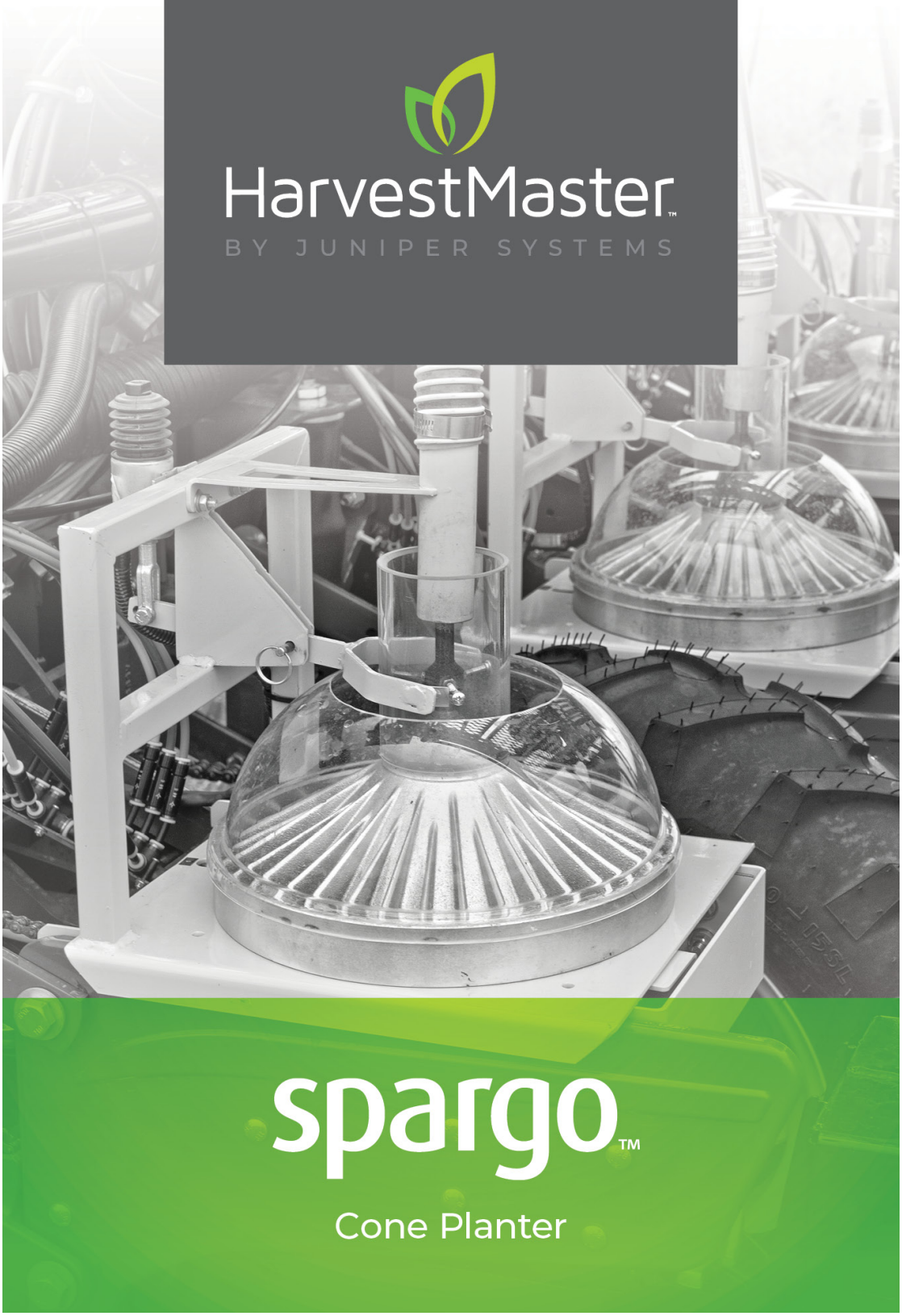
HarvestMaster™

BY JUNIPER SYSTEMS



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Cone Planter

USER MANUAL

Spargo Cone Planter User Manual

First published August 2020

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Trademarks

Disclaimer

Information is subject to change without notices.

Cautions

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

Contents

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CHAPTER 1

Getting Started

1 Getting Started

1.1 Spargo Cone Planter Overview

The Spargo Cone Planter, along with Mirus software, automates the planter on field research plots using in-furrow cone planters with a GNSS receiver.

System Features:

- Easily retrofitted and added to the most common cone planters already in use or added at time of purchase to new planters.
- Provides a simple solution to tripping the cones using your GNSS signal.
- Abililty to actuate electric solenoids, hydraulic, and pneumatic cylinders.
- Provides accurate records of which seed was applied to each plot.
- Easily connects to a wide range of GNSS receivers.
- Shows operators which plots are being planted and the current real-time position.
- Ability to take trait notes while planting.

Software requirements:

- Mirus, version 4.6.7 or later
- Spargo Cone Planter, version 1.2.0 or later
- GNSS, version 2.1.1 or later

1.2 Install Mirus

Mirus provides the user interface and software control of the Spargo Cone Planter and is designed to run on a rugged tablet under the Microsoft Windows 10 or later operating system. You can use the Mirus software across almost all research data collection and equipment control needs.

Step 1: Download Mirus to the rugged tablet.

1. Go to www.harvestmaster.com/support.
2. Select Mirus Harvest Software.
3. From Mirus Support, select **Downloads** > **Mirus Harvest Software Downloads**. Download the latest version of Mirus.

Step 2: Run Mirus software installation and follow the prompts on the screen.

Step 3: Activate Mirus online at www.harvestmaster.com/activate.

1.3 Install Spargo Cone Planter and GNSS Plugin

In addition to Mirus, you'll need the Spargo Cone Planter and GNSS plugin.

Note: Install and activate Mirus before installing Spargo and GNSS plugin.

Step 1: Download Spargo Cone Planter and GNSS plugin.

1. Go to www.harvestmaster.com/support.
2. Select **Mirus Plugins and Scripts**.
3. Select **Downloads** > **Mirus Harvest Software Plugins and Scripts**.
4. Download Spargo Cone Planter and GNSS plugin.

Step 2: Run the .mpd files for Spargo Cone Planter and the GNSS Plugin.

Step 3: Activate the plugins online at www.harvestmaster.com/activate. Contact your HarvestMaster representative for assistance.

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CHAPTER 2

System Setup

2 System Setup

2.1 Spargo Cone Planter System

The Spargo Cone Planter system uses a rugged tablet computer connected to a system controller which connects to an actuator module, allowing control of up to three solenoids or actuators that activate the cone planter.

2.2 System Parts

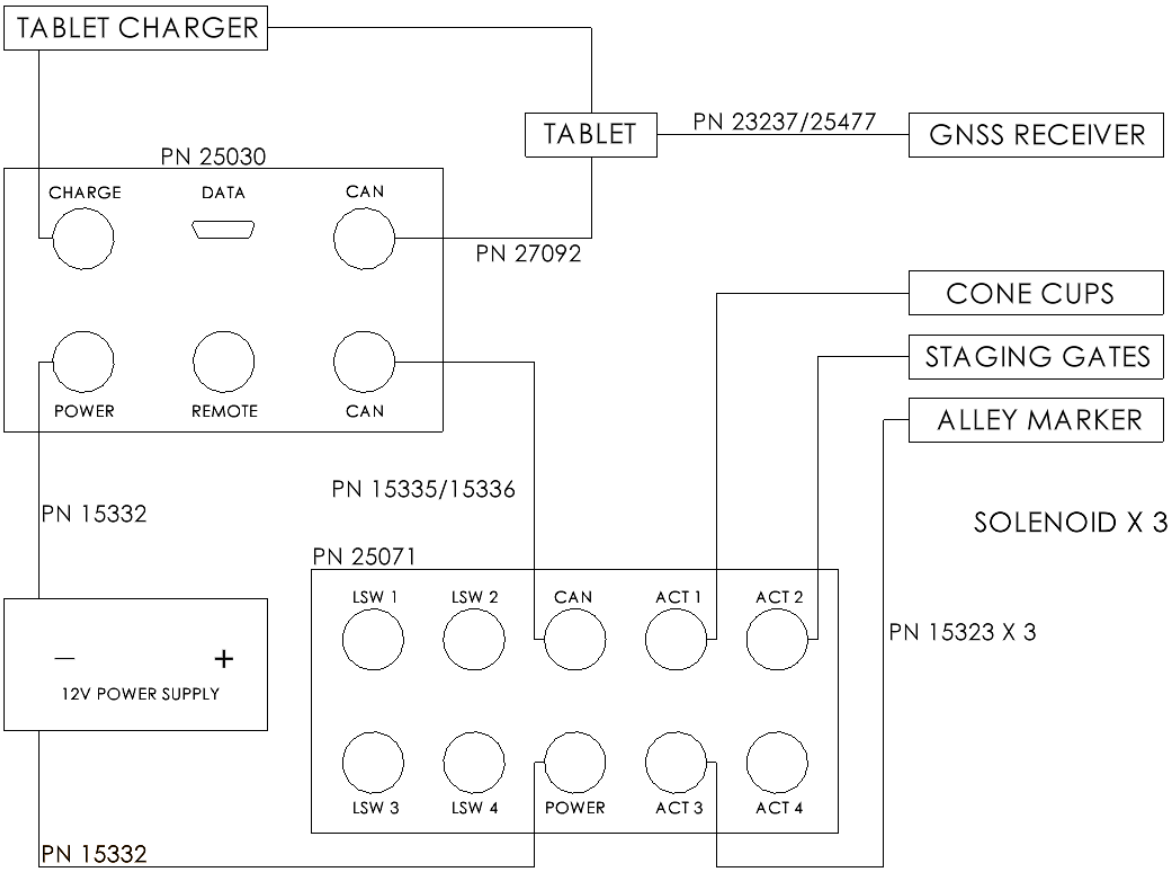
The following table lists the system parts.

System Parts				
PN	**Qty**	**Description**	**Notes/Purpose**	**Photo/ Drawing**
25071		H2 Actuator Module	This module controls the actions of the planter.	
25030	1	H2 System Controller with RAM mount and two button head screws	The system controller provides the primary interface between the tablet computer and the other components in the system.	
15332	2	HM8 12 VDC Power Cable, 20 ft	The power cable connects between the battery, or other 12 V DC power source, and the System Controller.	
15336	1	HM8 CAN Communications Cable, 20 ft	The CAN communications cable connects to the System Controller to the actuator modules in the enclosure.	

27092	1	HM8 USB CAN Converter Cable	The CAN converter cable connects the tablet PC to the System Controller.	
25477	1	GNSS/GPS Data Cable	This cable connects the tablet computer and the GNSS receiver.	
15323	2	Actuator Cable with pig tail ends	Connect to actuator ports on the H2 Actuator module and to the solenoid.	
Setup example		H2 Actuator Module with wiring, H2 System Controller, and connectors in enclosure	An enclosure with one actuator module mounted inside. The actuator module is wired to connection plugs. The system controller can be placed inside if desired.	

2.3 Connection and Wiring

The system requires these connections.



2.4 GNSS/GPS Setup

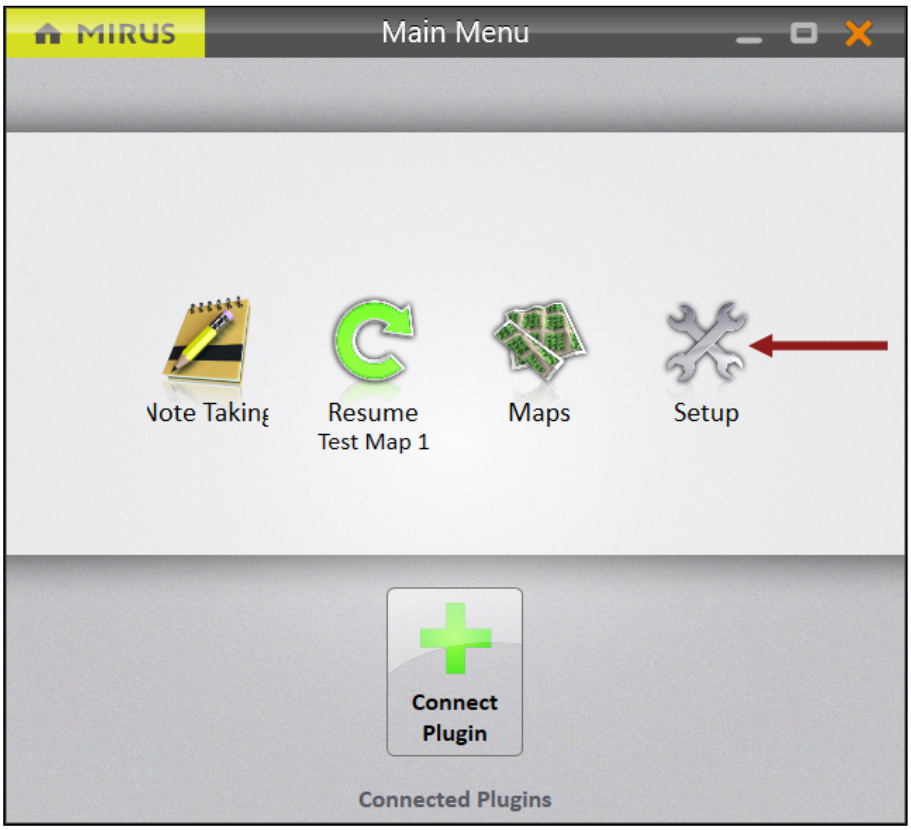
The GNSS/GPS receiver may need to be configured to communicate with Mirus. Follow the instructions provided for your GNSS/GPS receiver. You also need to configure Mirus to communicate with the GNSS/GPS.

Step 1: Refer to your GNSS/GPS receiver manual for instructions on configuring your receiver. On the receiver, enable GGA and VTG. For the best performance, disable other NMEA message types that may be enabled in your GNSS receiver.

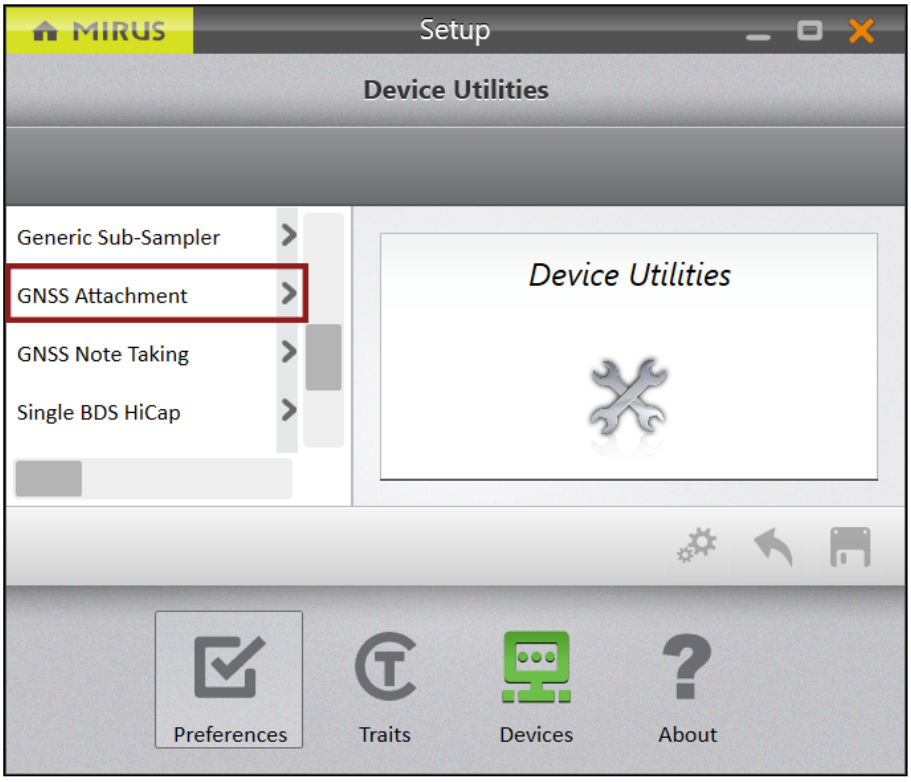
Step 2: With wiring complete and connected, power on the GNSS/GPS and the Spargo Cone Planter system.

1. Open Mirus, and disconnect any plugins.

2. Tap **Setup**.

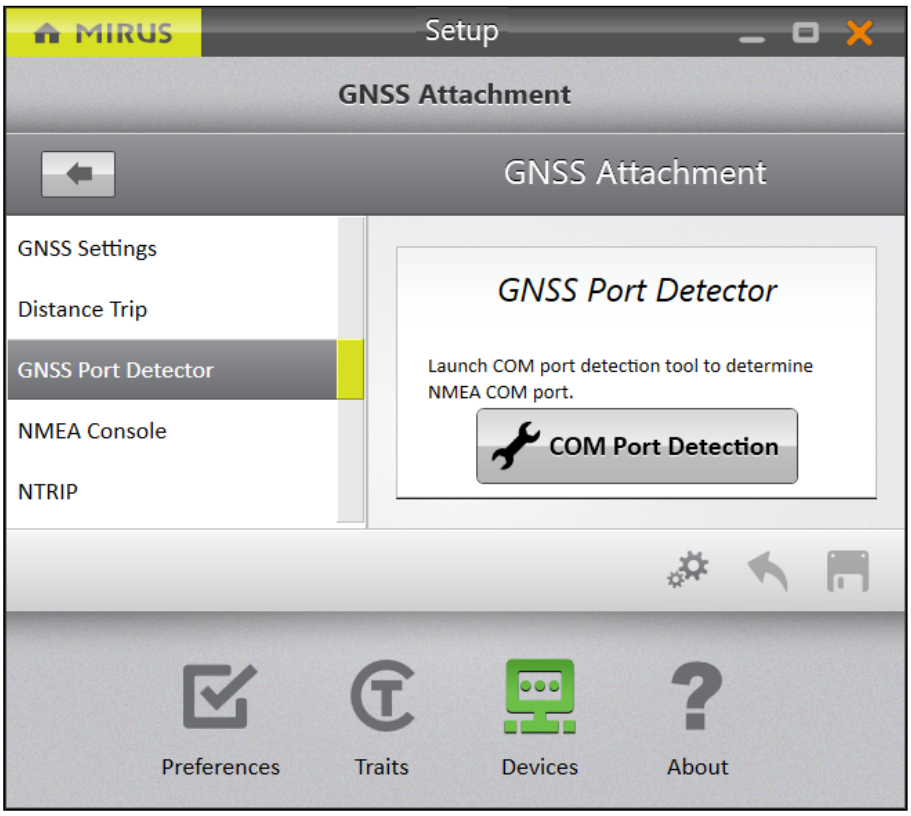


3. Scroll and tap **GNSS Attachment**.



On the **Setup** > **GNSS Attachment** screen,

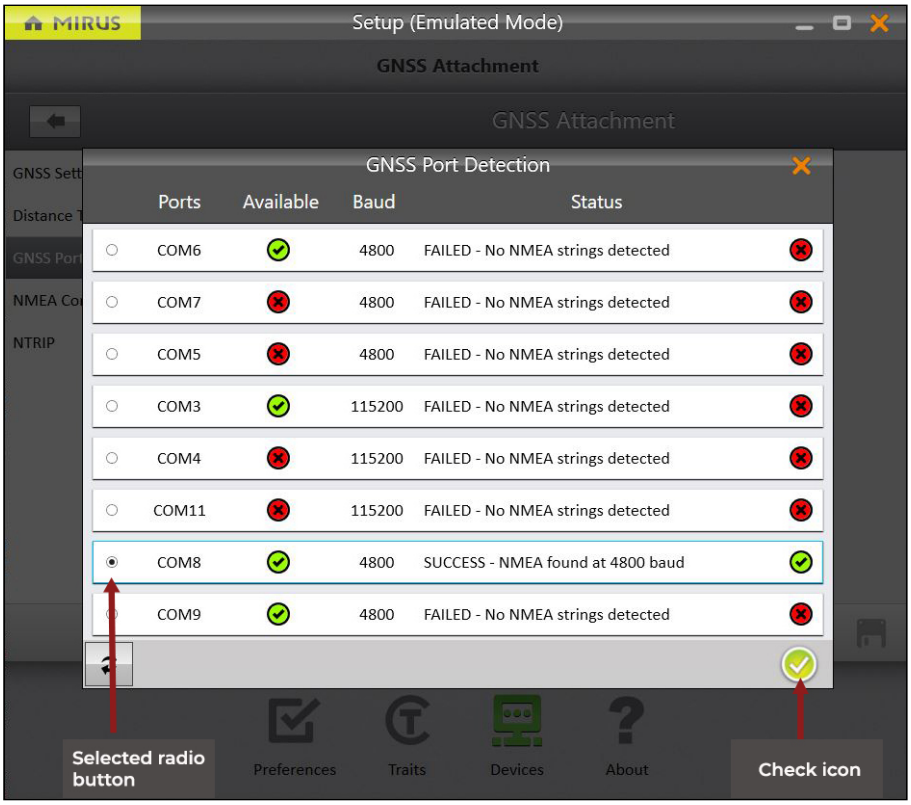
1. Tap **GNSS Port Detector** > **COM Port Detection**.



Mirus opens the GNSS Port Detection box and detects the ports.

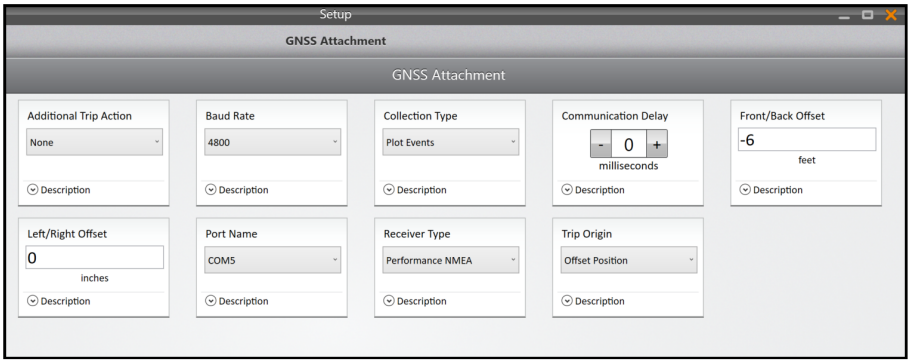
When the COM port detection is completed, you will see the name of each port, its availability, the baud rate through each port, and the status of NMEA messages. The port

in use is indicated by the selected radio button.



2. If you want to change the port, tap the port that you want to use.

   Note: The first time you use the GNSS plugin you select the receiver that you want to use.
3. Tap the check icon to apply the selected port and baud rate settings.
4. After the port detection completes, open GNSS Settings.
5. Input the Left/Right Offset and Front/Back offset.
6. Verify that the port name and baud rate are set correctly.

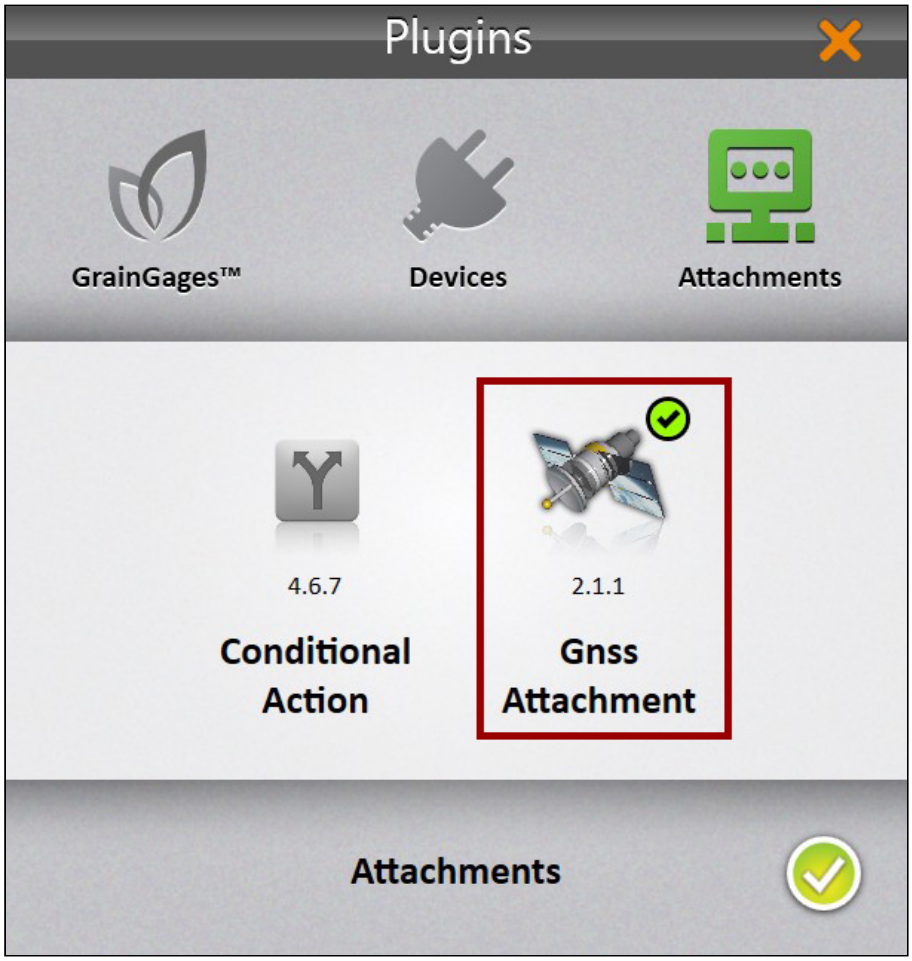


7. The following settings are filled in automatically.
   - Collection Type—Plot events
   - Capture Cycles—No
   - Additional Trip Action—None
   - Trip Origin Offset—Position
   - Receiver Type—Performance NMEA

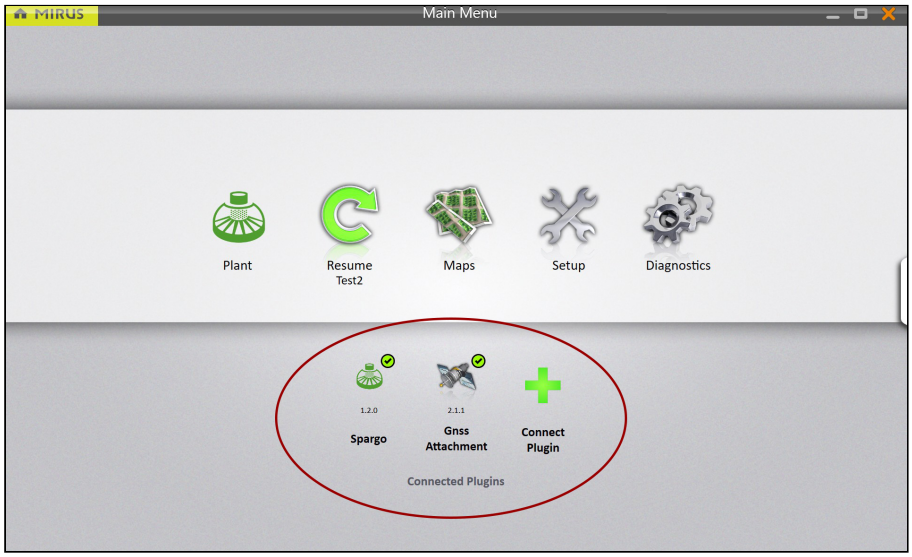
8. Save the settings and go to the Mirus Home screen.

Step 3: Connect the Spargo Cone Plugin under **Devices** tab.

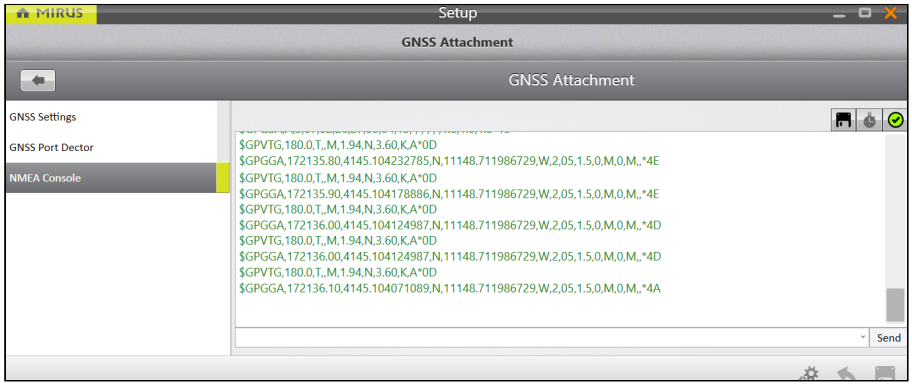
Step 4: Connect the GNSS Attachment under the **Attachments** tab.



Spargo and the GNSS Attachment have green checkmarks in the Connected Plugins.



Step 5: Once connected, use the diagnostics view or the NMEA Console to verify that Mirus is receiving live GNSS data.



2.5 Spargo Cone Planter Setup

Use the following sections to help you calibrate Spargo Cone Planter to work with your equipment and planting scenario.

2.5.1 Settings

In Mirus, go to **Setup** > **Cone** > **Settings**.

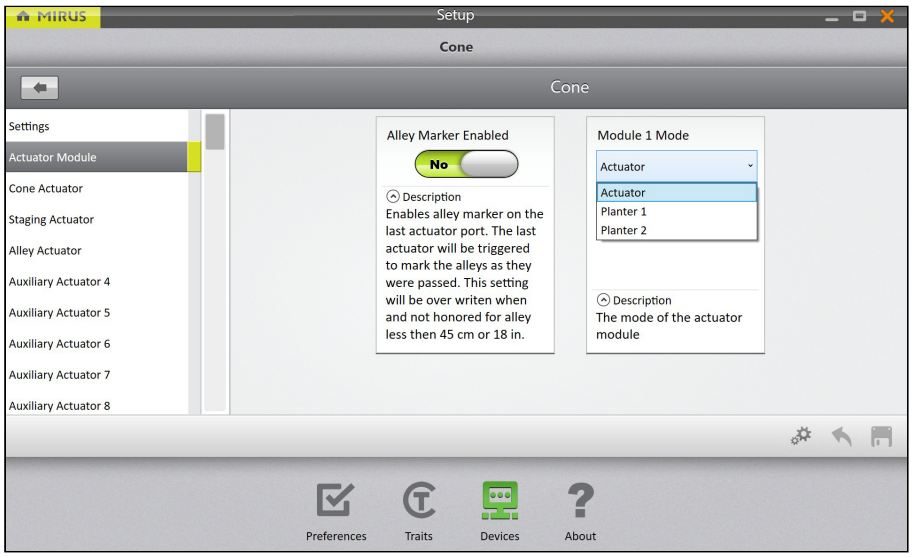
The following table describes the settings available from this screen.

Spargo Settings	
Setting	**Description**
Cone Start Delay	The amount of time it takes to actuate the cylinder or gate and for seed to drop to the ground. To begin, use a setting of 100 to 300 ms and then calibrate as needed. The times are subject to change based on the speed.

Alley Marker Start and Stop Delay	This calibrates the length of the alley marker. For information on how to calibrate the start delay and alley marker start and stop delays, see Operation.
Plots Per Pass	The number of plots planted simultaneously.

2.5.2 Actuator Module

In Mirus, go to **Setup** > **Cone** > **Actuator Module**.

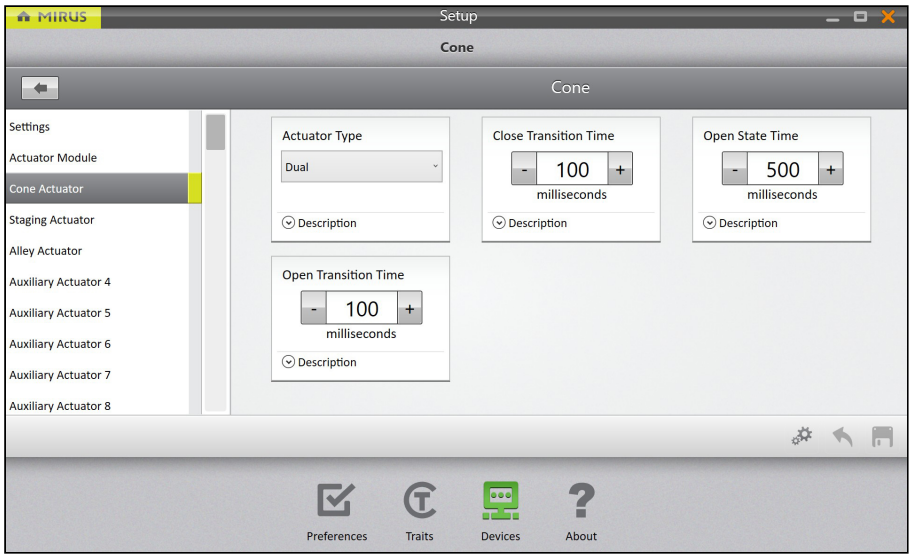


The following table describes the settings available from this screen.

Cone Actuator	
Setting	**Description**
Alley Marker Enabled	Enable or disable the alley marker on the last actuator port.
Module 1 Mode	Set the mode of the actuator control.

2.5.3 Cone Actuator

In Mirus, go to **Setup** > **Cone** > **Cone Actuator**.

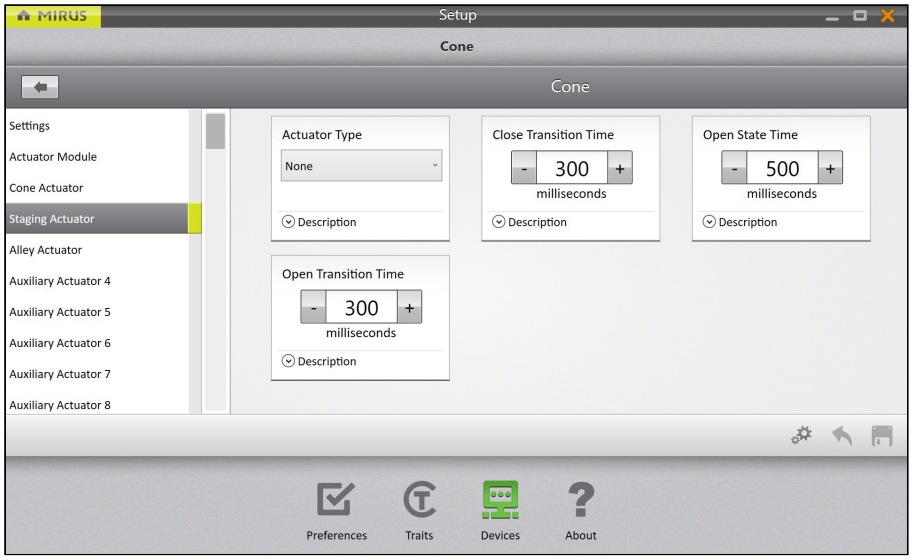


The following table describes the settings available for the actuator.

Cone Actuator	
Setting	**Description**
Actuator Type	▪ Dual (electric) ▪ Pneumatic (air)
Close Transition Time	Time it takes the actuator to transition close. This setting generally requires no adjustment. Default: 200 ms.
Open State Time	Time the cup stays open. Lengthen the time to hold open the cup longer for higher volumes of seed. Default: 1000 ms.
Open Transition Time	Time it takes the actuator to transition open. The time is adjusted during the calibration process. Default: 200 ms.

2.5.4 Staging Actuator

In Mirus, open **Setup** > **Cone** > **Staging Actuator**.

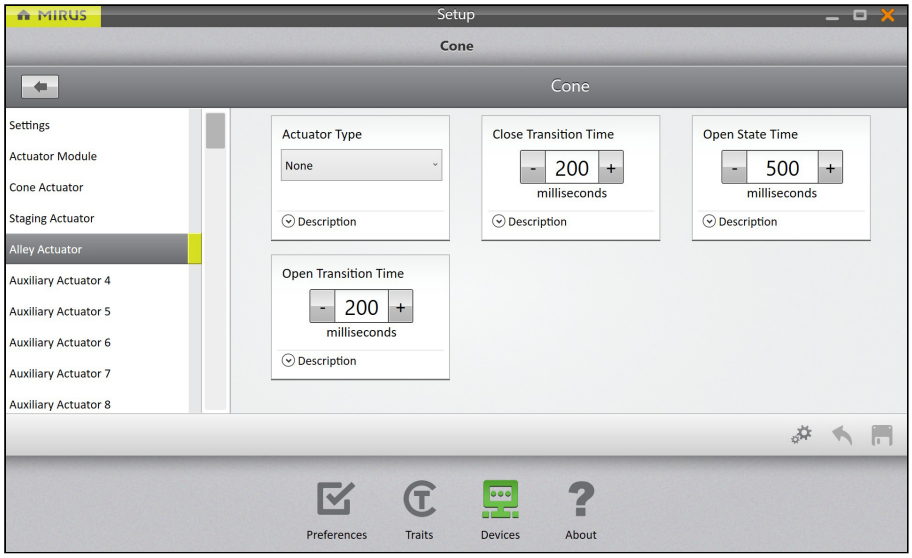


The following table describes the settings available for the staging actuator.

Staging Actuator	
Setting	**Description**
Actuator Type	▪ If you have a staging cone, select **Dual** or **Pneumatic**. ▪ If you don't have a staging cone, select **None**.
Close Transition Time	Time it takes the actuator to transition close. This setting generally requires no adjustment. Default: 200 ms.
Open State Time	Time the staging device stays open. Lengthen the time for large volumes of seed. Default: 1000 ms.
Open Transition Time	Time it takes the actuator to transition open. The time is adjusted during the calibration process. Default: 200 ms.

2.5.5 Alley Actuator

In Mirus, go to **Setup** > **Cone** > **Alley Actuator**.

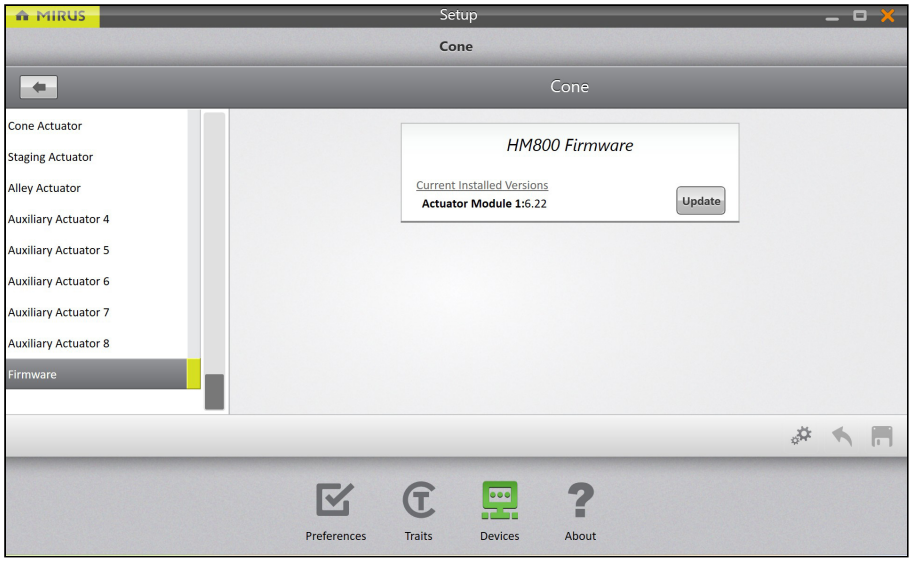


The following table describes the settings available for the alley actuator.

Alley Actuator	
Setting	**Description**
Actuator Type	▪ If you have an alley marker, select **Dual** or **Pneumatic**. ▪ If you don't have an alley marker, select **None**.
Close Transition Time	Time it takes the actuator to transition close. This setting generally requires no adjustment. Default: 200 ms.
Open State Time	Time the alley marker stays on. Lengthen the time for large volumes of seed. Default: 1000 ms.
Open Transition Time	Time it takes the actuator to transition open. The time is adjusted during the calibration process. Default: 200 ms.

2.5.6 Firmware

To view the current firmware on the actuator module, open **Setup** > **Cone** > **Firmware**. Tap **Update** to update the actuator firmware.


MIRUS
Setup
Cone
Cone
Cone Actuator
Staging Actuator
Alley Actuator
Auxiliary Actuator 4
Auxiliary Actuator 5
Auxiliary Actuator 6
Auxiliary Actuator 7
Auxiliary Actuator 8
Firmware
HM800 Firmware
Current Installed Versions
Actuator Module 1:6.22
Update
Preferences
Traits
Devices
About

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CHAPTER 3

Calibration

3 Calibration

3.1 Overview

When properly calibrated, the Spargo Cone Planter works with plots and alleys of different dimensions.

The process of calibrating the Spargo Cone Planter and GNSS plugin requires two main steps: calibrating the setback (offsets) and aligning the seed placement.

Generally, calibration is only required once, but the following factors require recalibration:

- If the GNSS/GPS receiver is re-calibrated or changed to a different model, perform recalibration for the communication delay as it may be different for different models.
- The setback may change if the applicator is being used with a different planter or if the GNSS/GPS antenna is moved to a new position. For situations like these, the setback needs to be re-calibrated. When the planter is located behind the GNSS/GPS, the front/back offset is negative.
- Based on the travel speed of the planter, adjust the cone start delay and alley start and stop. Any time the speed changes more than a 0.25 mph, you should make a change to the timers.

3.2 Prepare for Calibration

Before calibration, ensure that all solenoids or actuators are in good condition. Valves and/or gates that are sticky will adversely affect calibration and planting.

3.2.1 Seed Alignment with Plots

With setback and offsets properly set, make sure the seed placement is calibrated to start as the cone enters the plot.

Three key factors influence how well the seed placement can be aligned to start as the planter enters the plot: GNSS/GPS accuracy, GNSS/GPS communication delay, and cone start delay associated with the mechanics of the actuator.

3.2.2 GNSS/GPS Accuracy

The accuracy of the GNSS/GPS receiver affects how well the seed aligns to the plots. Mirus cannot compensate for misalignment that is due to lack of accuracy from the GNSS/GPS receiver. For example, consider a scenario in which an RTK receiver provides accuracy of 2 cm. The system will have up to 2 cm of stagger in both directions and could appear to be off by as much as 4 cm. Because of this factor, allow for a certain degree of imperfection in aligning the seed with the plot.

3.2.3 GNSS/GPS Communication Delay

The time for the GNSS/GPS receiver to transmit the current position to the tablet computer is a critical factor. In Mirus you can calibrate for this delay.

3.2.4 Actuator Start

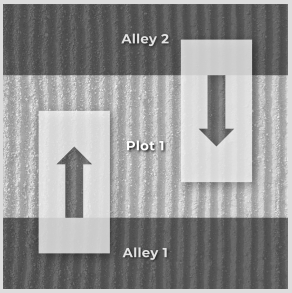
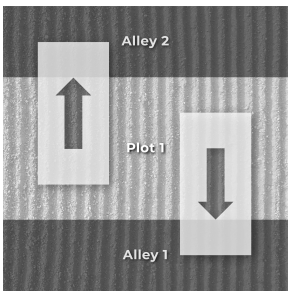
The mechanics of the actuator introduce delay from when Mirus sends the signal to start planting. The Cone Planter Delay allows adjustment to compensate for the mechanical delay. Raising this number opens the cone(s) sooner.

3.2.5 Setting Delays in Mirus

Considering the stagger that can be introduced from GNSS/GPS accuracy, it can be difficult to determine which delays need to be adjusted. If the cone start delay is too early or too late, the timers might need to be adjusted. Changing the communications delay also affects the GPS positions that are saved to the database, and so it is important to adjust the right parameters.

To calibrate the planter properly, make sure to drive at least two passes at the same speed, preferably the same speed as when you actually plant the plots.

The following scenarios outline likely issues and provide guidance for making adjustments in the Mirus settings.

Mirus Adjustments		
Issue Description	**Possible Cause(s)**	**Diagram**
Scenario 1 Planting begins early (before entering the plot). Planting ends early (before leaving the plot). Stagger is backward.	▪ Communication delay set too long. ▪ Cone start delay is too long. ▪ Offset is too short. *Note: Offset is unlikely if you properly calibrated the offset previously. But you can tell if set back is the issue by testing at different speeds (fast and slow). Setback is the problem if the stagger remains the same at fast and slow speeds. Delay settings are the problem if the seed placement becomes longer at higher speeds.*	
Scenario 2 Planting begins late (after entering the plot). Planting ends late (after exiting the plot). Stagger is forward.	▪ Communication delay set too short. ▪ Cone start delay is too short. ▪ Offset is too long. *Note: Offset is unlikely if you properly calibrated the setback previously. But you can tell if set back is the issue by testing at different speeds (fast and slow). Offset is the problem if the stagger remains the same at fast and slow speeds. Delay settings are the problem if the seed placement becomes longer at higher speeds.*	

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CHAPTER 4

Operation

4 Operation

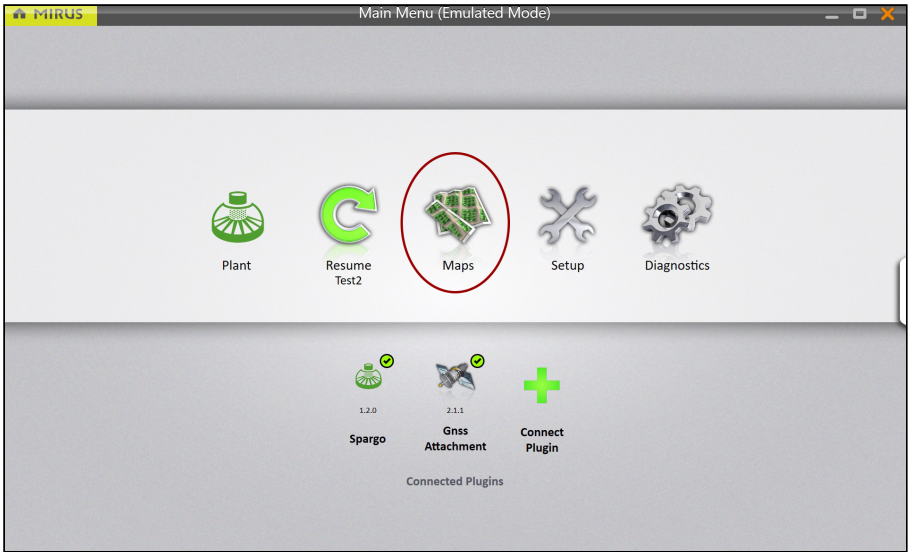
This section covers creating a map, setting up GPS/GNSS cycling, adding note-taking prompts, and planting. Be sure that calibration and system setup have already been completed.

4.1 Create a Map

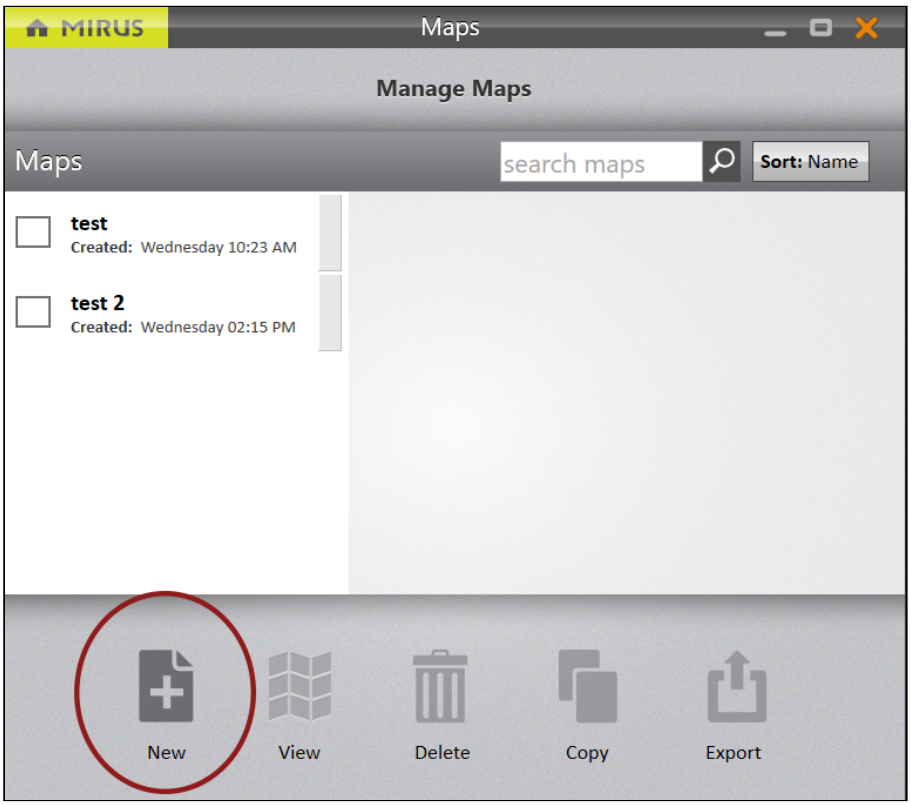
The following instructions walk you through creation of a Range Row map.

On the Mirus Home screen,

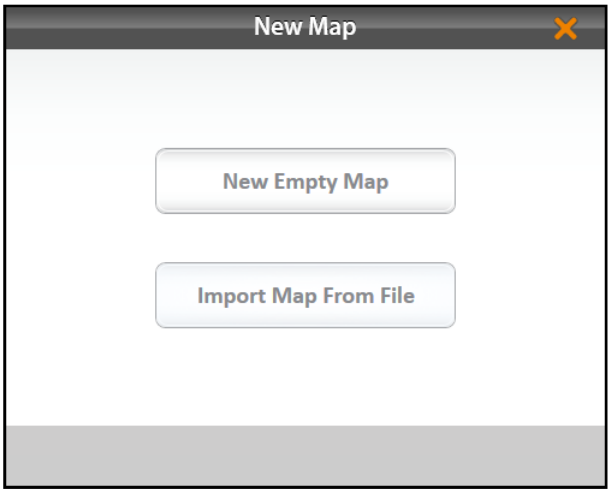
1. Tap **Maps** .



2. Tap **New**.

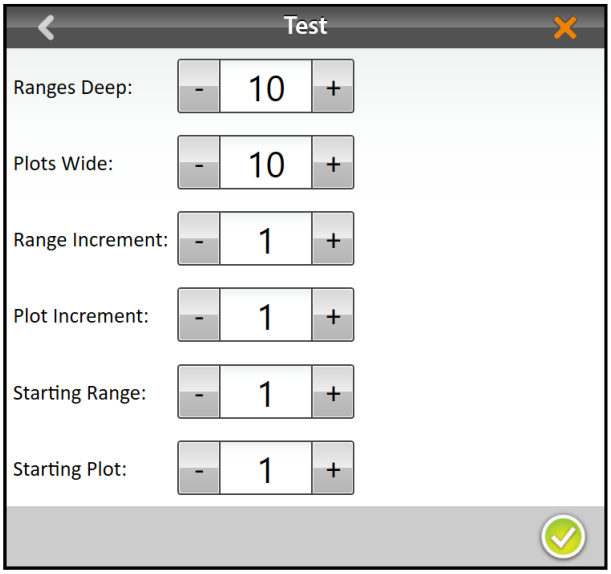


3. Select **New Empty Map**.



4. Name and describe the map.
5. Tap **Range Row**.
6. Tap the next arrow.

*Note: The Name box only accepts basic letters and numbers. Do not use emojis or the following special characters: > < : " \ ? | / **



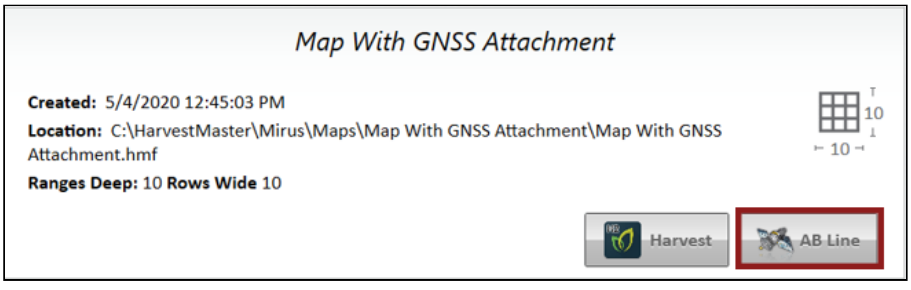
7. Set the following:
    - Ranges deep
    - Plots wide
    - Range increment
    - Plot increment
    - Starting range
    - Starting plot
8. Tap the check icon to save the map.

For more information about different kinds of maps or how to import a map, see the Mirus for H2/H3 GrainGage User Manual.

4.2 Set Up Automatic GPS/GNSS Cycling

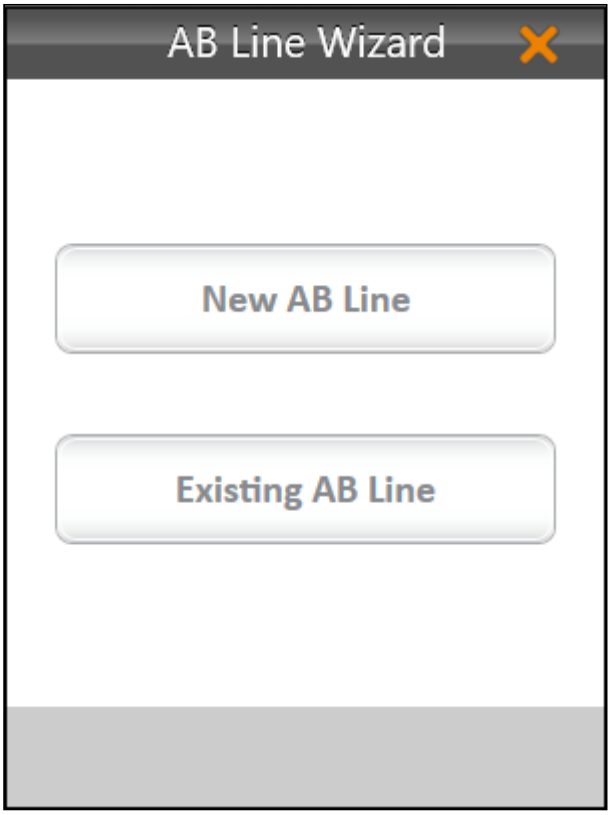
Create an AB line that corresponds to one side of your physical field.

1. Select a map, and tap **AB Line**.



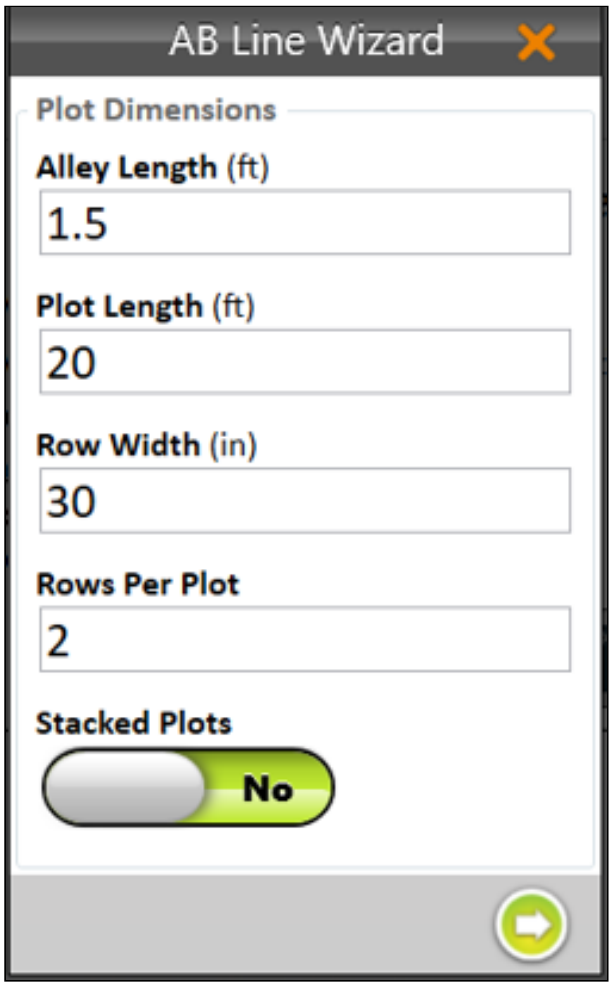
2. In the AB Line Wizard, tap **New AB Line**.

Note: If you want to edit an existing line, choose Existing AB Line and then select the map file that contains the AB line you want to copy.



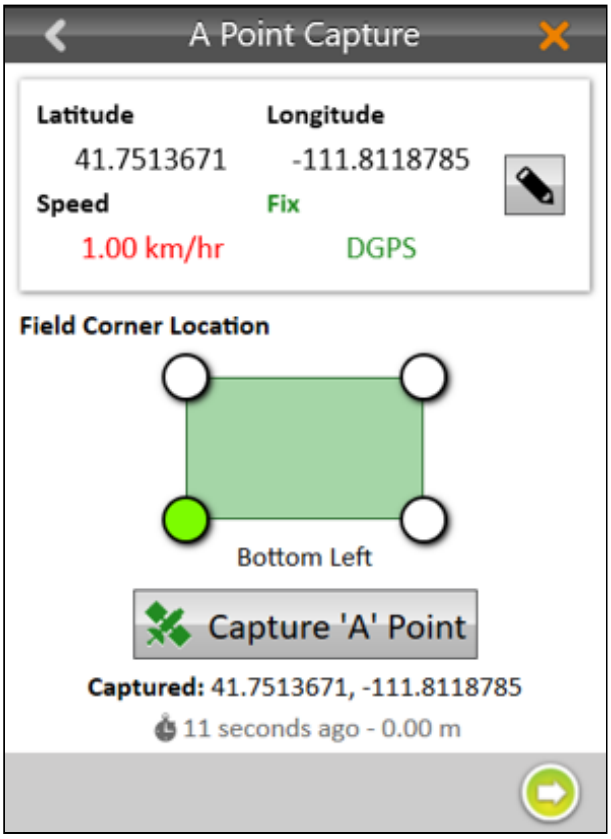
3. Set the Plot Dimensions.
    - **Alley Length**—The alley is the empty space between ranges.
      Note: The minimum Alley Length is 0.1 ft, which creates a field with no alley.
    - **Plot Length**—The length of the space allotted for the plants to grow.
    - **Row Width**—The width of the space allotted for each row of plants to grow.
    - **Rows Per Plot**—The number of plant rows to be grouped together to create a plot.
      Note: The row width and rows per plot should equal the effective swath width.
    - **Stacked Plots**—A group of plots separated from other plot groups by a larger alley. This option defines a longer alley after a specific number of smaller alleys between plots. If you are using stacked plots, enable **Stacked Plots** and define the number

of plots per stack and the stack alley width.



4. Tap the next arrow .
5. Move your GNSS receiver to the location you want displayed in Mirus as the lower left corner of the field. When using the GNSS attachment with a GrainGage and the correct offsets entered, position the planter in front of the first plot.
6. In Mirus tap **Capture 'A' Point**.

Note: You can manually edit the latitude and longitude of the 'A' point before capturing it.



7. Tap the next arrow .
8. Move your GNSS receiver to the location you want displayed in Mirus as the upper left corner of the field. For example, position the planter, pointing the same direction, at the end of the first row of the first plot.

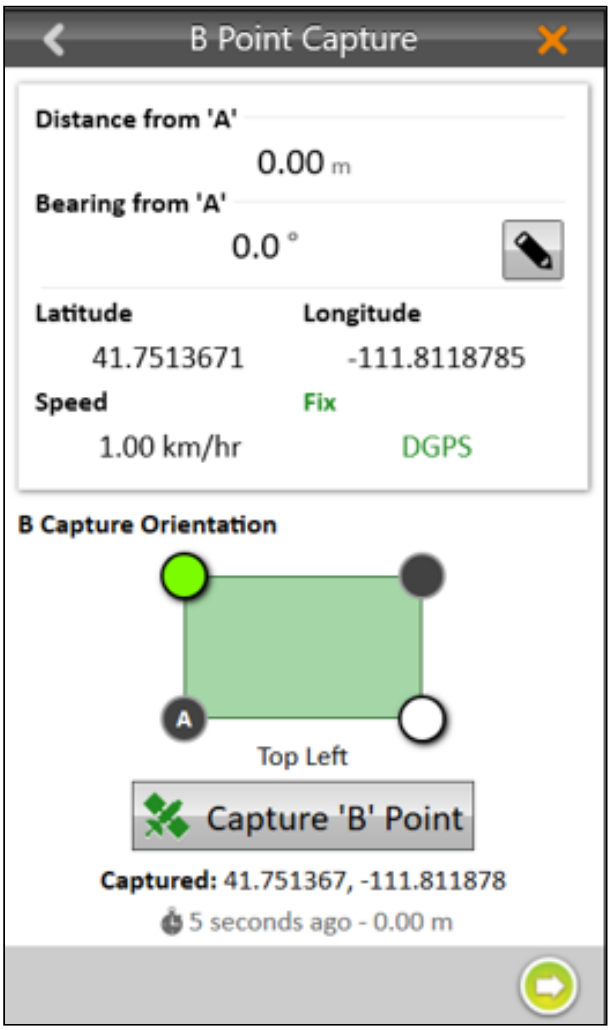
   Note: If it is not feasible to drive exactly along your row as you would to plant, you can drive the tractor parallel to your row to the side of the plot, and then reset the corner(s) using an offset distance in Mirus once the AB line has been created.

   To improve the accuracy of the map with the AB line you are defining,

   Drive the entire length of the field between capturing the 'A' and 'B' points.

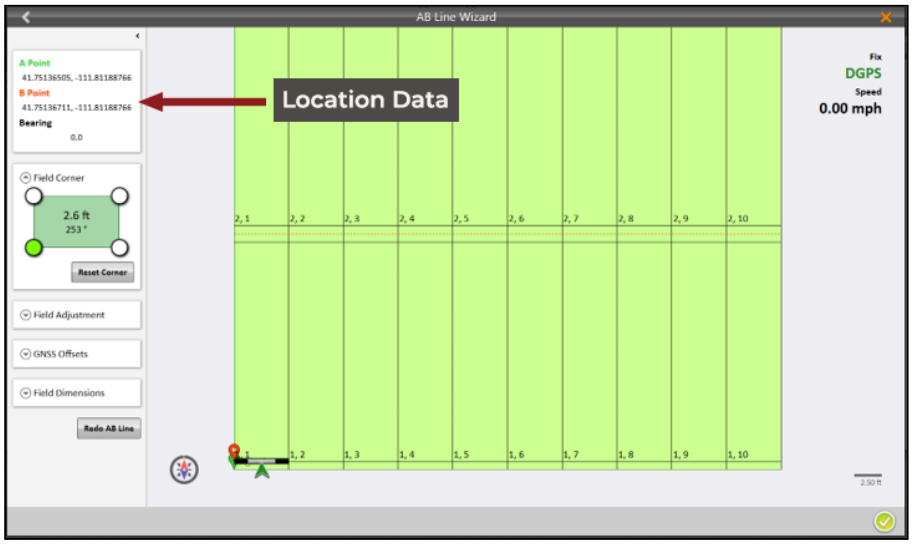
   Use the pencil button to enter the distance from your first corner A and the bearing in degrees from A to B.

9. In Mirus tap **Capture ‘B’ Point**.



10. Tap the next arrow .

Mirus will display the Map View of the field calculated from the AB Line.



All of the field parameters are displayed on the left side of the screen. Several of them can be edited from there.

AB Line Wizard Final Screen	
Setting	**Description and Options**
A Point B Point Bearing	View the A and B coordinates and the bearing entered.
Field Corner	Reset the corner to reposition the AB line based on your new position.
Field Adjustment	Change the vertical or horizontal width of your field.
GNSS Offsets	View the currently set offsets.
Field Dimensions	Adjust the Alley Length, Plot Length, Row Width, Rows Per Plot, and choose Stacked Plots.
Redo AB Line	Recapture the AB line.

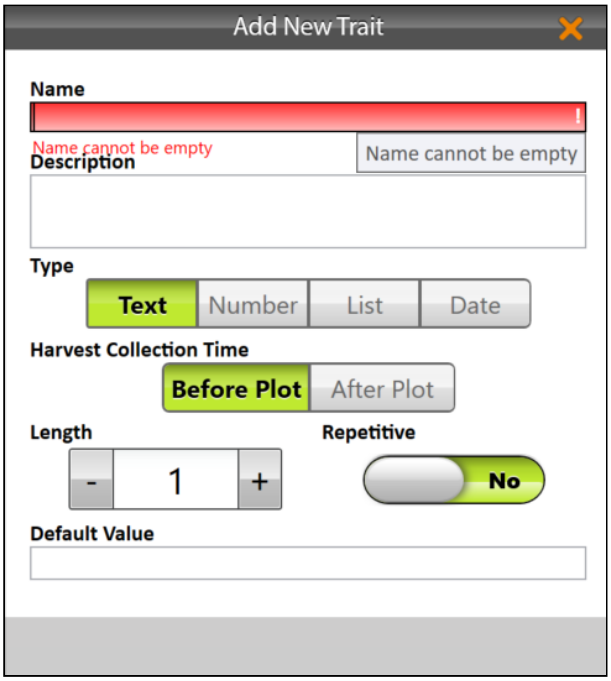
4.3 Add Trait Notes

The Trait Notes feature allows you to create customized prompts for recording planting notes. You can configure these prompts to appear before and/or after planting a plot, using various data types like text, numbers, lists, or dates. For example, you could use trait notes to capture the environmental conditions at the time of planting, such as temperature and soil moisture.

To create a prompt,

1. From the Setup screen, tap **Traits** .

2. Tap new .



3. Use the following table to help you set up the trait note.

Trait Note Settings	
Field	**Description**
Name	Enter the name of the trait.
Description	Describe the type of data that will be recorded with this trait.
Type	Select the type of data you want capture: **Text**—Use for recording text relative to the plot. You can set a character limit in Length and/or a default value for quick selection. **Number**—Use for recording a number, such as a score relative to a plot. You can set the character limit in Length and/or a default value for quick selection. **List**—Use for creating a list of options. Create the list by entering values in the Default Value field. To add multiple values, tap the Plus icon on the right side of the window. The list selection works best with no more than five trait values. **Date**—Use for recording the date. The default value is the current date, but you can select a different date.
Harvest Collection Time	Select **Before Plot** or **After Plot** to determine when the user is prompted to record the trait.

Length	Select the maximum number of characters that can be entered. Mirus automatically moves to the next trait when the character limit is reached.
Repetitive	Set the toggle to **Yes** if trait will be collected multiple times during the season. The default value is No.
Default Value	*(Optional)* Specify a default value for the trait. While recording the trait, the operator can press the Enter key to accept the default value or overwrite the default by entering a new value and pressing the Enter key.

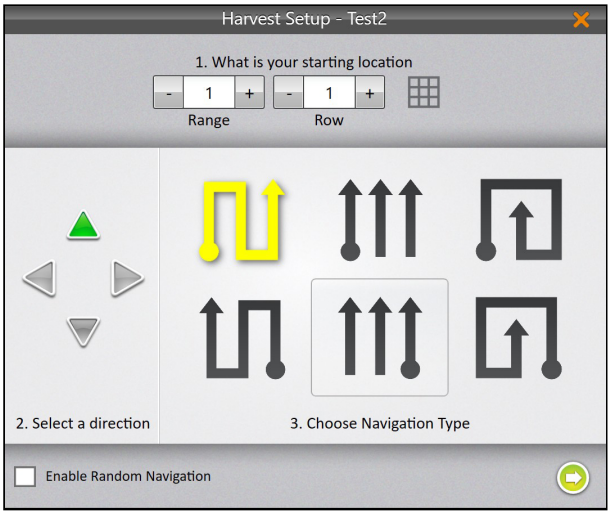
4. Tap the next arrow to save the trait.

4.4 Plant

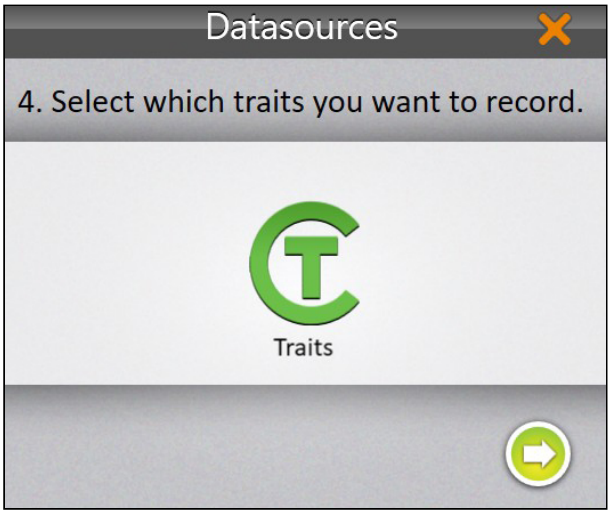
To plant, follow these steps.

Step 1: Begin planting.

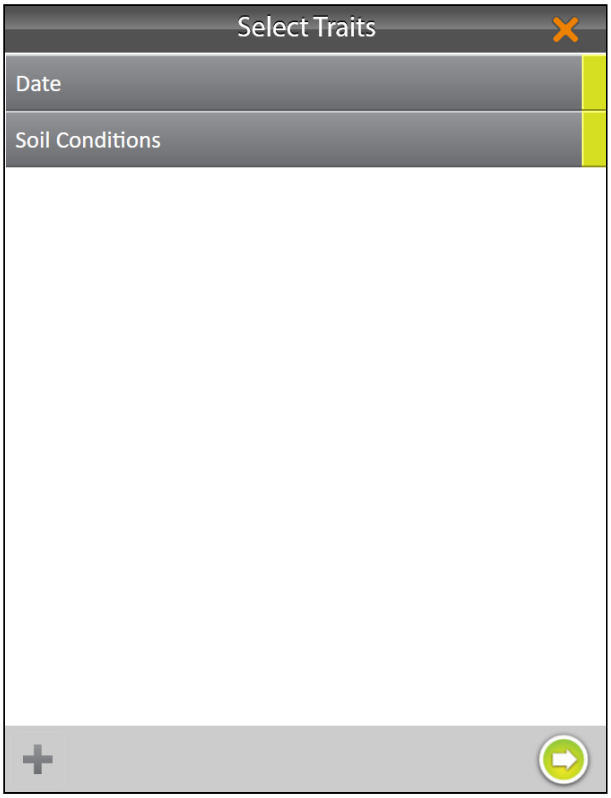
1. Under Manage Maps, select the map that you want to use and tap **Plant** .
2. Select your starting location, the direction, and the navigation type. Tap the next arrow .



3. (Optional) If traits have set up traits for this map, tap **Traits** and tap the next arrow .



   a. Select the trait(s) that you want to record. To add a new trait, tap the plus icon . (See Add Trait Notes.)



   b. Tap the next arrow .

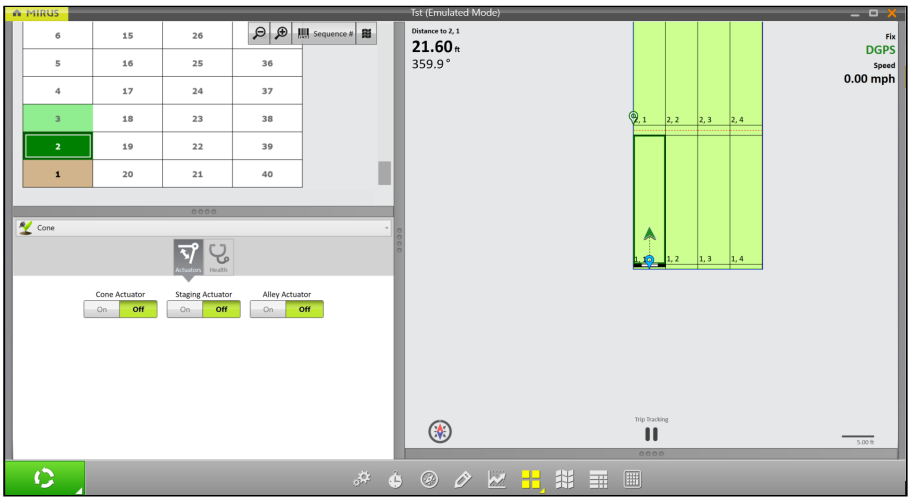
4. Tap the next arrow to open the planting screen.

5. In the planting screen, tap **Start** in the bottom left corner of the screen.

   Note: Ensure you are not in the field when you select start because the system will begin planting. For best results, move the planter back to a position outside of the plots (near your starting location), and start moving into and through the plots at your target speed.

6. Load seed into the cone.

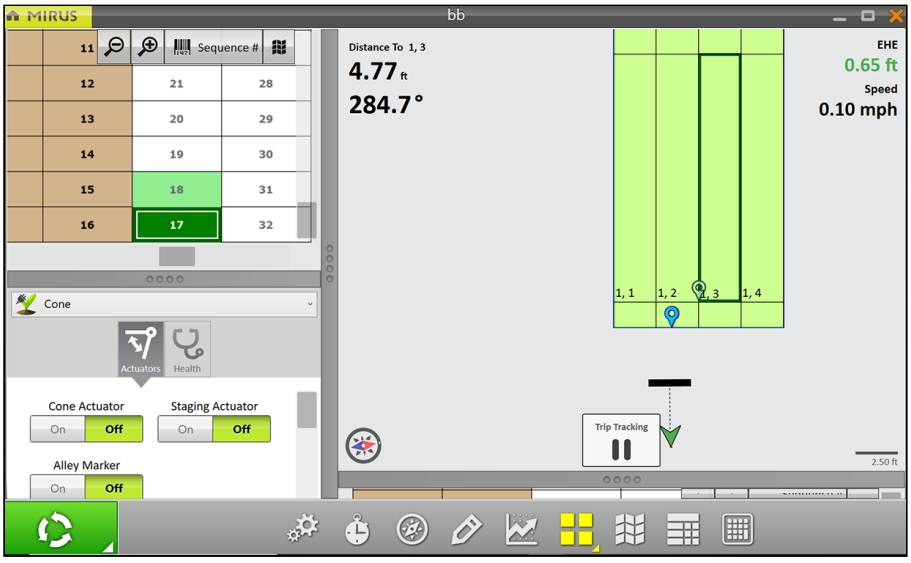
7. Drive into the field.



Step 2: In the quad view, choose the views that you would like to display.

If you use the spatial view in your quad view setup, it displays plots labeled with “Range, Row” by default. But you can select from a list of different spatial attributes by clicking on the spatial attribute button in that quad. To visually distinguish plots that have been

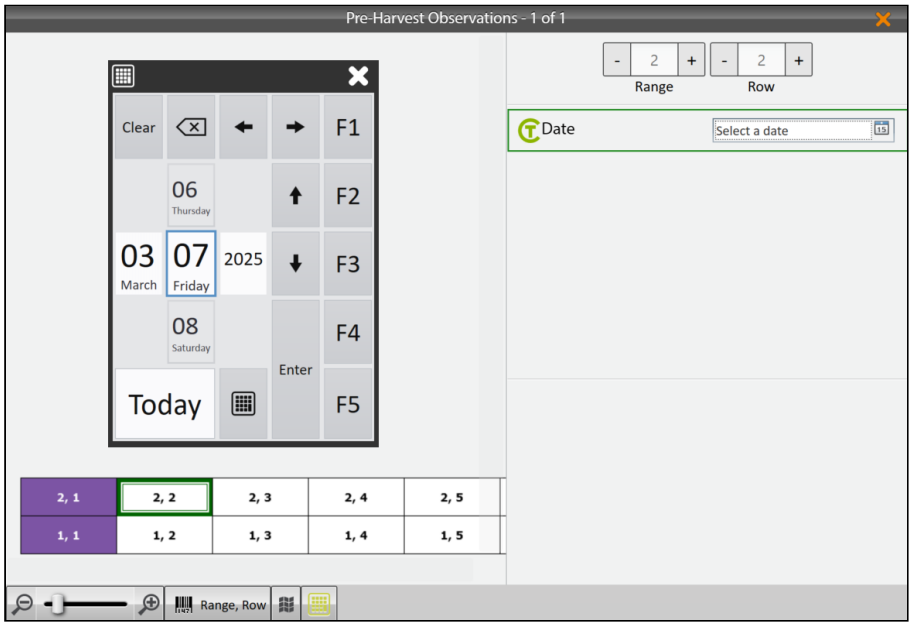
planted, select the spatial attribute with the sequence number.



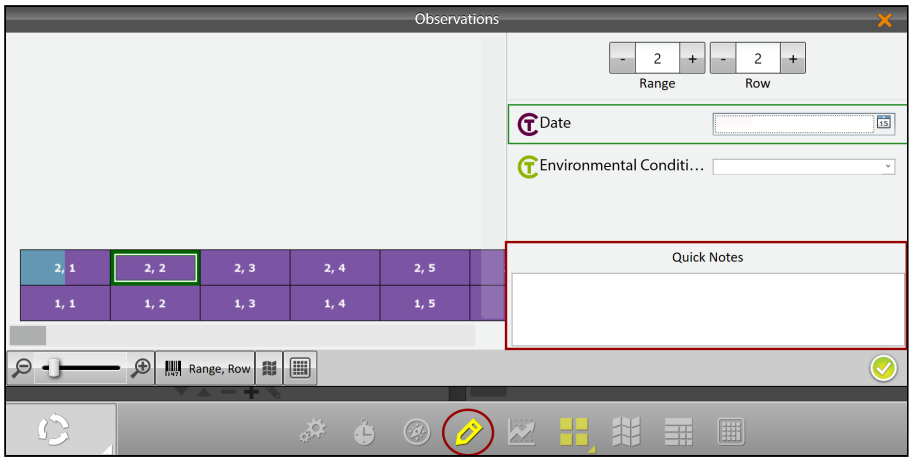
For more information on how to customize and configure the quad view screen, refer to the Mirus for H2/H3 GrainGage User Manual.

Step 3: **Proceed through the plots at a consistent speed. Mirus triggers the planter automatically.**

If trait notes have been set up, Mirus will prompt you to take notes before and/or after each plot, similar to the following example. (See Add Trait Notes.) After you enter the trait note, the system continues planting.



To add a quick note while planting, tap the pencil icon on the toolbar and enter the note in Quick Notes. Tap the check icon to close the screen and resume planting.



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CHAPTER 5

Export

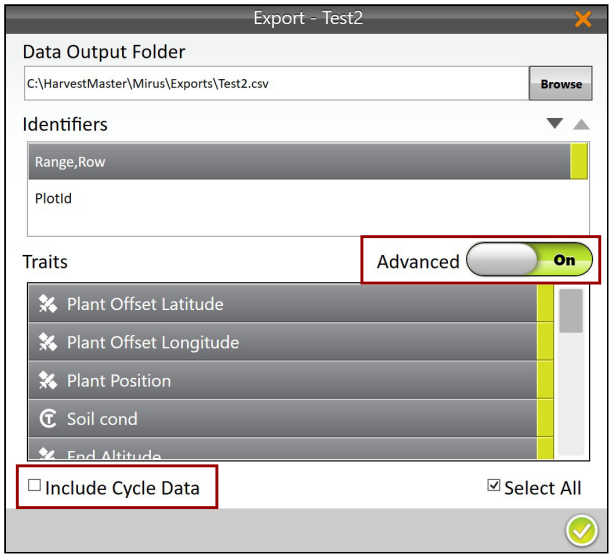
5 Export

5.1 Export GNSS Planting Data

The map export utility exports trip (start of row) positions for each plot.

From the Manage Maps screen, you can export map data as a CSV file. Then, the file can be viewed in Excel or imported into analysis software, such as AgroBase or Prism. For instructions on exporting data, refer to "Export Map Data" in the Mirus for H2/H3 GrainGage User Manual.

To include additional traits and fields, turn on **Advanced**. Deselect any traits that you don't want to include in the export. Select **Include Cycle Data** to include sub-cycle data.



The following is an example of exported data with GNSS data for each cycle.

Date/Time	Range	Row	Plot ID	Plant Offset Latitude	Plant Offset Longitude	Plant Position	Harvest Sequence
7/12/2025 13:56	1	1	101	41.76216494	-111.8622119	41.762163827, -111.862199761	2
7/12/2025 13:57	2	1	201	41.7621345	-111.8619736	41.762137287, -111.861959814	3
7/12/2025 14:03	3	1	301	41.76216074	-111.8620596	41.762161798 -111.862071770	4
7/12/2025 14:03	4	1	401	41.76218637	-111.8622635	41.762183296 -111.862277148	5
7/12/2019 14:07	5	1	501	41.76218322	-111.8621941	41.762181990 -111.862182028	6
7/12/2019 14:07	6	1	601	41.76215117	-111.8619635	41.762155624 -111.861950547	7

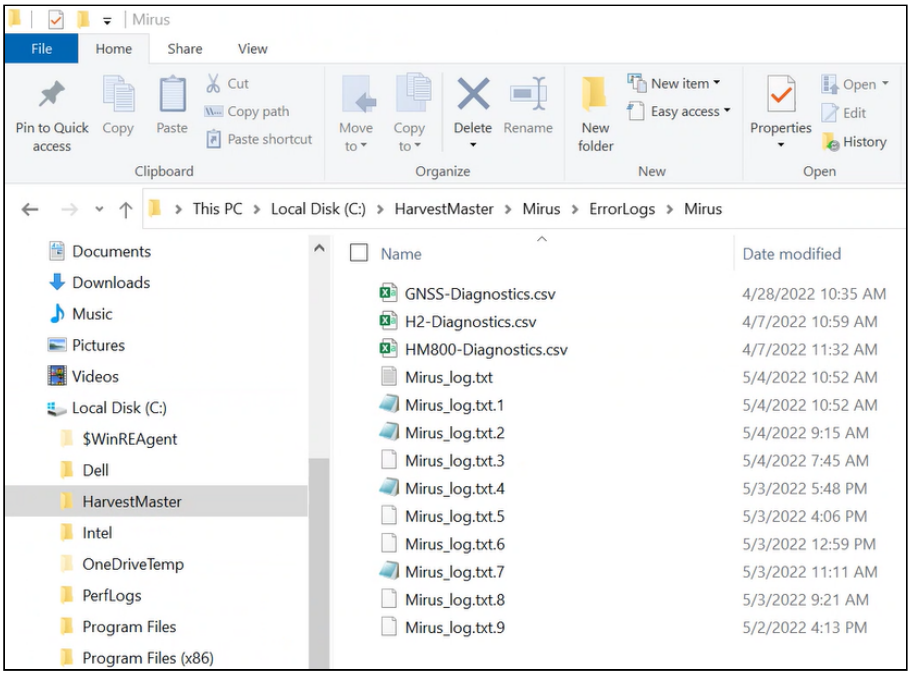
5.2 Export Error Logs

If you encounter a problem while installing or operating the Spargo Cone Planter, contact a HarvestMaster Field Service Engineer. If the HarvestMaster Field Service Engineer needs to look through the GrainGage error logs, you can find them saved on your device.

1. Insert a USB drive into your tablet.
2. Open File Explorer.
3. Go to C:\HarvestMaster\Mirus\ErrorLogs\Mirus

   The most recent error log will be saved under Mirus_log.txt. The Mirus_log.txt file will hold up to 15 MB before it moves to become Mirus_log.txt.1. When the next Mirus_log.txt fills up, Mirus_log.txt.1 will become Mirus_log.txt.2. The log will continue to cascade down until it

becomes Mirus_log.txt.9 and then is deleted from the folder.



4. Select the Mirus log file the HarvestMaster Field Service Engineer requested.
5. Copy the selected file to the USB drive.
6. Transfer the file to your desktop computer and email it to the HarvestMaster Field Service Engineer.

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CHAPTER 6

The Backup Log

6 The Backup Log

Mirus creates a backup log when you open a map for planting or note taking. The backup file is a CSV file stored at C:\HarvestMaster\Mirus\Backups\.

The following fields are included in the backup log but there may be additional fields for customized trait notes.

Backup Log	
Field Name	**Description**
Date/Time	Date and time that the data was collected (MM/DD/YYYY HH:MM).
Range	Identifier for the range number.
Row	Identifier for the row number.
Plot ID	Identifier assigned to the plot.
Plant Offset Latitude	Latitude coordinate (adjusted for the GNSS antenna front/back and left/right offsets) when the cone planter completes cycling at the end of the plot.
Plant Offset Longitude	Longitude coordinate (adjusted for the GNSS antenna front/back and left/right offsets) when the cone planter completes cycling at the end of the plot.
Plant Position	Latitude and longitude coordinates when the cone planter completes cycling at the end of the plot.
End Altitude (m)	Vertical elevation of the GNSS receiver above sea level when the cone planter completes cycling at the end of the plot.
End EHE (m)	Estimated accuracy of the GNSS receiver when the cone planter completes cycling at the end of the plot. Captured only when the receiver is configured to output either GST or RRE NMEA messages.
End Heading	Compass direction when the cone planter completes cycling at the end of the plot. Measured in degrees from the north magnetic pole.
End Latitude	Latitude coordinate for the north/south position on the Earth when the cone planter completes cycling at the end of the plot.
End Longitude	Longitude coordinate for the east/west position on the Earth when the cone planter completes cycling at the end of the plot.
End Offset Latitude	Latitude coordinate (adjusted for antenna offsets) when the cone planter completes cycling at the end of the plot.
End Offset Longitude	Longitude coordinate (adjusted for antenna offsets) when the cone planter completes cycling at the end of the plot.
End Speed (km/hr)	Rate at which the GNSS receiver is traveling (or the planter is moving) when the cone planter completed cycling at the end of the plot.

Plant AB Bottom Left Latitude	Latitude coordinate of the bottom left corner of the plot as projected by the AB line. The value is not captured in real time by the GNSS receiver.
Plant AB Bottom Left Longitude	Longitude coordinate of the bottom left corner of the plot as projected by the AB line. The value is not captured in real time by the GNSS receiver.
Plant Altitude (m)	Vertical elevation of the GNSS receiver above sea level when planting began.
Plant EHE (m)	Estimated horizontal error of the GNSS receiver when planting began.
Plant Estimated Plot Position	Range and row identifiers of the plot where the GNSS receiver is located when the position is captured.
Plant Front/Back Offset (m)	The value entered for the front/back offset for the GNSS antenna. The default value is 0.
Plant Heading	Compass direction (measured in degrees from the north magnetic pole) that the planter is headed when the cone planter completed cycling at the end of the plot. No GNSS offsets are applied.
Plant Latitude	Latitude coordinate when the cone planted completed cycling at the end of the plot. No GNSS offsets are applied.
Plant Left-Right Offset (cm)	The value entered for the left/right offset for the GNSS antenna. The default value is 0.
Plant Longitude	Longitude coordinate when the cone planted completed cycling at the end of the plot. No GNSS offsets are applied.
Plant Plot Width (cm)	Width of the plot.
Plant Speed (km/hr)	Average speed at which the planter is moving through the plot.
Start Altitude (m)	Vertical elevation above sea level for the GNSS receiver when the planting began (adjusted for Start Delay).
Start EHE (m)	Estimated horizontal error of the GNSS position when the planting began (adjusted for Start Delay).
Start Heading	Compass direction (measured in degrees from the north magnetic pole) when the planting began (adjusted for Start Delay).
Start Latitude	Latitude coordinate of the GNSS antenna when the planting began (adjusted for Start Delay).
Start Longitude	Longtitude coordinate of the GNSS antenna when the planting began (adjusted for Start Delay).
Start Offset Latitude	Latitude coordinate (adjusted for GNSS antenna offsets) when the planting began (adjusted for Start Delay).
Start Offset Longitude	Longitude coordinate (adjusted for GNSS antenna offsets) when the planting began (adjusted for Start Delay).

Start Speed (km/hr)	Rate at which the GNSS receiver is traveling (or the planter is moving) when planting began.
Quick Note	Quick notes entered in Mirus while planting.
Harvest Sequence	For new maps, this is the order in which the plots were planted. *Note: This sequence number does not match the planting order when planting from a previously used map.*

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CHAPTER 7

Obtain HarvestMaster Service Help

7 Obtain HarvestMaster Service Help

For technical questions or repairs, contact a HarvestMaster Field Service Engineer. In many situations, an engineer can resolve the problem over the phone and even guide you in replacing parts.

USA	Europe
Web: www.HarvestMaster.com Email: support@HarvestMaster.com Phone: +1 (435) 753-1881	Web: www.HarvestMaster.eu Email: support@HarvestMaster.eu Phone: +43 724 221 9333

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CHAPTER 8

Warranty

8 Appendix A: Limited Warranty

8.3 Software

Software products that are designed by Juniper Systems for use with a hardware product and that are properly installed on that hardware product are warranted to the end user not to fail to execute their programming instructions due to defects in material or workmanship for a period of one year from the date of delivery.

If Juniper Systems receives notice of such defects during the one year warranty period, Juniper Systems shall, at its option, repair or replace the defective software media. Warranty is limited to repair or replacement of software media.

The warranties provided herein do not apply in the case of improper or inadequate maintenance or in the case of repair by any person not previously authorized in writing by Juniper Systems to do such maintenance or make such repairs.

These warranties likewise do not apply where the products have been operated outside the environmental specification of the product, where software products other than those specified by Juniper Systems have been used, or where attempts at software interface have been made by any person not previously authorized by Juniper Systems to perform such interfacing operations.

8.4 Disclaimer of Warranties

The warranties set forth herein are in lieu of all other warranties of Juniper Systems, whether written, oral or implied. Juniper Systems makes no warranties regarding its products (hardware or software), including without limitation warranties as to merchantability, fitness for a particular purpose, any warranty arising from course of performance, course of dealing, or usage of trade whether any of the foregoing warranties are either expressed or implied. Juniper Systems specifically makes no warranties as to the suitability of its products for any particular application. Juniper Systems shall in no event be liable for special, incidental, or consequential damages in connection with or arising out of the furnishing, performance or use of any product covered by this agreement whether such claim is based upon warranty (express or implied), contract, strict liability, negligence or otherwise.

8.5 Updates or Modifications

Juniper Systems shall be under no obligation to update or modify its products except as herein noted to correct program errors. Furthermore, the customer agrees that all representations and warranties contained herein shall be immediately null and void in the event of any modification, alteration or change in or to any product affected by or on behalf of the customer except for a change made by Juniper Systems.

8.6 Removal of Serial Number

Removal of the Juniper Systems serial number label from an instrument will void any warranty on the said instrument. Juniper Systems will not repair or update an instrument and return it to an individual if the instrument is without the said serial number label.

8.7 Extended Warranties

Juniper Systems offers a variety of warranty options to extend coverage beyond the standard warranty. You can contact Juniper Systems Customer Service Department for details at (435) 753-1881 (6 am - 5 pm MT, Mon-Fri).