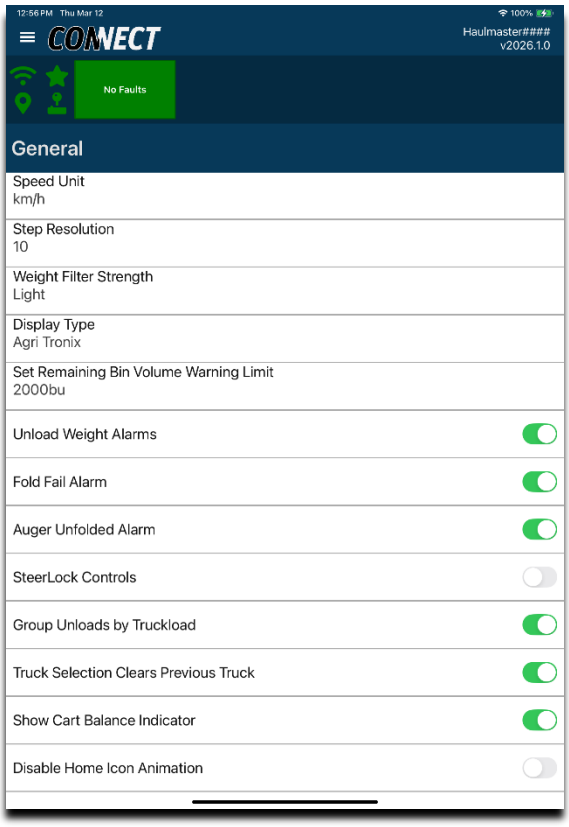


Figure 103 More General Settings

22. **Disable Home Icon Animation** allows you to turn off the home animation on the CONNECT symbol at the top of the screen.

3.9 ABOUT

3.9.1 UPDATE AND MANUAL

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

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

From the drop-down menu, press **About>Update & Manual.**

This page contains links to the App Store Connect App and a link to this manual.

3.9.2 ATTRIBUTION

From the drop-down menu, press **About>Attributions.**

Acknowledges the sources or contributors of various components of the Connect App.

3.9.3 TERMS & CONDITIONS

Shows the terms and conditions of Elmer's, along with an indicator for the acceptance of the conditions.

3.9.4 QUICK START GUIDE

Quick Start guide for app usage.

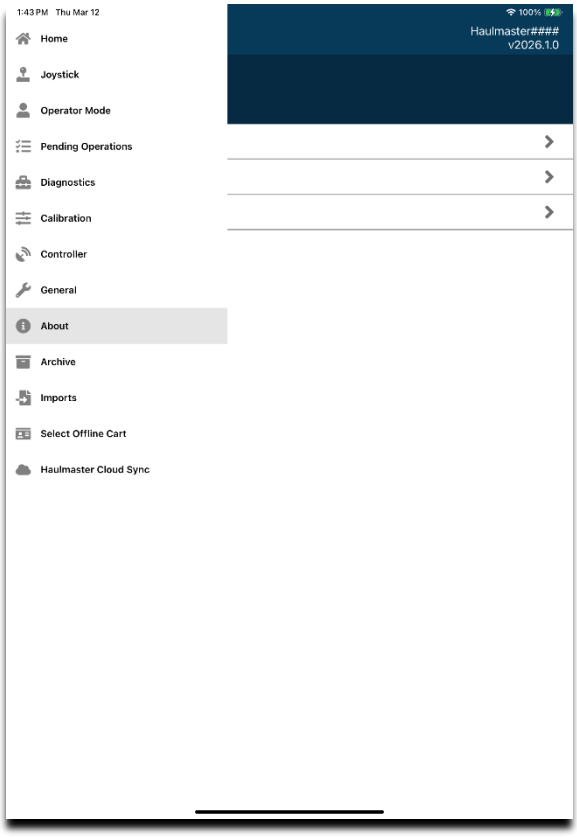


Figure 104 About in Menu

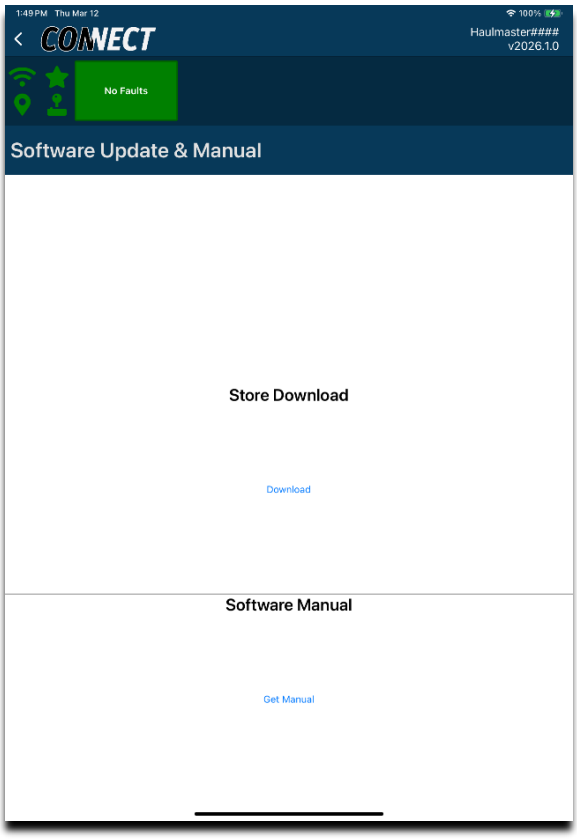


Figure 105 Software Update & Manual

3.10 ARCHIVE

The archive feature lets you clear all unload information from the controller and save it to the iPad. This can be handy when you want your controller to be clear for the next season. It is recommended to archive your information before each harvest season.

1. From the drop-down menu, press **Archive.**

2. Touch Archive in the top right corner to archive the iPad data.

WARNING:
Archiving will remove all Unload data from the controller. Your iPad will now be responsible for all archived files. It is recommended that you sync with the cloud after archiving to back it up to the cloud. You can also email your unload data as a backup.

3. The **prompt Archive Data will appear,** explaining that the unloads, transactions, and accumulated weights will be archived and reset for the current active period.

4. Archiving will keep all your crops, fields, trucks, and bins, but reset all their weights and unloads. Archived data will be visible in the archive section or the cloud if the iPad is synced.

5. Touch **Cancel** or **Archive Data** as appropriate.

6. A pop-up will appear. Enter a name for the archive or leave the designated name with the date and time. Press **Save.**

7. A pop-up will appear when the archive has been created. Press **OK**.

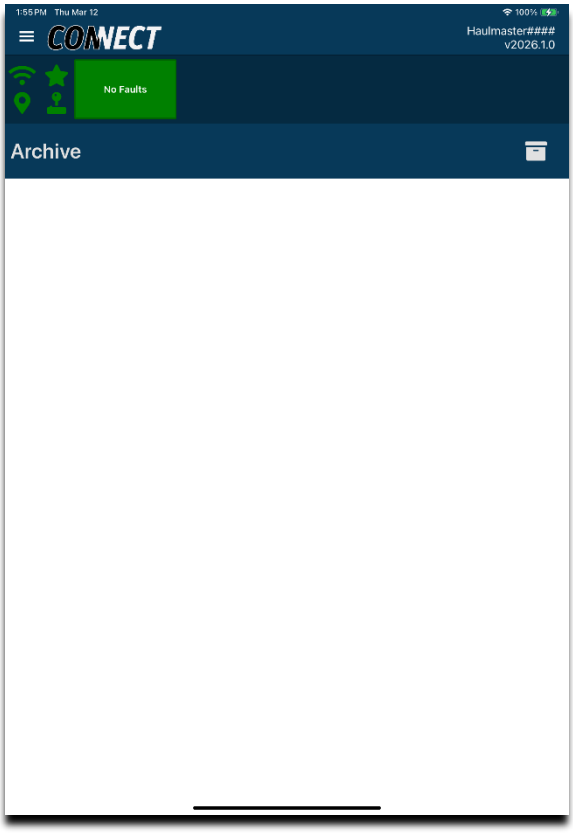


Figure 106 Archive Screen

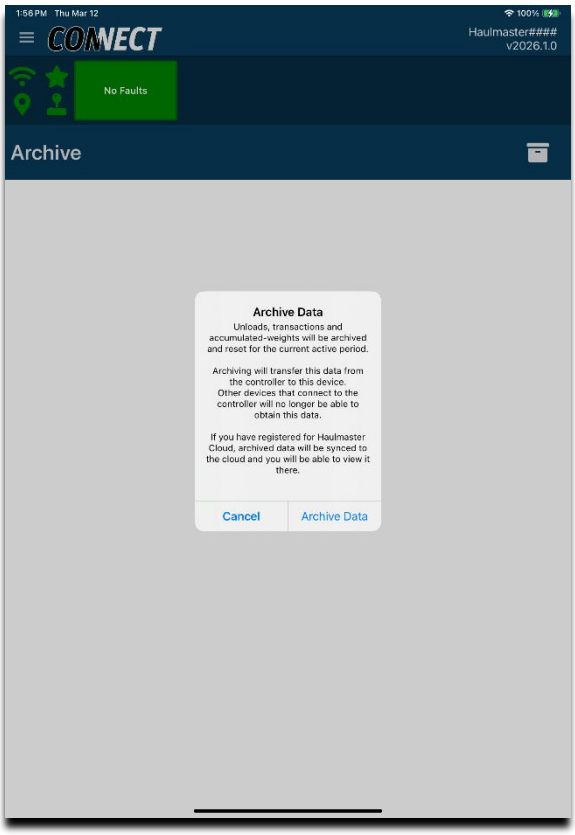


Figure 107 Archive Data Pop-Up

8. Once an archive is **created,** you can select it from the **Archive** screen for review and editing.

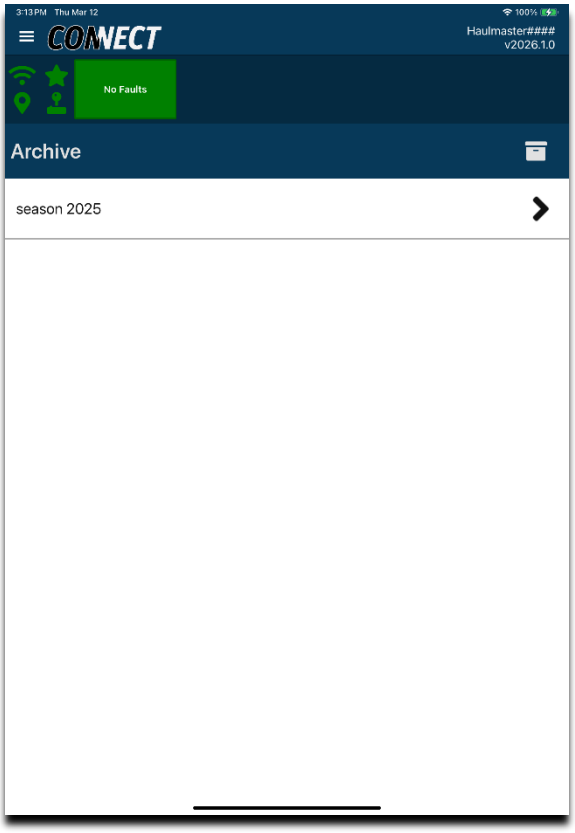


Figure 108 Archive Screen

9. Press **Weights** to access the unloads archive.

10. The **archive** total weights can be sorted by **Fields, Trucks, and Bins.**

11. Press the **Filter button** in the top right corner to filter the **list by Client or Farm**.

12**. Press** the drop-down arrow to **sort** by client, farm, field, truck, or bin.

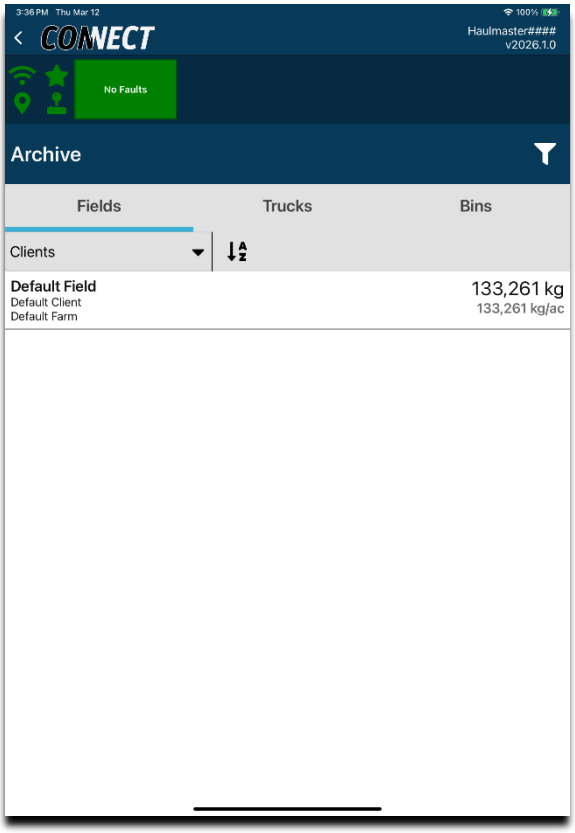


Figure 109 Archive Total Weights

13. From that **archive's** screen, press **Unloads**. Here you will find the unloads displayed as they are in the main home unload screen. See section **4.8 UNLOAD LIST.**

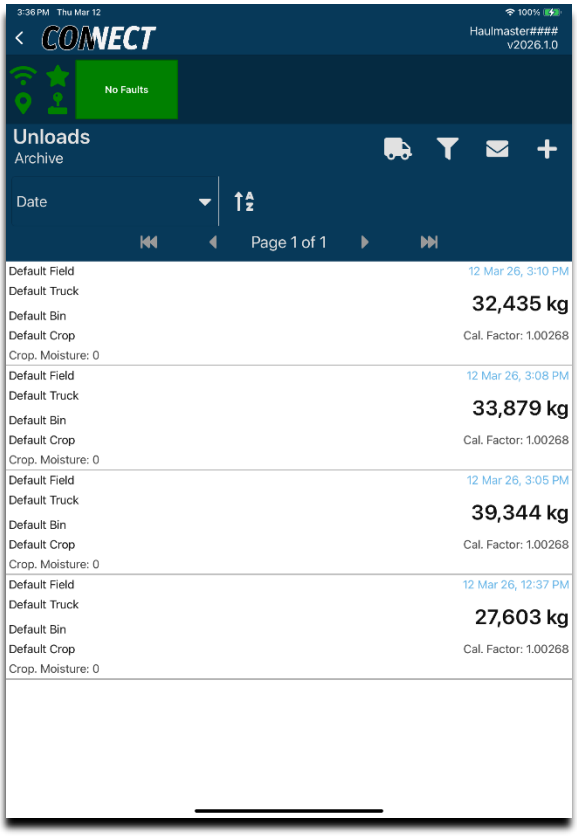


Figure 110 Archive Unloads

14. From that archive's screen, press **Transfers.** Here you will find the unloads displayed as they are in the main home screen, the Bin Transfers screen. See section **4.4 BINS.**

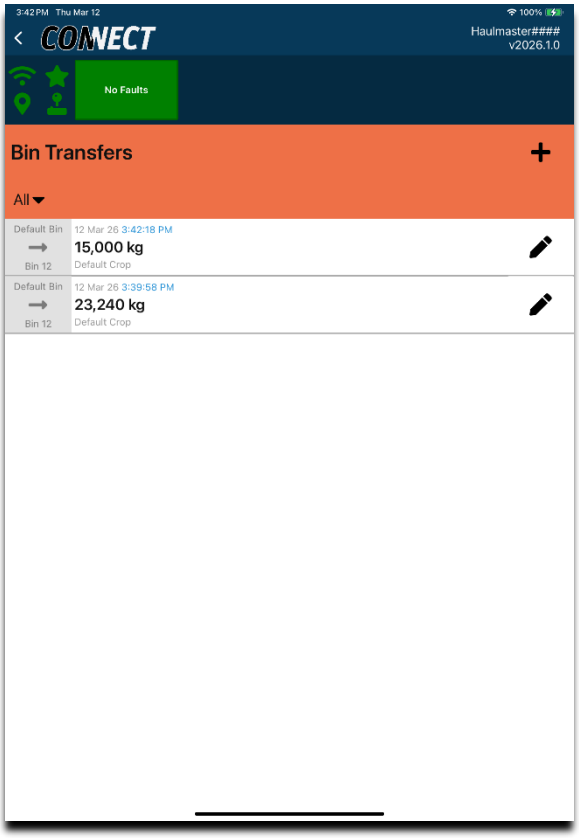


Figure 111 Archive Bin Transfers

3.11 IMPORTS

3.11.1 IMPORT FARM INFORMATION FROM CSV FILE

In this segment, we'll be going over how to import clients, farms, and fields from a CSV spreadsheet. 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
Haulmaster	Perch Farms	NE Field	150

3. The same can be accomplished in Notepad 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
Haulmaster,Perch Farms,NE Field,150

4. **Save** the file as **CSV**.

5. If you are using a PC, you will need your email set up on your Connect iPad. You can then **email the CSV** file to your email account on the iPad. Save the email attachments from the iPad to **Downloads.**

6. Back at the Connect app and using the drop-down menu, go to **Imports>Import Data from CSV File.**

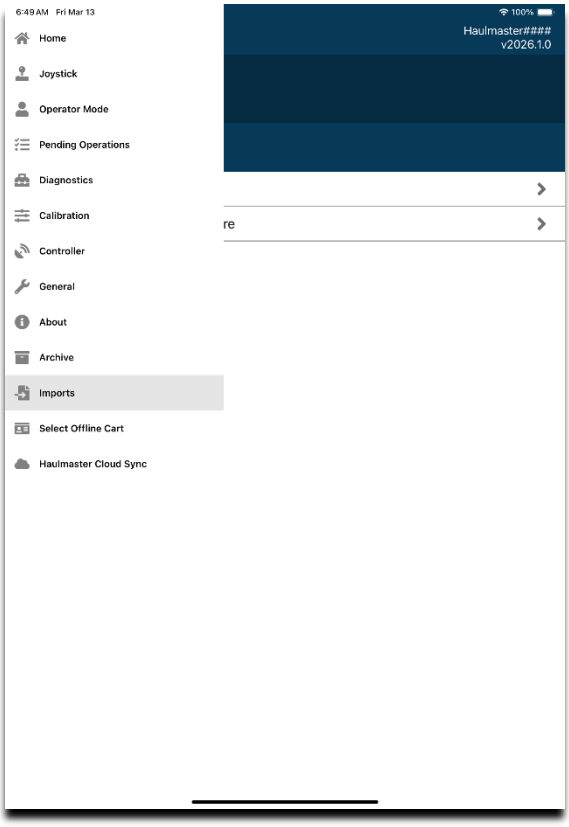


Figure 112 Select Imports

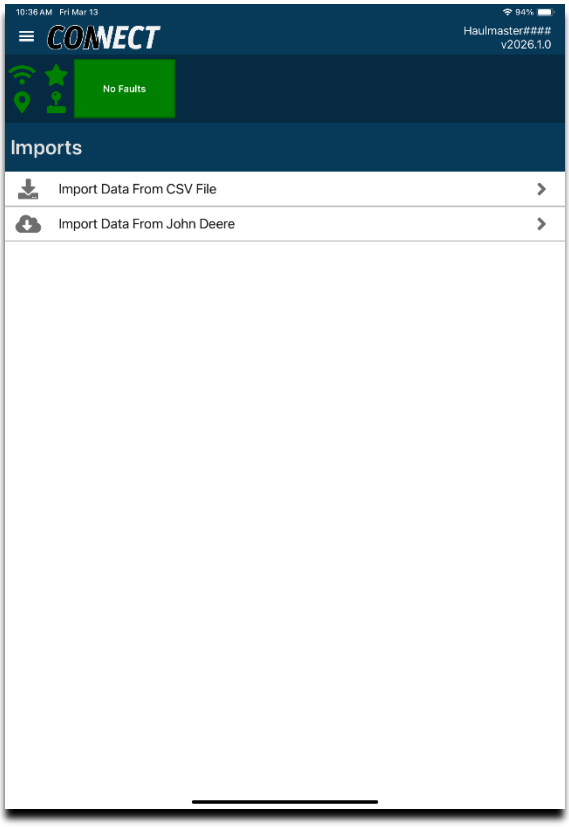


Figure 113 Changes Queued

7. **Select the upload** button in the top right corner of Import from CSV File.

8. **Press your CSV** file to select it.

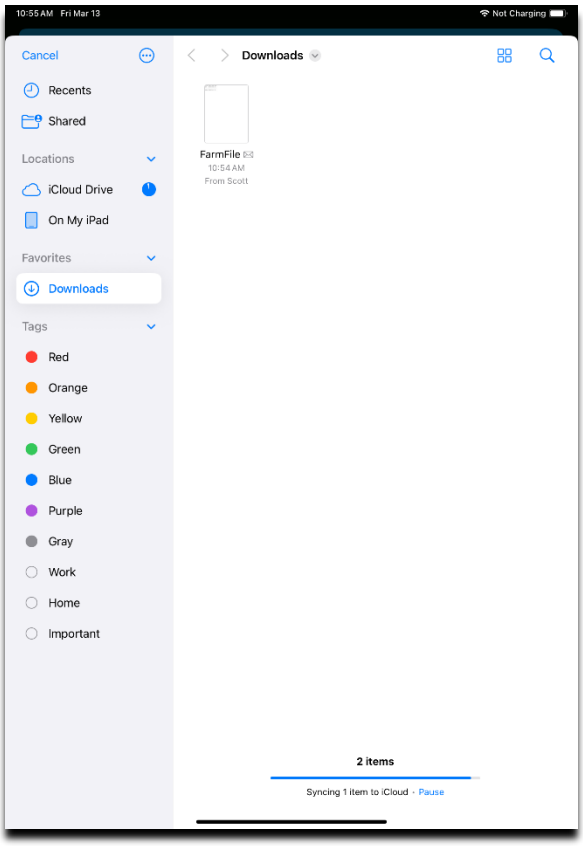


Figure 114 Select .csv File

9. **Deselect** any items you do **not want** to import.

10. Press **Save.** A prompt notifying you that the pending operations have been created will appear.

11. Select **OK**.

12. 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

Figure 115 Information to Import

3.11.2 IMPORT FARM INFORMATION FROM JOHN DEERE

Importing clients, farms, and fields from the John Deere Operation Center can speed up the process of creating all your farm information.

1. Before this process can be started, the iPad must have been **connected to the cart** at least **once** to collect certain information. The iPad must then be **connected** to the internet.

2. From the drop-down menu, go to **Imports>Import Data From John Deere.**

3. A pop-up will appear saying "**Changes will be queued**." Press **Ok** when available.

4. If connected to the internet, you will be brought to the **John Deere sign-in**. If you weren't connected to the internet, a pop-up will appear saying **No Internet Connection**.

5. Sign in to John Deere using your John Deere credentials. John Deere may redirect you to authorize Haulmaster Connect to access a specified organization within your John Deere account. **Follow prompts from John Deere** to allow access to the desired organization you want to sync the client, farm, and fields with. Return to the app when you've completed this step.

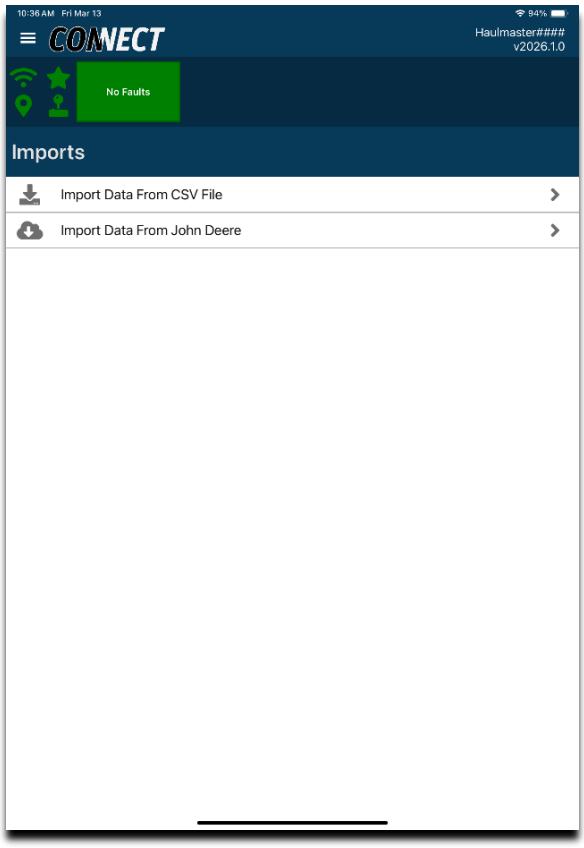


Figure 116 Imports

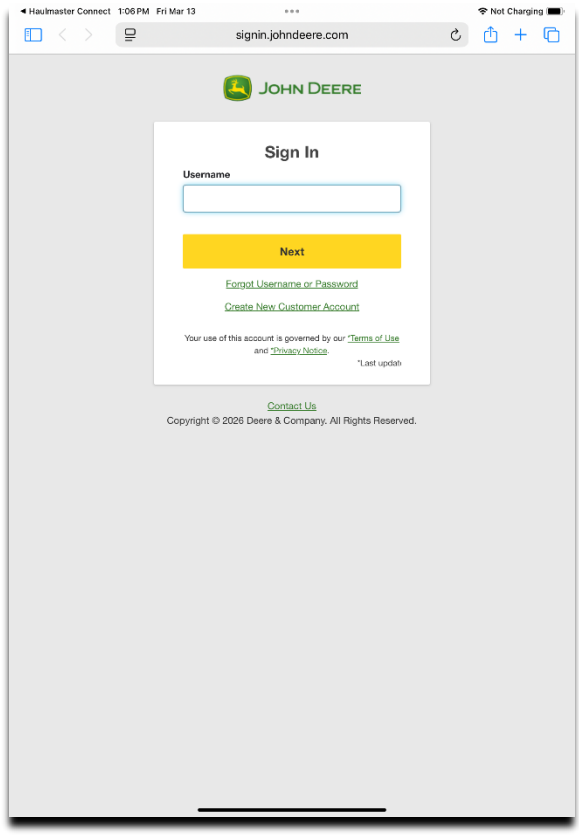


Figure 117 John Deere Sign In

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

7. Press **Retrieve Fields from John Deere**.

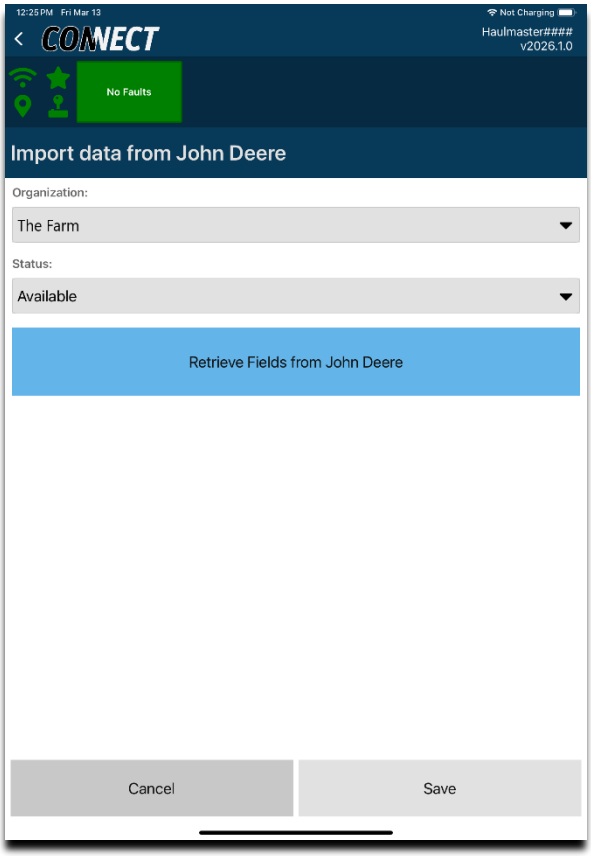


Figure 118 Import data Screen

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

9. **Deselect** any fields you **do not want** imported.

10. Press **Save**.

11. A success notification will appear. Press **OK.**

12. Connect to the Cart Wi-Fi.

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.

14. You can also perform this task through your online cloud account at **https://connect.elmersmfg.com/** and sync the iPad to the cloud to import your John Deere clients, farm, and fields.

Figure 119 Selected Data

3.12 SELECT OFFLINE CART

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

1. **Disconnect** the iPad from the Cart **controller Wi-Fi**.

2. From the drop-down **Menu >Select Offline Cart.**

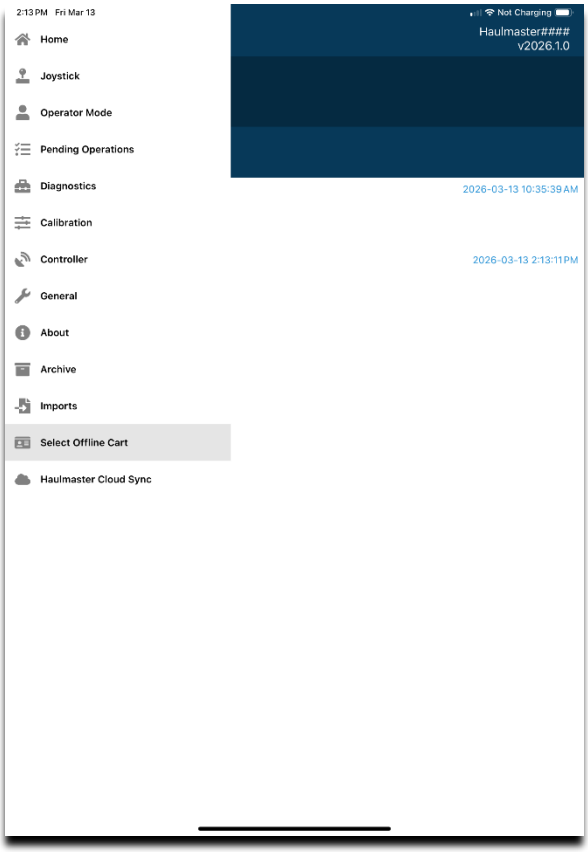


Figure 120 Select Offline Cart in Menu

3. You will see a **list** of previously connected carts, Figure 121.

4. **Folder ID:** This is the folder name where the specific cart data is stored.

5. **Cart S/N:** This will be your Grain Cart Serial Number.

6. **Controller:** This is your HM Connect Controller (Falcon) Serial Number.

7. **SSID:** This is the Wi-Fi Network Name of the cart that is displayed on the home screen. The date and time are the last time the device fully synced all the information with the cart

8. **Select** the desired cart.

9. **Return** to the home screen, and the cart's **SSID** should be **displayed** in the top right of the home screen.

10. You can now make **offline edits** or view closed seasons, unloads, crops, fields, trucks, and bins for this specific cart.

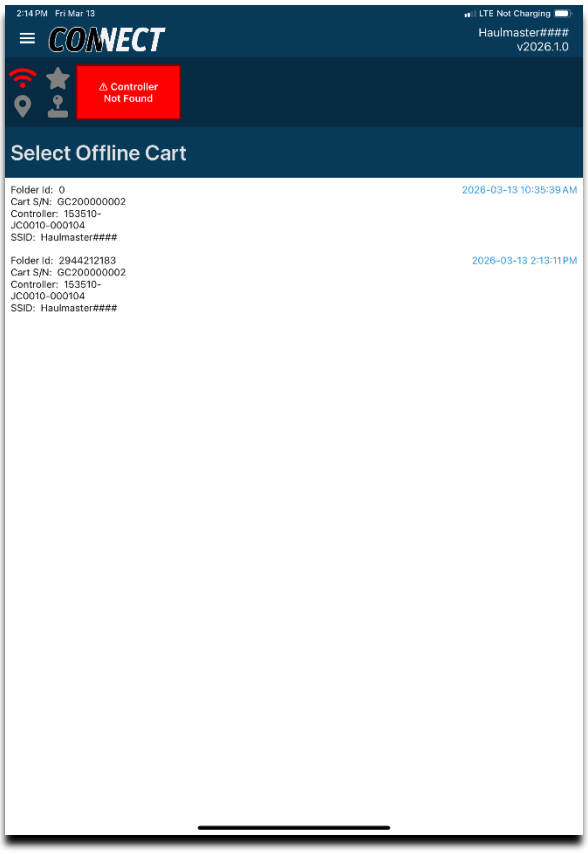


Figure 121 Choose Offline Carts

3.13 HAULMASTER CLOUD SYNC

With the **Connect Cloud** screen, you will be able to create a cloud account, sync your farm and field data, sync your cart parameters, and restore parameters.

To ensure your cloud account has the most up-to-date information, make sure the device you are using to sync was connected after the last unload or changes were made.

1. Connect the iPad to a **Wi-Fi** connection with an internet connection.

2. Go to **Menu>Haulmaster Cloud Sync.**

3. If you have created a **cloud account**, you can log in using your credentials. If you do not have an account, select **Register** to create an account. Enter a **name**, **email**, and **create** a **password** at least 6 characters long. You can also register for an account at connect.elmersmfg.com.

4. After you register for an account, you'll receive a verification email. Follow the instructions in it. If you don't see the email, check your junk folder.

5. Return to the **Login screen** in the app and enter your **credentials.**

6. Once logged in, you can **touch Cart Serial #** to select which cart you would like to sync to the cloud if you have connected to multiple carts.

7. Press **Sync** to sync all your farm objects, unloads, transfers, and archived data with the cloud for your selected cart. Any **new** data from the cart will be synced to the cloud, and edited cloud data will be synced back to the iPad and added to pending operations for the next time you connect to the specified cart.

8. If you want to sync just the new data, but all **new** and **old** data, press **Force Sync**.

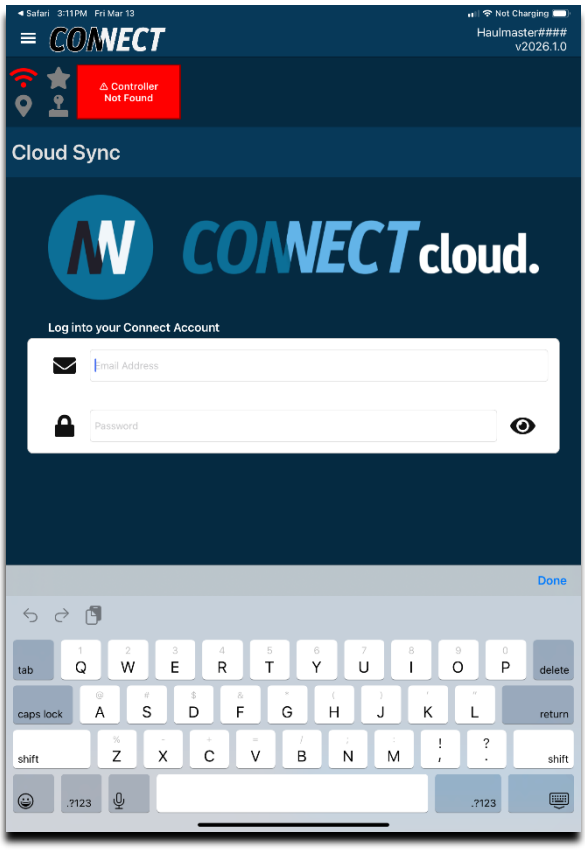


Figure 122 Connect Cloud Log In

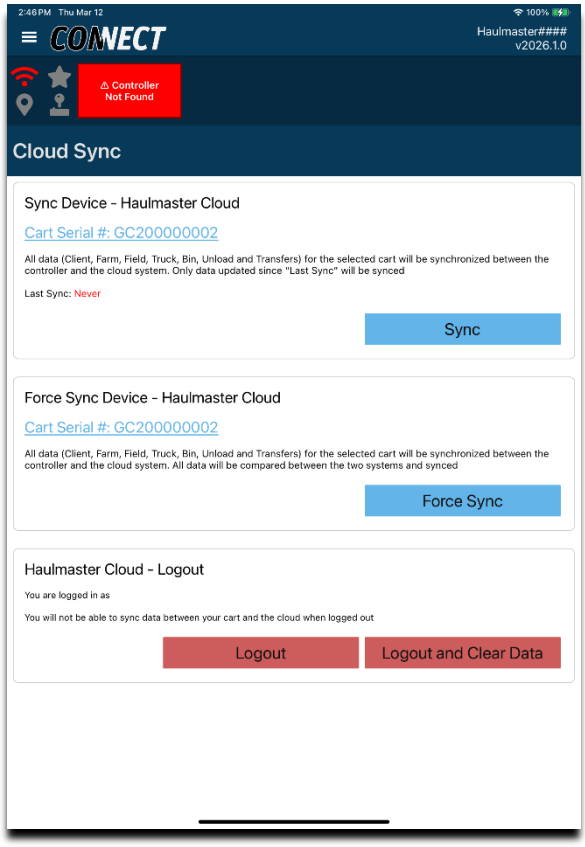


Figure 123 Sync Device

9. If needed, you can press **LOGOUT** to log the iPad out of your cloud account.

10. **Logout and Clear Data** will log out of the cloud and clear all the data from the controller. The next time the iPad connects to the controller, all the data will be reset.

WARNING: This button will clear **all** the data and unloads from the controller.

11. Using an internet-capable device, connect to the cloud and verify that all your unloads and data that you want saved appear on the cloud now.
The Connect Cloud, shown in Figure 125, can be found at: **connect.elmersmfg.com**

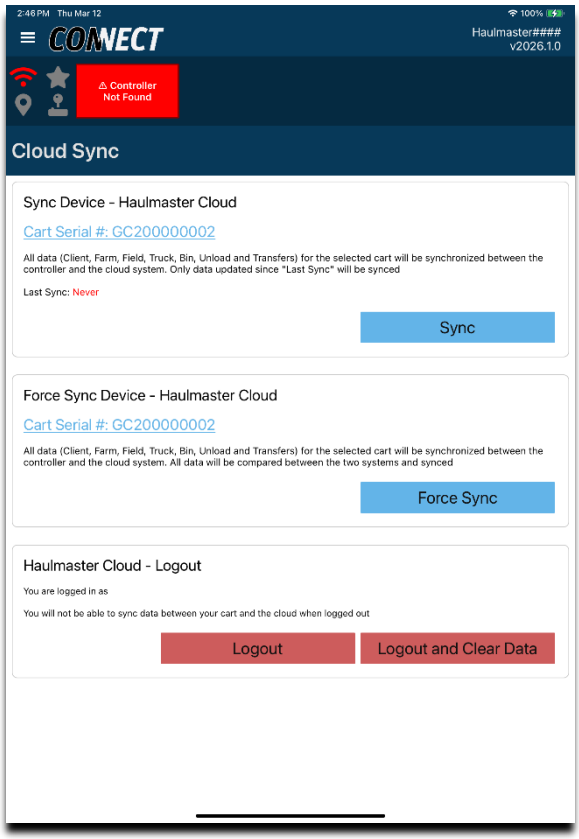


Figure 124 Cloud Sync and Clear Data

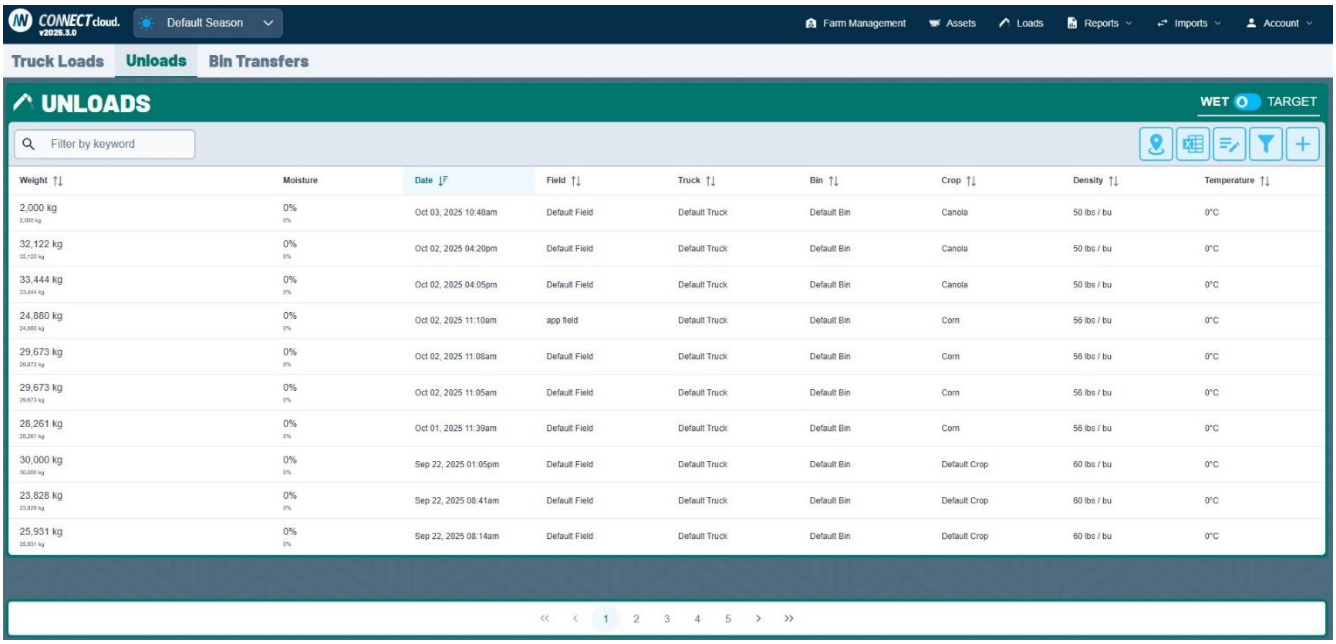


Figure 125 Connect Cloud Website

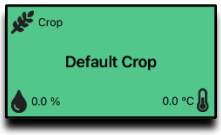
4. CONNECT APP UNLOAD MANAGEMENT

The Haulmaster controller weighs the cart and automatically calculates unloads. Unloads and their **crop type** are added to the selected **client**, **farm**, **field, truck**, and **bin**.

4.1 CROP

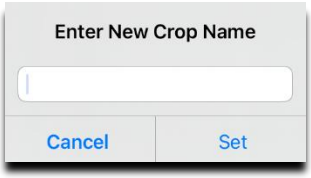
This section will explain how to **add**, **edit**, or **delete** crops:

1. To **change the crop** from the home screen, press the green **crop** button and then press the desired crop. Information about the crop is displayed inside the green button.



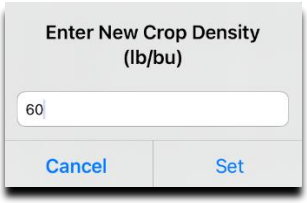
2. To add a crop, press the **+** button, and the **New Crop** screen will appear.

3. Press the center of the **name** box and the **Enter New Crop Name** using the pop-up keyboard.



4. Press **Save** when ready.

5. Press **Density** and enter the new crop density using the keyboard screen. Density units can be set on the **General** screen, section 3.8.



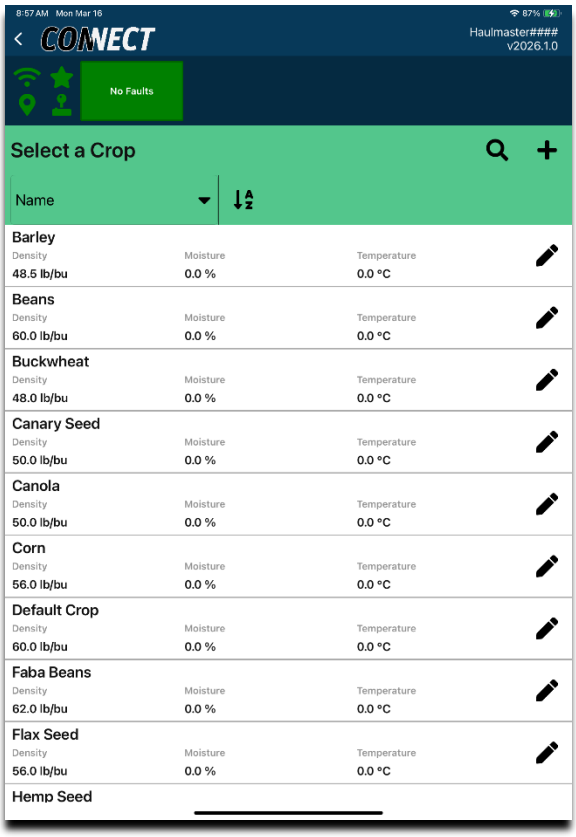


Figure 126 Select a Crop

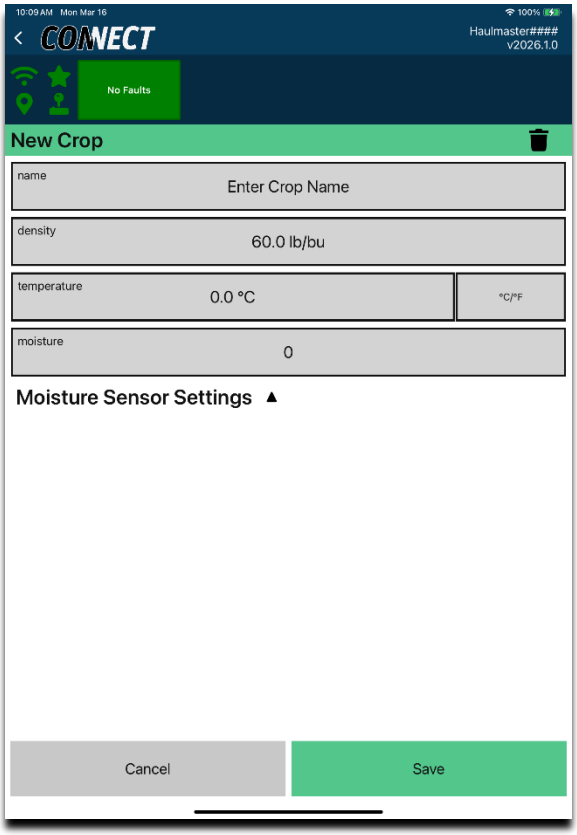
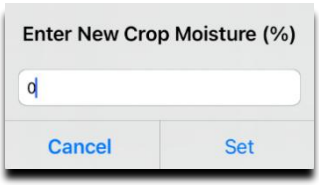


Figure 127 New Crop

6. Press the **temperature** button and enter the temperature. You can also change the **units** if necessary.

7. Press the **moisture** button and enter the moisture level.



8. If a moisture sensor is installed, press the **Moisture Sensor Settings**.

9. Change the moisture offset and the **Moisture mapping Crop** if necessary.
See Section 4.9**,** if the moisture sensor needs to be set up

10. When all options are filled, press **Save**. No crop or information will be added if **Cancel** is pressed. When **Save** is pressed, the information will be added to the **Select a Crop** list.

11. To **edit** an existing crop in the **Select a Crop** list, press the edit pencil to the right of the crop. The pre-loaded crop names cannot be edited, but you can edit their density, temperature, moisture, and crop type.

12. Touch the name, density, temperature, moisture, and crop type lines to edit their values.

13. Press **Cancel** or **Save** as appropriate.

14. To delete the crop, press the trash can.

15. A prompt appears asking if you want to delete the Crop. The pre-loaded and the currently selected crop can **not** be deleted.

16. **Cancel** or **delete** as appropriate.

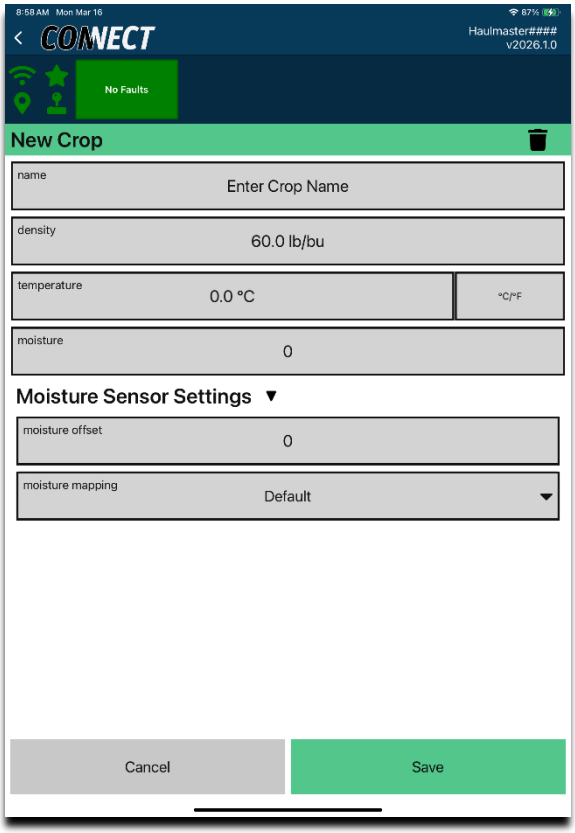


Figure 128 Crop Settings

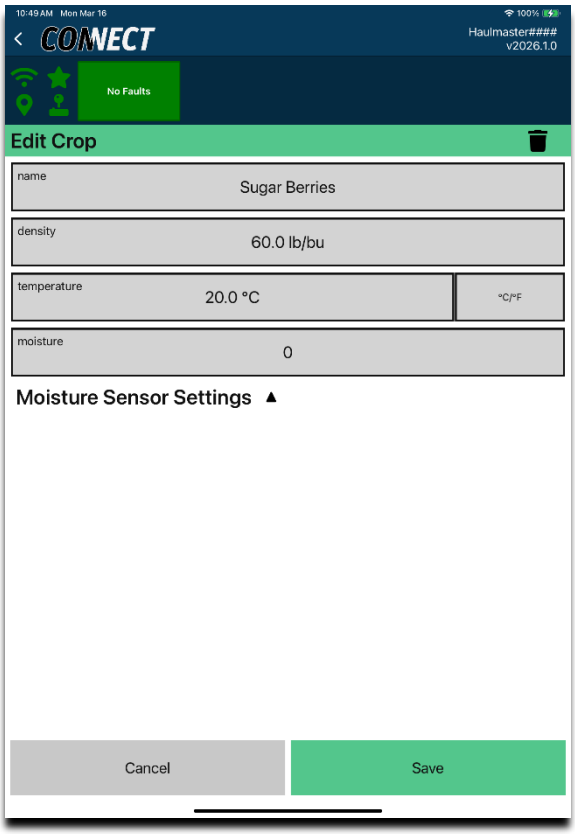


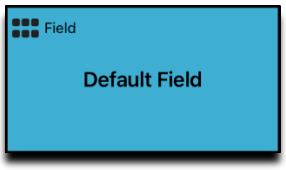
Figure 129 Edit Crop

4.2 CLIENTS, FARMS, AND FIELDS

Clients, farms, and fields are used to sort the unload information. Clients contain farms, and farms contain fields.

There are two ways to add a field. **First**, create a field, and then select an existing farm and client. **Second,** create a client, create a farm for that client, and then add fields to that farm.

1. To create a field first for an existing farm and client, press the **blue field button.**



2. Press the **+** button to add a field.

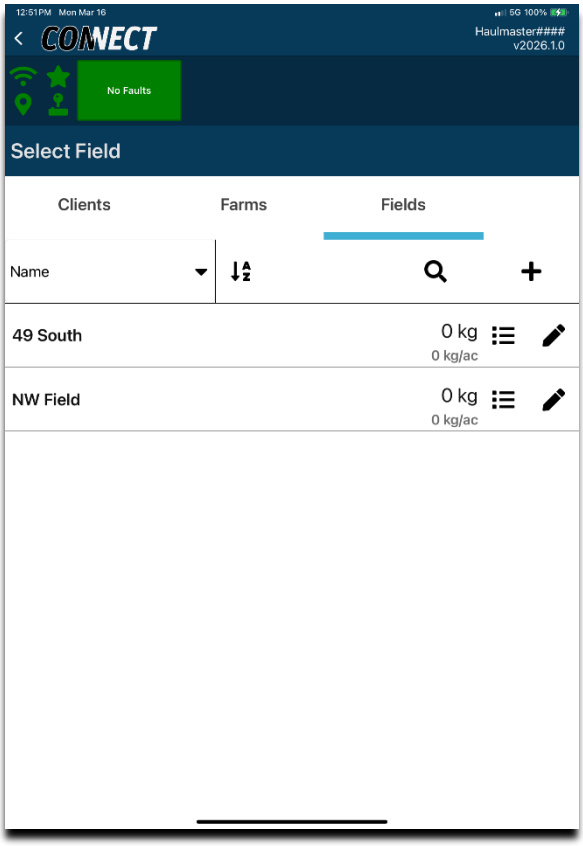


Figure 130 Field menu

3. Touch the center of the **name** box and **Enter Field Name**.

4. Press the center of the **area** box and enter the area of the field. **Acres** or **hectares** are used to calculate the field yield based on accumulated weight from unloads. Area units can be selected on the **General** Page. See section 3.8.

5. Press the center of the **client** box. A dropdown list of all created clients will appear. **Press** the **client** you want.

6. Press the center of the **farm** box, and a drop-down list of all created farms for the chosen client will appear. Press the **farm** you would like.

7. Press **Save** to add the field to the list.

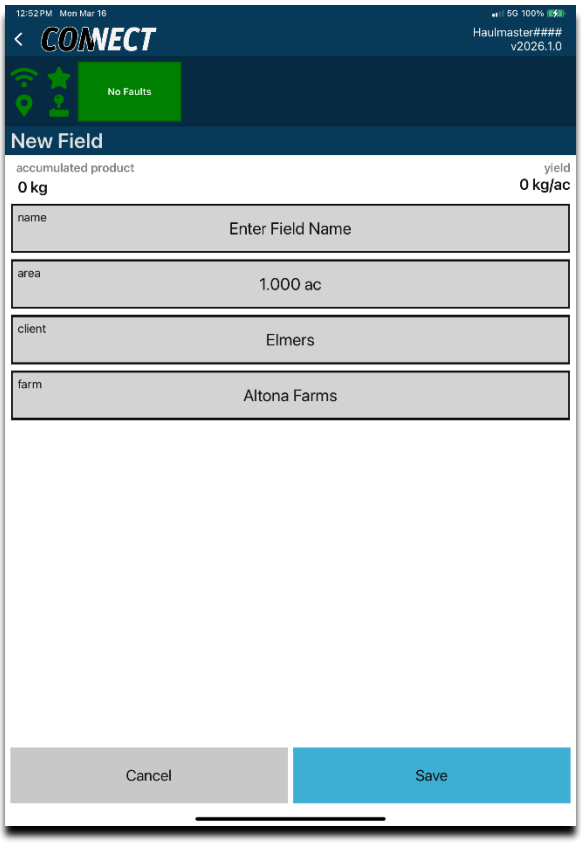
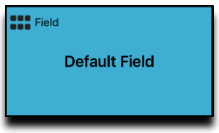


Figure 131 Adding Field

The next option is to create new clients, farms, and fields from scratch.

1. To create a client, press the **blue field button** from the home screen. This screen allows you to edit and select **Clients, Farms**, and **Fields**.



2. Press the **Clients** button to get to the client list.

3. Press **+** to be taken to the **New Client** screen.

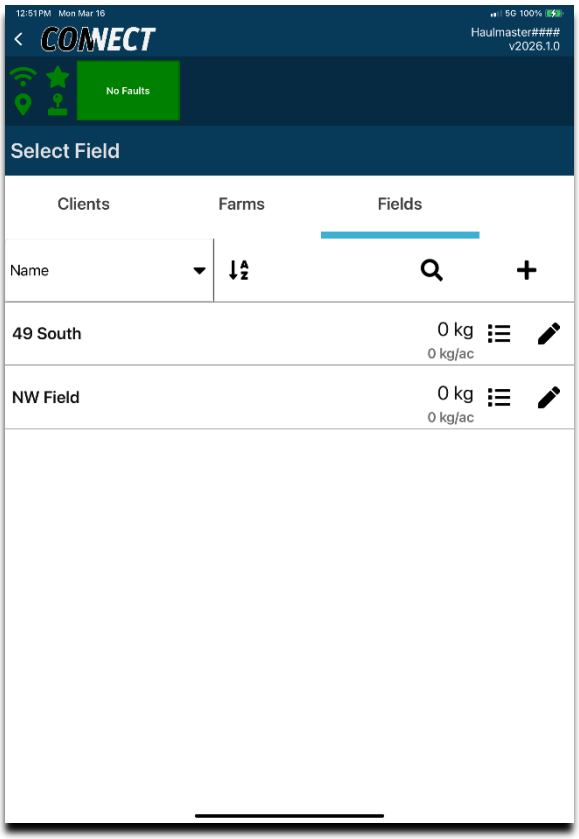
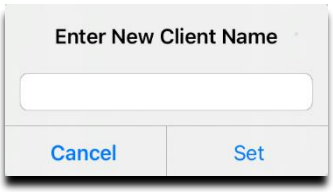


Figure 132 Select Field

4. Press **Enter Client Name** and enter the name of the client, and press Cancel or Set.



5. Press the blue **Save** button in Figure 133 when done.

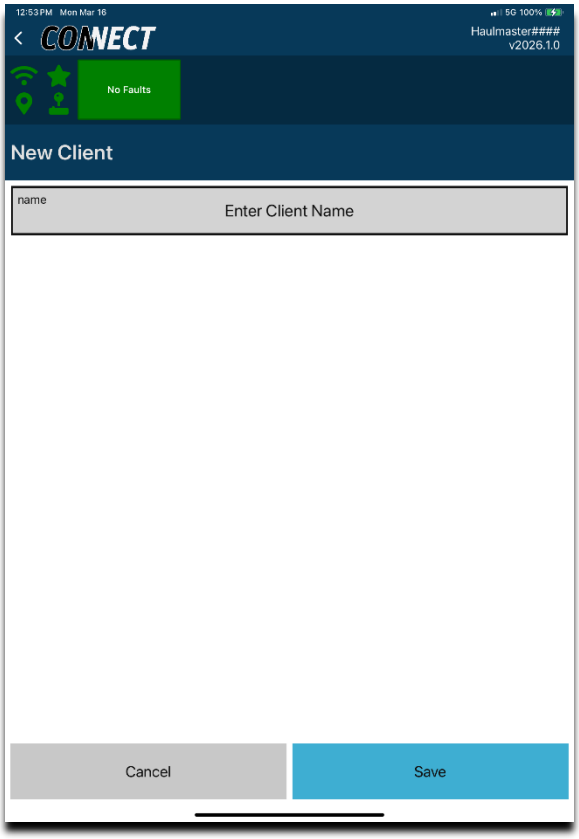


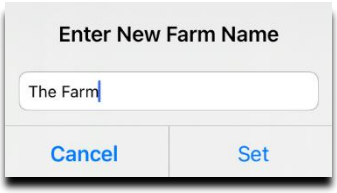
Figure 133 Enter Client Name

6. To create a farm under that client, press **Clients** and then select the Client you want.

7. You should now be in the **Farms menu**.

8. Press the + button to add a new Farm to that client.

9. Press the **name** button and enter the new farm name.



10. At this point, you also have the option to change the client you are under to another existing client.

11. Press **Save** to complete adding the Farm, and you will be taken back to the Select Field screen.

12. To **add a field** to that farm, **press the name** of the farm you want to add a field to. You should now be in the Field menu for that farm.

13. Press the + to add a **new field** to that farm.

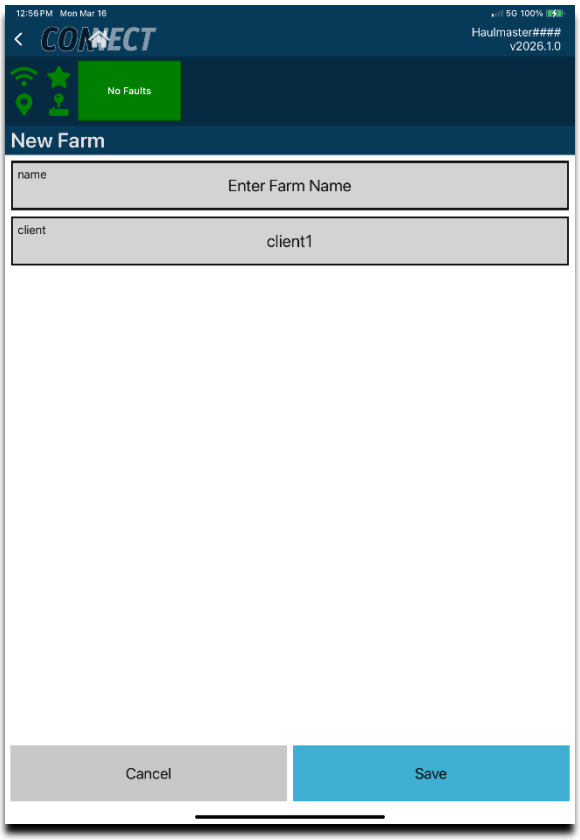


Figure 134 New Farm

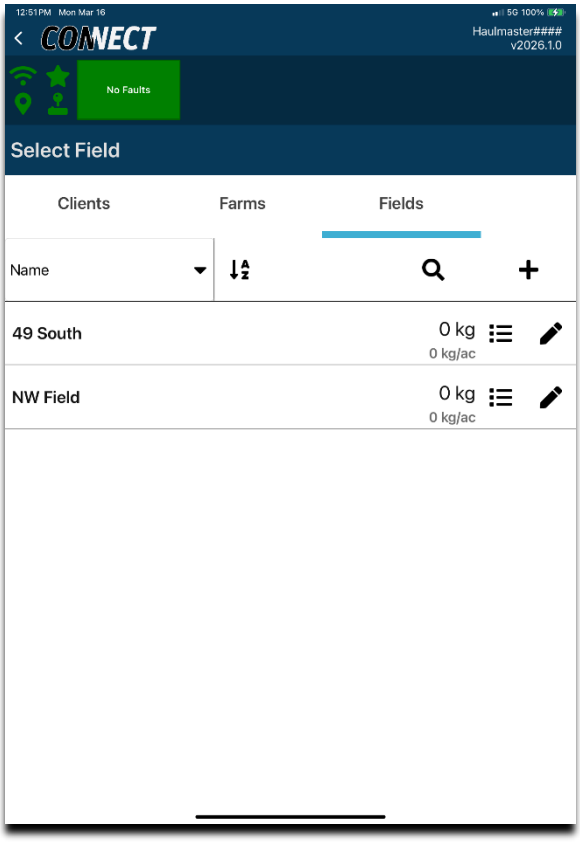
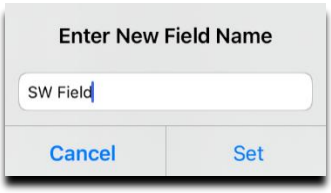
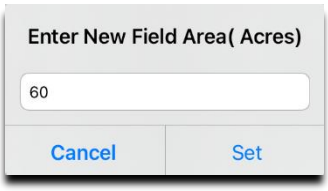


Figure 135 Select Field Screen

14. Touch the center of the name box and **Enter the Field Name**.



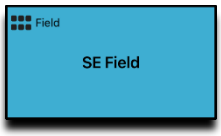
15. Press the **area** box, enter the area of the field, and save. Acres or hectares are used to calculate the field yield based on accumulated weight from unloads. Area units can be selected on the General Page. See the General section 3.8 for more information.



16. Press **Save** to complete.

EDITING A FIELD SHORTCUT

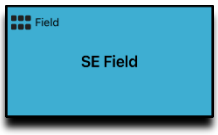
1. To edit the **current field,** press and **hold** the blue field button on the home screen.



2. The **Field Name** and the **area** can be edited. A different **client** or **farm** can also be selected. The **trash** can also be used to delete a field, but it does not allow deletion of the currently selected field.

The fields may also be edited through the Select Field menu.

1. **Briefly press** the blue field button on the home screen.



2. Navigate through clients and farms to get to the field you want to **edit or delete**.

3. Press the edit pencil next to the field you want to edit or erase. Make desired changes.
This will take you to **Edit Field** Figure 137.

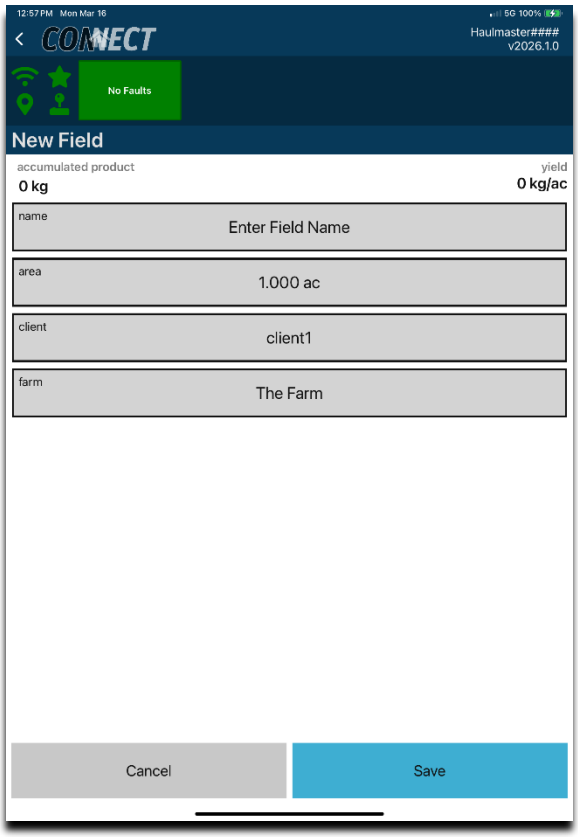


Figure 136 New Field

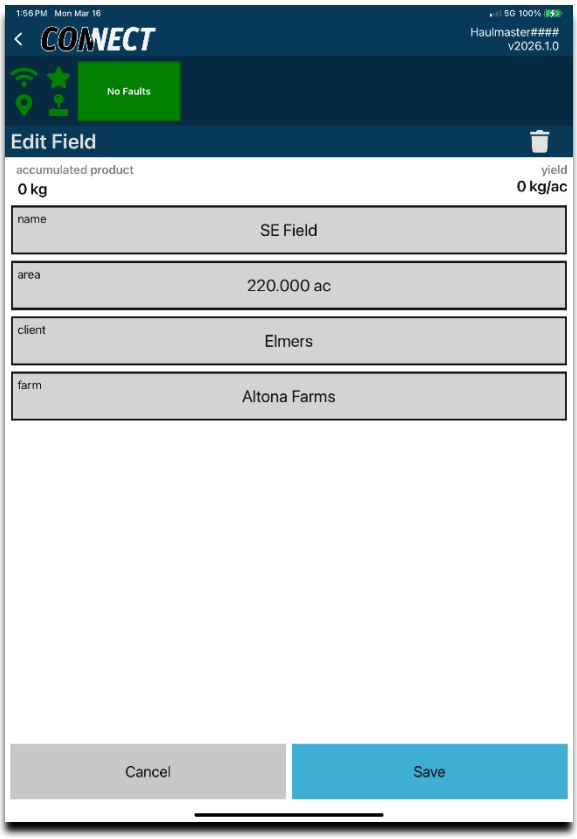


Figure 137 Edit Field

4.3 TRUCKS

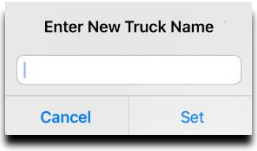
The Connect app allows you to add, edit, delete, or change trucks. It allows you to view the weight in each truck and records the unloads emptied into that truck.

ADDING A NEW TRUCK

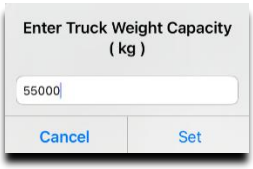
1. The **Select a Truck** menu can be accessed by pressing the yellow **Truck** button on the home screen.

2. Press **+** to access the **New Truck** screen

3. Press the **New Truck Name** button, Figure 138**,** to enter a new truck name. Press **Set** when done.



4. Press the **weight capacity** button to enter the weight capacity of the truck and press **Set**. Units can be changed on the home screen. → kg



5. 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 can sound at 0.

See section **3.8 General,** to silence the device's alarms.

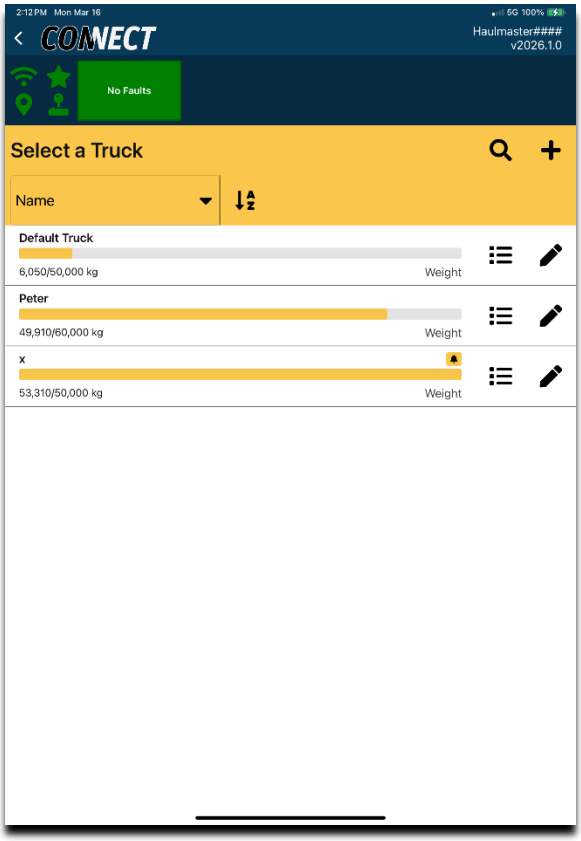


Figure 138 Select a Truck

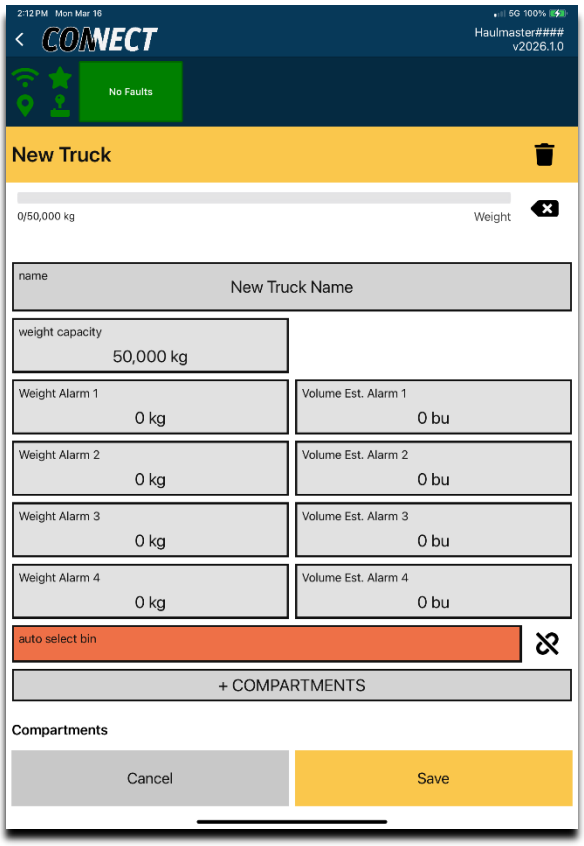


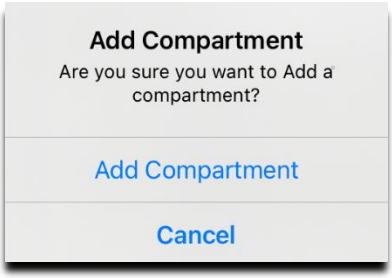
Figure 139 New Truck

6. If you want a specific bin always to be selected when you select that truck, press **auto-select bin**.

7. Select the **bin** you want to be automatically selected when this truck is used.

8. If you have a truck with multiple compartments to fill and you want to add a compartment, press **+ compartments.**

9. Verify by pressing **Add Compartment.**



10. A compartment will be added, as shown in fig 141.

11. If needed, you can click on the compartment to adjust the weight and weight alarms. Press **Save** when done. See Figure 142 below.

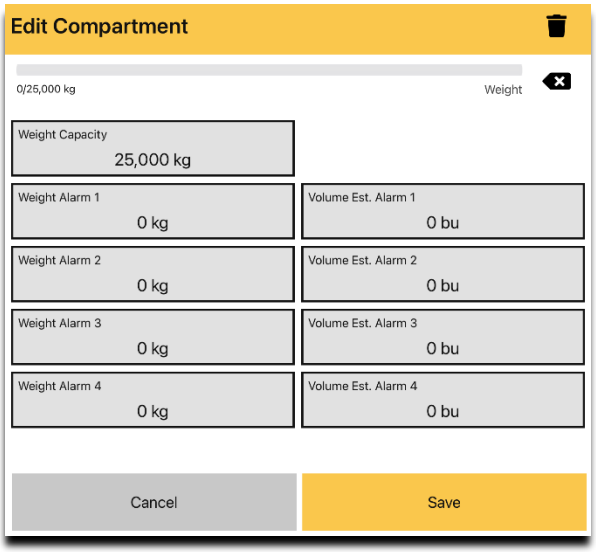


Figure 142 Edit Compartment

12. Press **Save** when all the truck settings are the way you want them.

13. Press the new truck if you want it to be the **active** truck, and you will be taken to the **home screen**.

Figure 140 Select Bin for Truck

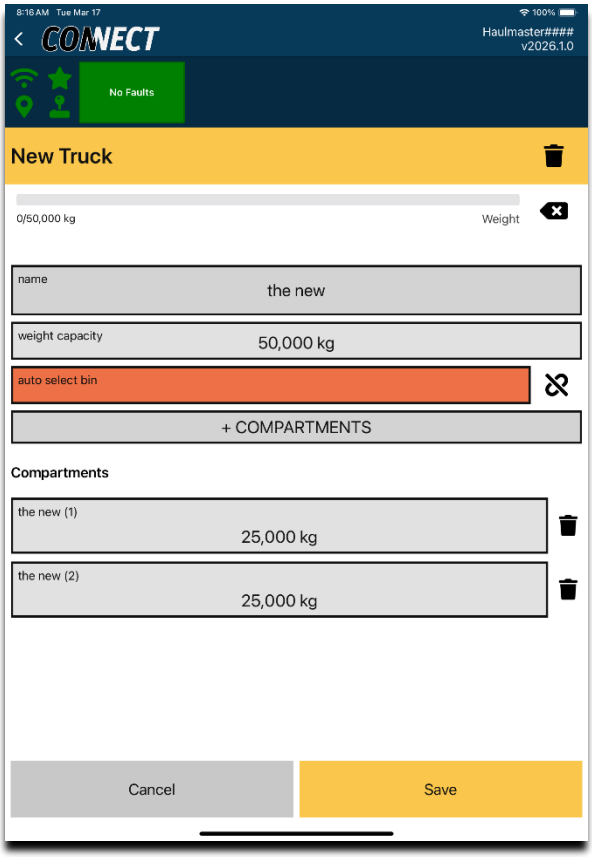
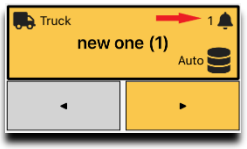


Figure 141 Adding Compartments

14. If the truck has more than one **compartment**, it will be shown as below, with arrows to choose the compartments you want to fill.

If a weight alarm is set, it will show up on the home screen as a bell icon



EDITING ANY TRUCK

1. The **Select a Truck** menu can be accessed by pressing the yellow **Truck** button on the home screen.

2. Press edit to access the **Edit Truck** screen. 

3. The **Edit Truck** screen, Figure 144, will allow you to edit the truck name, weight capacity, and set your weight alarms. You can edit the **Auto select bin** and the **compartments** as well. The name of the **default truck** can not be changed.

4. Press **Save** after your edits are done.

5. To delete the truck, press **trash**. **Note:** You can not delete the active or default truck. 

EDITING ACTIVE TRUCK

1. From the home screen, press and hold the **yellow truck button** to edit the active truck. The same **Edit Truck** screen will appear, shown in Figure 144.

2. The **Edit Truck** screen will allow you to edit the truck name, weight capacity, and set your weight alarms. The name of the **default truck** can not be changed.

3. Press **Save** after your edits are done.

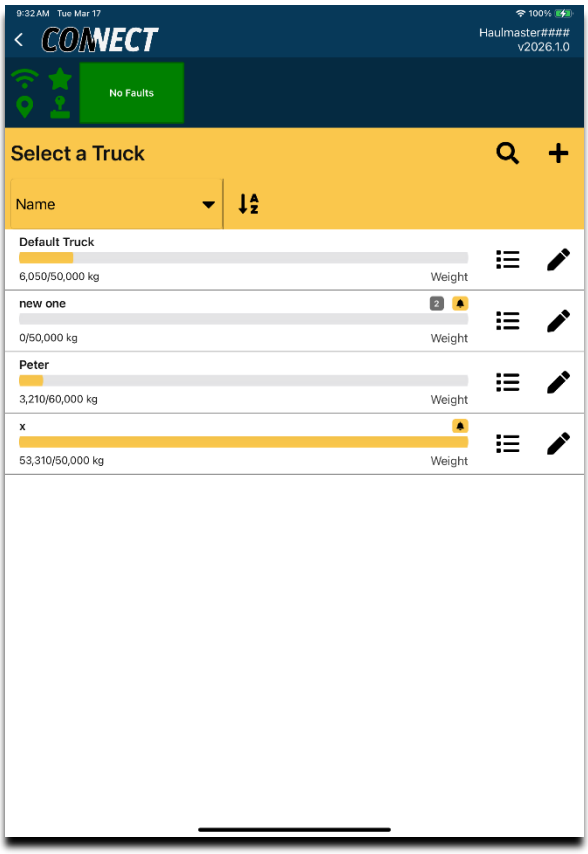


Figure 143 Select Truck

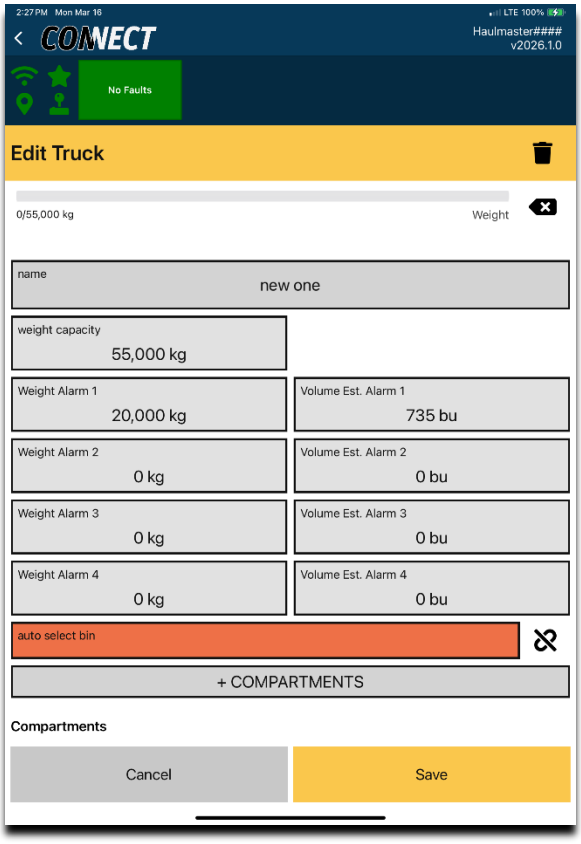


Figure 144 Edit Truck Screen

TRUCKLOADS

1. Press the yellow **Truck** button on the home screen to enter the **Select a Truck** screen.

2. **Press** the **menu symbol** beside the truck that you want to view truckloads for.

This will take you to the **Truckloads** Figure 145 to the right.

3. To view the unloads in a **Truckload,** press the down arrow to the right of the truckload.

4. **Press the up arrow** to collapse the unloads.

5. The truckloads can also be sorted for ease of viewing by pressing the **drop-down sorting menu** in the yellow area.

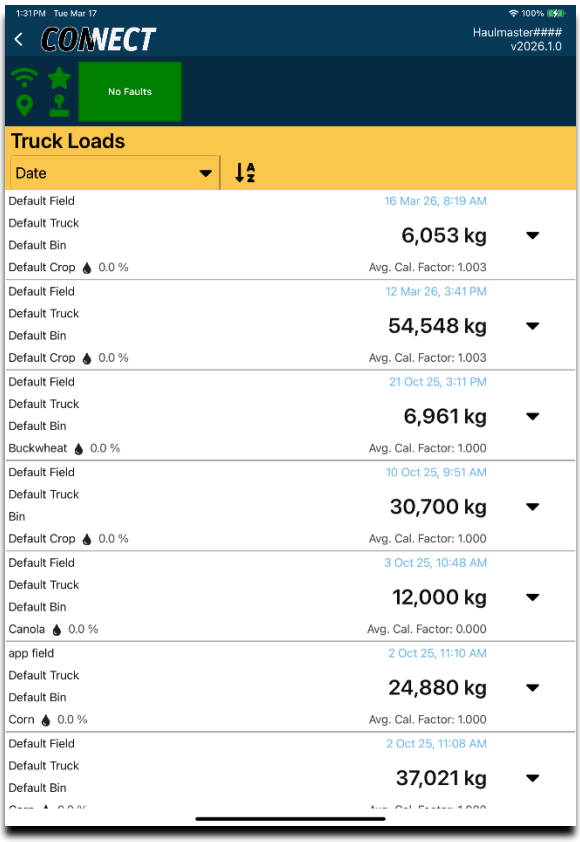


Figure 145 Truckload List

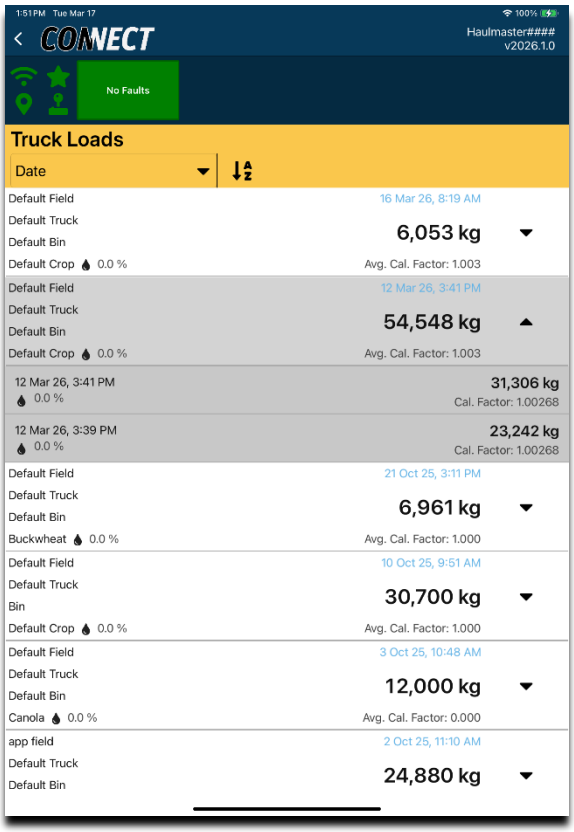


Figure 146 Unloads in Truckload

6. Select your sorting method. **Date, Bins, Trucks, Fields**, and **Last Modified** date are options for sorting methods.

7. Press the **sort by direction** symbol to sort between ascending and descending.

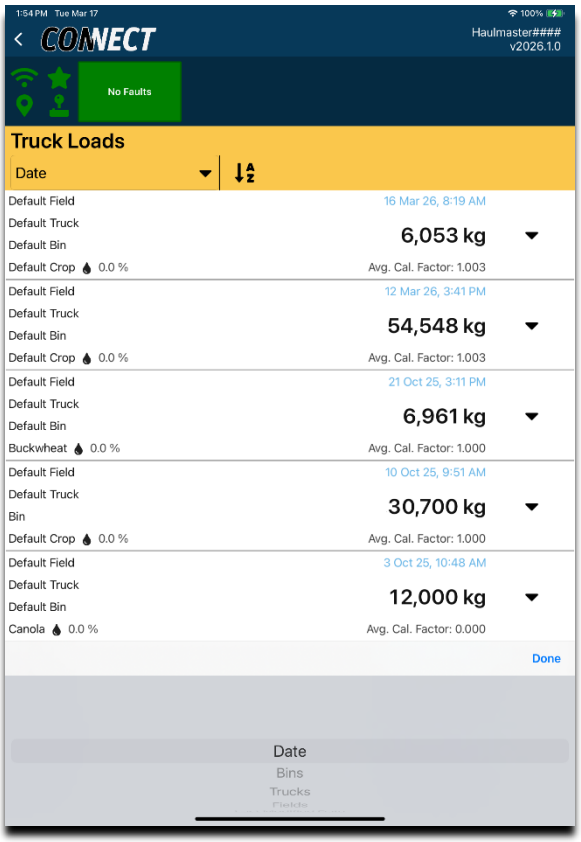
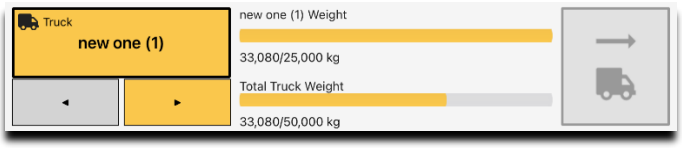


Figure 147 Truckload Sorting Method

TRUCK INFO FROM HOME SCREEN

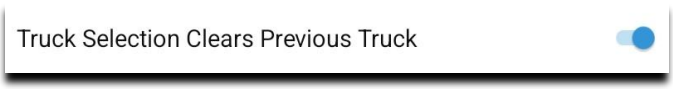
The home screen of the Connect app contains the current weight and total weight of the Truck and selected bin. It also features a progress bar indicating the truck's fill level.



When the truck is finished, the truck weight can be set back to zero using the clear truck button.

It is recommended to clear the truck once it is sent away for unloading rather than allowing the total to go above the truck's weight.

In the **general** menu, section 3.8, you can allow for the truck to be automatically emptied when the active truck is changed.



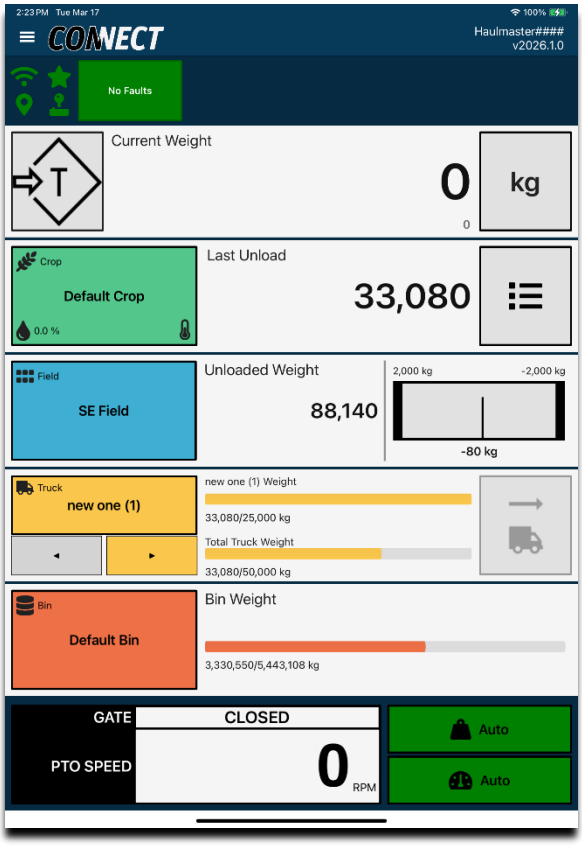
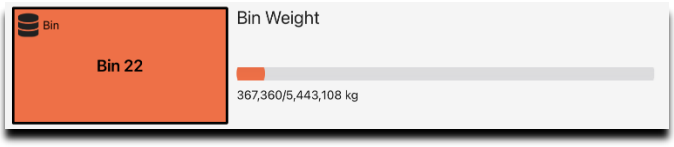


Figure 148 Trucks on Home Screen

4.4 BINS

The Connect app sorts and places all unloads into bins. The user can **add, edit, or delete bins** and bin transfers.

The home screen displays basic information about the active, currently selected bin. It contains a progress bar showing how much weight this individual cart has put into the bin.



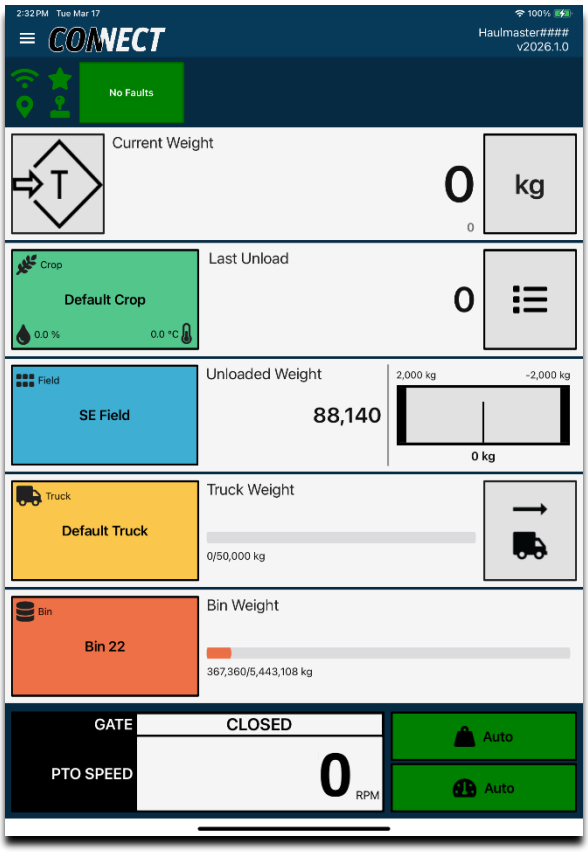


Figure 149 Bins on Home Screen

NEW BIN

1. Press the orange Bin box to access the **Select a Bin** screen.

The **Select a Bin Screen** allows you to select an active bin, add a new bin, edit the bins, and transfer weight from one bin to another.

2. Press the **+** button to access the **New Bin** screen and add a new bin.

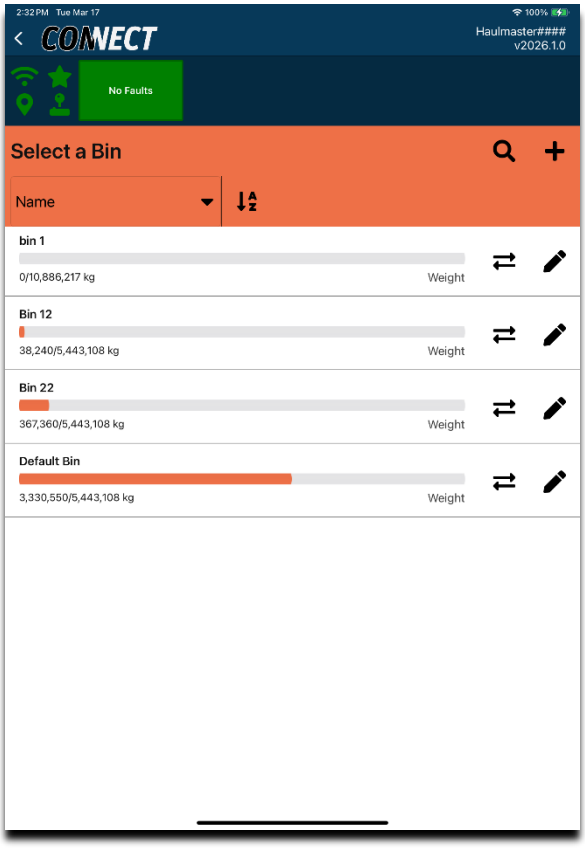
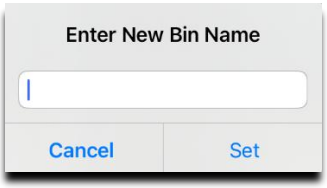
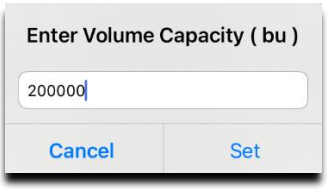


Figure 150 Select a Bin Screen

3. Press the **New Bin Name** button and enter the name of the new bin, and press **Save.** See Figure 151.



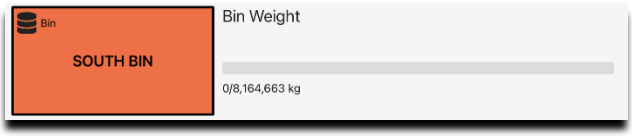
4. Press the **volume capacity** button, Figure 151, and enter the volume of the new bin and press **Save.**



The **volume units** can be changed in the **general** screen, section 3.8.

5. Press **Save** at the bottom right corner of the screen to return to the **Select a Bin** screen.

6. If you want to make the **New Bin** the **active bin,** press the **New Bin**. You will automatically be taken to the home screen.



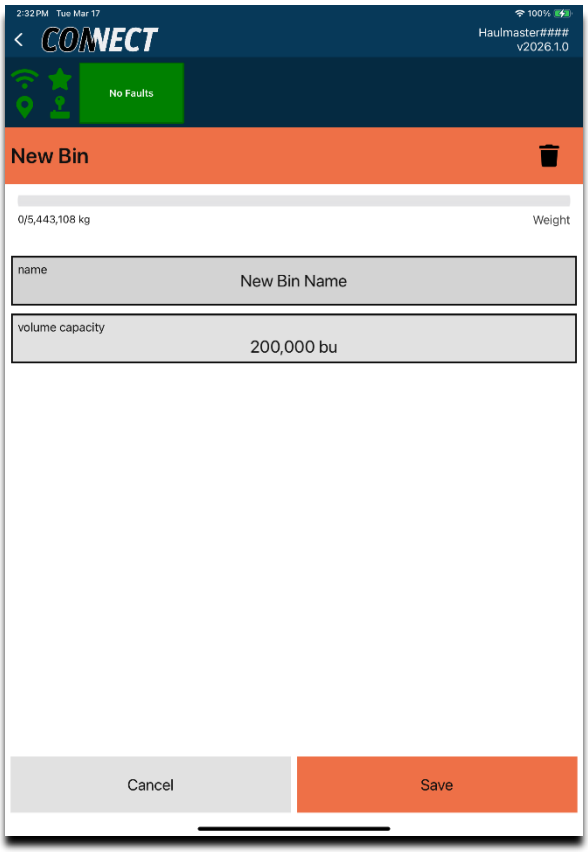


Figure 151 New Bin Screen

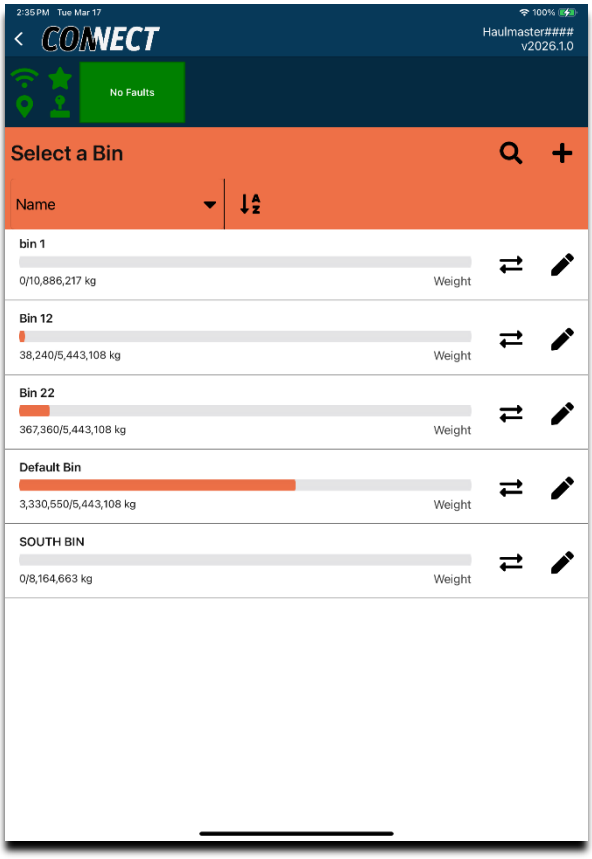
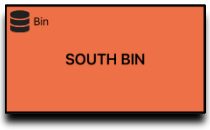


Figure 152 Select New Bin

EDITING BINS

1. The active bin can be edited but not deleted by a long press to the **orange bin** button on the home screen.



2. Likewise, **any other bin** can be edited or deleted by a quick press of the **orange Bin** button on the home screen, which will take you to the **Select a Bin** screen.

3. From the **Select a Bin** screen, select the edit button beside the bin that you want to edit.

4. Press the name or volume capacity to edit their values.

5. If you want to **delete the inactive bin,** press the trash button. Then confirm you want to delete the bin by pressing **Delete Bin**.

6. Press **Save** in the lower right corner to save and go back.

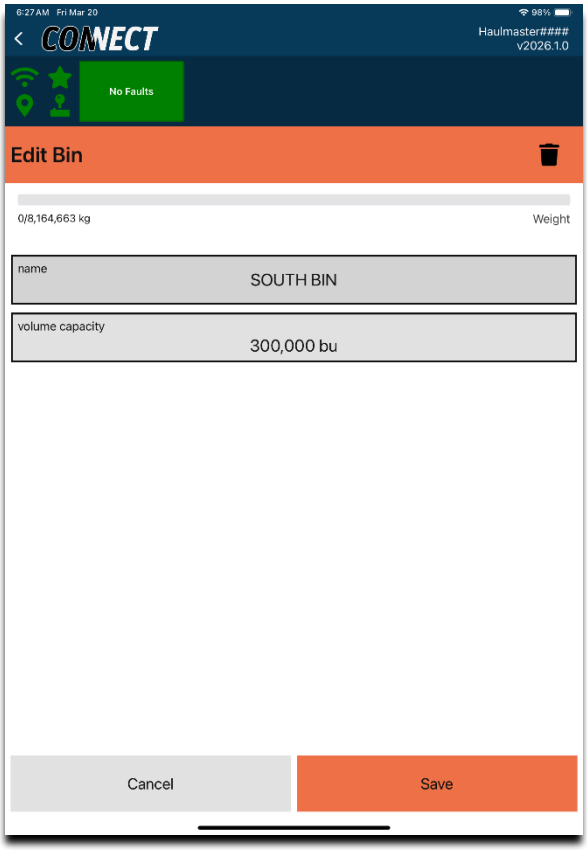
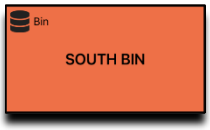


Figure 153 Edit Bin

BIN TRANSFERS

1. Press the orange Bin button to go to **Select a Bin**.



2. From the **Select a Bin** screen, press the bin transfer button of the bin you want to transfer from. This will take you to the **Bin Transfer** screen.

3. If needed, the bin transfers can be sorted. Press the down arrow to sort by **All, Incoming**, and **Outgoing**.

4. Press the + button in the upper right for the **New Transfer** screen.

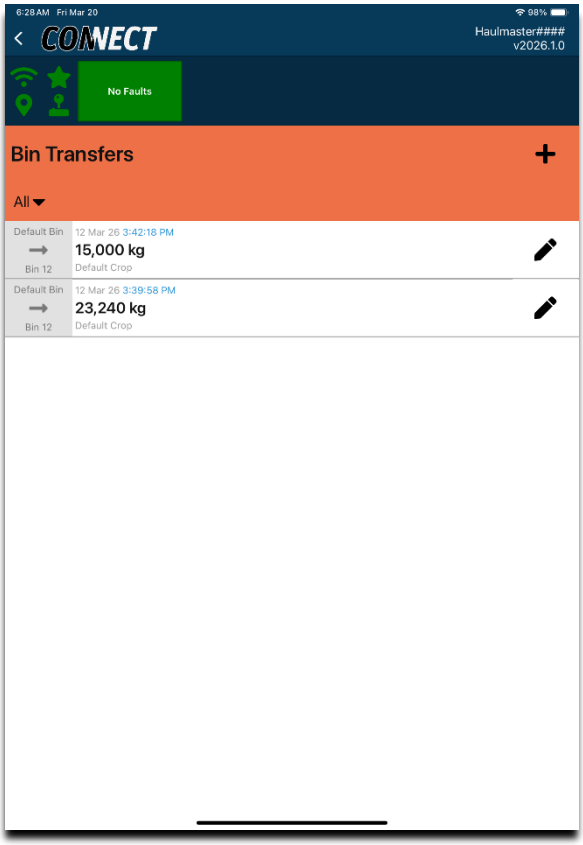


Figure 154 Bin Transfers

5. If the source bin needs changing, press the **source bin box**.

6. It will take you to the **Select a Bin** screen, shown in Figure 155, where you press the desired source bin.

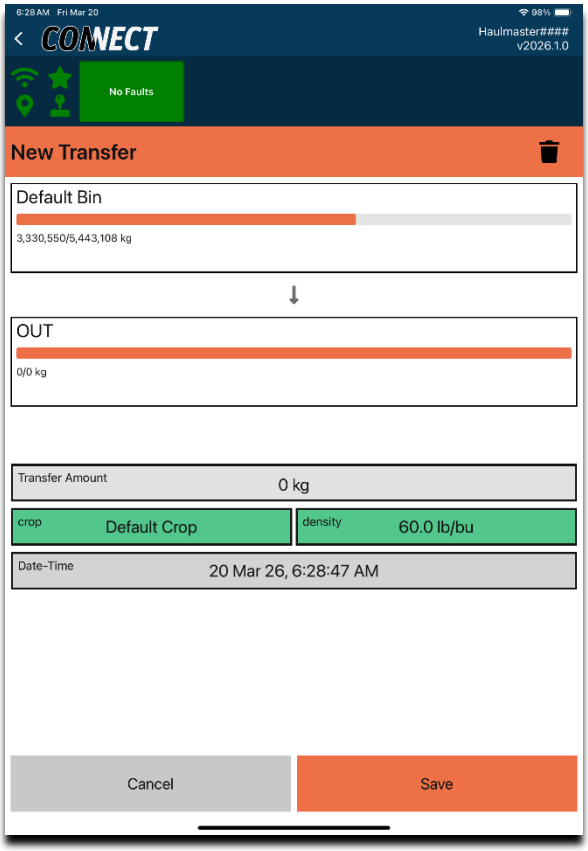
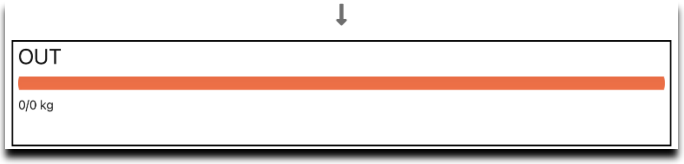


Figure 155 New transfer Screen

Note: The **OUT** bin is a non-accumulating destination or source (i.e., elevator or grain terminal). OUT is not available as an active bin on the home screen.

7. Press the **destination button**, shown below. It will be set to OUT by default.



8. Select the **destination bin** or **OUT**, shown in Figure 156.

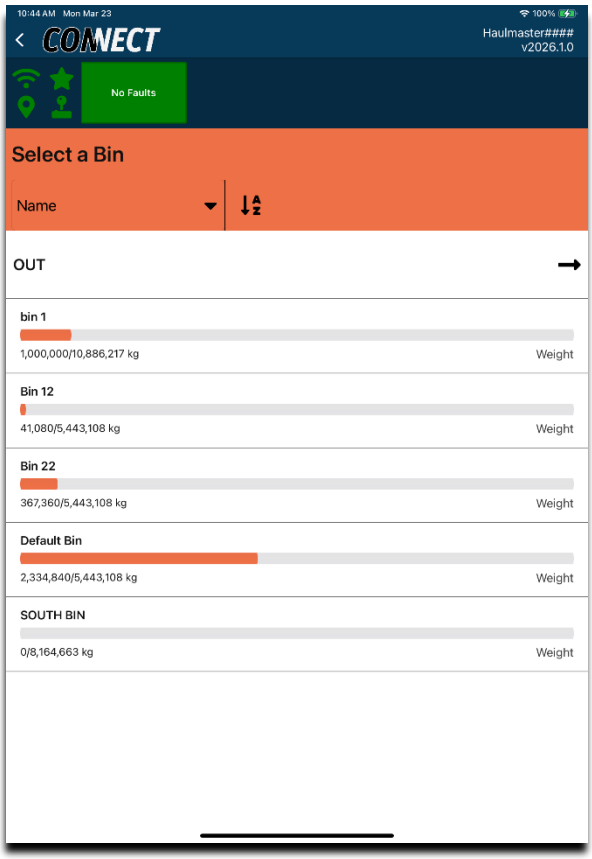
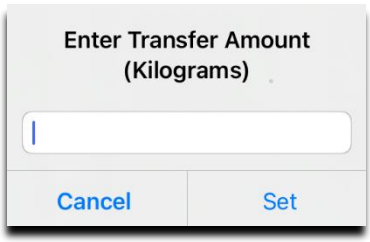


Figure 156 Select a Bin

9. Back at the **New Transfer** screen, shown in Figure 157, press the **Transfer Amount** button to enter the amount to transfer.

10. Enter the **transfer amount** in the pop-up. Units are based on the unit selected on the home screen.



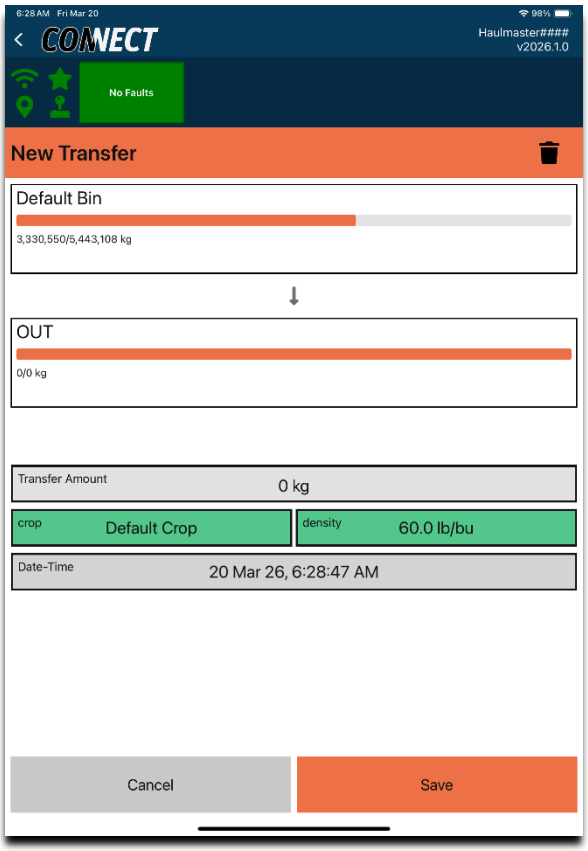


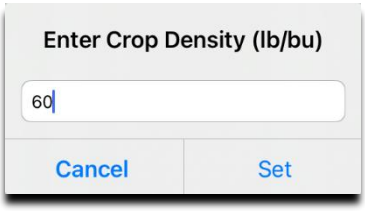
Figure 157 Transfer Summary

11. Press the **crop** box to access the **Select a Crop** list shown in Figure 158.

12. Press the **crop** you want to **show transferred**. You will return to the new Transfer screen.

13. Press the **density** box to change the density.

A pop-up asking for the density will be shown. Density units can be changed on the General page, section 3.8.



14. Enter the **density** you want shown and press **Set**.

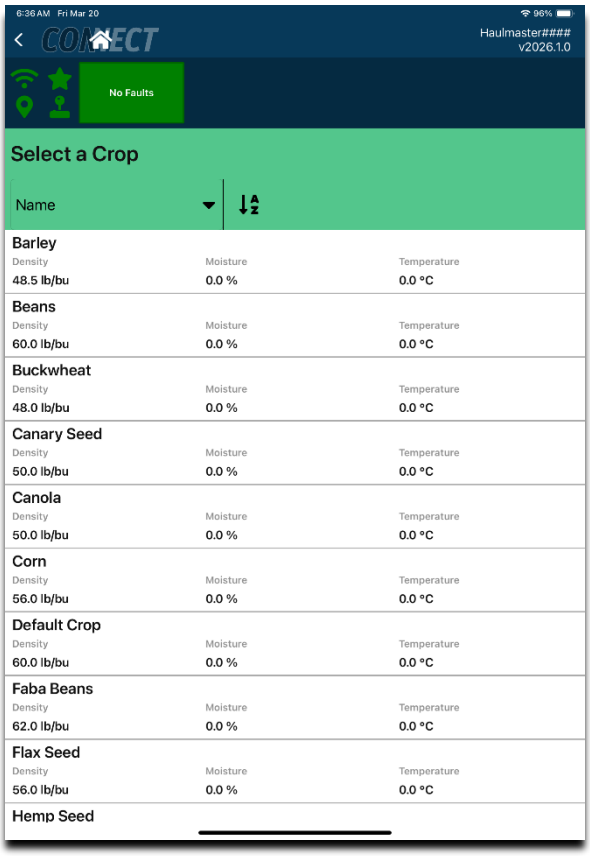


Figure 158 Select a Crop

15. Press the **Date-Time** button to change the date and time of the transfer if needed.

16. Select the **Transfer Date** from the calendar and press **Ok**.

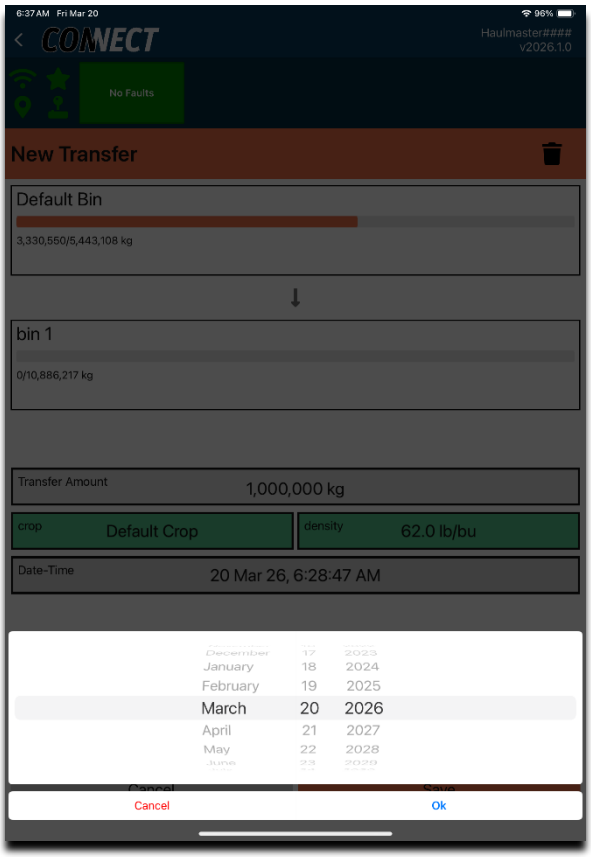


Figure 159 Select Transfer Date

17. Select the time of the transfer.

18. Press **Ok** when complete.

19. Press **Save** at the bottom of the New Transfer screen to access the Transfer Summary screen.

20. If **changes** are still needed, pressing the **back arrow** in the top left corner will return you to the New Transfer screen to make changes.

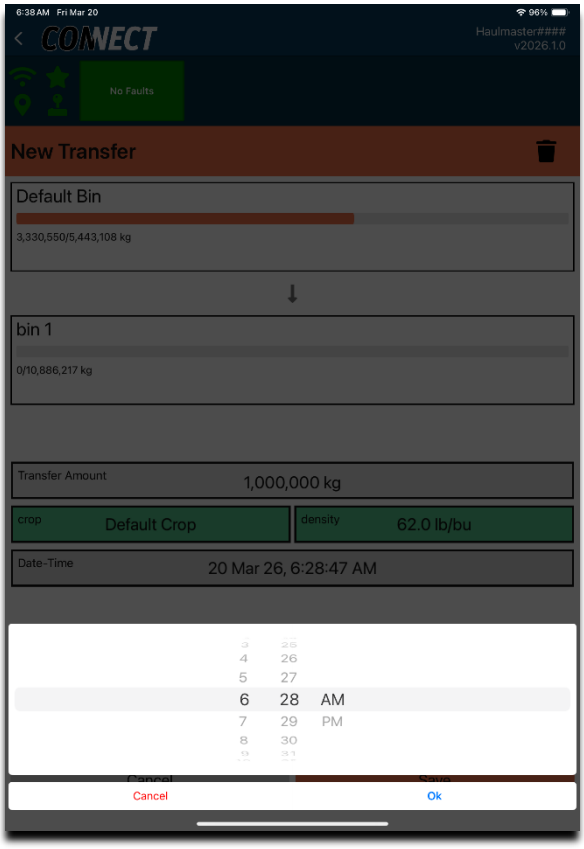


Figure 160 Select Transfer Time

21. Once satisfied with the transfer information, press the **Confirm** button. This will return you to the Transfer list of the originally chosen bin.

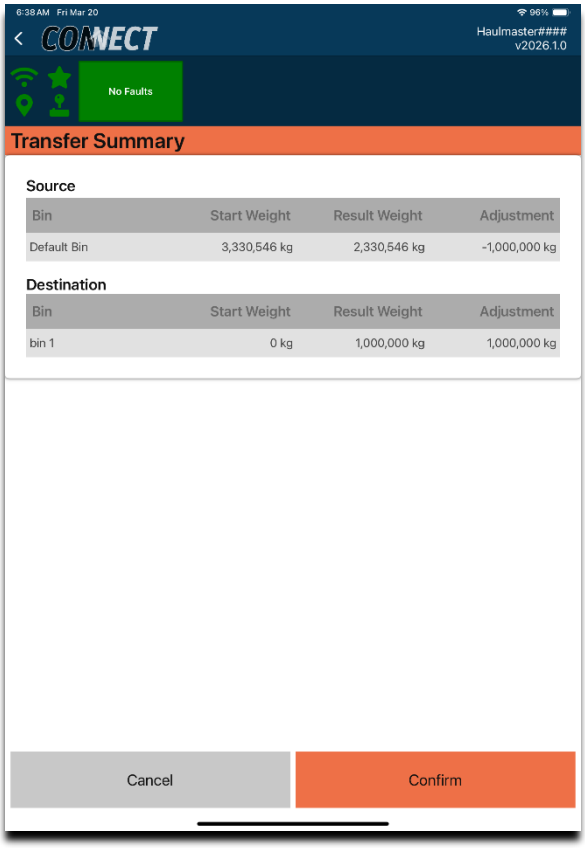


Figure 161 Transfer Summary

23. The screen will display the **bin transfers**.

24. The edit button will take you to the **Edit Transfer** screen. It has the same functionality as the New Transfer screen and allows you to **edit or delete** a bin transfer.

25. **Press** the source bin, destination bin, transfer weight, crop, density, or date-time to **edit their values**.

26. If you want to **delete** the bin transfer, press the trash can. You will be taken to the **Transfer Summary** screen.

27. Press the "**Confirm"** button to delete the bin transfer or "**Cancel"** if you did not intend to delete it. That bin's weight will return to the state before the bin transfer took place.

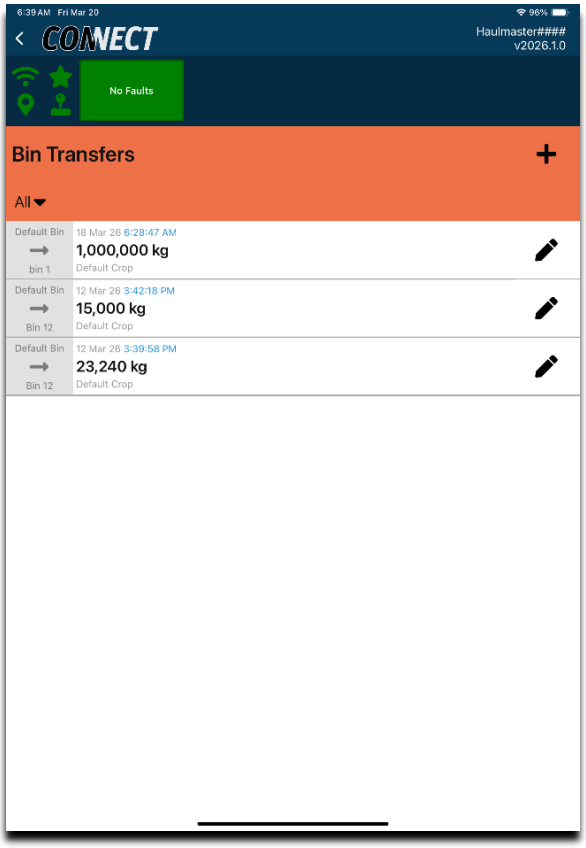
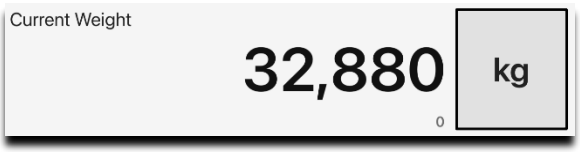


Figure 162 Bin Transfers

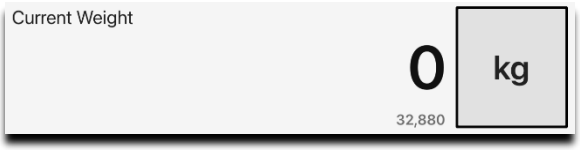
4.5 WEIGH SYSTEM DISPLAY

The Connect system will automatically detect unload amounts. These values will be placed in the selected truck and selected bin. The crop information will be attached to this unload.

At the top of the display, the **current cart weight** is shown. The small number **0 shown below** is used for the **temporary tare**.

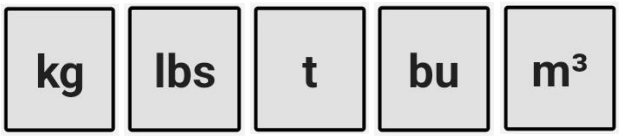


If the larger weight number is pressed, it will turn to 0 and create a temporary tare that can be used for your calculations. The actual weight will show up as the lower, smaller number.

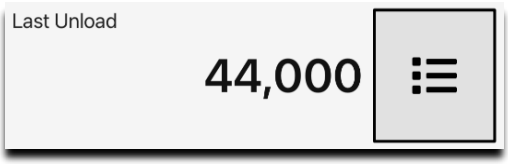


Pressing the weight again removes the **temporary tare,** and the display returns to the normal weight.

Pressing the **unit** button cycles through these 5 units. The units can also be changed in the **General** menu.



Below the weight is the last unload value. Selecting the menu button on the right will navigate you to the unload list.



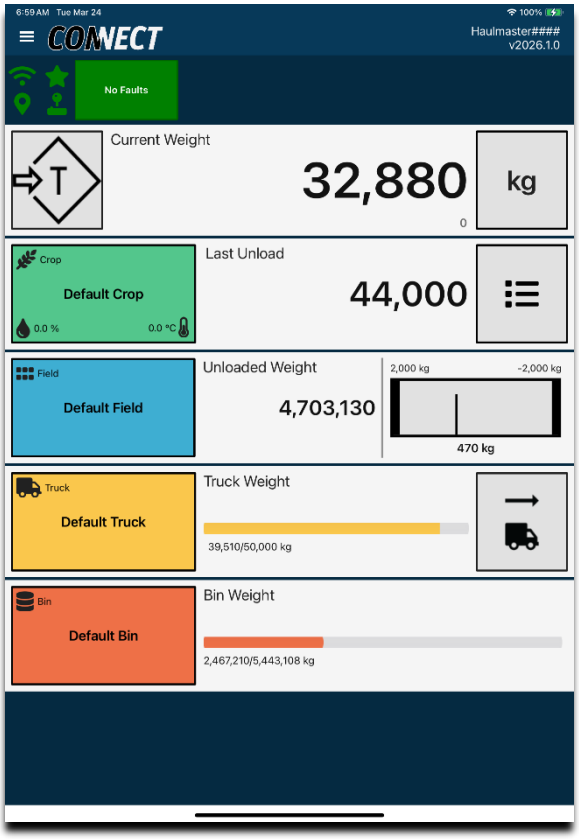


Figure 163 Home Screen

Press **Menu>Calibration>Auto Controls** to go to the Unloads Detection screen.

Here, you can select **Automatic unload detection,** which will detect unloads automatically without needing user input. If this feature is turned off, the home screen will have options to start and stop the unload manually.

The **Minimum Unload Size** setting is the minimum unload weight required to register an unload.

The **Unload Detection Timeout** setting is the number of seconds the system waits before confirming an unload after the weight stops decreasing.

With **Block Unload by Confidence,** a confidence level is calculated and used to determine whether an unload is valid. It can also be used to prevent false unloads.

The **End of Unload Rate** is how fast the end of the unload is recognized.

When **Automatic Unload Detection** is disabled, start and stop buttons are provided for **manual unloads** and weight recording. See Figure 165 across from the blue field button. The **start** button changes to a **stop** button when pressed.

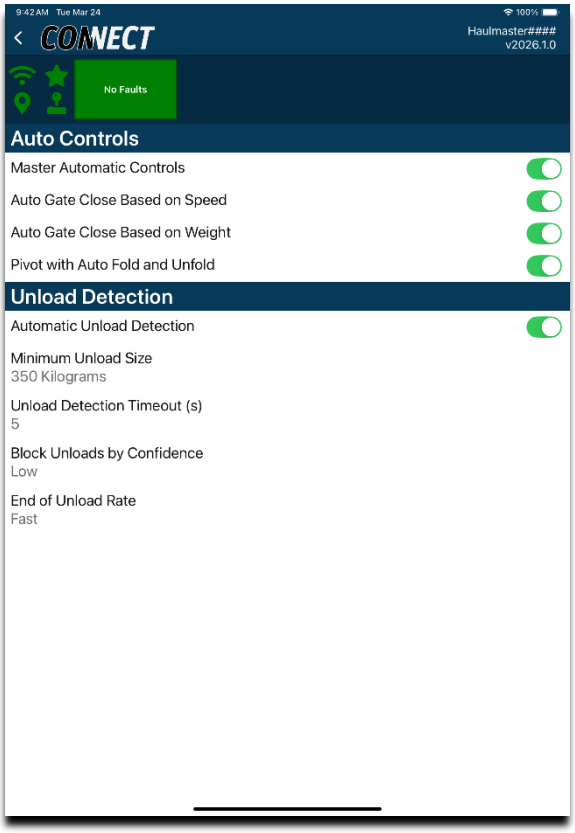


Figure 164 Unload Detection

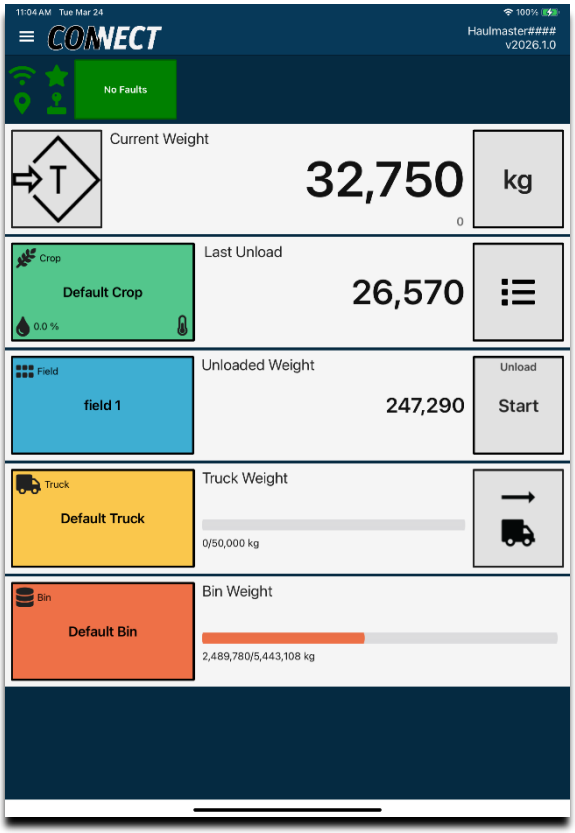


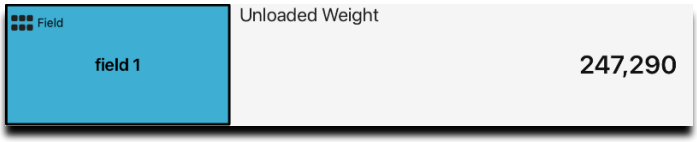
Figure 165 Unload Start Button

4.6 AUTOMATIC UNLOAD DETECTION

Automatic unload detection will detect unloads, so the user does not need to do anything to record their unloads.

If you want to enable Automatic Unload Detection, refer to the previous section. **Menu>Calibration>Auto Controls.**

1. When in **Auto Unload Detection** mode, only the weight will be shown next to the field. Otherwise, a Start or Stop button is shown in this location.



2. **Perform an unload** and watch the weight go down and settle when complete.

3. The unload should be displayed in the **Last Unload** area.

4. It should be added to the total for the selected field under **Unloaded Weight**.

5. It should be added to the **Truck Weight**.

6. And it will be added to the total **Bin Weight**.

7. If the **Truck is sent off** to be emptied, the unload truck button can be **pushed to zero** the truck weight.

8. If a user is experiencing small unloads while driving through the field, they can increase the Minimum Unload Size to a value greater than these unloads, so they don't continue to log false unloads. **Menu>Calibration>Auto Controls.**

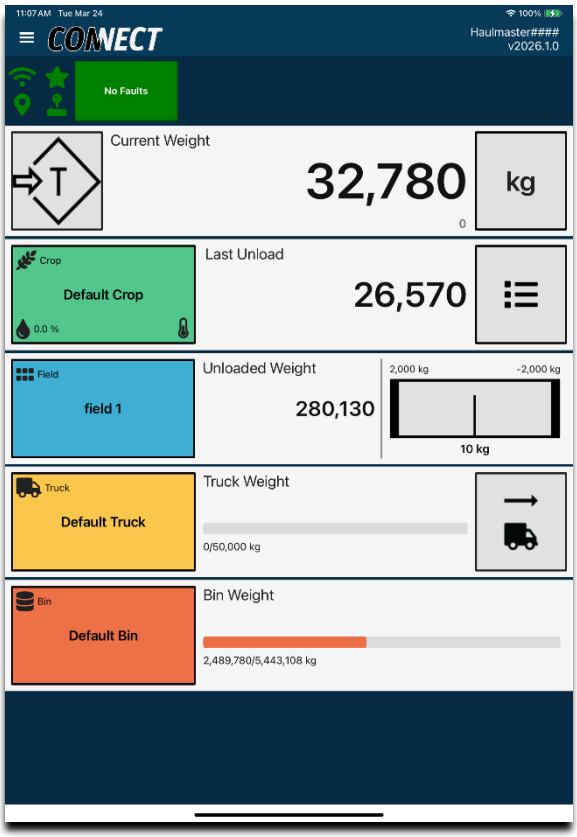


Figure 166 Home - Automatic Unloads

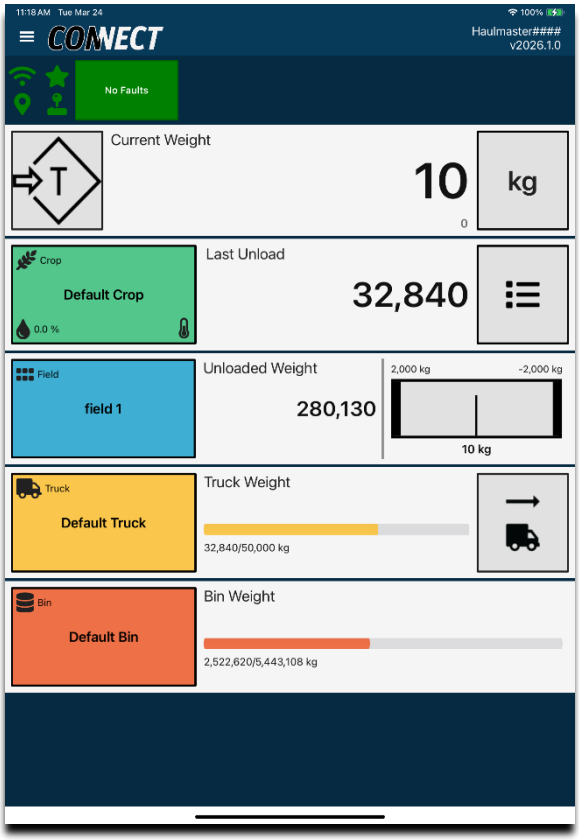
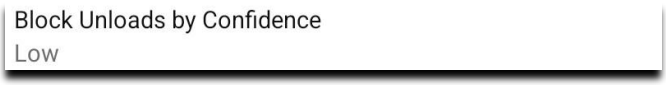


Figure 167 Unloaded

9. **Unload Detection Timeout (s)** is the number of seconds it takes at the end of an unload with no decrease in cart weight to lock in an unload; 5 seconds is the recommended timeout. Users who are logging multiple unloads per truckload due to the time it takes to move the cart can increase this time to allow them more time to complete the unload. This will, however, mean a longer wait time at the end of an unload for the system to log the unload. **Menu>Calibration>Auto Controls.**

10. **Block Unloads by Confidence** controls when the unload detection is allowed to detect an unload based on noise from the load cells; low is the recommended setting. If there is a large amount of noise in the weight readings, the unload detection does not start an unload because it could be due to travelling through the field. If a user is experiencing long delays before detecting the start of an unload, they can decrease the **Unload Detection confidence** to **very low**, **minimum,** or **none**. The system could now ignore the high vibration noise caused by the PTO or operator moving the tractor during the unload. Alternatively, if a user is detecting false unloads while driving through the field, they could increase the unload detection confidence to **moderate** or **higher** to try to ignore unloads occurring while driving. This option could be coupled with Minimum Unload Size to prevent false unloads.



11. The "**End of Unload Rate"** controls when to determine if an unload is complete; **"fast"** is the recommended setting. If a user finds that an unload is taking too long to complete, they can increase the end-of-unload rate to **"aggressive"** to speed up the completion of the unload.

Alternatively, if **bagging** and logging multiple unloads per bag due to a slow unload rate, the "end of unload" rate can be set to moderate or slow. This can be coupled with **"Unload Detection Timeout"** to prevent multiple unloads from being logged while unloading at slow rates.

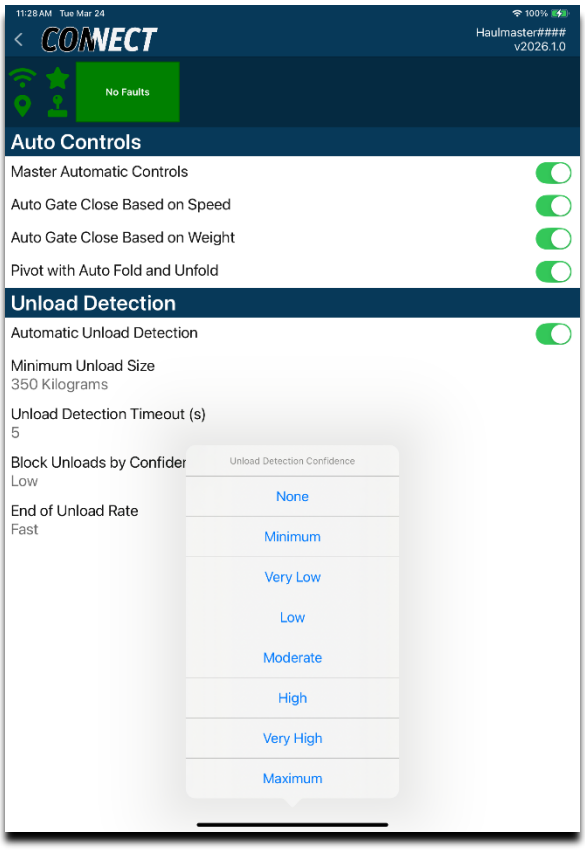


Figure 168 Unload Detection Confidence

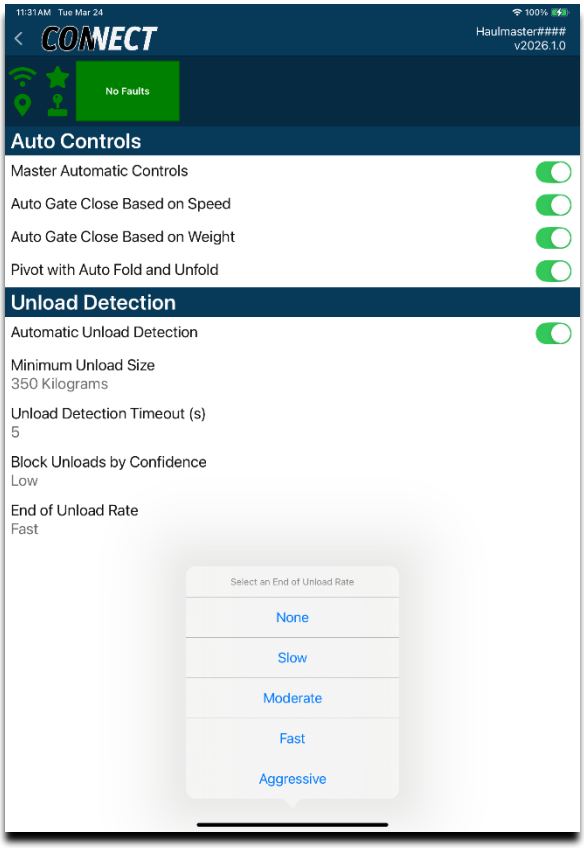


Figure 169 End of Unload Rate

4.7 MANUAL UNLOAD DETECTION

When set to manual unload detection, the dashboard will display a **manual unload** button. Manual unload detection is dependent on the user to start and stop the unload. The start and stop weights will be taken when this button is pressed, with a light filter applied to the weight. It is recommended to come to a complete stop when starting or stopping manual unload detection. The Unload detection method can only be altered in a Master mode.

1. To use manual unloading, go to **Menu>Calibration> Auto Controls>** and disable **Automatic Unload Detection.** Refer to section 3.6.5.

2. The home screen should now display an **Unload Start** button.

3. To start a manual unload, stop the cart to settle the weight and then press the **Unload Start** button.

4**. Perform the unload** and come to a stop.

5. Press the **Unload Stop** button.

6. The unload should be displayed in the **Last Unload** area.

7. The unload will be added to the **unload list** and the accumulated weights.

8. It should be added to the total for the selected field under **Unloaded Weight**.

9. It should be added to the **Truck Weight**.

10. And it will be added to the total **Bin Weight**.

11. If the Truck is **sent off** to be emptied, the unload truck button can be **pushed to zero** the truck weight.

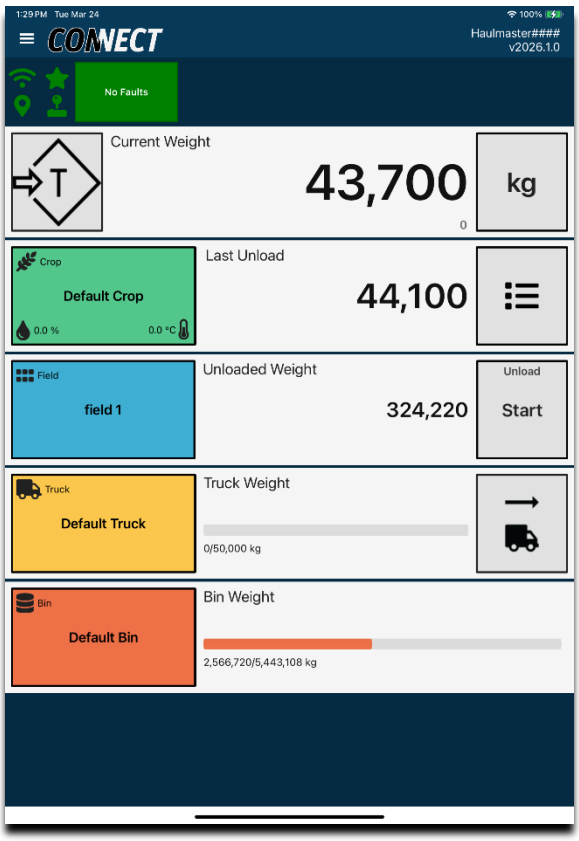


Figure 170 Stopped Full Cart

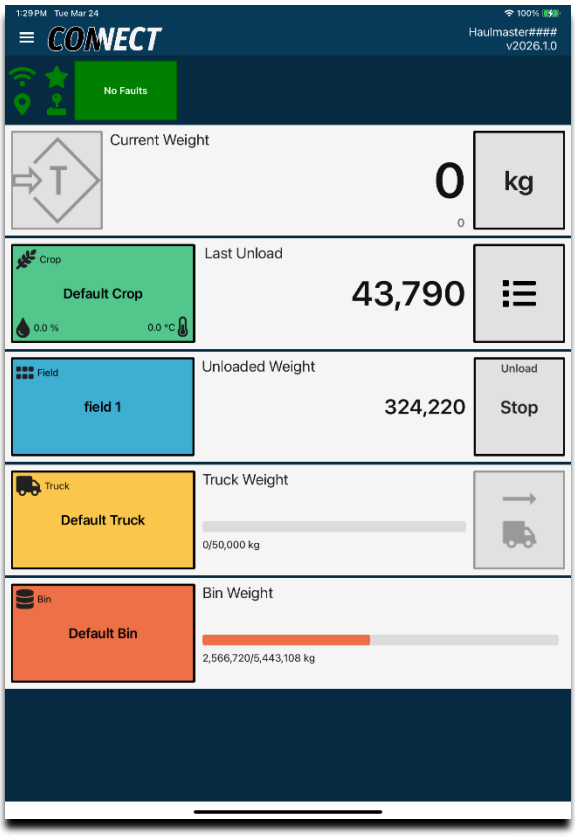


Figure 171 Cart Emptied

4.8 UNLOAD LIST, FUNCTIONS, & EDITING

This feature will allow you to view, add, edit, or delete unloads.

1. From the **home screen,** press the list button to the right of the Last Cart Unload Truckload, and the Unloads screen will appear.

2. The **truck** button changes the **view** to the truckloads view.

3. The **filter** button filters the types of unloads you want to see.

4. The mail button **emails** the unload list to an address.

5. The **plus** button adds a new unload manually.

VIEWING AND EDITING AN UNLOAD

By pressing any download in the unload list, you can view, edit, or delete any download. All information except the GPS location and calibration factor can be edited by pressing it.

MOVING AN UNLOAD TO A NEW TRUCK

1. Press the truck shown in Figure 173.

2. Select the truck you want to put it in.

3. If you want to **combine** the unload with another truck load, select the truck you want to combine it with.

4. If you want to create a separate truckload, press the + button and then select your new unload to go back.

5. Once back at the edit unload screen, press **Save**.

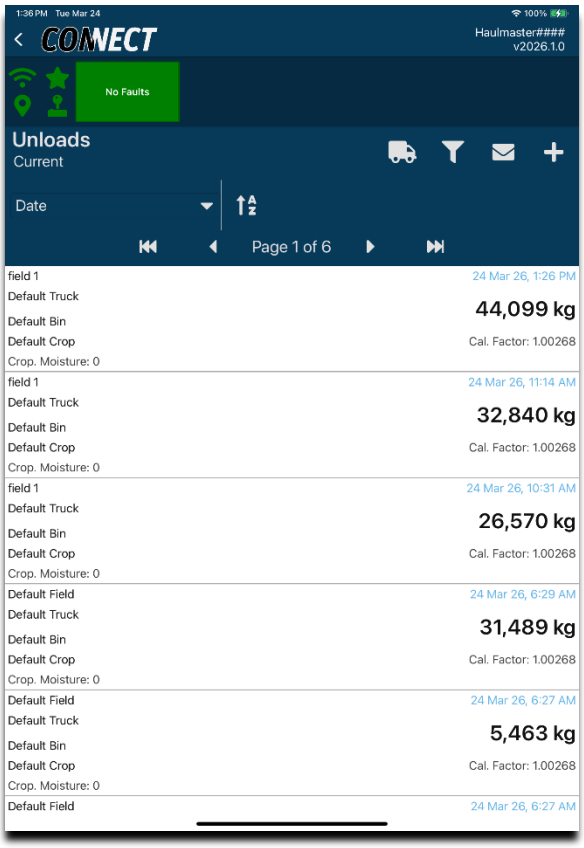


Figure 172 Unload List

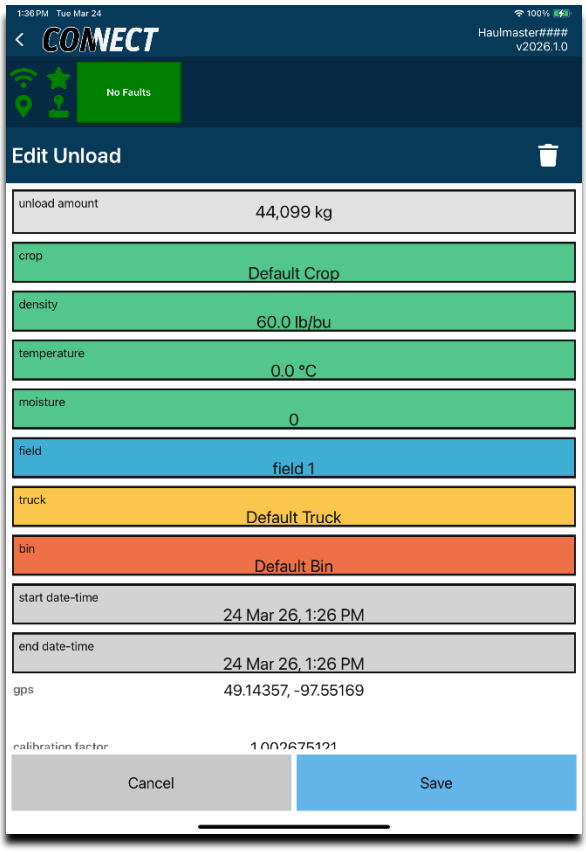
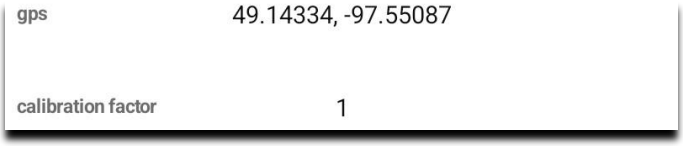


Figure 173 Edit Unload

OTHER SETTINGS

The **GPS** location of the cart is available if the cart is powered. This information is attached to automatically and manually **detected unloads**.



The unload can be deleted by pressing the trash button. This will **delete** all records of the **unload** and restore the bin, truck, and field totals as if the unload did not exist.

If desired, make changes and edits to the unload and press **Save** when done. Keep in mind, there is no undo button.

Press the **back arrow** or **"Cancel"** if you have made no changes or want to discard the changes.

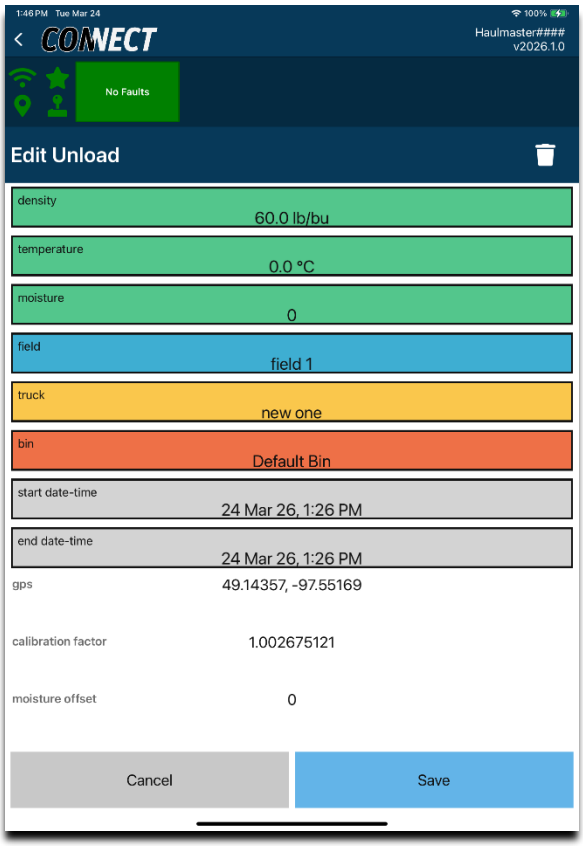


Figure 174 Edit Unload Page 2

MANUALLY ENTERING AN UNLOAD

An unload of any value can be made just by typing in the information.

1. From the home screen, press the unload list button

2. Press the **+** button, and the **New Unload** screen will appear.

Here you can create a new unload. **No GPS** location or **calibration factor** recorded with this unload. When looking through unloads, this is a good identifier that the unload has been entered manually.

3. Press the center of the **unload amount** box and enter the desired unload weight. Press **Set** when done.

4. Press the center of the **crop** box to access **Select a Crop**. Select the crop you want.

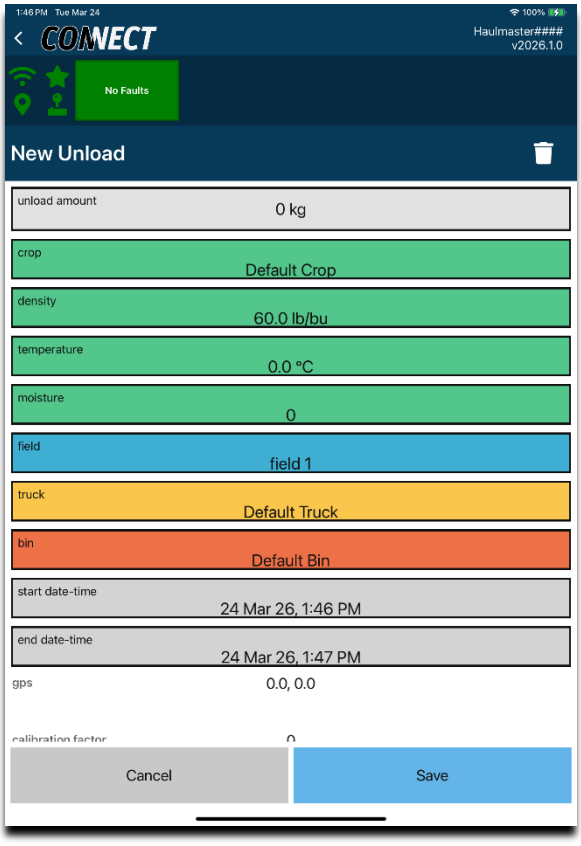


Figure 175 New Unload

5. **Density, temperature**, and **moisture** will update to match the selected crop. Press any of the three parameters to edit their values. These edits will only affect this unload. See section **3.8 General** for more information on density and temperature units.

6. Press **Field**, **Truck,** and **Bin** to select your desired parameters. See 4.2 FIELDS, 4.3 TRUCK, and 4.4 BINS for more information.

7. Press **start date-time** and then **end date-time** to edit their times.

8. When complete, hit **Save**. If you do not want to add the unload, press **Cancel** or the **back arrow**.

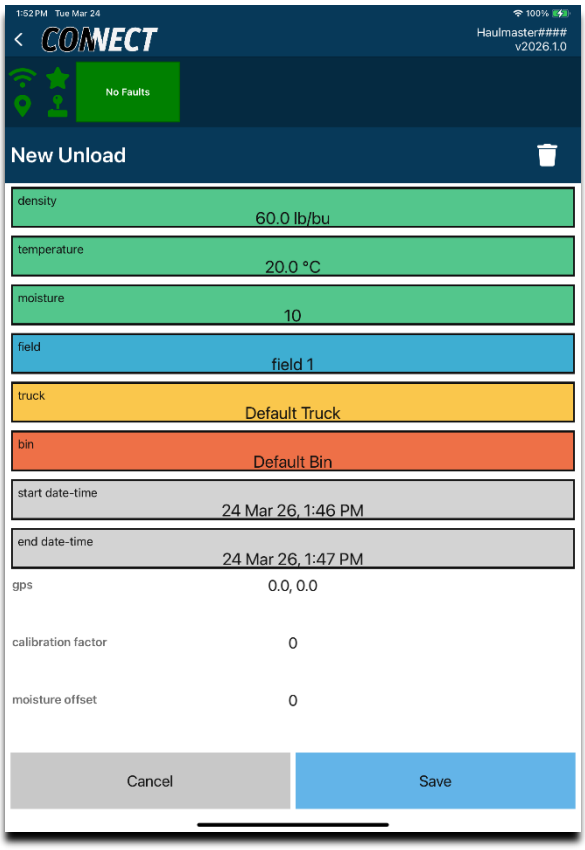


Figure 176 New Unload Part 2

CHANGING VIEW TO TRUCKLOAD VIEW

1. From the home screen, **press** the **unload list** button.

2. Press the truck button to take you to the unload's **Truckloads** view.

3. To go back to the **Unloads** view screen, press the menu button.

4. Like many of the screens, the **filter** button can be used to filter the results.

5. The **sort by area** and the ascending and descending buttons can be used to more **easily find unloads**.

6. The pages can also be changed using the forward and reverse buttons.

7. The unloads can also be **scrolled by swiping** the screen up or down over the unloads.

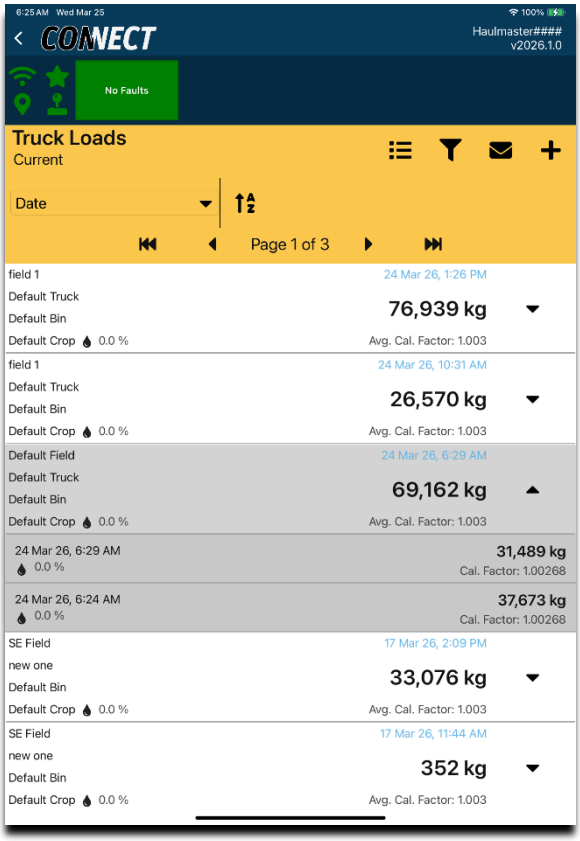


Figure 177 Truckloads

EMAILING AN UNLOAD LIST

1. From the home screen, press the **unload list button**.

2. To email the unload list, **disconnect** from the **Haulmaster Wi-fi** and **connect** the iPad to a Wi-fi or Hotspot with an **internet connection**.

3. Press the **mail** symbol on the Unloads screen to email the unload list in comma-separated values (CSV) format to an **email address**.

4. **Enter** your email address using the keyboard and press **Ok**.

5. You will receive a **Report Sent** pop-up when completed. Press **Ok** to acknowledge.

6. Check for an email from **noreply@elmersmfg.com**. Don't forget to check your email junk folder if the email isn't showing up.

7. The **email** will contain Unload.csv and Truckloads.csv.

Note: These files also contain deleted unloads, which may be useful if any were accidentally deleted.

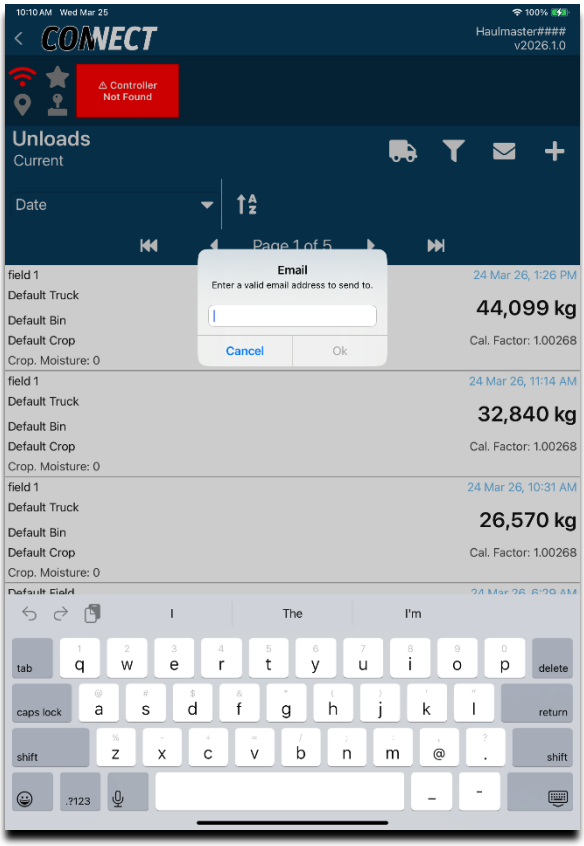


Figure 178 Emailing Unload List

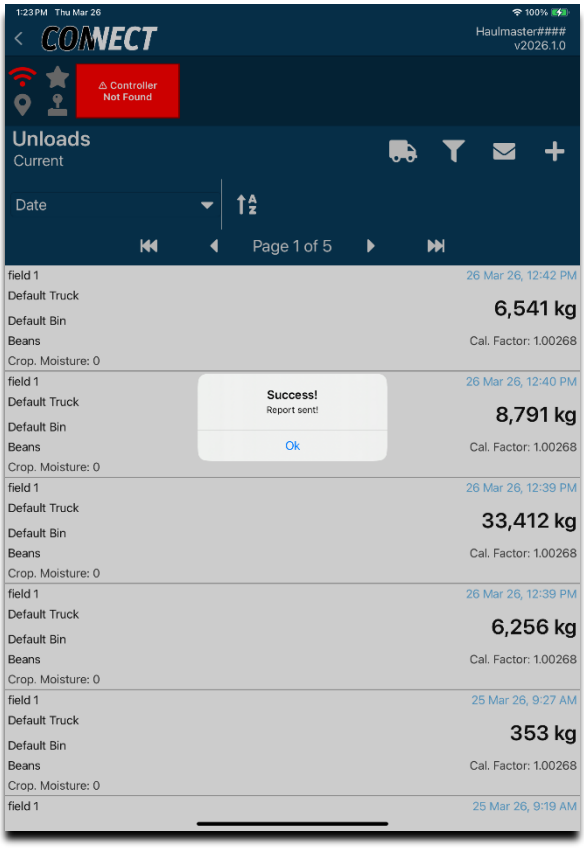


Figure 179 Success! Report Sent

4.9 MOISTURE SENSOR (OPTIONAL)

The moisture sensor provides a moisture reading for the crop as you are unloading. This reading will be displayed on the home page, and the average reading of an unload will be calculated and recorded with that unload. The moisture sensor will need to be set up and calibrated for each crop as required.

Figure 180 Crop Button

CALIBRATION PROCEDURE

Moisture sensor calibration is specific to **crop type** and must be done individually for each cart. Predefined crop types will include defined crop profiles. Custom crops must be assigned one of these predefined profiles before calibration. Calibration corrects the **sensor's offset** to match actual moisture measurements.

To set the crop to one of the predefined profiles:

1. Press the green crop type button shown in Figure 180.
2. Select edit on the crop you will be using.
3. Press **Moisture Sensor Settings** ▲
4. Press the **moisture mapping** button.
5. Press one of the **predefined crops** to map your crop to.

Note: The sensor manufacturer does not currently support PTO speed compensation. To ensure accuracy, always calibrate and unload at a consistent PTO speed.

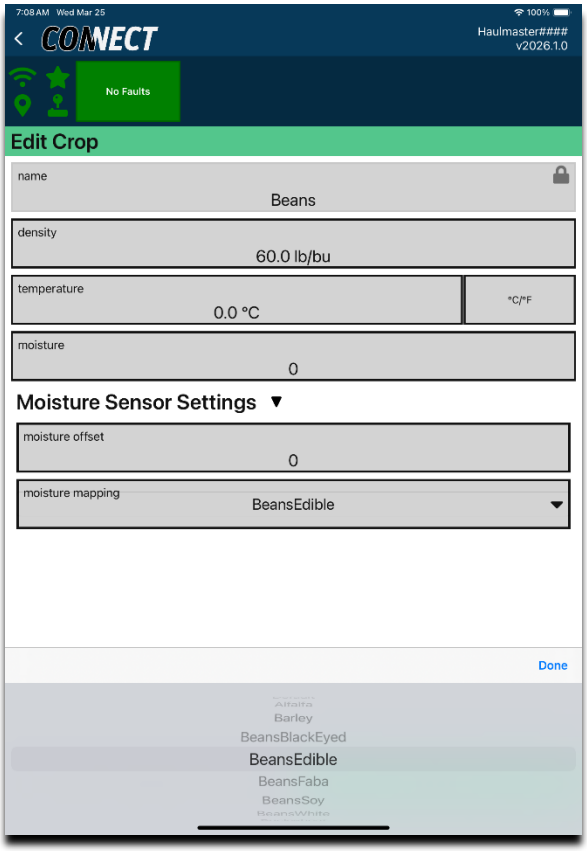


Figure 181 Predefined Crop Mappings

CALIBRATION BEST PRACTICES

1. Power on the grain cart.
2. Confirm the moisture sensor is active:
   - Check for temperature readings in the **Diagnostics** page or the **Dashboard**. When the sensor is connected, a live temperature reading will be shown.
   - Alternatively, ensure the sensor status shows "Moisture Sensor Connected: True" in **Diagnostics.** See Figure 182 on the next page.
3. Set PTO to your normal operating speed.
   Note: Higher auger speeds have a marginally lower moisture reading.
4. Begin unloading.
5. Open the gate enough to ensure **consistent crop flow** over the sensor.
   - **Low flow** can result in inaccurate readings due to poor crop contact.

6. Collect samples:
    - Take at least **three samples** (start, middle, and end of load).
    - More evenly distributed samples improve calibration accuracy.
7. Test your samples using the same method/device that will be used as validation for operations (e.g., local elevator or yard moisture tester).
8. Record:
    - **Unload average moisture** (from the unload page).
    - **Lab-tested sample moisture**.
9. Repeat with multiple loads of varying moisture levels for more reliable results.
10. Calculate the **average difference** between the unload log values and lab-tested values.
11. Enter this value as the **offset** in the crop edit screen and save.
12. If an existing Offset exists, add the new final offset to the existing offset.

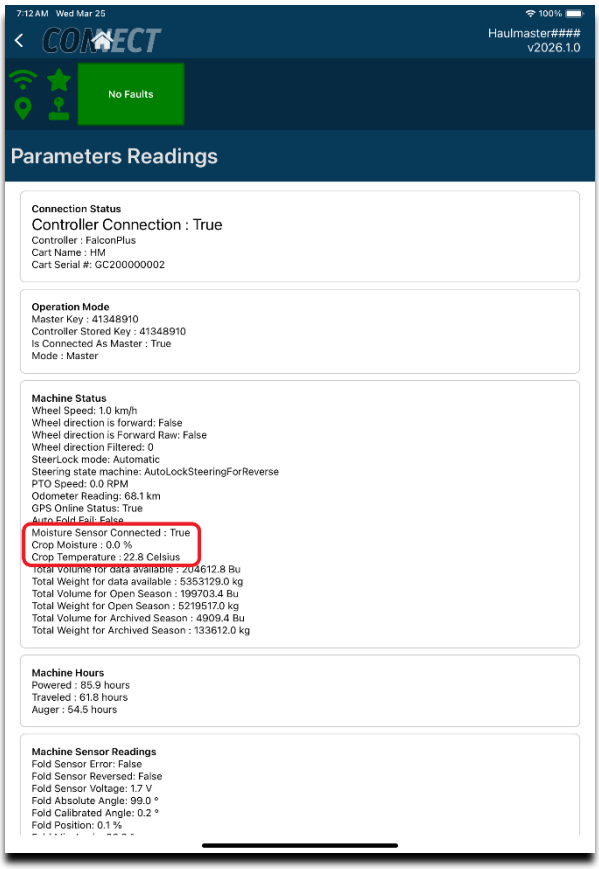


Figure 182 Moisture in Parameters

Wheat Example.

Unload #	Sample Result %	Unload Log %	Offset %
Unload #1	14.3	14.1	0.2
Unload #2	15.5	15.2	0.3
Unload #3	13.3	13.4	-0.1
Existing Offset	0	Final Offset	(0.4/3) + 0 = 0.13

Important: Calibrate once per crop. Recalibrate if the moisture readings become inconsistent or the operator changes their typical PTO speed.

Reminder: Always ensure to select the correct **crop type** before unloading and calibrating.

GENERAL MAINTENANCE

- At the start of each day, **clean the sensor face** to remove any crop buildup.
- Access the sensor through the **auger access door**.

PRODUCTION VALIDATION

- After installation, power on the system and open the app.
- Verify the sensor is recognized under **Diagnostics** and is reporting Moisture Sensor Connected: True and Crop Temperature data.

5. UPDATING APP AND FALCON CONTROLLER

The supplied iPad requires an Apple account and can update the app automatically when an update is available and the iPad is connected to the Internet.

To choose whether the app **updates automatically**, go to:

Settings> 

Scroll down to the bottom of the page.

Apps>

App Store>

Toggle App updates on or off to decide whether you want the app to update automatically.

If the Haulmaster Connect app is not set to update automatically, you must go to the App Store on your iPad**,** search for it, and press **Update.**

When you reopen the App, **accept the terms & conditions.**

Once the Connect app updates**,** you will have to update the controller when you connect to it.

OTHER DEVICES

If you have an Android device, you can use the Google Play Store and an internet connection to download or update it.

If you have an Android device and no Google Play Store account, you can download the app from Elmer's website and install it from the downloaded file.

Go to https://elmersmfg.com/firmware

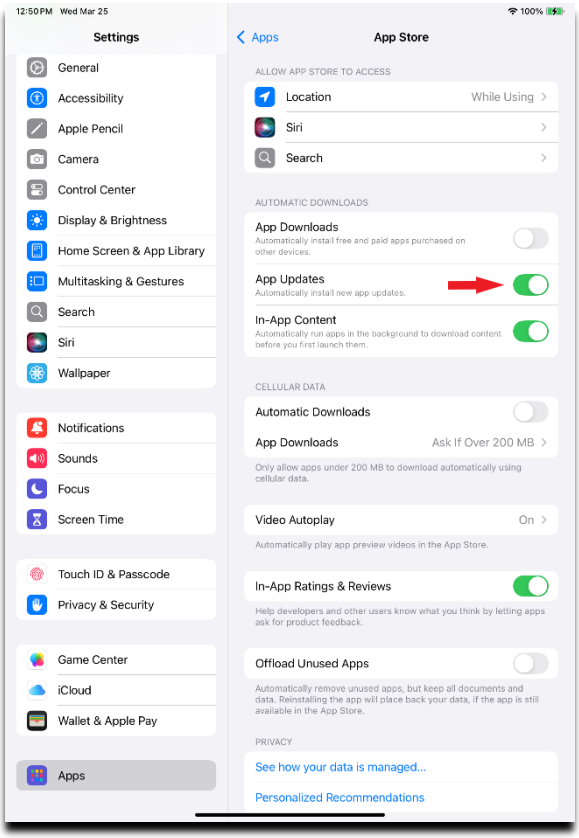


Figure 183 Automatic Updates

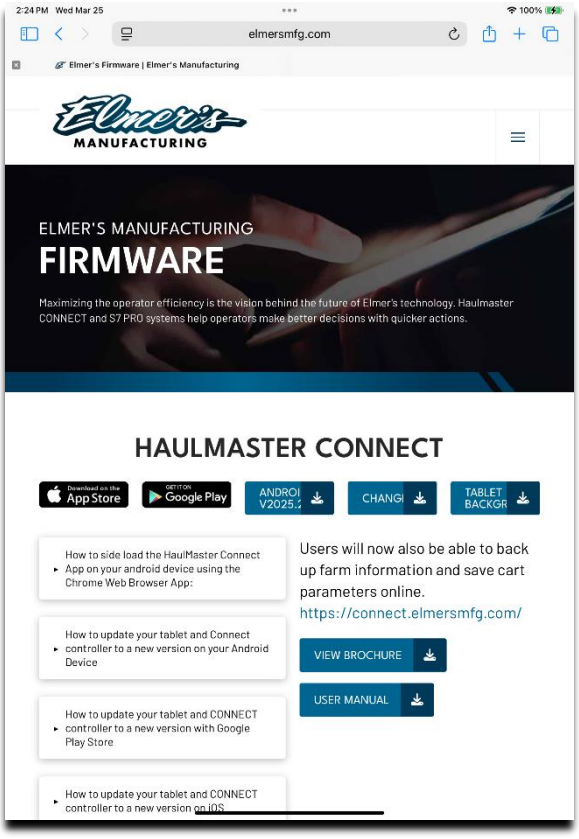


Figure 184 Elmer's Firmware Download Page

CONNECTING TO THE CART AND UPDATING THE CONTROLLER

After updating the Haulmaster Connect app, you must reprogram the controller.

1. **Connect** the iPad to the **controller Wi-Fi.**

2. Open the **Haulmaster Connect** app.

3. Once connected, the controller will prompt you to update. Press **Reprogram**.

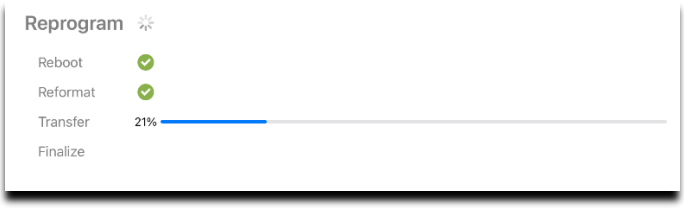
You will be taken to the **Reprogramming Screen** (Figure 186).

4. Make sure the **Selected Version** is the newest downloaded version.

WARNING: Do not shut the power off to the cart during this process; the cart may become inoperable.

5. Press **Start Reprogram**.

6. It will show the **progress** of the programming of the controller. It will take a minute or so.



7. Once completed, it is recommended to turn the controller **power off** and then, after a few seconds, turn the **power on.**

8**. Restart the app.**

9. **Reconnect** to the controller Wi-Fi if it doesn't reconnect itself.

Figure 185 Update Required

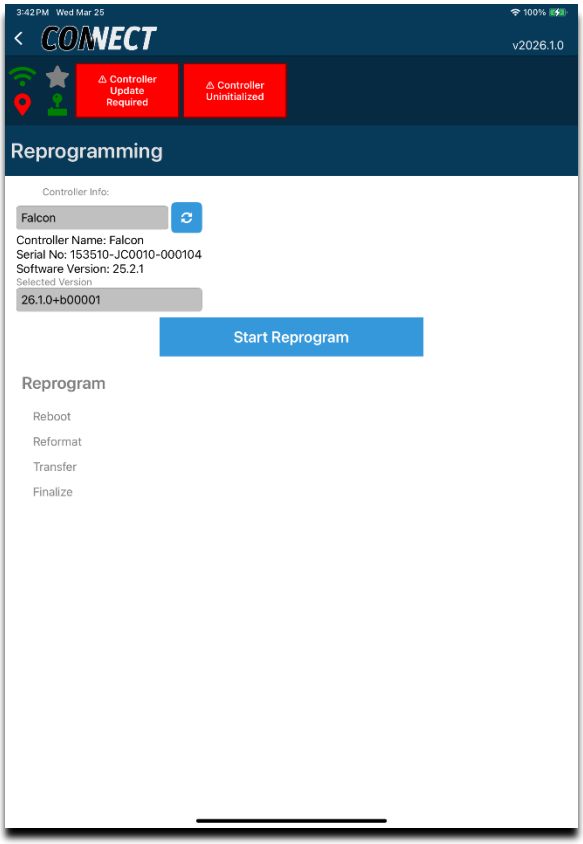


Figure 186 Start Reprogramming

6. JOHN DEERE GRAIN HARVEST WEIGHT SHARING

With the Haulmaster ISOBUS harness kit (14348500) installed and the tractor properly configured, the weight will appear as circled in Figure 187 below.

Figure 187 Harvest Weight Sharing

The Connect live cart weight, circled in the right picture, will be shown on your display as shown above.

Available for John Deere Gen 4 and Gen 5 displays.

An activated John Deere Gen 4 Premium 3.0, Gen 4 Automation 4.0, or G5 Advanced license, along with an active MTG/modem, is required to enable this function.

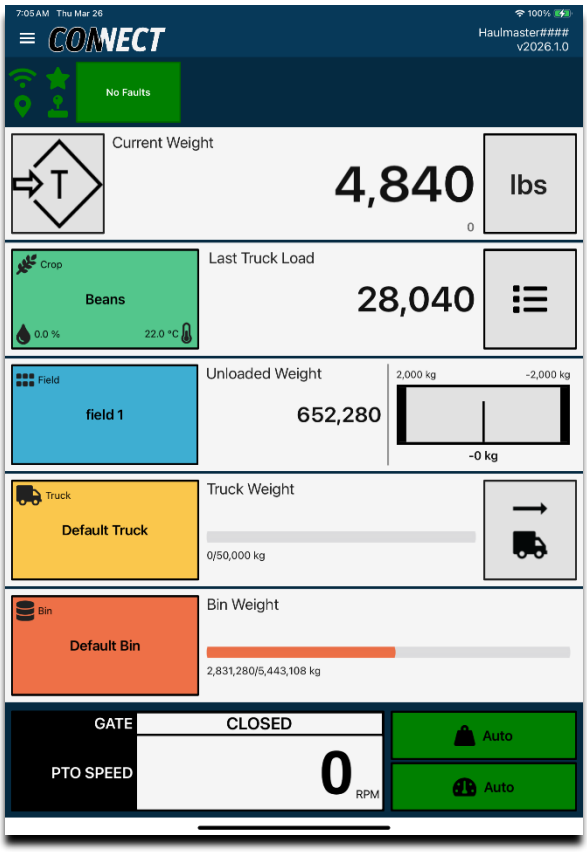


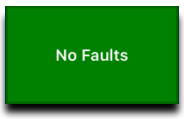
Figure 188 App Weight

7. WARNINGS, FAULTS, & MESSAGES

7.1 POP-UPS AND MESSAGES

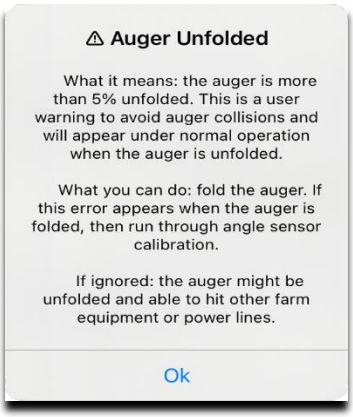
The home page of the Haulmaster Connect app displays several warnings, status, and fault indicators.

If there are **no faults** or warnings, it will display.



A **yellow** indicator gives a warning to the user.

If you press on the warning, it displays information about the warning.

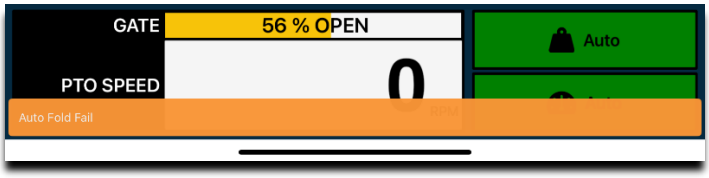


A **red** indicator indicates errors and problems.

If you **press the error**, it will display information about the error (see figure 190).

If you press **"Take me there,"** it will take you to a screen that will help you address the problem.

When a **fault or error** occurs, an audible alarm and visual warning will **pop up** at the bottom of the screen.



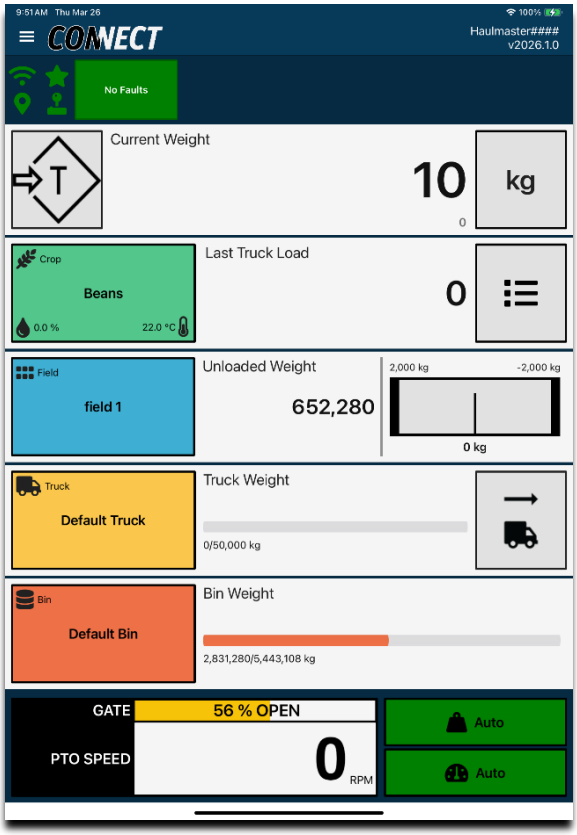


Figure 189 Home Screen Notifications

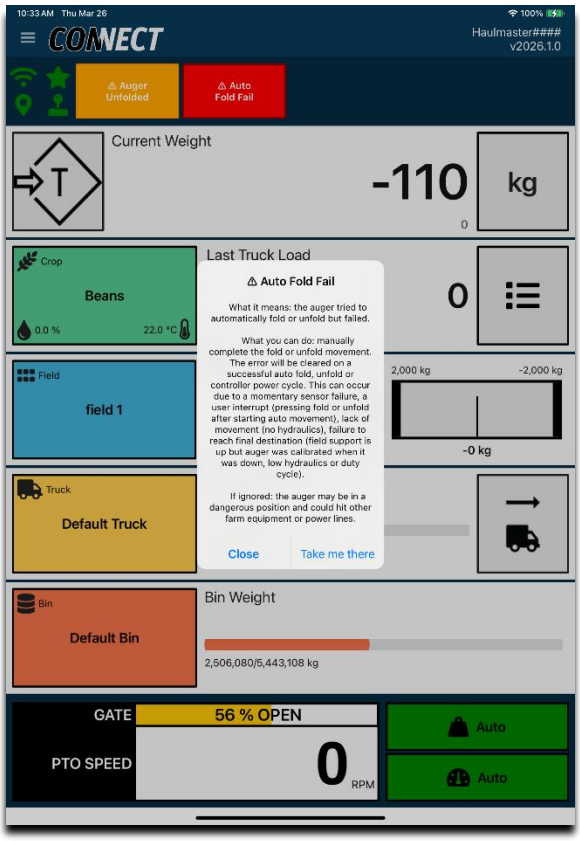


Figure 190 Solution Pop-Up

2 WEIGHT BALANCE WARNINGS

For safe cart handling, the weight must be properly balanced between the axle and hitch.

The indicator near the middle means the cart is balanced correctly. On an empty cart that has been tared, the reading should be close to zero.

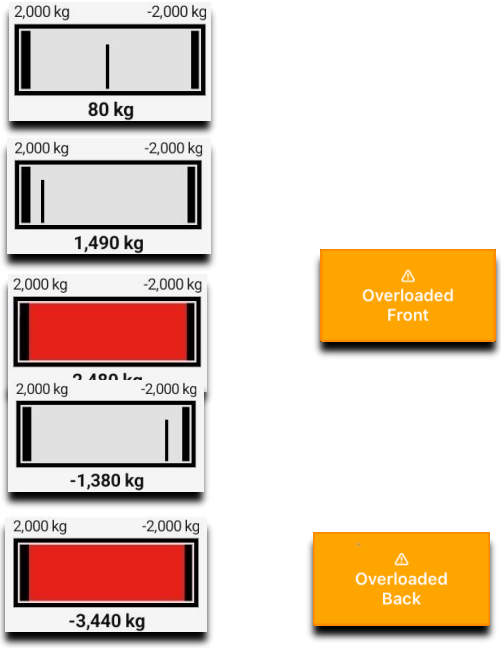
With more weight on the hitch**,** the bar will move left.

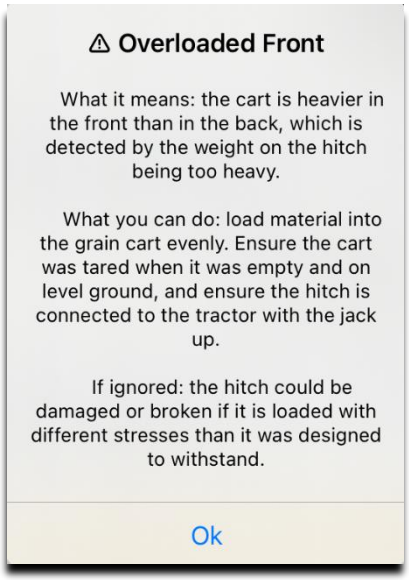
When the **hitch** gets **too heavy,** the indicator turns red, and a yellow warning appears.

When the **back** gets heavier, and **the hitch gets** lighter, the bar will move right.

When the **hitch is too light,** the indicator turns red, and a yellow warning appears. This could affect the tractor's handling.

If you press the overloaded back or front warning, the problem will appear as shown to the right.





8. TROUBLESHOOTING GUIDE

We strive to improve the user experience. Please check our website www.elmersmfg.com/connect to verify that our latest software is installed, which may address your issues.

1. PTO SENSOR NOT READING VALUE

Problem	Cause	Solution
The sensor light is always on when the shaft is rotated by hand.	The sensor is mounted too close to the PTO collar.	Take off the PTO shaft from the gearbox, and back away the sensor to 5 mm from the closest edge of the PTO collar.
The sensor light never comes on	The sensor is mounted too far 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
The sensor light never comes on when the shaft is rotated by hand.	The sensor does not have power. Harness B Aux 12V is not connected to Harness C Aux 12V	Trace Harness B 6 inches from the Connect controller to find the Aux 12V. Connect this to the Aux 12V on Harness C in the same area.
The sensor light never comes on when the shaft is rotated by hand.	The sensor does not have power. 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 connector that plugs into the sensor for 12 volts DC between pins 1 and 2. If voltage is present at Harness C and not at the sensor, replace Harness B.
The sensor light never comes on when metal is 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 iPad.	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 (PRO ONLY)

Problem	Cause	Solution
The “gate close on speed” indicator on the home screen won’t turn on or off when pressed.	Not currently the master iPad.	Surrender master mode from the master iPad. Request master mode from your current iPad. With master control (green star on the home screen), you should now be able to select or deselect the speed dial next to the RPM display.
The speedometer in the **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 labelled on the joystick, try driving forward again. Ensure under settings, calibration, outputs, that the gate max duty cycle is turned up.
The speed dial on the tractor is moving faster than 8 km/hr. The gate functions with a joystick.	The wheel speed sensor is not working.	Go to **Menu>Diagnostics> Parameter Readings** under the **Machine Status** heading, look at the wheel speed. Drive forward and verify that the wheel speed is approximately the same as the tractor's. If no wheel speed, see “WHEEL SPEED SENSOR NOT WORKING.”
The gate opens instead of closing.	Solenoid outputs are swapped.	See “JOYSTICK MOVEMENTS ARE DIFFERENT FROM JOYSTICK.”

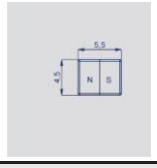
3. WHEEL SPEED SENSOR NOT WORKING

Problem	Cause	Solution
The 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. Since this sensor is the same as the PTO sensor, see “PTO SENSOR NOT READING VALUE” for all other troubleshooting tips.

4. AUTO GATE CLOSE - WEIGHT NOT WORKING

Problem	Cause	Solution
The auto gate closes on the weight indicator on the home screen, which won't turn on or off.	Not currently the master iPad.	Surrender master mode from the master iPad. Request master mode from your current iPad. With master control (green star on the home screen), you should now be able to select or deselect the weight button next to the RPM display.
The Auto Gate Close on Weight button is on; the truck weight is greater than the truck capacity on the home screen, 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 labelled on the joystick, try again. Ensure under **Menu> Calibration>Outputs** that the gate max duty cycle is turned up.
The gate opens instead of closing.	Solenoid outputs are swapped.	See "JOYSTICK MOVEMENTS ARE DIFFERENT FROM JOYSTICK".

5. ANGLE SENSOR ERROR (PRO ONLY)

Problem	Cause	Solution
The Sensor only reads 0 volts throughout the whole hydraulic movement.	The 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 that the sensor is plugged in.
The sensor only reads 0 volts throughout the whole hydraulic movement. Sensor connection has been verified.	Sensor damaged, harness damaged, or the magnet is missing.	If the magnet is present and its 5.5 mm edge is placed on the sensor, and it does not read, the sensor or harness may be damaged.
Sensor reads below 0.5 volts or above 4.5 volts	The sensor has the wrong magnet orientation	Flip the magnet 180 degrees on its north-south axis  
Sensor voltage does not change smoothly, or doesn't change when there is physical movement	Sensor mounting is loose.	If spout Z, check if the shaft set screw is tight. Check the mounting tightness of other sensors.

6. JOYSTICK NOT WORKING (PRO ONLY)

Problem	Cause	Solution
The joystick won't move any of the cart movements.	The hydraulics are not connected and turned on.	Verify HM Pro hydraulics are turned on and connected with the proper flow and 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, and the min pivot is 0% for full movement.
The joystick is connected, but the iPad 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.
The joystick is connected without the joystick extension, but the iPad shows a red joystick symbol.	The 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.
The joystick is not working, the GPS is not working, and a load cell malfunction is displayed in the app.	CAN network wiring problem or CAN device problem.	Unplug Joystick (JS), Thrasher, and Merlin CAN1-6 and MRLN-PWR from Harness C. Connect 1 device at a time to see if they work and to isolate the problem to a device or wire. If nothing works, repair or replace Harness C or its connections. In extreme cases, it may be a controller or its programming.
The joystick is not working through the app or the 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 are connectors labelled 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 that Aux 12V is connected between Harness B and Harness C.

7. JOYSTICK MOVEMENTS ARE DIFFERENT FROM JOYSTICK (PRO ONLY)

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 moved. Go to the hydraulic block and swap the movements to the corresponding 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.***

8. FOLD NOT WORKING (PRO ONLY)

Problem	Cause	Solution
Auger won't fold or unfold.	PTO is on.	Turn off the PTO. The PTO locks out the auger to fold and unfold.
Auger is unfolded but won't fold.	Spout Z won't go to its storage position.	When Auto controls are enabled, SpoutZ must move to its home position first. Go to **Menu>Diagnostics>Parameter Readings>** verify the SpoutZ **absolute** angle is within 10 degrees of the SpoutZ **stored** angle, and 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."
The fold or unfold movement is very slow, only works when holding the button, and has no automatic movement. Fold Limp Mode Warning in Error Notification Centre.	Limp home mode.	Go to **Menu>Calibration>Angle Sensor Calibration>** and verify that **automatic controls** are enabled. If disabled, complete the calibration. Verify no angle sensors are reading an error, see "ANGLE SENSOR ERROR"

9. HAULMASTER PRO FUNCTIONS NOT AVAILABLE, DISPLAYED AS CONNECT

Problem	Cause	Solution
The home screen is displayed as Connect. No PTO Speed or gate angle displayed.	Damaged Harness A.	Verify Harness D. The System needs to detect only one functioning sensor to enable HMPro. 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.

10. GATE TOO FAST

Problem	Cause	Solution
Closing or opening the gate is happening too fast.	The hydraulic flow is too high.	**Menu>Calibration>Outputs.** Reduce gate max duty cycle. Alternatively, turn down the hydraulic flow on the tractor.

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 **Menu>Calibration>Angle Sensor Calibration>**. Complete the calibration.
	The maximum fold duty cycle is set too high.	Go to **Menu>Calibration>Outputs** and decrease Fold Max Duty Cycle.
The angle sensor doesn't change position angle when folding or unfolding	Seized fold pin/ Loose locking bolts.	Verify that the auger fold pin is moving with the fold movement. The bolts should be lined up and tightened into the flat edges of the pin. For better control during this process, go into **Menu>Calibration>Angle Sensor Calibration>** and disable the automatic controls to put the cart into **limp mode**. This will remove SpoutZ home and move the auger fold/ unfold at a minimal speed.

12. AUTO FOLD / UNFOLD NOT WORKING (PRO ONLY)

Problem	Cause	Solution
Double-tapping the fold or unfold doesn't automatically fold or unfold. Holding the fold or unfold still functions. Auto Controls Disabled and Fold Limp Mode in the Error Notifications Centre.	Automatic controls disabled.	**Menu>Calibration>Angle Sensor Calibration>** and complete the calibration.
Double-tapping the fold or unfold starts automatically folding or unfolding, but stops in an **"Auto Fold Fail"** error.	Movement not fast enough and times out.	Check if the hydraulic pressure is high enough. If so, go to **Menu> Calibration> Outputs** and check if the duty cycles of the SpoutZ and Fold are high enough.
Double-tapping the fold or unfold doesn't automatically fold or unfold. Holding the fold or unfold still functions. Fold Sensor Error, ZSpout Sensor Error, or Sensor Harness Error, and Fold Limp Mode in the Error Notification Centre.	Angle sensor Error.	If the fold sensor or spout Z sensor is reading an error, the cart goes into limp mode, see "ANGLE SENSOR ERROR".

13. SPOUT MOVEMENTS NOT WORKING

Problem	Cause	Solution
Spout movement won't work.	Auger is not unfolded.	Under settings, diagnostics, parameter readings, the 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 **Menu> Calibration> Outputs,** increase Z Home Duty Cycle.
Spout Z won't go to its storage position.	Duty Cycle is too high	Under **Menu> Calibration> Outputs,** decrease Z Home Duty Cycle.

14. GATE KEEPS CLOSING (PRO ONLY)

Problem	Cause	Solution
The open gate keeps closing or won't open.	Auto Gate Close is triggered by speed or weight	Turn off the Auto Gate Close features. If using only Auto Gate close for weight, clear the truck weight in the app on the home screen or turn off the feature, the weight symbol next to the gate position should be grey 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 grey.

15. 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, the Wi-Fi may be unavailable with a damaged CAN network. Unplug the Merlin's 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 connected light is green on the Thrasher.	Connector C is disconnected from the HM Connect Controller.	Verify HM Connect Harness is fully inserted into the HM Connect Controller. If the connector is properly seated, verify voltage on connector C pin 5 and 12 is 12 volts DC, and 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.

16. LOAD CELL MALFUNCTION

Problem	Cause	Solution
The home screen displays the error Load cell malfunctions.	Unplugged Merlin	Verify both Merlins are fully plugged in.
The home screen displays the error Load cell malfunctions.	Damaged CAN Network.	Unplug the Thrasher Extension and the Joystick extension to try and isolate the problem.
Load cells 2 to 4 are not displaying proper values when loaded	Merlins 1 and 2 are not connected to the proper connector on the harness.	Go to **Menu>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 wires are plugged in. Merlin 1 should go false when MRLN1-A is unplugged. If Merlin 2 goes false when MRLN1-A is unplugged, swap MRLN1-A with MRLN2-A. MRLN1-A and MRLN1-B should be connected to the same Merlin.
Load cell weights are changing by thousands of KG	Loose EX+ and EX- wire in a cable to the load cell.	Shake and wiggle individual load cell connectors. When one load cell visibly affects the weight of all other load cells in diagnostics, open the connectors and look for a loose black or red wire.
The load cell is reading 0 or a n amount larger than 2 million.	The signal wire is shorted to ground, or EX+ is shorted to ground.	Open the connectors on the load cell, reporting a steady 0, and look for wire threads touching another wire.

17. FALSE GATE OPEN (PRO ONLY)

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

18. MASTER CONTROL NOT ACTIVE

Problem	Cause	Solution
The home screen star is grey, not allowing for full control of the app.	Not the Master iPad	Press the mode star at the top left of the app to get to the mode screen. In the mode screen, **request the master connection**. If the Master mode request is timed out, another iPad is the master and needs to surrender master control from this screen. If there is no other iPad 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.

19. 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 see all your edits in this screen, waiting for the master connection. Ensure the iPad is connected to the HM Connect controller and is also in master mode.

20. APP JOYSTICK ISN'T WORKING

Problem	Cause	Solution
The App Joystick functions are not moving any of the cart movements.	The are not connected/ hydraulics turned on.	Turn on the hydraulics to the cart. Try reversing the direction of hydraulic flow if it is still not working.
Buttons are greyed out.	The physical joystick was plugged in after the app joystick page was entered.	Unplug the physical joystick.

21. GPS NOT WORKING

Problem	Cause	Solution
The GPS map marker is red on the home screen.	The GPS controller is disconnected.	Plug in the GPS controller or the Thrasher Extension harness.
The GPS map marker is red on the home screen.	Damaged CAN Network.	See "HAULMASTER NETWORK NOT AVAILABLE." Damaged CAN Network.

22. WEIGHT CALIBRATION

Problem	Cause	Solution
Calibration ratio number is different than the known weight/ uncertified weight ratio.	Pre-existing calibration ratio	The formula for the calibration ratio is equal to the 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.

23. CAN'T E-MAIL UNLOAD LIST

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

24. CAN'T SEE LAST SEASON'S INFORMATION

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

25. 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 that you stop to let the current weight settle for a couple of 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 timed out if the weight stops decreasing for 5 seconds. Try unloading in a more fluid motion rather than starting and stopping.

26. WEIGHT DRIFTING

Problem	Cause	Solution
The cart's weight keeps drifting.	Bad load cell or connections.	Go to **Menu>Calibration>Load Cells.** Identify which load cell may be drifting. Check the connections inside the load cell connectors and verify the cable is not damaged.

27. WI-FI DISCONNECTING

Problem	Cause	Solution
Wi-Fi is cutting out.	Multiple local networks, such as Wi-Fi cameras.	Use a Wi-Fi Analyzer app to determine other network channels. See **3.7.1 WI-FI SETUP** to change the controller Wi-Fi channel to something as far from the other networks as possible.
Wi-Fi is cutting out, and controls are lagging.	Controller memory is getting full.	If an excessive number of unloads are recorded, back up, then archive the season. If log files have been turned on for a long time, turn them off and clear them.
Wi-Fi is cutting out or not working at all.	Bad power connection between the tractor and the controller. The controller will still be working and have power.	Check the tractor power connector for corrosion. Check all pins and connectors for connection issues on the 12V supply.

28. EXTERNAL DISPLAY PROBLEMS

Problem	Cause	Solution
Display is blank.	Bad connection in the power wiring.	Check for 12V across pins 1 and 2 of the display connector. If there is no power, check wires and connections feeding the Thrasher GPS.
Display reads SOF-30	There is no communication to the display.	Ensure display type is set to Agri Tronix in App. Reprogram Thrasher GPS if possible. If Thrasher is working, check the pins on the Y adapter and the Thrasher extension cable.
Display shows -99999	The weight reading is out of range	If the app weight is correct, cycle units in the app. If the app weight is incorrect, troubleshoot the weighing system.

MANUFACTURING

HM PRO CONTROLLER OPERATOR'S MANUAL

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