

HORIZON[®]

HEADER CONTROL SYSTEM



USERS MANUAL

FOR

POLY ARM SENSORS

09010003a



HEADSIGHT.COM | 574.546.5022

About Headsight

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About this Manual

How to use this manual

The instructions in this manual are in the order that they should be completed for new installations. Complete all applicable instructions in each section before proceeding. Note that some sections are labeled to indicate they only apply to certain machines or applications. An index is available in the front of the manual to help find technical information for previously installed systems.



This icon designates information of which you should take note.



This icon indicates Install Instructions or a special tool needed for a given task.



This icon designates an important instruction.

Suggestions

If you have any suggestions to improve this manual please call 574-546-5022 or email info@headsight.com.

Disclaimers

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US6883299; US7310931; US7647753; US9609806; US9609806; US10222410;
US10244680; US11696530; EP2955993(DE,ES,FR,IT,UK); EP2956851 AU2004203614;
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Safety Information

Safety Stop



Before working on combine or under header always:

1. Perform all combine and header manufacturer safety precautions for servicing header.
2. Insert stop to prevent movement of header.
3. Turn off combine and remove key from ignition.
4. Set combine parking brake.
5. Disconnect all drive shafts from the header.



Getting Started

Before You Start



Do you have a supported Virtual Terminal Screen?

- John Deere GS3 (2630 or GS3 Command Center) or GS4 (4600)
- CIH Pro 700 (must have Virtual Terminal Software installed)
- NH Intelliview IV (must have Virtual Terminal Software installed)
- AgLeader Integra or InCommand
- AGCO C2100 or Tyton
- Trimble FMX, GFX750, or 2050

Installation Overview

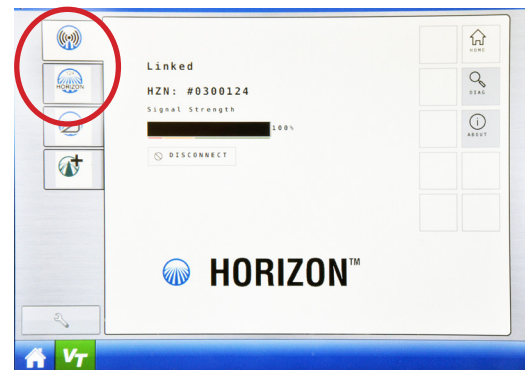


To install your Horizon system, follow the steps below in order.

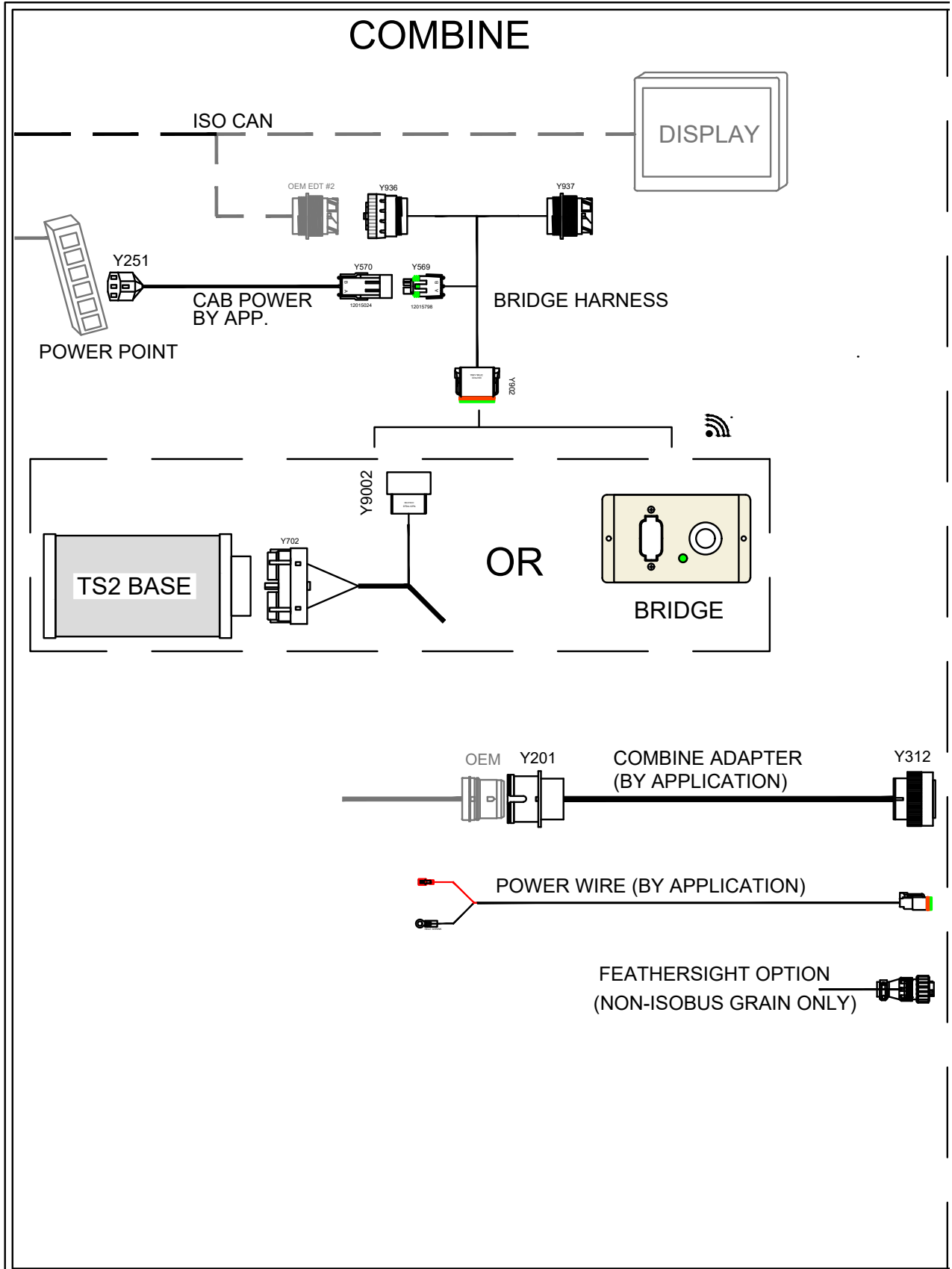
1. Install the Header components.
 - See the header model specific Installation Manual
2. Install the Combine components.
 - See the combine model specific Installation & Operation Manual
3. Find the ISOBUS (VT) application on your display.
 - For OEM displays, see the combine model specific Installation & Operation Manual
 - For aftermarket displays, see the relevant Aftermarket Installation & Operation Manual
4. Refer to this manual for detailed information on using Horizon.

Finding VT applications

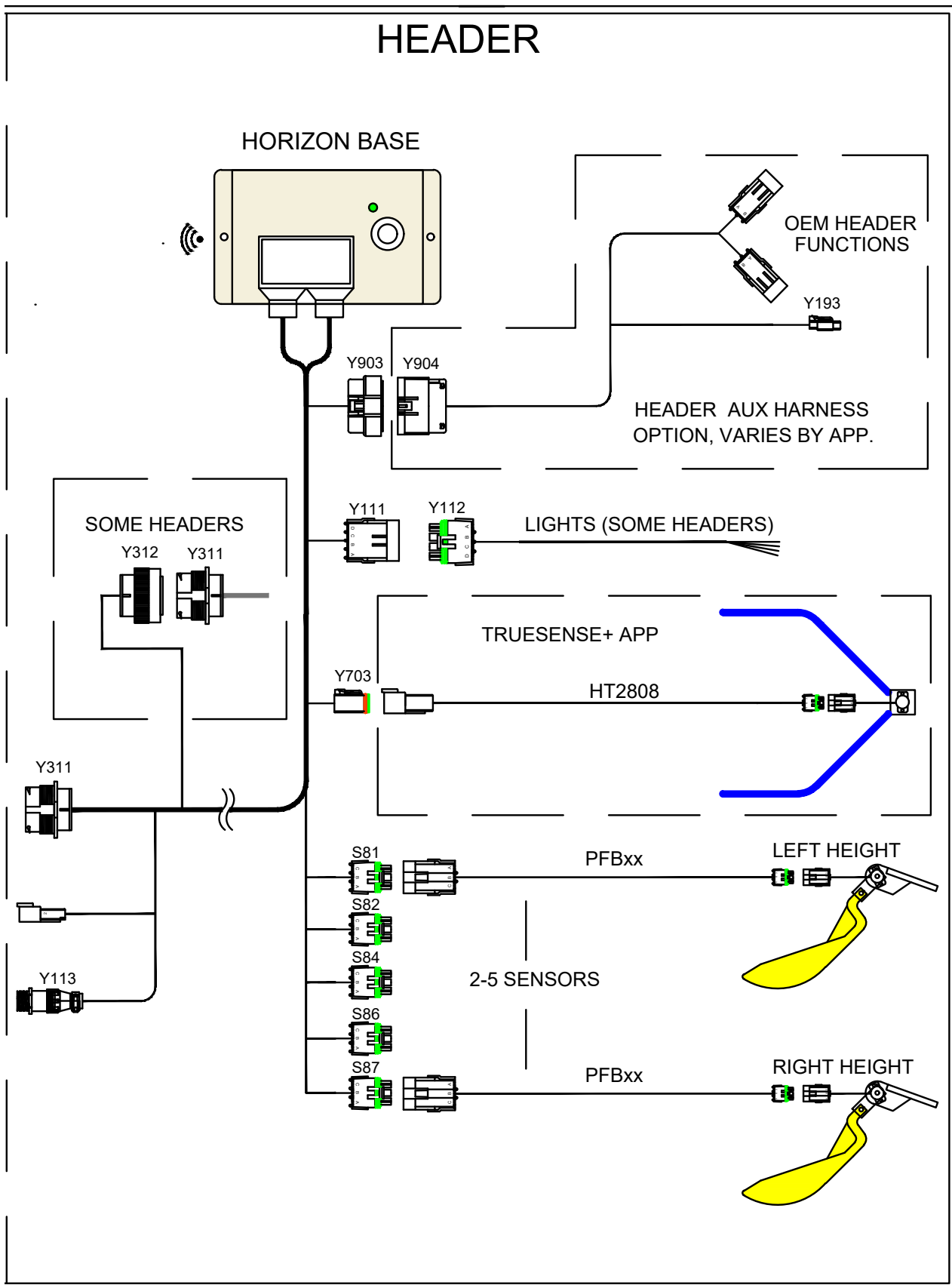
1. Access VT application on display.
 - See “Finding VT Applications” section in:
 - OEM combine model specific Operation manual
 - Aftermarket Display Operation Manual
 - Some displays show Apps on Home page
 - Some displays have a “VT” tab to access Apps.
2. Choose Horizon Bridge (shown) or Horizon app on display.



Connection Overview



Overview continued.



Headsight ISOBUS (VT) Application Guide

The following is a guide to the Headsight ISOBUS Applications you may see.



Horizon Bridge



Truesight2



Horizon Base (Main)



Truesense +



Horizon - Header App

Horizon Main Screens

HOME

- Overview of settings chosen
 - Combine & header make/model
 - # of Sensors
 - Optional modules

CAL(ibration)

- For calibration of header height/tilt sensors
- See “Calibration”

SETUP

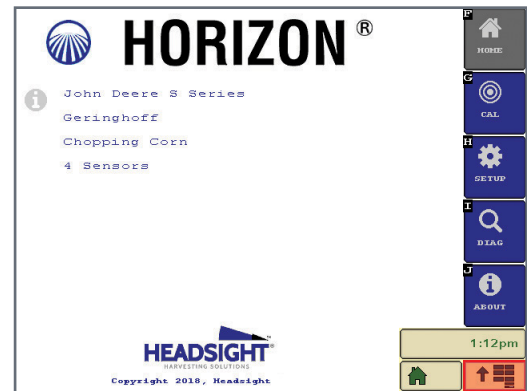
- All settings (combine, header, options, etc)
- See “Setup”

DIAG(nostics)

- Diagnostics and Error screens
- See “Diagnostics”

ABOUT

- All other - Hardware & software versions, contact info, etc.



Establishing WIFI link to Horizon



Horizon only needs to be linked at initial setup or any time a controller is replaced.



See “ISOBUS Application Guide” & “Finding ISOBUS Applications”

- For OEM displays, see the combine model specific Installation & Operation Manual
- For aftermarket displays, see the relevant Aftermarket Installation & Operation Manual

Setting Truesight 2 as Horizon Bridge



Use this section **ONLY** when using Horizon with Truesight 2. If using standalone Horizon Bridge module, skip this section. Before proceeding, complete the initial setup and calibration in the Truesight 2 manual (if not already done).

1. Select ISOBUS application “Truesight 2”.
2. Select “Setup”.
3. Select “WIFI”.
4. Select “Mode” and switch the mode to “Bridge”.
5. Cycle power, be sure that both VT monitor and Truesight 2 power cycle to save changes.
6. Follow the directions for “Linking Horizon to Horizon Bridge” below.



Linking Horizon with Horizon Bridge



This section must be completed before proceeding to setup Horizon system.

1. Select ISOBUS application “Horizon Bridge”.
2. Select serial number of Horizon base unit to which you want to connect.
3. Wait until screen says “Linked” and Loading of Pools has completed.
4. Go back to main menu and select ISOBUS application “Horizon”.



Initial Setup



If Horizon does not appear, temporarily remove any USB memory attached to the display monitor and cycle power.



Most Screens include Help pages that can be accessed by pressing the ? button. These pages contain further information about the items displayed on the current screen.

1. Power up Horizon by turning on combine ignition key.

- Claas combines must have engine running

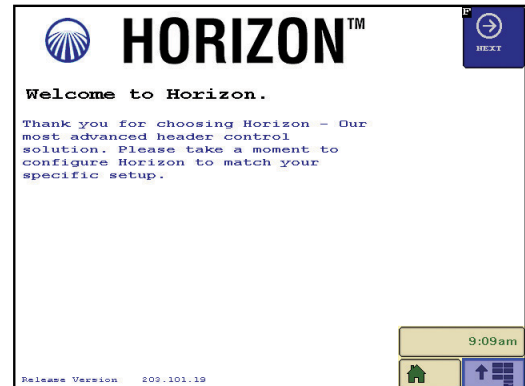
2. Select ISOBUS (VT) application “Horizon”.

- See Combine or Aftermarket Display specific manual to find Horizon VT Applications



3. You should see the “Welcome to Horizon” page shown.

4. Press Next.



5. Follow on screen choices, and setup for your specific Horizon kit. Refer to combine model specific Installation manual. Press Next or Previous to move through the selection pages.

- Combine Make - Choose make of combine
- Combine Model - Choose model number of combine
- Head Select - Type of head
- Header App - Choose specific head if applicable
 - Options depend on Header Select
 - May leave as “none”
- Sensor Type - Choose Poly Arm
- Sensor Count - Number of Height Sensors
- Verify Sensor Position - choose 2 or 4 sensor tilt
 - Check L/R for initial setup (Default)
- Sensor Mode
 - Standard (Default)
 - Foresight (Corn)
 - Feathersight (Grain)
- Pinpoint Diagnostics
 - Not installed (default)

6. Setup Successful!

7. Follow on-screen instructions, Press CAL to move to Calibration step.



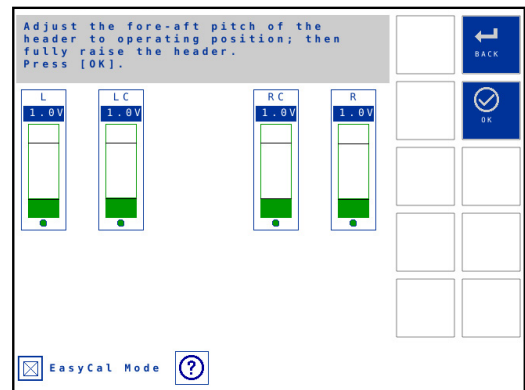
Initial Setup appears until all the initial requirements are met.

Calibration

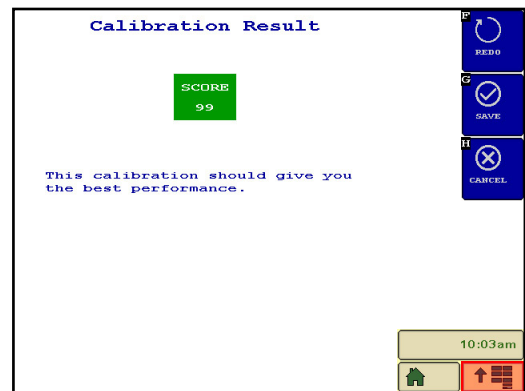
For the best header control and calibration score, always make sure the header f/a angle is set correctly. For cornheads, there should be 4-6” between skids and ground when snout tips touch, and snout tips must be adjusted even & level to header frame. Calibrate on a hard level surface such as a driveway or shop floor.

For all JD S-Series combines with HFAT (Hydraulic Fore/Aft Tilt option) make sure “Feeder House Fore/Aft Tilt Range” calibration has been completed on combine before Horizon calibration.

1. Select Horizon VT application.
2. Level header to the ground (lateral tilt).
3. For combines/heads with fore/aft pitch, adjust head to desired operating angle.
4. Select Calibrate on the display.
5. Select EasyCal Mode (Corn Only).
6. Raise header and select OK.
 - Follow on screen prompts
 - Calibration score will be calculated at end
 - Save Calibration if satisfied with score, if not satisfied with score repeat Calibration - See chart below
7. Calibrate header to combine as described in combine user manual.



Calibration Score	
Best Performance	90-100
Good Performance	80-89
Fair Performance	70-79
Unreliable Performance	0-69



Note: A score of < 10 indicates Horizon has identified a specific problem, which should be displayed directly below the score. The problem must be corrected before calibration can be completed.



If a desired calibration score is not attained and all the above recommendations were completed, try a calibration without EasyCal Mode checked. This will add calibration steps and not automatically set Foresight® gain.

Setup

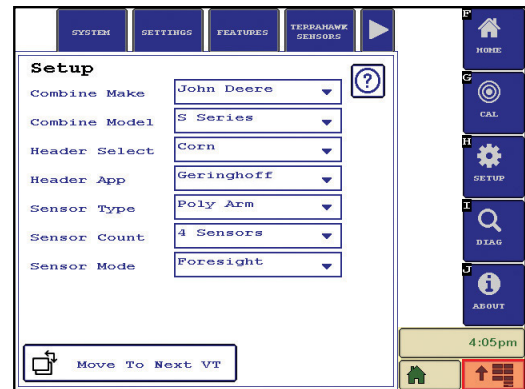
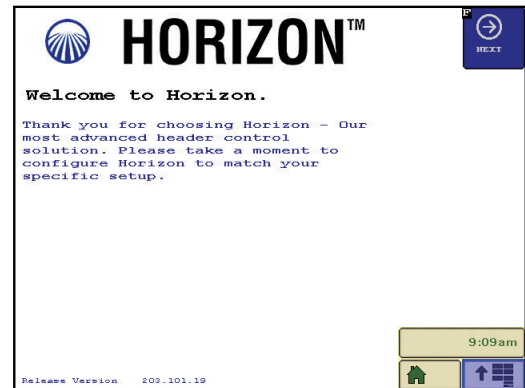


Most screens include “Help” pages that can be accessed by pressing the ? button. These pages contain further information about the items displayed on the current screen.

See Advanced Info, Setup/Reset to restore default settings if necessary.

System

1. Power up Horizon by turning on combine ignition key.
2. Select VT application “Horizon”.
 - See Operation section of this manual to find Horizon VT Applications
3. Follow on screen choices and setup for your specific Horizon kit. Also refer to combine model specific installation manual.
 - Combine Make - Choose make of combine
 - Combine Model - Choose model number of combine
 - Head Select- Important notes are below
 - Chopping Corn - Any Chopping corn head on JD combines
 - Other - Stripper Headers
 - Header App - Choose specific head if applicable
 - Options depend on Header Select
 - Sensor Type - Choose Poly Arm (unless using Terrahawk)
 - Sensor Count - Number of Height Sensors
 - Sensor Mode - Options depend on Header Select
 - Standard
 - Foresight - Corn only, see Settings/Foresight
 - Feathersight - Grain only, see Settings/Feathersight
 - Other special applications (choose only if specifically stated in application manual)



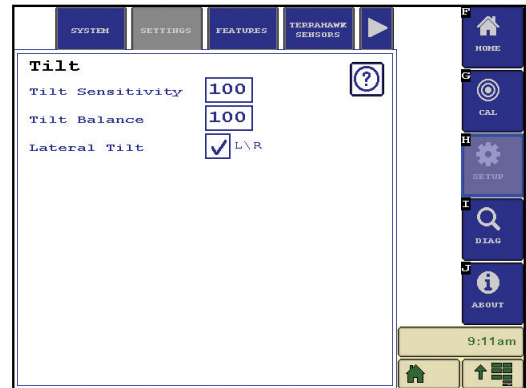
Settings

Tilt Sensitivity



If the head is too jumpy from side to side – decrease sensitivity. If you would like the head to be more responsive – increase sensitivity.

- Always increase combine tilt sensitivity before increasing Horizon tilt sensitivity
- Tilt sensitivity range - 0-200



Tilt Balance

If the head is consistently running higher on one end than the other, Tilt Balance manually tweaks the combine height inputs to level it out. Use Tilt Balance only after eliminating other possible solutions.

1. Before adjusting tilt balance:
 - Double check to make sure head frame is level and snouts are adjusted correctly
 - Re-calibrate Horizon on a flat, level surface
 - Re-calibrate combine on a flat, level surface
2. If head is still not running level, adjust the tilt balance setting.
 - Default tilt balance value is 100
 - Lowering the tilt balance number will lower the left end of the head
 - Raising the tilt balance number will lower the right end of the head
3. Tilt balance setting will only last until the next calibration.
 - Do not recalibrate combine without resetting tilt balance to 100

Tilt Algorithm Selection



Headsight offers two algorithm choices for controlling lateral tilt. The choice of tilt algorithm is only available for systems with at least 4 sensors.

Select only L/R for 2 sensor tilt (default) when harvesting:

- Across terraces
- Most standard conditions

Select both L/R & LC/RC for 4 sensor tilt when harvesting:

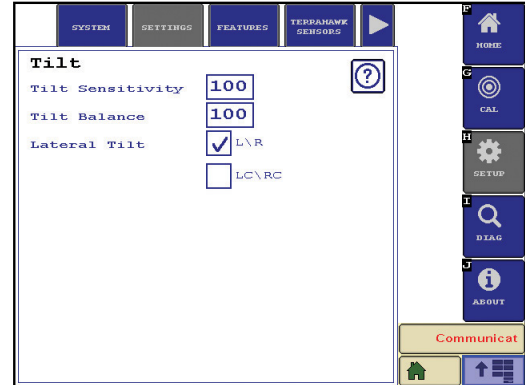
- Parallel to terraces
- Parallel to ditches
- With irrigation tracks

Outer 2 sensor tilt (default)

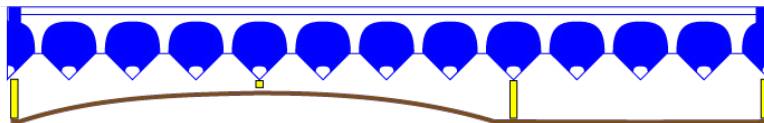
- Outer sensor on each side controls lateral tilt
- Keeps the outer two sensors the same distance from the ground
- All sensors control height
- Any sensor can cause the header to raise, all need to agree to lower the header
- Keeps the header's highest point closer to the ground but header may be higher on average

Outer 4 sensor tilt

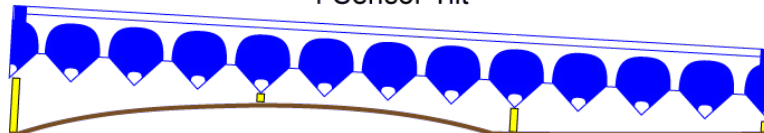
- Outer TWO sensors on EACH side control lateral tilt
- Keeps the closest of each outer pair of sensors the same distance from the ground
- All sensors control height
- Any 1 can raise, all need to agree to lower
- Keeps the header closer to the ground on average but may have one end higher



2 Sensor Tilt



4 Sensor Tilt



Foresight[®] - Gain (Corn Heads)



Foresight improves the performance of corn systems very near the ground. This setting is only applicable if you have turned on and calibrated the Foresight[®] option. If you used the Easy Cal feature, this number has been automatically determined in the calibration process. Otherwise follow instructions below.

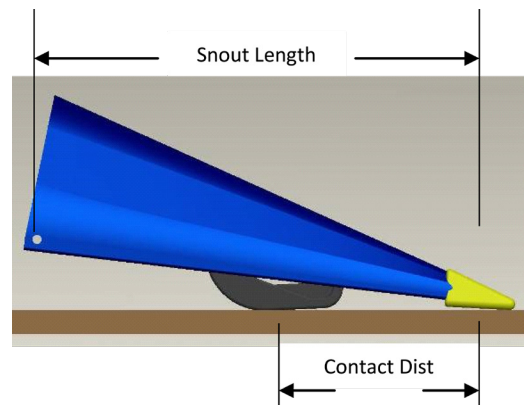
1. Set the Foresight Gain.

- The initial gain setting depends on the header dimensions
- The proper setting may be determined by:

$$\text{Gain} = \frac{\text{Snout Length}}{\text{Contact Distance}}$$

2. Fine tune the gain setting.

- Increase the gain for greater responsiveness near the ground
- Decrease the gain if the header seems jumpy near the ground ONLY
- If the header is jumpy with the points in the air, readjust the combine, NOT Foresight



Feathersight® - HP Balance (Grain Heads)



This setting is only applicable if you have installed, turned on, and calibrated the Feathersight® option.

What to know:

- This setting is the percentage of the height response determined by the height sensors – the remaining response is determined by the pressure sensor
- Changing this setting will not affect the tilt response
- This setting is only available when an auxiliary (pressure) sensor is detected during Horizon™ calibration
- The default value is 65 when an auxiliary (pressure) sensor is detected and 100 if no auxiliary (pressure) sensor is detected



Setting Hints:

- If you know that you intend to run with the header always on the ground, you may want to decrease the HP Balance
- If you know that you intend to run with the header always in the air, you may want to increase the HP Balance or recalibrate Horizon™ with the pressure sensor disconnected to disable the pressure sensing mode
- To increase the height response for the height sensors, increase the HP Balance
- To increase the height response for the pressure sensor, decrease the HP Balance

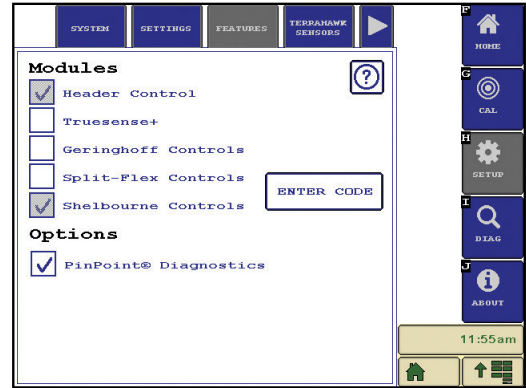
Features

Horizon Modules

Some modules require a feature unlock in the Horizon setup:

- Truesense+ (row guidance)
- Geringhoff Controls
- Split-flex Controls
- Shelbourne Controls

1. Go to Horizon/Setup/Features.
2. Module should be checked/greyed in.
 - The unlock is typically purchased with the system package and preloaded at the factory
3. Contact Headsight.
 - If you purchased a specific module and do not have a check in the box
 - If you wish to add a module to this Horizon unit



If you ever need to replace your Horizon Base, please have your current base s/n available (etched on bottom of base), and notify the Headsight sales team which modules are unlocked.

Truesense+ & Header App Settings

See the appropriate Headsight Truesense+ or header specific App Manual for detailed setup and operation instructions.



The Truesense+ application has its own setup & calibration to be completed before using row guidance. See the Truesense+ manual 09062350.

Pinpoint



Pinpoint is a diagnostic tool that utilizes software and hardware components to “Pin Point” a wiring problem.

- See Diagnostics for more information
- Works with Headsight “Poly Arm” sensors only
- Some applications cannot use Pinpoint
- Lexion/Bish conversions for JD headers
- Most other conversions
- Try turning Pinpoint off if you are getting random unexplained errors
- Check box to Enable

Terrahawk Sensors

Used only with Terrahawk Radar sensors. See Terrahawk Manual.

WIFI



Changing a WIFI channel is only needed when there is signal interference from another device. Renaming is optional, and may be used to assign unique identifiers to each head/machine. This can be very helpful when running multiple combine/header pairs.

1. Select SETUP>>WIFI on Horizon VT application.
2. Rename network by selecting box “Network Name”.
3. Switch channel by selecting drop down box “Channel”.
4. Press “Apply” or cycle power after any WIFI changes have been made.
 - Be sure that Horizon unit power cycles to save changes



Advanced

Advanced settings should only be changed when instructed by a Headsight technician

1. Output High & Output Low.
 - Set the maximum & minimum height voltages sent to the combine (based on calibration)
2. Combine Max Tilt.
 - Sets the maximum allowed “difference” left to right
3. Raise Bias.
4. P-Ramp High & Low (used only if required with Feathersight).
5. Algorithm Type.
 - Allows setting different output styles independently of combine type
 - Used only for special applications

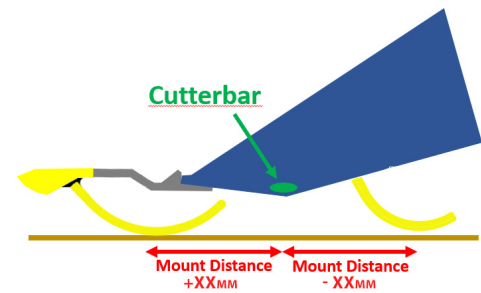
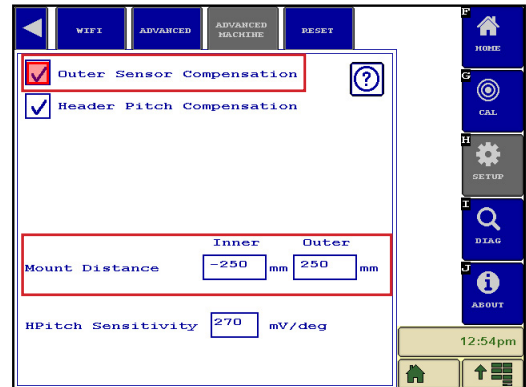
Advanced Machine

Outer Sensor Comp/Mount Distance (Grain Heads)

Properly setting Outer Sensor Comp/Mount Distance can significantly improve the performance of the header control.

Understanding Outer Sensor Comp

- Outer Sensor Comp should be selected when terrace-mounted sensors are being used on grain heads
- This setting corrects for the mounting position to provide the best performance possible



Header Pitch Comp



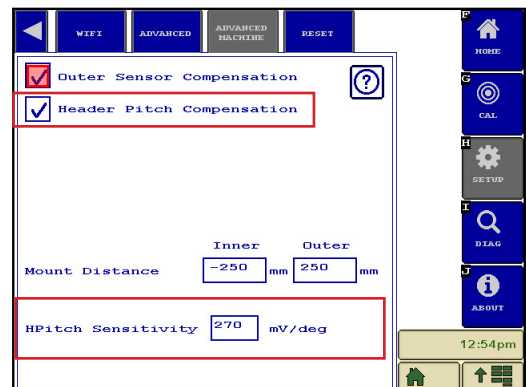
Header Pitch Comp noticeably improves the performance of the header control near ground on headers with fore/aft tilt.

Understanding Header Pitch Comp

- Header Pitch Comp should be selected when using header with fore/aft tilt
- This setting corrects calibration values based on header geometry
- Adjust the pitch of the head to desired operating position before performing the calibrations

Setting HPitch Sensitivity

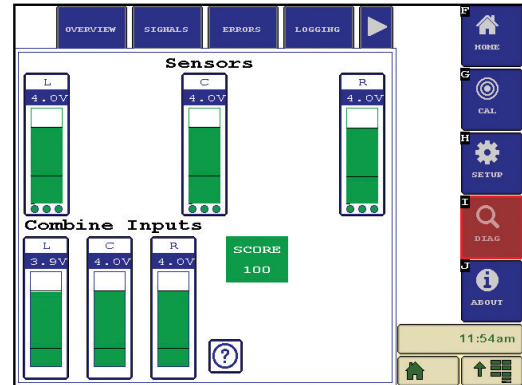
1. On the VT interface in the cab, open the Horizon pool, and press the “SETUP” softkey on the right.
2. Select the “ADVANCED MACHINE” tab along the top.
3. Select “Header Pitch Comp”.
4. Set HPitch Sensitivity:
 - Increase value to make it less sensitive
 - Decrease value to make it more sensitive
 - John Deere 6/700D Default is (270)
 - MacDon Default is (350)



Diagnostics

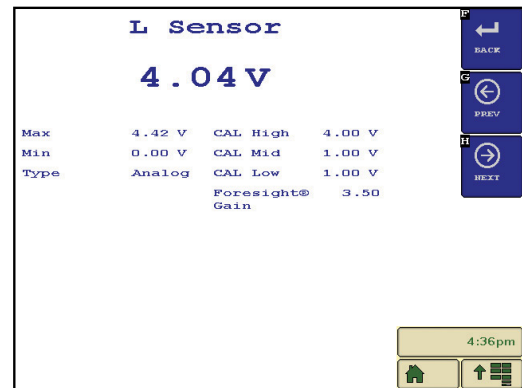
Overview

- Overview - displays voltages from sensors and voltages being sent to combine
- Calibration Score
- General reference to calibrated range - black lines on sensor graphs are high and low calibration points, middle hash mark is Foresight® calibration point when being operated on a corn head with Foresight® turned on
- Dots on graphs: Green - no codes, Yellow - had code but working, Red - code active



Detailed Sensor Voltages

- Press on any sensor graph
- Max and Min Voltages since last calibration
- High, Mid (used with Foresight), and Low calibration voltages
- Displays Foresight® Gain setting
- Use Previous and Next to scroll through sensors and Back to return to previous menu



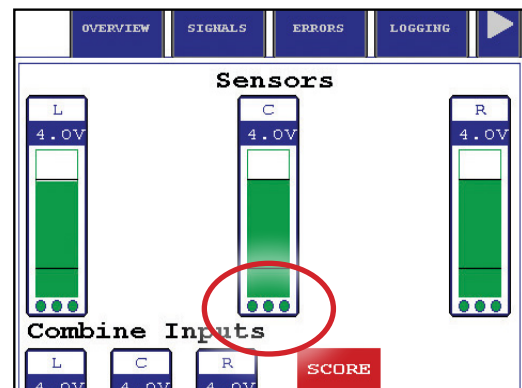
Pinpoint



Pinpoint is a diagnostic tool that utilizes software and hardware components to “Pin Point” a wiring problem.

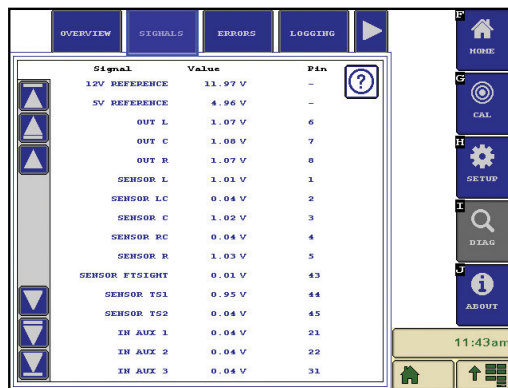
- Works with Headsight “poly arm” sensors only
- See Setup>Features to enable or disable
- Left to right, the dots represent wires A,B,C for each sensor (in sensor harness)
 - Green dot - no errors
 - Yellow dot - that wire previously had a fault
 - Red dot - a fault is currently present on that wire

To clear fault codes after a repair has been made, see the Diagnostics Errors section of this manual.



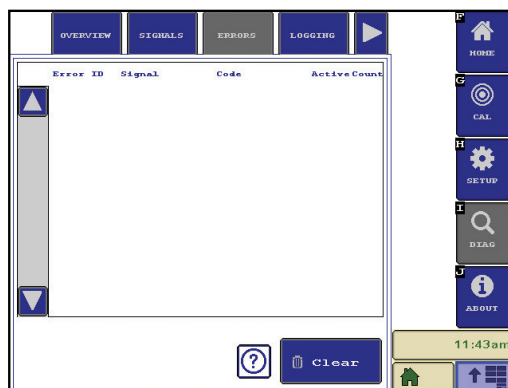
Signals

- General reference to inputs and outputs of Horizon™
- Displays - Signal, Value, and pin location on 50 pin connector on Horizon™



Errors

- Displays all error codes since last calibration or clearing of codes
- Displays active or inactive status for codes
- Allows clearing of codes after problem has been fixed



Other Application Diagnostics

Truesense+

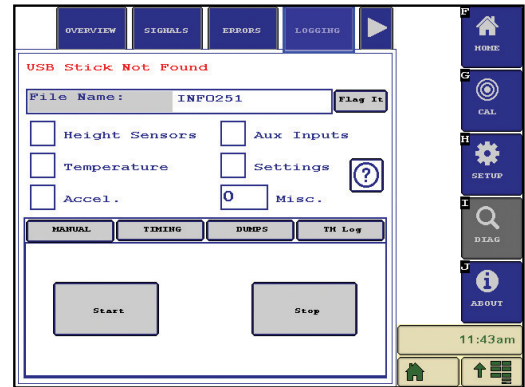
- See Truesense+ App manual for diagnostics
- Inputs/Outputs can also be read under Horizon/Signals above

Header Apps

- See Headsight specific Header App manual for diagnostics
- Inputs/outputs can also be read under Horizon/Signals above

Logging

- Allows logging specific inputs/outputs to a USB stick
- For diagnostics use if requested by Headsight engineering only

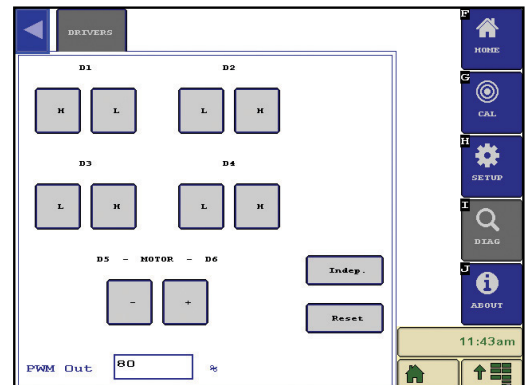


Drivers



Use only if instructed by a Headsight technician. There is a risk of damage to header or injury if used incorrectly.

- Allows manual operation of output driver modules (solenoids/lights)
- Only for use if directed by a Headsight technician
- Can be used to manually override some automatic functions if needed (folding, speed) in certain Header Apps



Operation

Header Height Control

1. Be sure you have the initial settings entered and have calibrated Horizon.
2. See the Combine specific Installation & Operation manual to setup & calibrate your combine.
3. Operate the Headsight system exactly like you would use your combine OEM height control system.
4. Fine tune all combine speed and sensitivity adjustments for best performance.

Truesense+ (For JD RowSense, Lexion Autopilot, Agco AutoGuide)

1. Be sure you have the initial settings entered and have calibrated Truesense+.
2. See the TrueSense+ Installation & Operation manual to setup & calibrate the combine.
3. Operate the system exactly like you would use your combine OEM row guidance system.
4. Fine tune all combine speed and sensitivity adjustments for best performance.

Header Options



Headsight has partnered with some header companies to display operational information for those heads. This information is available as a Horizon header app on the VT. These applications require a specific adapter harness.

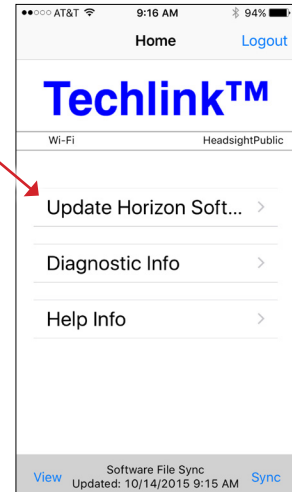
- Information displayed may include:
 - Deck plate spacing
 - Deck plate angle
 - Shaft speeds
 - Hours in service
 - Folding the head
 - Other
- If Headsight is controlling any function on the header (example - folding the header), the application will also require a header specific Unlock.
- See the appropriate Headsight specific Header App Manual for installation and operation instructions.

Advanced Information

Updating Software

Updating with Techlink™ App

1. Download Headsight Techlink App on your iPad or iPhone from the Apple store.
 - Must have Horizon 2.4.0 or later software
 - Must have Boot Loader 1.3.5 or later
 - Go to “Help Info” to learn how to use app
 - Make sure TechLink is synced to the latest software
 - On your phone wi-fi browser select the HZN xxxxxxx network
 - On TechLink, choose Update Controller Software
 - Once info is loaded, choose latest software and choose Update Software
 - Follow on-screen directions



Updating with USB

1. Download latest version from website.
2. Unzip files, copy file insight2.bin onto root directory on USB flash drive.
3. Unplug Bridge unit in the cab while the Base update is being applied.
4. Plug USB flash drive into USB port on Horizon base on header.
 - If unit is not yet powered up, cycle key on combine
 - Base unit should start blinking yellow shortly after applying power. If this doesn't happen, unplug and plug the single point connector on the feederhouse
5. Wait until Horizon base has a green indicator light (should be no longer than 5 minutes).
6. You can now safely remove the USB flash drive.
 - Be sure to replace USB cover cap to reseal box
7. Place USB stick in the Bridge unit.
8. Plug connector back into the Bridge unit.
9. Wait until Horizon bridge has a green indicator light (should be no longer than 5 minutes).
10. Unplug USB when a green light is displayed on the Bridge unit.
 - Be sure to replace USB cover cap to reseal box
11. Wait for Horizon Bridge pool to appear on VT.
 - A power cycle might be needed after update

12. Your units are now updated. Please verify that your Horizon initial settings are correct.

- If a drop down menu is displayed, select the serial number of the base unit (the base applications should start loading after the bridge indicates a “linked” status)



If your Horizon units fail to update you must do a complete format on USB drive to a (FAT) file type and then recopy insight2.bin to root directory. If Horizon box continues to blink orange for more then 6 minutes or has a red light during update, install Boot Loader Update file before the main update file.

Status Light

LED Blink sequences

- Loading Data from USB: rapid yellow blink (approx. every 0.1 sec)
- Unit looking for VT: green LED, blinks twice a second
- Normal Operation: green LED, blinks every 3 seconds
- User Interaction required (Update): rapid green blink (an alarm mask will prompt the user on the VT)
- 12V power low: red/yellow blink
- 5V supply low: 2 slow, 3 fast green blinks

(Bridge only)

- Sending updates to VT: green LED blinks fast 3 times, then off 1 time

Setup/Reset

Restore Defaults

- Will reset the “Settings” to factory default
 - Tilt Sensitivity, etc
 - Advanced Settings, etc
- Will not change selections in “System” tab
 - Combine Select
 - Header select
 - Etc.
- Will not affect module unlocks

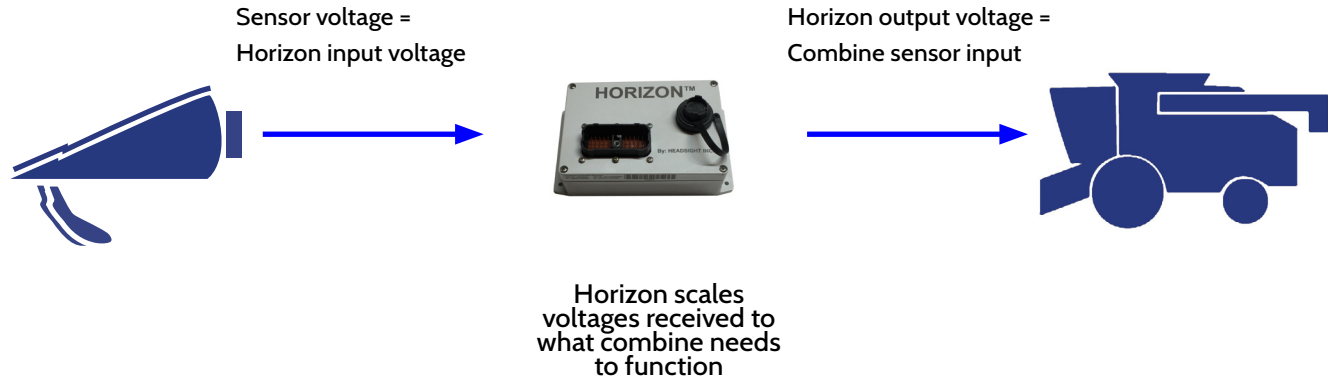
Reset All

- Will reset all “System” & “Settings” features to default/unselected
- Will not affect software updates
- Will not affect module unlocks

Theory of Operation



A review of the following points will help the service technician to understand the complete system, which will help diagnose specific problems.



1. Each sensor returns a variable voltage depending on header height.
 - High header height = high voltage (approximately 4 volts)
 - Low header height = low voltage (approximately 1 volt)
2. Each sensor has 3 wires:
 - black or lt blue = ground
 - white = signal returned to combine (typically varies 1-4 volts)
 - green or pink = 5 volt power
3. The Horizon base adjusts signals as needed then sends them to combine using the same combine wiring as OEM system would use.
 - All sensors are scaled to an appropriate range for combine
 - Horizon reads all sensors and sends signals to combine that will cause appropriate height and or tilt response
 - If Foresight is enabled - the Horizon magnifies the voltage change below the point where the snout tips touch the ground
4. The combine sensor inputs should be the same voltages on the Horizon “Combine Inputs” above.
5. These are exactly like what it would see with an OEM system. All existing combine controls and settings may be used.

Sensors - Basic Requirements



Each sensor must meet basic requirements for Horizon to accept the calibration. If any sensor does not meet the requirements below, you must correct it and then recalibrate the Insight box.

- See the header manual for sensor adjustment instructions.
- Sensor output voltage must always be between .3 and 4.7 volts.
- Sensor output voltage must change more than 1.0 volts from raised to lowered position for each sensor.

Troubleshooting



Before working on combine or under header always:

1. Perform all combine and header manufacturer safety precautions for servicing header.
2. Insert stop to prevent movement of header.
3. Set combine parking brake.
4. Turn off combine and remove key from ignition.
5. Disconnect all drive shafts from the header.



Troubleshooting Overview

Several Troubleshooting Sections are available, depending on the type of problem or symptoms.

1. Troubleshooting -Sensors & Harnesses.

- Use this section to troubleshoot a specific sensor that is not working or out of adjustment.
- Typical symptom:
 - Sensor fault code displayed - example: "Err 1130.00, Left Sensor Low Voltage"

2. Troubleshooting by Symptom.

- **WIFI & CAN**
 - Use this section to troubleshoot "connection" issues
- **AHHC Symptoms**
 - Use this section to diagnose poor operation symptoms
 - Not usually accompanied by an Error message or Fault Code

3. Troubleshooting by Horizon Error Code.

- See Diag/Errors tab

Troubleshooting—Sensors and Harnesses



To properly test the wiring and sensors on the header, follow the steps below in order. Use a Volt Meter as needed.

The sensor connector pattern is as follows:

- Pin A is Ground (Black or Lt Blue)
- Pin B is Signal (White)
- Pin C is 5V (Green or Pink)



A common problem during install is to reverse the wires at the connector after removing the plug to route the cables. Make sure that the wires/voltages are as shown. If A & C are reversed, the sensor output voltage will be 4.7V and not change.

The following requirements must be met before testing:

- Key on, combine engine running
- Header connected

Symptom	Problem	Solution
Bad Harness Wiring Disconnect Sensor Plug (Measure voltage on harness plug at sensor)	Measure C to Frame Ground Voltage should be 5V	If not, check harness for continuity or short on 5V wire Check Combine 5V source
	Measure C to A Voltage should be 5V	If not check harness for continuity on ground wire Check combine sensor ground source
	Jump C to B in harness plug Voltage should be 5V See "Diagnostics/Overview"	If not check signal wire for broken harness or bad connection
	All of the above are correct	Harness & combine connections pass test.
If you have a Headsight Sensor tester, use it to test the sensor. For all other:	Verify sensor is connected to extension harness Sensor voltage should be 0.5- 4.5V See "Diagnostics/Overview"	If sensor cannot be adjusted to achieve a voltage within the range, replace sensor.

Troubleshooting by Symptom



Nearly every problem with the header control system may be resolved by one of the following simple steps:

- Make sure each sensor meets basic requirements discussed in Advanced Info section
- Properly calibrate Horizon
- Properly calibrate combine AHHC (“Header Cal”)
- Enable appropriate AHHC functions on combine
- Properly set combine electronics and/or hydraulics

Symptom	Problem	Solution
CAN & WiFi Diagnostics		
No Horizon Bridge App on VT See Advanced Info/Status Light for more diagnostics	Bridge or TS2 not connected to VT CAN.	Make sure Bridge is connected to correct VT CAN
	Bridge does not have Power (no LED)	Make sure bridge has switched 12V.
	ISO or VT not installed/enabled on monitor	Install or enable VT
	Truesight 2 is not enabled as “Bridge”	Check WiFi setup in TS2
	Memory stick interfering (CNH only)	Remove memory stick from VT, cycle power.
	Check for 2nd Display	Make sure Horizon is not on other display
Bridge cannot find Base See Advanced Info/Status Light for more diagnostics	Base not connected	Connect Header to combine
	No 12V power to Base	Make sure Base has power. Check for power wire properly installed. Check power from combine Some applications, Base LED can be on, but WiFi not powered. Start combine engine.
	Base connected to BAT not keyed 12V	Make sure that Base turns off with key.
	Base not broadcasting WiFi	Check smartphone Wifi Browser for “HZN xxxxxx” network
	Other networks interfering. Wifi Cameras, Building Wifi, etc	Move combine away from buildings, etc. Change Wifi Channel. Cycle power and see if problem is resolved
	Base WiFi blocked	Move Base away from metal shields (frames, covers etc), Remove trash.

Symptom	Problem	Solution
CAN & WiFi Diagnostics		
Base not broadcasting WiFi No "HZN xxxxxxx" network on smartphone Wifi Browser See Advanced Info/Status Light for more diagnostics	No 12V Power	Make sure Base has 12V power. Check for power wire properly installed. Check power from combine Some applications, Base LED can be on, but WiFi not powered. Start combine engine.
	Shorted power system on header	Disconnect header wiring, Aux harness, Header CAN network, etc to see if WiFi will reappear
	Defective Base	Call Headsight for further diagnostics

Symptom	Problem	Solution
AHHC Diagnostics		
No automatic operation height or tilt	Wiring is not connected properly	Check wiring Installation
	Header control is not enabled with cab controls	See Combine owners manual
	Wrong HHC mode selected	Turn on AHHC, see Combine owners manual
	Error preventing operation	Correct error
Header is to jumpy or responds to slow	Combine is improperly set	See Combine owners manual
	Horizon needs to be re-calibrated	See Calibration section of this manual
Head Jumps and Jerks whole combine	Drop rate too fast	See Combine owners manual
	Unopened accumulator	Open accumulator valve 1-2 turn
	Discharged accumulator	Test accumulator as described in combine owner's manual, replace or recharge as necessary
Combine will not calibrate	Horizon not calibrated	Calibrate Horizon
	Horizon Outputs incorrect	See: Reading Voltages
	Combine Problem	Repair Combine

Symptom	Problem	Solution
AHHC Diagnostics		
<p>CNH only</p> <p>Combine will not go into Auto Height mode.</p> <p>Combine stays in RTC (Straight line under header icon)</p> <p>No "wavy line" mode</p>	<p>Combine inputs incorrect</p> <p>Combine not Calibrated</p> <p>Combine Quirk. (Random combines need a "boot" to get them to shift into Auto mode. Perform suggested solution exactly as shown.)</p>	<p>Calibrate Horizon/change setup, etc so combine has correct input voltages</p> <p>Perform combine Header CAL</p> <p>Cycle Key Redo Combine Header CAL Lower head until snoot tips/cutterbar are touching ground Engage Thresher & Header Set #1 Height point there (very low) Check for "Wavy line" icon Bump height up as desired</p>

Troubleshooting by Horizon® Error Codes

Error Code	Problem
1100.00	Left Wire A too High
1100.01	Left Wire A too Low
1100.03	Left Wire A shorted to High Source
1100.04	Left Wire A shorted to Low Source
1100.05	Left Wire A open
1101.00	Left Center Wire A too High
1101.01	Left Center Wire A too Low
1101.03	Left Center Wire A shorted to High Source
1101.04	Left Center Wire A shorted to Low Source
1101.05	Left Center Wire A open
1103.00	Center Wire A too High
1103.01	Center Wire A too Low
1103.03	Center Wire A shorted to High Source
1103.04	Center Wire A shorted to Low Source
1103.05	Center Wire A open
1105.00	Right Center Wire A too High
1105.01	Right Center Wire A too Low
1105.03	Right Center Wire A shorted to High Source
1105.04	Right Center Wire A shorted to Low Source
1105.05	Right Center Wire A open
1106.00	Right Wire A too High
1106.01	Right Wire A too Low
1106.03	Right Wire A shorted to High Source
1106.04	Right Wire A shorted to Low Source
1106.05	Right Wire A open
1110.00	Left Wire B too High
1110.01	Left Wire B too Low
1110.03	Left Wire B shorted to High Source
1110.04	Left Wire B shorted to Low Source

Error Code	Problem
1110.05	Left Wire B open
1111.00	Left Center Wire B too High
1111.01	Left Center Wire B too Low
1111.03	Left Center Wire B shorted to High Source
1111.04	Left Center Wire B shorted to Low Source
1111.05	Left Center Wire B open
1113.00	Center Wire B too High
1113.01	Center Wire B too Low
1113.03	Center Wire B shorted to High Source
1113.04	Center Wire B shorted to Low Source
1113.05	Center Wire B open
1115.00	Right Center Wire B too High
1115.01	Right Center Wire B too Low
1115.03	Right Center Wire B shorted to High Source
1115.04	Right Center Wire B shorted to Low Source
1115.05	Right Center Wire B open
1116.00	Right Wire B too High
1116.01	Right Wire B too Low
1116.03	Right Wire B shorted to High Source
1116.04	Right Wire B shorted to Low Source
1116.05	Right Wire B open
1130.00	Left Sensor too High
1130.01	Left Sensor too Low
1130.03	Left Sensor shorted to High Source
1130.04	Left Sensor shorted to Low Source
1130.05	Left Sensor open
1130.11	Left Sensor - Error not defined
1130.34	Left Sensor not detected
1131.00	Left Center Sensor too High
1131.01	Left Center Sensor too Low

Error Code	Problem
1131.03	Left Center Sensor shorted to High Source
1131.04	Left Center Sensor shorted to Low Source
1131.05	Left Center Sensor open
1131.11	Left Center Sensor - Error not defined
1131.34	Left Center Sensor not detected
1132.00	Truesight Sensor too High
1132.01	Truesight Sensor too Low
1132.03	Truesight Sensor shorted to High Source
1132.04	Truesight Sensor shorted to Low Source
1132.05	Truesight Sensor open
1132.11	Truesight Sensor - Error not defined
1132.34	Truesight Sensor not detected
1133.00	Center Sensor too High
1133.01	Center Sensor too Low
1133.03	Center Sensor shorted to High Source
1133.04	Center Sensor shorted to Low Source
1133.05	Center Sensor open
1133.11	Center Sensor - Error not defined
1133.34	Center Sensor not detected
1135.00	Right Center Sensor too High
1135.01	Right Center Sensor too Low
1135.03	Right Center Sensor shorted to High Source
1135.04	Right Center Sensor shorted to Low Source
1135.05	Right Center Sensor open
1135.11	Right Center Sensor - Error not defined
1135.34	Right Center Sensor not detected
1136.00	Right Sensor too High
1136.01	Right Sensor too Low
1136.03	Right Sensor shorted to High Source
1136.04	Right Sensor shorted to Low Source
1136.05	Right Sensor open
1136.11	Right Sensor - Error not defined
1136.34	Right Sensor not detected

FCC and IC Compliance Statements

The Horizon Box Contains Transmitter Module ESP32

WARNING: To satisfy FCC RF exposure requirements for mobile transmitting devices, a separation distance of 20cm or more should be maintained between the antenna of this device and persons during operation. To ensure compliance, operations at closer distances than this are not recommended.

ATTENTION: This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The FCC requires the OEM to be notified that any changes or modifications not expressly approved by SyChip, LLC may void the user's authority to operate the equipment. While an application of the ESP32 module in a product is not required to obtain a new FCC authorization for the module, this does not preclude the possibility that some other form of authorization or testing may be required for that end product.

This device using the integrated antenna has been tested to comply with FCC CFR Part 15. The device meets the requirements for modular transmitter approval as detailed in the FCC public notice DA00.1407.

ATTENTION: The term "IC" before the certification/registration number only signifies that the Industry Canada technical specifications were met.

Le terme "IC" devant le numéro de certification /d'enregistrement signifie seulement que les spécifications techniques Industrie Canada ont été respectées.

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to

The following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Cet appareil est conforme avec Industrie Canada RSS standard exempts de licence (s). Son utilisation est soumise à Les deux conditions suivantes: (1) cet appareil ne peut pas provoquer d'interférences et (2) cet appareil doit accepter Toute interférence, y compris les interférences qui peuvent causer un mauvais fonctionnement du dispositif.

This device complies with Health Canada's Safety Code 6 / IC RSS-210. The installer of this device should ensure that RF radiation is not emitted in excess of the Health Canada's requirement. Information can be obtained at: http://www.hc-sc.gc.ca/ewh-semt/pubs/radiation/radio_guide-lignes_direct-eng.php

Cet appareil est conforme avec Santé Canada Code de sécurité 6 / IC RSS-210. Le programme d'installation de cet appareil doit s'assurer que les rayonnements RF n'est pas émis au-delà de l'exigence de Santé Canada. Les informations peuvent être obtenues: http://www.hc-sc.gc.ca/ewh-semt/pubs/radiation/radio_guide-lignes_direct-eng.php

Statement of Limited Warranty

For Headsight® Products

Precision Planting DBA Headsight Harvesting Solutions (Headsight) warrants its new products to be free from defects in material and workmanship for a period of twelve (12) consecutive months following the date of purchase by the retail purchaser.

Headsight warrants its new corn sensors assemblies for a period of thirty-six (36) months.

Headsight warrants genuine Headsight replacement parts and components to be free from defects in material and workmanship for a period of six (6) consecutive months following the date of purchase or the remainder of the original equipment warranty period, whichever is longer.

Headsight's obligation under these warranties shall be limited to repairing or replacing, free of charge to the original purchaser, any part that, in Headsight's judgment, shows evidence of such defect.

Limitations to Warranty

This warranty does not cover:

- Warranty claims directly resulting from improper installation of the product.
- Any product damaged by accident, abuse, misuse, or negligence after shipment from Headsight.
- Any unauthorized product alteration or modification.
- Any unauthorized repairs made with parts other than genuine Headsight parts.
- Any repairs performed by anyone other than Headsight or an authorized Headsight dealer unless specifically authorized by Headsight.

Warranty Procedure

- Troubleshooting should be done between farmer/dealer and Headsight through our technical assistance @ **574.220.5511**.
- Labor reimbursement will occur only pre-arranged through Headsight technical assistance and be scheduled to a flat rate basis or reasonable time allowance in Headsight's judgment.
- There is no mileage reimbursement.
- Diagnostic time will not be reimbursed except in pre-arranged circumstances.
- Warranty claims should be on typical dealer service work order with a number and name to be attached for any future correspondence.
- All warranty work must be performed, and claims submitted, within thirty (30) days of the occurrence of the claim and within the warranty period.
- All parts removed during warranty repair must be returned to Headsight with Headsight's Return Form within thirty (30) days of the occurrence of the claim and within the warranty period.
- Headsight reserves the right to either inspect the product at the original retail purchaser's location or require it to be returned to Headsight for inspection.

Limitation of Liability

Headsight makes no express warranties other than those, which are specifically described herein. Any description of the goods sold hereunder, including any reference to buyer's specifications and any descriptions in circulars and other written material published by Headsight is for the sole purpose of identifying such goods and shall not create an express warranty that the goods shall conform to such description.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED. There are no implied warranties of merchantability or fitness of a particular purpose. This warranty states Headsight's entire and exclusive liability and buyer's exclusive remedy or any claim for damages in connection with the sale of furnishing of Headsight products, their design, suitability for use, installation or operation, or for any claimed defects herein. HEADSIGHT WILL IN NO EVENT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES WHATSOEVER, NOR FOR ANY SUM IN EXCESS OF THE PRICE RECEIVED FOR THE GOODS FOR WHICH LIABILITY IS CLAIMED.

No representative of Headsight nor any dealer associated with Headsight has the authority to change the items of this warranty in any manner whatsoever, and no assistance to purchaser by Headsight in the repair or operation of any Headsight product shall constitute a waiver of the conditions of this warranty, nor shall such assistance extend or revive it.

Headsight reserves the right to make improvements in design or changes in specifications at any time, without incurring any obligation to owners of units previously sold. Warranty: **1/2023**



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