Autopilot Diagnostics

AGRICULTURE

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TRIMBLE RESELLER CONFIDENTIAL

Autopilot Diagnostics

You can use diagnostics for Autopilot™ to:

- View the degree of the steering angle being given by the navigation controller and the actual degree of angle.
- Calibrate:
  - Manual override sensitivity
  - Vehicle system aggressiveness
  - Line approach aggressiveness
  - Engage aggressiveness
  - Proportional steering gain (P gain)
  - Roll calibration
  - Make incremental adjustments to a pattern using the nudge increment tool
- View:
  - Vehicle roll and yaw
  - Navigation controller orientation
  - IMU parameters
  - Sensor settings
- Set the NavController to output NMEA Messages.

Autopilot Diagnostics Contents		
Steering Performance for Autopilot System	Sensor Performance for Autopilot System	NMEA Messages

Steering Performance for Autopilot System

1. On the Diagnostics screen, tap **Performance** under Autopilot.
2. Tap **Steering**.

Button/Control	Description
P Gain	Balances rapid steering response and stability. See *Steering Proportional Gain (Manual Calibration)* in Auto Guidance Setup for more information on calibrating. **Note:** This setting is not available for certain vehicle types.
Engage Aggressiveness	Controls how aggressively the vehicle initially engages the automatic guidance system.
Line Approach Aggressiveness	Controls how fast the guidance system attempts to steer the vehicle onto the current guidance line. See *Line Acquisition* in Auto Guidance Setup for more information on calibrating.
	**Engage.** Use to engage the system in the diagnostics screen. For more information on the engage button, see Operating a Vehicle on the Run Screen.
Vehicle System Aggressiveness	How aggressively the vehicle responds to cross track error.
System Feedback, Angle Desired	The degree of the steering angle command being given by the navigation controller.
System Feedback, Angle Actual	The degree of the steering angle that is actually occurring.
Nudge Increment	This function is for advanced users to test the systems response to cross track error. While driving the vehicle online, tap the left or right button to move the line. Observe the response of the guidance system and adjust as necessary.

Sensor Performance for Autopilot System

1. On the Diagnostics panel, tap **Performance** under Autopilot.
2. Tap **Sensors**.

Button/Control	Description
VEHICLE ORIENTATION	Graphically indicates the roll and yaw settings. The yaw value is the heading error for the system in reference to the heading of the guidance swath.
CONTROLLER ORIENTATION	Orientation of the controller as entered by the user.
MANUAL OVERRIDE SENSITIVITY	Sets the level the voltage must reach before the guidance system disengages. The voltage must also drop below that level before automated steering can be engaged again. You can calibrate this control here or at the Vehicle setup panel. For instructions, see *Manual Override Sensitivity* in Auto Guidance Setup.
IMU PARAMETERS	The raw voltage reading from the accelerometer and gyroscopes in the navigation controller.
SENSORS	The raw voltage of all connected sensors.

NMEA Messages

Before you can setup NMEA output, you must turn on NMEA capability in settings. See *Steering and Guidance Settings* in Auto Guidance Setup.

To set the NavController to output NMEA messages:

1. On the Autopilot Diagnostics screen, tap **Performance** under Autopilot. Then tap the **Advanced** tab.
2. In the TAP SETTINGS section, tap in the **TAP** entry box.
3. Enter how often you want the NMEA message to be output by the NavController and tap **GET**. Enter the value in milliseconds. 1000 milliseconds equals 1 Hz.

NMEA Message	Message Information
`RawNMEAOutputIntervalGGA`	Fix data including 3D location and accuracy data
`RawNMEAOutputIntervalGSA`	GPS dilution of precision (DOP) and active satellites
`RawNMEAOutputIntervalGST`	GPS pseudorange noise statistics
`RawNMEAOutputIntervalVTG`	Velocity made good
`RawNMEAOutputIntervalZDA`	Date and time

4. To configure the baud rate:
    a. Enter **RawNMEAOutputBaudRate** in the TAP entry box, then tap **GET**.
    b. Enter the baud rate that is required by the external device.
    c. Tap **SET**.

For More Information

Contact your local Trimble Regional Sales Manager.