

Theory of Operation

AGRICULTURE
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TRIMBLE RESELLER CONFIDENTIAL

Precision-IQ: Firmware Version 6.60 Theory of Operation

This document provides details about the new features that are included in the Trimble® Precision-IQ™ version 6.60 (bundled within the following display versions: **GFX-350™ v1.60, GFX-750™ v2.60 and TMX-2050™ v6.60**). While development is ongoing to implement a variety of features, enhancements, and bug fixes, these are the main features of this release:

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TeamViewer

Screens affected: When connected, all screens will now be outlined in red.

What's new: The latest version of TeamViewer (v15.4.61) supports full remote control.

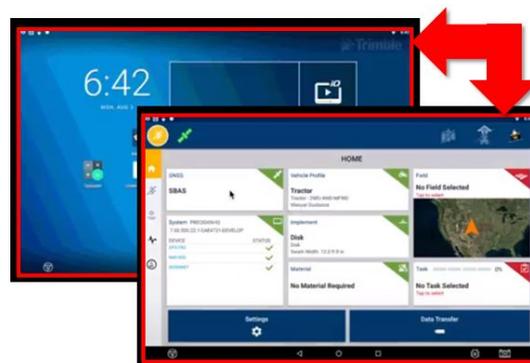
Follow the steps below to upgrade TeamViewer:

1. Uninstall TeamViewer. For this update, the TeamViewer application (**any** version) must first be removed:
 - a. In the Launcher screen, tap the **App central** icon.
 - b. Select the **ALL APPS** tab.
 - c. Tap the **TeamViewer QuickSupport** icon, then tap **UNINSTALL**.
 - d. Tap **OK** to confirm.
2. Install the new TeamViewer app:
 - a. From the Launcher screen, tap **App Central**.
 - b. In App Central, locate the **TeamViewer QuickSupport** app icon. This icon is at the top of the list of apps.
 - c. Tap the **TeamViewer QuickSupport** icon, then tap **INSTALL** to install the app.
3. Configure the new TeamViewer app:
 - a. On the Launcher screen, tap **All Apps**.
 - b. Locate and tap the **Settings** icon, then tap **Apps**.
 - c. Select the **TeamViewer QuickSupport** Settings.
 - d. Select **Permissions** and enable the app to *use Location and Storage* by toggling on these features.

Prior to starting the session, the operator must acknowledge that they are in control of and responsible for the vehicle and implement.

To show a remote control session is active, the display screen is highlighted with a red border.

Note: This version of TeamViewer is not supported on the TMX-2050™ display or any display using the Android 4 Operating System. The previous view-only version of TeamViewer is still supported on the TMX-2050 display.



For more details about this feature update, see the [TeamViewer: QuickSupport v15.4.61 Updates](#) bulletin.

AutoSync Updates

Screens affected: Precision-IQ Home screen.

What's new: A new AutoSync™ wizard has been added for first-time AutoSync users to facilitate the syncing process as well as to reduce the syncing time.

What's different: First-time AutoSync users can access the AutoSync feature from the Home screen.

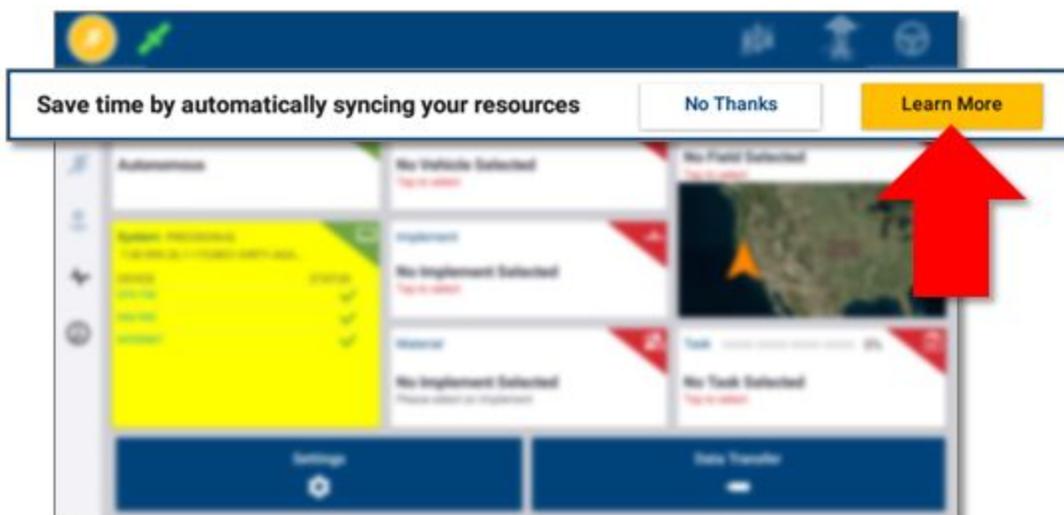
Prerequisites

- The display must be added to your online account.
- The display must be assigned to a vehicle in your online account.
- A display connection license must be added to the vehicle in your online account.
- The display must be connected to the internet in the machine.

How It Works

With the prerequisites met, follow the steps below to configure AutoSync:

1. If you have never used AutoSync, then a popup will appear on the Precision-IQ Home screen. Tap the **Learn More** button to begin:

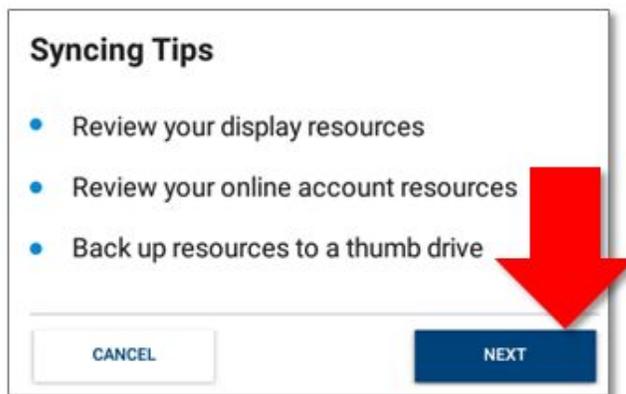


Note: If you tap **No Thanks**, then this popup reminder will no longer appear. If you need to reaccess the AutoSync wizard, then tap **Settings** and then **AutoSync**. On the AutoSync Settings screen, the AutoSync wizard can be accessed.

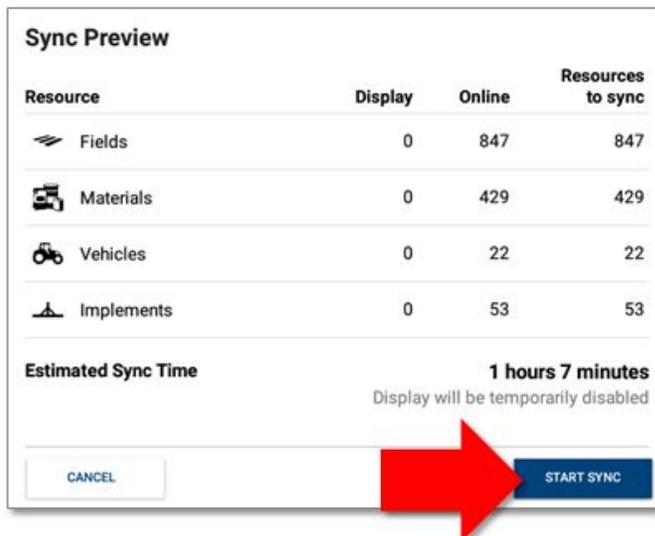
2. Tap **Get Started**:



3. Review the syncing tips, then tap **Next**:



4. A Sync Preview popup will appear to show you the resources to be synced as well as an estimated time to complete the AutoSync process. Tap **Start Sync**:



Notes:

- Once the initial AutoSync process has started, it cannot be interrupted. The display will be temporarily disabled.
- If AutoSync is set up and configured at the reseller, then the end user will never see this wizard.

Application Control Updates

Screens affected: Precision-IQ Run screen, Implement profile for Application Control.

What's new: The Application Control setting of an implement's profile now includes setup and calibration settings for Spinner Control. For TUVR and Field-IQ channels, a JumpStart can be triggered on the Run screen without a switchbox. This support has been added for TUVR implements.

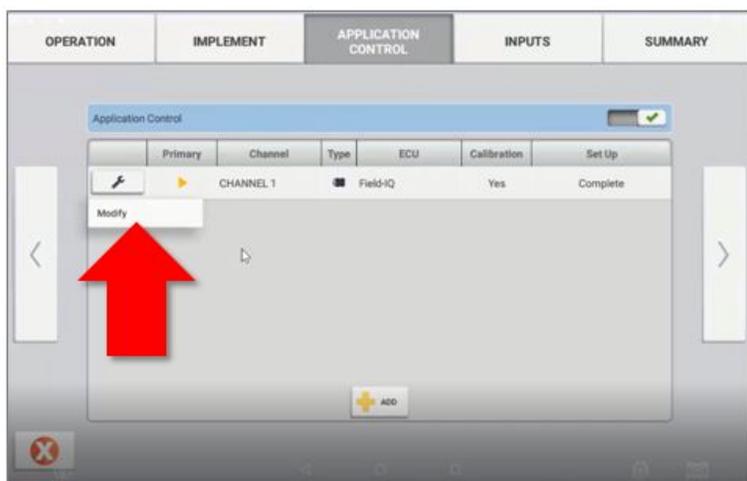
Prerequisites

- For Field-IQ, only the GFX-350 requires a license.
- For TUVR, ISO, Serial channels, a license is required.

Spinner Speed Setup

As part of the setup of an implement, a new Spinner Speed setting has been added. Follow the steps below to set up the spinner speed:

1. Edit the profile of an implement. Tap the **Application Control** tab, then tap the **Modify** icon:



2. On the Application Control configuration screen, a new Spinner Control tab has been added. Tap the **Spinner Speed** tab:



3. There are four (4) settings for Spinner Speed:

- a. **Settings.** Tap the slider to enable Spinner Speed Control and to set the number of drives (up to 2):



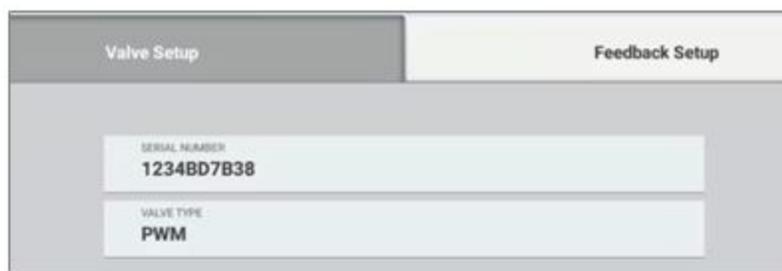
- b. **RPM.** Tap each field to set a Target RPM, RPM Increment, and Minimum and Maximum RPM:



- c. **Valve/Drive.**



Tap to set the **Valve Setup** (serial number and valve type):



And tap to set the **Feedback Setup** (feedback constant, gear ratio):



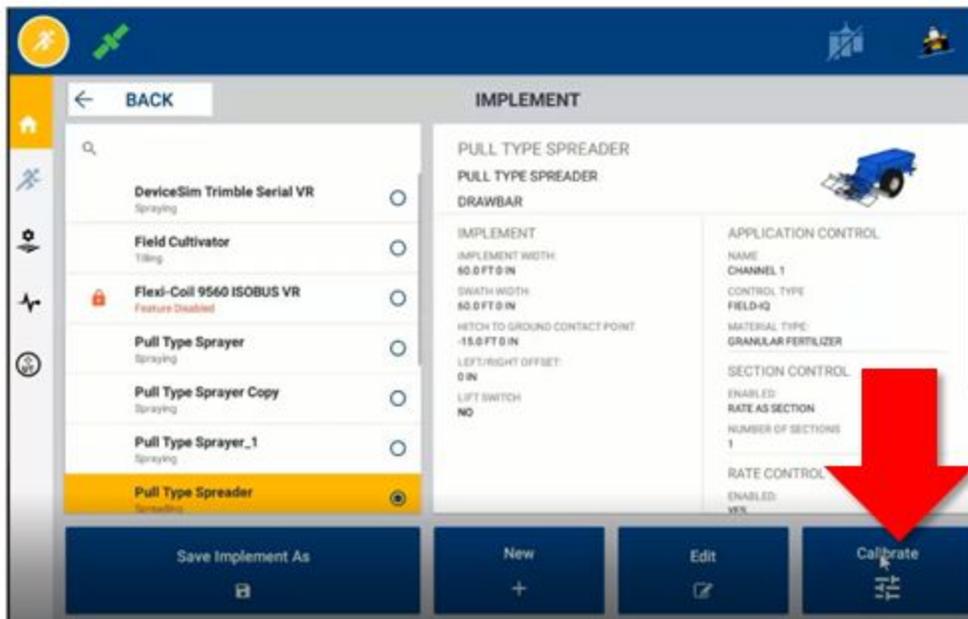
- d. Finally, an Advanced setting is available for you to select how the drive behavior should be when sections are closed or the belt is stopped:



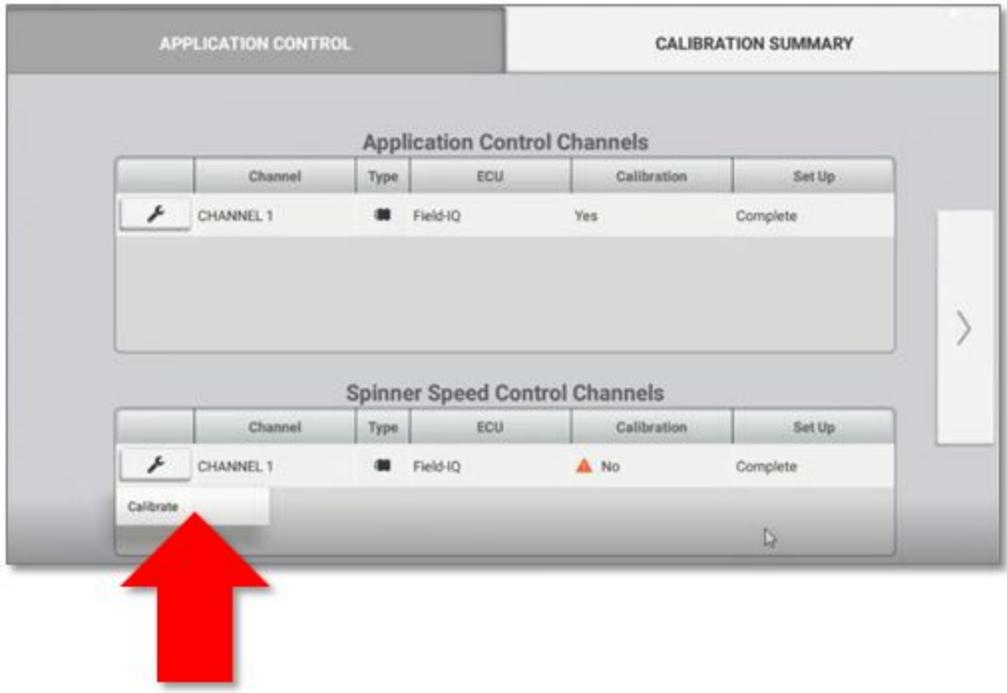
Spinner Speed Calibration

Once the profile is configured, it now needs to be calibrated. Follow the steps below to calibrate the Spinner Speed:

1. On the Implement screen, select a profile and tap **Calibrate**:



2. The Spinner Speed Control Channels have now been separated from the Application Control Channels. Tap the **Modify** icon to calibrate the Spinner Speed Control Channels:



3. Review the settings for Field-IQ Calibration and update as needed. Once you are satisfied with the settings, tap the green check mark to save the calibration:

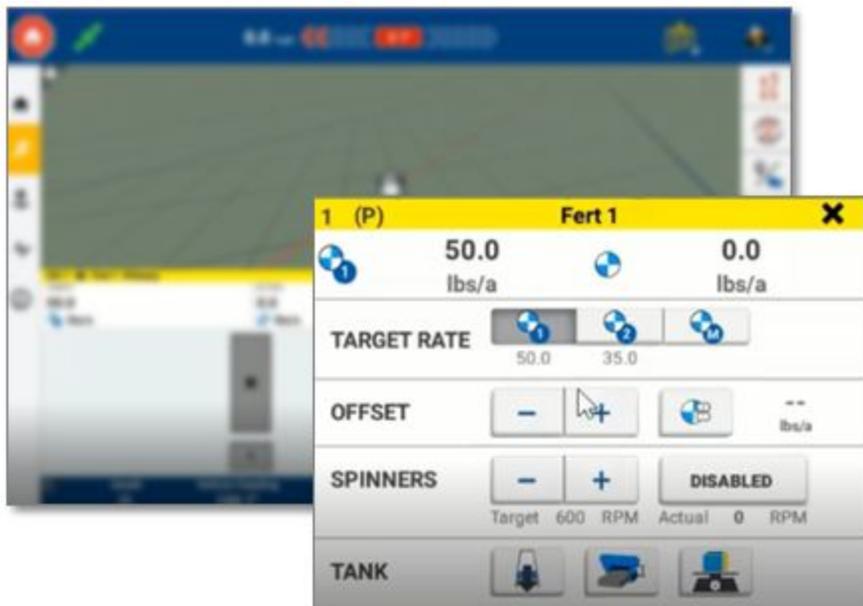


Spinner Speed on the Run Screen

A new Spinner Speed icon has been added to the Run screen:

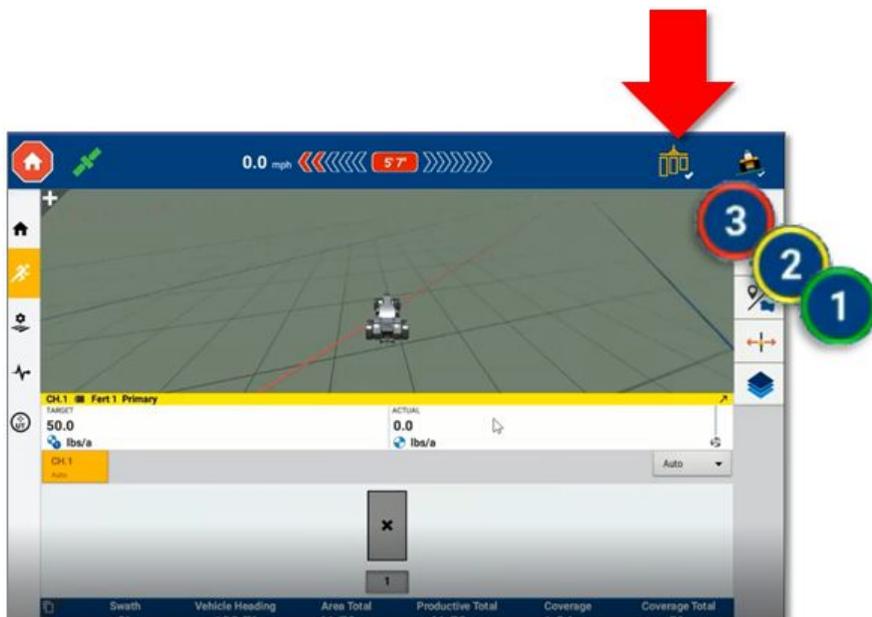


Tap this icon to enable and modify the Spinner:



JumpStart for All

With this version of Precision-IQ, a JumpStart can be triggered from the Run screen without using a switch box. It is available for all implement operation types. In the Status bar, long press the **Section Master** icon to begin a count down to the JumpStart:



Once engaged, the Section Master icon updates to show the JumpStart is active:



Note: TUVR devices must use the speed message provided by Precision-IQ.

Send Prescriptions to a Display

Screens affected: A new Prescriptions page has been added to Farmer Core.

What's new: Prescriptions can now be loaded from Farmer Core to this version of Precision-IQ outside of a work order.

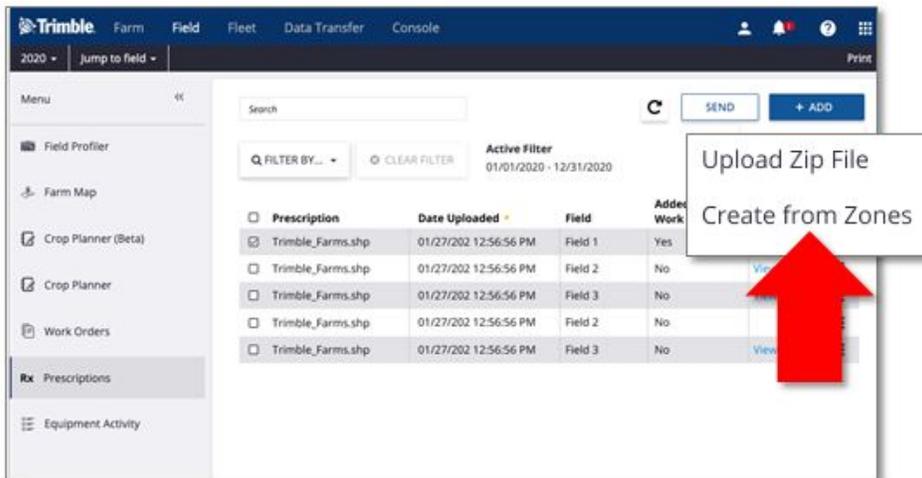
What's different: Previously, a work order would need to be created for each field that needed to deliver a prescription to Precision-IQ.

How It Works

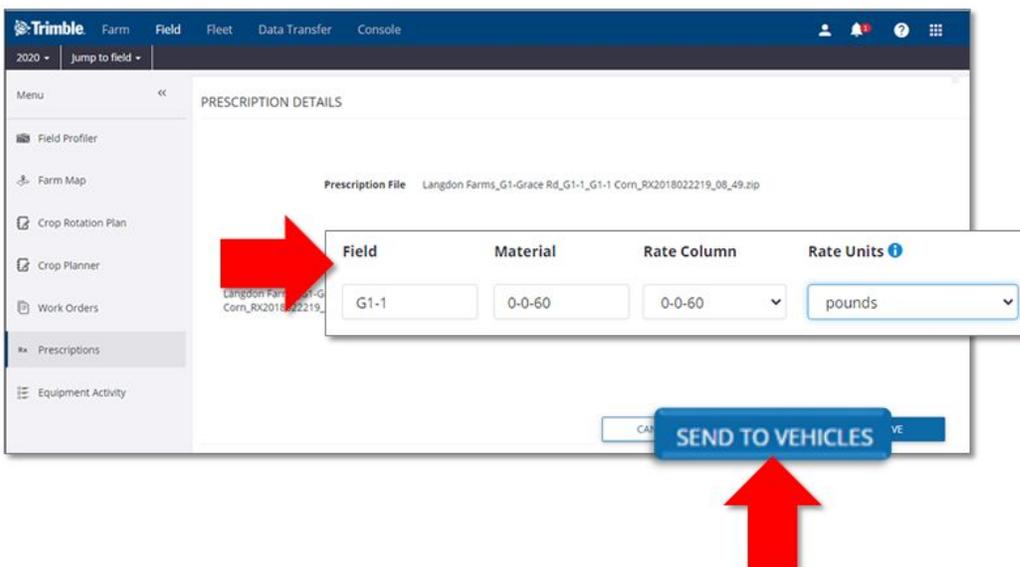
Prescription files can either be loaded as a zip file from an external source or created from zones in Farmer Core.

Upload Zip File

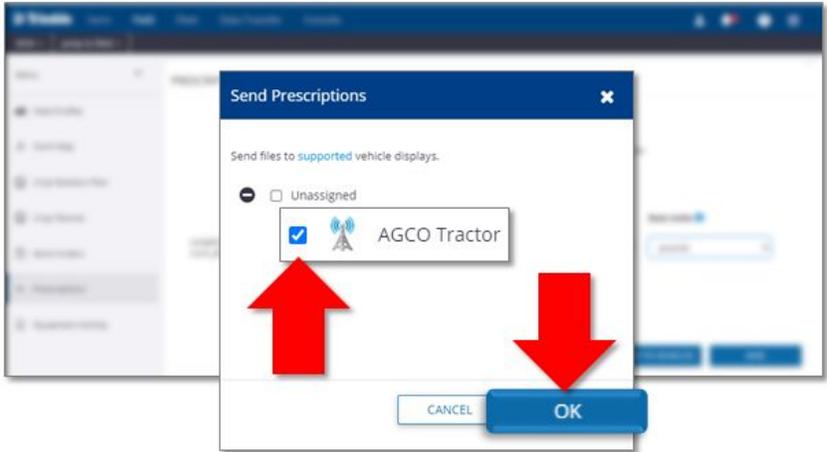
1. From Field >>> Prescriptions, click **+Add** and select **Upload Zip File**:



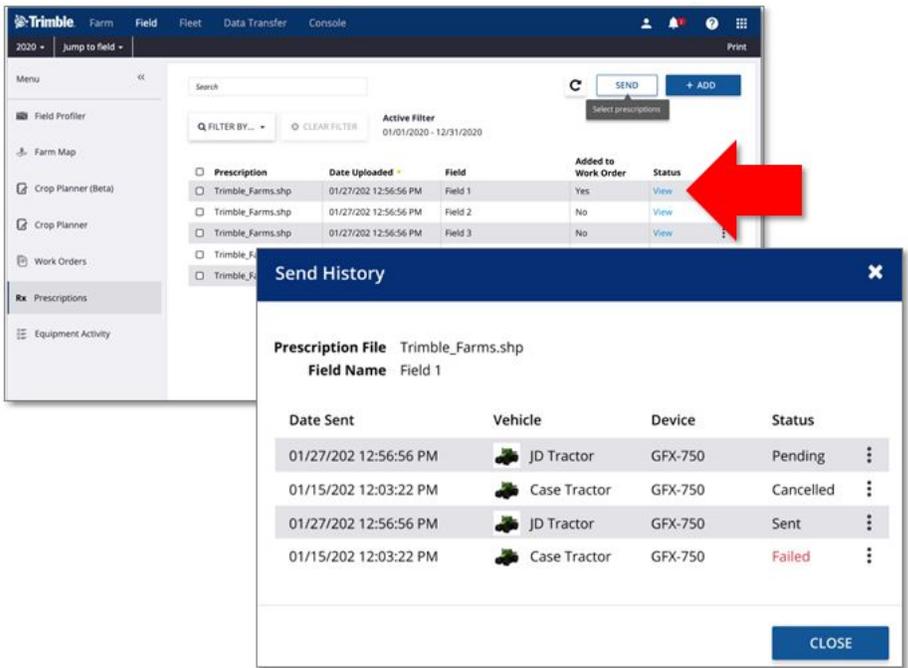
2. Populate Prescription Details and click **Send to Vehicles**:



3. Select Vehicle and click **OK**:



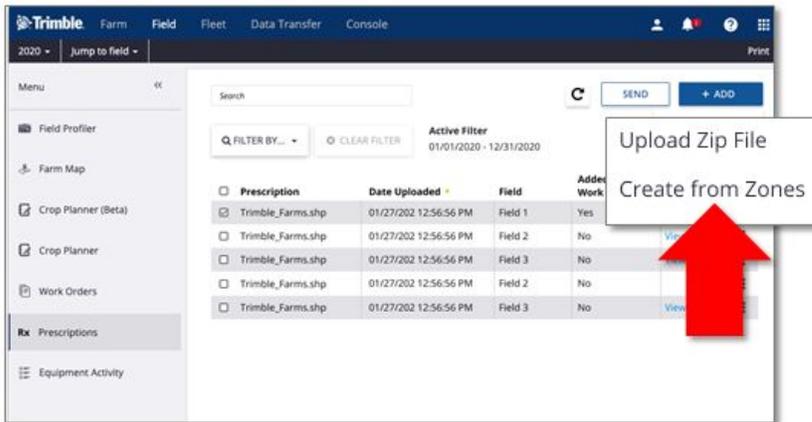
4. On the Prescriptions page, new files will appear at the top of the list. Click **View** for a prescriptions status log:



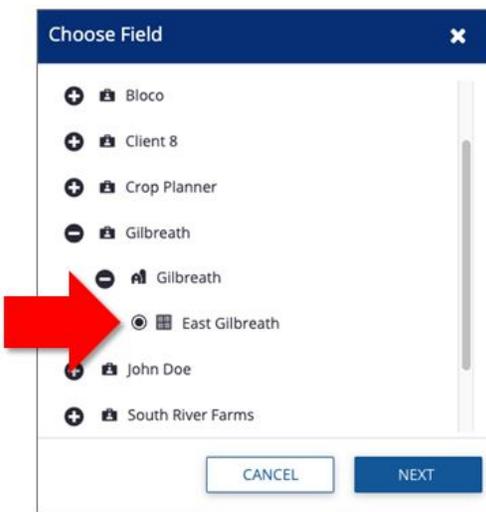
5. Access prescriptions in the Precision-IQ display.

Create From Zones

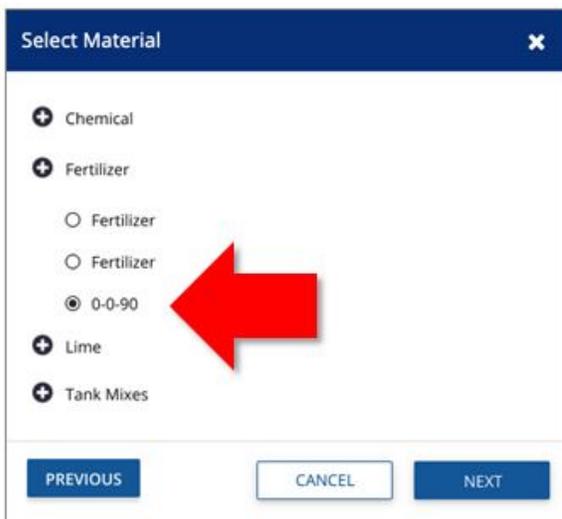
1. From Field >>> Prescriptions, click **+Add** and select **Create from Zones**:



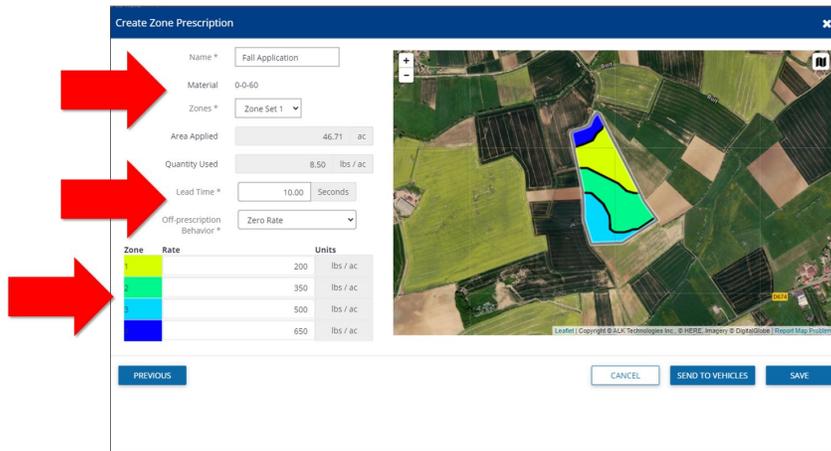
2. Choose a field:



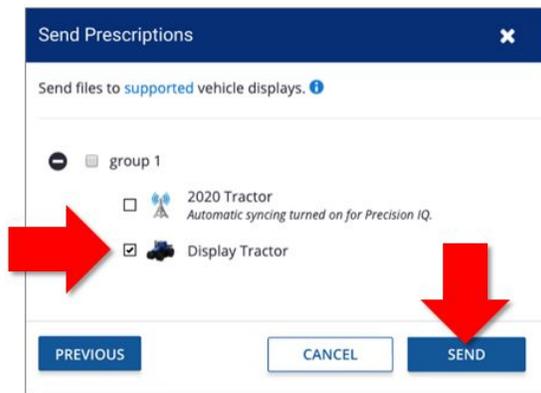
3. Select a material:



4. Enter a name, choose a Zone set, enter the Rates, Lead Time, and Off-prescription Behavior:

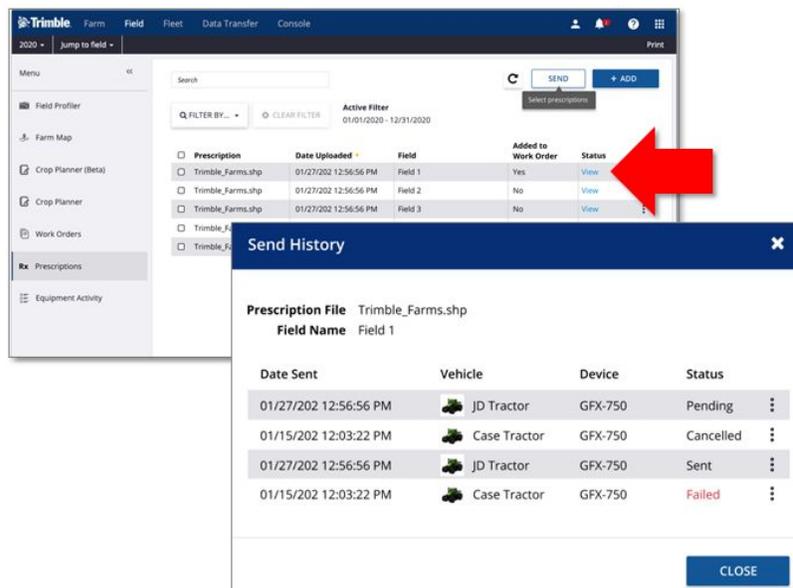


5. Select **Send to Vehicle** to send the prescription:



6. A message will display verifying that the file has been sent.

7. On the Prescriptions page, new files will appear at the top of the list. Click **View** for a prescriptions status log:



Return to Pause

Screens affected: Precision-IQ Run screen

What's new: This feature allows for the Guidance lines to be frozen while working with a field.

Features and Benefits

Once a guidance line has been created within a field, the operator will be able to use the Return-to-Pause feature for the following:

- A distance to be measured from the Pause point, a dynamic measurement will be actively shown as the vehicle travels away from that pause point.
- When traveling large distances from an active swath, the guidance lines and coverage array can be distorted and misrepresented. Using this feature will improve the projected guidance lines and coverage when returning to the paused position.
- A marked Pause location is retained over a power cycle allowing the user to continue an existing task over a power cycle.

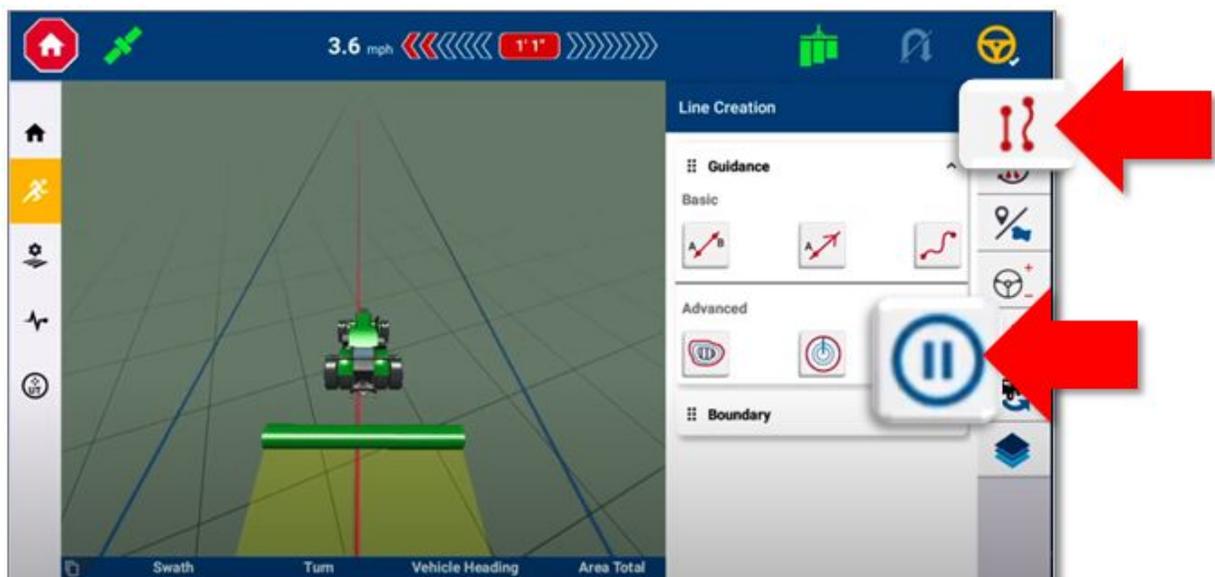
Prerequisites

None.

How It Works

As a best practice, bring the vehicle to a complete stop and disengage the application control. Follow the steps below to use the Return-to-Pause feature in this version of Precision-IQ:

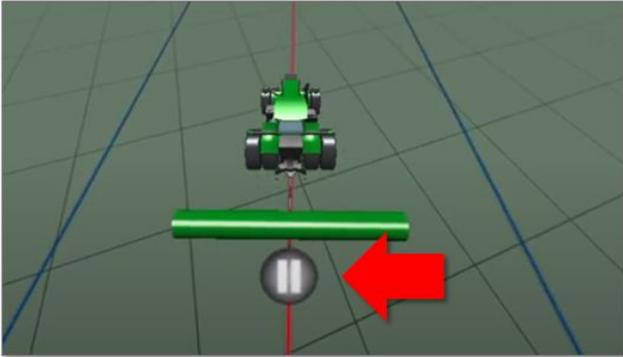
1. On the Run screen, tap the **Line Creation** icon to open the Line Creation Drawer. Then tap the **Pause** icon in the Advanced option of the Guidance section:



- When you are ready to define a pause location, tap the **green check mark** button:



- The virtual map of the Run screen will update to show that a *pause point* has been set:



- As you drive away from the pause point, the *Distance To Pause Point* field will update to show how far the vehicle is from where the pause point was set:



Note: To cancel the pause, tap the **Cancel** button or tap the **Pause** button again.

The system will now freeze the guidance active swath to the last swath highlighted, and you may engage on it but nothing to the right or left of this line; to continue coverage and guidance, the pause button must be canceled in order to continue work

- As you approach the pause point, the Distance to Pause Point field will update to show the distance remaining. Once you reach the pause point, bring the vehicle to a complete stop and tap the **Pause** button to end the pause. Now, tap the application control icon to continue the work where you left off.

NextSwath: Continuous and Alternating Block Patterns

Screens affected: Precision-IQ Run screen, NextSwath Patterns configuration drawer

What's new: This feature allows users to complete field blocks rather than alternate a fixed number of swaths across the whole field.

What's different: Users can define a specific block of swaths to be worked with Next Swath without user intervention. This work can be executed continuously in the same direction or alternate after every block.

Features and Benefits

Working in Blocks improves:

- Assists operators with Tramlining management when seeding.
- Reduces the impacts of GPS drift at lower correction types.
- Working in blocks improves field management and logistics for tender trucks.
- Reduces the impact of changes in weather conditions on tillage operations.

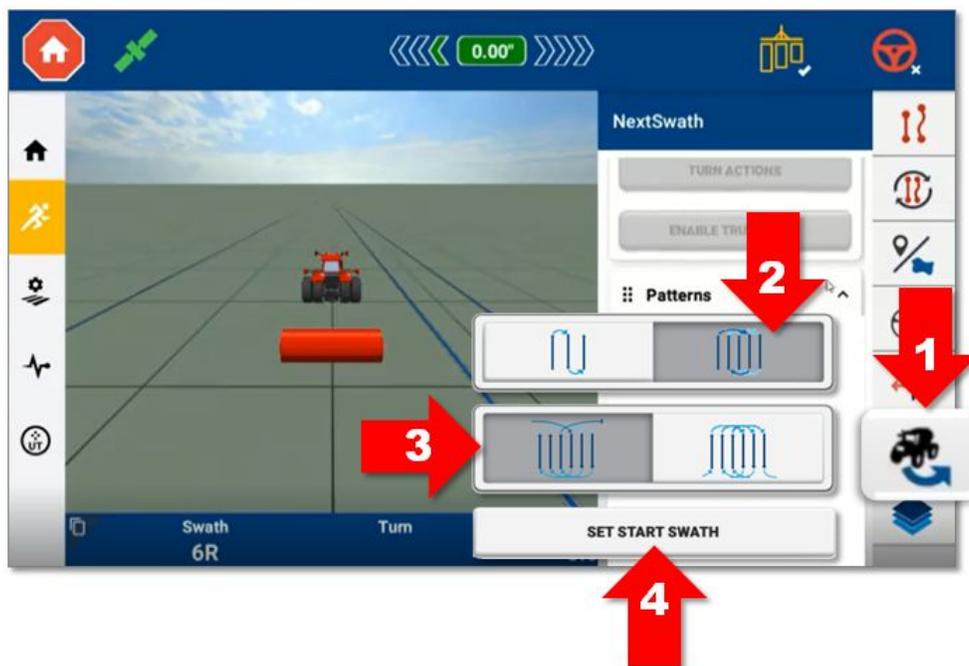
Prerequisites

This feature is only accessible for displays with the NextSwath license. No new license is required. If the display does not have a NextSwath license, then the NextSwath icon will not appear on the Run screen.

How It Works

Follow the steps below to access and select the new continuous or alternating NextSwath patterns:

1. On the Run screen, tap the **NextSwath** icon to open the NextSwath drawer.
2. In the NextSwath drawer, scroll to the Patterns section and tap the new **Block** button.
3. Select a new block pattern: **Continuous** on the left, or **Alternating** on the right.
4. Finally, tap **Set Start Swath** to begin using the new pattern.



Hardware Support Updates (VDM-912)

Screens affected: Hydraulic Autopilot™ installations

What's new: Support for the new VDM-912 (Valve Driver Module).

What's different: Replacement for the Trimble NavController III. Availability TBD.

Features and Benefits

- 50% reduction in footprint over the NavController III.
- Slimmer profile.
- IP67 rating for outdoor installations.
- Can be installed in any orientation.

Prerequisites

An Autopilot license is required.

How it Works

This solution replaces the NavController II to drive Trimble and third-party guidance valves.

Precision-IQ Test Plot

A new Precision-IQ Test Plot area has been specially set aside to give you a preview of upcoming and experimental features to be released in Precision-IQ. You can use the features in your field pre-release (licence permitting) with your current Precision-IQ setup and data.

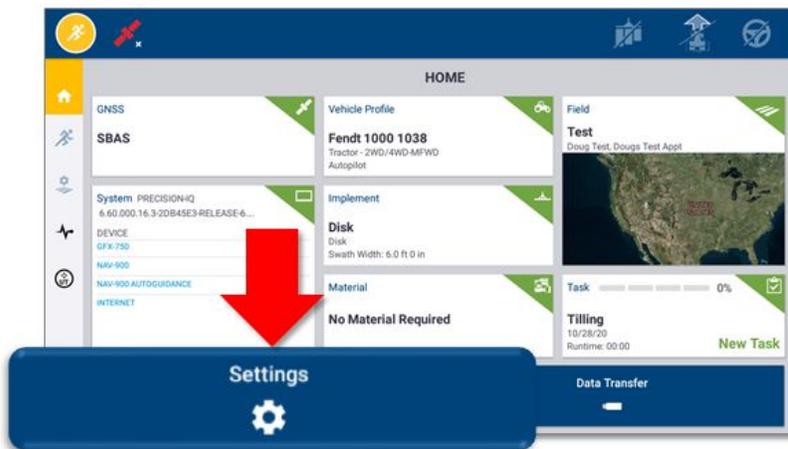
As with all pre-released software, any feature used in the Test Plot is not yet supported or will be "bug" free. Use at your own discretion and risk.

If you would like to preview a new Precision-IQ feature, then contact your local Trimble Dealer for details about the feature, how to obtain a license, if required, and most importantly how to submit your feedback.

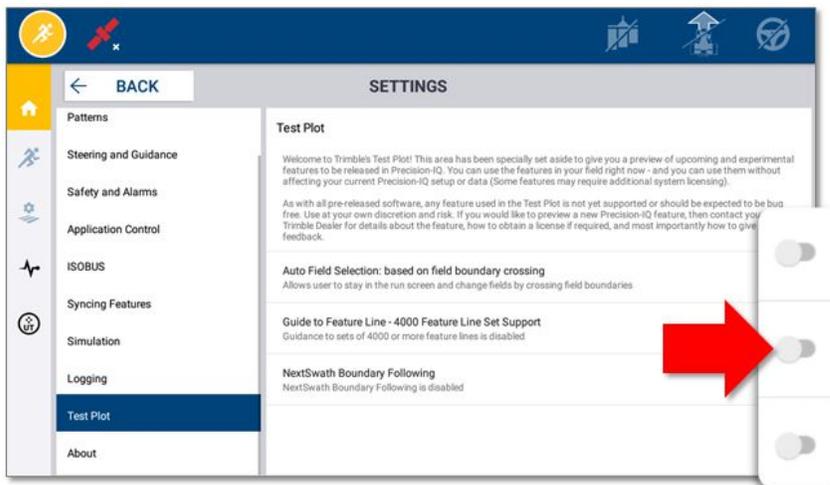
With each release of Precision-IQ, be sure to check the Test Plot to try out the new features being planned.

How to Access the Test Plot

1. From the Precision-IQ Home screen, tap the **Settings** button:



2. On the Settings screen, scroll down the available settings and select **Test Plot**.
3. On the Test Plot Settings screen, review the list of available preview features and enable the ones you want to evaluate:

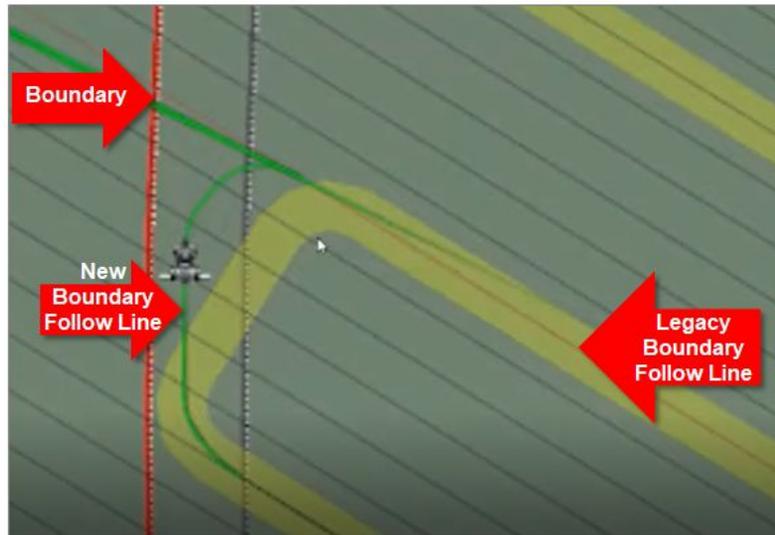


Note: The preview features will change with each release of Precision-IQ.

Precision-IQ v6.60 Test Plot Feature Preview

The following features are available for your preview in this release of the Precision-IQ Test Plot:

Boundary Following: Updates to allow for closer boundary following:



Feature Line Support for up to 4000 Lines: On the Precision-IQ Run screen, line handling has been updated to support up to 4000 feature lines. With this support, larger fields with more feature lines can be loaded.

Customers using Feature lines in large fields commonly have in excess of 2000 feature lines within a field. Improvements have been made with Precision-IQ as to how these are loaded and managed on screen.