ISOBUS Dry Rate Controller Operation Manual
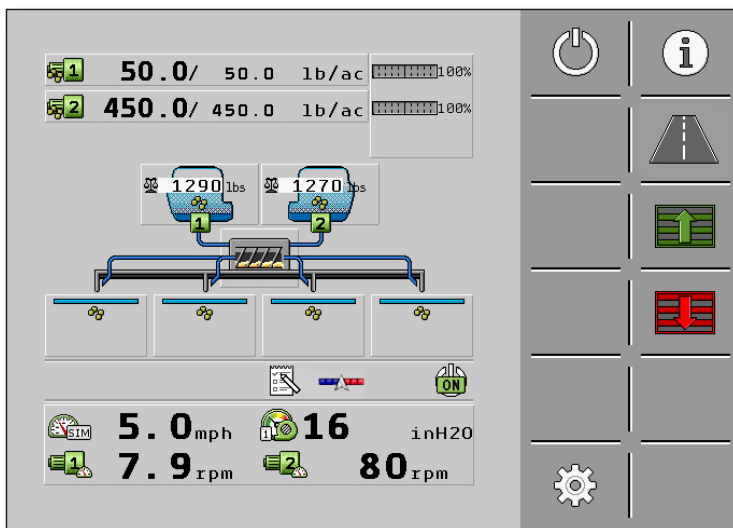
Read and follow these operating instructions.

Keep this operating instructions for future reference.

Table of Contents

1 For Your Safety
1.1 Basic Safety Instructions

Operation

Be sure to always comply with the following instructions during operation:

- Read the operating instructions to the agricultural device which you want to control by using the product.

- Before you leave the vehicle cabin, ensure all automatic mechanisms are deactivated or manual mode is activated.

- Keep children away from the implement and from the ECU.

Servicing

Keep the system in a functional condition. To do so, follow these instructions:

- Do not make any unauthorized modifications to the product. Unauthorized modifications or use may impair safety and reduce the service life or operability of the unit. Modifications are considered unauthorized if they are not described in the product documentation.

- Never remove any safety mechanisms or stickers from the product.

- Before charging the tractor battery, always disconnect the ECU from the tractor.

- The product does not include any user serviceable parts. Do not open the casing.

1.2 Intended Use

The ECU is only intended for use in the agricultural sector. The manufacturer is not liable for any other installation or use of the ECU.

The manufacturer cannot be held liable for any personal injury or property damage resulting from such non-compliance. All risk arising from improper use lies with the user.

Intended use also includes compliance with the conditions for operation and repairs prescribed by the manufacturer.

All applicable accident prevention regulations and all other generally recognized safety, industrial, and medical standards, as well as, all road traffic laws must be observed. Any unauthorized modifications made to the equipment will void the manufacturer's warranty.

1.3 Layout and Meaning of Warnings

All safety instructions found in these Operating Instructions are composed in accordance with the following pattern:

⚠️	⚠️ **WARNING**
	This signal word identifies medium-risk hazards, which could potentially cause death or serious physical injury, if not avoided.

⚠️	⚠️ **CAUTION**
	This signal word identifies hazards that could potentially cause minor or moderate physical injury or damage to property, if not avoided.

NOTICE

This signal word identifies hazards that could potentially cause damage to property, if not avoided.

There are some actions that need to be performed in several steps. If there is a risk involved in carrying out any of these steps, a safety warning will appear in the instructions themselves.

Safety instructions always directly precede the step involving risk and can be identified by their bold font type and a signal word.

Example:

1. **NOTICE! This is a notice. It warns that there is a risk involved in the next step.**
2. Step involving risk.

1.4 Safety Stickers on the Product

🚫	Do not clean with a high-pressure cleaner.

1.5 Disposal

When it has reached the end of its service life, please dispose of this product as electronic scrap in accordance with all applicable waste management laws.

2 About the ECU

2.1 ECU Functions

The ISOBUS ECU is the control center of the Dry Rate Controller. Several sensors are connected to the ECU, which monitors important implement parts. The ECU controls the implement based on these signals and on the operator's specifications. An ISOBUS terminal serves as an interface. All implement specific data is stored in the ECU and is therefore maintained even when changing the display.

Among other things, the ECU can perform the following tasks:

- Monitoring of the metering shaft
- Control of the tramline valves
- Starting the calibration using the calibration button
- Control of the pre-emergence marker
- Monitoring of the fan speed

2.2 System Overview

The image below shows the cabling diagram for the Dry Rate Control System.

Montag ISOBUS Harness
ME0514006

ECU Connector

Implement Switch

Ground Speed

Aux

Hydraulic Alarm

Bin 1 Gate **GRAY**

GRAY PWM Meter 1

Encoder Hopper 1

BROWN PWM Meter 2

Bin 2 Gate **BROWN**

GREEN Open Gate

Encoder Hopper 2

RED Close Gate
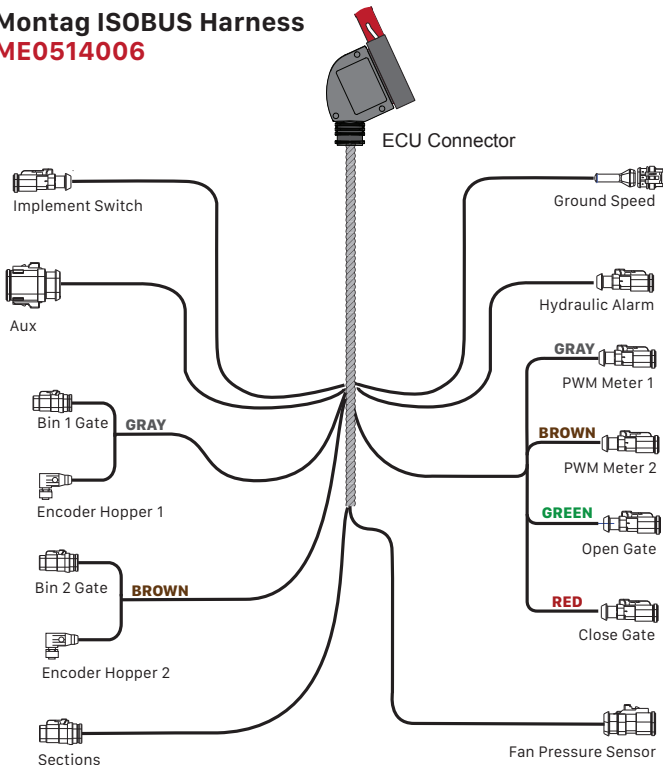
Sections

Fan Pressure Sensor

The following diagram shows how the Dry Rate Controller is structured:
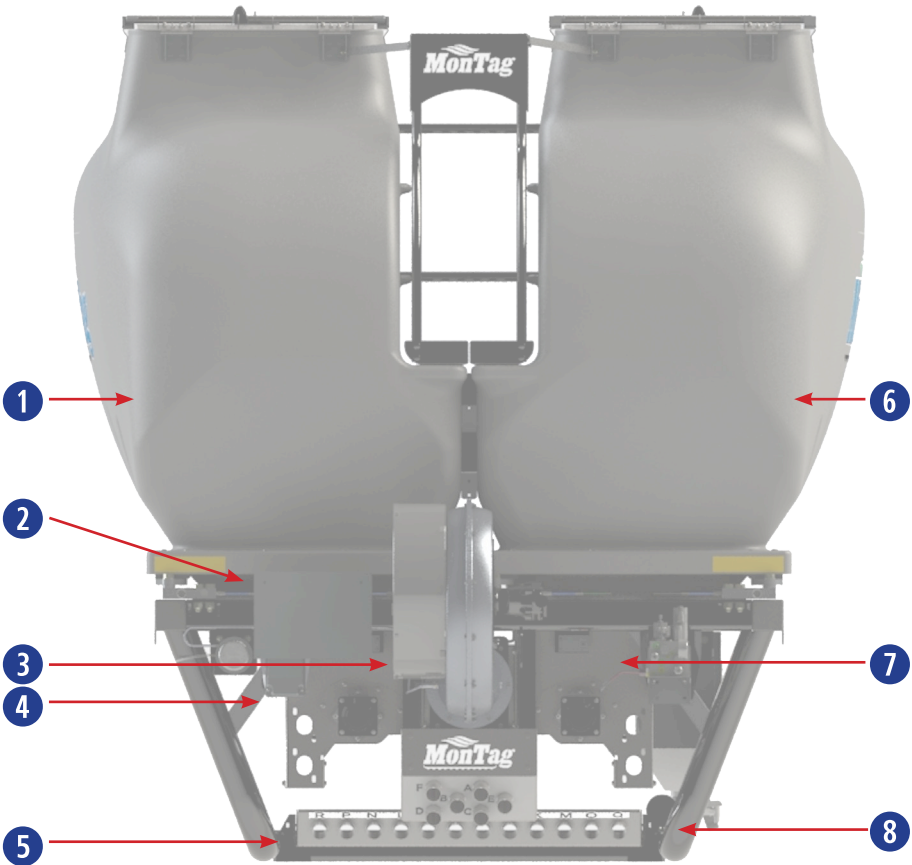
1	Hopper 2	**5**	Hopper 2 Encoder
2	ECU Control Enclosure	**6**	Hopper 1
3	Pressure Sensor	**7**	PWM Sections Case Drain
4	DigiStar Mount	**8**	Hopper 1 Encoder

2.3 Information on the Identification Label

On the outside of the ECU, you will find an Identification Label. The sticker provides a unique ECU identification.

3 About the Operating Instructions

3.1 Who is the Target User for the Operating Instructions?

These Operating Instructions are intended for operators of the Dry Rate Controller equipped with an ISOBUS ECU from Mueller-Electronics.

3.2 Scope of the Instructions

These instructions describe all of the functions that can be actuated with the ECU. This means that some chapters may not be relevant for the operation of certain implements.

3.3 Directional Information in the Instructions

All directional information in these instructions, such as "left", "right", "forward", "back", is relative to the movement direction of the vehicle.

3.4 Layout of Operating Instructions

The operating instructions explain step by step how you can perform certain operations with the product.

We use the following symbols throughout these Operating Instructions to identify different operating instructions:

Type of depiction	Meaning
1. 2.	Actions that must be performed in succession.
→	**Result of the action** - This will happen when you perform an action.
→	**Result of an operating instruction** - This will happen when you have completed all steps.
☑	**Requirements** - In the event that any requirements have been specified, these must be met before an action can be performed.

3.5 Layout of References

If any references are given in these Operating Instructions, they will appear as: Example of a reference: [→ 11]

References can be identified by their square brackets and an arrow. The number following the arrow shows you on what page the section starts where you can find further information.

4 Basic Control Principles

4.1 Powering Up the ISOBUS ECU

You can switch on the ISOBUS ECU as follows:

1. Supply the ECU with power. This can be done in the following ways:

   a) For ISOBUS tractors: Switch the tractor on using the ignition key.

   b) For non-ISOBUS tractors: Switch on the display.

2. You have switched on the ECU.

4.2 Powering Down the ISOBUS ECU

Always switch off the ECU in the following situations:

- When you have finished work.
- Before you leave the field.

You can switch off the ECU as follows:

1. Stop the tractor.

   → The ISOBUS ECU closes all the valves.

2. Switch application off by pressing the Master icon.

   → The application indicators beneath the icon of the implement are faded out.
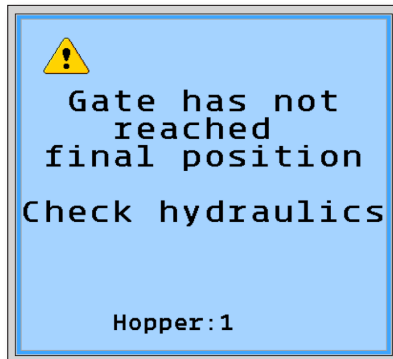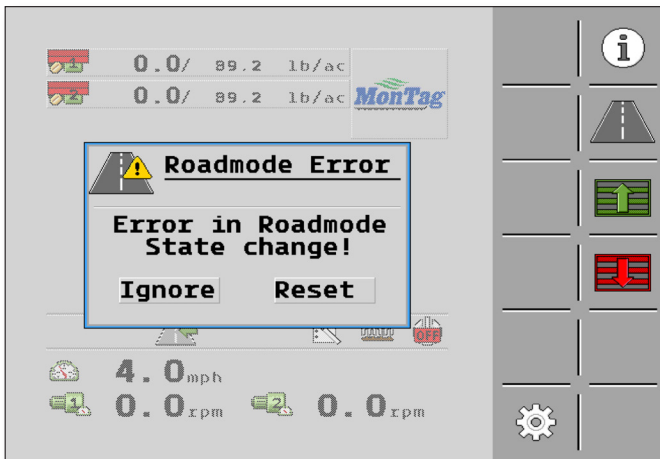
3. Activate Road Mode by pressing the Road icon.

Road Mode should be used whenever you are transporting the air cart to and from the field. This status disables all application and puts the control system in a state for out of the field travel.

When entering Road Mode, the machine will automatically close the hopper gates, once the gates are closed the meters will turn at 35% PWM output for 10 seconds to remove any remaining material from the meters. Confirm all sections are in the **BLUE** state. If in overlap or the sections are turned OFF manually, sections will not turn ON when running the cleanout process. This may result in the outputs becoming plugged.

If the gates do not close completely a warning message will appear showing the following:

```
        ⚠️

    Gate has not
       reached
   final position

  Check hydraulics



        Hopper:1
```

After acknowledging the warning a pop-up window will show:

```
   0.0/  89.2  lb/ac
   0.0/  89.2  lb/ac  MonTag

   ⚠️ Roadmode Error

   Error in Roadmode
      State change!

   Ignore      Reset



   4.0 mph
   0.0 rpm    0.0 rpm
```

4. Switch off the tractor at the ignition switch, and ensure that the display is switched off.

→ You have switched off the ECU.

4.3 ISOBUS ECU Symbol on a Display

You can recognize the ISOBUS ECU existence on your display by the Montag implement icon on the display. Press the icon to launch the ISOBUS Dry Rate Control System.

4.4 Browsing Between Screens

There are function icons that will advance you to the function screen desired. You can touch these (on a touch-screen) or press a function key beside the icon (on a non-touch display) to perform a function.

	Pressing the back arrow icon returns you to the previous screen. There are some screens that have too many functions to display them all on one screen. In these screens, you may need to browse further.
⦾⦾⦾	The three dots icon inform you that you can browse to the next screen. Pressing this icon also to toggle between Tank 1 & Tank 2 parameters.

4.5 Run Screen

The Run Screen is always displayed during work and contains the most important information. It informs you about the status of the Dry Rate Control System. Depending on the implement equipment, not all of the icons are always shown.

The Run Screen is divided into 4 areas.
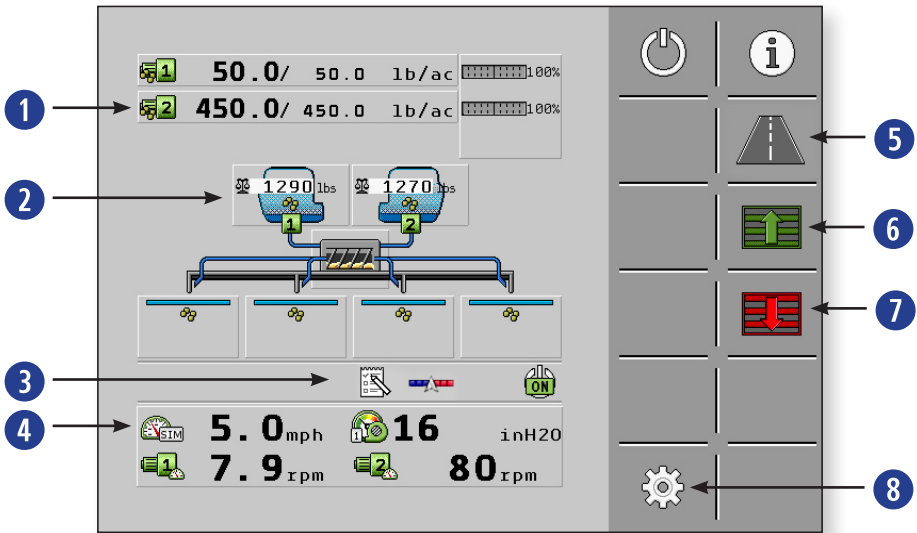
1	Hopper Target/Actual Rates
2	Dry Rate Controller Display Area
3	Status Line
4	Visible Values
5	Activate Road Mode
6	Gate Open
7	Gate Close
8	Settings

4.5.1 Hopper Target / Actual Rates

This area displays information on the Target Rate, Actual Rate, and the Delta Target being applied.
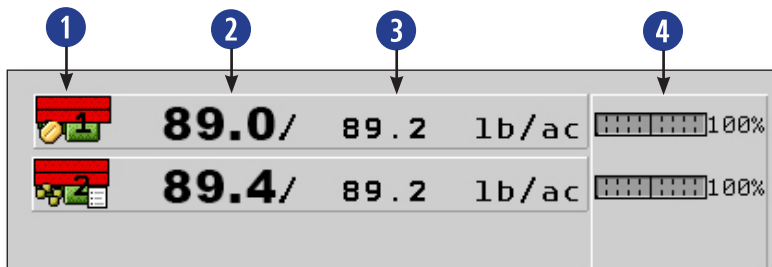
1	**Metering Drive Number** These icons indicate the number of drives that are setup in the system.	**3**	**Target Rate** This area will display the current Target Rate as set by operator.
2	**Actual Rate** This displays the actual As Applied rate	**4**	**Delta Target Rate Level** The bar graph provides feedback for the Delta Target Rate or by prescription.

Meter Drive Icons	Description
	Gate fully open
	Gate fully closed
	Gate partially open and calibrated.
	Gate partially open with no calibration factor. *(Possible failed sensor)*
	Gate fully open with no calibration factor
	Gate partially open with the meter turned off.
	Gate fully open and being controlled by a prescription.

4.5.2 Dry Rate Controller Display Area

This area of the Run Screen provides feedback of Dry Rate Controller operation.
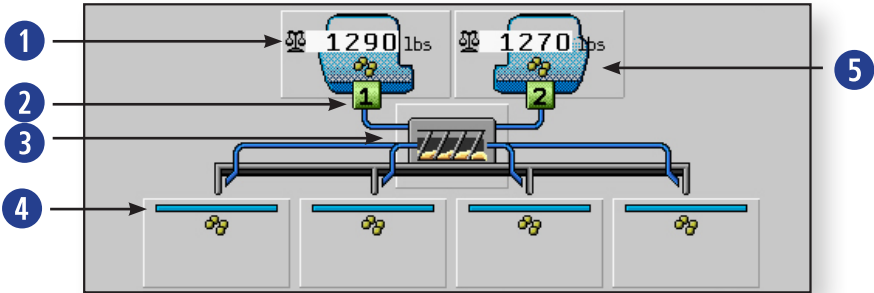
1	Hopper Weight - customer defined: actual or calculated
2	Hopper Number
3	Prime button to fill auger
4	Section ON/OFF Indicator - **BLUE** = sections on, **GREY** = sections manually off, **RED** = sections turned off by section control
5	Product Type - seed or solid

Each hopper can be pressed to show detailed information when the Master icon is on. This information includes product name, product density, product calibration, weight (scale, if installed, and virtual), and target rate.
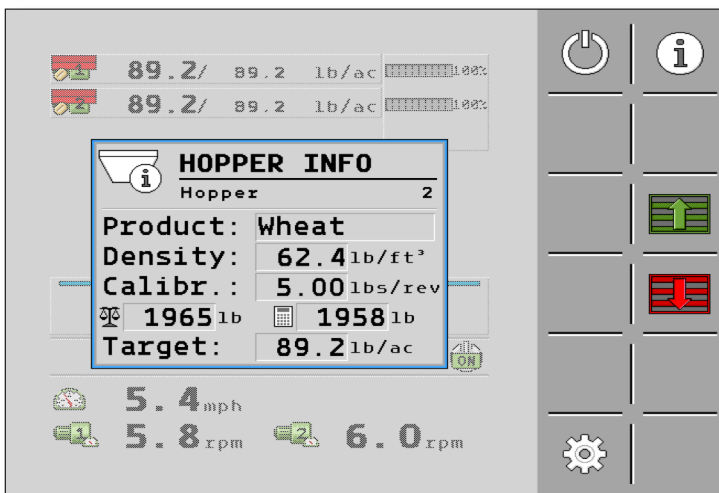
4.5.3 Status Line

The following information is shown in this area.
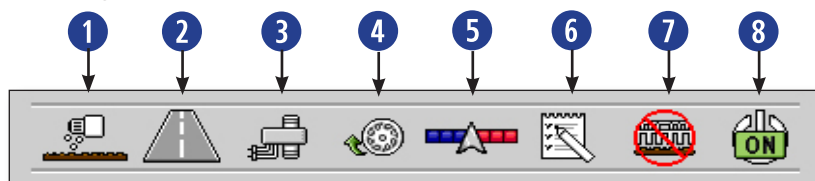
①	**Active Calibration** - displays when calibration is active *(when 'no catch test' is selected)*
②	**Road Mode indicator** - displays when the system is in Road Mode
③	**Blockage System** - displays icon when a row has blockage
④	**Prime indicator** - displays when the auger is being filled
⑤	**Section Control indicator** - displays when Section Control is active
⑥	**Task Controller indicator** - display when using Task Controller
⑦	**Work Position** - displays the status of the implement *(red line means inactive & the implement is raised)*
⑧	**Master ON/OFF indicator** - displays the status of the Master switch

Section Control

This symbol will be shown in the Status Line when automatic section control from the TC (Task Controller) is enabled and is controlling the application on and off function. As the machine crosses previously applied areas and borders, it will turn off application.

4.5.4 Visible Values

The following information is shown in this area.

If you have more than 4 items setup in the Visible Values, you can press the display to cycle through and see the additional items.
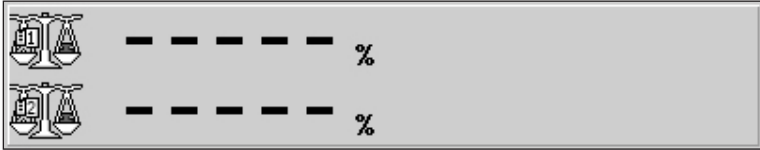
①	Speed Source and MPH
②	Auger 1 RPM
③	Fan Pressure
④	Auger 2 RPM
⑤	Weigh System Tank 1
⑥	Weigh System Tank 2

To configure the Dry Rate Controller Display area, Status Line, and Visible Values, refer to section **4.7.4 Run Screen Configuration** [→ 40].

4.5.5 Function Buttons

There are function buttons located on the right side of the screen. Each icon located on the function button depicts what the button is assigned to do.

	Sections Master Switch - Starts applying. The Regulation loop is active.
	Results Icon - Tracks how much of each product has been applied.
	Road Mode - Activates Road Mode when pressed for transporting the implement. Refer to implement manual for operating instructions.
	Blockage Icon - Allows the sensitivity of the Blockage System to be adjusted.
	Tramline Icon - Allows the setup of Tramlines.
	Gate Open - Tap the icon to open the gate incrementally. Press and hold the icon to open the gate completely.
	Gate Close - Tap the icon to close the gate incrementally. Press and hold the icon to close the gate completely.
	Succession Hopper Switch - This icon appears on the Run Screen when the hopper succession is setup [➡ 21]. Pressing the icon will manually switch the bins (turn bin 1 off, turn bin 2 on, and vise versa).

4.6 Settings Screen

Pressing the Setting icon on the Run Screen brings up a second page with 9 different areas to adjust settings.
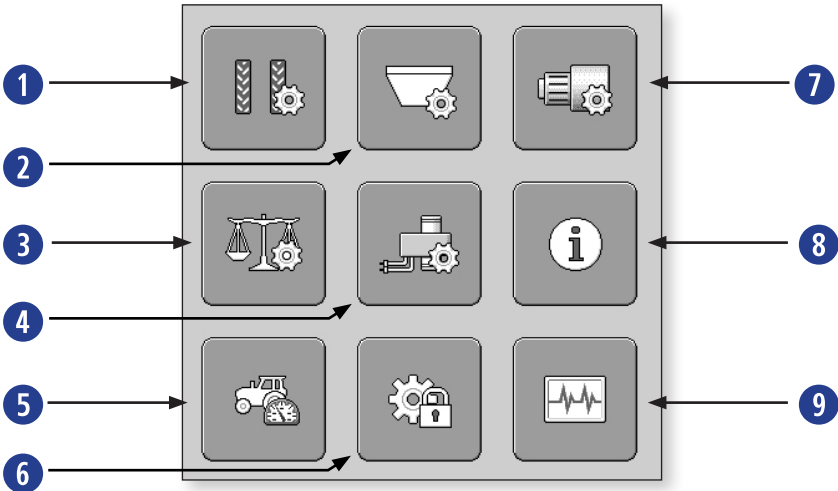
①	Tramline Settings	⑥	Configuration Settings
②	Hopper Settings	⑦	Metering Drives Settings
③	Weigh System Settings	⑧	Results
④	Blockage System Settings	⑨	Diagnostics
⑤	Speed Source Settings		

4.6.1 Hopper Settings

The Hopper Settings allow you to choose the product for each hopper, add a Succession Hopper, setup an Associated Shoot, and enable or disable a hopper.

To access the Hopper Settings from the Run Screen, press Settings. Press the Hopper Settings icon.

<u>**Choosing a Product for a Hopper**</u>

To choose or change a product for a hopper, press the selectable area under Associated Product. Select the product from the pop-up menu and press the checkmark to save the selection. To change or add a product to the menu, see the Product Configuration section. [→ 44] Density will default to the product database density.

<u>**Density**</u>

Measure and enter the correct density of the product in the hopper by touching the selectable area.

<u>**Succession Hopper**</u>

This feature is used to link hoppers together. This would apply when running a single product in multiple hoppers. The machine would then automatically change from any empty hopper to a full hopper automatically while in working mode.

There are two ways the system can automatically change from one hopper to the next. The first is if the entered amount went to zero in the previous hopper. Or if equipped with a level sensor, the amount fell below the level sensor.

To set this up, the operator would choose a hopper to be unloaded first then make the next hopper the succession hopper.

Press the selectable area under Succession Hopper to link the hoppers. Select the hopper number from the pop-up menu and press the checkmark to save the selection. Notice the hoppers are now visually linked on the Run Screen.
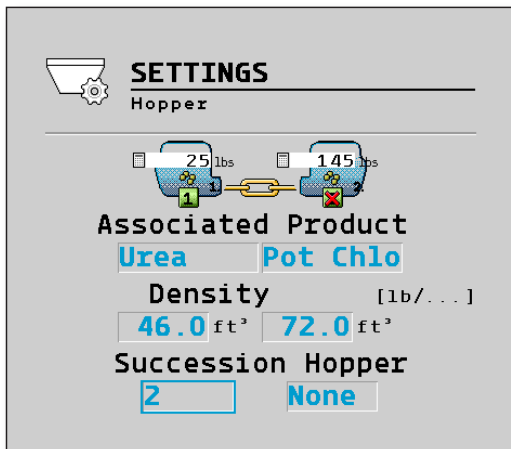
<u>**Scale Weight & Virtual Weight**</u>

	Pressing this icon allows users with scales to set virtual weight. The icon is only available when the unit is stationary (less than .6 MPH) and will set the virtual weight to match the scale weight. This is the only way to change virtual weight for machines using scales. After filling the hoppers, the weights should be synced to allow proper weight/rate calculations.
	Pressing this icon will toggle between scale weight and virtual weight. Hopper weight can be viewed on the Run Screen, on the Hopper Settings page, and on the Weight System Settings page.

4.6.2 Metering Drive Settings

The Metering Drive Settings allow you to set the Target Rate, enter calibration factor for each hopper, and setup the Delta Target Rate.

You can configure or view the following parameters for each metering unit:

Metering Unit	Defines the currently selected metering unit.
Target rate	Defines how much volume of product should be applied per acre for a manual rate.
Min. Speed	Defines the minimum motor speed in RPM's.
Max. Speed	Defines the maximum motor speed in RPM's.
Calibration Factor	Defines how much volume of product is applied per rotation of the metering shaft.
Delta Rate	Defines what percentage the target rate should be changed when you change it manually during the application.

To access the Metering Drive Settings from the Run Screen, press Settings. Press the Metering Drive Settings icon.

Setting a Target Rate

To choose or change a Target Rate, press the selectable area under the Metering Drive. Type in the Target Rate. Press the checkmark to save your selection.
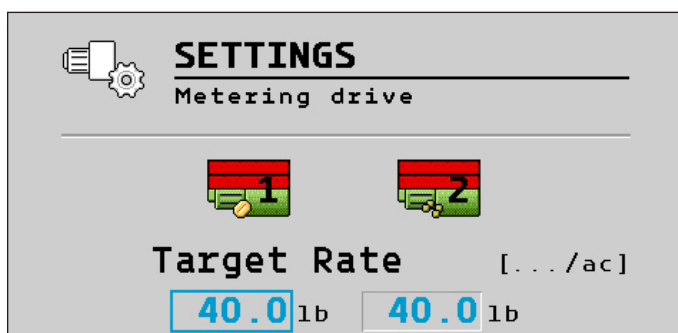
Hopper Calibration

There are two methods to conduct a Hopper Calibration. If your system does not have a scale system, you use the Catch Test calibration. If your system does have a scale system, you have the option of using the No Catch Test calibration.

Both procedures are outlined below.

<u>Hopper Calibration - No Catch Test Method</u>

Hopper Calibration can also be done without doing a Catch Test if you are using a scale system. In order to do this, there is a calibration procedure that needs to be followed. This process must be done any time a new product is added to a hopper that hasn't be calibrated.

☑ Verify the product name in the hopper is correct.

☑ Verify the product density is correct.

☑ Verify the correct CRF.

☑ Enter Target Rate that will be simulated.

☑ Vehicle will need to be stationary at the start of the calibration to take an accurate reading of the scales weight.

☑ Run normal application of 500-1000 lbs. Section control and prescriptions can be used.

☑ Confirm the Master Switch is on and sections are enabled. If not, you will get a warning message and will not be able to start calibration.

☑ To complete calibration, vehicle has to be stopped again to ensure a good reading of the scale.

1. The accuracy of the Montag Air Cart depends on using the correct Calibration Factor. This value is for the entire implement width.

To find the Cal. Factor when using ft^3/Rev, multiply the number of outputs for your setup by .0026.

ft^3/Rev Example: 12 outputs X .0026 = .0288

To find the Cal. Factor when using Lb/Rev, multiply the number of outputs for your setup by .0026 times the density.

Lb/Rev Example: 12 outputs X .0026 X density = 2.184

2. Type in the Calibration Factor. Press the checkmark to save your selection.

Calibration Factor [.../rev]   1.87 lb   .0300 ft³

3. To begin the Hopper Calibration - No Catch Test process, press the Metering Drive icon.

➜ The Calibration screen will be displayed.

```
┌──────────────────────────────────────┐
│  ▤   CALIBRATION          ⬑            │
│ ⬚    No Catch Test                     │
│                           ⚙            │
│  Metering cells filled?                │
│  fill with           ⚙    ▷            │
│  1. Start                              │
│  to start press      ▷                 │
│                                        │
└──────────────────────────────────────┘
```
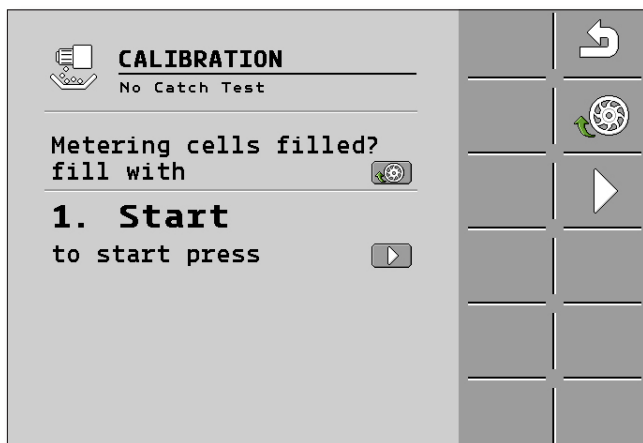
4. Start hydraulics and set the operating hydraulic pressure by the fan air pressure reading.

5. Fill the metering cells with product.

➜ The metering cells rotate for a few seconds.

6. Make sure the vehicle is stationary and start the calibration by pressing the play icon.

➜ The Configuration 2 screen appears with a field for the applied amount. During the No Catch Test Calibration the system will be reading the scale weight.

```
┌──────────────────────────────────────┐
│  ▤   CALIBRATION          ⬑            │
│ ⬚    No Catch Test                     │
│                                        │
│  2. Calibrating                        │
│                                        │
│                                        │
│  Amount applied:                       │
│  ▦1   0.0 1b                           │
│                                        │
└──────────────────────────────────────┘
```
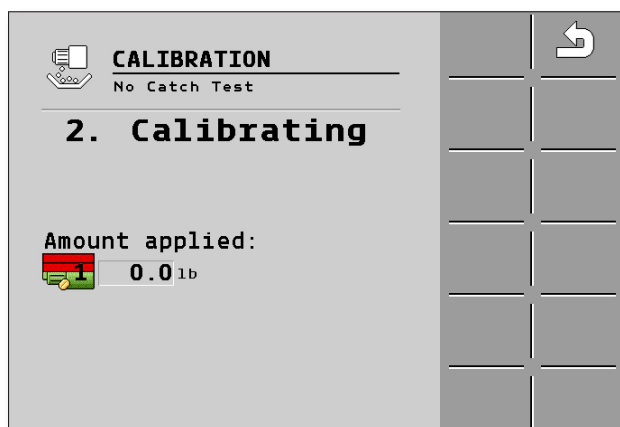
7. Start applying product. It is recommended to run 1000 lbs.

8. Stop application of product and stop the calibration on the implement. Shut–off hydraulics after the flow of product stops.

➡ The Calibration 3 screen appears.

```
CALIBRATION
No Catch Test

3.  Results      [lbs/rev]
🔲1  Old: 10.00   New:  0.17  ☐

Selection will be adopted!
```

9. Select the calibration.

10. Press the checkmark to confirm.

➡ The ECU saves all of the data on the product in the product database.

Delta Rate

The Delta Target Rate is the amount of adjustment you want to make over the Target Rate. This setting is setup as a percentage value by default, but it can be configured as a lb/ac value in the product database [➡45]. To choose or change the Delta Target Rate, press the selectable area under the Delta Rate. Type in the percentage of change you want to be made with each button press. Press the checkmark to save your selection.

```
Delta Rate
  10 %      10 %
```

Hopper Calibration - Catch Test Method

To operate the machine accurately the user must calibrate the product type to the hopper. In order to do this, there is a calibration procedure that needs to be followed. This process must be done any time a new product is added to a hopper that hasn't be calibrated.

☑ Verify the name of the product in the hopper is correct.

☑ Enter target rate that will be simulated.

1. The accuracy of the Montag Air Cart depends on using the correct Calibration Factor. This value is for the entire implement width.

To find the Cal. Factor when using ft³/Rev, multiply the number of outputs for your setup by .0026. *(.0026 is the starting number. This number may need to be adjusted by product or environment change.)*

ft³/Rev Example: 12 outputs X .0026 = .0288

To find the Cal. Factor when using Lb/Rev, multiply the number of outputs for your setup by .0026 times the density. *(.0026 is the starting number. This number may need to be adjusted by product or environment change.)*

Lb/Rev Example: 12 outputs X .0026 X density = 2.184

➡ To switch between ft³/Rev and Lb/Rev, refer to section 4.7.6. [➡ 44]

2. Type in the Calibration Factor. Press the checkmark to save your selection.

3. To begin the Hopper Calibration - Catch Test process, press the Metering Drive icon.

➡ The Calibration screen will be displayed.

```
┌─────────────────────────────────────┐
│  🖩②  CALIBRATION            ↩       │
│  ⟋⟍⟍⟍                               │
│  ─────────────────────      ⚙       │
│  Speed correct?    Amount?          │
│  15.0 mph            100 lb   ▷      │
│  Metering cells filled?             │
│  fill with           ⚙              │
│                                     │
│  1. Start                           │
│  to start press      ▷              │
│                                     │
│  Speed                              │
│  min.  1.1   max. 58.8 mph          │
└─────────────────────────────────────┘
```

4. The ECU calculates the minimum and the maximum speed at which these target rates are possible using the selected metering roll. Enter the speed into the display. In the amount input box, enter the pounds of product you want to catch. Start hydraulics and set the operating hydraulic pressure by the fan air pressure reading.

5. Fill the metering cells with product.

➡ The metering cells rotate for a few seconds.

6. Place a container (seed bag or bucket) under each discharge point. Make sure not to restrict air flow.

7. Start the calibration by pressing the play icon.

➔ The Configuration 2 screen appears counting down the applied amount and pulses.

```
┌─────────────────────────────────────┐
│  ⊟2   CALIBRATION                   │
│  ∿∿∿                            ╳    │
│                                      │
│   2. Calibrate                       │
│   or cancel with                     │
│       Rem. Amount   90.26 lb         │
│      Rem. Impulses  25505            │
│                                      │
└─────────────────────────────────────┘
```

8. Wait until the required quantity has been applied. The ECU calculates a weight from the available data.

9. Stop the calibration on the implement. Shut-off hydraulics after the flow of product stops.

   ➔ The Calibration 3 screen appears.

```
┌─────────────────────────────────────┐
│  ⊟2   CALIBRATION            ✓       │
│  ∿∿∿                         ╳       │
│                                      │
│   3. Quantity                        │
│   based on     25.3 rev.             │
│   enter       101.231 lb             │
│   ☒ Cancel                           │
│   ☑ Confirm                          │
│   Speed                              │
│   min.  1.1   max. 58.8 mph          │
└─────────────────────────────────────┘
```

10. Weigh the product that was applied during the calibration.

11. Enter the weight in the lb. field.

   ➔ The ECU calculates the deviation in percent between the calculated and the weighed value.

12. Press the checkmark to confirm.

   ➔ The ECU saves all of the data on the product in the product database.

4.6.3 Weigh System Settings

To access the Weigh System Settings from the Run Screen, press Settings. Press the Weigh System Settings icon.

→ The Weigh System screen will be displayed.
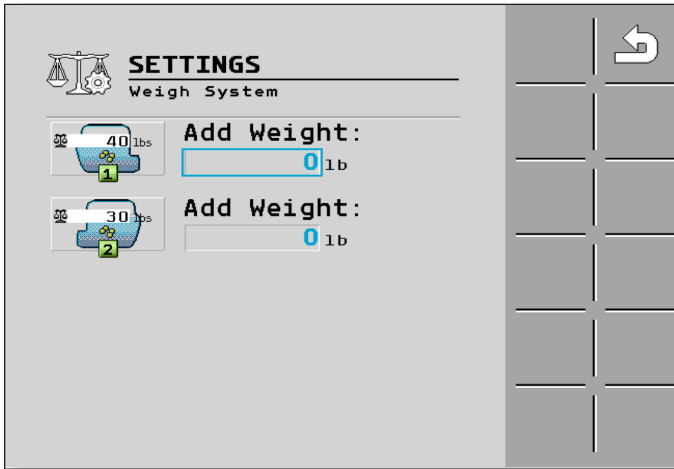
If a scale system is installed on the implement, use this procedure for the filling sequence:

1. Press the selectable area under Add Weight, and enter the desired weight for the hopper.


2. Press the press Hopper icon. Press the Add Hopper Weight icon.

3. Fill the hopper. A warning message will be displayed when the entered weight is reached. Press the checkmark.
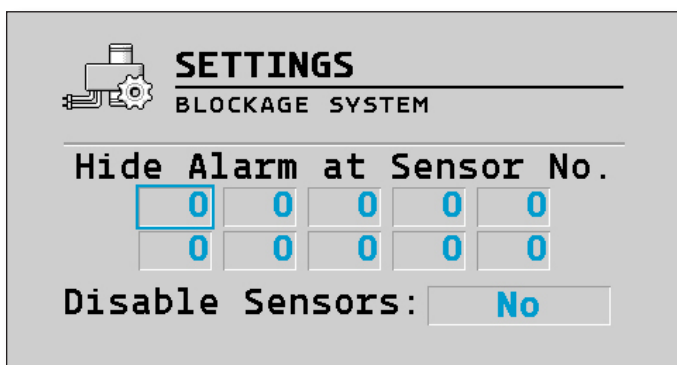
To reset the scale weight, select the hopper. Press the Clear Hopper Weight icon, and you will be prompted to verify you want to zero the scale value. Press the checkmark to confirm. Press the X to cancel.
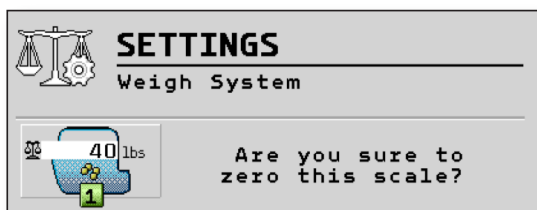
4.6.4 Blockage System Settings

The Blockage System Settings allow you to hide the alarms for individual sensors. The page also allows sensors to be disabled.

4.6.5 Speed Signal Settings

The speed input settings allow you to choose where the machine speed is coming from to control the application rate. There are two different working speed sources and one simulated speed source. The Tractor and Implement speed on the display are in real time.

Speed Source	Description
Simulation	The speed is a simulated by the display.
Tractor	The speed signal comes from the ISOBUS. You can also use GPS speed if equipped with a tractor ECU.
Implement	The speed signal comes from a source on the implement

1. From the Run Screen, press the Configuration icon. Press the Speed Configuration icon.

→ The Speed Calibration screen appears:

2. Press the screen to select the desired speed source.

Simulated Speed

The simulated speed source is used for troubleshooting purposes while not moving. To choose Simulated Speed, press the white box to enter a green check. Enter the desired speed by pressing the selectable area by MPH. Press the green checkmark to confirm. Simulation speed reverts back to 0 after a power cycle.

Tractor Speed

Tractor speed source gets the tractor speed off of the ISOBUS. Some machines will have this speed on the bus and other machines will have the ability to use GPS for Speed.

To choose Tractor Speed, press the white box to enter a green checkmark.

```
Tractor:
        Ground          0.0 mph    ☑
```
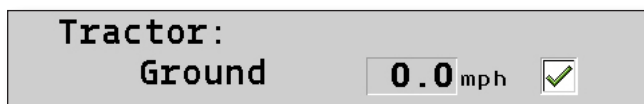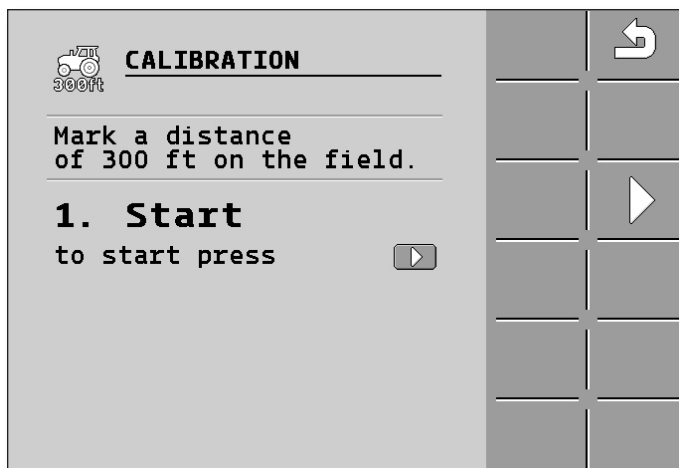
Implement Speed

Implement speed source gets the speed from a pulse either from a wheel sensor or radar.

1. To choose Implement Speed, press the white box to enter a green checkmark.

2. If you want to manually enter a pulse setting, enter the desired speed by pressing the selectable area by MPH. Press the green checkmark to confirm.

3. If you want to calibrate the implement speed, press the Tractor 300 ft. icon.

➡ The following screen appears:

```
🚜      CALIBRATION
300ft

Mark a distance
of 300 ft on the field.

1. Start
to start press           ▷
```

4. Mark a distance of 300 ft. Press the Play icon and drive the tractor 300 ft.

➡ The following screen appears:

```
┌─────────────────────────────────┐
│  🚜      CALIBRATION       ┌───┐ │
│  300ft   ─────────────     │ ↩ │ │
│          ───────────────   └───┘ │
│  Now cover the distance          │
│  and stop at the end.            │
│                            ┌───┐ │
│  2. Stop                   │ ✓ │ │
│  to stop press      ☑      └───┘ │
│  or cancel with            ┌───┐ │
│                            │ ✕ │ │
│  Speed Encoder:            └───┘ │
│  No. of Impulses      0          │
│                                  │
└─────────────────────────────────┘
```

5. Verify you have stopped at 300 ft.

6. Press the Check Mark to save the calibration value.

7. Enter the number of pulses.

4.7 Configuration Settings

The Configuration Settings allow the setup of different aspects of the control system.
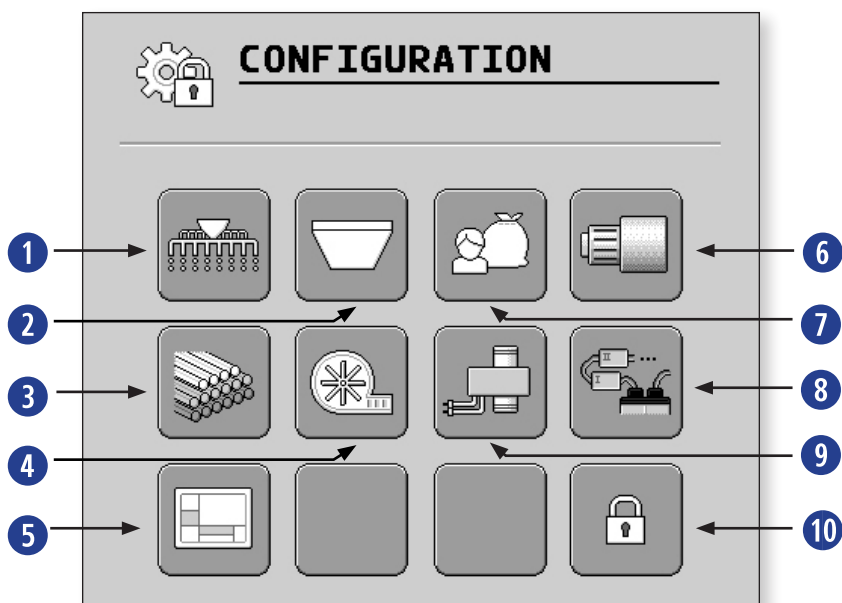
To access the Configuration Settings from the Run Screen, press Settings. Press the Configuration Settings icon.

➡ The Configuration screen will be displayed.

①	Implement Configuration	⑥	Metering Unit Configuration
②	Hopper Configuration	⑦	Product Configuration
③	Shoot Configuration	⑧	Blockage System Configuration
④	Fan Configuration	⑨	Blockage Chaining Configuration
⑤	Status Line Configuration	⑩	Locked Area

4.7.1 Implement Configuration

Implement Configuration allows you to choose the turn the Tramline System ON/OFF, setup the Blockage System, and configure the Working Switch.

To access the Implement Configuration from the Run Screen, press Settings. Press the Configuration icon. Press the Implement Configuration icon.
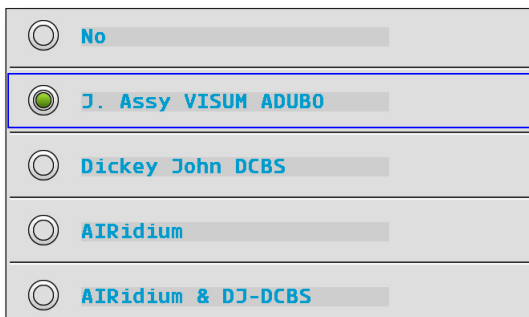
→ The Configuration screen will be displayed.
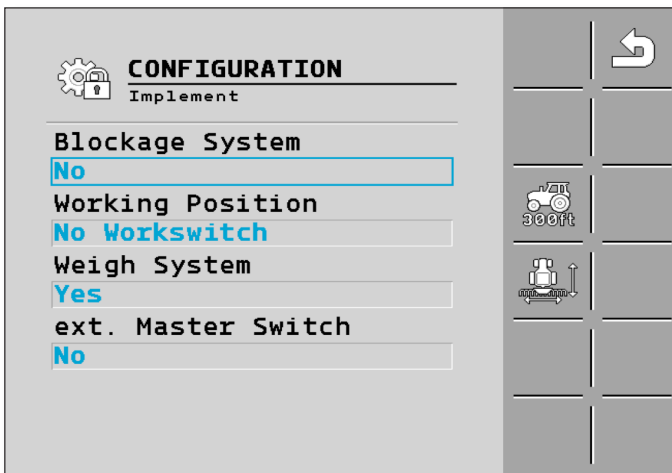
Blockage System

The Blockage System Configuration allows you to choose the type of system you have on your implement. To choose a system, press the selectable area under the Blockage System. Choose the correct option from the pop-up screen. Press the checkmark to save your selection.

Working Position

The Working Position allows the position of the Workswitch to be configured. To setup the Workswitch, press the selectable area under Workswitch Position. Choose the option for your setup from the pop-up screen. Press the checkmark to save your selection.

◉ No Workswitch
◎ Workswitch OFF in work
◎ Workswitch ON in work
◎ ISOBUS Tractor
◎ Case IH Planter Status

External Master Switch

If an External Master Switch is selected, the onscreen master softkey will be removed and working position options will be limited to: ISOBUS Tractor and Case IH Planter Status.

| |
|---|
| ◉ No |
| ◎ Momentary Switch |
| ◎ Latching (High in Work) |
| ◎ Latching (Low in Work) |

Implement Geometry

The geometry of an agricultural implement is defined as a series of parameters describing its dimensions. It is important particularly for all systems that are GPS-controlled. The distances you enter depends on whether the implement is towed, mounted on the tractor, or self-propelled.

You must enter the distances for the boom and for the connectors. In doing so, ensure that the center point of the implement axle is always the point of origin for all distances. Measurements towards the front are always positive, and measurements towards the rear are always negative.

To access the Implement Geometry from the Run Screen, press Settings. Press the Configuration icon. Press the Implement Configuration icon. Press the Geometry icon.

 + + +

➡ The Geometry screen will be displayed.
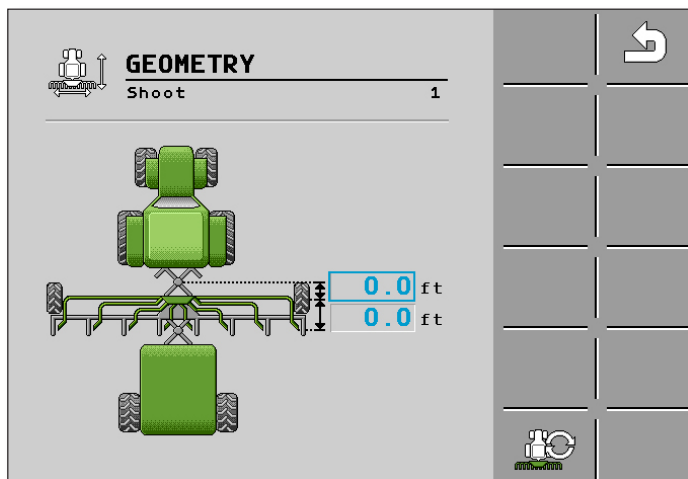
To enter the dimensions for your implement, press the selectable areas on the Geometry screen.

1. Enter the distance from the hitch point to the axle.

2. Enter the distance from the axle to the point of product application.

To select a different implement setup than what is pictured, press the Geometry Option icon.

1. Use the left/right arrows to scroll through the options.

	Trail behind implement		Rear implement mounted
	Box drill		Forward implement mounted

2. Press the implement on the screen to save the selection. Press the back arrow to return.
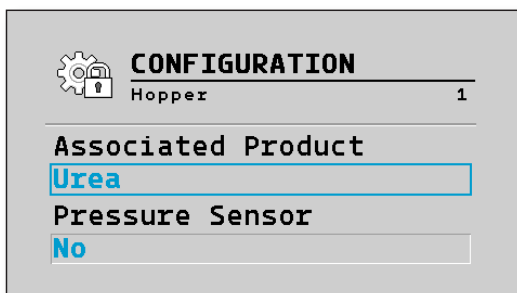
4.7.2 Hopper Configuration

Hopper Configuration allows you to set the Associated Product for a hopper. Press the selectable area under Associated Product.

To access the Hopper Configuration from the Run Screen, press Settings. Press the Configuration icon. Press the Hopper Configuration icon.

→ The Configuration screen will be displayed.

```
CONFIGURATION
Hopper                    1

Associated Product
Urea
Pressure Sensor
No
```

Choose the Product from the pop-up screen and enter the correct weight. Press the checkmark to save your selection.

Press the icon with three dots to cycle through the hoppers.

4.7.3 Shoot Configuration

Shoot Configuration allows you to set the number of sections, total working width, and the number of rows for the implement.

To access the Implement Configuration from the Run Screen, press Settings. Press the Configuration icon. Press the Shoot Configuration icon.

→ The Configuration screen will be displayed.

```
   CONFIGURATION
   Shoot                    1

Number of Sections
     2
Total Working Width
  30.0 ft
Number of Rows
    12
```

To make changes to the Shoot Configuration, press the selectable area under Total Working Width and/or Number of Rows. Type in your information into the pop-up screen. Press the checkmark to save your selection.

Section Configuration

1. To configure the sections, press the Section icon.
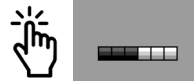
2. Enter the information for the number of section rows and working width of the sections. Press the checkmark to save your selection.

3. Press the icon with three dots to cycle through the sections.
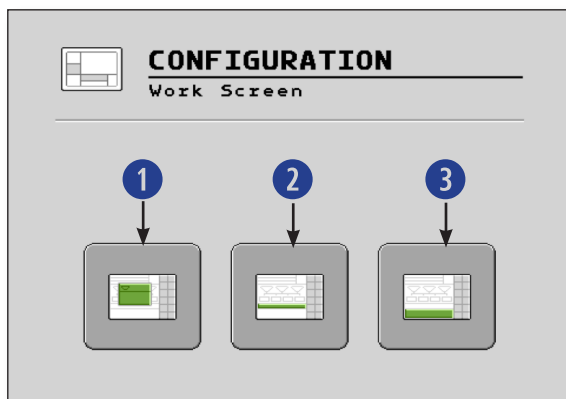
4.7.4 Run Screen Configuration

The Dry Rate Controller Display area, Status Line, and Visible Values on the Run Screen are configurable.
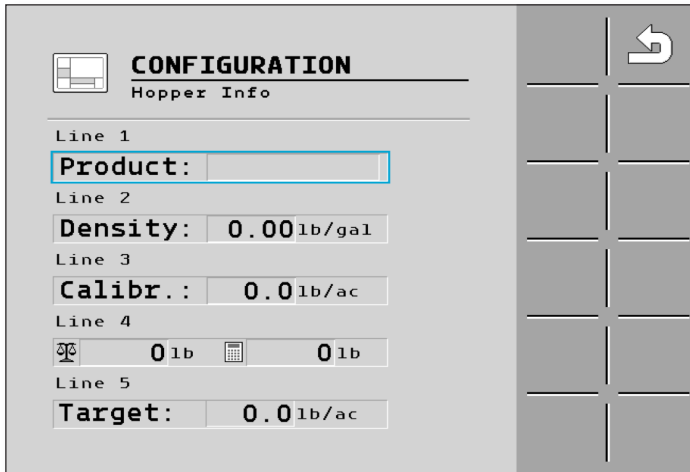

→ The Work Screen Configuration screen will be displayed.

1	Dry Rate Controller Display area
2	Status Line area
3	Visible Values area

Dry Rate Controller Display Area

Selecting a line area allows the information to be reorganized.
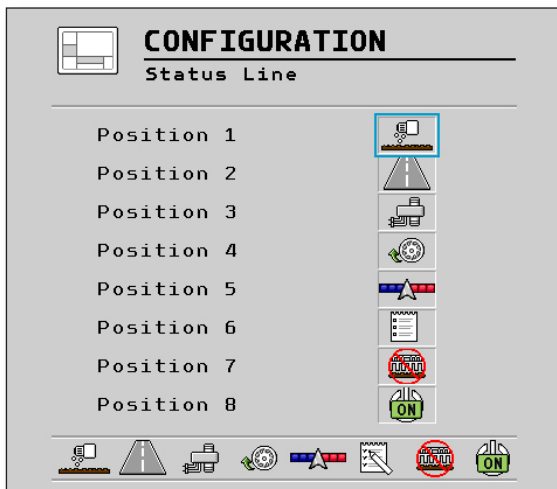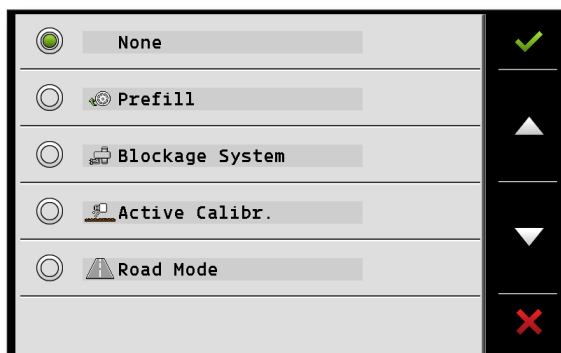

Status Line Area

To make changes, press the selectable area next to each position. Choose the status icon from the pop-up menu you want for the position. Press the check-mark to save your selection.

Visible Values Area

Press the selectable area next to each position. Choose the status icon from the pop-up menu you want for the position. Press the checkmark to save your selection.

4.7.5 Metering Drive Configuration
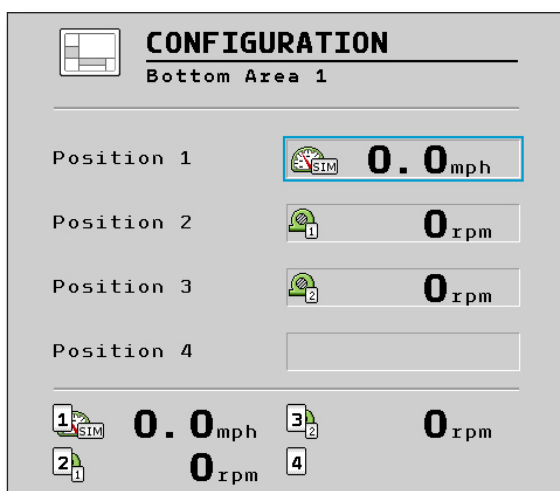
The Metering Drive Configuration allows you to set the Target Rate, set Deviation Tolerances, Min. Rotational Speed, and Max. Rotational Speed.

To access the Metering Drive Configuration from the Run Screen, press Settings. Press the Configuration icon. Press the Status Line Configuration icon.

➡ The Metering Unit Configuration screen will be displayed.

Press the selectable area next to the parameter you want to change. Enter a new value. Press the checkmark to save your selection.

Deviation Tolerance

This setting allows you to set the alarm threshold for the Target Rate. If the applied rate varies outside the set Deviation Tolerance, the system will show an alarm.

Pre-start Time

This Pre-start time setting adjusts the amount of time the auger runs when the system is primed.

Amplification Factor

This Amplification Factor changes the control loop aggressiveness. Increasing the number makes the meter more aggressive. Decreasing the number makes the meter less aggressive. If the system is slow to reach the target rate, increase the number. If the meter struggles to hold rate, decrease the number.

Calibration Type

Choose the type of calibration for the control system. The choices are: No, Calibration Switch, Simple Catch Test, and No Catch Test Calibration.

Press the down arrow for additional metering settings.

Section Control Delay

The amount of time it takes pressing the button to shut a section off and when it stops applying at the application point. Adjust the setting to increase or decrease this time. Typically, start and stop times should be the same.

Rate/Weight Monitoring Alarm

If a weigh system is installed and enabled, this setting allows the adjustment of allowable percentage error between the applied rate and the scale system. This feature compares how much product the system has applied to the actual scale weight of product. When the system is performing correctly, these two measurements should be in sync. If there is a discrepancy between the two measurements that is greater than the set monitoring percentage, the system will alert the operator. This could indicate a bridging problem in one of the hoppers. To engage this feature, place a check mark in the Rate/Weight Monitoring area and set the allowable percentage of discrepancy.

Press the icon with three dots to cycle to the next Metering Unit.

4.7.6 Product Configuration

The Product Configuration allows you to add new products to the database, change the parameters of products, set the target rate, and set the Delta Target Rate.

To access the Implement Geometry from the Run Screen, press Settings. Press the Configuration icon. Press the Hopper Configuration icon.

→ The Product Configuration screen will be displayed.

Renaming a Product

To rename product, press the selectable area and type in the new name. Press the checkmark to save your selection. Press the icon with three dots to proceed to the next product.

Product Type

To change the product type, press the selectable area and choose one of the options: seed, liquid, or solid. Press the checkmark to save your selection.

Target Rate

To choose or change a Target Rate, press the selectable area under the Metering Drive. Type in the Target Rate. Press the checkmark to save your selection.

Delta Target Rate

The Delta Target Rate is the percentage of adjustment you want to make over the Target Rate on the Run Screen. To choose or change the Delta Target Rate, press the selectable area under the Delta Rate. Type in the percentage of change you want to be made with each button press. Press the checkmark to save your selection. Rate values can be in percentage or lb/ac.

Calibration Factor & Units

Refer to the previous Hopper Calibration explanation in section 4.6.2 Metering Drive Settings [→ 22].

To a change the product application units, press the selectable area and choose from the pop-up menu. Press the checkmark to save your selection.

- Seed will always be in lbs/rev

- Liquids will always be in oz/rev.

- Solids can be lbs/rev or ft^3/rev.

Press the Calibration Meter icon to cycle through the available meters. Each meter can have a calibration factor per product per hopper.

Adding a New Product

To add a new product, press the Product Database icon. Press the Product Addition icon. Input the new product information.

4.7.7 Blockage System Configuration

The Blockage System Configuration communicates information about the installed modules.

To access the Blockage System Configuration from the Run Screen, press Settings. Press the Configuration icon. Press the Blockage Configuration icon.

4.7.8 Blockage Chaining Configuration

The Blockage Chaining Configuration allows you to To access the Blockage
System Configuration from the Run Screen, press Settings. Press the Configu-
ration icon. Press the Blockage Configuration icon. This icon will be grayed out
if you have the Blockage System setting set to No in Implement Configuration
[➔ 35].

➔ The Blockage Chaining Configuration screen will be displayed.
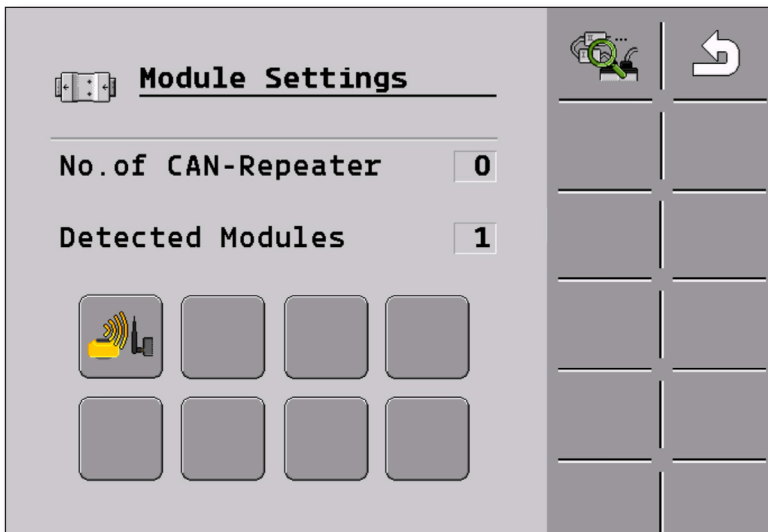
Press the Blockage Chaining icon to start the search
procedure for modules. The number of detected modules
will appear on the screen.

The J.Assy Blockage System icon will appear on the screen
when a module is detected.

4.7.9 Locked Area

Certain settings for the ISOBUS Control System reside behind a locked area.
You can contact your dealer for questions on how to access the locked area.

5 Operating the Implement in the Field

5.1 Filling Auger with Product

To be able to apply product from the beginning and avoid blank spots at the start of the field, you must fill the metering cells of the control system before you start driving. You can also use the pre-metering function.

1. On the Run Screen, press Metering Cell icon.

➜ As long as the metering cells are being filled, the following icon appears in the Status Line of the Run Screen:

2. Only start driving once the icon is turned off.

5.2 Start Applying

☑ The implement is moving.

☑ The implement is lowered.

☑ The metering cells are filled with product.

☑ The fan has reached the minimum revolution speed.

1. Start applying. Press the Sections Master icon.
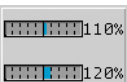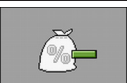
5.3 Stop Applying

1. Stop applying. Press the Sections Master icon.

➜ All of the metering drives are stopped.

## 5.4 Adjusting the Target Rate during Operation

The Target Rate can be adjusted while working. This can be done for both hoppers together or independently. Use the icons on the right side of the display to increase, decrease or return to the Target Rate.

Function Icon	Meaning
	Increases the Target Rate of a specific hopper. The target rate is increased by the percentage you defined in Product Configuration.
	Reduces the Target Rate of a specific hopper. The target rate is reduced by the percentage you defined in Product Configuration.
	Restores the target rate of a specific hopper back to 100%.
	This icon shows the delta target rate for the hoppers. Pressing this icon brings up the icons below on the right side of the screen.
	Increases the Target Rate for both hoppers. The target rate is reduced by the percentage you defined in Product Configuration.
	Reduces the Target Rate for both hoppers. The target rate is reduced by the percentage you defined in Product Configuration.
	Restores the target rate back to 100%.

☑ You have defined the **Target Rate** and **Delta Target** rate in Product Configuration.

<u>Changing the Target Rate of an Individual Hopper:</u>

1. On the Run Screen, press a Metering Drive:
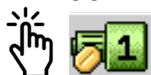
→ Function icons for the adjustment of the Target Rate appear on the right.

2. Press the increase or decrease icon from the right side of the display to change the Target Rate.

or **or**

→ The target rate of the metering units will be changed:

1	**0.0**/	48.0	lb/ac	120%
2	**0.0**/	48.0	lb/ac	120%

→ The ECU regulates the application according to the new Target Rate.

<u>Changing the Target Rate for both Hoppers:</u>

1. On the Run Screen, press Delta Target Rate icon: 110% 120%

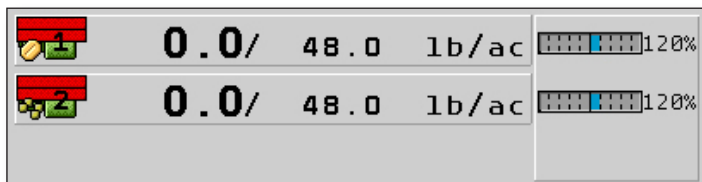→ Function icons for the adjustment of the Target Rate appear on the right.

2. Press the increase or decrease icon from the right side of the display to change the Target Rate.

or **or**
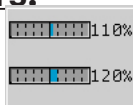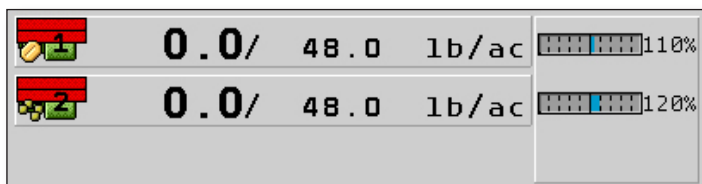
→ The target rate of the metering units will be changed:

1	**0.0**/	48.0	lb/ac	110%
2	**0.0**/	48.0	lb/ac	120%

→ The ECU regulates the application according to the new Target Rate.

## 5.5 Operating the Hydraulic System with the ECU

The ECU is used to adjust the position of the hydraulic valves so that the oil pressure is routed to specified parts of the Dry Rate Controller.

When operating the Dry Rate Controller with the ECU, remember that it cannot control the oil pressure. You have to use the control unit in the tractor to generate pressure in the system. Adjust the hydraulics by setting the face pressure between 10-22 (depending on rates, product density, and rows). Run at the lowest rate without causing blockage. It is best to start higher and decrease hydraulics to the optimal setting for the machine and application. Running too high will cause premature hose failure and use more horse power. Most machines will run 15-18 in H2O.

5.6 Operating Section Control

With section control, you can switch the sections of your implement. The size of the respective sections that you can switch depends on the implement type and equipment.

On the Run Screen, you can see which sections are switched on or off.
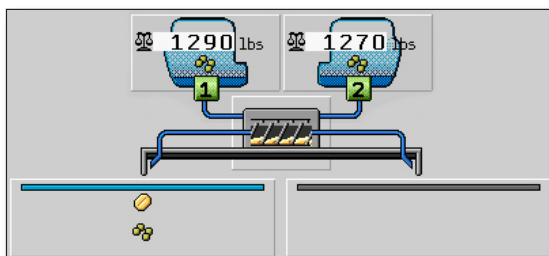
Left section is on and right section is off.
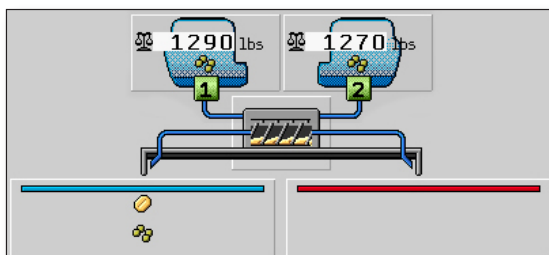
Left section is on and right section has been turned off by the Task Controller.

When product is coming out of the section, there is a granular icon in the window. The color of the section indicates it's status: **BLUE** = sections on, **GREY** = sections manually off, **RED** = sections turned off by section control.

5.7 Using Prescriptions

Prescriptions allow the Task Controller to vary the application rate while the system is in operation. Consult your the OEM display manual for instructions on how to load prescriptions for your specific display. Once a prescription is loaded into the display, follow these steps to assign it to the Dry Rate Controller System:

1. From the Run Screen, press the Delta Target Rate icon.

2. Press the Prescription icon from the right side menu. This icon will only appear is the display has a prescription loaded.
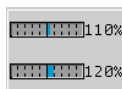
3. When the system is using a prescription, the meter icon will change.

5.8 Viewing and Clearing Counters Page

The counters page is used to store trip values, amount applied, area, time, and distance. These values are allowed to be cleared whenever the operator needs them to be cleared.

It also stores total tonnage, area, working time, distance and powered on time. These values are stored in the ECU and can only be cleared by a service tech.

1. Select the trip values function button on the main page. A list of the products and empty blanks will be displayed.

➜ The Results screen will be displayed.

RESULTS
Area, Quantity

DAP
Trip		Season	
92.6	ac	543.3	ac
237.2	lb	1211.1	lb

Potash
Trip		Season	
92.6	ac	543.3	ac
314.8	lb	1801.3	lb

2. To clear the trip results press the corresponding hopper trip clear function icon.

RESULTS
Area, Quantity

DAP
Trip		Season	
0.00 ac		**543.3** ac	
0 lb		**1211.1** lb	

Potash
Trip		Season	
0.00 ac		**543.3** ac	
0 lb		**1801.3** lb	

3. To clear the season results press the corresponding hopper season clear function icon.

RESULTS
Area, Quantity

DAP
Trip		Season	
0.00 ac		**0.00** ac	
0 lb		**0** lb	

Potash
Trip		Season	
0.00 ac		**0.00** ac	
0 lb		**0** lb	

4. To view the total values press the total function icon
   The Total Counter Page will be shown.

➡ The Results screen will be displayed.

Σ≡	**TOTAL RESULTS**	↩

1	Service Hours	**40** h
2	Total Time	**5** h
3	Total Distance	**16** mi
4	Total Area	**15** ac
5	Total Quantity	
	🔴 **0** lb 🟢 **0** lb	

1	**Service Hours** Total time powered up since ECU was powered up.
2	**Total Time** Total time during work since ECU was powered up.
3	**Total Distance** Total distance traveled during work since ECU was powered up.
4	**Total Area** Total area covered during work since ECU was powered up.
5	**Total Quantity** The total weight of each hopper since ECU was powered up.

6 Troubleshooting

6.1 Performing Diagnostics

The Diagnostics screen allows you to read the measured values for all of the pins that are connected to the junction box. In addition, you can test whether the functions of the ECU are working as desired.
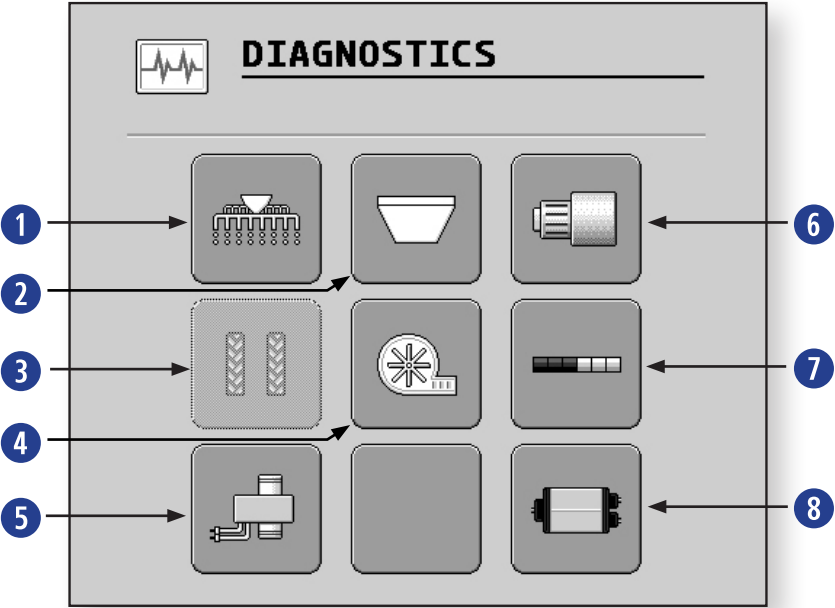
1	Implement Diagnostics	**5**	Blockage Diagnostics
2	Hopper Diagnostics	**6**	Metering Diagnostics
3	Tramline Diagnostics *(not used)*	**7**	Section Diagnostics
4	Fan Diagnostics	**8**	ECU Diagnostics

Implement Diagnostics

The Implement Diagnostics show feedback for Radar Impulses, Working Position, and the Calibration Switch.
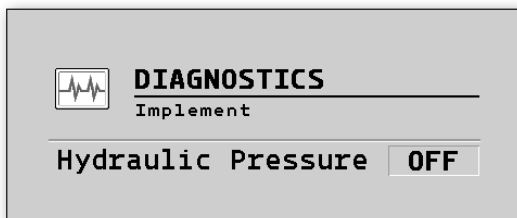
Hopper Diagnostics

The Hopper Diagnostics show feedback on hopper weight and hopper product.
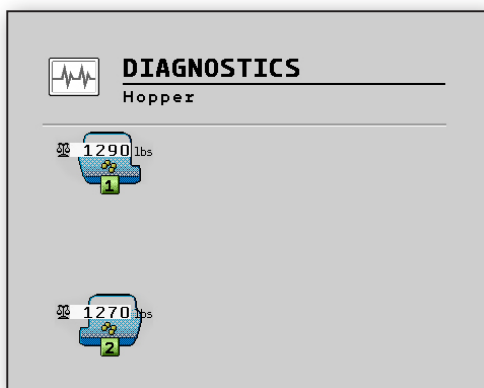
Fan Diagnostics

The Fan Diagnostics show feedback on fan impulses and fan RPM.
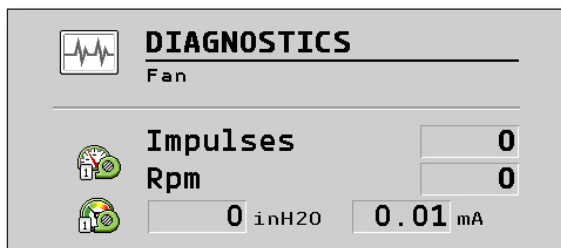
Blockage Diagnostics

Blockage Diagnostics give feedback on J. Assy blockage sensors.
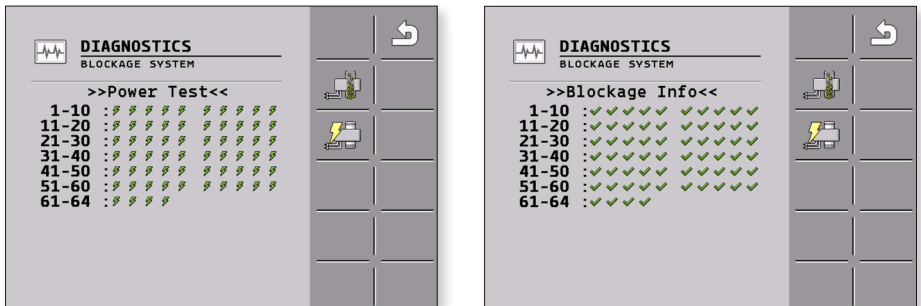
Metering Diagnostics

The Metering Diagnostics show PWM feedback. If applying, entering this screen will show PWM output per percentage, the number of pulses and RPM of the meters.

- Pressing the plus or minus buttons manually controls meter speed.

- A manual PWM percentage can be used entered into the selectable area.

- If either of these diagnostic tools are used, the drives will turn regardless of Master Switch state, fan speed, ground speed, or working position.

- Leaving this screen will either return to controlling to rate if the Master Switch is on and applying, or the drives will shut off if the machine is not applying (due to master off, working position out of work, zero speed…..).
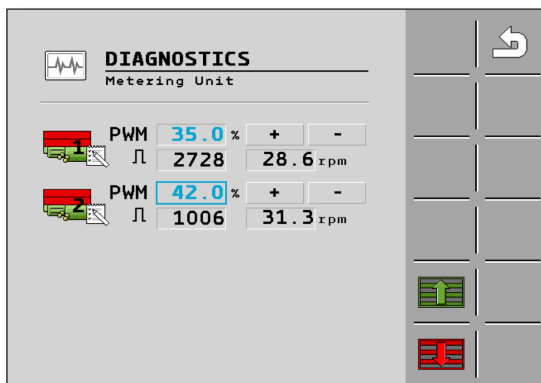
Section Diagnostics

The Section Diagnostics show the output pin numbers for each section.

- Select the section to diagnose.
- This page identifies which section is selected and the ECU pin.
- Output 0=ON 0v or 1=OFF 12v
- Press the checkmark and X icons to turn sections on and/or off.
- **WARNING:** If sections are turned off on this screen, they do not reset when you return to the Run Screen.
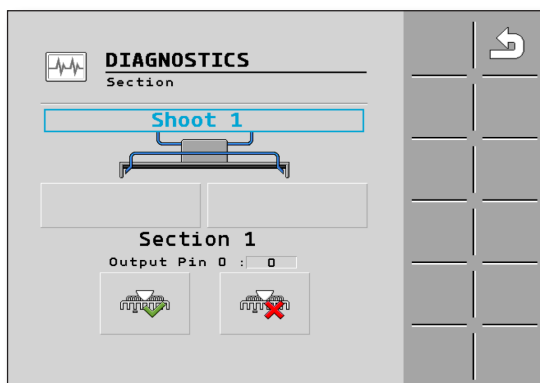
ECU Diagnostics

The ECU Diagnostics shows:

- Software Version
- Object Pool Version
- Power Voltage and Sensor Voltage
- ISOBUS CANload and SubBus CANload
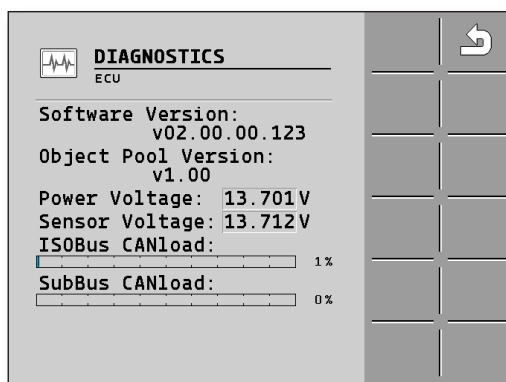
6.2 Case Drain Alarm

The Case Drain Alarm is a safety warning on the Dry Rate Controller. Should you see this alarm on your display, all product application is stopped until the issue is corrected.
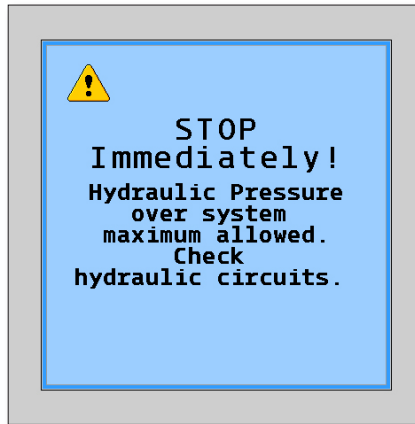
7 Technical Data

7.1 Harness Diagram

ME0514006

ME0502039

ME0502001
ISOBUS Harness
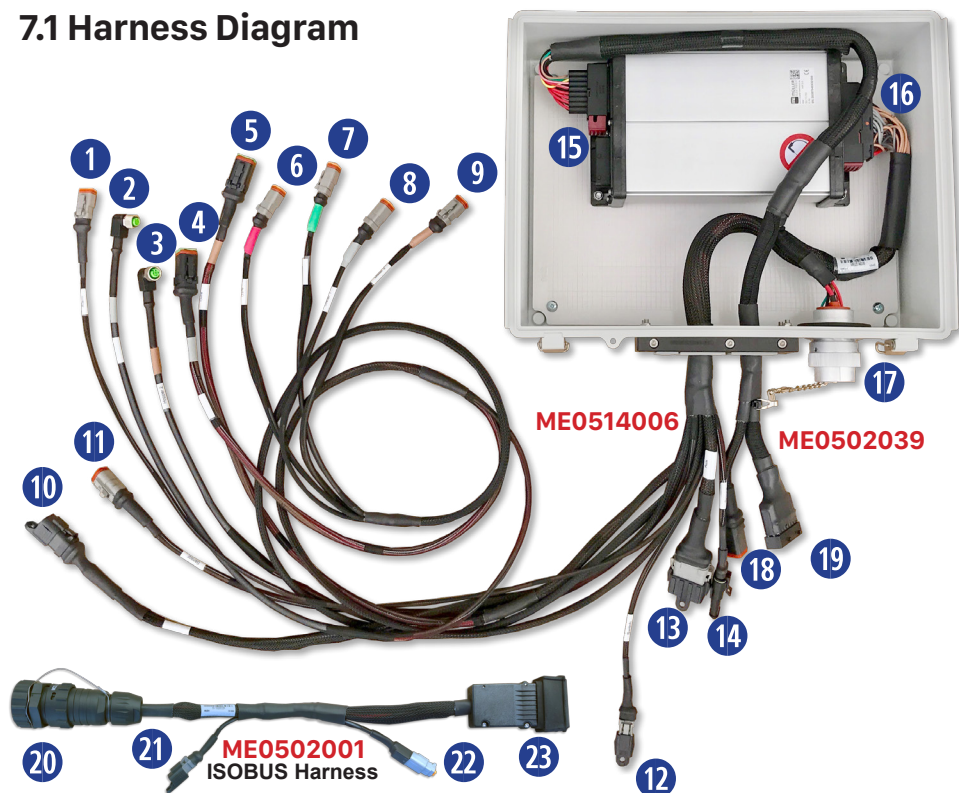
7.2 Cable Pin Diagrams

1

Cavity	Hydraulic Alarm - X8	ME0514006
Cavity	Description	Wire Color
1	Hyd Press Sensor	Tan
2	0v Electronic	Black/White

2

Cavity	Encoder Hopper 1 - X6	ME0514006
Cavity	Description	Wire Color
1	12v Electronic	Red/White
3	0v Electronic	Black/White
4	Meter 1 Encoder	Tan

3

Cavity	Encoder Hopper 2 - X7	ME0514006
Cavity	Description	Wire Color
1	12v Electronic	Red/White
3	0v Electronic	Black/White
4	Meter 2 Encoder	Tan

4

Cavity	Bin 1 Gate - X12	ME0514006
Cavity	Description	Wire Color
1	Plug	
2	0v Electronic	Black/White
3	12v Electronic	Red/White
4	12v Electronic	Red/White
5	Closed Hopper 1	Tan
6	Opened Hopper 1	Tan

5

Cavity	Bin 2 Gate - X13	ME0514006
Cavity	Description	Wire Color
1	Plug	
2	0v Electronic	Black/White
3	12v Electronic	Red/White
4	12v Electronic	Red/White
5	Closed Hopper 2	Tan
6	Opened Hopper 2	Tan

6

Close Gate - X15		ME0514006
Cavity	Description	Wire Color
1	Close Gate HS	Grey
2	0v High Current	Black

7

Open Gate - X16		ME0514006
Cavity	Description	Wire Color
1	Open Gate HS	Grey
2	0v High Current	Black

8

PWM Meter 1 - X2		ME0514006
Cavity	Description	Wire Color
1	PWM Meter 1	Grey
2	0v High Current	Black

9

PWM Meter 2 - X3		ME0514006
Cavity	Description	Wire Color
1	PWM Meter 2	Grey
2	0v High Current	Black

10

Sections - X5		ME0514006
Cavity	Description	Wire Color
1	0v High Current	Black
2	Section W	Grey
3	Section X	Grey
4	Section Y	Grey
5	Section Z	Grey
6	0v HC	Black

11

Fan Pressure Sensor - X17		ME0514006
Cavity	Description	Wire Color
A	12v Electronic	Red/White
B	Fan Pressure Sensor	Tan
C	0v Electronic	Black/White

12

Implement Switch - X10		ME0514006
Cavity	Description	Wire Color
1	Work Position	Tan
2	0v Electronic	Black/White

13

Aux - 18		ME0514006
Cavity	Description	Wire Color
1	12v High Current	Red
2	Bin 1 Pressure	Tan
3	Bin 2 Pressure	Tan
4	12v Electronic	Red/White
5	0v Electronic	Black/White
6	Fan Encoder	Tan
7	Aux Input 1	Tan
8	Aux Input 2	Tan
9	Fan 1 PWM HS	Grey
10	Aux Output 1	Grey
11	Aux Output 2	Grey
12	0v High Current	Black

14

Ground Speed - X11		ME0514006
Cavity	Description	Wire Color
1	0v Electronic	Black/White
3	12v Electronic	Red/White
4	Machine Speed Signal	Tan

15

Main - X1		ME0502039
Cavity	Description	Wire Color
1	12v High Current	Red
2	Bin 1 Pressure	Tan
3	Bin 2 Pressure	Tan
4		
5		
6		
7	Section W	Grey
8	Section X	Grey
9	Section Y	Grey
10	Section Z	Grey
11		
12		
13		
14		
15	Aux Output 1	Grey
16	Work Position	Tan
17	Hyd Pressure Sensor	Tan
18	Aux Input 1	Grey
19	Fan 1 PWM HS	Grey
20		
21	PWM Meter 1	Grey
22	PWM Meter 2	Grey
23	Aux Output 2	Grey
24		
25	Open Gate HS	Grey
26	Close Gate HS	Grey
27		
28		
29		
30	Aux Input 2	Grey
31	Fan1 Pressure	Tan
32	12v Electronic	Red/White
33	0v Electronic	Black/White
34	Meter 1 Encoder	Tan
35	Meter 2 Encoder	Tan
36	Machine Speed	Tan
37	Fan Encoder	Tan
38	Opened Hopper 1	Tan
39	Closed Hopper 1	Tan
40	Opened Hopper 2	Tan
41	Closed Hopper 2	Tan
42	0v High Current	Black

16

ECU 1 - X1		ME0514006
Cavity	Description	Wire Color
1	Termination Sense	Tan
2	CAN-L	Green
3	CAN-GND	Black/White
4	0v Electronic	Black/White
5	0v High Current	Black
6	0v High Current	Black
7	0v High Current	Black
8	0v High Current	Black
9	Plug	
10	CAN-H	Yellow
11	CAN-EN	Pink
12	12v Electronic	Red/White
13	12v High Current	Red
14	12v High Current	Red
15	12v High Current	Red
16	12v High Current	Red

17

ISO Out - X3		ME0502039
Cavity	Description	Wire Color
1	0v High Current	Black
2	0v Electronic	Black/White
3	12v High Current	Red
4	12v Electronic	Red/White
5	Termination Control	Tan
6	CAN-EN	Pink
7	CAN-GND	Black/White
8	CAN-H	Yellow
9	CAN-L	Green

18

Scale/CAN - X2		ME0502039
Cavity	Description	Wire Color
1	12v Electronic	Red/White
2	CAN-H	Yellow
3	0v Electronic	Black/White
4	CAN-L	Green
5	Plug	
6	Plug	

(19)

ISO Input - X4		ME0502039
Cavity	Description	Wire Color
1	Plug	
2	CAN-L	Green
3	CAN-GND	Black/White
4	0v Electronic	Black/White
5	0v High Current	Black
6	0v High Current	Black
7	0v High Current	Black
8	0v High Current	Black
9	Plug	
10	CAN-H	Yellow
11	CAN-EN	Pink
12	12v Electronic	Red/White
13	12v High Current	Red
14	12v High Current	Red
15	12v High Current	Red
16	12v High Current	Red

(23)

ECU Connection - X2		ME0502001
Cavity	Description	Wire Color
1	Plug	
2	CAN-L	Green
3	CAN-GND	Black/White
4	0v Electronic	Black/White
5	0v High Current	Black
6	0v High Current	Black
7	0v High Current	Black
8	0v High Current	Black
9	Plug	
10	CAN-H	Yellow
11	CAN-EN	Pink
12	12v Electronic	Red/White
13	12v High Current	Red
14	12v High Current	Red
15	12v High Current	Red
16	12v High Current	Red

(20)

ISO Tractor - X1		ME0502001
Cavity	Description	Wire Color
1	0v High Current	Black
2	0v Electronic	Black/White
3	12v High Current	Red
4	12v Electronic	Red/White
5	Termination Control	Tan
6	CAN-EN	Pink
7	CAN-GND	Black/White
8	CAN-H	Yellow
9	CAN-L	Green

(21)

Remote Master - X3		ME0502001
Cavity	Description	Wire Color
1	Master Switch	Tan
2	0v Electronic	Black/White

(22)

Remote Master - X4		ME0502001
Cavity	Description	Wire Color
1	Master Switch	Tan
2	0v Electronic	Black/White