Trimble Remote Output App

Trimble Remote Output App User Guide

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Trimble Remote Output App

Specifications

- Product: Remote Output
- Version: 2.00 Revision A
- Date: February 2024
- Manufacturer: Trimble Agriculture Division
- Address: 10368 Westmoor Drive, Westminster, CO 80021-2712, USA
- Website: www.trimble.com

Product Usage Instructions

Requirements

To run Remote Output, you will need the following:

- GFX-1060TM or GFX-1260TM display
- Precision-IQ v13.xx or later software
- GNSS receiver and steering correction service
- Remote output kit (Field-IQTM rate and section control module connected to the NAV-900)
- Remote Output license applied to the NAV-900
- Field-IQ Rate and Section Control module (part number 75774-01 and compatible upgradeable modules)

Setup Preparation

Before setting up Remote Output, ensure the following:

- Validate Remote Output Module Connection to the NAV-900
- Perform Initial Configuration steps

Operation

Remote Output allows precision activation of third-party equipment based on a grid pattern or field features using an analog signal. When enabled, Precision-IQTM will automatically output a 12V signal based on user-defined conditions.

Note: Remote Output does not support modeling of drawbar implements. If used, output targets will be modeled as if the implement were mounted.

Remote Output can be used with Serial/TUVR, Field-IQ, and ISO application controllers. Field-IQ and ISO devices must be on a separate CAN bus connected to the display.

FAQ

- **Q: Can Remote Output be used with any display?**
  - A: No, Remote Output requires a GFX-1060TM or GFX-1260TM display with Precision-IQ v13.xx or later.
- **Q: What type of signal does Remote Output automatically output?**
  - A: Remote Output automatically outputs a 12V signal based on user-defined conditions.

- **Q: Is modeling of drawbar implements supported by Remote Output?**
  - A: No, modeling of drawbar implements is not supported by Remote Output.

Legal Notices

Agriculture Business Area Trimble Agriculture Division 10368 Westmoor Drive Westminster, CO 80021-2712 USA

- www.trimble.com

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Remote Output Setup

Remote Output

Remote Output allows precision activation of third-party equipment based on a grid pattern or field features using an analog signal. When enabled, Precision-IQ™ will automatically output a 12V signal based on user defined conditions.

Requirements

The following are the requirements for running Remote Output:

Display

- GFX-1060™ or GFX-1260™ display
- Precision-IQ v13.xx or later

GNSS Receiver and Steering

- NAV-900 GNSS receiver – Must be used with one of the following guidance systems (see the Remote Output Switch Cabling Guide for proper harnessing depending on your guidance system):
- Roll-corrected manual guidance
- Autopilot™ motor drive, CAN, VDM-912, NavController III
- EZ-Pilot® Pro

NOTE – When using a NavController III with Remote Output, you may notice differences in performance. For optimal output performance, using a VDM-912 is suggested.

Correction Service

- CenterPoint® RTX or RTK differential corrections
- CenterPoint RTX Fast
- CenterPoint VRS
- xFill® Premium

NOTE – RangePoint®, SBAS, and autonomous positions are not supported.

Hardware and Licensing

- Remote output kit (Field-IQ™ rate and section control module connected to the NAV-900)
- Remote Output license (applied to the NAV-900)
- Field-IQ Rate and Section Control module (part number 75774-01 and other upgradeable modules such as 75774-00, 75774-10, and 75774-15 are compatible)

NOTES –

- The rate and Section Control module will output a 12V signal from the P4 -1 connector of 75526.
- While not explicitly restricted, the modelling of drawbar implements are not supported by remote output. If a drawbar implement is used, the output targets will be modelled as if the implement were mounted.
- Remote Output can be used in conjunction with Serial/TUVR, Field-IQ and ISO application controllers. Field-IQ and ISO devices must be on a separate CAN bus connected to the display.

Remote Output Setup Preparation

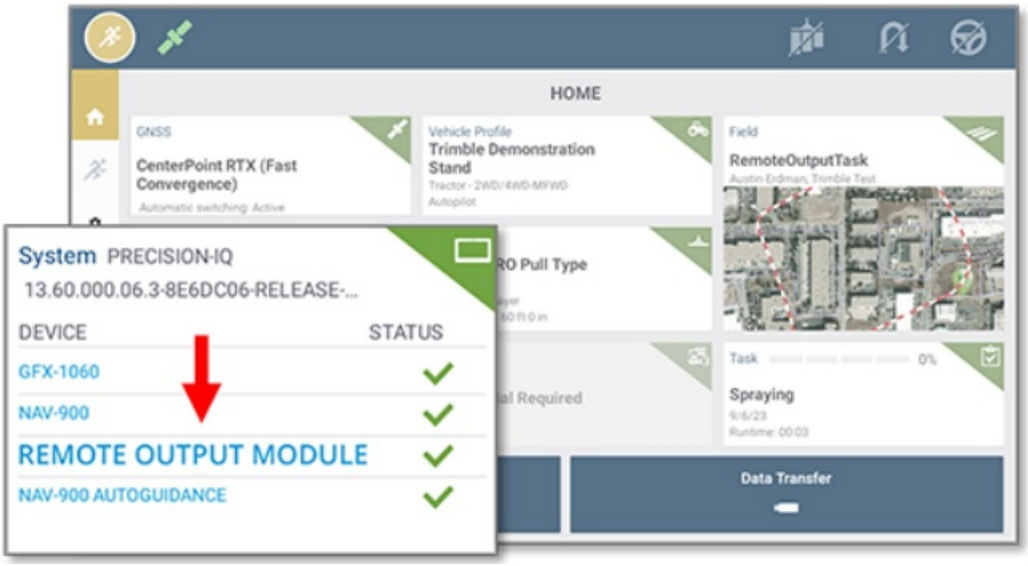
To ensure accurate placement, care must be taken to ensure that all vehicle and implement dimensions and offsets are properly measured and entered. Prior to configuring remote output, validate the following measurements:

- Vehicle antenna measurements
- Antenna height
- Antenna L/R offset
- Rear axle to antenna offset
- Vehicle hitch measurements
- Rear axle to tow hitch
- Rear axle to 3 pt hitch
- Implement measurements (used in next steps).
- Implement a hitch-to-ground contact point (drawbar implement) or hitch-to-application point (mounted).

NOTE – ISO, Serial, or TUVR devices may provide implement measurements to Precision-IQ. If these measurements are incorrect, they should be corrected on the controller before proceeding.

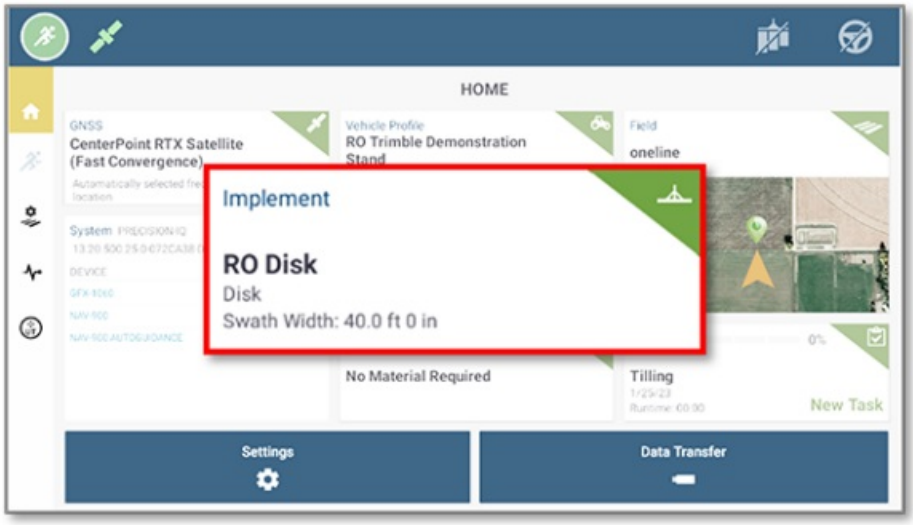
Validating Remote Output Module Connection to the NAV-900

When properly connected, the NAV-900 receiver has an active Remote Output license. A Remote Output module will be listed in the system tile on the Precision-IQ Home screen:

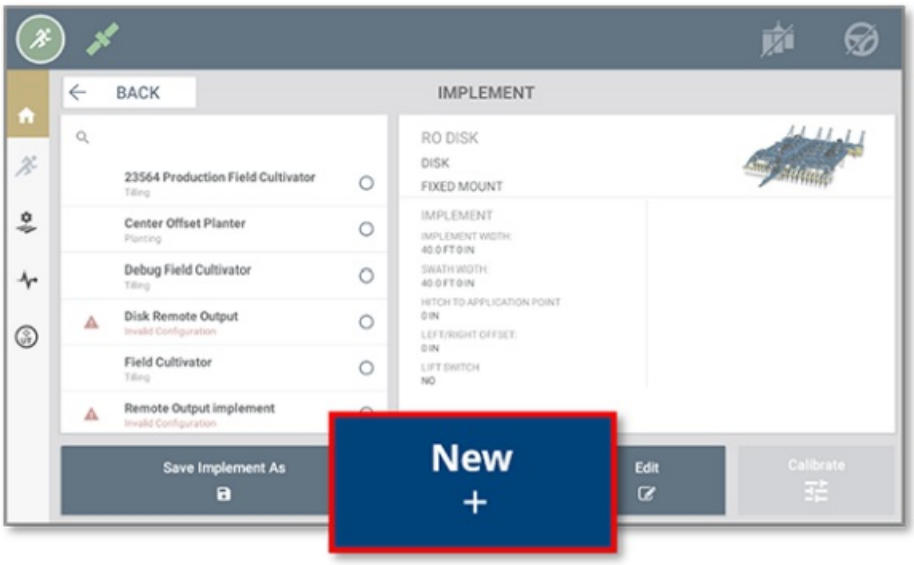


Initial Configuration

From the Precision-IQ Home screen, tap the Implement tile:



On the Implement screen, tap New to create a new implement:

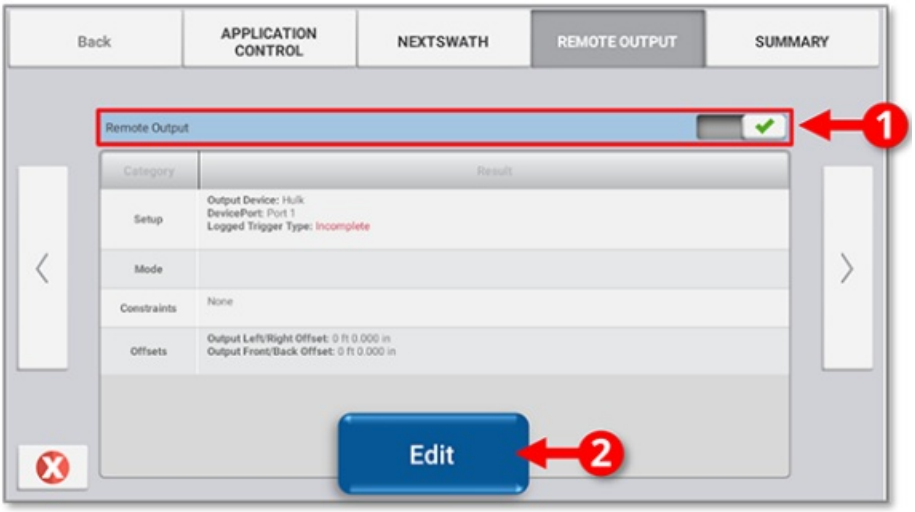


Proceed through the implement setup following the steps (Implement setup chapter). Up to the Remote Output tab.

Remote Output Setup

As part of the implement setup:

1. Tap the slider to enable Remote Output.
2. Tap Edit to configure the Remote Output settings



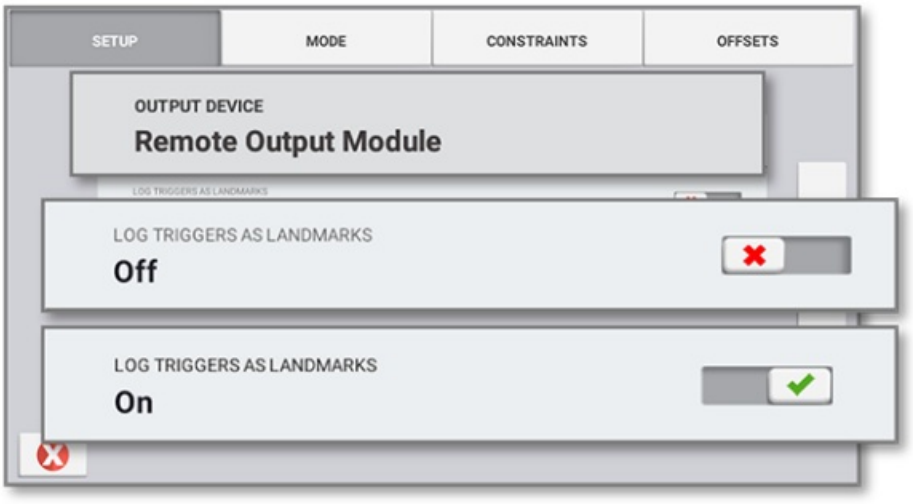
NOTE – If this switch is disabled, the remote output function for the selected implement will be disabled.

Setup Tab

Output Device: The output device will be represented by the serial number of the Rate and Section control module connected to the NAV-900 receiver.

Log Triggers as Landmarks

- Toggled Off (Default State): Output events will be recorded, stored, transferred, and deleted with the task. The features will only be visible if the task is reopened.
- Toggle On: Output events will be recorded and stored as permanent field landmarks. These features will be loaded anytime the field is opened.

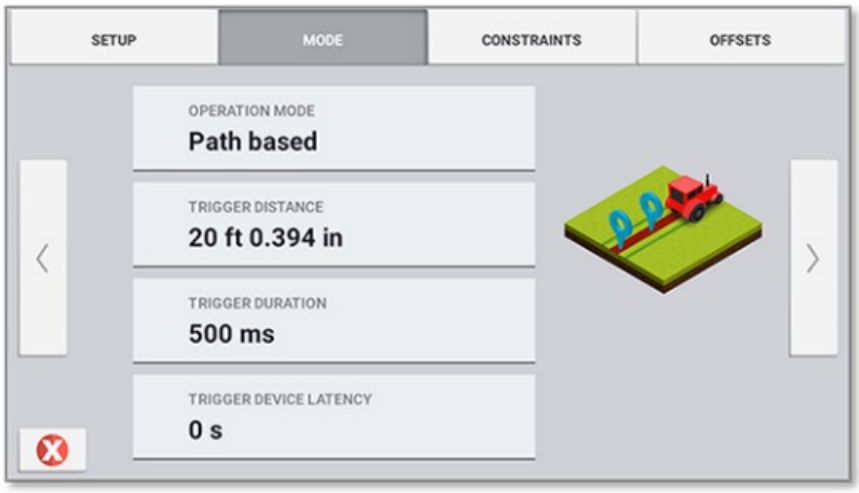


Mode (Operation Modes)

Path-based (distance-based): Outputs are triggered along a path on a distance-based interval. In this mode, an

AB or A+ line must be active. Grid-based output support is configured from within the Precision-IQ Run screen. When Path based is the selected operation mode, the following path-based settings are available:

- Trigger Distance: The distance in meters/decimal feet/feet and inches. The pulse occurs at each increment of this distance. The first output target will be placed at the A point of the line.
- Trigger duration: The duration of the pulse in milliseconds (ms)
- Trigger device latency: This setting specifies the amount of time (in seconds) that it takes for the remote device to respond to the trigger. This is used to account for any electrical or mechanical delay in the system

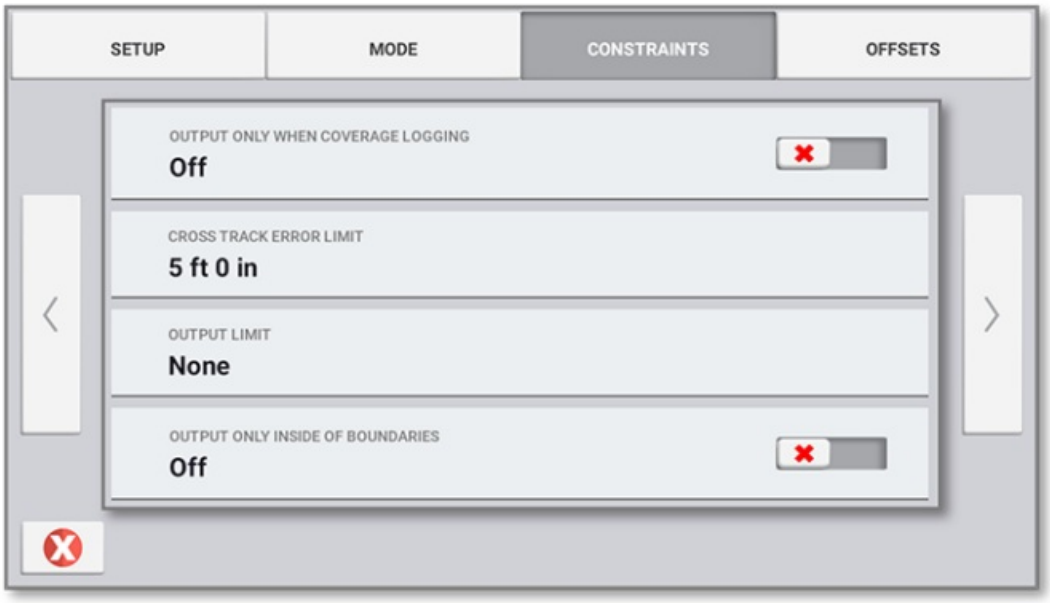


Feature File: Outputs are triggered on the crossing of line or the crossing into area features. Features are imported via the data transfer menu and selected when starting the task. When Feature File is the selected operation mode, the following settings are available:

- Output duration: The duration of the pulse in milliseconds (ms)
- NOTE – Duration is only used when triggering against line features. When triggering against area feature, the output will remain hi the entire time the implement is within the feature.
- Output device latency: This setting specifies the amount of time (in seconds) that it takes for the remote device to respond to the trigger. This is used to account for any electrical or mechanical delay in the system.

Constraints

Constraint	Description
Only When Coverage Logging	Outputs are only triggered when coverage is being logged. Coverage logging may be controlled by other system settings. To verify system configuration check **Settings > Mapping > Record Coverage** when engaged.
Cross Track Error Limit *(Path-based output only)*	Outputs are only triggered when the vehicle cross-track error relative to the guidance line is equal to or less than the value entered.
Output Limit *(Path-based output only)*	Sets the limit of targets that will be generated per swath. This can be set by one of two limit types: l Count of targets (Limit target generation by total number) l Distance limit from “A to B” point of the swath (Limit target generation by distance) When set to **None**, no limit will be applied.
Only Inside of Boundaries	Outputs are only triggered when the implement is inside the field boundary.

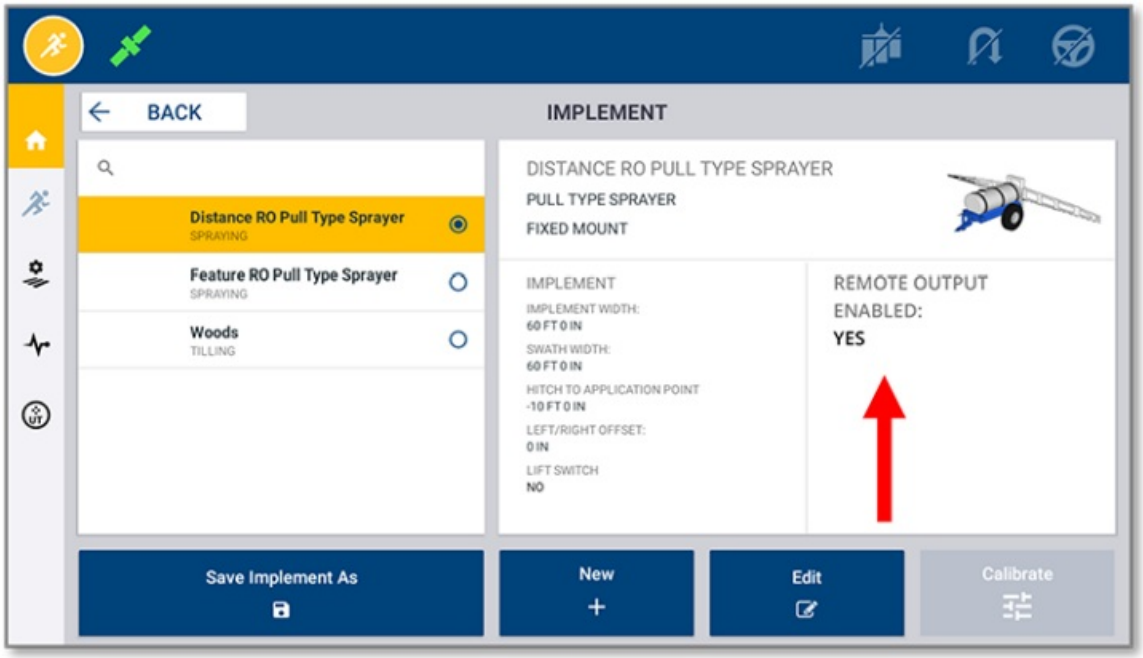


Offsets

Offsets are used to define the center point of the output relative to the implement ground contact point (drawbar) or application point (mounted implement).

Offset Value	Description
Output Left/Right offset	Defines the left or right output location from the center of the implement
Output Forward/Back offset	Defines the forward or back output location from the center of the implement. A negative value indicates that the trigger point is behind the implement.

Tap the green checkmark on the bottom right to save the remote output settings. A summary will be shown after clicking the green checkmark with the Setup, Mode, Constraints, and Offsets. After finishing the Implement Setup, you will see a note on the right side showing if Remote Output is enabled:



Remote Output Operation

Import Remote Output Designs

Follow the instructions below to import Remote Output line and area feature designs for use with Feature File mode.

Preparing the USB

Remote output designs are imported independently from general resources (Fields, Landmarks, Guidance lines, Equipment, etc.).
NOTE – Output designs are created by third-party GIS software that can generate ESRI shape files.

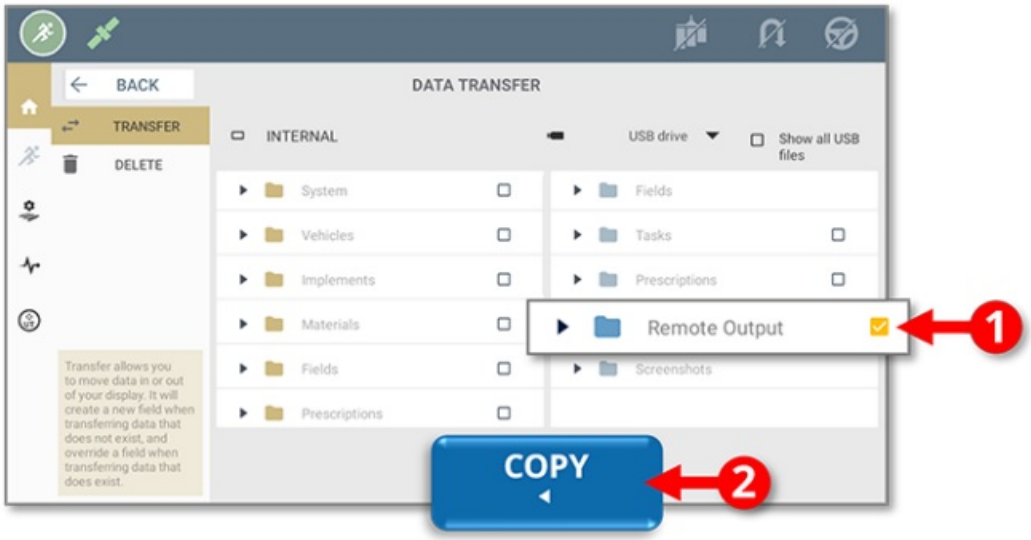
- If not already present, create an AgData folder on the root of the USB.
- Within the AgData folder, create a Remote Output folder. This folder will contain the line and area designs using ESRI shape and attribute files. (.shp, .shx, and .dbf).

Minimum Format Requirements

Column	Description	Format
Name	Feature name. Features of the same name will be loaded together	Text

Importing the designs

1. Insert the USB drive into the USB port on the display.
2. From the Precision-IQ Home screen, tap the Data Transfer button.
3. The Remote Output folder appears in the USB drive area. To import the folder to the display, select the Remote Output folder and tap the Copy button



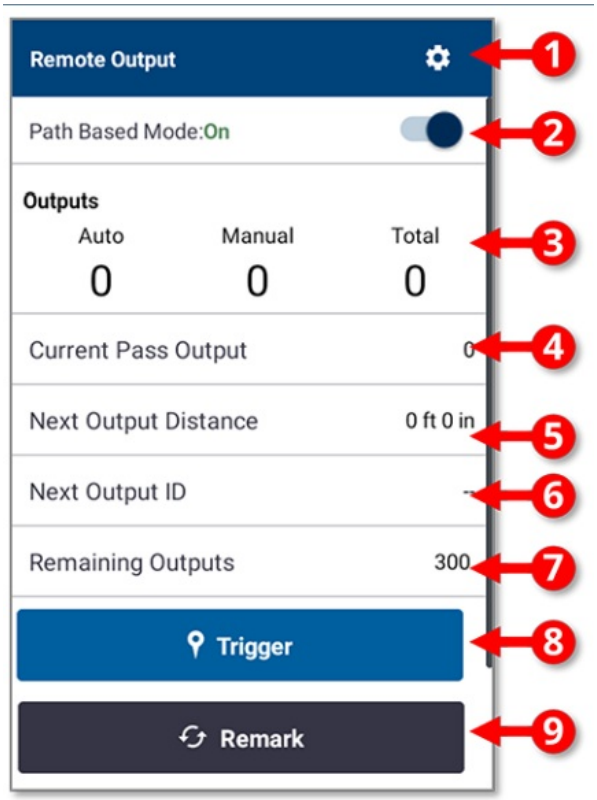
Remote Output Run Screen Overview

If a task is started with a Remote Output enabled implement, the Remote Output drawer will be shown. The remote output drawer contains all of the controls needed to enable and operate remote output in a field. On the Precision-IQ Run screen, tap the Remote Output button to open the Remote Output drawer

NOTE – The Remote Output license must be installed and a Remote Output enabled implement selected for the Remote Output button and drawer to be available.

Remote Output Drawer Contents

Item	Description	
1	**Remote output settings**	
2	**Remote output arm/disarm switch**	
3	**Outputs details** Remaining outputs is only available when the distance or count constraint is active	
4	**Current Pass Output**	
5	**Next Output Distance**	
6	**Next Output ID** l Path based ID is a combination of the swath number and direction and swath target count. Ex 1U01 is swath 1, up (relative to AB heading) output 1. l Feature File ID will read as “F” (feature) followed by a numerical value. The value represents the feature row number from the .dbf file.	
7	**Remaining Outputs**	
8	**Trigger** Allows user to send a manual pulse.	
9	**Remark** Target remark (adjust target anchor point location)	



Target and Trigger Event Icon Summary

Icon	Description
	**Task based (Automatic) triggers** This icon will appear when Remote Output triggers against the target.
	**Landmark (Automatic) triggers**
	**Landmark (Manual) triggers**
	**Task Based (Manual) triggers**
	**Target** This will appear as the next target for a trigger to be dropped on the map.
	**Constraint Violation** This will appear if a Target cannot be triggered against. If the target is missed due to a constraint, the icon will be removed from the *Run* screen.

Starting a New Task

Path Based Modes

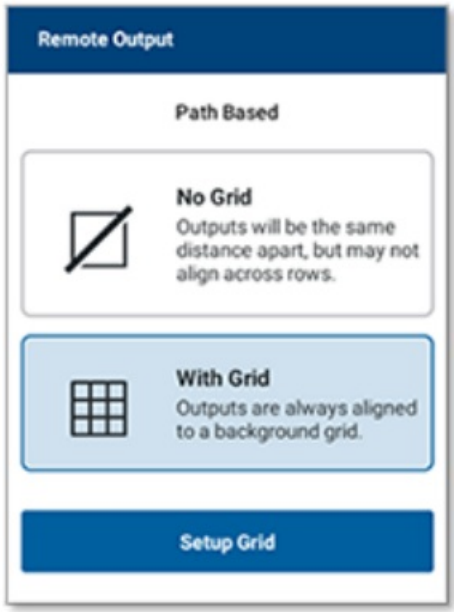
No Grid

In this mode outputs may not align from pass to pass. The first target will be anchored at the “A” point of the master swath.

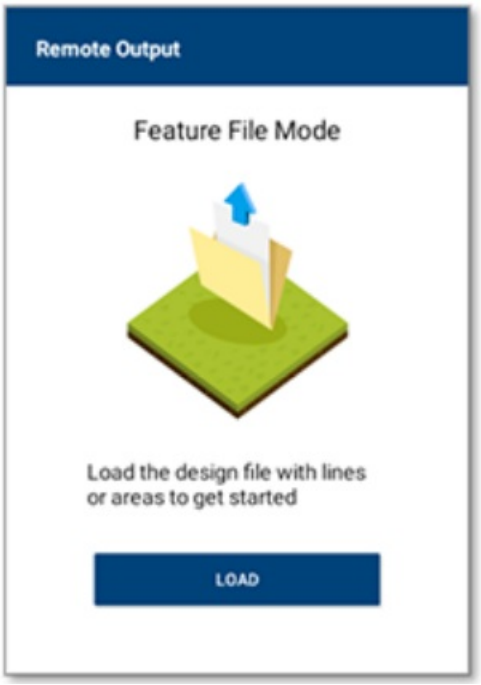
With Grid

In this mode, outputs will be aligned to a background grid heading. The first target will be anchored at the “A” point of the master swath. To setup the grid do the following:

1. Select With Grid and then tap Setup Grid:



2. Set the grid heading.
    - a. This is the heading that the subsequent passes will be offset by. All heading values are relative to 0* (North).
    - b. The heading value can be entered directly or an existing swath can be selected for a reference heading.



NOTES –

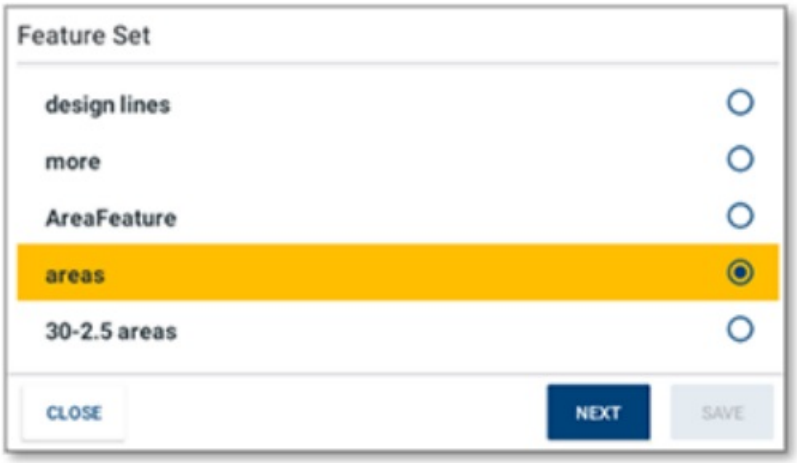
- While not explicitly restricted, we do not recommend using a guidance line or a manually entered heading for the grid heading that is closer to your active guidance line heading. This may cause inconsistencies in output spacing. Use the active picture on the left to preview the layout of outputs with the grid heading entered.
- When grid mode is active and the user switches to a curved guidance pattern, the grid will not deactivate on the screen but the trigger events will not follow the background grid.

Feature File Mode

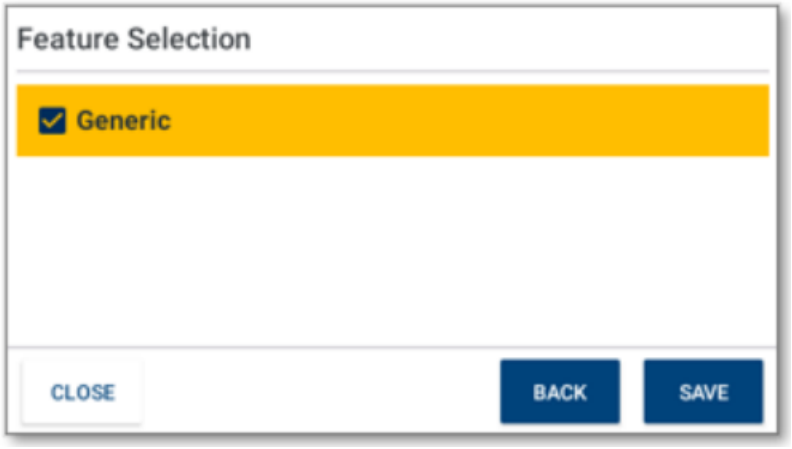
When starting a new task with feature file mode you will be required to select a line or area feature to trigger

against. Open the Remote Output drawer and tap the Load button to start the selection process:

The system will display all available design files. Select one of the files and tap Next to continue:



The system will then display the unique feature names available within the design file. Select one or more of the features to load for use with remote output. Any of the features selected will be triggered against:



Arming Remote Output

When first opening the task, Remote Output is disabled. From the Remote Output drawer, enable remote output using the remote output on/off switch. The user can now:

- Manually generate an output using the manual trigger.
- Start automatic outputs by creating an AB line and enabling the coverage logging switch (if the constraint is active).

Remote Output will be automatically

disabled when a new swath is loaded, a new line is created or a line is shifted. Using Remark (path-based modes only) Remark is used to shift the anchor point for the subsequent target points. The location of the new anchorpoint is based on the position of the defined output point at the time of the remark and includes any active Remote Output Forward/Back Offsets.

Key points for Remark and Anchor points:

- By default, the anchor point is the A point of the guidance line.
- Any time a guidance line is changed (shifted/remarked) or a new line is created/loaded, the anchor point will

automatically be set to the A point of the line.

- Remarking only moves the anchor point along the direction of the guidance path (Up and Down the path)
- If using Grid mode, this remark will act as the anchor point for subsequent targets. No attempt to align to previous outputs will be made.

  If using the output limit, remarking will reset the base point of the limit calculation.

Changing Settings During Operation

Tap to access the following settings. These settings can be changed without restarting the task. If Remote Output has not been disarmed, the system will prompt the user and automatically disarm the system before proceeding.

Setting	Description
Grid Mode	Allows the user to align the outputs to a grid.
Trigger Distance	Adjusts the distance between outputs
Trigger Duration	Adjusts the duration of the output
Trigger device latency	Adjust the latency (look ahead) of the output
Display Trigger events	When on, all outputs are rendered on the run screen
Manual trigger color	Sets the color of the manually triggered outputs
Auto trigger color	Sets the color of the automatically generated outputs

Documents / Resources

	Trimble Remote Output App [pdf] User Guide Remote Output App, Output App, App

References

- User Manual