ISOBUS BASIC PLANTER

Installation and Operation Guide

TRANSFORMING THE WAY THE WORLD WORKS

Trimble.

Agriculture Business Area

10368 Westmoor Drive

Westminster, CO 80021

USA

800-361-1249 (toll free in USA)

+1-937-245-5154 Phone

+1-937-233-9441 Fax

www.trimble.com

Email: trimble_support@trimble.com

Legal Notices

Release Notice

This is the December 2018 release (Revision A) of the Basic Planter documentation. It applies to the version 2.00 of the display software.

Legal Notices

the Product is installed, if such damage is found to be directly caused by the Product as reasonably determined by Trimble following a root cause analysis.

Warranty Exclusions and Disclaimer

These warranties shall be applied only in the event and to the extent that (a) the Products and Software are properly and correctly installed, configured, interfaced, maintained, stored, and operated in accordance with Trimble's relevant operator's manual and specifications, and; (b) the Products and Software are not modified or misused. The preceding warranties shall not apply to, and Trimble shall not be responsible for defects or performance problems resulting from (i) the combination or utilization of the Product or Software with hardware or software products, information, data, systems, interfaces or devices not made, supplied or specified by Trimble; (ii) the operation of the Product or Software under any specification other than, or in addition to, Trimble's standard specifications for its products; (iii) the unauthorized, installation, modification, or use of the Product or Software; (iv) damage caused by accident, lightning or other electrical discharge, fresh or salt water immersion or spray (outside of Product specifications); or (v) normal wear and tear on consumable parts (e.g., batteries). Trimble does not warrant or guarantee the results obtained through the use of the Product or that software components will operate error free.

THE WARRANTIES ABOVE STATE TRIMBLE'S ENTIRE LIABILITY, AND YOUR EXCLUSIVE REMEDIES, RELATING TO THE PRODUCTS AND SOFTWARE. EXCEPT AS OTHERWISE EXPRESSLY PROVIDED HEREIN, THE PRODUCTS, SOFTWARE, AND ACCOMPANYING DOCUMENTATION AND MATERIALS ARE PROVIDED "ASIS" AND WITHOUT EXPRESS OR IMPLIED WARRANTY OF ANY KIND BY EITHER TRIMBLE INC. OR ANYONE WHO HAS BEEN INVOLVED IN ITS CREATION, PRODUCTION, INSTALLATION, OR DISTRIBUTION INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, TITLE, AND NONINFRINGEMENT. THE STATED EXPRESS WARRANTIES ARE IN LIEU OF ALL OBLIGATIONS OR LIABILITIES ON THE PART OF TRIMBLE ARISING OUT OF, OR IN CONNECTION WITH, ANY PRODUCTS OR SOFTWARE. BECAUSE SOME STATES AND JURISDICTIONS DO NOT ALLOW LIMITATIONS ON DURATION OR THE EXCLUSION OF AN IMPLIED WARRANTY, THE ABOVE LIMITATION MAY NOT APPLY OR FULLY APPLY TO YOU.

NOTICE REGARDING PRODUCTS EQUIPPED WITH TECHNOLOGY CAPABLE OF TRACKING SATELLITE SIGNALS FROM SATELLITE BASED AUGMENTATION SYSTEMS (SBAS) (WAAS/EGNOS, AND MSAS), OMNISTAR, GPS, MODERNIZED GPS OR GLONASS SATELLITES, OR FROM IALA BEACON SOURCES: TRIMBLE IS NOT RESPONSIBLE FOR THE OPERATION OR FAILURE OF OPERATION OF ANY SATELLITE BASED POSITIONING SYSTEM OR THE AVAILABILITY OF ANY SATELLITE BASED POSITIONING SIGNALS.

Limitation or Liability

TRIMBLE'S ENTIRE LIABILITY UNDER ANY PROVISION HEREIN SHALL BE LIMITED TO THE AMOUNT PAID BY YOU FOR THE PRODUCT OR SOFTWARE LICENSE. TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, IN NO EVENT SHALL TRIMBLE OR ITS SUPPLIERS BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES WHATSOEVER UNDER ANY CIRCUMSTANCE OR LEGAL THEORY RELATING IN ANY WAY TO THE PRODUCTS, SOFTWARE AND ACCOMPANYING DOCUMENTATION AND MATERIALS, (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF BUSINESS PROFITS, BUSINESS INTERRUPTION, LOSS OF BUSINESS INFORMATION, OR ANY OTHER PECUNIARY LOSS), REGARDLESS WHETHER TRIMBLE HAS BEEN ADVISED OF THE POSSIBILITY OF ANY SUCH LOSS AND REGARDLESS OF THE COURSE OF DEALING WHICH DEVELOPS OR HAS DEVELOPED BETWEEN YOU AND TRIMBLE. BECAUSE SOME STATES AND JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES, THE ABOVE LIMITATION MAY NOT APPLY OR FULLY APPLY TO YOU.

PLEASE NOTE: THE ABOVE TRIMBLE LIMITED WARRANTY PROVISIONS WILL NOT APPLY TO PRODUCTS PURCHASED IN THOSE JURISDICTIONS (E.G., MEMBER STATES OF THE EUROPEAN ECONOMIC AREA) IN WHICH PRODUCT WARRANTIES ARE THE RESPONSIBILITY OF THE LOCAL DEALER FROM WHOM THE PRODUCTS ARE ACQUIRED. IN SUCH A CASE, PLEASE CONTACT YOUR TRIMBLE DEALER FOR APPLICABLE WARRANTY INFORMATION.

Official Language

THE OFFICIAL LANGUAGE OF THESE TERMS AND CONDITIONS IS ENGLISH. IN THE EVENT OF A CONFLICT BETWEEN ENGLISH AND OTHER LANGUAGE VERSIONS, THE ENGLISH LANGUAGE SHALL CONTROL.

Registration

To receive information regarding updates and new products, please contact your local dealer or visit the Trimble website at www.trimble.com/register. Upon registration you may select the newsletter, upgrade or new product information you desire.

Table of Contents

Safety and Compliance Information

Always follow the instructions that accompany a Warning or Caution. The information it provides is intended to minimize the risk of personal injury and/or damage to property. In particular, observe safety instructions that are presented in the following format:

⚠ WARNING – This alert warns of a potential hazard which, if not avoided, could result in severe injury or even death.

⚠ CAUTION – This alert warns of a potential hazard or unsafe practice which, if not avoided, could result in injury or property damage or irretrievable data loss.

NOTE – An absence of specific alerts does not mean that there are no safety risks involved.

Warnings

⚠ WARNING – Auto Guidance

Auto guidance systems cannot avoid items in the field such as obstacles. Make sure you are adequately trained to operate the auto guidance system.

Many large and sudden changes in satellite geometry caused by blocked satellites can cause significant position shifts. If operating under these conditions, auto-guidance systems can react abruptly. To avoid possible personal injury or damage to property under these conditions, disable the auto-guidance system and take manual control of the vehicle until conditions have cleared.

⚠ WARNING – Articulated Tractors

Articulated tractors pivot in the middle. Avoid putting yourself in a position where you could be injured by the pivoting rear section of the vehicle.

⚠ WARNING – Satellite Geometry

Many large and sudden changes in satellite geometry caused by blocked satellites can cause significant position shifts. If operating under these

conditions, auto guidance systems can react abruptly. To avoid possible personal injury or damage to property under these conditions, disable the auto guidance system and take manual control of the vehicle until conditions have cleared.

⚠ WARNING – Display

When the temperature of the display case reaches 65° C (149 ° F) the display shows the following: WARNING! HOT SURFACE, DO NOT TOUCH. The display will dim the screen until the temperature returns to normal. Use caution when touching the display when this warning is visible.

The display may contain a single-use, lithium-sulfide $LiSO_2$ battery. Do not expose the battery to temperatures greater than 85 °C (185° F) as the battery may vent poisonous gases.

⚠ WARNING – NH_3, Anhydrous Ammonia

Anhydrous valve and flow calibrations require the vehicle and implement to be moving and the implement must be in the ground (the implement lift switch must be down). Take all necessary precautions to ensure user safety. Failure to do so may result in serious injury or death.

NH_3 is an irritant and corrosive to the skin, eyes, respiratory tract and mucous membranes, and is dangerous if not handled properly. It may cause severe burns to the eyes, lungs, and skin. Skin, and respiratory-related diseases could be aggravated by exposure. It is recommended that protective gloves, boots, slicker and/or pants and jacket, and chemical-splash goggles that are impervious to anhydrous ammonia are worn at all times. See Working with Anhydrous Ammonia (NH3).

⚠ WARNING – Implement Master Switch

When the implement is down and the master switch or section master is in the On position, the machine is fully operational. Take all necessary precautions to ensure user safety. Failure to do so could result in injury or death.

⚠ WARNING – Calibration

Incorrect adjustment of *Manual Override Sensitivity* could cause this critical safety feature to fail, resulting in personal injury or damage to the vehicle. Do not to choose a setting that is either too sensitive or not sensitive enough. It is

vital to avoid setting the sensitivity so low that the system will not detect any steering wheel motion.

During the Implement Automatic Deadzone calibration, the system moves the vehicle's steering wheel. To avoid injury, be prepared for sudden vehicle movement.

⚠️ WARNING – Steering

The automated assisted steering system is solely intended for Agricultural use in an open field environment with agricultural vehicles approved by the manufacturer for use with the automated system, and should not be used with any other type of vehicle or for any other purpose.

Contact your local Trimble-authorized dealer or check www.trimble.com to confirm that the automated steering system has been tested and approved by the manufacturer for use with your vehicle make and model.

The automated steering system should not be installed on a vehicle not approved by the manufacturer for such use. Installation of the automated steering system on an unapproved vehicle will invalidate the product warranty.

The steering coulters can move abruptly during the Proportional Steering Gain procedure while the TrueTracker system tests the hydraulic response to the steering commands. These sudden movements can cause collisions with nearby obstacles or cause injury. Be prepared for sudden steering coulter movements.

When you tap the liquid flow, control valve, or fill disk calibration Start button, the machine will become operational. Take all necessary precautions to ensure user safety. Failure to do so may result in serious injury or death.

Material will be dispensed during calibration. Make sure that the implement is safe to operate.

⚠️ WARNING – Vehicle Safety

When you are working on the vehicle's hydraulic systems, vehicle attachments that are suspended can drop. If you are working around the vehicle, you could suffer serious injury if an attachment dropped on you. To avoid this risk, lower all vehicle attachments to the ground before you begin work.

The operator must remain in the driver's seat at all times when the vehicle is in motion and the auto-steering system is engaged.

If someone else attempts to drive the vehicle while you are working on or under it, you can suffer serious or fatal injuries. To avoid this possibility, install a lockout box on the battery terminal to prevent the battery from being reconnected, remove the key from the vehicle's ignition switch, and attach a "Do not operate" tag in the cab.

Vehicle cabs can be quite high in the air. To avoid potentially serious injury through falling from this height, always use the steps and handrails, and face the vehicle, when you enter or exit it.

Agricultural chemicals can pose serious health risks. If the vehicle has been used to apply agricultural chemicals, steam clean the vehicle to remove any chemical residue from the areas of the vehicle where you will be working.

The vehicle will need to move during the Hydraulic Tracked Pump Knees calibration procedure. To avoid injury, be prepared for vehicle movement.

The wheels can move abruptly during the Deadzone calibration or Proportional Steering Gain procedure while the Autopilot system tests the hydraulic response to the steering commands. These sudden movements can cause collisions with nearby obstacles or cause injury to occupants of the vehicle. To avoid injury, be prepared for sudden vehicle movement.

Cautions

⚠ CAUTION – Batteries

Battery posts, terminals, and related accessories contain lead and lead compounds, which can cause serious illness. To avoid ingesting lead, wash your hands thoroughly after touching the battery.

Also take care not to short circuit battery with tools and/or by the incorrect fitting of cables as fire, burns, and damage can occur.

⚠ CAUTION – Calibration

Obstacles in the field can cause collisions, which may injure you and damage the vehicle. If an obstacle in the field makes it unsafe to continue the Automated Deadzone calibration, stop the vehicle and turn the steering wheel to disengage the system.

1. Wait until ISOBUS Spreader ECU prompts you that the phase is ready to begin.

2. Look at the screen to determine whether the next phase will require a left or right turn.

3. Reposition the vehicle so that the turn will use the space that you have available.

4. Tap the button to begin the next phase.

The wheels can move abruptly during the Steering Proportional Gain procedure while the Autopilot system tests the hydraulic response to its steering commands. To avoid injury, be prepared for vehicle movement.

⚠ CAUTION – **Chemical Safety**

The system installation may bring you into contact with chemical substances, such as oil, which can cause poisoning. Wash your hands thoroughly after you finish working on the system.

⚠ CAUTION – **Antennas**

The GNSS antenna may experience interference if you operate the vehicle within 100 m (300 ft) of any power line, radar dish, or cell phone tower.

Wireless, cellular, radio, and GNSS signals can interfere with each other. For best performance, mount antennas at least 1 meter away from each other.

⚠ CAUTION – **Display**

Take the following precautions to preserve the integrity of the display:

- If you leave the display powered on after shutting off the vehicle's ignition, the display power can drain the battery.

- Do not attempt to power the display without an appropriate guidance controller module.

- Do not press on the screen with a sharp item, such as a pencil. You may damage the surface of the screen.

- Do not apply glass cleaner directly to the touchscreen.

⚠ CAUTION – **Cabling**

Connecting the Port Replicator of the NavController cable to the P4 or P12 connector of the NavController harness will result in damage to the equipment, and will void the warranty.

⚠ CAUTION – Pressurized Water

Do not direct pressurized water at:

- Electronic or electrical components or connectors.
- Bearings.
- Hydraulic seals.
- Fuel injection pumps.
- Any other sensitive parts or components.

Set the hose pressure as low as practicable, and spray at a 45° to 90° angle. Keep the nozzle of the power washer away from the machine at the distance recommended by the manufacturer.

⚠ CAUTION – Modems

Do not mount the modem in direct sunlight or in areas of high heat. This will cause degraded performance.

⚠ CAUTION – Protective Gear

Always wear protective equipment appropriate to the job conditions and the nature of the vehicle. This includes wearing protective glasses when you use pressurized air or water, and correct protective welder's clothing when welding. Avoid wearing loose clothing or jewelry that can catch on machine parts or tools.

⚠ CAUTION – USB Drive

Take the following precautions to protect your USB drive:

- Do not remove the USB drive while the display is writing to or from the drive. This will corrupt the data.
- Do not use a USB drive in each USB socket at the same time. If you are attempting to upgrade firmware using a USB drive and another USB drive is already in one of the sockets, the firmware upgrade will fail.

⚠ CAUTION – Vehicle Setup

Take the following precautions when setting up your vehicle:

- If you select a Vehicle Profile that is not suitable for your vehicle, you may experience degraded system performance.

- If you delete a vehicle, all information about the vehicle will be erased.

When the vehicle has been running, parts of the vehicle, including the engine and exhaust, can become extremely hot and can cause serious burns. To avoid burns, allow hot machine parts to cool before you begin working on them.

Always hold the steering wheel while you adjust the column tilt. Otherwise, the weight of the motor may cause the steering wheel to drop suddenly and cause damage to the steering column or dash.

If the vehicle has a master electrical disconnect, make sure the power cable ground connections are not directly attached to the battery terminal.

Attach the ground connects of the power cable to the chassis side of the main disconnect so that it is as close as possible to the battery, but still gets disconnected when the master disconnect is turned off. Failure to connect the power cable ground will cause damage to the display.

Parts of the vehicle may be under pressure. To avoid injury from pressurized parts, relieve all pressure in oil, air, and water systems before you disconnect any lines, fittings, or related items. To avoid being sprayed by pressurized liquids, hold a rag over fill caps, breathers, or hose connections when you remove them. Do not use your bare hands to check for hydraulic leaks. Use a board or cardboard instead.

To prevent damage to the system, make sure that no wires or hoses interfere with or catch on any mechanical linkages, or contact any machine parts that get hot.

Make sure the vehicle power is off when you are connecting system components.

Working with Anhydrous Ammonia (NH$_3$)

Contact your NH$_3$ supplier to review all safety requirements associated with anhydrous ammonia (NH$_3$).

Always wear correct personal protective equipment. This includes, but is not limited to:

- Goggles or face shield

- Protective suit and gloves

- Respirator

Do not allow anyone to operate the system without proper instruction and training.

Stand up-wind when working around NH3 and related equipment.

Always keep NH_3 equipment away from buildings, livestock, and other people.

Never work on NH_3 equipment in confined spaces.

Before you attempt to transport the implement, discharge the system of all NH_3 and completely shut down the system. See Discharging the System.

If symptoms of illness occur during or shortly after use of NH_3products, seek immediate medical attention.

Keep a source of clean water (at least five gallons) readily available. In case of exposure, flush exposed skin or eyes immediately with large quantities of water and seek immediate medical attention.

NH_3 can be harmful to the environment if not used correctly. Follow all local, state, and federal regulations regarding proper handling of this chemical.

Servicing the Equipment

1. Remove the system from operation before performing any maintenance.
2. Thoroughly bleed all system lines and disconnect the nurse tank hose. See Discharging the System.
3. Make sure that the gauge pressure is at zero before you open the system.
4. Use extreme caution when opening a previously pressurized system.

Discharging the System

1. Turn off the console or vehicle master switch.
2. Completely close the main shut-off valve on the supply or nurse tank.
3. Resume field application until the pressure gauge shows zero pressure.
4. Check again that the console and/or vehicle master switch, and all section switches, are turned off.
5. Completely close the emergency shut-off valve the cooling tower.
6. Bleed and disconnect the nurse tank supply hose from the system.
7. Turn on the console master switch and all section switches.
8. Stand up-wind from the implement and then slowly open the bleed valve(s) until fully open.
9. Allow at least one (1) hour for the system to fully discharge.
10. Before you open the system, make sure that the pressure gauge on the manifold reads zero and that the cooling tower is not cold to the touch. This ensures that all liquid NH_3 has evaporated and that the pressure is discharged.

NOTE – Frost on any component is a positive indication of trapped NH_3 at low pressure. Lack of frost does not always indicate a lack of NH_3.

COMPLIANCE INFORMATION

Federal Communications Commission (FCC) Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or service provider for help.

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.

Contains FCC ID: TLZ-NM230NF and Z642564N

Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Industry Canada Interference Statement

This device complies with Industry Canada's license-exempt RSSs. 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 aux CNR exemptes de licence d'Industrie Canada. Son fonctionnement est soumis aux deux conditions suivantes:

1. Ce dispositif ne peut causer d'interférences; et
2. Ce dispositif doit accepter toute interferene, y compris les interférences qui peuvent causer un mauvais fonctionnement de l'appereil.

Radiation Exposure Statement

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

Déclaration d'Exposition aux Radiations

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps.

Contains IC: 6100A-NM230NF and 451I-2564N

INTERNATIONAL COMPLIANCE

Australia and New Zealand

This product conforms with the regulatory requirements of the Australian Communications and Media Authority (ACMA) EMC framework, thus satisfying the requirements for RCM Marking and sale within Australia and New Zealand.

Canada

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme ICES-003 du Canada.

This apparatus complies with Canadian RSS-GEN.

Cet appareil est conforme à la norme CNR-GEN du Canada.

Europe

This product has been tested and found to comply with the requirements for Class B device according to Radio Equipment Directive 2014/53/EU, thereby satisfying the requirements for CE Marking and sale within the European Economic Area (EEA). Contains a radio module. These requirements are designed to provide reasonable protection

against harmful interference when the equipment is operated in a residential or commercial environment.

RECYCLING WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE)

For product recycling instructions and more information, please go to www.trimble.com/Corporate/Environmental_Compliance.

Recycling in Europe: To recycle Trimble WEEE (Waste Electrical and Electronic Equipment, products that run on electrical power.), call +31 497 53 24 30, and ask for the "WEEE Associate". Or, mail a request for recycling instructions to:

Trimble Europe B.V. WEEE Recycling

C/O Menlo Logistics

Gate 19 to 26

Meerheide 43

5521 DZ

Eersel

The Netherlands

Introduction to the Basic Planter

ISOBUS Basic Planter General Functions

The ISOBUS ECU is the control center of the Basic Planter Control Unit. Several sensors are connected to the ECU, which monitors important implement parts. The ECU controls the implement based on these signals and on the operator's specifications. An ISOBUS terminal serves as an interface. All implement specific data is stored in the ECU and is therefore maintained even when changing the display.

Among other things, the ECU can perform the following tasks:

- Seed Monitoring
- Section Control

Information on the Identification Label

On the ISOBUS Basic Planter, you will find an identification label. This label provides all the information you need to clearly identify the product.

Have these details ready when you contact your dealer.

Trimble
Powered By **me MUELLER ELECTRONICS**

ECU, Trimble ISOBUS Planter ← Product Name

PN: 123456-78 ← Part Number

‖ 30397040B54321 ‖‖‖‖ ‖ ‖ ‖‖

SN: 30397001Y12345 ← Serial Number

CE

Powering Up the ISOBUS Basic Planter

You can switch on the ISOBUS Basic Planter as follows:

1. Supply the ECU with power. This can be done in the following ways:

    a. For ISOBUS tractors: Switch the tractor on using the ignition key.

    b. For non-ISOBUS tractors: Switch on the display.

2. You have switched on the ECU.

ISOBUS Basic Planter Symbol on a Display

You can recognize the ISOBUS Basic Planter existence on your display by the following icon:

Tap this icon to launch the ISOBUS Basic Planter application.

Powering Down the ISOBUS Basic Planter

Always switch off the ISOBUS Basic Planter in the following situations:

- When you have finished work.

- Before you leave the field.

- When someone approaches the implement.

You can switch off the ECU as follows:

1. Stop the tractor. The ISOBUS ECU closes all the valves.

2. To stop the application, tap the **Master Switch** softkey:

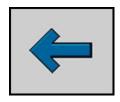The status icon on the main mask will change state to be **Master Switch - OFF**:

The application indicators beneath the icon of the implement are faded out.

3. Switch off the tractor at the ignition switch, and ensure that the display is switched off.

    You have switched off the ISOBUS Basic Planter.
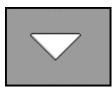
Browsing Between Screens

There are navigation soft keys that will advance you to the function screen desired. You can touch these (on a touch-screen).

Tapping the back arrow softkey returns you to the previous screen.

There are some screens that have too many functions to display them all on one screen. In these screens, you may need to browse further.

The down arrow softkey lets the user move from one page to the next in a series of screens in the same category.

Tap the **Next Screen** softkey to browse to the next function screen:

2

ISOBUS Basic Planter Installation

▶ Installation Summary

▶ Mounting Location for ECU

▶ ECU Harnessing to Tractor ISO Connector

▶ Downloadbox Cabling Diagram

Installation Summary

The system consists of an ECU that is mounted on the Basic Planter and controls the operation.

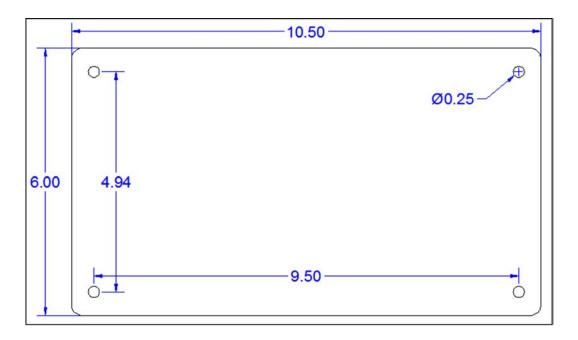The following diagram shows how the Basic Planter is structured:

If you are using Field-IQ, then you will need to add a harness adapter to the complete harness. Connect the adapter to the rate connector on the complete harness.

Plug in the Aux. I/O, rate control, encoder, and spinner control to the existing connectors on your bar.

Mounting Location for ECU

1. Locate a stable and flat area of the implement approximately 8 by 16 inches. The area should be protected from flying debris and dirt. The ECU can be mounted in any orientation. Front toolbar frames often are suitable.

2. A mounting plate can be fabricated from 1/8" plate and bolted to the toolbar with the following dimensions if a suitable location cannot be found.
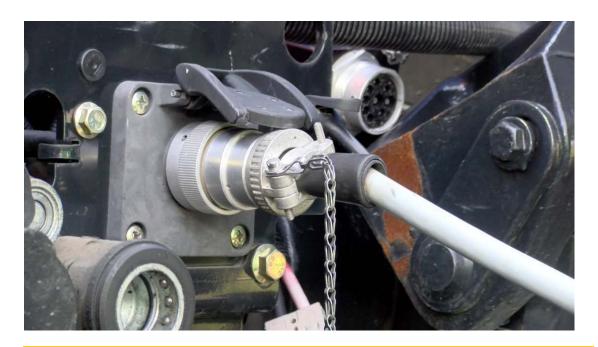

⚠ CAUTION – Do not over tighten mounting bolts. Doing so may damage ECU housing.

---

3. Using four 1/4" x 3/4" length (or another length required) bolts and nylon locking nuts, bolt the ECU to the mounting plate.
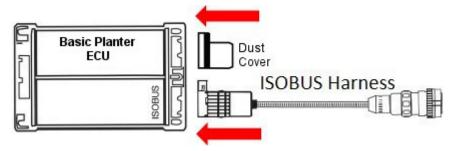
ECU Harnessing to Tractor ISO Connector

1. Route the ISO Implement Cable from the ECU to the implement hitch point. This cable will mate with the Tractor ISOBUS connector (factory equipped).
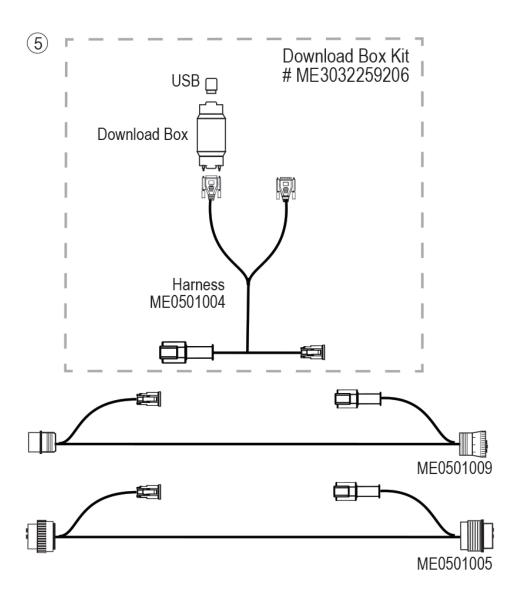
> ⚠ CAUTION – Isolate the harness from pinch points and sharp edges that may damage the harness. Secure any excess cabling with included cable ties.

2. Plug in the ISO Implement Cable harness to the ISOBUS connection on the ECU. Make sure you do not connect the harness to the left side of the ECU. The ISOBUS connection on the ECU is the left hand 16-pin AMP connector when facing the end of ECU with 2 16-Pin AMP connectors. If the harness is connected incorrectly, the system will not power up.

Downloadbox Cabling Diagram

The Downloadbox is used to update or change firmware on the ECU. It necessary to have the ME3032259206 kit, either ME0501009 or ME0501005 may be needed to interface with the ISOBUS to make firmware changes. Refer to the Downloadbox Operations Manual for instructions on updating/changing ECU firmware. The diagram below shows a cabling diagram and the part numbers.

⑤

Download Box Kit
ME3032259206

USB

Download Box

Harness
ME0501004

ME0501009

ME0501005

3

Configuring the ISOBUS Basic Planter ECU

▶ Configuration Overview

▶ Settings Screen

▶ Configuration Settings Screen

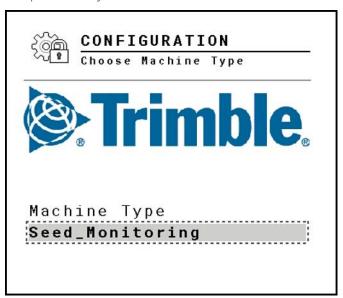▶ Verification of Installation and Setup

Configuration Overview

It's important to understand the terms profile and configuration.

- A profile is a pre-built file that can be loaded onto the ECU and serves as a starting point for your machine.
- A configuration is a profile that has been customized with settings and has been saved and stored on the ECU. Configurations are machine specific and should not be used on a different piece of equipment.

Choosing a Profile

The current system provides the option of 3 different base profiles: 16 Row, 12 Row, and 8 Row.

The first screen that will appear when the system is turned on will allow the user to select the profile they wish to use.
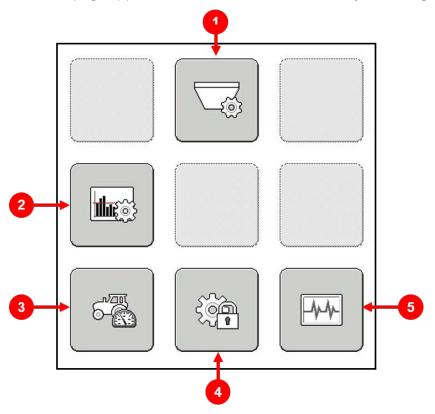

To select a profile, tap the selectable area under Machine Type. Select the profile you wish to use and tap the checkmark. The ECU will restart to load the selected profile.

Settings Screen

From the Run screen, tap the **Settings** softkey:

A second page appears with five different areas to adjust settings:

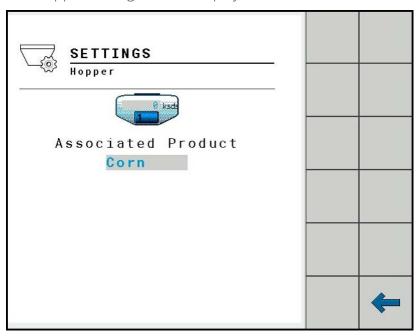|	Description		Description
1	Hopper Settings	4	Configuration Settings Screen
2	Seed Statistics Settings	5	Performing Diagnostics
3	Speed Signal Settings		

Hopper Settings

The Hopper Settings allow the user to choose the Product for the hopper.

From the Settings screen, tap the **Hopper Settings** button:

The Hopper Settings Screen displays:

Choosing a Product for a Hopper

To choose or change a product for the hopper, tap the selectable area under Associated Product. Select the product from the pop-up menu and tap the checkmark or make the selection (dependent on the UT display) to save the selection. To change or add a product to the menu, see Product Configuration.
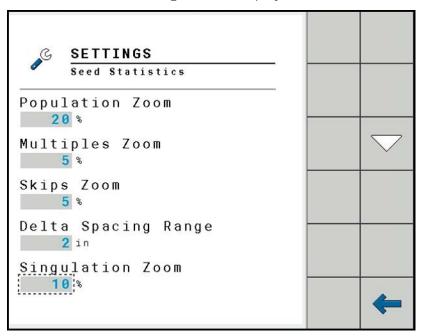
Seed Statistics Settings

The Seed Statistics Settings allow the user to modify the Zoom or range of visible values in the Seed Statistics section of the Run Screen. The user can modify the Population, Multiples and Skips, Singulation, and Delta Spacing Range.

From the Settings screen, tap the **Seed Statistic Settings** button:

The Seed Statistics Settings screen displays:

To make a change, tap the selectable area under each option and type the new value into the pop-up menu. Press the checkmark to save the selection.

Population Zoom

Population refers to the number of seeds planted in an acre of land. The Population Zoom value sets the range of population values that will be visible in the Seed Statistics graph on the Run Screen.

Multiples Zoom

Multiples occur when the planter puts down more than one seed at one location. The Multiples Zoom value sets the range of seed multiples that will be visible in the Seed Statistics graph on the Run Screen.

Skips Zoom

Skips occur when the planter fails to drop a seed. The Skips Zoom value sets the range of seed skips that will be visible in the Seed Statistics graph on the Run Screen.

Delta Spacing Range

Delta Spacing Range sets the range for the graph on the Run Screen. This graph shows the deviation of the seed spacing compared to the target seed spacing.

Singulation Zoom

Singulation refers to how accurate the planter is at putting down one seed at a time. The Singulation Zoom value sets the range of singulation values that will be visible in the Seed Statistics graph on the Run Screen.
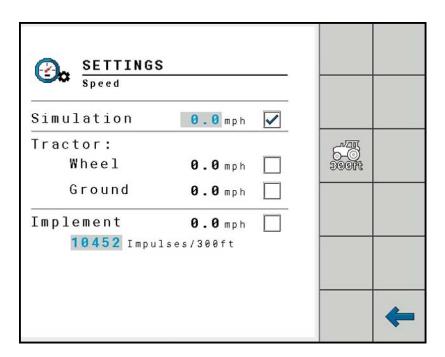
Speed Signal Settings

The speed input settings allow you to choose where the machine speed is coming from to control the application rate. There are three different working speed sources (wheel, ground, and implement) and one simulated speed source. The Tractor and Implement speed on the display are in real time.

Speed Source	Description
Simulation	The speed is simulated by the display.
Tractor (wheel and ground)	The speed signal comes from the ISOBUS. You can also use GPS speed if equipped with a tractor ECU. GPS speed may be an option on the tractor and can be made available through the tractor ECU to the ISOBUS. Two speed types are available on the ISOBUS from the tractor ECU: wheel speed and ground speed. The user has the option to select the best source.
Implement	The speed signal comes from a source on the implement, radar sensor, or GPS device outputting a radar pulse.

1. From the Settings screen, tap the **Speed Settings** button:

   The Speed Settings screen appears:

2. Tap the screen to select the desired speed source.
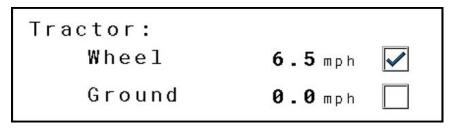
Simulated Speed

The simulated speed source is used for troubleshooting purposes and PID tuning while not moving. To choose Simulated Speed, tap the white box to enter a green checkmark. Enter the desired speed by tapping the selectable area by MPH. Enter the new speed value in the pop-up menu. Tap the checkmark to save the selection.

Tractor Speed

Tractor speed source gets the tractor speed off of the ISOBUS. Some machines will have this speed on the bus and other machines will have the ability to use GPS for Speed.

To choose Tractor Speed, tap the white box to enter a checkmark.

This message from the tractor includes both a *wheel speed* message and a *ground speed* message that could be from different sources on the tractor (such as a transmission

sensor or GPS receiver or any combination). The purpose here is to select the most stable message for use with the application.

Implement Speed

The Implement Speed source gets the speed from a pulse, either from a wheel sensor or radar on the implement. To choose an Implement Speed:

1. Tap the white box to enter a green checkmark.

2. If you want to manually enter a pulse setting, then enter the desired speed by tapping the selectable area by MPH and typing the new value in the pop-up menu. Tap the checkmark to save the selection.

   - Radar pulses per 300 ft are around 11500 to 12500 as a starting point.

   - You can adjust the pulse count to get the ECU displayed speed to match the tractor speed.

Configuration Settings Screen

The Configuration Settings allow the setup of different aspects of the control system. Configuration settings are set up for three levels of access:

- **User level.** User access is for all users and has no restrictions.
- **Dealer level.** Dealer access is for the selling dealer to allow him to set configuration items specifically for the equipment that user does not have access to.
- **OEM level.** OEM level is designed for the settings that are not provided for user and dealer.

Access for all levels is controlled with password access explained later.
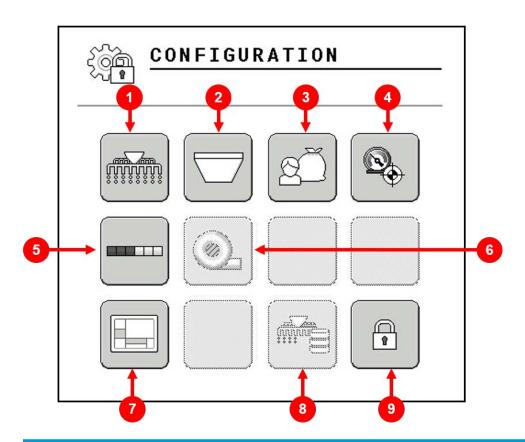
To access the Configuration Settings from the Run screen, tap the **Settings** softkey:

Then tap the **Configuration Settings** button:

The Configuration screen will be displayed:

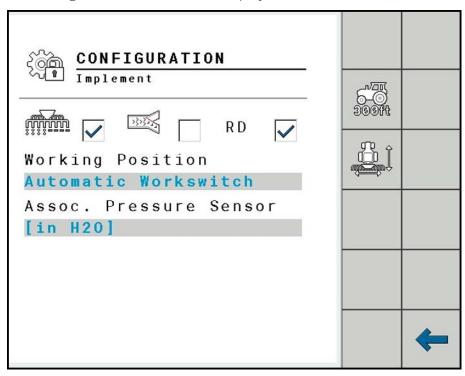| Description		Description	
1	Implement Configuration	6	Fan Configuration *(not applicable at this time)*
2	Hopper Configuration	7	Feedback Configuration
3	Product Configuration	8	Profile Database Configuration *(Unlock password required)*
4	Pressure Sensor Configuration	9	Password Configuration Area
5	Boom Configuration		

Implement Configuration

Implement Configuration allows the user to configure Section Control and Rate Detection, as well as a Working Position and Associated Pressure Sensor.
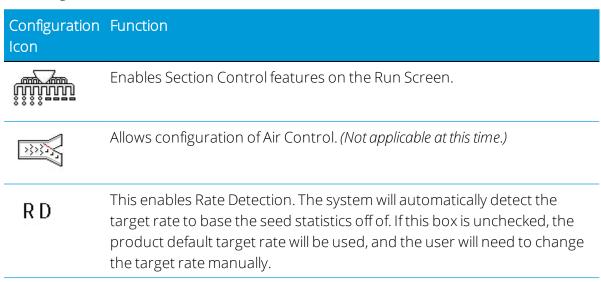
From the Configuration screen, tap the **Implement Configuration** button:
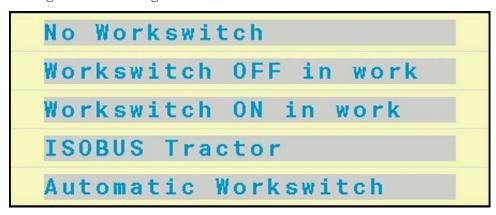
The Configuration screen will be displayed:

Tapping the white box next to each option at the top of the screen will place a green checkmark in the box and enable that feature. Tapping the white box again to remove the green checkmark will disable that feature. **These features require the system to reboot by returning to the Run Screen.**

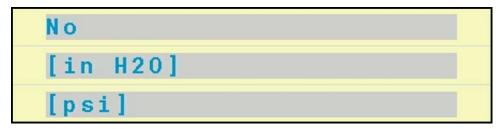| Configuration Icon	Function
	Enables Section Control features on the Run Screen.
	Allows configuration of Air Control. *(Not applicable at this time.)*
R D	This enables Rate Detection. The system will automatically detect the target rate to base the seed statistics off of. If this box is unchecked, the product default target rate will be used, and the user will need to change the target rate manually.

Working Position

The Working Position allows the position of the Workswitch to be configured. To setup the Workswitch, tap the selectable area under Workswitch Position. Choose the option for

your setup from the pop-up menu. Tap the checkmark to save the selection. The default setting for the Working Position is set to **Automatic Workswitch**.

Assoc. Pressure Sensor

Allows the user to choose the pressure sensor reading units.

To setup the Associated Pressure Sensor, tap the selectable area under Associated Pressure Sensor. Choose the option for your setup from the pop-up menu. Tap the checkmark to save the selection. The default setting for the Associated Pressure Sensor is **psi**.
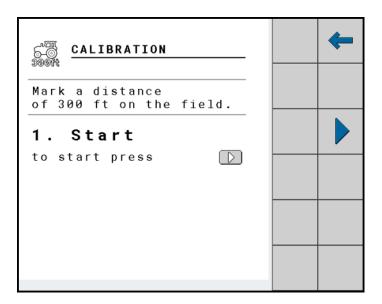
Choosing **[in H20]** or **[psi]** will enable the Associated Pressure Sensor and require the system to reboot by returning to the Run Screen. To make further adjustments to the Associated Pressure Sensor and perform a calibration, refer to the Pressure Sensor Configuration screen.

Implement Speed Calibration

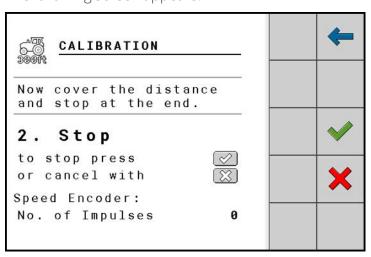1. If you want to calibrate the implement speed, tap the **Tractor 300 ft.** softkey:

   The following screen appears:

2. Mark a distance of 300 ft. Move the tractor and implement to start of 300 ft. Tap **Play** and drive the tractor 300 ft.

The following screen appears:

3. Verify you have stopped at 300 ft.
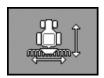
4. Tap the green checkmark to save the calibration value.

The pulse value updates once you save the calibration, but you can adjust value manually, if desired.
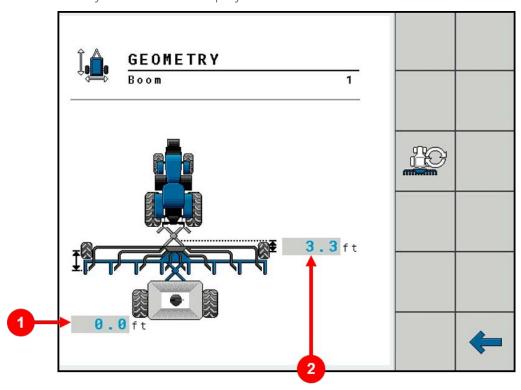
Implement Geometry

The geometry of an agricultural implement is defined as a series of parameters describing its dimensions. It is important particularly for all systems that are GPS-controlled. The distances you enter depends on whether the implement is towed, mounted on the tractor, or self-propelled.

You must enter the distances for the boom and for the connectors. In doing so, ensure that the center point of the implement axle is always the point of origin for all distances. Measurements toward the front are always positive, and measurements toward the rear are always negative.

From the Implement Configuration screen, tap the **Geometry** softkey:

The Geometry screen will be displayed:

To enter the dimensions for your implement, tap the selectable areas on the Geometry screen. Enter a new value and tap the checkmark to save the selection.
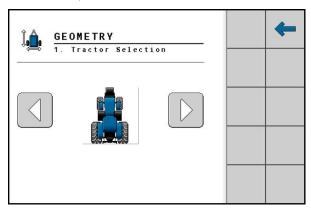
Description
1   The distance in feet from the hitch-to-implement axle to the pivot point.
2   The distance in feet from the implement axle to the application point.

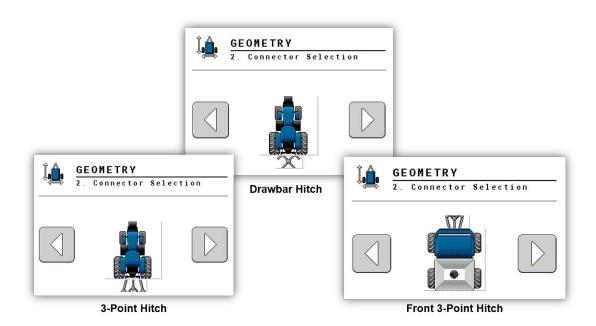To select a different implement setup than what is pictured, press the **Geometry Option** softkey:

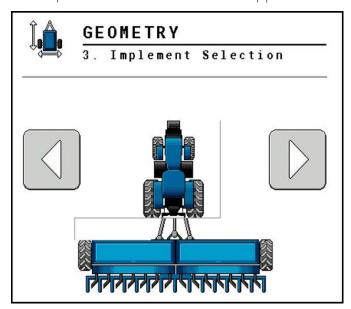1. On the Tractor Selection screen, use the left/right arrows to scroll through the tractor selection options:

Once the correct tractor is visible on the screen, save the selection by tapping on the tractor button.

The Connector Selection screen will appear. For example:

Drawbar Hitch
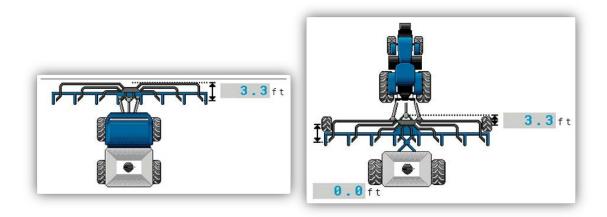
3-Point Hitch

Front 3-Point Hitch

2. Use the left/right arrows to scroll through the connector selection options. Once the correct connector is visible on the screen, save the selection by tapping on the connector button.

    The Implement Selection screen will appear:

3. Use the left/right arrows to scroll through the Implement Selection options. Once the correct implement configuration is visible on the screen, save the selection by tapping on the implement button. This will cycle back to the main geometry screen.

Depending on the Implement Geometry selected, different Implement Measurements may be needed, as shown below.
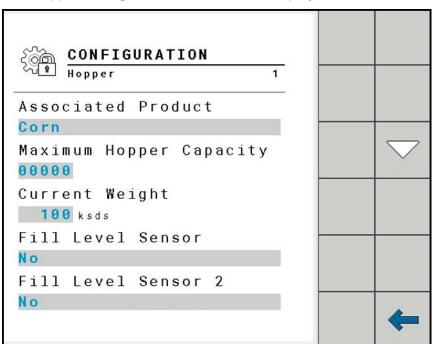
Hopper Configuration

Hopper Configuration allows you to set the Associated Shoot for a hopper.

From the Configuration screen, tap the **Hopper Configuration** button:

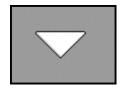The Hopper Configuration screen will be displayed:

Choose the Associated Product, Maximum Hopper Capacity, Current Weight, Fill Level Sensors, and Virtual Hopper option by tapping on the selectable areas under each option and selecting a new option in the pop-up menu. Tap the checkmark to save the selection.

To change or add a product to the Associated Product menu, refer to the Product Configuration screen.
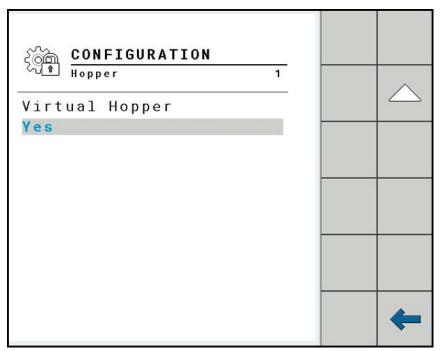
Fill Level Sensors

Selecting **Yes** in the pop-up menu will enable a fill level sensor in the hopper to issue an alarm when the hopper is at full capacity. Tapping **No** in the pop-up menu will disable this feature. The user can use either one Fill Level Sensor, or both. If using both, the alarm will trigger whenever either one is tripped.

Tap the down arrow to move to the next screen:

The Configuration 2 screen will be displayed.

Virtual Hopper

The Virtual Hopper gives an approximate weight of product in the hopper based on the amount added to the hopper and the amount applied from the hopper. This option may be utilized if the user is not interested in tracking the actual amount of product in the hopper. If the user chooses **No** in the pop-up menu, the Virtual Hopper weight will no longer be visible on the Run Screen.
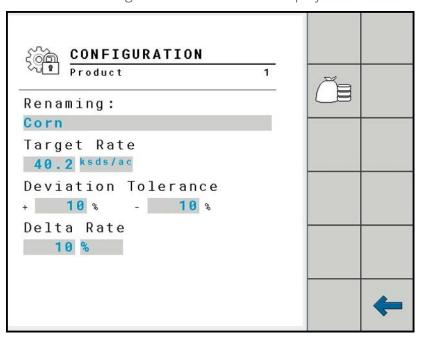
Product Configuration

Product Configuration allows the user to add new products to the database, rename products, and set the Target Rate, Deviation Tolerance, and Delta Target Rate. A maximum of 30 products can be added. The application will have some default products setup for the hopper that must be updated to run for the machine.

From the Configuration screen, tap the **Product Configuration** button:

The Product Configuration screen will be displayed:

To make a change, tap the selectable area under each option. Type the new value into the pop-up menu. Tap the checkmark to save the selection.

Renaming a Product: This option allows the user to rename product 1.

Target Rate: Defines how much mass or volume of product should be applied per acre.

Deviation Tolerance: Allows the user to set the alarm threshold for the Target Rate. If the applied rate varies outside the set Deviation Tolerance, the system will issue an alarm.
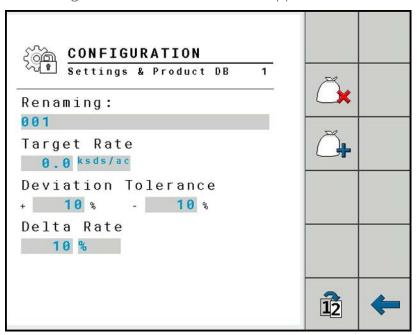
Delta Target Rate: The Delta Target Rate is the percentage or unit of adjustment you want to make from the Target Rate. To change the Delta Target Rate, tap the selectable area under Delta Rate. Type in the percentage or unit of change you want to be made with each button press *(when equipped)*. Tap the checkmark to save the selection. The units can also be changed to percent or ksds per acre.

Editing Saved Product Configurations

Tap the **Product Database** softkey:

The Settings and Product DB screen will appear:

To make a change, tap the selectable area under each option. Type the new value in the pop-up menu. Tap the checkmark to save the selection.

Tap the **Next Screen** icon *(if applicable):*

Adding a New Product

To add a new product, tap the **Product Addition** softkey:

Removing a Product

To remove a saved product, tap the Product Removal softkey. A pop-up window will ask if you would like to delete the product. Tap Yes to delete the product or no to return to the previous screen.
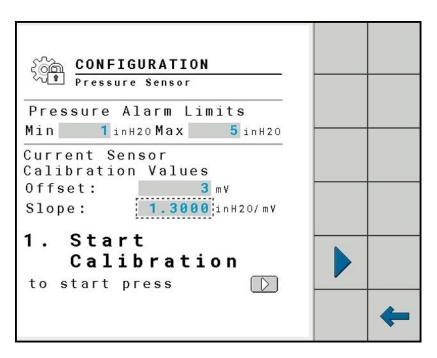

Pressure Sensor Configuration

The Pressure Sensor Configuration screen allows the user to make changes to the Pressure Alarm Limits, as well as Calibrate the sensor.

From the Configuration screen, tap the **Pressure Sensor Configuration** button:
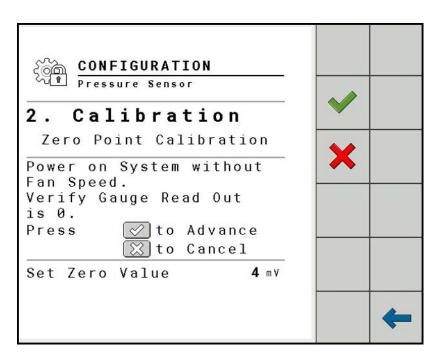

The Pressure Sensor Configuration screen displays:

1. As needed, insert new pressure alarm limits and sensor calibration values by tapping on the selectable areas, typing in a new value, and tapping the checkmark to save the selection.
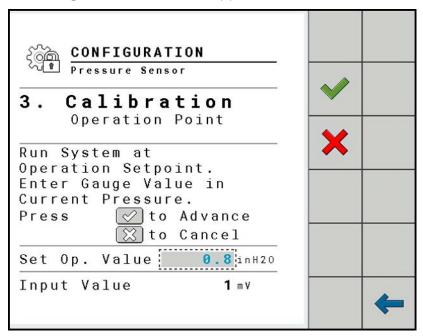
2. Tap the arrow to start the calibration:

The Configuration 2 screen will appear:

3. To set the zero value, turn the system power on without running the fan. Then tap the checkmark to set the zero value.

   The Configuration 3 screen will appear:

4. Next, set the operation point by running the system as it would be in work. Enter the pressure sensor gauge value in the **Set Op. Value** pop-up menu. Tap the checkmark to save the selection. Tap the **X** to return to the first Calibration screen and rerun the calibration.
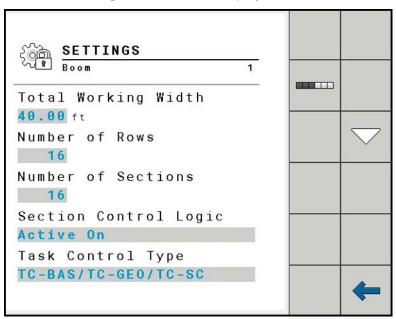
Boom Configuration

Boom Configuration allows Section Control and Task Control to be set, and the Number of Sections, Total Working Width, and Number of Rows to be configured for the implement.

From the Configuration screen, tap the **Boom Configuration** button:

The Boom Configuration screen displays:

To make changes to the Boom Configuration, tap the selectable area under each option. Type the new value or option into the pop-up menu. Tap the checkmark to save the selection.

Section Control Logic

The **Active On** sets the section to be applying when a 12 volt system is applied to the section control circuit. **Active Off** sets the section to apply when 0 volts are applied to the section control circuit; applying 12 volts will turn Off the sections.

Task Control Type

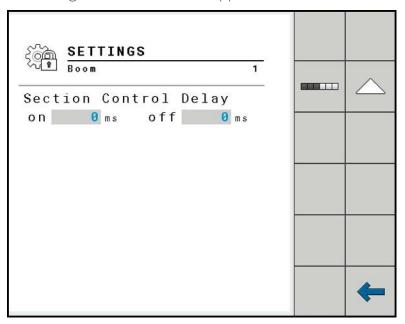The Task Control Type pop-up menu provides the following options:

- **TC-BAS:** this option provides log data only.
- **TC-BAS/TC-GEO:** this option provides log data and allows for mapping.

- **TC-BAS/TC-SC:** this option provides log data and allows for section control.
- **TC-BAS/TC-GEO/TC-SC:** this option provides log data, as well as mapping and section control options.

Tap the down arrow to move to the next screen:

The Configuration 2 screen will appear:

Section Control Delay

This time is used by the UT terminal Task Controller to regulate or look ahead for starting/stopping sections with going into or out of overlap or entering/exiting a boundary of a field. Adjust the setting to increase or decrease this time.
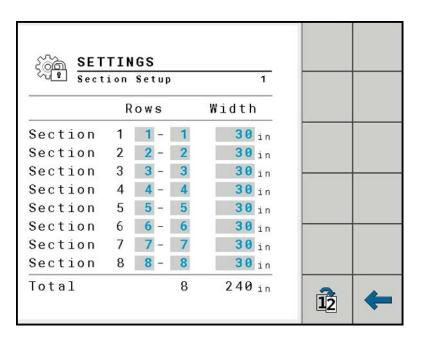
Typically, start and stop times should be the same.

Section Setup

1. To configure the Sections, tap the **Section Configuration** softkey:

   The Configuration 3 screen will appear:

2. Enter values for each Section by tapping the selectable areas next to each option, entering a new value in the pop-up menu, and tapping the checkmark to save the selection.

   The total rows and width will appear at the bottom of the screen.

3. Tap the **Next Screen** softkey to cycle through the sections (if more than 8 sections are set up):

   The number of Sections available to set up is determined by the number of Sections designated in the Boom Configuration screen.
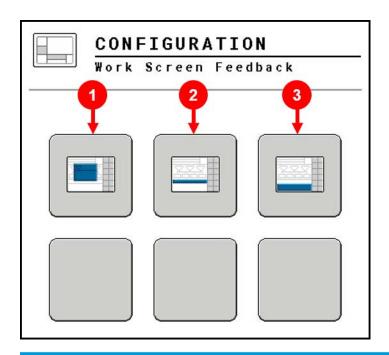
Feedback Configuration

Feedback Configuration puts icons in the Status Line of the Run Screen that communicate the status of the ISOBUS control system. These Icon locations are customizable.

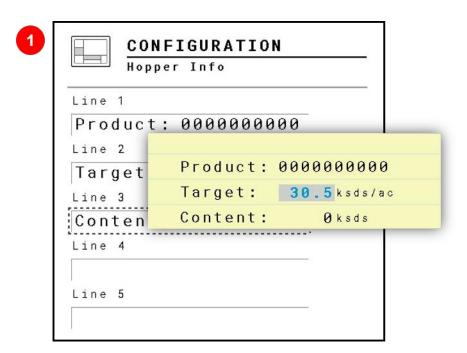From the Configuration screen, tap the **Feedback Configuration** button:

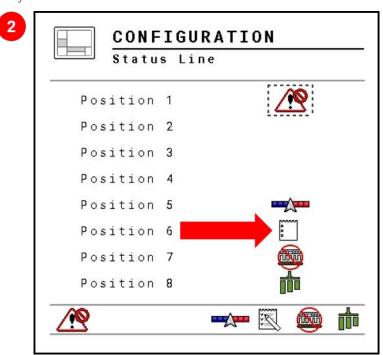The Feedback Configuration screen will appear:

Description	
1	Hopper Information
2	Status Line Indicator
3	Feedback Information

1. Tapping on the first button will bring up the Hopper Information screen, which allows the user to select the information that will appear when tapping the Hopper Information button on the main Run Screen.
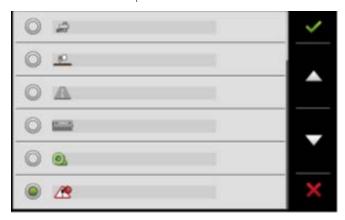
A pop-up screen will appear when tapping on the box underneath each line option. Tap the circle to select it, then tap the checkmark to save the selection.

2. Tapping the second button on the Configuration screen will bring up the Status Line Configuration screen, allowing you to choose which icons are displayed and where they are located in the Status Line on the Run Screen.
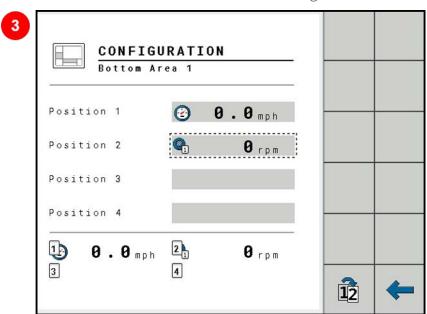

To make changes, tap the selectable area next to each position.

Choose the desired status Icon from the pop-up menu for the position and tap the circle to select it. Tap the checkmark to save the selection.

3. Selecting the third button on the configuration screen will bring up options for the Bottom Area of the Run Screen.

When chosen, the Bottom Area Feedback Configuration screen will be displayed:

Tap the selectable area next to each Position. Choose the desired feedback from the pop-up menu to make it visible in the Feedback section of the Run Screen. Tap the checkmark to save the selection.

Press the softkey with three dots to scroll to Positions 5-8. The current application only allows the MPH Feedback to be visible on the Work Screen. PSI feedback is only available if an Associated Pressure Sensor is configured.
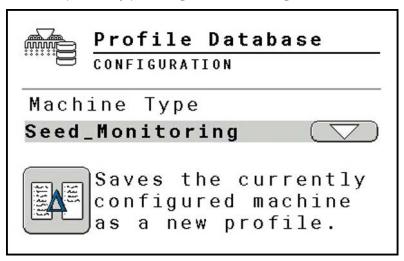
Profile Database Configuration

The machine type can be selected in the Profile Database Configuration.

From the Configuration screen, tap the **Database Configuration** icon:

Pressing the down arrow under Machine Type brings up a list of selectable options. The operator can choose: 16 rows, 12 rows, or 8 rows. The current machine type can be saved as a new profile by pressing the Save Configuration icon.

Press the RED X to delete the current profile and reset back to factory defaults.
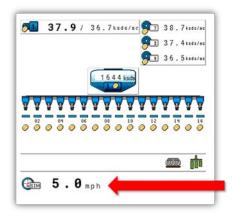
Password Configuration Area

Certain settings for the ISOBUS Control System reside behind a locked area. Contact your dealer for questions on how to access the locked area.

Verification of Installation and Setup

The final step of the installation process is to go through the checklist below to confirm and double-check that your system is ready for operation.
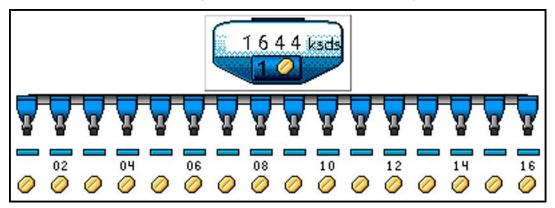
1. The first step is to test drive the tractor and verify that the ground speed is functioning and accurate. Depending on the speed source selection, confirm that the tractor display or tractor A-post speed matches the speed displayed in the Universal Terminal.
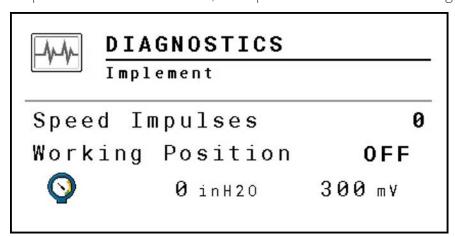
There are two common sources for speed discrepancy.

a. If the firmware on the Tractor ECU and/or the display is not up-to-date, you may be getting an inaccurate speed reading. Once the ISOBUS system is installed, the tractor is now receiving speed from this source. Update the Tractor ECU and display firmware to the latest release to guarantee your ISOBUS system is correctly communicating the tractor speed.

b. If the tractor speed is not correctly calibrated, you may see a discrepancy between the A-post speedometer speed and the ISOBUS display speed. Because the ISOBUS is getting its speed from a GPS source, it is most often accurate. The solution is to use the manufacturer's method to calibrate your vehicle's speed.

2. Verify that you have the correct number of sections by counting the blue bars on the Universal Terminal. The example below has sixteen rows set up:

3. If a pressure sensor is installed, run a pressure sensor check in Diagnostics.
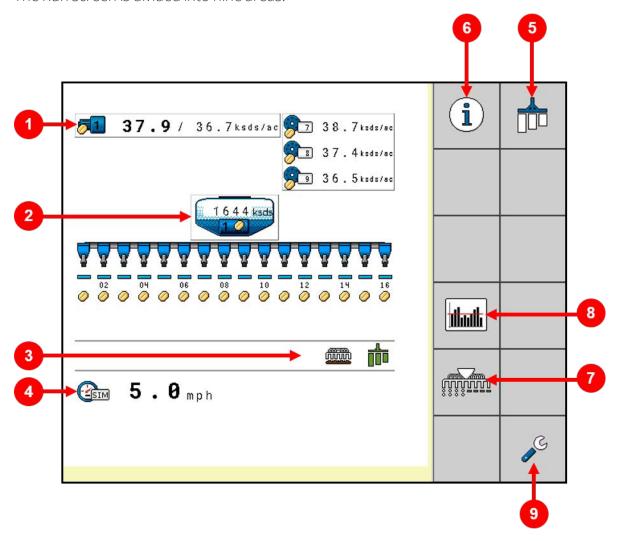
Run Screen

Run Screen Overview

The Run screen is always displayed during work and contains the most important information. It informs you about the status of the Rate Control System. Depending on the implement equipment, not all of the icons are always shown.
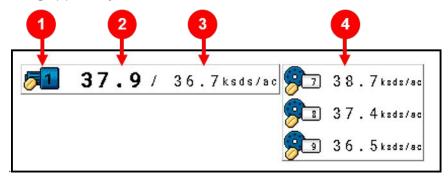
The Run screen is divided into nine areas:

Item	Description	Item	Description
1	Meter Actual/Target Rates	6	Counters (Function Softkeys)
2	Hopper Display Area	7	Section Control (Function Softkeys)
3	Status Line	8	Seed Statistics (Function Softkeys)
4	System Feedback Values	9	Settings (Function Softkeys)
5	Master Apply (Function Softkeys)		

Meter Actual/Target Rates

This area displays information on the Target Rate, Actual Rate, and Individual Row Rates being applied by the meter.

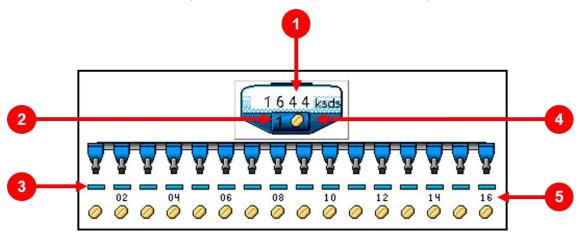| Item	Description
1	**Metering Drive Number** This indicates the number of drives that are setup in the system.
2	**Actual Rate** This displays the actual As Applied rate.
3	**Target Rate** This area will display the current Target Rate as set by the operator.
4	**Individual Row Actual Rates** This displays the actual As Applied rate of each row, showing data for 3 rows at a time.

Hopper Display Area

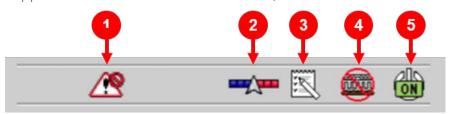This area of the Run Screen provides feedback of Basic Planter operation.

Item	Description	Item	Description
1	Current Hopper Weight or Product Remaining	4	Product Type
2	Hopper Number	5	Row Number
3	Section State Indicators		

When product is coming out of the section, a product type icon will be visible beneath the Row Number. No product icon indicates that no product is being dropped.

Status Line

The following information is shown in this area based on user selection (some are supported in the ISOBUS Rate Controller):

	Description		Description
1	Alarm Concepts indicator	4	Work Position
	Displays when an alarm has been ignored, but is active.		Displays the status of the implement (red line means out of work).
2	Section Control indicator	5	Master ON/OFF indicator

Description	Description
Displays when Section Control is active.	Displays the status of the Master Switch.

3 Task Controller indicator

Displays when using the Task Controller.

Section Control

This symbol will be shown in the Status Line when automatic section control from the TC (Task Controller) is enabled and is controlling the section ON and OFF state:
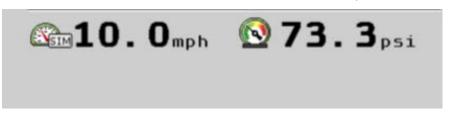

As the machine crosses previously applied areas and field boundaries, it will turn off the section.

NOTE – Section Control requires a GPS receiver for the Task Controller on the UT display.
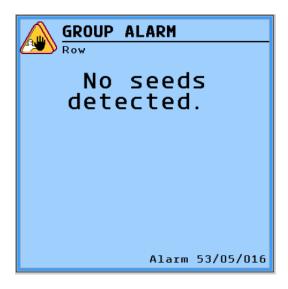
System Feedback Values

The tractor speed information is shown in this area. The pressure sensor feedback is only available when an Associated Pressure Sensor is set up.
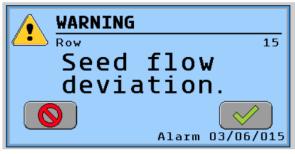

NOTE – When equipped, the user can set up 8 System Feedback values to monitor from the Run Screen.

System Alarm Messages

System alarm messages may appear on the Run Screen. Tap the green checkmark to accept the alarm message, or tap the red circle to ignore the alarm message.

NOTE – *These accept and decline keys may appear in the softkeys on the right side of the screen.*

Function Softkeys

Function softkeys are located on the right side of the screen. Each icon located on the function button or softkey depicts what the function is.

Function Softkey	Description
	Master Apply softkey - Starts applying. Regulation loop is active.
	Counters softkey - Tracks how much of each product has been applied.
	Section Control softkey- Allows the rows to be manually switched **ON** and/or **OFF**.
	Settings softkey - Takes you to the Settings screen.
	Seed Statistics softkey - Provides at-the-moment feedback for singulation, spacing, multiples and skips, and population.

5

Using the ISOBUS Basic Planter in the Field

Start Applying

✓ The implement is moving.

✓ The implement is lowered.

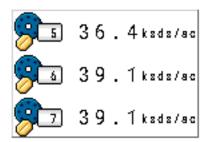Tap the **Master Apply** softkey or external master switch to start applying:

Stop Applying

Tap the **Master Apply** softkey to stop applying:

Viewing As-Applied Row Rates

This section of the Run Screen will display row rates while cycling through 3 rows at a time. To lock the 3 rows that are visible on the screen, press the button shown above. To resume viewing other rows, press the button again.
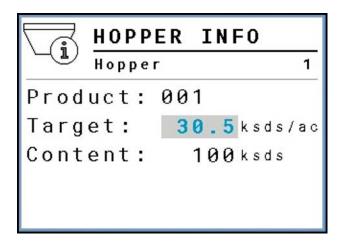

Changing Hopper Information

To make a change to the Target Rate or view the Hopper Information, tap the hopper in the middle of the screen:

This information can be configured in the Feedback Configuration section.

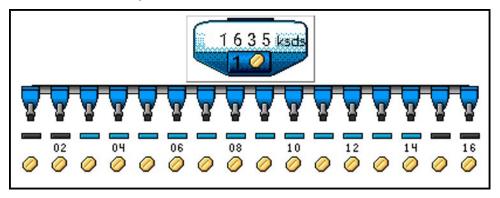The Hopper Information pop-up will appear:

To change the selectable values, tap the selectable area next to each option and enter the new value in the pop-up menu. The target rate value is in ksds/ac, or thousand seeds per acre.

Operating Section Control

With section control, you can switch ON or OFF the sections of your implement *(If equipped)*.

The size of the respective sections that you can switch depends on the implement type and equipment. To configure the sections, refer to the Section Setup Settings in Boom Configuration.

On the Run Screen, you can see which sections are switched **ON** or **OFF**.

Possible Section States

The sections can be in four states. The state of a section can be seen on the work screen in the Implement Display Area.

Display	Section State
	Section is in an ON ready state but NOT applying due to being out of work.

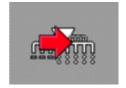| Display	Section State
	Section is Manually turned OFF. As long as SECTION-Control is working in automatic mode, this section cannot be switched on or off automatically.
	Section is turned off via Task Controller due to overlap or outside the boundary.
	Section is applying.

Section Control Softkeys

Section Control allows the planter rows to be manually turned ON and OFF while the implement is in work.

To access the Section Control softkeys from the Run Screen, tap the main **Section Control** softkey.

The Section Control softkeys will be displayed on the right side of the screen.
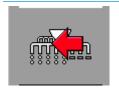
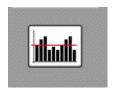| Softkey	Function
	Manually turns off rows one-by-one from left to right.
	Manually turns on rows one-by-one from right to left that have been turned off with the icon above.
	Manually turns off rows one-by-one from right to left.
	Manually turns on rows one-by-one from left to right that have been turned off with the icon above.

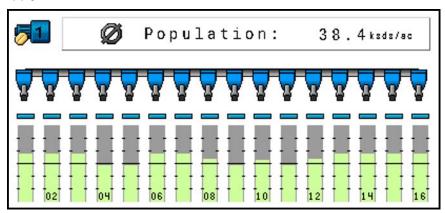| Softkey	Function
	Manually turns all rows on.

Viewing Seed Statistics

Seed Statistics allows the user to see up-to-the-moment data on Singulation, Spacing, Multiples, Skips, and Population.

1. Tap the **Seed Statistics** softkey on the Run screen:

The following screen change will appear. *(This screen will be faded out unless the Master Apply Switch is **ON**)*

Readings above the middle line in the bar graphs represent values at the upper end of the percentage indicated in the Seed Statistics Settings. Readings below the middle line represent values at the bottom end of the percentage indicated in Seed Statistics Settings.

2. Tap the gray button that reads "population" to scroll to the singulation, spacing, and multiples/skips data screens. The number on the ride side of this button shows the average value over the whole planter. The icon on the left side of this button symbolizes this value as being an averaged value.
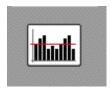
Population: Population refers to the number of seeds planted in an acre of land. The Target population can be updated in the Product Configuration section. The range of values visible on the chart above is determined by the Population Zoom in Seed Statistics Settings. For example, with a target population of 32,000, a Population Zoom of 10% will show values from 10% under this target rate up to 10% above this target rate. This will be the range of values visible in the bar graph on the screen above.

Singulation: Singulation refers to how accurate the planter is at putting down one seed at a time. The Singulation Zoom value is the percent deviation from 100%. So, for example, if a Singulation Zoom of 10% is set, the bar graph will start at 90% and end at 100%. If the user sets the Singulation Zoom to a value such as 2% and the planter is not that accurate, readings outside of that range will not show up on the bar graph. Starting with a Zoom of 10% should provide a good range of visible values.
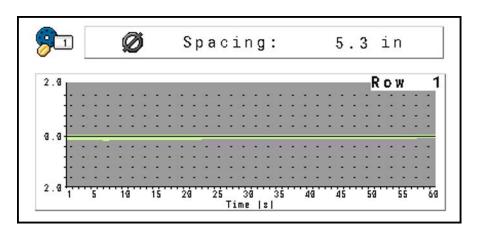
Spacing: Spacing refers to the distance between seeds in a row. This number is calculated based on seed population and row spacing. In the graph shown below, the green sections represent how far off the target you are. For example, a green box 1 inch above the middle line represents spacing that is 1 inch too wide; a green box 2 inches below the middle line represents spacing that is 2 inches too narrow.

Skips/Multiples: Skips occur when the planter fails to drop a seed. Multiples occur when the planter puts down more than one seed at one location. The values above the middle line of the graph represent multiples while the values below the middle line represent skips. Readings higher than the percentages set in the Seed Statistics Settings will fill the bar graphs completely.

3. Tap the Seed Statistics softkey again:

The following screen change will appear:

This screen shows individual row data in bar graph form for Population, Singulation, Spacing, Multiples & Spacing.
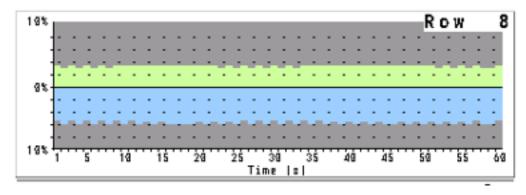
The vertical axis of the graph represents the Zoom or value range that has been specified by the user in the Seed Statistics Settings screen. If the Spacing Zoom is set to 2 inches, the graph will display values up to 2 inches above and below the target.

4. Press the gray button displaying these options once again to scroll through the other Seed Statistics and bring up their individual row data for the row number shown in the upper right hand corner of the graph.
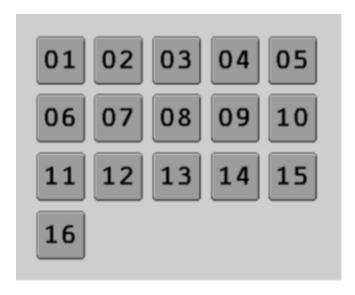

Cycling Through Row Data

1. To view data for another row, tap the bar graph:

The following screen will appear:

2. Tap a new row number to view its Seed Statistics on the screen.

3. Tap the **Seed Statistics** softkey again to return to the main Run Screen:
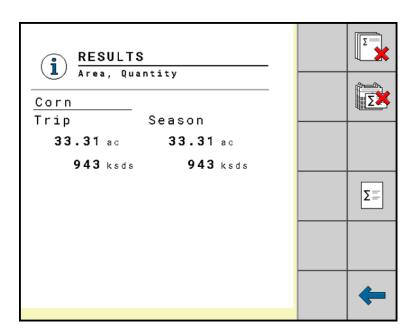

Viewing and Clearing the Counters Page

The counters page is used to store trip values, amount applied, and area. These values are allowed to be cleared whenever the operator needs them to be cleared.

It also stores the total amount of product applied, area, working time, distance, and powered on time. These values are stored in the ECU and can be cleared when necessary.

1. Tap the **Counters** softkey on the main page. A list of the products and values will be displayed.
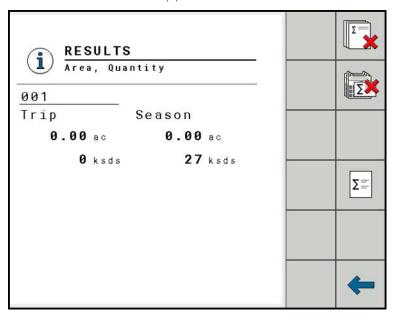

The Results screen will be displayed:

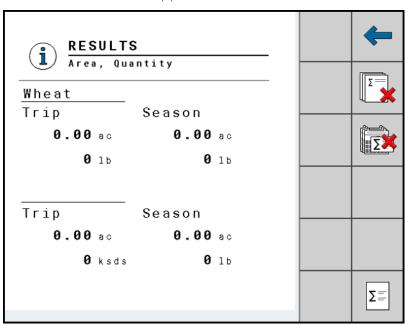2. To clear the trip results, tap the corresponding hopper trip clear softkey:
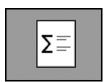

The Results screen will appear

3. To clear the season results, tap the corresponding hopper season clear softkey:
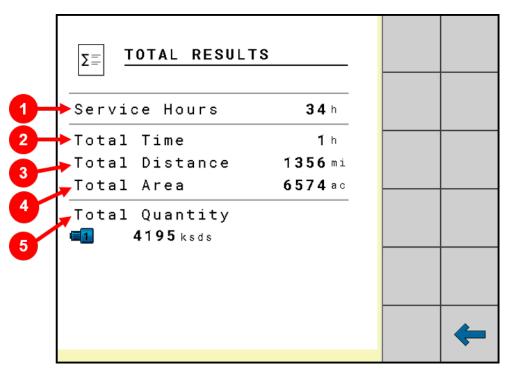

The Results screen will appear:

4. To view the total values tap the **Summary Data** softkey:

The Total Results screen will be displayed:

Description		Description	
1	Service Hours	4	Total Area
	Total time powered up since ECU was powered up.		Total area covered during work since ECU was powered up.
2	Total Time	5	Total Quantity
	Total time during work since ECU was powered up.		The total product applied by each meter since ECU was powered up.
3	Total Distance		
	Total distance traveled during work since ECU was powered up.		

Troubleshooting and Technical Data
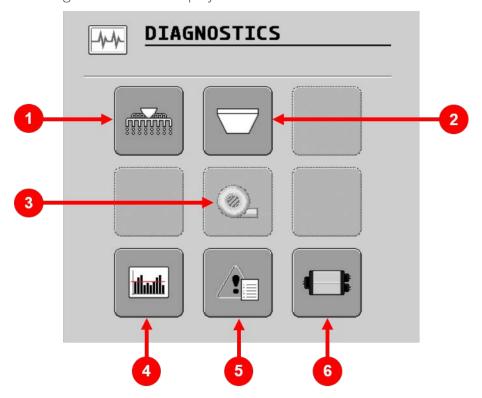
▶ Performing Diagnostics

Performing Diagnostics

The Diagnostics screen allows you to read the measured values for all of the input and output devices connected to the ECU. In addition, you can test whether the functions of the ECU are working as desired.

From the Settings screen, tap the **Diagnostics** button:
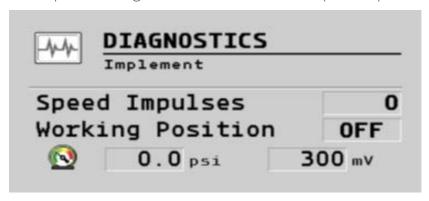
The Diagnostics screen displays:

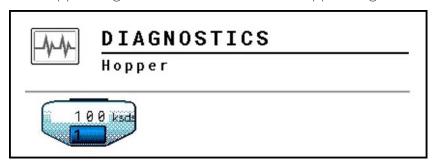| Description		Description	
1	Implement Diagnostics	4	Seed Statistics Diagnostics *(Available with Unlock Only)*
2	Hopper Diagnostics	5	Alarm Concepts
3	Fan Diagnostics *(not applicable at this time)*	6	ECU Diagnostics

Implement Diagnostics

The Implement Diagnostics show feedback for Speed Impulses and Working Position:

NOTE – *Pressure Sensor feedback will only be visible if an Associated Pressure Sensor is configured.*

Hopper Diagnostics
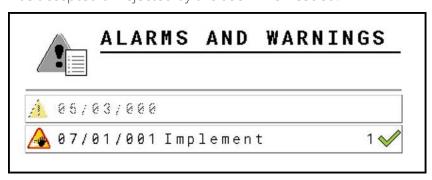
The Hopper Diagnostics show feedback on hopper weight and hopper product.

If level or pressure sensors are assigned to the hoppers, then this screen will show the level sensor on/off state, pressure sensor voltage, current or frequency value, and the pressure value based on calibration those value represent.

Alarms and Warnings
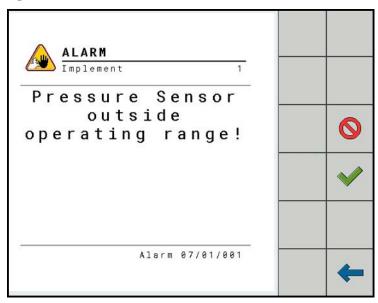
The Alarms and Warnings page show warnings and alarms that the system has issued. The green checkmark or red circle on the right side of each button shows whether the alarm was accepted or rejected by the user when issued.

Tapping on each warning button will bring up the details of the alarm.

If the alarm was originally accepted when issued, a red circle softkey will appear on the right side of the screen.
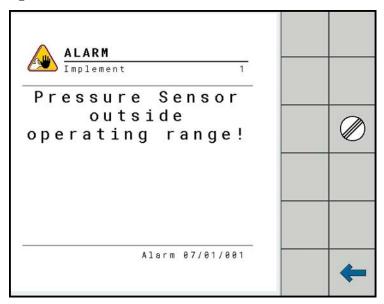
Tap this softkey to ignore the alarm.

The following screen will appear:

To confirm ignoring the alarm, press the checkmark softkey. To decline ignoring the alarm, press the **X** softkey to return to the previous screen.

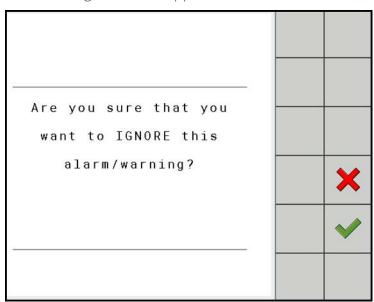If the alarm was originally ignored when issued, a white circle softkey will appear on the right side of the screen.

Tapping this softkey will accept the alarm and return you to the main Alarm Concepts screen. Accepting a previously ignored alarm will also remove the Alarm Concepts Icon from the Status Line of the Run Screen.

ECU Diagnostics

The ECU Diagnostics shows:

- Software Version
- Object Pool Version
- Power Voltage and Sensor Voltage
- ISOBUS CANload and SubBus CANload

```
┌─────────────────────────────────────────┐
│ ┌──────┐  DIAGNOSTICS                    │
│ │ ⎍∿∿⎍ │  ──────────────────────────    │
│ └──────┘  ECU                            │
│ ─────────────────────────────────────   │
│ Software                                 │
│            v02.03.00.37                  │
│ Object Pool Version:                     │
│            v1.00                         │
│                                          │
│ Power Voltage:  13.778 V                 │
│ Sensor Voltage: 13.735 V                 │
│                                          │
│ ISOBus Termination:  ON                  │
│ ISOBus CANload:                          │
│ [█                              ]  2 %   │
│ SubBus CANload:                          │
│ [                               ]  0 %   │
└─────────────────────────────────────────┘
```