TABLE OF CONTENTS

Safety Notices **1**

Introduction **3**
System Overview 3
Specifications 5

Major Features **7**
Performance 7
Console/Display 7
Compatibility 7
User Aid 7

Quick Start Guide **9**
Planter Configuration 9
Ground Speed Configuration 10
Help Card 10

Keys **13**
On/Off Key 13
Alarm Cancel Key 13
Enter Key 14
Escape Key 14
Up And Down Arrow Keys 14
Left And Right Arrow Keys 14
Operate Key 14
Planter Setup Key 14
Ground Speed Setup Key 15
Limits Setup Key 15
Display And Service Key 15
Accessory Setup Key 15
Seed Count Mode Key 15
Speed Area Mode Key 15

Installation **17**
Standard Mounting Bracket 17
Optional Mounting 3D Adjustable Bracket 18
Installing Console Harnesses 19
Installing Implement Harness And Sensors 20

Setup **21**
Planter And Ground Speed (Requires Data Entry) 21
Accessory Setup (Optional) 22
Limits Setup (Optional) 24
Display And Service Setup (Optional) 24
Auxiliary Modes 29

Monitoring **31**
Operate (Main) Screen 31
Parameter Outputs And Scrolling (Upper Half) 31
Row Indicators (Lower Half) 32
Monitoring Functions 32

Alarms **37**
Hopper Level Alarms 37
Row Blockage (Two Seeds Per Second Threshold) — Solid ON Alarm 37
All Rows Failure — Eight Chirps 38
Hi/Low Limit Exceeded (Optional Limits For Population) — Alarm Chirp 38
Hi/Low Limit Exceeded (Optional Limits For Accessories) — Solid ON Alarm 39
Failed Ground Speed Sensor (Planting Detected Without Ground Speed) 40
Self-Test Failure (Battery Voltage Out Of Limits) 40
Maximum Speed Exceeded (Optional) 41

Troubleshooting **43**
Monitor Will Not Power On 43
Connector Pin-Outs 46

Connector Pin-Outs **47**

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.

INTRODUCTION

SYSTEM OVERVIEW

The DICKEY-john PM Series Planter Monitors (PM300, PM332, and PM400) offer features to monitor 16, 32, and 36 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 PM300, PM332, and PM400 are designed to meet the custom needs of users. The display may be configured to output a comprehensive set of planter parameters. The user selects the type and number of parameters to be monitored. Choices may be as simple as monitoring population and field area or may be more complex (refer to Figure 2 for examples). Similarly, blink or fail mode information may be viewed as a bar graph, gauge, or symbol. Information may be viewed in large format (for ease of viewing), or small format (for entire planter view). Auto-scrolling and arrow key override are used to maintain control of real-time information required by the user.

Figure 1

PM Console

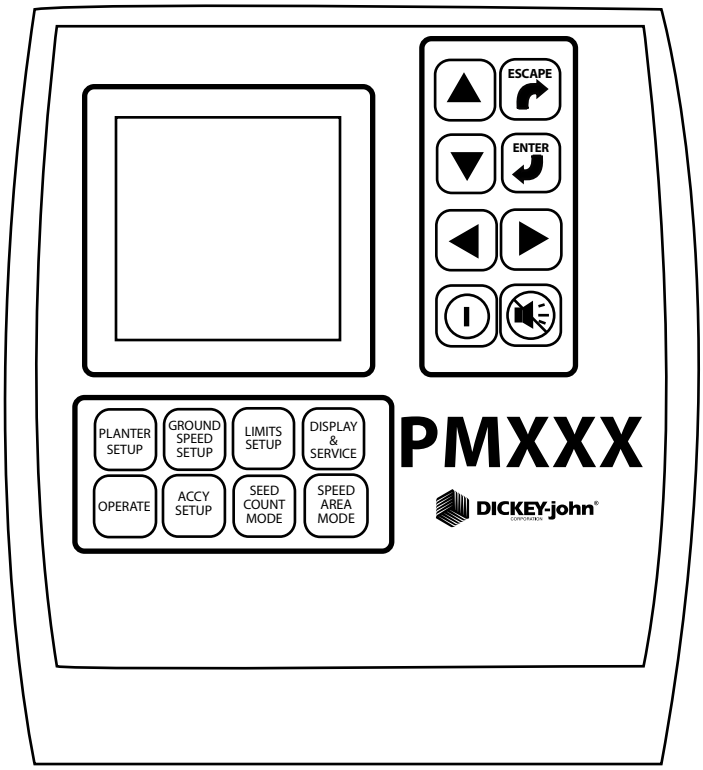
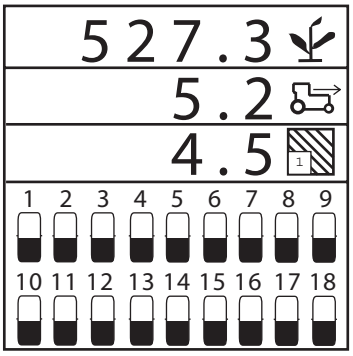
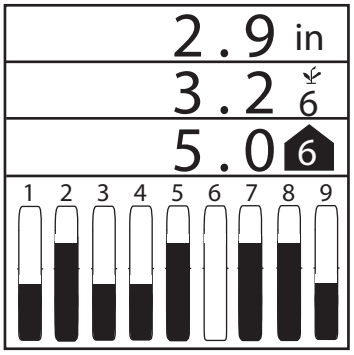


Figure 2

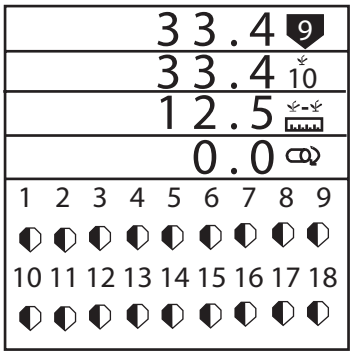
User-Definable Display Examples



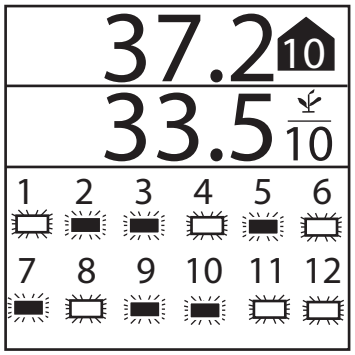
Graphic mode: average population, speed, and field 1 output with row symbols



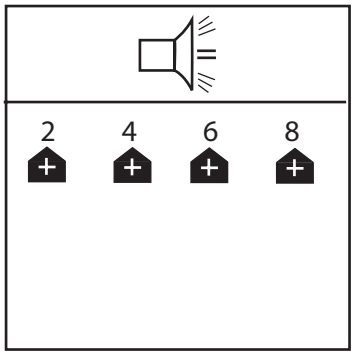
Text mode: average spacing, spacing scan and min/max/avg spacing output with bar graphs



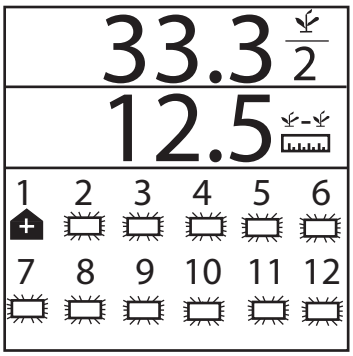
Min/max/avg population, population row scan, avg speed spacing, and shaft speed with gauges



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)

SPECIFICATIONS

Power	10–16 VDC, 0.5 A maximum (8.0 A maximum with 16 seed sensors)
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 18.4 cm H x 18.0 cm D (7.3" W x 7.3" H x 1.7" D)
Weight	4.4 lbs for 16-row PM300 system 4.8 lbs for 32-row PM332 system 6.4 lbs for 36-row PM400 system *Weight includes console and attached cables (battery power cable and signal cable that extends to the drawbar).
Wire Harnesses	The PM300, PM332, and PM400 include integrated harnesses to supply the unit's power (fused), ground speed input, and sensor inputs (to hitch). The connectors are compatible with existing DICKEY-john harnesses. DICKEY-john can supply the 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.
Optional mounting	Three-axis adjustable mounting bracket
Contrast adjustment	Automatic temperature compensation for contrast
Backlight adjustment	Three settings for full sun, daytime, or nighttime use
CE certified	
Dust and moisture resistant	

MAJOR FEATURES

PERFORMANCE

- Planter monitoring of 16 rows (PM300), 32 rows (PM332), or 36 rows (PM400)
- Monitoring of ground speed, two hopper levels, one frequency function (fan, shaft, or flow)
- Easy and flexible configuration
- User-definable view of two, three, or four functions (may select several more that require the use of an **Arrow** key to view):
  - 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
  - Total Area 3
  - 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
- User-definable text size for ease of viewing
- Graphic or text-based output labels
- Backlit graphic display for nighttime use
- Three-level backlight intensity adjustment
- Large, concise error messages displayed with audible alarm
- English or metric units
- Horizontal and vertical mounting (optional 3D adjustment bracket)

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

QUICK START GUIDE

Three inputs are required for monitor operation.

- Number of rows
- Row spacing
- Ground speed constant

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

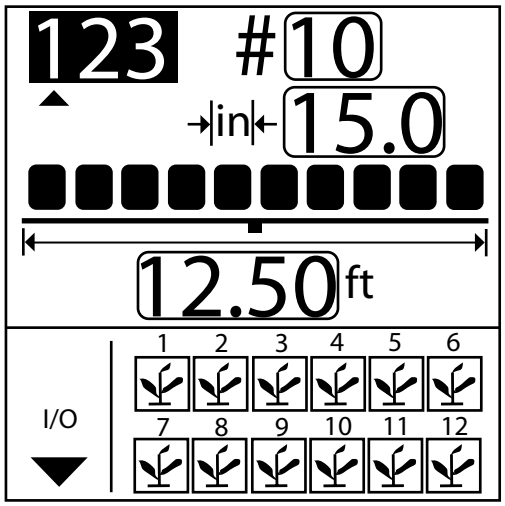
PLANTER CONFIGURATION

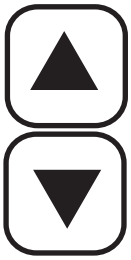
Planter Setup key

To program the planter configuration, select the **Planter Setup** key. The **Planter Configuration** screen will be displayed.

Figure 3

Planter Setup Screen





Up and Down Arrow keys

Left and Right Arrow keys

Enter key

Escape key

Operate key

The PM300, PM332, and PM400 can store three planter configurations for users with split row planters or multiple planters and seeders. Many users program only a single configuration.

Select a planter configuration number (1, 2, or 3) by moving the selection arrow indicator (▲). Use the **Arrow** keys to highlight the number of rows. Select the **Enter** key to modify the number of rows. Use the **Arrow** keys to select digits, increment, and decrement values. Select the **Enter** key to accept the new number. Enter the row spacing in the same manner. Once the new values are entered, select either the **Escape** or **Operate** key to return to the **Operate** (main) screen.

Ground Speed Setup key

Up and Down Arrow keys

Enter key

Escape key

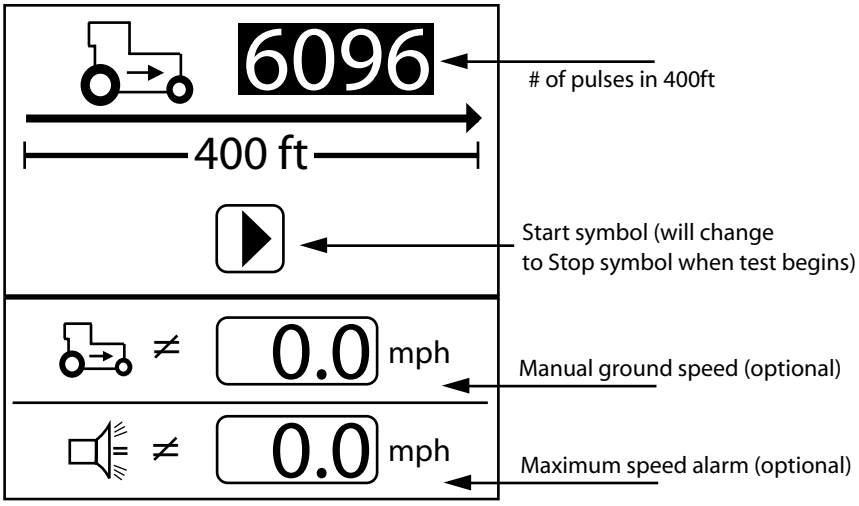
Operate key

GROUND SPEED CONFIGURATION

To select the **Ground Speed Setup** screen, press the **Ground Speed Setup** key. The **Ground Speed Setup** screen will be displayed.

Figure 4

Ground Speed Setup Screen



PERFORMING NEW CALIBRATION

Measure a 400 foot (122 meter) course, clearly marking the beginning and end. Begin forward movement with the tractor (2 - 5 mph). When the tractor is even with the beginning marker, highlight the **Start** softkey on the screen (▶) using the **Arrow** keys. Select **Enter** to start the 400-foot calibration. After the calibration has begun, the softkey on the screen will change to a **Stop** (■) softkey. Drive the 400 foot course. When the tractor is even with the end marker, press the **Enter** key to stop the calibration. The new calibration factor will be displayed on the window. Record this number. Selecting the **Escape** key while the calibration is running will not save the value. Select either the **Escape** or **Operate** key to return to the **Operate** (main) screen. It is recommended that you perform this calibration at least three times and average the numbers. This will ensure greater accuracy.

MANUAL GROUND SPEED CONSTANT ENTRY

Use the **Arrow** keys to highlight the manual ground speed value. Select the **Enter** key to modify the constant. Use the **Arrow** keys to select digits, increment, and decrement values. Select the **Enter** key to accept the new number. Once the new values have been entered, select either the **Escape** or **Operate** key to return to the **Operate** (main) screen. Set manual ground speed to zero to disable.

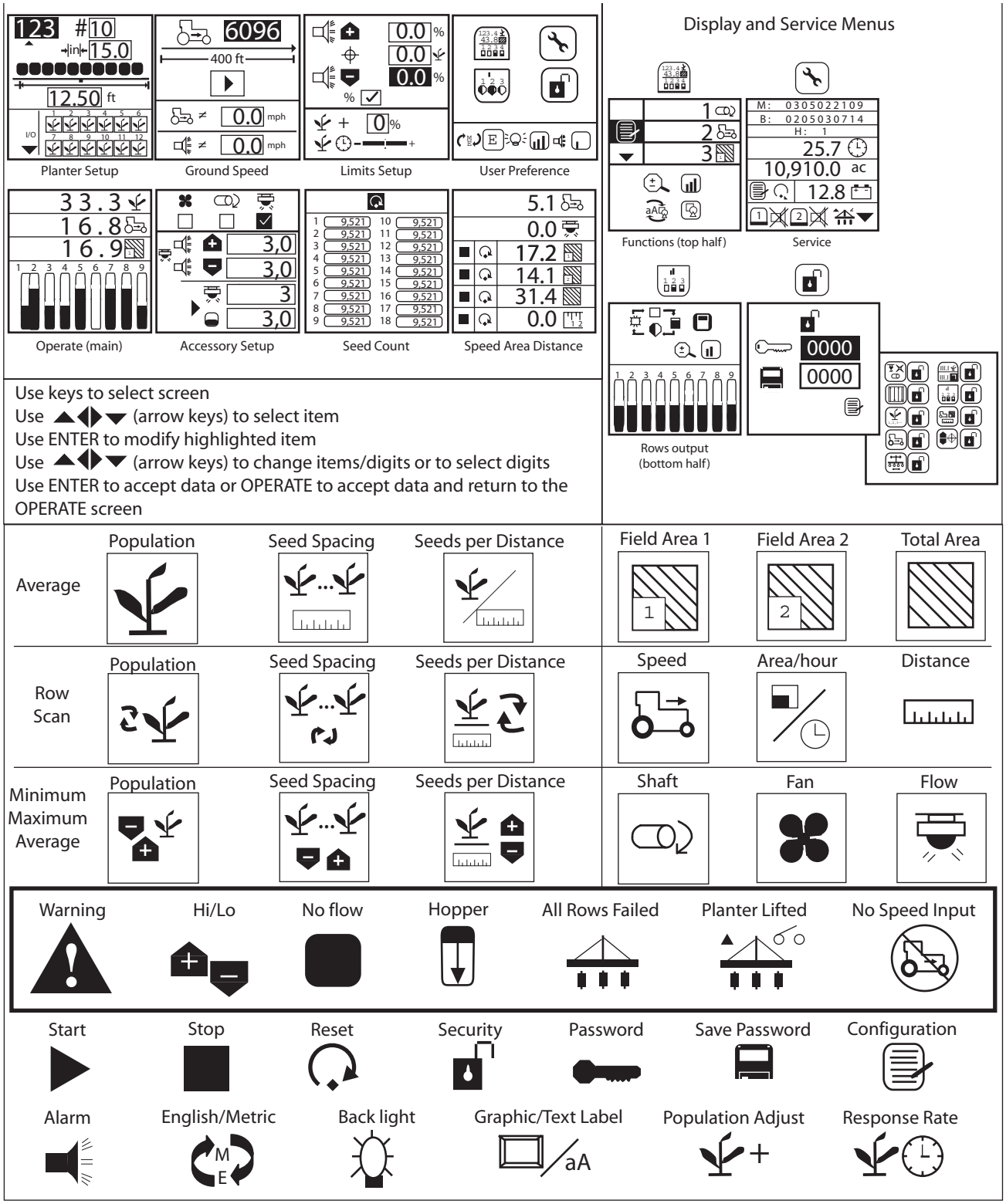
*NOTE: To verify that the correct calibration number has been obtained, move to the **Speed, Area, Distance** screen. Verify that the speed matches the vehicle's speedometer or remeasure the 400-foot distance.*

HELP CARD

The help card (Figure 5) may be cut out to provide a compact reference for definitions, set-up screens, and general operating information.

Figure 5

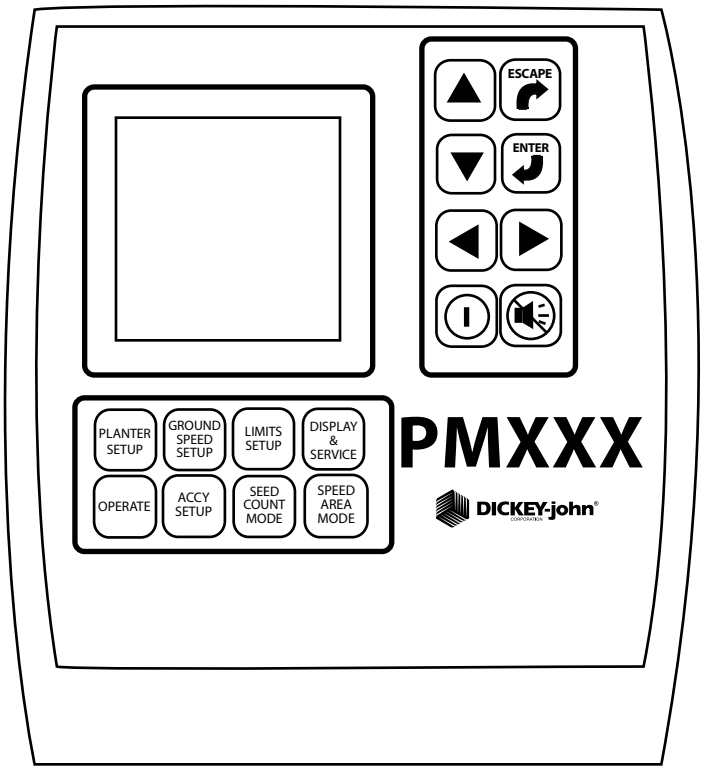
Help Card



KEYS

Figure 6

Keys



ON/OFF KEY

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

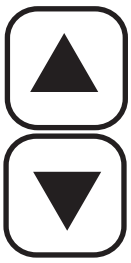
Alarm Cancel key

During normal operation, pressing 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 pressed again to cancel the alarm.

When there are no alarms active, alarm volume may be modified by selecting and holding the **Alarm Cancel** key.

Enter key

Escape key



Up and Down Arrow keys

Left and Right Arrow keys

Operate key

Planter Setup key

ENTER KEY

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

ESCAPE KEY

On the **Operate** (main) 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 **Operate** (main) 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 **Operate** (main) 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 **Operate** (main) 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.

OPERATE KEY

The **Operate** (home) key is used to return the user to the **Operate** (main) screen.

If data is changed, it is saved when this key is selected.

PLANTER SETUP KEY

The **Planter Setup** key is used to navigate to the **Planter Setup** screen for input of the number of rows, row spacing, implement width (optional), and row type (population — default, blockage, skipped, or disabled).

If data is changed, it is saved when this key is selected.

Ground Speed Setup Key

GROUND SPEED SETUP KEY

The **Ground Speed Setup** key is used to navigate to the **Ground Speed Setup** screen for input of the ground speed calibration (or manual entry of ground speed calibration number), manual ground speed (used if no ground speed is available), and ground speed maximum limit (optional).

If data is changed, it is saved when this key is selected.

Limits Setup Key

LIMITS SETUP KEY

The **Limits Setup** key is used to navigate to the **Limits Setup** screen for input of the upper limit (optional), target population value (optional), lower limit (optional), population adjustment factor (optional for sensors that count less than 100% of all seeds), and response rate (optional to increase or decrease the console's response rate).

If data is changed, it is saved when this key is selected.

Display And Service Key

DISPLAY AND SERVICE KEY

The **Display And Service** key is used to navigate the user to the **Display & Service Setup** screen for access to the function, row indicators, service, and security sub-menus; English/Metric units selection; display backlight intensity; and alarm volume.

If data is changed, it is saved when this key is selected.

Accessory Setup Key

ACCESSORY SETUP KEY

The **Accessory Setup** key is used to navigate to the **Accessory Setup** screen for selection of a fan (RPM) / shaft (RPM) / or flow (G/MIN or L/min) labels, upper and lower alarm limits, and calibration (or manual calibration number entry).

If data is changed, it is saved when this key is selected.

Seed Count Mode Key

SEED COUNT MODE KEY

The **Seed Count Mode** key is used to navigate to the **Seed Count** screen. This mode allows users to test planters for proper operation prior to field use.

If data is changed, it is saved when this key is selected.

Speed Area Mode Key

SPEED AREA MODE KEY

The **Speed Area Mode** key is used to navigate to the **Speed Area Distance** screen. This mode allows use of the console for non-planting operations. This mode is also used to start, stop, or clear the three independent area accumulators (FIELD AREA 1, FIELD AREA 2, and TOTAL AREA).

If data is changed, it is saved when this key is selected.

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.

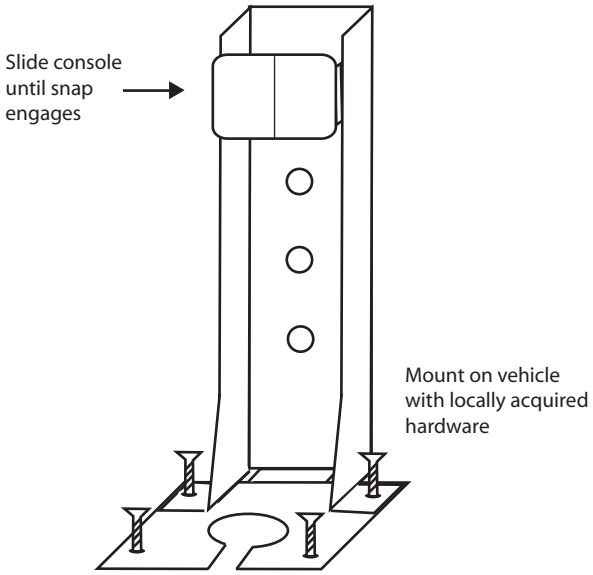
STANDARD MOUNTING BRACKET

NOTE: When mounted to a vertical surface, a tie-wrap may 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 7

Standard Mounting Bracket



WARNING

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

CAUTION

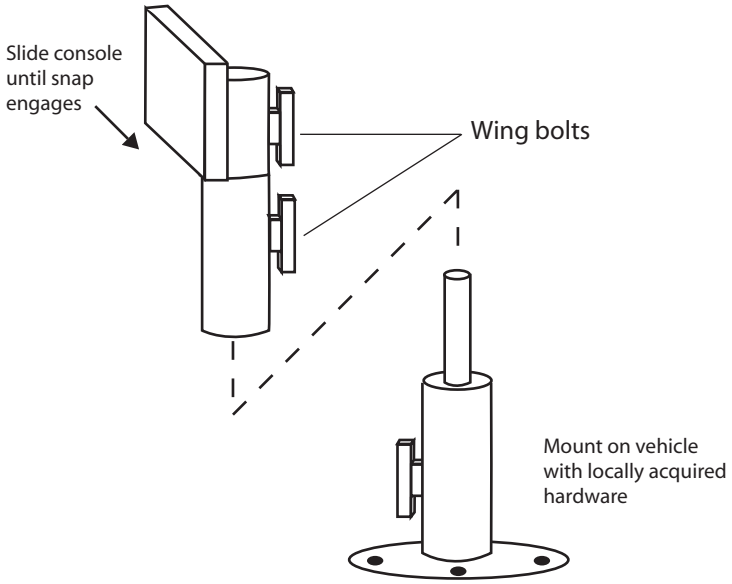
To prevent damage to the console, be sure the snap fully engages during installation.

OPTIONAL MOUNTING 3D ADJUSTABLE BRACKET

Separate the bracket halves from one another by loosening the wing bolt. Install the upper bracket half into the console by sliding the bracket's rectangular section into the console mating grooves until the snap engages. Install the bottom bracket half at the location of your choice using locally acquired hardware.

Figure 8

Optional 3D Mounting Bracket



WARNING

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

CAUTION

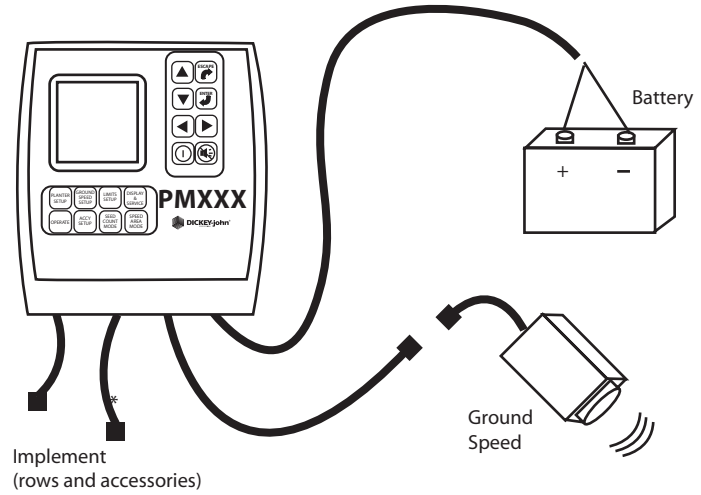
To prevent damage to the console, be sure the snap fully engages during installation.

INSTALLING CONSOLE HARNESSES

Several harnesses are located at the bottom of the PM300, PM332, and PM400. These include power, ground speed sensor, and sensor inputs (rows, lift switch, two hopper levels, and one frequency function [shaft/fan/flow]).

Figure 9

Console Harnesses



*PM300 does not have a second accessory cable
PM332 has a 9-pin cable
PM400 has a 37-pin cable

1. Route the power harness directly to the battery (+12V).
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 hitch.

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

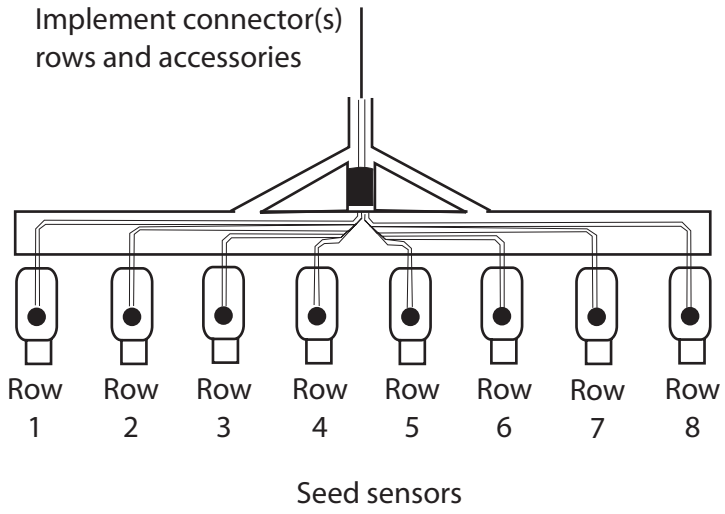
Poor +12 V connections may cause intermittent console operation. Be sure to connect the power harness to a clean, well-conditioned source. Direct battery connection is optimum.

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 10

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.

SETUP

The monitor is designed for ease of basic monitoring by new users while supporting expanded features for advanced users. The user may decide which features to configure.

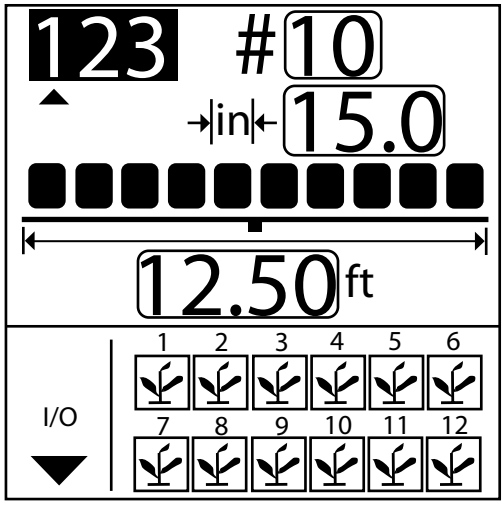
PLANTER AND GROUND SPEED (REQUIRES DATA ENTRY)

Planter Setup key

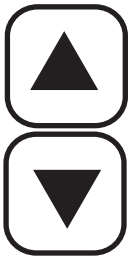
The two setup screens that require input for the system to function as a monitor are the **Planter Setup** screen (Figure 11) and the **Ground Speed Setup** screen (Figure 12).

Figure 11

Planter Setup Screen



Enter key


Up and Down Arrow keys

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 by highlighting the I/O option and pressing the **Enter** key. The **Up** and **Down Arrows** navigate through option selections.

- 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.

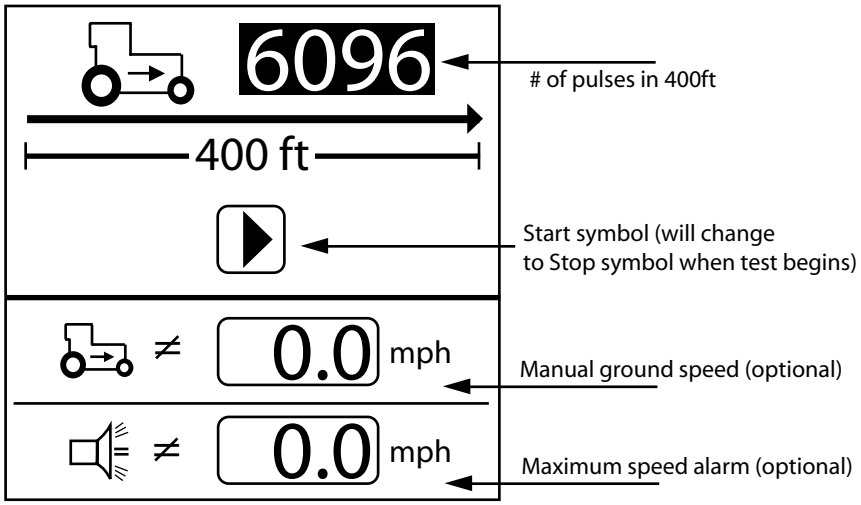
Enter key

Left and Right Arrow keys

The **Planter Setup** screen must include the number of rows and the row spacing or implement width for the console to properly display population. The user may program up to three individual configurations. This supports users with split row planters (CONFIGURATION 1 for NORMAL and 2 for SPLIT ROW) and a separate seeder or drill (CONFIGURATION 3). These configurations may be selected by highlighting the 123 123 at the upper left corner of the screen, pressing the **Enter** key, and using the **Left** and **Right Arrow** keys to select the appropriate number.

Figure 12

Ground Speed Setup Screen



Ground Speed Setup key

The **Ground Speed Setup** screen must include a calibration factor for proper calculation and display of ground speed. Also included on the **Ground Speed Setup** screen are a calibration aid, a manual ground speed value, and a maximum speed alarm. The calibration aid may be used to measure the calibration factor, which is the number of pulses in 400 ft (122 m). The manual ground speed (optional) may be used when a ground speed sensor is not installed or has failed in the field. The maximum speed alarm (optional) provides the user with an over-speed alarm.

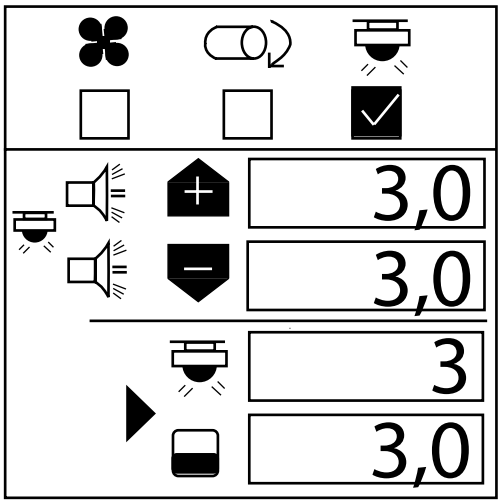
Accessory Setup key

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 may be added to the calibrated sensors. A fan, shaft, or flow sensor may be monitored with HI and/or LOW alarms or no alarm values.

Figure 13

Accessory Screen



If the number of pulses per revolution (shaft/fan) or the number of pulses per gallon (flow) is known, choose the appropriate icon at the top of the screen and select the **Enter** key. The calibration number may then be entered. If the calibration factor is unknown, the monitor can determine the calibration factor by using the built-in calibration mode.

Enter key

WARNING

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

Start softkey

Stop softkey

To perform a sensor calibration, highlight the **Start** softkey. Assure the system is in a safe state. Start the monitor calibration by selecting the **Enter** key. The **Start** softkey (triangle) will change to a **Stop** softkey (square). Activate the shaft, fan, or flow. Count the revolutions (shaft/fan) or catch liquid (flow) while the monitor measures pulses. Deactivate the shaft, fan, or flow. Stop the monitor calibration by selecting the **Enter** key again. Highlight the revolutions or liquid level window. Select the **Enter** key. Enter the number of revolutions (shaft/fan) or gallons (flow).

Limits Setup key

LIMITS SETUP (OPTIONAL)

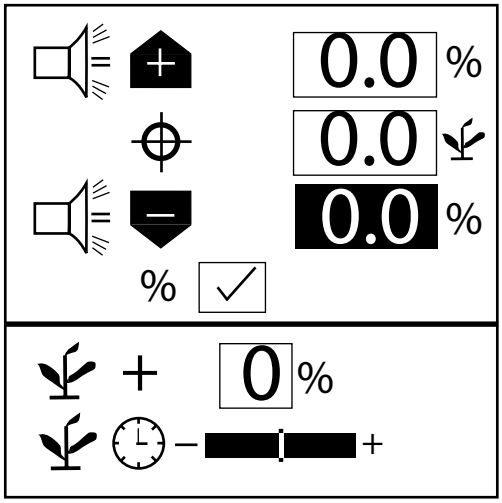
The **Limits Setup** screen allows users to define several population features (refer to Figure 14). Users may define a target population. If no value is selected, the monitor will use the average population as a calculation for alarms and row indicators. Minimum and maximum limits may be assigned with either percentage or value based entries. If the % box is selected, the entry is percentage based; otherwise it is value based.

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

The population response rate is also selectable. This feature is used to provide population display stability for planters with few rows versus planters with many. Slide this to right for high seeding rates and to the left for low seeding rates.

Figure 14

Limits Setup Screen



Display and Service key

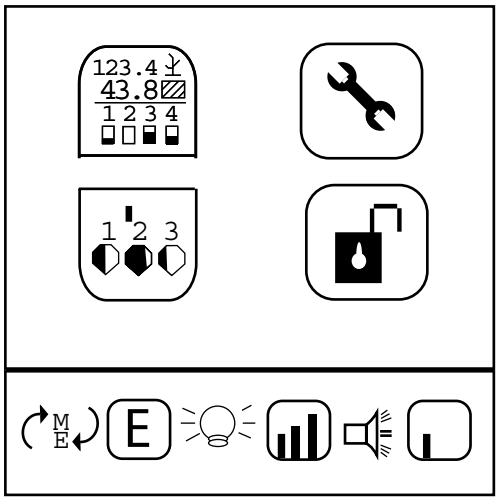
DISPLAY AND SERVICE SETUP (OPTIONAL)

The **Display And Service Setup** screen is used to customize the display to include only the information the operator desires (refer to Figure 15). Factory default selections are set for typically-desired parameters for basic monitoring. However, a broad range of input features allows the user to define the information available for viewing and the size of the information (small, medium, or large).

The display includes two sets of icons. The upper set includes icons for upper screen setup, lower screen setup, security, and service. The lower set includes icons for configuration of English/Metric, alarm volume, and backlight intensity. English/Metric allows the operator to select the units preferred. The alarm volume and backlight intensity each allow for three levels of adjustment.

Figure 15

Primary User Interface Screen



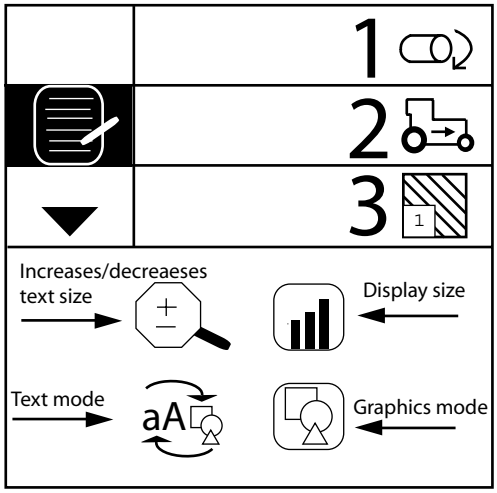
Upper Screen softkey

Enter key

The upper screen parameters may be modified by selecting the **Upper Screen** softkey and the **Enter** key. Once the upper screen is entered, the upper half of the display is used for parameter selection, while the lower half is used for changing text sizes or switching between graphic and text displays (refer to Figure 16). The graphics/text mode allows the operator to view graphic symbols or text-based labels (i.e., versus MPH). The bar selection causes the text size to display large, medium, or small, respectively. The default value is three lines (medium).

Figure 16

Upper Parameters Screen



Parameters may be selected to display in numerical order from the following list. (refer to MONITORING FUNCTIONS for additional information).

- 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
- Total Area 3
- Ground Speed
- Fan, Shaft, or Flow Frequency

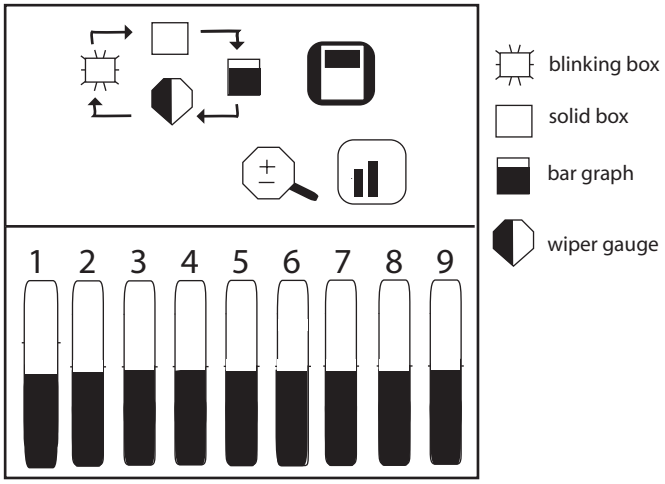
Lower Screen softkey

Enter key

The lower screen parameters (refer to Figure 17) may be modified by selecting the **Lower Screen** softkey and selecting the **Enter** key. The row indicator type may be selected at the top of the screen. Types include blinking box (blink rate proportional to seeding rate), solid box (indicating row failure), bar graph, or wiper gauge. These may be displayed in a small, medium, or large size, which is the next selection item. The size determines the number of rows displayed on the bottom half of the screen. Default setting is non-blinking box, medium size.

Figure 17

Lower Screen Parameters Screen



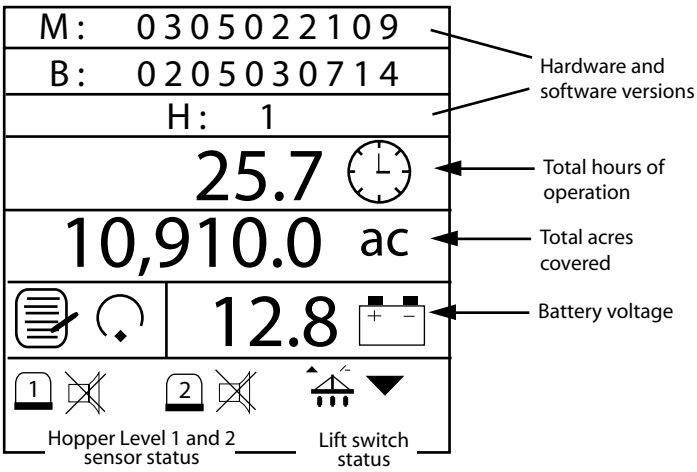
Security features allow password protection security levels to be activated (refer to Figure 18). This prevents unauthorized personnel from modifying key parameters in the field. Defaults are TEXT, ENGLISH, HIGH VOLUME, HIGH BACKLIGHT, and UNLOCKED SECURITY.

Service softkey

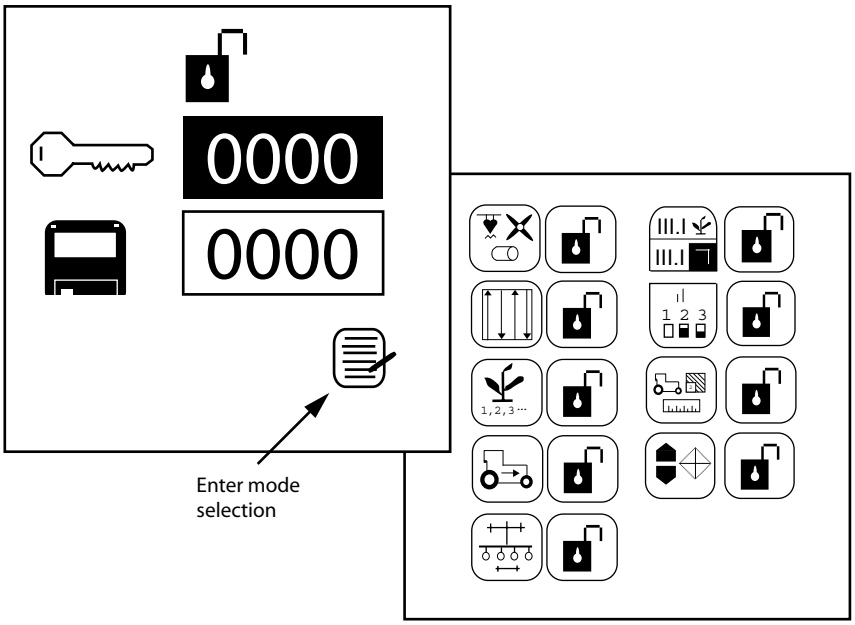
The **Service and Security** screen displays hardware and software versions, total hours of operation, total acres covered, battery voltage, hopper level 1 and 2 sensor status, and lift switch status.

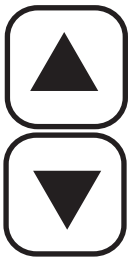
Figure 18

Service And Security Screens



Security softkey





Up and Down Arrow keys

Left and Right Arrow keys

Enter key

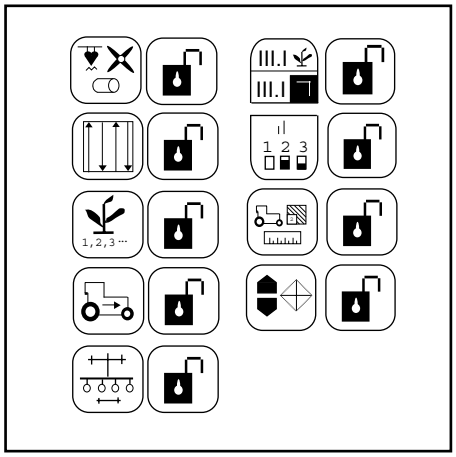
Configuration softkey

Escape key

The password screen allows the operator to individually lock screens to assure they are not modified. Using the **Arrow** keys, highlight the icon and select the **Enter** key to enter a password. Modify the digits and select the **Enter** key again to accept the password. Select the **Configuration** softkey to navigate to the list of screens. Lock or unlock screens as desired. Select the **Escape** key to return to the **Password** screen. Highlight the padlock and select the **Enter** key to toggle the unlocked state to locked. The selected screens will require input of the password prior to modification.

Figure 19

Screens That May Be Locked



AUXILIARY MODES

NOTE: Alarms are disabled in these modes.

The monitors provide modes for alternate monitor use and row unit testing.

SPEED, AREA, DISTANCE MODE

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

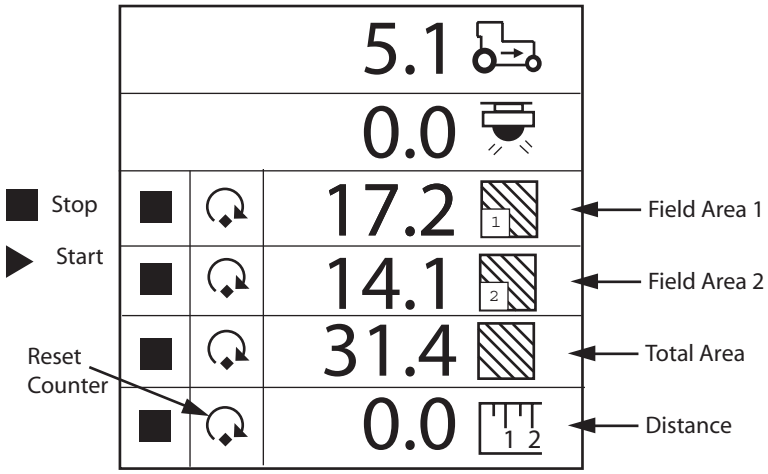
If a manual ground speed is selected, the area and distance will not accumulate in this mode.

The SPEED, AREA, DISTANCE mode is used for cultivating (Figure 19). This mode includes start/stop/reset for Field Area 1, Field Area 2, Total Area (ha/ac), and distance.

Speed Area Mode key

Figure 20

Speed, Area, Distance Mode



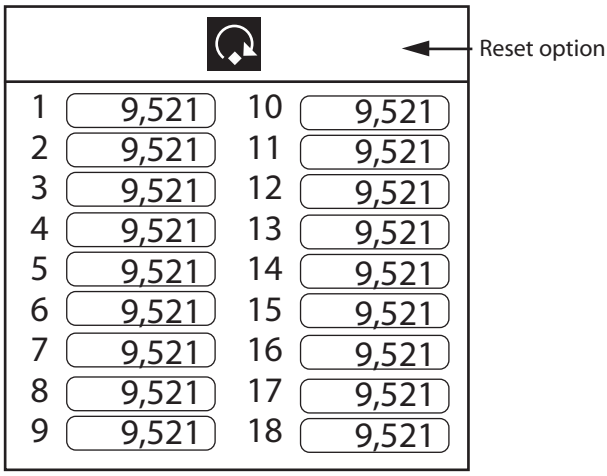
SEED COUNTING MODE

Seed Count Mode key

The SEED COUNTING mode is used to determine row unit performance when operating in a stationary manner. A reset for all rows is included (refer to Figure 20).

Figure 21

Seed Counting Mode

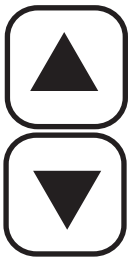


MONITORING

OPERATE (MAIN) SCREEN

Operate key

Escape key


Up and Down Arrow keys

The **Operate** (main) screen provides monitoring functions. No matter where a user has navigated in the setup, security, or auxiliary modes, selecting the **Operate** key or repeatedly selecting the **Escape** key will return the user to the **Operate** (main) screen.

The **Operate** (main) screen is divided into two halves, upper and lower. The upper half provides user-definable output parameters (population, area, speed, etc.) while the lower half is dedicated to row information.

PARAMETER OUTPUTS AND SCROLLING (UPPER HALF)

Through User Interface settings, it is possible for additional parameters to be selected than are viewable on the screen. The **Up** and **Down Arrow** keys are used to scroll between the parameters. This function provides wrapping.

An example of five parameters selected:

1 = Average population

2 = Speed

3 = Field area

4 = Total area

5 = Shaft RPM

If the screen is configured to display three items, the **Operate** (main) screen will display average population, speed, and field area (refer to Figure 21). When the **Down Arrow** key is selected, the screen will display items 2, 3, and 4. Selecting the **Down Arrow** key a second time will display items 3, 4, and 5 and so on.

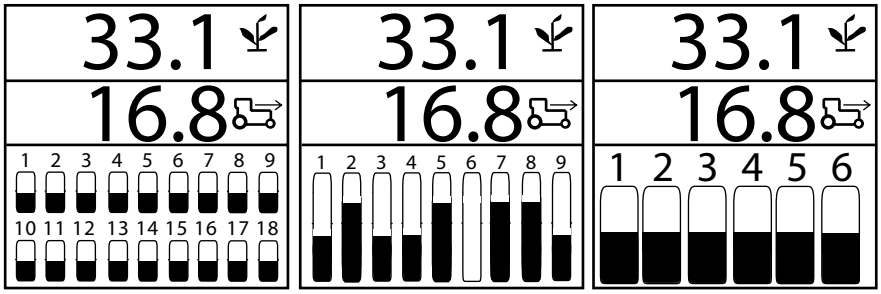
Left and Right Arrow keys

ROW INDICATORS (LOWER HALF)

The number of rows displayed on the lower half are user-definable. When more rows are configured ON than are viewable, the monitor automatically scrolls through the rows at 5 second intervals. The operator may use the **Right** and **Left Arrow** keys to manually select the desired rows. Automatic scrolling will restart 10 seconds after a manual selection. Similar to parameters display, row indicators may be small, medium, or large (refer to Figure 23).

Figure 22

Row Indicators

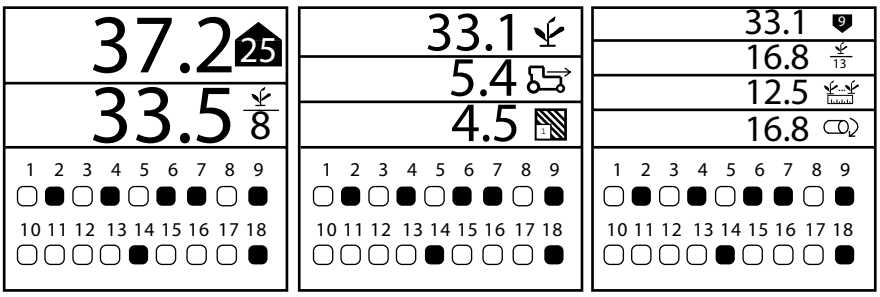


MONITORING FUNCTIONS

The operator may choose to simultaneously view two, three, or four monitoring functions (refer to Figure 24) and may select several more that require the use of an **Arrow** key to view.

Figure 23

Display Of Two, Three, Or Four Parameters



AVERAGE POPULATION

Average Population

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

Minimum/Average/Maximum Population

Population Row Scan

Average Spacing

Minimum/Average/Maximum Spacing

Spacing Row Scan

Seeds Per Distance

Minimum/Average/Maximum Seeds Per Distance

Seeds Per Distance Row Scan

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 (inches or cm) 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 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

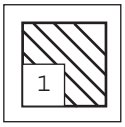
Average Seeds Per Distance displays the average seeds per foot (s/ft) or seeds per meter (s/m) of the planter's rows that are configured for population. This function may be labeled with a symbol or text, depending on the text/graphic setting.

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.

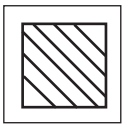
SEEDS PER DISTANCE ROW SCAN

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.



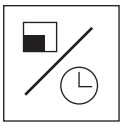
Field Area 1

Field Area 2



Total Area

Speed



Area Per Hour

Fan

Shaft

Flow

FIELD AREA 1

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

FIELD AREA 2

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

TOTAL AREA

Total Area (ac3/ha3) displays the total field area in acres (ac) or hectares (ha) depending on the English/Metric setting. This function may 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 English/Metric setting. This function may 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 acres per hour (ac/hr) or hectares per hour (ha/hr) depending on the English/Metric 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 gallons per acre (g/ac) or liters per hectare (l/ha) depending on the English/Metric setting.

ALARMS

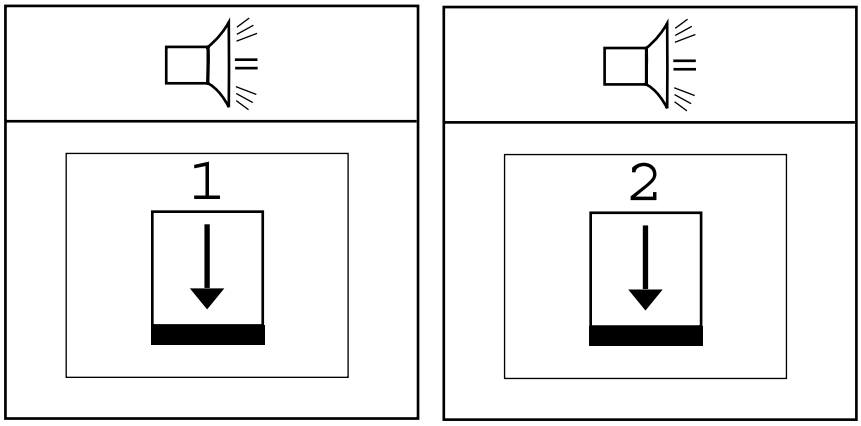
NOTE: An audible 2-chirp alarm is also output during navigation or data entry to indicate an illegal or nonfunctional key selection.

Primary operating alarms are displayed on the entire screen and are accompanied by an audible alarm. Hopper level alarms are depicted as HL1 or HL2.

HOPPER LEVEL ALARMS

Figure 24

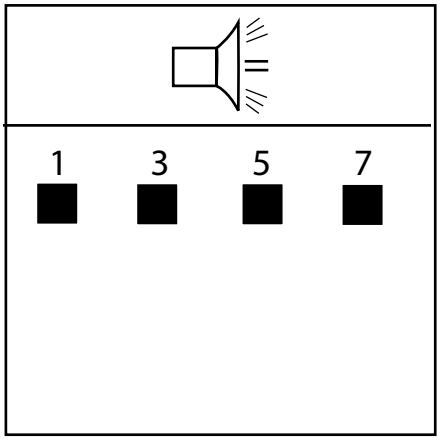
Hopper 1 And 2 Alarms



ROW BLOCKAGE (TWO SEEDS PER SECOND THRESHOLD) — SOLID ON ALARM

Figure 25

Row Blockage Display

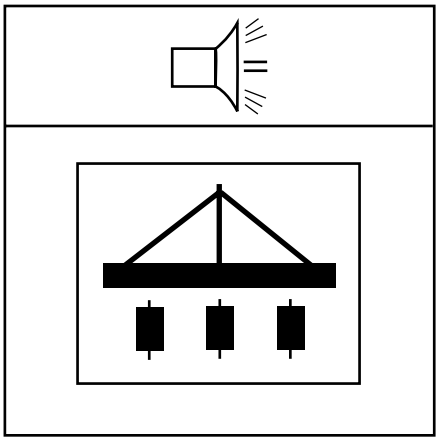


ALL ROWS FAILURE — EIGHT CHIRPS

NOTE: A lift switch may be used to override this alarm.

Figure 26

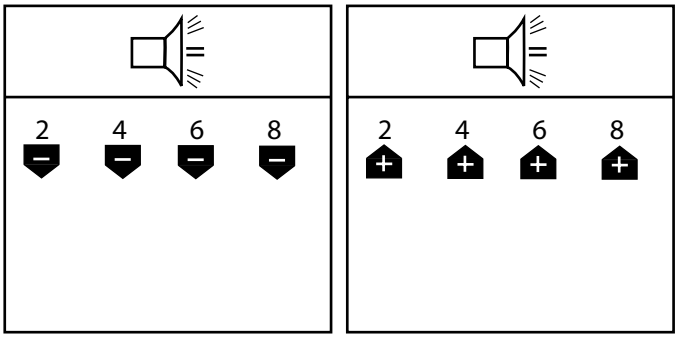
All Rows Failure Display



HI/LOW LIMIT EXCEEDED (OPTIONAL LIMITS FOR POPULATION) — ALARM CHIRP

Figure 27

Population Limit Warning Display



HI/LOW LIMIT EXCEEDED (OPTIONAL LIMITS FOR ACCESSORIES) — SOLID ON ALARM

Figure 28

Fan Speed Limit Warning Display (Optional)

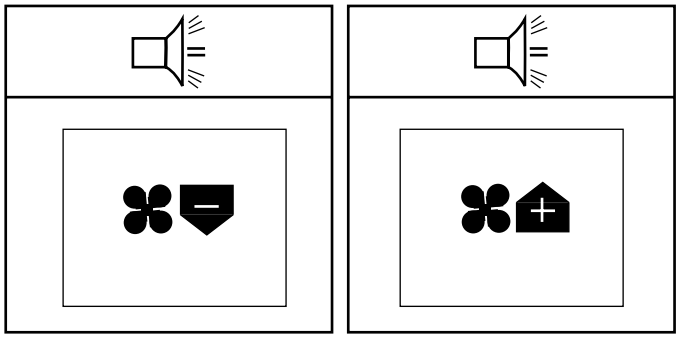


Figure 29

Shaft Speed Limit Warning Display (Optional)

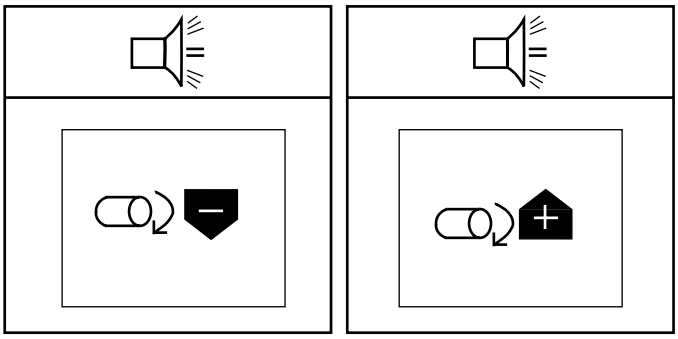
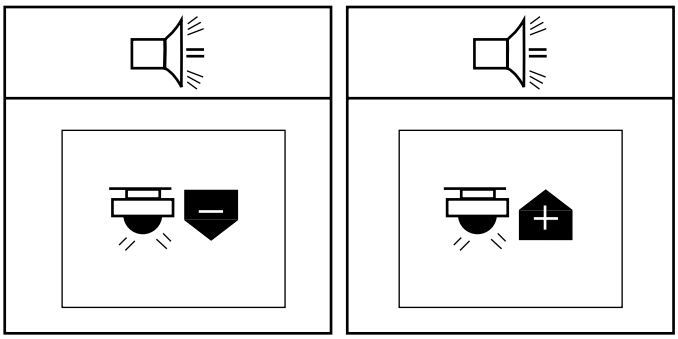


Figure 30

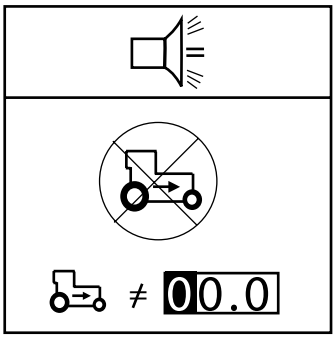
Pressure Hi Limit Warning Display (Optional)



FAILED GROUND SPEED SENSOR (PLANTING DETECTED WITHOUT GROUND SPEED)

Figure 31

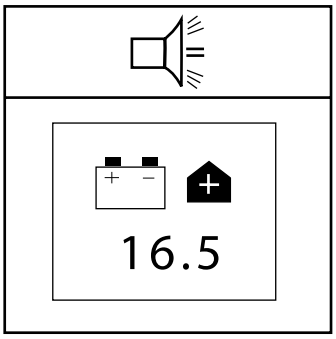
Ground Speed Sensor Failure Display



SELF-TEST FAILURE (BATTERY VOLTAGE OUT OF LIMITS)

Figure 32

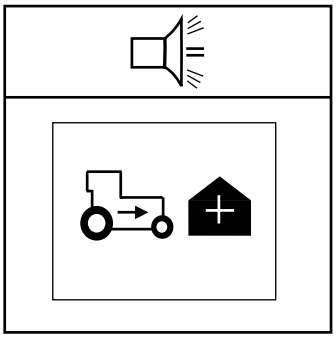
Self-Test Failure Display



MAXIMUM SPEED EXCEEDED (OPTIONAL)

Figure 33

Maximum Speed Exceeded Warning Display (Optional)



TROUBLESHOOTING

MONITOR WILL NOT POWER ON

Probable Cause

1. Blown console fuse
2. Poor battery connection
3. Low battery voltage
4. Defective console

Corrective Action

1. Check fuse (located near battery connection). If needed, replace with 7.5 A fuse maximum. If fuse blows again, check all harnesses for pinches or breaks that may cause power short to ground.
2. Be sure connections are clean and tight. Inspect harness for damage.
3. Console voltage must be at least 10 V. If low, recharge or replace battery.
4. Console is damaged. Contact your dealer, DICKEY-john USA (1-800-637-3302), or DICKEY-john Europe (011-33-141-192189).

ROW FAILURE OR HI/LOW ALARM WHEN ROW IS PLANTING PROPERLY

Probable Cause

1. Seed sensor coated with dirt
2. Faulty sensor or harness
3. Defective console

Corrective Action

1. Clean sensor using a dry bottle brush.
2. Trigger sensor while observing troubleshooting LED. If sensor does not have LED, swap harness connection with adjacent sensor to determine if sensor or harness is damaged. Replace sensor or harness.
3. Console is damaged. Contact your dealer, DICKEY-john USA (1-800-637-3302), or DICKEY-john Europe (011-33-141-192189).

HOPPER ALARM DOES NOT SOUND WHEN HOPPER IS EMPTY

Probable Cause

1. Hopper sensor coated with dirt
2. Faulty sensor or harness shorted to ground
3. Defective console

Corrective Action

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 your dealer, DICKEY-john USA (1-800-637-3302), or DICKEY-john Europe (011-33-141-192189).

HOPPER ALARM SOUNDS WHEN HOPPER IS FULL

Probable Cause

1. Faulty sensor or harness open
2. Defective console

Corrective Action

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.
2. Console is damaged. Contact your dealer, DICKEY-john USA (1-800-637-3302), or DICKEY-john Europe (011-33-141-192189).

SYSTEM VOLTAGE ALARM

Probable Cause

1. Low battery voltage
2. Poor battery connection
3. Damaged harness

Corrective Action

1. Console voltage must be at least 10 V. 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 may cause power or 8 V-sensor power short to ground.

ACCESSORY ALARM SOUNDING WHEN SHAFT, FAN, OR FLOW IS WORKING

Probable Cause

1. Sensor failure
2. Wrong calibration number
3. Incorrect limits
4. Defective console

Corrective Action

1. Shaft, fan, or flow sensor not operating. Replace defective sensors.
2. Sensor calibration number is incorrect. Check calibration number in accessory setup screen.
3. Sensor limits are incorrect. Check limits in accessory setup screen.
4. Console is damaged. Contact your dealer, DICKEY-john USA (1-800-637-3302), or DICKEY-john Europe (011-33-141-192189).

GROUND SPEED ALARM SOUNDS WITH FORWARD MOVEMENT

Probable Cause

1. Ground speed sensor failure
2. Console failure

Corrective Action

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 your dealer, DICKEY-john USA (1-800-637-3302), or DICKEY-john Europe (011-33-141-192189).

GROUND SPEED HIGH ALARM SOUNDING

Probable Cause

1. Ground speed alarm set too low
2. Incorrect ground speed constant

Corrective Action

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 (**Speed Setup** screen).

SELF-TEST ALARM

Probable Cause

1. Seed sensor coated with dirt
2. Faulty sensor or harness
3. Console failure

Corrective Action

1. Clean sensor using a dry bottle brush.
2. Trigger sensor and observe troubleshooting LED. If sensor does not have LED, swap harness connection with adjacent sensor to determine if sensor or harness is damaged. Replace sensor or harness.
3. Console is damaged. Contact your dealer, DICKEY-john USA (1-800-637-3302), or DICKEY-john Europe (011-33-141-192189).

CONNECTOR PIN-OUTS

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

PM300 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)

PM332 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)

PM332 Implement Accessory Harness	
Pin #	**Description**
1	Lift Switch (light green)
2	Hopper # 1 (brown)
3	Hopper # 2 (light blue)
4	Frequency (orange)
5	+8 V Acc Power (yellow)
6	+ 12 V Acc Power (purple)
7	Acc Return (gray)
8	RS-232 Rx (pink)
9	RS-232 Tx (neutral)

PM400 Implement 1	
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)

PM400 Implement 1 (continued)	
Pin #	**Description**
26	Sensor return (black)
27	Sensor return (black)
28	Row 24 (orange/green)
29	Hopper 1 (white)
30,31	No connection
32	8 V power (red)
33	No connection
34	Sensor return (black)
35,36	No connection
37	Lift switch (black/white/red)

PM400 Implement 2	
Pin #	**Description**
1	Row 25 (green)
2	Row 26 (brown)
3	Row 27 (blue)
4	Row 28 (orange)
5	Row 29 (yellow)
6	Row 30 (violet)
7	Row 31 (gray)
8	Row 32 (pink)
9	Row 33 (tan)
10	Row 34 (white/black)
11	Row 35 (red/black)
12	Row 36 (green/black)
13-23	No connection
24	8 V sensor power (red/black/white)
25	8 V sensor power (red)
26	Sensor return (white/black/red)
27	Sensor return (black)
28	No connection
29	Hopper 1 (orange/black)
30	Hopper 2 (blue/black)
31	Shaft/Fan/Flow (black/white)
32	8 V power (red)
33	12 V switched power (green/white)
34	12 V return (black)
35	RS-232 Rx (blue/white)
36	RS-232 Tx (red/white)
37	No connection

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. 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

DICKEY-john® CORPORATION

Revolutionizing Electronics

Headquarters:
5200 Dickey-john Road, Auburn, IL 62615
TEL: 217-438-3371, FAX: 217-438-6012, WEB: www.dickey-john.com

Europe:

DICKEY-john Europe S.A., 165, boulevard de Valmy, 92706 - Columbes - France

TEL: 33 (0) 1 41 19 21 80, FAX: 33 (0) 1 47 86 00 07