FarmTRX™

YIELD MONITOR AND MOISTURE SENSOR OPERATOR'S MANUAL

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SAFETY INFORMATION

Read this manual and the safety instructions carefully before installation and operation of the Yield Monitor and Moisture Sensor.

- Follow the safety information provided in this manual.
- Install the system on a level surface, with the combine parking brake applied.
- If you require assistance in installation, refer to the Yield Monitor Installation Manual or contact FarmTRX Support for guidance.
- Follow all safety labels affixed to the system components.

When operating the machine after installing the Yield Monitor and Moisture Sensor:

- Be alert and aware of your surroundings.
- Do not operate the FarmTRX system while under the influence of alcohol or drugs when impaired.
- Remain in the operator's position in the machine at all times while the system is engaged.
- Follow all safety instructions issued by the machine maker while in operation.

Electrical and Wiring Safety:

- Always verify that the power leads are connected to the correct polarity as marked.
- Verify that all cables and connectors are away from sharp edges and are not pinned.
- Ensure wiring is routed away from moving parts of the combine.

INTRODUCTION

This manual describes the in-cab components for operation of the FarmTRX Yield Monitoring System, including a brief overview of installation, detailed setup of the mobile application and troubleshooting operating issues. The Yield Monitor consists of optical sensors, a data logger, grain moisture sensor (optional), GPS antenna and CANBus compatible wiring. The data logger installs in the cab of the combine with sensors installed on the clean grain elevator. Yield data is uploaded to the cloud-based FarmTRX Web Application by the operator using their mobile device or tablet and is automatically processed into corrected precision yield maps.

We encourage users to read this manual closely to learn more about the special features of the product and to ensure complete setup of the system. We advise storing the Operator's Manual in the combine for help when first getting started with the system and for seasonal reminders on operation.

HOW IT WORKS

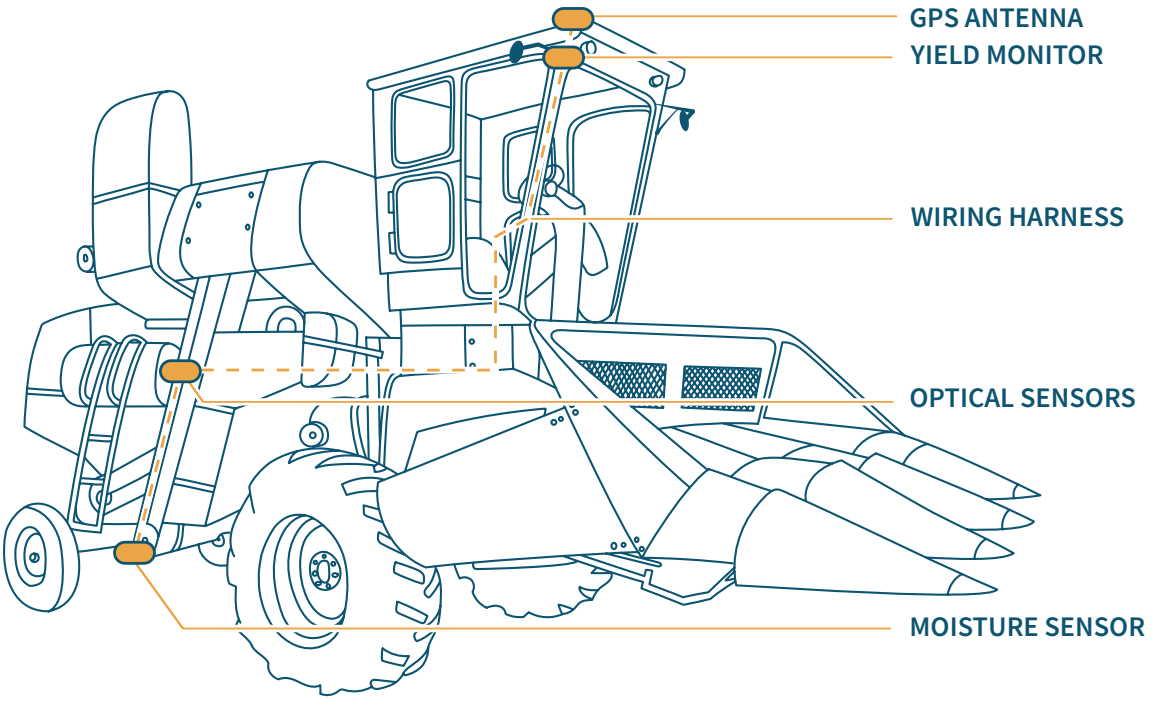
The optical sensors install directly opposite of each other on the up-side of the combine clean grain elevator. A light beam is emitted from the Sensor Transmitter on one side and received by the Sensor Receiver on the other. The Yield Monitor measures the amount of time that the Sensor Receiver is obstructed (by passing grain and elevator paddles) to record grain yield. The raw sensor readings are always recorded, providing that the Yield Monitor is powered on, whether the Mobile App in-cab display is connected or not.

The typical pre-harvest calibration process includes crop type, header and sensor calibration so that the width of the elevator paddles may be measured and combine tared. However, whether pre-harvest calibration was accurately completed before harvesting or not, the optical sensors will still record accurately via relative difference measured in yield. The process of calibration is that of correlating those differences recorded by the sensors with actual differences in your yield.

Users can post-calibrate with the FarmTRX Web Application by inputting a measured volume or weight from a scale or an elevator ticket. Therefore, if calibration is incorrect or unsuccessful the ability to get accurate yield data and yield maps is unaffected.

There may be exceptions to this. A broken elevator chain, extreme variability in test weights, incorrect combine settings, or not filtering enough foreign material or chaff will affect yield accuracy. Providing that the machine is in good operating order, calibration should not impact a user's ability to get accurate data and precision maps.

SYSTEMS OVERVIEW



GPS Antenna: an external multi-constellation antenna (GPS/GLONASS/Galileo) connects to the Yield Monitor via an SMA connector. When mounted on the centerline of the combine, the antenna will provide better positional accuracy than the internal GPS antenna within the Yield Monitor data logger.

Yield Monitor—data logger:

- Central Processing Unit
- 32GB on-board storage (over 250,000 acres)
- Internal GPS antenna
- Bluetooth© connectivity
- Publishes GPS location, speed, yield and moisture to the CANBus (compatibility currently includes Climate FieldView™)

The Yield Monitor mounts in the cab of the combine and needs to be wired into switched 12V-28V power.

Wiring Harness: connects the Yield Monitor to the optical sensors installed on the clean grain elevator.

Optical Sensors: install on opposite faces of the clean grain elevator and measure grain using a light beam.

Moisture Sensor: optional component to the yield monitoring system. The Moisture Sensor installs at the base of the clean-out hatch door and measures the sensed moisture of grain.

FULL COMPONENTS OVERVIEW

Components:

1. Yield Monitor—data logger
2. Moisture Sensor
3. Optical Sensors
4. Mounting Plates
5. 8 ft. (2.4 m) Sensor Interconnect Wiring Harness
6. 20 ft. (9 m) Primary Wiring Harness
7. Drill Guide Kit
8. External GPS Antenna

Not Pictured:

1. Parts Bag
   a. Electrical T-Splice Connectors
   b. Zip ties
   c. Alcohol Swabs
   d. 2-9/16” (65mm) Hole-Saw

INSTALLATION

GETTING STARTED

Tools Required:

Yield Monitor

1. Power Drill
2. 5/32” (4 mm) Drill Bit (included)
3. 3/4” (18 mm) Step Drill Bit (included)
4. Pliers, Vice Grips, or Side Cutters
5. Center Punch
6. Measuring Tape
7. Marker, Pen, or Pencil
8. Slot Screwdriver
9. Masking Tape
10. Round Bastard File

Moisture Sensor

1. Paper Cutting Template (included)
2. Center punch
3. 2-9/16” (65mm) Hole-Saw
4. Angle Grinder with Cut-off Wheel Blade
5. 3/32” (2.5mm) Allen Key/Hew Wrench
6. 1/4” (6.5mm) socket
7. 11/32” (8.5mm) socket

First Steps

Make sure the combine is turned off with the parking brake applied. Installation of the Yield Monitor and Moisture Sensor should be completed on a flat surface.

Registration

Register your new account at www.FarmTRX. com/register/. Upload or draw field boundaries in your FarmTRX Web App account for your recorded yield data to populate in the correct fields.

Cleaning

Remove dirt and debris from the elevator surface by cleaning with a damp cloth. Use the supplied alcohol wipes to completely clean oil and residue from the sensor installation locations on the clean grain elevator. This will ensure proper adhesion of the sensor mounts to the elevator. DO NOT USE soap as this will leave behind a residue.

Elevator Chain

The elevator chain should be inspected and tightened to manufacturer specifications. If the elevator chain is overly loose with paddles damaged or missing, the accuracy of yield readings will be negatively affected.

Update the FarmTRX App

Download the latest version of the FarmTRX Harvest App on the Apple App Store or Google Play Store. If using the Moisture Sensor in stand-alone mode, download the latest version of the FarmTRX Moisture Application on the Apple App Store or Google Play Store.

INSTALLATION OF THE YIELD MONITOR

The content covered below is a general installation overview, not a step-by-step guide. When installing the Yield Monitor for the first time, follow the complete instructions within the Yield Monitor 2.0 Installation Guide at www.FarmTRX.com/documentation/.

Installation of the Yield Monitor consists of four general phases:

1. Choosing and Drilling Sensor Locations
   Two optical sensors install on the up-side of the elevator and record the amount of grain on each paddle by measuring the time that the sensor light is blocked. The Yield Monitor will automatically transfer yield data to your Web App account with data sync completed through the mobile app.

To obtain the most accurate readings, the placement of the optical sensors should meet the following criteria:

a. Sensors should be installed as high up the elevator as reasonably possible, in a place where the inside and outside of the elevator can be accessed. Take care to ensure the sensors do not come in contact with moving parts on the combine.

b. Sensors should be centered on the paddles of the elevator chain. Some elevator chains may have brackets supporting the paddles which can interfere with the sensor beam. If this is the case, you can cheat the sensor location outwards to avoid the brackets.

With sensor location marked, a 3/4" (18 mm) hole will be drilled into the front face of the elevator.

2. Installing QuickConnect Sensors
Sensors will come with QuickConnect Mounting Plates and Drill Guide. The Mounting Plates fix to the elevator walls by removing the adhesive backings and pressing to the elevator for at least 15 seconds.

The Drill Guide and Drill Extension allow for straight-through drilling from the front to the back wall of the elevator, so both sensor holes are level and to ensure a simple and precise installation.

3. Installing the Yield Monitor—data logger
The Yield Monitor—data logger installs in the cab of the combine and is powered by 12V-28V switched power. The external GPS antenna is mounted to the roof of the cab on the centerline, connecting to the Yield Monitor through an SMA connector. When connected to the external GPS antenna, the monitor can be mounted anywhere inside the cab.

If you cannot use the external antenna, the Yield Monitor contains an internal GPS. In this case, mount the monitor along the centerline of the combine above the headliner with the label facing skyward. Please note that this is not viable with a metal cab roof. The monitor should be mounted in a dry, dust-free location.

4. Wiring
The Primary Wiring Harness should be routed outside of the cab and towards the clean grain elevator. The harness can exit through the base of a window if the seal allows, at an existing wiring grommet or by drilling a new location. Avoid any moving parts of the combine.

TESTING THE YIELD MONITOR

Once the optical sensors are installed and connected to the Yield Monitor, the system can be tested in the following ways:

1. Power on the combine. This should power on the Yield Monitor wired to switched 12V power.

2. Test the power: using your smart phone or tablet, download and open the FarmTRX Harvest App and navigate to the Connection page to search/scan for Bluetooth© devices. A device called "YM:___" should appear under Available Devices. If it does not appear, try pressing the refresh button. If it still does not appear you may need to cycle Bluetooth© on your phone or tablet off and on.

3. Test the optical sensors: with the combine powered on (the engine does not need to be running for this), go to the clean grain elevator and turn the thresher drive by hand. When the empty paddles pass by the optical sensors, the Receiver Sensor with the LED lights will blink. If blinking occurs then the optical sensors are powered on correctly and in alignment.

INTERPRETING THE YIELD MONITOR LEDS

Use the below chart to interpret the state of the Yield Monitor as indicated by the LED:

State	Colour	Flash
POWER ON	Red	Solid
OPERATING	Green	Solid
READY	Green	Flashing
WARNING	Orange	Flashing
ERROR	Red	Flashing
ACQUIRING BLUETOOTH© CONNECTION	Blue	Flashing

MOISTURE SENSOR INSTALLATION

For step-by-step instruction on installing the Moisture Sensor, refer to the Moisture Sensor 2.0 Installation Guide at www.FarmTRX.com/documentation/.

1. Choose Sensor Location

   - The Moisture Sensor installs on the base of the clean grain elevator on the lower door and takes capacitance readings from grain as it moves through the elevator. The raw data gathered from the Moisture Sensor is sent to the Yield Monitor for display during harvest, then wirelessly uploaded to create precision moisture maps viewable through the FarmTRX Web App.
   - Installation varies from combine to combine. The key to installation location is to install close to where grain exits the cross auger and near the lowest point of the door.

2. Cut Sensor Hole

   Cut a hole in the hatch door for the Sensor to occupy by positioning the Moisture Sensor Cutter Template on the inside of the door and using a 2-9/16” (65mm) hole-saw to create two hole-saw circles. Clear the remaining pieces with an angle grinder cut-off wheel blade or using a plasma cutter.

3. Mount Sensor

   Mount the Moisture Sensor Flange on the inside of the hatch door and place the Moisture Sensor onto the Flange. Secure the Sensor and Flange into place using the supplied bolts, washers and nuts with the notch at the base of the Sensor cable aligning with the notch in the Flange.

4. Tighten Into Place

   Secure the lid of the Sensor onto the outside of the hatch door using the Nyloc nuts. Take care not to overtighten.

5. Connect

   Attach to the 8 ft. (2.4 m) Sensor Interconnect Wiring Harness.

SETTING UP THE HARVEST MOBILE APP CHECKLIST

The FarmTRX Mobile App is the primary way of communicating with the Yield Monitor and Moisture Sensor. Through the app the user can: monitor live yield and moisture data, calibrate the Yield Monitor and Moisture Sensor, change crops and headers as well as upload yield data to the Web Application for processing into yield maps.

This overview will outline the initial setup on the Harvest App for first time users, as well as guide users in seasonal setup before harvesting. For detailed Mobile App setup, refer to the *MOBILE APP NAVIGATION AND FUNCTIONS* section.

Compatibility

The FarmTRX Mobile App is compatible with most mobile devices. Android devices are required to have Android 4.4 or newer. iOS devices are required to have iOS 8 or newer. The devices used must have Bluetooth© connectivity. Android requires Location Services to be on for making Bluetooth© connections to devices. Below is a condensed list of the general devices that can be used.

- iPhone
- iPad
- iPod Touch
- Android Phone
- Android Tablet
- Amazon Fire Tablet

Update

Before configuration, the Mobile App should be updated to the latest available version, via the Apple App Store or Google Play Store for Apple or Android devices respectively.

In-App Help

To guide the user though the app, most screens have help messages. Help messages provide tutorials and explanations to assist users. Access the help function by selecting the question mark icon.

1. Press on the specific part of the app where you would like assistance
2. Press the right side of your screen to progress through the tutorial
3. Press the left side of the screen to go back to a previous step
4. The “skip” button closes the tutorial

IN THE YARD

Device Setup

1. Connect to Bluetooth©

   From the Connection page of the app, connect to your Yield Monitor via Bluetooth© by pressing the “Connect” button on the desired Yield Monitor and wait for the connection steps to complete. Periodically, FarmTRX updates the firmware on the Yield Monitor. These updates are done Over-the-Air and you will be prompted to update firmware if your Yield Monitor is not up-to-date during the connection process.

   - Press “Ok” if firmware update required
   - Wait for the update to complete. Do not disconnect from the Yield Monitor or turn off your device. This will take several minutes depending on your device. You will need to reconnect the Yield Monitor after the update.

   If the Moisture Sensor’s firmware is not up to date, you will be prompted to update upon connection.

When connection is successfully established, you will be directed to the Live Harvesting screen automatically.

2. Add Headers

- Navigate to Add/Edit Headers by using the icon. There will be a default header in the list already, this can be deleted or edited
- Press the Add Header button at bottom of screen. Enter header name, type, and width. Width can be entered in meters or feet
- Repeat for all headers the combine may be using

3. Add Crops

- Navigate to Add/Edit Crops by using the icon
- The default crop list will already be populated.

  If you want to add custom varieties or additional crops not found in the default list, press the Add Crop button at the bottom of the screen
- Enter Crop Name, Crop Category, Test Weight, and Dry Moisture (value the elevator considers as “dry”). Confirm units chosen are correct.
- The crop can be saved once the crop name is entered. Default values will be used for all other fields if not specified by the user

4. Live Harvesting Screen

a. Change Display

- Long press any tile you would like to change until a menu appears
- Select the value you would like to be displayed

b. Changing Units

- Press the unit text at the bottom of the tile to open the available units for that measurement
- Select the unit you would like displayed
- You can have multiple tiles set to the same measurement, displaying different unit values. For example, you can have Yield displayed in both bu/ac and lbs/ac side by side.

c. Selecting Crop/Header

- Long press the Crop or Header tile on the Live Harvesting page until a menu appears
- Select the correct crop being harvested and/or header in use
- If the wrong crop was selected for a section of the field, you can correct this later in the Web App

5. Sensor Calibration

For accurate calibration of the optical sensors, ensure the combine is stationary with engine at full throttle and threshing clutch engaged.

- Navigate to the Device Calibration page
- Press “START CALIBRATION” under Sensor Calibration
- Press the box beside each condition (a checkmark will appear) once each condition is met
- Press “Ready” to start the calibration
- When the calibration has finished, press “Complete”
- If calibration was unsuccessful, an error message will appear. Make sure your optical sensors are properly installed, and the combine is stationary and running at full throttle with the threshing clutch engaged

IN THE FIELD

Machine Setup

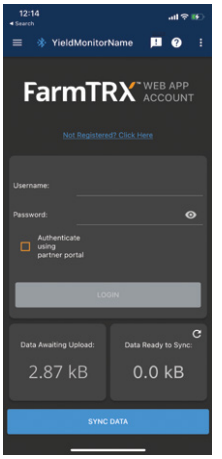
1. Set Processing Delay
    - Press “Edit Delay” in Device Calibration
    - Enter the processing delay in seconds (time from cutting head to sensor measurement e.g. 10 seconds) or (time from cutting head to sensor reading/ value display)
2. Crop Calibration
    - Navigate to the Crop Calibration page from the main menu. Ensure that all listed conditions are met and press their associated boxes on the checklist
    - Press “Start Calibration” and begin harvesting
    - Press “Pause” as soon as harvest is unloaded. Enter measured weight and/or volume, along with measured moisture (if available/applicable). Press “Complete”
3. Moisture Sensor Calibration
    - Obtain a moisture sample while harvesting
    - Press “Edit Average” on the Crop Calibration screen
    - Enter the measured values from the sample

Post-Harvest Calibration

Calibration can be completed after harvest by inputting a total known yield with the FarmTRX Web App.

- Log in to your Web App account and Select Field Editor Tab
- Select the field you want to edit. Edit the field by clicking the pencil icon or right click field name and press “Edit Field”
- Enter a known yield under Input Total Yield—select the appropriate unit (measurement is for entire field total, not field average)

MOBILE APP NAVIGATION AND FUNCTIONS



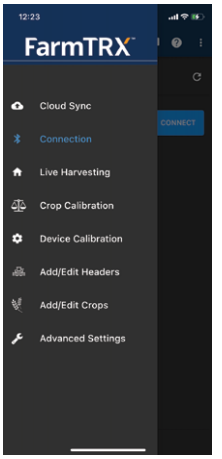
LOGIN

1. If you have not already registered for a FarmTRX Web App account, press “Not Registered? Click Here”
2. Enter your username and password into the designated fields
3. Press “LOGIN”

LOGOUT

Press the “LOGOUT” button below your username.

MOBILE APP BAR



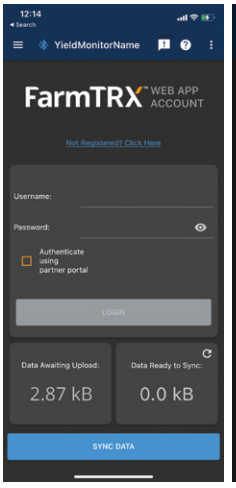
The navigation drawer allows for easy navigation throughout the app. Press the three horizontal lines in the top left corner and select the desired page by pressing on it.

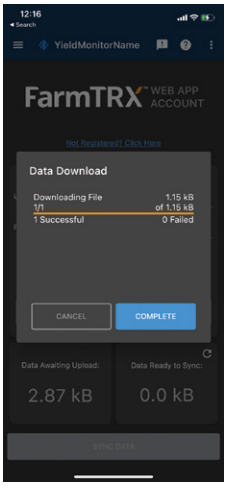
CLOUD SYNC

The Cloud Sync screen allows the user to login to their FarmTRX account and upload yield data to the Web App.

Syncing Yield Data

This transfers raw yield data and settings from the Yield Monitor to your device so it can be uploaded to the FarmTRX Web App. The data will automatically upload to your device if it has an internet or mobile data connection and is logged into your FarmTRX account.



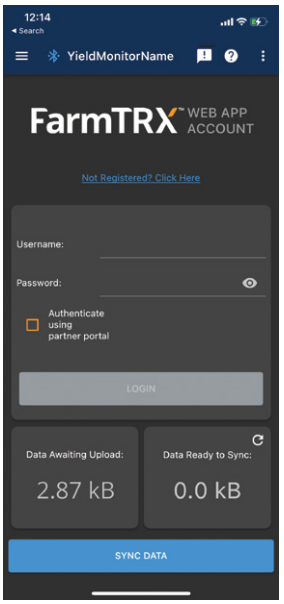


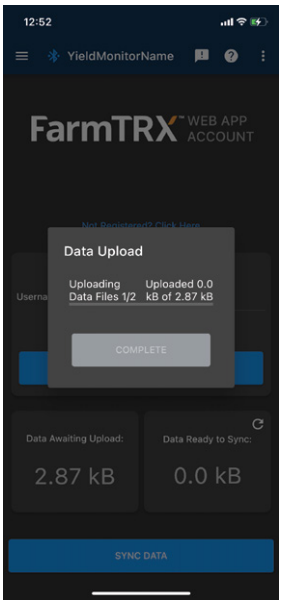
1. Connect to the Yield Monitor you would like to sync data from. The amount of data on your Yield Monitor that has not yet been synced will be found in the “Data Ready to Sync” tile
2. Press “SYNC DATA” and wait for all files to be downloaded
3. Press “COMPLETE”
4. If you have a WiFi or mobile connection, the data will automatically upload to the FarmTRX Web App.

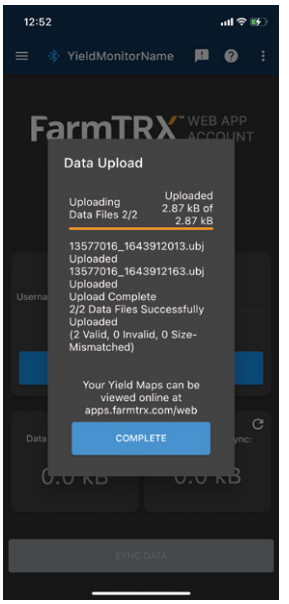
Uploading Yield Data

If your device is not connected to the internet or mobile data during the syncing process, data can be uploaded to the cloud in a separate process once internet is available (e.g. at home or the office). The amount of data on your device that still requires upload to the Web App can be found in the “Data Awaiting Upload” tile.

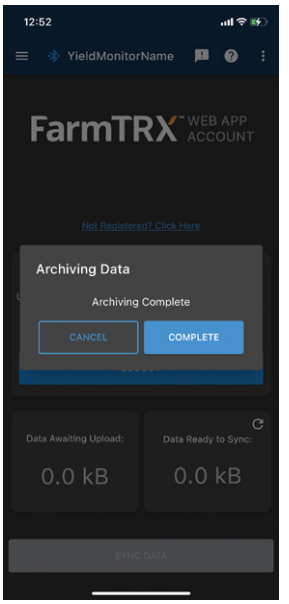
1. Ensure that “Data Awaiting Upload” is not 0.00 kB. If this is the case, either the data was already uploaded, or it was not synced from the yield monitor.
2. Press “SYNC DATA”
3. Wait for all files to upload, the “COMPLETE” button will turn blue upon completion
4. Press “COMPLETE” to finish the process and return to Cloud Sync





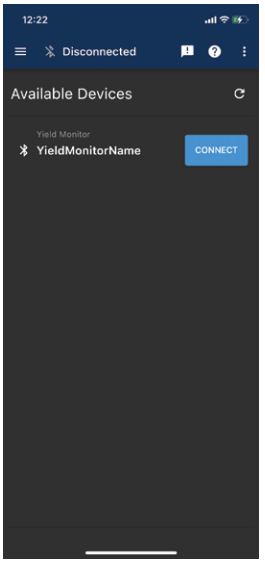


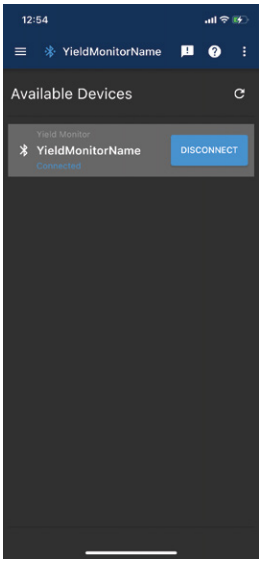
Once data upload to the FarmTRX Web App has been confirmed, it will be archived on the Yield Monitor data logger. If you are not connected to a Yield Monitor during upload, the data will be archived the next time your device is connected.



CONNECTION

This section of the app is used to search for, connect to, and disconnect from Yield Monitors.





Searching for a Yield Monitor

Searching for Yield Monitors can be done by pressing the refresh button in the top right corner.

Connecting to a Yield Monitor

1. Press the “CONNECT” button beside the device you would like to connect to
2. Wait for all connecting steps to complete; this may take a moment
3. You will be redirected to the Live Harvesting screen

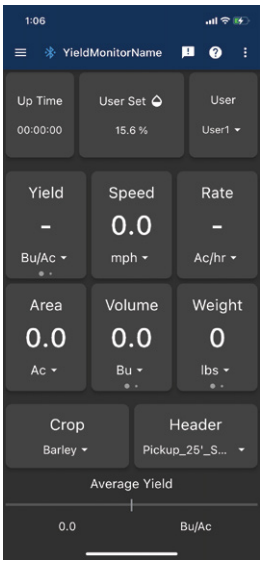
Disconnecting from a Yield Monitor

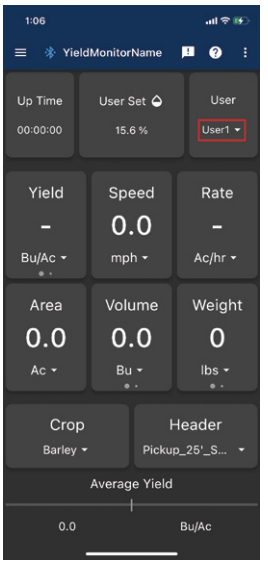
1. Press on the Yield Monitor currently connected; a disconnect button should appear below its name
2. Press “DISCONNECT”

LIVE HARVESTING

Live Harvesting is used to observe real-time harvest data, such as area covered, current yield, average yield, volume harvested, and weight harvested. Additional combine information such as speed, rate and uptime are shown. If you have a Moisture Sensor, current and average moisture will also be available.

Crop type and header can be changed on the Live Harvesting screen, as well as user-specific preferences such as layout, values shown, and units.



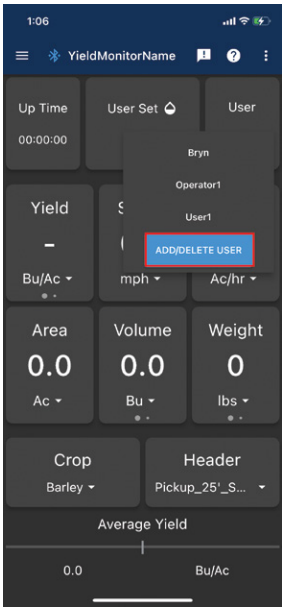


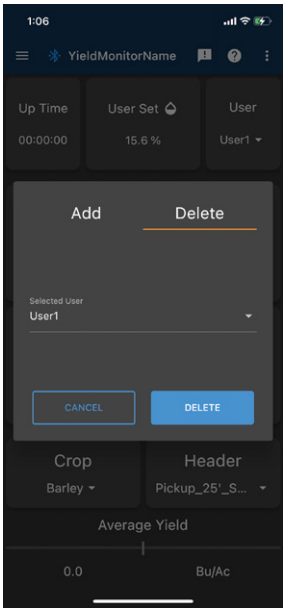
Changing User

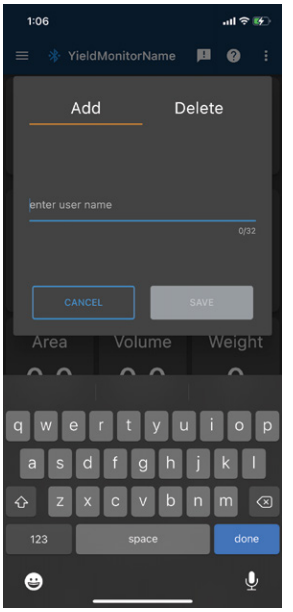
1. Press the currently selected profile under “User” in the top right corner
2. Press on the profile you would like to use

Adding/Deleting a User

1. Press the currently selected profile under “User” in the top right corner
2. Press “ADD/DELETE USER”
3. To add a user, type the desired username for the new profile, then press “SAVE”
4. To delete a user, press “Delete” or swipe to the left. Select the user you want to delete from the drop-down menu, then press “DELETE”

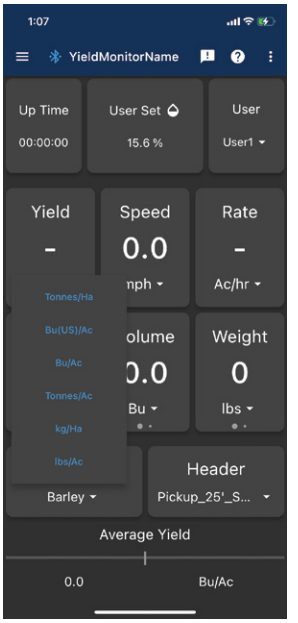






Changing Units

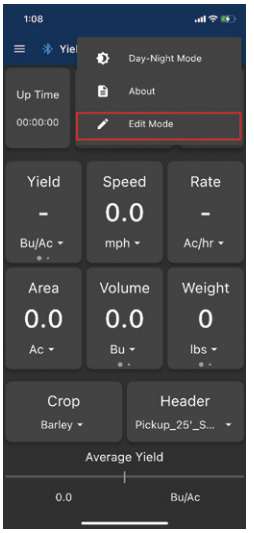
1. Press the units you would like to change
2. Select desired units

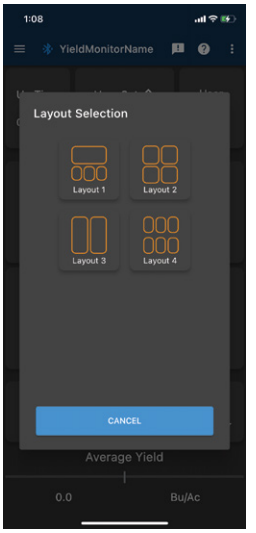


Changing Layout

Each user can change the layout of the panels on their Live Harvesting screen.

1. Press in the top right corner, a menu should appear
2. Select “Edit Mode”
3. Choose the desired layout.

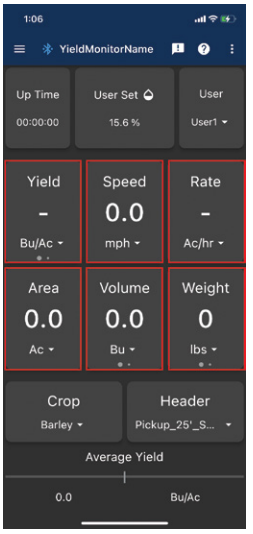


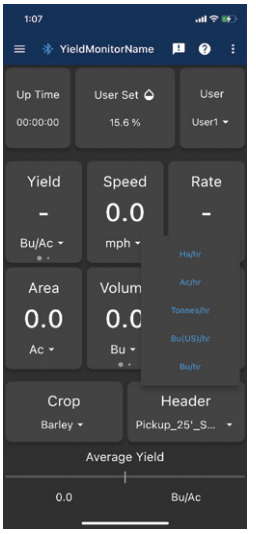


Changing Displayed Values

Each panel on the Live Harvesting Screen can be changed to display values the user desires.

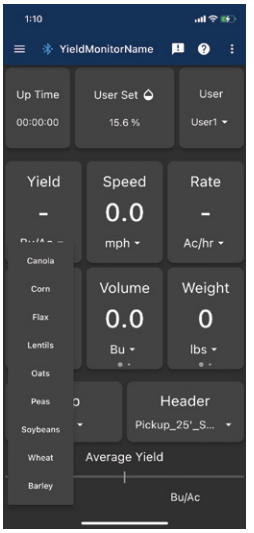
1. Press and hold the panel you would like to change; a menu appears showing available values after about 1 second
2. Select the value you want displayed on that panel

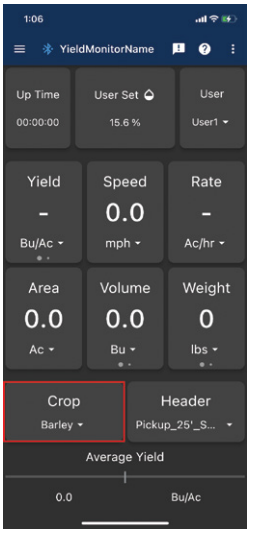




Changing Crop

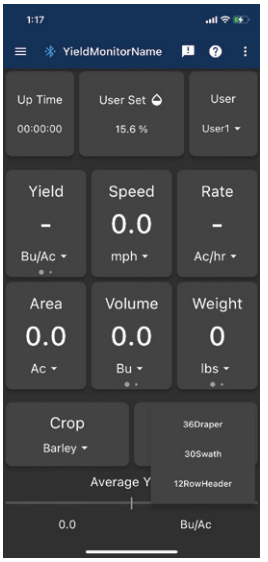
1. Press “Crop” in the bottom left corner
2. Select desired crop

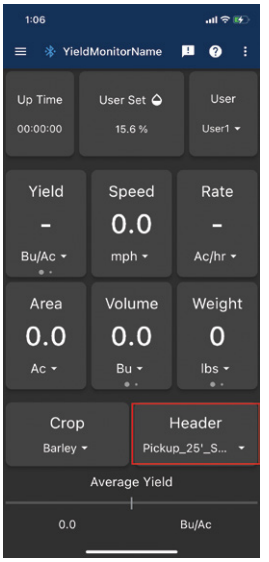




Changing Headers

1. Press “Header” in the bottom right corner; a menu with all headers saved on the device will appear
2. Select desired header
3. To prevent accidental header switching, we require the user to confirm that they want to change headers. Press “Yes” to save your header change



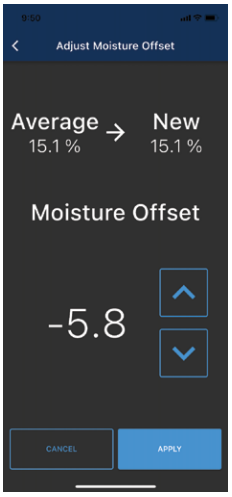


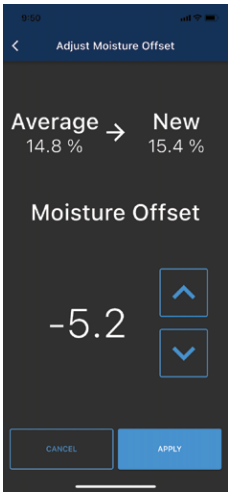
Changing Moisture

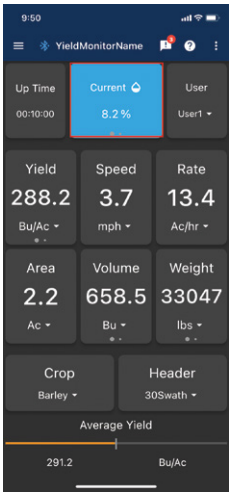
Live Harvesting operates in different modes depending on whether a Moisture Sensor is connected. If there is no Moisture Sensor connected, the app allows a moisture value to be entered manually. This allows the user to view the approximate market yield. If a Moisture Sensor is connected, live moisture readings are shown. The user may notice a difference between the moisture on the live screen and what is being reported by a moisture tester. This is typically the result of incorrect calibration. To calibrate the Moisture Sensor and manually enter moisture:

If a Moisture Sensor is connected:

1. Long press the blue “Current Moisture” or “Average Moisture” tile in the top center of the screen
2. Use the right Up/Down buttons to increase or decrease the adjustment
3. The new moisture value will be shown under “New” in the top right
4. Press “APPLY” when the moisture is properly adjusted

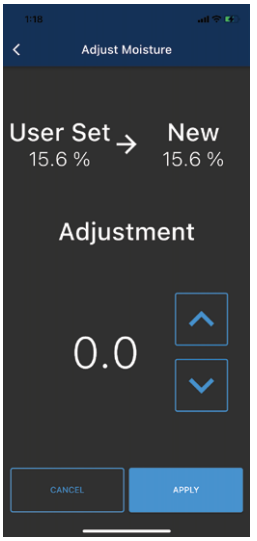


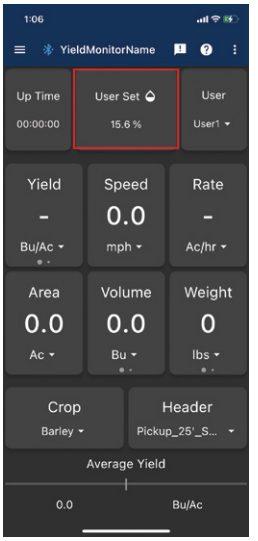


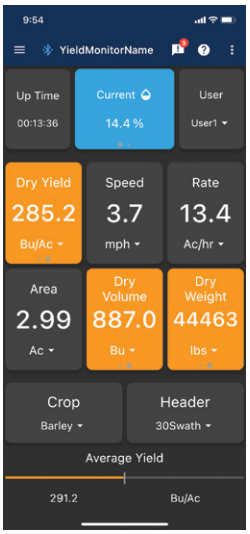


If a Moisture Sensor is not connected:

1. Long press “User Set Moisture”
2. Use the right Up/Down buttons to increase or decrease the adjustment
3. The new moisture value will be shown under “New” in the top right
4. Press “APPLY” when the moisture is properly adjusted. This value will be associated with each yield data point following adjustment







Market (Dry) Values

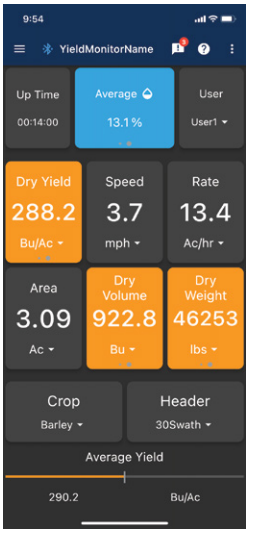
Live Harvesting allows the user to view their harvested dry yield volume and weight. The dry values are calculated using the average moisture input by the user associated with the Crop Type table.

1. Swipe left on Yield, Volume or Weight
2. The panel will turn orange and display the dry values

Monitoring Moisture

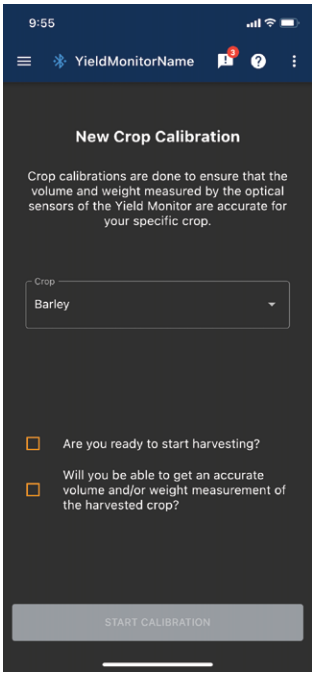
Both average and current moisture can be seen on the Live Harvesting screen as a blue panel when a Moisture Sensor is connected.

1. Live Harvesting will default to show the Current Moisture
2. Swipe left on the tile displaying moisture to view Average Moisture



CROP CALIBRATION

Crop calibrations are done to ensure that the volume and weight measured by the optical sensors of the Yield Monitor are accurate for each specific crop type.



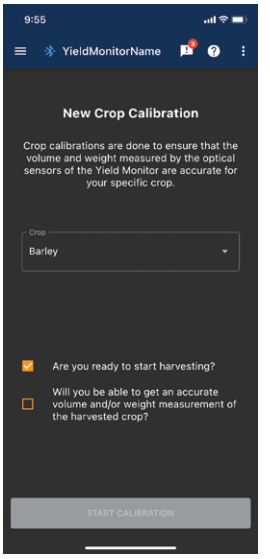
Starting Calibration

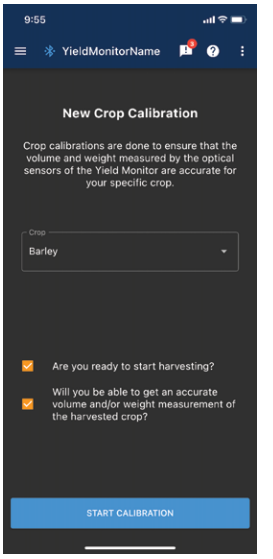
1. Select the crop that is being calibrated by pressing on the current crop; a list of crops should appear, press on the desired crop
2. Press “START CALIBRATION”
3. Confirm that all conditions specified are met; press the boxes beside each condition
4. Press “READY” when you would like to begin the calibration run

Note: You require a quantitative measurement only for what you will harvest after pressing “START CALIBRATION”—this typically means starting with an empty grain tank.

CALIBRATION MONITORING

The user can observe elapsed time, area, volume, and weight while completing their calibration run from the calibration screen. They may also use the Live Harvesting screen to monitor the harvest but must remember to return to the Crop Calibration screen to complete the calibration run.





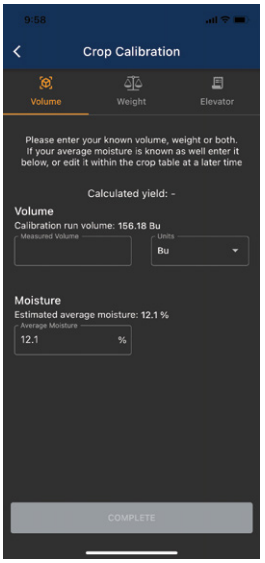
COMPLETE CALIBRATION

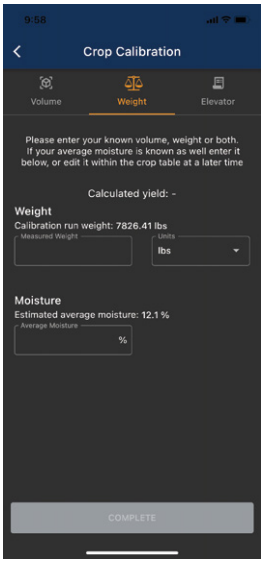
As soon as the combine is finished harvesting your calibration pass, press either the Pause or Check-mark Completion button. The Pause button is used when you want to continue harvesting while you wait for the results of the calibration load measurement (for example, results from the elevator).

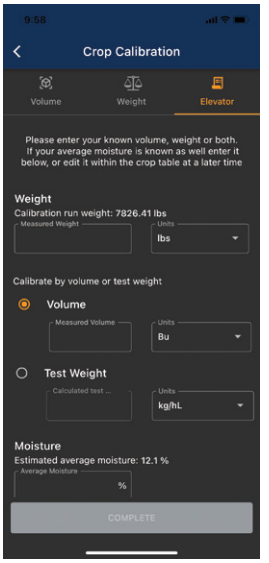
The Check-mark Completion button is used when you have access to an immediate means of measurement (for example, a weigh wagon with scales or an estimation of volume using a full grain tank).

Note: If you have pressed the Check-mark Completion button but will not be getting immediate results, you can return to the Crop Calibration page later to enter the measured value for the calibration sample.

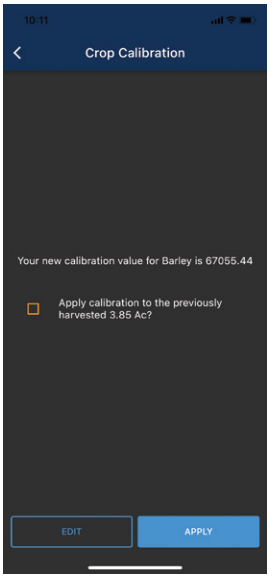
1. Await measurements for volume and/or weight, and moisture
2. Based off of your measurement method, choose either the Volume, Weight or Elevator tab
   a. **Volume:** this method is simplest and relies on the user knowing the volume of the combine grain tank. Typically, start calibration from empty and harvest a full grain tank. Complete the calibration when the full bin light goes off. This should ensure you are within 2-5% accuracy.
   b. **Weight:** this method typically uses a weigh wagon or grain cart with scales. This method should ensure accuracy within 2%.
   c. **Elevator:** this method does not require getting a measurement from the elevator but uses standard values that an elevator provides with a scale ticket. Enter the measured weight. Choose from entering a test weight or volume depending on what the elevator scale ticket provided. Lastly, enter the average moisture based off the representative sample. This method will provide the highest accuracy as it takes into account custom test weights.







3. After entering the measurements, press “COMPLETE” to apply the calibration
4. You will be prompted to apply the calibration values to previously harvested area. Choosing to apply calibration to previously harvested crop will apply the calibration value to any yield values made since the last crop change



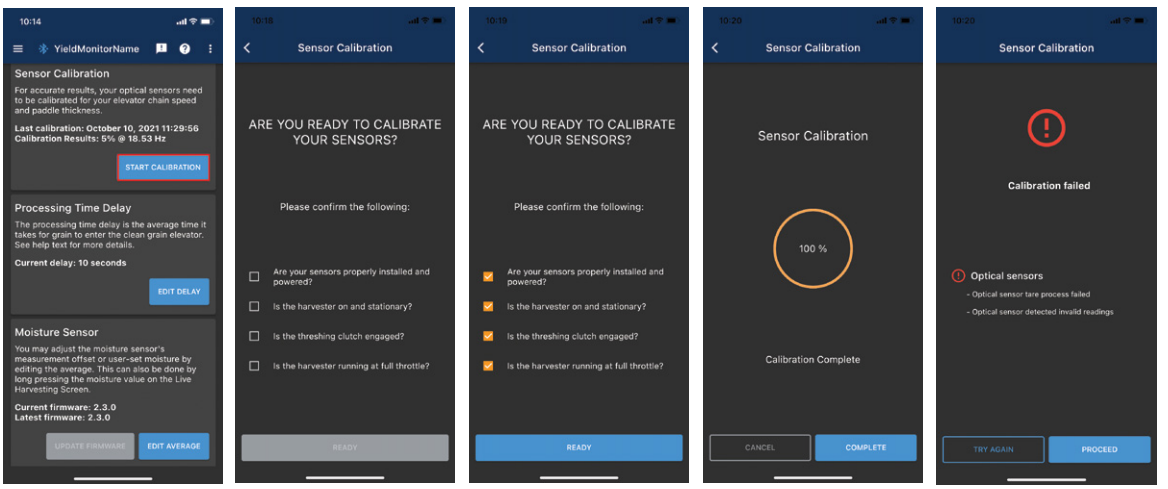
Sensor Calibration

Sensor Calibration determines a baseline measurement of the clean grain elevator to ensure accurate data is gathered from your specific machine.

1. Navigate to Device Calibration
2. Press “START CALIBRATION” under Sensor Calibration
3. Check the boxes associated with each condition when they are met
4. Press “READY” to start the calibration
5. When the calibration has finished, press “COMPLETE”

If calibration was unsuccessful, an error message will appear:

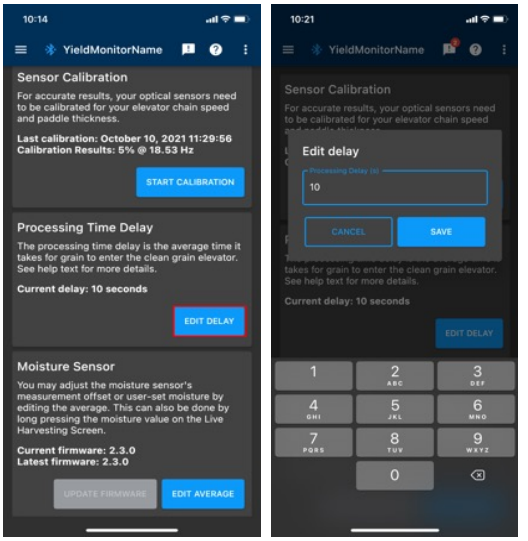
- Check that your optical sensors are properly installed, your combine is stationary and running at full throttle, and the threshing clutch is engaged
- Press “TRY AGAIN”



Processing Delay

Processing delay is the amount of time it takes for the grain entering the system to reach the clean grain elevator. This is the elapsed time (delay) from the cutting head until the grain passes the sensors in the clean grain elevator. If the delay is not known, a default of 10 seconds will be applied.

1. Press “EDIT DELAY”
2. Enter the machine specific processing delay in seconds
3. Press “SAVE”

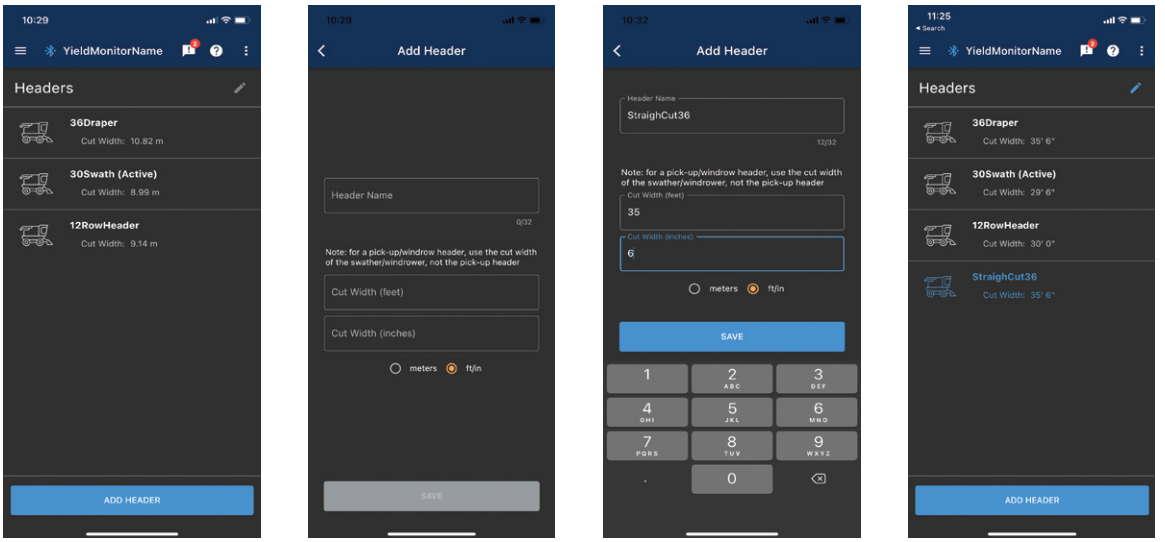


ADD/EDIT HEADERS

The Yield Monitor needs to know what width of land is being harvested for the yield calculation. All headers used by the combine can be entered and saved beforehand to avoid requiring the user to enter the header width every time the header is changed. The user can select a header on the Live Harvesting screen.

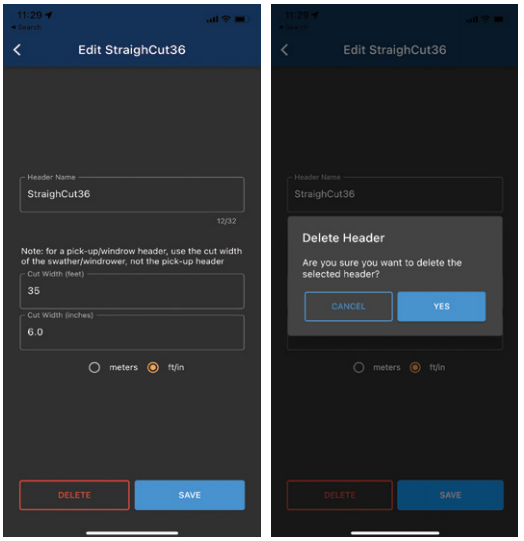
Adding a Header

1. Add a header by pressing the “ADD A HEADER” button at the bottom of the page
2. Enter desired Header Name
3. Choose “CUT WIDTH”
4. Press “SAVE”



Edit or Delete a Header

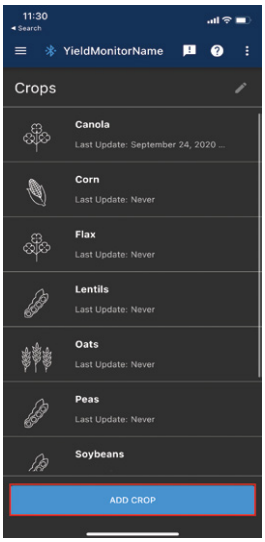
1. Press the pencil icon in the top right corner
2. Edit the header information and press “SAVE”
3. Press “DELETE” to delete the header

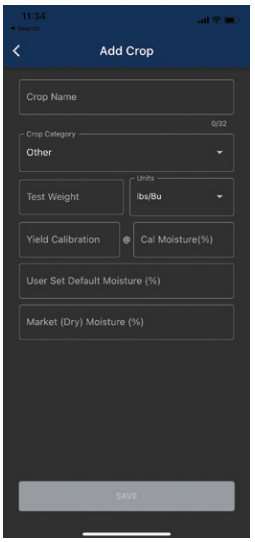


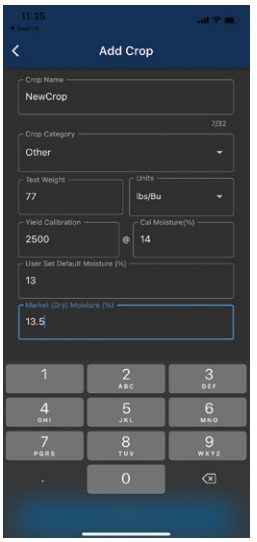
ADD/EDIT CROPS

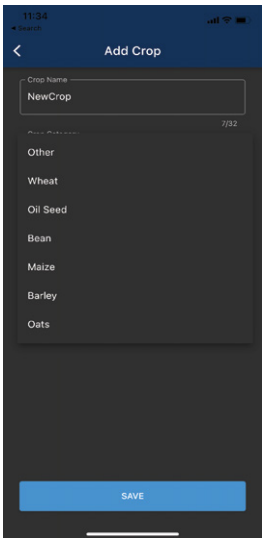
The crop list stores several important pieces of data for accurate yield data:

- Test Weight is the volume/weight ratio
- Yield calibration is the crop specific calibration value that is calculated by Crop Calibration. This can be calculated and entered manually if necessary
- Field Average Moisture is the expected moisture content set by the user and is used to calculate the dry yield, volume and weight in Live Harvesting
- Market Moisture is the maximum moisture content that is considered dry by the elevator



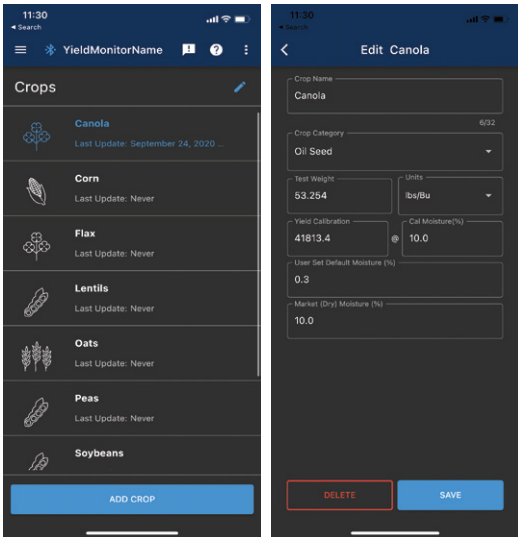






Adding a Crop

1. Press “ADD CROP”
2. Enter the name of the crop type
3. Select the category the crop type belongs to (Cereal, Oil Seed, Pulse, Corn, Other)
4. Enter test weight; if nothing is entered a default value will be used
5. Enter yield calibration if known; if not a default value will be used until a calibration run is completed
6. Press “SAVE”



Editing or Deleting a Crop

1. Select the crop you would like to edit by pressing on it
2. Enter the desired changes and press “SAVE”
3. To delete, press “DELETE”

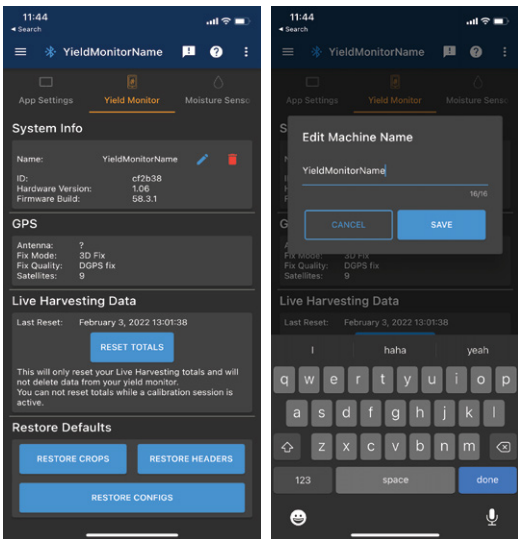
ADVANCED SETTINGS

Advanced Settings allow the user to change machine-specific settings such as the combine name, enable detailed logging, and log file syncing. The user can also restore their device’s crops, headers, and name to the default values. Advanced settings also provide an alternative way to reset the totals that appear on the Live Harvesting screen.

Editing Yield Monitor Name

The Yield Monitor name that is displayed on the Connection Screen and App Bar can be changed to make it easier to identify for the user (e.g. JD 9600). This is recommended especially if there are multiple combines in use.

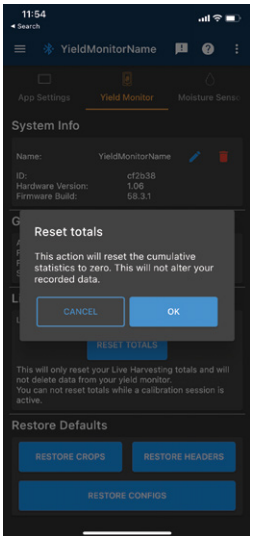
1. Under the Yield Monitor page, press the pencil icon to edit the Yield Monitor name
2. Press “SAVE”

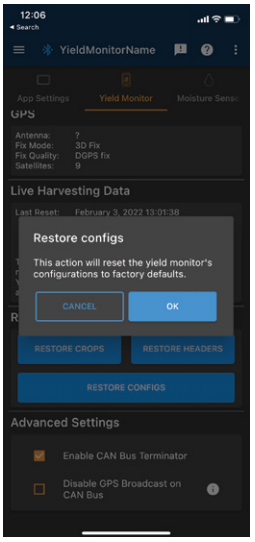


Reset Live Harvesting Totals

The Live Harvesting totals can be reset without changing the crop type. Doing this will reset Area, Volume, Weight and Average Yield to zero. The operator can decide to reset to zero between two fields with the same crop type or can elect to track the total for both fields without resetting.

1. Press “RESET TOTALS”
2. Press “OK”





Restore Configurations

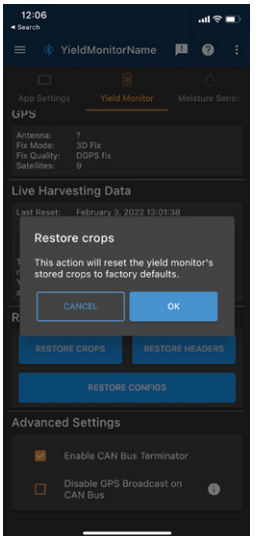
This will reset all configured values and preferences on the Yield Monitor essentially resetting it to factory defaults. The values that are reset include crop selection, machine name, processing delay, Live Harvesting totals, Logging level, and Tare.

1. Press “RESTORE CONFIGS”
2. Press “OK”

Restore Crops

The Yield Monitor’s crop list can be reset to the 10 default crops and their associated yield values. These crops are: Barley, Canola, Corn, Flax, Lentils, Oats, Peas, Sorghum, Soybeans and Wheat.

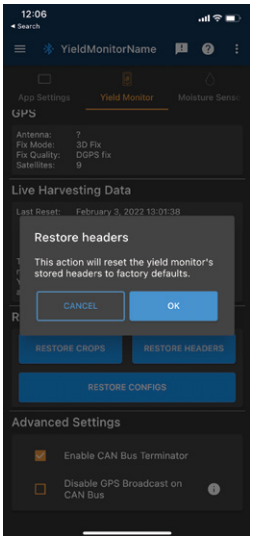
1. Press “RESTORE CROPS”
2. Press “OK”

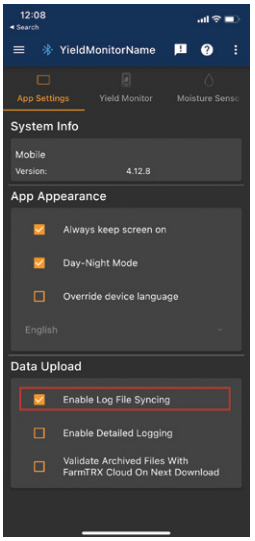


Restore Headers

The Yield Monitor's header list can be reset to the 3 default headers and their associated widths. The defaults are 10m straight cut, 25' swath and 30' row headers.

1. Press "RESTORE HEADERS"
2. Press "OK"



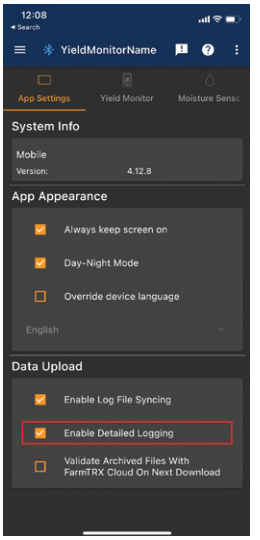


Enable Log File Syncing

This will allow the log files mentioned above to be uploaded to the FarmTRX Web App so that they can be reviewed by the support team. Enable this by checking the box beside "Enable Log File Syncing".

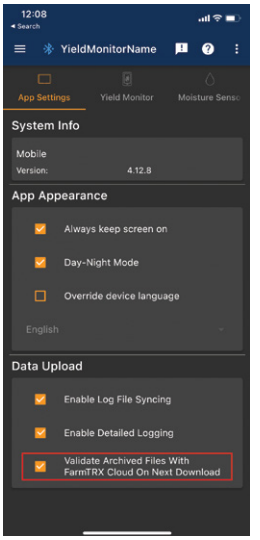
Enable Detailed Logging

Detailed logging saves the processes happening on the system. This becomes useful for the FarmTRX support team to reference if any issues are experienced by the user. Enable detailed logging by checking the box beside "Enable Detailed Logging".



Validate Archived Files with FarmTRX Web App on Next Download

This will ensure that all files in the Yield Monitor's archive directory are on the FarmTRX Web App. This should only be selected if files have been accidentally archived before uploaded.



TROUBLESHOOTING THE MOBILE APP

YIELD ACCURACY

Problem:	Probable Cause:	Solution:
Yield is inaccurate after calibration	• Inconsistent harvesting during calibration run • Sensors are dirty or damaged • Error while entering values and units on Calibration Completion page	• Calibration run best practice —complete in consistent/ average part of field with minimal turns • Click sensor out of mounting base and inspect lenses • Confirm correct units were entered on Calibration Completion page of app. Make sure test weight was entered properly
Bushels are incorrect but weight is correct	• Test weight set incorrectly (lbs/bu, kg/hL)	• Go to Add/Edit crops page from app main menu, select crop type and edit. Confirm test weight values and units are correct
Average yield is incorrect but live yield is correct	• Yield Monitor is calculating area incorrectly • If elevator is running at partial throttle while not collecting yield, Yield Monitor will be confused	• Confirm sensor calibration is correct. Yield Monitor should not be counting area while not harvesting

Problem:	Probable Cause:	Solution:
Yield readings display 0 while harvesting	• Issues with GPS • Sensor calibration not completed properly • Sensor fault • In rare cases, sensors are placed too close to the elevator chain and the chain is blocking sensors during sensor calibration process	• Confirm you have a ground speed—if no speed, unplug external antenna to see if speed appears. If so, contact support for a new antenna • Rerun sensor calibration from the Device Calibration page of the App menu (must be done while stationary with no crop in elevator, at full throttle) • Visually inspect sensors and confirm the green status LEDS are on and there is power to the monitor. The receiver should have a blinking or solid yellow light indicating it sees the other sensor and elevator is stationary • Redrill. Contact support to determine diagnosis and for advice on sensor location before drilling
Area is incorrect	• Sensor calibration not completed or incorrect • Moving without harvesting while at partial throttle and with thresher engaged	• Rerun sensor calibration from the Device Calibration page of the App menu (must be done while stationary with no crop in elevator, at full throttle) • Try to ensure throttle is at 100% while driving with header up or threshing clutch is disengaged (this won't affect your field averages for your maps. ie the accuracy of your yield data)
Yield does not display until well into the swath/pass	• Processing time delay set incorrectly	• Time delay should be around 12 seconds. Edit the processing time delay on the Device Calibration page. Count the new delay by measuring time from first crop entering header to just before crop enters the grain tank
Yield values disappear after a sensor calibration	• In rare cases, sensors are placed too close to the elevator chain and the chain is blocking sensors during sensor calibration process	• Contact support to determine diagnosis. Rare cases may require redrilling. Contact support for advice on sensor location before drilling.

Problem:	Probable Cause:	Solution:
Yield values appear on live screen when driving empty across field	• If separator clutch is not engaged, a paddle may be bouncing in the line of sight of the sensor • Driving with separator clutch engaged but at partial throttle	• This will not affect the accuracy of your yield maps • Disengage separator clutch or operate at full throttle
Dry live-yield/volume/weight are inaccurate but wet are accurate	• Dry moisture or current moisture reading is incorrect	• Dry values are calculated from the current wet moisture down to the dry (market) moisture. To change market moisture, go to Add/Edit crops page from app main menu, select crop type and edit. Confirm dry (market) moisture value is correct
Yield values inaccurate when only harvesting a partial pass	• Yield Monitor does not account for partial swaths in field	• Follow best practice by trying to keep consistently full swaths. Partial swaths will be automatically corrected in the Web App.

BLUETOOTH© CONNECTIVITY

Problem:	Probable Cause:	Solution:
Yield Monitor is not showing up as available	• Yield Monitor is not powered on • Yield Monitor is already connected to a different mobile device • Bluetooth© radio may not have initialized • The mobile device is not detecting the Yield Monitor	• Confirm power to the Yield Monitor (LED is green if a Yield Monitor 2.0) • Confirm no other devices are currently paired to Yield Monitor • Reboot the Yield Monitor by powering on and off • Toggle Bluetooth© on and off on the device
Yield Monitor connection fails	• Interruption of Bluetooth© connection • Mobile App was unable to retrieve settings from the Yield Monitor • The Yield Monitor did not initialize	• Try reconnecting, if it does not connect on first try this is not the root problem • Reboot by powering the Yield Monitor on and off

Problem:	Probable Cause:	Solution:
Mobile App loses connection to Yield Monitor during operation	• Bad power source	• Do not use a cigarette light as a power source • If using T-Splice connectors found in kit, ensure they are properly snapped down • Ensure all connectors are fully snapped together and the 15 pin connector attached to the Data Logger is properly fastened
Firmware update fails	• Mobile device failed data transmit	• Do not close the application while updating, let update complete before navigating away • If update continues to fail close the app, reboot the Yield Monitor and try again.
Firmware update requires re-doing	• Firmware update encountered error	• Turn the combine's power off for 60 seconds and attempt to reconnect to the Yield Monitor and continue with firmware updates.

SENSOR CALIBRATION

Problem:	Probable Cause:	Solution:
Calibration is unsuccessful	• Sensor misalignment	• Check that optical sensors are properly installed
	• Speed detected	• Make sure the combine is stationary
	• Grain elevator running too slow	• Ensure threshing clutch is engaged and engine is running at normal operating speed
	• Sensors aren't plugged in	• Ensure both sensors are plugged in and lights are on

OPERATING THE WEB APPLICATION

CREATING FIELD BOUNDARIES

The Web App is the location where yield data will be uploaded, automatically sorted and corrected to produce precision yield maps. Users can upload yield data daily, weekly or all at once at the end of harvest. Boundaries and crop types need to be set before uploaded data will be processed into yield maps as part of FarmTRX's commitment to your data integrity.

Draw New Field Boundaries:

1. Select the Field Editor tab in the Web App
2. Select "FIELDS"
3. Open the season that you would like to add the field
4. At the bottom right menu, click the "Create New Field" icon
5. Double click to finish drawing the field boundary
6. Give the field a name and fill out the additional information
7. Select "SAVE"

Import Field Boundaries:

1. Select the Field Editor tab in the Web App
2. Select "Fields"
3. Open the season that you would like to add the field
4. At the bottom right menu, click the "Import Shape File" icon
5. Import the field Shape Files
6. Select "Analyze"

EXPORTING YIELD DATA

Raw yield data is available to all users to export as ESRI shapefile or AgLeader Basic file formats.

1. Select the field folder you wish to export
2. Select the "Export Field" icon or right click on the field name
3. Select the layer and format you wish to export (Output Type)
4. Click "Export"

EXPORTING YIELD MAPS

Corrected precision yield maps are automatically created in the Web App for users with full subscription access to the application. Corrected yield maps can be exported as ESRI Shapefile, Google Earth KMZ, AgLeader Basic, AgLeader Advanced, and Climate Fieldview formats.

1. Select the folder for the field you wish to export
2. Select the "Export Field" icon or right click on the field name
3. Select the layer and format you wish to export (Output Type)
4. Select "Export"

TROUBLESHOOTING GENERIC

SPEED ISSUES

Problem:	Probable Cause:	Solution:
Mobile App showing 0 speed while moving	• Issues with GPS	• Confirm you have a ground speed—if no speed, unplug external antenna to see if speed appears. If so, contact support for a new antenna.
	• Not connected to a Yield Monitor	• Reconnect to the Yield Monitor
Mobile App showing very slow speed while combine is stationary	• GPS drift	• There is no effect on accuracy of yield data recorded

ACCOUNT LOGIN

Problem:	Probable Cause:	Solution:
Login Failed	• Incorrect username or password	• Reset password at https://apps.farmtrx.com/web/login.php
Login Failed	• No data connection	• Connect to mobile or WiFi network

POWER SUPPLY ISSUES

Problem:	Probable Cause:	Solution:
Device does not show up in Bluetooth© devices list	• The Yield Monitor is not connected to the power source	• Ensure the device is plugged into the Primary Wiring Harness and hooked up to 12V switched power source and Key is on
Yield Monitor 2.0 LED not displaying	• The Yield Monitor is not connected to the power source	• Check that the fuse on the Primary Wiring Harness is not blown

BEST PRACTICE AND ROUTINE MAINTENANCE

CLEANING AND MAINTENANCE

Be mindful to check the state of the hardware each season for the following:

- The optical sensors for damage or dirt buildup
- Visually inspect the Primary Wiring Harness for damages such as rub through or rodent damage
- When combining pulse crops (soybeans, peas etc.) periodically inspect the Moisture Sensor for debris and buildup; we suggest clearing the sensor face once daily during harvest.

CALIBRATION

Sensor calibration should be performed at the beginning of each harvest

- Make sure the clean grain elevator chain is adjusted to manufacturer specifications

Crop calibration should be performed once per crop type/variety per season

- Make sure crop type, header width and delay times are set properly
- Harvest part of the field prior to calibrating —this gives time to set the combine and work out any issues before calibration
- Make sure the combine is set (chaffer, sieve, concave clearance, fan) prior to calibration
- It is best to calibrate in a representative area of the field with minimal turning, start and stops
- Start calibration with an empty grain tank, harvest a known volume or weigh the calibration loads to get the actual weight of the grain

CROP VARIETIES

Different crop varieties may warrant a separate calibration. In these cases you may want to create a new crop type on the Harvest Mobile App.

MULTI-COMBINE HARVESTING

Each combine will require its own calibration. Do not use calibration numbers from one machine to another.

WARRANTIES

FarmTRX hardware is covered by a 2-year warranty. FarmTRX guarantees that it will repair, replace or refund a product that is defect in materials or workmanship during the warranty period. FarmTRX may offer different delivery methods for warranty service, including but not limited to parts and product dispatches. The warranty is conditional on proper installation and normal use.

For help determining what additional parts or products may be required under warranty contact support@farmtrx.com or call 1-800-991-5136.

CONTACTING SUPPORT

To reach a product expert or get support, contact us at www.farmtrx.com/support/ or call 1-800-991-5136.
Email: support@farmtrx.com