



INTELLIAG[®] ISO₆[™] PLANTER DRILL CONTROL VERSION 4



OPERATOR'S MANUAL



Safety Notices	1
Disclaimer	1
System Components	2
Universal Terminal (UT)	3
ISO ₆ Master Module	3
Working Set Member (WSMB) Module (Optional)	4
Working Set Member2 (WSMB2) Module (Optional)	4
CAN Terminators	5
Component Installation	6
ISO ₆ Module	6
Working Set Member (WSMB) Module	7
WSMB Install Considerations	7
Bolt WSMB To Frame.....	8
TIE-Strap WSMB To Frame	8
Connect Cab/Terminal Harnessing	11
Connect Implement Harnessing	11
Cab Harnessing (Non ISO Bus Ready Tractors).....	12
Implement Harnessing Diagrams	13
Accessory Harness (Optional).....	15
Sensor Installation	15
System Modes	19
Intelliag ISO ₆ Access	19
Work Mode	19
User Levels	20
User Level 1 Operator (Basic Access)	20
User Level 2 (Dealer)	21
User Level 3 (OEM).....	23
Navigation And Action Buttons	24
Navigation.....	24
Navigation Buttons Defined	24
Action Buttons.....	25
Action Buttons Defined	25
Home Menu	27
Version Information	27
Basic Setup Steps	27
System Setup Buttons	29
System Setup Buttons Defined.....	30
Modules	34
Module Limits:.....	34
Connecting Seed Sensors To ISO ₆ /WSMB.....	34
Replacing Installed Modules (Auto Config)	34
Adding New Modules.....	36
Auto Sort Feature	36
Identify Harness	37
Selecting A Harness:	37

OPERATOR'S MANUAL



Row Setup	38
Configuration Setup	39
Material Setup	39
Creating A Materials Table	41
Clear Material From Table	42
View Next Material Page	43
Edit/Define Material Parameters.....	43
Material Type	44
Planter Control Material Type	46
High/Low Population Alarms	49
Granular Seeding Material Type.....	50
Liquid Flow Material Type.....	56
Planter Monitor Material Type	59
Granular Monitor Material Type.....	63
Shaft Control.....	66
Fan Control	69
Control Channel Setup	71
Assign A Control Channel	71
Delete A Control Channel.....	72
Copy A Control Channel.....	73
Channel Linking.....	73
Control Channel Type.....	74
Planter Control Channel	75
Granular Control Channel.....	77
Liquid Flow Control Channel	80
Nozzles	82
Planter Monitor Channel	84
Granular Monitor Channel	86
Fan Control	88
Disable Control On Control Failure Alarm	90
Shaft Control.....	90
Individual Row Control (IRC)	92
Drop Spreader	93
Calibrations-Valve And Spreader	94
Planter Control And Granular Valve Calibration	94
Perform A Valve Calibration	94
Limit Output (Granular).....	95
Spreader Calibration (Granular)	97
Spreader Constants Defined	98
Liquid Flow Calibration	99
Limit Output	101
K-Factor Calibration.....	101
Perform A Liquid Flow Catch Test.....	102
Operations	103
To Edit An Operation:	103
Section Control	104
Clutch Sections.....	104
Identify Sections And Outputs	104
Assign Channels/Rows/Outputs/Switches	105

OPERATOR'S MANUAL



Liquid Boom Section Control	107
Boom Setup	107
Assign Channels, Rows, Outputs, Switches	108
Section Linking.....	109
Section Linking Examples	111
Implement Geometry	112
Three-Point Hitch Type.....	114
Semi-Mount And Drawbar Hitch Types	115
Double Pivot Hitch Type	116
Sensor Setup	118
Sensor Configuration Requirements:	118
Sensor Setup	119
Sensor Summary.....	121
Sensor Details	122
Module And Sensor Setup Comparison	124
Ground Speed Setup.....	126
Accessory Sensors	131
Accessory Summary.....	131
Accessory Setup.....	131
Accessory Alarm Setup	133
Pressure Sensor Setup	134
Hopper Sensor Setup	135
Rpm Sensor Setup	136
Digital Sensor Setup.....	137
Bout Markers	139
Bout Marker Setup.....	139
Customizing The Work Screen	141
Modifying The Instrument Layout	142
Selecting An Instrument	143
Instruments Without Setup Defined.....	145
Instruments With Setup Defined.....	145
Area Instrument	151
Materials Instrument	154
Product Levels	156
Accessories	157
Operation	159
Performing A Fill Disk	159
Begin Operation.....	160
Scroll Work Mode Screens	161
Work Screen Functions	162
Reading The Control Instrument	162
Control Channel Adjustment.....	163
Operate Screen Symbols	164
Task Controller Icon	165
Work Mode Information Screens	165
Control Channel.....	166
Materials	167
Seed Count.....	167
Population.....	168

OPERATOR'S MANUAL



Product Levels	174
Using The Precharge Feature	176
Dispensing Material With Flush Enable.....	177
Manual Speed Mode	178
Task Controller Compatibility.....	179
Selecting A Universal Terminal Type	180
Override Tc Functionality.....	181
Import/Export Data	182
System Test	184
Continuous Test	184
5 Rev Test	185
Remote Test Switch	186
Accumulators	188
Seed Count.....	188
Totals.....	188
Version Information	191
To View Version Information:	191
Factory Reset (User Level 3)	193
Alarms	194
Alarm Log And Details.....	194
Alarm Reset (Level 3 OEM User)	195
Diagnostics	196
Manual Open Of Channel (System Failure)	198
Software Add-Ons	201
To View Feature Keys:	201
Feature Key Possible Add-Ons	201
Troubleshooting & Alarm Codes	202



SAFETY NOTICES

Safety notices are one of the primary ways to call attention to potential hazards.



This Safety Alert Symbol identifies important safety messages in this manual. When you see this symbol, carefully read the message that follows. Be alert to the possibility of personal injury or death.



WARNING

Use of the word **WARNING** indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION

Use of the word **CAUTION** with the Safety Alert Symbol indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

CAUTION

CAUTION

Use of the word **CAUTION** without the Safety Alert Symbol indicates a potentially hazardous situation which, if not avoided, may result in equipment damage.

DISCLAIMER

DICKEY-john reserves the right to make engineering refinements or procedural changes that may not be reflected in this manual. Material included in this manual is for informational purposes and is subject to change without notice.



SYSTEM COMPONENTS

The DICKY-john IntelliAg ISO₆ is a complete monitoring and control system that provides up to 8 channels of control for row crop planters, drills, air seeders, and air carts to control planting, liquid, and granular applications. The system monitors up to 120 rows with up to 6 sensors per row for individual row performance and population. 1 ground speed, 5 hopper levels, 4 air pressure, 4 RPM sensor, and 1 lift switch are available with additional working set members (WSMB).

NOTE

The IntelliAg system is designed to ISO11783 CAN communication standards providing the capability of communicating with other manufacturer's ISO11783-compatible equipment.

The IntelliAg system includes the following required components:

- Universal Terminal
- ISO₆ Master Module
- Safety Input Sensors (any two of the following)
 - Implement Lift
 - Ground Speed
 - Secondary Ground Speed
- Master Switch
- Two CAN Terminators
- Cab and Implement Harnessing

Optional components include:

- Working Set Member Modules (WSMB)
- Implement Lift
- ISO Output Module (section control)
- Working Set Member 2 (seed singulation)
- Remote Test Switch (required for Continuous Test and 5 Rev Test)
- WSMB Accessory Module
- Frame Fold Module
- Row Shutoff Switch Module
- Boom Shutoff Switch Module
- Tramline Module

DICKY-john provides a full suite of complimentary sensors that are compatible with the IntelliAg ISO₆ platform.

Terminal mounts in the cab using:

- RAM Mount
- Terminal Mounting Plate



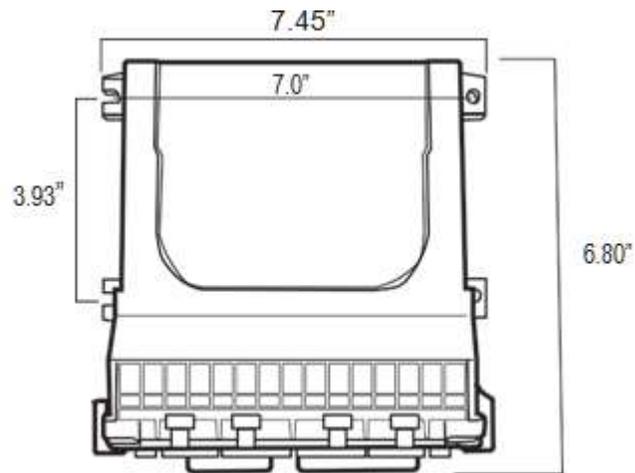
UNIVERSAL TERMINAL (UT)

A universal terminal is the main user interface with the IntelliAg system components to monitor and control product application. ISO₆ is compatible with most ISO11783-compliant universal terminals.

ISO₆ MASTER MODULE

Figure 1

ISO₆ Master Module



The ISO₆ module houses the system's primary interface device. All system parameters, constants, and memory are stored in the ISO₆. The ISO₆ has 8 channels for planter control, granular seeding, granular fertilizer, liquid control, and monitor only mode or RPM control. In addition, the module can accept inputs from up to 4 hopper level sensors, 4 air pressure sensors, 3 RPM sensors, 1 ground speed sensor, and up to 16 population/blockage sensors with all 16 rows capable of advanced seeding calculations (skips, doubles, seed spacing). The ISO₆ module uses a 30-pin and 18-pin connector to connect to the ISO₆ module secured with a 1/4" socket or nut driver.

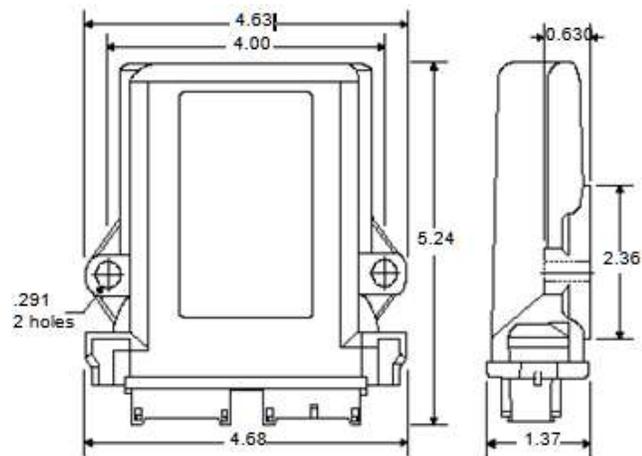


WORKING SET MEMBER (WSMB) MODULE (OPTIONAL)

Each Working Set Member (WSMB) module is an auxiliary to the ISO₆. A WSMB can accept up to 18 rows of seed sensors. The WSMB passes information directly to the ISO₆. Up to 8 WSMB's can be installed to monitor up to 120 sensors. The flexible design of the WSMB allows for installation virtually anywhere on the implement.

Figure 2

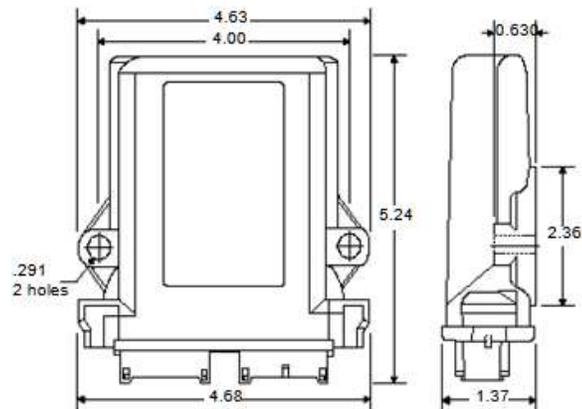
Working Set Member Module



WORKING SET MEMBER2 (WSMB2) MODULE (OPTIONAL)

Figure 3

Working Set Member 2 Module





A Working Set Member 2 module provides seed singulation calculations for spacing quality, seed singulation, skips, and multiples. A maximum of 5 WSMB2 modules can be installed to monitor up to 90 sensors. A total of 96 sensors are supported for seed quality data using a combination of WSMB2 modules and the ISO₆ Master Module.

CAN TERMINATORS

CAN terminators are necessary for proper communication between each component of the system.

- One terminator is located on the cab harness approximately 30 inches from the universal.
- One terminator plugs into the implement harness of the last module connected to the CAN bus.

Figure 4
CAN Terminator





COMPONENT INSTALLATION

ISO₆ MODULE

1. Select an area on the implement to mount the ISO₆ module that allows for easy hookup and access.
2. Use the enclosure as a template to mark the location of the mounting holes.
3. Drill four 9/32 inch diameter holes where marked.
4. Mount with the label side of module facing out. Do not mount with the connector facing up (see Caution).

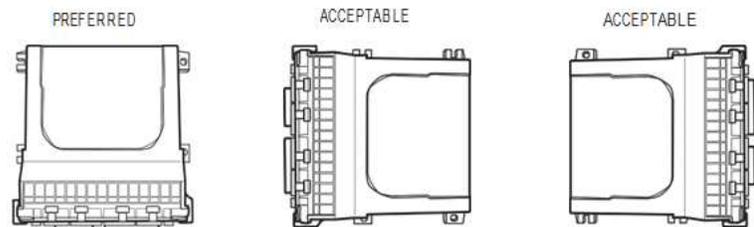
IMPORTANT

Do not use the enclosure as a guide when drilling. Do not over tighten nuts as this may damage the mounting tabs of the enclosure. Recommended torque is 10-12 in-lbs.

The ISO₆ may be mounted in any of the following orientations:

Figure 5

Acceptable Orientation



CAUTION

Do not install the module in any orientation other than shown in (Figure 5). The connection wires must not be mounted upward, as moisture can collect inside the unit and damage the circuits. Ensure that module connectors do not face upward when implement is in a folded position as well.



WORKING SET MEMBER (WSMB) MODULE

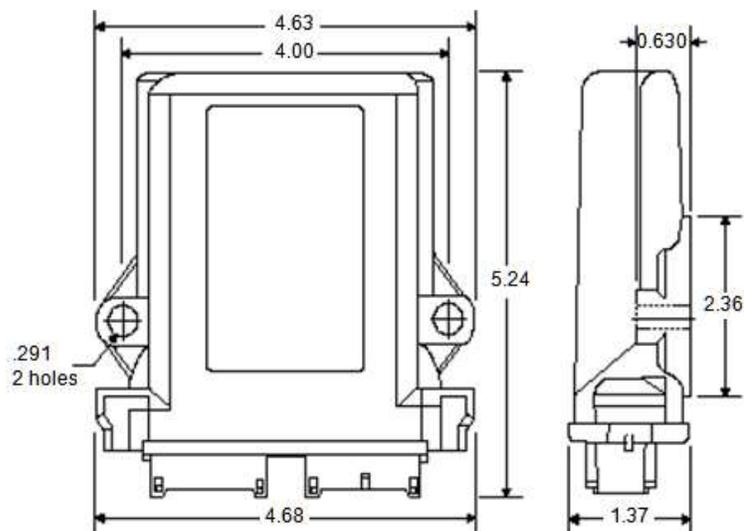
The WSMB module can be attached to the implement by:

1. Bolting to the implement.
2. Using tie straps to secure to implement.

IMPORTANT

For applications using multiple modules, it is recommended that the WSMB's are mounted on the implement by increasing serial number order from left to right.

Figure 6
WSMB



WSMB INSTALL CONSIDERATIONS

1. Select an area on the implement to mount the member that allows for easy hookup and access. Extensions may be used to reach members installed on remote areas of the implement.
2. The module can be mounted in the same orientations as the ISO₆ module as illustrated in (Figure 5).
3. Mount with the label side of the module facing out.

CAUTION

Do not install the module in any orientation other than illustrated in (Figure 5). The connection wires must not be mounted upward as moisture can collect inside the unit and damage the circuits. Ensure that module connectors do not face upward when implement is in a folded position as well.



BOLT WSMB TO FRAME

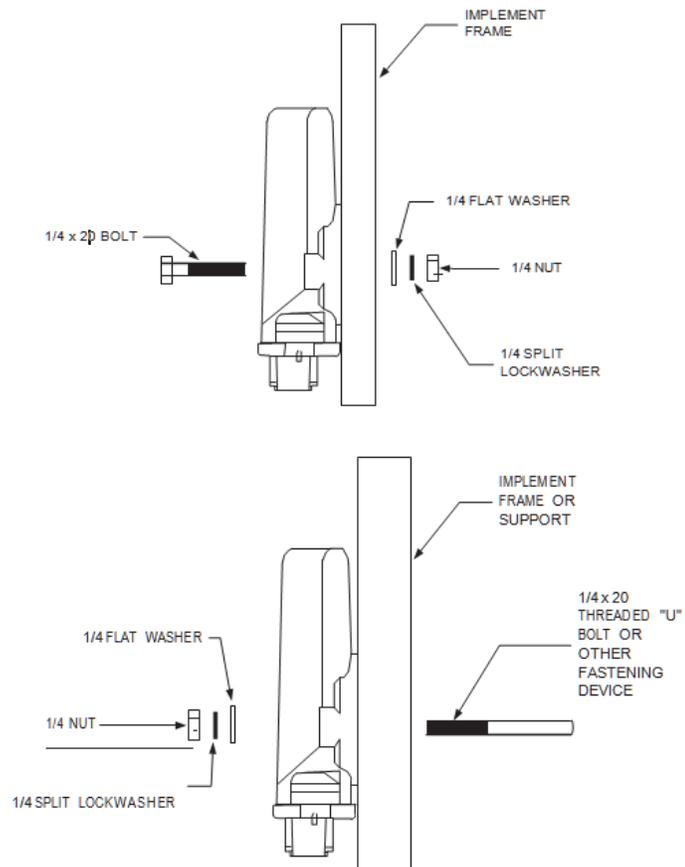
1. Use the enclosure as a template to mark the location of the mounting holes.
2. Drill two 9/32 inch diameter holes where marked.
3. Attach to frame using 1/4 x 20 bolts or other fastening devices as illustrated in (Figure 7).

CAUTION

Do not use the enclosure as a guide when drilling. Do not over tighten nuts as this may damage the mounting tabs on the enclosure.

Figure 7

Working Set Member Installation (Bolted)



TIE-STRAP WSMB TO FRAME

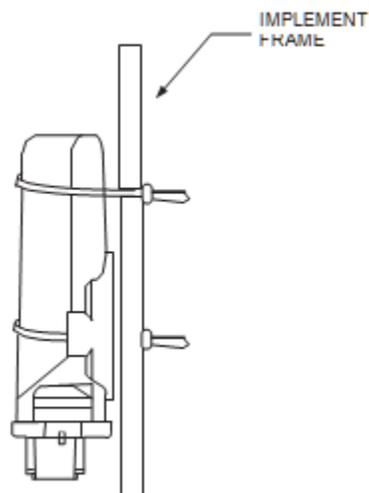
1. Use one long tie-strap to loop around the member body and through both mounting holes as illustrated in (Figure 8).
2. If necessary, drill mounting holes described above.



3. Securely tighten tie-strap.
4. Install a second tie-strap toward the label end of the enclosure for additional support.

Figure 8

Working Set Member Installation (Tie-Strap)



5. Connect a WSMB harness to the WSMB module and connect the WSMB harness to the Power/CAN backbone, refer to (Figure 11).
6. Connect each module harness to its module inserting both connectors until the connector locking tabs engage.
7. Layout the planter harness along the implement frame to each of the seed sensors.
 - For seed sensors, extensions will most likely not be necessary.
8. Route sensor wires in locations where they will not be damaged by chains, drive shafts, sprockets, etc.
9. Secure the harness to the toolbar with a minimum of 3" straight wire exiting the module before bending and attaching with tie-straps.
10. Coil and secure any unused sensor connections.
11. The WSMB Module harness can accept a standard DICKY-john PM style planter harness (single round 37-pin connector) or an SE style planter harness (1 gray 12-pin, 1 black 12-pin rectangular connector) depending on the WSMB harness. Harnesses are available for a number of row configurations.
 - Route the planter harness on the implement, securing as necessary.
 - Install seed sensors per the instructions included with the sensors. Refer to the implement harness diagram for additional information (Figure 11) or (Figure 12).



IMPORTANT

Be sure the locking tabs engage when inserting the connectors. The connection is sealed only when the locking tabs have fully engaged.

NOTE

The last module harness in the system must have a CAN Terminator installed for proper system operation. Refer to Implement Harness (Figure 10) or (Figure 11) for additional information.

12. Connect any additional adapter harnesses to the module harness. The ISO₆ T-Harness can accept the following adapter harnesses:
 - **Channel Actuator Harness:** This harness has 2 PWM Outputs, 2 Channel Feedbacks, 1 RPM Sensor, 1 Hopper Sensor, 1 Speed Sensor, 1 Implement Lift Switch, and 1 Test Switch (P/N 467980162).
 - **Channel Actuator Harness:** This harness accepts up to 4 Output Control Channels, 4 Control Channel Feedbacks, 1 Hopper Level Sensor Input, 1 Shaft Sensor Input, 1 Ground Speed Input, 1 Implement Switch Input, and a Test Switch Connector (P/N 467980160, 467980164). In addition, a pair of 6-pin connectors are available for Servo connection that use FB1/FB2 respectively. Install sensors, valves, etc. per the instructions included with the items. Install the PWM valve assembly and feedback sensor for each control loop and connect the devices to their respective inputs on the harness, making certain to match PWM1/Servo 1 with FB1, PWM2/Servo 2 with FB2 etc. Secure any unused and excess cable lengths where necessary.
 - **6 Channel Actuator Harness:** Similar to the 4 Channel Actuator Harness but brings in a second speed input and adds feedback 5 and 6. Servos are labeled 5 and 6 and must be matched with feedback 5 and 6.
 - **8 Channel Actuator Harness:** Similar to the 6 Channel Harness but replaces the 2 servo channel outputs with 4 more PWM channel outputs. PWM outputs are labeled 1-8 and must be matched with the respective 1-8 feedback.
 - **4 Channel Servo Harness:** Similar to the 6 Channel Actuator Harness but replaces the 4 PWM channel outputs with 2 servo outputs. Servos are labeled 1 through 4 and must be matched with their respective 1 through 4 feedbacks.



- **Seed Sensor Harness:** This harness accommodates any standard Dj Seed Sensor Harness (PM style 16 row or SE style 12 row) depending on the ISO₆ harness. Install all seed sensors per the instructions included with the individual sensors.

A wide variety of harnesses are available to accommodate various numbers of sensor inputs. Secure any unused or excess cable lengths as necessary.

CONNECT CAB/TERMINAL HARNESSING

Refer to (Figure 9). (FOR NON-ISOBUS READY TRACTORS)

1. Connect the cab harness to the back of the universal terminal.
2. Connect the power leads directly to the battery.
3. Connect the ignition wire to a switched +12VDC.
4. Connect the ground leads to the negative battery terminal post.
5. Connect the CAN terminator, radar speed sensor, and row switch module (optional) to the respective connectors on the cab harness.

TIP: If the speed sensor is connected to the IntelliAg actuator/control harness, do not connect anything to the speed sensor connector on the cab harness. Route the IBBC connector to the rear of the tractor where implement attachment occurs. Mount IBBC connector in a secure location at the rear of the tractor.

CONNECT IMPLEMENT HARNESSING

Refer to (Figure 10) and (Figure 11).

1. Connect the Implement CAN Breakaway extension to the mating IBBC connector installed on the back of the tractor. If using an ISO-ready tractor and terminal, the implement connect can be plugged directly into the OEM IBBC connector.
2. Route the harness along the implement hitch to the ISO₆ module harness (use an implement extension harness if additional length is needed).
3. Secure harness as needed.
4. Connect the module harness to the mating connectors of the Implement CAN harness and then connect the module to the harness. The ISO₆ harness module uses a 30 and 18-way connector with a jackscrew to secure the connector to the module using a 1/4" socket or nut driver. The WSMB uses a pair of 12-pin connectors.
5. Secure module harness as needed.



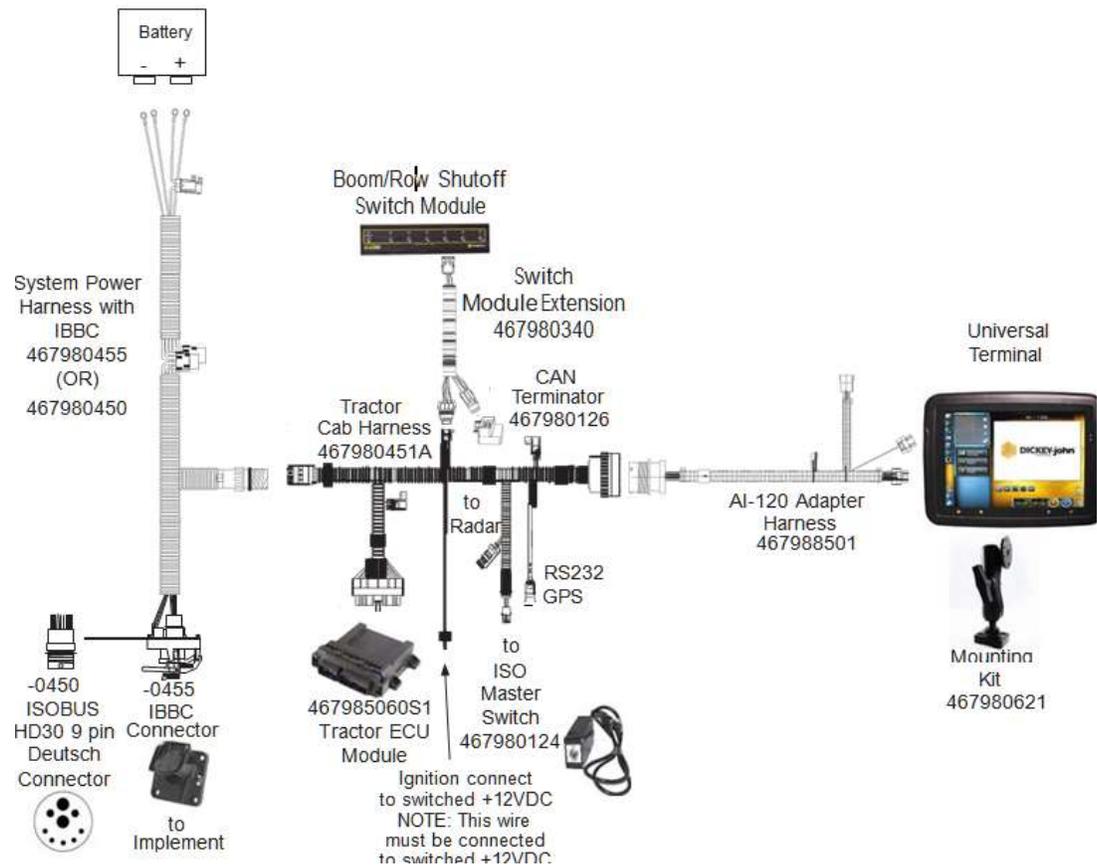
CAB HARNESSING (NON ISOBUS READY TRACTORS)

The UT display connects to the tractor cab harness via an adapter harness. A GPS receiver is required to provide implement position via CAN or RS232 communication. A row switch module provides quick access of turning sections on and off when manual override is required. Ignition wire connects to switched power source.

A DICKEY-john output module and harness are required for interfacing with shutoff modules (Tru Count solenoid modules are not supplied by DICKEY-john). Harnessing structure illustrated below.

Figure 9

Cab Harness Connections to Universal Terminal





IMPLEMENT HARNESSING DIAGRAMS

Various implement harness options are available based on application type and must be selected at the System screen.

Figure 10
Implement Harnessing

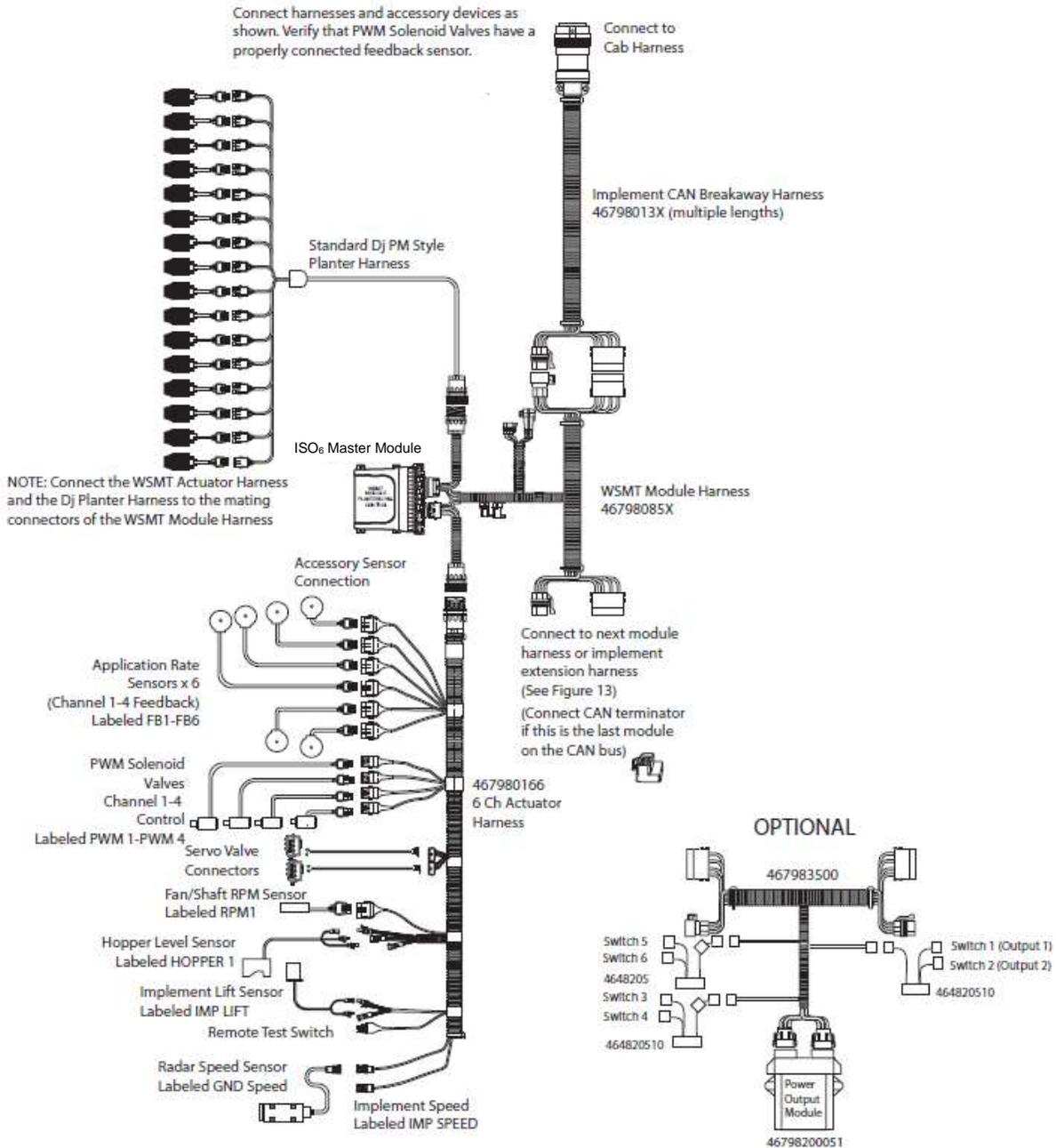
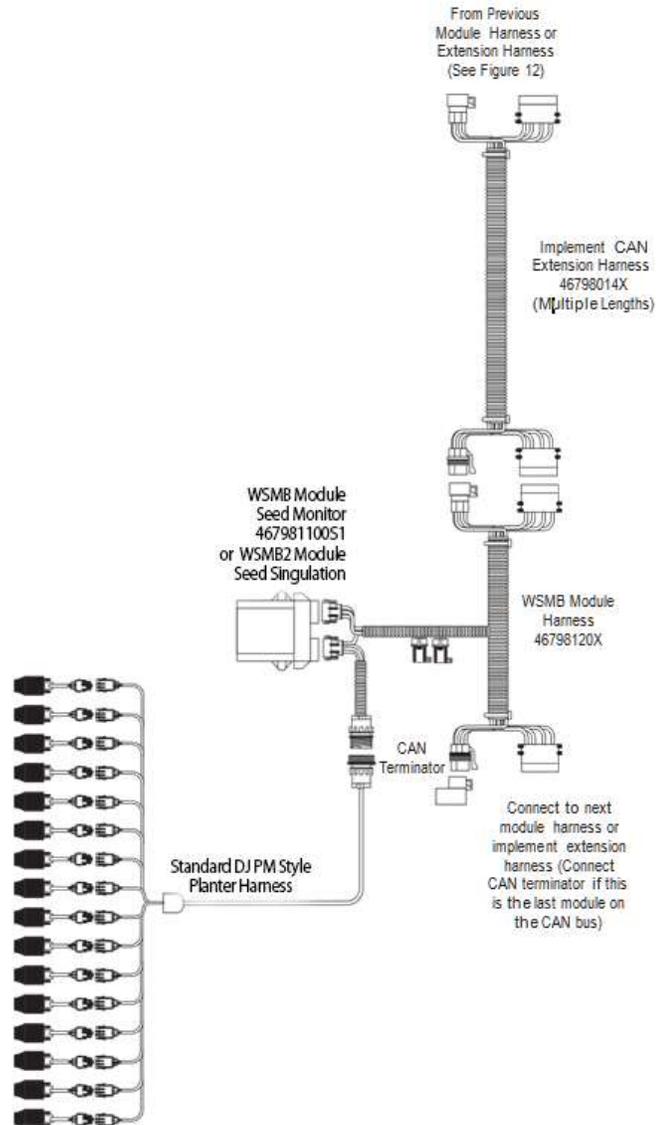




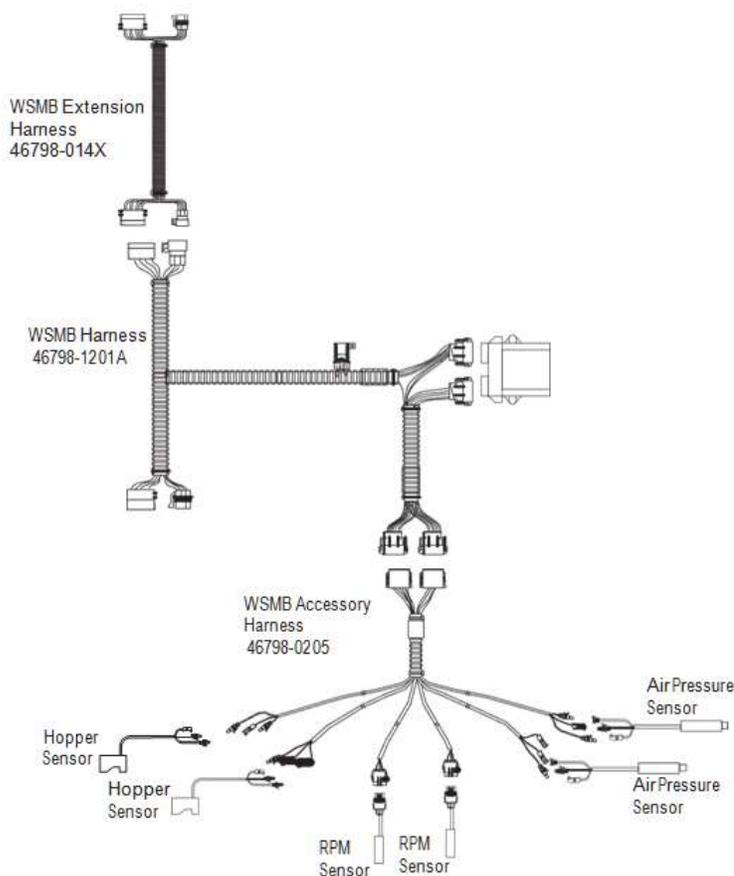
Figure 11
Implement Harnessing





ACCESSORY HARNESS (OPTIONAL)

Figure 12
Accessory Harness



SENSOR INSTALLATION

For proper system operation, all sensors used with the system must be connected properly as described in the following sections. Sensors that are incorrectly installed will not be properly identified by the system and will result in incorrect numbering of the sensors.

SEED SENSORS

The system is compatible with all existing DICKY-john seed sensors. Seed sensors may be connected to the ISO₆ master module and all WSMB planter monitor modules. Any number of sensors up to the maximum capacity of the module may be connected with up to 6 sensors per row. A maximum of 196 seed sensors can be connected to the system.

OPERATOR'S MANUAL



When connecting seed sensors to the modules, the following requirements must be observed:

All seed sensors installed must be connected to the seed sensor harness SEQUENTIALLY starting with the Row 1 input. In the event that not all row inputs on the module are used, the unused inputs must be the last inputs on that module.

If the module has multiple sensors for the same row, all sensors assigned to the same channel must be sequential.

Figure 13

Correct Seed Sensor Module Connection

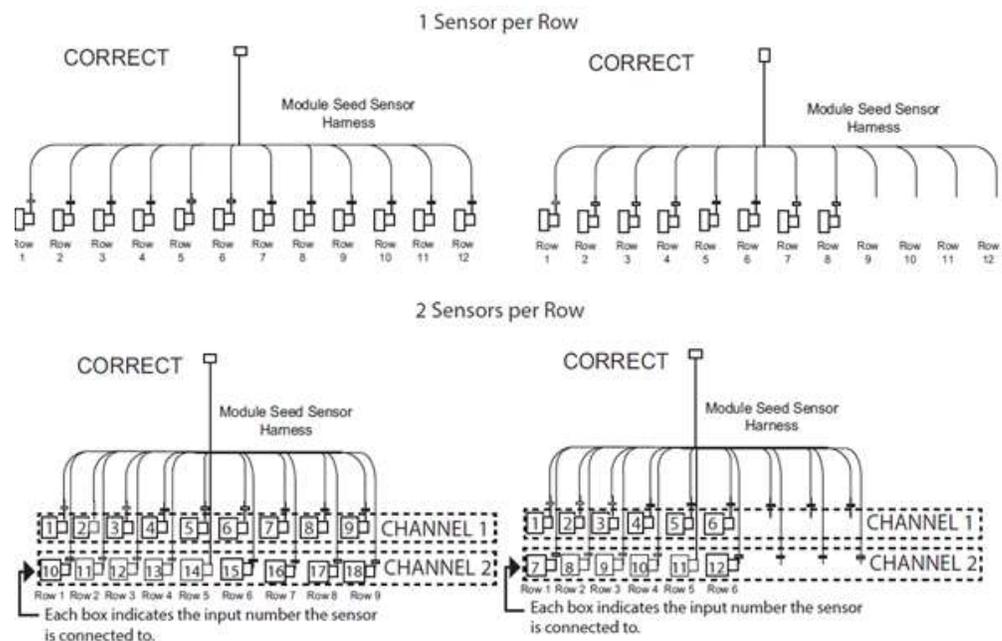
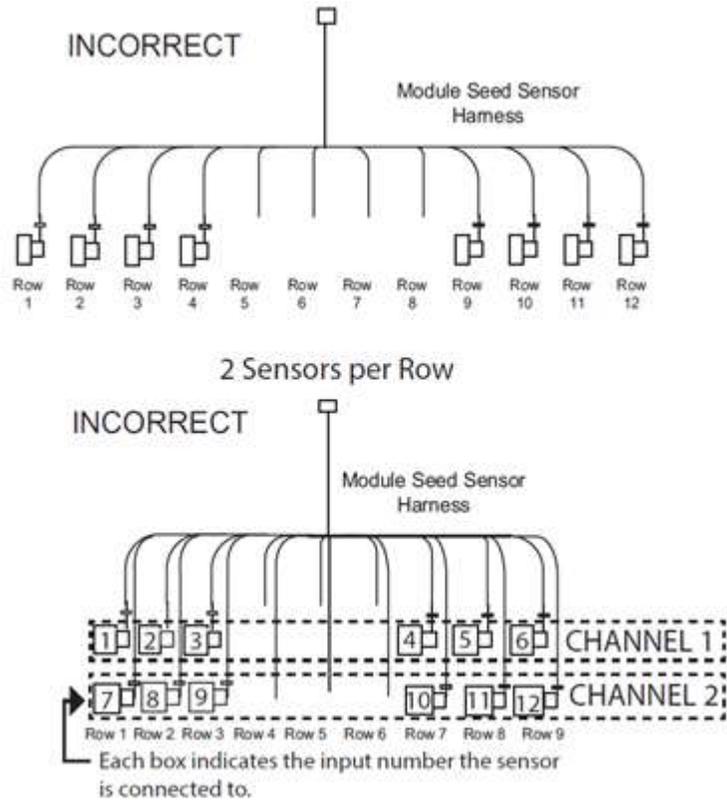




Figure 14

Incorrect Seed Sensor Module Connection



Failure to correctly install seed sensors will result in incorrect row assignment on the planter monitor display functions and alarms.

HOPPER LEVEL SENSORS

The system is compatible with the DICKY-john planter hopper level sensors. One hopper level sensor can connect to the actuator harness and another 4 hopper sensors connect using an accessory harness (P/N 46798-0201). Both harnesses are connected to the ISO₆. The hopper level connection is labeled HOPPER 1 2.

RPM SENSORS

The system is compatible with all existing DICKY-john digital RPM sensors. One RPM sensor connects to the ISO₆ module. The sensor connects to the actuator harness and is labeled RPM 1. Up to 3 additional RPM sensors connect to an accessory harness (P/N 46798-0201).



AIR PRESSURE SENSORS

The system is compatible with DICKY-john air pressure sensors. One air pressure sensor with adapter harness connects to the RPM harness connection labeled RPM1. Three additional pressure sensors connect to accessory harness (P/N 46798-0201). Other frequency based air pressure sensors may be used and configured in the sensor setup menu.



SYSTEM MODES

INTELLIAG ISO₆ ACCESS

The IntelliAg system is accessed by pressing the ISO₆ button located in the UT's working set list.

The ISO₆ Control System has two modes of operation:

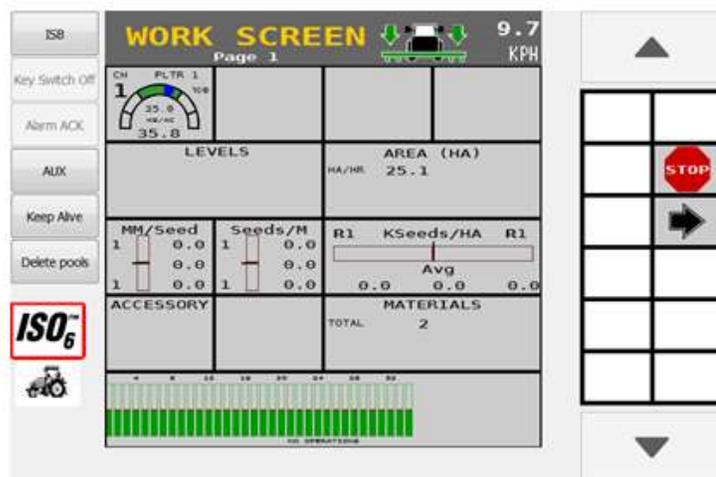
- Work Mode (master/control switch ON or implement DOWN).
- System Setup (Level 2 and 3 users are accessible with password).

WORK MODE

When the master/control switch is in the ON position, the **START** button is pressed with the implement down, ground speed is greater than 0, or the minimum ground speed is shutoff; the ISO₆ Control System is in Work Mode. In this mode, all enabled system components and control channels are operational, as well as all monitoring functions and system accumulators.

When the master switch is in the OFF position or the **STOP** button is pressed (red), the implement up, or ground speed is 0 or less than the defined ground speed shutoff, all control and row monitoring functions cease.

Figure 15
IntelliAg ISO₆ Icon and Work Mode Active





USER LEVELS

The system has three user levels that allow access to certain screens based on user level type.

- User Level 1 Operator (Basic View)
- User Level 2 Dealer (Advanced Setup)
- User Level 3 OEM (Authorized Personnel)

At initial power up the system will be in user level 3 (OEM). After a power cycle, the system will continue to log into the chosen User level until changed at the Password screen. The user level is changed at the Version screen using a password.

USER LEVEL 1 OPERATOR (BASIC ACCESS)

Operator View (User Level 1) is a restricted level that does not allow any setup/configuration constants to be changed.

In operator view the following functions can be performed:

- Assign materials to channels
- Access calibration parameters
- Perform a fill disk
- Increase and decrease rates
- Turn on/off a control channel
- Change instruments on Work screen
- Access Diagnostics screen
- View Version screen
- View Alarm Log and Detail screens
- View Section Control screen
- View Implement Geometry screen
- View Speed screen

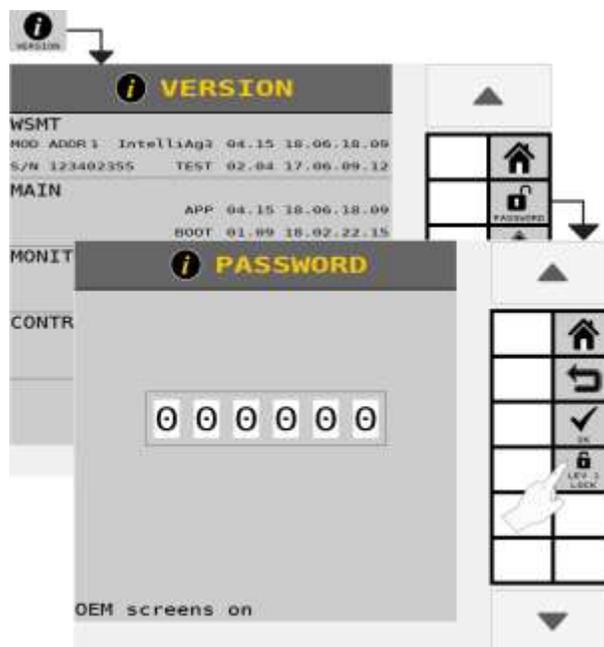
All Setup screens are viewable in level 1 mode with non-selectable constants in a gray tone.

TO SET USER LEVEL 1 MODE:

1. Press the **VERSION** button.
2. At the Version screen, press the **PASSWORD** button.
3. At the Password screen, press the **LEV 1 LOCK** button.
4. The "OEM or Dealer Screens On" located at screen bottom disappears after the **LEV 1 LOCK** button is pressed as an indicator it is now in user level 1 mode.



Figure 16
Locking to User Level 1



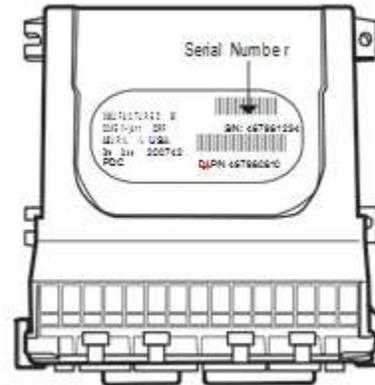
USER LEVEL 2 (DEALER)

User Level 2 provides open access to all setup/configuration screens excluding Factory Reset and the Alarm Log. To change from operator level to dealer level, a 6-digit password is required. Password includes the five-digit serial number found on the label of the ISO₆ or on the Version screen.

TO UNLOCK TO DEALER ACCESS:

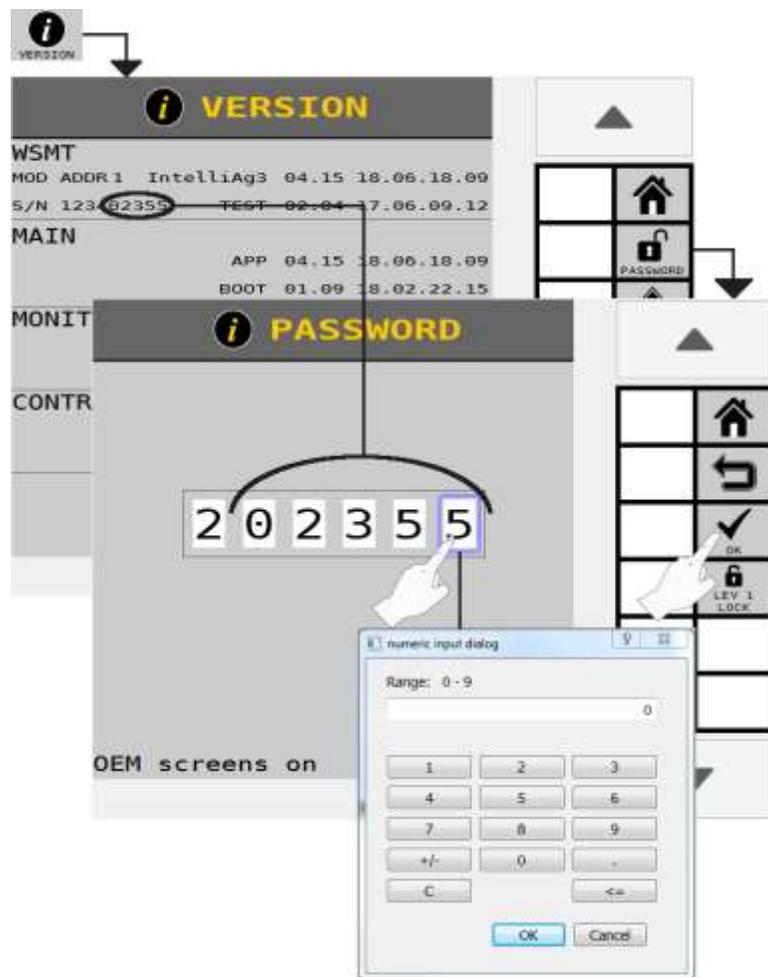
1. At the Version screen:
 - Record the serial number of the ISO₆ module.
 - Press the **PASSWORD** button.
2. On the Password screen, enter the 6-digit password as follows:
 - Enter the first digit as 2.
 - For the next five digits, enter the last five digits of the serial number taken from the ISO₆ module found on the label or
 - the last five digits found at the Version Information screen (example S/N 1632**10044** - use 10044).
3. Press the Checkmark button to accept password. At the Password screen, text at screen bottom states "Dealer screens on" in the User Level 2 (Dealer) mode.

OPERATOR'S MANUAL



The system remains at the Dealer level after each power cycle until changed in the Password screen.

Figure 17
Changing User Level





USER LEVEL 3 (OEM)

User Level 3 (OEM) mode provides access to many features not available to Level 2 (Dealer), including access to three additional features:

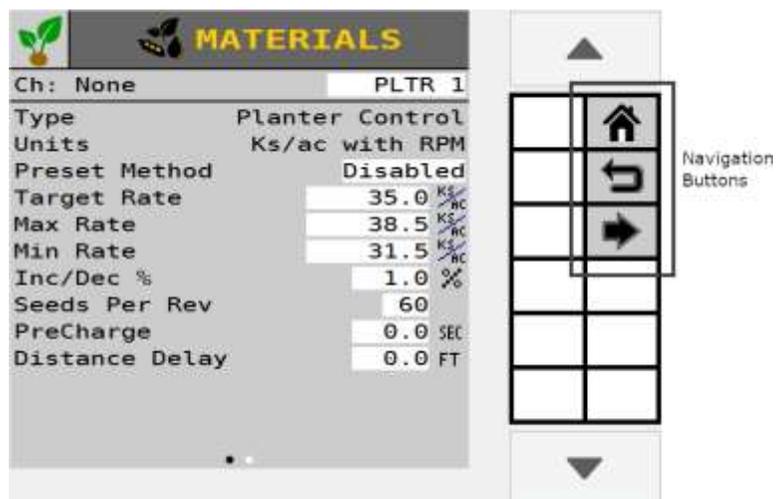
1. **SET DEFAULTS** button - Allows setting to factory defaults or to the previous configuration settings.
2. **ALARM LOG** button - Clearing of Alarm logs.
3. Control Channel and Row-Pro Calibration Parameters screen - Manual adjustment of valve calibration parameters. These adjustments should be made with the guidance of a DICKEY-john technical support representative.
4. **MODULE AUTO-SORT** button – sorts modules according to serial number.



NAVIGATION AND ACTION BUTTONS

A set of buttons on the right side of each screen guides the user to navigate between screens. Some system functions have multi-tiered setup screens with a unique set of navigation buttons to guide within those system setup screens. Location of these buttons are based off of the settings in the Universal Terminal.

Figure 18
Navigation Buttons Defined



NAVIGATION

NAVIGATION BUTTONS DEFINED

HOME

The **HOME** button is always located as the first button on a screen and returns to the top level menu when pressed.

LEFT/RIGHT ARROWS

The Left Arrow button returns to the previous screen within the multi-tiered setup screens. A Right Arrow button indicates there is an additional setup screen; pressing the right arrow advances to the next setup screen.

BACK

The Back button returns to the top level screen within a multi-tiered setup function, i.e., setting up a control channel has several screens within the setup function. Pressing the Back button returns to the top level screen within Control setup.



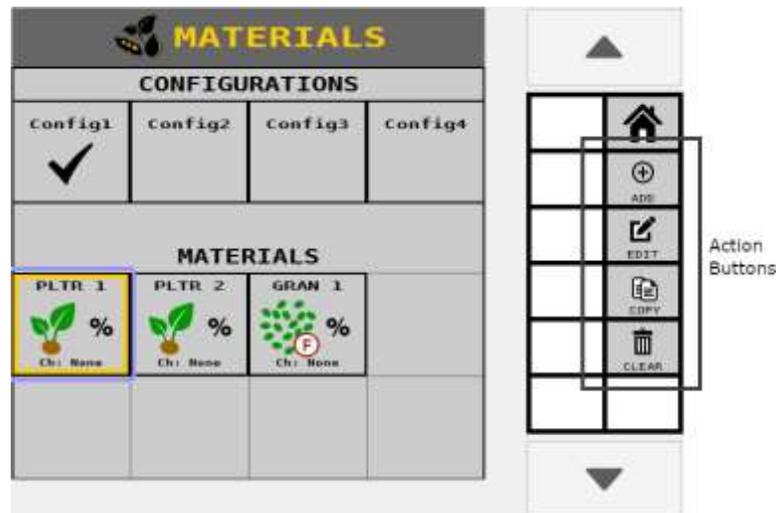
DOWN/UP ARROWS

Used to navigate in the same page or move to the previous/next set of data.

ACTION BUTTONS

Action buttons perform an action relating to setting up system parameters. Some system functions have multi-tiered setup screens with a unique set of navigation buttons to guide within those system setup screens. These buttons' locations are part of the Virtual Terminal settings and may look slightly different than shown.

Figure 19
Action Buttons Defined



ACTION BUTTONS DEFINED

MODIFY

The **MODIFY** button is only available on the top level Home Menu and is used to select and place a commonly used button on the top level Home Menu.

EDIT

The **EDIT** button allows modification of parameters for Materials, Channels, Channel Linking, Accessories, Operations, Section Linking setup screens, and other screens.



COPY

Allows material, control channel, or accessory parameters to be copied and added as another instance of that setup type.

CLEAR

Removes any of: material from the material library, button from the Main Menu, or an instrument from the instrument library.

NEXT

Used to navigate to the next page or next set of data.

ALARM CANCEL

Cancels an active alarm.

DONE

Accepts changes made to the displayed screen.

ACCEPT

Accepts changes made to the displayed screen.

CANCEL

Cancels changes made to the displayed screen and reverts to the previous settings.

Additional buttons that are specific to the selected setup screen are described in the relevant sections throughout the manual.



HOME MENU

The default Home Menu is the main screen that a user interfaces with to gain access to primary system setup screens and the Work Screen. The Home Menu also allows access to the system version information and user access levels.

VERSION INFORMATION

Provides software version installed for the ISO₆ and connected modules, allows access to enter user level passwords, and restart the system.

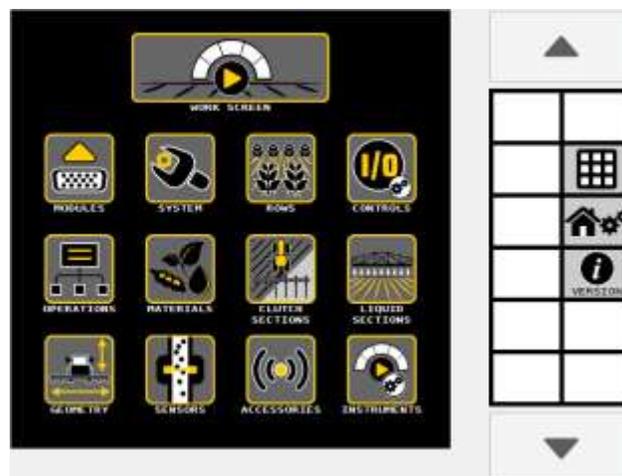
BASIC SETUP STEPS

The basic steps below are recommended in the listed order for initial system setup:

1. **MODULES** configuration (set module addresses)
2. **SYSTEM** screen (select harness)
3. **ROWS** (assign)
4. **CONTROLS** (define control channels)
5. **OPERATIONS** (define control/application configuration)
6. **MATERIALS** (specify material type)
7. **CLUTCH SECTIONS** (setup for section control)
8. **LIQUID SECTIONS** (setup for liquid section control)
9. **GEOMETRY**
10. **SENSORS** (assign sensor type)
11. **ACCESSORIES**
12. **INSTRUMENTS** (set up Instruments in Work Screen view)
13. All setup steps are configurable in any order. System setup buttons at the Home Menu screen are the main setup parameters for the system operation and are prioritized from left to right, top to bottom in the recommended setup order (Figure 20).

Figure 20

Home Menu Screen



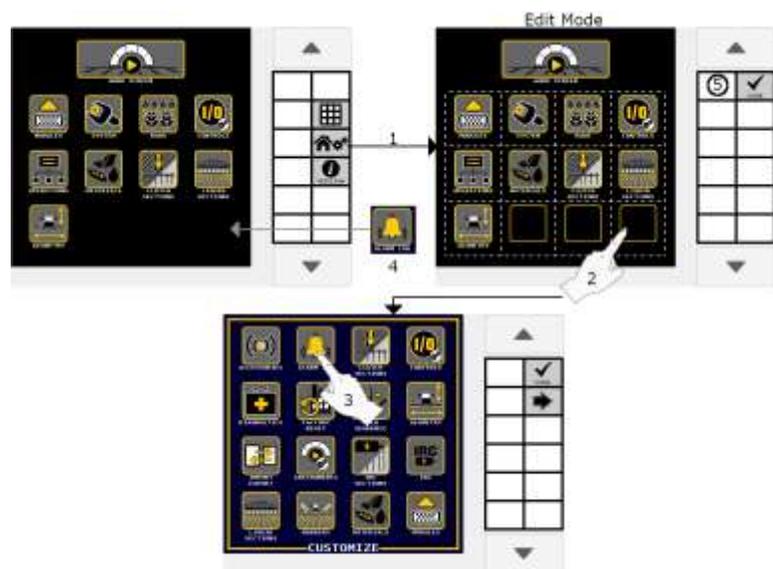


REPLACE A SYSTEM SETUP BUTTON ON THE HOME MENU:

1. Press the **MODIFY** button. The Home Menu is now in **EDIT** mode.
2. Select the button on the Home Edit screen to replace with new.
3. Select the desired button to replace the button selected on the Home Menu.
 - Two Button Selection screens display in Edit mode with available Setup buttons.
 - Press the Next Page button to display the second Button Selection menu.
4. The selected new button auto fills into the selected area at the Home Menu.
5. When finished, press the **DONE** button to return to the Home Menu that now displays the new button.

Figure 21

Customizing the Home Menu



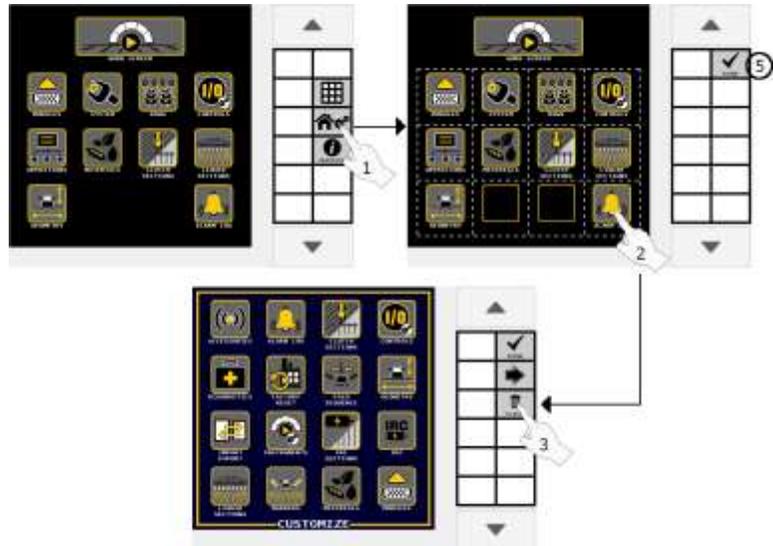
REMOVE A BUTTON FROM THE HOME MENU:

1. Press the **MODIFY** button.
2. Select the button to clear from the Home Menu.
3. At the Button Selection screen, press the **CLEAR** button.
4. The button is automatically cleared from the Home Menu and a blank placeholder button added until a new button is added.
5. When finished, press the **DONE** button to return to the Home Menu that now displays an empty placeholder button.



Figure 22

Removing a Button from the Home Menu

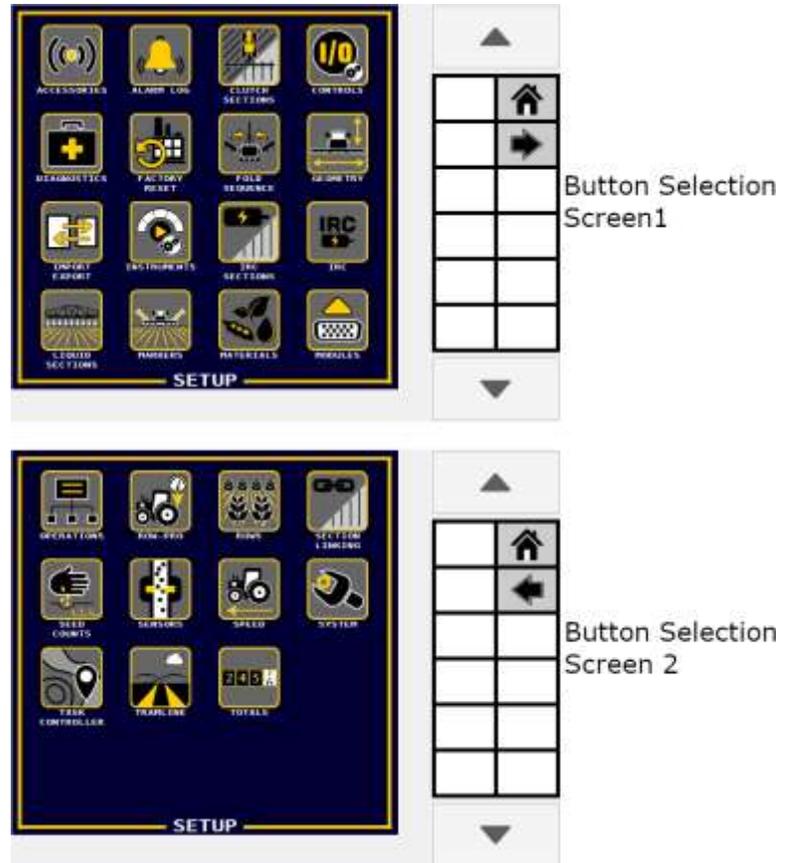


SYSTEM SETUP BUTTONS

Dedicated buttons are used to setup the Home Menu and also provide navigation to setup system functions. Press the Right Arrow button to display 1 of 2 button selection screens. Buttons are in alphabetical order.



Figure 23
Button Selection Screens.



SYSTEM SETUP BUTTONS DEFINED

WORK SCREEN

Available only on the Home Menu and opens the Work Screen used during normal operation to monitor and control applications.

ACCESSORIES

Setup parameters for installed sensors, e.g. pressure, hopper, RPM, digital.

ALARM LOG

A listing of alarms that have occurred to the system with details on each alarm as well as a Reset button to clear alarms.



CLUTCH SECTIONS

Planter Clutch Setup; define sections by channels, rows, outputs, and switches, to automatically or manually shut off individual sections.

CONTROLS

Setup of the control channel type identifying the channel parameters.

DIAGNOSTICS

Informational screen to aid in troubleshooting for system issues.

FACTORY RESET

Clears setup parameters and returns to factory default settings or overwrites factory defaults to the existing configuration settings as defined by the user. Alarm Log and Accumulators will be lost.

FOLD SEQUENCE

Set up Frame Folding steps, working hydraulics, and hardware.

GEOMETRY

Entry of physical implement coordinates in relation to fixed positions on the vehicle to determine GPS coordinates in the field.

IMPORT/EXPORT

Implement configurations stored on the ISO₆ can be exported to a USB memory device for transfer to other machines. This file transfer eliminates manual entry of all settings to similar machines via the import feature.

IRC SECTIONS

Define Individual Row Control (IRC) sections by channels, rows, and switches to automatically or manually shut off individual sections.

IRC SETUP

Setup Individual Row Control (IRC) module hardware.

INSTRUMENTS

Allows customization of the Work Screen to display system functions and instruments to user preferences.



LIQUID SECTIONS

Define sections by channels, rows, outputs, and switches to automatically or manually shut off individual sections (Liquid).

MARKERS

Enables or disables bout marker outputs and feedback.

MATERIALS

Setup of material types that are assigned to a control channel. Minimum/maximum limits, target rates, and alarm conditions are defined for materials.

MODULES

Identifies module position on the implement and allows performing an Auto Configuration to locate addresses for connected modules and sensor detection.

OPERATIONS

Identifies the actual physical configuration of how channels are grouped, either in a series or in parallel, and communicates the overall channel width to the Task Controller. A total of 6 operations are possible.

ROWS

Assigns the number of rows and row width. Defines the implement width.

ROW-PRO

Setup and calibration of down pressure control parameters.

SECTION LINKING

Links sections/channels that are in serial or in parallel formation together with other sections of the system to simultaneously turn on or off when a section is shutoff and turned on.

SEED COUNTS

Displays the number of seeds detected by each sensor.

SENSORS

Identifies sensor type by operations and rows as population or blockage type.

SPEED

Setup of ground speed source and ground speed constants.



SYSTEM

Selection of the system harness type and access to feature keys, optional system add-ons per customer requirements.

TASK CONTROLLER

Provides the active state of the task controller and the current operations communicating with the task controller. Also selection of the universal terminal type.

TRAMLIN

Setup of hardware, outputs, sprayer geometry, and bout configurations used for tramlining. The advanced tramline feature uses input sprayer geometry to determine bout sequencing.

TOTALS

System accumulator data displays the total amount of time the system has been on, the amount of time and area application control has occurred, and the distance traveled.



MODULES

The Module screen identifies modules connected to the CAN bus. A check mark to the left of each module's serial number identifies that the module is active and communicating.

The Module Address (MOD ADDR) column identifies the module's position on the implement. Accurate module placement is required for proper operation.

MODULE LIMITS:

- Up to 16 seed sensors can connect to the ISO₆ module.
- Up to 8 WSMB can be installed to monitor up to 144 sensors.
- Up to 5 WSMB2 can be installed to monitor up to 90 sensors with quality data.

Each module present on the CAN bus is identified on the Module screen by the serial number and module type. A label on the module indicates the serial number and corresponds with the serial number on the Module screen.

CONNECTING SEED SENSORS TO ISO₆ /WSMB

- Each module address is determined by the order in which the modules are installed on the implement.
- Modules and their respective address appears on the Module screen as installed on the implement.
- Seed sensors must be connected to the ISO₆ or WSMB continuously and consecutively. Any skipped inputs will cause an alarm.

Example: Module Address 1 should be assigned to the module connected to Row 1. Module Address 2 should be assigned to the module connected to the next set of rows. The assigned numbering continues until all rows are numbered.

REPLACING INSTALLED MODULES (AUTO CONFIG)

When an installed module is replaced, e.g. for a defective module, an auto configuration is necessary to remove the old module from the system and replace with the new module.



When a new module is added to the system, it defaults to the last position on the Module screen. Performing an auto configuration positions the module in the correct location.

WARNING

WARNING

Some system configuration will need to be repeated when replacing a module.

TO PERFORM AN AUTO CONFIGURATION:

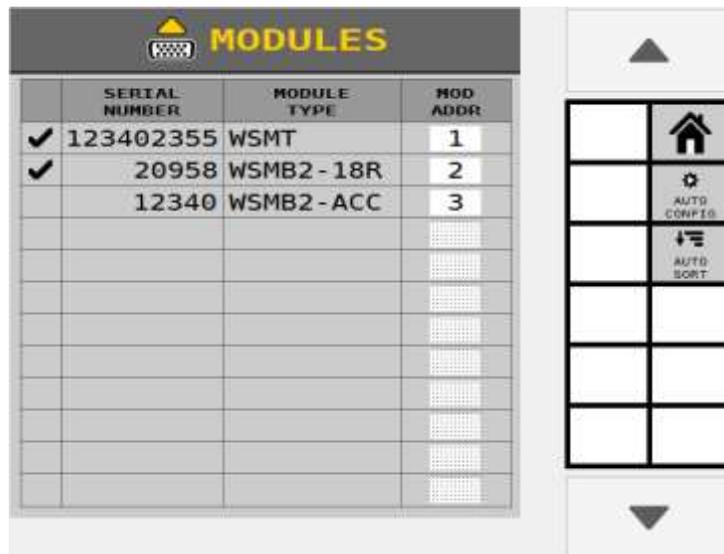
1. Press the **MODULES** button.
2. At the Module Configuration screen, press the **AUTO CONFIG** button.
 - An hour glass appears in the center of the screen during configuration.
3. After completion, the new module appears in the correct module address column and the old module is removed.

NOTE

Auto Configuration is only available to User Level 3 (OEM).

Figure 24

Module Configuration Screen





ADDING NEW MODULES

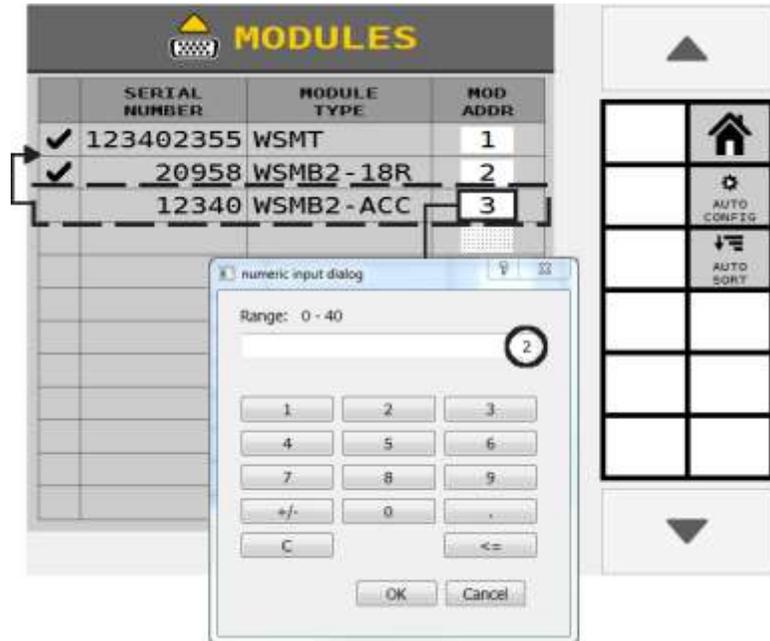
When adding a new module to the system, the module appears as the last module and must be placed in its correct position as installed on the implement.

TO ADD A NEW MODULE:

1. Press the MODULE ADDRESS input box of the new module.
2. Manually enter the correct module address location.
 - The module location automatically adjusts to the correct position and preceding modules change to the new module address.

Figure 25

Adding a New Module



AUTO SORT FEATURE

Performing an Auto Sort is a feature used for those systems that have all modules installed on the implement in sequential order by serial number. When modules are added or removed, pressing the **AUTO SORT** button automatically places the modules in order by their serial number.



IDENTIFY HARNESS

IMPORTANT

The harness must be selected prior to channel setup.

The system default is set to "Monitor Only" with no control channels enabled.

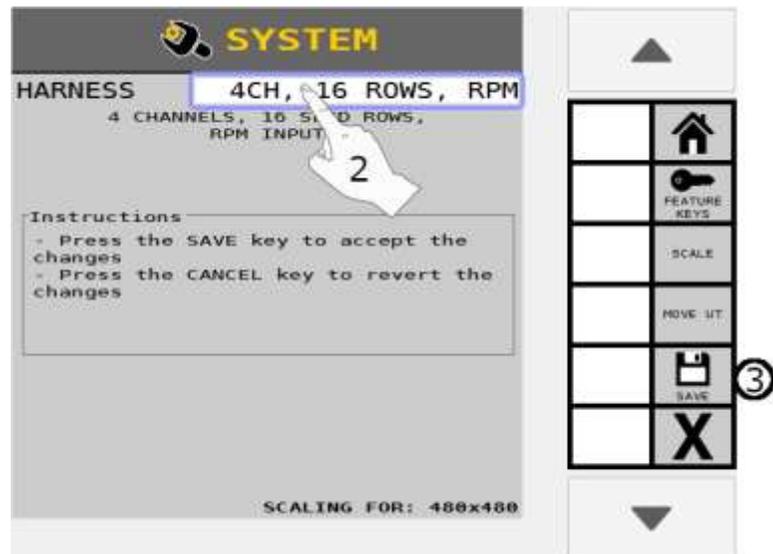
SELECTING A HARNESS:

1. Press the **SYSTEM** button.
2. Press the HARNESS drop down box and select the appropriate harness.
3. Press the **SAVE** button.
 - Press the Cancel '**X**' button to cancel the selected changes.
4. A power cycle is required to reboot the system.

NOTE

Refer to the Software Add-ons section for details on the **FEATURE KEYS** button.

Figure 26
Select the Harness Type





ROW SETUP

NOTE

Applies to planter, granular, liquid, RPM, Monitor Only, and IRC applications.

Row Setup controls the number of rows that are monitored and the distance between the rows in order to establish implement width.

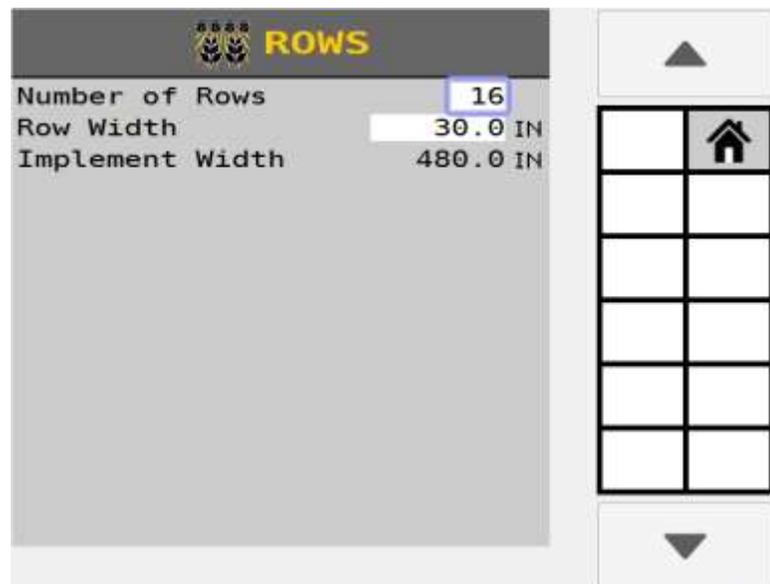
- Individual row sensors can be set to ON or OFF.
- Any detected row can be set to OFF.
- Rows set to OFF remain off until they are turned ON again or are set to ON through Pattern Select.
- Rows set to OFF are ignored by the system and will not report data or react to row failures.

TO ACCESS ROW SETUP:

1. Press the **ROWS** button to access the Row Setup screen.
2. Enter desired row numbers and width per implement specifications.

Figure 27

Row Setup Planter Control



NUMBER OF ROWS

Enter total number of implement rows.



ROW WIDTH

Row width is used for seed rate data and to control calculations. This is the distance in inches (centimeters) between rows with a resolution of 0.1.

IMPLEMENT WIDTH

Implement width is the seeding width of the implement in inches (centimeters) with a resolution of 0.1. This value is used for Total, Field 1/ Field 2 area accumulators only and does not affect seed rate data. Implement width is calculated from number of rows and row width.

MATERIAL SETUP

CONFIGURATION SETUP

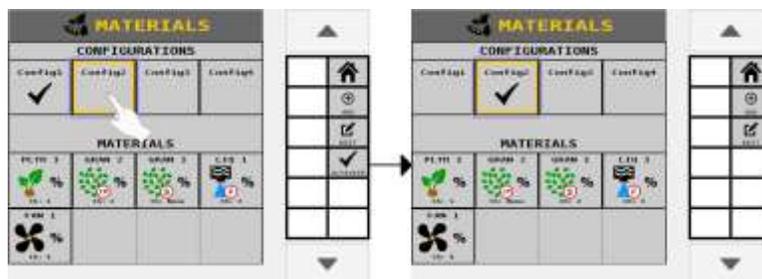
Configurations are the assignment of materials to channels. The system can store up to 4 different configurations. Changing configurations may require a system restart. Configurations also contain the row pattern for the operations/channels.

TO ACTIVATE/CHANGE A CONFIGURATION:

1. Press the **MATERIALS** button.
2. Press and highlight the Configuration to be activated.
3. Press the **ACTIVATE** softkey.

Figure 28

Activate a Configuration



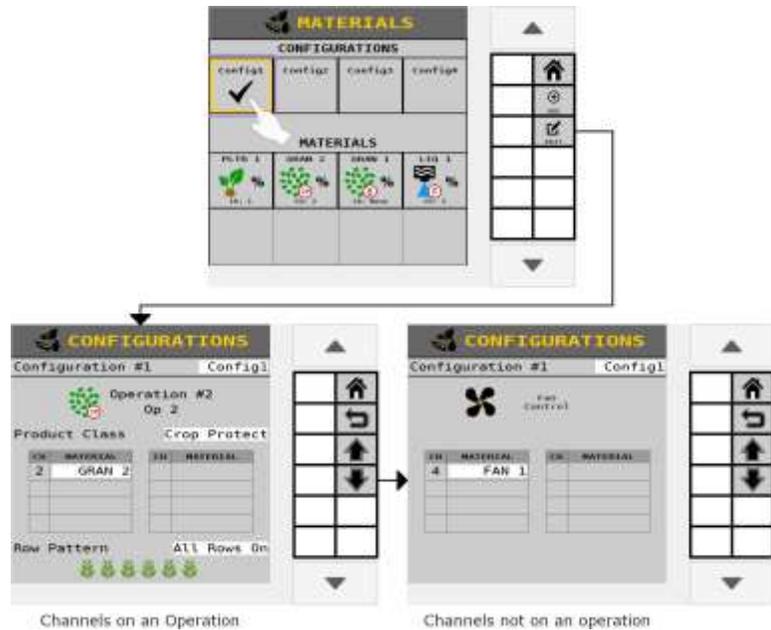
TO EDIT A CONFIGURATION:

1. Press the **MATERIALS** button.
2. Press and highlight the Configuration to edit.
3. Press the **EDIT** softkey.

The configuration is organized first by operation, then by individual channels (if it is not on an operation). Use the Up and Down arrows to select an operation/channel. You can rename the configuration by editing the configuration name text box.



Figure 29
Edit a Configuration



TO CHANGE THE OPERATION PRODUCT CLASS:

Select the desired product class from the product class list. Only valid product classes for the selected channel/operation will be shown.

TO CHANGE AN ASSIGNED MATERIAL:

Use the list associated with the desired channel. Only valid materials for the specific channel and selected product class will be shown.

TO CHANGE THE ROW PATTERN:

Select the desired row pattern from the row pattern list. Row patterns are operation specific.



CREATING A MATERIALS TABLE

A Materials table stores up to 16 user-defined materials that provide an overview of all materials assigned and configured for a control channel. A material is setup by selecting one of the material buttons. As materials are configured and saved, the materials appear in the materials table. Up to 8 materials are displayed at a time, with a Down button to navigate to the next set.

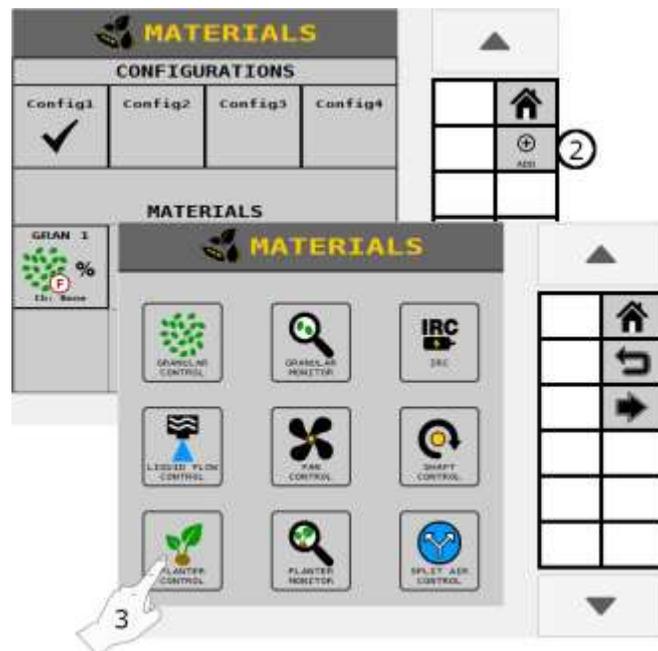
The Materials page also stores Configurations which set up the assignments of materials to channels. For more information about Configurations, see the Configurations section.

TO CREATE A MATERIAL:

1. Press the **MATERIALS** button.
2. At the Materials table screen, press the **ADD** softkey.
3. Select the material type to add. The Material is added to the next open space in the material table.

Figure 30

Create a Material





COPY MATERIALS TO TABLE

An existing material and its parameters can be copied to another Materials button to eliminate entry of similar items. Once the material is copied it can be edited to make modifications as necessary.

TO COPY AN EXISTING MATERIAL:

1. At the Material table, press the **MATERIAL** button to highlight the material to copy to a new button.
2. Press the **COPY** button. Material is copied to the next open slot in the table.

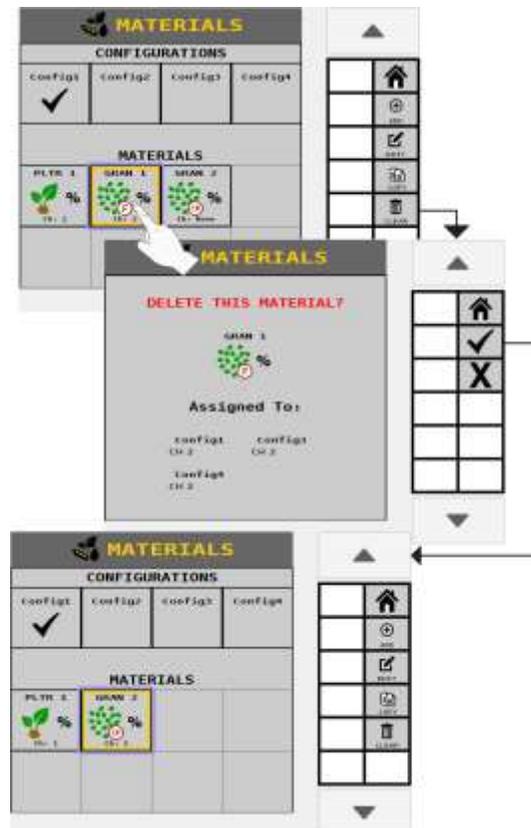
CLEAR MATERIAL FROM TABLE

A material and its parameters can be removed from the material table.

TO CLEAR MATERIALS:

1. At the Materials Table screen, press to select and highlight the material to remove from the table.
2. Press the **CLEAR** button. Material is cleared from the table.

Figure 31
Clearing Material





VIEW NEXT MATERIAL PAGE

Creating more than 8 Materials will create a new Materials page. Press the Down softkey to view Materials 9-16 in the table. Pressing the Up softkey allows viewing Material 1-8 in the table.

TO CLEAR MATERIALS:

1. At the Materials Table screen, press to select and highlight the material to remove from the table.
2. Press the **CLEAR** button. Material is cleared from the table.

EDIT/DEFINE MATERIAL PARAMETERS

The Material Edit screen defines the parameters for a material. Up to 16 materials can be configured for various channel types. Material parameters may vary based on the material type selected.

NOTE

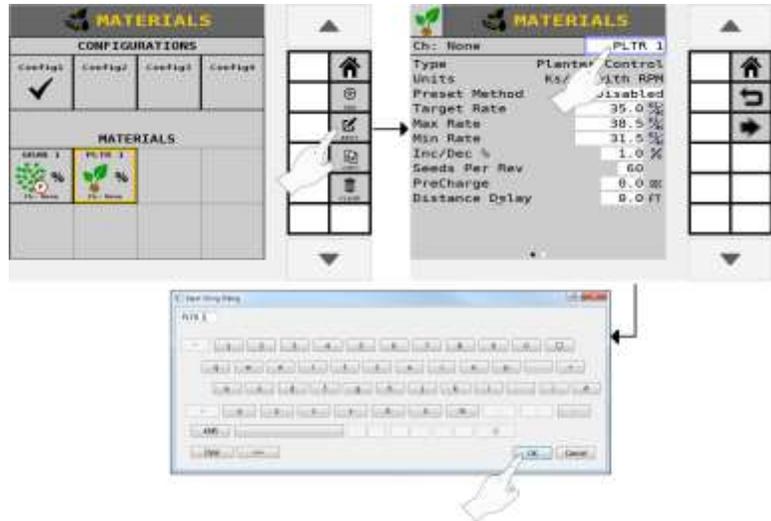
Material Edit screen is accessed from the Material Table.

TO DEFINE MATERIAL NAME AND PARAMETERS:

1. Press to highlight the Material to edit at the Materials table.
 - The **EDIT** button will not display until the material is selected.
2. Press the **EDIT** button.
3. Press on the Name input box.
 - Type in the desired name using the virtual keypad.
4. Press the Check button or OK on the keyboard to accept change.
5. Review and adjust material parameters relevant to the application. Refer to definitions of material parameters that follow in this section.



Figure 32
Create a Material Name



MATERIAL TYPE

Type establishes the desired type of application control channel used for a specific material. **This step is very important. Material type must correctly match Control type.**

Type	Used for
Planter Control	Hydraulic drive row crop planter
Planter Monitor	Ground drive row crop planter
Granular Control	Granular application control on drills, planters, air seeders and air carts
Liquid Flow Control	Liquid application control with flow meter
Granular Monitor	Ground drive air seeder, air cart or drill
Fan Control	Fans e.g. seed distribution, vacuum
Shaft Control	RPM control

After the Material has been created, the Type field in the Material Setup Page is shown as a read-only field for reference.

OPERATOR'S MANUAL



PRODUCT CLASS

Granular and Liquid Flow Materials have respective product class types. These product class types define how the material will be used for each material type.

Granular Product Class	Used for
Fertilizer	Solid fertilizers
Crop Protect	Solid pesticides, insecticides, herbicides, and inoculants
Seeding	Granular seeds e.g. wheat or soybeans

Liquid Product Class	Used for
Fertilizer	Liquid fertilizers
Crop Protect	Liquid pesticides, insecticides, herbicides, and inoculants

After the Material has been created, the Product Class field in the Material Setup Page is shown as a read-only field for reference.

MATERIAL TABLE SYMBOLS

Material assignments are identified at the material table by symbols indicated below.

Figure 33

Material Library and Product Class Symbols





PLANTER CONTROL MATERIAL TYPE

Material setup for seeding applications.

Figure 34

Material Setup Screen for Planter Control

MATERIALS	
Ch: None	PLTR 1
Type	Planter Control
Units	Ks/ac with RPM
Preset Method	Disabled
Target Rate	35.0 <small>Ks/ac</small>
Max Rate	38.5 <small>Ks/ac</small>
Min Rate	31.5 <small>Ks/ac</small>
Inc/Dec %	1.0 %
Seeds Per Rev	60
PreCharge	0.0 SEC
Distance Delay	0.0 FT

TYPE

Read-only field that shows Planter Control for reference.

UNITS

An application rate setting in thousands of seeds per acre (KS/AC) or thousands of seeds per hectare (KS/HA).

PRESET METHOD ENABLED

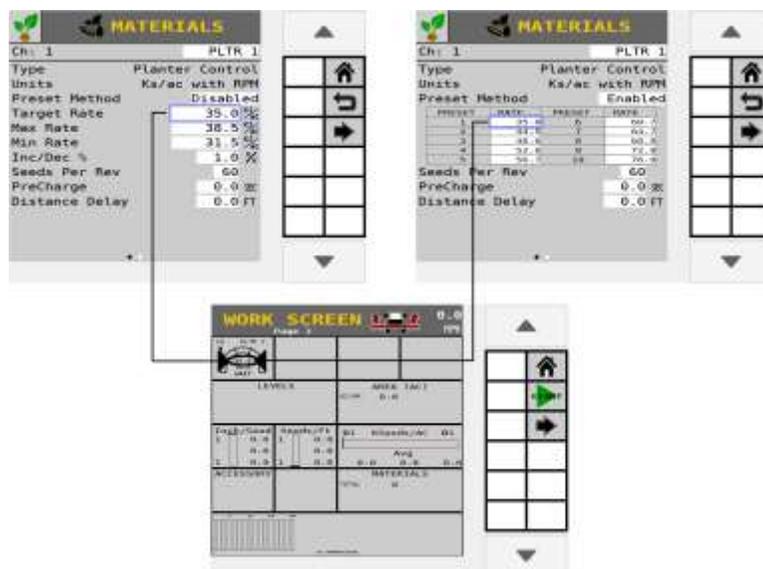
The Preset Method table allows 10 user-defined target rates to be entered. When enabled, target rates can be adjusted from the Work Screen using the Increment/Decrement buttons (Figure 35).

PRESET METHOD DISABLED

When Preset Method is disabled, the target rate on the Work Screen can be adjusted by pressing the Material Increment/Decrement buttons. The target rate increases or decreases based on the Inc/Dec % value set at the Material Configuration screen (Figure 35).



Figure 35
Material Setup Screen-Preset Method



PRESET METHOD-ENABLED

Target rate adjusts based on the 10 rates entered.

PRESENT METHOD-DISABLED

Target rate adjusts based on the Inc/Dec % rate.

TARGET RATE

Desired rate of application displays in thousands of seeds per acre (KS/AC) or thousands of seeds per hectare (KS/HA).

MAXIMUM RATE

The maximum application rate in thousands of seeds per acre (KS/AC) or thousands of seeds per hectare (KS/HA) that the control allows. Target rate cannot be incremented to a value greater than this established maximum rate.

MINIMUM RATE

The minimum application rate in thousands of seeds per acre (KS/AC) or thousands of seeds per hectare (KS/HA) that the control allows. Target Rate cannot be decremented to a value lower than this established minimum rate.

INCREASE/DECREASE %

Establishes the percentage of change of the entered target rate that is applied each time the material Increment/Decrement button is pressed on the Work Screen. This value is not used for manual mode. Instead the Increment/Decrement buttons will adjust the rate by 2% in either direction.



IMPORTANT

The maximum or minimum rates may not be reached if the % increase or decrease, based off the Target Rate, exceeds the maximum or minimum rate limits set.

EXAMPLE: Maximum Rate is set for 101. Target Rate is set for 100. If the % increase is set at 2%, the maximum rate of 101 will not be met because the % increase of 2% would exceed the 101 maximum rate limit.

SEEDS PER REV

Displays the number of seeds that are dropped in one revolution of the seed disk.

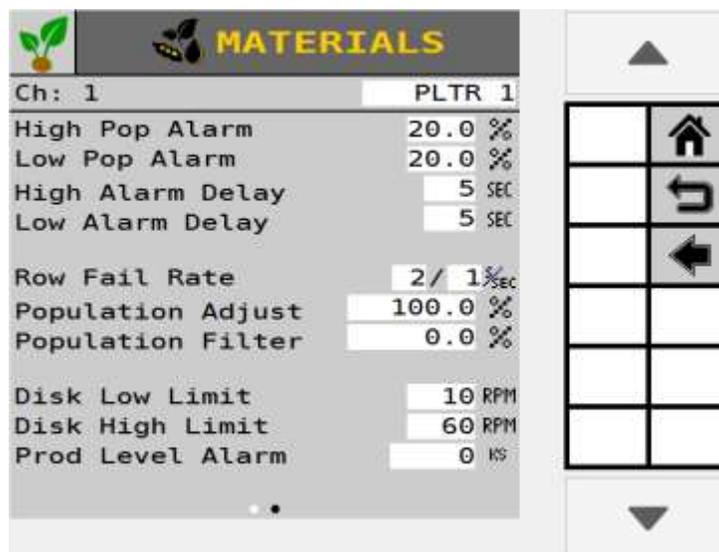
PRECHARGE

See "Using the PreCharge Feature" for more information on PreCharge setup.

DISTANCE DELAY

The delay in M or FT that the implement must travel before the Channel is turned on or off. Distance Delay does not function if the Task Controller is connected and active.

Figure 36
Material Setup Page 2





NOTE

Press the Arrow button on the Materials screen to view second screen.

HIGH/LOW POPULATION ALARMS

High and Low Alarm option sets the high and low population limit values. The entered value is dependent on the target rate.

The High and Low Alarms are entered as a percentage. The percentage value is referenced in relation to the current channel target rate setting if rows are assigned to a channel. Otherwise the alarm will trigger from planter average population.

High Alarm example:

If the Target Rate is 100.0 and the High Alarm is 5.0%, multiply 100.0×1.05 (a 5% increase) = 105.0. The alarm will activate at this population.

Low Alarm example:

If the Target Rate is 100.0 and the Low Alarm is 5.0%, multiply 100.0×0.95 (a 5% decrease) = 95. The alarm will activate at this rate.

HIGH/LOW ALARM DELAY

Establishes the delay between the detection of a high or low population alarm condition and the resulting alarm display. The value is entered in seconds. If the value is set to 10, a row must be in a high or low population alarm condition continuously for 10 seconds before the alarm is issued.

NOTE

Population is updated every 5 seconds. Setting the Alarm Delay for under 5 second intervals does not provide any delay at all.

ROW FAIL RATE

Sets the threshold for row failure alarms. The value is entered in seeds per second. Both values are adjustable allowing for numerous combinations. The default value is 2/1 that indicates a row failure threshold of 2 seeds in 1 second.



POPULATION ADJUST

Scales the displayed population value to allow for inaccuracies with seed sensors in certain applications. This is a multiplier of the monitored population value. For true calculated results, the value should be set to 100.0%. If the monitored value is reading low, the value can be increased above 100.0% to achieve the desired population display. The displayed value is calculated by the monitored value x population scalar.

$$\frac{(\text{Actual Population} - \text{Monitor Population}) \times 100}{\text{Monitor Population}}$$

POPULATION FILTER

Stabilizes the monitored population display. For a true population value, this number should be set to 0.0%. 0.0 is no filtering at all. 99 is the highest level of filtering available. Set the filter to meet the appropriate level of filtering for your specific use (Advanced use only).

DISC HIGH/LOW LIMITS

The maximum or minimum RPM at which the seed disc operates. The control will not allow the seed disc to rotate faster than the Disc High or Low Limit setting based on the app rate sensor feedback and any gear ratio entered.

PRODUCT LEVEL ALARM

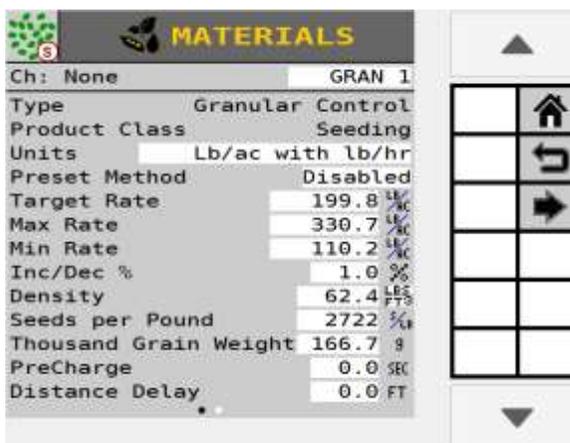
The product level alarm sets the weight (LBS or KG) to alert of low seed levels. The entered value is an estimate in pounds/kilograms (LBS or KG).

GRANULAR SEEDING MATERIAL TYPE

Granular Control setup is used for fertilizer, seeding, and crop protect applications using hydraulic or electric control systems.

Figure 37

Material Setup - Granular Control



TYPE

Read-only field that shows Granular Control for reference.

PRODUCT CLASS

Product class identifies the type of application as either (seeding, fertilizer, or crop protect e.g. insecticide).

UNITS

The rate units used for the material in pounds per acre (LB/AC), kilograms per hectare (KG/HA), 1000 seeds per acre (KS/AC), 1000 seeds per hectare (KS/HA), seeds per square foot (S/FT²) or seeds per square meter (S/M²).

PRESET METHOD ENABLED

The Preset Method table allows 10 user-defined target rates to be entered. When enabled, target rates is adjusted from the Work Screen using the Increment/Decrement buttons.

PRESET METHOD DISABLED

When Preset Method is disabled, the target rate on the Work Screen is adjusted by pressing the Increment/Decrement buttons. The target rate increases or decreases based on the Inc/Dec % value set at the Material Configuration screen.

TARGET RATE

Target Rate establishes the desired rate of application according to the units specified in the Units setting.

MAXIMUM RATE

Maximum Rate establishes the maximum application rate in pounds per acre (LB/AC) or kilograms per hectare (KG/HA) that the control allows. Target Rate cannot be incremented to a value greater than this established maximum rate.



MINIMUM RATE

Minimum Rate establishes the minimum application rate in pounds per acre (LB/AC) or kilograms per hectare (KG/HA) that the control allows. Target Rate cannot be decremented to a value lower than this established minimum rate.

INCREASE/DECREASE %

The increment and decrement percent rate establishes the percentage of change of the entered target rate applied each time the Increment/ Decrement button is pressed on the Work Screen.



IMPORTANT

The maximum or minimum rates may not be reached if the % increase or decrease, based off the Target Rate, exceeds the maximum or minimum rate limits set.

EXAMPLE: Maximum Rate is set for 101. Target Rate is set for 100. If the % increase is set at 2%, the maximum rate of 101 will not be met because the % increase of 2% would exceed the 101 maximum rate limit.

DENSITY

Density is the weight per volume of material to be dispensed and is required to convert the spreader constant. May be in units of LB/FT³, LB/BU, or KG/L.

PRECHARGE

See "Using the PreCharge Feature" for more information on PreCharge setup.

DISTANCE DELAY

The delay in M or FT that the implement must travel before the Channel is turned on or off. Distance Delay does not function if the Task Controller is connected and active.

SEEDS PER POUND

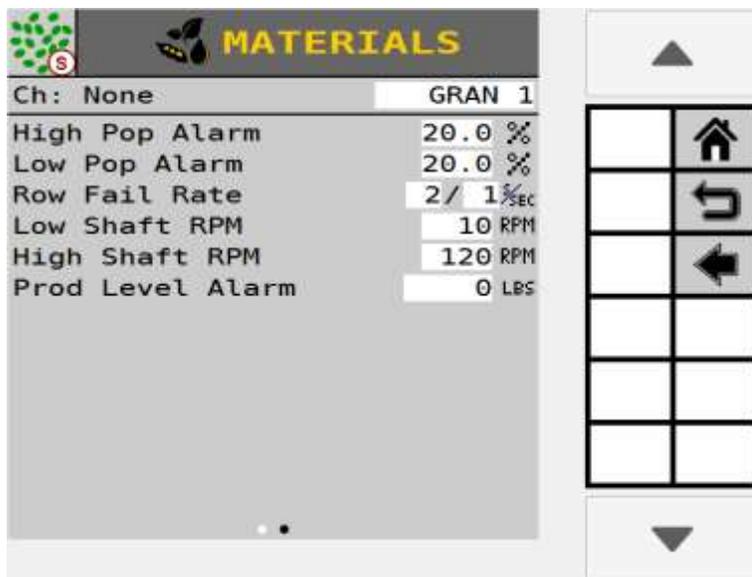
The number (#) of seeds per pound (S/LB) or seeds per kilogram (S/KG). This setting is used when calculating population values and triggering alarms. The Seeds per Pound is also used when material Units are set to KS/AC or Seeds/Ft² to convert the target rate to LBS/AC or KG/HA. Editing this setting will update the Thousand Grain Weight setting.

This number is often found printed on the seed bag. This setting is only used for materials with Seeding type for Product Class.



Figure 38

Material Setup - Granular Control Page 2



NOTE

Press the Arrow button on the Materials screen to view second screen.

THOUSAND WEIGHT GRAIN

The weight of 1000 seeds in either ounces or grams. This setting is used when calculating population values and triggering alarms. The Thousand Grain Weight is also used when material Units are set to KS/AC or Seeds/Ft2 to convert the target rate to LBS/AC or KG/HA. Editing this setting will update the Seeds per Pound setting.

This number can be found by counting out 1000 seeds and weighing them, or it may be printed on the seed bag. This setting is only used for materials with Seeding type for Product Class.

HIGH/LOW POPULATION ALARMS

The High and Low Alarm option sets the high and low population limit values. The entered value is dependent on the target rate. This setting is only used for materials with seeding type for Product Class.

The High and Low Alarms are entered as a percentage. The percentage value is referenced in relation to the Target Rate x Seed/Lb setting.

**High Alarm example:**

If the Target Rate is 100.0 x 30 KS/AC and the High Alarm is 5.0%, multiply 30 KS/AC x 1.05 (a 5% increase) = 31.5 KS/AC. The alarm will activate at this rate.

Low Alarm example:

If the Target Rate is 30 KS/AC and the Low Alarm is 5.0%, multiply 30 KS/AC x .95 (a 5% decrease) = 28.5 KS/AC. The alarm will activate at this rate.

ROW FAIL RATE

Sets the threshold for row failure alarms. The value is entered in seeds per second. Both values are adjustable allowing for numerous combinations. The default value is 2/1 which indicates a row failure threshold of 2 seeds in 1 second.

LOW/HIGH SHAFT RPM

Low/High Shaft RPM establishes the low shaft and high shaft RPM the meter shaft will operate. Low shaft RPM is the lowest shaft RPM speed the control channel operates. High shaft RPM is the highest shaft RPM the control channel operates.

PRODUCT LEVEL ALARM

The product level alarm sets the weight to alert of low product levels. The entered value is an estimate in pounds/kilograms (LBS/KG).



LIQUID FLOW MATERIAL TYPE

Material setup for liquid flow control of fertilizer and crop protection applications.

Figure 39

Material Setup Liquid Flow

The screenshot shows a control panel titled "MATERIALS" with a list of settings for "LIQ 1". The settings are as follows:

Field	Value	Units
Ch:	None	LIQ 1
Type	Liquid Flow Control	
Product Class	Fertilizer	
Units	Gal/ac with gal/min	
Preset Method	Disabled	
Target Rate	19.9	GAL/AC
Max Rate	33.0	GAL/AC
Min Rate	11.0	GAL/AC
Inc/Dec %	1.0	%
PreCharge	0.0	SEC
Distance Delay	0.0	FT

TYPE

Read-only field that shows Liquid Flow Control for reference.

PRODUCT CLASS

Identifies the type of application as either fertilizer or crop protect e.g. insecticide.

UNITS

An application rate setting in gallons per acre (GAL/AC) or liters per hectare (L/HA). Units automatically change with the material application type selected.

PRESET METHOD ENABLED

The Preset Method table allows 10 user-defined target rates to be entered. When enabled, target rates can be adjusted from the Work Screen using the Increment/Decrement buttons.



PRESET METHOD DISABLED

When Preset Method is disabled, the target rate on the Work Screen can be adjusted by pressing the Material Increment/Decrement buttons. The target rate increases or decreases based on the Inc/Dec % value set at the Material Configuration screen.

TARGET RATE

Target Rate establishes the desired rate of application in gallons per acre (GAL/AC) or liters per hectare (L/HA).

MAXIMUM RATE

Establishes the maximum application rate in gallons per acre (GAL/AC) or liters per hectare (L/HA) that the control will allow. Target Rate cannot be incremented to a value greater than this established maximum rate.

MINIMUM RATE

Establishes the minimum application rate in gallons per acre (GAL/AC) or liters per hectare (L/HA) that the control will allow. Target Rate cannot be decremented to a value lower than this established minimum rate.

INCREASE/DECREASE %

The Increment/Decrement Percent rate establishes the percentage of change that is applied each time the Increment/Decrement button is pressed on the Work Screen.

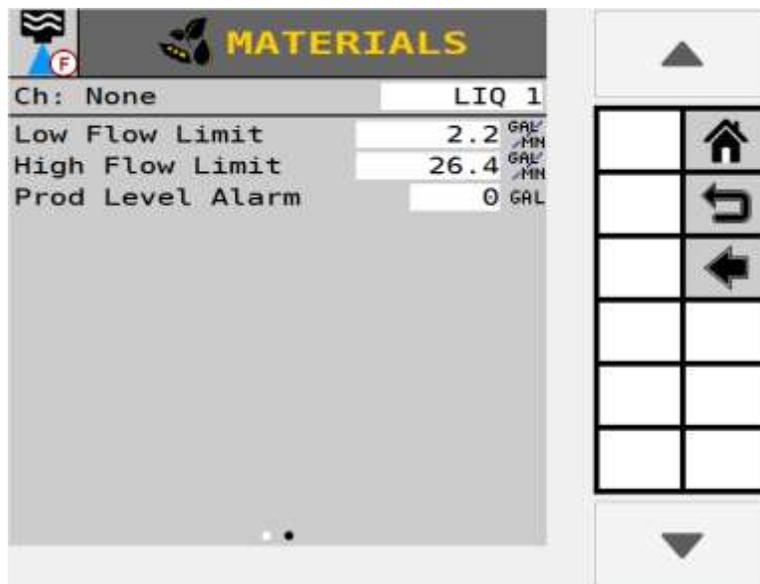
IMPORTANT

The maximum or minimum rates may not be reached if the % increase or decrease, based off the Target Rate, exceeds the maximum or minimum rate limits set.

EXAMPLE: Maximum Rate is set for 101. Target Rate is set for 100. If the % increase is set at 2%, the maximum rate of 101 will not be met because the % increase of 2% would exceed the 101 maximum rate limit.



Figure 40
Material Setup - Liquid Page 2



NOTE

Press the Arrow button on the Materials screen to view second screen.

PRECHARGE

See "Using the Precharge Feature" for more information on Precharge setup.

DISTANCE DELAY

The delay in M or FT that the implement must travel before the Channel is turned on or off. Distance Delay does not function if the Task Controller is connected and active.

LOW/HIGH FLOW LIMIT

The Low/High Flow Limit sets the lowest /highest gallons per minute (G/MN) or liters per minute (L/MN) rate that the control channel operates.

PRODUCT LEVEL ALARM

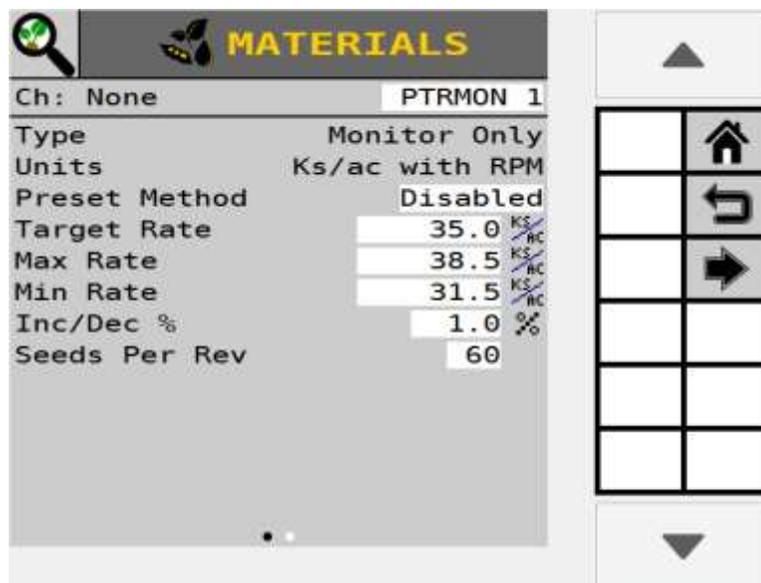
Sets the gallons left in the tank to trigger an alarm alerting of low liquid levels. The entered value is an estimate in gallons (GAL) or liters (L)



PLANTER MONITOR MATERIAL TYPE

Planter Monitor is typically used for ground drive applications to monitor population with high and low alarms.

Figure 41
Planter Monitor Screen



TYPE

Read-only field that shows Planter Monitor for reference.

PRESET METHOD ENABLED

The Preset Method table allows 10 user-defined target rates to be entered. When enabled, target rates can be adjusted from the Work Screen using the Increment/Decrement buttons.

PRESET METHOD DISABLED

When Preset Method is disabled, the target rate on the Work Screen can be adjusted by pressing the Material Increment/Decrement buttons. The target rate increases or decreases based on the Inc/Dec % value set at the Material Configuration screen.

TARGET RATE

Target Rate establishes the desired rate of application in thousands of seed per acre (KS/AC) or thousands of seeds per hectare (KS/HA).



MAXIMUM RATE

Maximum Rate establishes the maximum application rate in thousands of seed per acre (KS/AC) or thousands of seeds per hectare (KS/HA) that the control allows. Target Rate cannot be incremented to a value greater than this established maximum rate.

MINIMUM RATE

Minimum Rate establishes the minimum application rate in thousands of seed per acre (KS/AC) or thousands of seeds per hectare (KS/HA) that the control allows. Target Rate cannot be decremented to a value lower than this established minimum rate.

INCREASE/DECREASE %

The Increment/Decrement Percent rate establishes the percentage of change that is applied each time the Increment/Decrement button is pressed on the Work Screen.

IMPORTANT

The maximum or minimum rates may not be reached if the % increase or decrease, based off the Target Rate, exceeds the maximum or minimum rate limits set.

EXAMPLE: Maximum Rate is set for 101. Target Rate is set for 100. If the % increase is set at 2%, the maximum rate of 101 will not be met because the % increase of 2% would exceed the 101 maximum rate limit.

SEEDS PER REV

Displays the number of seeds that are dropped in one revolution of the seed disk.

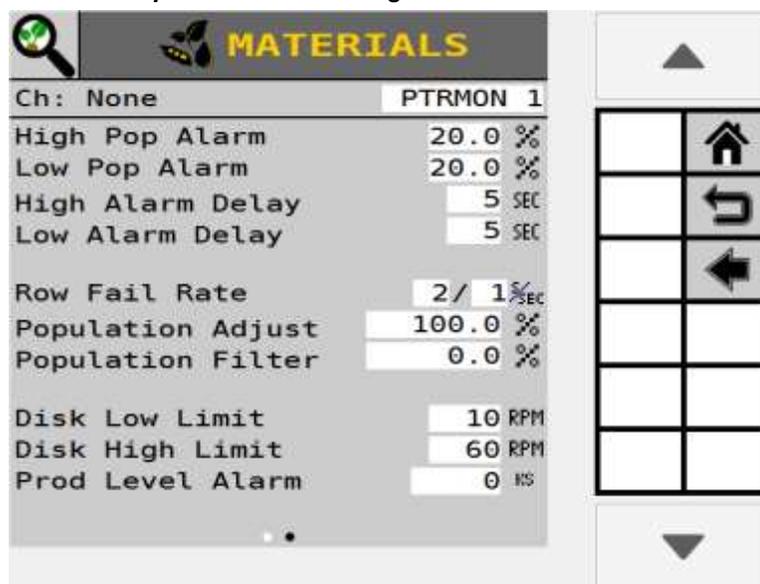
NOTE

Press the Arrow button on the Materials screen to view second screen.



Figure 42

Material Setup-Planter Monitor Page 2



HIGH/LOW POPULATION ALARMS

The High and Low Alarm option sets the high and low population limit values. The entered value is dependent on the target rate.

The High and Low Alarms are entered as a percentage.

The percentage value is referenced in relation to the Target Rate x Seed/Lb setting.

HIGH ALARM EXAMPLE:

If the Target Rate is 100.0 x 30 KS/AC and the High Alarm is 5.0%, multiply 30 KS/AC x 1.05 (a 5% increase) = 31.5 KS/AC. The alarm will activate at this rate.

LOW ALARM EXAMPLE:

If the Target Rate is 30 KS/AC and the Low Alarm is 5.0%, multiply 30 KS/AC x .95 (a 5% decrease) = 28.5 KS/AC. The alarm will activate at this rate.

NOTE

Population is updated every 5 seconds. Setting the Alarm Delay for under 5 second intervals does not provide any delay at all.

HIGH/LOW ALARM DELAY

Establishes the delay between the detection of a high or low population alarm condition and the resulting alarm display. The value is entered in seconds. If the value is set to 10, a row must be in a high or low population alarm condition continuously for 10 seconds before the alarm is issued.



ROW FAIL RATE

Sets the threshold for row failure alarms. The value is entered in seeds per second. Both values are adjustable allowing for numerous combinations. The default value is 2/1 which indicates a row failure threshold of 2 seeds in 1 second.

POPULATION ADJUST

Scales the displayed population value to allow for inaccuracies with seed sensors in certain applications. This is a multiplier of the monitored population value. For true calculated results, the value should be set to 100.0%. If the monitored value is reading low, the value can be increased above 100.0% to achieve the desired population display. The displayed value is calculated by the monitored value x population scalar.

$$\frac{(\text{Actual Population} - \text{Monitor Population}) \times 100}{\text{Monitor Population}}$$

POPULATION FILTER

Stabilizes the monitored population display. For a true population value, this number should be set to 0.0%. 0.0 is no filtering at all. 99 is the highest level of filtering available. Set the filter to meet the appropriate level of filtering for your specific use (Advanced use only).

DISC HIGH/LOW LIMITS

The maximum or minimum RPM at which the seed disc will operate.

PRODUCT LEVEL ALARM

The product level alarm sets the weight to alert of low seed levels. The entered value is an estimate in thousands of seeds (KS)

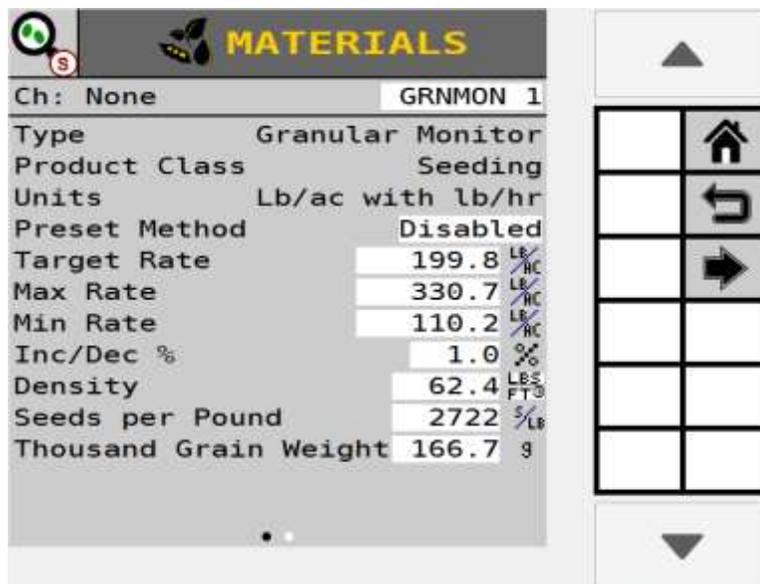


GRANULAR MONITOR MATERIAL TYPE

Select Granular Monitor setup for fertilizer and crop protect applications using hydraulic control systems.

Figure 43

Granular Monitor Screen



TYPE

Read-only field that shows Granular Monitor for reference.

PRODUCT CLASS

Product class identifies the type of application as either (fertilizer, seeding or crop protect i.e., insecticide).

UNITS

The rate units used for the material in pounds per acre (LB/AC), kilograms per hectare (KG/HA).

PRESET METHOD ENABLED

The Preset Method table allows 10 user-defined target rates to be entered. When enabled, target rates can be adjusted from the Work Screen using the Increment/Decrement buttons.

PRESET METHOD DISABLED

When Preset Method is disabled, the target rate on the Work Screen can be adjusted by pressing the Material Increment/Decrement buttons. The target rate increases or decreases based on the Inc/Dec % value set at the Material Configuration screen.



TARGET RATE

Target Rate establishes the desired rate of application in pounds per acre.

MAXIMUM RATE

Maximum Rate establishes the maximum application rate in pounds per acre (LB/AC) or kilograms per hectare (KG/HA) that the control will allow. Target Rate cannot be incremented to a value greater than this established maximum rate.

MINIMUM RATE

Minimum Rate establishes the minimum application rate in pounds per acre (LB/AC) or kilograms per hectare (KG/HA) that the control will allow. Target Rate cannot be decremented to a value lower than this established minimum rate.

INCREASE/DECREASE %

The Increment/Decrement Percent rate establishes the percentage of change that will be applied each time the Increment/Decrement button is pressed on the Work Screen.

IMPORTANT

The maximum or minimum rates may not be reached if the % increase or decrease, based off the Target Rate, exceeds the maximum or minimum rate limits set.

EXAMPLE: Maximum Rate is set for 101. Target Rate is set for 100. If the % increase is set at 2%, the maximum rate of 101 will not be met because the % increase of 2% would exceed the 101 maximum rate limit.

DENSITY

Density is the weight per volume of material to be dispensed and is required to convert the spreader constant. May be in units of LB/FT³, LB/BU, or KG/L.

SEEDS PER POUND

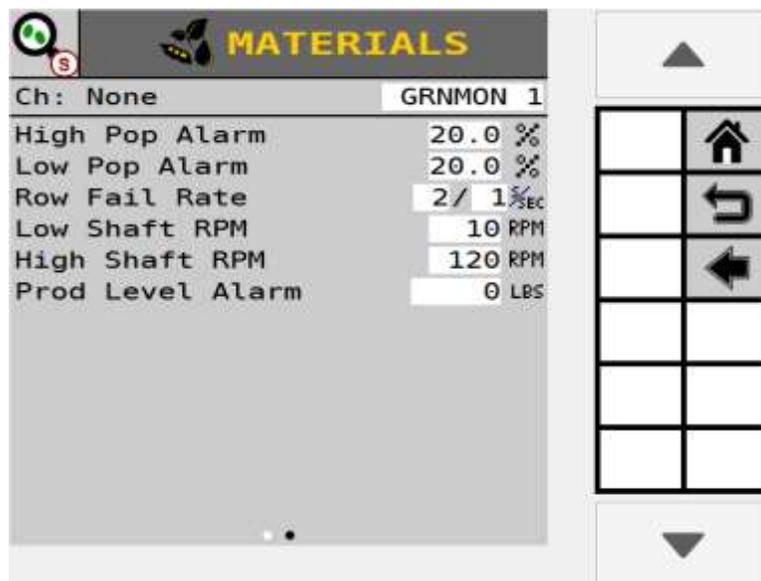
The number (#) of seeds per pound (S/LB) or seeds per kilogram (S/KG). This setting is used when calculating population values and triggering alarms. The Seed Per Pound is also used when material Units are set to KS/AC or Seeds/Ft² to convert the target rate to LBS/AC or KG/HA. Editing this setting will update the Thousand Grain Weight setting. This number is often found printed on the seed bag.



This setting is only used for materials with Seeding type for Product Class.

Figure 44

Material Setup-Granular Monitor Page 2



THOUSAND WEIGHT GRAIN

The weight of 1000 seeds in either ounces or grams. This setting is used when calculating population values and triggering alarms. The Thousand Grain Weight is also used when material Units are set to KS/AC or Seeds/Ft2 to convert the target rate to LBS/AC or KG/HA. Editing this setting will update the Seeds Per Pound setting.

This number can be found by counting out 1000 seeds and weighing them, or it may be printed on the seed bag. This setting is only used for materials with Seeding type for Product Class.

HIGH/LOW POPULATION ALARMS

Set when an alarm and row indicator displays to warn of a population problem. The values are % based. The high and low population values are independent of each other and do not have to be the same percentage value. This setting is only used for materials with Seeding type for Product Class.

ROW FAIL RATE

Sets the threshold for row failure alarms. The value is entered in seeds per second. Both values are adjustable allowing for numerous combinations. The default value is 2/1 which indicates a row failure threshold of 2 seeds in 1 second.



LOW/HIGH SHAFT RPM

Low/High Shaft RPM establishes the low shaft and high shaft RPM the meter shaft will operate.

PRODUCT LEVEL ALARM

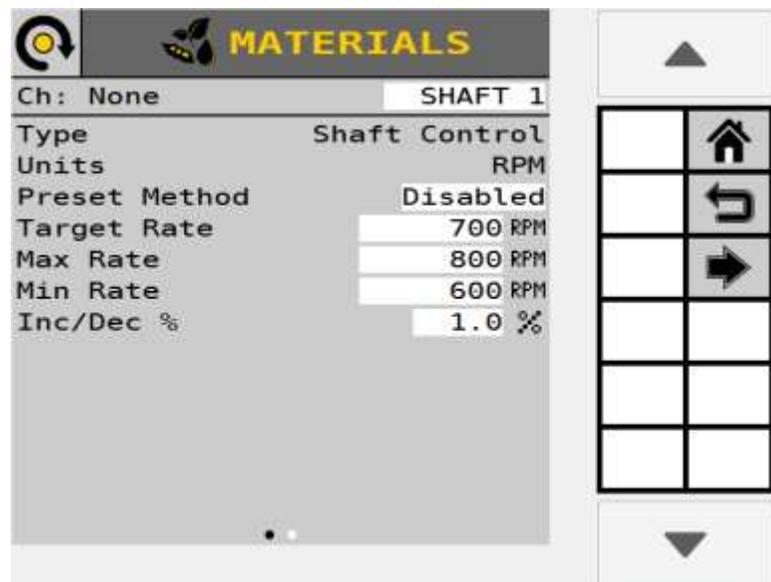
The product level alarm sets the weight to alert of low seed levels. The entered value is an estimate in pounds (LBS) or kilograms (KG).

SHAFT CONTROL

Shaft Control channel defines the setup parameters to regulate a shaft control input, i.e. spinner, RPM.

Figure 45

Shaft Control



TYPE

Read-only field that shows Shaft Control for reference.

UNITS

An application rate setting in units that automatically change with the type of material application selected.



PRESET METHOD ENABLED

The Preset Method table allows 10 user-defined target rates to be entered. When enabled, target rates can be adjusted from the Work Screen using the Increment/Decrement buttons.

PRESET METHOD DISABLED

When Preset Method is disabled, the target rate on the Work Screen can be adjusted by pressing the Material Increment/Decrement buttons. The target rate increases or decreases based on the Inc/Dec % value set at the Material Configuration screen.

TARGET RATE

Target Rate establishes the desired rate of application according to the units specified in the Units setting.

MAXIMUM/MINIMUM RATE

Maximum Rate establishes the maximum application rate in RPM. Target Rate cannot be incremented to a value greater than this established maximum rate.

Minimum Rate establishes the minimum application rate in RPM. Target Rate cannot be decremented to a value lower than this established minimum rate.

INCREASE/DECREASE %

The Increment/Decrement percent rate establishes the percentage of change of the entered target rate to be applied each time the Increment/ Decrement button is pressed on the Work Screen.

The maximum or minimum rates may not be reached if the % increase or decrease, based off the target rate, exceeds the maximum or minimum rate limits set.

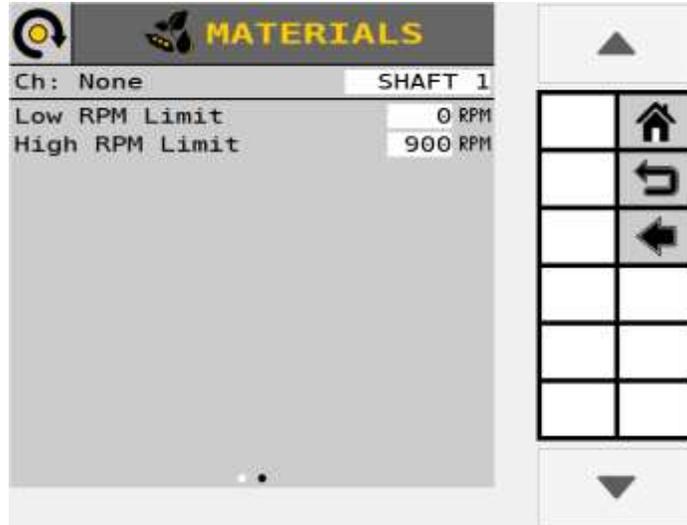
NOTE

Press the Arrow button on the Materials screen to view second screen.



Figure 46

Material Setup - RPM Control Page 2



LOW/HIGH RPM LIMIT

Low/High Shaft RPM establishes the low shaft and high shaft RPM the meter shaft will operate. Low shaft RPM is the lowest shaft RPM speed the control channel operates. High shaft RPM is the highest shaft RPM the control channel operates



FAN CONTROL

Fan Control channel defines the setup parameters to regulate a fan control input in RPM.

Figure 47
Fan Control

MATERIALS	
Ch: None	FAN 1
Type	Fan Control
Units	RPM
Preset Method	Disabled
Target Rate	700 RPM
Max Rate	800 RPM
Min Rate	600 RPM
Inc/Dec %	1.0 %

TYPE

Read-only field that shows Fan Control for reference.

UNITS

An application rate setting in units that automatically change with the type of material application selected.

PRESET METHOD ENABLED

The Preset Method table allows 10 user-defined target rates to be entered. When enabled, target rates can be adjusted from the Work Screen using the Increment/Decrement buttons.

PRESET METHOD DISABLED

When Preset Method is disabled, the target rate on the Work Screen can be adjusted by pressing the Material Increment/Decrement buttons. The target rate increases or decreases based on the Inc/Dec % value set at the Material Configuration screen.

TARGET RATE

Target Rate establishes the desired rate of application in RPM.



MAXIMUM/MINIMUM RATE

Maximum Rate establishes the maximum application rate in RPM. Target Rate cannot be incremented to a value greater than this established maximum rate.

Minimum Rate establishes the minimum application rate in RPM. Target Rate cannot be decremented to a value lower than this established minimum rate.

INCREASE/DECREASE %

The Increment/Decrement percent rate establishes the percentage of change of the entered target rate to be applied each time the Increment/Decrement button is pressed on the Work Screen.

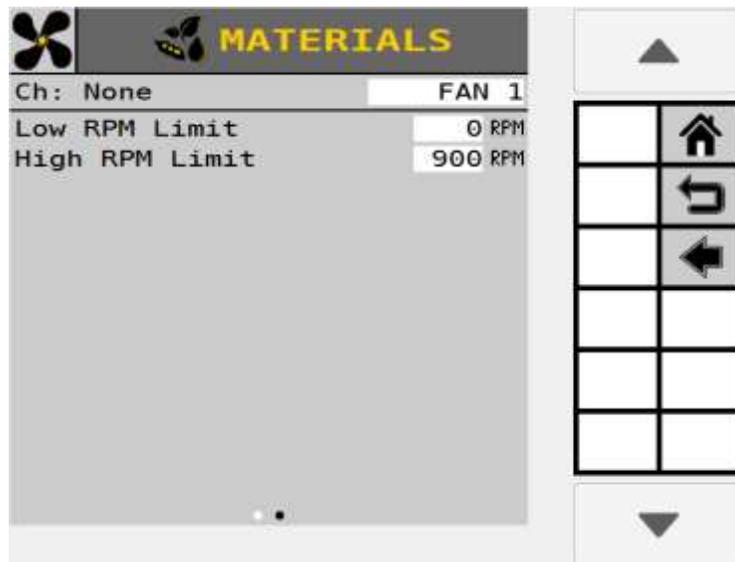
The maximum or minimum rates may not be reached if the % increase or decrease, based off the target rate, exceeds the maximum or minimum rate limits set.

NOTE

Press the Arrow button on the Materials screen to view second screen.

Figure 48

Material Setup - Fan Page 2



LOW/HIGH RPM LIMIT

Low/High Shaft RPM establishes the low shaft and high shaft RPM the meter shaft will operate. Low shaft RPM is the lowest shaft RPM speed the control channel operates. High shaft RPM is the highest shaft RPM the control channel operates.



CONTROL CHANNEL SETUP

Up to eight material application control channels are available based on the number of purchased channels and corresponding hardware.

ASSIGN A CONTROL CHANNEL

The Controls screen on initial setup is blank. Adding, deleting, and editing channel setup parameters are defined at this screen. As channels are configured and saved in sequential order, the Controls screen identifies the channel type and material assigned. A channel type cannot be changed after setup. The channel must be removed and a new one created. Materials may be assigned to channels from the Materials page. Once a channel is created, select the channel to edit setup parameters.

NOTE

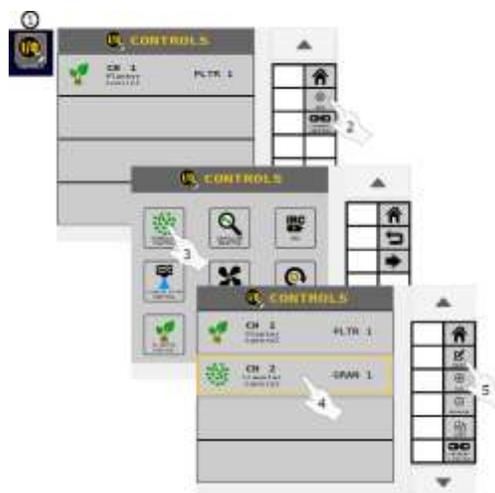
It is recommended that materials are created before configuring channels. A default material will be created for the specific control channel type if no materials are set up.

TO ADD AND EDIT A CONTROL CHANNEL:

1. Press the **CONTROLS** button.
2. Press the **ADD CHANNEL** button to select the control channel type.
 - Select the desired Channel Type button.
3. The selected channel type now appears on the Controls screen.
4. Press to highlight and select the channel.
5. Press the **EDIT** button to open the channel and establish channel parameters. Reference the "Control Channel Type" section.

Figure 49

Select a Control Channel Type





DELETE A CONTROL CHANNEL

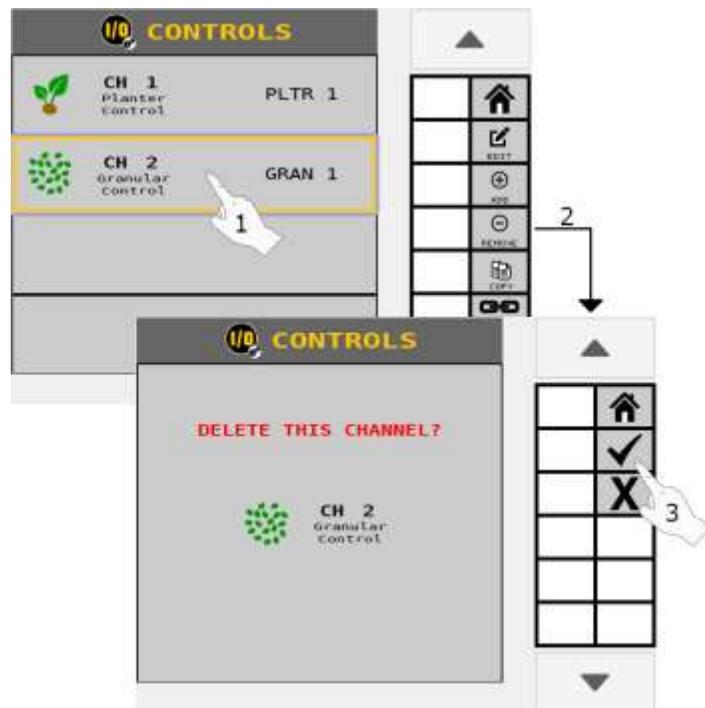
A control channel and its parameters can be removed from the Controls screen. Deleting a channel clears the entered parameters for the channel.

TO REMOVE A CHANNEL:

1. At the Controls screen, press to select and highlight the control channel.
2. Press the **REMOVE** button.
3. Press the Checkmark button to acknowledge.
 - Channel parameters are cleared and the channel can be setup as a new control type in the future.
 - Press the Cancel 'X' button to abort.

Figure 50

Clear a Control Channel





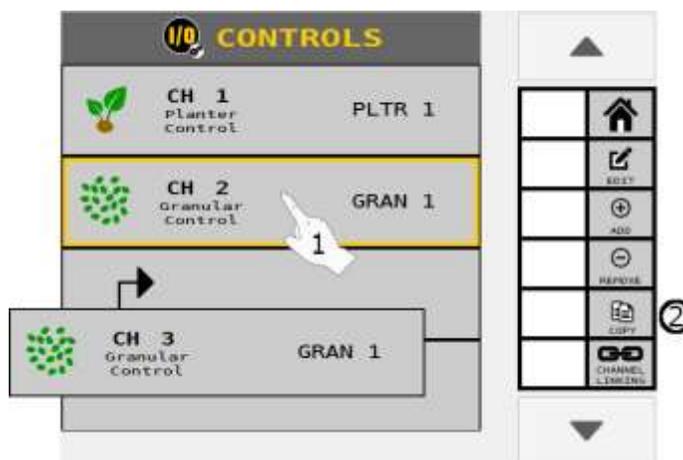
COPY A CONTROL CHANNEL

A control channel's setup parameters can be copied to another channel.

1. Select to highlight the control channel to copy.
2. Press the **COPY** button.
 - The copied channel appears in the next open channel space.

Figure 51

Clear a Channel



CHANNEL LINKING

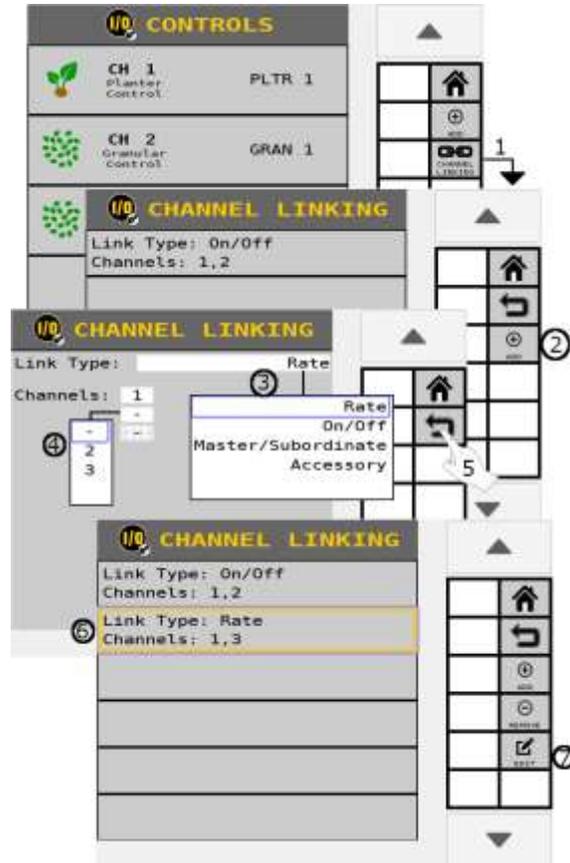
Material application control channels can be linked together in a master/ subordinate relationship. This allows for simultaneous on/off and rate control from the Work Screen.

TO LINK CHANNELS:

1. At the Control screen, press the **CHANNEL LINKING** button.
2. At the Channel Linking screen, press the **ADD LINK** button.
3. Select the link type as:
 - **Rate:** linking the rates of multiple channels.
 - **On/Off:** Linking channels to simultaneously turn ON and OFF.
 - **Master/Subordinate:** Links a master/subordinate output to simultaneously turn on/off channels, i.e. planter control channel/fan.
 - **Accessory:** Allows an accessory alarm to turn the linked channel(s) off.
4. Press the channels input box to select the channels to link.
 - Continue to press the **ADD LINK** button until are links are complete.
5. When finished, press the Back button.
6. The new link type and channels display on the Channel Linking screen.
7. To edit a link, select a specific link and press the **EDIT** button to open and make any changes.



Figure 52
Linking Channels



CONTROL CHANNEL TYPE

A material application channel can be assigned as Planter Control, Planter Monitor, Granular Control, Granular Monitor, Liquid Flow, Fan Control, Shaft Control, or IRC.

TO EDIT CONTROL CHANNEL PARAMETERS:

At the Controls screen, highlight the channel and press the **EDIT** button.

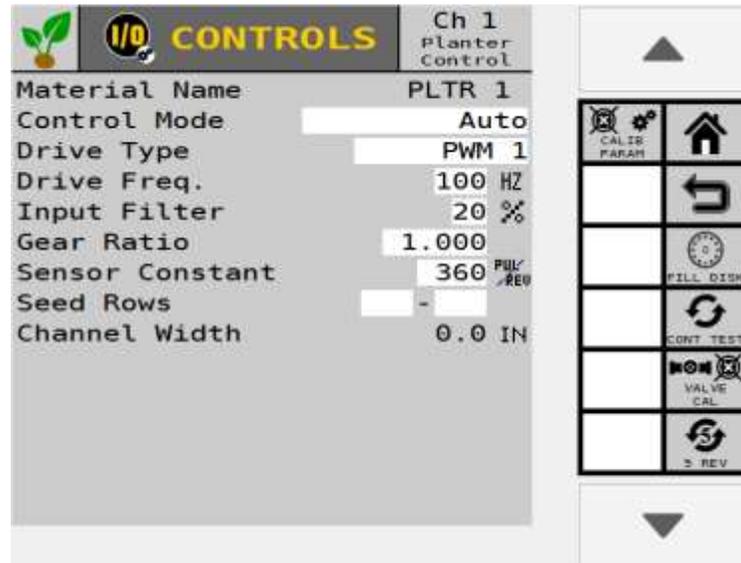


PLANTER CONTROL CHANNEL

A Planter Control channel contains the parameters to control the application rate of a row crop planter.

Figure 53

Planter Control Setup



MATERIAL NAME

Display the material name assigned to the channel. This value can be changed by editing Configurations in the Material screen.

CONTROL MODE

Auto-Control Channel is calculating application rates based on ground speed and row spacing under normal operating conditions.

MANUAL WITH FEEDBACK - Overrides the current system when not operating properly, e.g. Faulty coil. Using the increment/decrement buttons at the main operate screen will set the rate for the control channel. Manual mode with feedback shows the actual application rate applied based on actual ground speed and constants.

MANUAL WITHOUT FEEDBACK - Overrides the current system when not operating properly, e.g. Bad feedback sensor. Using the increment/ decrement buttons at the work screen will set the rate for the control channel. No application rate feedback will display.



NOTE

DICKEY-john proportional valves operate at 100 Hz.

NOTE

The correct number of pulses generated for one revolution must be determined for sensors other than DICKEY-john.

DRIVE TYPE PWM (PULSE WIDTH MODULATION)

A valve, usually hydraulic, which varies the oil flow to a hydraulic motor proportioned to electric current supplied. This type of valve consists of a flow cartridge and coil assembly.

DRIVE FREQUENCY

Specifies the frequency for the proportional valve installed. The recommended setting for this option should be specified from the specific valve manufacturer.

INPUT FILTER

Provides a setting for the amount of filtering applied to the feedback frequency of the control channel.

IMPORTANT

It is NOT recommended to change the Filter setting. Any adjustments could result in the channel not operating properly. If adjustments are made, a valve calibration must be performed.

GEAR RATIO

Specifies the actual ratio from the application rate sensor to the seed meter. This specifies the number of revolutions the application rate sensor turns in relation to one revolution the seed meter turns.

NOTE

The correct number of pulses generated for one revolution must be determined for sensors other than DICKEY-john.

SENSOR CONSTANT

Establishes the number of pulses for one revolution of the application rate sensor. If a standard DICKEY-john application rate sensor is used, the value should be set to 360.



SEED ROW ASSIGNMENT

Enter the first and last number of the seed rows assigned to the control channel.

NUMBER (#) OF SEED ROWS

Displays the total number of seed rows assigned to the control channel.

CHANNEL WIDTH

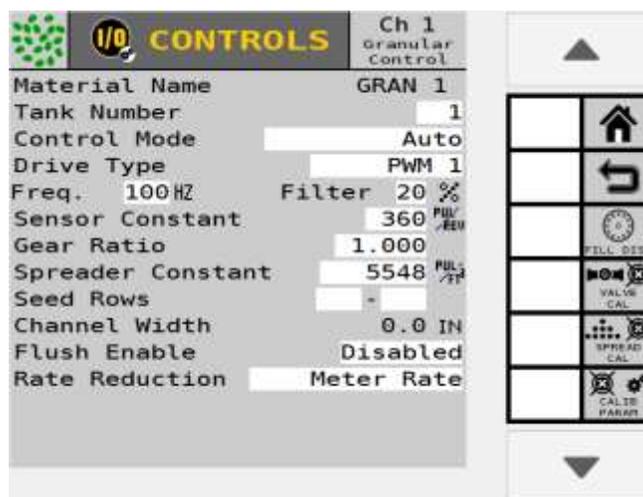
The overall row width assigned to a specific channel. Width calculation is determined by the number of rows assigned to the channel multiplied by the row spacing defined on the Rows page.

GRANULAR CONTROL CHANNEL

A granular control channel controls granular application on planters, drills, air seeders, and air carts.

Figure 54

Granular Control Channel



MATERIAL NAME

Display the material assigned to the channel. This value can be changed by editing the configurations in the Material screen.

TANK NUMBER

Enter the tank number linked to the channel for control of material.

CONTROL MODE

Auto-Control Channel is calculating application rates based on ground speed and row spacing under normal operating conditions.



MANUAL WITH FEEDBACK - Overrides the current system when not operating properly, e.g. faulty coil. Using the Increment/Decrement buttons at the Main Operate screen will set the rate for the control channel. Manual Mode with Feedback shows the actual application rate applied based on actual ground speed and constants.

MANUAL WITHOUT FEEDBACK - Overrides the current system when not operating properly, e.g. bad feedback sensor. Using the Increment/Decrement buttons at the Work Screen will set the rate for the control channel. No application rate feedback will display.

DRIVE TYPE PWM (PULSE WIDTH MODULATION)

A valve, usually hydraulic, which varies the oil flow to a hydraulic motor proportioned to electric current supplied. This type of valve consists of a flow cartridge and coil assembly.

NOTE

DICKEY-john Servo valves operate at 40 Hz; DICKEY-john Proportional Valves operate at 100 Hz.

NOTE

The correct number of pulses generated for one revolution must be determined for sensors other than DICKEY-john.

SERVO

A ball valve or butterfly valve that is driven by an electric motor gearbox and the valve is installed in the tank return line.

DRIVE FREQUENCY

Specifies the frequency for the proportional valve installed. The recommended setting for this option should be specified from the valve manufacturer.

FILTER

The amount of filtering applied to the frequency feedback of the control channel.

IMPORTANT

It is NOT recommended to change the Filter setting. Any adjustments could result in the channel not operating properly. If adjustments are made a valve calibration must be performed.



SENSOR CONSTANT

Establishes the number of pulses for one revolution of the metering unit. If a standard DICKEY-john application rate sensor is used, the value should be set to 360.

GEAR RATIO

Specifies the actual ratio from the application rate sensor to the output shaft. This specifies the number of revolutions the application rate sensor turns in relation to one revolution the final output shaft.

SPREADER CONSTANT

How many pulses the application rate sensor produces per volume of material discharged.

SEED ROW ASSIGNMENT

Enter the first and last number of seed rows assigned to the control channel.

NUMBER (#) OF SEED ROWS

Displays the total number of seed rows assigned to the control channel.

CHANNEL WIDTH

Granular Seeding-The implement width for rows assigned to a channel.

Granular Fertilizer-The fertilizer spread width assigned to a channel.

FLUSH ENABLE

Flush Enable is a manual override mode that opens the valve and dispenses granular fertilizer, granular seed, or liquid material for a period of time in relation to a user-defined flush speed.

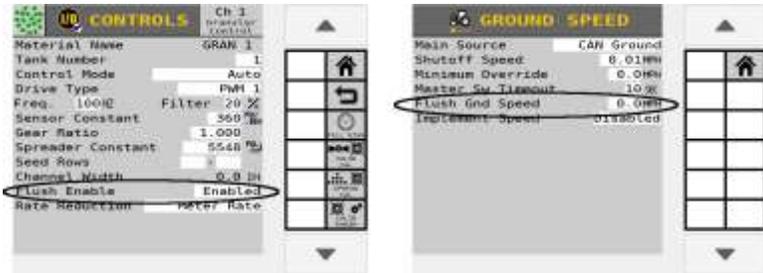
The Flush Enable feature can only be activated when the tractor is stopped.

To Activate:

1. At the Controls screen, change Flush Disabled to Enabled. Flush Enable must be activated at the Control screen before the Flush Ground Speed feature is displayed on the Speed setup screen.
 - A Flush Ground Speed greater than 0 must be entered on the Speed setup screen for this feature to operate.



Figure 55
Flush Enable



RATE REDUCTION

Return to Tank

As the channel's applied width reduces, the shaft speed is not reduced. Typically used for machines that have diverter shutoffs that returns seed to the tank.

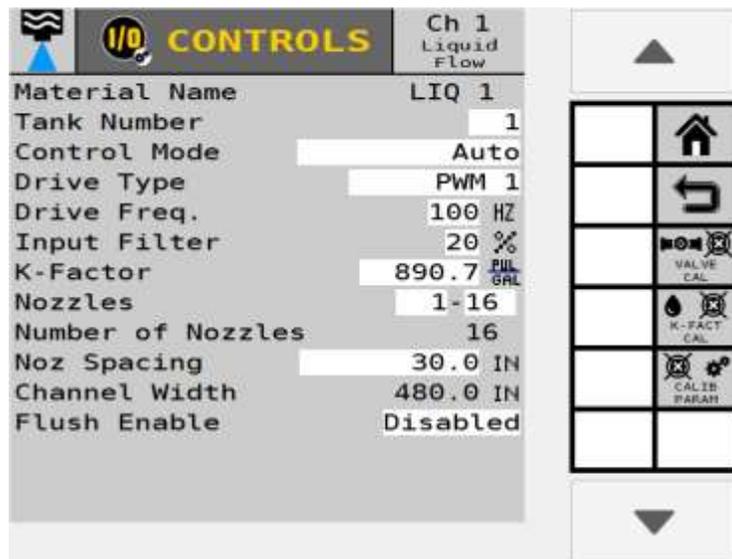
Meter Rate

As the channel's applied width reduces, the shaft speed is reduced to maintain the sample application rate. Typically used for machines that have row shutoff that block seed flow to the row.

LIQUID FLOW CONTROL CHANNEL

Control setup parameters for liquid flow control applications.

Figure 56
Liquid Flow Control





MATERIAL NAME

Display the material assigned to the channel. This value can be changed by editing the configurations in the Material screen.

TANK NUMBER

Enter the Tank Number linked to the channel that controls material application.

CONTROL MODE

Auto-Control Channel is calculating application rates based on ground speed and row spacing under normal operating conditions.

MANUAL WITH FEEDBACK - Overrides the current system when not operating properly, e.g. faulty coil. Using the Increment/Decrement buttons at the Main Operate screen will set the rate for the control channel. Manual Mode with Feedback shows the actual application rate applied based on actual ground speed and constants.

MANUAL WITHOUT FEEDBACK - Overrides the current system when not operating properly, e.g. bad feedback sensor. Using the Increment/ Decrement buttons at the Work Screen will set the rate for the control channel. No application rate feedback will display.

DRIVE TYPE PWM (PULSE WIDTH MODULATION)

A valve, usually hydraulic, which varies the oil flow to a hydraulic motor proportioned to electric current supplied. This type of valve consists of a flow cartridge and coil assembly.

SERVO

A ball valve or butterfly valve that is driven by an electric motor gearbox and the valve is installed in the tank return line.

NOTE

DICKEY-john Servo valves operate at 40 Hz; DICKY-john Proportional valves operate at 100 Hz.

DRIVE FREQUENCY

Specifies the frequency for the proportional or servo valve installed. The recommended setting for this option should be specified from the valve manufacturer.

INPUT FILTER

An adjustment setting for the amount of filtering applied to the flow meter feedback frequency of the control channel.



IMPORTANT

It is NOT recommended to change the Input Filter. Any adjustments could result in the channel not operating properly. If adjustments are made, a valve calibration must be performed.

K-FACTOR

How many pulses are produced by the sensor per gallon (liter) of liquid through the flow meter? A flow meter calibration is recommended for better accuracy. However, if known, the K-Factor can be entered manually. If not, a flow meter calibration is required. Refer to the Liquid Flow Calibration section for additional information.

NOZZLES

Enter the first and last number of nozzles assigned to a channel.

NUMBER OF NOZZLES

The total number of nozzles assigned to a channel.

NOZZLE SPACING

The distance in inches (centimeters) between nozzles on the spray bar for broadcast operations. The value to enter is determined by measuring the distance between nozzles to the nearest 1/10th.

CHANNEL WIDTH

Channel Width is an automatic calculation of the overall channel width based from the number of nozzles times width spacing.

FLUSH ENABLE

Refer to (Figure 57).

Flush Enable is a manual override mode that opens the valve and dispenses granular fertilizer, granular seed, or liquid material for a period of time in relation to a user-defined flush speed. The Flush Enable feature can only be activated when the tractor is stopped.

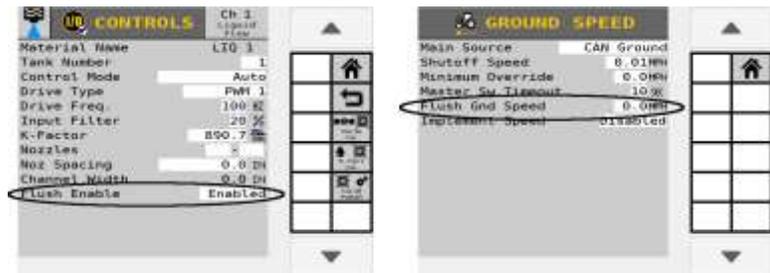
OPERATOR'S MANUAL



To Activate Flush Enable:

1. Change Flush Disable to Enable. Flush Enable must be activated before the Flush Ground Speed feature displays on the Ground Speed Setup screen.
 - A Flush Ground Speed greater than 0 must be entered on the Ground Speed setup screen for this feature to operate.

Figure 57
Flush Enable





PLANTER MONITOR CHANNEL

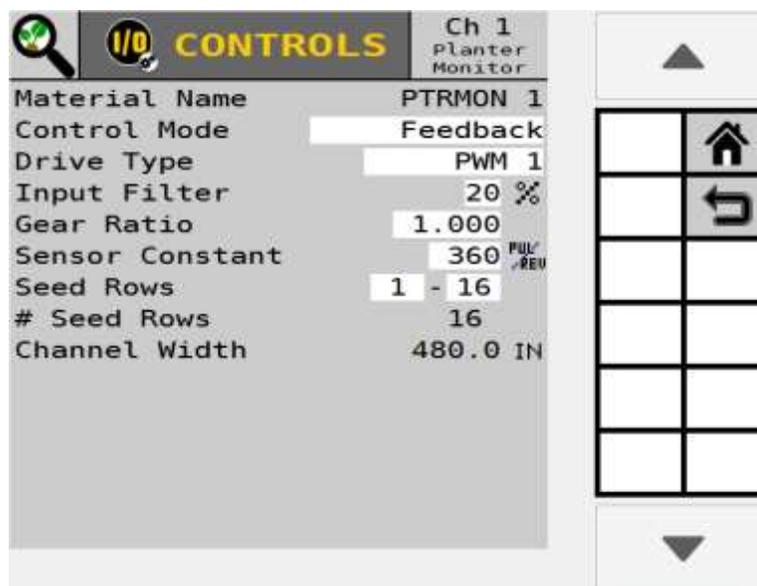
Control setup parameters for planter monitor applications.

IMPORTANT

When using an application rate sensor, select the appropriate Drive Type and install the application rate sensor to the corresponding feedback.

Figure 58

Planter Monitor Channel Setup



MATERIAL NAME

Display the material assigned to the channel.

CONTROL MODE

FEEDBACK - Overrides the current system when not operating properly, e.g. faulty coil. Using the Increment/Decrement buttons at the Main Operate screen sets the rate for the control channel. Manual Mode with Feedback shows the actual application rate applied based on actual ground speed and constants.

NO FEEDBACK - Overrides the current system when not operating properly, i.e., bad feedback sensor. Using the Increment/Decrement buttons at the Work Screen will set the flow rate for the control channel. No application rate feedback will display.



DRIVE TYPE PWM (PULSE WIDTH MODULATION)

A valve, usually hydraulic, which varies the oil flow to a hydraulic motor proportioned to electric current supplied. This type of valve consists of a flow cartridge and coil assembly.

INPUT FILTER

An adjustment setting for the amount of filtering applied to the feedback frequency feedback of the control channel.

IMPORTANT

It is NOT recommended to change the Input Filter. Any adjustments could result in the channel not operating properly. If adjustments are made, a valve calibration must be performed.

GEAR RATIO

Specifies the actual ratio from the application rate sensor to the output shaft. This specifies the number of revolutions the application rate sensor turns in relation to one revolution the final output shaft turns.

SENSOR CONSTANT

Establishes the number of pulses for one revolution of the metering unit. If a DICKY-john application rate sensor is used, the value should be set to 360.

SEED ROW ASSIGNMENT

Enter the first and last number of seed rows assigned to the control.

NUMBER (#) OF SEED ROWS

Displays the total number of seed rows assigned to the control channel.

CHANNEL WIDTH

Enter the width of rows assigned to a specific channel. Width calculation can be determined by number of planter rows assigned to the channel multiplied by the row spacing.



GRANULAR MONITOR CHANNEL

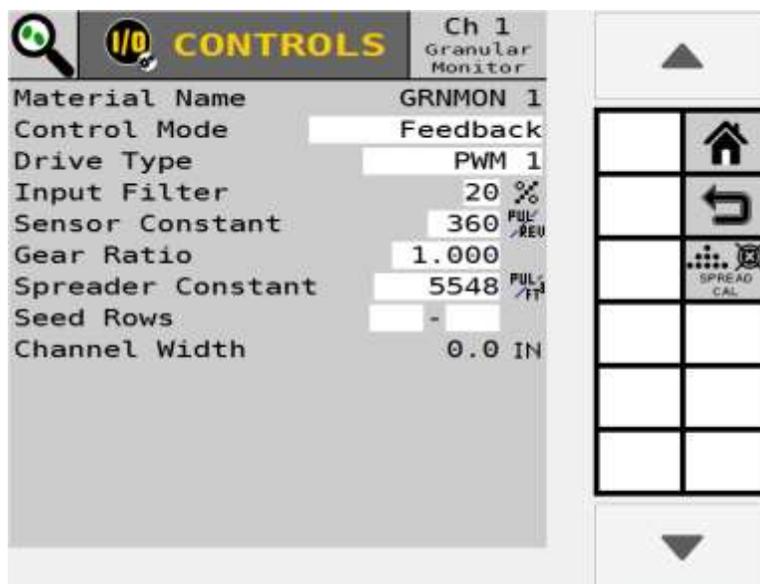
The following constants define the parameters for Granular Monitor.

IMPORTANT

When using an application rate sensor, select the appropriate Drive Type and install the application rate sensor on the corresponding feedback.

Figure 59

Granular Monitor Control Channel



MATERIAL NAME

Display the material assigned to the channel. This value can be changed by editing the configurations in the Material screen.

CONTROL MODE

FEEDBACK - Overrides the current system when not operating properly, i.e., faulty coil. Using the Increment/Decrement buttons at the Main Operate screen will set the rate for the control channel. Manual Mode with Feedback shows the actual application rate applied based on actual ground speed and constants.

NO FEEDBACK - Overrides the current system when not operating properly, i.e., bad feedback sensor. Using the Increment/Decrement buttons at the Work Screen will set the flow rate for the control channel. No application rate feedback will display.



DRIVE TYPE PWM (PULSE WIDTH MODULATION)

A valve, usually hydraulic, which varies the oil flow to a hydraulic motor proportioned to electric current supplied. This type of valve consists of a flow cartridge and coil assembly.

INPUT FILTER

An adjustment setting for the amount of filtering applied to the feedback frequency feedback of the control channel.

IMPORTANT

It is NOT recommended to change the Input Filter. Any adjustments could result in the channel not operating properly. If adjustments are made, a valve calibration must be performed.

SENSOR CONSTANT

Establishes the number of pulses for one revolution of the metering unit. If a DICKY-john application rate sensor is used, the value should be set to 360.

GEAR RATIO

Specifies the actual ratio from the application rate sensor to the output shaft. This specifies the number of revolutions the application rate sensor turns in relation to one revolution the final output shaft turns.

SPREADER CONSTANT

How many pulses the application rate sensor produces per volume of material discharged.

SEED ROW ASSIGNMENT

Enter the first and last number of seed rows assigned to the control channel.

NUMBER (#) OF SEED ROWS

Displays the total number of seed rows assigned to the control channel.

CHANNEL WIDTH

Enter the width of rows assigned to a specific channel. Width calculation can be determined by number of planter rows assigned to the channel multiplied by the row spacing.

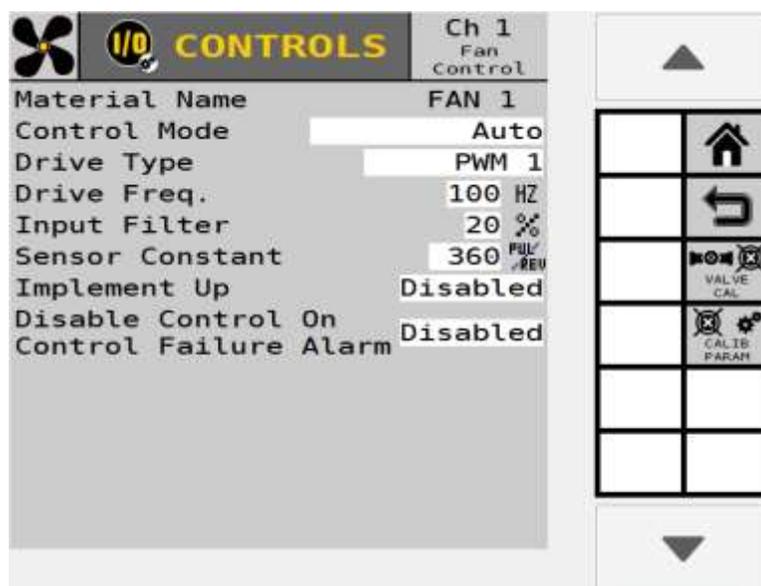


FAN CONTROL

The following constants define the parameters for fan control.

Figure 60

Fan Control Channel Setup



MATERIAL NAME

Display the material assigned to the channel. This value can be changed by editing the configurations in the Material screen.

CONTROL MODE

Auto-Control Channel is calculating application rates based on ground speed and row spacing under normal operating conditions.

MANUAL WITH FEEDBACK - Overrides the current system when not operating properly, e.g. faulty coil. Using the Increment/Decrement buttons at the Main Operate screen will set the rate for the control channel. Manual Mode with Feedback shows the actual application rate applied based on actual ground speed and constants.

MANUAL WITHOUT FEEDBACK - Overrides the current system when not operating properly, e.g. bad feedback sensor. Using the Increment/Decrement buttons at the Work Screen will set the rate for the control channel. No application rate feedback will display.



DRIVE TYPE PWM (PULSE WIDTH MODULATION)

A valve, usually hydraulic, which varies the oil flow to a hydraulic motor proportioned to electric current supplied. This type of valve consists of a flow cartridge and coil assembly.

DRIVE FREQUENCY

Specifies the frequency for the proportional valve installed. The recommended setting for this option should be specified from the specific valve manufacturer.

INPUT FILTER

An adjustment setting for the amount of filtering applied to the feedback frequency feedback of the control channel.

IMPORTANT

It is NOT recommended to change the Input Filter. Any adjustments could result in the channel not operating properly. If adjustments are made, a valve calibration must be performed.

SENSOR CONSTANT

Establishes the number of pulses for one revolution of the application rate sensor. If a standard DICKY-john application rate sensor is used, the value should be set to 360.

IMPLEMENT UP

Disabled

The control loop runs regardless of implement lift state. If sufficient hydraulic capacity is not available, alarms may trigger if the fan is not maintaining set point.

Locked

When the implement is raised the control loop is stopped and output is frozen at its previous value. If you don't have enough hydraulic capacity and the fan is not maintaining set point prevents alarms for occurring even though fan is still not working properly.



DISABLE CONTROL ON CONTROL FAILURE ALARM

Select "Enabled" to turn off ALL non-fan control channels when the RPM value of the sensor falls below the low alarm level setting.

The two settings include:

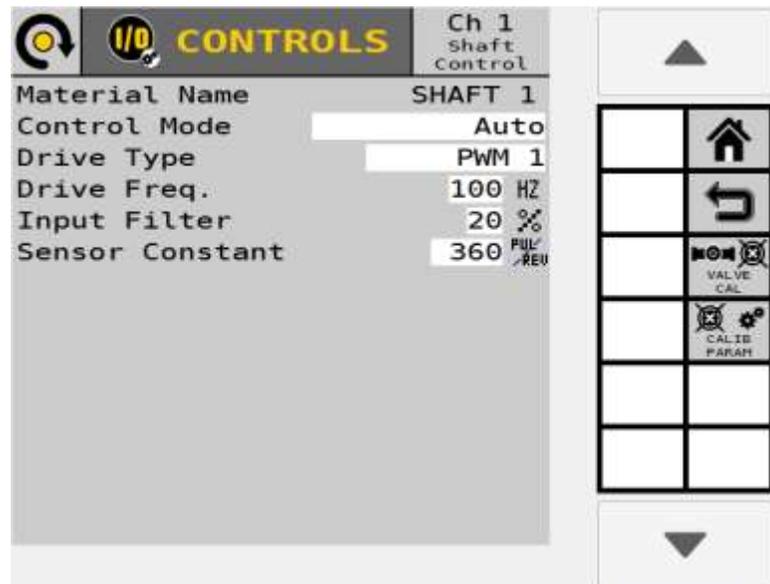
- **ENABLED** - control channels shut down when the RPM value falls below the low warning setting.
- **DISABLED** - will disable the function. Control channels continue to operate normally regardless of the RPM value. However, when the low RPM state occurs, the information alarm still occurs.

SHAFT CONTROL

The following constants define the parameters for Shaft Control.

Figure 61

Shaft Control Channel Setup



MATERIAL NAME

Display the material assigned to the channel. This value can be changed by editing the configurations in the Material screen.



CONTROL MODE

Auto-Control Channel is calculating application rates based on ground speed and row spacing under normal operating conditions.

MANUAL WITH FEEDBACK - Overrides the current system when not operating properly, e.g. faulty coil. Using the Increment/Decrement buttons at the Main Operate screen will set the rate for the control channel. Manual Mode with Feedback shows the actual application rate applied based on actual ground speed and constants.

MANUAL WITHOUT FEEDBACK - Overrides the current system when not operating properly, e.g. bad feedback sensor. Using the Increment/Decrement buttons at the Work Screen will set the rate for the control channel. No application rate feedback will display.

DRIVE TYPE PWM (PULSE WIDTH MODULATION)

A valve, usually hydraulic, which varies the oil flow to a hydraulic motor proportioned to electric current supplied. This type of valve consists of a flow cartridge and coil assembly.

DRIVE FREQUENCY

Specifies the frequency for the proportional valve installed. The recommended setting for this option should be specified from the specific valve manufacturer.

INPUT FILTER

An adjustment setting for the amount of filtering applied to the feedback frequency feedback of the control channel.

IMPORTANT

It is NOT recommended to change the Input Filter. Any adjustments could result in the channel not operating properly. If adjustments are made, a valve calibration must be performed.

SENSOR CONSTANT

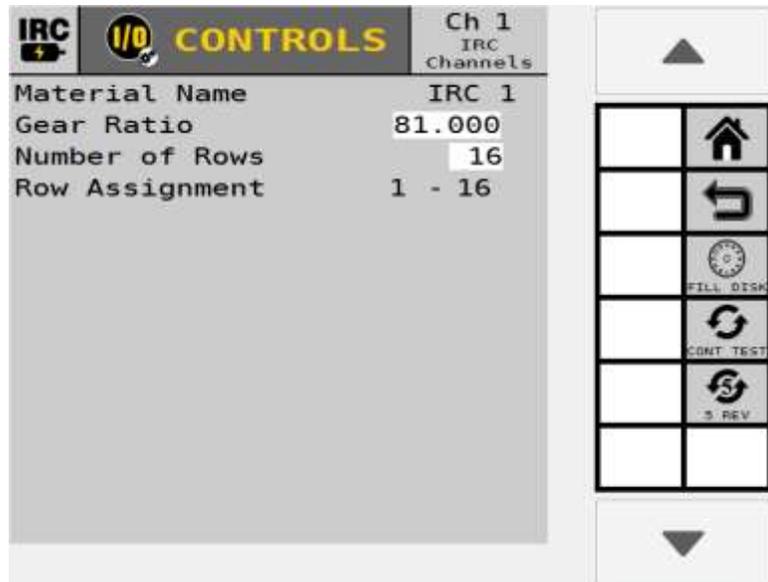
Establishes the number of pulses for one revolution of the application rate sensor. If a standard DICKEY-john application rate sensor is used, the value should be set to 360



INDIVIDUAL ROW CONTROL (IRC)

The following constants define the parameters for Individual Row Control.

Figure 62
IRC Channel Setup



MATERIAL NAME

Display the material assigned to the channel. This value can be changed by editing the configurations in the Material screen.

GEAR RATIO

Specifies the actual ratio from the application rate sensor to the output shaft. This specifies the number of revolutions the application rate sensor turns in relation to one revolution the final output shaft turns.

NUMBER (#) OF SEED ROWS

Specifies the total number of seed rows assigned to the control channel.

SEED ROW ASSIGNMENT

Display the first and last number of seed rows assigned to the control channel.

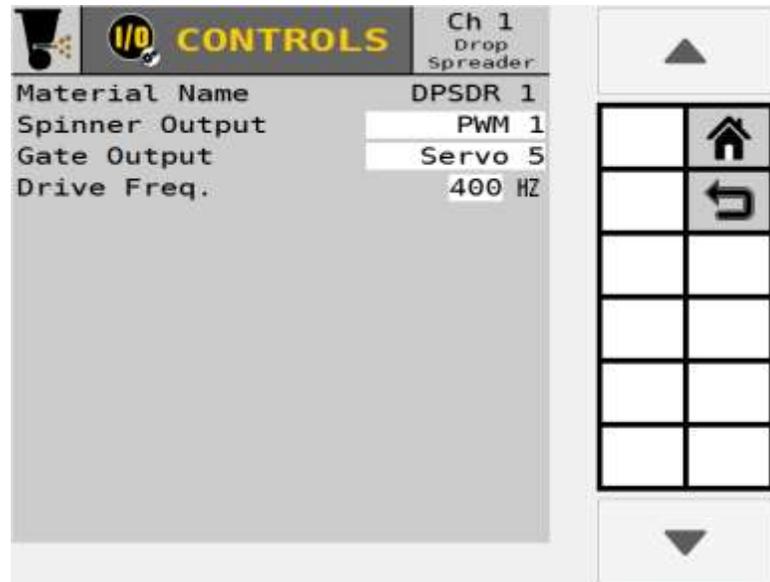


DROP SPREADER

The following constants define the parameters for Drop Spreader.

Figure 63

Drop Spreader Channel Setup



MATERIAL NAME

Display the material assigned to the channel.

SPINNER OUTPUT PWM (PULSE WIDTH MODULATION)

A valve, usually hydraulic, which varies the oil flow to a hydraulic motor proportioned to electric current supplied. This type of valve consists of a flow cartridge and coil assembly.

GATE OUTPUT

SERVO

A ball valve or butterfly valve that is driven by an electric motor gearbox and the valve is installed in the tank return line.

DRIVE FREQUENCY

Specifies the drive frequency for the PWM channel on the Spinner Output. The recommended setting for this option should be specified from the valve manufacturer.



CALIBRATIONS-VALVE AND SPREADER

Valve calibrations are required for proper system operation for planter, granular, and liquid flow channels. Some calibration screens vary based on control channel type.

PLANTER CONTROL AND GRANULAR VALVE CALIBRATION

Performing a valve calibration is required for planter, granular, fan, shaft, and liquid flow channels to set system parameters and should be performed for best results. A Valve Calibration button appears on the control channel screen if this step is appropriate for the assigned channel type.

TIP: Valve calibration steps 1-10 are the same when performing for Planter, Granular, Liquid Flow, Fan and Shaft Control.

CAUTION

Hoppers are assumed to be empty for this calibration. If loaded, material may dispense from the meter.

NOTE

Refer to the System Tests section for using a remote test switch during a valve calibration.

PERFORM A VALVE CALIBRATION

1. At the Controls screen, press the **VALVE CALIBRATION** button to access the Valve Calibration screen (Figure 64).
 - If necessary, run Limit Output before running the Valve Calibration. Refer to the Limit Output section.
2. Move the implement to the “raised” position.
3. Apply the tractor brakes and lock in the applied position.
4. Put the transmission in “park” or in a locked, neutral position.
 - Verify disc speed high limit is set correctly. Valve calibration will try and obtain the high disc speed.

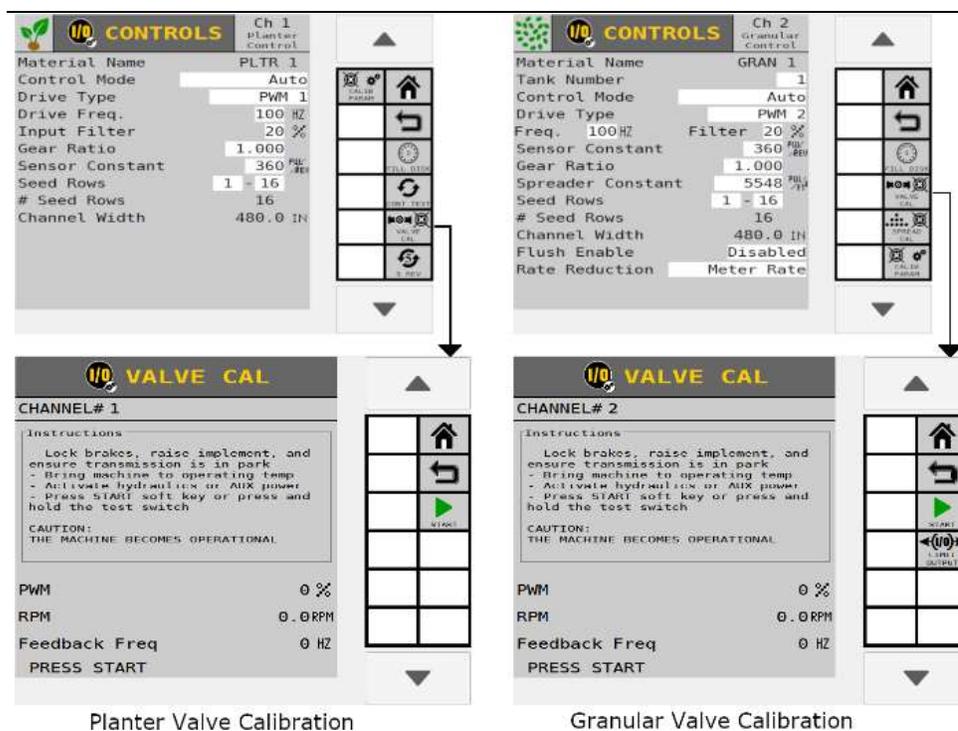
DANGER

When the START key is engaged, the machine will become operational. All necessary precautions must be taken to ensure user safety. Failure to practice all necessary caution may result in serious injury or death.



5. Start the tractor and engage the hydraulic system.
6. Run the engine at normal operating speed until the hydraulic fluid is at normal operating temperature.
7. Press the **START** button.
8. The valve calibration immediately starts.
9. Keep the hydraulics engaged until the calibration is complete. The calibration may take a minute up to several minutes. Each calibration step is monitored at the bottom of the display.
10. When the calibration is complete, the control shuts down automatically. All calibration data is automatically stored.

Figure 64
Valve Calibration



Planter Valve Calibration

Granular Valve Calibration

LIMIT OUTPUT (GRANULAR)

It is necessary to limit the output of the control channel before running a valve calibration in the event that system capacities are greater than the actual desired capacities. These features allow setting the maximum output of the channel to prevent machine damage.

TO PERFORM A LIMIT OUTPUT:

1. At the Valve Calibration screen, press the **LIMIT OUTPUT** button to access the Limit Output screen.
2. Move the implement to the "raised" position.
3. Apply the tractor brakes and lock in the applied position.

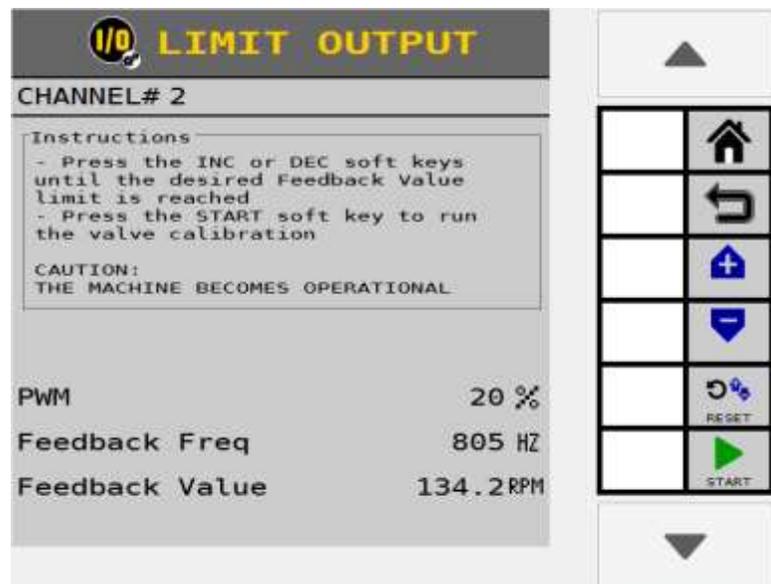


4. Put the transmission in "park" or in a locked, neutral position.
5. Engage hydraulic system.
6. Run engine at normal operating RPM until hydraulic fluid is at normal operating temperature.
7. To change the valve position, press the Increment or Decrement buttons repeatedly until the desired maximum output value is reached.
8. Press the **START** button and the valve calibration immediately begins.

The calibration runs using the new max flow value.

Figure 65

Limit Output Screen





SPREADER CALIBRATION (GRANULAR)

NOTE

Refer to the System Tests section for using a remote test switch during a spreader calibration.

A Spreader Constant Calibration requires a catch test to determine the spreader constant. This function is only available for granular seed and fertilizer applications.

PERFORM A SPREADER CALIBRATION

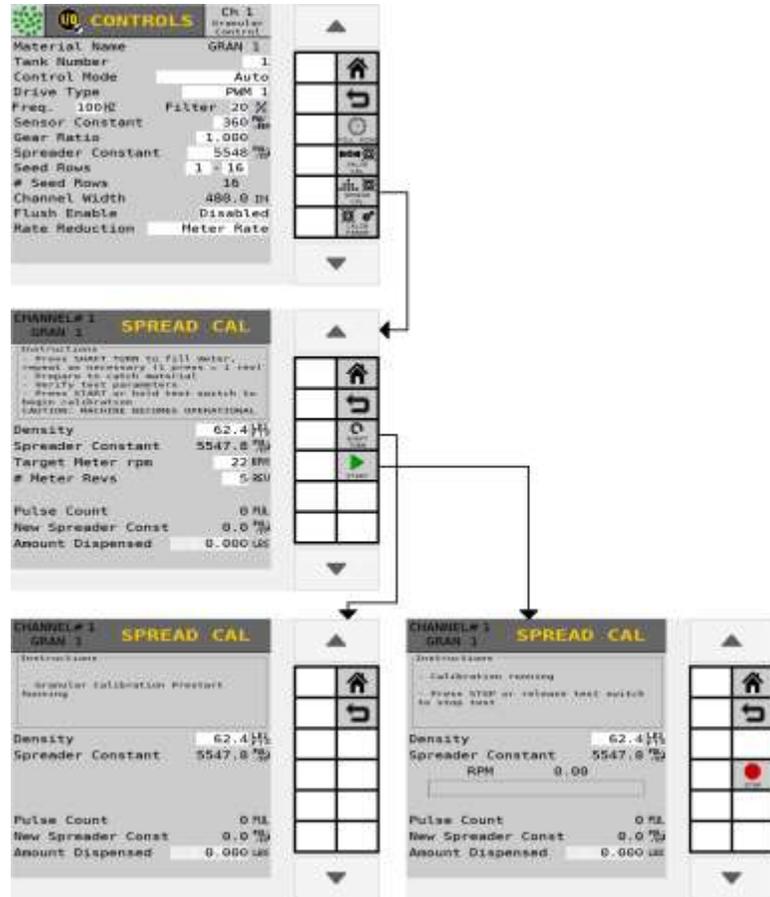
IMPORTANT

A valve calibration should be performed before a spreader calibration.

1. Load hopper with material.
2. Move implement to the raised position.
3. Apply tractor brakes and lock in applied position.
4. Put transmission in park or in a locked, neutral position.
5. Engage hydraulic system.
6. Run engine at normal operating RPM until hydraulic fluid is at normal operating temperature.
7. At the Controls screen, press the **SPREAD CAL** button.
8. Press the **SHAFT TURN** button to fill seed/fertilizer metering system before starting calibration.
9. At the Calibration screen, enter the following values:
 - **Density** - Enter product weight per volume in 1 lbs/ft³.
 - **Target Meter RPM** - Enter the RPM at which the output meter shaft will turn during the calibration.
 - **# of Meter Revs** - Enter number of total revolutions the meter will turn during the calibration. This determines the length of the test and is more accurate the higher the number.
10. At the Calibration screen, press the **START** button.
11. Weigh and enter lbs. of material dispensed in the Amount Dispensed field.
12. Press the **SAVE** button.
13. The new spreader constant automatically calculates and is entered for this material.



Figure 66
Granular Control Spreader Calibration



SPREADER CONSTANTS DEFINED

DENSITY

Relative granular density as represented by the weight of product per volume (lb/ft³, lb/bu, kg/L). If not known, enter a value of lb/ft³.

SPREADER CONSTANT

Determines how many pulses the application rate sensor produces per volume of material discharged.

TARGET METER RPM

The speed at which the output meter shaft turns while the calibration is performed.



NUMBER (#) METER REVS

The number of revolutions the meter turns during the calibration. This will constitute the length of the test. The higher the number, the more accurate the calibration.

NOTE

If performing a Spreader Calibration on a box type drill, catch the output of a few seed meters, average the weight measured from these meters, and multiply this average weight by the total number of meters on the drill. Enter this weight for the Amount Dispensed value.

PULSE COUNT

A pulse count that is produced from the feedback sensor. This number is informational only.

NEW SPREADER CONSTANT

After the spreader calibration is performed and the amount is entered, press the **SAVE** button to accept the new constant.

AMOUNT DISPENSED

Enter the amount (Lbs/Kg) dispensed after performing the spreader constant calibration. The amount dispensed number is used with pulse count and density to calculate the new spreader constant.

SHAFT TURN

The **SHAFT TURN** button turns the shaft one (1) gear revolution and fills the seed meter for instant seed flow when the control is turned on.

The meter should be full of material before the calibration is started.

LIQUID FLOW CALIBRATION

Performing a Limit Output, Valve Calibration, and K-Factor Calibration are recommended for a Liquid Flow control channel type.

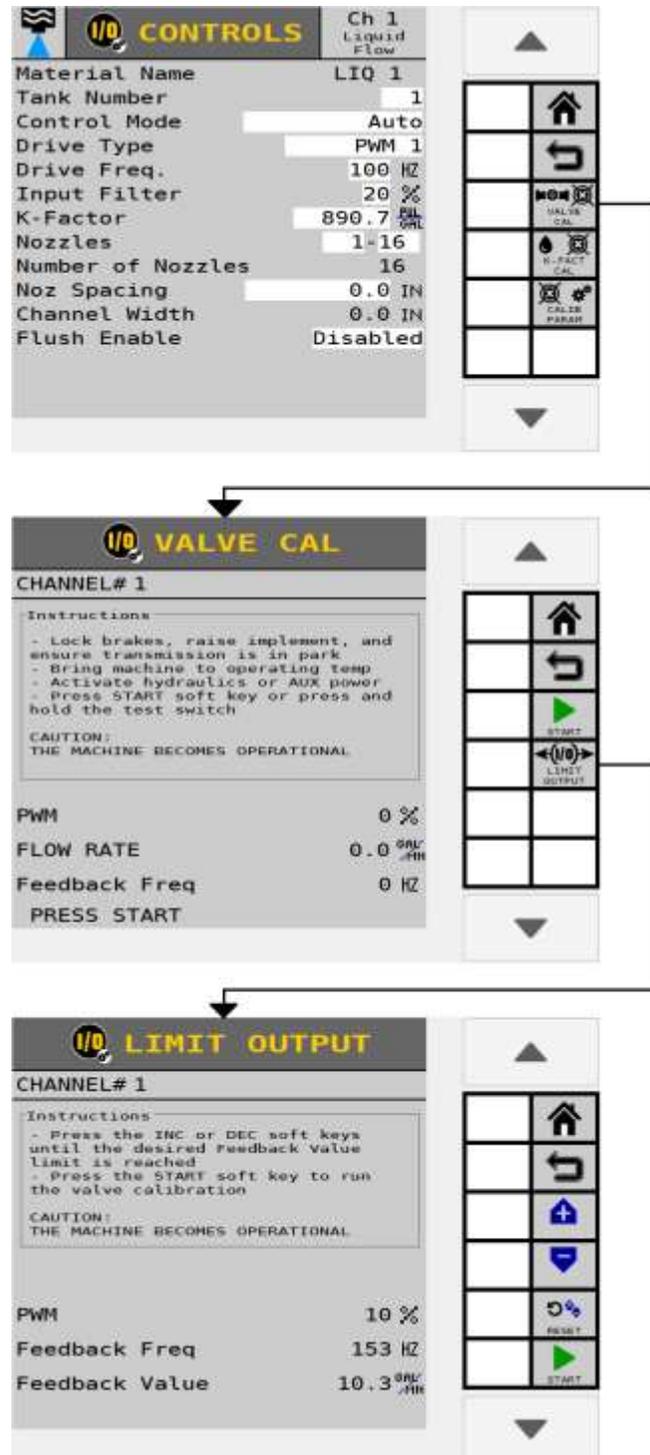
PERFORM A VALVE CALIBRATION

Follow valve calibration steps 1-10 listed in planter and granular control valve calibration section.

OPERATOR'S MANUAL



Figure 67
Liquid Flow Valve Calibration and Limit Output





LIMIT OUTPUT

It is necessary to limit the output of the control channel before running a valve calibration in the event that system capacities are greater than the actual desired capacities. These features allow setting the maximum output of the channel to prevent machine damage.

PERFORM A LIMIT OUTPUT:

1. At the Valve Calibration screen, press the **LIMIT OUTPUT** button.
2. Move the implement to the "raised" position.
3. Apply the tractor brakes and lock in the applied position.
4. Put the transmission in "park" or in a locked, neutral position.
5. Engage hydraulic system.
6. Run engine at normal operating RPM until hydraulic fluid is at normal operating temperature.
7. To change the valve position, press the Increment or Decrement buttons repeatedly until the desired maximum output value is reached.
8. Press the **START** button and the valve calibration immediately begins.

The calibration runs using the new max flow value.

K-FACTOR CALIBRATION

NOTE

Refer to the System Tests section for using a remote test switch during a K-Factor calibration.

To determine the actual K-Factor of a system, water should be dispensed through the system and measured. The calibration procedure will accumulate the pulse. At the end of the calibration procedure, the operator enters the amount dispensed. This number becomes the actual K-Factor instead of the one stamped on the flow meter body. The more liquid passing through the system during calibration increases the degree of K-Factor accuracy.

100% CATCH TEST

This is the recommended method because a larger volume of liquid passes through the entire sprayer system making errors in weighing a smaller factor.

1. Fill the tank and weigh the load.
2. Activate the calibration routine.
3. After spraying a few hundred gallons but before the load is empty, stop the calibration.
4. Weigh the load again.
5. Calculate gallons dropped.



PERFORM A LIQUID FLOW CATCH TEST

CAUTION

Tanks must contain material. Be prepared to catch the material in a container so it can be weighed at the end of the calibration.

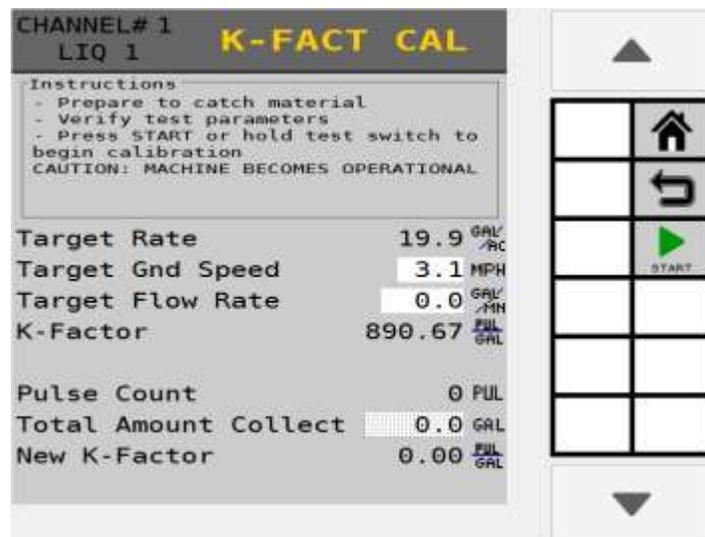
DANGER

When the **START** key is engaged, the machine will become operational. All necessary precautions must be taken to ensure user safety. Failure to practice all necessary caution may result in serious injury or death.

1. At the Liquid Control setup screen, press the **K-FACTOR CAL** button.
2. Enter the Target Ground Speed and Target Flow Rate to calculate the operation rate.
3. Press the **START** button.
4. Press **STOP** button when container is full.
5. Enter amount (gallons) dispensed in the Total Amount Collect field.
6. Press **SAVE** button to accept the selection.
7. The system automatically calculates and saves the new K-Factor for this material.

Figure 68

K-Factor Screen





OPERATIONS

The Operations screen groups together a series of channels with the same type and product class that have no overlapping rows. A maximum of 6 operations are possible.

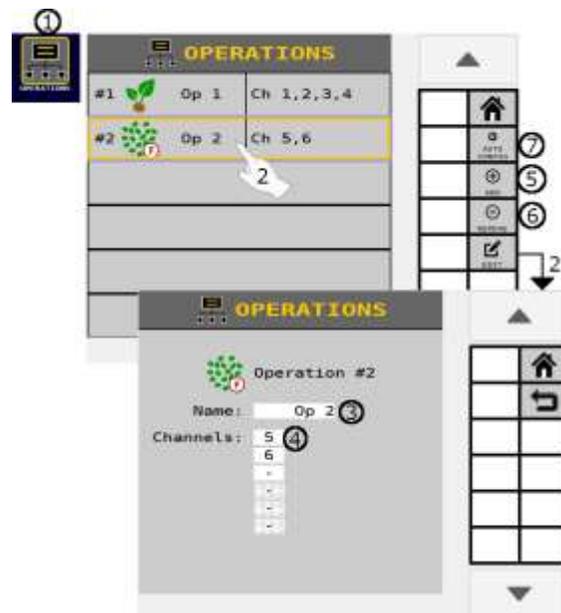
The system automatically assigns similar channels to an operation but these assignments can be changed to user-specific requirements. Only channels with rows that can be controlled by the Task Controller will be added to operations. Channels with rows that can be controlled by the task controller must have an operation, and cannot be removed from operations completely.

TO EDIT AN OPERATION:

1. Press the **OPERATIONS** button.
 - The Operations screens displays the operation groups and the channel assigned to each group.
2. Highlight an operation and press the **EDIT** button.
3. Press the Name input box to change the operation name, if desired.
4. Press the Channels input box to change a channel.
5. Press the **ADD** button to create a new operation.
6. Press the **REMOVE** button to split an operation. All channels on the operation to be removed will be given their own new operation if possible.
7. Press the **AUTO CONFIG** button to reset all Operations to the default groupings and remove any added operations.

Figure 69

Enter an Operation





SECTION CONTROL

CLUTCH SECTIONS

ROW CROP PLANTER

Auto Section Control is an automated row shutoff system that automatically shuts off individual sections utilizing a GPS signal as previously planted areas are approached. Manual control is also possible using optional equipment.

Required:

- ISO₆ Master Module
- Output Module(s)
- Harnessing
- Clutch/Hardware system

Optional:

- Switch Module(s)
- Virtual Switch feature key

IDENTIFY SECTIONS AND OUTPUTS

MULTIPLE OUTPUT MODULE ASSIGNMENT

Output module addresses are a critical parameter used to identify a module's position on the implement that controls row shutoff switches. There is a 24 clutch maximum.

IMPORTANT

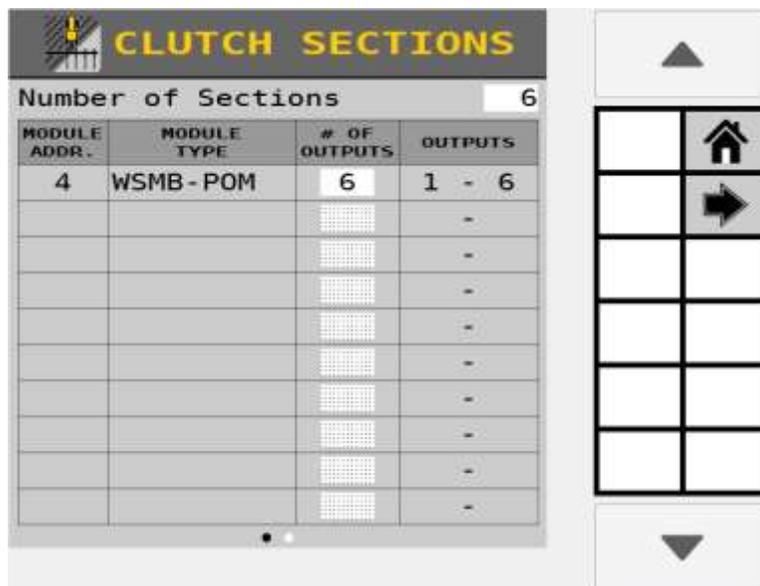
If a planter uses more than one output module, modules MUST be installed in increasing serial number order starting on the left side and proceeding to the right so that row assignment is configured correctly.

TO ENTER # OF OUTPUTS PER MODULE:

1. Press the **CLUTCH SECTIONS** button.
2. At the Clutch Sections screen, enter the total number of sections.
3. Enter the number of solenoid outputs for each module. Outputs do NOT always total the number of clutches but the total number of controlled solenoids. The Outputs column value is automatically sequenced for each module based on the module address value.
4. Press the Arrow button to assign channels, rows, outputs, and switches.



Figure 70
Clutch Output Assignment



ASSIGN CHANNELS/ROWS/OUTPUTS/SWITCHES

Rows, channels, outputs, and switches require assignment to sections. As rows are assigned to each section, row numbers automatically populate.

TO ASSIGN CLUTCH SECTION SWITCHES:

1. At the Clutch Sections screen, press the Arrow button.
2. Enter the total number of switches.
3. Enter the channel that corresponds with the section.
4. Enter the number of rows to be turned on/off by each output/channel. The row numbers are sequentially assigned to the left, center, and right outputs based on the # of rows entered.
5. Enter the output assigned to the respective row.
6. Enter the switch assigned to the respective row that identifies what switches on the row shutoff switch box enable and disable planter sections or outputs. If a task controller is used, manual switches are optional. If used, they serve as a "Priority Off" function which will override the task controller section state when the manual switch is in the off position.

OPERATOR'S MANUAL



Figure 71
Assigning Clutch Sections

CLUTCH SECTIONS

Number of Switches

SECT. #	CH.	# OF ROWS	ROW #	OUTPUT	SWITCH
1	1	6	1 - 6	1	1
2	2	6	7 - 12	2	2
3	3	6	13 - 18	3	3
4	4	6	19 - 24	4	4
5	5	12	1 - 12	5	5
6	6	12	13 - 24	6	6
			-		
			-		
			-		
			-		

Control Panel: Home button, Left Arrow button, Up Arrow, Down Arrow



LIQUID BOOM SECTION CONTROL

For liquid pressure applications using boom control, a module's position, number of outputs, and boom assignment must be defined.

Controlling sections require:

- Boom Output Module
- Boom Switch Modules (optional)

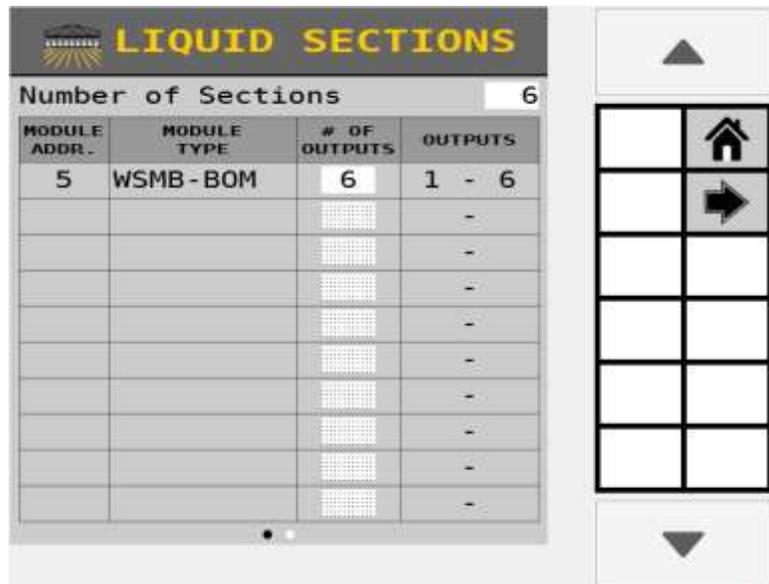
BOOM SETUP

The Boom Setup screen identifies how many boom output modules are connected to the system and allows assignment of boom outputs and boom sections to each module.

TO ASSIGN BOOM OUTPUT MODULES:

1. Press the **LIQUID SECTIONS** button.
2. Enter total number of sections.
3. Enter number of nozzles assigned to each module in the # OF OUTPUTS input box.

Figure 72
Boom Setup





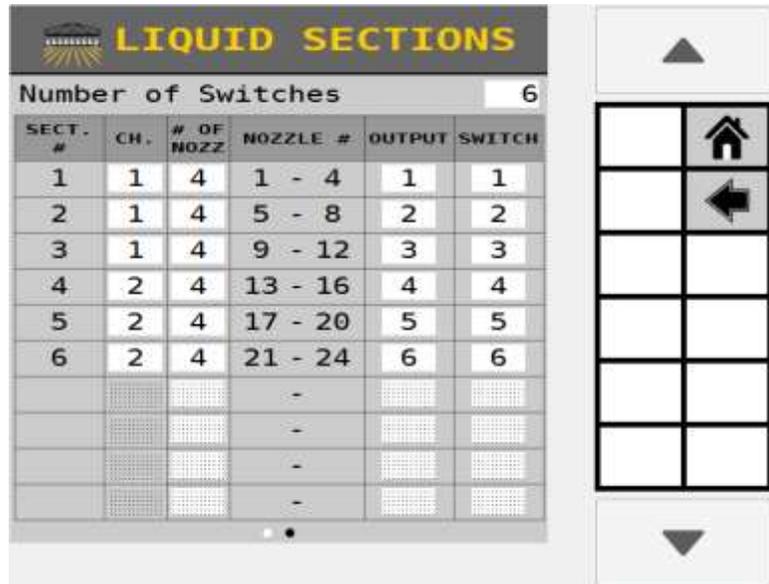
ASSIGN CHANNELS, ROWS, OUTPUTS, SWITCHES

Assigns control channels, rows, outputs, and switches to the associated boom section.

TO ENTER CHANNELS ASSIGNED TO SECTIONS:

1. At the Liquid Sections screen, press the Arrow button.
2. Enter the total number of switches.
3. Press the Channel input box to assign a control channel to a section.
4. Enter number of nozzles, the outputs, and boom switch module switches for each section.

Figure 73
Assign Sections





SECTION LINKING

Section Linking groups sections in a series or in parallel to other sections in the system so that these 'linked' groups turn on or off simultaneously at the Work Screen.

Sections are commonly used as a channel (swath-by-drive), individual, or series of rows commanded as a single section (clutch control).

Subordinate sections turn off when all their assigned master sections are off at the same time. Subordinates have no control over the master sections.

TO LINK SECTIONS:

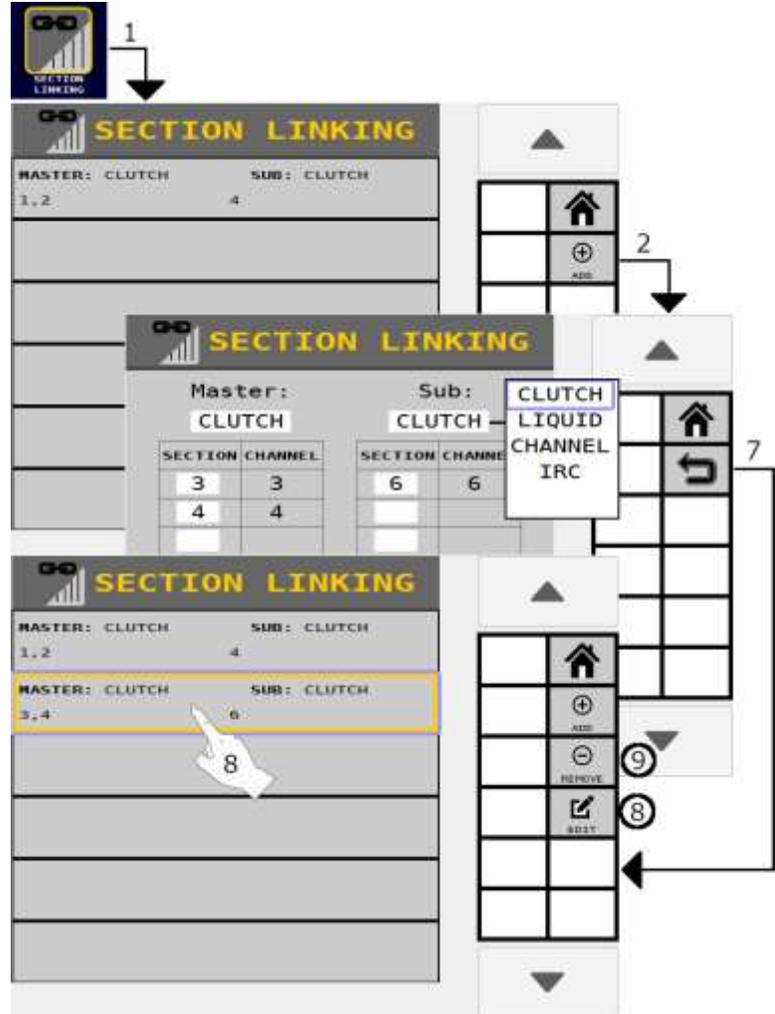
1. Press the **SECTION LINKING** button.
2. At the Section Linking screen, press the **ADD** button.
3. Press the Master selection box and select the Master control type to turn on/off sections as clutch, liquid, channel, or IRC.
4. Press the Subordinate selection box and select the secondary auxiliary to the Master.
5. Assign each section controlled by the Master to the appropriate channel.
6. Assign each section of the subordinate module controlled by the Master.
7. After all sections and channels are linked, press the Back button.
 - The Section Linking screen is now populated with all of the master/subordinate linkages.
8. Press a specific section linking item and press the **EDIT** button to make changes.
9. Press a specific section linking item and press the **REMOVE** button to delete a link.
10. Press the Down Arrow button to view additional section linking items.

IMPORTANT

Refer to the Task Controller screen and/or the Channel Linking screens for more refined settings that are beyond the parameters of section linking.



Figure 74
Linking Sections





SECTION LINKING EXAMPLES

Figure 75 depicts 3 typical examples of linking sections:

A) A swath-by-drive with:

- Channel 1 master with Channel 4 subordinate
- Channel 2 master with Channel 5 subordinate
- Channel 3 master with Channel 6 subordinate

The subordinate channels will shut off when the master channels are commanded off, such as when a task controller is active and the channels cross over a previously applied area.

B) Six seeding channels of different crops with a common operation.

- Channel/Section 1 - 4 Corn
- Channel/Section 5 Fertilizer linked to Channel 1 and 2
- Channel/Section 6 Fertilizer linked to Channel 3 and 4

A swath-by-drive example with Channel 5 (Section 5) linked as subordinate to Channel 1 (Section 1) and Channel 2 (Section 2) masters and Section 6 subordinate linked to Channel 3 and 4 masters. Section 5 turns off when Channels 1 and 2 are turned off; Section 6 turns off when Channels 3 and 4 are turned off.

C) 3 Seeding channels and one fertilizer channel.

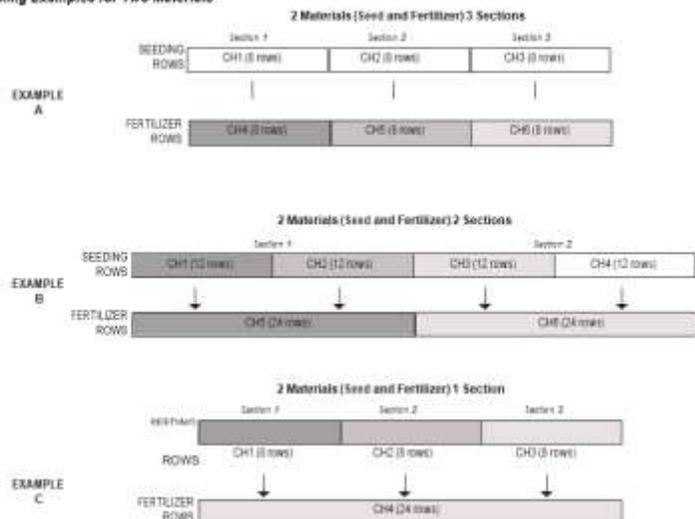
Channel/Section 4 will remain on unless Channel/Sections 1-3 are all off.

- Channel/Section 1 through 3 master sections with Channel 4 as subordinate.

Figure 75

Section Linking Examples

Section Linking Examples for Two Materials





IMPLEMENT GEOMETRY

Physical layout of the implement is required to determine the position of a channel in the field. Configuring an implement identifies the hitch type the implement uses, and area the implement covers. Exact distances are required for physical layout of the implement. This is important so coverage maps and section control work properly.

MEASURE X/Y COORDINATES

Stand behind the implement facing the tractor.

X coordinate:

- Measure from the hitch pivot point to where the seed is placed in the ground, e.g. bottom of seed tube, entered as a negative entry (-X). This measurement should be entered for each control channel enabled.

Y coordinate:

- For each channel determine the center point of the channel.

Use this method:

- Find the implement center. This is the point on the toolbar that is directly behind the hitch.
- Determine the distance from the implement center for the first and last rows or nozzles on the channel.
- Calculate the distance from implement center of the center point of the channel by adding the first and last row distances and dividing by two.
- Distances left of the implement center are entered as negative numbers (-Y) and to the right are entered as positive numbers.
- For channels that use rows the Y values are automatically populated, so use the channel center points to verify the channel setup is correct.
- For channels that use nozzles, enter the center point for reach channel.

Figure 76

32 Row Planter, 3 Point, 2 Control Channels X/Y Coordinate Example

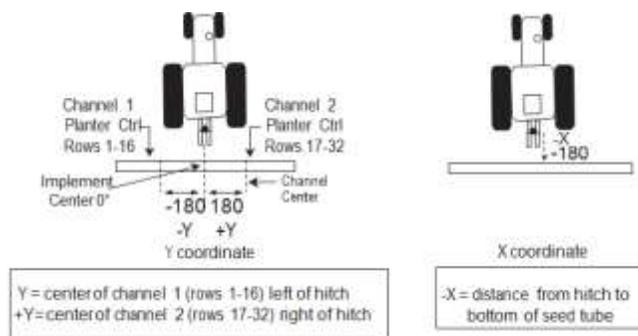
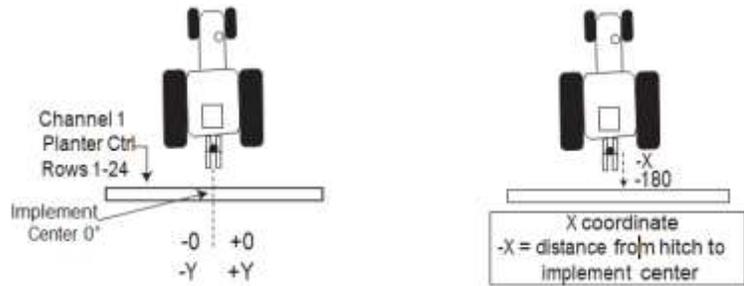




Figure 77

24 Row Planter 1 Control Channel X/Y Coordinate Example

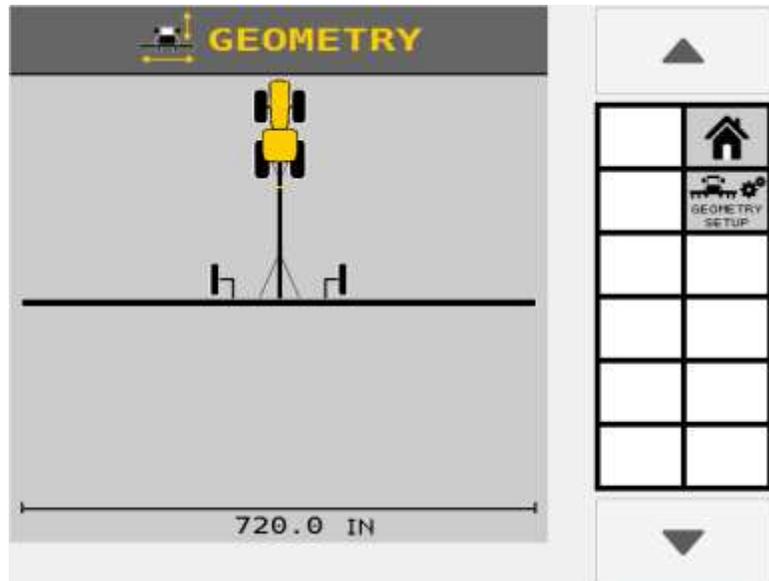


IMPORTANT

It is critical to enter the exact distances required when setting up the physical layout of the implement position. It is strongly suggested that a tape measure is used to ensure exact measurements. Failure to enter accurate measurements of the implement control channels will impact the system's performance to shut row sections off at the proper location within the field.

Figure 78

Geometry Summary Screen

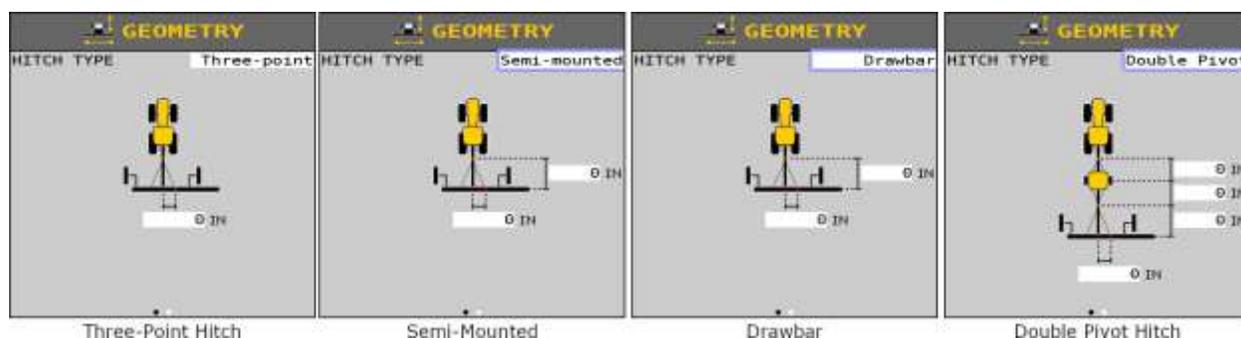




TO ENTER X/Y COORDINATES:

1. Press the **GEOMETRY** button.
2. At the Geometry screen, press the **GEOMETRY SETUP** button.
 - The tractor/implement illustration on the Geometry screen (Figure 78) is a visual indicator of channel/implement layout once dimensions are entered at the Geometry Setup screen.
3. At the Geometry Setup screen, select the implement type used that matches the equipment.

Figure 79
Select Implement Type



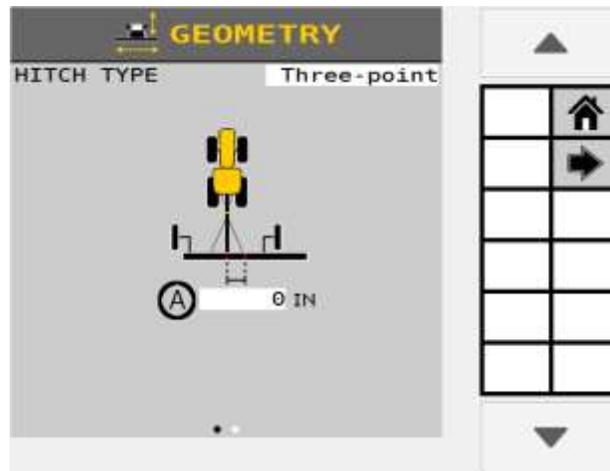
4. At the Geometry Setup screen, enter the X and Y coordinates for the implement type selected. Measurements for each implement type defined below.
 - Note that -Y is to the left of the hitch, +Y is to the right of the hitch, -X is further behind the tractor and +X is towards the tractor with respect to the hitch.

THREE-POINT HITCH TYPE

A) Enter the distance (Y value) from implement center to channel center left and right. If implement bar is offset from 0, enter the size of the offset. This value is typically 0.



Figure 80
Three-Point Hitch Dimensions

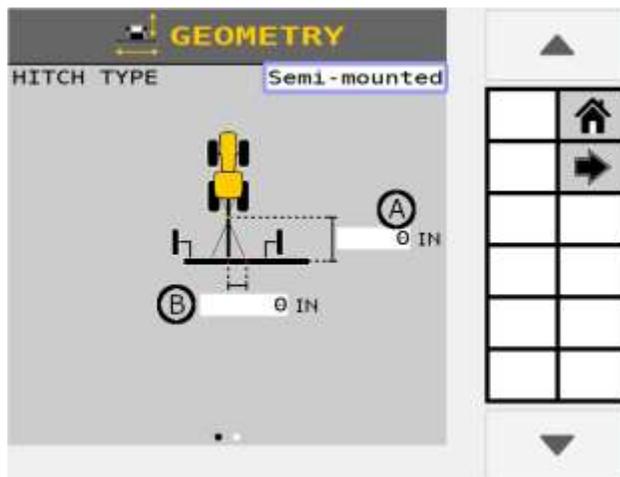


SEMI-MOUNT AND DRAWBAR HITCH TYPES

A) Enter the distance from the hitch to the pivot point axle center. On a 2 point implement, the measurement is taken at the semi-mount single pivot point that is incorporated into the 2 point mount.

B) Enter the distance (Y value) from implement center to channel center left and right. If implement bar is offset from 0, enter the size of the offset. This value is typically 0.

Figure 81
Semi-Mount Implement Type





DOUBLE PIVOT HITCH TYPE

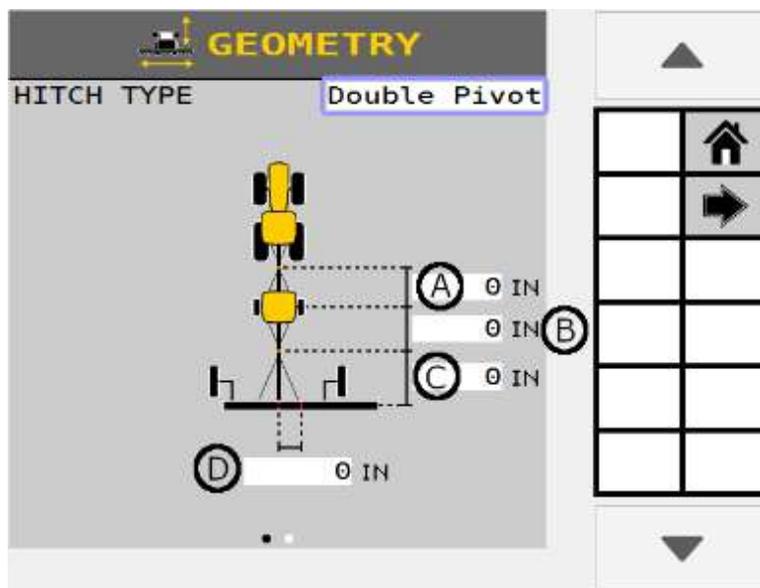
1. Enter the distance from the tractor hitch to cart axle center.
2. Enter the distance from the first cart axle center (directly behind tractor) to the second cart hitch.
3. Enter the distance from the second cart hitch to the implement axle center.
4. Enter the distance (Y value) from implement center to channel center left and right. If implement bar is offset from 0, enter the size of the offset. This value is typically 0.

NOTE

Double Pivot type are typically used with tow between air carts.

Figure 82

Double Pivot Implement Type



5. Press the Arrow button to display the Channel Preview screen. A channel's position identifies the distance between the implement GPS coordinates and where seed is dispersed.
 - The dashed line represents the X coordinate entered on the hitch selection screen.
6. The initial Channel Geometry screen displays multiple channel positions stacked behind one another.
7. Enter the 'X' coordinate in inches (centimeters) for the first channel.
8. Press the Down Arrow button to enter the next channel's coordinates. As each channel's position 'X' coordinate is entered it displays in the new assigned position.
9. Press the **DONE** button when finished.



IMPORTANT

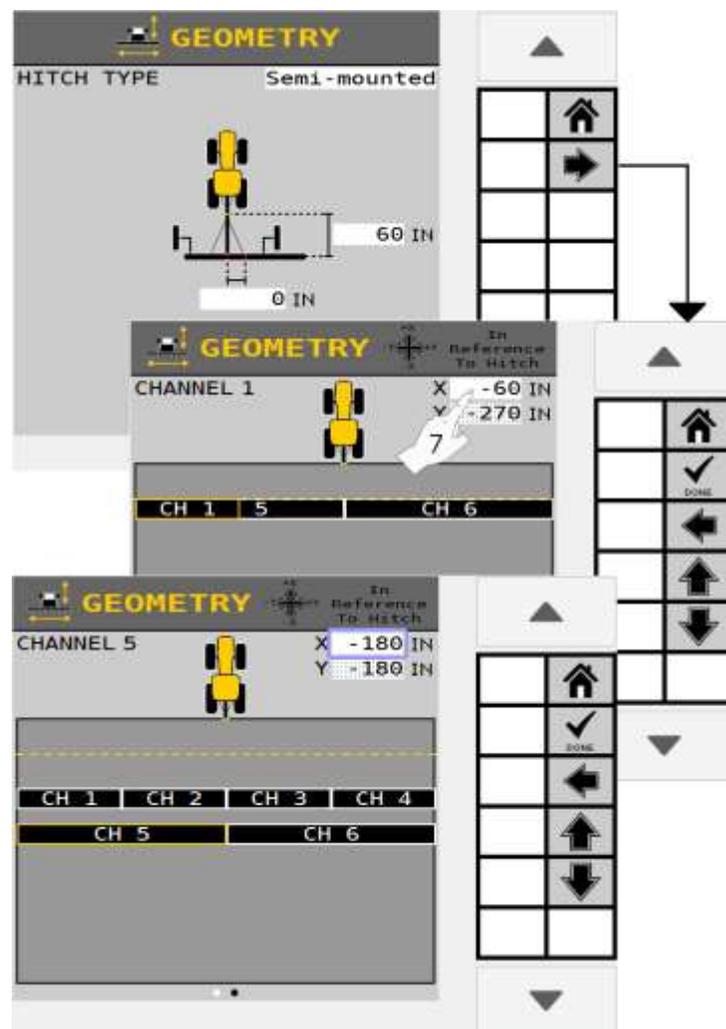
Verify that all channels align correctly and no channel overlap occurs. Failure to enter accurate measurements of a control channel's position will impact the system's performance to shut row sections off at the proper location within the field.

NOTE

Liquid channels must enter the Y coordinate on the channel preview setup page if there is more than one channel. Planter and granular channels cannot edit the Y on the channel preview screen, and only modify it on the hitch type selection page.

Figure 83

Enter Control Channel Positions "X" Coordinate





SENSOR SETUP

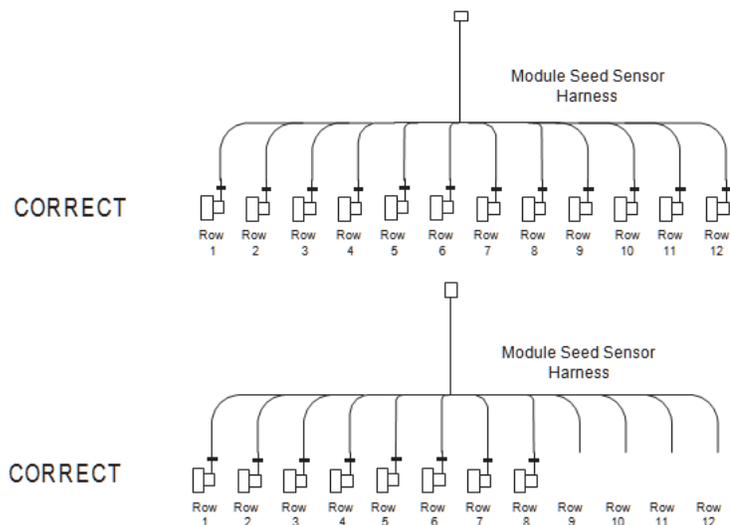
Sensor setup assigns up to 196 sensors to rows, selection of the row type (population/blockage), and assignment of operations to a module type. If no rows are configured, population monitoring cannot occur.

SENSOR CONFIGURATION REQUIREMENTS:

- An Operation and its channels must have continuous row numbers.
- A section must have continuous row numbers.
- Inputs on a module must start at input 1 and sequence up a number continuously with no skipped inputs.
- A row sensor may not be assigned to more than one Operation.
- If a row has multiple sensors, the sensors on that row cannot share Operations.
- The lowest module address must represent the module closest to the left side (row 1) of the system. The highest module address must represent the module closest to the right side (number of configured rows) of the system.
- A module does not have to use all row sensors available to it.
- The operation number assigned to a sensor determines what is measured. For example, assigning a blockage sensor to a fertilizer operation or a seed sensor assigned to a population operation.

Figure 84

Correct Sensor Connections to Module



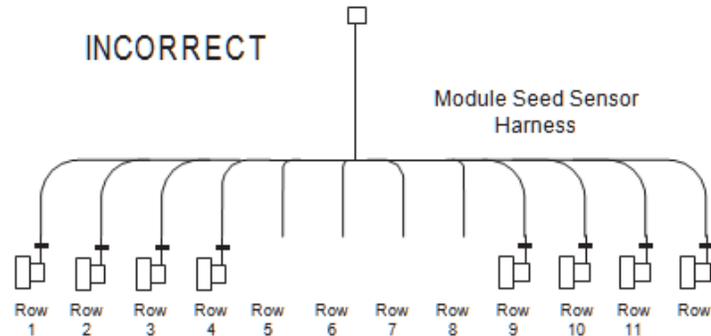


IMPORTANT

If there are gaps in sensor inputs on a module, the counting of sensors stops and an alarm activates.

Figure 85

Incorrect Sensor Connections to Module



SENSOR SETUP

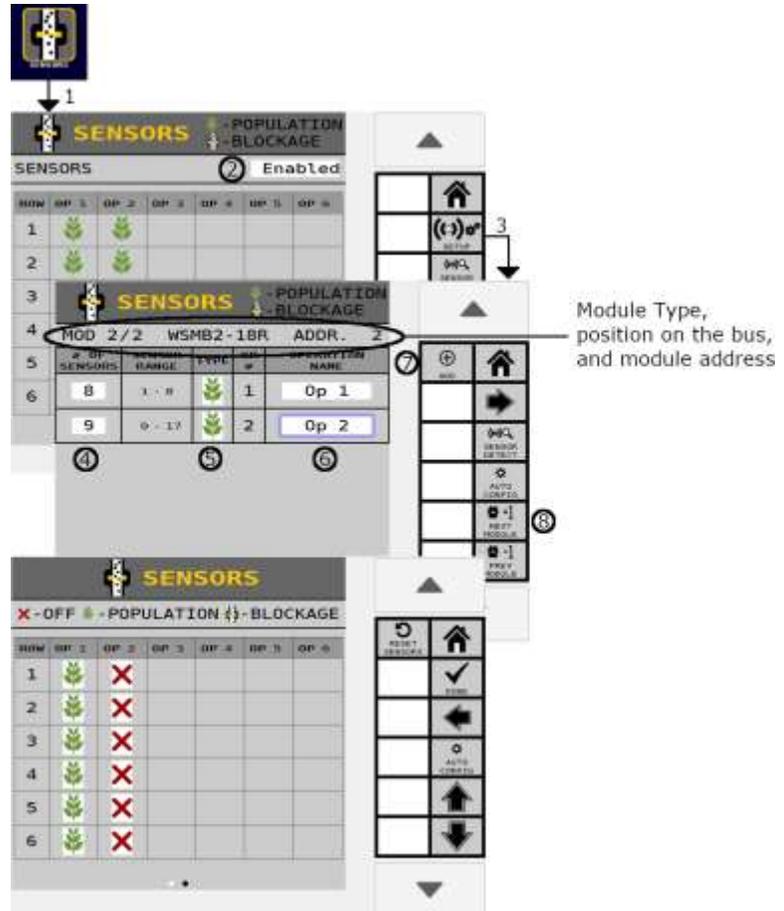
Sensor Setup assigns sensors to modules and operations.

TO ASSIGN SENSORS:

1. Press the **SENSORS** button.
2. Press the **SETUP** button.
3. Enter number of sensors assigned to the module.
4. Enter the row type as population or blockage.
5. Select the name of the operation to assign the sensors to that operation.
6. Press the **ADD** button to display a new sensor row input bar and repeat steps 3 through 5 as needed.
7. If there are row sensors available on more than one module, press the **NEXT MODULE** button to display the next Module screen.
 - Press the **PREV MODULE** button to return to previous screen.
 - Repeat Steps 3 through 6 for each module.



Figure 86
Assigning Sensors to ISO₆ Module

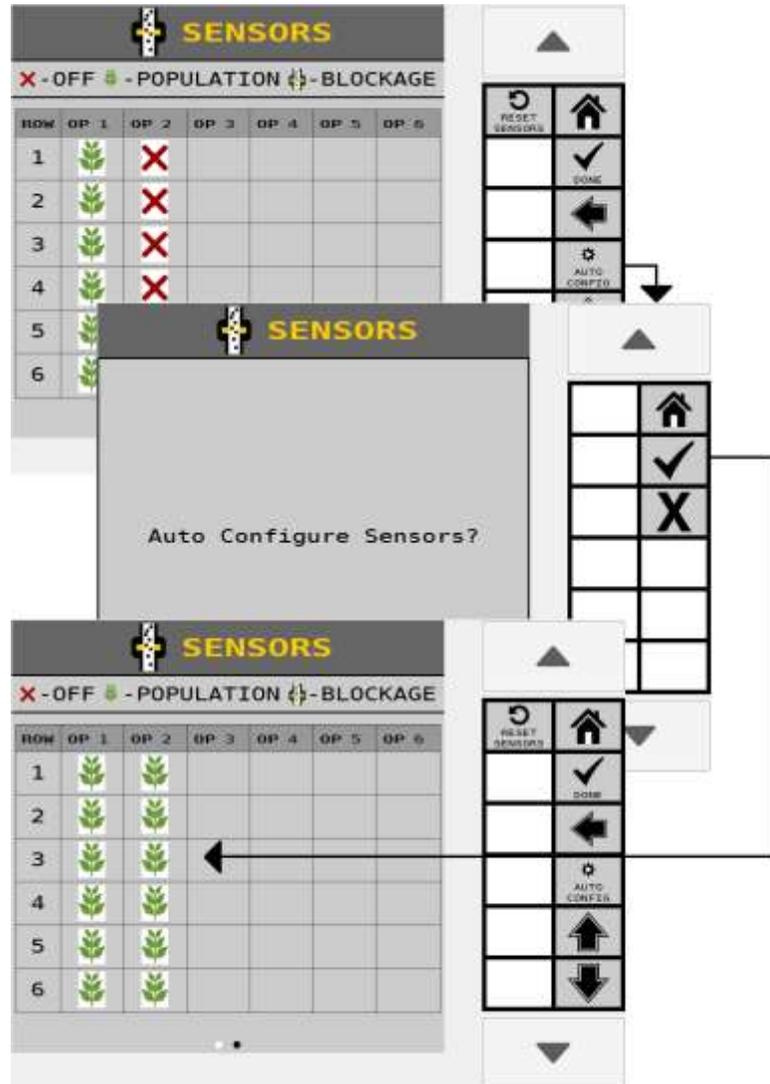


8. After all sensors are entered, press the Arrow button to navigate to the next screen.
9. Press the **AUTO CONFIG** button to auto-assign sensors to the operations.
 - A sensor's position is indicated in the operation column it is assigned with an "X" indicating the sensor is off.
 - Sensors may be assigned manually by pressing the icon in the table corresponding to the row and operation.
10. Press the Checkmark button to begin auto configuration.
 - Operation/sensor assignment does not become active until the sensor is configured to a sensor type.
11. After configuration is complete, sensors and assignments now display on the Sensors Summary screen as population or blockage.



A malfunctioning sensor can be set to OFF to eliminate row failure alarms. Sensors turned off are not calculated in population blockage. A physically disconnected sensor will trigger a Configured but not Detected alarm.

Figure 87
Performing an Auto Configuration



SENSOR SUMMARY

After performing an Auto Configuration, sensor row assignments appear at the Sensor Summary screen identifying sensor location/row number on the module and sensor type assignment as population, blockage, or off.

At any time, not just during setup, a sensor's current state can be changed at this screen as either off or its original assignment.



In certain instances, a user may want to manually adjust a sensor's location that has been configured by performing an Auto Configuration, e.g. when there are fewer sensors than rows on an operation. A sensor can be turned off for a row and manually entered at another location.

Also a faulty sensor can be turned off to eliminate population alarms.

TO ADJUST A SENSOR TYPE:

1. Press the **SETUP** button.
2. At the Sensor Module Assign screen, scroll using the Up or Down Arrow buttons to select the appropriate sensor range.
3. Select the desired sensor type of Population or Blockage.
4. Press the Arrow button to navigate to the next page.
5. Perform an Auto Configuration or select the operation row sensor and select the new sensors type for each sensor.

Figure 88

Edit Sensor Type



SENSOR DETAILS

Sensor Summary displays sensors on a row and their respective operation assignment. In Summary view, the table displays the type of sensor configured. The legend in the header displays the available types.



Pressing the **DETAILS** button displays the module address (red) and input number (blue). This screen is viewable only.

Figure 89
Sensor Details

ROW	OP 1	OP 2	OP 3	OP 4	OP 5	OP 6
1	1 1	2 9				
2	1 2	2 10				
3	1 3	2 11				
4	1 4	2 12				
5	1 5	2 13				
6	1 6	2 14				

The screenshot shows a screen titled "SENSORS" with a status "Enabled". The table above lists sensor configurations for 6 rows. To the right is a vertical sidebar with buttons for Home, Setup, Sensor Detect, Summary, and navigation arrows.

SENSOR DETECT

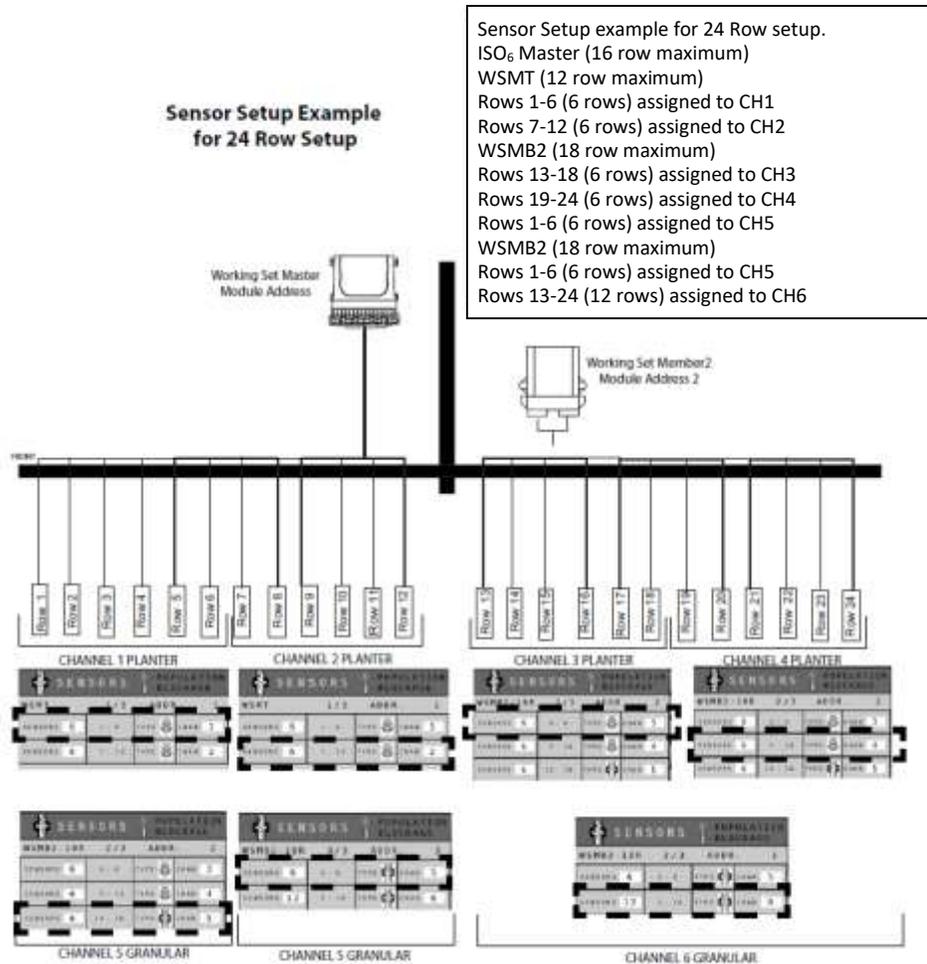
Performing a Sensor Detect checks the system configuration to verify that sensors configured match the actual number of sensors connected to a module.

- An alarm may trigger if any missing sensors are found or too many sensors are configured.
- If an alarm occurs, verify that the number of sensors at the Sensor Summary screen matches the actual number of sensors connected to the appropriate module.
- Confirm that all harnessing and sensors are connected properly.



MODULE AND SENSOR SETUP COMPARISON

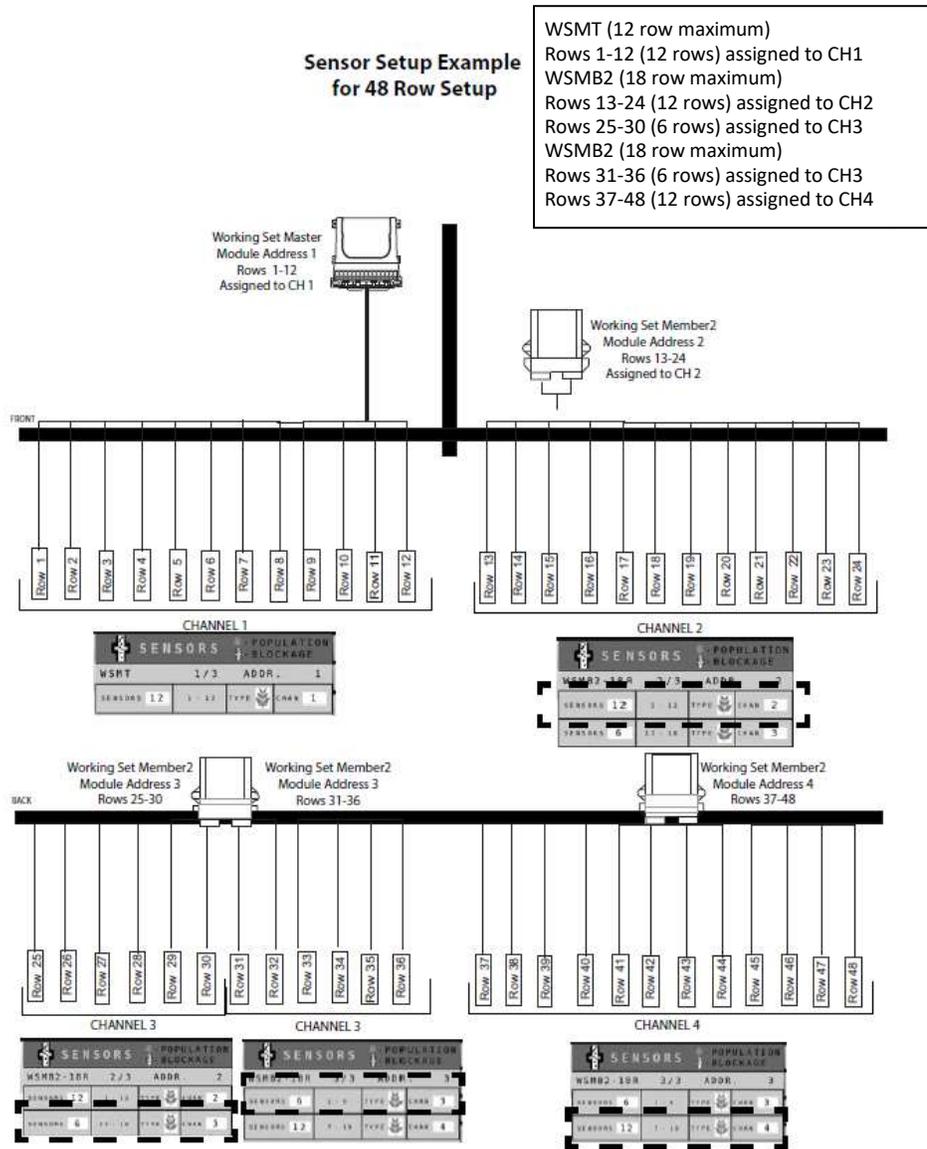
Figure 90
24 Row Installation



OPERATOR'S MANUAL



Figure 91
48 Row Installation





GROUND SPEED SETUP

The default ground speed source is set to CAN ground.
Other sources include:

- CAN Ground
- CAN Wheel
- Digital Frequency
- Reluctance Frequency
- Manual
- IRC
- CAN GPS

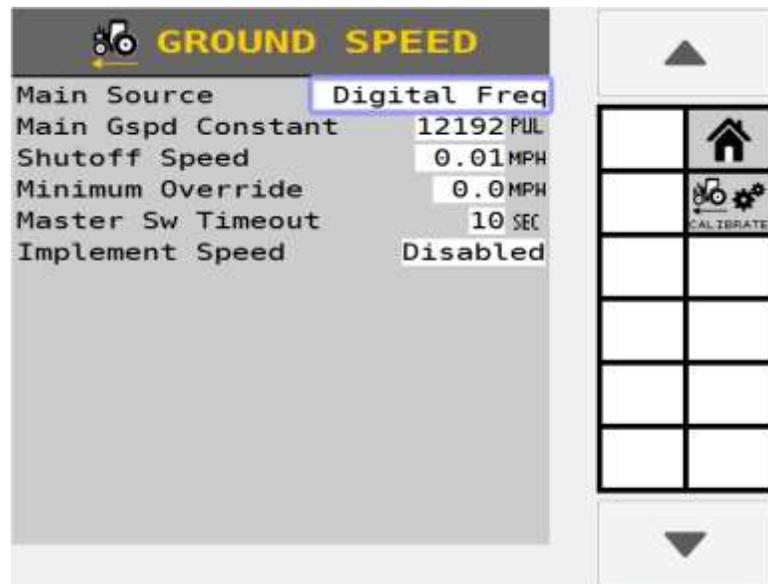
Performing a ground speed calibration is required for digital frequency, reluctance frequency, and IRC settings.

TO SELECT A GROUND SPEED TYPE:

1. Press the **SPEED** button.
2. On the Speed Set screen, enter ground speed parameters as defined below.

Figure 92

Ground Speed Setup Screen



MAIN SOURCE

Source selects the type of ground speed sensor used and where the sensor's input is on the system.



CAN GROUND

Ground speed is provided by a radar/digital (3-wire) type sensor connected to the tractor ECU through the cab harness or if radar/forward ground speed is communicated on the CAN bus.

CAN WHEEL

Wheel speed data is communicated on the CAN bus. This source does not account for slip-like CAN ground.

RELUCT FREQ

Ground speed is provided by a reluctance (2-wire) type sensor connected to the actuator harness through an adapter harness.

DIGITAL FREQ

Ground speed is provided by a radar/digital (3-wire) type sensor connected to the actuator harness.

MANUAL

A **MANUAL SPEED** button displays on the Work Screen and sets the system to operate using a constant, internally generated ground speed and is typically used in the event of a ground speed sensor failure. This is a constant, internally generated ground speed that causes the system to operate when the master switch is ON at the speed that has been programmed. This value can be set to any speed within the delivery capabilities of the system.

- No ground speed sensor is required when using the Manual setting.
- No area accumulation occurs when speed source is manual.
- **Implement Lift Override:** If enabled the implement lift is not needed to run.

NOTE

Manual ground speed can only be entered if the source is changed to MANUAL.

IRC

IRC ground speed is provided by two radar/digital (3-wire) type sensor connected to the left-most and right-most IRC modules on the system.

An offset from the center must be provided for each sensor.

CAN GPS

Ground speed is provided by the tractor GPS. Specific PGN outputs are required for this setting.

- GPS must output messages on CAN bus.
- The message required for communication is PGN 129026, NMEA high-precision rapid update.



MAIN GROUND SPEED CONSTANT

Represents the pulse count produced by the ground speed sensor over a 400' distance. A ground speed calibration is recommended to obtain the ground speed constant. Refer to the Calibration section for additional information.

Using a single source radar assumes all rows are moving at the single speed provided by the tractor speed sensor.

SHUTOFF SPEED

Indicates the minimum ground speed allowed before the system shuts off all control channels.

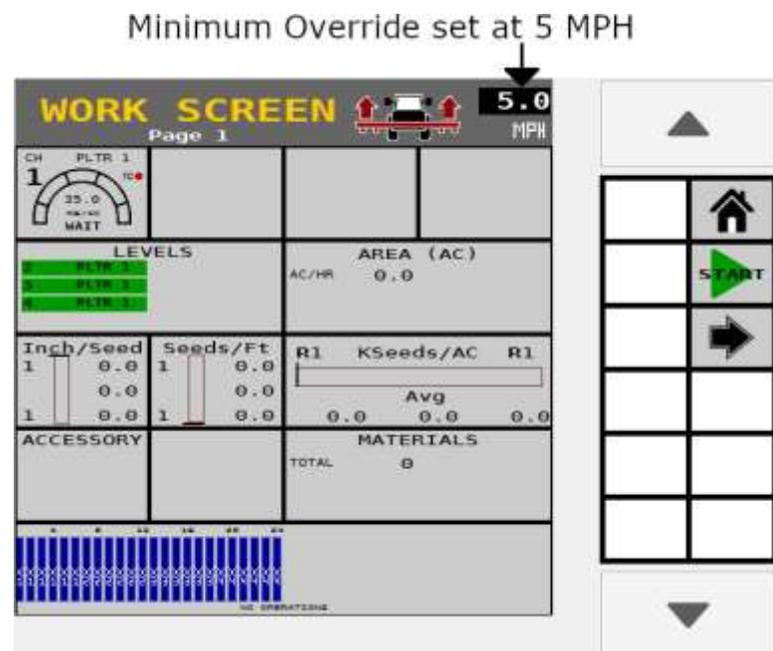
MINIMUM OVERRIDE

Minimum override takes over when actual ground speed is below the designated value. The control operates at this speed until actual ground speed rises above the minimum override speed or the actual speed drops below the shutoff speed. The Minimum Override speed has a background color of black and appears in the ground speed location on the Work Screen.

NOTE

Minimum override and Master Switch Timeout features will not display on the Ground Speed setup screen when only Monitor Type channels are configured.

Figure 93
Minimum Override





MASTER SW TIMEOUT

Determines the length of time before the system disables the operate function after ground speed is 0 (zero) if the master switch remains in the ON position. After the delay time elapses, an alarm is issued stating that the master switch must be toggled OFF/ON before the system will restart.

GROUND FAIL ALARM DELAY

Determines the length of time after the ground speed goes to zero and seed flow continues before the alarm sounds. This alarm only applies when Monitor Type control channels are configured.

IMPLEMENT SPEED

A harness is required for this feature and is an input that is connected to the sensor that senses the implement speed, i.e. tone wheel with digital proximity sensor. If enabled, the frequency detected on this input must be above the frequency threshold before channels will run. Implement Speed must be enabled when the **MASTER SWITCH** button is not used.

GROUND SPEED CALIBRATION

Ground speed is the rate in MPH (Kph) as measured by the ground speed sensor. The number reflects the number of pulses generated by the ground speed sensor while traveling a distance of 400 feet (100 meters).

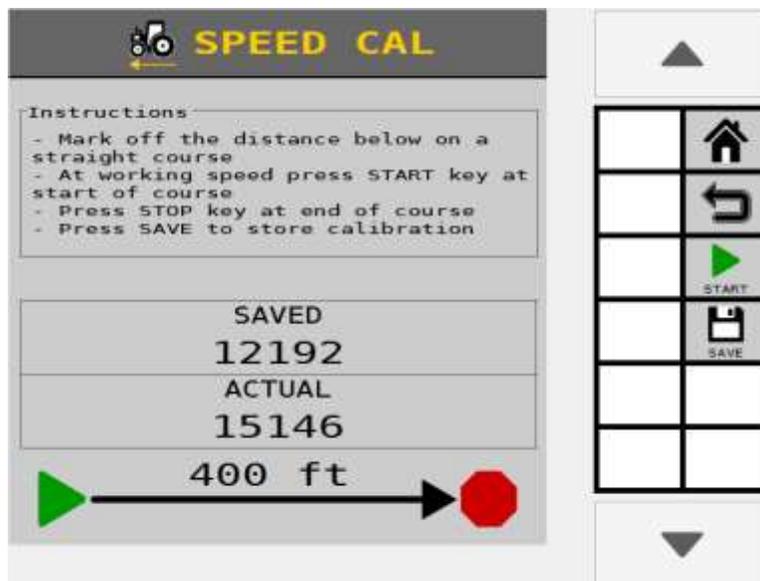
IMPORTANT

Performing a ground speed calibration directly influences population, area accumulation, and application rate control and is required for digital frequency, reluctance frequency and IRC.



Figure 94

Ground Speed Calibration



TO PERFORM A CALIBRATION:

1. Measure a 400 foot (100 meters) course marking start and finish points.
2. Press the **CALIBRATE** button to open the Calibration screen.
3. Drive tractor 2-5 mph and press the **START** button at the start of the 400 foot course to begin calibration. The display showing the ground speed calibration will zero and begin counting ground speed pulses.
4. Press **STOP** button at the end of the 400 foot course. The new calibration number displays on the center of the screen.
5. Enter the average calibration number.
6. Press the **SAVE** button to save the new calibration.

TIP: For better accuracy, run this course 3 times and average the 3 calibration numbers. Enter the averaged number at Main Ground Speed Constant.



ACCESSORY SENSORS

ACCESSORY SUMMARY

The Accessory Sensor screen displays the optional sensors installed i.e. an RPM sensor to monitor shaft/fan speeds or an air pressure sensor. Supported Accessory sensors include:

- Hopper
- Pressure
- RPM
- Digital

The landing page shows currently configured sensors. Pressing the **ACC SETUP** button enters setup to configure sensors for each available ACC module on the system. Pressing the **ACC DIAG** button enters the Accessories Diagnostic page which can be used to test configured Accessory Sensors.

ACCESSORY SETUP

Figure 95

Accessory Summary Screen



The Accessory Setup screen allows accessory sensors to be configured for each supported accessory module. Pressing the **NEXT MODULE** softkey navigates through each supported accessory module to setup sensors for the selected module.



Performing a Sensor Detect checks the system configuration to verify that sensors configured match the actual number of sensors connected to a module. Sensor Detect is performed on all modules. Sensor Detect only detects Pressure and Hopper accessory sensors.

- An alarm may trigger if any missing sensors are found or too many sensors are configured.
- If an alarm occurs, verify that the number of sensors at the Sensor Summary screen matches the actual number of sensors connected to the appropriate module.
- Confirm that all harnessing and sensors are connected properly.

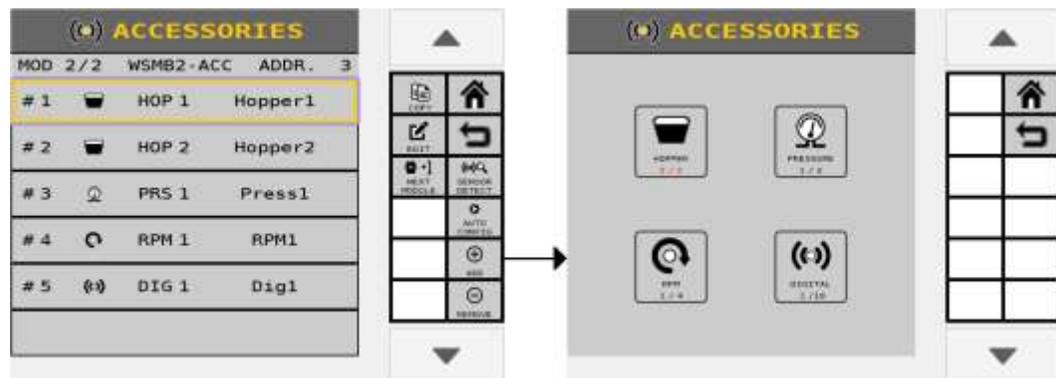
Pressing the **AUTO CONFIG** button performs a Sensor Detect and automatically configures unassigned sensors. **AUTO CONFIG** only works for Pressure and Hopper sensors. RPM and Digital sensors must be configured manually.

Pressing the **ADD** button allows adding a sensor for the selected module. The Add Sensor Type screen shows the number of currently configured sensors vs. the max number of allowed sensors for each type on the module.

After a sensor has been added to the selected module, press the created sensor row to find the **REMOVE**, **COPY** and **EDIT** softkeys. Pressing **REMOVE** deletes the sensor from the module. Pressing **COPY** will create a new sensor with the same properties as the highlighted sensor on the selected module as long as the maximum number of that sensor type has not been reached for the selected module. Pressing **EDIT** will enter the sensor setup screen for that sensor type as seen in sections below.

Each sensor setup screen is comprised of two pages: the first page sets up parameters specific to that sensor type and the second page sets up alarm parameters. The alarm parameters have a common setup.

Figure 96
Add Accessory





ACCESSORY ALARM SETUP

Page 2 of the accessory setup contains common alarm settings.

Each accessory type shares these alarm parameters:

SENSOR NAME

Pressing the Sensor Name field at the top right can change the desired name for the sensor.

HIGH/LOW ALARM LEVEL

Enter a value for the sensor type at which the high/low warning alarm alerts an out-of-limits state.

HIGH/LOW ALARM DELAY

Enter a value in seconds that creates a delay between the detection of a high/low alarm condition and the resulting alarm display.

HIGH/LOW ALARM GATING

Select where high/low alarms should display:

- **None:** Accessory alarms can appear regardless of the system state.
- **In Work:** Accessory alarms can only appear in the Work Screen.
- **Safety Input Active:** Accessory alarms can only appear the Safety Input is active.
- **Implement Down In Work:** Accessory alarms can only appear when in the Work Screen with the implement down.

HIGH/LOW ALARM BEHAVIOR

Select how often high/low alarms should display:

- **No Alarms:** Accessory alarms cannot display.
- **Repeatedly:** Accessory alarms can display continuously. Pressing **CANCEL** when the alarm comes up will temporarily disable the alarm until the alarm state is reentered.
- **Once Per Power Cycle:** Accessory alarms can display only once per power cycle.
- **Once Per Safety Input:** Accessory alarms can display only once per Safety Input cycle.
- **Once Per Imp Lift:** Accessory alarms can display only once per implement lift cycle.

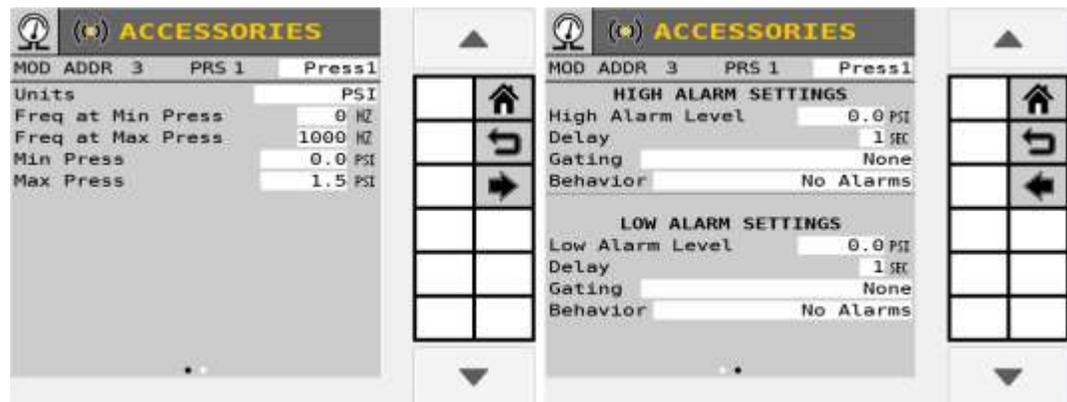


A combination of the gating and behavior alarms determine where and how often an alarm will appear. For example, if Gating is set to **None** and Behavior is set to **Repeatedly**, the alarm will trigger regardless of what screen the user is in and will continuously happen when the alarm state is re-entered.

PRESSURE SENSOR SETUP

Figure 97

Pressure Sensor Setup Pages 1 and 2



SENSOR NAME

Pressing the Sensor Name field at the top right can change the desired name for the sensor.

PRESSURE UNITS

Select between millibar, bar, or KPA for the pressure unit.

FREQUENCY AT MIN/MAX PRESSURE

Enter a frequency value for the minimum/maximum pressure range of the sensor.

MIN/MAX PRESSURE

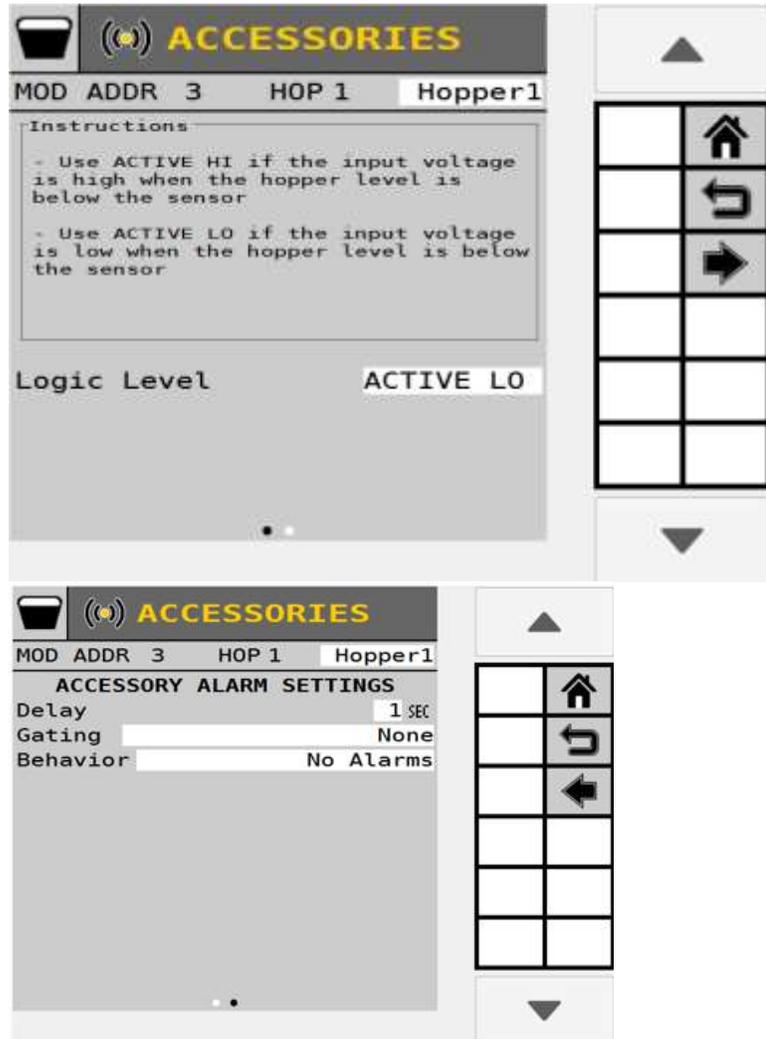
Enter a pressure value for the minimum/maximum pressure range of the sensor.

Refer to Accessory Alarm Setup for details on alarm setup for Pressure Sensors.



HOPPER SENSOR SETUP

Figure 98
Hopper Sensor Setup



SENSOR NAME

Pressing the Sensor Name field at the top right can change the desired name for the sensor.

NOTE

For a Dj Hopper Level sensor, this value should be set to ACTIVE LO.



LOGIC LEVEL

Sets the active state of the sensor and allows flexibility to connect sensors that have different active outputs. There are two settings available:

ACTIVE HI - Sets the active state to “High” signifying that an alarm is generated if the sensor’s output is in a high state. Use this setting if the connected sensor outputs a high condition when active.

ACTIVE LO - Sets the active state to “Low” signifying that an alarm is generated if the sensor’s output is in a low state. Use this setting if the connected sensor outputs a low condition when active.

LOGIC LEVEL TABLE

ENSOR LOGIC LEVEL	VALUE	HOPPER	STATUS	ALARM
Active High	0	Full	Blocked	No alarm
Active High	1	Empty	Not Blocked	Alarm
Active Low	0	Empty	Not Blocked	Alarm
Active Low	1	Full	Blocked	No Alarm

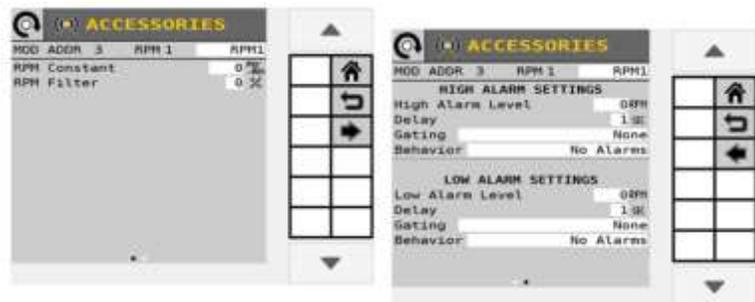
Refer to Accessory Alarm Setup for details on alarm setup for Hopper Sensors.

RPM SENSOR SETUP

IMPORTANT

Performing an Auto Config does not detect installed RPM sensors.

Figure 99
RPM Setup Screen



SENSOR NAME

Pressing the Sensor Name field at the top right can change the desired name for the sensor.



RPM CONSTANT

Enter the number of pulses per shaft revolution. If the sensor is mounted directly to the shaft, the value to enter is the number of pulses generated by the sensor per revolution of the shaft itself. If the sensor is mounted elsewhere, a gear or sprocket ratio must be calculated and entered into the RPM constant.

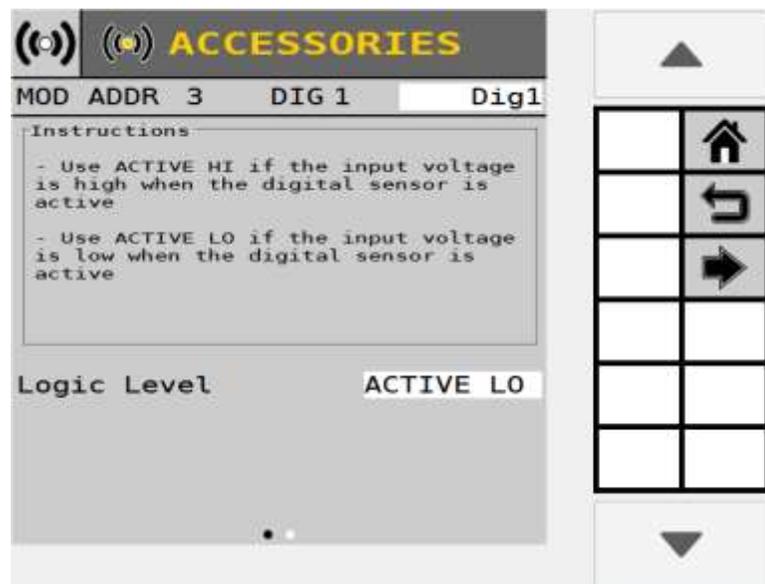
RPM FILTER

Enter a value that filters the signal out of the RPM sensor. Typically no filtering is required so the standard value is set at 0%. If the RPM readout on the Work Screen is oscillating in excess of 10%, increasing the filter value will filter the signal to reduce the oscillation. For a true RPM value this number should be set to 0%.

DIGITAL SENSOR SETUP

Figure 100

Digital Sensor Setup



SENSOR NAME

Pressing the Sensor Name field at the top right can change the desired name for the sensor.



LOGIC LEVEL

Sets the active state of the sensor and allows flexibility to connect sensors that have different active outputs. There are two settings available:

ACTIVE HI - Sets the active state to “high” signifying that an alarm is generated if the sensor’s output is in a high state. Use this setting if the connected sensor outputs a high condition when active.

ACTIVE LO - Sets the active state to “Low” signifying that an alarm is generated if the sensor’s output is in a low state. Use this setting if the connected sensor outputs a low condition when active.

Logic Level Table

SENSOR LOGIC LEVEL	VALUE	ALARM
Active High	0	No alarm
Active High	1	Alarm
Active Low	0	Alarm
Active Low	1	No Alarm

Refer to Accessory Alarm Setup for details on alarm setup for Digital Sensors.



BOUT MARKERS

BOUT MARKER SETUP

Bout Marker output control can be enabled by selecting Enabled in the Marker Control Dropdown.

Checking Up for Marker Feedback enables sensors on the left and right that activate when the respective marker is in the "Up" position.

Checking Down for Marker Feedback enables sensors on the left and right that activate when the respective marker is in the "Down" position.

Table 6. Proximity Sensor States with only Bout Marker Up Sensors Enabled

NOTE		
Because this sensor is detecting the Up condition, if the target is sensed then the sensed state is Up.		

Target	Up Sensor State	Feedback Sensed State
Not Present	LO	Down
Present	HI	Up

Table 7. Proximity Sensor States with only Bout Marker Down Sensors Enabled

NOTE		
Because this sensor is detecting the Down condition, if the target is sensed then the sensed state is Down.		

Target	Down Sensor State	Feedback Sensed State
Not Present	LO	Up
Present	HI	Down

NOTE		
Because both an Up and a Down sensor are present, the cases where both sensors do not detect targets (moving) and where both sensors do sense targets (error) can be handled. If only one sensor senses the target then the Sensed State follows the above cases.		

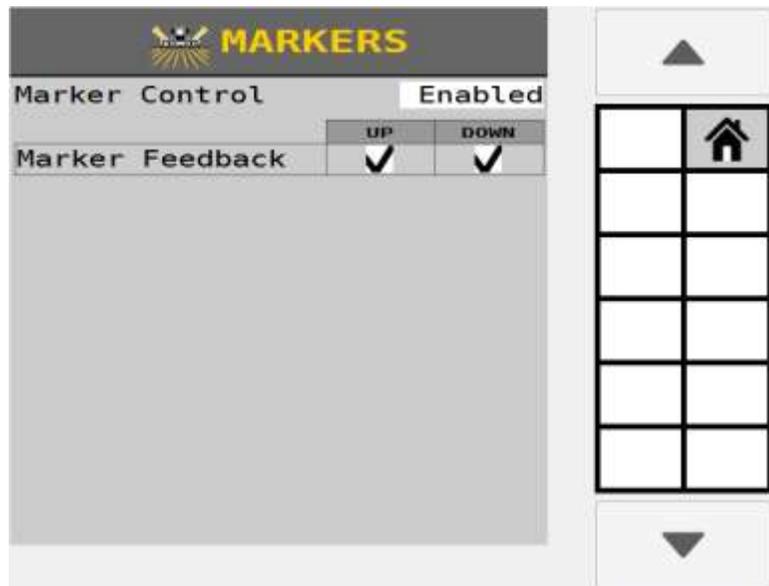
OPERATOR'S MANUAL



Table 8. Proximity Sensor States with Bout Marker Up and Bout Marker Down Sensors Enabled

Up Target	Up Sensor State	Down Target	Down Sensor State	Feedback Sensed State
Not Present	LO	Not Present	LO	Moving
Not Present	LO	Present	HI	Down
Present	HI	Not Present	LO	Up
Present	HI	Present	HI	Error

Figure 101
Marker Setup Screen





CUSTOMIZING THE WORK SCREEN

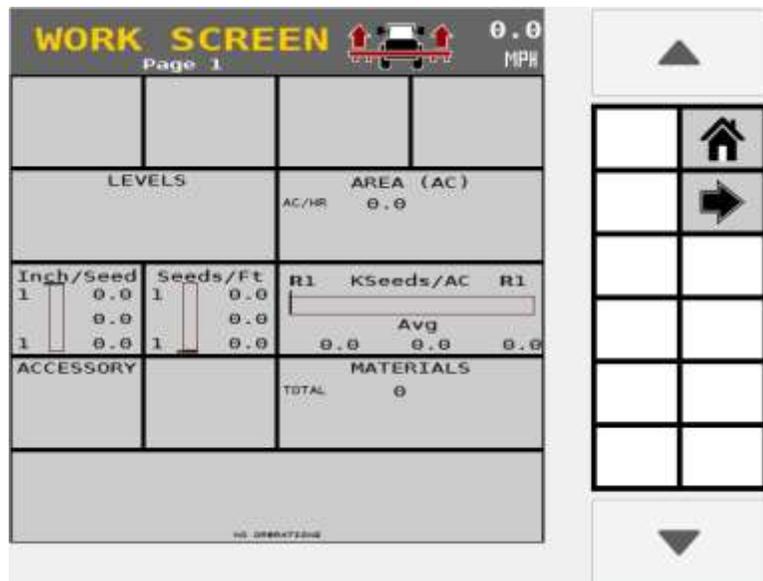
The Instruments screen allows customization of how the Work Screen appears during operation. Two default screens display the most commonly used instruments but can be changed as desired. A total of 4 Work Screens are possible.

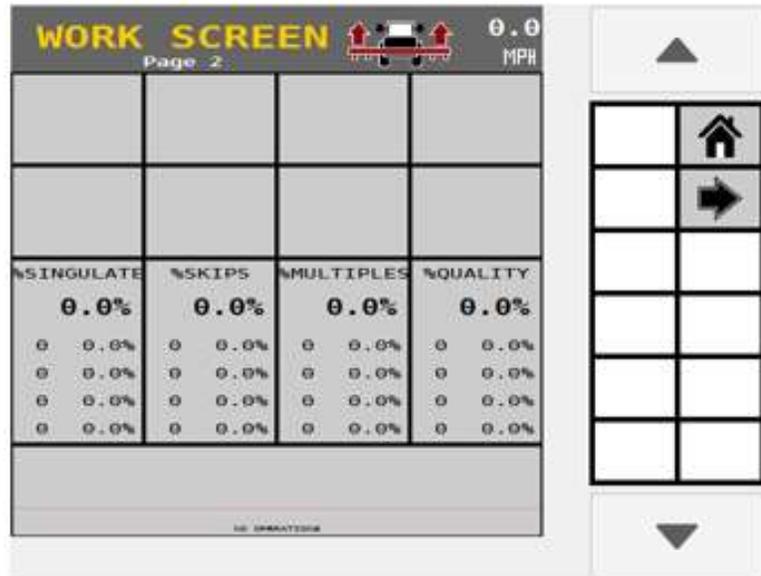
Page 1 and 2 defaults include:

- Product Levels
- Area
- 3 Seeding instruments
- Accessories
- Materials
- Population (bar graphs)
- 4 Singulate instruments
- Quality (bar graphs)

Figure 102

Work Screen Defaults



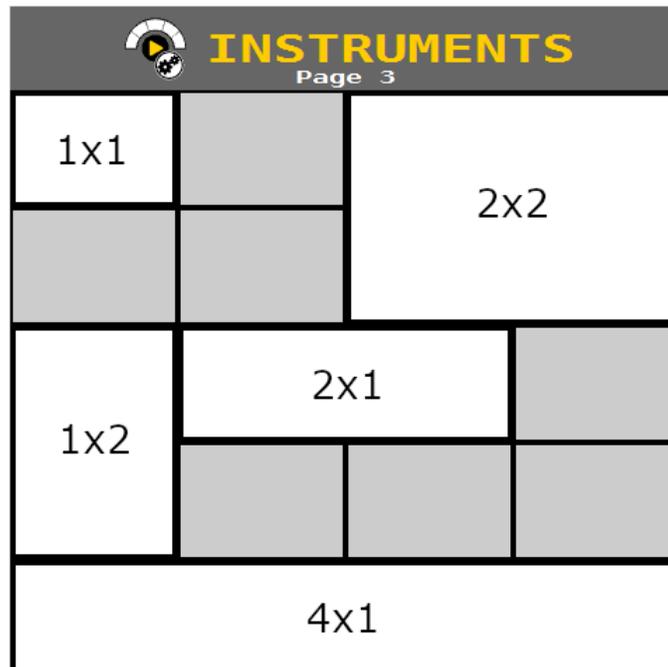


MODIFYING THE INSTRUMENT LAYOUT

The Work Screen layout is divided into 20 cells. Some instruments cover more than one cell depending on the size and orientation selected for the instrument. The choice is selected at the individual instrument setup screens. Up to 4 works screens can be set up at 1 time.

Figure 103

Possible Work Screen Instrument Sizes





SELECTING AN INSTRUMENT

Instruments are the selectable parameters that appear on the Work Screen that monitor control channels, rate targets, individual row performance, spacing, population, ground speed, and coverage area during operation.

Instruments can be selected and placed in any position. Instruments can be changed at any time through the Instruments screen.

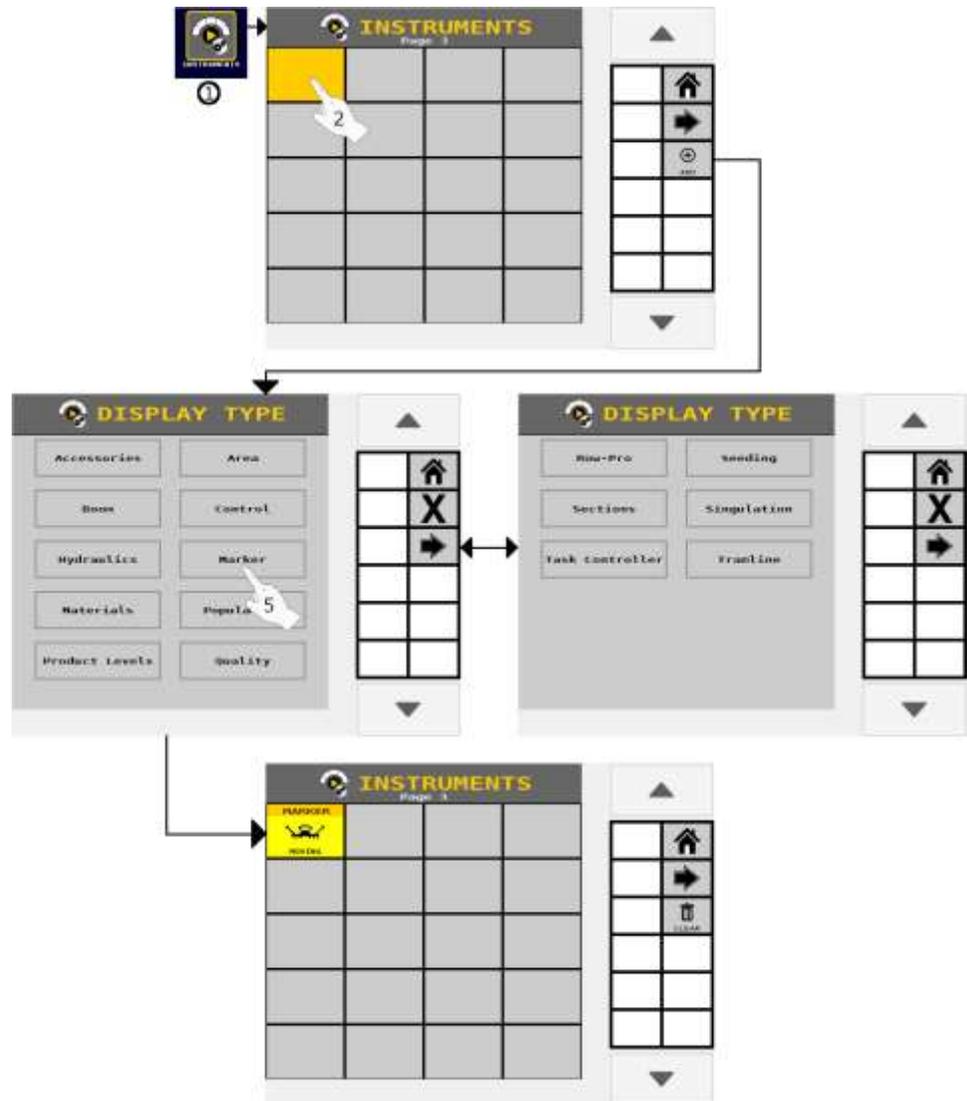
- Any instrument can be placed in any position.
- Certain types of instruments allow duplicate instruments to be configured on a single display if desired.
- Up to four display screens are configurable.
- Existing instruments may limit the size of the neighboring instruments.
- Instrument size and orientation are selected at the individual Instrument Setup screens.
- The size/orientation option will not be selectable if the larger data item selection will not fit on the Work Screen page.

TO SELECT INSTRUMENTS:

1. Press the **INSTRUMENTS** button.
2. Select one of the cells.
3. If an existing instrument with options is selected, hit **EDIT** to change the Instrument properties or **CLEAR** to remove the Instrument. If the cell is blank, hit the **ADD** softkey to add a new Instrument.
4. At the Display Type screen, press a button to select one of the 16 main heading types. Depending on the system configuration, there may be a second page of instrument options.
5. Select the desired data item type and size. Refer to Instruments. Defined section below for definitions. Some instrument types do not require selecting further options.
6. Press the **DONE** key to accept selection.
 - Press the **CLEAR** key to remove selected data item.
 - Press the Arrow key to create a second Work Screen (up to 4 Work Screens).



Figure 104
Adding an Instrument





INSTRUMENTS WITHOUT SETUP DEFINED

Several instruments may be added to the work screens without set up. They include the following:

- Marker (1x1 only)
- Task Controller (1x1 only)

MARKER INSTRUMENT

This instrument displays the current position of the markers. Displays when the markers are up, down, moving, or in an error state.

TASK CONTROLLER INSTRUMENT

This instrument indicates the active status of the task controller.

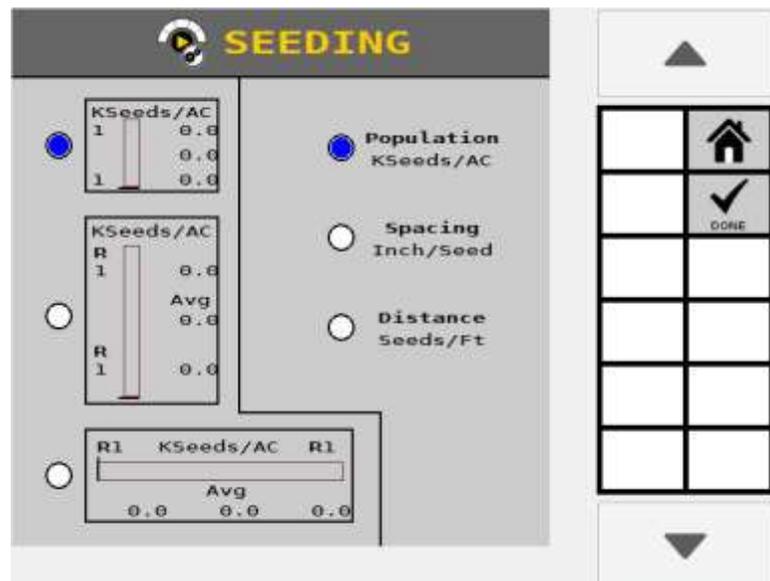
INSTRUMENTS WITH SETUP DEFINED

SEEDING INSTRUMENT

Displays row number (R1 is row 1 in Figure 106) with the min/max/average of the selected instrument; Population (KSeeds/AC or KSeeds/HA), Spacing (Inch/Seed or MM/ Seed) and Distance (Seeds/Ft or Seeds/M).

Figure 105

Seeding Instrument Setup



OPERATOR'S MANUAL



Figure 106
Seeding Instrument Defined (Work Screen)

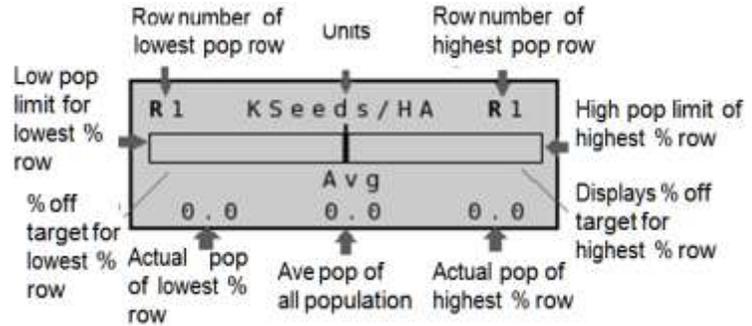


Figure 107
Seeding Instrument Info Page

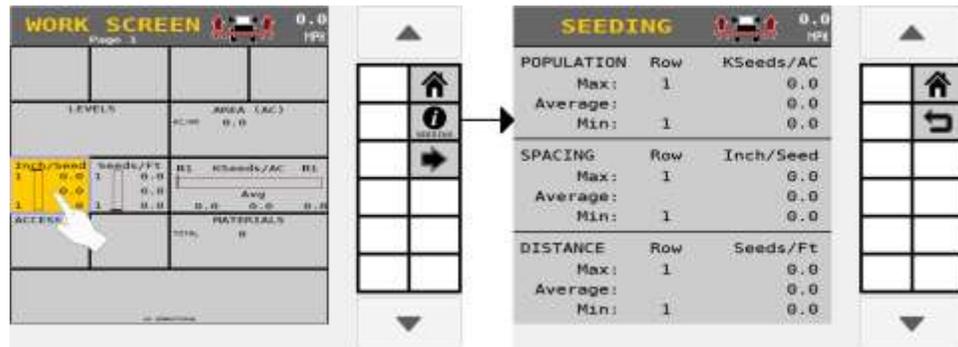
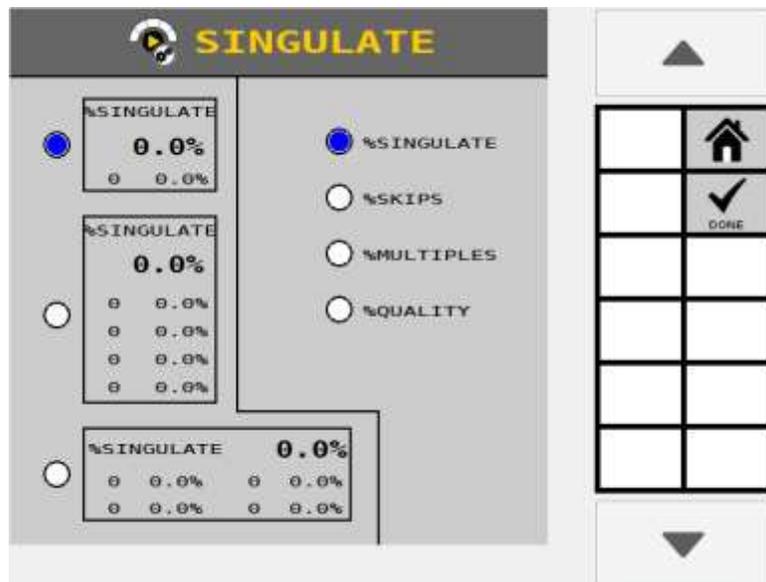


Figure 108
Singulate Instrument Setup





SINGULATION INSTRUMENT

Seed singulation maximum is 196 rows of seed input.

% Singulation

Singulation refers to the portion of seeds planted individually rather than in groups. This instrument displays the average percent seed singulation of the planter's rows that are configured for population in large bold font. Additional information includes the worst four performing rows.

% Multiples

This instrument displays the average percent of multiple seeds dropped within each row in one location in large bold font. Also displays the worst 4 performing rows.

% Quality

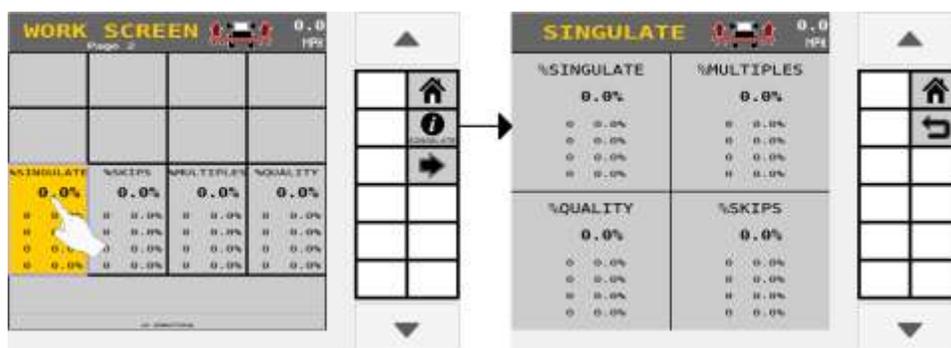
This instrument displays the average percent spacing quality across the planter rows against all planter rows in large bold font. The rows will only have quality data if they are configured on the ISO₆ module with the Advanced Seed Data feature or on a WSMB2 module. The instrument lists the worst 4 performing rows.

% Skips

This instrument displays the average percent of seeding skips in rows with quality data against all planter rows in large bold font. The rows will only have quality data if they are configured on the ISO₆ module with the Advanced Seed Data feature or on a WSMB2 module. The instrument lists the worst 4 performing rows.

Figure 109

Singulate Instrument Info Page



POPULATION BAR GRAPH INSTRUMENT

This instrument displays population status by row and allows customization of the rows that are monitored and displayed on the Work Mode screen. Multiple bar graphs can be added with different settings per bar graph.

OPERATOR'S MANUAL



Width

This instrument selects the graphic size of the bar graphs as either narrow, medium, or wide. The wider bar graphs may not all appear on the first screen if a larger number of rows are monitored.

2x1 (fits 6 wide rows, 12 medium rows, or 24 narrow rows) and 4x1 (fits 12 wide rows, 24 medium rows or 48 narrow rows).

Row Scan

This instruments scans through rows at a fast or slow rate. After the last row displays, the scan rows will re-sequence beginning with the first active row.

Operations

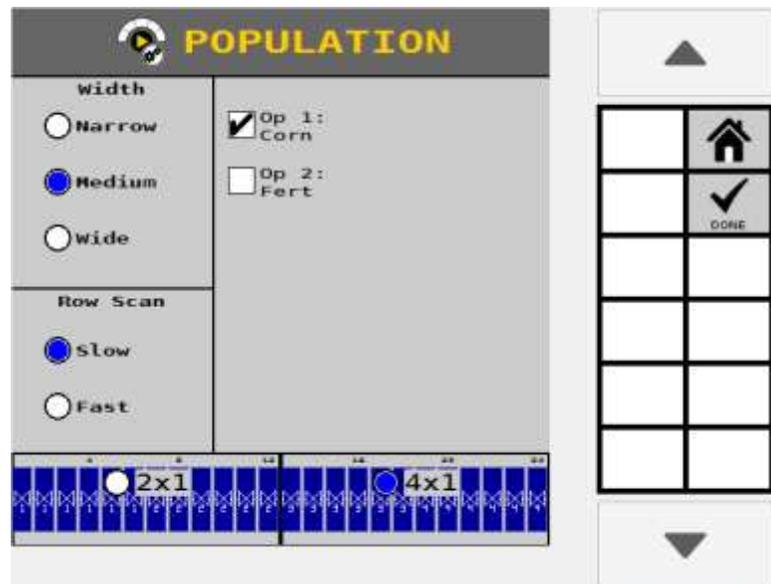
This instrument selects the operations to monitor on the Work Screen.

IMPORTANT

Operations must be selected at this screen to become active on the Work Screen.

Figure 110

Population Bar Graph Setup





QUALITY BAR GRAPH INSTRUMENT

This instrument displays the amount of spacing between each seed while planting that provides a comparison of row-to-row meter performance. Ideal conditions are equal spacing between each seed (100%). As spacing becomes less uniform and more random, the spacing quality percentage decreases and falls below 100%. Multiple Quality bar graphs instruments can be added with different settings per bar graph.

Seed shape, meter type, meter settings, seeding rate, seed bed preparation and vehicle speed are all factors that can affect overall spacing quality.

Width

This instrument selects the width of the bar graphs as either narrow or medium. The wider bar graphs may not all appear on the first screen if a larger number of rows are monitored. 2x1 (fits 6 wide rows, 12 medium rows, or 24 narrow rows) and 4x1 (fits 12 wide rows, 24 medium rows or 48 narrow rows).

Row Scan

This instrument scans through rows at a fast or slow rate. After the last row displays, the scan rows will re-sequence beginning with the first active row.

Operations

This instrument selects the operations to monitor on the Work Screen.

Spacing Variance

This instrument sets the user-defined percentage to set the bar graph range for spacing quality. The bottom of the bargraph will correspond to the user set Spacing Variance subtracted from 100%. A spacing variance of 10% will result in graphs that show quality levels that range from 90% to 100%.

Bar Graph Size

This instrument sets the bar graph size as 2x1 or 4x1 column.

Row Scan

This instrument scans through rows at a fast or slow rate. After the last row displays, the scan rows will re-sequence beginning with the first active row.

Operations

This instrument selects the operations to monitor on the Work Screen.



Spacing Variance

This instrument sets the user-defined percentage to set the bar graph range for spacing quality. The bottom of the bar graph will correspond to the user set Spacing Variance subtracted from 100%. A spacing variance of 10% will result in graphs that show quality levels that range from 90% to 100%.

Bar Graph Size

This instrument sets the bar graph size as 2x1 or 4x1 column.

Row Scan

This instrument scans through rows at a fast or slow rate. After the last row displays, the scan rows will re-sequence beginning with the first active row.

Operations

This instrument selects the operations to monitor on the Work Screen.

Spacing Variance

This instrument sets the user-defined percentage to set the bar graph range for spacing quality. The bottom of the bar graph will correspond to the user set Spacing Variance subtracted from 100%. A spacing variance of 10% will result in graphs that show quality levels that range from 90% to 100%.

Bar Graph Size

This instrument sets the bar graph size as 2x1 or 4x1 column.



Figure 111
Spacing Quality Bar Graph Setup

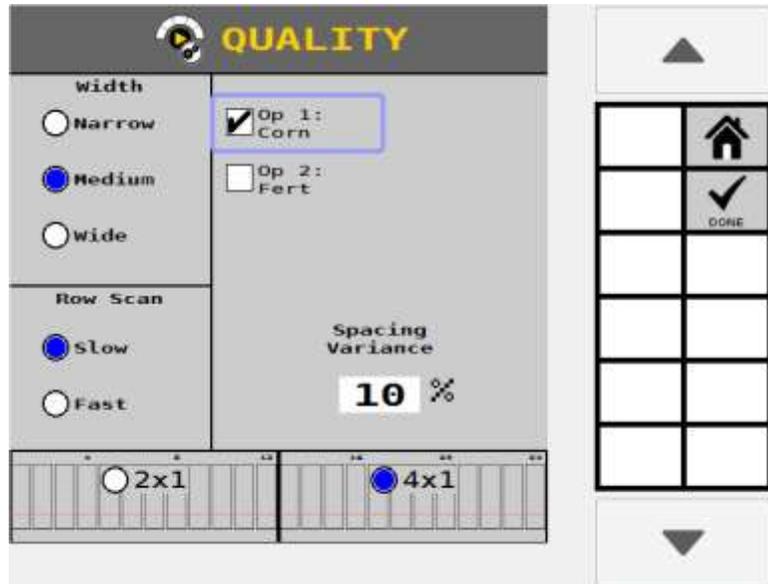
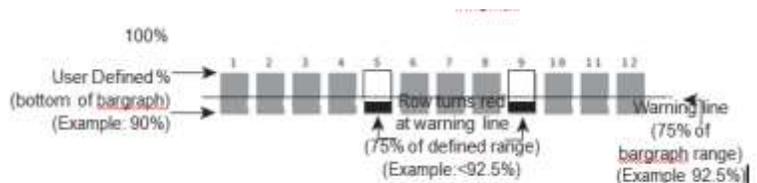


Figure 112
Spacing Quality Bar Graph Defined



AREA INSTRUMENT

Area Per Hour

This instrument displays the current area per hour of the planter in acres (AC) or hectares (HA). The value is continuously calculated based on the current ground speed and implement width.

Channel Scan

When active, this instrument scans through active channels displaying the total acreage covered by a specific channel.

Channel Area

This instrument displays the area covered by control channels 1-8. Area is calculated using the channel width parameter. Area accumulates when the master switch is ON and the ground speed is above the shutoff speed. This accumulator is resettable to 0.0 through the Field Reset key on the Area Info screen or the Totals screen. Current area is retained after power down.

OPERATOR'S MANUAL



Selecting a channel type, e.g. Channel 1 Area, displays area totals specific to that channel.

Material Type Area

This instrument displays 6 material types for a total area: Planter, Granular Seed, Granular Fertilizer, Liquid Fertilizer, Granular Crop Protect, and Liquid Crop Protect.

To display total area of all channels on a particular material type, the product class must be defined at the Material setup screen. When the product class is defined for current channels, this choice appears on the Material Instrument screen (Figure 115).

NOTE

Area Totals for a specific field is selected at the Totals screen.

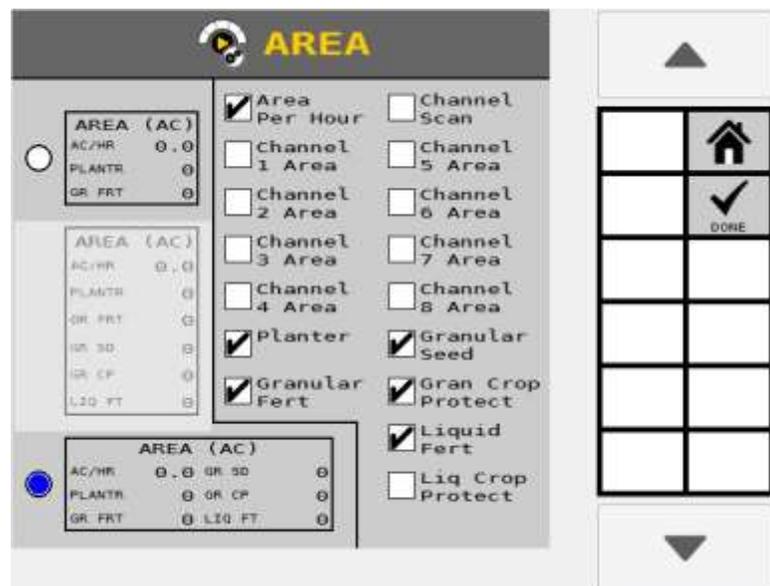
IMPORTANT

Items must be selected at this screen to become active on the Work Screen.

IMPORTANT

An accumulator reset is completed for an entire field. Resetting area to zero for an individual item is not possible.

Figure 113
Area Instrument Setup



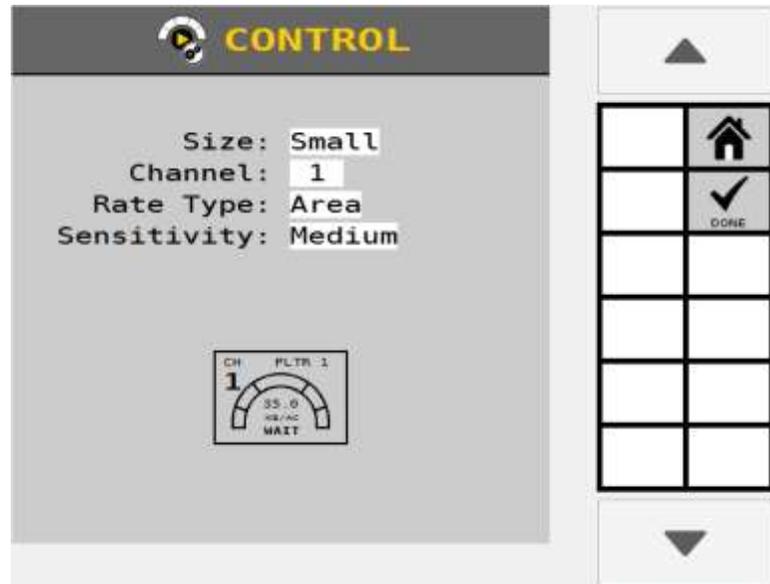


CONTROL INSTRUMENT

1. Select the instrument size ('small' covers 1x1 and 'large' covers 2x2 cells).
2. Select the channel number and the instrument to appear on the Work Screen.
3. Select the Rate Display Type:
 - **Area** - Displays actual application rate values for the desired channel with the target rate value in black. Both rates appear in black within target parameters and red when outside of parameter limits. Only available for channel types that cover an area.
 - **RPM** - Displays the actual RPM of the channel. This option is available for fan and shaft channels. Both target RPM and actual RPM appear in black when controlling within target parameters and actual RPM displays in red when outside of parameter limits.
 - **Time** - Displays actual seeds per second values for the desired channel with the application target rate value in black. Only available for channels that have a per-time rate.
 - **None** - Displays only the target application rate value in black. Does not display an actual rate
4. Select the Sensitivity of the arched gauge:
 - **Fine** - the arched gauge will display green when the actual rate is +/- 3% of the target rate, yellow when >3% and <= 10% error from target, and red when >10% and <12.9% error. When greater than 12.9% error, the gauge will display as red with the indicator dot remaining at the edge.
 - **Medium** - the arched gauge will display green when the actual rate is +/- 5% of the target rate, yellow when >5% and <= 10% error from target, and red when >10% and <12.9% error. When greater than 12.9% error, the gauge will display as red with the indicator dot remaining at the edge.
 - **Coarse** - the arched gauge will display green when the actual rate is +/- 8% of the target rate, yellow when >8% and <= 10% error from target, and red when >10% and <12.9% error. When greater than 12.9% error, the gauge will display as red with the indicator dot remaining at the edge.



Figure 114
Control Instrument Setup



MATERIALS INSTRUMENT

This instrument displays accumulating material totals for distance and seed counts by field. The specific field totals that displays as an Instrument data item is set at the Totals screen.

Total Seeds Applied

This instrument counts pulses for all seed sensors set to population. Also displays total number of seeds planted.

Channel 1- 8 Seeds

This instrument displays the area covered by control channels 1-8. Material distributed accumulates when the master switch is ON and the ground speed is above the shutoff speed. Current material distributed is retained after power down.

Channel Scan

This instrument cycles through active control channels every few seconds displaying material counts.

Material Type

This instrument displays total material distributed by material type that encompasses all channels with the same material type, the product class must be defined at the Material Setup screen. When the product class is defined, this choice appears on the Material Instrument screen.



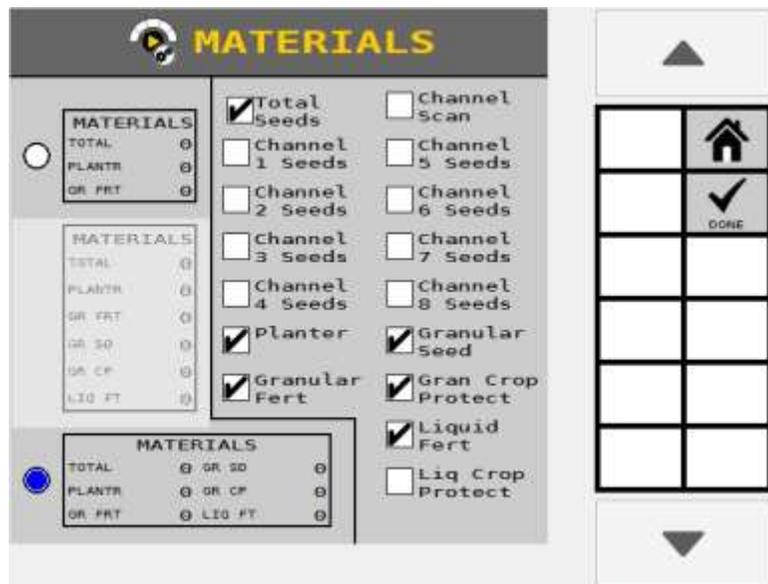
IMPORTANT

Channels must be selected at this screen to become active on the Work Screen.

IMPORTANT

An accumulator reset is completed for an entire field. Resetting to zero for an individual item is not possible.

Figure 115
Materials Instrument Setup



SECTION/BOOM

This instrument displays section status by channel.

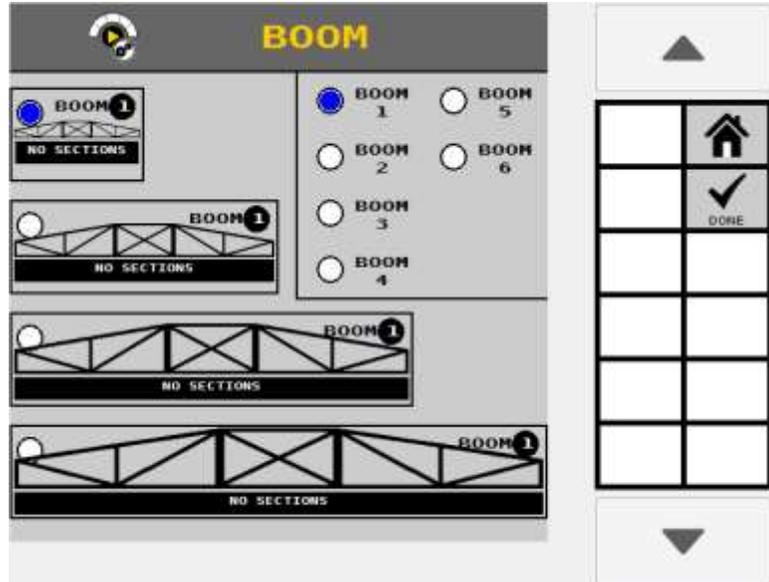
Select the operation number to monitor (Boom 1-6 correspond to Operation 1-6) and the instrument size (1x1 through 1x4 columns) to appear on the Work Screen by pressing the respective radio button.

IMPORTANT

Operations must be selected at this screen to become active on the Work Screen.



Figure 116
Section/Booms



PRODUCT LEVELS

This instrument displays how much product remains in the hopper or tank for the channels selected. All eight channels are selectable.

Product level remaining is tracked by material.

Channel Number

Select the channel number (Channel 1 Level - Channel 8 Level) and the instrument size to appear on the Work Screen (1x1 through 1x2 columns) by pressing the respective radio button.

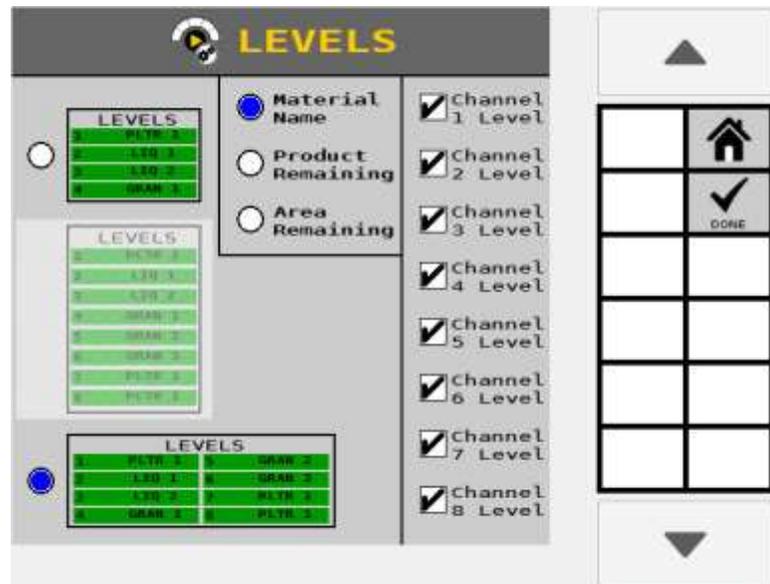
Display Value

Select the value to display on the instrument:

- **Material Name** - displays the name of the material assigned to the channel.
- **Product Remaining** - displays how much material is remaining of the Material assigned to the channel.
- **Area Remaining** - displays an estimate of how much area the channel will cover before the channel's material runs out. This is based off of Material level, application rate, and active channel width.



Figure 117
Product Levels Instrument Setup



ACCESSORIES

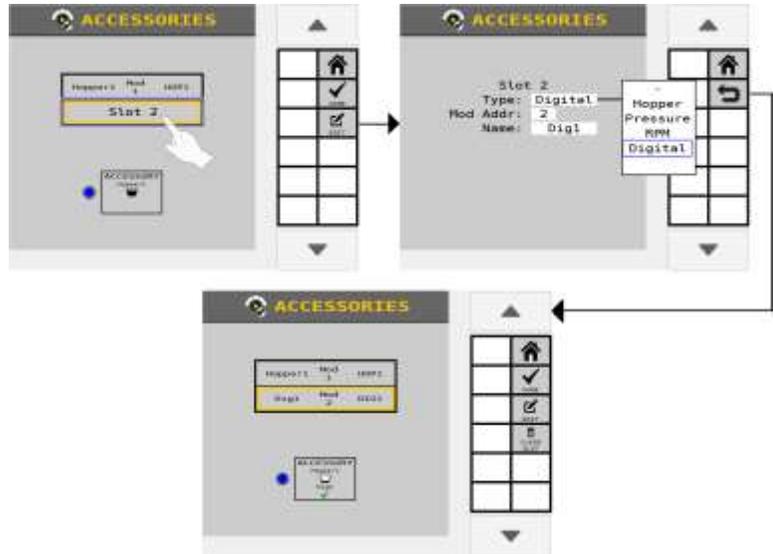
This instrument displays the status of pressure, RPM, hopper, and digital sensors.

TO ADD AN ACCESSORY TO BE DISPLAYED ON THE INSTRUMENT:

1. Select a slot on the instrument to edit. A selected slot will be outlined, and the **EDIT** key will appear.
2. Press the **EDIT** key.
3. Select the accessory type from the drop down list.
4. Select the Module Address of the accessory from the drop down list.
5. Select the Name assigned to the accessory.
6. Press the **RETURN** key to return to the Accessory Instrument Setup main page.



Figure 118
Accessories Instrument Setup





OPERATION

PERFORMING A FILL DISK

Fill Disk fills the seed meters after a material variety change or after power up on air-actuated planters with seed to allow instant seed flow when the control is turned on.

The **FILL DISK** button allows the seed meter to make one revolution.

FILL DISK FOR PLANTER/GRANULAR SEEDING CHANNELS

The **FILL DISK** button at the Work Screen runs the selected channel.

1. At the Work Screen, highlight the appropriate channel.
2. Press the **NEXT PAGE** button to display the **FILL DISK** button.
3. Press the **FILL DISK** button.
4. Raise the implement.
5. With brakes locked and transmission in the park position, start the engine.
6. Engage hydraulics and run engine at normal speed until hydraulic fluid is at operating temperature.
7. Press the **START** button. The seed meters will turn for 1 revolution, then stop.
8. Pressing the **STOP** button will also terminate the test.

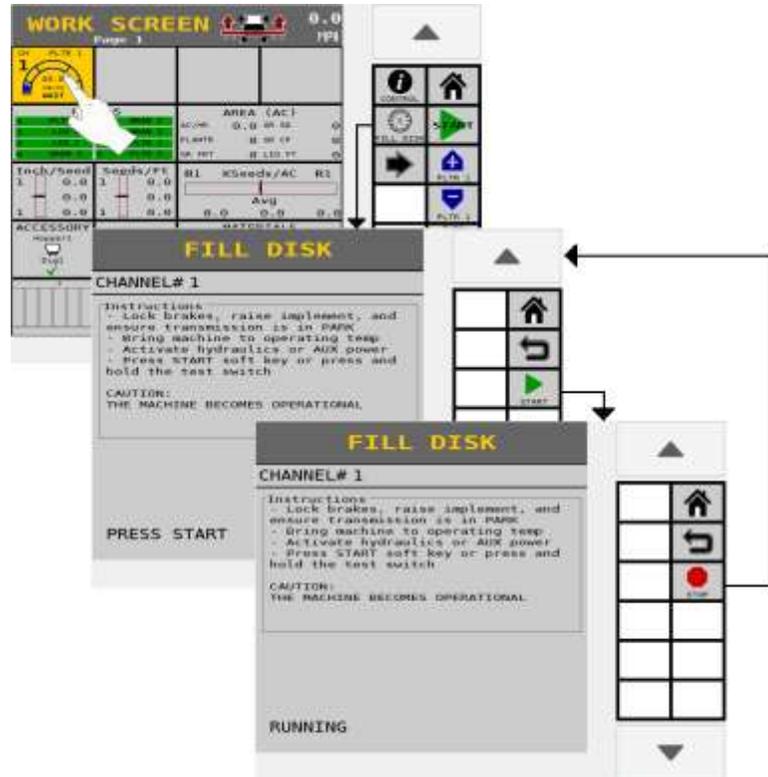
NOTE

Refer to the System Tests section for using a remote test switch during a fill disk operation.

CAUTION

Implement will begin to operate after pressing the Start button. Ensure that all persons and objects are away from the implement to avoid personal injury.

Figure 119
Fill Disk Screen for Control Channels



BEGIN OPERATION

START

1. Lower the implement to operating position, engaging the implement switch, if present and enabled.
2. Ensure the system is engaged with the hydraulic system engaged and the tractor at its normal operating RPM.
3. Set the master/control switch to the ON position or press the **START MASTER** button. All enabled control channels will begin controlling at the current ground speed. All accumulators will begin recording data.

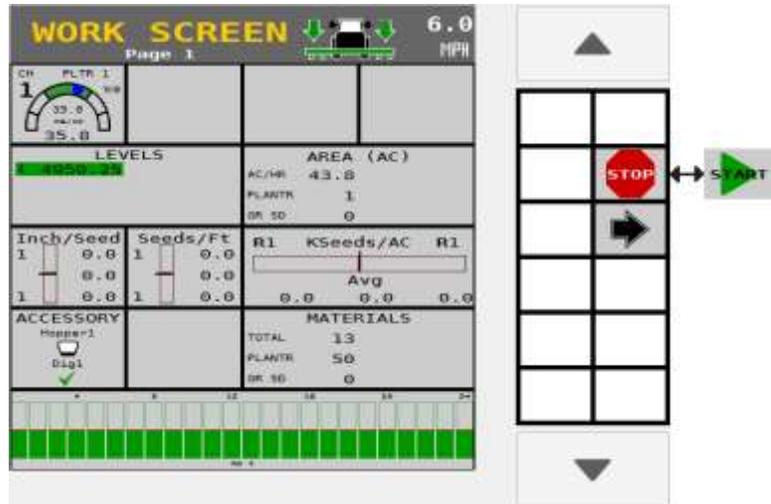


WARNING

When the implement is down and the safety input is active (master switch in the ON position or secondary speed above threshold), the machine is fully operational. All necessary precautions must be taken to ensure user safety. Failure to practice all necessary caution may result in serious injury or death.



Figure 120
Work Mode Start Master Switch On



STOP

1. Set the master/control switch to the OFF position or press the **STOP MASTER** button. All control channels cease operation and all data accumulation halts.
2. Operation immediately stops when the ground speed is 0 or the implement is raised to disengage.

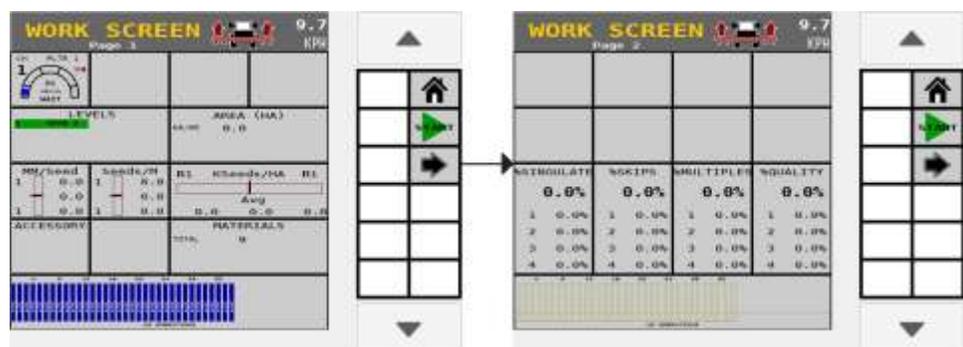
SCROLL WORK MODE SCREENS

Users have the ability to scroll between multiple work screens during operation. A total of four Work Mode screens are accessible during operation if four screens are setup.

TO CHANGE WORK SCREEN VIEW:

At the Work Mode screen, press the Right Arrow button. Continue to press this button to advance to the next screen.

Figure 121
Toggle Work Screens



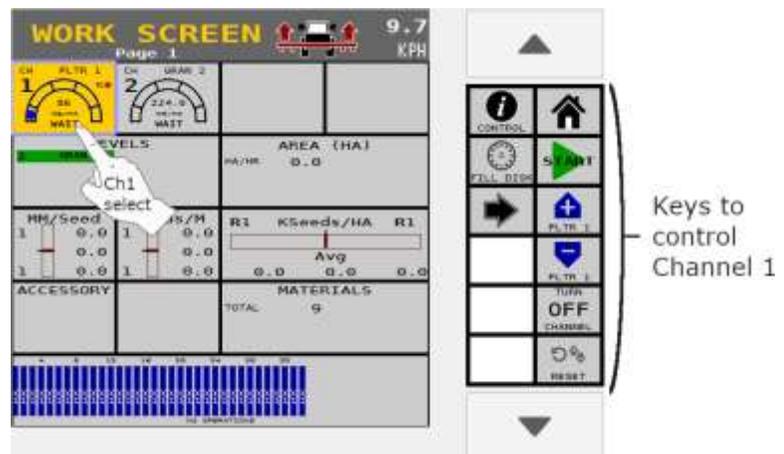


WORK SCREEN FUNCTIONS

The Work Screen in Work Mode displays the various instruments that were selected at the Instruments screen. A total of four Work Screens are accessible during Work Mode if four screens are setup.

In Work Mode, buttons appear on the right side of the screen based on the main instruments selected on the Instruments screen. (Virtual terminals may vary on button locations) (Figure 122) shows channel 1 control instrument selected. All buttons on the right side of the screen affect channel 1. When another instrument is selected, these buttons are replaced with the buttons relative to the newly selected instrument.

Figure 122
Selecting Channel 1 Instrument

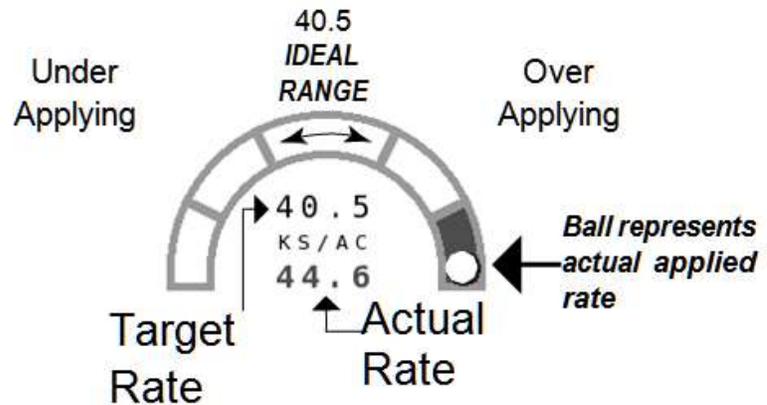


READING THE CONTROL INSTRUMENT

- The status ball represents the actual applied rate of material.
- The arched status bar contains 5 sections. The middle section is the ideal applied rate/target rate (Green). Section percent ranges vary depending on instrument set up. See Control Instrument Setup for more information.
- The rates to the left of the ideal range are under applying rates below the target limit parameters.
- The rates to the right of the ideal range are over applying rates above the target limit parameters.
- The target rate displays as a constant value. Application rates appear in black within target rate range. Rate values appear in red when outside of target rate limit parameters.



Figure 123
Reading the Control Channel



CONTROL CHANNEL ADJUSTMENT

Control channels can be adjusted in Work Mode by selecting the channel on screen (Figure 122). A channel can be adjusted as follows:

- Active channel can be set to ON or OFF by selecting the On/Off Channel button.
- Target rates can be adjusted by using the Inc/Dec buttons and the **RESET** Target button.

INCREMENT

Increases the active channel's target rate by the amount specified in the Inc/Dec % or rate table setup for that material. Increment can be pressed several times to increase the target rate by the specified amount for every actuation, until the maximum rate value or preset value is reached. The active channel/material is displayed in the button text.

DECREMENT

Decreases the active channel's target rate by the amount specified in the Inc/Dec % or rate table setup for that material. Decrement can be pressed several times to reduce the target rate by the specified amount for every actuation, until the minimum rate value or preset value is reached. The active channel/material is displayed in the button text.

INC/DEC RESET TO TARGET

Returns the active channel to the original material target rate. This button is only available for channels that are active and have had the target rate adjusted using the Increment or Decrement buttons in Inc/Dec % mode.



CONTROL ON/OFF CHANNEL

The active channel can be turned either ON or OFF by pressing this button. Channels that are set to OFF will not operate when the master/ control switch is set to the ON position. Turning a channel OFF is not the same as disabling a channel in Channel Setup mode. The active channel is displayed in the button text. If the button text is OFF, this is the action that occurs when the button is pressed.

OPERATE SCREEN SYMBOLS

IMPLEMENT LIFT SWITCH

The Work Screen identifies the implement position as up or down. The implement lift switch automatically turns the control channels on and off without turning the master/control switch off. The Implement Lift Indicator must be in the down position for the control channels to operate.

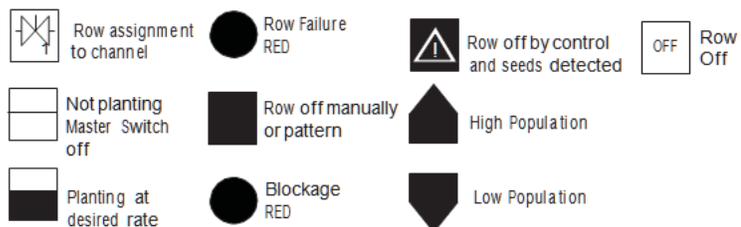
Refer to the Implement Lift Sensor instructions for installation location.

ROW INDICATORS

Row Indicators in the bar graph area of the Work Screen indicate seed rate for each row. The size of the bar graphic is automatically proportional to the screen size. The following symbols illuminate in the bar graph area:

Figure 124

Row Indicator Symbols





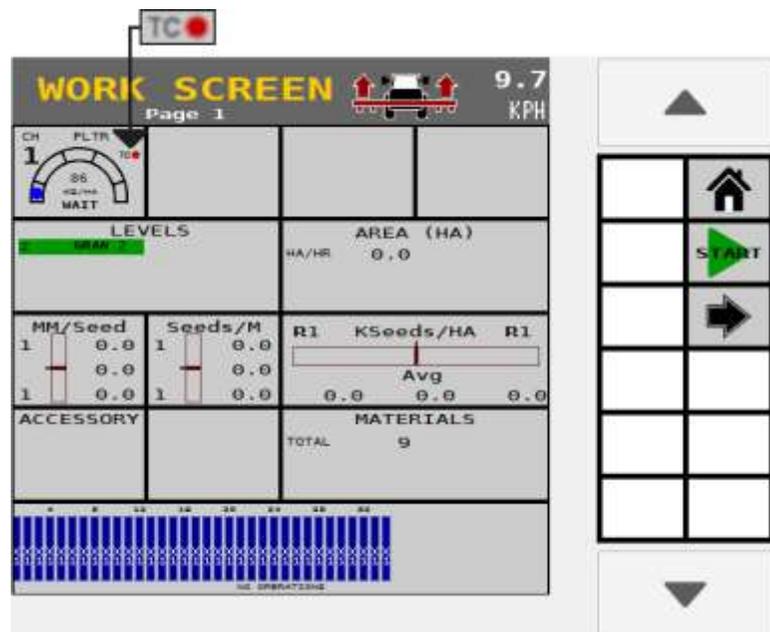
TASK CONTROLLER ICON

A Task Controller icon displays on control instruments during operation to indicate that the task controller function is actively running. The color reflects the current task controller state:

- Red – Task Controller is disconnected.
- Green – Task Controller is connected and applying at the set applied rate.
- Gray – Task Controller is connected and not commanding rate.
- Yellow – Task Controller is connected and is being overridden by Manual Rate Override.

Figure 125

Task Controller



WORK MODE INFORMATION SCREENS

Each instrument on the Work Screen has an associated information screen that provides specific details relating to that item.

Some values can be reset to zero from these Information screens or reset to zero when the master switch is off. Once an accumulator has reached its maximum value, it will roll over to zero.



TO VIEW WORK MODE INFORMATION SCREENS:

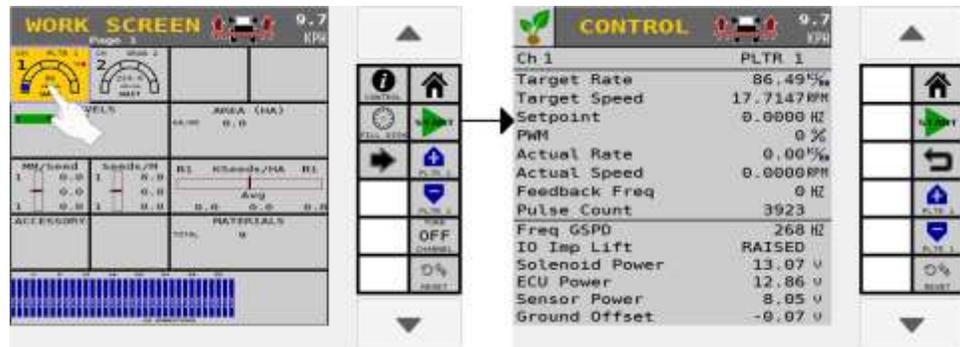
1. At the Work Screen, press the Instrument box to highlight. Refer to Figure 126.
2. The associated **INFORMATION** button appears in the right side bar. Press the **INFORMATION** button to open.

CONTROL CHANNEL

The Control Information screen provides data for the selected channel for feedback sensors, valve output, and system voltages of the ISO₆ module.

This data with descriptions are also found at the Diagnostics screen.

Figure 126
Control Information Screen



SEEDING

The Seeding Information screen provides population, spacing, and distance data with maximum and minimum values by row as well as the overall average data.

POPULATION:

- Seeding row with the minimum and maximum population in thousands of seeds per acre (KSeeds/AC) or thousands of seeds per hectare (KSeeds/HA).
- Average population in thousands of seeds per acre ((KSeeds/AC) or thousands of seeds per hectare (KSeeds/HA)).

SPACING:

- Seeding row with the minimum and maximum spacing in inches.
- Average spacing in inches per seed (Inch/Seed) or millimeters per seed (MM/Seed) of all active seeding rows.

OPERATOR'S MANUAL

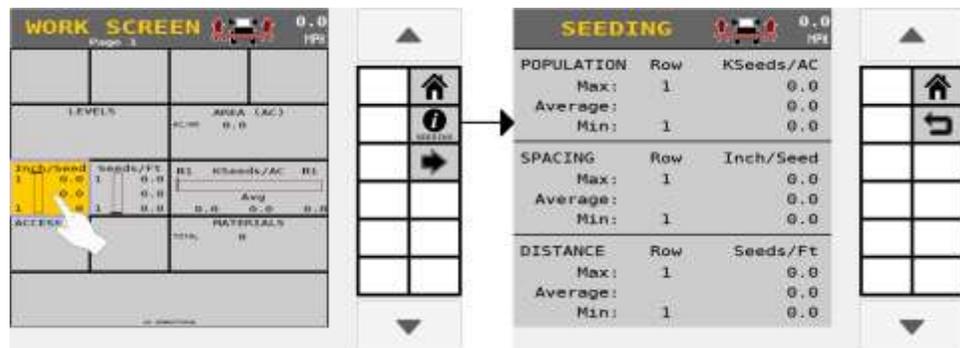


DISTANCE:

- Seeding row with the minimum and maximum number of seeds per foot (Seeds/Ft) or seeds per meter (Seeds/M).
- Average distance displays the average number of seeds per foot (Seeds/Ft) or seeds per meter (Seeds/M) of all active seeding rows.

Figure 127

Seeding Information Screen

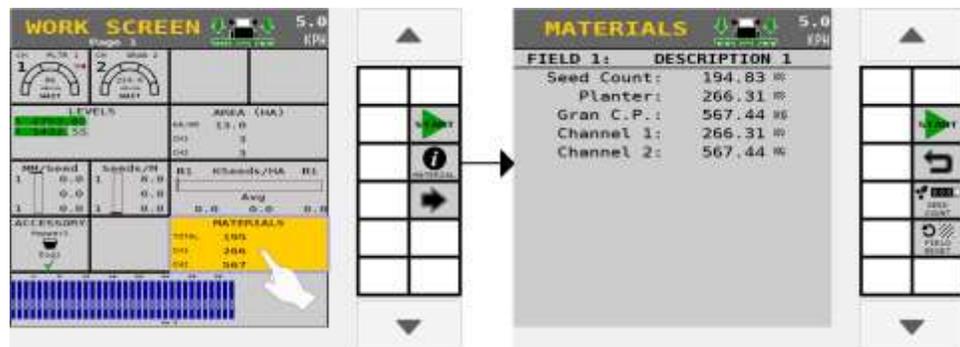


MATERIALS

Provides material totals by a single channel as well as material totals for all similar channels. Material totals are retained after power down. Material reset is completed by pressing the **FIELD RESET** button.

Figure 128

Materials Instrument Info Page



SEED COUNT

A seed count is performed from the Materials Information screen.

TO USE THE SEED COUNT FUNCTION:

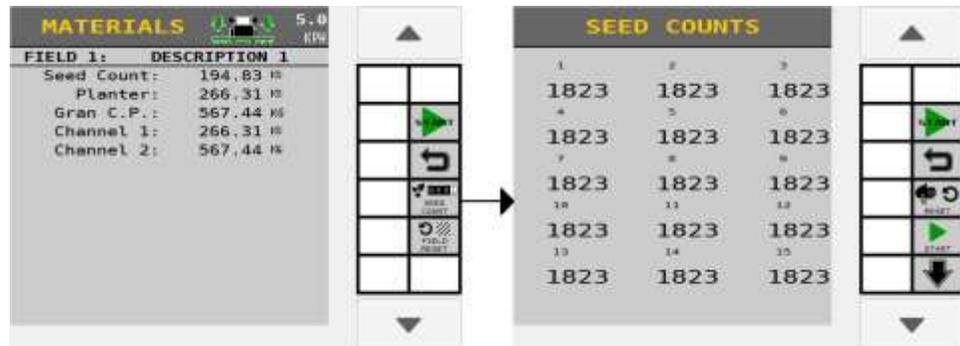
1. Press the **SEED COUNT** button.

OPERATOR'S MANUAL



2. At the **SEED COUNT** screen, press the **START** button. Seed count data for each sensor accumulates when seed drops through the sensor.
 - Press the **DOWN** button to view additional rows.
3. Press the **STOP** button to stop counting seeds.

Figure 129
Seed Count

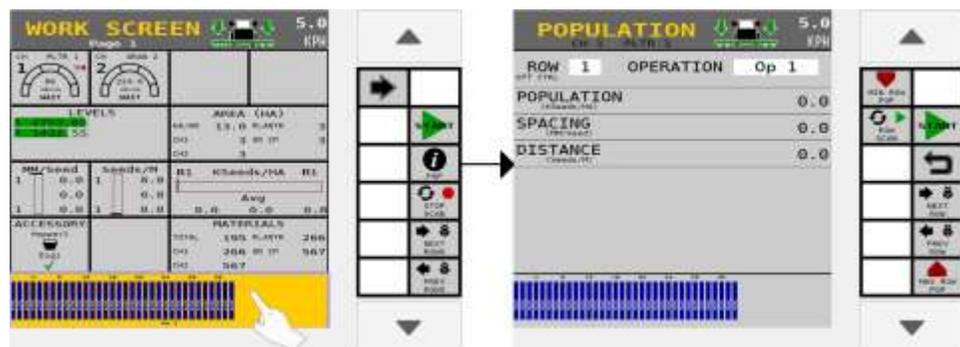


POPULATION

Population Information screen displays complete population data on one screen for a specific row. Highlight the row input box to change to another row or press the **NEXT ROW** button to view data for the next row.

Data specifics for a row include Population, Spacing, and Distance.

Figure 130
Population Bar Graph Info Page



Next Row

Advances to the next row and relevant data.

Previous Row

Advances to the previous row and relevant data.

OPERATOR'S MANUAL



Max Row Population

Displays the row producing the highest population.

Min Row Population

Displays the row producing the lowest population.

Row Scan

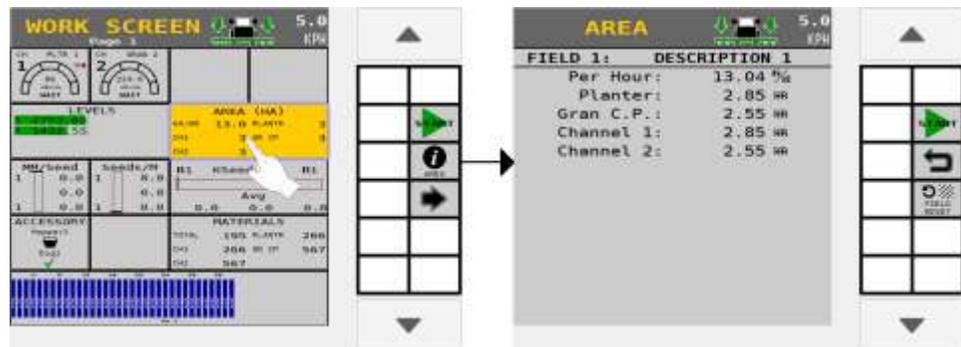
Starts and stops cycling through all active rows and their respective data.

AREA

Provides area totals by a single channel as well as area totals for all similar channels. Area totals are retained after power down. Area total reset is completed by pressing the **FIELD RESET** button. Per Hour displays acres covered per hour and is not re-settable.

Figure 131

Area Instrument Info Page



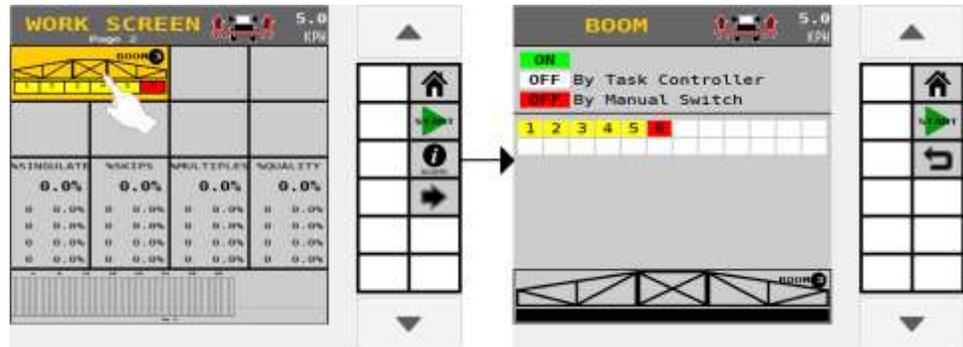
BOOM

Booms indicate the status of each boom section and is only operational with liquid control channels when a DICKEY-john boom switch module and boom output module are installed for boom control. The boom status is indicated in Green, Red, or White.

- Green - Section is on.
- Red - Section is off by manual switch.
- White - Section is off by task controller.
- The boom channel (example below BOOM 1) indicates the active channel.



Figure 132
Boom Instrument Info Page



ACCESSORIES

PRESSURE

Actual pressure measured in oz/in² (kPa) displays for installed pressure sensors.

RPM

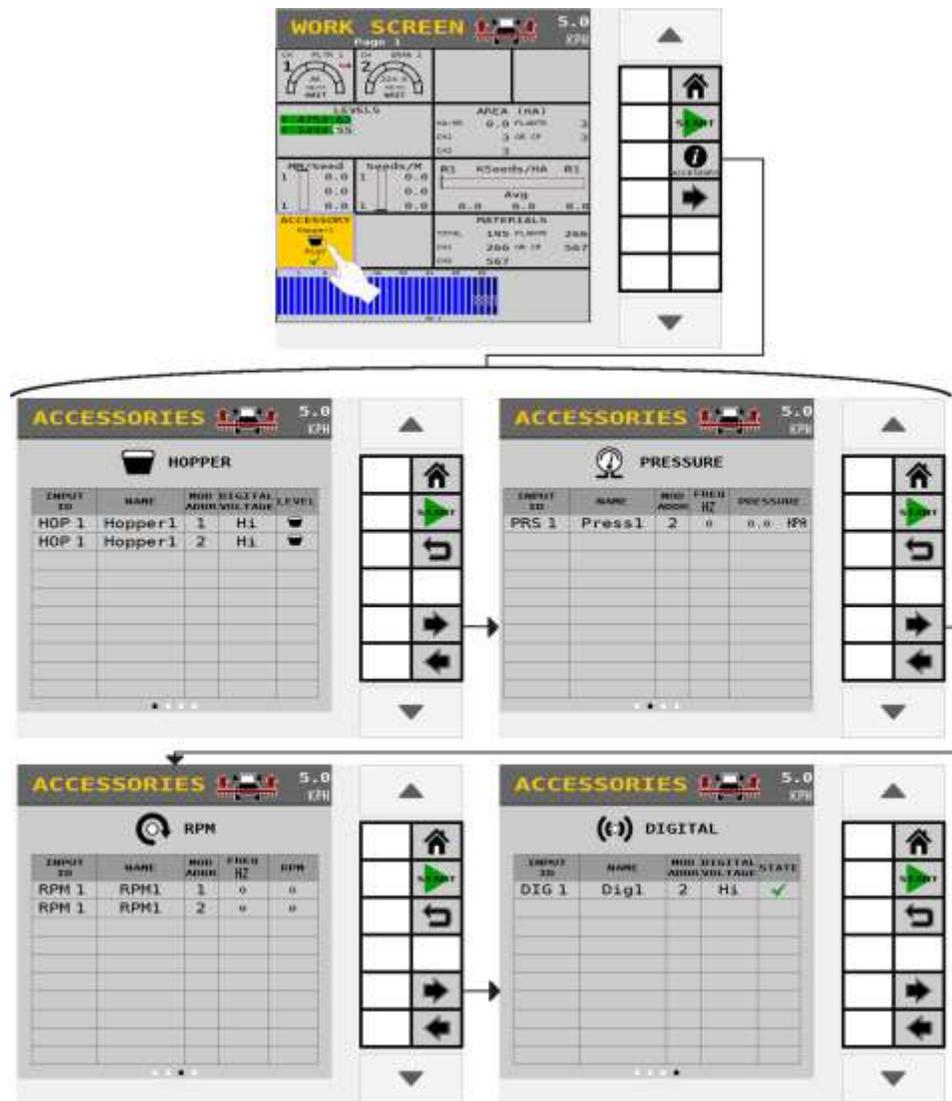
Actual RPM for active shaft/fan sensors displays for installed RPM sensors. HOPPER Empty or nonempty status displays for installed hopper sensors.

DIGITAL

Active (Check) or Inactive (X) status displays for installed digital sensors.



Figure 133
Accessories Instrument Info Page



SEED SINGULATION AND SPACING QUALITY

% SINGULATE

An average singulation percentage displays in the % Singulate column. The average percent seed singulation of the planter rows are configured using an ISO₆ module or a WSMB2 module against all planter rows.

% MULTIPLES

A seed multiples average displays in the % Multiples column; which is the average percent of multiple seeds dropped in one location across the planter.

OPERATOR'S MANUAL



% QUALITY

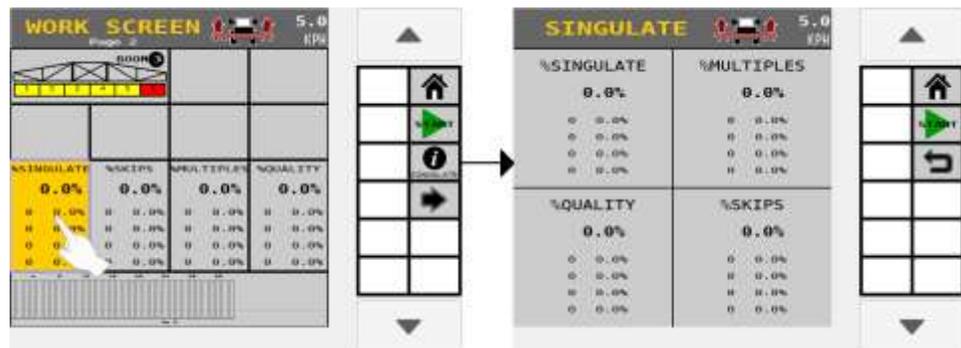
Displays the average percent spacing of quality across the planter rows in the % Quality column.

% SKIPS

Displays the average percent of seeding skips across the planter in the % Skips column.

Figure 134

Seed Singulation and Spacing Quality



QUALITY

Quality bar graph information screen displays complete data on one screen for a specific row. Highlight the row input to change to another row or press the Next Row button to view the next row.

Data specifics for a row include Singulation %, Quality %, Skips %, and Multiples %.

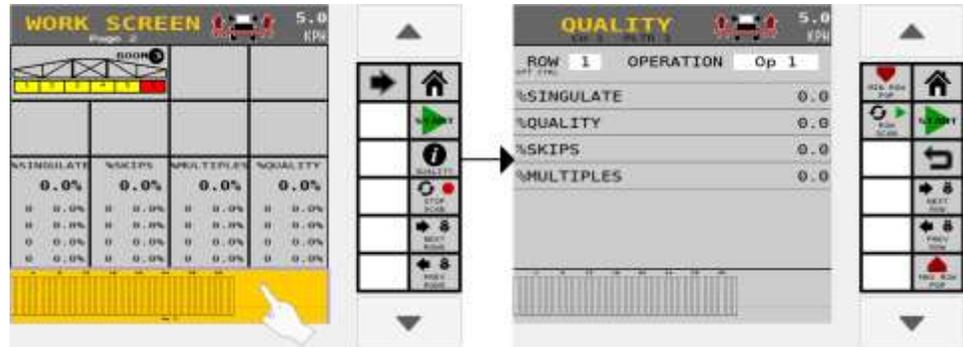
IMPORTANT

Singulation, Quality, Skips, and Multiple % is only calculated for the rows connected to a WSMB2 module or an ISO₆. Any rows connected to a WSMB module will NOT be included in this calculation.

OPERATOR'S MANUAL



Figure 135
Quality Instrument Info Page



Next Row

Advances to the next row and relevant data.

Previous Row

Advances to the previous row and relevant data.

Max Row Population

Displays the row producing the highest population.

Min Row Population

Displays the row producing the lowest population.

Row Scan

Starts and stops cycling through all active rows and their respective data.

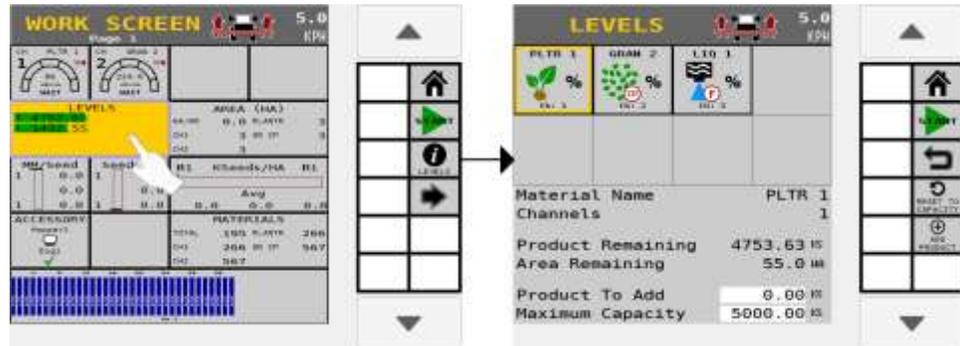


PRODUCT LEVELS

Channel product levels indicate how much product remains in the hopper or tank. Product Levels are tracked according to material. Each material is assumed to have only one tank. The instrument displays the amount of product remaining of the material for that channel. The Info page allows the user to reset or add product to the level of the material. Multiple channels that share the same material will share the same product level. The **RESET TO CAPACITY** button allows you to reset a material to a specified maximum capacity. The **ADD PRODUCT** button allows you to add a specified amount to what is still remaining in your hopper for that material.

Figure 136

Product Levels Instrument Info Page



MARKERS

Indicates the state of left and right markers and displays a moving or error condition. The Markers Instrument does not have an info page.

Marker State

See Marker Setup for more information on possible states. The Instrument shows the following marker states for both left and right markers:

- **Arm/Marker Up:** Marker sensed up.
- **Arm/Marker Down:** Marker sensed down.
- **Yellow overlay:** Marker sensed moving (both Up and Down sensed target not present).
- **Red overlay:** Marker sensed error (both Up and Down sensed target present).

Toggle

Lifts the marker that is down, and lowers the marker that is up.

OPERATOR'S MANUAL



Left Up/Down

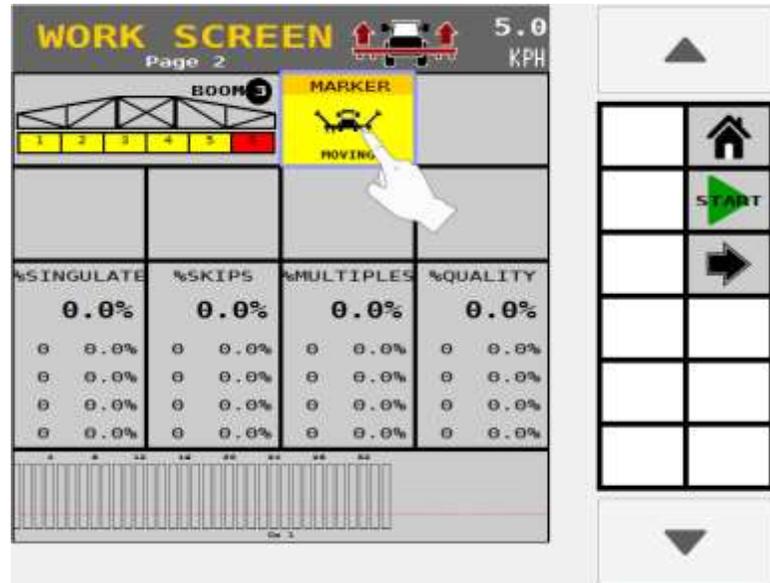
Left Up will raise the left marker. Left Down will lower the left marker.

Right Up/Down

Right Up will raise the right marker. Right Down will lower the right marker.

Figure 137

Marker Instrument



TASK CONTROLLER

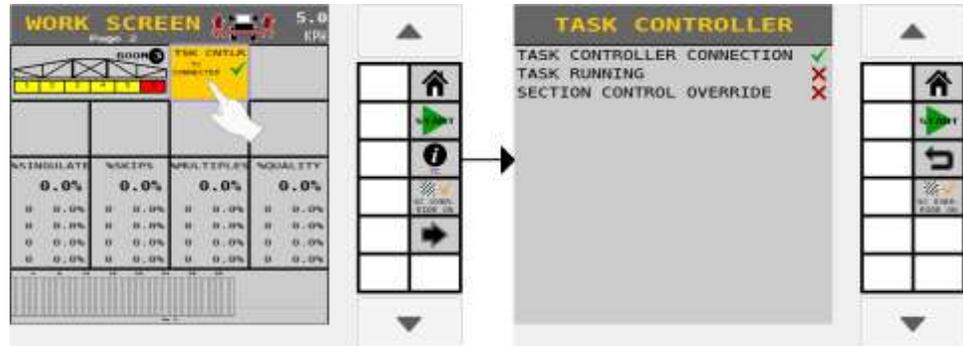
Indicates Task Controller status as connected (Check), disconnected (X), and displays the override (**SC OVERRIDE**) if active.

SECTION CONTROL OVERRIDE BUTTON

Press the **SECTION CONTROL OVERRIDE** button to ignore task controller state commands. This function is useful when planting over an area that is already planted and prevents a reset of the task controller map.



Figure 138
Task Controller Instrument Info Page



USING THE PRECHARGE FEATURE

The Precharge feature is typically used in applications that have significant distance between the storage bulk tank and the implement row unit where seed placement takes several seconds due to the travel time of the seed/ fertilizer from the bulk tank to the ground. When the PreCharge feature is activated, material dispenses at the rate at which the PreCharge ground speed is set.

PRECHARGE FEATURES:

- Operates until the PreCharge time lapses or the PreCharge ground speed is exceeded.
- Aborts when reducing ground speed to 0.
- Displays alarm any time the preset feature is established or changed and the master/control switch is turned on.

This feature does not work for manual or monitor only materials.

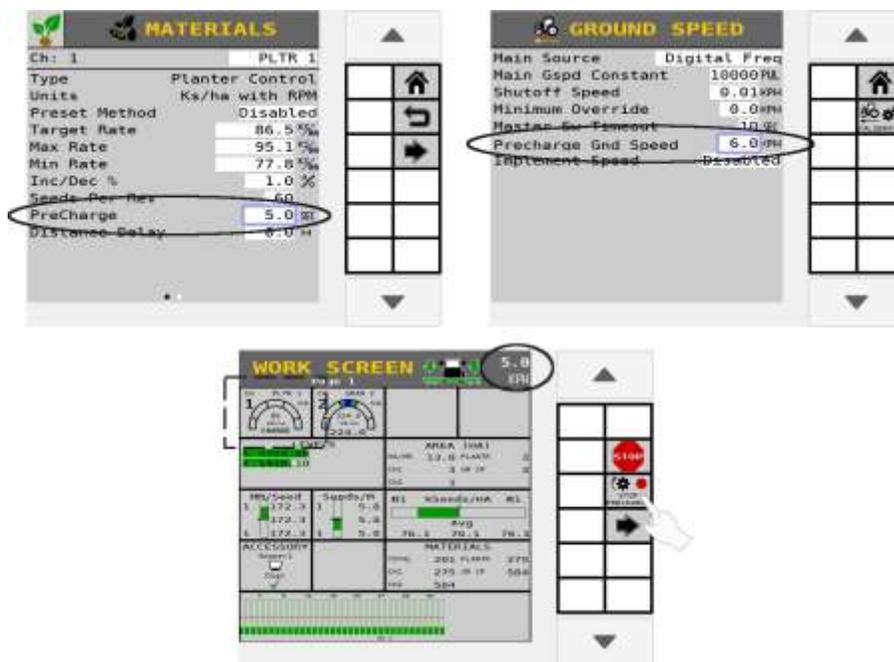
Reference the System Configuration section for control channel and ground speed setup instructions.

Precharge is enabled at the Material Setup and Speed Setup screens.

1. Turn the master/control switch on.
2. PreCharge initiates when the Start PreCharge key is activated and the ground speed is less than the PreCharge ground speed but greater than 0.
 - The rate instrument populates with the word "CHARGE".



Figure 139
PreCharge Feature



DISPENSING MATERIAL WITH FLUSH ENABLE

NOTE

Flush Enable will abort if the button is pressed during a PreCharge state.

The Flush Enable feature is typically used to begin dispensing material at a higher rate when the tractor is below shutoff speed, i.e. during startup or turn around conditions. Material dispenses at the rate set at the ground speed setup screen.

Flush enable is applicable to granular seeding, fertilizer, or liquid control channels.

Reference System Configuration for control channel and ground speed setup instructions.

OPERATING THE FLUSH ENABLE FUNCTION:

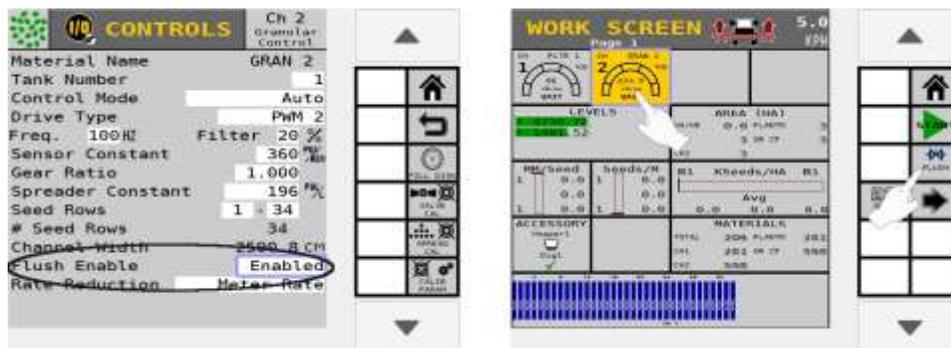
1. Select the desired channel.
2. Verify the master switch is turned ON below shutoff speed. Tractor ground speed must be 0 mph.
3. Press the **NEXT PAGE** button to display the **FLUSH ENABLE** button.
4. Press and hold the **FLUSH ENABLE** button to dispense material.



5. Release the **FLUSH ENABLE** button to stop dispensing material. Once speed is above shutoff speed, flush is aborted and ground speed based control will take over.

Tip: If Flush button does not display on the Work Screen, verify Flush Enable is enabled at Control Channel Setup screen and a Flush Ground Speed is entered at the Speed Set screen.

Figure 140
Flush Enable on Work Screen



MANUAL SPEED MODE

Manual speed mode is typically used when a ground speed sensor failure has occurred. This sets the system to operate using a constant, user specified, internally generated ground speed. This value can be set to any speed within the delivery capabilities of the system.

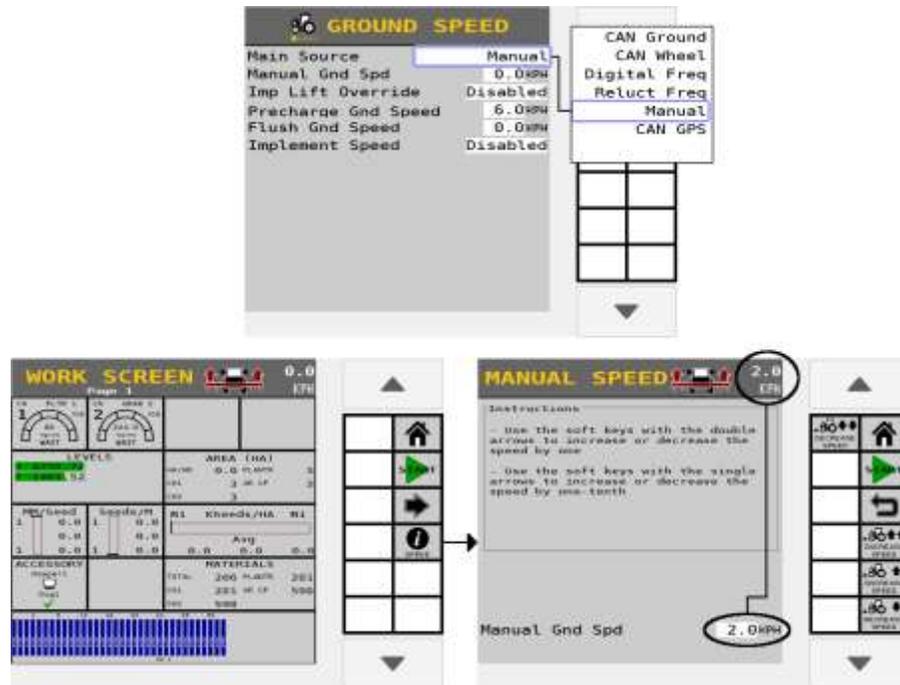
- No ground speed sensor is required when using the Manual setting.
- No area accumulation occurs when speed source is set to manual.

TO OPERATE IN MANUAL SPEED MODE:

1. Press the **SPEED** button and set the ground speed source to Manual.
2. Enter the desired manual ground speed.
3. Press the **HOME** button to return to Home Menu.
4. At the Home Menu, press the **WORK SCREEN** button. The manual ground speed entered at the Speed Set screen displays at screen top.
5. To change the manual speed while operating, press the **SPEED INFORMATION** button.
6. To increase or decrease speed use the Increase or Decrease buttons. Speed is adjustable by one or by one-tenth.
7. Press **DONE** button to return to Work Screen.



Figure 141
Manual Speed Setup and Operation During Operation



TASK CONTROLLER

The Task Controller screen provides the active state of the task controller and the current operations communicating with the task controller. Anytime changes to the system setup occurs the Task Controller momentarily disconnects. Some instances require performing a power cycle.

TASK CONTROLLER COMPATIBILITY

To further refine an operation, such as when the task controller is not communicating properly with the implement, adjustments can be made to correct. Any enabled function at this screen overrides the Operation setup until disabled.

- Disable a channel/operation to prevent data calculations relating to the specific operation from being sent to the task controller.
- Combine channels grouping their data calculations and send to the task controller.
- Combine sections grouping their data calculations and send to the task controller.



NOTE

Some universal terminals have limitations that can cause issues between the task controller and universal terminal. If the system continues to have communication issues, contact DICKY-john Technical Support for assistance at 1-800-637-3302.

TO DISCONNECT TASK CONTROLLER:

1. Press the **TASK CONTROLLER** button.
 - At the Task Controller screen, the image displays the current task controller status.
2. To disconnect, press the **DISCONNECT** button.
3. Press the Checkmark button to reconnect and restart the system. Press the Cancel 'X' softkey to cancel.

TO RECONNECT TO THE TASK CONTROLLER:

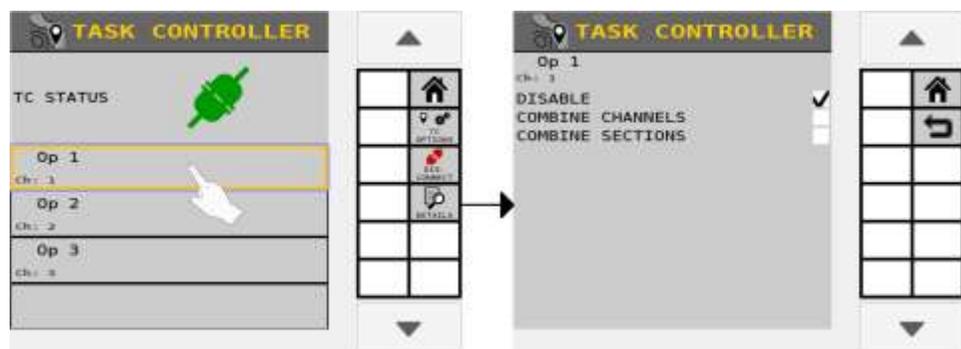
1. Press the **TASK CONTROLLER** button.
2. To reconnect, press the **RECONNECT** button.
3. Press the Checkmark button to reconnect and restart the system.

TO REFINE AN OPERATION:

1. Press to highlight the Operation to change.
2. Press the **DETAILS** button.
3. Select Disable, Combine Channels, or Combine Sections.
4. Hit the Back button to return to the previous screen or the Home button to return to the Home Menu.

Figure 142

Task Controller Operation Details



SELECTING A UNIVERSAL TERMINAL TYPE

The universal terminal type must be selected to identify if the terminal is an AI-120 or standard (all other UTs). The selection of the universal terminal type may resolve compatibility issues with the task controller.



The default setting is set to Standard and only needs changed if an AI-120 universal terminal is installed.

TO CHANGE THE COMPATIBILITY MODE:

1. At the Task Controller screen, press the **TC OPTIONS** button.
2. Press the Compatibility Mode input box and select AI-120.
 - For all other universal terminal types, leave the setting at Standard.

OVERRIDE TC FUNCTIONALITY

The TC functionality can be overridden if it is not reported as supported by the Task Controller. The follow functions can be overridden: TC-Basic, TC-Sections, and TC-Geo. The Reported column will display a green check if support or a red 'X' if not supported.

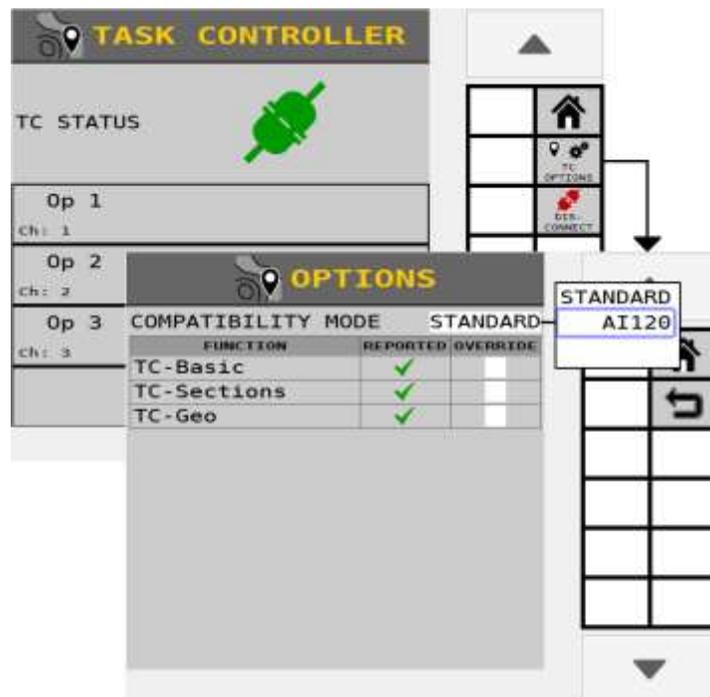
The system will disconnect from the Task Controller if an override option is changed.

TO OVERRIDE SPECIFIC TC FUNCTIONALITY:

1. At the Task Controller screen, press the **TC OPTIONS** button.
2. Press the respective Checkbox in the override column to activate the desired function override.

Figure 143

Selection of Universal Terminal Type





IMPORT/EXPORT DATA

Implement configurations stored on the ISO₆ module can be exported to a USB memory device for transfer to other machines. This file transfer eliminates manual entry of all settings to similar machines.

Only configurations created from the universal terminal can be imported and exported; no configurations created from a computer will transfer.

NOTE

UT must have file server capabilities in order to import/export data.

NOTE

Configuration files are only compatible with the same version set. Version 4.X software is not compatible with Version 3.X software.

IMPORTANT

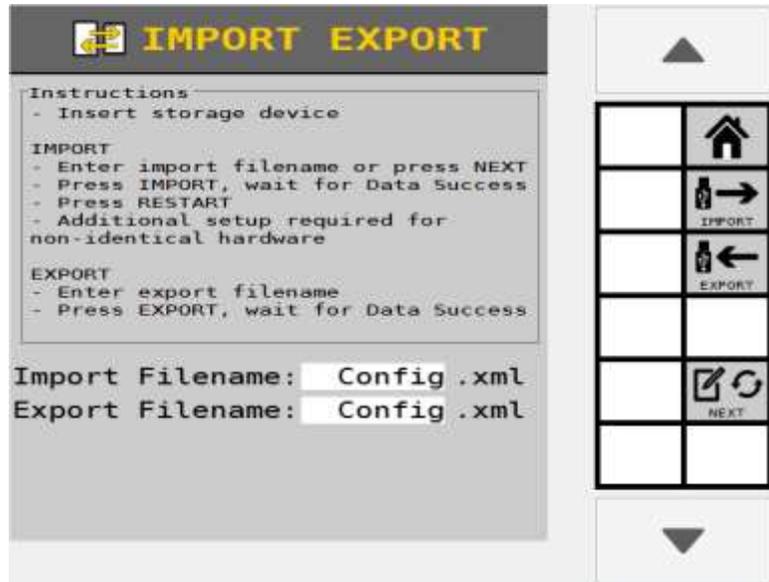
Import/Export does NOT save ECU or other Task Controller functions.

EXPORT DATA

1. Insert a USB memory device in the terminal.
2. Press the **IMPORT/EXPORT** button.
3. Press the Export File name input box and enter a file name. File name is case sensitive and must be exact for the import function to appear.
 - Default file name is Config.xml
4. The new data file name appears in the input box and saved as an .xml file extension.
5. Press the **EXPORT** button.
 - As files are saved, an hourglass flashes at the top of the screen and "Exporting Data...." appears at screen bottom. The user cannot leave the screen until the operation is complete. A successful data transfer appears when complete.



Figure 144
Import Export Screen



IMPORT DATA

1. Insert the USB memory device in the terminal.
2. Verify all modules and sensors are connected properly.
3. Press the **IMPORT/EXPORT** button.
4. At the Import/Export screen, enter the import file name to transfer. File name is case sensitive and must be exact for the import function to appear.
5. Press **NEXT** button to search for the next file or to find a file with a different name other than "Config".
6. Press the **IMPORT** button.
 - As files are transferring, an hour glass spins and "Import Data" appears at screen bottom.
 - The **SET DEFAULTS** button only appears in User Level 3. Press the **SET DEFAULTS** button to save the imported data as the factory defaults. A confirmation screen must be acknowledged for this to occur.
7. Press the Power button to reboot the terminal.



SYSTEM TEST

CONTINUOUS TEST

Performing a continuous test runs the control while stationary for troubleshooting or maintenance purposes. The values entered will not affect any other setup values that have previously been entered.

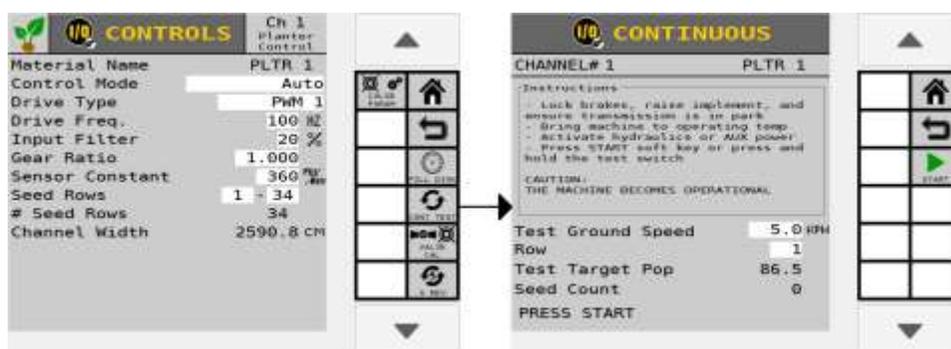
NOTE

A remote test switch is recommended to perform this test.

TO RUN A CONTINUOUS TEST:

1. At the Home Menu, press the **CONTROLS** button.
2. At the Controls screen, select the appropriate channel.
3. Press the **EDIT** button.
4. Press the **CONTINUOUS TEST** button.
5. Enter values to perform a continuous test for
 - Test Ground Speed
 - Row
6. Press the **START** button.
7. Press and hold remote test switch until the test is complete.
8. Release test switch and the control will stop.
9. Press the test switch again to clear the seed count and restart the control.
10. Steps 4-6 will repeat until the Stop button is pressed.

Figure 145
Continuous Test



TEST GROUND SPEED

Desired ground speed reference to perform the test.



ROW

The active row viewed on the system. The row that is set here is the row that reports back a seed count in the Test Seed Count value. The operator can change the row # to get performance of all rows during the continuous test to see row-to-row variability.

TEST TARGET POPULATION

The seed rate at which the test is performed. This value is the current target rate and is automatically populated.

TEST SEED COUNT

The seed count reported back on the specified row set in the row data item and is automatically populated.

NOTE

The Test Seed Count automatically resets whenever a new continuous test is performed.

5 REV TEST

NOTE

Refer to the System Tests section for using a remote test switch during a 5 Rev Test operation.

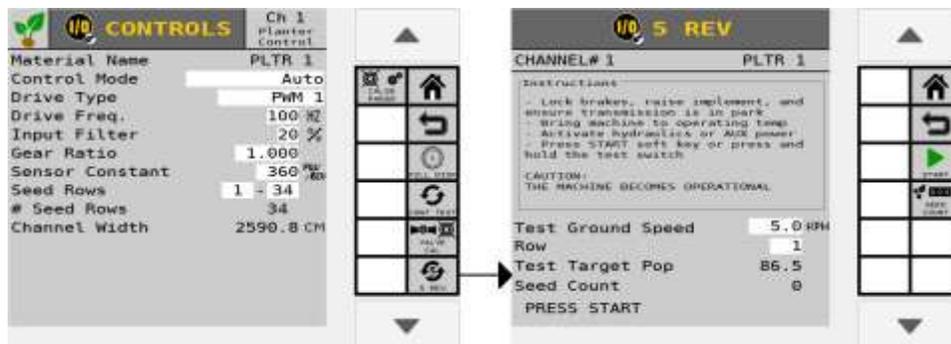
5 Rev Test checks the seed meters for accuracy. When started, the test runs the control for five revolutions of the seed meters then shuts down. The seed count can then be correlated on a row versus the seed count actually dispensed by the meter. A remote test switch is recommended to perform this test. The values entered do not affect any other setup values that have previously been tested.

TO PERFORM THE 5 REV TEST:

1. At the Control screen, select the appropriate channel for the test.
2. Press the **EDIT** button.
3. Press the **5 REV** button.
4. The following parameters must be entered to perform a 5 Rev Test.
 - Test Ground Speed
 - Row
5. Press the **START** button. The test runs for 5 revolutions then stops.



Figure 146
5 Rev Test Screen



TEST GROUND SPEED

The ground speed reference used to perform the test.

ROW

The active row configured in the system. The row that is set here is the row that reports a seed count in the Test Seed Count value. The operator can change the row # to get the seed count of all rows during the test.

TEST TARGET POPULATION

The seed rate at which the test is performed. This value is the current target rate and is automatically populated.

TEST SEED COUNT

The seed count that automatically populates on a specified row set.

REMOTE TEST SWITCH

A momentary switch can be purchased from DICKEY-john that allows the control to be turned on when pressed and held during the fill disk, valve calibration, K-Factor calibration, spreader calibration, continuous test, and 5 Rev tests. Releasing the button stops the operations. Using a remote test switch allows the operator to go back to the implement to perform the test and investigate mechanical issues or perform seed counts instead of performing the test inside the cab from the terminal. The test switch only functions when the implement switch is in the up (off) position.



NOTE

Test Seed Count automatically resets whenever a new continuous test is performed.

NOTE

The remote test switch connects to the actuator harness. Remote test switch part number is 464210515S1.



CAUTION

Once testing is complete, the remote test switch should be disconnected to prevent accidental control engagement.



ACCUMULATORS

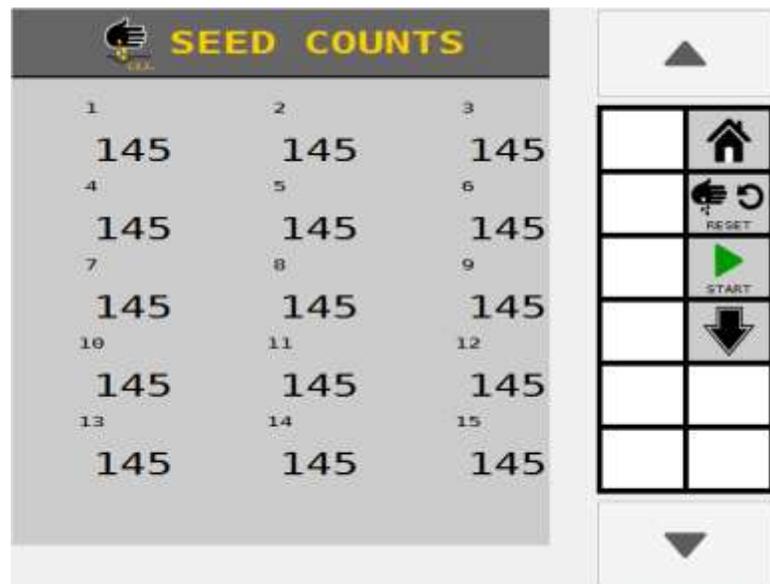
SEED COUNT

Displays the number of seeds detected by each sensor. Individual seed rows can be assessed and seed counts for those rows can be accumulated. Up to 15 row numbers display at one time.

TO USE THE SEED COUNT FUNCTION:

1. Press the **SEED COUNTS** button.
2. Press the **START** button. Seed count data for each sensor accumulates when seed drops through the sensor.
 - Press the Down button to view additional rows.
3. Press the **STOP** button to stop counting seeds.
4. Press the Home button to exit or the Back button to return to the System menu screen.

Figure 147
Seed Count Screen



TOTALS

The Totals screen displays the total amount of time the system has been on, the amount of time and area application control has occurred, and the distance traveled and active field description.

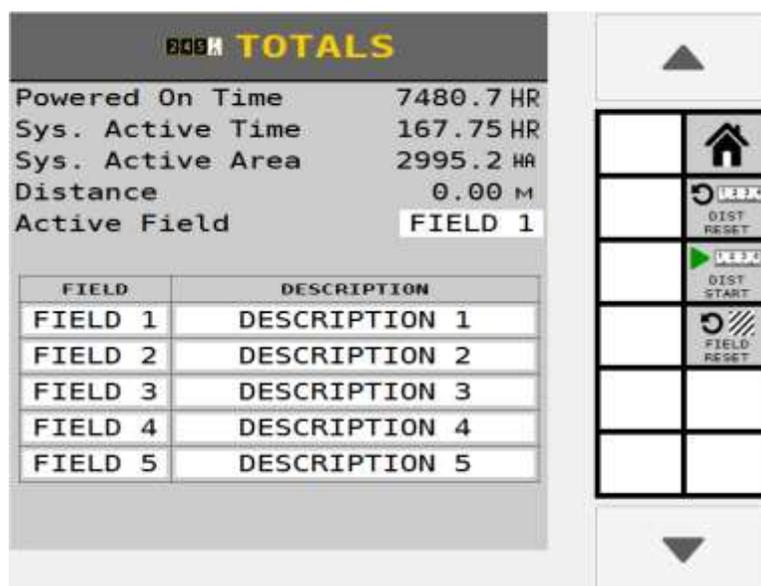


TO VIEW TOTALS:

1. At the Home Menu, press the **TOTALS** button.
2. Select the active field to report totals on the Work Screen.
 - Field totals display in the Materials and Area Instrument Information Screen.
 - Field names and descriptions can be renamed by pressing the respective input boxes.
 - Up to five field totals are possible.

Figure 148

Totals Screen



POWERED ON TIME

Powered On Time is the accumulated time, in hours, that the system has been powered ON. Powered On Time accumulates regardless of the mode of operation - whether it is in Setup or Operate mode.

SYSTEM ACTIVE TIME

System Active Time is the accumulated time, in hours, that the machine has actively been controlling. System Active Time accumulates whenever seeds are detected on at least one sensor. Planting time does not accumulate during an ALL ROWS FAILED condition.

SYSTEM ACTIVE AREA

System Active Area is the accumulated area covered while the master/control switch is ON. System Active Area cannot be reset.



DISTANCE

Distance is the accumulated distance, in feet (meters), that the implement has traveled. The Distance accumulator function is controlled by using the following procedures:

1. Press the **START DISTANCE** button to begin accumulating distance. This occurs whenever there is ground speed.
2. Press the **STOP DISTANCE** button to stop distance accumulation.
3. Press the **RESET DISTANCE** button to reset the value back to 0.0.

ACTIVE FIELD

Select the desired field to display the current totals for a field that appears on the Work Screen in either the Materials or Area Instrument data item. Each field can be renamed. The user can also enter a description for each field. The current active field can be reset by pressing the **FIELD RESET** softkey. The field stores the following information:

- Material and Channel Area accumulator.
- Population, Material, and Channel Application accumulator.



VERSION INFORMATION

IMPORTANT

The master switch must be off to view Version Information screens.

The Version Information screen displays the module software versions and serial numbers of all modules connected to the system. This information may be required when troubleshooting. No information on the screen can be edited.

Each module connected is identified by module type (i.e. WSMB-RSM), module position (i.e. MOD ADDR 1), and serial number (i.e. S/N 18847). Module position cannot be altered on this screen.

There is also a softkey that can be used to restart the WSMT without turning off the tractor ignition.

TO VIEW VERSION INFORMATION:

1. Press the Version softkey at the Main Menu screen.
2. Press the Down button to access additional screens displaying all module types.

NOTE

Entry of passwords to change user levels is accessed at this screen. Reference the User Level section.

Figure 149
Version Screen

OPERATOR'S MANUAL



 VERSION	
WSMT	
MOD ADDR 1	IntelliAg3 04.15 18.06.18.09
S/N 123402355	TEST 02.04 17.06.09.12
MAIN	
	APP 04.15 18.06.18.09
	BOOT 01.09 18.02.22.15
MONITOR	
	APP 04.00 18.03.01.15
	BOOT 01.02 17.05.30.10
CONTROL	
	APP 04.05 18.03.01.14
	BOOT 01.02 17.06.09.12

▲

	
	 PASSWORD
	
	
	 RESTART

▼



FACTORY RESET (USER LEVEL 3)

Level 3 Users have access to restore system settings to:

- **FACTORY DEFAULTS** - restores configuration files to factory defaults.
- **OVERWRITE DEFAULTS** - configuration files set by the user that overwrites factory defaults.

CAUTION

Performing a factory reset should be completed by an authorized service technician. Restoring or overwriting current configuration files removes the user-defined configuration settings. User-defined configuration files can be exported to a USB memory device for importing a later time, if desired.

TO RESET MEMORY:

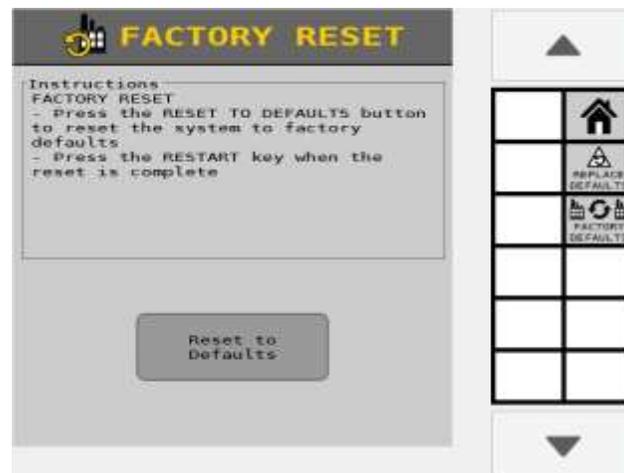
1. Press the **FACTORY RESET** button.
2. Select the button type to Reset to Defaults.
3. Press the Checkmark button to begin system reset.
 - Press the Cancel 'X' button to cancel reset.

TO CHANGE DEFAULTS:

1. Press the **FACTORY RESET** button.
2. Press Replace Defaults or Factory Defaults.
 - Replace Defaults overwrites the system defaults to the current system configuration.
 - Factory Defaults sets the system defaults to the defaults programmed from the factory.
3. Press the Checkmark button to begin system reset.
 - Press the Cancel 'X' button to cancel reset.

Figure 150

Factory Reset Screen





ALARMS

Alarms display when an abnormal event occurs outside of normal parameters. Alarms are typically in a full screen display describing the alarm and may give instructions on how to fix the alarm. Each alarm has an associated alarm number. Some alarms (such as the master/control switch alarm) require a specific action by the operator before the alarm condition will cease. In these cases, instructions are indicated on the alarm display.

Alarms can be acknowledged by pressing the **CANCEL** button. Detailed information about the alarm can be accessed by pressing the **ALARM INFO** button.

ALARM LOG AND DETAILS

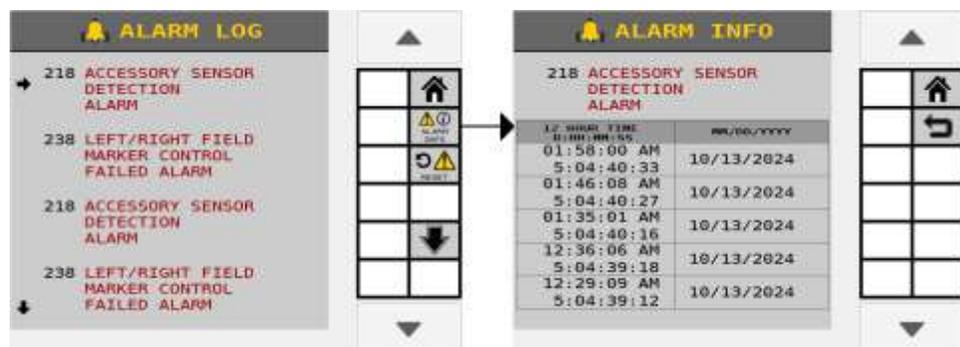
An Alarm Log provides a list of specific alarms issued during system operation. Information displayed is informational only and cannot be edited. Each time specific alarm conditions are detected, it is logged and communicated to the ISO₆ module.

TO VIEW ALARM LOG AND INFO:

1. Press the **ALARM LOG** button.
2. At the Alarm Log screen, a list of alarms displays.
 - Alarm number and description displays
 - Up to 20 alarms can be recalled
 - Each alarm occurrence can have up to 5 instances of the alarm tagged with a date and time stamp.
3. To select specific alarm details, press the Previous or Next buttons to move the small display arrow next to the desired alarm number.
4. Press the **ALARM INFO** button to view all of the occurrences of the selected alarm.
 - The down arrow in the lower left at screen bottom signifies that more alarms are present and accessible by pressing the Previous or Next buttons.

Figure 151

Alarm Log and Detail Screen



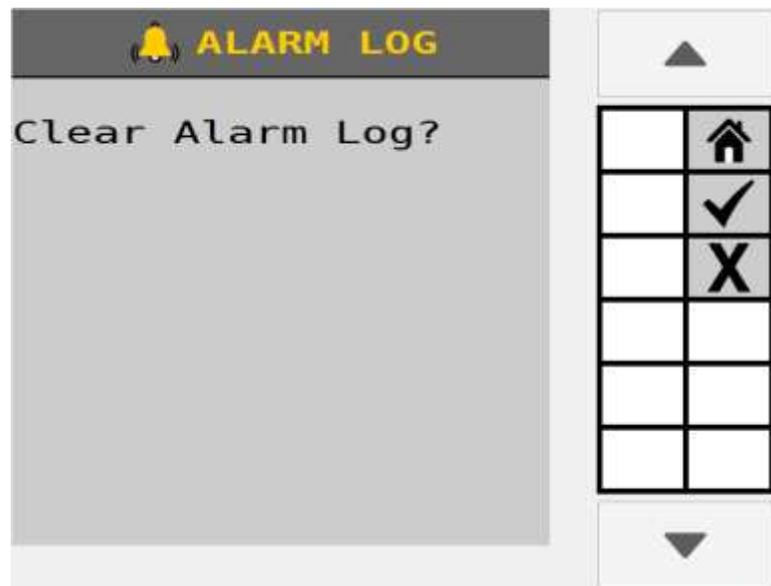


ALARM RESET (LEVEL 3 OEM USER)

OEM Level users have access to clear logged alarms. To reset the Alarm Log, press the Alarm Reset button.

1. Press the Checkmark button to clear.
2. Press the 'X' button to retain alarm log and return to Alarm Log screen.

Figure 152
Alarm Reset





DIAGNOSTICS

The Diagnostics screen provides information from feedback sensors, valve output, and system voltages of the planter drill control. The control valve can be manually opened on this screen when necessary.

Each channel has its own Diagnostics screen. Items on the screen are not editable, but the Channel Pulse Count data is re-settable. The system can be active on the Diagnostics screen.

DANGER

When the **START** key is engaged, the machine will become operational. All necessary precautions must be taken to ensure user safety. Failure to practice all necessary caution may result in serious injury or death.

Figure 153
Diagnostics Screen

Ch 1	PLTR 1
Target Rate	86.49 K^3/Hn
Target Speed	0.0000 RPM
Setpoint	0.0000 HZ
PWM	0 %
Actual Rate	0.00 K^3/Hn
Actual Speed	0.0000 RPM
Feedback Freq	0 HZ
Pulse Count	0
<hr/>	
Freq GSPD	139 HZ
IO Imp Lift	RAISED
Solenoid Power	13.03 V
ECU Power	12.77 V
Sensor Power	8.05 V
Ground Offset	-0.12 V

▲

⌂ RESET	⬆️
▶️ START	⬇️ PLTR 1
⬆️ PLTR 1	⬇️ TURN CHANNEL
OFF	OFF

▼

TARGET RATE

Channel Target is the current channel's rate as entered into the Target Rate constant on the Controls Configuration screen.

TARGET SPEED

The calculated RPM or flow rate for the current channel.



SETPOINT

Channel Setpoint is calculated by the system displaying the expected feedback frequency of the application rate sensor or flow meter used for that channel's feedback.

PWM

The Channel PWM value is the current pulse width modulation (PWM) output drive signal to the solenoid valve. The higher the number, the further the valve opens.

ACTUAL RATE

The Channel Actual Rate value is the current channel's actual controlled rate with the system active.

ACTUAL SPEED

The channel's actual RPM or flow rate.

FEEDBACK FREQUENCY

Feedback frequency is the current channel's feedback frequency of the application rate sensor or flow meter used for that channel's feedback.

PULSE COUNT

The Channel Pulse Count value is the accumulated pulse count detected from the channel feedback sensor. This value may be reset by the operator by pressing the **Reset Channel Pulse Count** button.

FREQ GSPD

Ground Speed Frequency is the feedback frequency of the ground speed sensor. Ground Speed Frequency is only shown when using Digital Frequency or Reluctance Frequency settings for Ground Speed.

NOTE

If the values are reversed and the value displays a "lowered" when the implement is raised, the wiring for the implement switch will need to be reversed so that an accurate readout is achieved.

IO IMP LIFT

The IO Implement Lift value displays the current state of the implement status switch. This text states "lowered" when the implement is down. The text states "raised" when the implement is raised.



SOLENOID POWER

The Solenoid Power Volt value displays the detected solenoid power voltage. This voltage level is the high current voltage leg of the system which is used to power high current solenoids and valve actuators. This value will generally be equal or nearly equal to the tractor battery voltage.

ECU POWER

The Electrical Control Unit (ECU) Power Volt value is the detected ECU voltage. This voltage level is the low current voltage leg of the system and is used to power modules and sensors. This value will generally be equal or nearly equal to the tractor battery voltage.

SENSOR POWER

The Sensor Power Volt value is the detected output voltage to the seed sensor on the ISO₆ module. This value is typically +8 VDC.

GROUND OFFSET

Measures the difference between the ECU ground and the solenoid ground. This value is typically between -0.5V and +0.5V. Values below -2.0V and above +2.0V triggers the Ground Offset Voltage Out of Range alarm.

MANUAL OPEN OF CHANNEL (SYSTEM FAILURE)

Manual opening of a selected channel's valve is used for calibration or troubleshooting purposes in the case of system failure. This procedure should only be performed with the guidance of an authorized technician.

DANGER

When the START key is engaged, the machine will become operational. All necessary precautions must be taken to ensure user safety. Failure to practice all necessary caution may result in serious injury or death.

TO MANUALLY OPEN CHANNEL:

1. At the Controls screen for the appropriate channel, set the Control Mode to either Manual with Feedback or Manual without Feedback.
2. Press the Home button to return to the Home Menu and select the **DIAGNOSTICS** button.
3. Go to the Diagnostics screen.



- The Diagnostics screen will show Channel 1 as a default.
 - If a channel other than Channel 1 needs selected, press the Down button until the appropriate channel displays. The Down button only displays when more than one channel is configured.
4. Set the master switch to the ON position or press the **START** button.
 5. Make sure the implement is down.
 6. Press the Increment button to open the channel's valve. The Channel Pulse Width Modulation (PWM) data item displays the current PWM signal that is output to the valve.
 - The Increment button must be pressed repeatedly to increase the PWM signal to the valve. Each press will increase the signal by 2% PWM. The Channel Pulse Count and Channel Frequency Filter values display the current output of the feedback sensor.
 7. Press the Decrement button to decrease the PWM signal and close the valve. The Decrement button must be pressed repeatedly to decrease the PWM signal to the valve. Each press decreases the signal by 2% PWM.
 - The active channel displays in the button text.
 8. Turn the master switch off to shutdown control channel or press the **STOP** button.
 9. Press the Home button and select the **CONTROLS** button to reset Control Mode to Auto.

OPERATOR'S MANUAL



Figure 154
Manual Open of a Channel

CONTROLS Ch 1 Planter Control

Material Name	PLTR 1
Control Mode	Auto
Drive Type	PWM 1
Drive Freq	100 HZ
Input Freq	20 %
Gear Ratio	1.000
Sensor	360 PUL/REV
Seed Rows	1 - 34
# Seed Rows	34
Channel Width	2590.8 CM

DIAGNOSTICS Ch 1 PLTR 1

Target Rate	86.49 K\$/Hr
Target Speed	0.0000 RPM
Setpoint	0.0000 HZ
PWM	0 %
Actual Rate	0.00 K\$/Hr
Actual Speed	0.0000 RPM
Feedback Freq	0 HZ
Pulse Count	0
Freq GSPD	139 HZ
IO Imp Lift	RAISED
Solenoid Power	13.02 V
ECU Power	12.76 V
Sensor Power	8.05 V
Ground Offset	-0.14 V



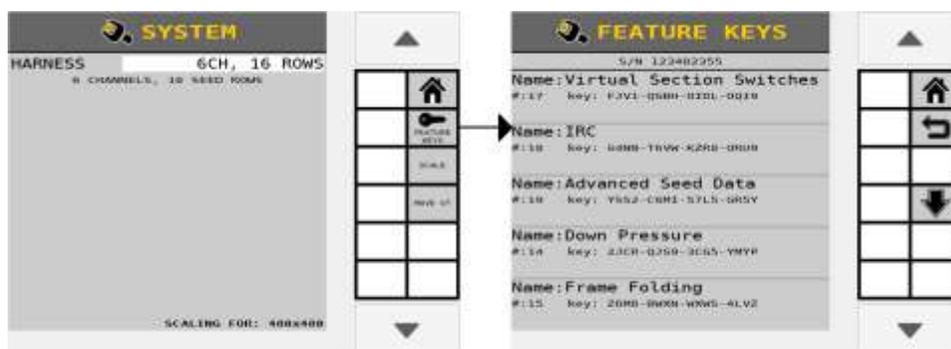
SOFTWARE ADD-ONS

The FEATURE KEYS screen displays customer-specific add-ons to the specific master module. Each line item identifies the module name and details that may be required for troubleshooting purposes. This screen is viewable only and cannot be changed.

TO VIEW FEATURE KEYS:

1. Press the **SYSTEM** button.
2. At the System screen, press the **FEATURE KEYS** button.
 - All add on software displays onscreen.
3. Press the **NEXT** button to view additional feature keys.

Figure 155
Feature Keys Screen



FEATURE KEY POSSIBLE ADD-ONS

Additional functionality is available by adding FEATURE KEYS and includes:

- Frame Folding/Working Hydraulics
- Advanced Seed Data
- Channel expansion (3,4,5,6,7,8)
- Tramlining
- IRC
- Virtual Section Switches



TROUBLESHOOTING & ALARM CODES

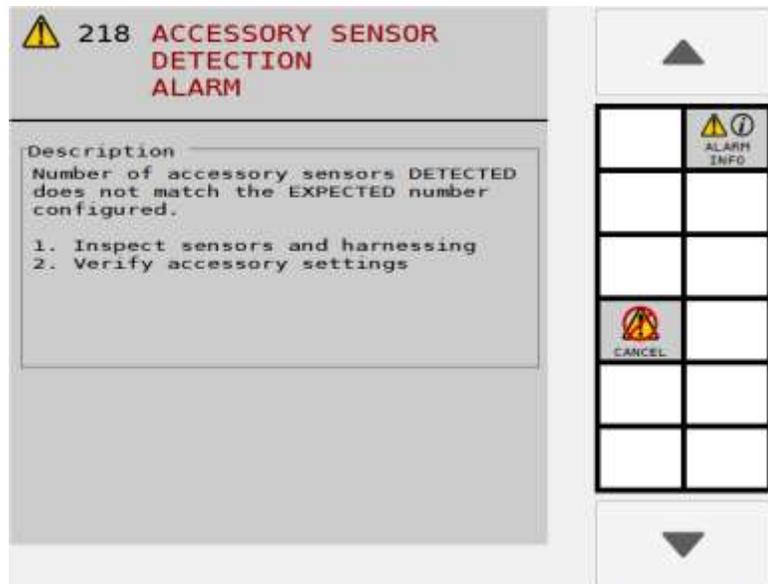
Alarms are presented in a full screen display with description and resolution instructions, if applicable. Each alarm type has an associated alarm number that can be cross-referenced in this section.

An audible alarm is terminated by pressing the **ALARM CANCEL** button or ESC key. In addition, detailed descriptions of the current alarm can be viewed by pressing the **ALARM DETAIL** button.

Some alarms (e.g. Master Switch alarm) require a specific action before the alarm condition will cease. In these cases, the instructions to proceed are indicated in the alarm display.

Figure 156

Alarm Screen for Alarm Number 218





The following tables describe the possible alarm conditions, causes, and remedies.

For troubleshooting assistance, please contact your local dealer.

OPERATOR'S MANUAL



ALARM #	ALARM	PROBABLE CAUSE	CORRECTIVE ACTION
5	Control CPU Communications Failed Alarm	Processor has automatically restarted or cannot boot.	<ol style="list-style-type: none"> 1. Wait until intermittent alarm occurs before running system. 2. Power off the system if intermittent alarm does not appear. 3. If system does not recover, consult dealer.
6	Control CPU Communications Intermittent Alarm	Processor that had previously failed communication has come online.	<ol style="list-style-type: none"> 1. No action needed.
7	Monitor CPU Communications Failed Alarm	Processor has automatically restarted or cannot boot.	<ol style="list-style-type: none"> 1. Wait until intermittent alarm occurs before running system. 2. Power off the system if intermittent alarm does not appear. 3. If system does not recover, consult dealer.
8	Monitor CPU Communications Intermittent Alarm	Processor that had previously failed communication has come online.	<ol style="list-style-type: none"> 1. No action needed.
200	Master Switch Time Out Alarm	<p>Master switch is active but no ground speed is detected. If no speed is detected, the master switch will deactivate.</p> <ol style="list-style-type: none"> 1. Faulty master switch harness. 2. Faulty ground speed sensor/harness. 	<ol style="list-style-type: none"> 1. Press CANCEL to keep the master switch active. 2. Inspect ground speed harnessing if speed should be present.
201	Ground Speed Communication Failure Alarm		
202	Ground Speed Failure Alarm	<p>Only active in Planter Monitor mode. No ground speed detected.</p> <ol style="list-style-type: none"> 1. Incorrect speed source setting or calibration. 2. Defective speed sensor or harness. 3. Defective module or universal terminal. 	<ol style="list-style-type: none"> 1. Verify correct speed source setting and speed calibration on the Ground Speed Calibration screen. 2. Inspect speed sensor/harness for damage or replace speed sensor. 3. Replace module or universal terminal.
206	Control Channel Unable to Control Alarm	<p>Control channel is unable to achieve the target rate.</p> <ol style="list-style-type: none"> 1. Incorrect channel settings. 2. Incorrect feedback sensor installation. 3. Defective feedback sensor. 	<ol style="list-style-type: none"> 1. Verify correct setup constants on the Control Channel screen. 2. Perform a valve calibration. 3. Verify correct installation of the feedback sensor. Inspect feedback sensor for damage or replace. 4. Check control valve for damage. 5. Check harness and module for damage.

OPERATOR'S MANUAL



207	Channel Unstable Alarm	Control channel is unstable at the current target rate. 1. Incorrect channel settings. 2. Incorrect feedback sensor installation. 3. Defective feedback sensor.	1. Verify correct setup constants on the Channel Configuration screen. Perform a valve calibration. 2. Verify correct installation of the feedback sensor. 3. Inspect feedback sensor for damage or replace. 4. Verify system is stable using Manual Control Mode.
208	Channel Saturation Exceeded Alarm	Control cannot obtain the specified rate. 1. Excessive speed. 2. Incorrect channel settings. Desired rate too high for implement. 3. Target rate too high.	1. Reduce speed. 2. Verify correct setup constants on the Channel Configuration screen. 3. Perform a valve calibration and a Calibration constant. 4. Inspect feedback sensor, motor and harnessing. 5. Reduce target rate.
209	Control High Limit Alarm	Feedback has exceeded the material High Limit setting. 1. Target Rate too high. 2. Ground speed too low.	1. Reduce speed or Target Rate. 2. Verify material High Limit setting. 3. Review control channel setup.
210	Control Low Limit Alarm	Feedback has dropped below the material Low Limit setting. 1. Target Rate too low. 2. Ground speed too high.	1. Increase speed or Target Rate. 2. Verify material Low Limit setting. 3. Review control channel setup.
211	All Rows Failed Alarm	Seeding was not detected on any rows. 1. Seed meter drive malfunction. 2. Rows are not assigned to channel and channels are turned off.	1. Check seeding drive(s). 2. Assign rows to channel. 3. Inspect sensors and harnessing for damage.
212	Row Failure Alarm	Seed rate has fallen below the row fail rate setting on the Seed Monitor Setup screen. 1. Seed meter malfunction. 2. Dirty or defective seed sensor. 3. Damaged planter harness. 4. Defective module harness or module. 5. Out of seed.	1. Verify proper planter operation. 2. Inspect seed sensor for dirt or damage. Replace if necessary. 3. Inspect planter harness for damage. Repair or replace. 4. Inspect harness and module for damage. Replace if necessary. 5. Fill with seed. 6. Review material settings.

OPERATOR'S MANUAL



ALARM #	ALARM	PROBABLE CAUSE	CORRECTIVE ACTION
213	High Population Limit Exceeded Alarm	Seed rate has exceeded the High Alarm Setting on the Seed Monitor Setup screen. <ol style="list-style-type: none"> Seed meter malfunction or incorrect setup. Defective seed sensor. Defective module. 	<ol style="list-style-type: none"> Verify proper planter options/setup. Inspect seed sensor for damage. Replace if necessary. Inspect module for damage. Replace if necessary. Review material settings.
214	Low Population Limit Exceeded Alarm	Seed rate has dropped below the Low Pop Alarm Setting on the Seed Monitor Setup screen. <ol style="list-style-type: none"> Seed meter malfunction or incorrect setup. Defective seed sensor. Defective module. Running out of seed. 	<ol style="list-style-type: none"> Verify proper planter operation/setup. Inspect seed sensor for damage. Replace if necessary. Inspect module for damage. Replace if necessary. Fill with seed.
215	High Pressure Limit Exceeded Alarm	Sensed pressure exceeds the high alarm setting on the Pressure Setup screen. <ol style="list-style-type: none"> Implement malfunction or incorrect setup. Defective pressure sensor. Defective module. 	<ol style="list-style-type: none"> Verify proper implement operation/setup. Inspect pressure sensor for damage. Replace if necessary. Inspect module for damage. Replace if necessary.
216	Low Pressure Limit Exceeded Alarm	Sensed pressure below the low alarm setting on the Pressure Setup screen. <ol style="list-style-type: none"> Implement malfunction or incorrect setup. Defective pressure sensor. Defective module harness or module. 	<ol style="list-style-type: none"> Verify proper implement operation/setup. Inspect pressure sensor for damage. Replace if necessary. Inspect module and/or module harness for damage. Replace if necessary.
217	Member Module Detection Alarm	Number of modules detected does not match the expected modules configured. <ol style="list-style-type: none"> Too few modules connect to system. Too many modules connected to system. Defective CAN/module harness. Blown module harness fuse. Defective module. New module has been added to system. 	<ol style="list-style-type: none"> Verify correct module configuration setup on the Module Configuration screen. Verify correct module configuration setup on the Module Configuration screen. Identify missing module in the Module Configuration list. Inspect CAN/module harness of the missing module for damage. Repair or replace harness. Inspect module harness fuse of the identified module. Replace if necessary. Identify missing module in the Module Configuration list. Inspect missing module for damage or replace. Verify correct module configuration setup on the Module Configuration screen.
218	Accessory Sensor Detection Alarm	Number of accessory sensors detected does not match the expected number configured. <ol style="list-style-type: none"> Defective Sensor. Defective module or damaged module harness. Additional sensor detected but not configured in the Accessory Setup screen. 	<ol style="list-style-type: none"> Inspect sensor for damage or replace. Inspect module and/or module harness for damage. Replace if necessary. Verify correct# ACC setting for each module.

OPERATOR'S MANUAL



219	Row Sensor Not Detected Alarm	<p>Number of seed sensors detected does not match the expected seed sensors configured.</p> <ol style="list-style-type: none"> 1. Incorrect seed row connections. 2. Additional seed sensor detected. 3. Incorrect setup. 4. Defective seed sensor. 5. Defective module or damaged module harness. 	<ol style="list-style-type: none"> 1. Inspect seed sensor for damage or replace. 2. Inspect module and/or module harness for damage. Replace if necessary. 3. Verify correct # ROWS setting for each module.
220	Feedback with Control Off Alarm	<p>Control channel is not running but feedback was detected.</p> <ol style="list-style-type: none"> 1. Improper channel setup. 2. Defective feedback sensor. 3. Defective module or damaged module harness. 	<ol style="list-style-type: none"> 1. Inspect feedback sensor, control valve and harnessing. 2. Verify control channel feedback settings. 3. Verify control channel calibrations.
221	Channel Invalid State Alarm	<p>The system has encountered a software error.</p> <ol style="list-style-type: none"> 1. Internal system software error. 	<ol style="list-style-type: none"> 1. Cycle system power Off/On. If condition persists, contact your local dealer.

ALARM #	ALARM	PROBABLE CAUSE	CORRECTIVE ACTION
222	Control Channel Step Height Error Alarm	<p>Control channel step height cannot be calculated.</p> <ol style="list-style-type: none"> 1. Implement hydraulic system malfunction. 2. Defective control valve. 3. Incorrect feedback sensor installation. 4. Defective feedback sensor. 5. Limit Max Output set too low. 	<ol style="list-style-type: none"> 1. Verify implement hydraulic system operation. 2. Inspect control valve for damage. Replace if necessary. 3. Verify correct installation of the feedback sensor. 4. Inspect feedback sensor for damage or replace. 5. Set Limit Max Output to a higher PWM% on the Valve Calibration screen. Perform a new valve calibration.
223	Control Channel Max Feedback Unreachable Alarm	<p>Control channel maximum feedback cannot be reached.</p> <ol style="list-style-type: none"> 1. Limit Max Output set too low. 2. Incorrect feedback sensor installation. 3. Defective feedback sensor. 	<ol style="list-style-type: none"> 1. Set Limit Max Output to a higher level on the Valve Calibration screen. Perform a new valve calibration. 2. Verify correct installation of the feedback sensor. 3. Inspect feedback sensor for damage or replace.
224	No Channel Gain Steps Calculated Alarm	<p>Control channel gain steps cannot be calculated.</p> <ol style="list-style-type: none"> 1. Implement hydraulic system malfunction. 2. Defective control valve. 3. Incorrect feedback sensor installation. 4. Defective feedback sensor. 	<ol style="list-style-type: none"> 1. Verify implement hydraulic system operation. 2. Inspect control valve for damage. Replace if necessary. 3. Verify correct installation of the feedback sensor. 4. Inspect feedback sensor for damage or replace.

OPERATOR'S MANUAL



225	Hopper Sensor Low Alarm	<p>The hopper level is low.</p> <ol style="list-style-type: none"> 1. Incorrect logic level setting on the Hopper Setup screen. 2. Dirty or defective hopper sensor. 3. Defective module harness or module. 4. Hopper empty. 	<ol style="list-style-type: none"> 1. Verify correct logic level setting on the Hopper Setup screen. 2. Clean/inspect hopper sensor. Replace if necessary. 3. Inspect harness and module for damage. Replace if necessary. 4. Fill hopper.
226	RPM High Limit Alarm	<p>Sensed RPM exceeds the high alarm setting on the RPM or Control Setup screen.</p> <ol style="list-style-type: none"> 1. Implement malfunction or incorrect setup. 2. Defective RPM sensor. 3. Defective module. 	<ol style="list-style-type: none"> 1. Verify proper implement operation/setup. 2. Inspect RPM sensor for damage. Replace if necessary. 3. Inspect module for damage. Replace if necessary.
227	RPM Low Limit Exceeded Alarm	<p>Sensed RPM exceeds the low alarm setting on the RPM or Control Setup screen.</p> <ol style="list-style-type: none"> 1. Implement malfunction or incorrect setup. 2. Defective RPM sensor. 3. Defective module harness or module. 	<ol style="list-style-type: none"> 1. Verify proper implement operation/setup. 2. Inspect RPM sensor for damage. Replace if necessary. 3. Inspect module for damage. Replace if necessary.
229	Digital Sensor Alarm	<p>One or more digital sensors have entered an alarm state.</p> <ol style="list-style-type: none"> 1. Incorrect logic level setting on the Digital Setup screen. 2. Dirty or defective digital sensor. 3. Defective module harness or module. 4. Improper control of actuator that uses digital sensor feedback. 	<ol style="list-style-type: none"> 1. Verify correct logic level setting on the Hopper Setup screen. 2. Clean/inspect hopper sensor. Replace if necessary. 3. Inspect harness and module for damage. Replace if necessary. 4. Inspect connected actuator for damage.

ALARM #	ALARM	PROBABLE CAUSE	CORRECTIVE ACTION
232	Control Channel Shutdown Alarm	<p>RPM has dropped below the disable control on low alarm setting on the Accessory Setup screen.</p> <ol style="list-style-type: none"> 1. Defective RPM sensor. 2. Damaged module harness. 3. Defective module. 4. Low RPM. 	<ol style="list-style-type: none"> 1. Inspect RPM sensor for damage. Replace if necessary. 2. Inspect module harness for damage. Repair or replace. 3. Inspect module for damage. Replace if necessary. 4. Increase RPM.
235	New Member Module Detected Alarm	<p>New member module has been found.</p>	<ol style="list-style-type: none"> 1. Assign sensors to the new module at the Module Configuration Setup screen and its position.
236	Intermittent Member Module Detected Alarm	<p>A member module that had previously failed communication has come online.</p>	<ol style="list-style-type: none"> 1. Inspect harness connections to this module.
237	Product Level Low Alarm	<p>Estimated product level has dropped below alarm level.</p>	<ol style="list-style-type: none"> 1. Fill product bin and reset level.
241	Seeding Detected on a Control Off Row Alarm	<p>Seed rate detected on an off row.</p> <ol style="list-style-type: none"> 1. Defective row sensor. 2. Control shutoff malfunction. 3. Improper row channel assignment. 	<ol style="list-style-type: none"> 1. Inspect harness and module for damage. 2. Check control shutoff. 3. Verify correct row to control channel assignment.

OPERATOR'S MANUAL



248	BSM/ESM Communication Lost Alarm	BSM has lost communication with an ESM. 1. Damaged CAN or module harness. 2. Blown module harness fuse. 3. Defective module.	1. Identify missing module in the Module Configuration list. Inspect CAN/module harness of the missing module for damage. Repair or replace harness. 2. Inspect module harness fuse, replace if necessary. 3. Identify missing module in the Module Configuration list. Inspect missing module for damage or replace.
249	BSM/ESM Foot Switch Lost Alarm	BSM has detected an error with the foot switch. 1. Incorrect foot switch connections. 2. Defective BSM or foot switch. 3. Defective module harness.	1. Inspect BSM, foot switch, and module harness.
256	Channel Invalid Material Alarm	No material exists that is compatible with channel type.	1. Setup a material for the channel type. 2. Review control setup.

ALARM #	ALARM	PROBABLE CAUSE	CORRECTIVE ACTION
272	Defaults Loaded Alarm	System configuration is corrupt and has been reset to default settings. 1. Error code provided for cause.	1. Check system configuration for correctness. If this persists, contact dealer for support
300	Disconnected from Task Controller Alarm	System configuration has changed and the connection to the task controller has been disconnected.	1. Continue setup and restart system or restart using the RECONNECT key on the TASK CONTROLLER screen.
301	Task Controller Rate Override Alarm	The commanded rate from the task controller has been manually overridden.	1. Press the Reset button to return to the commanded rate. 2. Review Rate Override setup.
602	8 Volt Supply Failure Alarm	8V supply voltage rail is below 7.2V or higher than 16V. 1. Damaged module harness. 2. Defective seed or hopper sensor. 3. Defective module.	1. Inspect module harness for damage. Repair or replace harness. 2. Inspect seed or hopper sensors connected to the identified module for damage. Replace sensors if necessary. 3. Replace identified module.
603	Member Module Communication Failed Alarm	Communication with an active member module has failed. 1. Damaged CAN or module harness. 2. Blown module harness fuse. 3. Defective module.	1. Identify missing module in the Module Configuration list. Inspect CAN/module harness of the missing module for damage. Repair or replace harness. 2. Inspect module harness fuse, replace if necessary. 3. Identify missing module in the Module Configuration list. Inspect missing module for damage or replace.
604	ECU Voltage Alarm	ECU voltage is below 11V or higher than 16V. 1. Damaged CAN or module harness. 2. Defective module	1. Inspect CAN/module harness of the identified module for damage. 2. Inspect identified module for damage or replace.

OPERATOR'S MANUAL



605	Solenoid Voltage Alarm	Solenoid voltage is below 11V or higher than 16V. 1. Damaged CAN or module harness. 2. Blown module harness fuse. 3. Defective module.	1. Inspect CAN/module harness of the identified module for damage. Repair or replace harness. 2. Inspect module harness fuse or replace. 3. Inspect identified module for damage or replace.
606	Ground Offset Voltage Alarm	The ground offset is below -2V or above 2V. 1. Damaged/shorted Actuator Harness. 2. Defective PWM valve driver or Servo valve driver. 3. Defective module.	1. Inspect Actuator Harness for damage around the WPM and Servo valve connections. Repair or replace harness. 2. Inspect PWM or Servo valve drivers for damage and replace if necessary. 3. Inspect identified module for damage and replace if necessary.

Dealers have the responsibility of calling to the attention of their customers the following warranty prior to acceptance of an order from their customer for any DICKEY-john product.

DICKEY-john[®] WARRANTY

DICKEY-john warrants to the original purchaser for use that, if any part of the product proves to be defective in material or workmanship within one year from date of original installation, and is returned to DICKEY-john within 30 days after such defect is discovered, DICKEY-john will (at our option) either replace or repair said part. This warranty does not apply to damage resulting from misuse, neglect, accident, or improper installation or maintenance; any expenses or liability for repairs made by outside parties without DICKEY-john's written consent; damage to any associated equipment; or lost profits or special damages. Said part will not be considered defective if it substantially fulfills the performance expectations. THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES OF MERCHANTABILITY, FITNESS FOR PURPOSE, AND OF ANY OTHER TYPE, WHETHER EXPRESS OR IMPLIED. DICKEY-john neither assumes nor authorizes anyone to assume for it any other obligation or liability in connection with said part and will not be liable for consequential damages. Purchaser accepts these terms and warranty limitations unless the product is returned within fifteen days for full refund of purchase price.

**For DICKEY-john Service Department, call
+1-800-637-3302 in either the U.S.A. or Canada**



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INTELLIAG[®] ISO₆[™] PLANTER DRILL CONTROL VERSION 4

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