

Dm-250



Speed-Distance Monitor with Alarm

by Agri-Tronix Corporation

P/N 1000-6958

System Overview

The Dm-250 is a computerized distance and speed monitor with alarm that has data logging capabilities. The Dm-250 will record the distance and speed of a moving object. The data can be reviewed after the pull and 4 data graphs can be saved to memory. The speed sensing device can be a non-contact radar sensor, a gear tooth sensor that senses the rotation of ground driven wheel, or the speed information can be picked up from properly equipped pulling sleds. The programmable alarm feature in the Dm-250 alerts the driver that the preset speed limit is being approached. An audible alarm will sound when the speed alarm point is being approached. The graphic display also utilizes a bar graph style indicator to visually alert the driver he is nearing the alarm set point. The Dm-250 is a durable piece of electronic equipment built to take the punishment of tractor pulling. The software has been designed to make the operation and setup of the Dm-250 easy and informative.

Distance Sensor Information

The Dm-250 can be used with several different types of distance sensors.

1. Radar - Radar sensors can be connected to the 4-pin connector located on the rear of the DM-250. The DM-250 supplies power to the radar through the connector. Please note that the accuracy of the radar sensor will vary proportionally with changes in the angle of the radar sensor relative to the ground.

2. Wheel Sensor - A gear tooth sensor can be used to monitor a rotating ground wheel. Drive wheels are not recommended since many times the drive wheel will be turning faster than the true ground speed. When using the front wheels, ground contact must be maintained for accurate speed readings.

3. Pulling Sled Output - On sleds equipped with Agri-Tronix's sled systems and remote output. The ground speed signal can be picked up from the output of the on-board electronics. The Calibration number of the DM-250 must match the calibration number of the Sled Monitor Electronics. This option is the most desirable since the Dm-250's speed will match the pulling sled's speed exactly.

4. GPS Speed Sensor - A GPS speed sensor can be used with the DM-250 system. A drawback of using this system is that the GPS speed sensor will not work in an enclosed building.

NOTE!!!

Every attempt has been made to achieve the highest degree of accuracy possible from the speed reading of the Dm-250.

It is possible and very probable that the speed reading of the DM-250 will not match the sled's speed exactly. Plus or Minus .1 mph can be expected due to speed calculation rounding and the different styles of speed input. Remember the sled speed reading dictates whether you are disqualified or not.

Console Installation

1. Select a rigid surface to mount the console. The display should be mounted in a location that does not obstruct the vision of the driver. The display should be located so that the readings can be seen from the drivers seat while looking forward down the track.
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 mounting holes. Use the 5/16" bolts provided in the hardware kit to mount the bracket.
3. The console may optionally be mounted using a strong magnet*.
4. The console can easily be removed and stored by disconnecting the cables and removing the mounting knobs located on the sides of the monitor.



***Caution:** At most competition pulls, if anything falls off the tractor you will be disqualified. Be sure, if using magnets to mount the console, that there is a safety strap to restrain the monitor in the event the magnets are shaken loose.

Cable Installation

1. Mate the 4-pin power lead connector to the 4-pin connector on the rear of the DM-250 console. And connect the ringed sta-kon to a 12 volt power source. Connect the red lead to a positive 12 volts and the black lead to the negative side of the 12 volt power source.

Note:

Once information is saved to memory in the Dm-250, power can be disconnected from the console and all information will be retained

2. Mate the speed connector to the rear of the console and route the 4-pin connector end to the speed sensor.
3. Route the cables to avoid all hot parts and all moving parts including clutch linkage and throttle levers.
4. The 9-pin connector is for future expansion.
5. This completes the installation of the console and wiring harness

Console Setup CONTROL KEYS

Setting up the DM-250 requires entering a calibration number, an alarm point and a pre-alarm warning point. Before beginning the setup routine, we will review the operation of the front panel controls.

1. The toggle switch located on the rear of the unit is used to turn power on and off to the speed sensor and the Dm-250 console.
2. The data selector knob on the front of the console is used to enter and select data on the DM-250



Rotating the data selector knob clockwise and counterclockwise will increment and de-increment the numbers and selections. This symbol will be used throughout the manual indicating the data selector knob should be rotated.



Pressing and releasing the data selector knob is the same as pressing an Enter key. This symbol will be used throughout the manual indicating the data selector knob should be pressed and released.

To place the DM-250 in Setup Mode:

1. Turn the console to the “off” position.
2. Press and hold the data selector knob in.
3. Turn the DM-250 on
4. Release the data selector knob when the setup screen appears.

To begin setting up your DM-250, place the unit in
“Setup Mode”.
(See black box at bottom of page 6).

EDIT MPH ALARM

This is the speed at which the DM-250 will give an alarm. This feature is used in events where there is a maximum speed the sled is allowed to be pulled.

↻ Rotating the data selector knob will cause the display to toggle from “EDIT YES” to “EDIT NO”.

↻ With the words “EDIT YES” displayed on the screen press and release the data selector knob.



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

↻ Rotating the data selector knob will increase or decrease the value of the digit above it.

↻ When the digit is set to the desired value, press and release the data selector knob, this will cause the arrow symbol to advance to the next digit to the left.

↻ After the last number is set, pressing and releasing the data selector knob will cause the digit selection arrow to disappear and “EDIT NO” will be displayed on the left side of the screen.

↻ With “EDIT NO” displayed, press and release the data selector knob. The DM-250 will advance to the next setup screen.

EDIT PREALARM BAR?

This number indicates when the bar graph for the mph alarm will appear and start pulsing the alarm. Example: If this number is set to 1.0 and the mph alarm is set for 5.5 mph, the bar graph will first appear at 4.5 mph and close the center gap between the bars as the speed approaches the alarm point. With pre-alarm turned on, the alarm pulses quicker as the gap gets more narrow.

↻ Rotating the data selector knob will cause the display to toggle from “EDIT YES” to “EDIT NO”.

↻ To edit the Pre-Alarm, press and release the data selector knob 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 the data selector knob

NOTE! Setting the pre-alarm value to 0.0 will disable this feature



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 the data selector knob is rotated

↻ When the desired value is displayed, press and release the data selector knob. The digit selection arrow will advance to the next digit on the left.

↻ After the last digit is entered, press and release the data selector knob 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 Pre-alarm value, press and release the data selector knob and the DM-250 will advance to the next setup screen.

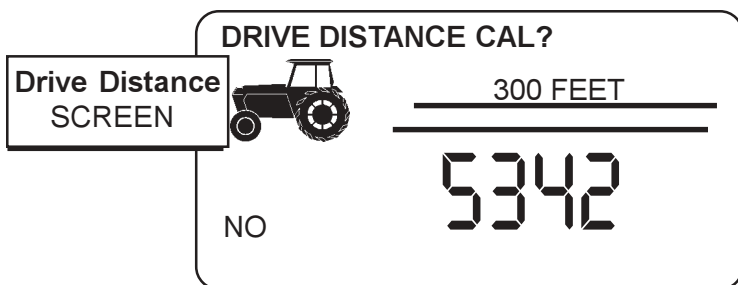
Stop

Start



DRIVE DISTANCE CAL?

It is necessary to calibrate the speed sensor when the DM-250 is first installed. To calibrate the distance sensor, the first step will be to measure off a 300 foot distance in a straight line. Place the DM-250 console in the Setup Mode, advance to the distance calibration screen shown below and follow the directions outlined.



🔄 To perform the distance calibration, rotate the data selector knob until the word “YES” appears on the left side of the display.

👉 Press and release the data selector knob. “PRESS ANY KEY THEN START DRIVING 300 FEET” will appear at the top of the display.

👉 At the start of the 300 ft. run, press and release the data selector knob.

The text at the top of the screen will change to display: “PRESS ANY KEY TO STOP” and the numbers on the screen will increment as the vehicle is moved. Drive to the end of the 300 ft. run.

👉 At the end of the 300 ft. run, press and release the data selector knob and the screen value will stop incrementing. The number displayed on the screen is the distance calibration number.

👉 Press and release the data selector knob to advance to the next setup screen.

Console Setup EDIT DISTANCE CALIBRATION

7942

(Old Number)



2487

(New Number)

EDIT DISTANCE CAL?

The purpose of this screen is to manually change the calibration number. If using the DM-250 with pulling sleds that have an Agri-Tronix distance sensor port, the distance calibration number must be set to match the calibration number on the pulling sled.

↻ To edit the Distance Calibration Number, rotate the data selector knob until the screen reads “EDIT YES” on the left side of the screen.

↻ When the words “EDIT YES” displayed on the screen, press and release the data selector knob.



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

↻ The number above the “digit select” symbol will increase or decrease when the data selector knob is rotated.

↻ When the digit is set to the desired value, press and release the data selector knob. The digit selection arrow will advance to the next digit on the left. Repeat the above steps until the desired calibration number is set.

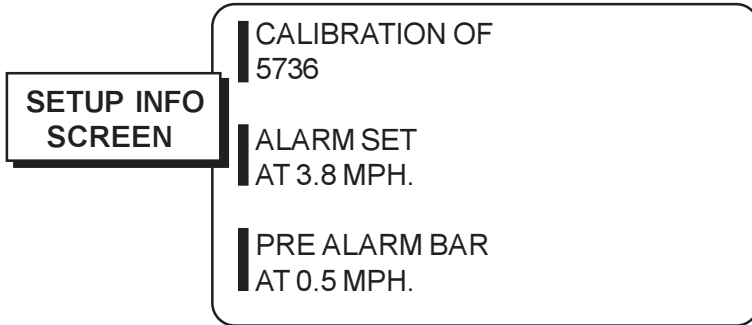
↻ After the last digit is entered, press and release the data selector knob and the digit select symbol will disappear and the words “EDIT NO” will be displayed on the left side of the screen.

↻ If the value entered is correct, press and release the data selector knob and the DM-250 will advance to the next setup screen. If the number is wrong, rotate the knob to “EDIT YES” and repeat the above steps.

Console Operation

Once the DM-250 system has been installed and calibrated it is now ready to be used.

When the DM-250 is turned on, the "START SCREEN" will appear that displays the DM-250 logo and the version number of software installed in the console. After approximately 3 seconds the "START SCREEN" will close and the setup information screen will appear shown below.:



When the ALARM SET or PRE ALARM text is reversed out, this indicates that the feature has been disabled.

(The DM-250 will automatically go into the MPH SCREEN (shown below) after an 4 second delay)



Once the "MPH SCREEN" appears, a speed sensor signal will cause the DM-250 to display the speed. *(The DM-250 is not recording at this time)* If a radar sensor is being used, waving your hand or foot in front of the radar sensor will cause the DM-250 to display a speed reading. (It is possible for the DM-250 to not give a speed reading if the calibration number is out of range)

To set the DM-250 up for recording mode see the next page.....

MPH Recording Mode

Overview:

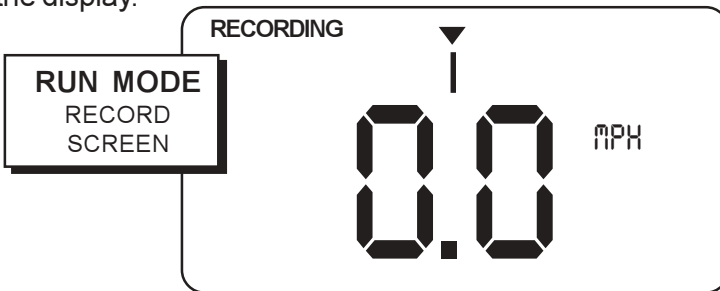
Once staged, the DM-250 will record a speed reading for every one foot of movement. Up to 300 readings (300 ft.) will be recorded and can be saved and reviewed after the pull. Four pulls total can be saved

To Enter Recording Mode:

With the DM-250 in run mode (MPH digits displayed) press the data selector knob when you are ready to start recording. The alarm will pulse and the word “STAGED” will flash on the screen.

STAGED

When the DM-250 receives speed sensor pulses, the DM-250 will begin recording the speed at every 1 foot of travel. The word “RECORDING” in the upper left side of the screen is an indication that the DM-250 is in recording mode. The DM-250 will continue to read and save MPH readings until 300 readings have been saved or the data selector is pressed. After 300 readings are collected, the words MEMORY FULL will be displayed in the upper left corner of the display.



The DM-250 will continue to record up to 300 readings even if you are unhooked and driving off the track. To end the recording mode you must rotate (**do not press**) the data selector knob to stop recording.

Rotating the data selector knob will cause the DM-250 to stop recording and the graph screen to appear.

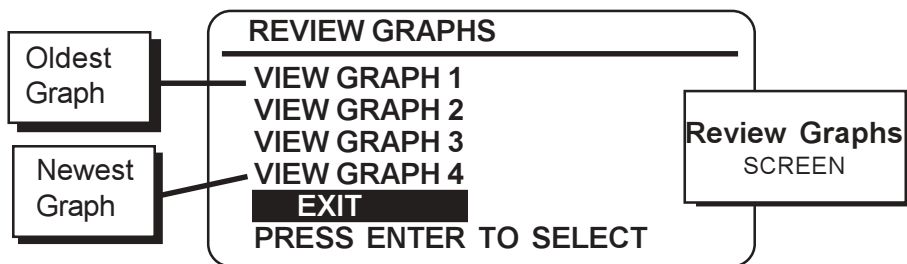
Exit the graph screen by pressing the data selector knob and a screen will appear giving the user the option to save the graph to memory for later recall or discard the graph.

NOTE!! Selecting “NO” in the SAVE GRAPH? screen will discard the recorded reading and it cannot be recalled.

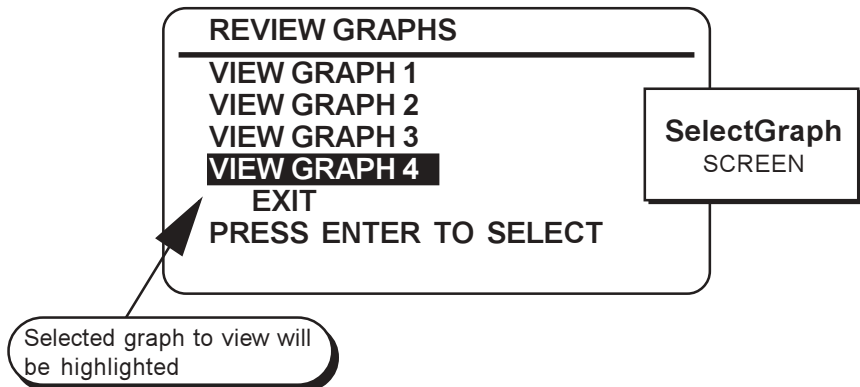
Recalling Saved Graphs

The DM-250 will save up to four graphs in memory that can be recalled. Graph 1 is the oldest graph and graph 4 will be the most recent graph saved to memory. As new graphs are saved to memory, the oldest graph will be discarded and the other saved graphs will shift down one number while placing the most recent graph in location number 4.

Rotating Data Selector Knob when in the MPH screen will display the screen below .



Rotate the data selector knob to make a selection.



To view a graph: Rotate the data selector knob and highlight a desired graph to view. The reverse text box is the graph that will be displayed.

To view the graph that is highlighted press and release the data selector knob.

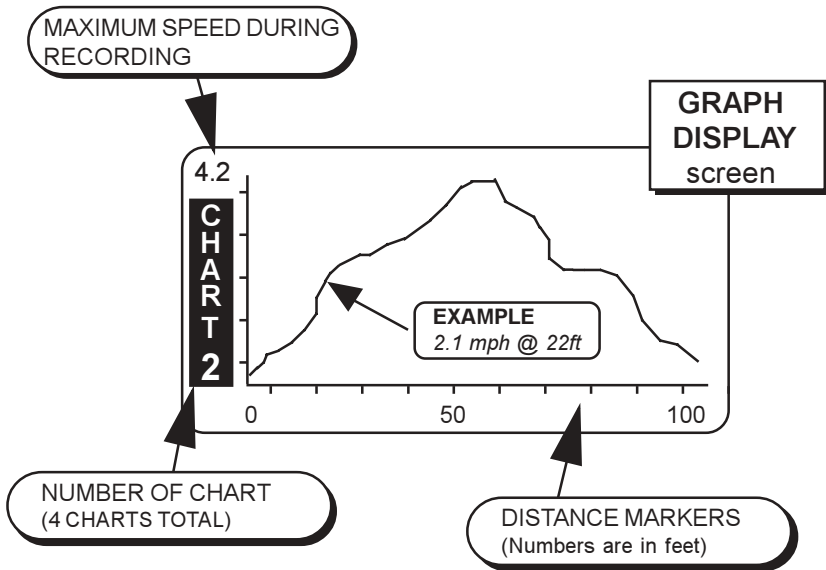
The saved graph will appear and rotating the data selector knob will allow you to scroll through the 300 feet of recording.

To exit the graph, press and release the data selector knob.

Reading the Graphs

When the DM-250 displays the graph, the MPH readings are scaled between zero and the maximum recorded speed. The number in the upper left corner of the display is the maximum speed recorded during the recording session. Half way up the chart (y-axis) will be 50% of the maximum speed, 25% will be one fourth, etc. An example graph is shown in the drawing below.

↻ Rotating the data selector knob will cause the graph to scroll left and right through the 300 ft. run.



↻ To exit the "Graph Display Screen" press the data selector knob, this will return the monitor to the "REVIEW GRAPH ?" screen.


↻ When in the "REVIEW GRAPH" screen, pressing the data selector knob will return the display to the MPH screen.

Screen Legend Map

Dm-250

Ver.x.x

By Agri-Tronix

 Rotate Knob

 Press Knob

RESOLUTION OF
25 INCHES
ALARM SET
AT 3.8 MPH.
PRE ALARM BAR
AT 0.5 MPH.

Holding knob in while powering up will cause the Dm-250 to enter the setup menus.

Setup
Menus
Set Alarm Point
Set Pre-Alarm
Drive Dist. Cal
Edit Dist. Cal

0.0 MPH

STAGED

Advances to the next screen when movement is detected

RECORDING
0.0 MPH

REVIEW GRAPHS
VIEW GRAPH 1
VIEW GRAPH 2
VIEW GRAPH 3
VIEW GRAPH 4
EXIT
PRESS ENTER TO SELECT

EDIT MPH ALARM

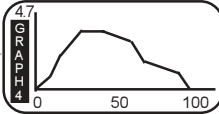
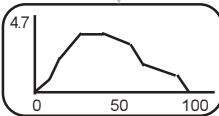
EDIT NO 03.5

EDIT PREALARM BAR ?

EDIT NO 02.5

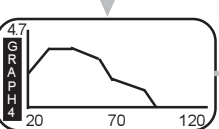
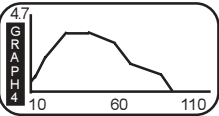
DRIVE DISTANCE CAL?

300 FEET
NO 5346



EDIT DISTANCE CAL?
EDIT NO 5346

4.2
SAVE GRAPH ?
YES
NO



GRAPH SAVED!!

GRAPH DISCARDED!!



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