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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

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 DICKEY-john IntelliAg MVT is a 2 channel control system for row crop planters to control planter, liquid, and granular applications and monitors up to 84 seed sensors for individual row performance and population. In addition, the system offers optional manual individual 24-row section control. The system is capable of monitoring up to 84 rows, ground speed, 3 hopper level, 3 air pressure, 2 RPM sensors, and 1 lift switch.

NOTE: The IntelliAg system is designed to ISO11783 CAN communication standards providing the capability of communicating with other manufacturer's ISO 11783-compatible equipment.

The IntelliAg system includes the following required components:

- Virtual terminal
- Planter Control Module (PCM)
- Two CAN Terminators
- Cab and implement harnessing

Optional components include:

- Working Set Member Modules (WSMB) Up to 5 Working Set Member Modules (monitors up to a total of 84 rows of seed input)
- Implement Lift
- Clutch/Switch Module and Planter Output Module
- Remote Test Switch (required for Continuous Test and 5 Rev Test)

IntelliAg is compatible with all DICKEY-john sensors.

Terminal Mounts in the cab using:

- RAM Mount
- Terminal Mounting Plate

VIRTUAL TERMINAL (VT)

Two terminal size options are available each with different navigation methods that is the user interface with the IntelliAg system components to monitor and control product application.

A virtual terminal with 4.3" color display features a rotary dial and 8 softkeys to navigate to Operate and Setup screens.

Figure 1

IntelliAg MVT Virtual Terminal 4" Display





A virtual terminal with 7" color display features a touch screen in lieu of rotary dial and hard keys for menu navigation.

Figure 2

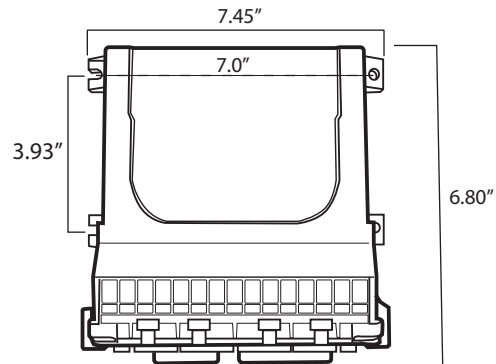
IntelliAg MVT Virtual Terminal 7" Display



PLANTER CONTROL MODULE (PCM)

Figure 3

Planter Control Module



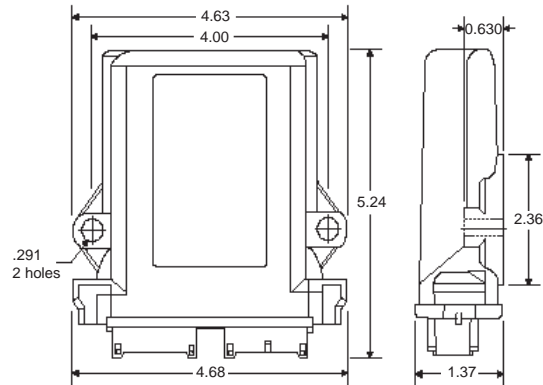
The Planter Control Module houses the system's primary interface device. All system parameters, constants, and memory are stored in the PCM. The PCM has two channels for planter control. In addition, the PCM can accept inputs from 8 accessory sensors: 3 hopper level, 3 air pressure, 2 RPM, 1 ground speed, and up to 12 population/blockage sensors. The PCM module uses a 48-pin connector with a jackscrew to secure the connector to the module. The PCM is typically mounted on the implement.



WORKING SET MEMBER (WSMB) MODULE (OPTIONAL)

Figure 4

Working Set Member Module



Each Working Set Member (WSMB) module is an auxiliary to the Planter Control Module (PCM). Each WSMB can accept up to 18 rows of seed sensors. The WSMB passes information directly to the PCM. Up to 5 WSMB's can be installed to monitor up to 84 rows. The flexible design of the WSMB allows for installation virtually anywhere on the implement.

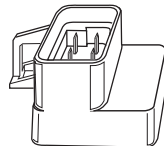
CAN TERMINATORS

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 Virtual Terminal connector.
- One terminator plugs into the implement harness of the last module connected to the CAN bus.

Figure 5

Can Terminator



TERMINAL MOUNTING KIT

The terminal is secured in the tractor cab by a bracket that is installed in a location that does not obstruct the view of tractor operation. Terminal installation is the same for both terminal sizes.

Terminal mounting kit includes:

- Terminal mounting plate
- RAM Mount
- Bolts to secure mounting plate to RAM mount



Bracket Features:

- A ball mount at top and bottom of bracket orients terminal in many different positions.
- Wing bolt tighten and secures the VT in the desired position.

⚠ DANGER

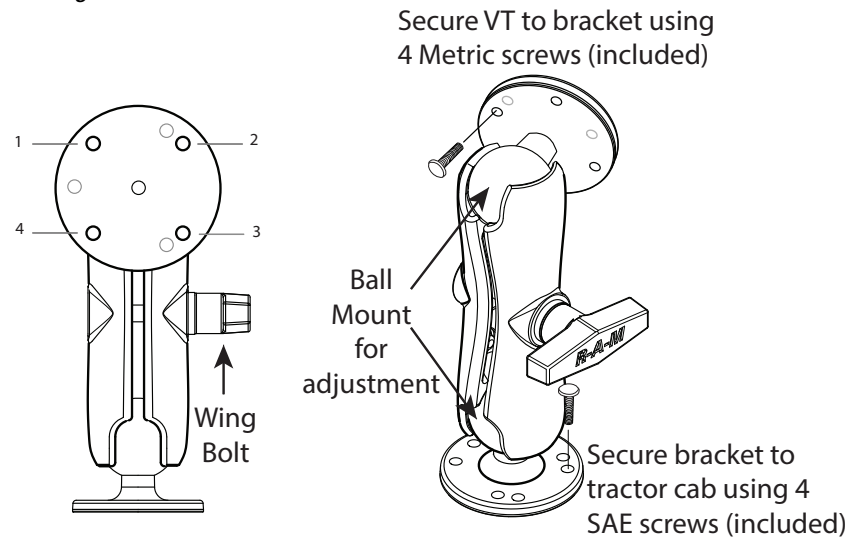
The console must not obstruct the view of the operator or interfere with the operation of the tractor.

To Assemble the Terminal Mounting Kit:

1. Secure RAM mount to desired location in cab with 4 screws (included) per (Figure 6).

Figure 6

Mounting Bracket Features



2. Attach terminal mounting plate to the virtual terminal and RAM mount.

Figure 7

Terminal Bracket

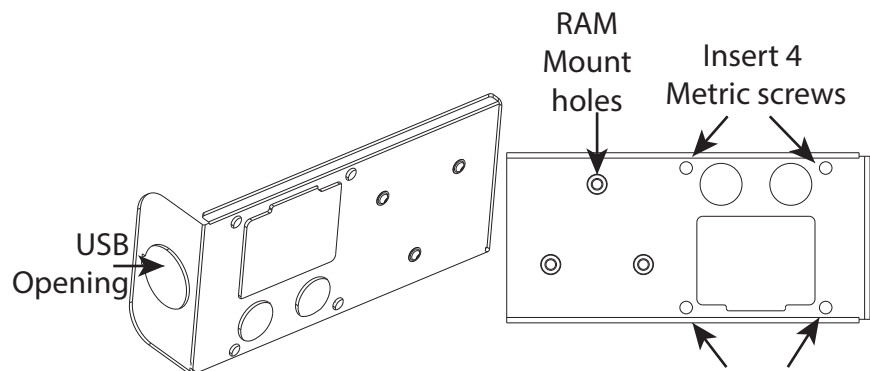




Figure 8

Attach Terminal Bracket to Virtual Terminal

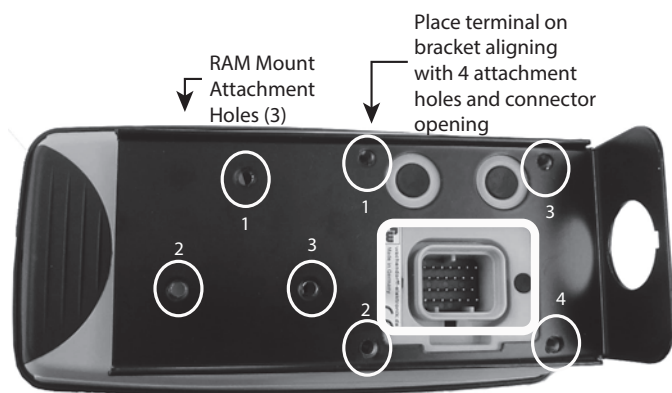


Figure 9

Terminal Bracket and RAM Mount







COMPONENT INSTALLATION

PLANTER CONTROL MODULE (PCM)

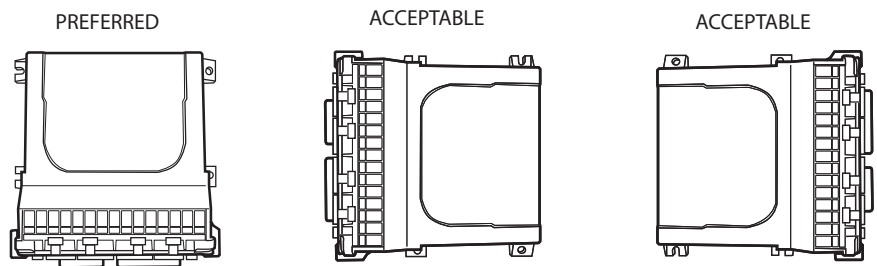
1. Select an area on the implement to mount the PCM that allows for easy hookup and access.
2. Use the enclosure as a template to mark the location of the mounting holes.
3. Drill four 9/32 inch diameter holes where marked.

IMPORTANT: Do not use the enclosure as a guide when drilling. Do not overtighten nuts as this may damage the mounting tabs of the enclosure.

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

Figure 10

Acceptable Orientation



⚠ CAUTION

Do not install the module in any orientation other than shown in (Figure 10). 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.

4. Mount with the label side of module facing out. Do not mount with the connector facing up (see Caution).



WORKING SET MEMBER (WSMB) MODULE

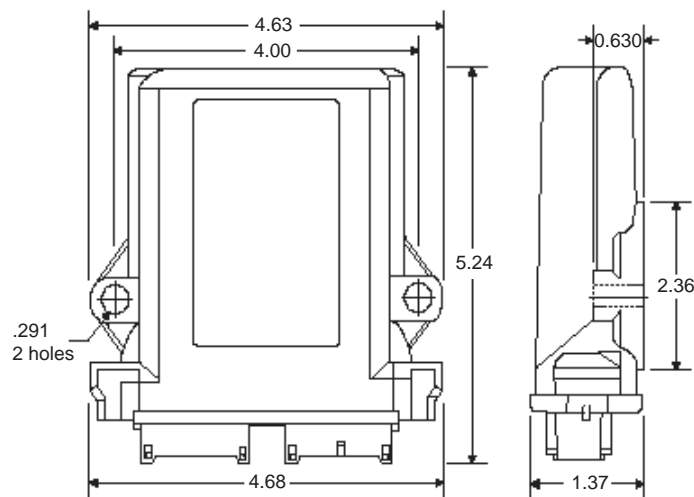
The WSMB module can be attached to the implement:

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 11

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 Planter Control Module (PCM) as illustrated in (Figure 10).

CAUTION

Do not install the module in any orientation other than illustrated in (Figure 10). 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.

3. Mount with the label side of the module facing out.



BOLT WSMB TO FRAME

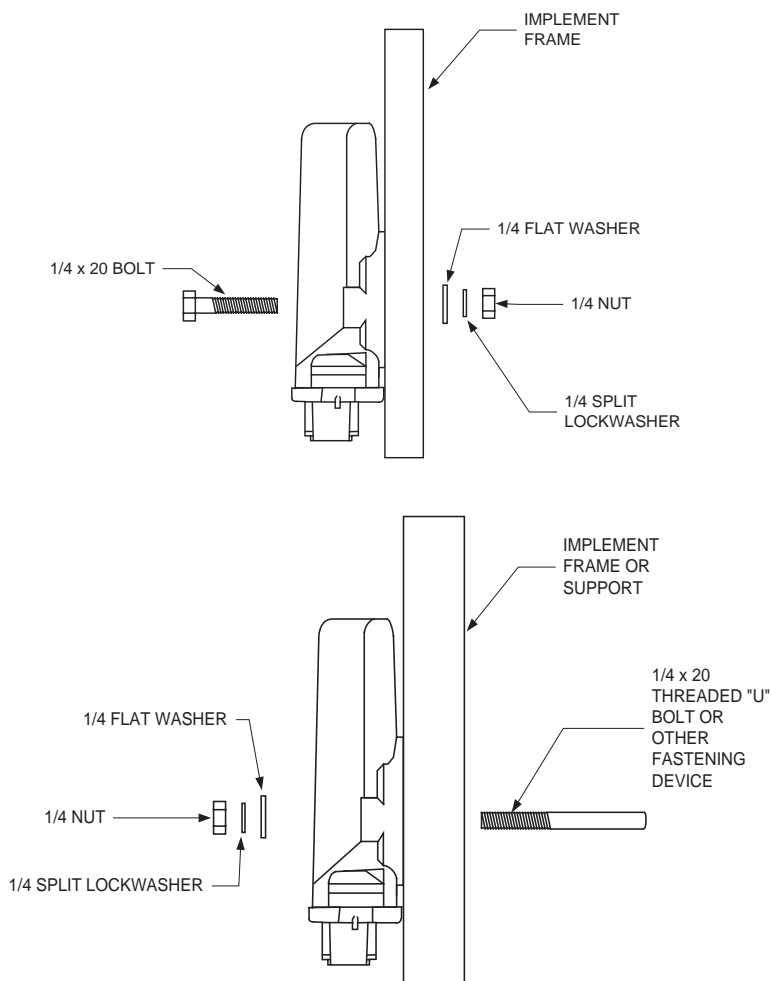
1. Use the enclosure as a template to mark the location of the mounting holes.
2. Drill two 9/32 inch diameter holes where marked.
3. Attach to frame using 1/4 x 20 bolts or other fastening devices as illustrated in (Figure 12).

CAUTION

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

Figure 12

Working Set Member Installation (Bolted)



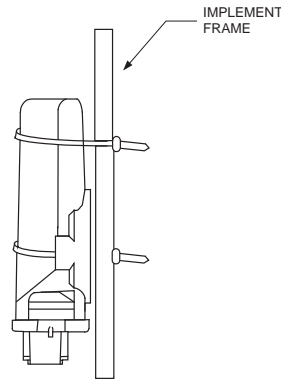


TIE STRAP WSMB TO FRAME

1. Use one long tie-strap to loop around the member body and through both mounting holes as illustrated in (Figure 13).
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 13

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 16).
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 DICKEY-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 13) or (Figure 14).

NOTE: The last module harness in the system must have a CAN Terminator installed for proper system operation. Refer to Implement Harness (Figure 13) or (Figure 14) for additional information.

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



12. Connect any additional adapter harnesses to the module harness. The PCM Module harness can accept the following adapter harnesses:
 - **Actuator Harness:** This harness accepts up to 2 output control channels, 2 control channel feedbacks, 3 hopper level sensor inputs, 3 air pressure inputs, 2 RPM sensor inputs, a ground speed input, and an implement switch input. In addition, a pair of 6-pin connectors are available for Servo connection which 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 PWM 1/Servo 1 with FB 1, PWM 2/Servo 2 with FB 2, etc. Secure any unused and excess cable lengths where necessary. Refer to [\(Figure 15\)](#) for additional information.
 - **Seed Sensor Harness:** This harness accommodates any standard Dj Seed Sensor harness (PM style or SE style) harness depending on the PCM harness. A wide variety of harnesses are available to accommodate various numbers of sensor inputs. Install all seed sensors per the instructions included with the individual sensors. Secure any unused or excess cable lengths as necessary.

CONNECTING CAB/TERMINAL HARNESSING

Refer to [\(Figure 14\)](#).

1. Connect the cab harness to the back of the virtual terminal.
2. Insert the USB component into the terminal bracket USB opening.
3. Secure the USB component to the bracket with the supplied locking nut.
4. Connect the power leads directly to the battery.
5. Connect the ignition wire to a switched +12VDC.
6. Connect the chassis ground lead to a bare point of the cab frame that offers a good chassis ground connection.
7. Connect the CAN terminator, radar speed sensor, and row switch module 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.

CONNECTING IMPLEMENT HARNESSING

Refer to [\(Figure 15\)](#) and [\(Figure 16\)](#).

1. Connect the Implement CAN Breakaway extension to the mating connector of the cab harness.
2. Route the harness along the implement hitch to the PCM 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 PCM module uses a 30 and 18-way connector with a jackscrew to



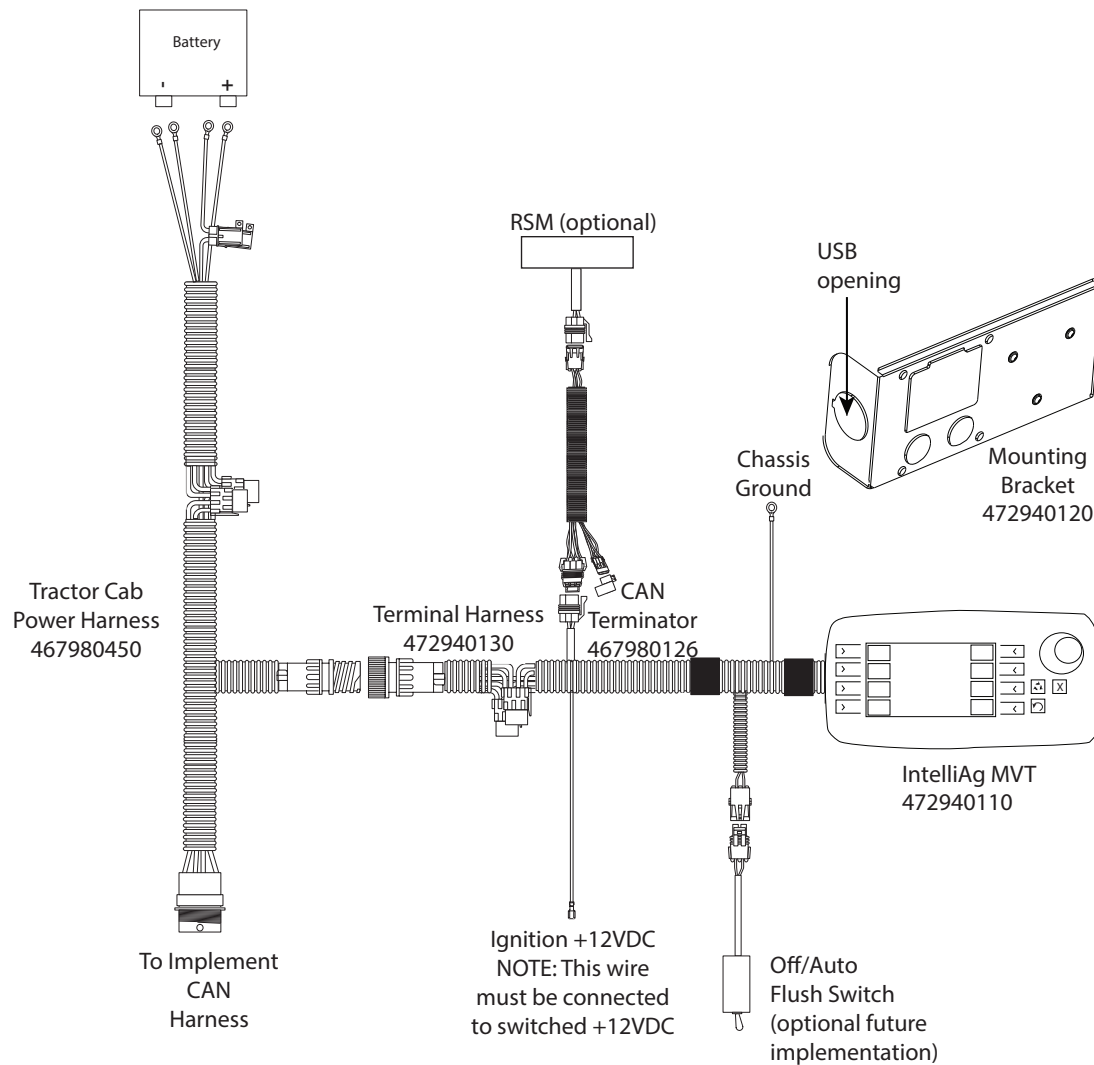
- secure the connector to the module. The WSMB uses a pair of 12-pin connectors.
- 5. Secure module harness as needed.

CAB HARNESSING DIAGRAM

The following diagram illustrates the cab harness layout and connecting to the virtual terminal.

Figure 14

Cab Harness Connections to Virtual Terminal





IMPLEMENT HARNESSING DIAGRAMS

Figure 15

Implement Harnessing

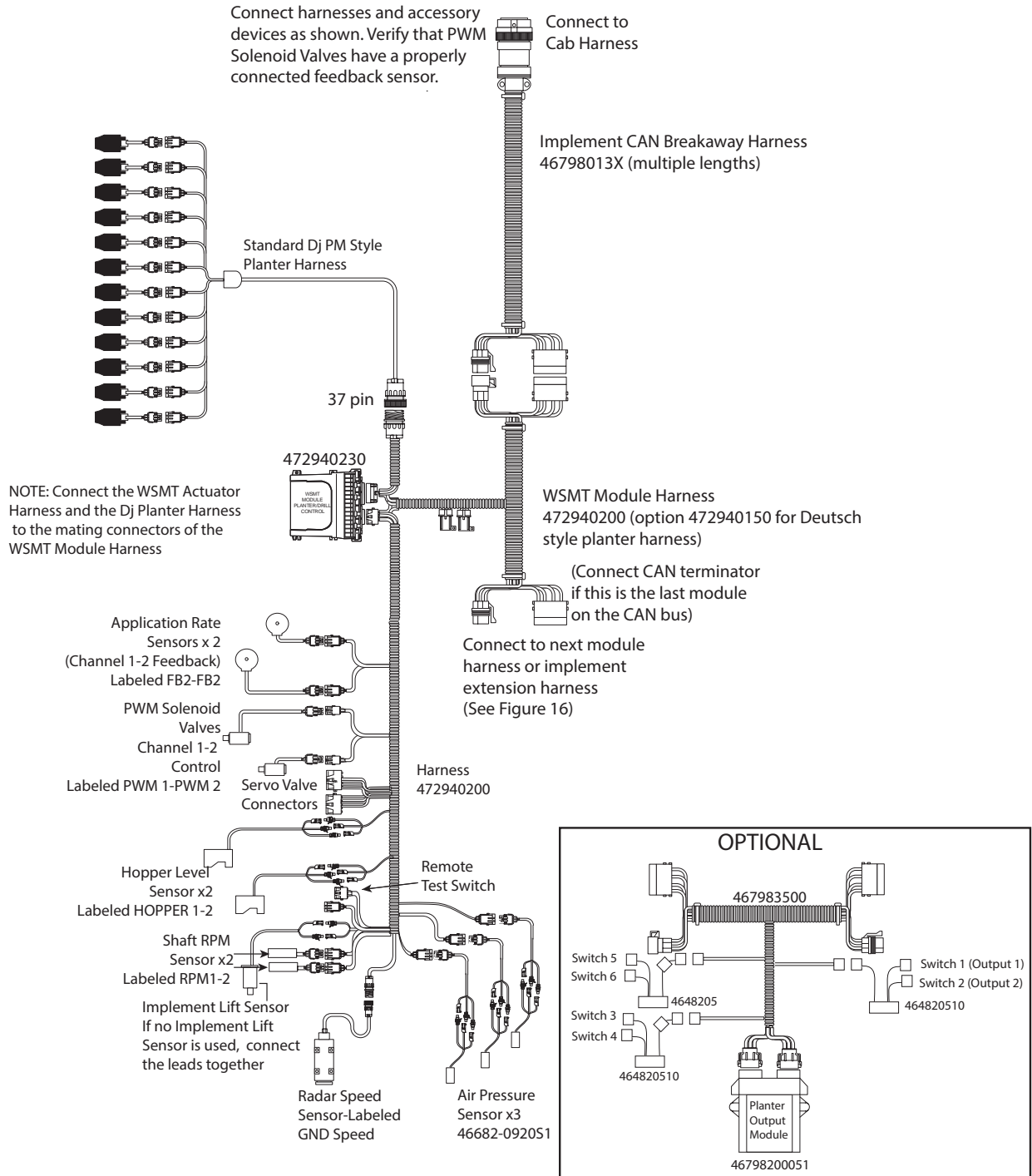
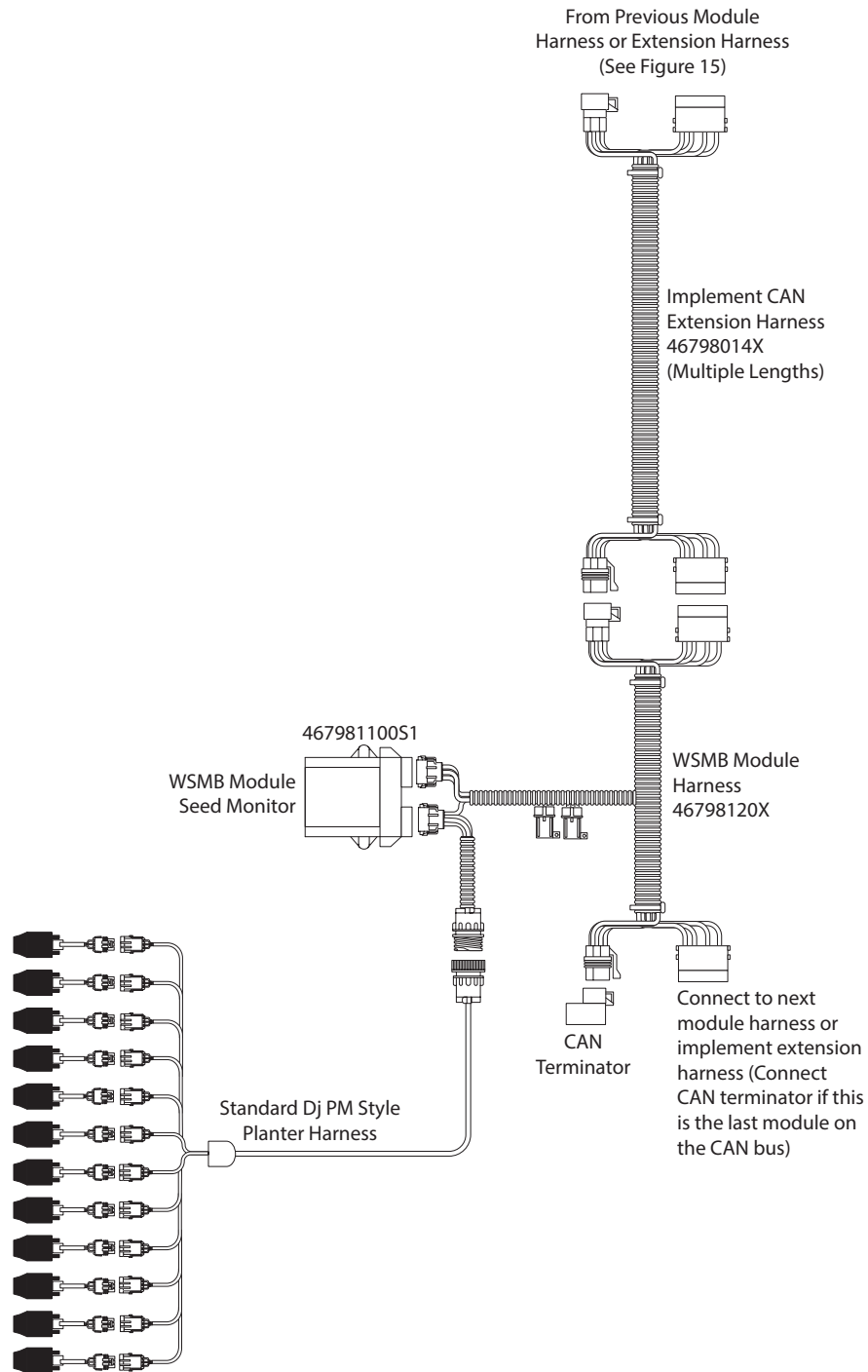




Figure 16

Implement Harnessing





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 DICKEY-john seed sensors. Seed sensors may be connected to the PCM module and all WSMB planter monitor modules. Any number of sensors up to the maximum capacity of the module may be connected. A maximum of 84 seed sensors can be connected to the system.

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.

Figure 17

Correct Seed Sensor Module Connection

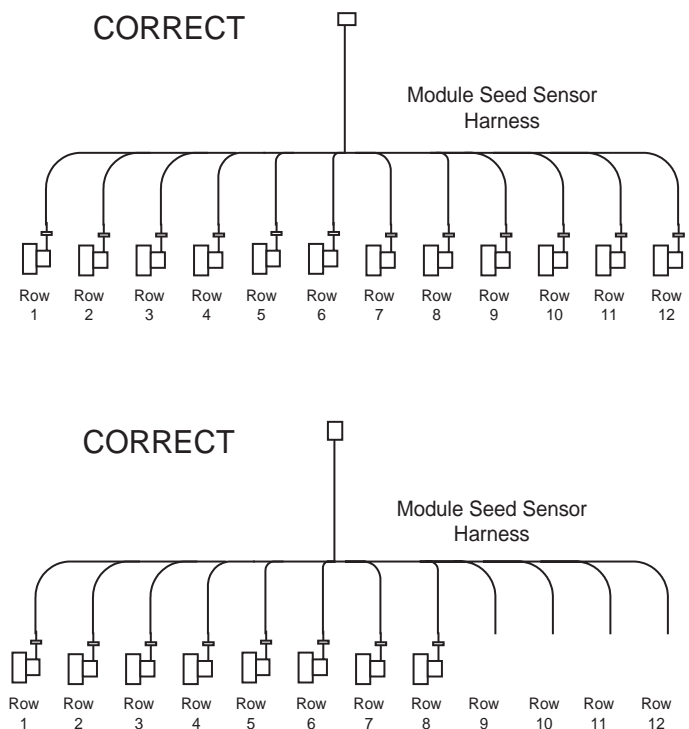
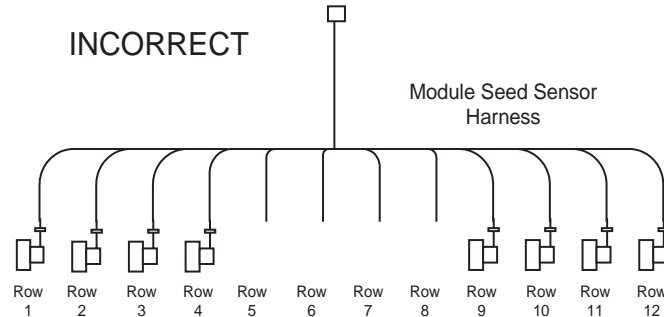




Figure 18

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 DICKEY-john planter hopper level sensors. Three hopper level sensors can be connected to the PCM module. The hopper sensor is connected to the actuator harness. The hopper level connection is labeled HOPPER 1-3.

RPM SENSORS

The system is compatible with all existing DICKEY-john RPM sensors. Two RPM sensors may be connected to the PCM module. The sensor is connected to the actuator harness. The RPM sensor connection is labeled RPM 1-2.

AIR PRESSURE SENSORS

The system is compatible with DICKEY-john air pressure sensors. Three air pressure sensors with adapter harness connects to the RPM harness connection labeled RPM1.

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.



VIRTUAL TERMINAL FEATURES

The Virtual Terminal (VT) is the main user interface with the IntelliAg Planter Drill Control system. The terminal is mounted in the tractor cab for easy accessibility. Terminal features vary between the 4" and 7" display and are defined below.

POWER ON/OFF

The terminal is powered ON when the ignition key is turned ON and turns OFF when the ignition key is turned off. A series of startup screens display while the system is booting. The Top Menu (Setup) screen displays after power up is complete.

IMPORTANT: The manual is written using the 4" terminal display. There are some variances in setup instructions between the terminals in how to navigate to buttons/menus but menu structures are the same.

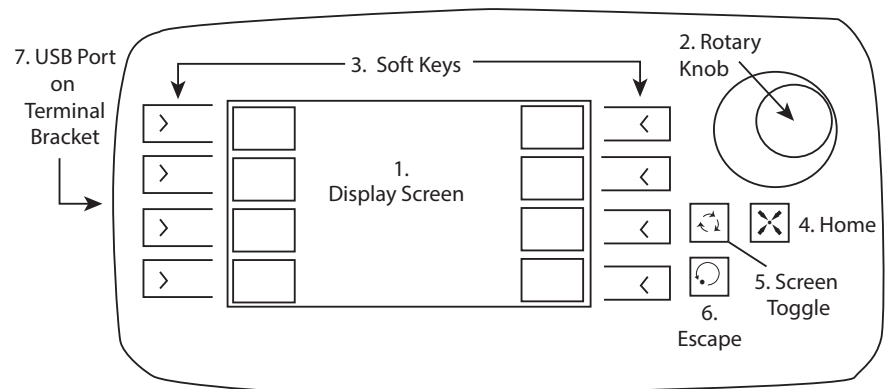
4" DISPLAY USER INTERFACE

The terminal consists of the following features used for programming, material selection, rate change, configuration file import/export, and navigation:

1. Display screen (High definition 4.3" color display)
2. Rotary knob
3. Hard key buttons (8)
4. Home button
5. Screen toggle button
6. Escape button
7. USB port

Figure 19

Virtual Terminal 4" Display





HARD KEYS

The eight hard keys on the left and right of the display correspond to the buttons on the display. Pressing the hard keys perform the action of the button.

HOME BUTTON

Captures a screen shot of the currently displayed window and saves to a USB device. This screen shot can be sent to DICKEY-john technical support team for troubleshooting purposes.

SCREEN TOGGLE BUTTON

Toggles between the two primary main screens of the terminal:

1. Main Work screen
2. Terminal Setup screen

ESCAPE KEY

Escape key toggles between the current screen and the previous screen.

USB PORT

The USB port is located on the terminal bracket. A memory device can be inserted to import and export configuration files, update PCM software, and capture screen shots of the display for troubleshooting assistance.

SCREEN NAVIGATION

Selecting items to edit on the screen is accomplished via the rotary dial. Items are selectable via a window with defined choices or by entering desired values using a keypad/keyboard.

USING THE ROTARY DIAL

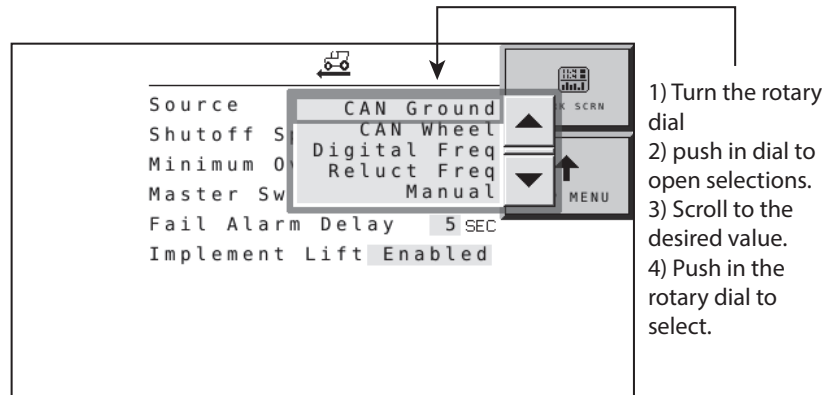
Refer to [\(Figure 20\)](#).

1. Turn the rotary dial to the selected item to edit.
 - Selected item is highlighted in green.
2. Push in the rotary dial.
 - A window displays with defined choices.
3. Turn the rotary dial to highlight the desired choice.
4. Push in the rotary dial to accept and return to the previous screen.



Figure 20

Selecting a Value Using the Rotary Dial



USING THE KEYPAD

Numeric values are changed using a keypad. How the number is changed can be accomplished using one of the methods detailed in step 3 (a through c).

1. Turn dial to select the numeric value.
2. Push in the dial to open keypad.
3. The black field displays the current value. The value can be changed as follows:
 - a) With the black field highlighted push the rotary dial in.
 - The highlight changes from green to red.
 - Turn the rotary dial clockwise to increase the value; counter clockwise to decrease value.
 - Push in the rotary dial to lock in value or;
 - b) Turn the rotary dial to highlight the increase or decrease button.
 - Push in the rotary dial and continue to do so to increase/decrease the value until the desired value displays.
 - Push in the rotary dial to lock in value or;
 - c) Highlight the individual keypad numbers.
 - Push in the rotary dial to lock in value or;
 - d) Clears the value displayed
 - e) Cancels the value displayed
 - f) Returns to previous screen and does not save changes made at the keypad
4. Press the **Check** button to save selection and return to previous screen.



Figure 21
Keypad Entry

1. Turn dial to select numeric value. Selected item highlights in green.
2. Push in dial to open keypad.

b) - 3) a. 0 + b) WORK SCR
c) 7 8 9 ← d) TOP MENU
4 5 6 ⊗ e)
1 2 3
0 . ⊗ ✓
f) 4)



USING THE KEYBOARD

1. Turn dial to select the value.
2. Push in the dial to open keyboard.
3. Scroll to the desired letter.
4. Press in the dial to accept the letter that will appear at the top entry box.
5. Continue selecting letters until the desired name is finished.
6. Press the **Check** button to accept selection and return to the previous screen.

Figure 22

Keyboard Types

Default
Keyboard
abc?



All Caps
Keyboard
↑



Numeric
Keyboard
123?



Characters
Keyboard
+ + +





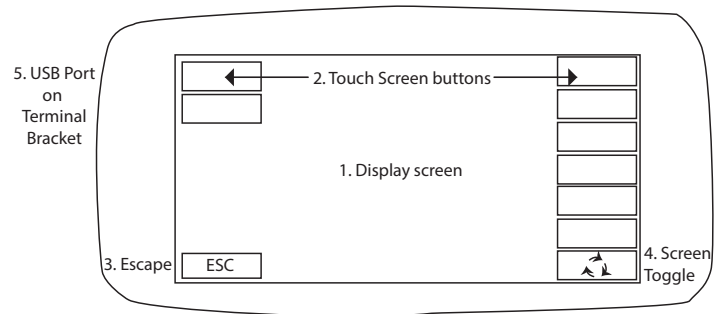
7" DISPLAY USER INTERFACE

The 7" display features a touch screen for programming, material/channel selection, rate change, configuration file import/export, and menu navigation:

1. Display screen (High definition 7" touch screen)
2. Softkey touch screen buttons
3. Escape softkey button
4. Screen toggle softkey button
5. USB port

Figure 23

7" Virtual Terminal Display (modify)





VIRTUAL TERMINAL SETUP

Terminal Setup allows customization of the terminal to user preferences and includes:

1. Terminal Brightness
2. Audio Volume Control
3. Language
4. Unit of Measurement
5. Date/Time
6. ISO BUS
7. Information



To Select an Item for Adjustment:

1. Press the **Screen Toggle** button located on the terminal face.

Selecting an item on the Setup screen is completed by using the rotary dial.

1. Turn the rotary dial to:
 - Open a selection window
 - Highlight the adjustment bar or select increase/decrease buttons.
2. The selected item outlines in green.

HOW TO USE THE ROTARY DIAL TO SELECT A BUTTON:

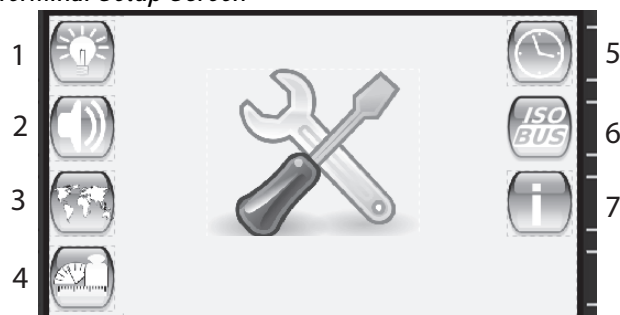
- Highlight the button.
- Push in the dial repeatedly until the desired setting is reached.
- Push dial again to save.

HOW TO CHANGE THE ADJUSTMENT BARS:

- Highlight the adjustment bar. Highlights in green.
- Push in the rotary dial on the adjustment bar. Highlight changes to red.
- Turn the rotary dial clockwise or counterclockwise to adjust the bar until the desired setting is reached.

Figure 24

Virtual Terminal Setup Screen





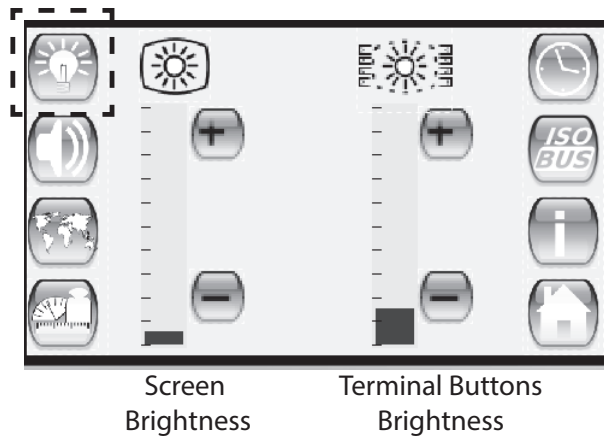
BRIGHTNESS CONTRAST

There are two types of brightness settings:

- Screen brightness adjust the screen background to varying degrees of light and dark.
- Button background brightness adjusts the lighting behind the rotary dial and softkeys to varying degrees of light and dark.

Figure 25

Brightness Contrast

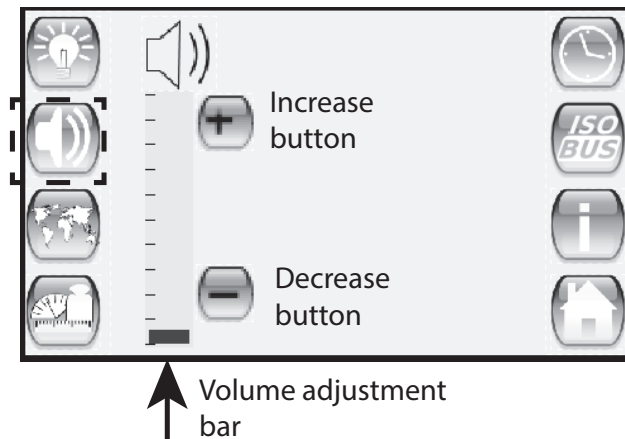


ALARM VOLUME

Adjusts the volume when an alarm event occurs.

Figure 26

Volume Control



LANGUAGE

The terminal is equipped with numerous languages that displays the user screens in the language selected.

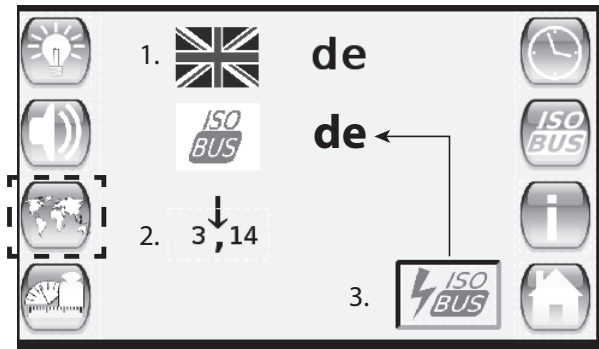
1. Language choices are identified by the country flag. An abbreviated identifier of the selected language displays next to the language window.



2. Decimal point choices are available to display unit of measure (period or comma format).
3. To save the language and decimal changes made at this screen, use the rotary dial to highlight the ISOBUS button.
4. Push in the rotary dial to save changes. The changes can be verified by returning to the Main Work screen. If the ISOBUS button is not selected and the rotary dial pressed, the changes will NOT save. The abbreviated language when saved appears next to the ISO Bus button.

NOTE: Remember to complete the final step of highlighting the ISOBUS button and pushing in the rotary dial to accept saved changes.

*Figure 27
Language*



UNIT MEASUREMENT

Unit measurement settings are adjustable to regional preferences. Units include:

- Length
- Area
- Volume
- Mass
- Temperature
- Air pressure
- Force

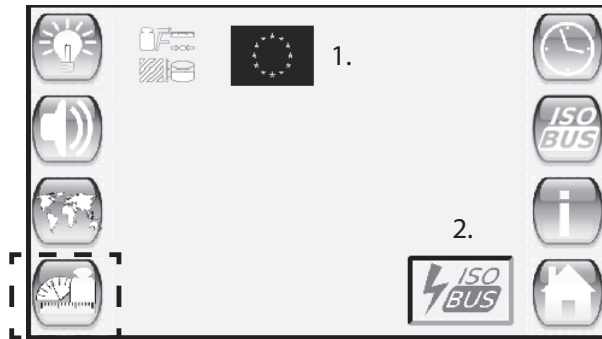
To Change Unit Measurement:

1. Unit measurement choices are identified by the country flag. Select the appropriate region flag.
2. To save the unit measurement changes made at this screen, use the rotary dial to highlight the ISOBUS button.
3. Push in the rotary dial to save changes. The changes can be verified by returning to the Main Work screen. If the ISOBUS button is not selected and the rotary dial pressed, the changes will NOT be saved.



Figure 28

Unit Measurement



NOTE: Remember to complete the final step of highlighting the ISOBUS button and pushing in the rotary dial to accept saved changes.

DATE/TIME

Adjusts the date and time format to regional preferences.

Time format choices:

- 12 hour clock
- 24 hour clock

Date format choices:

- DDMMYYYY
- DDYYYYMM
- MMYYYYDD
- MMDDYYYY

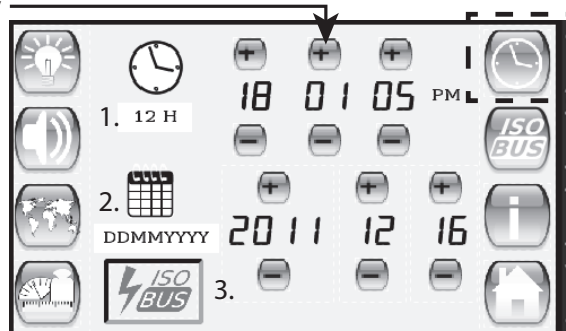
To Change Date and Time:

1. Highlight the Time input box and select 12 or 24 hour. Inc/dec buttons (+/-) incrementally changes the hour, minute, and seconds.
2. Highlight the Date input box and select the desired format. Inc/dec buttons (+/-) incrementally changes the month, date, and year.
3. To save the time and date changes made at this screen, use the rotary dial to highlight the ISOBUS button.
4. Push in the rotary dial to save changes. The changes can be verified by returning to the Main Work screen. If the ISOBUS button is not selected and the rotary dial pressed, the changes will NOT be saved.

Figure 29

Date and Time

Increase/
Decrease
buttons





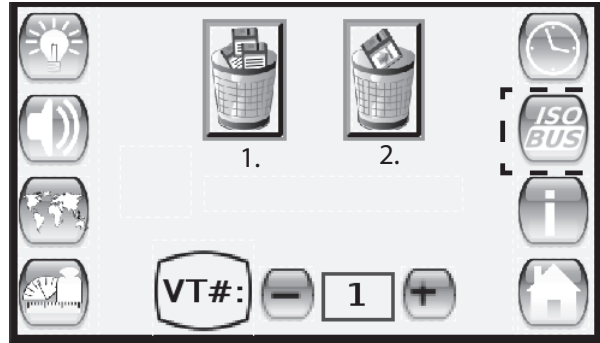
ISOBUS

The ISOBUS screen should only be used for troubleshooting purposes with the guidance of DICKEY-john technical support.

1. Deletes all object pools.
2. Deletes the latest object pool.

Figure 30

ISOBUS



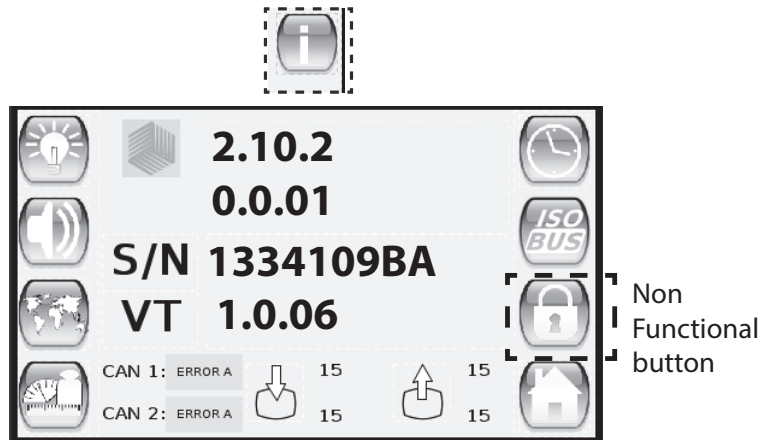
INFORMATION

The Information screen displays the module software versions connected to the system and is typically used for troubleshooting. No information on the screen can be edited.

The Lock button is not an active button.

Figure 31

Information







VIRTUAL TERMINAL SYSTEM MODES

The Virtual Terminal has two modes of operation:

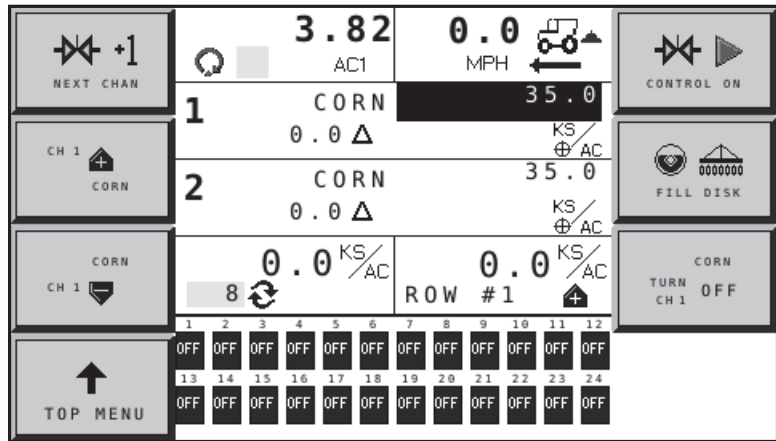
- Operate (master/control switch ON)
- Setup-accessible only with password (master/control switch OFF)

OPERATE MODE

When the master/control switch is in the ON position, the Virtual Terminal (VT) is in Operate mode. In this mode, all enabled system components and control channels are operational, as well as all monitoring functions and system accumulators.

Figure 32

Main Menu in Operate Mode



OPERATE MODE BUTTONS

Virtual buttons on the display are used to interact with the system. Top-level buttons that appear on the Operate and Setup/Configuration screens are defined below.



NEXT CHANNEL

Selects the next available channel for changes of rate or to turn channel off. This button is visible only when multiple channels have been configured.

- The active channel can be set to ON or OFF by selecting the On/Off Channel button described below.
- The active channel is displayed in reverse video display in a multiple channel configuration.
- The Target Rate for a channel can be adjusted by using the Inc/Dec buttons described below.
- The channel's Inc/Dec buttons, as well as the ON/OFF buttons, display the current channel label.



NEXT WORK SCREEN

Displays information on the next available work screen. The number to the left of the graphic identifies the current screen. The number on the right identifies the next screen to display. The Next Work Screen is only visible when multiple screens are configured.



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. The active channel displays in the button text.



TOP MENU

Provides an overview screen of how the system is setup including channels, rows, ground speed, accessory sensors, and implement lift status. Also, access to Setup screens is completed using the buttons on the Top Menu screen.



CONTROL ON/OFF CHANNEL

The active channel can be turned either ON and 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.



SETUP (TOP MENU) MODE

When the master/control switch is in the OFF position, the terminal is in Setup mode. In this mode, all control and monitoring functions cease. A password is required to access this mode.

- Setup screens are accessed by selecting the **Top Menu** button.
- **Next Page** button displays the second Setup screen and associated buttons.

There are two Setup menu screens with dedicated buttons for programming the system to user preferences.

The Setup screen also provides a summary of how the system is setup identifying channel type, row assignment, ground speed, accessories, and implement lift status.

Figure 33

Setup Screens

Button	Setup Menu Screen 1	Button	Setup Menu Screen 2	Button
MODULE CFG	Channel #1 CORN PLANTER CONTROL	WORK SCR	Channel #1 CORN PLANTER CONTROL	WORK SCR
ACCESSORIES	Channel #2 CORN PLANTER CONTROL	CONTROLS	Channel #2 CORN PLANTER CONTROL	INFO
SEED ROWS	24 Seed Rows 23.6 IN.Row Width 567 IN.Implement Width	MATERIALS	24 Seed Rows 23.6 IN.Row Width 567 IN.Implement Width	DIAGNOSTIC
NEXT PAGE	12192 GroundSpeed Const 0.01 MPH Speed ShutOff	SPEED SET	12192 GroundSpeed Const 0.01 MPH Speed ShutOff	ALARM LOG
	3 Sections Controlled 0 Accessory Sensors Implement Lift ENABLED		3 Sections Controlled 0 Accessory Sensors Implement Lift ENABLED	

SETUP MODE BUTTONS

MODULE CONFIGURATION

User-entered data pertaining to module configuration is setup on this screen.

ACCESSORIES

The number of pressure and RPM sensor connections..

SEED ROWS

All user-entered constants relating to general planter monitor functions are accessed on this screen.

NEXT PAGE

Displays the next available Setup screen and associated buttons.

WORK SCREEN

Displays the Main Work screen.





CONTROLS

Enter data relative to the control channel based on user preferences for 2 control channels.



MATERIALS

Configure and store up 16 different materials for planter control.



SPEED SET

Accesses the Ground Speed Setup screen and allows adjustment of the ground speed in MPH (Km/h) as measured by the ground speed sensor.



PLANTER FILL DISK

Fills the seed meters to allow instant seed flow when the channel is turned ON. Pressing the Fill Disk button rotates the seed meters on **ALL ACTIVE** planter control channels one revolution, then stops. For additional information, refer to the System Configuration section.



SYSTEM ACCUMULATORS

Displays all of the system accumulators for time and distance. There is no user-entered data on this screen.



SCREEN CONFIGURATION

The Virtual Terminal can be customized to display any combination of data items available. Up to three individual display screens can be customized. All work screen configurations are established on this screen.



INFORMATION

Displays the module software versions connected to the system and is typically used for troubleshooting. Each module connected is identified by module type, module position, and serial number. Module position cannot be altered on this screen and can only be established on the Module Configuration screen.



DIAGNOSTICS

Various system operating parameters display on this screen. There is no user-entered data on this screen.



ALARM LOG

A listing of previous alarms that have occurred display on screen. There is no user-entered data on this screen. Not all alarms are recorded in the alarm log.



USER LEVELS

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

- User Level 1 Operator (Basic View)
- User Level 2 OEM/Dealer (Full Access)

At initial powerup, the system loads in User Level 2. The system can be locked at User Level 1 and will continue to load at this level at every power cycle. A password is required to return to User Level 2 screens.

USER LEVEL 1 OPERATOR (BASIC VIEW)

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:

- Perform a fill disk
- Increase and decrease rates
- Turn on/off a control channel
- Access Diagnostics screen
- Access/view Information screen
- Access/view Alarm Log and Detail screens

All other screens for configuring and setup of constants must be performed in Level 2 mode.



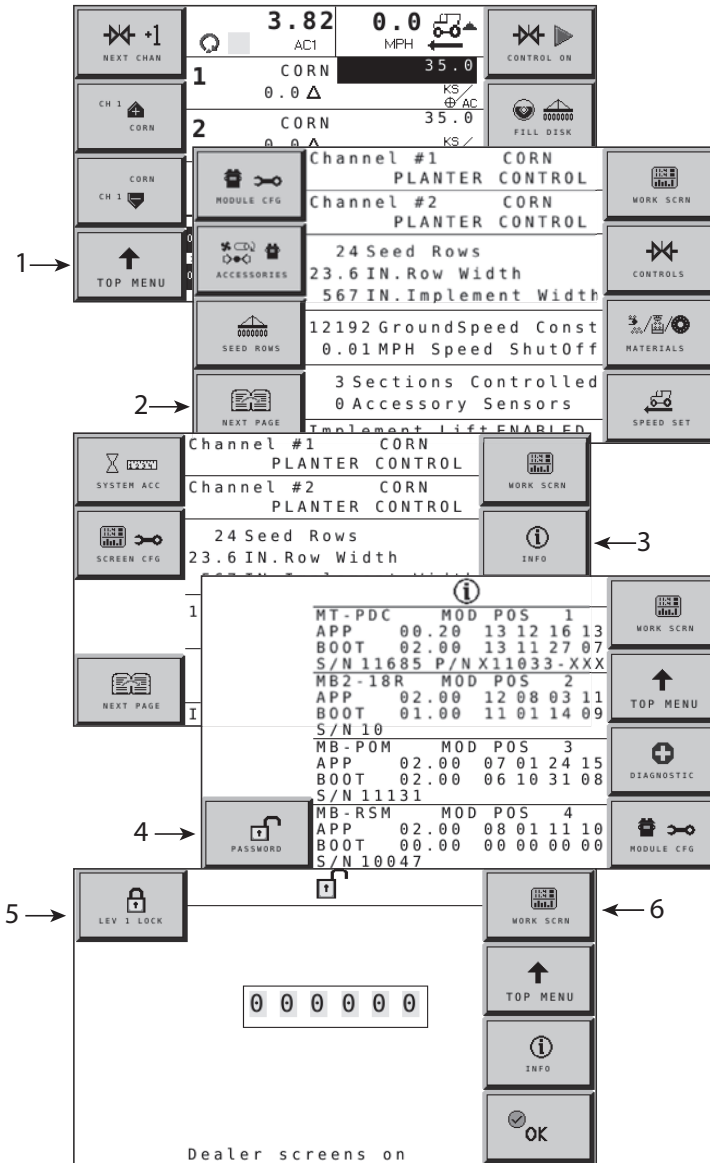
To change to User Level 1 Mode (Basic Operator View):

1. Press the **Top Menu** button.
 - At the Main Work screen, press the Work Screen button to access the Top Menu button.
2. At the Top Menu screen, press the **Next Page** button.
3. Press the **Information** button.
4. At the Information screen, press the **Password** button.
 - At the Password screen, text at screen bottom states “Dealer screens on” in the User Level 2 (Full Access) mode.
5. Press the **Lev 1 Lock** button. The **Lev 1 Lock** button will disappear from the screen and the system will now operate in Level 1 mode.
6. Press the **Work Screen** button to return to the Main Work screen.

The system will return to the previous set level at each power cycle until changed at the Password screen.



Figure 34
Changing User Level





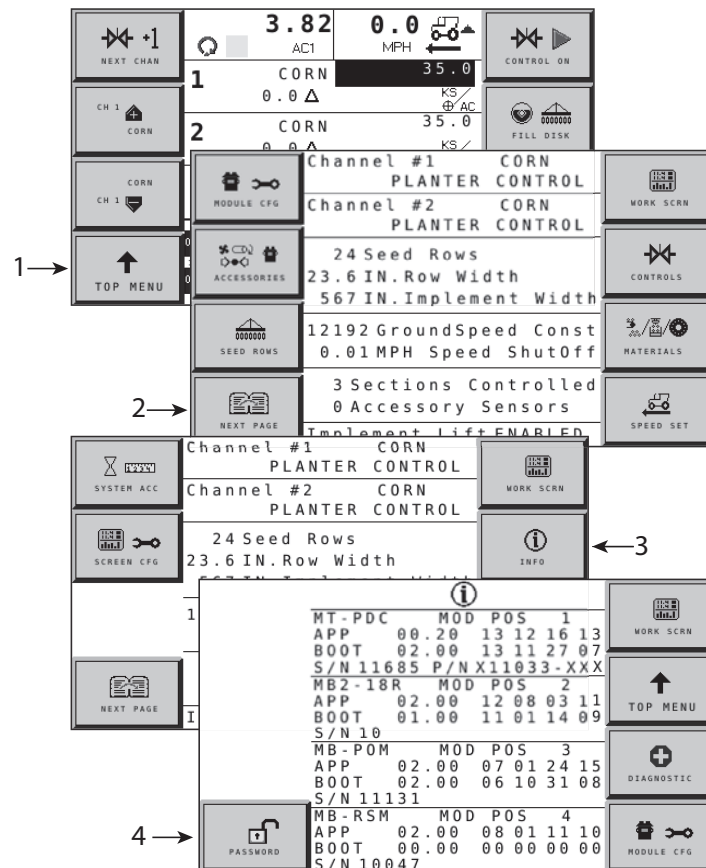
USER LEVEL 2 (OEM/DEALER)

To change from operator level to OEM/dealer level, a 6-digit password is required. Password includes the five-digit serial number found on the label of the Planter Control Module or on the Information screen.

1. Press the **Top Menu** button.
 - At the Main Work screen, press the Work Screen button to access the Top Menu button.
2. At the Top Menu screen, press the **Next Page** button.
3. Press the **Information** button.
4. At the Information screen, press the **Password** button.

Figure 35

Changing the Password

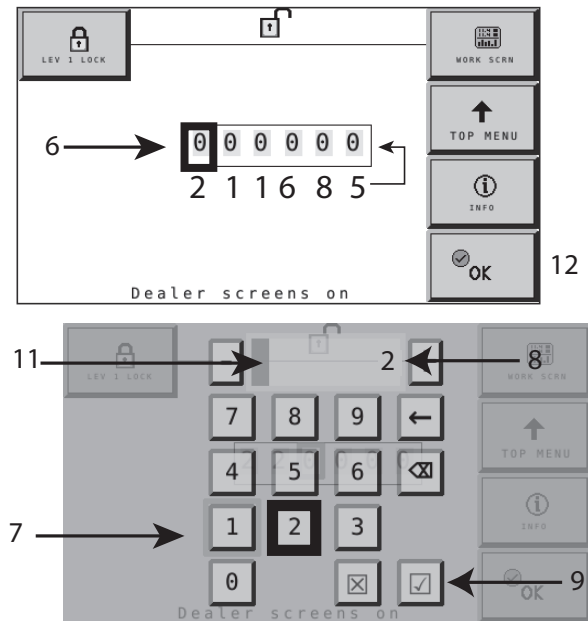


NOTE: Refer to section “Using Keypad to Enter Password”.

5. On the Password screen, enter the 6-digit password as follows:
 - Enter the first digit as 2 for User Level 2.
 - For the next five digits, enter the Planter Control Module Serial Number taken from the PCM or Information screen (example S/N 11685).



Figure 36
Enter Password



USING THE KEYPAD TO ENTER PASSWORD

6. At the Password screen, highlight the first entry box and push in the rotary button to select.
7. At the virtual keyboard, turn the rotary dial to select the first number of the password, which is 2.
8. Push in the rotary dial to select. The number appears at top.
TIP: Only 1 number can be entered at time. The entire 6 digits cannot be entered at the keypad.
9. Select the green **Check** button to accept the number selection.
 - The Password screen displays after the green **Check** button is pressed.
10. Repeat steps 1-4 until all numbers are entered.
11. If a red bar appears in the top box that displays the chosen number, the red **Cancel** button must be pressed and entry started again.
12. At the Password screen, press the **OK** button to finalize.



MATERIAL SETUP

The following parameters must be defined for effective system operation:

- Channel Setup
- Material Setup
- Ground Speed Setup and Calibration
- Module Configuration (Planter Control Module and Members)

CREATING A MATERIALS LIST

The Materials screen provides an overview of all materials assigned and configured for a channel. Unassigned materials appear with a generic name of MATRL 1, etc. A total of 16 user-defined materials can be created for a channel. As materials are configured and saved, the material button on the Materials list changes to the name created at the Material Setup screen.

Creating a material name allows for easy identification and displays throughout various screens to identify the active material assigned to a channel.

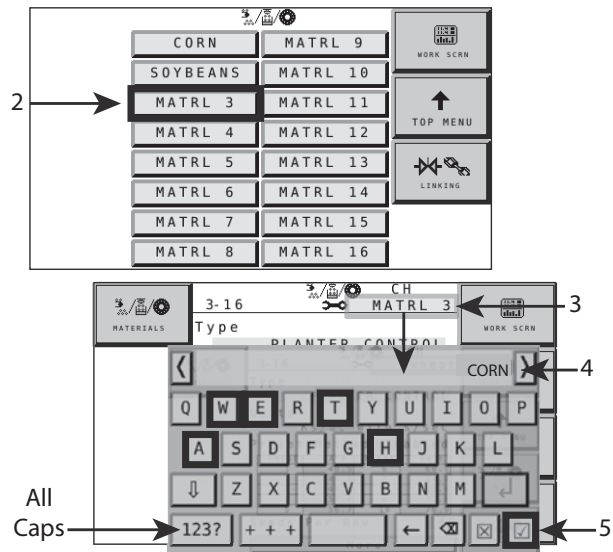
To Create a Material Name:

1. At the Top Menu screen, press the **Materials** button.
2. At the Materials screen use the rotary knob to select and highlight the material name. Push in the rotary knob to display the Material Configuration screen.
3. Highlight the MATL NAME box and push in the rotary knob.
4. Use the virtual keyboard to type in the desired name.
5. Press the **Check** button to accept name and return to Material Configuration screen.

NOTE: The whole name can be entered at one time using the virtual keyboard unlike the keyboard used to enter a password.

Figure 37

Enter a Material Name





DEFINE MATERIAL PARAMETERS

After creating a material name that appears at the top of the Material Configuration screen, material parameters are entered that include:

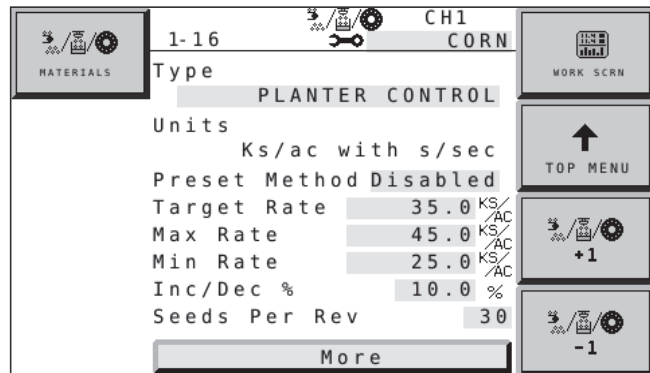
- Type
- Units
- Preset Method
- Seeds per Revolution
- Disc Low/High Limits
- Alarms
- On/Off Pattern

To Define Material Parameters:

1. At the Materials screen, use the rotary button to highlight each yellow input box.
2. Push in the rotary button to select or change the value.
3. Press the **More** button to add additional parameters.

Figure 38

Planter Control Setup Screen - Preset Method Disabled



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	seeding on a row crop planter
* Monitor Only	population monitoring only
Liquid Control	liquid application control
Granular Control	granular application control for drills and planters

NOTE: Refer to the Operate section for Monitor Only setup and operate instructions.

* Monitor Only is typically used for ground drive applications to monitor population with high and low alarms. All seeding control channels **MUST** be disabled in this configuration and/or no rows assigned to those seeding channels.

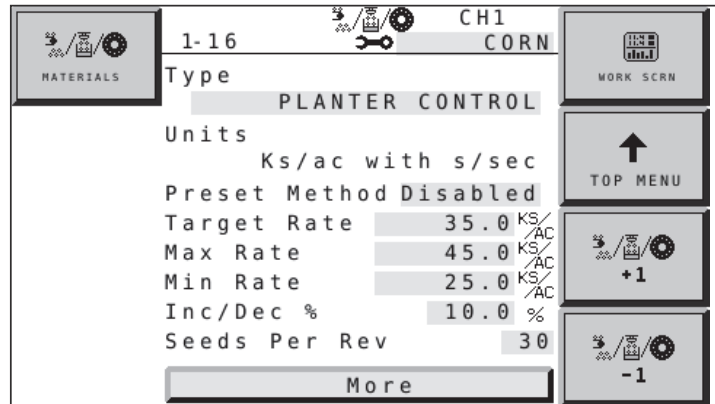


PLANTER CONTROL MATERIAL TYPE

Material setup for seeding applications.

Figure 39

Planter Control Material Type



TYPE

Select Planter Control as the control type.

UNITS

An application rate in KS (thousand) seeds per acre or (KS/Ha). Units automatically change with the type of material application selected.

PRESET METHOD DISABLED

When Preset Method is disabled, the target rate on the Main 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 (Figure 40).



NOTE: Rate changes can only occur on actively viewed control channels.

Figure 40

Material Configuration Setup Screen-Preset Method Disabled

With Preset disabled, target rate adjusts based on the Inc/Dec % rate set at the Materials Setup screen. Value to the left of the triangle is the difference off of the target rate.

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 Main Work screen using the **Increment/Decrement** buttons.

Figure 41

Material Setup Screen-Preset Method Enabled

With Preset enabled, target rate adjusts based on the rates entered at the Material Setup screen.

PRESET	RATE	PRESET	RATE
1	40.5	6	60.7
2	44.5	7	64.7
3	48.6	8	68.8
4	52.6	9	72.8
5	56.7	10	76.9



TARGET RATE

The desired rate of application displays in KS (thousand) seeds per acre or (KS/Ha).

MAXIMUM RATE

The maximum application rate in KS (thousand) seeds per acre or (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 KS (thousand) seeds per acre or (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 Main 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.



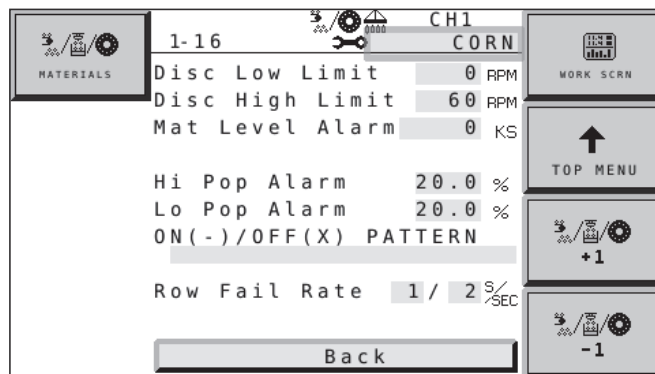
NOTE: Press the **More** button on the Materials screen to view second screen.

SEEDS PER REV

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

Figure 42

Material Setup (Second Screen)



DISC HIGH/LOW LIMITS

The maximum or minimum RPM at which the seed disc will operate. The control will not allow the seed disc to rotate faster than the Disc High or Low Limit setting.



MATERIAL LEVEL ALARM

Sets the level to trigger an alarm alerting of low product levels. The entered value is an estimate volume.

HIGH/LOW POPULATION ALARMS

High and Low Alarm option sets the high and low population limit values. The limit can be set to 0.0 to disable the population alarms. 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) = 95.0. The alarm will activate at this population.

ON/OFF PATTERN

For split, twin, or skip row type seeding implements there are 21 predefined patterns to configure row patterns. When a row pattern is selected, all of the rows are automatically turned ON or OFF according to the pattern. Individual rows in the Row Setup screen can still be manually edited to Population, Blockage, or Off before or after a pattern is selected. The pattern setting, when selected, will override previous individual existing row settings.

PATTERN	Description/Example
.....	Every Row On
-X-X-X	Every 2nd Row Off
X-X-X-	Every 2nd Row On
--X--X	Every 3rd Row Off
-X--X-	Every 3rd Row Off
X--X--	Every 3rd Row Off
XX-XX-XX-	Every 3rd Row On
X-XX-XX-X	Every 3rd Row On
-XX-XX-XX	Every 3rd Row On
---X---X	Every 4th Row Off
--X--X-	Every 4th Row Off
-X--X-	Every 4th Row Off
X--X--	Every 4th Row Off
XXX-XXX-	Every 4th Row On
XX-XXX-X	Every 4th Row On
X-XXX-XX	Every 4th Row On
-XXX-XXX	Every 4th Row On
--XX--XX--XX	Twin Rows
-XX--XX--XX-	Twin Rows
XX--XX--XX-	Twin Rows
X--XX--XX-X	Twin Rows



ROW FAIL RATE

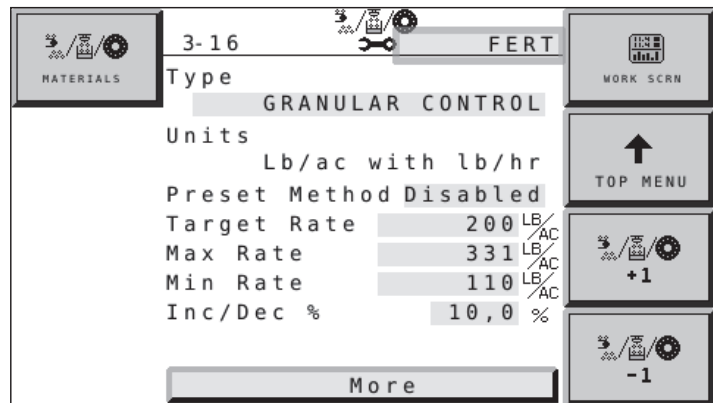
Sets the threshold for row failure alarms. The value is entered in seeds per second. Both values are adjustable allowing for numerous combinations. The default value is 2/1 that indicates a row failure threshold of 2 seeds in 1 second.

GRANULAR CONTROL MATERIAL TYPE

Granular control setup for fertilizer and seeding applications using hydraulic control systems.

Figure 43

Granular Control Material Type



TYPE

Select Granular Control as the type.

UNITS

An application rate in Lb per acre. Units 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 Main Work screen using the **Increment/Decrement** buttons (Figure 41).

PRESET METHOD DISABLED

When Preset Method is disabled, the target rate on the Main 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 40).

TARGET RATE

Target Rate establishes the desired rate of application in pounds per acre (kg/Ha).



MAXIMUM RATE

Maximum Rate establishes the maximum application rate in pounds per acre (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 (kg/Ha) that the control allows. Target Rate cannot be decremented to a value lower than this established minimum rate.

INCREASE/DECREASE %

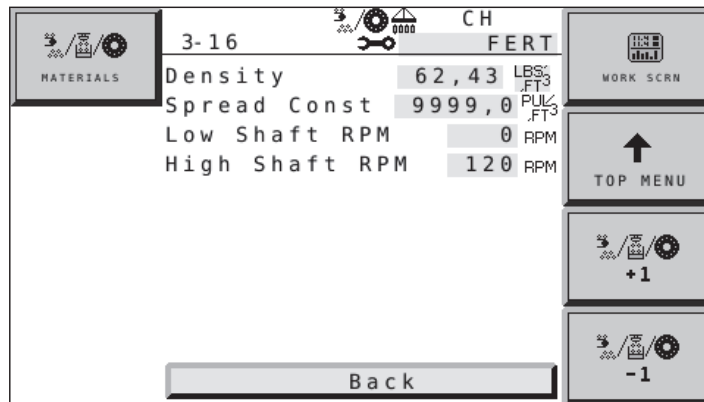
The increment and decrement percent rate establishes the percentage of change of the entered target rate applied each time the **Increment/Decrement** button is pressed on the Main Work Screen.

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 44

Granular Control Material Type Screen 2



DENSITY

Density is the weight per volume of material to be dispensed and is required to convert the spreader constant. If density is unknown, a value of 1 can be entered to perform a spreader constant. This will place the channel into a pure pulse/ft³ granular system.



SPREADER CONSTANT

Spreader Constant establishes the value for the amount of material per pulse of the application rate sensor. The value entered defines the pulses from the feedback sensor per ft³ of material discharged. Each material (and gate setting as applicable) has its own spreader constant. For best results, the value must be as accurate as possible. **This value may be set manually, however, using the spreader constant calibration is recommended for the most accurate results.**

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 that the control channel will operate. High shaft RPM is the highest shaft RPM the control channel will operate.

PRODUCT LEVEL ALARM

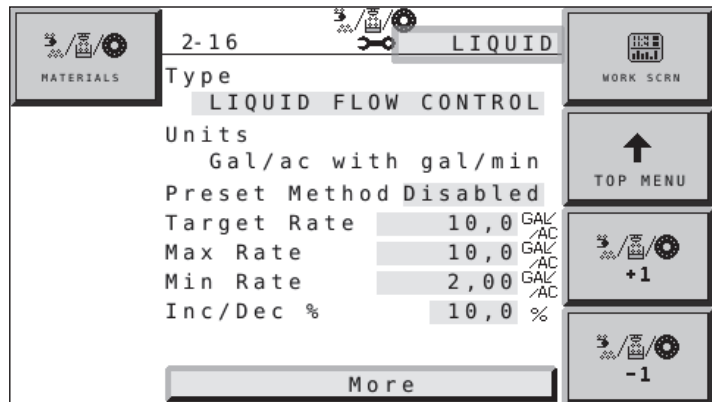
The product level alarm sets the weight (lbs/Kg) to alert of low seed levels. The entered value is an estimate in lbs.

LIQUID FLOW MATERIAL TYPE

Material setup for liquid flow control of fertilizer applications.

Figure 45

Liquid Flow Material Type



TYPE

Select Liquid Flow Control as the control type.

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 Main Work screen using the **Increment/Decrement** buttons (Figure 41).



PRESET METHOD DISABLED

When Preset Method is disabled, the target rate on the Main 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 40).

TARGET RATE

Target Rate establishes the desired rate of application in gallons per acre (Liters/Ha).

MAXIMUM RATE

Maximum Rate establishes the maximum application rate in gallons per acre (Liter/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 gallons per acre (Liter/Ha) that the control will allow. Target Rate cannot be decremented to a value lower than this established minimum rate.

INCREASE/DECREASE %

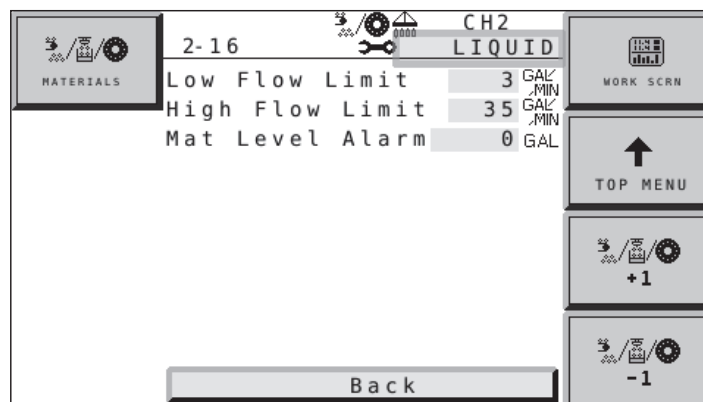
The Increment/Decrement Percent rate establishes the percentage of change that will be applied each time the **Increment/Decrement** button is pressed on the Main Work screen.

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 46

Liquid Control Material Type Screen 2





LOW FLOW LIMIT

The Low Flow Limit sets the lowest gallon per minute flow rate which the control channel will operate.

HIGH FLOW LIMIT

The High Flow Limit set the highest gallon per minute flow rate which the control channel will operate.

MATERIAL LEVEL ALARM

The Material 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.





CONTROL CHANNEL SETUP

Channel Setup allows configuration of two independent control channels. Control channel parameters include:

- Control Mode
- Drive Type
- Drive Frequency
- Input Filter
- Gear Ratio
- Sensor Constant
- # Seed Rows
- Channel Width
- Precharge Time
- Delay Time
- Flush Time

DEFINE CHANNEL PARAMETERS

To Setup a Control Channel:

1. Press the **Top Menu** button to display the Setup screen.
2. Press the **Controls** button.
 - To configure more than one control channel, press the **Next Channel** button.
 - A channel identified as **Disabled** indicates the channel is not in use.
3. At the Channel Setup screen, use the rotary button to highlight each yellow input box.
4. Push in the rotary button to select or change the value.
5. Push in the rotary button again to accept the change.
6. Press the **More** button for additional parameters.



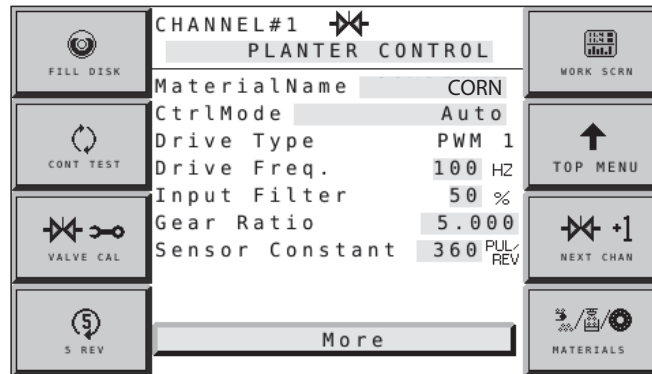


PLANTER CONTROL CHANNEL

A Planter Control channel controls the application rate of a row crop planter.

Figure 47

Control Channel Setup



MATERIAL NAME

Select the material assigned to the channel.

CONTROL MODE

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

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

MANUAL W/O FEEDBACK-Overrides the current system when not operating properly, i.e., bad feedback sensor. Using the **Increment/Decrement** buttons at the Main 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.

DRIVE FREQUENCY

Drive Frequency specifies the frequency for the proportional valve being used. The recommended setting for this option should be specified from the specific valve manufacturer.



NOTE: DICKEY-john proportional valves operate at 100 hz.



Input Filter

The Input Filter provides a setting for the amount of filtering applied to the feedback frequency feedback of the control channel.

IMPORTANT: It is NOT recommended that the Input Filter be manually altered. Any adjustments could result in the channel not operating properly. If adjustments are made, a valve calibration must be performed.

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

GEAR RATIO

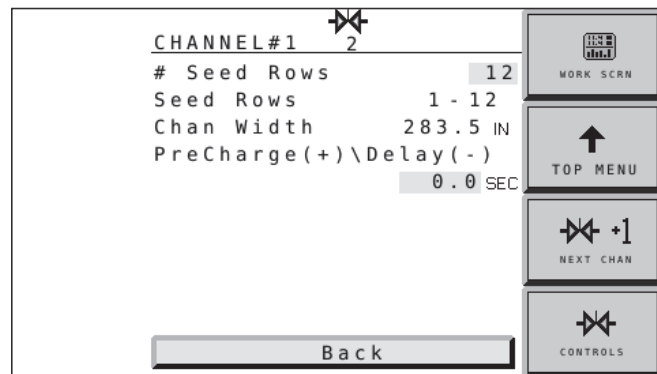
Gear Ratio specifies the actual ratio from the **application rate** sensor to the **seed meter**. This specifies the number of revolutions the application rate sensor turns in relation to one revolution the seed meter turns.

SENSOR CONSTANT

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 360.0.

Figure 48

Control Setup (Second Screen)



NUMBER (#) OF SEED ROWS

Allows entry of a specific number of seed rows to the control channel. Row assignment is given a priority based on the channel and will be assigned sequentially thereafter. Channel 1 will always be assigned to the first set of rows, Channel 2 the next set of rows, and so on. This will disable the row alarms when a respective channel is turned off.

CHANNEL WIDTH

Channel Width is the width for 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.



PRECHARGE TIME

Precharge Time is a specified length of time a control channel will operate or be active with a minimum precharge ground speed greater than 0 (Refer to the Speed Set section for Precharge Ground Speed setup information). This feature will activate the control when the master/control switch is turned ON even without ground speed.

The Precharge feature is typically used in applications that have significant distance between the implement row unit and storage bulk tank where seed placement takes several seconds due to the travel time of the seed/fertilizer from the bulk tank to the ground.

The Precharge feature will operate until the precharge time lapses or the precharge ground speed has been exceeded. If the master/control switch is turned OFF, the precharge feature will abort.

A Precharge Alarm displays any time the Preset feature is established or changed and the master/control switch is turned ON.

IMPORTANT: A Precharge number MUST be entered as a positive number (5.0 seconds) for the system to identify between a Precharge or Delay Time state.

To Activate Precharge:

1. At the Control screen, enter a Precharge time. A Precharge Time must be entered as a **POSITIVE** number (5.0 seconds) before the Precharge Ground Speed feature displays on the Speed Setup screen (Refer to Ground Speed section).
2. Press the **Top Menu** button and select the **Speed Set** button.
3. Enter a Precharge Ground Speed greater than 0.



IMPORTANT: Turn the master/control switch ON to activate the Precharge feature.

DELAY TIME

IMPORTANT: A Delay Time number MUST be entered as a negative number (-5.0 seconds) for the system to identify between a Delay Time or Precharge state. At the virtual keypad, scroll the rotary knob counter clockwise until negative numbers appear.

NOTE: Delay Time functionality may work differently than described above if the system has been purchased direct from the original equipment manufacturer. Refer to the manufacturer's operator manual for further instruction.

With an Implement Lift Switch

Delay Time determines the length of time before the control channel will start after the master/control switch has been turned ON and the implement switch is in a lowered position.

- The system will **immediately** shutdown the channel when the implement lift switch is in the raised position.
- The system will delay the channel shutdown if the master/control switch is turned OFF and the implement is in the down position.



Without an Implement Lift Switch

When the Delay Time feature is utilized without an implement lift switch:

- The control channel will delay after the master/control switch has been turned ON.
- A delay will also occur and then shutdown the control channel when the master/control switch is turned OFF.

FILL DISK FOR A CONTROL CHANNEL

Fill Disk fills the seed meters after a variety change or after power up on air-actuated planters with seed to allow instant seed flow when the control is turned on. Press the **Fill Disk** button to rotate the seed meters 1 time, then stop.

IMPORTANT: Fill disk button at Main Work screen runs all active planter control and granular seeding control channels.

To Run Fill Disk:

1. Press the **Controls** button.
2. Press the **Fill Disk** button.
3. Raise the implement.
4. With brakes locked and transmission in the park position, start the engine.
5. Engage hydraulics and run engine at normal speed until hydraulic fluid is at operating temperature.



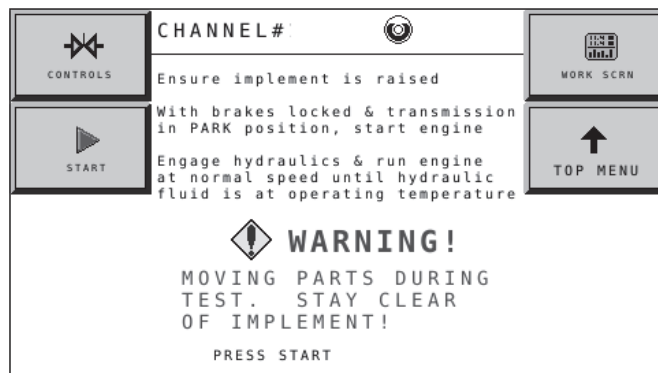
CAUTION

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.

6. Press the **Start** button. The seed meters will turn for 1 revolution, then stop.
7. Pressing the **Stop** button will also terminate the test.

Figure 49

Fill Disk Screen for One Control Channel



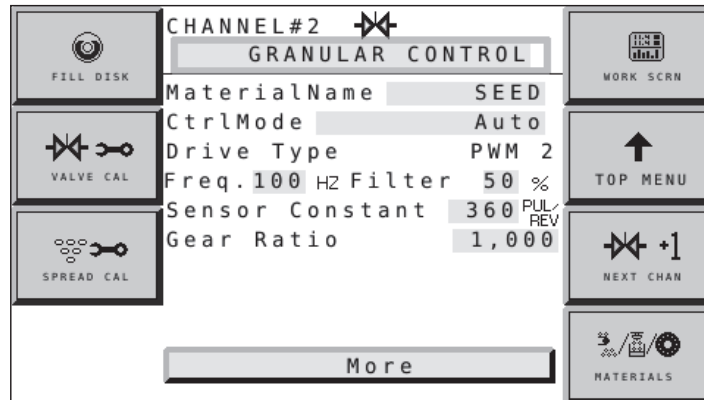


GRANULAR CONTROL CHANNEL

A granular control channel controls granular application on planters and drills.

Figure 50

Granular Control Channel



TYPE

Select Granular Control as the control type.

MATERIAL NAME

Select a material assigned to the channel. The Material Name displays only when a material is configured for the same channel type.

CONTROL MODE

AUTO-Control channel is calculating application rates based on ground speed and channel width under normal operating conditions.

MANUAL W/FEEDBACK-Overrides the current system when not operating properly, i.e., faulty coil. Using the **Increment/Decrement** buttons from the Work Mode 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.

MANUAL W/O FEEDBACK-Overrides the current system when not operating properly, i.e. bad feedback sensor. Using the **Increment/Decrement** buttons from the Work Mode screen sets the rate for the control channel. No application rate feedback displays.

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; DICKEY-john Proportional Valves operate at 100 Hz.

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 that the Filter be altered. Any adjustments could result in the channel not operating properly. If adjustments are made a valve calibration must be performed.

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

SENSOR CONSTANT

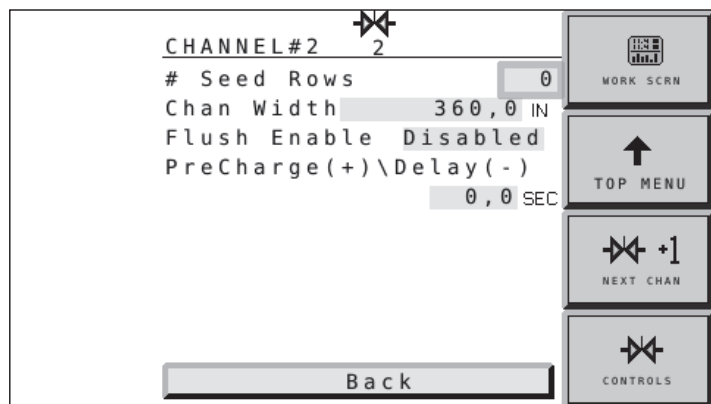
Establishes the number of pulses for one revolution of the metering unit. If a standard DICKEY-john application rate sensor is used, the value should be set to 360.0.

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.

Figure 51

Granular Control Channel (Screen 2)





NUMBER (#) OF SEED ROWS

Enter number of seed rows assigned to a control channel. Row assignment is given a priority based on the channel and will be assigned sequentially thereafter. Channel 1 will always be assigned to the first set of rows, Channel 2 the next set of rows, and so on. This will disable the row alarms when a respective channel is turned off.

CHANNEL WIDTH

Granular Seeding

Enter the implement width for rows assigned to a channel.

Granular Fertilizer

Enter 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 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.
2. A Flush Ground Speed greater than 0 must be entered on the Ground Speed setup screen for this feature to operate.

PRECHARGE TIME

A specified length of time a control channel operates or is active with a minimum Precharge ground speed greater than 0. (Refer to the Ground Speed Setup section for Precharge Ground Speed Setup information). This feature will activate the control when the master switch is turned ON even without ground speed.

NOTE: The master switch must be ON to activate the Precharge feature.

The Precharge feature is typically used in applications that have significant distance between the implement row unit and storage bulk tank where seed placement takes several seconds due to the travel time of the seed/fertilizer from the bulk tank to the ground.

A Precharge alarm will display any time the Preset feature is established or changed and the master switch is turned ON.

IMPORTANT: A Precharge number MUST be entered as a positive number (5.0 seconds) for the system to identify between a Precharge or Delay Time state.

To activate Precharge:

1. At the Control Channel screen, enter a Precharge time. A Precharge Time must be entered before the Precharge Ground Speed feature displays on the Ground Speed Setup screen (Refer to Ground Speed Setup section).



2. Press the **Work Screen** button and select the **Speed Set** button.
3. Enter a Precharge Ground Speed greater than 0.

IMPORTANT: Turn the master switch ON to activate the Precharge feature.

DELAY TIME

NOTE: Delay Time functionality may work differently than described above if the system has been purchased direct from the original equipment manufacturer. Refer to the manufacturer's operator manual for further instruction.

IMPORTANT: A Delay Time number MUST be entered as a negative number (-5.0 seconds) for the system to identify between a Delay Time or Precharge state.

With an Implement Lift Switch

Delay Time determines the length of time before the control channel will start after the master switch has been turned ON and the implement switch is in a lowered position.

- The system will **immediately** shutdown the channel when the implement lift switch is in the raised position.
- The system will delay the channel shutdown if the master switch is turned OFF and the implement is in the down position.

Without an Implement Lift Switch

When the Delay Time feature is utilized without an implement lift switch:

- The control channel delays after the master switch has been turned ON.
- A delay also occurs and then shutdowns the control channel when the master switch is turned OFF.

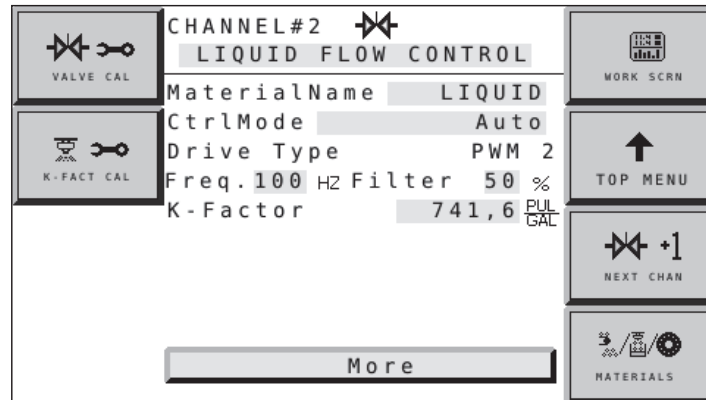


LIQUID FLOW CHANNEL

Control setup parameters for liquid flow control applications.

Figure 52

Liquid Flow Control



TYPE

Select Liquid Flow Control as the channel type.

MATERIAL NAME

The Material Name displays only when a material is configured for the same channel. Press the Material Name input field to select the appropriate name.

CONTROL MODE

AUTO-Control Channel is calculating application rates based on ground speed and channel width under normal operating conditions.

MANUAL W/FEEDBACK-Overrides the current system when not operating properly, i.e., faulty coil on hydraulic valve. Using the **Increment/Decrement** buttons from the Work Mode 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.

MANUAL W/O FEEDBACK-Overrides the current system when not operating properly, i.e., bad flow meter. Using the **Increment/Decrement** buttons from the Work Mode screen sets the rate for the control channel. No application rate feedback will display.

DRIVE TYPE

PWM (Pulse Width Modulation)

A proportional valve regulating hydraulics and 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.



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.

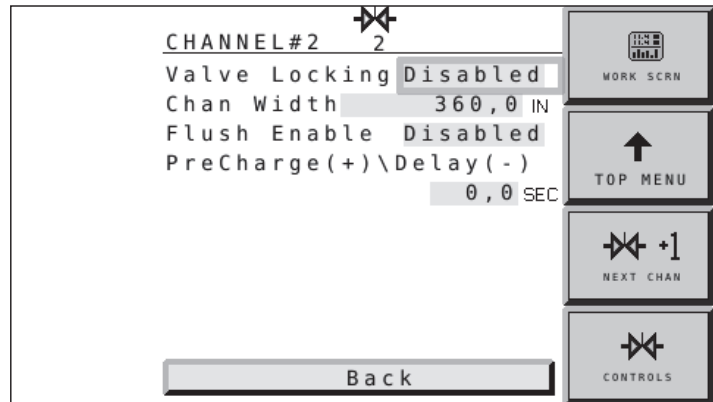
IMPORTANT: It is NOT recommended that the Input Filter be altered. Any adjustments could result in the channel not operating properly. If adjustments are made, a valve calibration must be performed.

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.

Figure 53

Liquid Control (Screen 2)



VALVE LOCKING

When enabled, locks the valve into the last operating position whenever the booms are turned off. This maintains system pressure while turning so a quick spray pattern may resume after turning is complete. Valve locking is also used for tank agitation.

CHANNEL WIDTH

Channel Width requires a manual entry of the width of the liquid sprayed.



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 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

PRECHARGE TIME

Precharge Time is a specified length of time a control channel will operate or be active with a minimum Precharge ground speed greater than 1. (Refer to the Ground Speed Setup section for Precharge Ground Speed setup information).

IMPORTANT: A Precharge number MUST be entered as a positive number (5.0 seconds) for the system to identify between a Precharge or Delay Time state.

To activate Precharge:

1. At the Control Channel screen, enter a Precharge time. A Precharge Time must be entered before the Precharge Ground Speed feature displays on the Ground Speed Setup screen (Refer to Ground Speed Setup section).
2. Press the **Work Screen** button and select the **Speed Set** button.
3. Enter a Precharge Ground Speed greater than 0.

IMPORTANT: Turn the master switch ON to activate the Precharge feature.

NOTE: The master switch must be ON to activate the Precharge feature.

DELAY TIME

IMPORTANT: A Delay Time number MUST be entered as a negative number (-5.0 seconds) for the system to identify between a Delay Time or Precharge state.

With an Implement Lift Switch

Delay Time determines the length of time before the control channel will start after the master switch has been turned ON and the implement switch is in a lowered position.

- The system will **immediately** shutdown the channel when the implement lift switch is in the raised position.
- The system will delay the channel shutdown if the master switch is turned OFF and the implement is in the down position.



Without an Implement Lift Switch

When the Delay Time feature is utilized without an implement lift switch:

- The control channel will delay after the master switch has been turned ON.
- A delay will also occur and then shutdown the control channel when the master switch is turned OFF.

NOTE: Delay Time functionality may work differently than described above if the system has been purchased direct from the original equipment manufacturer. Refer to the manufacturer's operator manual for further instruction.

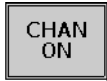




VALVE CALIBRATION

A valve calibration sets the machine hydraulic system parameters and should be performed for best results. Each control channel that is enabled requires a valve calibration. Some calibration screens vary based on control channel type.

CHANNEL ON



The **Channel On** button appears on this screen only if the channel is turned off. The channel must be ON before performing a valve calibration. Press the **Channel On** button to turn the channel on.

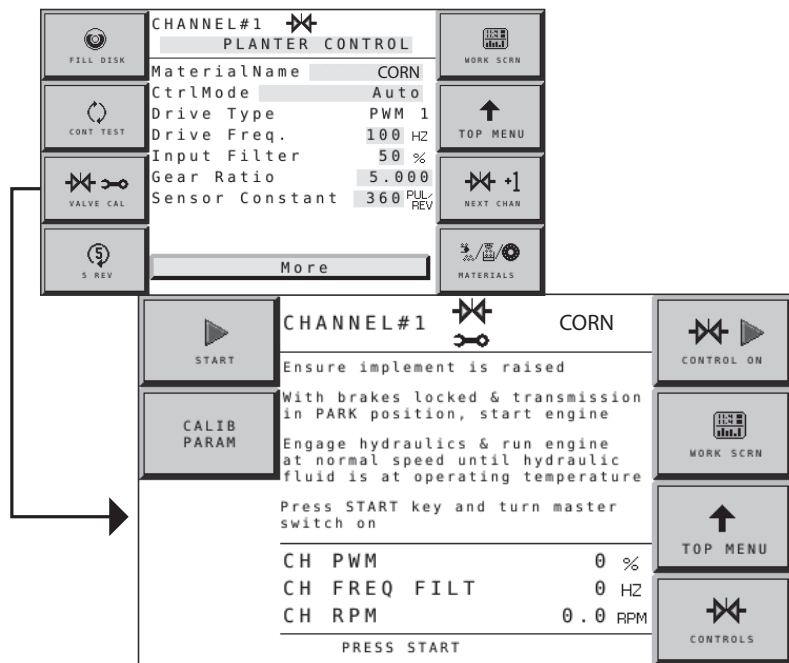
PLANTER CONTROL CALIBRATION

Performing a valve calibration is required for a planter control channel type. The Valve Calibration screen sets the machine hydraulic system parameters and should be performed for best results.

NOTE: Verify disc speed high limit is set correctly. Valve calibration will try and obtain the high disc speed.

Figure 54

Valve Calibration Screen - Planter Control



⚠ WARNING

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.



CAUTION

Hoppers are assumed to be empty for this calibration. If they are loaded, material will be dispensed onto the ground.

To Perform the Control Channel Valve Calibration:

1. Press the **Controls** button.
2. Press the **Valve Calibration** button.
3. Move the implement to the "raised" position.
4. Apply the tractor brakes and lock in the applied position.
5. Put the transmission in "park" or in a locked, neutral position.
6. Start the tractor and engage the hydraulic system, i.e. PTO or auxiliary lever.
7. Run the engine at normal operating speed until the hydraulic fluid is at normal operating temperature.
8. Press the **Start** button.
9. Turn the master/control switch to the ON position.
10. The valve calibration immediately starts.
11. Keep the hydraulics engaged until the calibration is complete. The calibration may take a minute up to several minutes. Each calibration step is monitored on the lower left corner of the display.
12. When the calibration is complete, the control shuts down automatically. All calibration data is automatically stored.





GRANULAR CONTROL CALIBRATION

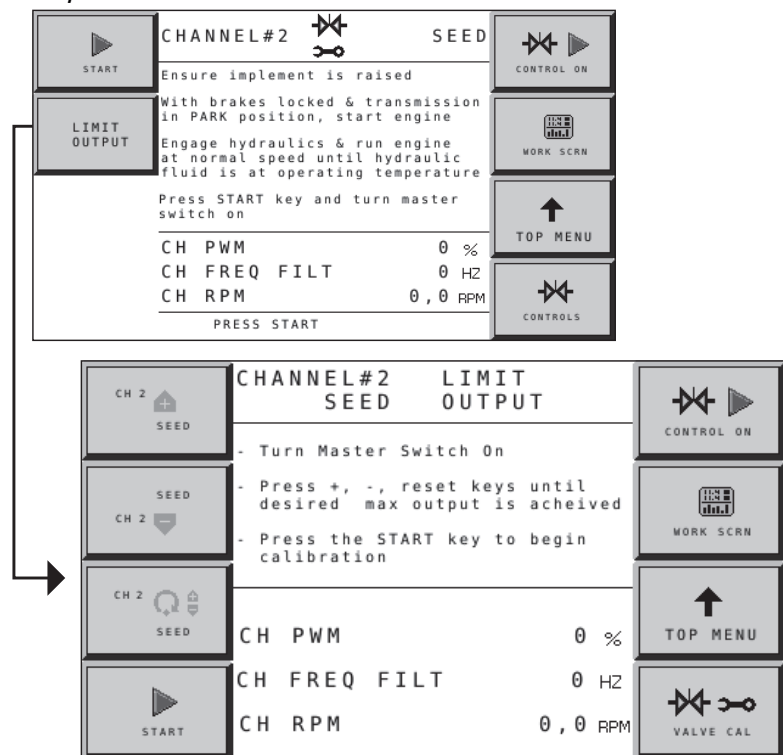
Performing a Limit Output, Valve Calibration, and Spreader Calibration are required for a granular control channel type.

LIMIT OUTPUT

In certain instances, it is necessary to limit the output of the control channel before running a valve calibration. System capacities are greater than the actual desired capacities. These features allow setting the maximum output of the channel to prevent machine damage.

Figure 55

Limit Output



To Perform a Limit Output:

1. 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. Place the master switch in the ON position.
8. To change the valve position, press the **Increment** or **Decrement** buttons repeatedly until the desired minimum or maximum output value is reached.
9. Press the **Start** button and the valve calibration immediately begins. The calibration runs using the new max flow value.

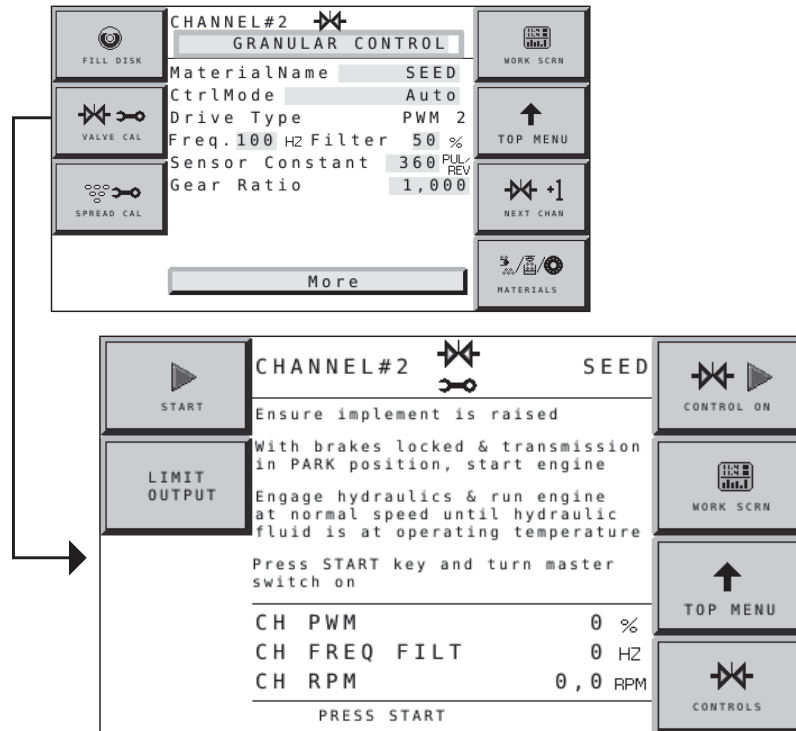


GRANULAR CONTROL VALVE CALIBRATION

Follow valve calibration steps 1-12 listed in planter control calibration section.

Figure 56

Valve Calibration



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.**

IMPORTANT: A valve calibration should be performed before a spreader calibration.

To Perform a Spreader Calibration:

1. Load hopper with material.
2. Move implement to 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. Press the **Shaft Turn** button to fill seed/fertilizer metering system before starting calibration.
8. At the Calibration screen, enter the following values:
Density-Enter product weight per volume in 1 lbs/ft³.



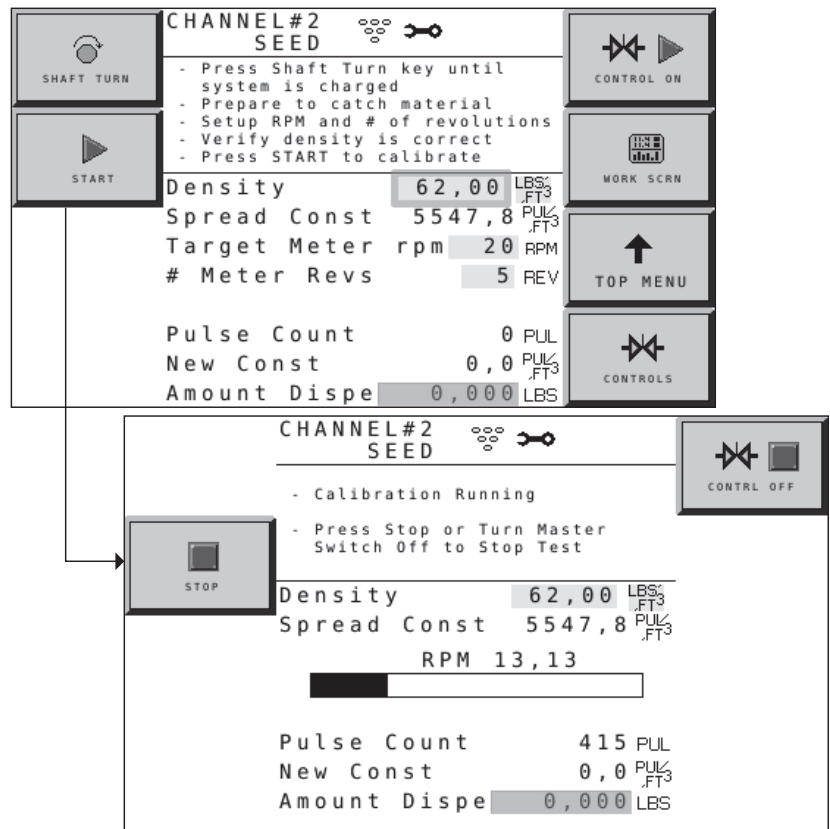
Target Meter RPM-Enter the RPM at which the output meter shaft will turn during the calibration.

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.

9. At the Calibration screen, press the **Start** button.
10. Turn the master switch ON. Calibration starts and will shut down automatically.
11. Weigh and enter lbs. of material dispensed in the **Amount Dispersed** field.
12. Press the **Save** button.
13. The new spreader constant automatically calculates and is entered for this material.

Figure 57

Granular Control Spreader Calibration



SPREADER CONSTANTS DEFINED

Density

Relative granular density as represented by the weight of product per volume (lbs/ft³, Lbs/bu.) If not known, enter a value of 1 lbs/ft³.

Spreader Constant

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



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.

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.

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.



LIQUID FLOW CALIBRATION

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

LIMIT OUTPUT

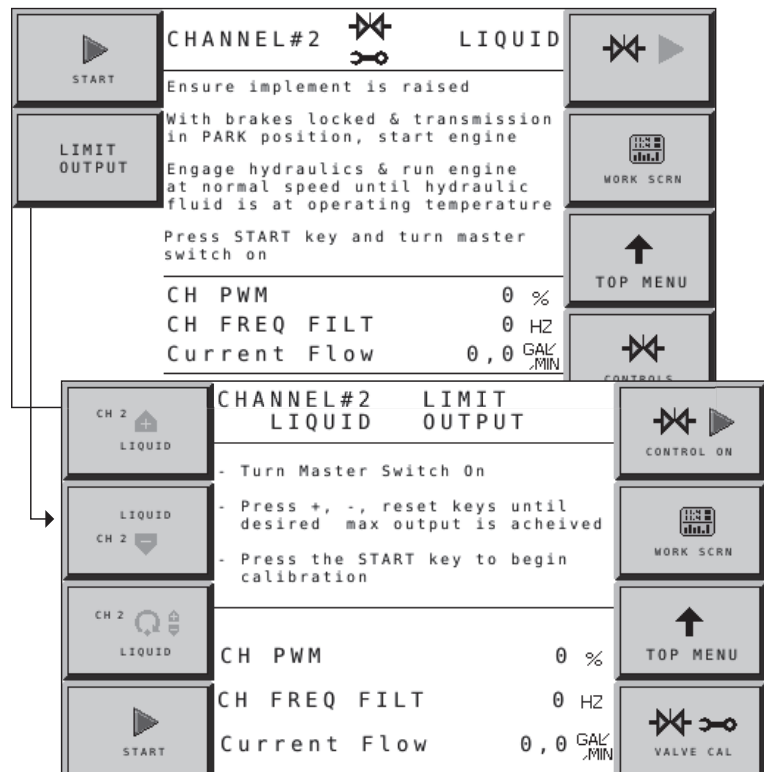
In certain instances, it is necessary to limit the output of the control channel before running a valve calibration. System capacities are greater than the actual desired capacities. These features allow setting the maximum output of the channel to prevent machine damage.

To Perform a Limit Output:

1. At the Valve Calibration screen, press the **Limit Output** button.
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. Place the master switch in the ON position.
8. To change the valve position, press the **Increment** or **Decrement** buttons repeatedly until the desired minimum or maximum output value is reached.
9. Press the **Start** button and the valve calibration immediately begins. The calibration runs using the new max flow value.

Figure 58

Limit Output



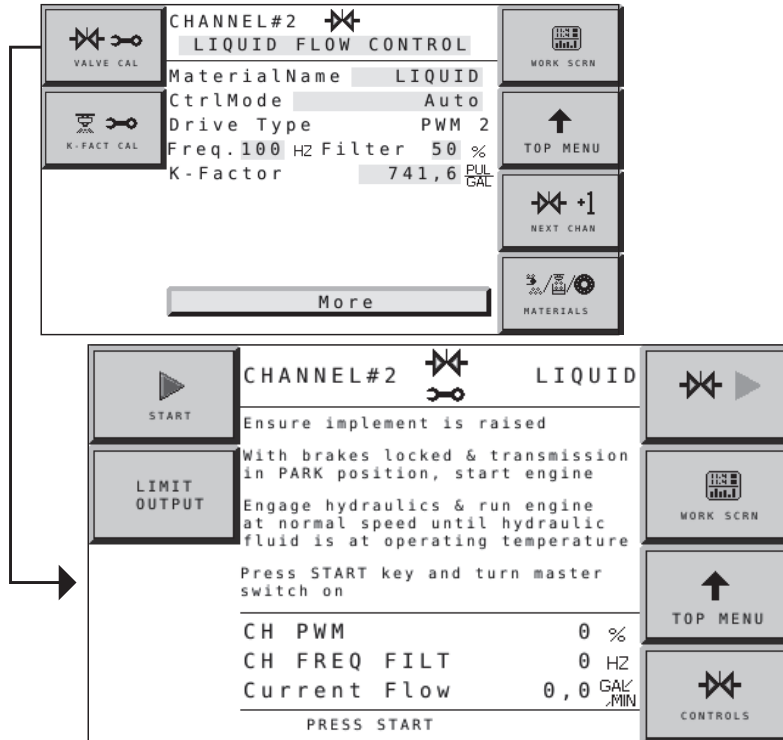


PERFORM A VALVE CALIBRATION

Follow valve calibration steps 1-12 listed in the planter control section.

Figure 59

Valve Calibration Liquid



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.

One of two methods can be used to measure the gallons of liquid flowing through the sprayer system. The more liquid passing through the system during calibration increases the degree of K-Factor accuracy.

Method 1 100% 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.



Method 2 Partial Catch:

1. Use a container such as a bucket or barrel to catch all liquid.
2. Weigh empty container.
3. Weigh container with liquid.
4. Calculate weight of the liquid (weight of full container minus empty container).
5. Calculate gallons dispensed.
6. Calculate % of total volume caught.
7. Gallons dropped/% caught.

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.

1. At the Controls screen, press the **K Factor Calibration** button.
2. Enter the Target Ground Speed and Target Flow Rate to calculate the operation rate.
3. Press the **Start** button.
4. Turn on physical master switch or press the **Master Switch** button.
5. Press **Stop** button when container is full.

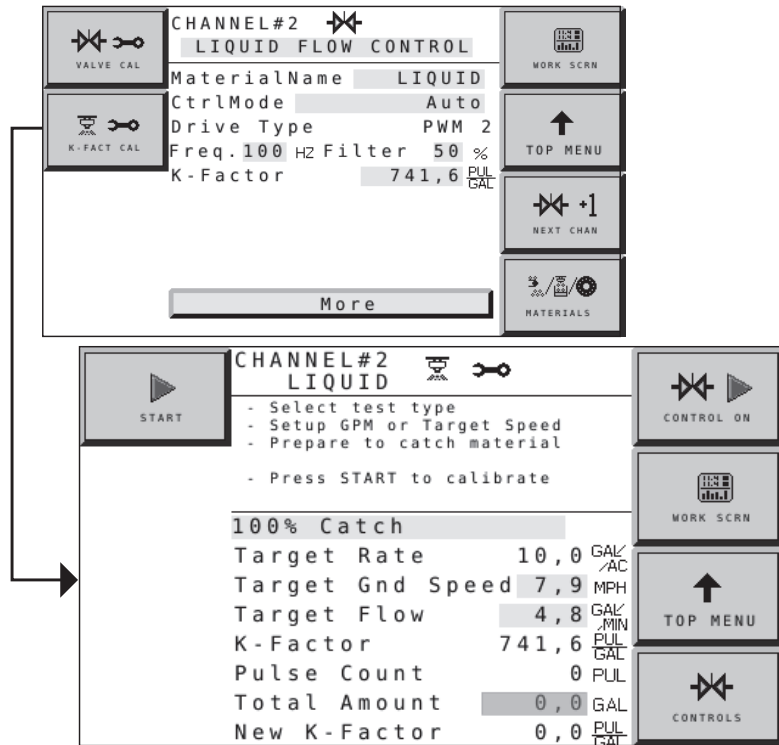
DANGER

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.

6. Enter amount (gallons) dispensed in the **Total Amount** field.
7. Press **Save** button to accept the selection.
8. The system automatically calculates and saves the new K Factor for this material.



Figure 60
K Factor





SYSTEM CONFIGURATION

MODULE CONFIGURATION

System components must be installed correctly and vehicle parameters entered into the IntelliAg system for effective operation. The following steps provide guidelines for entering those parameters.

The Module Configuration screen identifies modules on the CAN bus and the sensors connected to each module. This configuration is necessary for proper sensor monitoring and self-test operation.

- A check mark to the left of each module's serial number identifies the module is active and a communicating module on the bus.
- If the current installation does not use a specific component (e.g., pressure sensors, hoppers, seed sensors) or if the module is not connected in the system, the module will not display on the screen.

MODULE ADDRESS

The Module Address column is a critical parameter used to identify module's position on the implement and to identify the number of rows connected to the Planter Control Module (PCM) and Working Set Members (WSMB) (optional). Accurate placement of the modules is required for correct console operation.

- Up to 12 seed sensors can connect to the planter control module
- Working set members can be added to monitor 18 rows each
- Up to 5 working set members can be installed to monitor up to a total 84 rows

The following requirements must be observed when connecting seed sensors to the PCM or WSMB:

1. Each module address is determined by the order in which the modules are installed on the implement.
2. The module address should always start at the number 1 position.
3. Seed sensors must be connected to the PCM or WSMB continuously and consecutively. Any skipped rows 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 have been numbered.

SERIAL NUMBER AND MODULE TYPE

Each module present on the CAN bus is identified by the serial number and module type. The module type corresponds to the identification on the serial number label attached to that module.

IMPORTANT: If an implement uses more than one module type, mount the modules on the implement in serial number order starting on the left side and proceeding to the right.



IMPORTANT: Place the master/control switch in the OFF position to access and input data into the SETUP/CONFIGURATION mode.



To Display the Module Configuration Screen:

1. Press the **Top Menu** button.
2. Press the **Module Config** button.
 - At the Module Configuration screen, a **Module Next Page** button will display if more than 12 modules are connected.
 - Press the **Module Next Page** button to display additional modules.

Figure 61

Module Configuration Screen

INFO	SERIAL NUMBER	MODULE TYPE	ADDR	WORK SCR
ROM ASSIGN	✓ 10016	MT-PCM	1	TOP MENU
ACCESSORIES	✓ 11054	MB-POM	2	AUTO CONFIG
BOOM SETUP	✓ 10242	MB-RSM	3	CLUTCH MOD



PERFORM AN AUTO CONFIGURATION

The **Auto Config** button is an automated method of configuring the attached seed sensors and hopper sensors. To utilize the Auto Configuration function, all sensors must be connected to the appropriate modules in correct sequence.

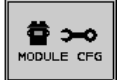
Auto Config performs the following:

- detects the presence of seed, hopper, and pressure sensors connected to each module. The detected number of seed sensors for each module automatically appears in the # of Rows data items on the Seed Sensor Configuration screen.
- the detected number of hopper sensors are automatically entered in the # of Hopp data items on the Hopper Sensor Configuration screen.
- the detected number of pressure sensors are automatically entered in the # of ACC data items on the Accessory Sensors Configuration screen.
- row numbers are automatically assigned based on the module address of each module.

IMPORTANT: Double check each sensor configuration to verify correct numbering. RPM sensors must be configured manually.



IMPORTANT: All sensors must be connected to the harnessing in the correct sequence for AUTO CONFIG to operate properly. Refer to the Installation Instructions accompanying each module for correct installation.



To Perform an Auto Configuration:

1. At the Module Configuration screen press the **Auto Config** button.
 - An hour glass appears in the upper right corner while the system is configuring. The following illustrations provide examples of possible installations:

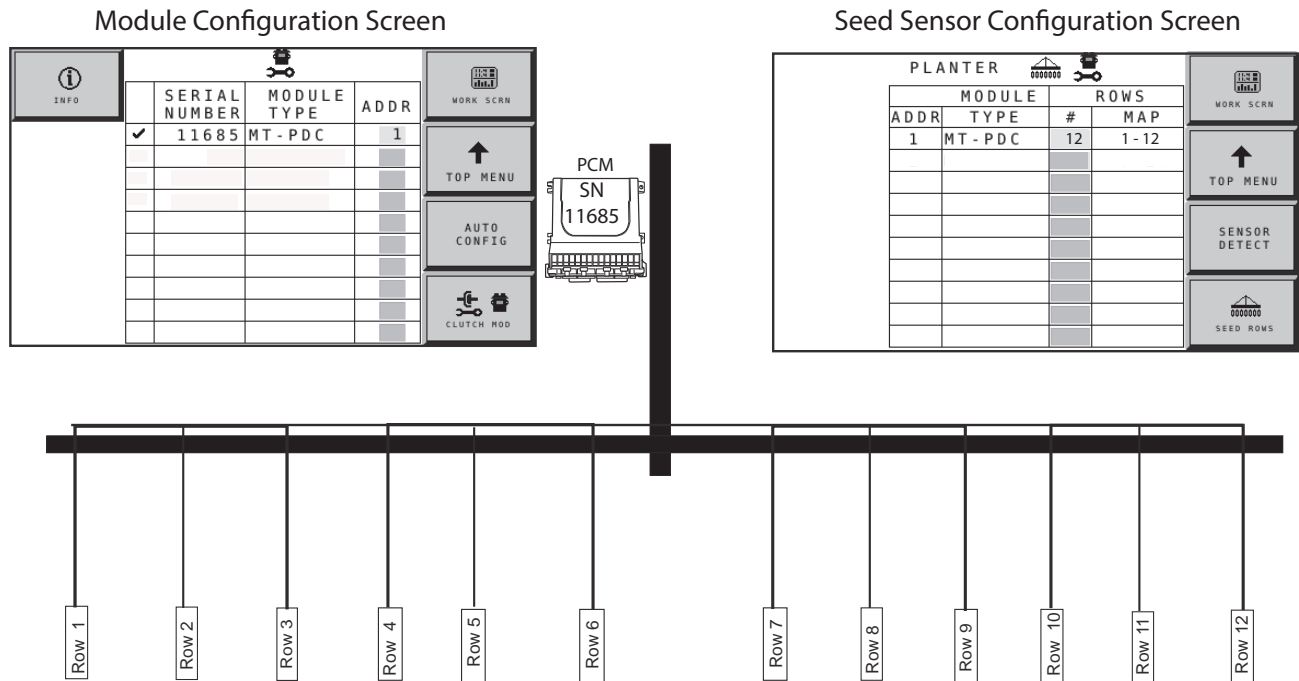
MODULE & SENSOR INSTALLATION EXAMPLES

12 ROW INSTALLATION

A 12 row installation connected to the Planter Control Module and assigned to Module Address 1. No Working Set Member is utilized.

Figure 62

12 Row Installation Example (PCM only)



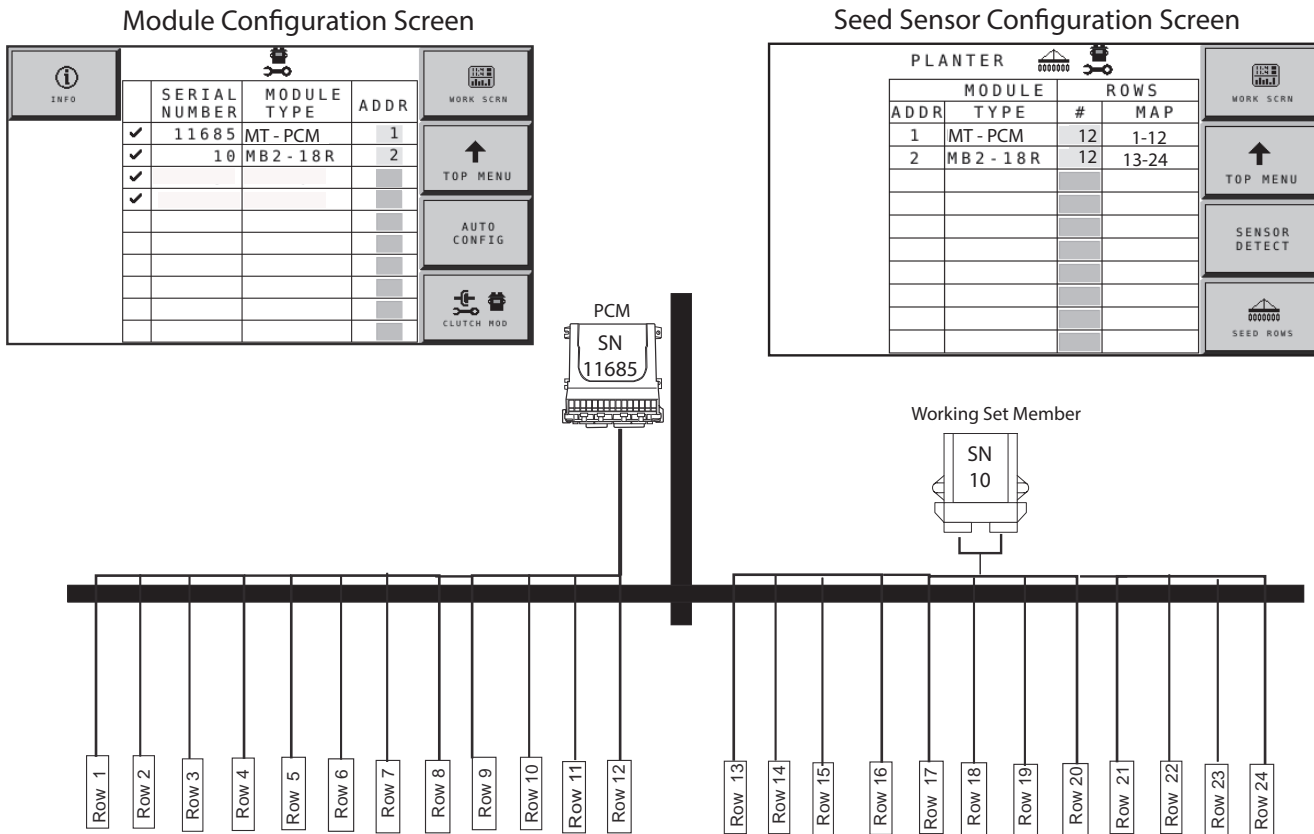


24 ROW INSTALLATION

A 24-row installation with the planter control module assigned to module address 1 to monitor rows 1-12. One Working Set Member is utilized to monitor rows 13-24.

Figure 63

24 Row Installation Example



OPERATOR'S MANUAL

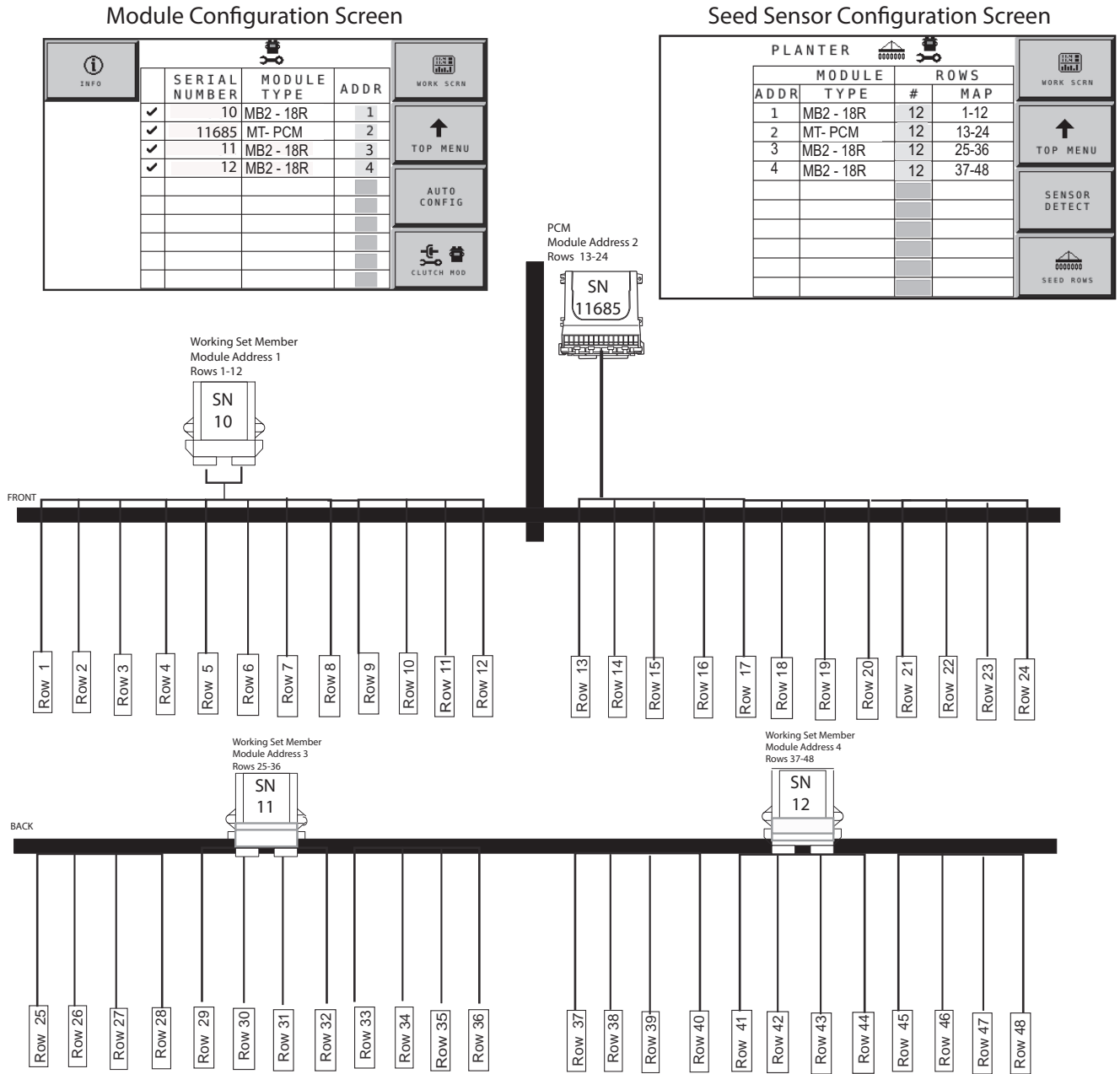


48 ROW INSTALLATION

A 48-row installation with the planter control module assigned to module address 2 and rows 13-24. Three working set members are assigned to the additional rows.

Figure 64

48 Row Installation Example





SEED ROW SETUP

Seed Row Assignment controls the rows that are monitored and the distance between rows and implement width.



- Individual rows 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 seed data or react to row failures.

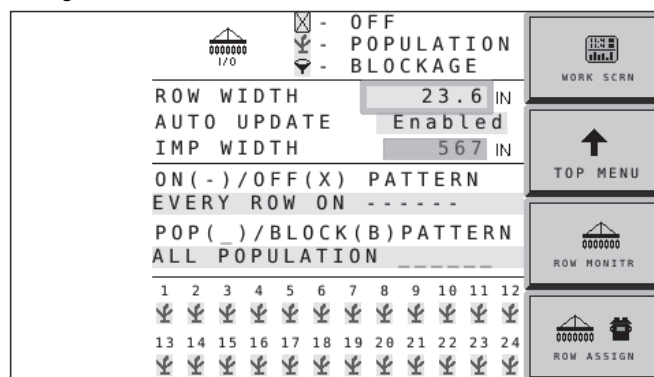
To Assign Rows:

1. At the Top Menu screen, press the **Seed Rows** button.
2. Use the rotary knob to highlight the yellow input box.
3. Press in the rotary knob to select or change the value.

NOTE: The Next Rows button is only present if more than 24 rows are configured.

Figure 65

Seed Row Assignment Screen



ROW WIDTH

Row Width is used for seed rate data and control calculations and is the distance in inches (centimeters) between rows with a resolution of 0.1. This value updates automatically with changes in the On/Off Pattern Setting option if the Auto Update Width option is set to Enabled.

AUTO UPDATE WIDTH

Auto Update Width automatically updates the Row Width and Implement Width settings when changes are made to the Pattern Setting option.

IMPORTANT: Depending on the configured number of rows, some On/Off pattern settings can result in erroneous row width or implement width updates if the Auto Update Width is enabled. Always check the calculated values for accuracy when the Auto Update Width is enabled. If the adjusted values are not correct, disable the Auto Update Width feature and manually enter a row width and implement width.



There are two choices available for this option:

ENABLED

Row Width and Implement Width settings automatically adjust with ON/OFF pattern setting changes.

The following two examples use a 16 row planter set for 15.0 inch row width. Implement width is automatically calculated as 240.0 inches.

Example 1: The On/Off Pattern Setting is changed to every other row (even rows) OFF. The row width parameter adjusts to 30.0 automatically. The implement width calculated value remains unaffected at 240.0 inches.

Example 2: The On/Off Pattern Setting is changed to every 3rd row off. The row width parameter adjusts to 22.5 inches automatically. The implement width value adjusts to 247.5 inches to accommodate the new pattern.

DISABLED

The Row Width and Implement Width values will not be adjusted with changes to the ON/OFF Pattern Setting. Implement Width will not be automatically calculated and must be manually entered.

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 automatically calculates as described in Auto Update Width if the feature is enabled. If Auto Update Width is disabled, manually enter the implement width.

ON/OFF PATTERN

For split, twin, or skip row type seeding implements there are 21 predefined patterns to configure row patterns. When a row pattern is selected, all of the rows are automatically turned ON or OFF according to the pattern. Individual rows in the Row Setup screen can still be manually edited to Population, Blockage, or Off before or after a pattern is selected. The pattern setting, when selected, will override previous individual existing row settings.



Figure 66

Pre-Defined On/Off Patterns

PATTERN	Description/Example
.....	Every Row On
-X-X-X	Every 2nd Row Off
X-X-X-	Every 2nd Row On
--X--X--X	Every 3rd Row Off
-X--X--X-	Every 3rd Row Off
X--X--X--	Every 3rd Row Off
XX-XX-XX-	Every 3rd Row On
X-XX-XX-X	Every 3rd Row On
-XX-XX-XX	Every 3rd Row On
---X---X	Every 4th Row Off
--X---X-	Every 4th Row Off
-X---X--	Every 4th Row Off
X---X---	Every 4th Row Off
XXX-XXX-	Every 4th Row On
XX-XXX-X	Every 4th Row On
X-XXX-XX	Every 4th Row On
-XXX-XXX	Every 4th Row On
--XX--XX--XX	Twin Rows
-XX--XX--XX-	Twin Rows
XX--XX--XX--	Twin Rows
X--XX--XX--X	Twin Rows

On/Off Pattern Symbols:
 Rows turned ON = -
 Rows turned OFF = X

Row Icons

Population =

Blockage =

OFF = X

Pattern Definitions

Blockage = B

Population = -

BLOCKAGE PATTERN

Determines which sensors are used to calculate population and those used only for blockage detection. Depending on the customer's preference at the time of purchase, either all Hi Rate sensors, all Recon Flow sensors, or a combination of the two can be chosen.

The system can be configured for:

- Every Row Population (_ _ _ _ _)
Using all Hi Rate sensors
- Every Row Blockage (BBBBBB)
Using all Recon Flow sensors
- Every 2nd Row Block (_ B _ B _)
Even rows use Recon and odd rows use Hi Rate
- Every 2nd Row Pop (B _ B _)
Even rows use Hi Rate and odd rows use Recon



ROW MONITOR SETUP

The **Row Monitor Setup** screen controls the parameters for:

- Material Name - monitor only
- High alarm delay
- Low alarm delay
- Population adjustment
- Population filter
- Row fail rate

To Edit Row Monitor Setup:

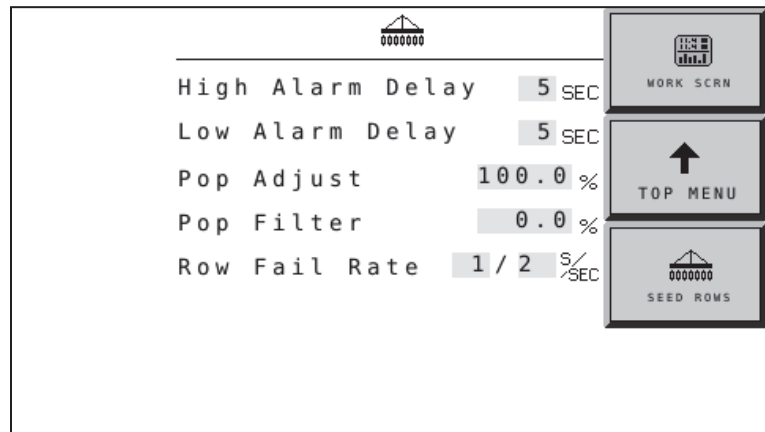
1. Press the **Row Monitor** button.
2. Use the rotary dial to highlight and change yellow input box values.
3. Push in the dial to accept.



NOTE: A material name will display on the Row Monitor Setup screen only when ALL seeding control channels are disabled, no seed rows are assigned to channels, and material is set for Monitor Only.

Figure 67

Row Monitor Setup Screen



IMPORTANT: For ground drive/nonhydraulic applications using the planter monitor only feature, all seeding control channels must be disabled, no seed rows assigned to these channels, and a Material Name selected at the Row Monitor Setup screen. Reference the Material Setup-Monitor Only section for additional information.

MATERIAL NAME

Material Name only displays if there are **NO** seeding channels enabled and no rows assigned to these channels. The Monitor Only selection must be selected at the Material Configuration Setup screen.

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.



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.

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.



ROW ASSIGNMENT

Row assignment automatically populates with the module address and module type entered at the Module Configuration screen.

IMPORTANT: Number of seed rows assigned to a module and the Row MAP value automatically populates when the Auto Config button is used to configure installed sensors.

To Manually Assign Rows to a Module:

1. Press the **Seed Rows** button
2. Press the **Row Assign** button.
3. Use the rotary knob to highlight the yellow input box.
4. Press in the rotary knob to display virtual keyboard and enter desired number of rows assigned to the module.
5. Select the **Check** button and push in rotary knob to accept.

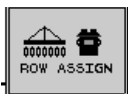


Figure 68

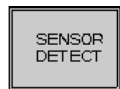
Row Assignment Screen

PLANTER			
MODULE		ROWS	
ADDR	TYPE	#	MAP
1	MT-PCM	6	1-6
2	MB2-18R	18	7-24

ADDING NUMBER OF ROWS

The Number of Rows column displays the total number of seed sensors that are connected to each module. The Row #'s value is automatically configured by Auto Config for proper row numbering for each module based on the module address value and number of rows.

NOTE: Only modules that support seed sensors display on the **Row Assignment** screen.



To Edit Number Of Rows:

1. Enter the number of rows to be assigned to each module.
2. Press the **Sensor Detect** button to detect and test seed sensors.
 - An hour glass appears in the upper right corner while the sensors are tested.
3. If the number of sensors detected on each module is not in agreement with the # of Rows value entered, an alarm activates.
 - Verify that the # of sensors entered on the Row Assignment screen match the actual number of sensors connected to the appropriate module.
 - Confirm that all harnessing and sensors are connected properly.

Refer to the Troubleshooting section for further information.





HIGH/LOW ALARM

Sets the RPM value at which a high/low RPM warning error is generated. The value is entered in RPM.

HIGH/LOW ALARM DELAY

Establishes the delay between the detection of a high/low RPM alarm condition and the resulting alarm display. The value is entered in seconds.

RPM CONSTANT

The number of pulses per shaft revolution. If the sensor is mounted directly to the shaft, the value 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

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 Main 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%.

DISABLE CONTROL ON LOW ALARM

The setting shuts down ALL active control channels if the RPM value of the selected sensor falls below the low alarm level setting.

The two settings include:

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



HOPPER SENSOR SETUP

The number of hopper sensors connected to each module is entered at this screen. The hopper # value is automatically configured for proper numbering sequence for each module based on the module address value if an auto configuration is performed.

TIP: Press Auto Config button to automatically populate installed sensors.

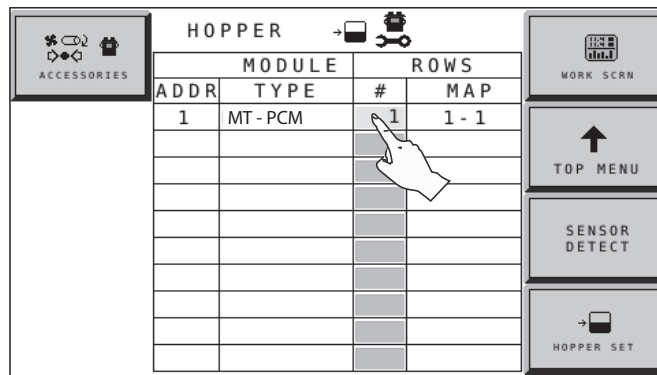
To Assign Hopper Sensors:



1. At the Accessories screen, press the **Hop Assign** button.
2. Enter the number of hoppers assigned for each module.
3. Press the **Sensor Detect** button to detect and test the hopper sensors.
 - An hour glass appears in the upper right corner during system configuration.
4. If the number of sensors detected on each module is not in agreement with the number of sensors entered, an alarm activates.
 - Verify that the number of sensors entered on the Hopper Assignment screen matches the actual number of sensors connected.
 - Confirm that all hopper sensor harnessing is connected properly.

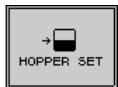
Figure 72

Hopper Assignment Screen



The Hopper Set screen sets the active state of the hopper sensors and the alarm delay time. If a hopper sensor is installed, the number of sensors detected is entered at the Accessories screen in the # of Hoppers column.

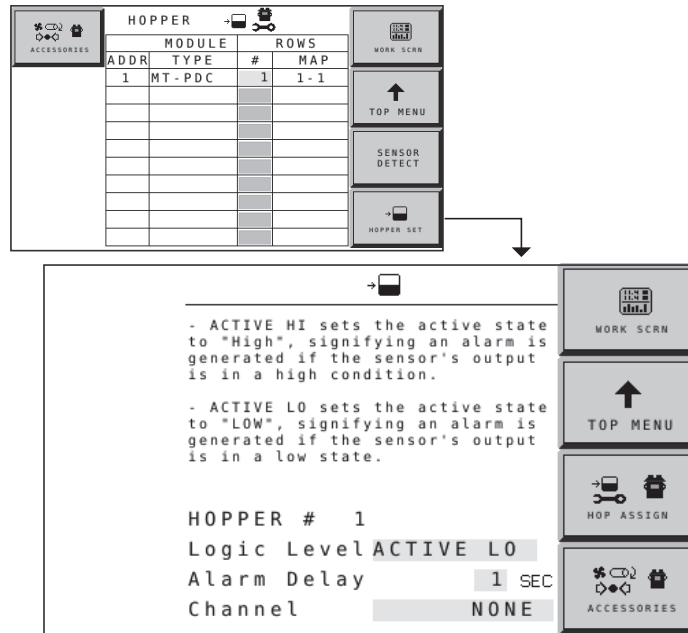
To Set the Active State and Alarms of Hopper Sensors:



1. At the Hopper Assignment screen, press the **Hopper Set** button.
2. Use the rotary dial to highlight the yellow input box.
3. Push in the rotary dial to select or enter a value.
4. Push in the rotary dial to accept.



Figure 73
Hopper Set Screen



LOGIC LEVEL

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:

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

ACTIVE HIGH

- 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.

ALARM DELAY

Alarm Delay controls the delay time between the detection of a hopper alarm condition and the generation of the resulting alarm. The value is entered in seconds.

CHANNEL

Assigns the hopper sensor to a specific control channel.



GROUND SPEED SETUP

Ground speed setup requires selecting a ground speed type, setting speed parameters, and performing a calibration.

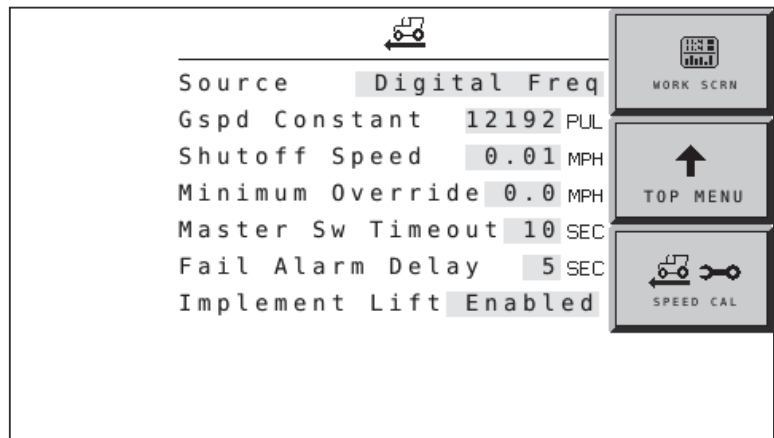
To Setup Ground Speed:

1. At the Top Menu screen, press the **Speed Set** button.
2. Use the rotary dial to highlight the yellow input box.
3. Push in the rotary dial to select or enter a value.
4. Push in the rotary dial to accept.



Figure 74

Speed Set Screen



SOURCE

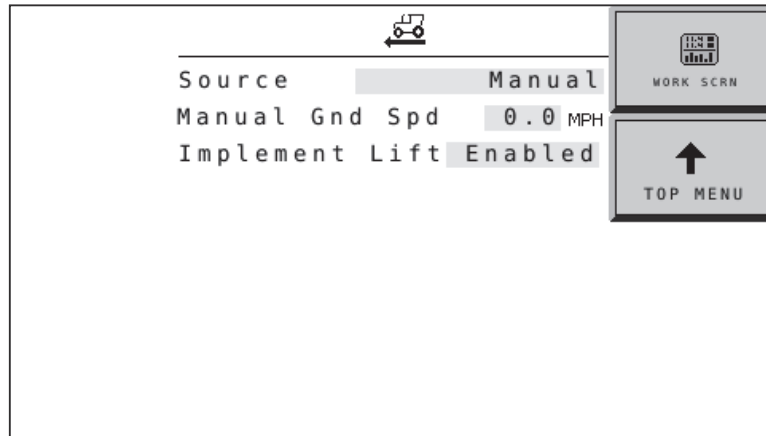
Selects the type of ground speed sensor used and where the sensor's input is located on the system.

MANUAL

Sets the system to operate using a constant, internally generated ground speed. No ground speed sensor is required when using the manual setting. No area accumulation occurs when speed source is manual. Manual ground speed can be used in the event of a failure of the ground speed sensor. This is a constant, internally generated ground speed that will cause the system to operate when the master/control switch is ON at the programmed speed. This value can be set to any speed within the delivery capabilities of the system.



Figure 75
Manual Ground Speed



RELUCT FREQUENCY

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

DIGITAL FREQUENCY

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

CAN GROUND

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

CAN WHEEL

Used when wheel speed data is communicating on the CAN bus. This source does account for slip-like CAN ground.

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

GSPD CONSTANT

A Ground Speed Constant is the value representing the pulse count produced by the ground speed sensor over a 400' distance. Refer to Ground Speed Calibration for additional information.

SHUT OFF SPEED

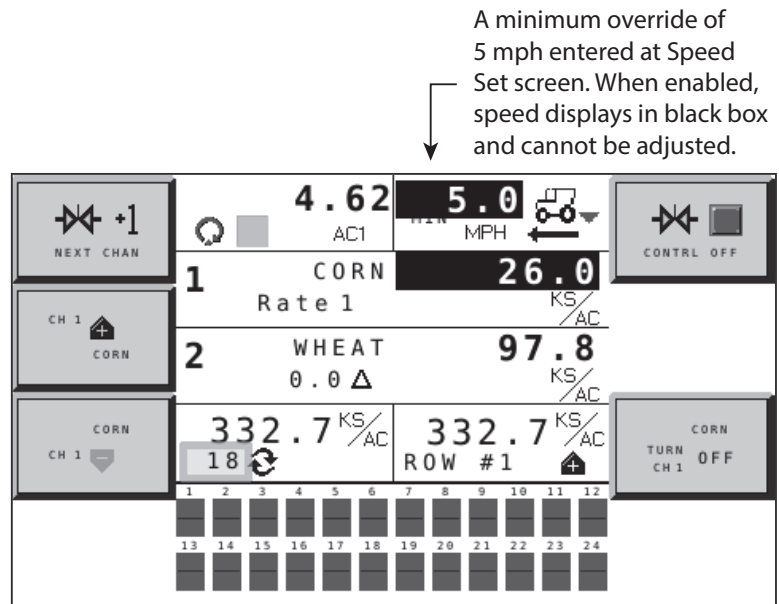
Shut Off Speed indicates the minimum ground speed allowed before the system shuts off all control channels.

MINIMUM OVERRIDE

Minimum Override takes over when actual ground speed is below the designated value. The control will operate at this speed until actual ground speed rises above the minimum override speed or the actual speed drops below the shutoff speed.



Figure 76
Minimum Override



MASTER SWITCH TIMEOUT

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

GROUND FAIL ALARM DELAY

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 all control channels are disabled and the system is running in a Planter Monitor Only mode.

IMPLEMENT LIFT

If an implement lift switch is used, the implement lift status must be enabled. While operating, an alarm condition will occur if the master/control switch is off for more than 5 to 10 seconds, the implement is down, and ground speed is greater than zero. An **Alarm Cancel** button allows the alarm to be deactivated during the current power cycle. If an implement lift switch is not required, this function should be disabled.



NOTE: Older DICKEY-john ground speed calibrations had a default value of 6096, which is the nominal pulse count for the radar speed sensor. ISO ground speed calibration has a default value of 12,192. To convert older DICKEY-john ground speed constants, multiply the recorded value by two for an approximate ISO conversion.

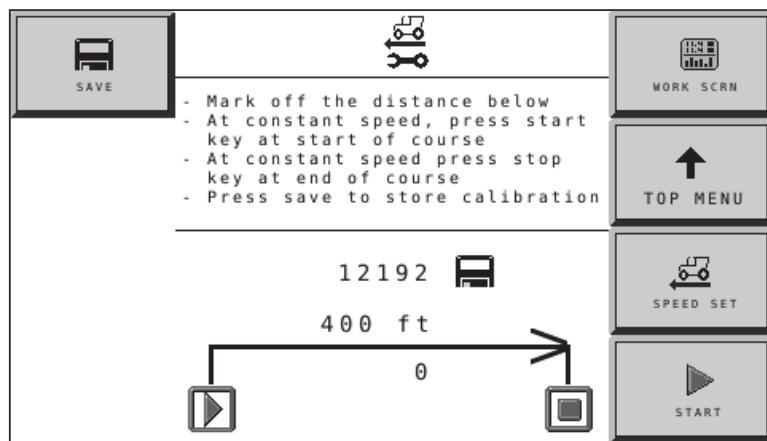
SPEED CALIBRATION

Ground speed is the rate in MPH (Km/h) 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: It is imperative to get an accurate ground speed reading as this reading directly impacts the accuracy of population, area accumulation, and application rate control.

Figure 77

Ground Speed Calibration Screen



To Perform the Initial Ground Speed Calibration:

1. Measure a 400 foot (100 meter) course marking start and finish points.
2. Press the **Speed Cal** button.
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' course. The new calibration number displays on the center of the screen.

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

5. Enter the average calibration number.
6. **Save** the desired settings.



SECTION CONTROL -MANUAL

Section Control is available for manual shutoff of sections as previously planted areas are approached.

Controlling sections by rows require:

- Planter output modules (1 to 4 depending on how many sections)
- Row shutoff modules (1 to 4 maximum)

The following screens must be configured to perform Manual Section Control functions:

- Control channel setup assigning number of rows per channel
- Clutch module assignment
- Switch assignment

Clutch configuration is required to:

- Identify how many planter output modules are connected to the IntelliAg system
- Assign how many outputs are assigned to each output module
- Assign how many rows are assigned to each output
- Assign row shutoff module switches to outputs that enable and disable planter sections

OF OUTPUTS TO MODULES

Multiple Tru Count Output Module Assignment

Output module addresses are a critical parameter to identify a module's position on the implement that controls row shutoff switches.

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. At the Top Menu screen, press the **Module Config** button.
2. At the Module Config screen, press the **Clutch Module** button.
3. At the Clutch Configuration screen, 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 Output Numbers (#s) value is automatically sequenced for each module based on the module address value.

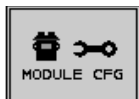
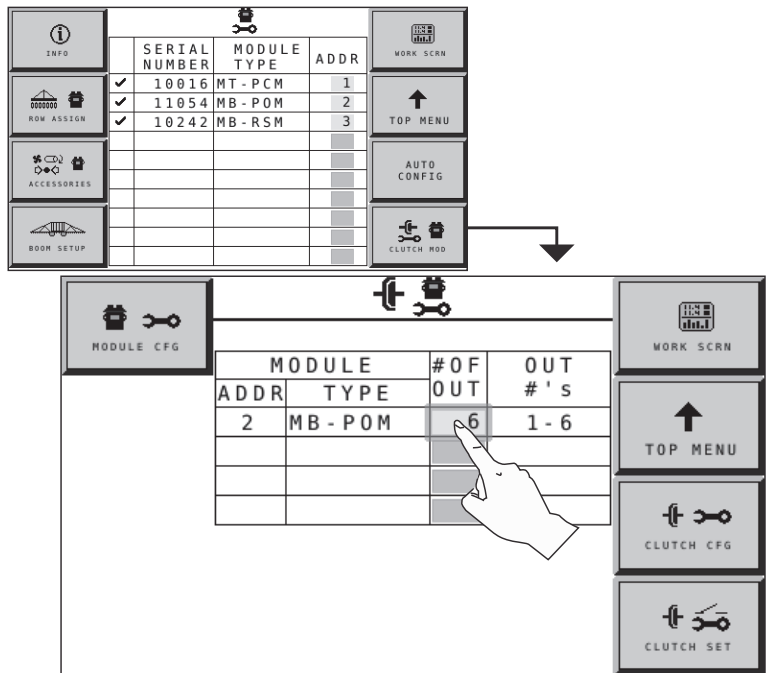




Figure 78

Clutch Output Assignment Screen



ASSIGN ROWS TO OUTPUTS

After identifying number of modules installed, rows are assigned to each module. As rows are assigned to each output, row numbers automatically populate.

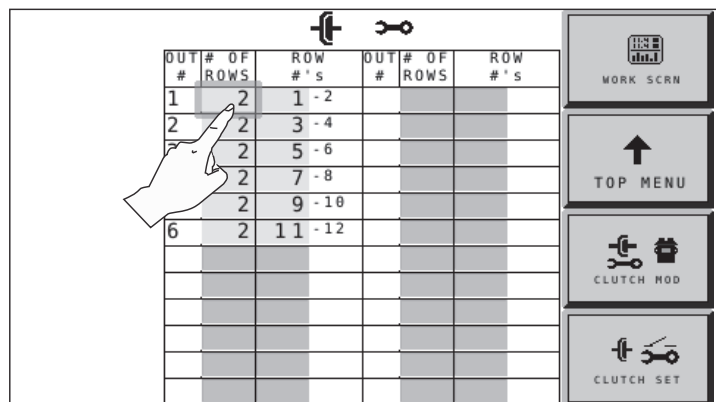
To Assign Rows to Outputs:

1. At the Clutch Module screen, press the **Clutch Configuration** button.
2. Enter the number of rows to be turned on/off by each output. The row numbers are sequentially assigned to the output number based on the # of rows entered.



Figure 79

Assign Rows Screen





ASSIGN SHUTOFF SWITCHES

The Clutch Set screen identifies what switches on the row shutoff switch box enable and disable planter sections or outputs.

Control channels can be linked to RSM switches and outputs. When linked and a switch is shutoff, the corresponding width (number of rows x row spacing assigned to that switch) is reduced on the channel the switches are linked.

For example, if output 1 and switch 1 are assigned to 2 rows at 3" spacing and that switch is shutoff, the width of channel 2 is reduced by 60". The assumption is made that 60" of channel 2 is no longer applying material so the application rate adjustment for active width applying material is maintained and the acre counter is correct.

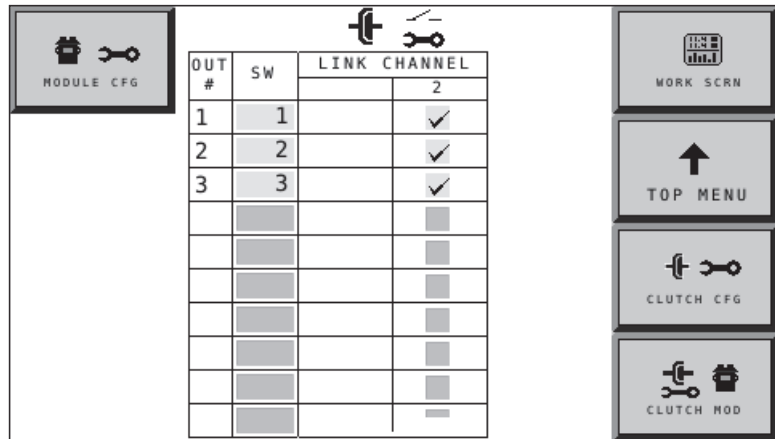


To Assign Switches to Outputs:

1. Press the **Clutch Set** button.
2. Enter the switch number that controls the on/off status of each module output.
3. Press the Link Channel input box to link a channel to a switch (checkmark).

Figure 80

Assign Shutoff Switches Screen





BOOM ASSIGNMENT-LIQUID

For liquid applications using boom sense or boom control, a module's position, number of outputs and boom assignment must be defined. Three screens require inputs for boom control operation:

- Boom setup
- Boom width
- Boom assignment

BOOM SETUP

Identifies how many boom output modules are connected to the system and allows assignment of boom outputs and boom sections to each module.

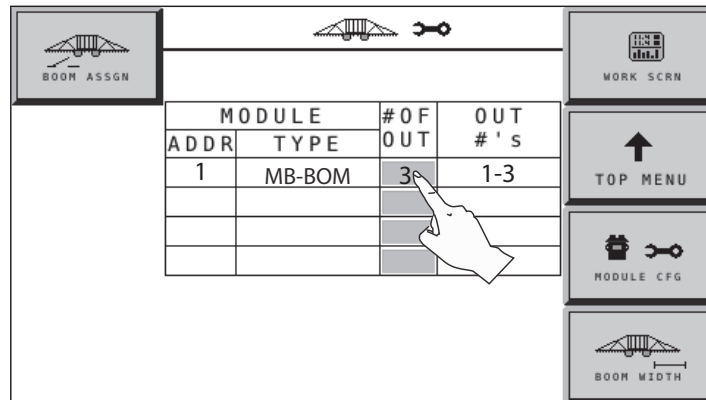
To Setup Boom Output Modules:

1. At the Module Configuration screen, press the **Boom Setup** button.
2. Enter number of outputs (shutoffs) assigned to each module in the # of Out input box. The value is automatically established for proper numbering sequence for each output based on the module address value.



Figure 81

Boom Setup



BOOM WIDTH/SECTION CONTROL

Identifies which control channel is associated with a boom section and the width of each section.

An additional screen appears for configuring more than 12 boom sections. A maximum of 24 sections can be assigned to a channel or split between 2 channels.

To Enter Channels and Nozzles:

1. At the Boom Setup screen, press the **Boom Width** button.
2. Press the Channel input boxes to enter the channel to control a section.







CUSTOMIZING THE WORK SCREEN

Data items are the selectable parameters that display on the Main Work screen that monitor control channels, rate targets, individual row performance, spacing, population, ground speed and coverage area during operation.

What data items appear on the Main Work screen can be selected and placed in any position.

- The display is functionally divided into 2 columns and 6 rows.
- Any data item can be placed in any position.
- Duplicate data items can be configured on a single display if desired.
- Up to three display screens can be configured.
- Some data items display on an entire row.

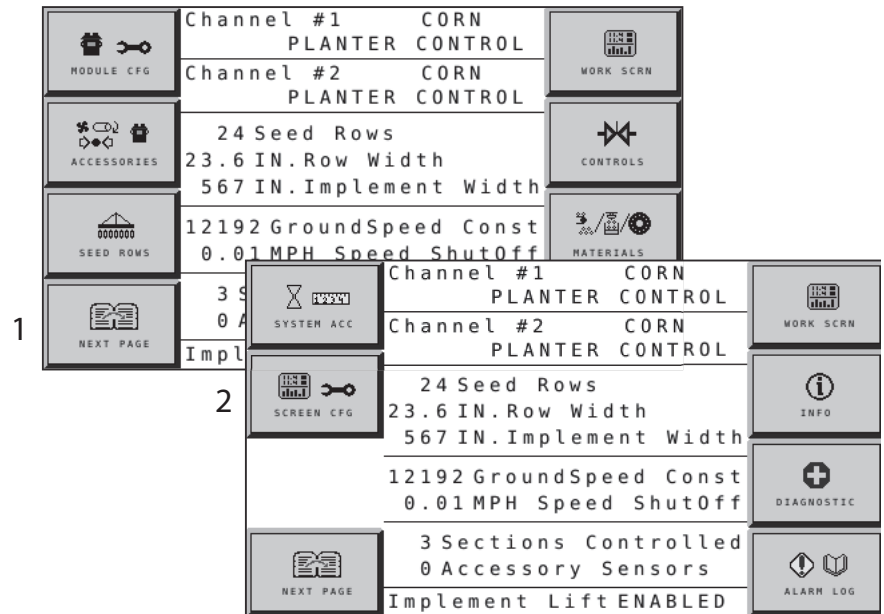


To Select Data Items:

1. At the Top Menu screen, press the **Next Page** button.
2. Press the **Screen Cfg** button.

Figure 84

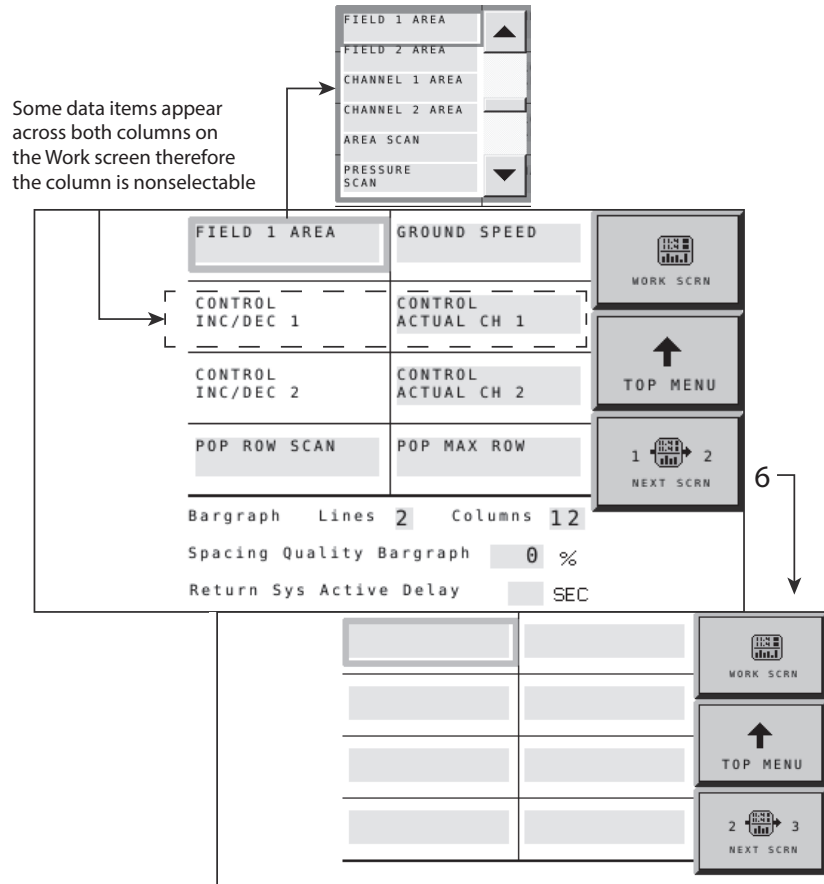
Top Menu Screen



3. Use the rotary knob to select a yellow input box.
4. Push in the knob to select and display data item choices.
5. Scroll using the knob and push in to select.
6. Press the **Next Screen** button to create 2 additional work screens.



Figure 85
Work Screen Configuration Screen



CLEARING DATA ITEM ACCUMULATORS

Some Data Item values can be reset to zero from the Main Work screen. Accumulator displays (e.g., Area 1 Field, Seed Count, etc.) on the active screen can be reset to zero by placing a check mark in the box next to the data item.

- Only accumulators that currently display on the Work screen can be reset.
- Accumulators are reset independently.
- Accumulators can only be reset when the master/control switch is OFF.
- Once an accumulator has reached its maximum value, it will roll over to 0.0.

BAR GRAPH SETUP

Bar graph setup allows customization of the rows being monitored and displayed on the Main Work screen. A maximum of 2 lines and 24 columns can display. Default displays 1 line and 24 columns.



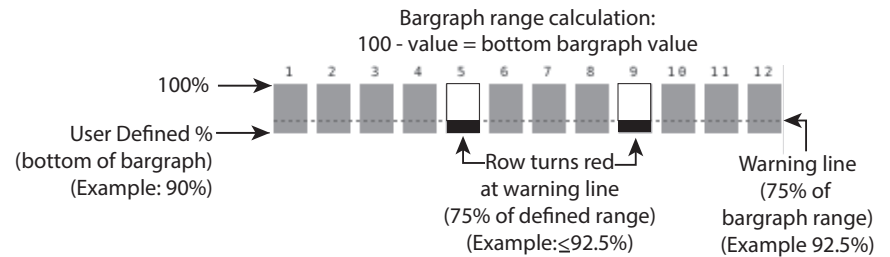
SPACING QUALITY BAR GRAPH

Spacing quality reflects how much spacing occurs between each seed while planting and 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%.

IMPORTANT: WSMB2 module is required for spacing quality.

Figure 86

Spacing Quality 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.

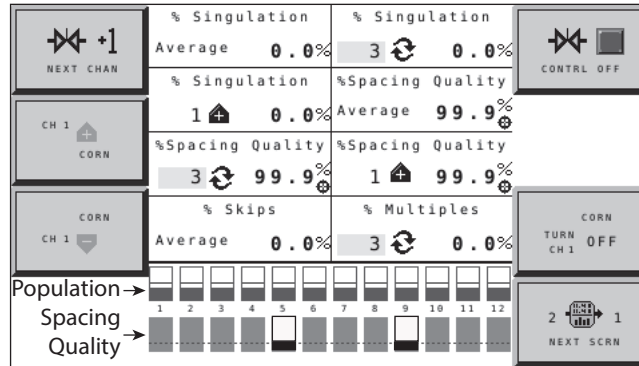
Spacing quality values can display as a data item and/or as a bar graph on the Main Operate screen. (Figure 87) depicts spacing quality as a bar graph and seed singulation, spacing quality %, skips, and multiples as data items.

To enable Spacing Quality Data Items and/or Bar graph:

- To enable the spacing quality bar graph, enter the user-defined percentage to set the bar graph range for spacing quality per row or refer to the Data Items and Function section to display as a data item on the Main Work screen.
 - Seed singulation maximum is 72 rows of seed input



Figure 87
Spacing Quality as a Bar Graph



RETURN SYSTEM ACTIVE DELAY

Setting a time delay (seconds) in the Return System Active Delay input box will trigger the IntelliAg Main Work screen to automatically return as the active screen view when other system application screens are used.

The delay time starts when the master/control switch is turned ON and the implement is in a down position. Delay time will not start unless both of these conditions are met.

IMPORTANT: This feature only operates with DICKEY-john virtual terminals.

DATA ITEMS AND FUNCTIONS

Data items are display parameters that can be selected to appear on the Main Work screen. Display parameter placement can be moved to display on the Main Work screen to individual preferences.

CONTROL ACTUAL CHANNELS 1-2

CORN CH1
Rate 1 **40.5** $\frac{KS}{AC}$

Control Actual Channels 1 - 2 display the channel actual application rates in its respective units depending on channel setup. The channel increment/decrement or preset table rate value also displays.

- When the master/control switch is OFF, the target rate displays in a small font for the channel.
- When the master/control switch is ON, the rate displays in a large font and is the actual application rate.
- When the channel's target rate is adjusted with the Inc/Dec or rate table function, the new target rates display for 5 seconds, followed by the actual rate.
- **This Data Item displays on an entire row of the Work screen.**



CONTROL TARGET CHANNELS 1-2

CORN CH1
Rate 1 40.5 * $\frac{KS}{AC}$

Control Target Channels 1 - 2 display the channel target set rates depending on channel setup. The channel Inc/Dec value or preset table rate also displays.

- When the master/control switch is OFF, the rate displays in a small font.
- When the master/control switch is ON, the rate displays in a large font.
- **This Data Item displays on an entire row of the Work screen.**

CONTROL RATE CHANNELS 1-2

CORN CH1
0.0 $\frac{S}{SEC}$ 40.5 $\frac{KS}{AC}$

Control Rate Channels 1-2 display the channel actual application rates depending on channel setup. The channels calculated flow rate displays.

- When the master/control switch is OFF, the rate displays in a small font.
- When the master/control switch is ON, the rate displays in a large font.
- When the channels target rate is adjusted using the Inc/Dec or Preset Table Rate function, the new target rate is displayed for 5 seconds followed by the actual rate.
- **This Data Item displays on an entire row of the Work screen.**

CONTROL SCAN

NITROGEN CH2
Rate 1 98.1 $\frac{LBS}{AC}$

Control Scan displays all active control channels sequentially showing the actual rate in its respective units depending on channel setup, and the Inc/Dec value or preset table rate for each channel in five-second intervals.

This Data item will display on an entire row on the Work screen.

POP ROW SCAN

5  0.0 $\frac{KS}{AC}$

Pop Row Scan displays all active seed rows population in seeds per acre (or seeds/Ha) for each detected seed sensor. The value to the left side displays the current row number being scanned. The value on the right is the population data. The scans continue sequentially in four-second intervals unless a particular row number is selected for continuous view.

This Data Item will display on an entire row of the Work screen.



POP MIN MAX ROW SCAN

3  $\frac{\text{KS}}{\text{AC}}$ 0.0  $\frac{\text{KS}}{\text{AC}}$

Pop Min Max Scan alternately displays the seeding row with the minimum population and the seeding row with the maximum population in seeds per acre (or seeds/Ha). The value to the left side displays the current row number. The value to the right is the population data. Dwell time for each display is four seconds. **This Data Item displays on an entire row of the Work screen.**

POP MIN ROW

4  $\frac{\text{KS}}{\text{AC}}$ 0.0  $\frac{\text{KS}}{\text{AC}}$

Pop Min Row displays the seeding row with the minimum population in seeds per acre (or seeds/Ha). The value to the left side displays the current row number. The value on the right is the population data. **This Data Item will display on an entire row of the Work screen.**

POP MAX ROW

1  $\frac{\text{KS}}{\text{AC}}$ 0.0  $\frac{\text{KS}}{\text{AC}}$

Pop Max Row displays the seeding row with the maximum population in seeds per acre (or seeds/Ha). The value to the left side displays the current row number. The value on the right is the population data. **This Data Item will be displayed on an entire row of the Work screen.**

POP AVG

0.0 $\frac{\text{KS}}{\text{AC}}$

Pop Avg displays the average population in seeds per acre (or seeds/Ha) of all active seeding rows per channel.

SPACING ROW SCAN

1  0.00 $\frac{\text{IN}}{\text{S}}$

Spacing Row Scan scans all active seed rows and displays the spacing in inches (cm) for each row as detected by the sensors. The value to the left side displays the current row number. The value on the right is the population data. The scans continue sequentially in four-second intervals unless the rotary knob is used to select a particular row number for continuous view. **This Data Item displays on an entire row of the Work screen.**



SPACING MIN MAX ROW SCAN

1  IN/S 0.0  IN/S

Spacing Min Max Row Scan alternately displays the seeding rows with the minimum and maximum spacing in inches (cm). The value to the left side is the current row number. The value on the right is the spacing. Dwell time for each display is four seconds. **This Data Item displays on an entire row of the Work screen.**

SPACING MIN ROW

1  IN/S 0.0  IN/S

Spacing Min Row displays the seeding row with the minimum spacing in inches (cm). The value to the left side displays the current row number. The value on the right is the spacing. **This Data Item displays on an entire row of the Work screen.**

SPACING MAX ROW

1  IN/S 0.0  IN/S


Spacing Max Row displays the seeding row with the maximum spacing in inches (cm). The value to the left side displays the current row number. The value on the right is the spacing. **This Data Item displays on an entire row of the Work screen.**

SPACING AVG

0.0  IN/S

Spacing Avg displays the average spacing in inches (cm) of all active seeding rows per channel.

SEED/DISTANCE ROW SCAN

1  0.0  S/FT

Seed/Distance Row Scan displays all active seed rows and the number of seeds per foot (seeds/meter) for each row detected by the sensors. The value to the left side displays the current row number. The value on the right is the seeds per distance data. The scan continues sequentially in four-second intervals unless a particular row number is selected for continuous view. **This Data Item displays on an entire row of the Work screen.**



SEED/DISTANCE MIN MAX ROW SCAN

1 $\frac{\uparrow S}{FT}$ 0.0 $\frac{\uparrow S}{FT}$

Seed/Distance Min Max Row Scan alternately displays the seed row with the minimum number of seeds per foot (seeds/meter) and the seeding row with the maximum number of seeds per foot (seeds/meter). The value to the left side displays the current row number. The value on the right is the seeds per distance data. Dwell time for each display is four seconds. **This Data Item displays on an entire row of the Work screen.**

SEED/DISTANCE MIN ROW

1 $\frac{\downarrow}{/}$ 0.0 $\frac{\downarrow}{/}$

Seed/Distance Min Row displays the seeding row with the minimum number of seeds per foot (meter). The value to the left side displays the current row number. The value on the right is the seeds per distance data. **This Data Item displays on an entire row of the Work screen.**

SEED/DISTANCE MAX ROW

1 $\frac{\uparrow S}{FT}$ 0.0 $\frac{\uparrow S}{FT}$

Seed/Distance Max Row displays the seeding row with the maximum number of seeds per foot (meter). The value to the left side displays the current row number. The value on the right is the seeds per distance data. **This Data Item displays on an entire row of the Work screen.**

SEED/DISTANCE AVERAGE

0.0 $\frac{\overline{S}}{FT}$

Seed/Distance Average displays the average number of seeds per foot (meter) of all active seeding rows per channel.

SINGULATION AVERAGE

0 $\overline{\%}$

Singulation Average displays the average percent seed singulation of the planter's rows that are configured for population. Singulation refers to the portion of seeds planted individually rather than in groups.




SINGULATION ROW SCAN

 0 %

Singulation Row Scan displays the percent singulation of each of the planter's rows. The displayed row increments every four seconds. After the last row is displayed, the scan will re-sequence beginning with the first active row.

SINGULATION MIN MAX SCAN

1  0 %

Singulation Min Max Scan alternates the display of the minimum row singulation and maximum row singulation every two seconds. When a minimum row displays, the corresponding symbol is shown with the row number.


GROUND SPEED

7.7 ^{MPH} 


Ground Speed displays the current ground speed of the tractor in miles per hour (Kph). The ground speed source is defined during the Ground Speed Calibration setup.

This data item also displays the implement status using an up/down arrow next to the tractor icon.

TOTAL AREA

0.00  ACT

NOTE: Data Items on the Main Work screen with a check box allows the number to be reset to zero.


0.00  ACT

Reset box

Total Area displays the area covered by the implement in acres (Ha). Total area is calculated using the Implement Width parameter entered on the **Row Setup** screen. Area accumulates for seeding when seeds are detected on at least one seeding row and the ground speed is above the shutoff speed parameter entered on the **Ground Speed Calibration** screen. This accumulator is independent of any other area accumulator and can be reset to 0.0 at any time. Current area is retained after power down. If no rows are configured, the Total Area Accumulator will use the largest channel width.




FIELD 1 AREA

0.00  AC1

Reset
↓

Field 1 Area displays the area covered by the implement in acres (Ha). Field 1 Area is calculated in the same manner as Total Area. This accumulator is independent of any other area accumulator and can be reset to 0.0 at any time. Current area is retained after power down.

FIELD 2 AREA

0.00  AC2

Reset
↓

Field 2 Area displays the area covered by the implement in acres (Ha). Field 2 Area is calculated in the same manner as Total Area. This accumulator is independent of any other area accumulator and can be reset to 0.0 at any time. Current area is retained after power down.

CHANNELS 1 - 2 AREA

10.95  1AC

Reset
↓

Channels 1 - 2 Area displays the area covered by Control Channels 1 - 2. Area is calculated using the Channel Width parameter that is entered on the **Control Setup** screen. Area accumulates when the master/control switch is ON and the ground speed is above the Shutoff Speed parameter entered on the **Ground Speed Calibration** screen. This accumulator is independent of any other area accumulator and can be reset to 0.0 at any time. Current area is retained after power down.

AREA SCAN

0.00 ^{AC1}

Area Scan scans through all area accumulators sequentially displaying the area for each accumulator in four-second intervals.

CONTROL FEEDBACK SCAN

0.0 ^{CH2}
RPM

Feedback Scan scans through all active control channel feedback sensors sequentially displaying the actual RPM or GPM measured in four-second intervals. The current sensor is identified by the number displayed above the RPM symbol (planter control, granular seeding, granular fertilizer) or GPM symbol (liquid flow).



ACCESSORY INPUT - PRESSURE SCAN

0.00 ¹ OZ / IN²


Pressure Scan scans through all active pressure sensors sequentially displaying the actual pressure measured in oz/in² (kPa) in four-second intervals. The current sensor is identified by the number above the pressure symbol.

ACCESSORY INPUT - RPM SCAN

0.0 ¹ RPM

RPM Scan scans through all active shaft/fan sensors sequentially displaying the actual RPM measured in four-second intervals. The current sensor is identified by the number displayed above the RPM symbol.

CHANNEL 1-2 PRODUCT LEVEL

Reset
↓
0  CH1
LBS

Channels 1-2 Product Levels indicate how much product remains in the hopper or tank. The Reset button is unique in that it does not reset the value to zero but allows the known amount of product be added. Selecting the Reset button thereafter will default to the original amount entered. To enter the starting product level, select the value and change to the desired level.

HOPPER LEVEL STATUS SCAN

1 → 

Hopper Level Status Scan scans through all the hopper level sensors in the system and indicates an empty or nonempty status.



SYSTEM TESTS

CONTINUOUS TEST

Performing a Continuous Test runs the control while stationary for troubleshooting or maintenance purposes. A remote test switch is recommended to perform this test. The values entered will not affect any other setup values that have previously been entered.

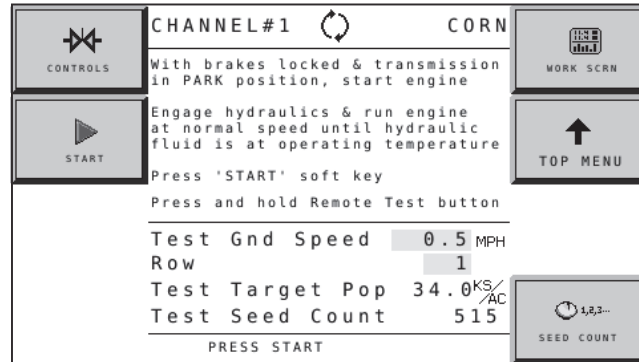


To Run Continuous Test:

1. Press the **Controls** button.
2. Press the **Continuous Test** button.
3. Enter values to perform a continuous test for
 - Test Ground Speed
 - Row
4. Press the **Start** button.
5. Press and hold remote test switch until the test is complete.
6. Release test switch and the control will stop.
7. Press the test switch again to clear the seed count and restart the control.
8. Steps 2-4 will repeat until the **Stop** button is pressed.

Figure 88

Continuous Test Screen



TEST GROUND SPEED

Test Ground Speed is the ground speed reference used to perform the test.

ROW

Row is 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

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



NOTE: *The Test Seed Count will automatically reset whenever a new Continuous Test is performed.*

TEST SEED COUNT

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

5 REV TEST

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.

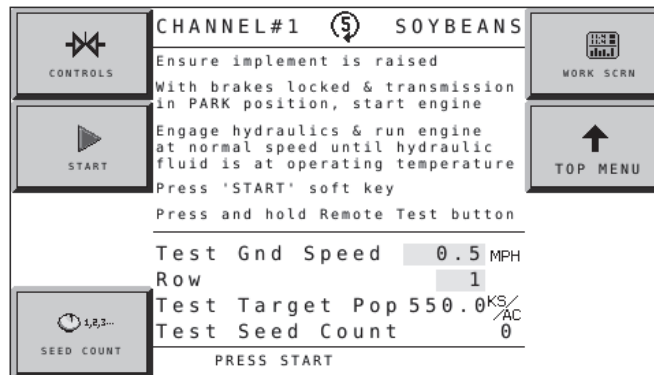
To Perform the 5 Rev Test:

1. Press the **Controls** button.
2. Press the **5 Rev Test** button.
3. The following parameters must be entered to perform a 5 Rev Test.
 - Test Ground Speed
 - Row
4. Press the **Start** button. The test runs for 5 revolutions then stops.



Figure 89

5 Rev Test Screen



5. To display the number of seeds detected by each sensor, press the Seed Count button.
 - **Stop** button suspends the test
 - **Next Rows** button displays next series of rows
 - **Count Reset** button clears seed count



Figure 90

Seed Count Screen

CNT RESET	1,2,3...			CONTROL ON
	1	2	3	
	1093	1093	1093	
STOP	4	5	6	WORK SCRIN
	1093	1093	1093	
	7	8	9	
NEXT ROWS	10	11	12	TOP MENU
	1093	1093	1093	
	13	14	15	
5 REV	1093	1093	1093	DIAGNOSTIC

TEST GROUND SPEED

Test Ground Speed is the ground speed reference used to perform the test.

ROW

Row is the active row configured in 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 the seed count of all rows during the test.

TEST TARGET POPULATION

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

TEST SEED COUNT

Test Seed Count is the seed count reported back on a specified row set in the row data item and is automatically populated.

REMOTE TEST SWITCH

A momentary switch can be purchased from DICKEY-john that allows the the control to be turned on/off during the Continuous and 5 Rev tests.

The 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 Virtual Terminal. The test switch will only function when the implement switch is in the up (off) position.

The remote test switch is to be connected to the actuator harness.

NOTE: Test Seed Count will automatically reset whenever a new Continuous Test is performed.



Remote test switch part number is 464210515S1.



CAUTION

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



OPERATION

PRE-OPERATING PREPARATION

Planters should perform a fill disk at every system startup or a variety/seed-type change. This will ensure no voids are left in the field when starting to plant.



FILL DISK FOR ALL CONTROL CHANNELS

1. At the Main Work screen, press the **Planter Fill Disk** button.
2. Raise the implement.
3. With brakes locked and transmission in the park position, start the engine.
4. Engage hydraulics and run engine at normal speed until hydraulic fluid is at operating temperature.

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.



5. Press the **Start** button. The seed meters will turn for 1 revolution, then stop.
6. Pressing the **Stop** button will also terminate the test.

Figure 91

Fill Disk Screen for All Planter Controls



START

1. Lower the implement to operating position engaging the implement switch, if present and enabled.
2. With the hydraulic system engaged and the tractor at its normal operating RPM, set the master/control switch to the On position. All enabled control channels will begin controlling at the current ground speed. All accumulators will begin recording data.



WARNING

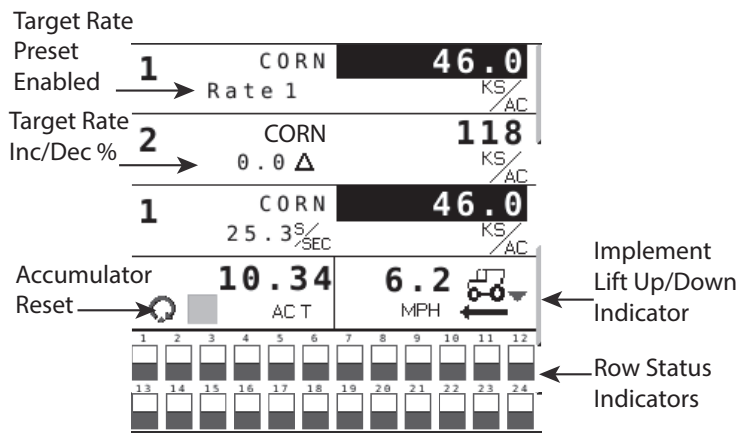
When the implement is down and the master/control switch in the On position, the machine is fully operational. All necessary precautions must be taken to ensure user safety. Failure to practice all necessary caution may result in serious injury or death.

STOP

1. Set the master/control switch to the Off position. All control channels will cease operation and all data accumulation will halt.
2. Operation will immediately stop when the ground speed is 0 or the implement is raised to disengage.

Figure 92

Main Work Screen Functions





OPERATE SCREEN SYMBOLS



TARGET RATE

The Target Application Rate displays when master/control switch is off. The actual applied rate appears during Operate mode.



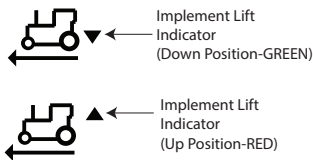
INCREASE/DECREASE % RATE

The Increase/Decrease rate is the percentage change being applied each time the Material Increase/Decrease button is pressed during Operate mode.

RATE 1

TARGET PRESET RATE

The Preset Rate is the applied rate that was entered at the Material Configuration Setup screen and increases or decreases when the **Material Increase/Decrease** button is pressed during Operate mode.



IMPLEMENT LIFT SWITCH

When an implement lift switch is installed, the Main Work screen will identify if the implement is in the up or down position. Using an 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. **The Implement Lift Switch box on the Ground Speed Configuration screen must be enabled if an implement lift switch is used.**

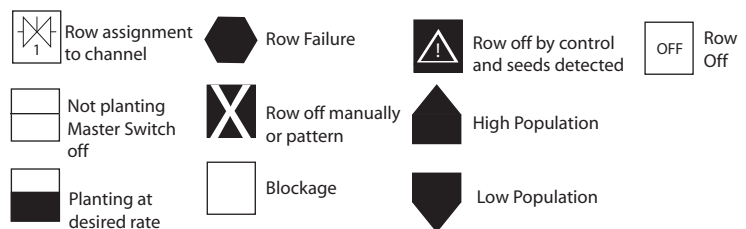
Refer to the Implement Lift Sensor instructions for installation location.

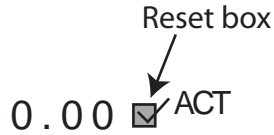
ROW INDICATORS

Row Indicators in the bar graph area on the bottom 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 93

Row Indicator Symbols





ACCUMULATORS

Some data item values can be reset to zero from the Main Work screen. An accumulator displays (e.g., Area 1 Field, Seed Count, etc.) on the active screen and can be reset to zero by placing a check mark in the box next to the data item. Only accumulators on the currently-displayed screen can be reset. Accumulators are reset independently and can only be reset when the master/control switch is OFF. Once an accumulator has reached its maximum value, it will roll over to 0.0.

To Reset Values on the Main Work screen:

1. Use the rotary knob to scroll to the Data Item to edit; the chosen check box will be highlighted.
2. With the desired check box highlighted, push in the rotary knob.
3. Scroll the rotary knob to enter a check mark in the highlighted box. Continuing to turn the rotary knob will toggle the checkmark on and off in the box.
4. Press the **OK** softkey to accept selection or press **Cancel** to return to the previous setting.

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 will dispense 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.
- if ground speed reduces to 0, precharge aborts.
- alarm displays any time the preset feature is established or changed and the master/control switch is turned on.
- applicable to planter control channels; not monitor only.

TIP: The master/control switch must be turned ON to activate precharge.

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

Enable the Precharge function:

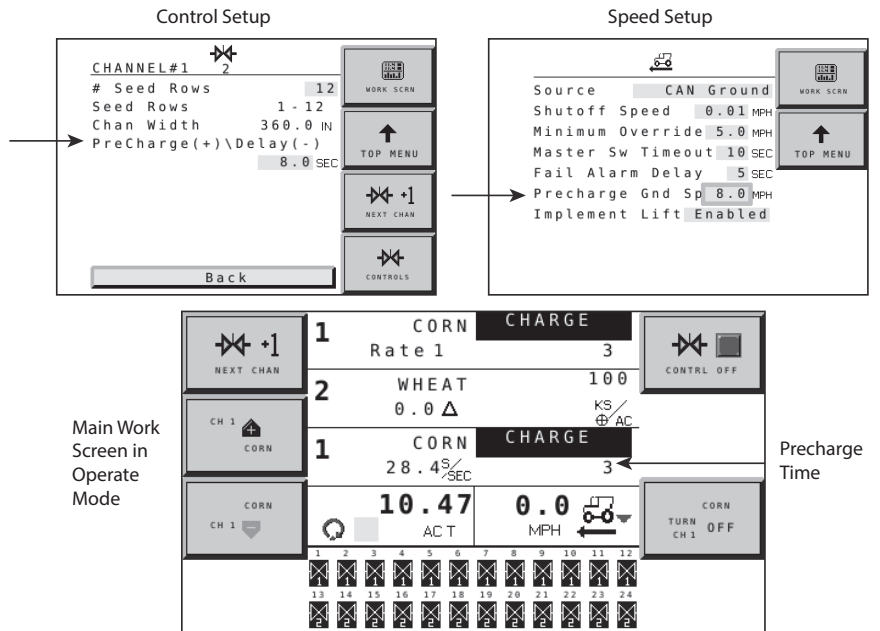
Precharge is enabled at the Control Setup and Speed Setup screens.

1. Turn the master/control switch on.
2. Precharge automatically initiates when the master/control switch is turned on and the ground speed is less than the precharge ground speed but greater than 0.
 - The rate instrument populates with the word “CHARGE” and the countdown timer.
 - Timer displays how much precharge time is left before it aborts.



Figure 94

Precharge Feature



MONITOR ONLY FEATURE

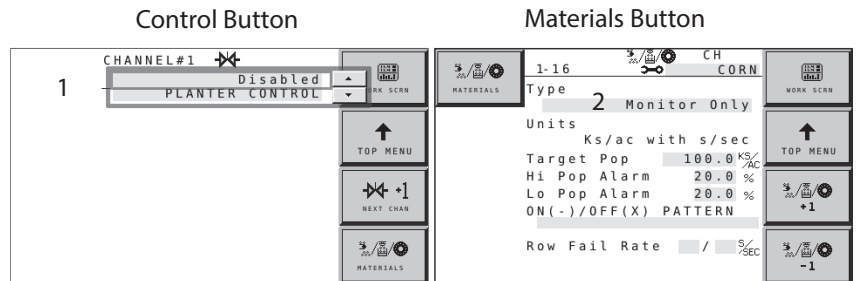
Monitor Only is typically used for ground drive applications to monitor population with high and low alarms. All seeding control channels **MUST** be disabled in this configuration and/or no rows assigned to those seeding channels. Monitor only mode monitors up to 72 rows.

To Operate in Monitor Only mode:

1. Press the **Control** button and select **Disabled** as the channel.
2. Press the **Materials** button and change the type to **Monitor Only**.

Figure 95

Channel and Material Settings

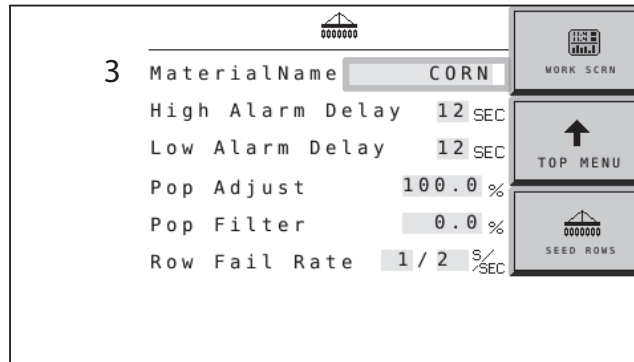


3. Press the **Row Monitor** button. Select the associated material.
 - *Material Name* only appears when the channel is disabled and Monitor Only is selected. A material name is required to activate associated high and low population alarms.





Figure 96
Row Monitor Screen



LINKING CHANNELS AND RATES

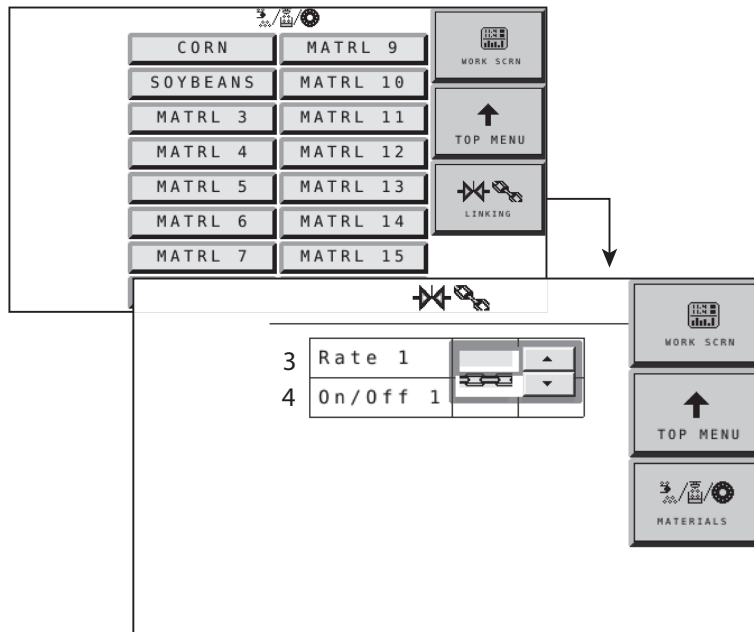
Control channels 1 and 2 can be linked together so that rates can be increased or decreased simultaneously and turned on or off simultaneously during operation at the Main Work screen.

To Link Channels:

1. Press the **Materials** button.
2. Press the **Linking** button.
3. Highlight the Rate 1 box and select the linking symbol to control channel 1 and 2 rates simultaneously.
4. Highlight the On/Off 1 box and select the linking symbol to control turn channel 1 and 2 on and off simultaneously.



Figure 97
Linking Channel Rates





SYSTEM ACCUMULATORS

System accumulator data displays the amount of time the system has been on, the amount of time and area application control has occurred, and the distance traveled. Data on this screen is for display purposes only - it cannot be edited.

TIP: The master/control switch must be set to the OFF position to view System Accumulators screen.

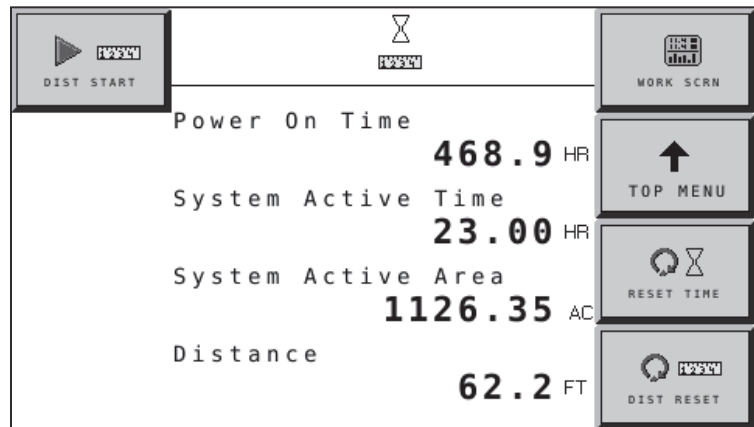
To View System Accumulators:

1. At the Top Menu screen, press the **Next Page** button.
2. Press the **System Acc** button.



Figure 98

System Accumulators Screen



POWER 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. Powered On Time cannot be reset.

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 Time can be reset by pressing the **Reset Time** button.



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.



DIAGNOSTICS

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

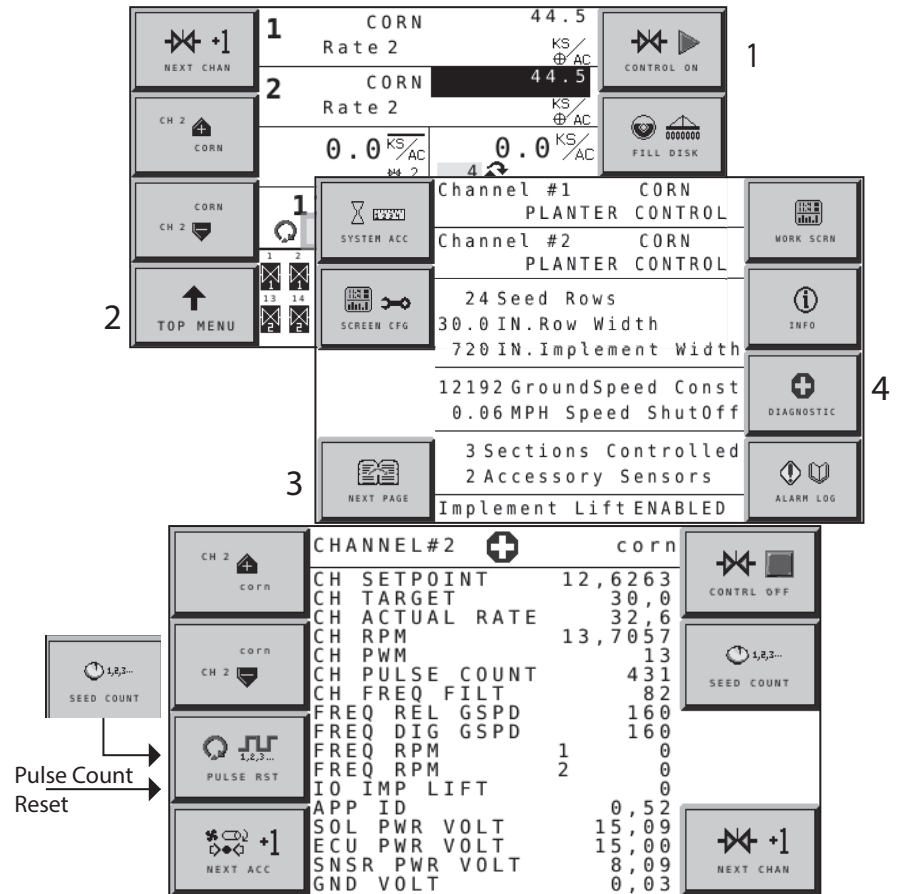
Each channel has its own Diagnostics screen. Channel Pulse Count data is resettable by pressing the **Pulse Reset** button. The system can be active on the Diagnostics screen.

To View Diagnostics:

1. At the Main Work screen, verify the master/control switch (Control On) button is off.
2. Press the **Top Menu** button.
3. Press the **Next Page** button.
4. Press the **Diagnostics** button.
5. At the Diagnostics screen, press the **Control On** button.



Figure 99
Diagnostics







IMPORT/EXPORT DATA

Implement configurations stored on the Working Set Master (WSMT) 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 virtual terminal can be imported and exported; no configurations created from a computer will transfer.

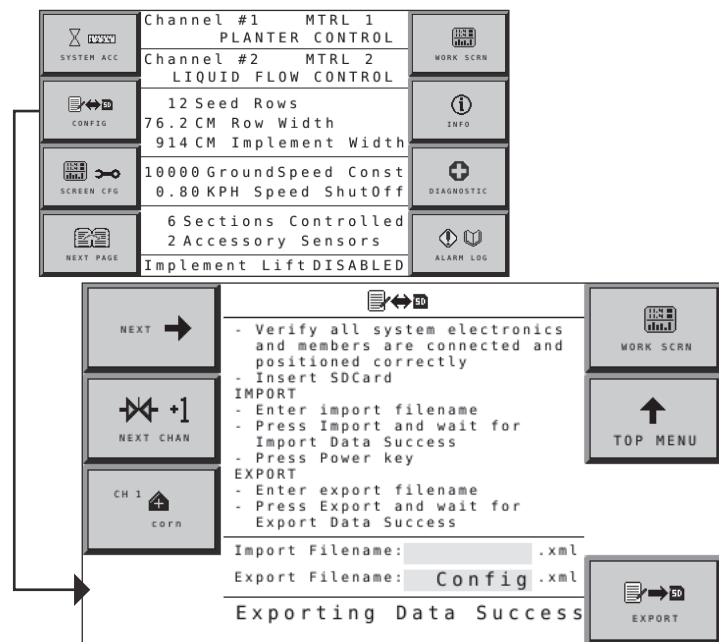
NOTE: *Import/export does NOT save ECU or other Task Controller functions.*

EXPORT DATA

1. Insert a USB memory device in the terminal. The USB memory device must be installed first before the **Import/Export** button displays on screen.
2. At the Top Menu screen, press the **Next Page** button.
3. Press the **Config** button.
4. 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. Write down the file name and keep for future reference.
 - Default file name is Config.xml
5. The new data file name will appear in the input box and be saved as an .xml file extension.
6. Press the **Export** button.
 - As files are saved, an hour glass will flash at the top of the screen and “Exporting Data....” appears at screen bottom. A successful data transfer will appear when complete.
7. The **Import** button will appear after a successful transfer.

Figure 100

Export Data



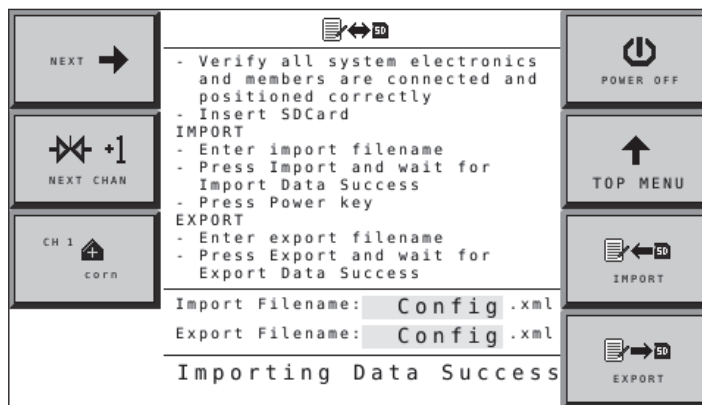


IMPORT DATA

1. Insert the USB memory device in the terminal.
2. 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.
3. Press the **Import** button.
 - As files are transferring, an hour glass will flash and "Import Data Validation" will appear at screen bottom. Importing Data Success appears when finished.
4. Press the **Power** button to reboot the terminal.

Figure 101

Import Data





PCM SOFTWARE UPGRADE

Upgrading the planter control module software requires a USB memory device formatted to FAT32.

NOTE: Contact Technical Service for upgrade assistance if required at the DICKEY-john U.S. office at 1-800-632-3307 or the Europe office at +33 1 41 19 21 80 (europe@dickey-john.com).

To Load Software:

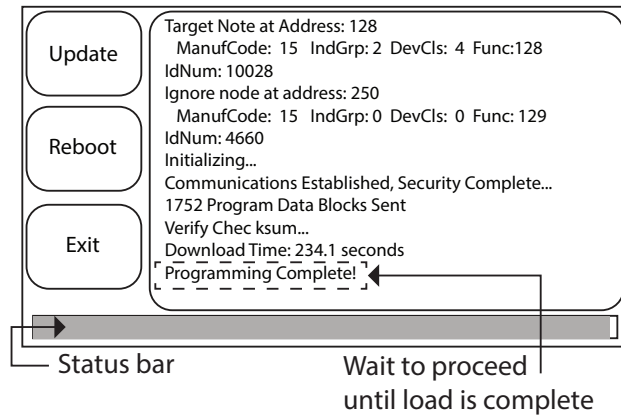
1. Power on terminal.
2. Insert USB memory device that has the software upgrade.
3. An Update screen displays. Press the **Update** button. The update begins with a status bar indicating load progress.

IMPORTANT: Do not press any buttons while loading is in progress!

4. When "Programming Complete!" appears on screen, press the **Reboot** button to restart.
5. Remove USB memory device.

Figure 102

Loading Software







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 **Alarm Cancel** button. Detailed information about the alarm can be accessed by pressing the **Alarm Detail** button.

ALARM LOG

The Alarm Log screen provides a list of specific alarms that have been issued during system operation. Information displayed on the Alarm Log screen is informational only and cannot be edited.

Each time specific alarm conditions are detected, it is logged and communicated to the PCM.

To View the Alarm Log:

1. At the Top Menu screen, press the **Next Page** button.
2. Press the **Alarm Log** button.
 - The number of the alarm and alarm 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 Detail** 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.

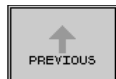
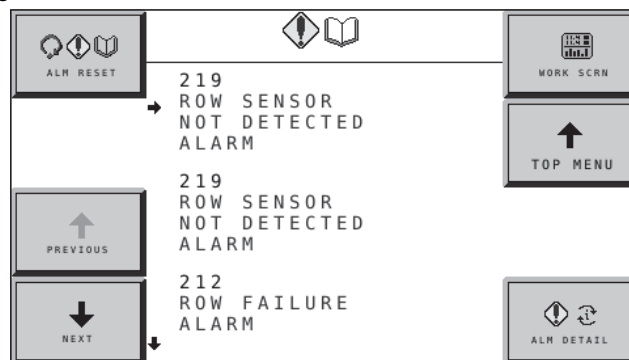


Figure 103

Alarm Log



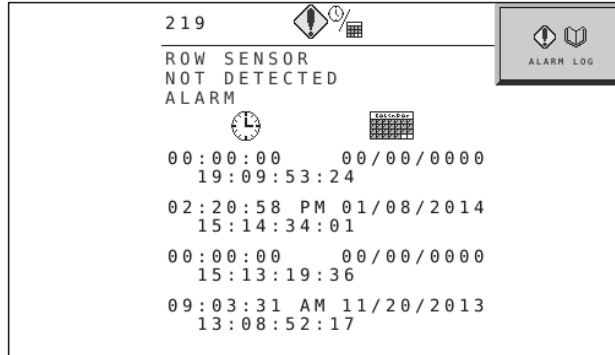


ALARM DETAIL

1. To view specific alarm details, press the **Alarm Detail** button.
 - The time and date of the selected alarm displays for each occurred instance.
 - The Alarm Log will save up to 4 instances of the selected alarm.

Figure 104

Alarm Detail Screen



ALARM RESET

To reset the Alarm Log, press the **Alarm Reset** button.

1. Press **YES** button to clear.
2. Press **NO** button to return to Alarm Log Detail screen.



Figure 105

Alarm Reset



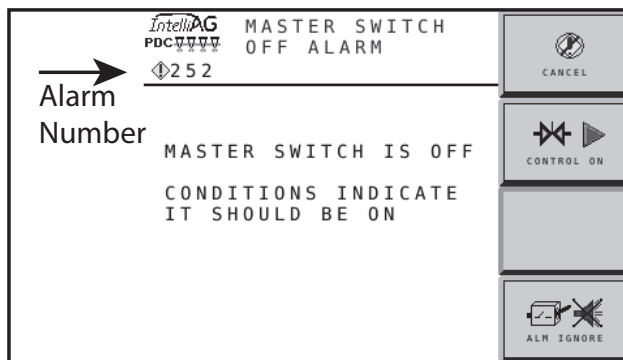


TROUBLESHOOTING & ALARM CODES

Alarms are indicated on the Virtual Terminal with the an exclamation and alarm number with a continuous, audible alarm.

Figure 106

Alarm and Alarm Number



The following table describes the possible alarm conditions, causes, and remedies.

For troubleshooting assistance, please contact our DICKEY-john U.S. Support Team at 1-800-637-3302 or the DICKEY-john Europe office at +33 1 41 19 21 80 or europe@dickey-john.com.



OPERATOR'S MANUAL



ALARM #	ALARM	PROBABLE CAUSE	CORRECTIVE ACTION
1	Software Task Stack Overflow Alarm	1. Internal system software error.	1. Cycle system power OFF/ON. If condition persists, contact DICKEY-john Technical Support (1-800-637-3302) or DICKEY-john Europe (011-33-141-192180).
2	Software System Stack Overflow Alarm	1. Internal system software error.	1. Cycle system power OFF/ON. If condition persists, contact DICKEY-john Technical Support (1-800-637-3302) or DICKEY-john Europe (011-33-141-192180).
3	VT Out of Memory Alarm	The ECU memory requirements are greater than the Virtual Terminal can handle.	1. Remove any unnecessary ECU's 2. Contact DICKEY-john Technical Support (1-800-637-3302) or DICKEY-john Europe (011-33-141-192180) for updated hardware.
4	Software Version Does Not Support this Configuration Alarm	1. Occurs if new software is loaded and does not support the configuration of the hardware it is loaded on.	1. Record software and model information listed below. 2. Contact dealer for software update.
202	Ground Speed Failure Alarm	ONLY ACTIVE IN PLANTER MONITOR MODE. SEEDS ARE DETECTED WHEN THERE IS NO GROUND SPEED. 1. Incorrect speed source setting or calibration. 2. Defective speed sensor or harness. 3. Defective module or virtual terminal.	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 virtual terminal.
203	Continuous Test Failure Alarm	CONTROL CONDITIONS EXCEED THE DISK RPM LIMITS. 1. Test speed setting is set too high or low. 2. Disk Hi and/or Disk Low settings are incorrect.	1. Enter an appropriate Test Speed. 2. Verify or enter appropriate Disk Hi and/or Disk Low values.
204	5 Revolution Test Failure Alarm	CONTROL CONDITIONS EXCEED THE DISK RPM LIMITS. 1. Test Speed setting is set too high or low. 2. Disk Hi and/or Disk Low settings are incorrect.	1. Enter an appropriate test speed. 2. Verify or enter appropriate Disk Hi and/or Disk Low values.
205	Channel Failure Alarm	1. Defective control valve. 2. Defective feedback sensor. 3. Defective module harness or module harness fuse. 4. Defective module.	1. Inspect control valve for damage or replace. 2. Inspect feedback sensor for damage or replace. 3. Inspect module harness for damage. Replace harness fuse. 4. Inspect module for damage or replace.
206	Channel Unable to Control Alarm	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.

OPERATOR'S MANUAL



ALARM #	ALARM	PROBABLE CAUSE	CORRECTIVE ACTION
207	Channel Unstable Alarm	<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 Channel Configuration screen. Perform a valve calibration. 2. Verify correct installation of the feedback sensor. 3. Inspect feedback sensor for damage or replace.
208	Channel Saturation Exceeded Alarm	<ol style="list-style-type: none"> 1. Excessive speed. 2. Incorrect channel settings. Desired rate too high for implement. 3. Target rate too high 	<ol style="list-style-type: none"> 1. Reduce speed. 2. Verify correct setup constants on the Channel Configuration screen. Perform a valve calibration and a Calibration constant. 3. Reduce target rate.
209	Channel High Limit Exceeded Alarm	<p>CONTROL LIMITED BY HIGH LIMIT. UNDER APPLICATION IS OCCURRING. NOTE: System will not run faster than High Limit Value.</p>	<ol style="list-style-type: none"> 1. Check and/or reduce speed. 2. Verify Channel setup (high RPM) 3. Perform new valve calibration. 4. Check and/or reduce target rate. 5. Inspect feedback sensor for damage. 6. Inspect control valve for damage. 7. Inspect harness/module for damage. 8. Decrease target rate.
210	Channel Low Limit Exceeded Alarm	<p>CONTROL RATE LIMITED BY LOW LIMIT. OVER APPLICATION IS OCCURRING.</p>	<ol style="list-style-type: none"> 1. Increase speed. 2. Verify correct setup constants (low RPM). 3. Perform valve calibration. 4. Increase target rate.
211	All Rows Failed Alarm	<ol style="list-style-type: none"> 1. Seed meter drive malfunction. 2. Rows are not assigned to channel and channels are turned off. 	<ol style="list-style-type: none"> 1. Check seeding drive(s). 2. Assign rows to channel.
212	Row Failure Alarm	<p>SEED RATE HAS FALLEN BELOW THE ROW FAIL RATE SETTING ON THE SEED MONITOR SETUP SCREEN.</p> <ol style="list-style-type: none"> 1. Seed meter malfunction. 2. Dirty or defective seed sensor. 3. Damaged planter harness. 4. Defective module harness or module 5. Out of seed 	<ol style="list-style-type: none"> 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
213	High Population Limit Exceeded Alarm	<p>SEED RATE HAS EXCEEDED THE HIGH ALARM SETTING ON THE SEED MONITOR SETUP SCREEN.</p> <ol style="list-style-type: none"> 1. Seed meter malfunction or incorrect setup. 2. Defective seed sensor. 3. Defective module. 	<ol style="list-style-type: none"> 1. Verify proper planter options/setup. 2. Inspect seed sensor for damage. Replace if necessary. 3. Inspect module for damage. Replace if necessary.
214	Low Population Limit Exceeded Alarm	<p>SEED RATE HAS DROPPED BELOW THE LOW ALARM SETTING ON THE SEED MONITOR SETUP SCREEN.</p> <ol style="list-style-type: none"> 1. Seed meter malfunction or incorrect setup. 2. Defective seed sensor. 3. Defective module. 4. Running out of seed. 	<ol style="list-style-type: none"> 1. Verify proper planter operation/setup. 2. Inspect seed sensor for damage. Replace if necessary. 3. Inspect module for damage. Replace if necessary. 4. Fill with seed.

OPERATOR'S MANUAL



ALARM #	ALARM	PROBABLE CAUSE	CORRECTIVE ACTION
215	High Pressure Limit Exceeded Alarm	<p>SENSED PRESSURE EXCEEDS THE HIGH ALARM SETTING ON THE PRESSURE SETUP SCREEN.</p> <ol style="list-style-type: none"> 1. Implement malfunction or incorrect setup. 2. Defective pressure sensor. 3. Defective module. 	<ol style="list-style-type: none"> 1. Verify proper implement operation/setup. 2. Inspect pressure sensor for damage. Replace if necessary. 3. Inspect module for damage. Replace if necessary.
216	Low Pressure Limit Exceeded Alarm	<p>SENSED PRESSURE BELOW THE LOW ALARM SETTING ON THE PRESSURE SETUP SCREEN.</p> <ol style="list-style-type: none"> 1. Implement malfunction or incorrect setup. 2. Defective pressure sensor. 3. Defective module harness or module. 	<ol style="list-style-type: none"> 1. Verify proper implement operation/setup. 2. Inspect pressure sensor for damage. Replace if necessary. 3. Inspect module and/or module harness for damage. Replace if necessary.
217	Member Module Detection Alarm	<p>NUMBER OF MEMBER MODULES DOES NOT MATCH THE SYSTEM CONFIGURATION.</p> <ol style="list-style-type: none"> 1. Too few modules connect to system. 2. Too many modules connected to system. 3. Defective CAN/module harness. 4. Blown module harness fuse. 5. Defective module. 6. New module has been added to system. 	<ol style="list-style-type: none"> 1. Verify correct module configuration setup on the Module Configuration screen. 2. Verify correct module configuration setup on the Module Configuration screen. 3. Identify missing module in the Module Configuration list. Inspect CAN/module harness of the missing module for damage. Repair or replace harness. 4. Inspect module harness fuse of the identified module. Replace if necessary. 5. Identify missing module in the Module Configuration list. Inspect missing module for damage or replace. 6. Verify correct module configuration setup on the Module Configuration screen.
218	Pressure Sensor Detection Alarm	<p>NUMBER OF PRESSURE SENSORS CONNECTED DOES NOT AGREE WITH THE NUMBER OF SENSORS CONFIGURED ON THE PRESSURE SENSOR CONFIGURATION SCREEN.</p> <ol style="list-style-type: none"> 1. Defective Sensor. 2. Defective module or damaged module harness. 3. Additional pressure sensor detected. 	<ol style="list-style-type: none"> 1. Inspect pressure sensor for damage or replace. 2. Inspect module and/or module harness for damage. Replace if necessary. 3. Verify correct # ACC setting for each module.
219	Row Sensor Detection Alarm	<p>NUMBER OF SEED SENSORS CONNECTED DOES NOT AGREE WITH THE NUMBER OF SENSORS CONFIGURED ON THE SEED SENSOR CONFIGURATION SCREEN.</p> <ol style="list-style-type: none"> 1. Defective seed sensor. 2. Defective module or damaged module harness. 3. Additional seed sensor detected. 	<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	Row Sensors Installed Incorrectly Alarm	<p>ROWS ARE NOT DETECTED SEQUENTIALLY ON A MODULE.</p> <ol style="list-style-type: none"> 1. Incorrect seed row connections. 2. Defective seed sensor. 3. Defective module or damaged module harness. 	<ol style="list-style-type: none"> 1. Verify seed sensors are connected sequentially on all modules as instructed in installation. 2. Inspect seed sensor for damage or replace. 3. Inspect module and/or module harness for damage. Replace if necessary.
221	Channel Invalid State Alarm	<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 DICKEY-john Technical Support (1-800-637-3302) or DICKEY-john Europe (011-22-141-192180).

OPERATOR'S MANUAL



ALARM #	ALARM	PROBABLE CAUSE	CORRECTIVE ACTION
222	Channel Setup Height Error Alarm	<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	Channel Max Feedback Unreachable Alarm	<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	<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.
225	Hopper Sensor Low Alarm	<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 Sensor High Limit Exceeded Alarm	<p>SENSED RPM EXCEEDS THE HIGH ALARM SETTING ON THE RPM 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 Sensor Low Limit Exceeded Alarm	<p>SENSED RPM BELOW THE LOW ALARM SETTING ON THE RPM 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.
228	Hopper Sensor Detection Alarm	<p>NUMBER OF HOPPER SENSORS CONNECTED DOES NOT AGREE WITH THE NUMBER OF SENSORS CONFIGURED ON THE HOPPER SENSOR CONFIGURATION SCREEN.</p> <ol style="list-style-type: none"> 1. Defective hopper sensor. 2. Defective module or damaged module harness. 3. Additional hopper sensors detected. 	<ol style="list-style-type: none"> 1. Inspect hopper sensor for damage or replace. 2. Inspect module and/or module harness for damage. Replace if necessary. 3. Verify correct # HOPP setting for each module.

OPERATOR'S MANUAL



ALARM #	ALARM	PROBABLE CAUSE	CORRECTIVE ACTION
229	Hopper Sensors Installed Incorrectly Alarm	HOPPER SENSORS ARE NOT INSTALLED SEQUENTIALLY ON A MODULE. 1. Incorrect hopper sensor connections. 2. Defective hopper sensor. 3. Defective module or damaged module harness.	1. Verify hopper sensors are connected sequentially on all modules as instructed in INSTALLATION. 2. Inspect hopper sensor for damage or replace. 3. Inspect module and/or module harness for damage. Replace if necessary.
230	Pressure Sensors Installed Incorrectly Alarm	PRESSURE SENSORS ARE NOT INSTALLED SEQUENTIALLY ON A MODULE. 1. Incorrect pressure sensor connections. 2. Defective pressure sensor. 3. Defective module or damaged module harness.	1. Verify pressure sensors are connected sequentially on all modules as instructed in INSTALLATION. 2. Inspect pressure sensor for damage or replace. 3. Inspect module and/or module harness for damage. Replace if necessary.
231	Seeding Detected on a Tramline Row Alarm	Occurs if a tramline row does not shut off the row unit and seeds continue to be detected. (Only possible if system supports tramlining). 1. Output to row mapping is assigned incorrectly. 2. Seed sensor malfunction.	1. Check output row mapping. 2. Check seed sensor to ensure no false triggering. 3. Inspect and verify Tramline output is shutting off seeds correctly.
232	RPM Sensor Low Limit Exceeded With Control Channel Shutdown Alarm	RPM HAS DROPPED BELOW THE DISABLE CONTROL ON LOW ALARM SETTING ON THE ACCESSORY SETUP SCREEN. 1. Defective RPM sensor. 2. Damaged module harness. 3. Defective module. 4. Low RPM	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.
233	Channel Activation Alarm	CHANNEL DELAY OR PRECHARGE IS ENABLED. DURING THIS THE CONTROL WILL RUN WITHOUT GROUND SPEED OR WITHOUT THE IMPLEMENT DOWN.	1. Acknowledge alarm to activate control channels. 2. Acknowledge alarm and disable Delay or Precharge to stop control.
235	New Member Module Detected Alarm	1. New member module has been found.	1. Assign sensors to the new module at the Module Configuration Setup screen and its position.
236	Intermittent Member Module Detected Alarm	1. A member module that had previously failed communication has come online.	1. Inspect harness connections to this module.
237	Product Level Low Alarm	1. Calculated product level has dropped below alarm level.	1. Fill product bin and reset level.
240	Seeding Detected on a Control Off Row Alarm	1. Channel turned off and seed continues to be detected.	1. Check seed dispensing unit for proper shut off.
241	Control Not Active With Implement Lowered and Speed	1. Control will not operate while on a setup screen.	1. Navigate to the Work Screen to activate the control. 2. Raise implement and stop forward speed to clear alarm.
246	Master Switch Softkey Press Alarm	1. Warning of action associated with key press.	1. Press Control Start key to activate control.
249	Control Channel Activation Alarm	1. Controls will run without ground speed or without implement lowered. Channel Manual Mode or Precharge is enabled. During this the control will run without ground speed or without the implement down.	1. Acknowledge alarm to activate control channels. 2. Acknowledge alarm and disable manual or precharge to stop control.

OPERATOR'S MANUAL



ALARM #	ALARM	PROBABLE CAUSE	CORRECTIVE ACTION
251	New Hardware Detected Alarm	1. New hardware detected that requires system to be rebooted to acknowledge hardware.	1. Cycle system power to complete hardware install.
253	Monitor Channel High Limit Exceeded Alarm	1. High limit set incorrectly. 2. Transmission not set correctly.	1. Verify high limit. 2. Verify transmission setting.
254	Monitor Channel Low Limit Exceeded Alarm	1. Low limit set incorrectly. 2. Transmission not set correctly.	1. Verify low limit. 2. Verify transmission setting.
255	Channel Invalid Material Alarm	1. There is no material defined with a type that matches the selected control channel type.	1. Create a material with the channel type.
260	Control Channel Failure Alarm	1. Control channel is not responding.	1. Cycle Master Switch or implement switch to restart the control channel. 2. Verify drive is connected and engaged. 3. Check feedback sensor for damage. 4. Check harness for damage. 5. Check module for damage.
261	Control Channel Unable to Control Alarm	1. Control Channel cannot control to the specified rate.	1. Inspect control channel setup. 2. Perform new valve calibration. 3. Check feedback sensor for damage. 4. Check control valve for damage. 5. Check harness for damage. 6. Check module for damage.
262	RPM Control Channel is off Alarm	1. RPM Channels are off. System may not operate properly.	1. Acknowledge alarm to leave RPM control channels off. 2. Press "CHAN ON" to turn all RPM channels on.
264	Ground speed Calibration Configuration Alarm	Current ground speed calibration exceeds the max number of ground speed pulses of 50000 that can be entered as a ground speed constant.	1. Probable that the marked off course limits were exceeded. Verify course length of 400 ft (100m). 2. Ground speed sensor has too high resolution of pulses. Check speed sensor for damage.
602	8 Volt Supply Failure Alarm	8V SUPPLY VOLTAGE 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 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.
605	Solenoid Voltage Out of Range 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.

OPERATOR'S MANUAL



ALARM #	ALARM	PROBABLE CAUSE	CORRECTIVE ACTION
606	Ground Offset Voltage Out of Range Alarm	<ol style="list-style-type: none">1. Damaged/shorted Actuator Harness.2. Defective PWM valve driver or Servo valve driver.3. Defective module.	<ol style="list-style-type: none">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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