

# DM-100



*Operator's  
Manual*

# Introduction

The DM-100 is a universal population planter monitor designed to accurately monitor seed population, area and ground speed of all types of drills.

The DM-100 system contains two high-count seed sensors, a distance sensor, all wiring and a computer-controlled display console that displays: speed, two area counters, left and right seed population.

Installation consists of mounting two seed sensors in the two rows that run out of seed first. The DM-100 will alert the operator when the drill is running out of seed or when a malfunction occurs.

The two resettable area counters will monitor area covered and will accumulate area anytime a seed sensor detects seeds. When either row stops planting, the area counters will turn off until planting resumes. When in "area speed mode" the population readings will display "bars" and area will accumulate anytime there is speed. (When the DM-100 is first turned on it will be in area-speed mode until a seed is detected, from that point the DM-100 will be in population mode until powered off.)

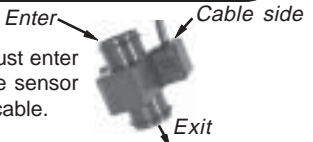
The accuracy of the population reading can be calibrated for different drills and seed sensors. A guideline value to start with is printed in this manual, but it is recommended that the operator run a population test to achieve the most accuracy. Counting bags of seeds for a known area, capturing seeds for a known distance and counting the seeds, and digging up seeds are some possible ways to check population.

The reading in the "Left" and "Right" windows are the number of seeds planted times 1000, per acre. If the display reads 184.2, that is equivalent to 184,200 seeds per acre.

The DM-100 will display the first population reading approximately 50 feet after you start planting. When changing gate settings or gears to adjust the drill population, it is recommended to plant at least 1000 feet for the highest accuracy.

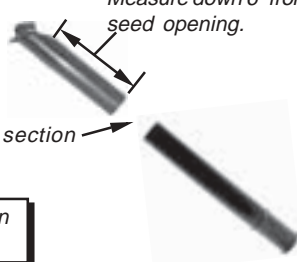
# Seed Sensor Installation

Tip: Locate the seed tubes that run out of grain first when the seed bins are low. On most drills this is the end rows or the rows one row in from the end.


The seeds must enter the end of the sensor that has the cable. 

**Style A** Rigid style seed tubes typical of early model John Deere 750® style Drills.

Measure down 6" from seed opening.  
Remove 3" section and discard.




**Note:** Do not overtighten clamps

Completed Installation 

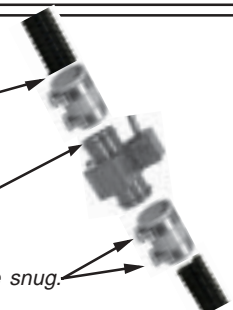
**Style B** Rigid style seed tubes under 1.5 inches in diameter.

It is important that the seed tube in the bottom coupling not extend up into the sensor. The path for the seed needs to be free flowing with as little obstruction as possible.

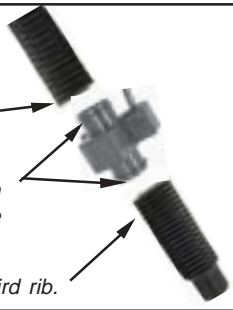
"Bell shape" coupling is acceptable. (Do not insert the tubes past the top edge of clamp.)

Insert tubes to this point 

**Style C** Hard flex style seed tubes typical of the early model John Deere 750® style Drills.

- 1 | Measure down 6 inches from seed cup and remove 2 inch section of seed tube.
  - 2 | Place the clamp over the end of the seed sensor and insert the seed tube into the end of the coupling until it touches the seed sensor.
  - 3 | Tighten clamps until they are snug. Do not overtighten.
- 

**Style D** Soft Flexible style seed tubes typically found on Great Plains®, Sunflower® and other popular drills.

- 1 | Measure down 6 inches when in planting position and cut flex hose.
  - 2 | Place tubes over ribs on seed sensor and secure with ty-raps.
  - 3 | Place ty-rap in third rib.
- 

# Distance Sensor Installation

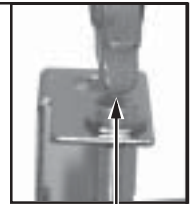
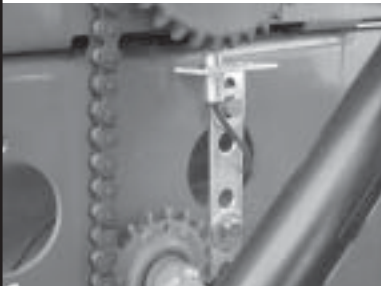
The distance sensor included with the DM-100 system is an electronic device that can detect the teeth on a chain sprocket. A bracket is supplied and the general installation instructions are presented below.

1. Locate a sprocket on the drill that is ground driven. The sprocket should be a sprocket that does not change speed if the transmission ratio is changed.
2. The speed sensor must sense the teeth on the sprocket that does not have a chain engaged.
3. Attach the bracket so that the sprocket teeth pass the center of the sensor (see figure below) and the air gap is the thickness of a quarter. It may be necessary to drill holes to mount the bracket.
4. Route the cables so they clear all moving shafts and chains. (Be sure they clear when the drill is in both the up and down position.)
5. This completes the distance sensor installation.

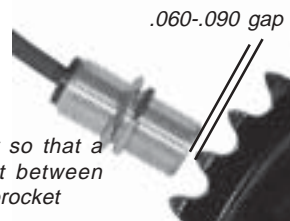
**NOTE!** The display will read "SPEED FAILURE" in the MPH window anytime seeds are detected and no speed is detected.

The speed sensor kit is a universal kit and may need to have the bracket bent or re-drilled to fit some drill applications.

*Typical installation on a John Deere 750® drill.*



*Align sensor so that the sprocket is in the center of the distance sensor*



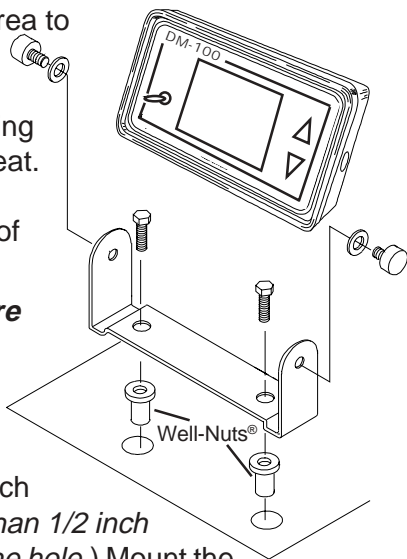
*Adjust sensor so that a quarter will fit between sensor and sprocket*

# Console Installation

1. Select a rigid surface in the cab area to mount the console. The display should be mounted in a location that can be easily seen while looking straight ahead from the driver's seat. Also, make sure there is room to route the cab harness to the rear of the tractor.

2. **(Before drilling holes, make sure there are no cables or objects behind the panel that could be damaged by the drill bit.)**

Using the mounting bracket as a template, mark and drill two 1/2 inch holes. ( Do not drill a hole larger than 1/2 inch or the well nuts will not tighten in the hole.) Mount the bracket as shown in the above figure . Use the 1/4-20 bolts and rubber well nuts provided in the hardware kit.

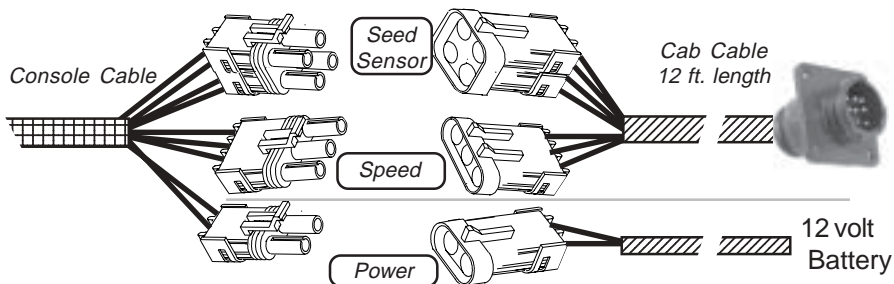


# Drill Harness Installation

1. Place the harness in the center of the tool bar on drill.
2. Locate the cables marked "Left" and "Right" and route these cables to the seed sensor that was installed on the left side of the drill. Locate the cable marked "Right" and route this cable to the seed sensor that was installed on the right side of the drill.
3. The third cable is the distance input cable and it will be marked as "Distance". Route this cable to the speed sensor. (If a radar speed sensor is being used with the DM-100, this cable will not be used. Coil up the cable and secure it.)
4. Secure the signal harness to the tongue of the drill and secure with ty-raps. (Do not ty-rap the signal cable to hydraulic lines.)
5. Check all wiring and make sure the wires clear all moving parts when planting and **make sure all wires have clearance when the drill is raised and lowered.**
7. This completes the installation of the wiring harness on the drill.

# Cab Cables Installation

1. Connect the end of the 12 ft. cab cable with the 4-pin and 3-pin connector to the connectors on the monitor console.
2. Connect the 2-pin power lead connector to the 2-pin connector on the rear of the DM-100 console.
3. Route the cab cable to the rear of the tractor cab being careful to route the cable so it does not interfere with any moving parts in the tractor cab. The harness from the drill will mate to the 9-pin connector of the cab cable.

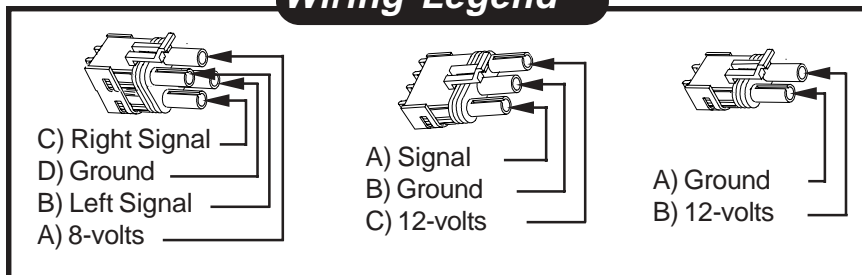


4. Connect the power lead to a 12-volt power source. The red lead goes to the positive side of the battery and the black lead goes to the ground side of the battery.

**Caution!!** On tractors with 24-volt starting systems, be sure to connect to 12 volts **not 24 volts**.

5. This completes the installation of the console and wiring harness in the tractor cab.

## Wiring Legend



# Console Setup CONTROL KEYS

Setting up the DM-100 to use is a simple process of answering several questions about your drill. Before beginning the setup routine, we will review the operation of the front panel controls.

1. The toggle switch on the front of the unit is used to turn power on and off to the distance sensor, seed sensors and the console.
2. The two arrows are keyboard switches that are used to enter data and make selections.



The **Up-Arrow** will increment numbers when pressed and released.



The **Down-Arrow** will de-increment numbers when pressed and released.



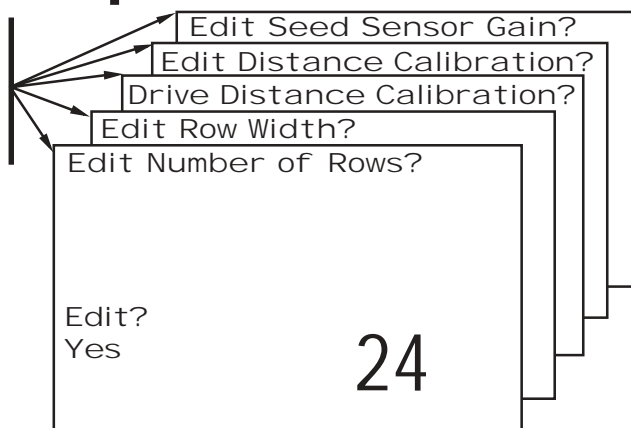
If both buttons are pressed and released at the same time, this is the same as pressing the “**ENTER**” key on a computer.

## To place the DM-100 into Setup Mode:

1. Turn the console to the “off” position.
2. While holding in either arrow key, turn the console on.
3. When the setup screen appears release the arrow key.

## Setup Screens

There are **5** setup screens in the DM-100 that are used to enter information about your drill.



To begin setting up your DM-100, place the unit in  
“**Setup Mode**”.  
(See black box in center of page 6).

## Edit Number of Rows ?

This number is the total number of rows on your drill. (*This number is not the number of seed sensors installed.*) This value is used along with the row width value to calculate the total width of the drill. The DM-100 needs to know “implement width” so the covered area can be calculated.

Pressing and releasing the ▲UP arrow key or ▼DOWN arrow key will cause the display to toggle from “EDIT YES” to “EDIT NO”.

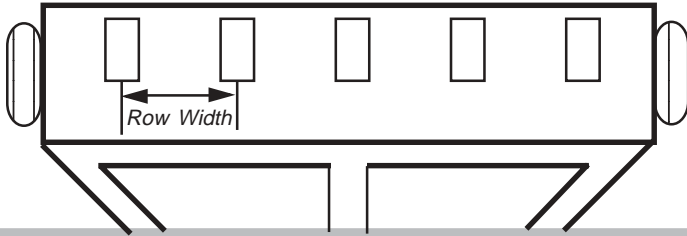
- ▲ With the words “EDIT YES” displayed on the screen press
- ▼ and release both arrow keys.



An arrow symbol will appear under the last digit to the right indicating that the number above it can be edited.

Pressing and releasing the ▲UP arrow key or ▼DOWN arrow key will increase or decrease the value of the digit above it.

- ▲ When the digit is set to the desired value, press and release
- ▼ both arrow keys, this will cause the arrow symbol to advance to the next digit to the left.
- ▲ After the last number is set, pressing and releasing both arrow
- ▼ keys will cause the digit selection arrow to disappear and “EDIT NO” will be displayed on the left side of the screen.
- ▲ If the number entered is correct press and release both arrow
- ▼ keys and the DM-100 will advance to the next setup screen.



## Edit Row Width?

This number is the width (in inches) between rows on the drill.

Pressing and releasing the ▲UP arrow key or ▼DOWN arrow key will cause the display to toggle from "EDIT YES" to "EDIT NO".

To edit the Row Width, press and release the ▲UP arrow key or ▼DOWN arrow key until the screen reads "EDIT YES" on the left side of the screen.

- ▲ When the words "EDIT YES" are displayed on the screen
- ▼ press and release both arrow keys.



Under the digit furthest to the right, an arrow will appear that indicates that the number can be edited.

The number above the "digit select" symbol will increase or decrease when pressing and releasing the ▲UP arrow key or ▼DOWN arrow key.

- ▲ When the digit is set to the desired value, press and release both arrow keys. The digit selection arrow will advance to the next digit on the left.
- ▲ After the last digit is entered, press and release both arrow keys and the digit select symbol will disappear and the words "EDIT NO" will be displayed on the left side of the screen.
- ▲ If the value entered is the correct row width, press and release both arrow keys and the DM-100 will advance to the next setup screen.

Stop

Start



## Drive Distance Calibration?

It is necessary to calibrate the distance sensor or optional radar sensor when the DM-100 is first installed. To calibrate the distance sensor, the first step will be to measure off a 400 foot distance in a straight line on a surface that is the same as that in which the drill will be used.

### Did You Know????

Calibrating the DM-100 on a hard surface, such as blacktop, will yield a different calibration than you would get in soil ready for planting. The reason for this is that the drive wheel will make more revolutions on a hard surface since it rides on the outside circumference of the tire. When in soft soil, the tire sinks down into the soil and will make less revolutions in a given distance.

To perform the distance calibration, press and release the ▲UP arrow key or ▼DOWN arrow key until the words “EDIT YES” appear on the left side of the display.

- ▲ Press and release both arrow keys and the words “PRESS AND RELEASE AN ARROW KEY AT THE START OF 400 FEET” will appear at the top of the display.

At the 400 ft. start point, press and release the ▲UP arrow key or ▼DOWN arrow key. The text at the top of the screen will change to display: “PRESS AND RELEASE AN ARROW KEY AT THE END OF 400 FEET” and the large numbers on the screen will increment as the implement is moved. Drive to the end of the 400 ft. run at planting speed.

At the end of the 400 ft. run, press the ▲UP arrow key or ▼DOWN arrow key and the large numbers will stop incrementing. The number shown is the distance calibration number. NOTE: The DM-100 will not accept a number less than 100 in the distance calibration mode.

- ▲ ▼ Press both arrow keys to advance to the next setup screen.

# Console Setup EDIT DISTANCE CALIBRATION

7942

(Old Number)



2487

(New Number)

## Edit Distance Calibration?

This screen normally is not needed if a distance calibration was performed. The purpose of this screen is to manually change the calibration number. Sometimes when changing different soil types (tilled verses non tilled) or input devices (sprocket sensor verses radar) and the calibration number is known, it is much easier to enter the new value instead of repeating the distance calibration run.

To edit the Distance Calibration Number, press and release the ▲UP arrow key or ▼DOWN arrow key until the screen reads “EDIT YES” on the left side of the screen.

- ▲ When the words “EDIT YES” are displayed on the screen,
- ▼ press and release both arrow keys.



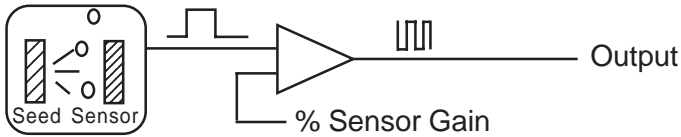
### Note!

The DM-100 will not accept a value less than 100.

Under the digit furthest to the right, an arrow will appear that indicates that the number can be edited.

The number above the “digit select” symbol will increase or decrease when pressing and releasing the ▲UP arrow key or ▼DOWN arrow key.

- ▲ When the digit is set to the desired value, press and release
- ▼ both arrow keys. The digit selection arrow will advance to the next digit on the left.
- ▲ After the last digit is entered, press and release both arrow
- ▼ keys and the digit select symbol will disappear and the words “EDIT NO” will be displayed on the left side of the screen.
- ▲ If the value entered is correct, press and release both arrow
- ▼ keys and the DM-100 will advance to the next setup screen.



## Edit Seed Sensor Gain?

This is one of the most impressive features of the DM-100. This feature allows the operator to calibrate the seed sensor so that the reading on the console is accurate to the actual population being planted. The reason your seed sensor is not 100% accurate has to do with how well your drill singulates the seeds as they are being planted. Anytime two seeds fall at precisely the same time, the electric eye cannot distinguish that there are two seeds. The DM-100 allows the operator to compensate for the amount of seeds the sensor cannot count. *(Note: Wheat cannot be accurately measured.)*

A guideline for some drills is presented below:

### GAIN SETTING (Soybeans only)

Drills with standard fluted cups	13-15%
Precision drills	1-4%

Pressing and releasing the ▲UP arrow key or ▼DOWN arrow key will cause the display to toggle from “EDIT YES” to “EDIT NO”.

- ▲ With the words “EDIT YES” displayed on the screen, press ▼ and release both arrow keys.



Use the ▲ UP or ▼DOWN arrow keys to edit the digit above the digit select symbol. When the digit is set to the desired value, press and release both arrow keys to edit the next digit to the left.

- ▲ Pressing and releasing both arrow keys again will cause the arrow symbol to disappear and “EDIT NO” will be displayed on the left side of the screen.
- ▲ If the number entered is correct, press and release both arrow keys and the DM-100 will advance to the Run Screen.

# Operation

## Note!

The horn can be silenced anytime by pressing an arrow key.

The DM-100, while planting, will display a speed reading and will update the population counters from a start within the first fifty feet.

It is recommended when adjusting the gates of your drill to drive at least 1000 feet to get a stable population reading. The first reading will be slightly off because of the way drills start dropping seeds when first started.

## SPEED FAILURE

In the event seeds are dropping and there is no speed input the words "SPEED FAILURE" will appear where the speed is normally displayed.

## ROW FAIL

The words "LEFT FAIL" or "RIGHT FAIL" will appear in the seed population windows in the event a row stops planting and there is speed input. It is normal for both population windows to display FAILURE when transporting the drill in the non-planting position.

## population reading

The DM-100 monitors distance covered and the number of seeds the seed sensors detect. The reading on the screen is the number of seeds planted per acre times 1000. If the display reads 215.4, this means the system is detecting 215,400 seeds per acre. It is normal for this number to vary slightly from reading to reading. For accurate counts see page 11; "Setting Seed Sensor Gain".

## Reset area counters

*Resetting the Area counters cannot be performed while in "Setup Screens"*

The area counters can easily be reset to zero using the following procedure while in the "normal operating screen":

To reset the field area counter press in and hold the ▲UP arrow key for approximately 2.5 seconds until display reads 0.0 .

To reset the Total Area counter press in and hold the ▼DOWN arrow key approximately 2.5 seconds until the display reads 0.0.

