Owner's Manual

H_2O Sensor - Model 201FH
Forage Harvester
Precision Moisture Sensing Kit

HarvestTec®

EST. 1976

H20 Sensor-201FH-26-Owners
8/26

Model 201FH Owner's Manual Table of Contents

Introduction

Congratulations and thank you for purchasing a Harvest Tec Model 201FH. This system is designed to read moisture at levels of 40-75% (or dry matter 25-60%) by using two sensor pads mounted in the spout discharge of a forage harvester. Readouts are displayed on a smartphone or tablet using the Harvest Tec app H2O Precision Moisture Sensor (for Forage Harvesters). H2O App is available for both Apple and Android device platforms. Please read this manual carefully to ensure correct steps are taken to attach the system to the forage harvester.

Requirements

The Harvest Tec H2O Precision Moisture Sensor (for Farage Harvesters) app is supported by current operating system and one previous version for both Apple and Android devices. See website for current versions supported. **Recommended to use Samsung and Apple branded devices for best connection.**

***This system uses a wired connection between the display device and the 201FH system. Bluetooth connections are not supported. A quality USB-C to USB-A cable compatible with data transfer is included with the kit for use with current Apple and Android devices. Older model devices will require the operator to source the appropriate device cable with plug for the 201FH System Module. Use of adapters is not supported.*
When sourcing cables for older model devices, make sure it is a data cable -not just a charging cable.

Tools Needed

Side cutter	Hammer	C -Channel Vise Grips
Allen wrench set	Measuring tape	Center punch
Drill	Small wrench set	

Installation - 201FH - Forage Harvester Precision Moisture Sensing Kit

Moisture Sensors (030-2760 Pad and Diverter)

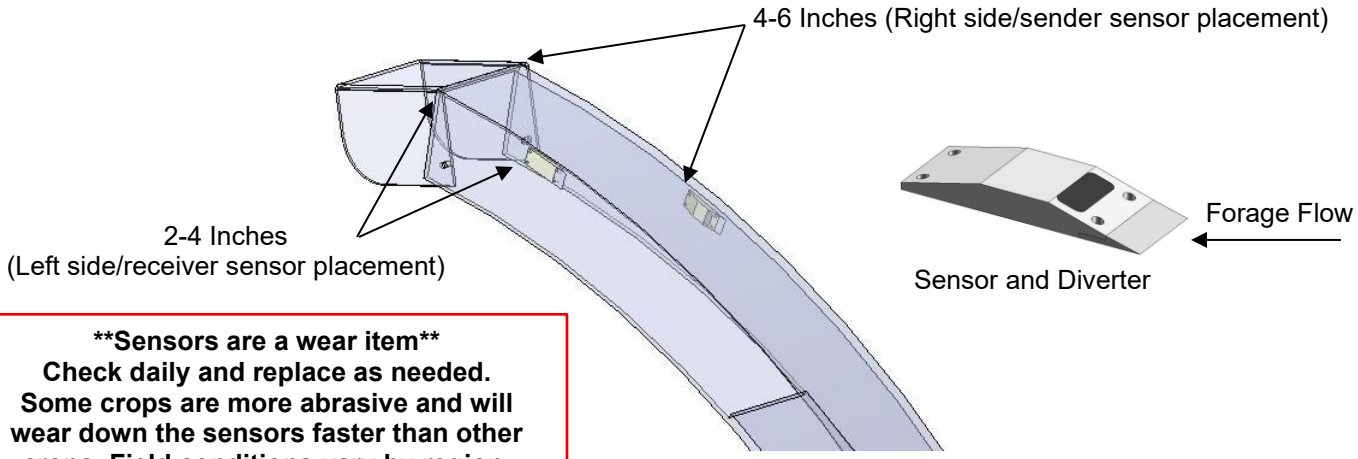
The moisture sensors are a wear item and should be checked before each use. Kit includes one replacement set of moisture sensors. The lifespan of the sensors varies, depending on forage type and field conditions.

The Moisture Sensor Pads are to be mounted offset and on opposite sides of the forage harvesters spout, similar to the diagram below. Sensors should not be mounted on the spout deflector or spout extensions. Sensors are to be mounted near the top of the spout curvature, in a location that is free of buildup and where the paint has (or will be) worn off. **This location is usually within 1/2" of the top of the spout curvature.**

For Pull-Type Forage Harvesters, or Low Capacity SPFH use the Alternate Sensor Placement

SPFH Sensor Placement: With the spout in transport position, measure approximately 2-4 inches in from the end of the spout for the left side. The right sensor should be slightly offset (approximately 2 inches from the left sensor placement) toward the front of the machine, measuring approximately 4-6 inches from the end. Use provided sensor template (001-2762AT) to mark holes needed to install sensor. The side of the template with three holes should be pointing towards the front of the machine (opposite the forage flow direction).

Drill all marked template holes using a 1/8" drill bit first, then use 3/16" drill bit. Last, drill only the single center hole to 1/4" to allow for wire clearance. Debur all holes (inside and out) to assure a tight fit and to prevent damage to the sensor wires. Apply RTV silicone adhesive to the back of the sensors, prior to installing, to fill any voids behind the sensor for secure fit. Feed sensor wire through 1/4" center hole. Use four 8/32 x 3/4" flat head bolts and nylock nuts to mount sensors and diverters (metal wedge) to the machine with the leading edges pointing towards the accelerator of the forage harvester. Be careful not to overtighten bolts or sensor plastic may crack. Sensor is still functional if plastic is cracked.



****Sensors are a wear item****
Check daily and replace as needed.
Some crops are more abrasive and will wear down the sensors faster than other crops. Field conditions vary by region.

Alternate Sensor Placement – Top Mounted Sensor Placement

for Pull-Type Harvesters or Low Capacity SPFH

Mount both sensors on the top of the inside of the chute, similar to example pictured below. Measure approximately 2-4 inches in from the end of the spout for the left side. The right sensor should be slightly offset (approximately 2 inches from the left sensor placement) toward the front of the machine, measuring approximately 4-6 inches from the end. Use provided sensor template (001-2762AT) to mark holes needed to install sensor. The side of the template with three holes should be pointing towards the front of the machine (opposite the forage flow direction).

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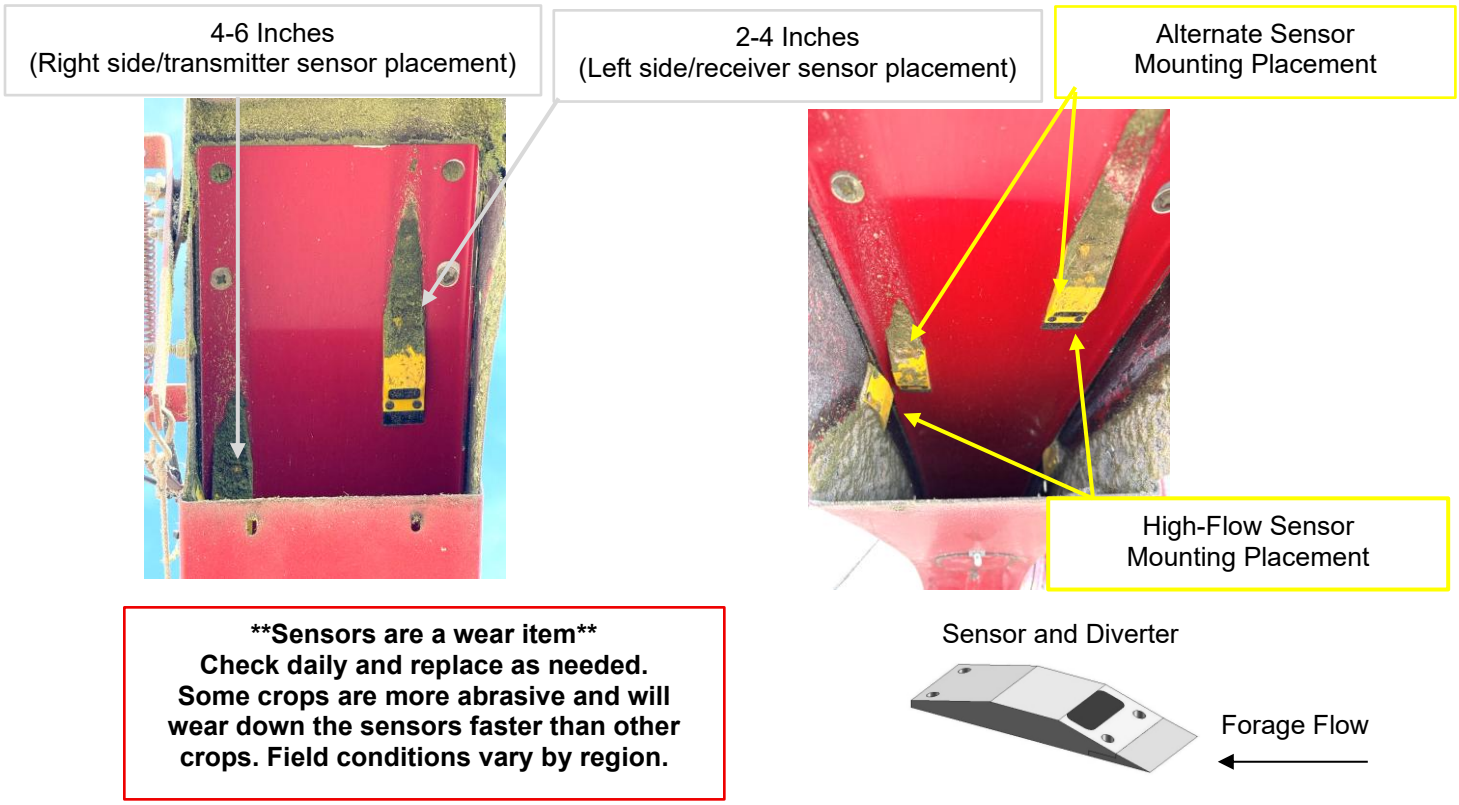
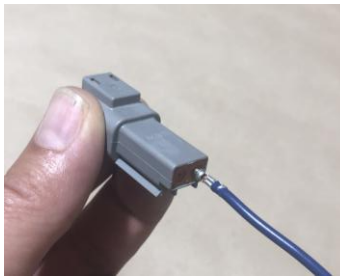
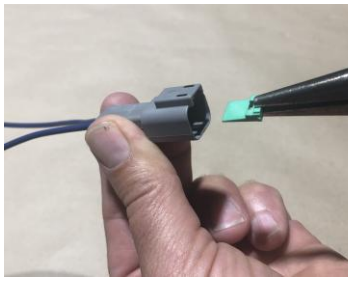
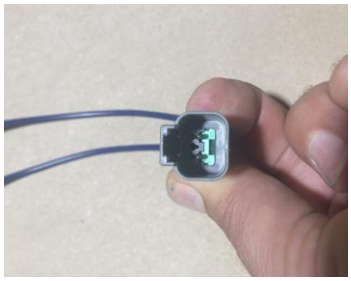


****Sensors are a wear item****
Check daily and replace as needed. Some crops are more abrasive and will wear down the sensors faster than other crops. Field conditions vary by region.

Pin Sensor Plug: Insert the pins of the moisture sensor wires into the back of the plug included in the moisture sensor parts bag. **Right side/transmitter sensor to Port 1. Left side/receiver sensor to Port 2.** Pins should audibly snap when pushed into place. Secure pins in place by placing the plastic wedge lock into the front of the plug. Use needle-nose pliers to fully insert the wedge.







Moisture Harness Wires (006-2766, 006-2765 and 006-2764)

For All Forage Harvesters:

Multiple lengths of Moisture Harnesses are included with the 201FH kit. Allow ample slack for moisture harnesses used on the spout to allow for rotation between transport and field positions, following existing wires when possible. Secure moisture harness wire to the machine with cable ties. If using the cable tie pads, clean mounting surface with mineral spirits or paint thinner and allow to dry completely before adhering. Cable tie pads use acrylic adhesive and take 48-72 hours to fully set.

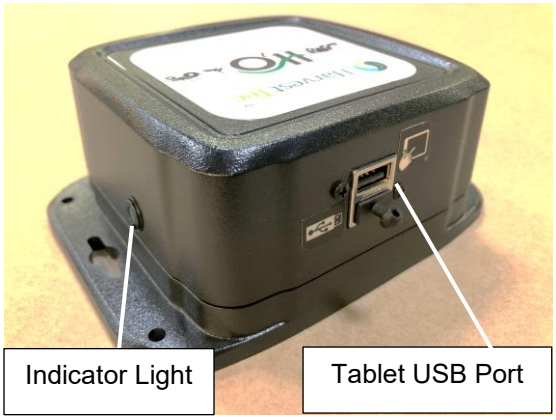
For Self Propelled Forage Harvesters: Connect Extension Harness (006-2764, 25' length) from the module in the cab out to the swivel of the spout and up to the first extension. Some SPFH Operators use different spout extensions depending on the crop and interchange them during the season. Mount the other length harness to the spout extensions so they can stay with the spout when switching.

For Pull Type Forage Harvesters: Both Extension Harnesses (006-2765 and 006-2764) will likely be needed to reach from the hitch point behind the tractor to the end of the discharge spout. Harnesses can be connected in either order. Used the 8 ft extension (006-2766) coming out of the cab to the drawbar.

Moisture Control Module (006-2473FH)

Locate a suitable location inside the cab of the SPFH or Tractor to place the moisture control module (006-2473FH).

Attach the power leads of harness (006-2763) to a **12-volt keyed power source** in the SPFH or Tractor. If no key switch is available: recommended to add a toggle switch to a 12-volt power source and manually turn the system on/off as needed. Verify power supplied to module is 12-volts, using a voltmeter prior to connecting harness.
Make sure module light turns off when the key is turned off.



Connect Main Plug from Power Harness (006-2763) to the correlating port on the bottom of control module 006-2473FH.

Plug the tablet/phone USB Data Cord** into the communication port indicated by the tablet symbol.

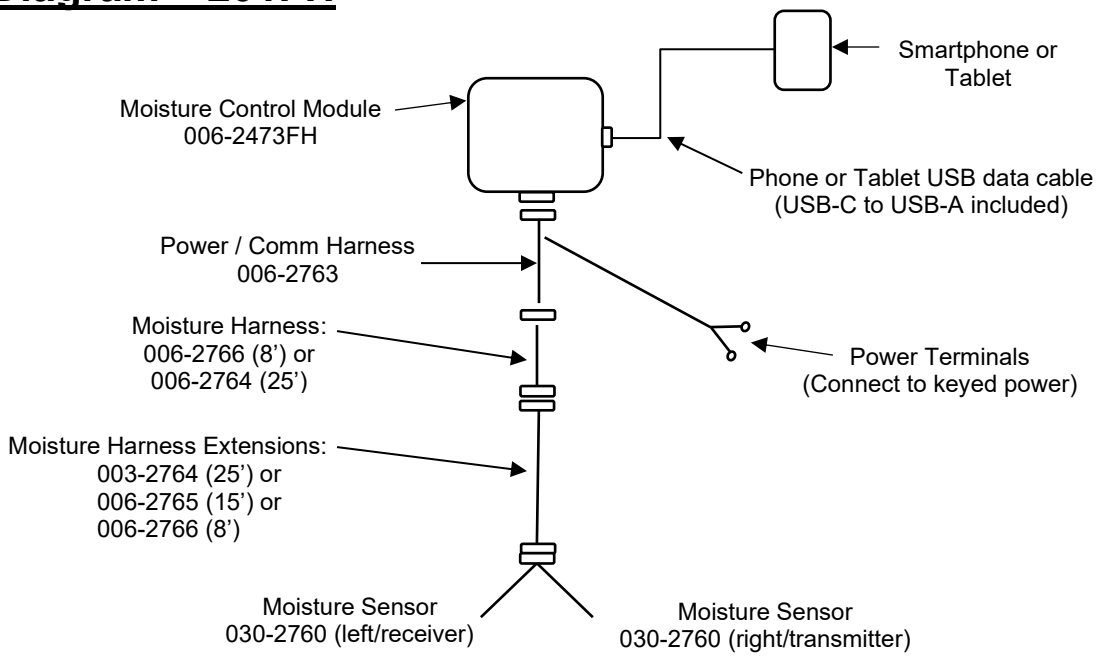
The control module (006-2473FH) is equipped with a green light to indicate both power and connection.

Slow Blink – System has power and is attempting to communicate to phone or tablet.

Solid Green – Device is connected.

***A quality data communication cable ending with a USB-A plug must be used with Harvest Tec modules. Many lower cost power cables will not properly transmit data between the phone/tablet and the Harvest Tec system module. Use of adapters is not supported.*

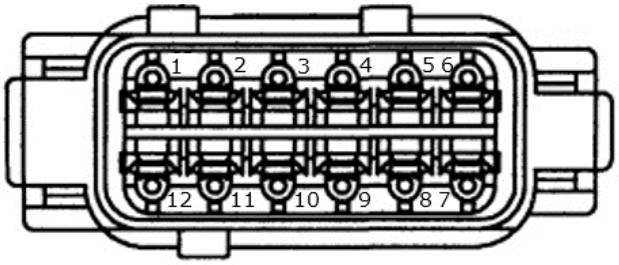
Wiring Diagram – 201FH



Pin Outs

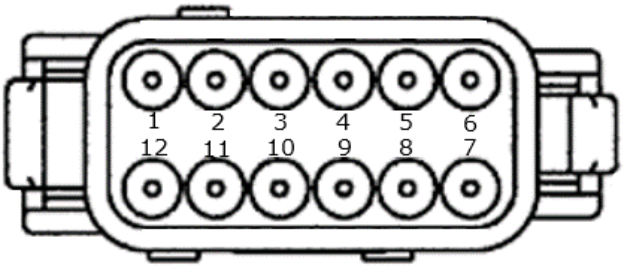
Moisture Control Module 006-2473FH (Main Plug)

Pin 1	Red	Module Power
Pin 2	Not used	
Pin 3	Not used	
Pin 4	Grey	Right Moisture Sensor (Transmit)
Pin 5	Brown	Left Moisture Sensor (Receiver)
Pin 6	Not used	
Pin 7	Not used	
Pin 8	Not used	
Pin 9	Not used	
Pin 10	Not used	
Pin 11	Not used	
Pin 12	Black	Ground



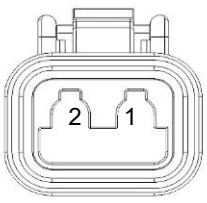
Power/Comm. Harness 006-2763 at Module Plug

Pin 1	Red	Module Power
Pin 2	Not used	
Pin 3	Not used	
Pin 4	Grey	Left Moisture Sensor (Receiver)
Pin 5	Brown	Right Moisture Sensor (Transmit)
Pin 6	Not used	
Pin 7	Not used	
Pin 8	Not used	
Pin 9	Not used	
Pin 10	Not used	
Pin 11	Not used	
Pin 12	Black	Ground



Moisture Sensor Harnesses 006-2764, 006-2765, 006-2766

Pin 1	White	Right Moisture Sensor (Transmitter)
Pin 2	Black	Left Moisture Sensor (Receiver)



Optional Smartphone Display Kit – 201DK

The 201DK Smartphone Display Kit includes a smartphone (running the Android operating system) and mounting stand for use as a display to show moisture readouts while using the H2O Precision Moisture Sensor system.

Smartphone comes with the H2O App installed and settings have been adjusted on the device to keep the screen illuminated for extended periods of time. Be sure to turn off screen when not in use. For best connection, close app fully after use and open app from fresh prior to start-up of the moisture reader system.

Smartphone device must have a battery level above 35% before it will connect to the system, taking 30-60 seconds to connect. Smartphone does not have a sim card installed or cellular service enabled. Device comes from Harvest Tec set to Airplane mode, with the Wi-Fi and Bluetooth options turned off. Use provided USB-C to USB-A communication cable to connect devices. Launch app before powering on the moisture system.

Basic Operation

Power Buttons

Press and hold the lower button on the right hand side of the device to power on. Allows device to boot up.

Press this same button once to put the device either into or bring out of stand-by mode.

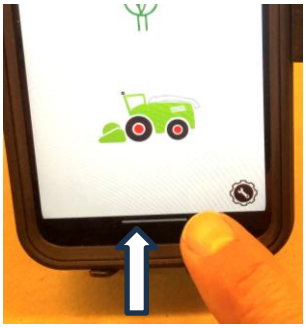
Power off by pressing and holding the top and bottom buttons on the right hand side simultaneously. Tap the 'Power Off' button that populates on the selection screen. Recommended to power down device when done.

Selecting App

Locate the H2O App button from the home screen and press to select. App should automatically pull up and be available to connect with the moisture module when activated.

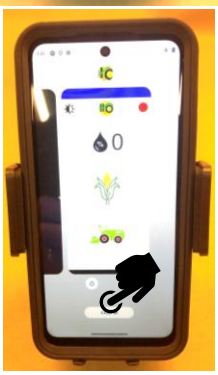
Shutting Down the App

It is recommended to shut down and clear the app on the device between uses. This is done so the app is not continuing to run in the background and will open fresh when using the system in future sessions.



1. Minimize the app by touching and slowly sliding upwards on the grey bar at the bottom of the device screen to make the app run screen smaller. This will also show any other screens on the device that are open.

2. 'Select All' button will populate. Tap this button to close all of the running program windows. Upon completion, you will be returned to the Home Screen.



Recommended to both close out the app <u>and</u> fully power down the smartphone device when done using the H2O system. Devices left on will slowly drain the device battery. Devices with less than 35% battery power will not connect properly to the H2O system module.

System Setup – App

The 201FH can be ran using a variety of smartphone or tablet devices- see the Harvest Tec website for current device compatibility requirements to support the Harvest Tec systems and apps.

Downloading H_2O App

The Harvest Tec app H2O Precision Moisture System for Farage Harvesters is available for compatible smartphone or tablet running a recent version of Apple or Android operating system software. Download the app by going to Apple App Store for Apple devices or the Google Play store for Android devices. Note: there are two Harvest Tec H20 Precision Moisture System apps- app with the Gold background is for the Forage Harvester systems.

For Apple Phones or Tablets

- On your phone or tablet locate and open the App Store Icon
- Locate the search menu within the App Store
- Search for 'H2O Precision Moisture'
- Scroll and select the Gold H20 Precision Moisture System app icon
- Select "Get" and download the app

For Android Phones or Tablets

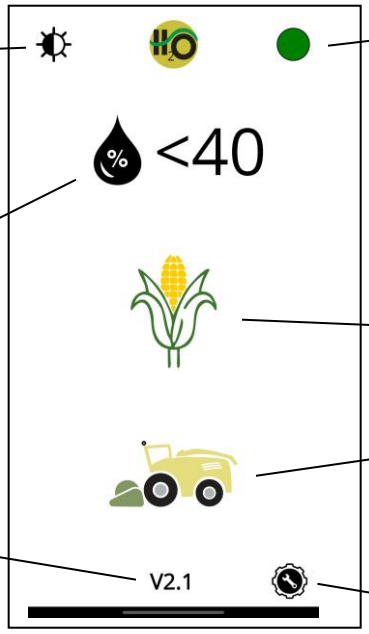
- Samsung brand devices are recommended for best system connections
- On your phone or tablet locate and open the Google Play Store Icon
- Locate the search menu within the Google Play Store
- Search for 'H2O Precision Moisture'
- Scroll across the top and select New, if app is not populated in listing
- Scroll and select the Gold H20 Precision Moisture System app icon
- Select "Install" then "open" once loaded

Note – Apple ID or Google account information may be required before downloading App

App must be opened on the display device before the H2O System is powered on by using the keyed switch. Display device must also have a minimum of 35% battery level indicated before attempting connection.

Screen Definitions

Home Screen Icons



Brightness Adjustment:
Tap to switch between day and nighttime brightness

Device Connection- Indicates when connection is made between app and system control box

Red = Not Connected
Green = Connected

Current Moisture or Dry Matter Reading: Information will display once forage comes in contact with sensors

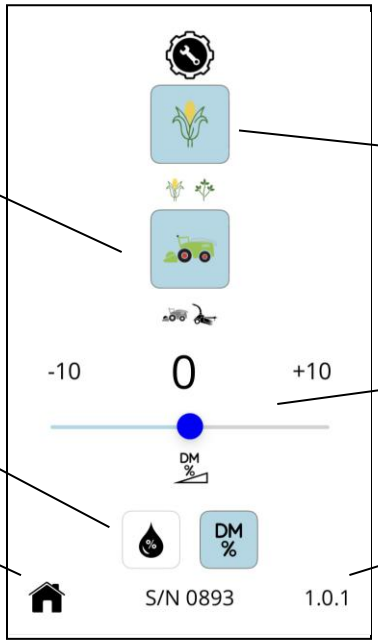
Crop type selected for moisture

Machine type selected

Current Firmware Version (example)

Settings Tab – Select to switch to Settings Screen

Settings Screen Icons



Machine Type Selection: Select the machine closest to the one the system is being used with

Crop Type being harvested

Moisture Offset Slider allows +/- ten-point adjustment to dial in system

Select to see either as Moisture or Dry Matter Percentage

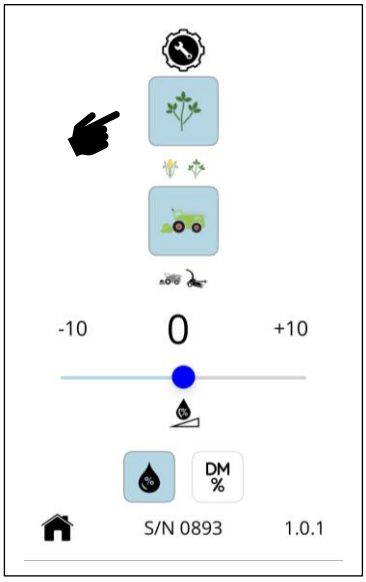
Home Tab – returns program to Home Screen

Current App Version

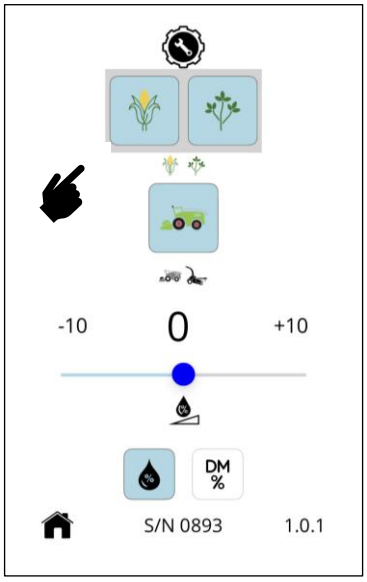
Settings Tab - Changing Selection Types

Crop Type Selections

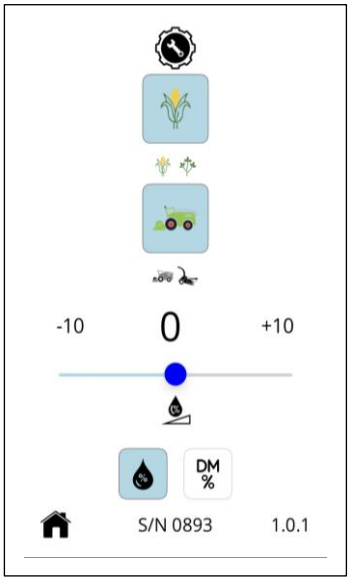
In the settings screen select the Crop Icon. Once selected a slider will show allowing you to view the possible selections. Select the one you would like by touching the icon best representing crop type.



Select the Crop Icon



Choose Crop to Harvest



New Crop will display

Crop Type Icon Descriptions

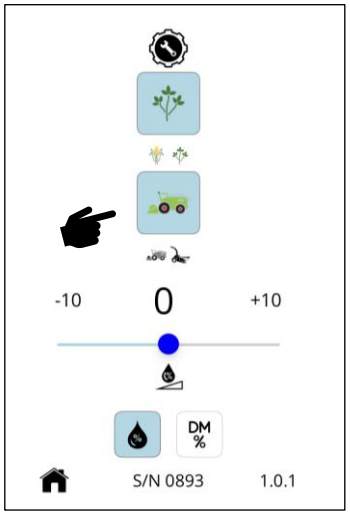
Hay Silage

Corn Silage

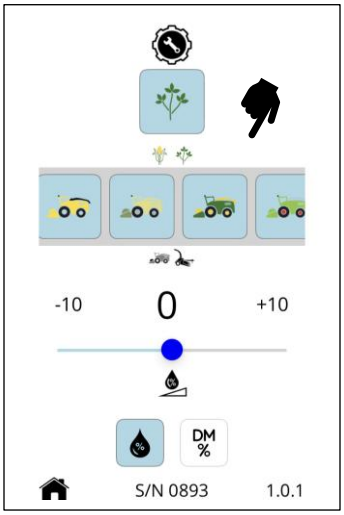
Additional crop choices may be available in future system versions. App software updates will be accessed through the Apple App Store and Google Play Store when made available. Updated system software versions will be posted to the Harvest Tec website when made available.

Machine Type Selections

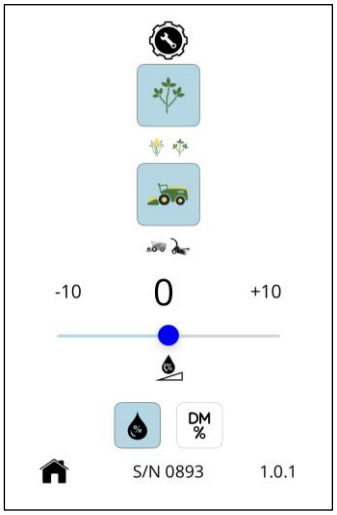
In the settings screen select the Machine Type Icon. Once selected a slider will show allowing you to view machine type options. Scroll and select the icon that best represents your machine type.



Select Machine Type Icon



Choose Machine



New Machine will display

Machine Type Icon Descriptions

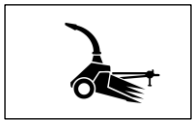
The H2O Moisture Sensor has been configured for various types of machines. Select the appropriate icon representing what machine the system will be used with.


John Deere SPFH


Claas SPFH

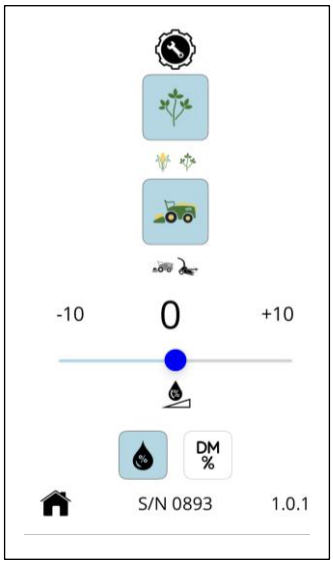

Krone SPFH


New Holland SPFH

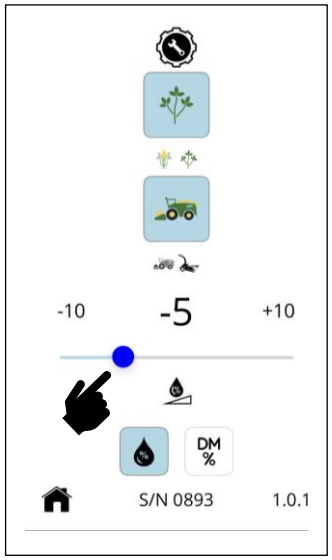

Pull Type Forage Harvester (all makes)

Offset Adjustment

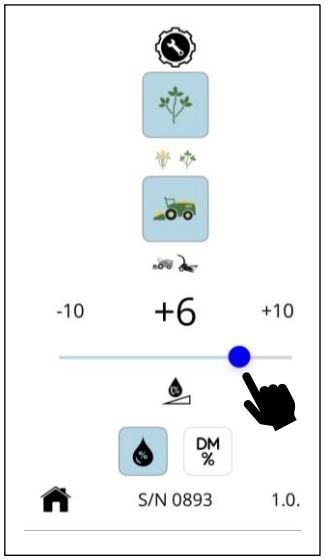
The system allows you to dial in the moisture or dry matter offset based on your second hand or lab test validation. From the service screen adjust the slider up or down 10 points to match your offset.



No Offset



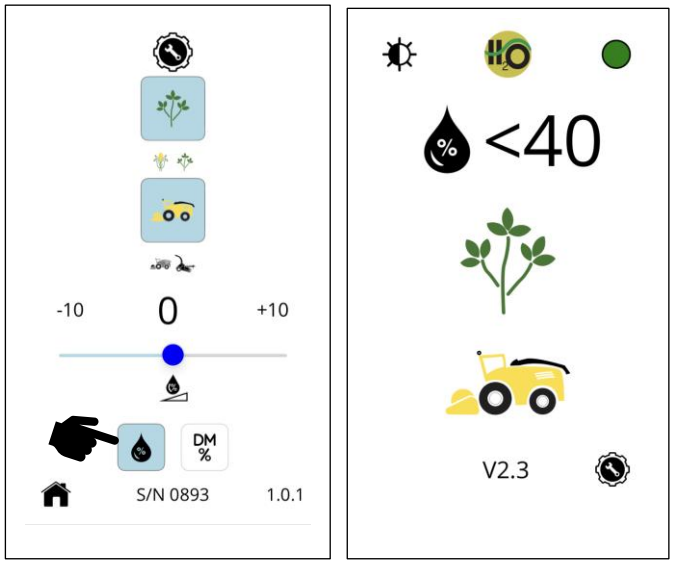
Negative 5 Point Offset



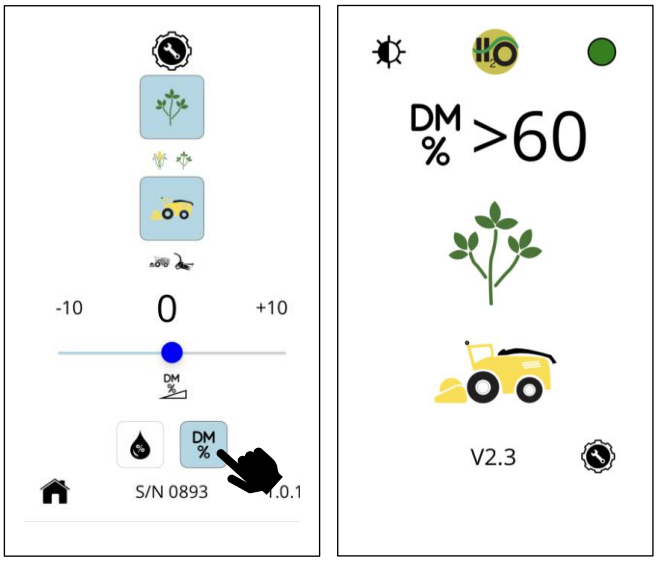
Positive 6 Point Offset

Moisture vs. Dry Matter Percentage

The system allows the option to show readout values as either moisture or dry matter percentages. From the service screen select the moisture drop icon for moisture percentage, or the DM% icon for dry matter percentage to see readouts in the selected format.



Moisture % Selected

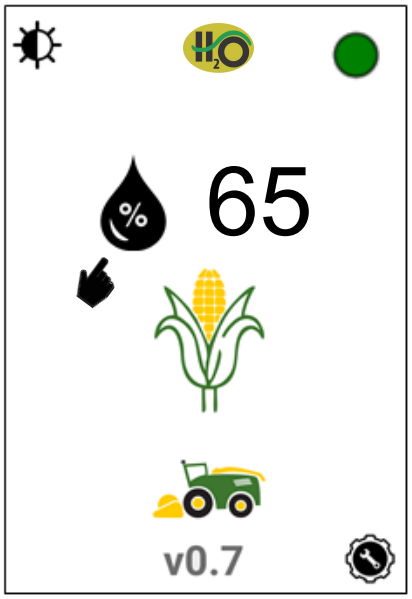


Dry Matter % Selected

Operation

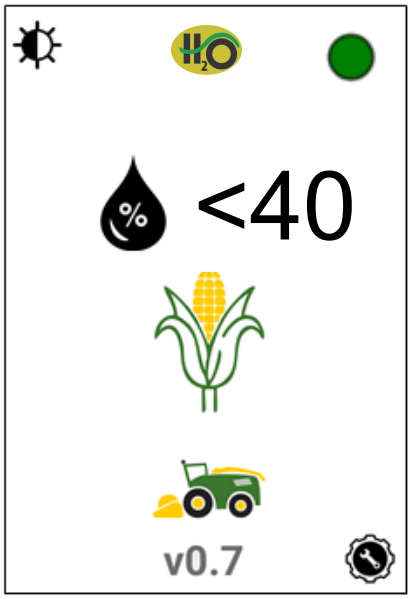
Ensure that the display device has at least a 35% battery charge before connecting to tractor module. Open the H2O Precision Moisture System app on display device **BEFORE** activating the system by turning the key switch of your SPFH or Tractor. A green light on the control module will illuminate when system connection is made between the App and the system moisture module.

Reading Moisture



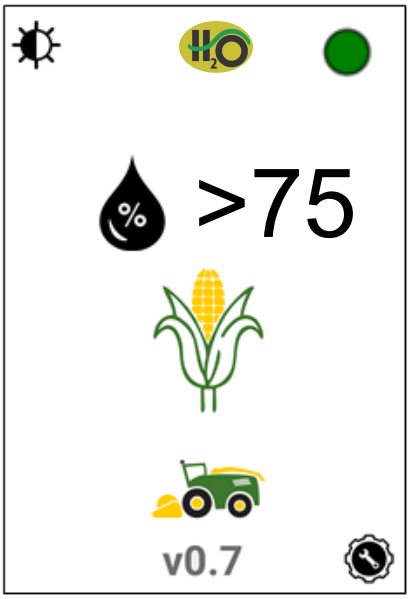
Current moisture displayed when crop comes into contact with sensors

Low Moisture Reading Range



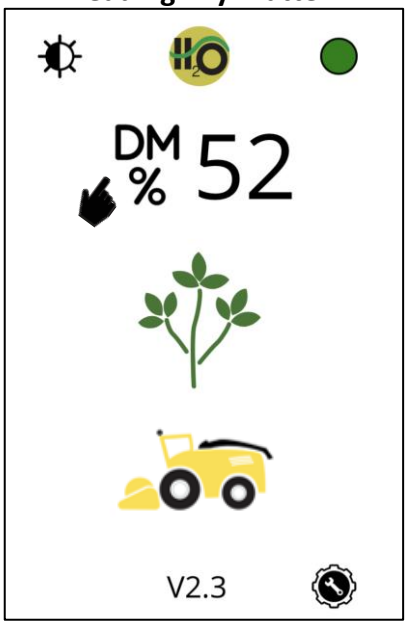
For moisture readings less than 40% the screen will appear as shown above

High Moisture Reading Range



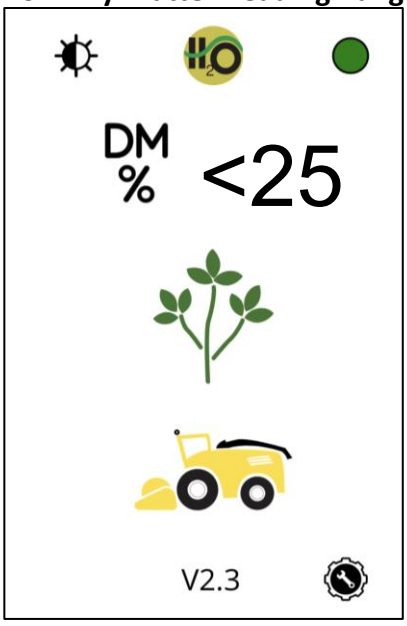
For moisture readings above 75% the screen will appear as shown above

Reading Dry Matter



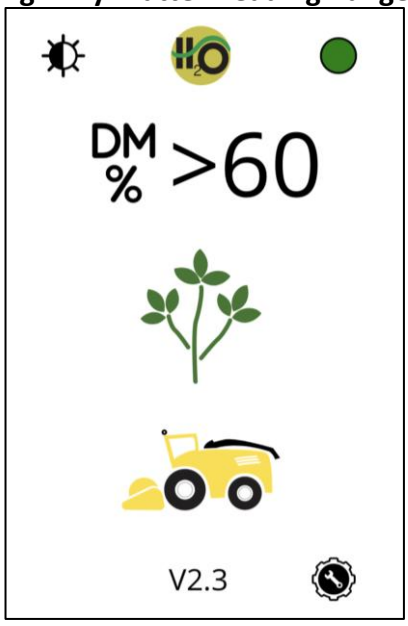
Current dry matter displayed when crop comes into contact with sensors

Low Dry Matter Reading Range



For dry matter readings less than 25% the screen will appear as shown above

High Dry Matter Reading Range



For moisture readings above 60% the screen will appear as shown above

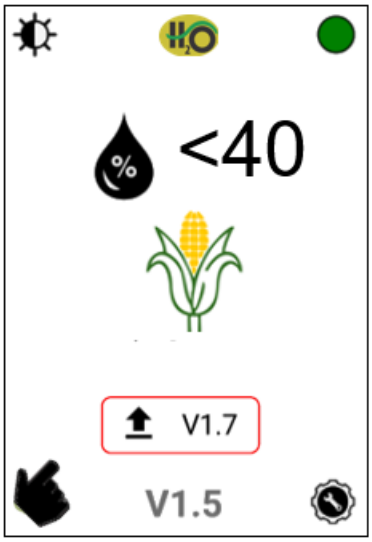
H_2O System Firmware Updates

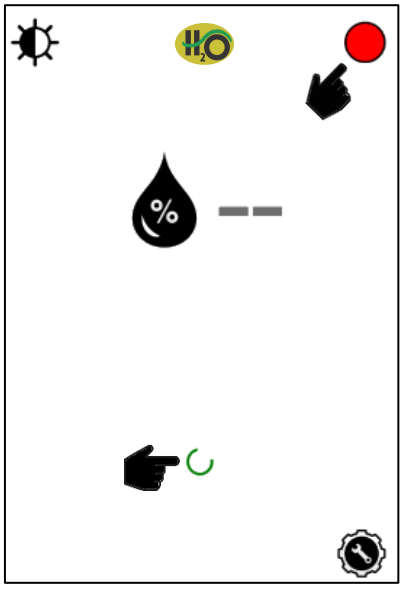
When there is a firmware update available for the H_2O system, Harvest Tec will post it on their website.

Download the updated version to a clean, small capacity USB storage jump drive. Plug it into the USB port that the data cable is not connected to.
Turn on key power. File will load and update will appear.

<u>At this point the system can run without updating if the operator chooses. The icon will simply remain on the screen.</u>

Once the operator decides to perform the software update, they will press the new version number or upload arrow to begin.

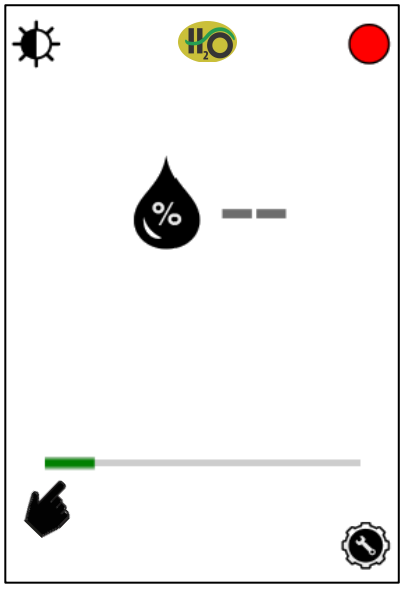




Once the update is initiated, the system will enter update mode

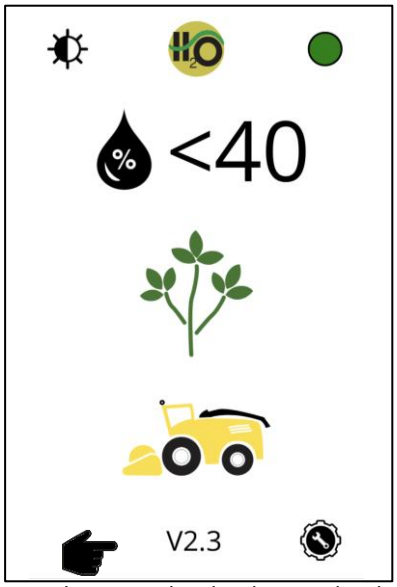
The status light will turn red

A green loading symbol will begin to circulate on the screen



A status bar with then appear to show the update progress

Updating can take 3-5 minutes to properly load firmware



Once the status bar loads completely, the system will boot back up

The status light will again turn green

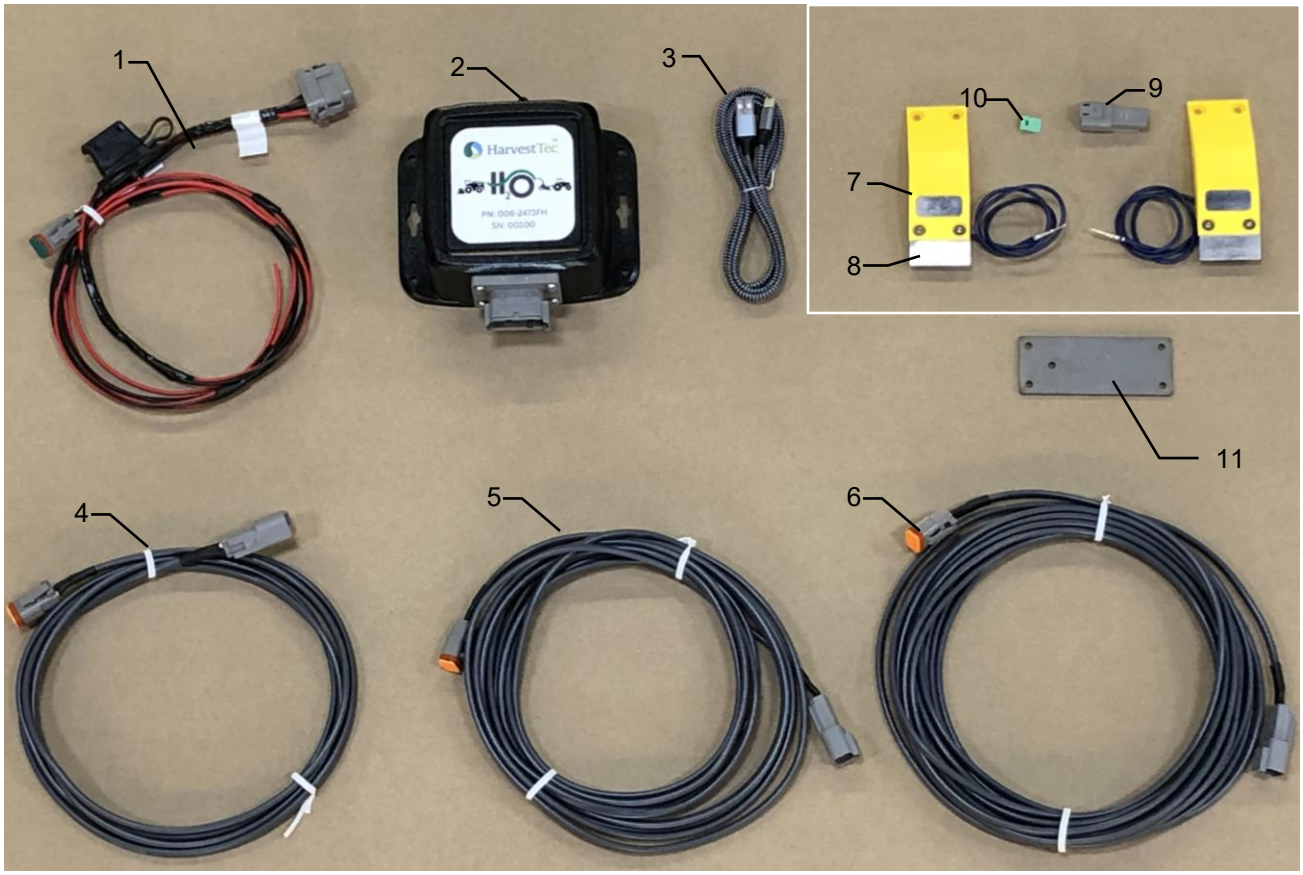
The updated version number will be shown at the bottom of the screen

Note: System will default back to factory presets after firmware updates.

Troubleshooting

Symptom	Possible Cause: Solution
Red Indicator on App will not turn green	Possible data cable issue: Replace data cable. Unit not getting +12v power or key is turned off. Display device undercharged: battery charge needs to be above 30% to connect to module.
Green light on Control Module not illuminating	Unit not getting +12v power or key is turned off: Check power connections.
Green light on Control Module only flashes and does not go solid when app is open	Possible data cable issue: Data cable not plugged into correct port. Check data cable connection, and swipe app closed. Reopen app and restart system by cycling power.
Moisture reading not showing <40 when crop is not being harvested	Crop bridging between sensors: check sensors for crop buildup or blockages. Wet Crop: blower is removing excess moisture from machine
Moisture reading does not change from >75	Sensor or wire harness short: Replace failed sensor or wire harness
Moisture reading does not change from <40 when crop is being harvested	Not receiving sensor signal: Moisture wires damaged or unplugged- Reconnect wires or replace moisture harness. Sensors wore down or missing- Replace damaged or missing sensor Low crop throughout: Adjust moisture offset to account for light crop conditions.
Unit is reading lower than validated samples	Light crop not contacting the sensors: Move spout moisture sensors into better crop flow.

Parts Breakdowns – 201FH



Ref	Description	Part #	Qty
1	Power/Comm. Harness	006-2763	1
2	Control Module	006-2473FH	1
3	USB-A to USB-C Cable	006-6672USBX	1
4	Moisture Harness (8')	006-2766	1
5	Moisture Harness (15')	006-2765	1
6	Moisture Harness (25')	006-2764	1
12	Optional Smartphone Display Kit*	201DK	
13	Smartphone Mounting*	(Included with 201DK)	

*Actual models may vary from shown

Ref	Description	Part #	Qty
7	Moisture Sensor	001-2762	2
8	Diverter	001-2761	2
9	Sensor Plug	001-2762D	1
10	Plug Wedge Lock	001-2762E	1
NP	RTV Silicone		1
11	Drilling template	001-2762AT	1

Replacement Sensor Kit **030-2760**
(Includes all parts ref 7-10)

Complete Kit **030-201FH**

Harvest Tec LLC. Warranty and Liability Agreement

Harvest Tec, LLC. will repair or replace components that are found to be defective within 12 months from the date of manufacture. Under no circumstances does this warranty cover any components which in the opinion of Harvest Tec, LLC. have been subjected to negligent use, misuse, alteration, accident, or if repairs have been made with parts other than those manufactured and obtainable from Harvest Tec, LLC.

Our obligation under this warranty is limited to repairing or replacing free of charge to the original purchaser any part that in our judgment shows evidence of defective or improper workmanship, provided the part is returned to Harvest Tec, LLC. within 30 days of the failure. If it is determined that a non-Harvest Tec manufactured product has been used inside the Harvest Tec applicator system where the failure occurred, then Harvest Tec reserves the right to deny the warranty request at their discretion. Parts must be returned through the selling dealer and distributor, transportation charges prepaid.

This warranty shall not be interpreted to render Harvest Tec, LLC. liable for injury or damages of any kind, direct, consequential, or contingent, to persons or property. Furthermore, this warranty does not extend to loss of crop, losses caused by delays or any expense prospective profits or for any other reason. Harvest Tec, LLC. shall not be liable for any recovery greater in amount than the cost or repair of defects in workmanship.

There are no warranties, either expressed or implied, of merchantability or fitness for particular purpose intended or fitness for any other reason. This warranty cannot guarantee that existing conditions beyond the control of Harvest Tec, LLC. will not affect our ability to obtain materials or manufacture necessary replacement parts.

Harvest Tec, LLC. reserves the right to make design changes, improve design, or change specifications, at any time without any contingent obligation to purchasers of machines and parts previously sold.

Revised 1/24

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