



HarvestMaster™

BY JUNIPER SYSTEMS



alvo™

Sensor Upgrade Kit

USER MANUAL

Alvo Sensor Upgrade Kit User Manual

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Cautions

⚠ CAUTION: This symbol indicates that failure to follow directions could result in serious injury, damage to equipment, or loss of information.



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CHAPTER 1

Prepare the Software

1 Prepare the Software

The Alvo Sensor Upgrade Kit provides additional hardware and software for the Alvo Field Applicator that allows you to control the system pressure, application rate, and flow rate of each boom in your system. This user manual covers how to set up and use Alvo Sensor in Mirus.

For instructions on using Alvo Field Applicator, refer to the [Alvo Field Applicator User Manual](#).

1.1 Install Alvo Sensor Plugin


Mirus provides the user interface and software control for the Alvo Field Applicator and Alvo Sensor. To use the Alvo Sensor Plugin in Mirus, you need Mirus, Alvo Field Applicator, and the GNSS Attachment.

1.1.1 Software Requirements

- Mirus, version 4.6.7 or later
- Alvo Field Applicator, version 2.1.1 or later
- GNSS Attachment, version 2.1.1 or later

1.1.2 Install and Activate Alvo Sensor Plugin

After you purchase a license for Alvo Sensor Plugin,

1. Go to [Mirus Plugins and Conditional Actions](#).
2. Tap the download icon  for Alvo Sensor. The files automatically download.
3. Run the .mbp file for Alvo Sensor.
4. Follow the installation instructions.
5. Activate the software online at www.harvestmaster.com/activate.

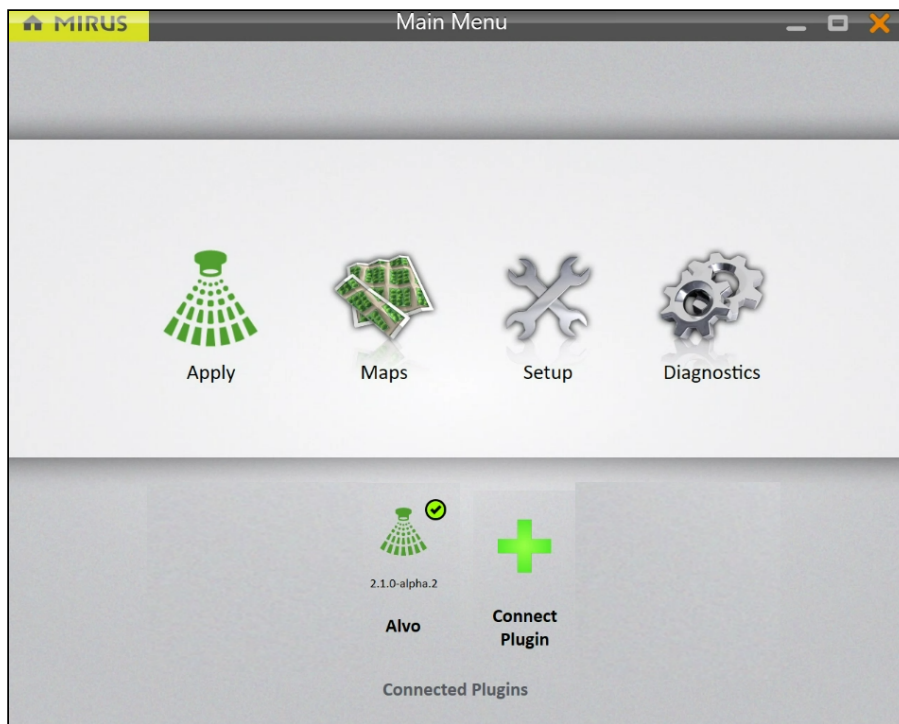
1.2 Connect the Alvo Sensor Plugin

To connect the Alvo Sensor Plugin,

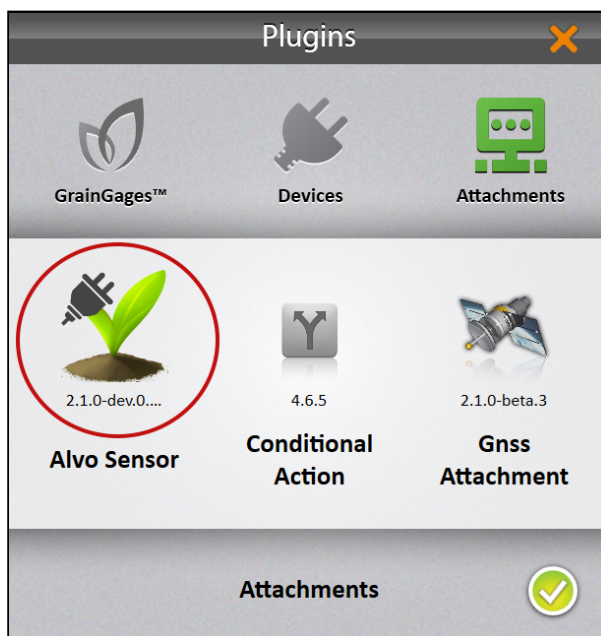
1. Open Mirus.




- From the Main Menu, tap **Connect Plugin**.
Note: You must have the Alvo plugin connected.

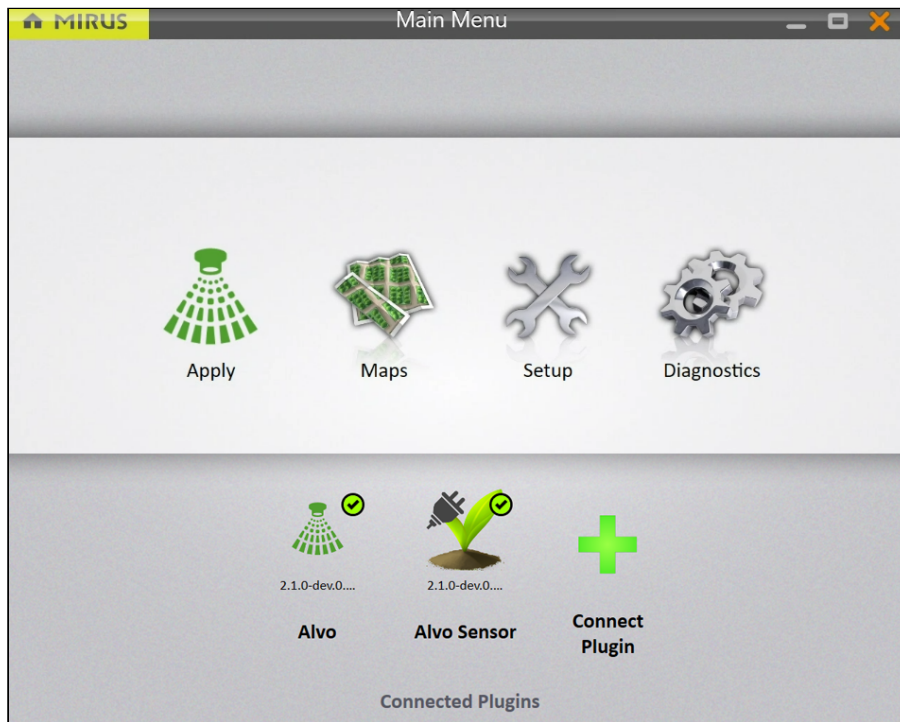


- Tap **Attachments**.
- Tap **Alvo Sensor**.



- Tap the check icon .

6. Return to the Main Menu. Alvo Sensor has a green check mark.



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CHAPTER 2

Define Settings & Check Calibration

2 Define Settings & Check Calibration

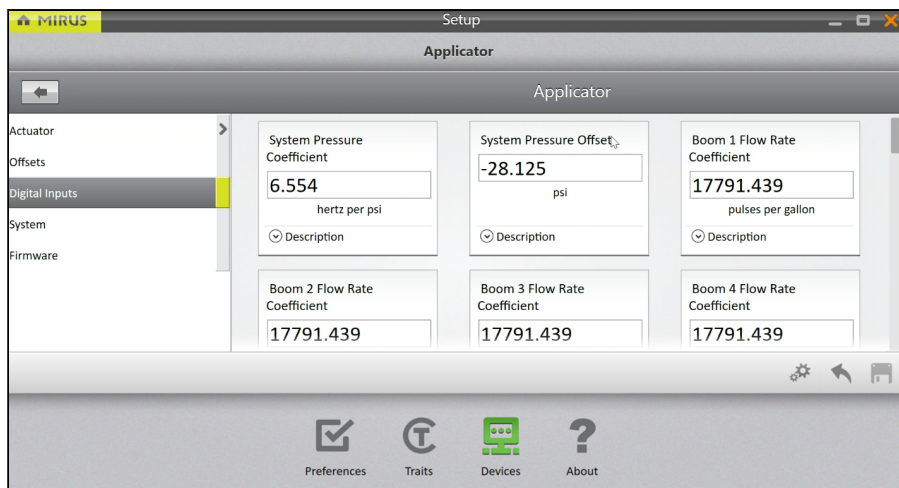
Before you apply treatments, define the sensor settings in Mirus.

2.1 Define Digital Inputs

From the Digital Inputs screen in Mirus, you can adjust the system pressure as well as the application rate and flow rate for each boom.

To define the settings in Mirus,

1. Select **Setup > Applicator > Digital Inputs**.



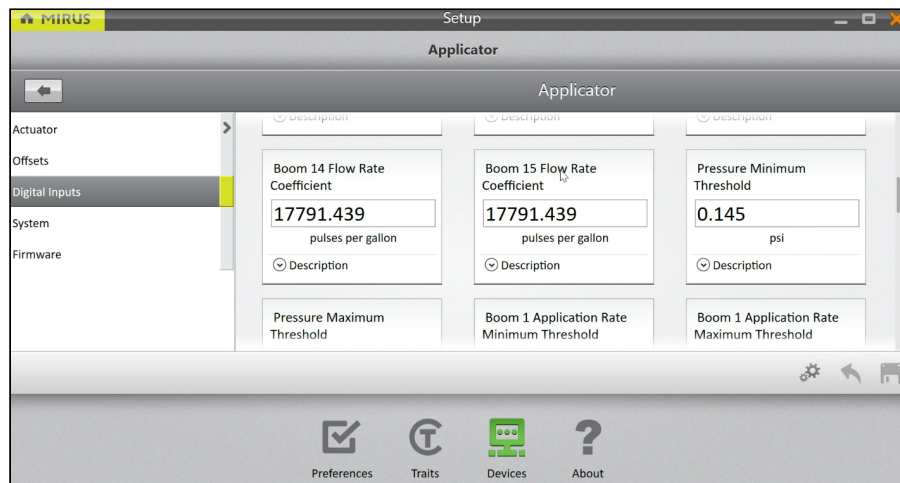
Note: In most cases, the default values for System Pressure Coefficient and System Pressure Offset are accurate. Contact HarvestMaster if you need to adjust these values.

2. Enter values in **Flow rate coefficient** for each boom.

Note: The default value is based off the density of water and is accurate for most cases. If you are using a liquid with a density different from that of water, adjust the coefficients.

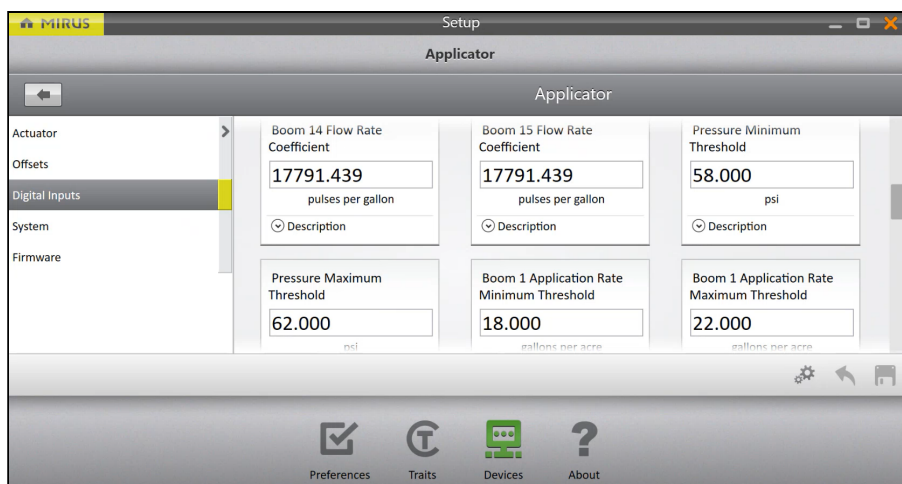
3. Enter values in **Pressure minimum threshold** and **Pressure maximum threshold**.

These two values set the acceptable range for the system pressure. The difference between the values should be relatively small, for example, 4 psi.



- Enter values in **Application rate minimum threshold** and **Application rate maximum threshold** for each boom.

Customize the application rate for each boom to accommodate different nozzle sizes. These two values set the acceptable range for the application rate.



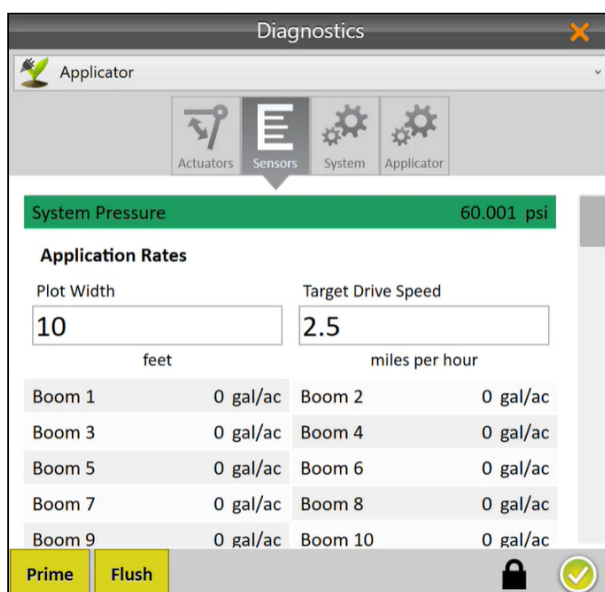
- Tap Save .

2.2 Set Application Width and Drive Speed

On the Diagnostics screen, enter the width of the area covered by the field applicator and the targeted drive speed. After these values are set, you only need to update them if you change your equipment or adjust the drive speed.

To set the application width and drive speed,

- From the Main Menu, select **Diagnostics**.
- Select the **Sensors** tab.
- Enter the width of the area covered by the field applicator in **Plot Width**.
- Enter the target drive speed.

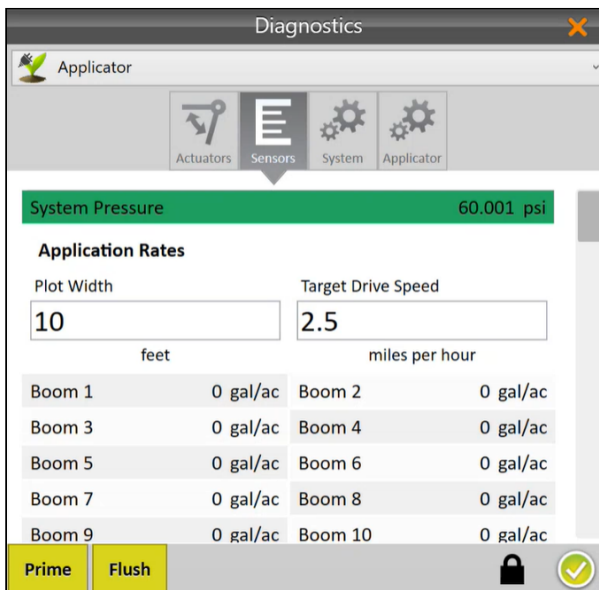


5. Tap the check icon .

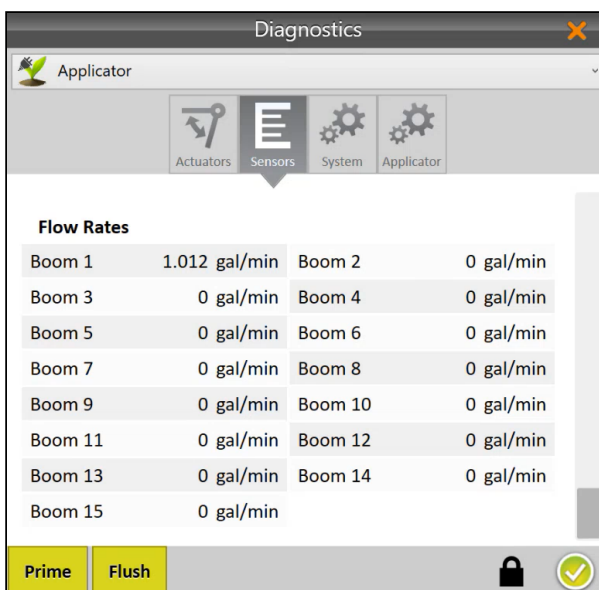
2.3 Check Flow Rate Calibration


You can verify the sensor calibration by checking that the output for each boom matches the flow rate calculated by Mirus.

1. Fill a container with liquid and connect it to the boom that you want to test.
2. Place a catch bucket under each nozzle on the targeted boom.
3. Turn on the boom for 1 minute.
4. Pour the contents in each catch bucket into a liquid measuring container.
5. From the Mirus Main Menu screen, select **Diagnostics**.
6. Select the **Sensors** tab.



7. Scroll down to see the boom's flow rate.



8. Verify that the flow rate shown in Mirus matches the amount of liquid that you collected in the measuring container.
9. If the values are not the same, adjust the flow rate coefficient on the [Digital Inputs screen](#).
For example, if the collected volume is 10% below the reported flow rate, raise the flow rate coefficient on the Digital Inputs screen by 10%.
10. Tap the check icon .
11. Repeat this procedure for each boom.

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CHAPTER 3

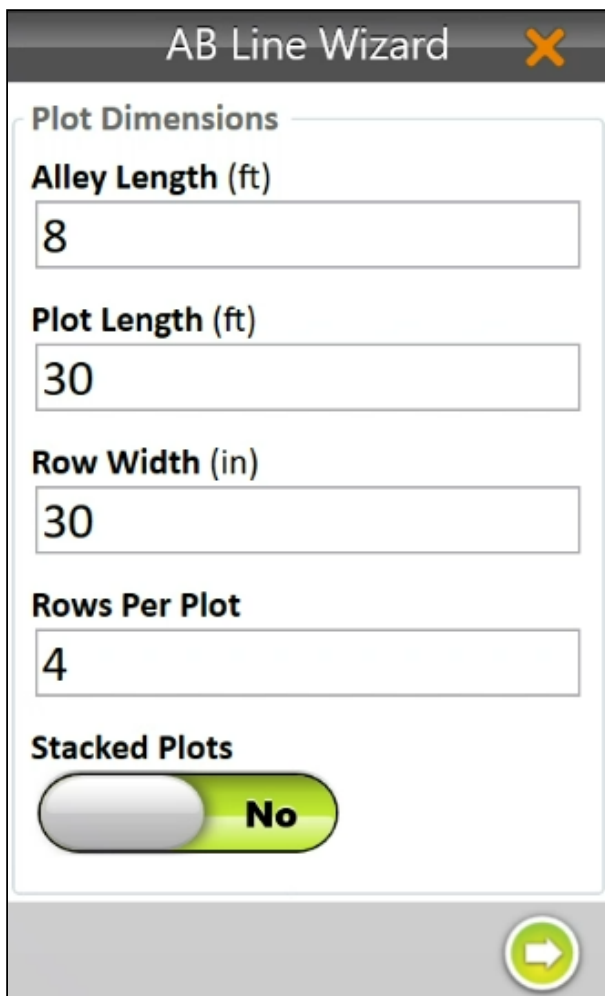
Operate System

3 Operate System

Follow the instructions on applying treatments as outlined in [Alvo Field Applicator User's Guide, Chapter 5 "Apply Treatments."](#) This section contains additional details specifically for using the Alvo Sensor plugin.

3.1 Set Plot Dimensions in AB Line Wizard

Mirus uses the plot dimensions entered in the AB Line Wizard in the application rate calculation. Ensure these values are accurate. For more information on using the AB Line Wizard, see [Alvo Field Applicator User's Guide, Chapter 5, "Apply Treatments."](#)

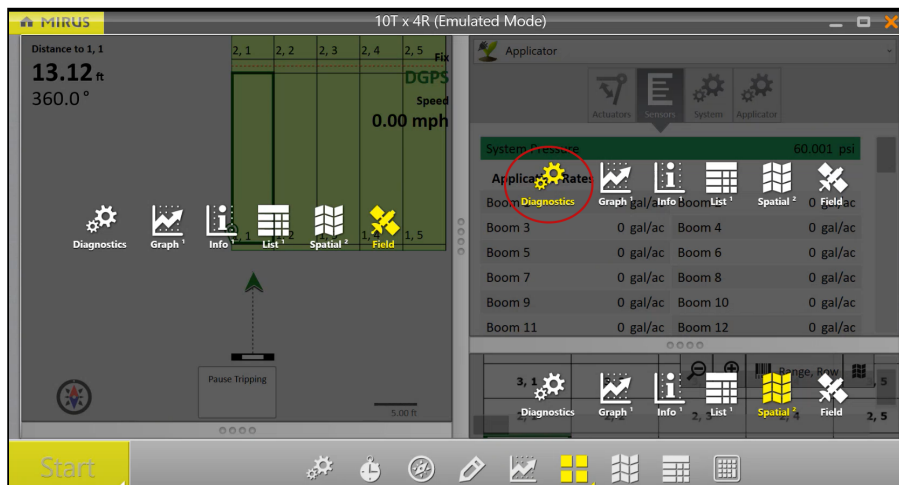


The screenshot shows the 'AB Line Wizard' interface. At the top, there is a title bar with 'AB Line Wizard' and a red 'X' icon. Below the title bar, the 'Plot Dimensions' section is visible. It contains four input fields: 'Alley Length (ft)' with the value '8', 'Plot Length (ft)' with the value '30', 'Row Width (in)' with the value '30', and 'Rows Per Plot' with the value '4'. Below these fields is a 'Stacked Plots' toggle switch, which is currently set to 'No'. At the bottom right of the interface, there is a green circular button with a white right-pointing arrow.

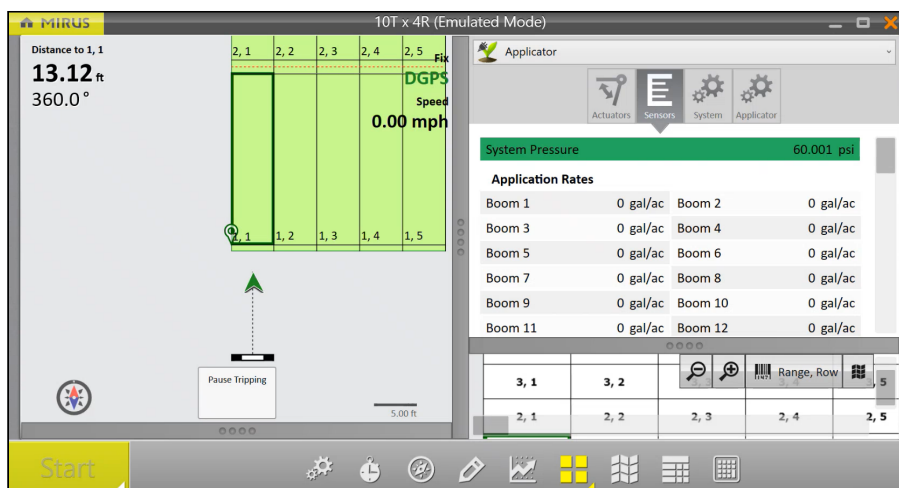
3.2 Configure Map Screen

To monitor the system pressure, application rate, and flow rate while applying treatments,

1. Set up the Map screen to display Diagnostics.



2. Select the **Sensor** tab.

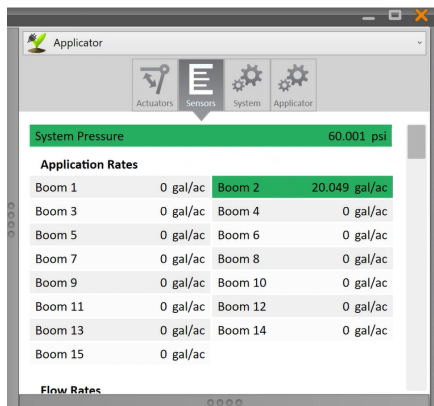


3.3 Monitor System Pressure and Application Rate

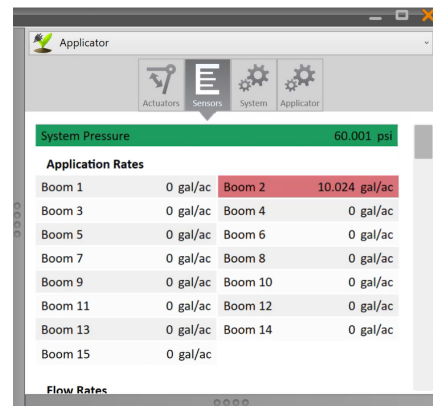
While you are applying treatments, Mirus uses green, yellow, and red color bands to show whether the system pressure and application rate are within the acceptable ranges set on the [Digital Inputs screen](#).

Color Bands	
Color	Definition
Green	Within the acceptable range
Yellow	Below the minimum threshold
Red	Above the maximum threshold

In Example 1, the system pressure and the application rate for boom 2 are within the acceptable ranges. In Example 2, the system pressure is within the acceptable range, but the application rate for boom 2 is above the maximum threshold.



Example 1



Example 2

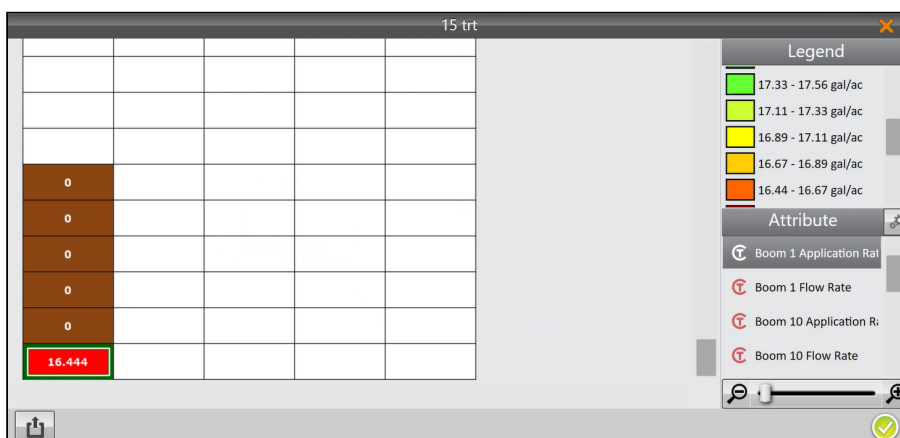
Ranges	
Value	Based on
System pressure threshold	Pressure minimum threshold and Pressure maximum threshold . Entered by user on Digital Inputs screen .
Application rate threshold	Application rate minimum threshold and Application rate maximum threshold for each boom. Entered by user on Digital Inputs screen .

3.4 View Treatment Data from the Map Screen

From the Map screen, you can view the treatment data in Spatial Display or List View.

Spatial Display

Use the Spatial Display to view the average application rate and flow rate for each plot. In the Attribute section, scroll down and select the boom and attribute for which you want to view data.



List View

Use List View to review the treatment for each plot. The system pressure, application rate, and flow rate are averaged for each plot.

Range	Row	Treatment	Boom 1 Application Rate	Boom 2 Application Rate	Boom 3 Application Rate	Boom 4 Application Rate
1, 1	1		16.444 gal/ac	0 gal/ac	0 gal/ac	0 gal/ac
2, 1	2		0 gal/ac	17.71 gal/ac	0 gal/ac	0 gal/ac
3, 1	3		0 gal/ac	0 gal/ac	17.629 gal/ac	0 gal/ac
4, 1	4		0 gal/ac	0 gal/ac	0 gal/ac	17.629 gal/ac
5, 1	5		0 gal/ac	0 gal/ac	0 gal/ac	0 gal/ac
6, 1	6		0 gal/ac	0 gal/ac	0 gal/ac	0 gal/ac
7, 1	7					

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CHAPTER 4

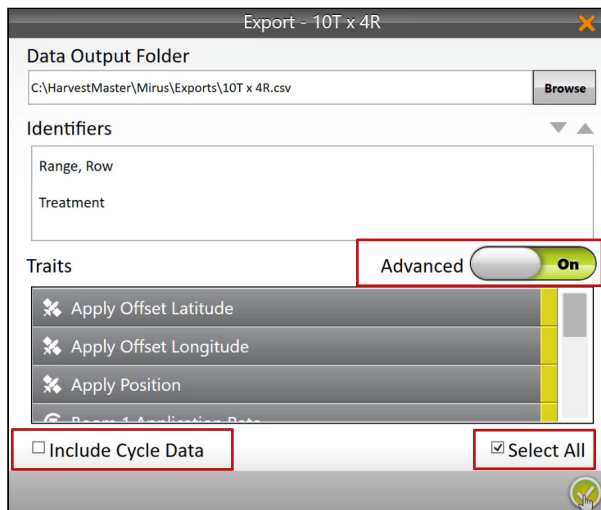
Export Data

4 Export Data

The procedure for exporting treatment data is the same as for the Alvo Field Applicator. However, with the addition of the Alvo Sensor Plugin, the exported data contains the system pressure as well as application rate and flow rate for each boom. For more information on exporting information, see [Alvo Field Applicator User's Guide, Chapter 6 "Export Information."](#)

When you are exporting Alvo data, use the following settings to customize the sensor data.

1. Turn on **Advanced**.
2. Select the traits that you want to include. To view all traits, select the **Select all** checkbox.
3. Select how the data is reported.
 - To see values recorded every 200 milliseconds (5 Hz), select the **Include cycle data** checkbox.
 - To see averaged values across the entire plot, clear the **Include cycle data** checkbox.



Mirus saves the exported data in a CSV file.

	A	B	C	D	E	F	G
1	Date/Time	Range	Row	Cycle	System Pri	Boom 1 Ap	Boom 1 Flc
2	10/31/2024 14:34	1	1	1	40.845	10.048	0.641
3	10/31/2024 14:34	1	1	2	41.608	12.343	0.779
4	10/31/2024 14:34	1	1	3	40.845	12.076	0.762
5	10/31/2024 14:34	1	1	4	40.845	12.18	0.762
6	10/31/2024 14:34	1	1	5	41.608	12.596	0.779
7	10/31/2024 14:34	1	1	6	40.845	12.414	0.762
8	10/31/2024 14:34	1	1	7	40.845	12.478	0.762
9	10/31/2024 14:34	1	1	8	40.845	12.532	0.762
10	10/31/2024 14:34	1	1	9	40.845	12.607	0.762
11	10/31/2024 14:34	1	1	10	40.845	12.662	0.762
12	10/31/2024 14:34	1	1	11	40.845	12.707	0.762
13	10/31/2024 14:34	1	1	12	40.845	12.729	0.762
14	10/31/2024 14:34	1	1	13	40.845	12.769	0.762
15	10/31/2024 14:34	1	1	14	40.845	12.85	0.762
16	10/31/2024 14:34	1	1	15	40.082	12.606	0.745
17	10/31/2024 14:34	1	1	16	40.845	12.935	0.762
18	10/31/2024 14:34	1	1	17	40.845	12.979	0.762

The following table describes the exported data unique to the Alvo Sensor plugin.

Exported Data	
Field Name	Description
Cycle	<p>Length of the data cycle. If the field displays</p> <ul style="list-style-type: none"> T—Data is an average across the plot Number—Data was captured every 200 milliseconds (5 Hz) across the plot
System pressure	System pressure averaged across the plot or captured every 200 milliseconds (5 Hz) if you included cycle data.
Application rate	Application rate averaged across the plot or captured every 200 milliseconds (5 Hz) if you included cycle data.
Flow rate	Flow rate averaged across the plot or captured every 200 milliseconds (5 Hz) if you included cycle data.