DICKEY-john®
CORPORATION
Revolutionizing Electronics

OPERATOR'S MANUAL
PM 300E and PM 332E
PLANTER MONITORS

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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.


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INTRODUCTION

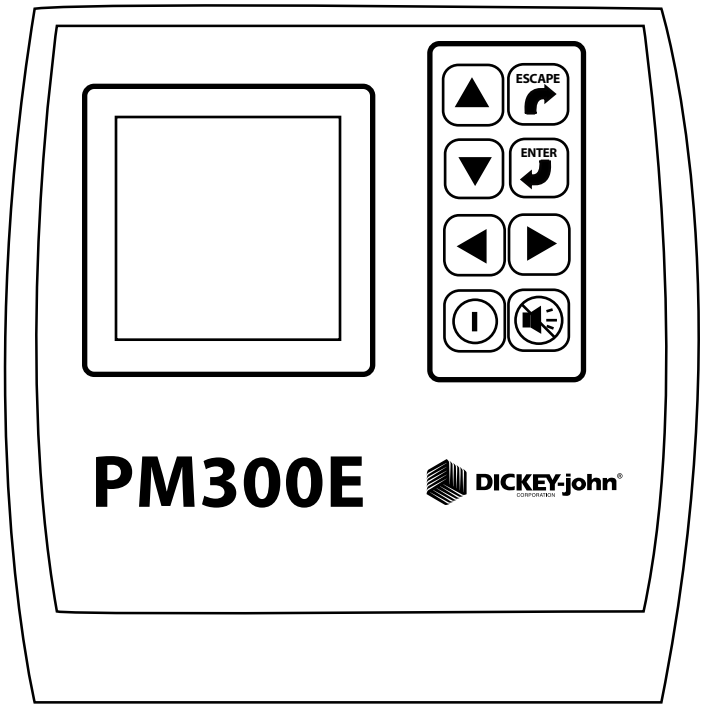
SYSTEM OVERVIEW

The DICKEY-john PM300E and PM332E Planter Monitors offer features to monitor 16 and 32 rows respectively. The units monitor seed or fertilizer rows, two hopper levels, and a frequency input (shaft, fan, or flow). The monitors are compatible with DICKEY-john seed, flow, hopper level, and gear sensors. The units store all configuration data in nonvolatile memory, retaining information even when disconnected from power. Figure 1 provides an illustration of a generic console.

The monitors are designed to meet the custom needs of individual users. The display can be configured to output a comprehensive set of planter parameters. The user selects the type and number of parameters to be monitored. Auto-scrolling and arrow key override are used to maintain control of real-time information required by the user.

Figure 1

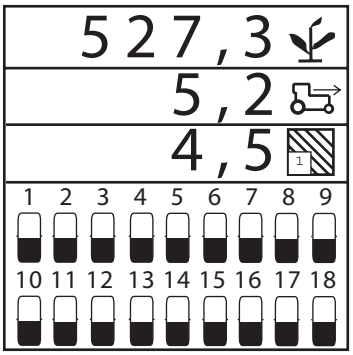
PM300E Monitor



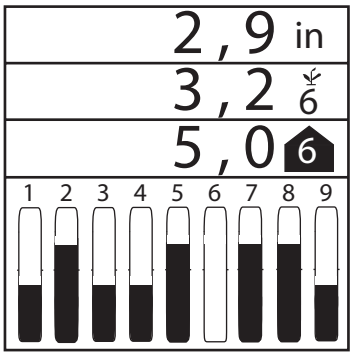
(Figure 2) depicts examples of various displays of locked and unlocked screens. Unlocked screens require an authorized user with a password to modify. Refer to the Operate Mode section for customizing screen displays and Advanced Setup for using a password.

Figure 2

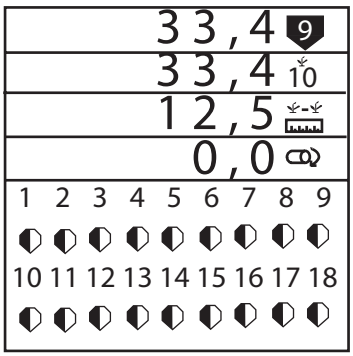
User-Definable Display Examples (Locked and Unlocked)



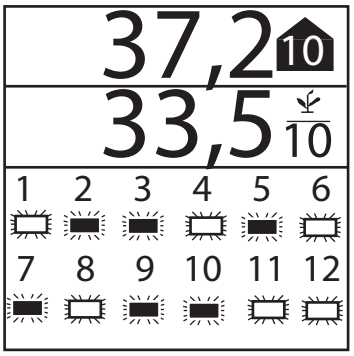
Graphic mode: average population, speed, and field 1 area output with bar graphs



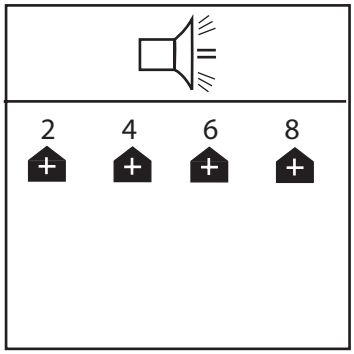
Text mode: average spacing, spacing scan and min/max/avg spacing output with bar graphs



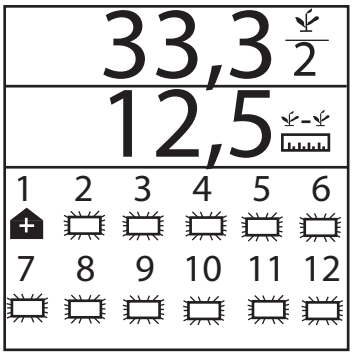
Min/max/avg population, population row scan, avg speed spacing, and shaft speed with gauges



Min/max/avg population and row scan with blinking row symbols



Rows 2, 4, 6, 8 (above limit) alarm screen



Row scan and average spacing with blinking symbols and row 1 hi alarm (alarm cancel returns user to operate screen)

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SPECIFICATIONS

Power	10.5–16 VDC, 5 A maximum
Operating temperature range	-20°C to 70°C (-4°F to 158°F)
Storage temperature range	-40°C to 85°C (-40°F to 185°F)
Size	18.4 cm W x 20.1 cm H x 4.3 cm D (7.3" W x 7.9" H x 1.7" D)
Weight	4.4 lbs for 16-row PM300E system 4.8 lbs for 32-row PM332E system *Weight includes console and attached cables (battery power cable and signal cable that extends to the drawbar).
Wire Harnesses	The PM300E and PM332E include integrated harnesses to supply the unit's power (fused), ground speed input, and sensor inputs (to drawbar). The connectors are compatible with existing DICKEY-john harnesses. DICKEY-john can supply custom harnesses required for sensor inputs.
Sensors	Compatible with existing DICKEY-john sensors
Standard mounting	Rear attached horizontal or vertical mounting bracket Mounting bracket weighs 1.0 lb.
Contrast adjustment	Automatic temperature compensation for contrast
Dust and moisture resistant	Cab installation only


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MAJOR FEATURES

PERFORMANCE

- Planter monitoring of 16 row (PM300E) or 32 rows (PM332E)
- Monitoring of ground speed, two hopper levels, one frequency function (fan, shaft, or flow)
- Easy and flexible configuration
- Three planting functions viewable during operation:
  - Average Population
  - Average Seed Spacing
  - Average Seeds per Distance
  - Population Row Scan
  - Seed Spacing Row Scan
  - Seed per Distance Row Scan
  - Minimum, Maximum, Average Row Population
  - Minimum, Maximum, Average Row Spacing
  - Minimum, Maximum, Average Spacing per Distance
  - Field Area 1
  - Field Area 2
  - Field Area 3
  - Total Area
  - Ground Speed
  - Fan, Shaft, or Flow Frequency
- User-definable row information
  - Bar graph
  - Wiper gauge
  - Symbols (failure mode)
  - Symbols flashing proportional to seeding rates

CONSOLE/DISPLAY

- Large, user friendly keys
- Large text size for easy viewing
- Graphic labels
- Backlit graphic display for nighttime use
- Large, concise error messages displayed with audible alarm
- Metric or English units

COMPATIBILITY

- Compatible with DICKEY-john sensors
- Plug-in replacement for other DICKEY-john monitors
- Optional support of RS-232 based data logging

USER AID

- Help card


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INSTALLATION

The monitor is tested and inspected before shipping to ensure the unit is fully operational and meets measurement specifications. Inspect for damage that may have occurred during transit. Save all packing materials until the inspection is complete. If damage is found, immediately file a claim with the carrier and notify your DICKEY-john Sales Representative.

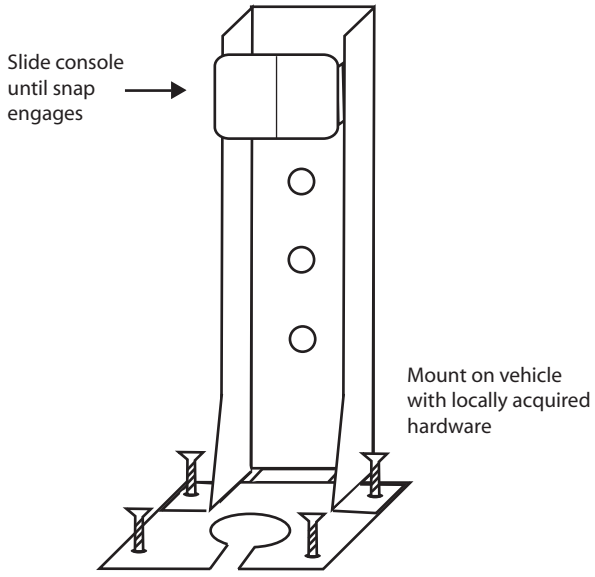
STANDARD MOUNTING BRACKET

NOTE: When mounted to a vertical surface, a tie-wrap can be used to secure the cables to the bottom of the bracket.

Install the mounting bracket at the desired location using locally acquired hardware. Install the console to the bracket by aligning the console mating grooves with the bracket and sliding the console onto the bracket until the snap engages.

Figure 3

Standard Mounting Bracket



⚠WARNING

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

CAUTION

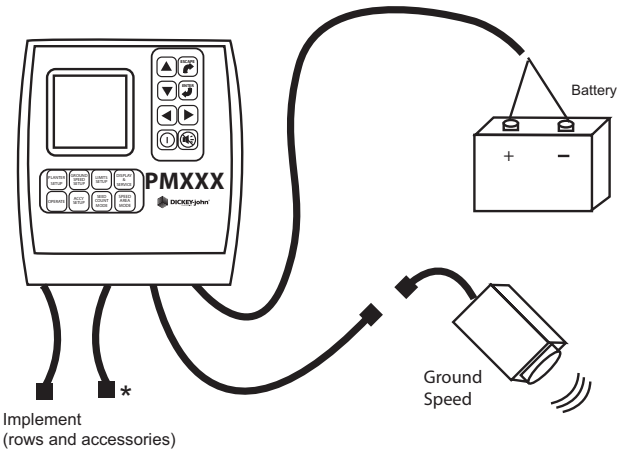
To prevent damage to the console, be sure the snap fully engages during installation.

INSTALLING CONSOLE HARNESSES

Console harnesses are located at the bottom of the monitor. These include power, ground speed sensor, and sensor inputs (rows, lift switch, two hopper levels, and one frequency function [shaft/fan/flow]).

Figure 4

Console Harnesses



*PM300E does not have a second cable
PM332E has a 9-pin accessory cable

1. Route the power harness to a +12 V source near the battery if possible.
2. Route the ground speed sensor harness connection to the RADAR, Hall Effect, or GPS ground speed sensor.
3. Route the implement harness to the location of choice, typically near the drawbar.

⚠WARNING

The harnesses must not obstruct movement of the operator or of the moving parts of the tractor or implement. Take care when routing harnesses to secure them at proper locations; provide slack as needed to allow for movement.

CAUTION

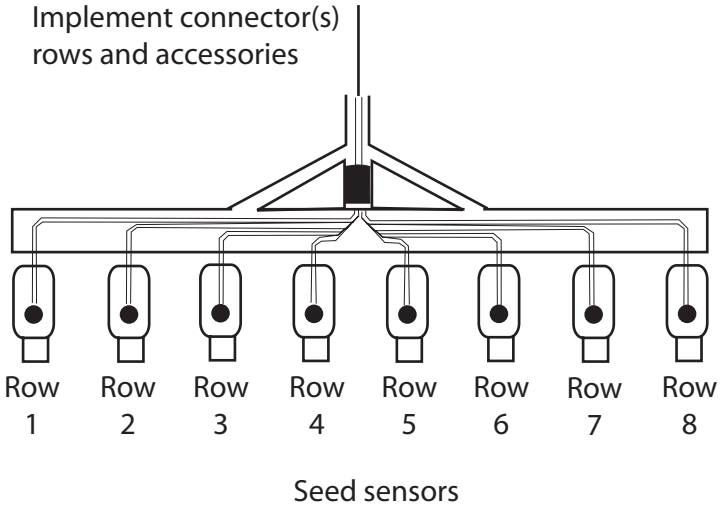
Poor +12 V connections may cause intermittent console operation. Be sure to connect the power harness to a clean, well-conditioned source (direct battery connection is preferred).

INSTALLING IMPLEMENT HARNESS AND SENSORS

The implement harness provides custom fit and functions required by the implement. Each harness branch is labeled for location (row 1, row 2, etc.) or sensor (lift switch) for routed connection. Some sensors may require special adapters for connection.

Figure 5

Implement Harness/Sensors



1. Install sensors onto seed tubes using tie-wraps.
2. Route implement harness to the appropriate locations; provide slack near moving parts to allow for movement. Attach harness to the implement using tie-wraps.
3. Make sure the hitch connections will connect to the tractor connections with the proper amount of slack for implement movement.

CAUTION

The harnesses must not obstruct moving parts of the tractor or implement. Take care when routing harnesses to retain them at proper locations with adequate slack for movement.

KEY FUNCTIONS

Refer to (Figure 1) for key placement.

ON/OFF KEY

The **On/Off** key activates the unit. During power up, the monitor performs internal self-tests, illuminates the display, sounds the alarm, and determines which sensors are connected to the system. Pressing and holding the key for one second when the power is ON will turn the power OFF, independent of the screen being displayed.

ALARM CANCEL KEY

During normal operation, selecting the **Alarm Cancel** key acknowledges the alarm condition displayed on the screen. Active row alarms are reset after an ALL ROWS FAILURE condition or a power down-up sequence occurs. If the error condition continues, the key must be selected again to cancel the alarm. When no alarms are active, the volume may be modified by selecting and holding the **Alarm Cancel** key.

ENTER KEY

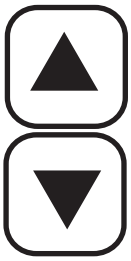
The **Enter** key selects a highlighted item for data modification. After changing the parameter values, **Enter** accepts the modified data.

ESCAPE KEY

On the Main Operate screen, select and hold the **Escape** key for four seconds to clear an area accumulator if it is located on the top line of the display.

When navigating through sub-menus, the **Escape** key moves the user back one selection. After changing parameter values, selecting **Escape** accepts the modified data. The **Escape** key also serves as an alarm cancel key.

UP AND DOWN ARROW KEYS



On the Main Operate screen, the **Up** and **Down Arrow** keys are used to manually select the parameters viewed at the top of the display. They are inactive if all parameters are already displayed (number of parameters are equal to or less than number of lines).

On the Main Operate screen, the arrows are used to navigate between options. On set-up screens, the arrows are used to navigate between options or to change a digit/option.

LEFT AND RIGHT ARROW KEYS

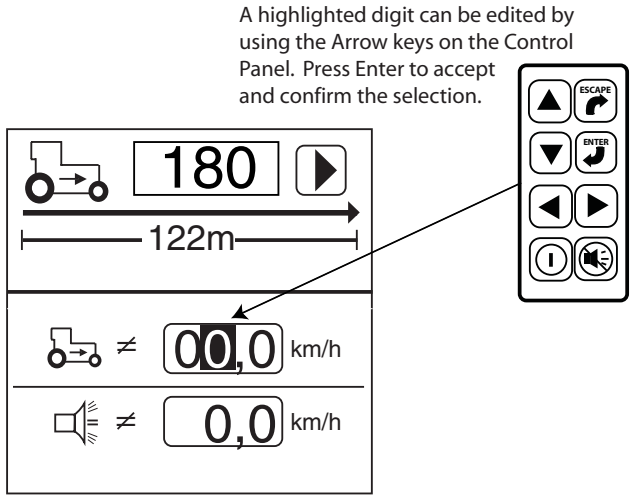
On the Main Operate screen, the **Left** and **Right Arrow** keys are used to manually select the rows viewed at the bottom of the display. They are inactive if all rows are already displayed. On other screens, the arrows are used to navigate between options.

EDITING SCREEN FIELDS

The term "highlight" used throughout the manual refers to pressing a key to activate and move the cursor until the desired digit on the screen is highlighted. Pressing **Enter** accepts and confirms the selection.

Figure 6

Editing Screens



MAIN MENU SCREEN

All user-defined screens are accessed through the Main Menu screen.

To Display the Main Menu:

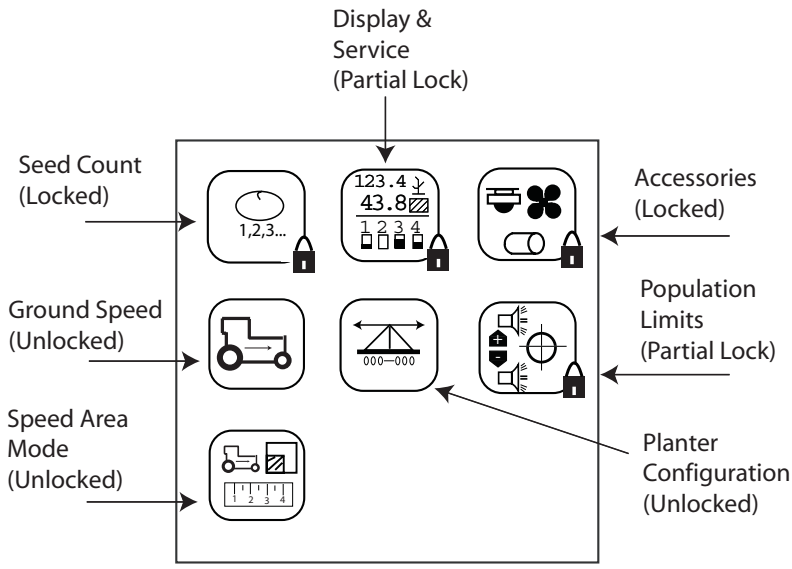
1. At the Main Operate screen, press the **Enter** key and the Main Menu will display.

Seed Count and Accessories are locked screens that can be modified only by using a password entered by an authorized user. Display & Service and Population Limits have some locked data; all other screens are unlocked and can be customized to user preference.

NOTE: Italicized text indicates functionality that is locked. Authorized users can unlock screens by highlighting the icon and pressing Enter to display the Password screen. Refer to the Advanced Setup section for additional information.

Figure 7

Main Menu Screen



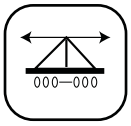
MONITOR SETUP

Selecting a pre-programmed planter configuration provides easy setup of planter row width, number of rows, implement width, and row types.

Three inputs are required for monitor operation:

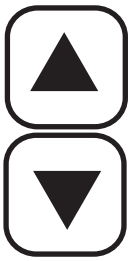
1. Number of rows
2. Row spacing
3. Ground speed constant

Row type is an optional entry that can be configured as ON (population), OFF (split row), FLOW (blockage), or DISABLED.



Planter Configuration icon

Left and Right Arrow keys



Up and Down Arrow keys

PLANTER CONFIGURATION

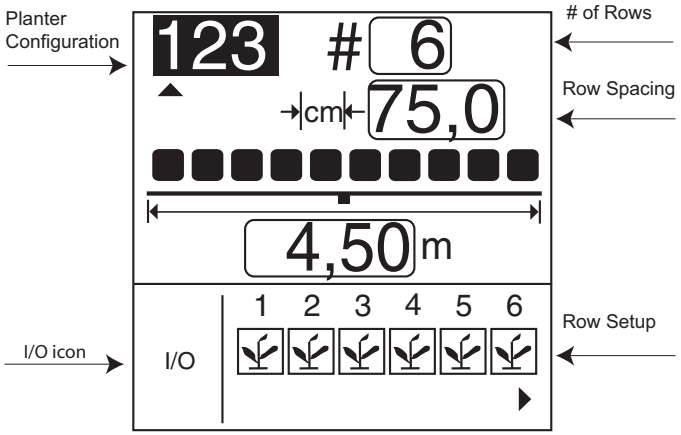
The PM300E and PM332E can store three planter configurations for split row planters or multiple planters and seeders.

To Select a Planter Configuration (1, 2, or 3):

1. Press the **Enter** key to display the Main Menu screen.
2. Highlight the **Planter Configuration** key and press **Enter** to display the Planter Configuration screen.
3. To select a planter configuration number (1, 2, or 3) press **Enter** to highlight and select the arrow indicator (▲).
4. Press the **Left and Right** keys to move the arrow indicator to the desired Planter Configuration.
5. Press **Enter** to display the selected planter configurations.

Figure 8

Planter Configuration Screen



NUMBER OF ROWS

To change number of rows:

1. Use the **Left and Right Arrow** keys to highlight the number of rows field.
2. Press **Enter** to modify the number of rows. Use the **Right and Left Arrow** keys to select the digit to change. Use the **Up and Down Arrow** keys to edit the selected digit. Use the Up Arrow key to increase the value; use the Down Arrow key to decrease the value.
3. Press the **Enter** key to confirm the selection.

ROW SPACING

To change row spacing:

1. Use the **Down** arrow to highlight the row spacing field.
2. Press **Enter** to select the field.
3. Use the **Left and Right Arrow** keys to select a digit for editing.
4. When a digit is highlighted, use the **Up and Down Arrow** keys to edit the value displayed. Use the Up Arrow key to increase the value; use the Down Arrow key to decrease the value.

5. When the field shows the correct planter row spacing, press **Enter** to confirm the selection. The implement width automatically calculates as row spacing is entered.

ROW SETUP (AUTO ASSIGNED)

The console will automatically assign the number of rows defined on the **Planter Setup** screen as ON (population rows).

Rows may be configured to ON (population), OFF (split row), FLOW (blockage), or DISABLED.

- When ON is selected (plant), the row is active and the console will detect sensors and seed flow.
- When OFF is selected (blank), the row is removed and remaining rows are re-numbered. This is used for split row systems where every other row or sets of internal rows are not planting. Their corresponding row number is ignored, allowing for true planting operations to be displayed on the monitor.
- When DISABLED is selected (circle with slash), the row input is ignored. The row number will be displayed. This is used when a row or sensor is malfunctioning and the operator wants to disable monitoring on that row.
- When FLOW is selected (funnel), the row will not be included for population calculations but will be monitored for flow. The flow rows will be used to detect flow (fertilizer or seeds) and alarm if the flow falls below two pulses per second.

The **Planter Setup** screen must include the number of rows and the row spacing or implement width for the console to properly display population. Up to three individual configurations can be programmed and supports split row planters (CONFIGURATION 1 for NORMAL and 2 for SPLIT ROW) and a separate seeder or drill (CONFIGURATION 3).

To Configure Row Setup:

1. Press the **Down Arrow** key to highlight the **I/O** icon for row setup.
2. Press the **Enter** key to select the icon and highlight the first row unit.
3. Use the **Up or Down Arrow** key to toggle through the four possible configurations: On, Off, Disabled or Flow.
4. Use the **Left or Right Arrow** key to highlight another row unit.
5. Press the **Enter** key to save the selection.
6. Press the **Enter** key again to select another row and the **Left or Right Arrow** key to move to other row units.

Press the **Escape** key to save and return to the Main Operate screen.

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ENTER

GROUND SPEED CALIBRATION

Ground speed is the rate of vehicle travel in Km/h and is measured by the ground speed sensor. The calibration value reflects the number of pulses generated by the sensor while traveling a distance of 122 meters.

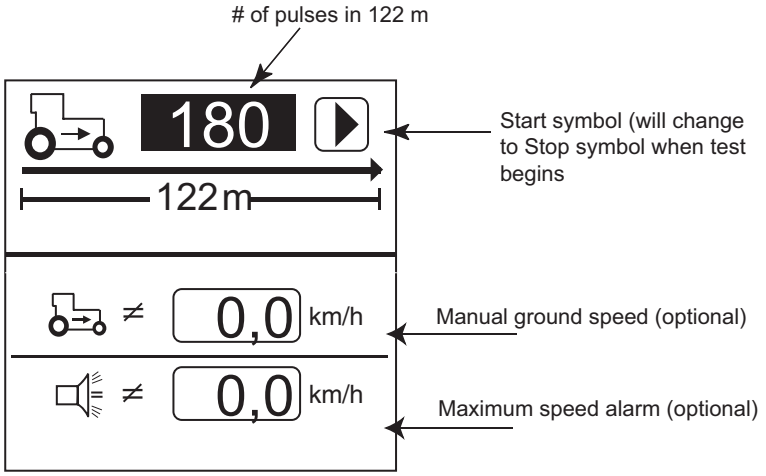
To Perform a Ground Speed Calibration:

1. From the Main Operate screen, press the **Enter** key to display the Main Menu screen.
2. At the Main Menu screen, highlight the **Ground Speed** icon and press **Enter** to display the Ground Speed Calibration screen.

Ground Speed icon

Figure 9

Ground Speed Calibration Screen



ESCAPE

To Perform a New Calibration:

1. Measure a 122 meter course, clearly marking the start and finish points.
2. Using the Arrow keys, highlight the **Start** symbol on the screen (▶).
3. Begin moving the tractor forward.
4. With the tractor moving between 3.0 and 8 Km/h, press the **Start** button when the tractor is exactly even with the designated start point.
5. After the calibration has started, the Start symbol on the screen will change to a **Stop** (■) symbol.
6. When the tractor is even with the finish point, press the **Enter** key. The new calibration factor will display. Once the **Stop** symbol is selected, the value will save on screen exit. **Selecting the Escape key while the calibration is running will not save the value**.
7. Press the **Escape** key to return to the Main Operate screen.

MANUAL GROUND SPEED CONSTANT ENTRY

*NOTE: To verify that the correct calibration number has been obtained, move to the **Speed Area Mode** screen. Verify that the speed matches the vehicle's speedometer or remeasure the 122 meter distance.*

A manual ground speed value should only be entered when the ground speed sensor or tractor radar has failed and no ground speed input is available.

IMPORTANT: Entering a manual ground speed value when the ground speed sensor or tractor radar is working properly and connected to the monitor will interfere with the proper operation of the planter monitor.

To Enter a Manual Ground Speed Value:

1. Press the **Enter** key to display the Main Menu screen.
2. Use the **Down Arrow** key to highlight the manual ground speed value.
3. Press the **Enter** key to modify the constant.
4. Use the **Arrow** keys to select digits, increment, and decrement values.
5. Select the **Enter** key to accept the new number.
6. Once the new values have been entered, press the **Escape** key to return to the Main Operate screen.

Any non-zero value will activate manual ground speed. Set manual ground speed to zero to disable.

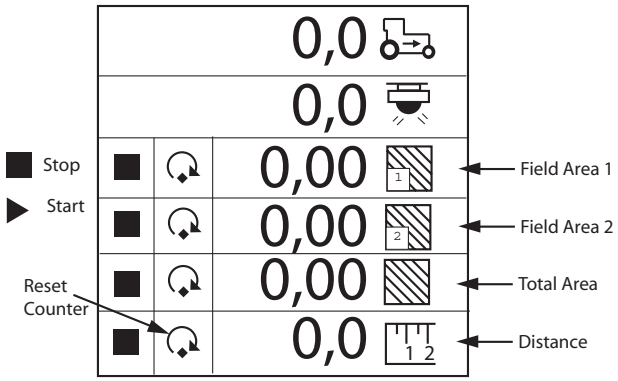
Speed Area Mode icon

To verify that the correct calibration number has been obtained, move to the Speed Area Mode screen.

1. At the Menu screen, select the **Speed Area Mode** icon and press **Enter** to display the Speed Area Mode screen.
2. Verify that the speed matches the vehicle's speedometer or re-measure the 122 meter distance.

Figure 10

Speed Area Mode Screen

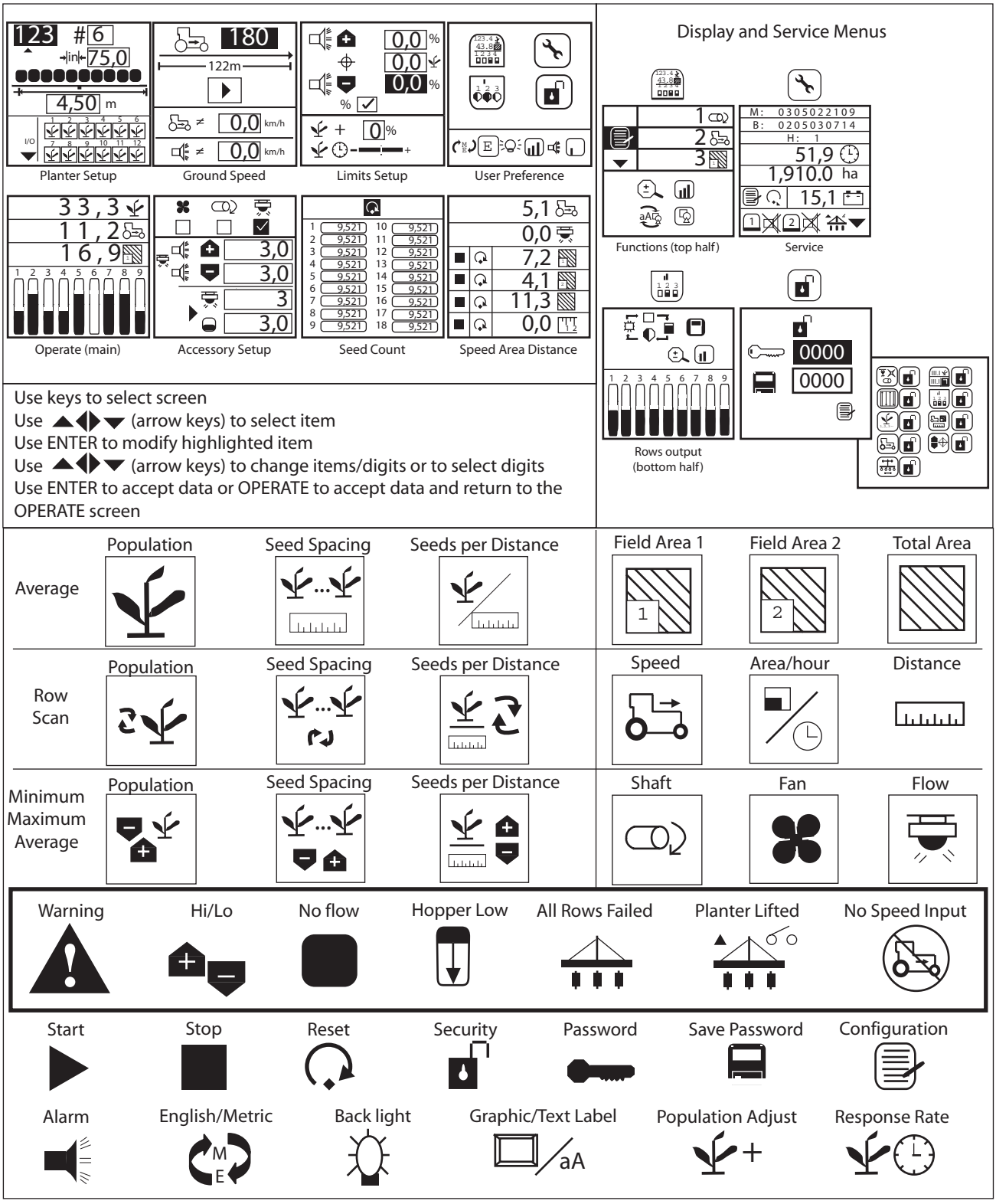


HELP CARD

The help card (Figure 11) can be cut out to provide a compact reference for definitions, set-up screens, and general operating information.

Figure 11

Help Card



ADVANCED SETUP

Display & Service icon

Upper Display Setup icon

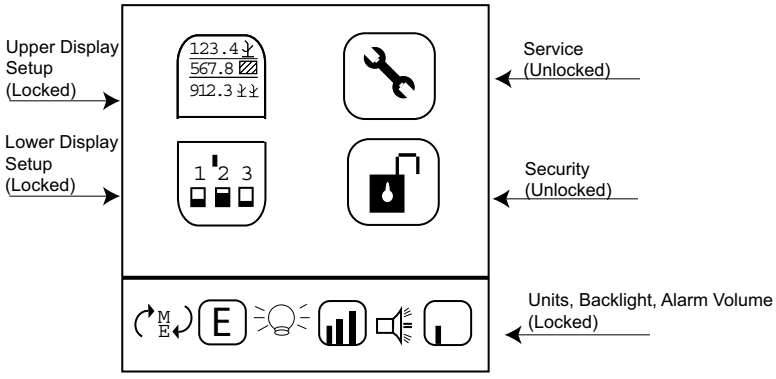

Service icon

DISPLAY & SERVICE

The Display & Service menu provides access to the service and security screens. Upper Display and Lower Display Setup icons are locked screens and are only accessible via a password by authorized users.

Figure 12

Display & Service Screen



SERVICE SCREEN

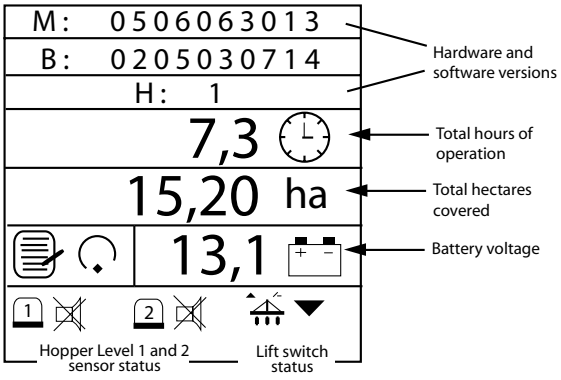
The service screen provides information about the monitor's software and hardware versions, total hours of operation, total hectares covered, battery voltage, hopper level 1 and 2 sensor status, and lift switch status. Information on this screen is informational only and cannot be changed.

To Display the Service Screen:

1. From the Main Operate screen, press the **Enter** key to display the Main Menu screen.
2. Highlight the Display & Service icon and press **Enter** to view the Display & Service screen.
3. Highlight the Service icon and press **Enter**.

Figure 13

Service Screen



Display & Service icon

Security icon

SECURITY

Security features allow password protection on specific screens to prevent unauthorized personnel from modifying key parameters in the field.

The password screen provides access to the Lock/Unlock screen to individually select which screens can be accessed by an operator. All locked screens will require input of the password prior to modification.

The monitor is programmed with a default password (9270). The default password must be entered to create a new password, to access the Lock/Unlock screen, and to access any locked screen. If all screens are unlocked, a password will only be required at the Lock/Unlock screen, as illustrated in (Figure 14).

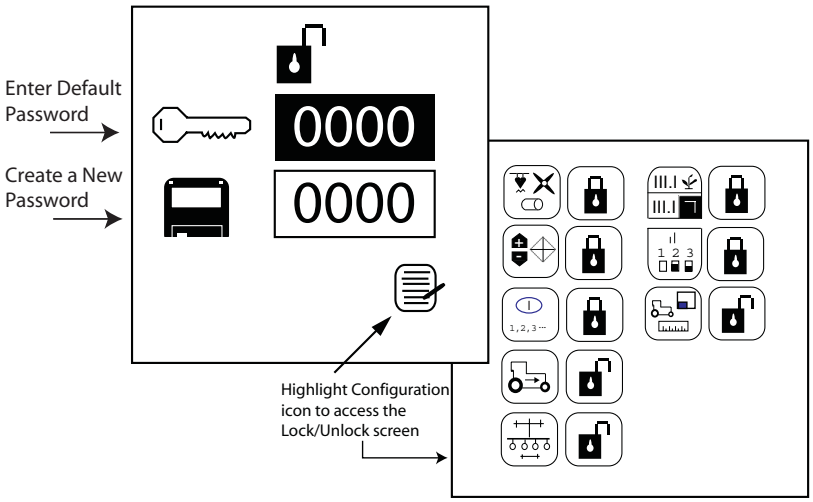
IMPORTANT: The password should be kept confidential and given only to authorized users. If a new password is created, it is recommended that this new number be written down as it will be required to gain access to any locked screen and the Lock/Unlock screen.

Access the Password Screen:

1. From the Main Operate screen, press the **Enter** key to display the Main Menu screen.
2. Highlight the Display & Service icon and press **Enter** to view the Display & Service screen.
3. Highlight the Security icon and press **Enter** to display the Password screen.
4. To edit a digit, press **Enter**. Use the **Up or Down Arrow** keys to select a number and the **Left or Right Arrow** keys to move to the next digit.
5. Press the **Enter** key again to accept the new password.

Figure 14

Password Screen and Lock/Unlock Screen




Configuration icon

Access the Lock/Unlock Screen:

1. Highlight the **Configuration** icon and press **Enter** to navigate to the list of available screens to lock and unlock.
2. Use the **Up or Down Arrow** key to highlight an icon.
3. Press **Enter** to select the Lock/Unlock icon.
4. Toggle the **Up or Down Arrow** keys to lock and unlock a screen.
5. Press the **Enter** key to accept Lock or Unlock.
6. When finished, press the **Escape** key to return to the Password screen.

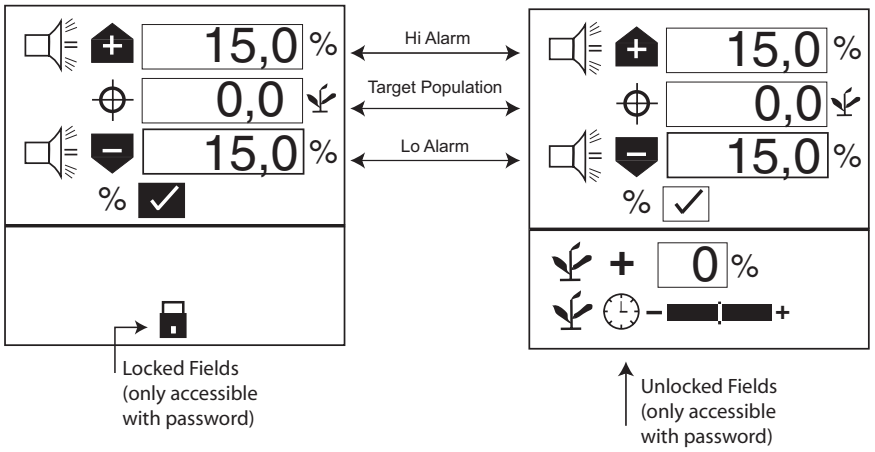
LIMITS SETUP (POPULATION)


Limits Setup icon

The **Limits Setup** screen allows minimum and maximum population limits to be set based on a defined target population.

Figure 15

Limits Setup Screen



TARGET POPULATION

Target population is defined in 1000s of seeds per acre or hectare, dependent on the unit of measurement selected. If no value is entered, the monitor uses average population to calculate alarms or row population indicators.

To Change Target Population:

1. At the Main Menu screen, select the **Limit Setup** icon and press **Enter** to display the Limits Setup screen.
1. Use the **Down Arrow** key to highlight the target population field.
2. Press the **Enter** key to highlight field.
3. Use the **Left or Right Arrow** key to select a digit for editing.
4. When a digit is highlighted, use the **Up or Down Arrow** keys to edit the value displayed.
5. When the field shows the desired target population, press the **Enter** key to confirm the selection.
6. Press the **Escape** key to return to the Main Operate screen.

HI POPULATION/LOW POPULATION

High population and low population values determine when an alarm or row indicator displays to warn of a population problem. If the percentage (%) box is checked, the values are percentage based.

For example, 10% of 70,000 seeds/ha for the over population setting (77,000 seeds/ha) and for the under population setting (63,000 seeds/ha). If the percentage (%) box is not checked, the values are population based and expressed in 1000s of seeds per acre or hectare. The over population and under population values are independent of each other and do not have to be the same percentage value.

To change the percentage (%) box setting,

1. Use the **Up or Down Arrow** key to highlight the percentage (%) box.
2. Press the **Enter** key to toggle the setting from checked to unchecked.

To Change the Population Value Settings:

1. Use the **Up or Down Arrow** key to highlight the hi alarm or low alarm field.
2. Press the **Enter** key to highlight the field for editing.
3. Use the **Left or Right Arrow** key to select a digit for editing.
4. When a digit is highlighted, use the **Up or Down Arrow** keys to edit the value displayed.
5. Press **Enter** key to confirm the selection.
6. Press the **Escape** key to return to the Main Operate screen.

NOTE: Italicized text indicates functionality that is locked. Authorized users can unlock screens by highlighting the icon and pressing the Enter key to display the Password screen. Refer to the Advanced Setup section for additional information.

POPULATION ADJUSTMENT

A population adjustment provides a means to display populations nearer the actual versus the sensed seeding rates. This is useful when sensors do not detect doubles, triples, etc.

To change the over population value setting:

1. *Use the **Up or Down Arrow** key to highlight the field.*
2. *Press the **Enter** key to highlight the field for editing.*
3. *Use the **Left or Right Arrow** key to select a digit for editing.*
4. *When a digit is highlighted, use the **Up or Down Arrow** keys to edit the value displayed.*
5. *Press **Enter** key to confirm the selection.*
6. *Press the **Escape** key to return to the Main Operate screen.*

POPULATION RESPONSE RATE

The population response rate is used to provide population display stability for planters with few rows versus many or if extremely low ground speed constants occur. Use the Population Filter to stabilize population and alarm reporting.

To change population response rate:

1. *Move the slide to the right when planting high seed rates and to the left when planting low seed rates, refer to (Figure 15).*
2. *Press the **Escape** key to return to the Main Operate screen.*

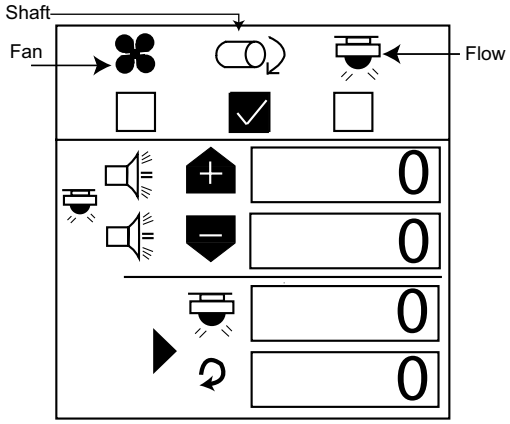
Accessory Setup icon

ACCESSORY SETUP (OPTIONAL)

To add an auxiliary sensor and its performance characteristics (calibration values, limits, etc.) to the monitoring inputs, it must be activated by entering a calibration constant. If minimum or maximum alarms are desired, the limits can be added to the calibrated sensors. A fan, shaft, or flow sensor can be monitored with HI and/or LOW alarms or no alarm values.

Figure 16

Accessory Screen



To Enter a Calibration Constant:

1. *At the Main Menu screen, highlight the **Accessory Setup** icon and press **Enter**.*
2. *Use the **Left and Right** key to select fan, shaft or flow symbol.*
3. *Use the **Down Arrow** key to change high and low alarm values.*
4. *Press **Enter** to highlight digit to change. If the calibration factor is unknown, the monitor can determine the calibration factor by using the built-in calibration mode.*

⚠WARNING

Ensure equipment is configured to operate safely. Shaft/fan calibration requires movement in associated equipment and revolution counting. Flow calibration requires liquid dispensing, catching, and measurement.

Start symbol

Stop symbol

To Perform a Sensor Calibration:

1. *Highlight the **Start** symbol. Ensure the system is in a safe state.*
2. *Start the monitor calibration by selecting the **Enter** key. The **Start** symbol (triangle) will change to a **Stop** symbol (square).*
3. *Activate the shaft, fan, or flow. Count the revolutions (shaft/fan) or catch liquid (flow) while the monitor measures pulses.*
4. *Deactivate the shaft, fan, or flow.*
5. *Stop the monitor calibration by selecting the **Enter** key again.*
6. *Highlight the revolutions or liquid level window.*
7. *Select the **Enter** key.*
8. *Enter the number of revolutions (shaft/fan) or liters (flow).*

Display & Service icon

Units

Backlight

Alarm Volume

UNITS OF MEASUREMENT, BACKLIGHTING, AND ALARM VOLUME CONTROL

The monitor can be customized to change the units of measurement to English or Metric, control backlight intensity, and increase or decrease alarm volume.

To Change Units, Backlight, and Alarm Volume:

1. *From the Main Menu screen, highlight the **Display & Service** icon and press **Enter**.*
2. *Press the **Down Arrow** key to highlight either the **Units**, **Backlight or Alarm Volume** icon.*
3. *Press **Enter** to highlight the setting to change and the **Up and Down Arrow key** to cycle through selection.*
4. *Press **Enter** to confirm the desired selection.*

AUXILIARY MODES

NOTE: Alarms are disabled in these modes.

The monitor provides modes for cultivating and row unit testing.

SPEED AREA MODE

NOTE: A lift switch may be used to more accurately monitor hectare accumulators and is required for acreage monitoring in non-planting operations.

If a manual ground speed is selected, the area and distance will not accumulate in this mode.

SPEED AREA mode is used for cultivating. This mode includes start/stop/reset for Field Area 1, Field Area 2, Total Area (hc3/ac3), and distance.

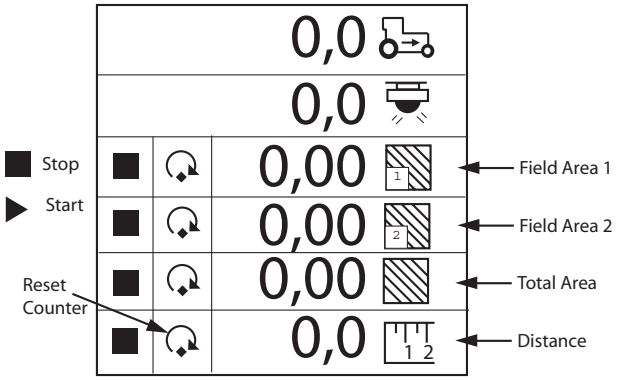
To Access Speed Area Mode:

1. From the Main Operate screen, press **Enter** to access the Main Menu screen.
2. Highlight the Speed Area Mode icon and press **Enter** to access the **Speed Area Mode** screen.

Speed Area Mode icon

Figure 17

Speed Area Mode Screen



SEED COUNT MODE

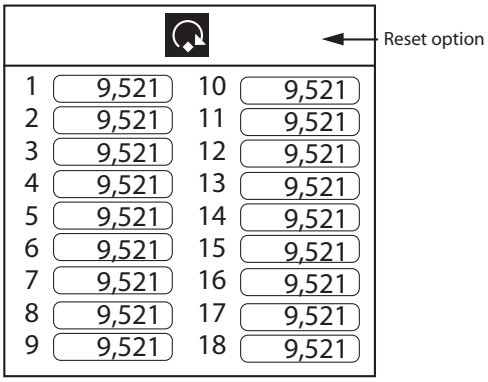
NOTE: Italicized text indicates functionality that is locked. Authorized users can unlock screens by highlighting the icon and pressing the Enter key to display the Password screen. Refer to the Advanced Setup section for additional information.

SEED COUNT mode is used to determine row unit performance when operating in a stationary manner. A reset for all rows is included.

Seed Count Mode icon

Figure 18

Seed Count Mode



OPERATE MODE

OPERATE SCREEN SETUP

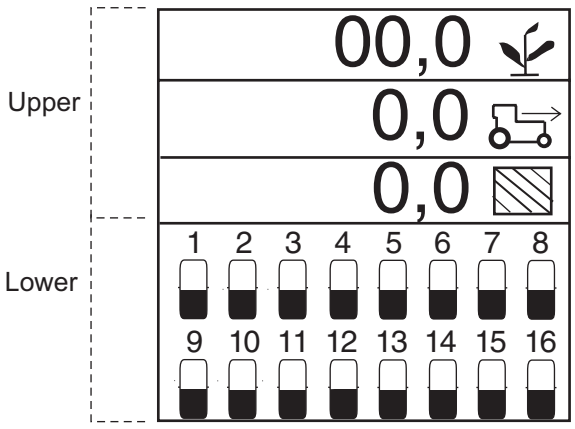
The Main Operate screen provides many tools to monitor planting. This screen can be immediately accessed from any other screen or sub-menu by pressing the **Escape** key.

The Operate screen is divided into the upper parameter window that displays three planting parameters in graphics mode. Pressing the **Down and Up Arrow** keys on the Main Operate screen will scroll through other available planting parameters.

The lower parameter window monitors individual row status. When more rows are configured ON than are viewable, the monitor automatically scrolls through the rows at 5 second intervals (bar graph with 32-row machine). The operator can use the **Right** and **Left Arrow** keys to manually select the desired rows. Automatic scrolling will restart 10 seconds after a manual selection.

Figure 19

Main Operate Screen



CUSTOMIZING THE UPPER PARAMETER WINDOW

The Main Operate screen can be customized by changing the number of parameter lines to display in the upper window, the icon selected as text or graphic, and the planting parameter reported for each line.

An example of five parameters selected:

1 = Average population

2 = Speed

3 = Field area

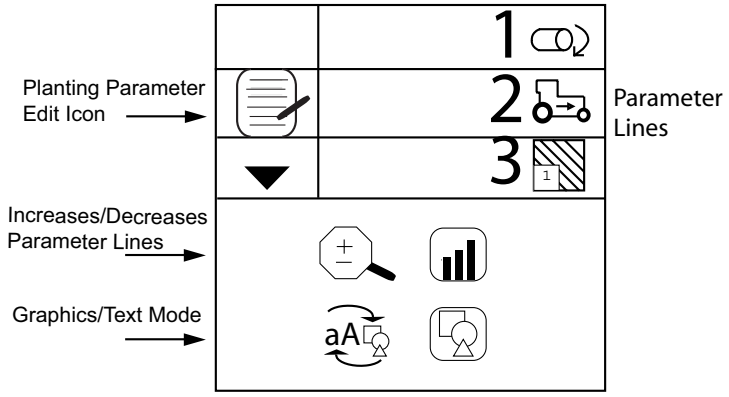
4 = Total area

5 = Shaft RPM

NOTE: Italicized text indicates functionality that is locked. Authorized users can unlock screens by highlighting the icon and pressing the Enter key to display the Password screen. Refer to the Advanced Setup section for additional information.

Figure 20

Upper Parameters Screen



Changing Number of Parameters

*The parameter lines display can be configured to show 2, 3, or 4 parameters at one time by changing the size of the parameters. The **Up and Down Arrow** keys are used at the Main Operate screen to scroll down to see all parameters being monitored.*

Display & Service icon

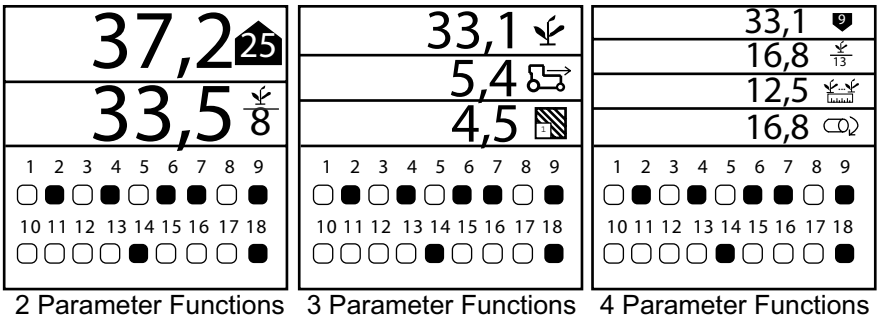
To Change the Number of Parameter Lines:

1. *From the Main Menu screen, highlight the **Display & Service** icon.*
2. *Highlight the **Upper Parameter** icon and press **Enter**.*
3. *Press the **Down Arrow** key to highlight the magnifying glass.*
4. *Press the **Enter** key to select the icon. Use the **Up or Down Arrow** key to toggle through the options for 2, 3 or 4 display lines.*
5. *Press **Enter** to confirm the selection.*

Upper Parameter icon

Figure 21

Parameter Line Options



2 Parameter Functions 3 Parameter Functions 4 Parameter Functions

CHANGING GRAPHIC OR TEXT ICONS

The planting parameters display can be configured for text or graphic icons in the upper window.

To Change the Graphic/Text Settings:

1. *At the Main Menu screen, highlight the Display & Service icon and press **Enter**.*

NOTE: Italicized text indicates functionality that is locked. Authorized users can unlock screens by highlighting the icon and pressing the Enter key to display the Password screen. Refer to the Advanced Setup section for additional information.

Display & Service icon

Upper Parameter icon

Edit icon

2. *At the Upper Parameter icon, press **Enter** to display the Upper Parameter Setup screen.*
3. *Use the **Down Arrow** key to highlight the Graphic/Text icon.*
4. *Press **Enter** key to select the icon. Use the **Up or Down Arrow** key to toggle to desired setting.*
5. *Press **Enter** to confirm selection.*

CHANGING PLANTING PARAMETERS

Several planting parameter choices are available for viewing on the Main Operate screen with a maximum of 4 viewable lines displayed. Available planting parameter choices are listed below.

To Select a Planting Parameter:

1. *At the Upper Parameter icon, press **Enter** to display the Upper Parameter Setup screen.*
2. *With the Edit icon highlighted, press the **Enter** key again.*
3. *Use the **Up or Down Arrow** keys to select a position to change.*
4. *Use the **Right or Left Arrow** keys to scroll the listing of planting parameters.*
5. *Press **Enter** to accept the selection.*

AVAILABLE PLANTING PARAMETERS

AVERAGE POPULATION

Average Population displays the average of the planter's rows that are configured for population in thousands of seeds per hectare (s/ha) or thousands of seeds per acre (s/ac). The population response rate and population adjustment can be modified on the target setup screen. This function can be labeled with a symbol or text, depending on the text/graphic setting.

MINIMUM/AVERAGE/MAXIMUM POPULATION

Minimum/Average/Maximum Population alternates the display of the minimum row, planter average, and maximum row every two seconds. When a minimum or maximum row is displayed, the corresponding symbol is shown with the row number.

POPULATION ROW SCAN

Population Row Scan displays the population of each of the planter's rows. The displayed row is incremented every two seconds. After the last row is displayed, the scan will resequence beginning with the first active row.

AVERAGE SPACING

Average Spacing displays the average seed spacing (cm or inches) of the planter's rows that are configured for population. This function can be labeled with a symbol or text, depending on the text/graphic setting.

MINIMUM/AVERAGE/MAXIMUM SPACING

Minimum/Average/Maximum Spacing alternates the display of the minimum row, planter average, and maximum row every two seconds. When a minimum or maximum row is displayed, the corresponding symbol is shown with the row number.

SPACING ROW SCAN

Spacing Row Scan displays the spacing of each of the planter's rows. The displayed row is incremented every two seconds. After the last row is displayed, the scan will resequence beginning with the first active row.

SEEDS PER DISTANCE

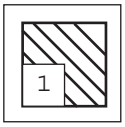
Average Seeds Per Distance displays the average seeds per meter (s/m) or seeds per foot (s/ft) of the planter's rows that are configured for population. This function may be labeled with a symbol or text, depending on the text/graphic setting.

MINIMUM/AVERAGE/MAXIMUM SEEDS PER DISTANCE

Minimum/Average/Maximum Seeds Per Distance alternates the display of the minimum row, planter average, and maximum row every two seconds. When a minimum or maximum row is being displayed, the corresponding symbol is shown with the row number.

SEEDS PER DISTANCE ROW SCAN

Seeds Per Distance Row Scan displays the seeds per distance of each of the planter's rows. The displayed row is incremented every two seconds. After the last row is displayed, the scan will resequence beginning with the first active row.



FIELD AREA 1

Field Area 1 (ac1/ha1) displays the area of Field 1 in hectares (ha) acres (ac) depending on the Metric/English setting. This function can be labeled with a symbol or text, depending on the text/graphic setting.

FIELD AREA 2

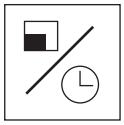
Field Area 2 (ha2/ac2) displays the area of Field 2 in hectares (ha) or acres (ac) depending on the Metric/English setting. This function can be labeled with a symbol or text, depending on the text/graphic setting.

TOTAL AREA

Total Area (ha3/ac3) displays the total field area in hectares (ha) or acres (ac) depending on the Metric/English setting. This function can be labeled with a symbol or text, depending on the text/graphic setting.

SPEED

Speed displays vehicle speed in miles per hour (MPH) or kilometers per hour (km/h) depending on the Metric/English setting. This function can be labeled with a symbol or text, depending on the text/graphic setting.



AREA PER HOUR

Area Per Hour displays the current rate of area per hour in hectares per hour (ha/hr) or acres per hour (ac/hr) depending on the Metric/English setting.

FAN

Fan displays the fan's speed in revolutions per minute (RPM).

SHAFT

Shaft function displays the shaft's speed in revolutions per minute (RPM).

FLOW

Flow displays the flow rate speed in liters per hectare (l/ha) or gallons per acre (g/ac) depending on the Metric/English setting.

Display & Service icon

Lower Parameter Setup icon

CUSTOMIZING THE LOWER PARAMETER WINDOW

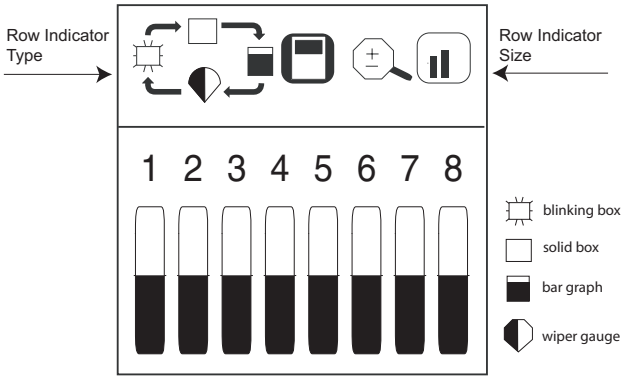
The lower setup screen parameters can be modified to change the row indicator type and size. Row indicator types include blinking box (blink rate proportional to seeding rate), solid box (indicating row failure), bar graph, or wiper gauge.

To Change the Row Indicator Type and Row Indicator Size:

1. *At the Display & Service screen, highlight the **Lower Parameter** icon.*
2. *Press **Enter** to display the Lower Parameter Setup screen.*
3. *Highlight the Row Indicator Type or Row Indicator Size icon to change.*
4. *Press the **Up or Down Arrow** key to cycle through desired setting.*
5. *Press **Enter** to accept selection.*

Figure 22

Lower Parameters Screen



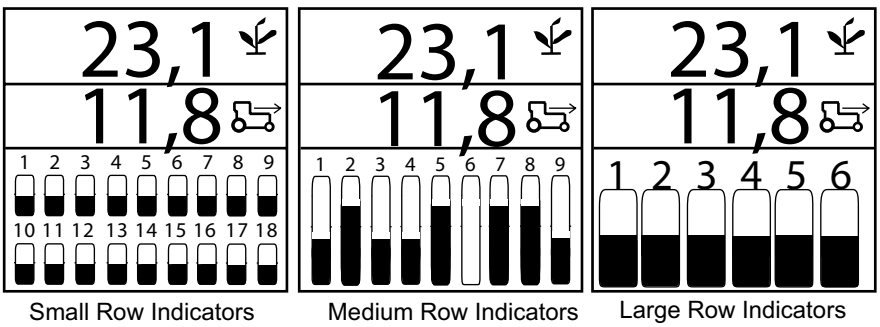
NOTE: Italicized text indicates functionality that is locked. Authorized users can unlock screens by highlighting the icon and pressing the Enter key to display the Password screen. Refer to the Advanced Setup section for additional information.

Row indicator size determines the number of rows displayed on the bottom half of the screen and can be displayed in a small, medium, or large size as shown in (Figure 23). Default setting is non-blinking box, medium size.

*When more rows are configured ON than are viewable, the monitor automatically scrolls through the rows at 5 second intervals (bar graph with 32-row machine). The operator can use the **Right** and **Left Arrow** keys to manually select the desired rows. Automatic scrolling will restart 10 seconds after a manual selection.*

Figure 23

Row Indicator Size



ALARMS

NOTE: An audible 2-chirp alarm is also output during navigation or data entry to indicate an illegal or nonfunctional key selection.

Primary operating alarms are displayed on the entire screen and are accompanied by an audible alarm.

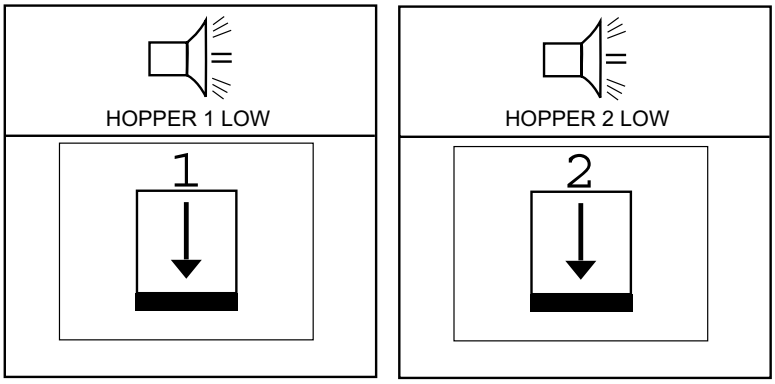
All monitor alarms are set to a default of Zero (0) and will not activate unless programmed per the Advanced Setup section.

HOPPER LEVEL

Hopper level alarms activate when the seed level drops below the sensor mounting level. Alarm can be silenced by pressing the **Alarm Cancel** key.

Figure 24

Hopper 1 And 2 Alarms



ROW FAILURE

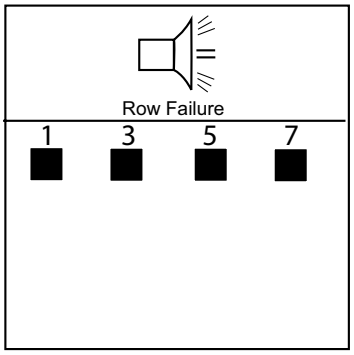
A row failure alarm occurs when the console detects less than 2 seeds per second through the seed tube. This may result from a poor or faulty connection to the seed sensor harness. This is a solid on alarm indicating a problem has been detected and is silenced by pressing the **Alarm Cancel** key as shown in (Figure 25).

Once the **Alarm Cance**l key is pressed, the alarm will not sound again unless:

1. Planting condition returns to a normal state and falls again below 2 seeds per second.
2. Power on/off sequence occurs before problem is corrected.
3. An All Rows Failure alarm occurs then the console again detects less than 2 seeds per second through the seed tube.

Figure 25

Row Failure Display



ALL ROWS FAILURE

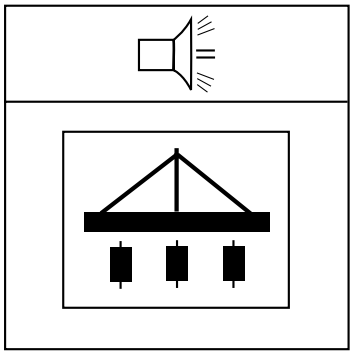
An All Row Failure alarm is a unique alarm identifier (8 chirps) that differentiates from all other alarms and triggers when no seed flow is detected from any row unit when ground speed is detected.

Typical scenarios to activate an All Row Failure alarm:

1. Tractor is stopped while planter is in the ground.
2. Tractor is operating with planter lifted.
3. Normal "end of run" turn around.

Figure 26

All Rows Failure Display

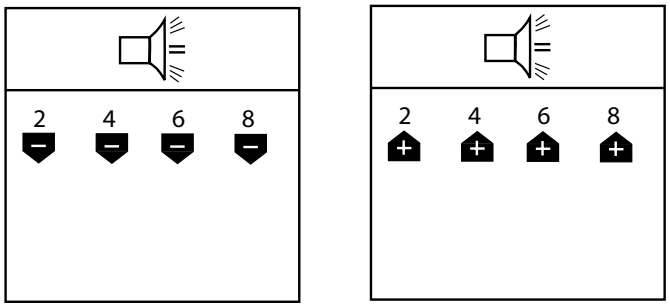


HI/LOW POPULATION WARNING

The Hi and Low population alarm triggers when seed flow drops below the population alarm limit set on the Limits Setup screen. The alarm display will beep and flash on the screen briefly indicating row units are over or under the desired population. The Main Operate screen will display the row unit over or under population symbol until corrected, All Rows Failure occurs, or sensor mechanical problems are fixed.

Figure 27

Population Limit Warning Display

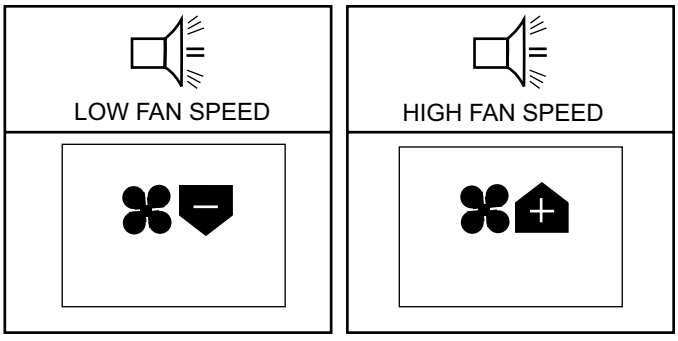


FAN SPEED LO/HI LIMIT WARNING

Fan speed alarms are triggered with a solid-on alarm when any fan speed exceeds or falls below the value entered for Fan Speed Lo/Hi Limits in the Setup mode. Alarm can be silenced by pressing **Alarm Cancel** key, but will re-activate if problem is not resolved.

Figure 28

Fan Speed Limit Warning Display (Optional)

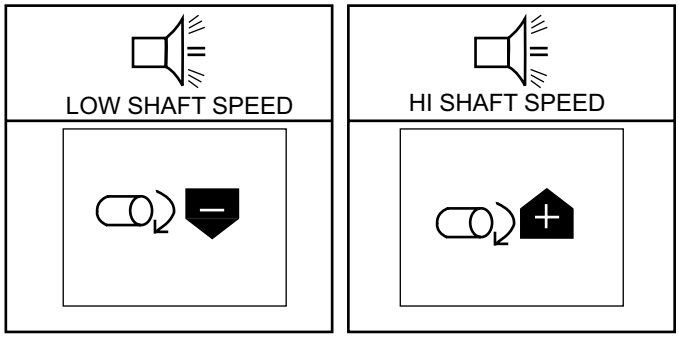


SHAFT SPEED LOW/HI LIMIT WARNING

Alarm sounds when any shaft speed exceeds or falls below the value entered for Shaft Speed Lo or Hi Limits in the Setup mode. Alarm can be silenced by pressing **Alarm Cancel** key, but will re-activate if problem is not resolved.

Figure 29

Shaft Speed Limit Warning Display (Optional)

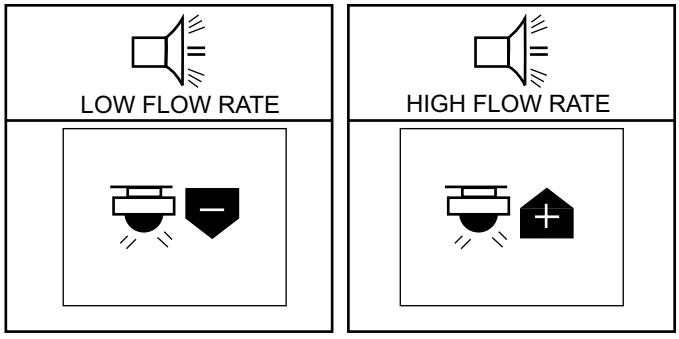


FLOW LOW/HI LIMIT WARNING

An alarm will sound when flow inputs exceed or fall below the value entered for the Flow Lo or Hi Limits in the Setup mode. Alarm can be silenced by pressing **Alarm Cancel** key, but will re-activate if problem is not resolved.

Figure 30

Flow Low/ Hi Limit Warning Display (Optional)

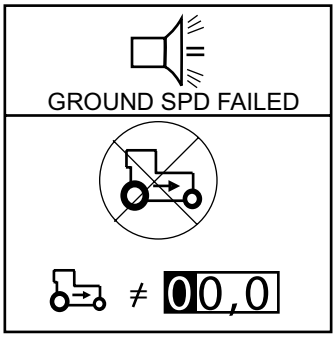


FAILED GROUND SPEED SENSOR (PLANTING DETECTED WITHOUT GROUND SPEED)

The failed ground speed sensor alarm triggers when planting is detected with no ground speed being reported. This can result from a poor or faulty connection to the speed sensor or from a defective sensor. This is a 4-chirp alarm which is acknowledged by pressing the **Alarm Cancel** key, but will re-activate until the problem is corrected.

Figure 31

Ground Speed Sensor Failure Display

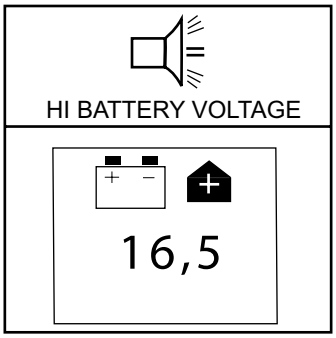


BATTERY HI/LOW

The battery hi/low alarm triggers when battery voltage is out of range - over voltage and under voltage. The correct power operating range is 10.5-16 VDC. Alarm indicates an electrical problem exists that must be corrected. The alarm cannot be shut off and will continue to sound until corrective action is taken.

Figure 32

Battery Failure Display



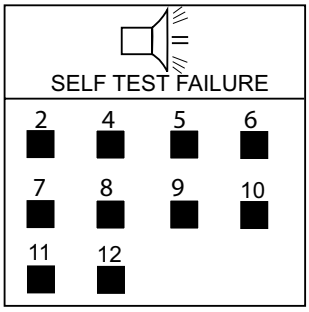
Seeds Per Distance Row Scan

SELF-TEST FAILURE

The Self Test Failure alarm activates at every power cycle comparing configured number of rows to number of rows detected. Any sensor not found during self-test or inaccurate configuration will sound alarm and display on the Main Operate screen. The alarm can be acknowledged by pressing the **Alarm Cancel** key, but will re-activate until problem is resolved.

Figure 33

Self Test Failure

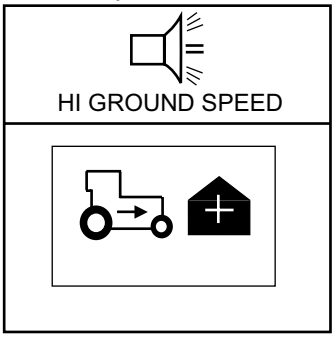


HI GROUND SPEED EXCEEDED (OPTIONAL)

The Hi Ground Speed Exceeded alarm is triggered anytime the speed has exceeded the kmh/mph input in the Ground Speed Setup screen. Alarm can be silenced by pressing the **Alarm Cancel** key.

Figure 34

Maximum Speed Exceeded Warning Display (optional)



TROUBLESHOOTING

Alarm	Probable Cause	Corrective Action
Monitor will not power on.	1. Blow console fuse. 2. Poor battery connection 3. Low battery voltage 4. Defective console	1. Check fuse (located near battery connection). If needed, replace replace with 5.0 amp fuse maximum. If fuse blow again, check all harnesses for pinches or breaks that can cause power short to ground. 2. Be sure connections are clean and tight.
Row failure or hi/ low alarm when row is planting properly.	1. Seed sensor coated with dirt. 2. Faulty sensor or harness. 3. Defective console.	1. Clean sensor using a dry bottle brush. 2. Drop seed down the seed tube or place a dry bottle brush down the seed tube to trigger sensor. Observe if troubleshooting sensor LED mounted to the tube blinks. If sensor does not blink, replace the sensor. If the sensor LED blinks, check harness for damage or pinched wires. If the sensor does not have an LED, swap harness connection with adjacent sensor to determine if sensor is damaged. 3. Console is damaged. Contact dealer or DICKEY-john Europe (+33-141-192-180).
Hopper alarm does not sound when hopper is empty.	1. Hopper sensor coated with dirt. 2. Faulty sensor or harness shorted to ground. 3. Defective console.	1. Clean sensor using a dry bottle brush. 2. Swap harness connection with another sensor to determine if sensor or harness is damaged. Use service screen if another sensor is not available. Replace sensor or repair harness. 3. Console is damaged. Contact dealer or DICKEY-john Europe (+33-141-192-180).
Hopper alarm sounds when hopper is full.	1. Faulty sensor or harness open. 2. Defective console.	1. Swap harness connection with another sensor to determine if sensor or harness is damaged. Use service screen if another sensor is not available. Replace sensor or repair harness.
System voltage alarm.	1. Low battery voltage. 2. Poor battery connection. 3. Damaged harness.	1. Console voltage must be at least 10V. If low, recharge or replace battery. 2. Be sure connections are clean and tight. Inspect harness for damage. 3. Check all harnesses for pinches or breaks that can cause power or 8V sensor power short to ground.

Alarm	Probable Cause	Corrective Action
Monitor will not power on.	1. Blow console fuse. 2. Poor battery connection 3. Low battery voltage 4. Defective console	1. Check fuse (located near battery connection). If needed, replace replace with 5.0 amp fuse maximum. If fuse blow again, check all harnesses for pinches or breaks that can cause power short to ground. 2. Be sure connections are clean and tight.
Accessory alarm sounds when shaft, fan, or flow is working	1. Sensor failure 2. Wrong calibration number 3. Incorrect limits 4. Defective console	1. Shaft, fan, or flow sensor not operating. Replace defective sensors. 2. Sensor calibration number is incorrect. Check calibration number at Accessory Setup screen. 3. Sensor limits are incorrect. Check limits at Accessory Setup screen. 4. Console is damaged.Contact dealer or DICKEY-john Europe (+33-141-192-180).
Ground Speed Alarm Sounds with Forward Movement	1. Ground speed sensor failure 2. Console failure	1. No ground speed sensor is detected, or planting is detected on at least one row with no ground speed. Replace faulty ground speed sensor. 2. Console is damaged. Contact dealer or DICKEY-john Europe (+33-141-192-180).
Ground speed high alarm sounds	1. Ground speed alarm set too low. 2. Incorrect ground speed constant.	1. Set ground speed alarm limit higher or to zero to disable. 2. Ground speed sensor has not been calibrated, radar sensor angle has changed, or incorrect sensor constant is entered. Use Speed, Area, Distance mode to determine if speed is correct. If incorrect, recalibrate speed constant.
Self-Test alarm	1. Faulty sensor or harness. 2. Console failure	1. Trigger sensor and observe troubleshooting LED. If sensor odes not have LED, swap harness connection with adjacent sensor to determine if sensor or harness is damaged. Replace sensor or harness. 2. Console is damaged. Contact dealer or DICKEY-john Europe (+33-141-192-180).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CONNECTOR PINOUTS

Battery	
Pin Label	**Description**
Red Wire	Battery +12V
Black Wire	Battery Ground

PM300E Implement	
Pin #	**Description**
1	Row 1 (green)
2	Row 2 (brown)
3	Row 3 (blue)
4	Row 4 (orange)
5	Row 5 (yellow)
6	Row 6 (violet)
7	Row 7 (gray)
8	Row 8 (pink)
9	Row 9 (tan)
10	Row 10 (white/black)
11	Row 11 (red/black)
12	Row 12 (green/black)
13	Row 13 (orange/black)
14	Row 14 (blue/black)
15	Row 15 (black/white)
16	Row 16 (red/white)
17-23	No connection
24	8 V sensor power (red)
25	8 V sensor power (red/black/white)
26	Sensor return (black)
27	Sensor return (white/black/red)
28	No connection
29	Hopper 1 (green/white)
30	Hopper 2 (blue/white)
31	Shaft/Fan/Flow (black/red)
32	8 V power (red)
33	12 V switched power (white/red)
34	12 V return (black)
35	RS-232 Rx (blue/red)
36	RS-232 Tx (red/green)
37	Lift switch (orange/red)

Ground Speed	
Pin #	**Description**
1	Ground (black)
2	Signal (green)
3	Power (red)
4	Sense (white)

PM332E Implement	
Pin #	**Description**
1	Row 1 green)
2	Row 2 (brown)
3	Row 3 (blue)
4	Row 4 (orange)
5	Row 5 (yellow)
6	Row 6 (violet)
7	Row 7 (gray)
8	Row 8 (pink)
9	Row 9 (tan)
10	Row 10 (white/black)
11	Row 11 (red/black)
12	Row 12 (green/black)
13	Row 13 (orange/black)
14	Row 14 (blue/black)
15	Row 15 (black/white)
16	Row 16 (red/white)
17	Row 17 (green/white)
18	Row 18 (blue/white)
19	Row 19 (black/red)
20	Row 20 (white/red)
21	Row 21 (orange/red)
22	Row 22 (blue/red)
23	Row 23 (red/green)
24	+8 V Snsr Pwr Left (red)
25	+8 V Snsr Pwr Right (red/blk/white)
26	Ground Left (black)
27	Ground Right (white/black/red)
28	Row 24 (orange)
29	Row 25 (black/white/red)
30	Row 26 (green/black/white)
31	Row 27 (orange/black/white)
32	Row 28 (blue/black/white)
33	Row 29 (black/red/green)
34	Row 30 (white/red/green)
35	Row 31 (red/black/green)
36	Row 32 (green/black/orange)
37	Lift Switch (white)

PM332E 9-pin Cable Assembly	
Pin #	**Description**
1	Lift Switch
2	Hopper #1
3	Hopper #2
4	Shaft
5	+8V
6	+12V Switched
7	Sensor Return
8	RS232 Rx
9	RS232 Tx

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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