

Troubleshooting

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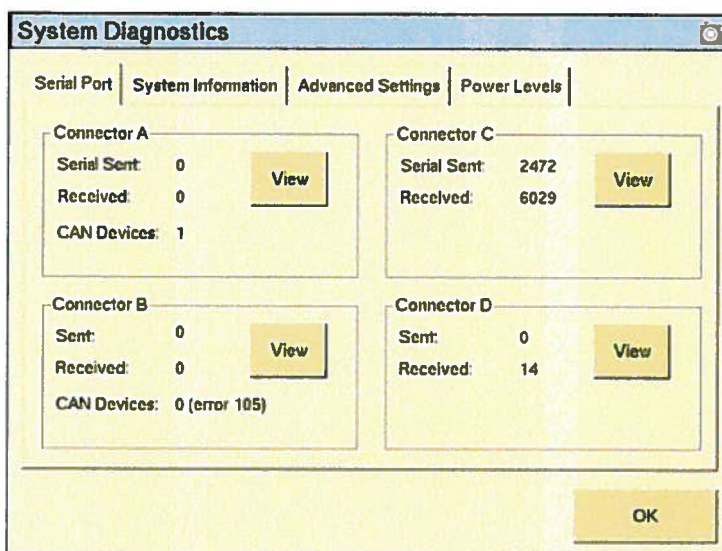
- Advanced diagnostics
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This chapter describes how to analyze problems that may occur with the FM-1000 integrated display.

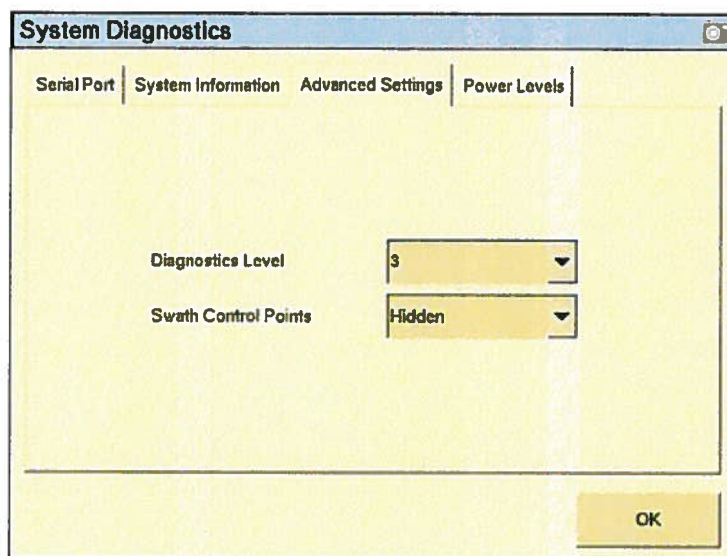
Advanced diagnostics

the System option's Diagnostics mode enables you to configure advanced guidance settings. Most users will not need to adjust these settings.

1. From the *Configuration* screen, select System and then tap **Diagnostics**:



2. Tap **Advanced**:

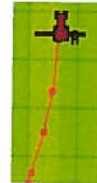


3. Select the diagnostics level. This determines how much debugging information is logged in the program files:

Item	Description
1	Minimal level of information
6 (default)	Medium level of information
9	Highest level of information

4. Select whether or not to show swath control points. When the guidance line is a curve, it appears on-screen as a series of short straight sections joined together. The Swath Control Points appear where these line segments meet:

Item	Description
Hidden (default)	Normal guidance lines
Visible	Guidance lines show the control points



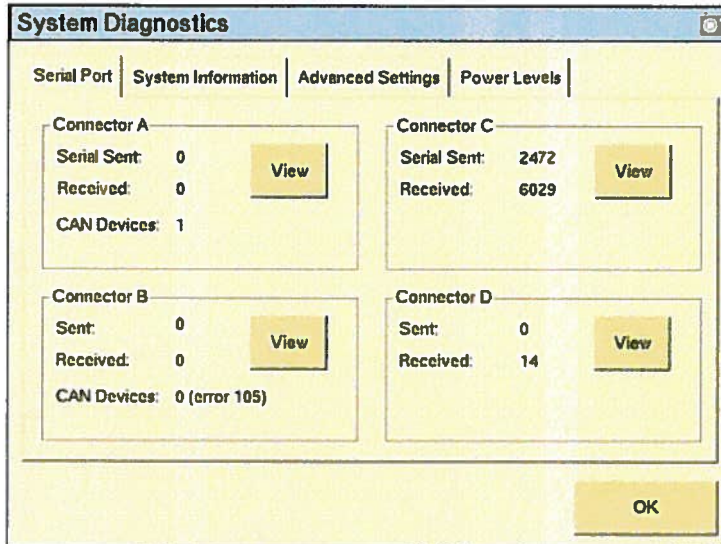
You can also use the *System Diagnostics* screen to view raw port data. For more information, see [Viewing raw serial data, page 25-4](#).

Viewing raw serial data

You can view raw serial data as the display receives it. This can be useful for analyzing the GPS signal.

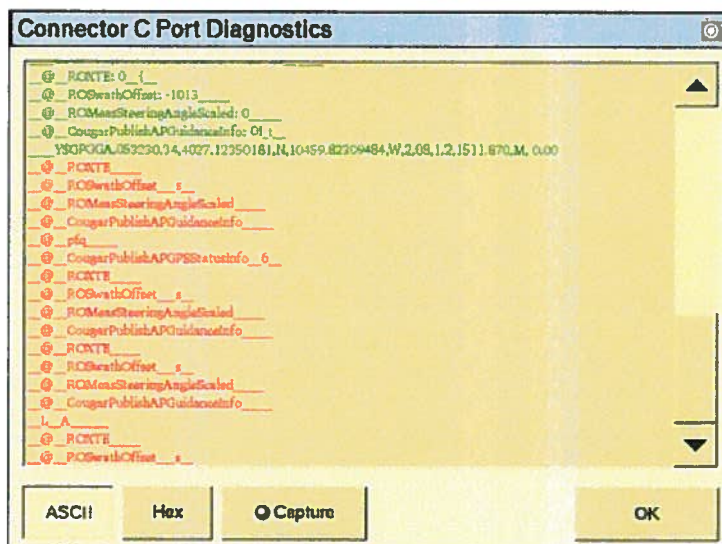
To view the raw serial data:

1. From the *Configuration* screen, select the System option and then tap **Diagnostics**:



This screen shows each of the connectors (ports) on the FM-1000 harness and the number of data packets that have been sent and received.

2. To view the raw data from a port, tap the appropriate **View** button. The port diagnostics screen for that port appears:



The screen shows either ASCII text or Hex code, depending on which button you select. Tap **ASCII** to view incoming data from the NMEA data string.

The Hex code is for engineering use only.

The data appears only when tap **Capture**.

A virtual LED on the *Capture* button flashes to show that data is being sent or received on that serial port.

To view the data, tap **ASCII** or **Hex** and then tap **Capture**. Approximately five seconds of serial data is captured and then appears on the screen. You can review the data or capture another snapshot.

Note – Data shown in green is incoming data; data shown in red is outgoing data.

Restoring default settings

You can reset the display to its default values. This can be useful if:

- you made changes to the display settings; the results are poor, but you cannot determine which setting was the cause.
- you move the display from one vehicle to another.

Note – If you restore the defaults, the Autopilot vehicle setup information is not reset.

To restore the default settings:

1. From the *Configuration* screen, select the System option and then tap **Setup**. The *Display Setup* screen appears.
2. Tap **Default**. A confirmation screen appears.
3. Tap **Yes**.

The default settings are restored.

Viewing FM-1000 integrated display diagnostic information

Display configuration information

To view display configuration information, tap  at the top right of the display.

The Home screen shows:

- Display firmware information
- Autopilot controller information
- GPS receiver and correction method information
- Vehicle make and model

USB memory stick information

To view information about the USB memory stick that is in the display, select the System option and then tap **Diagnostics** on the *Configuration* screen.

The card information tab appears on the *System Diagnostics* screen.

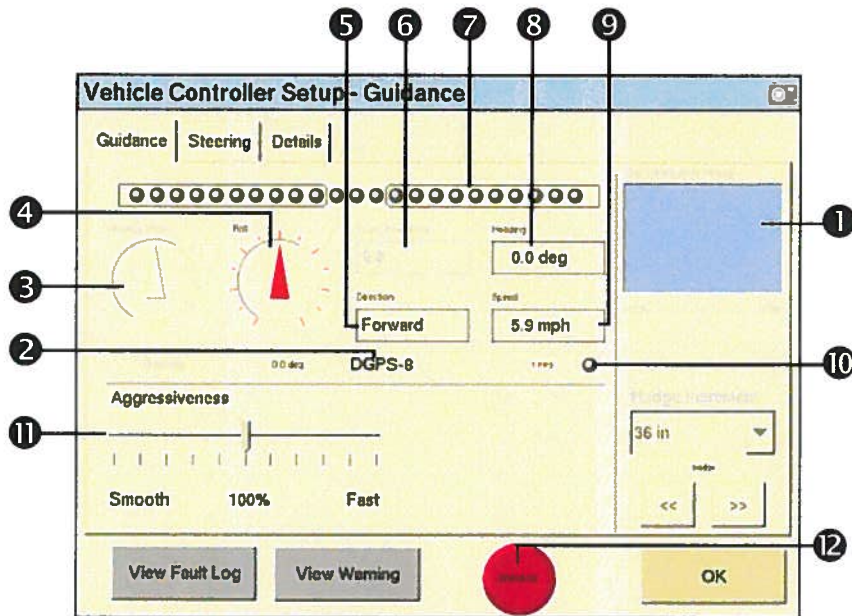
Viewing vehicle diagnostic information

From the *Configuration* screen, select the Autopilot option and then tap **Diagnostics**. The *Vehicle Controller Setup - Guidance* screen appears.

There are five parts to the Vehicle Diagnostics menu:

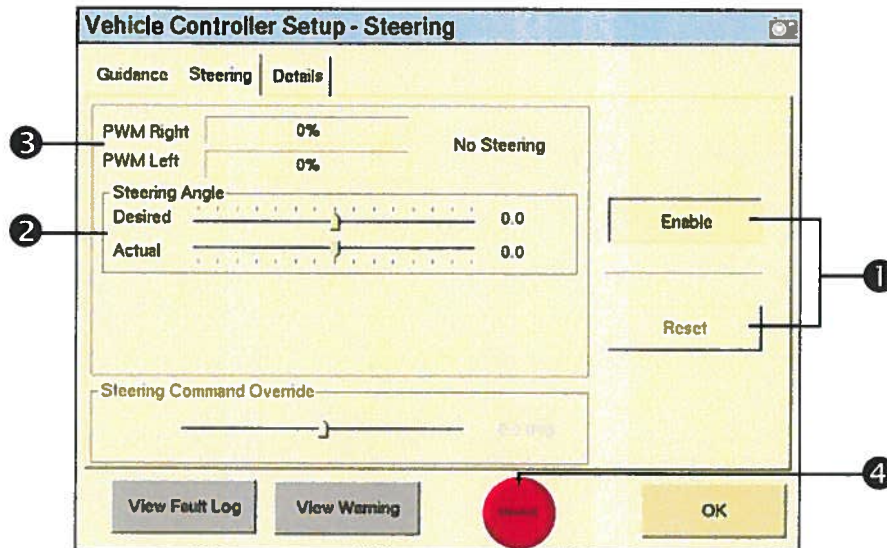
- Guidance screen
- Steering screen
- Details screen
- Fault log screen
- View warning screen

Vehicle Diagnostics: Guidance screen



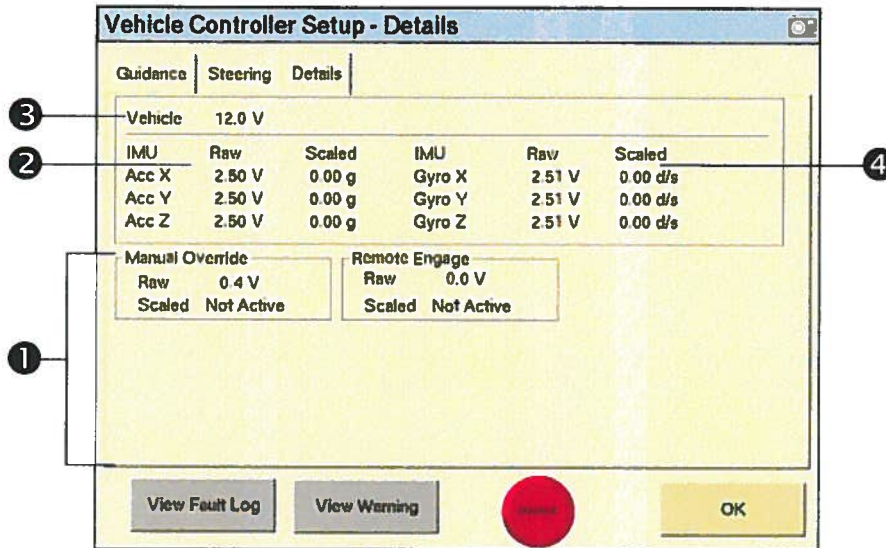
Item	Section	Description
①	Offline distance graph	A graph of offline distance over time. It is useful for diagnosing problems with the vehicle coming online and staying online.
②	GPS status	The current GPS position fix quality and number of satellites.
③	Heading error	Shows the difference between vehicle heading and path heading.
④	Roll	Shows the current roll value calculated by the system.
⑤	Direction	The current vehicle direction – forward, backward, or stopped.
⑥	Cross Track Error	A numeric value of the offline distance.
⑦	Virtual lightbar	Visual representation of offline distance.
⑧	Heading	The current vehicle heading calculated by the system.
⑨	Speed	The current vehicle speed calculated by the system.
⑩	1PPS	Shows whether the 1PPS signal from a GPS receiver is detected.
⑪	Aggressiveness	A slider for adjusting the Aggressiveness of the steering system.
⑫	Engage button	Engages/disengages the system and shows the current engage state. When this button is red, tap it to see the fault that is preventing automatic mode.

Vehicle Diagnostics: Steering screen



Item	Section	Description
1	Steering command override	Bypasses the normal steering command to the wheels. With this feature, you can force a certain angle of turn and make sure that the system responds as expected.
2	Steering angle	Shows the required and actual steering angles. The required angle is that which the system is trying to attain and the actual is where the system calculates the wheels are pointing.
3	PWM status	Shows the current PWM signals being sent to the electro-hydraulic valve. This is an indication of whether the system is attempting to turn left or right.
4	Engage button	Engages/Disengages the system and shows current engage status.

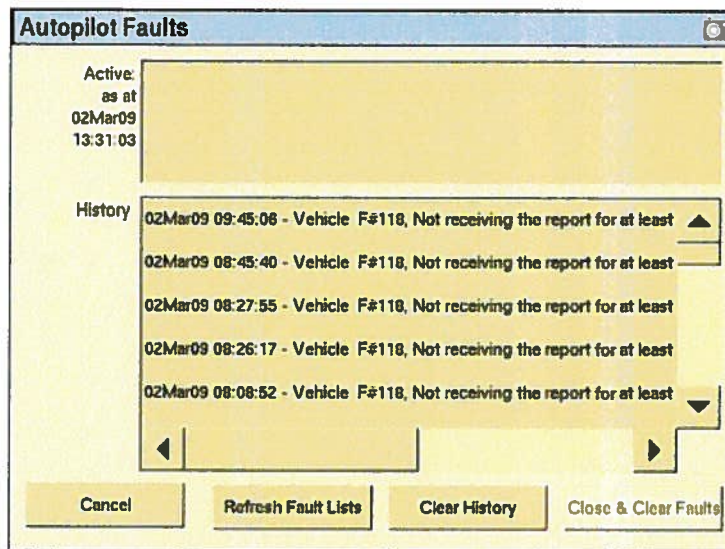
Vehicle Diagnostics: Details screen



Item	Name	Description
①	Diagnostics	Vehicle and configuration specific diagnostics - up to 9 diagnostics can be shown.
②	Accelerometers	The raw voltage and scaled G-force for each of the system's accelerometers
③	Vehicle voltage	The input voltage currently being fed into the Autopilot system from the vehicle's electrical system
④	Gyroscopes	The raw voltage and scaled degrees per second of each of the system's gyroscopes

Autopilot Faults screen

The *Autopilot Faults* screen lists all faults on the Autopilot controller:



Two separate lists show:

- Any faults that are currently active
- A history of faults that have occurred

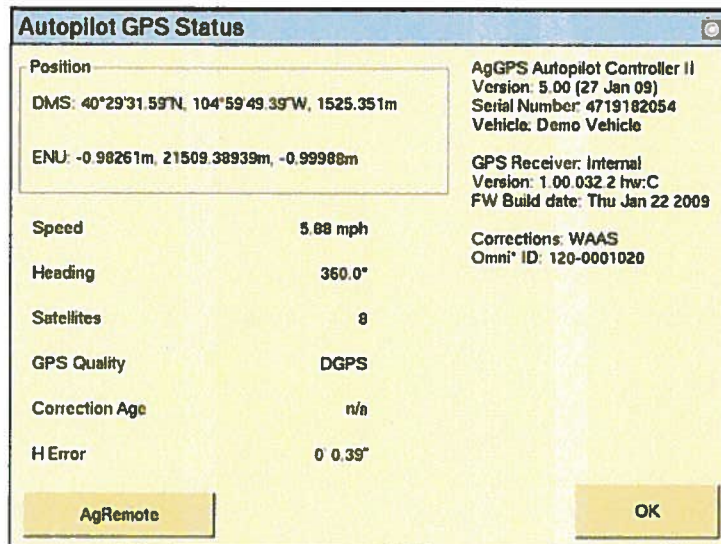
View Warning screen

When you are viewing the vehicle diagnostics screens, the **View Warning** button flashes red if there is an active warning on the display. To view any active warnings, tap the button.

GPS Status screen

The *GPS Status* screen provides information on the current GPS data from the GPS receiver. Use this screen to check that the GPS receiver is outputting the expected data.

- From the *Configuration* screen, select the Autopilot GPS Receiver option and then tap **Diagnostics**:





This screen shows:

- Your current GPS position
- The number of satellites
- GPS quality
- The Autopilot system and receiver version numbers

Screen snaps

To save images in the FM-1000 integrated display, tap the button on the right of the screen that matches the current screen.

For example, to create a screen snap of the Run screen:

1. Tap . The Run screen appears.
2. Tap  again. The screen snap is saved in the `\AgGPS\Diagnostics\Screenshots\` folder. A warning sound indicates that you have created a screen snap.

Note – The screen snap is of the lowest level folder under each button. So if you take a screen snap while in the Implement Setup screen, the snap is of the Configuration screen. The screen snap feature is most useful for capturing images of the Run screen.

Forcing the system to turn off



CAUTION – Do not do this unless absolutely necessary. If the display is writing to the USB memory stick, this method of shutting down the system could corrupt the data on the card. If possible, use one of the other shutdown methods. See [Turning off the display, page 2-9](#).

If the display stops responding, hold down the Power button for 10 seconds to force the system to turn off.