



LOUP II DRILL MONITOR

OPERATION AND CALIBRATION MANUAL

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Service and Technical Support

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1.0 Operation

The Loup II Drill Monitor is a full featured monitor designed to provide accurate population and seed flow information for conventional and air drills. This manual will familiarize you with operation, calibration and technical information. All aspects and features are detailed but may not be applicable to your system configuration.

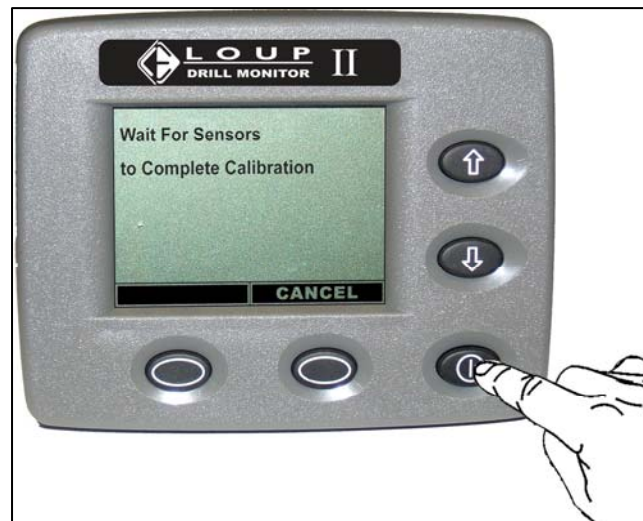
The LOUP ELECTRONICS Drill Monitor is capable of monitoring and displaying:

- Ground speed (Implemented Mounted Speed Sensor or optional Radar)
- Population in Seeds/Acre (up to 24 sensors can be connected)
- Spacing between seeds or Seeds per Foot (S/FT or IN/S)
- Three shaft speed RPM's (Left, Center & Right)
- Seed Flow (up to 112 sensors can be connected)
- Field Area
- Total area
- Three Hoppers (displayed as bargraph display)
- Weight (Measured Weight in Hoppers)
- Calc Pop (Calculated Population)
- Area Left (Calculated Value of Area to be covered with remaining seed)
- Weight/Area (Calculated Value of Area covered and seed used)

1.1 Normal Start-up

For everyday operation the Loup II monitor will remember all settings that have been saved from the previous use. Press the power button in the lower right hand corner as shown in the picture below.

The display will read "Wait for Sensors to Complete Calibration". During this time the monitor is checking all connected sensors to ensure they are working properly. Once this "self-test" is complete the monitor will display the normal operate screen.

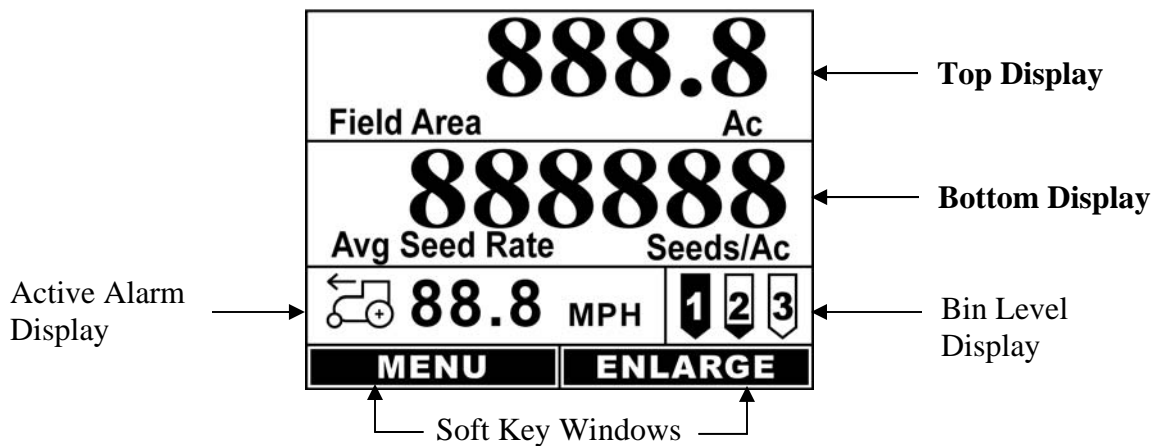


1.2 Normal Operate Screen

The Normal Operating Screen is divided into the following areas:

- 2 – Display Sections or 1 enlarged Display Section (User Chosen)
- 1 – Active alarm window or, if there are no active alarms, the current ground speed is displayed
- 1 – Bin level icon window
- 2 – Soft-key label windows

Below is a sample screen shot:



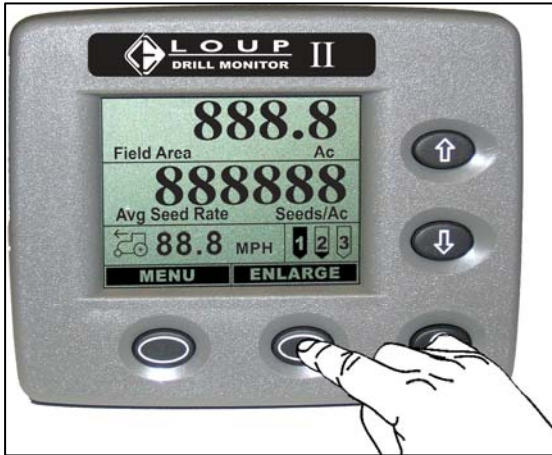
Sample of the Normal Operate Screen

In the Sample Normal Operate Screen above, the different areas are as follows:

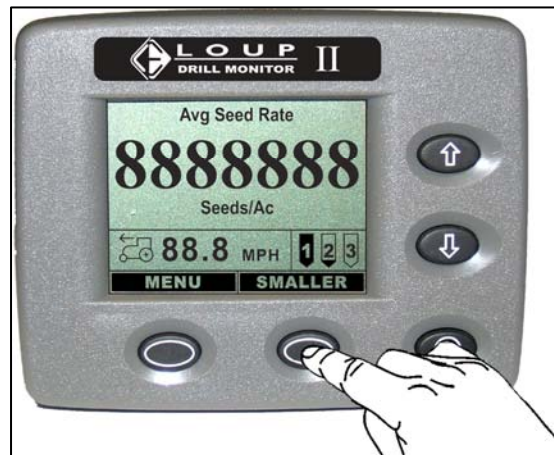
- The Top Display Section is the window with “Field Area” in it.
- The Bottom Display Section is the “Average Seed Rate” window.
- The active alarm window has the Ground Speed “88.8 MPH” displayed on it.
- The Bin Level Window is shown as 3 graphics:
 - 1 shows a full hopper
 - 2 shows an empty hopper
 - 3 shows no hopper sensor present
- The soft key windows are displaying “Menu” and “Enlarge”.

1.3 Changing Display Size

Depending on the preference of the operator, the Bottom display of the Loup II can be enlarged to make viewing easier. To change the display size press the bottom button labeled ENLARGE. Notice the button label now reads SMALLER. To return to the smaller screen press the bottom button labeled SMALLER.



Small Operate Screen



Enlarged Operate Screen

1.4 Changing Displayed Functions

The display of the Loup II monitor can be changed to show any of the available functions the operator chooses. Pressing either the UP arrow or the DOWN arrow button while at the normal operate screen will allow you to pick from a list of the available functions. Pressing the UP arrow will change the Top Display, pressing the DOWN arrow will change the Bottom Display.



-OR-



Note: The sample procedure on the next page is based on the UP arrow being pressed. The procedure is the same when the DOWN arrow is pressed.

In this sample we will change the top display from reading Field Area to Seeds per Distance (Seeds/Ft).

Having pressed the UP arrow in the Normal Operate screen, a menu screen titled “Top Display Section” is now shown. The current displayed function will be highlighted. In this sample Field Area was shown in the top display thus Area is highlighted.



Press the UP arrow until “Seeds per Distance” is highlighted. (Depending on your system set-up, some of the options shown may not be available.)

Press the “Select” button when “Seeds per Distance” is highlighted.



The “Seeds per Distance” menu is now displayed.

The “Seeds per Distance” menu provides several options to choose from.

- Auto Scrolling – Automatically scans all rows with population sensors
- Min – Displays the row that is planting the least amount of seed
- Max – Displays the row that is planting the most amount of seed
- Average – Displays the average seed spacing for all rows
- 1 – Row #1 ; 2 – Row #2 ; ect.
- Manual – Allows the Operator to manually scroll through all rows



For this example use the DOWN arrow button to highlight Average.

Press SELECT



The display now returns to the Normal Operate screen. Notice that the Top Display now reads Seeds per Foot.



1.5 Alarms

The alarm display will become active when any conditions fall below the set alarm points. For example: High or Low population, Low hopper level, No Ground Speed, Low seed flow.

All alarms operate in a similar fashion: An audible alarm will sound and an alarm message will appear on the display. This alarm display will only become active when the monitor is at its normal operating screen.

Pressing "OK" will silence all alarms. All acknowledged alarms are displayed on the normal operating screen's active alarm window until the alarm condition is fixed.

Sample alarm screens are shown on the following page.

1.5.1 Should be Seeding

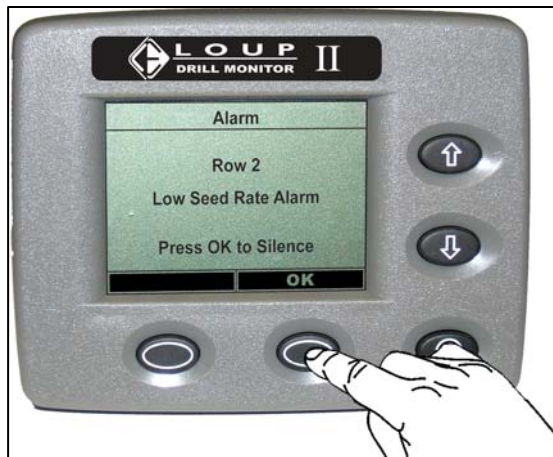
Should be Seeding alarms indicates that the implement has been out of motion for more than 30 seconds.



Acknowledged Should be Seeding alarm displayed in active alarm window

1.5.2 Low Seed Rate

A Low Seed Rate alarm occurs when the seed rate has fallen below the set alarm point. A row number will be displayed indicating which sensor is that is in alarm. In this example Row 2 has fallen below the low alarm point.



Acknowledged Low Seed Rate displayed in active alarm window

1.5.3 Empty Bin

An Empty Bin alarm occurs when the grain in the hopper has fallen below the hopper sensor indicating that the hopper is near empty. An Empty Bin alarm only occurs if your system is equipped with hopper level sensors.

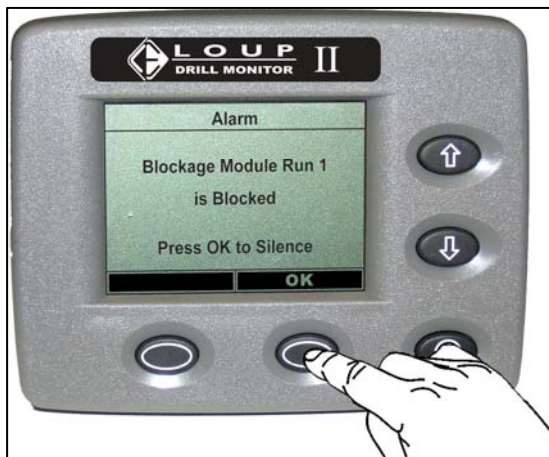


Acknowledged Empty Bin displayed in active alarm window

1.5.4 Blockage Module

Two different Blockage Module alarms may occur.

Blocked: Blockage Module Run 1 is Blocked indicates the displayed row has stopped seeding and should be cleaned.



Acknowledged Run Blocked alarm displayed in active alarm window

Bad: Blockage Module Run 1 is Bad indicates the displayed row has stopped has failed the self test. This does not mean the sensor is bad! Run a blockage calibration as shown in Section 2.7.4. If the indicated sensor will not calibrate, the sensor should be replaced.



Acknowledged Run Bad alarm displayed in active alarm window

1.5.5 Communication Error

A Communication Error occurs any time the monitor loses communication with a learned sensor. This includes Ground Speed, Shaft, Population, Hopper sensors and Blockage Modules.

If a communication error is received:

- Check that all harness connections are securely connected.
- If no loose connections are found, check all wiring to ensure the wires have not been broken



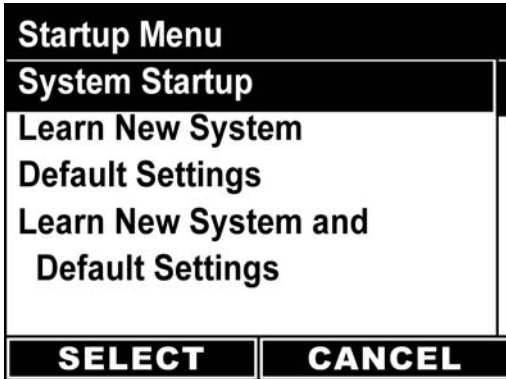
Acknowledged Communication Error displayed in active alarm window

If any of the listed alarms persist or if an alarm is displayed that is not listed contact Loup Electronics.

1.6 Special Start-up

A special start-up screen will appear when the monitor is turned on in the following circumstances:

- 1) The monitor has been learned but is unplugged from the drill.
- 2) The monitor has been learned but has lost its memory
- 3) The monitor has not been learned



- **System Start-up:** Selected for “Normal Operation”. The last used system configuration and settings will be loaded
- **Learn New System:** Special start-up used to learn all new sensors while keeping the previous system settings.
- **Default Settings:** Special start-up used to reset all sensor settings to their default setting
- **Learn New System and Default Settings:** Complete reset of the monitor. Removes all learned sensors and restores all the default sensor settings

If this screen appears and you are unsure of what to do contact Loup Electronics.

1.6.1 Learn New System

The learn mode is a onetime process that identifies each sensor with the monitor. Before entering the Learn Mode, be sure to unplug all the sensors that have a 3-pin connector, i.e. Ground Speed Sensor, Fan Sensor, Shaft Sensors, Hopper Sensors, Population Sensors & Blockage Modules. (Blockage Sensors have a 2-pin connector and can be plugged into their appropriate connection on the blockage harness.)

Procedure:

1. Press the Power Button to turn the monitor on.
2. Press the DOWN arrow to highlight Learn New System and Default Settings
3. Press SELECT





4. A warning message now appears asking **Are you Sure?** Press **SELECT** to proceed or press **CANCEL** to exit.



5. Install New System – Plug your sensors in as the monitor asks for them. For sensors that are unavailable, press **SELECT** to **Skip this Sensor**.

The first sensor the monitor will look for is a Speed sensor. This is an implement-mounted sensor monitoring a shaft. Plug it in now. If no speed sensor is mounted on the drill, press **SELECT** to **Skip this Sensor**.

Once the speed sensor has been accepted or skipped, the monitor will move to the next sensor. The order the monitor will ask for sensors is shown below.

- Speed
- Shaft 1
- Bin 1
- Shaft 2
- Bin 2
- Shaft 3
- Bin 3
- Seed 1 through 24 (population sensors)
- Blockage Module 1 through 8

Note: If during the Learn Mode you receive a **Wrong Sensor Type for:** message, the monitor is “seeing” a type of sensor other than what is required for this function. For example: This message would appear if monitor asks for **Shaft 1** but a hopper sensor is plugged in.



6. When all sensors have been plugged in or skipped the monitor will display Installation Complete.
7. Press SELECT. The monitor will display the Normal Operate Screen.



Note: It is recommended that you turn the monitor off and back on to ensure the Learn Mode was completed properly. If the **Startup Menu** appears when the monitor is turned on, check that the monitor has not been disconnected from the harness. If a sensor **Missed** or **Wrong Sensor Type** for message appears, check that all harness connections are secure. If no connections are unplugged it may be necessary to Re-Learn the system.

If problems persist, contact Loup Electronics

2.0 System Settings

Pressing the MENU button on the Normal Operate Screen will access your system settings.

Use the DOWN arrow to highlight the desired menu. Press the SELECT button to enter the selected menu item.

Theses settings should be reviewed and changed as necessary.



Important: All new systems must have to proper Row Spacing, Implement width and ground speed to give accurate population readings. A Ground Speed Calibration must be done on all new systems (See section 2.3.5). Systems that including blockage sensors must perform a Blockage Calibration (See Section 2.7.4)

2.1 Installation

2.1.1 Install New System

Install New System allows you to overwrite the existing Sensor setup. Refer to Section 1.6.1 for information on Learning a new system.

2.1.2 Replace a Sensor

Replace a Sensor allows you to replace a bad sensor without re-learning the system. This refers only to Learned Sensors; i.e. Shaft Sensors, hopper sensors, population sensors and blockage modules.

2.1.3 Add a Sensor

Add a Sensor allows you to add a new sensor without re-learning the system. This refers only to Learned Sensors; i.e. Shaft Sensors, hopper sensors, population sensors and blockage modules.

2.1.4 Remove a Sensor

Remove a Sensor allows you to remove a sensor from your existing system without re-learning the system. This refers only to Learned Sensors; i.e. Shaft Sensors, hopper sensors, population sensors and blockage modules.



2.2 Implement Setup

2.2.1 Units

The Units setting changes the units of measure that the monitor displays

Imperial = Acres/Feet/Miles per Hour

Metric = Hectares/Meters/ Kilometers per Hour

2.2.2 Implement Width

Adjust accordingly to the size of your drill (i.e. 15ft, 20ft, 30ft, 40ft)

2.2.3 Clear Field Area

Use to zero or clear your Field Acres

2.2.4 Clear Total Area

Use to zero or clear your Total Acres



2.3 Speed Settings

2.3.1 Pulses Per Rev

Pulses per Rev (revolution) are the number of magnets the implement mounted speed sensor sees in one revolution of the shaft being monitored. For most applications this number will remain 4.

2.3.2 Wheel Pulses Per 400Ft

This is the ground speed calibration number for a implement mounted speed sensor. Refer to section 2.3.5 for calibration instructions. The default number is 175

2.3.3 Radar Pulses Per 400 Ft

This is the ground speed calibration number for a radar speed sensor. Refer to section 2.3.5 for calibration instructions. The default number is 15151

2.3.4 Lift Switch

Lift Switch is used to tell the monitor if a lift sensor is being used to determine when you are seeding and when you are not. The Lift Sensor is used when shaft rotation cannot be used or a variable rate drive, common on air seeders, is being used.

If a Lift switch is to be used, a clutch activated shaft sensor must be learned as Shaft 1 and this setting must be set to **ENABLED**.

2.3.5 Speed Calibration

All new systems require a ground speed calibration to ensure accurate population readings, accurate area totals and accurate ground speed readings. To complete the calibration, measure a course 400 feet long preferably on level ground with a start and finish point. The drill must be in the down position throughout this procedure.

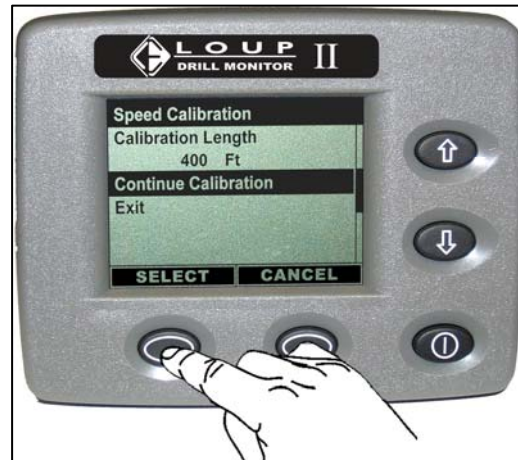
Note: During the calibration the monitor is looking for the number of pulses produced from the drill mounted sensor or in the case of radar, the number of radar pulses. The monitor will not display 400 when the speed calibration is complete rather it will display the pulses counted in 400 feet.



Procedure:



1. From the Speed Settings menu Highlight Speed Calibration and press SELECT



2. Press SELECT again on Continue Calibration



3. The display will now say **Start Driving**. With the drill in the down position, drive the 400-foot course. As you drive the pulses receive will begin counting up.



4. Press SELECT at the end of the 400-foot course to Exit and Save
Note: The 235 under Wheel Pulses Received is for illustration purposes only.

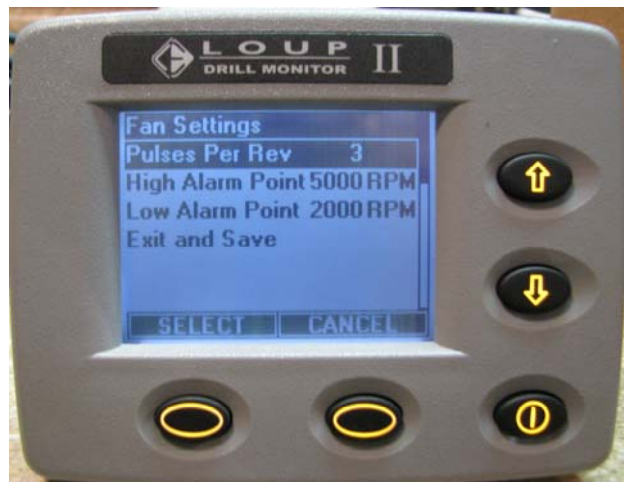
5. The display is now back at the Speed Settings menu. Notice the Wheel Pulses Per 400 feet has changed to the calibrated number. (The number shown is for illustration purposes only).



2.4 Fan Settings

2.4.1 Pulses per Rev

This is the number of pulses produced by the fan sensor in one revolution. The pulse setting is equal to the number of targets presented to the fan sensor in one revolution.



2.4.2 Low Alarm Point

The Low Alarm Limit is set by the user for low rpm notification. Default is 1500 RPM

2.4.3 High Alarm Point

The High Alarm Limit is set by the user for high rpm notification. Default is 5500 RPM.

**Fan RPM above the High Alarm Point or Below the Low Alarm Point will cause an alarm condition that cannot be acknowledged.

2.5 Bin Settings

Bin Settings allow the operator to Enable and Disable the alarms for Hopper Level Sensor. By default, these will be set to Enable when Hopper Sensors are Learned.

If your system does not include hopper sensors, this menu will not be available



2.6 Shaft Settings



2.6.1 Pulses per Rev

Pulses per Rev (revolution) are the number of magnets the associated sensor sees in one revolution of the shaft being monitored. For most applications this number will remain 2. Changing this number to 0 will turn the sensor OFF.

2.6.2 Low Alarm Point

The Low Alarm Point is set as a reference point for the alarm. If the shaft turns slower than this designated point, an alarm will sound.

2.7 Seed Settings

2.7.1 Low Alarm Point

The Low Alarm Point is set as a reference point for the population alarm. If the seed population drops below this designated point, an alarm will sound.

Default = 50,000 Seeds per Acre

2.7.2 High Alarm Point

The High Alarm Point is set as a reference point for the population alarm. If the seed population goes above this designated point, an alarm will sound.

Default = 500,000 Seeds per Acre

2.7.3 Row Spacing

The Row Spacing must be set to give accurate population readings. Adjust accordingly.

Default = 7.5 inches

2.7.4 Machine Type

The Machine Type setting tells the monitor what kind of machine is being used and the type of grain being planted. This setting will have a big influence on population readings. Make sure this is set appropriately.

Options

- Drill (conventional)
- Air Seeder at High Rate (such as wheat)
- Air Seeder at Low Rate (such as soybeans)

Default = Drill

2.7.5 Population Adjust

The Population Adjust setting will influence your population by a set percentage. This should only be used if population counts are consistently low by a specific percent.

Default = 0



2.8 Blockage Module Settings

The Blockage Module Settings only affect those systems with Blockage Sensors (single sided sensor detecting seed flow only). A blockage module is large box mounted to the frame of the drill that blockage sensors are connected to.

Note: If the menu shows Number of Modules 0, this indicates that there are no blockage modules or sensors being used with the current system.



2.8.1 Runs per Module Setup

The Runs per Module setting will adjust the number of Blockage Sensors that are connected to the selected module

Default = 16

2.8.2 Individual Runs Setup

The Individual Runs Setup allows you turn specific blockage sensors on (Enable) and off (Disable).

Default = Enabled (all rows are on)

2.8.3 Blockage Module Test

The Blockage Module Test can be used to check communication from the monitor and the modules.

2.8.4 Blockage Calibration

A blockage calibration must be done for proper operation of the blockage sensors. This procedure should be done when changing seed rates or seed varieties i.e. Soybeans to Wheat.

Procedure (Continued on next page):



1. Enter the Calibration mode by highlighting Blockage Calibration and pressing SELECT



2. Begin driving at a normal speed. You must be planting through this entire process.

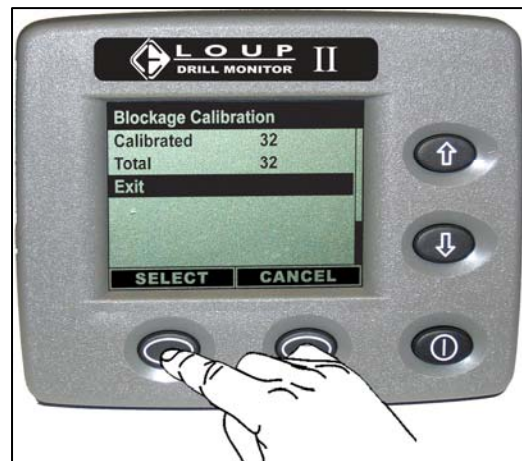
3. As you drive the display will show the number of row that have been calibrated on the second line. The third line shows the Total number of rows.



Note: The number 32 is for illustration purposes only. Your number may be different.

4. When the Calibrated row equals the Total Calibration is complete.

Press SELECT to Exit



2.9 Weight Settings

The Weight Settings are only applicable if your system is equipped with a JP43 Scale Interface.

2.9.1 Seeds/Lb

This is a user entered value for the number of seeds per pound for the crop being planted. This number can be taken from the seed tag supplied with the purchased seed or a measured weight of seed can be counted and calculated. The Seeds/Lb value is entered to the nearest 100 seeds/Lb. with a range of 1,000 to 150,000 seeds per pound.



NOTE: If an inaccurate number is entered for this value, the calculated population per acre value will be inaccurate.

2.9.2 Min Area Before Calc Pop Start

This is a user defined value that sets the minimum area that must be seeded before the Loup II Drill Monitor has enough scale and area information to accurately calculate population rates. The minimum value is .5 acre and the max value is 10 acres. If seeding stops before this minimum value is attained then the Loup II Drill Monitor will not report back Calculated population, Area Left, or Applied weight information when forward travel drops below 2 MPH. It will accumulate this information until the “Minimum Area Before Calc Pop Starts” value is reached and display the information the next time the forward travel speed has dropped below 2 MPH. Seeds such as Soybeans and wheat applied at normal rates will show enough weight change in $\frac{1}{2}$ - $\frac{3}{4}$ of an acre to provide accurate results. Crops planted at very low application rates or very low density crops may require a larger coverage area to give accurate results for calibration.

2.9.2 Reset Weight Calculations

Selecting this menu option resets the acre accumulation and all previous population, acres left to plant, and applied weight per acre information to zero. This menu choice must be selected each time the drill is reset due to a desired application rate change, seed size change, or crop type change. The minimum area before calc pop starts is reset to zero as well and must be covered again before information is reported by the Loup II Drill Monitor.

NOTE: Resetting the field acres in the Implement Settings menu also resets the weight calculation. Resetting the total acres has no effect on these functions.

2.10 Global Settings

2.10.1 Volume/Pitch

Volume/Pitch will adjust the sound of the audible alarm

Default = 50% Range = 0% – 100%

2.10.2 Backlight

Backlight adjust the brightness of the display

Default = 50% Range = 0% – 100%

2.10.3 Contrast

Contrast adjust the contrast of the display

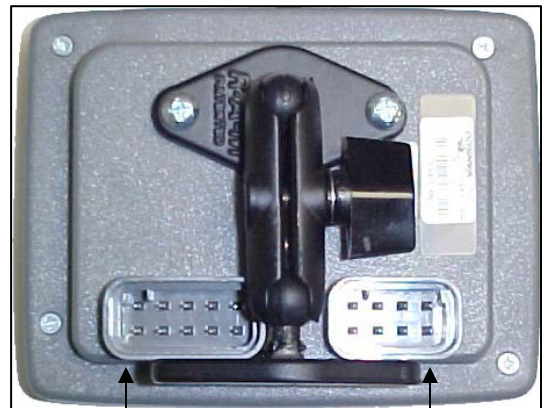
Default = 100% Range = 0% – 150%



3.0 General Installation

3.1 Console

The console installation varies based on the operator's personal preference and the available space for the console. Loup Electronics has attempted to keep the size of the console to a minimum to allow you to find the best location within the cab to mount your console. A RAM mounting bracket and two #10 screws have been supplied for mounting purposes.



J1: Used by the supplied Console Cable

J2: Optional JP43 Scale Interface Cable

3.2 Sensors

Each sensor has a specific installation instruction packaged with the sensor. These instructions will describe and illustrate the location and procedure for proper installation.

3.3 Wire Connections (Loup II DM Only)

There are only four types of connections that can be made to the monitor: Power (2 ring terminals), Hitch Connection (3 pin shroud connector) and Optional Speed Connection (3 pin tower connector).

3.3.1 Radar Connection

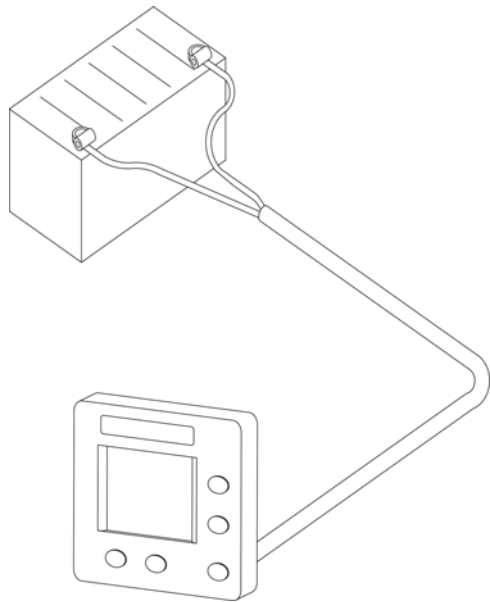
A 3-pin tower connector is available to be connected to Radar if desired. A Mux Adapter Sensor and Mux to Radar Cable will be required. Once this kit is installed per included instructions, the Radar Connections are as follows.

Radar Connection: AMP CPC connector
Pin 1: Ground
Pin 2: Radar signal
Pin 3: +12 V to RADAR
Pin 4: Enable

3.3.2 Power Connection

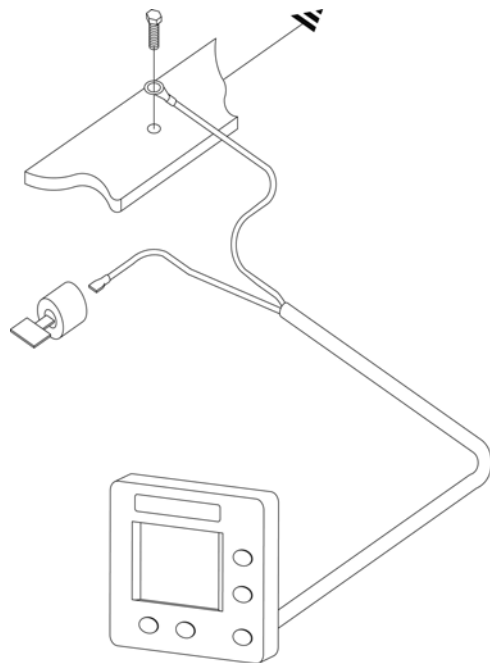
The monitor requires 12 volts to operate. Power can be acquired through a direct connection to the battery, connecting to the ignition circuit or using an auxiliary plug.

Power connection: Red: +12 V (Positive)
Black: Ground (Negative)



Power Connection direct to Battery

-OR-



Power Connection to ignition

Note: The monitor will not power on if it is connected to 6 volts and will not withstand 24 volts without incurring damage.

3.3.3 Harness Connections

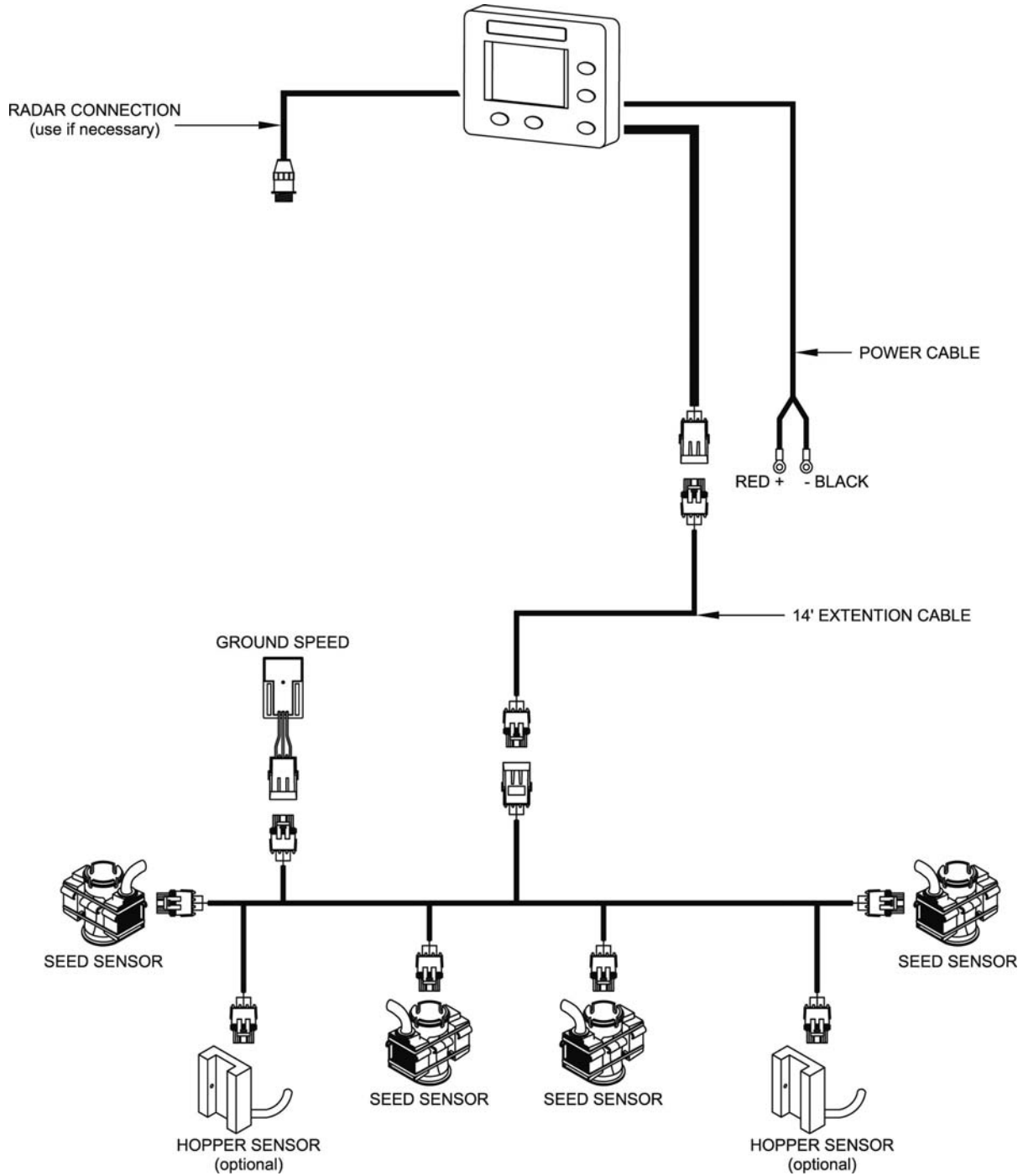
The Loup II drill monitor uses 'smart sensor' technology. This means that all of the sensors share the same wires for power, ground and communication.

Sensor connection: 3-pin Packard Weather Pak Connector
Pin A: +12 V (White)
Pin B: Ground (Black)
Pin C: Data (Green)

The harness is installed on the drill frame and varies from one drill make and model to the next. Each harness is built specifically to fit the drill that you have and accommodate the sensors that were ordered with the system. There is only one connector that the Hitch Extension cable will mate to and this connector will be marked "TO MONITOR" or "TO HITCH". The main precaution is to secure this harness out of the way of moving parts.

Within the harness, all the 'like' wires are shorted together, (all the white wires are connected together, all the black wires are connected together, and all the green wires are connected together). Thus there is continuity between all of the 'like' wires.

3.4 Basic Wire Diagram



Notes: