Pub. 988-0154-522

EP-85R Storage Device

Electronic Sensor

Installation and Operation Instructions

This document shows how to connect an EP-85R storage device to a NMEA 2000® network. The EP-85R stores Fuel Used, Trip Fuel Used and Seasonal Fuel Used data for up to three NMEA 2000 compatible engines that output standard NMEA 2000 Fuel Rate Data.

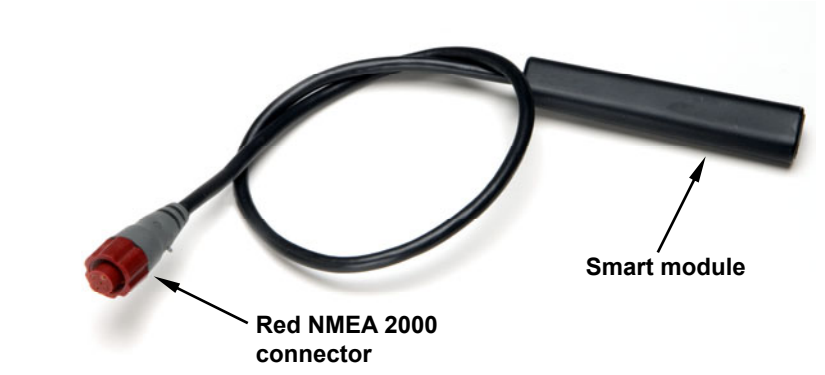
NMEA 2000 is the communication bus standard developed by the National Marine Electronics Association (NMEA) for use in boats. Lowrance has introduced a line of products that can communicate over a NMEA 2000 network (LowranceNet).

All Lowrance NMEA 2000 capable devices are either NMEA 2000 certified or certification is pending.

CAUTION:

Installing LowranceNET NMEA 2000 devices is ***significantly different*** *from installing earlier Lowrance components without NMEA 2000 features. You should read all of the installation instructions before proceeding. Decide where you want to install all components before drilling any holes in your vessel.*

Some sonar or GPS display units may require a software upgrade to display NMEA 2000 data correctly. For free software upgrades or additional information on the LowranceNet NMEA 2000® network system, visit our web site, www.lowrance.com.



The EP-85R Storage Device.

The EP-85R consists of a red cable connector and a smart module. It accumulates fuel used data from fuel flow messages it receives from up to three engines. Fuel used data includes: Fuel Range, Fuel Used, Trip Fuel Used and Seasonal Fuel Used.

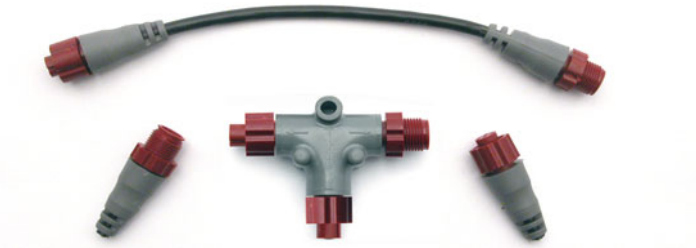
The EP-85R Storage Device, like the other LowranceNet Electronic Probe (EP) sensors, is designed for use with a NMEA 2000 network. Your sensor, however, is also compatible with LowranceNet blue connector networks. It can be added to a blue connector network by using a red female to blue female adapter cable. Your sensor *MUST* be connected to a NMEA 2000 network or it *WILL NOT* function.

The NMEA 2000 red female to blue female adapter cable allows users to add red connector devices to a blue connector network.

Tools and Supplies

Your EP sensor packs with a T connector needed to attach it to a LowranceNET NMEA 2000 network. If you are connecting to an existing LowranceNET network, those are all the electronic components you need. If this is the first sensor you are connecting, you will also need a one-time purchase of a LowranceNET Node Kit.

For complete instructions on setting up a new NMEA 2000 network or expanding an existing one, see the other document packed with your EP-85R Storage Device, "*Setup and Installation of NMEA 2000 Networks, General Information*," part number 988-0154-173. If that document is not available, it can be downloaded free at www.lowrance.com.



LowranceNET Node Kit for a NMEA 2000 network. Includes a 2-foot extension cable, T connector and two 120-ohm terminators.

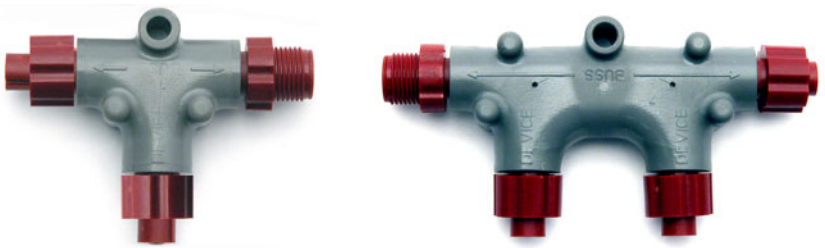
Installation

To install the EP-85R Storage Device, route the sensor's cable connector to the T on the network backbone where you intend to attach it and plug it in.

Connecting to a NMEA 2000 Network

A NMEA 2000 network is a communications link between two or more devices that transfer NMEA 2000 information. LowranceNET is the NMEA 2000 networking system developed by Lowrance Electronics. A NMEA 2000 network functions like the phone wiring in a house. If, for example, you pick up a phone in the living room you will be able to hear the conversation someone is having on a phone in the bedroom.

In similar fashion, a NMEA 2000 network allows multiple display units to receive data from a GPS antenna or multiple sonar units to receive messages sent by a temperature sensor. A NMEA 2000 network gives you the flexibility to view information like engine diagnostics and fuel level data on digital gauges or display units located anywhere on your boat.



There are two types of LowranceNet red connectors: the single T connector (left) and the double T connector (right).

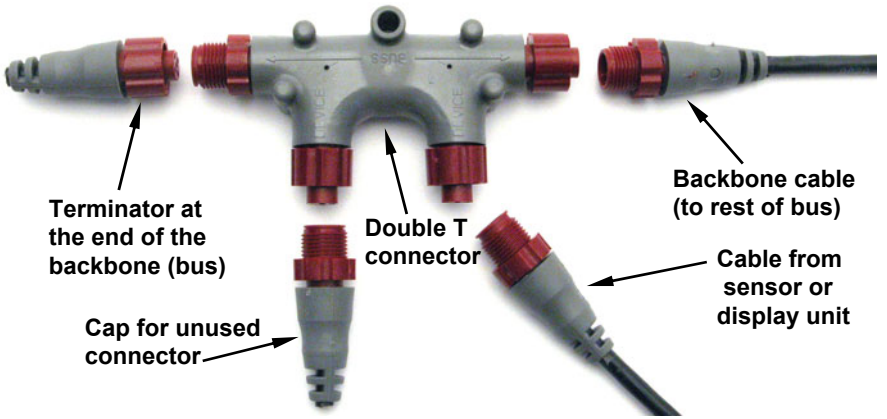
Network Backbone and Network Nodes

A network bus backbone consists of network cabling, terminators and T connectors. Network nodes are made by fitting T-shaped connectors into the backbone (using the sockets on the sides) and attaching any network device to the bottom of the T.

Staying with the previous phone wiring example, T connectors on the backbone are the equivalent of phone jacks spread throughout a house. To pick up a phone and be able to hear a conversation from another phone in the house, both phones have to be connected to the main phone line. In similar fashion, only sensors and display units plugged into the NMEA network can share information. The network backbone is like the phone wiring that runs throughout a home.

It connects the network nodes, allowing them to communicate across the network. Connections found in the middle of the bus could have T connectors or backbone network cable plugged into one or both sides.

Connections at the end of a network will have the backbone cable plugged into one side and a terminator plugged into the other, as shown in the following figure.



NMEA 2000 network node located at the end of a NMEA 2000 backbone.

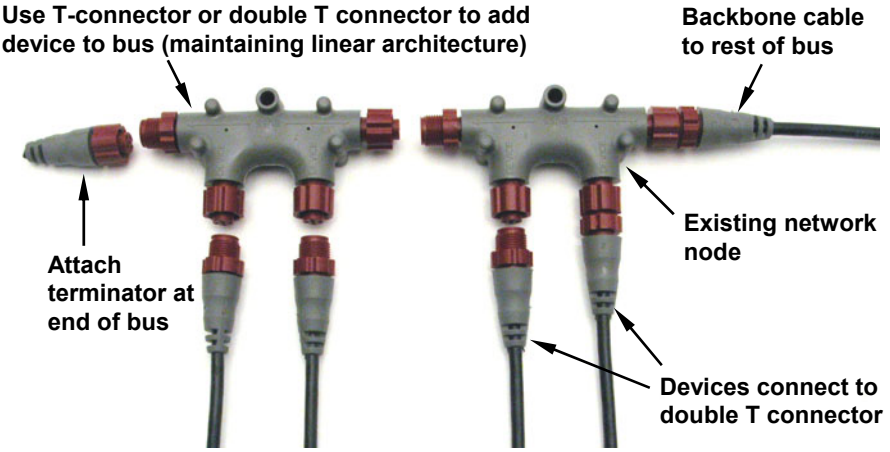
NOTE:

If you have a double T Connector on your network that is not attached to a device, you must cap the unused connector with a NMEA 2000 cap. This will protect the pin connectors from corrosion. The NMEA 2000 cap looks like a terminator, but has "Cap" stamped into the connector housing.

All T connectors on your network probably will be connected to a device. If you want to add another node to a working network, add another T connector. T connectors may be purchased from LEI (ordering information appears on the back page of this booklet). If you are adding a Lowrance or LEI NMEA 2000 sensor, it will come with a T connector.

Adding a Network Node

You can add a node to any existing connection, anywhere along the network backbone. This connection could be between a T connector and a terminator, between two T connectors, between a T connector and a backbone extension cable or between two extension cables. Wherever you want to add the new node, separate the sockets of the existing connection and install the T connector between them. If you want to add a node at the end of the backbone (network bus) remove the terminator from the last connector, like the figure above. Install the new T connector and attach the terminator to the side of the connector.



In this example, a new device is added to the NMEA 2000 bus by installing a T connector between a T connector and a terminator at the end of the backbone (network bus).

Additional Network Information

For more information on creating or expanding a network refer to the NMEA 2000 network setup booklet, part number 988-0154-173, which came packed with this document.

Notes

LMF-200: EP-85R Operation

This section covers how to use EP-85R Storage Device with the LMF-200 Multi-function gauge.

NOTE:

You will notice the LMF-200 does not have an Exit key. Menus will time out after a preset amount of time (3, 5, 10 or 15 seconds). The default setting is 5 seconds. Refer to your LMF-200 instruction manual for more information on the Timeout feature.

LMF-200 Multi-function Digital Gauge.

Boat Setup

If this is the first time you have turned on your LMF-200, you will have to complete Boat Setup before you will be able to use the gauge or the EP-85R Storage Device.

To execute Boat Setup:

1. With Boat Setup highlighted on the screen, press **MENU**. The Boat Setup menu will appear, allowing you to select an engine-tank configuration that matches the number of engines and fuel tanks on your vessel. Boat Setup options include: 1 En/1 Tk, 1 En/2 Tk, 2 En/1 Tk, 2 En/2 Tk, 3 En/1 Tk and 3 En/3 Tk.

2. Select the configuration option that matches number of engines and tanks on your vessel and press **MENU**.

3. Select the tank you want to set up and press **MENU**, which will open the Tank Size window.

4. Use the **UP** and **DOWN** keys to input the number of gallons the tank will hold and press **MENU**. Repeat steps 3 and 4 for each additional tank. After all tanks have been set up, you will be directed to the main display.

Boat Setup Reset

If you want to access the Setup screen (Boat Setup) after an engine-tank configuration has been chosen you will have to reset the configuration to default settings.

To reset engine tank configuration:

1. Press **MENU**, highlight **SYSTEM SETUP** and press **MENU**.

2. Choose **ENG/TANK** and press **MENU** twice. The following message will appear: *Hit menu to reset Eng/Tnk*.

3. Press **MENU**. The Setup screen will appear with Boat Setup highlighted.

Fuel Remaining Source (FRem Src)

The Fuel Remaining source function allows you to select the device used to measure the amount of fuel remaining in the tank. It will be set to fluid level by default. The Fuel Remaining Source should be set to fuel flow (Eng/FFlow) if you are going to use the EP-85R to monitor the fuel remaining.

To set Fuel Remaining Source to Fuel Flow:

1. Press **MENU**, use the **UP** and **DOWN** keys to select **SYSTEM SETUP** and press **MENU**. Select **FUEL MNGR** and press **MENU**.

2. Highlight **FREM SRC** and press **MENU**. That will open the FRem Src menu..

3. Select **ENG/FFLOW** and press **MENU**, which will take you back to the main display.

NOTE:

If you select Fuel Level (Fluid Level) as the Fuel Remaining Source, the EP-85R WILL NOT calculate Fuel Range.

Fuel Manager menu

The Fuel Manager menu allows you to adjust options used to measure fuel economy. The following options can be set or reset from the Fuel Manager menu: Refill Tank (Refill T), Part Fill (Partial Fill), Economy Speed Source (Eco spd), Fuel Remaining Source (FRem Src), Reset Trip Fuel (Rst trip F), Reset Seasonal Fuel (Rst Seas).

Refill Tank (Refill T)

Since the EP-85R is not connected to the tank, its fuel information is not automatically updated when the tank is filled up. You must use the Refill Tank command to ensure the fuel information in the EP-85R

stays consistent with the amount of fuel actually in the tank. *The Refill Tank command will NOT be used when the EP-65R Fluid Level is set as the Fuel Remaining Source.*

To refill tank:

1. Press **MENU**, use the **UP** and **DOWN** keys to select **SYSTEM SETUP** and press **MENU**. Highlight **FUEL MNGR** and press **MENU**.

2. Select **REFILL T** and press **MENU**. If your unit is configured for more than one tank, the Select Tank menu will appear with up to three options. (If you are using a single tank configuration, you will not see the Select Tank menu.)

3. Select the desired tank and press **MENU**. The following message will appear: *Hit Menu if Tank filled up*. Press **MENU** and you will be taken you back to the main display.

Partial Fill (Part Fill)

Since the EP-85R is not connected to the tank, its fuel information is not automatically updated when fuel is added to the tank. When you add fuel to a tank without completely filling it up, you must use the Partial Fill command. This will ensure the fuel information in the EP-85R stays consistent with the amount of fuel actually in the tank.

To use Partial Fill:

1. Press **MENU**, use the **UP** and **DOWN** keys to select **SYSTEM SETUP** and press **MENU**. Highlight **FUEL MNGR** and press **MENU**.

2. Highlight **PART FILL** and press **MENU**. The Select Tank menu will appear with up to three options. (If you have one tank, you will be taken directly to the Fuel Quantity window.) Select the desired engine and press **MENU**.

NOTE:

When using the Partial Fill command, you will only be able to input an amount of fuel less or equal to the fuel used figure. The unit will not allow you to input a fuel amount greater than the fuel used figure.

3. The Fuel Quantity window will appear. Use the **UP** and **DOWN** keys to enter the amount of fuel you added to the tank and press **MENU**. You will be taken back to the main display.

Economy Speed Source (Eco spd)

The Economy Speed Source menu allows you to choose the speed source (Water Speed, Pitot Speed or Ground Speed) the LMF-200 will use to calculate Fuel Economy. Ground Speed is the default speed source for Fuel Economy.

To change Economy Speed Source:

1. Press **MENU**, use the **UP** and **DOWN** keys to select **SYSTEM SETUP** and press **MENU**. Select **FUEL MNGR** and press **MENU**.

2. Highlight **ECO SPD** and press **MENU**, which will open the Eco spd menu. The menu has three options: Water Spd (Water Speed), Pitot Speed and Gnd Spd (Ground Speed). A NMEA 2000 GPS module measures ground speed, while a paddlewheel, like the EP-25 measures water speed.

3. Select the desired speed source and press **MENU**, which will take you back to the main display.

Reset Trip Fuel Used (Rst trip f)

The EP-85R Storage Device keeps a running total of fuel used for a trip. By using the Reset Trip command, you can reset to zero the running total of fuel used on a trip.

To Reset Trip Fuel (Rst trip f)

1. Press **MENU**, use the **UP** and **DOWN** keys to select **SYSTEM SETUP** and press **MENU**. Highlight **FUEL MNGR** and press **MENU**.

2. Select **RST TRIP F** (Reset Trip Fuel) and press **MENU**. The Select Engine menu will appear with up to four options. Select the desired engine or All Engines and press **MENU**. (If you are using a single-engine configuration you will not see the Select Engine menu.)

3. The following message will appear: *Hit Menu to Rst Trip F.* Press **MENU**, which will reset the trip fuel used to zero and take you back to the main display.

Reset Seasonal Fuel (Rst Seas)

The EP-85R Storage Device keeps a running total of fuel used for a season. By using the Reset Seasonal command, you can reset to zero the running total of fuel used for a season.

To reset seasonal fuel:

1. Press **MENU**, use the **UP** and **DOWN** keys to select **SYSTEM SETUP** and press **MENU**. Highlight **FUEL MNGR** and press **MENU**.

2. Choose **RST SEAS** and press **MENU**. If you have more than one engine, the Select Engine menu will appear with up to four options.

3. Select the desired engine or All Engines and press **MENU**. The following message will appear: *Hit Menu to Rst USD:S.*

4. Press **MENU**, which will take you back to the main display.

Displaying Storage Device Data

You can display your storage device data on the Single Digital, Dual Digital and Fuel Manager pages.

Page Screen Rotation

The Page Screen Rotation consists of multiple pages that have been set for display. Once pages have been added to the rotation, they can be set to scroll across the screen automatically or manually. Press the **UP** and **DOWN** keys to manually scroll pages across the screen. Pressing the **UP** key moves the scroll in one direction. Pushing the **DOWN** key moves the scroll in the other direction. You can use Autoscroll if you want the pages to automatically scroll across the screen. Refer to your LMF -200 manual for information about Autoscroll.

Adding a page:

1. Press **MENU**, use the **UP** and **DOWN** keys to select **PAGES** and press **MENU**, which will open the Pages menu with the following options: Add Page, Rem Page, Autoscroll and Set Pop-up.

2. Highlight **ADD PAGE** and press **MENU**.

3. Select Single Digital, Dual Digital or the Fuel Manager page and press **MENU**. You will be taken back to the main display, where the page you selected will be shown.

Customizing Pages

The customizing pages feature allows you to choose what data will be displayed and how it will be displayed on select pages. You can customize the Single Digital, Dual Digital or Fuel Manager pages with storage device data (Fuel Used, Trip Fuel Used or Seasonal Fuel Used).

To customize Single Digital page:

1. After the Single Digital page has been added to the page screen rotation, use the **UP** and **DOWN** keys to display it on the screen.

2. Press **MENU**, select **CUSTOMIZE** and press **MENU**.

3. Highlight **FUEL USED (USD)**, **TRIP FUEL USED (USD: TP)** or **SEASONAL FUEL USED (USD: SE)** and press **MENU**. A menu will appear, allowing you to display data from a single engine or show data from all engines on the vessel. (If your unit is configured for one engine, you will be directed back to the main display.)

4. Select the desired engine or, to display data from all engines, highlight Vessel and press **MENU**. You will be taken back to the main display, where the data you selected will be shown.

To customize Dual Digital page:

1. After the Dual Digital page has been added to the page screen rotation, use the **UP** and **DOWN** keys to display it on the screen.

2. Press **MENU**, select **CUSTOMIZE** and press **MENU**. The Position menu will appear with two options: Top Data and Bottom Data.

3. Select the desired data position and press **MENU**.

4. Highlight **FUEL USED (USD)**, **TRIP FUEL USED (USD: TP)** or **SEASONAL FUEL USED (USD: SE)** and press **MENU**. A menu will appear, allowing you to display data from a single engine or show data from all engines. (If your unit is configured for one engine, you will be directed to the main display.)

5. Select the desired engine or, to display data from all engines, highlight Vessel and press **MENU**. You will be taken back to the main display, where the data you selected will be shown.

To customize Fuel Manager page:

1. After the Fuel Manager page has been added to the page screen rotation, use the **UP** and **DOWN** keys to display it on the screen.

2. Press **MENU**, select **CUSTOMIZE** and press **MENU**.

3. Highlight **FUEL USED (USD)**, **TRIP FUEL USED (USD: TP)** or **SEASONAL FUEL USED (USD: SE)** and press **MENU**. A menu will appear, allowing you to display data from a single engine or show data from all engines on the vessel. (If your unit is configured for one engine, you will be directed to the main display.)

4. Select the desired engine or, to display data from all engines, highlight Vessel and press **MENU**. You will be taken back to the main display, where the data you selected will be shown.

Fuel Warning

The Fuel Warning feature allows you to set a Low level or High level alarm for each fuel tank. A pop-up window will appear and an alarm will sound if the amount of fuel rises above (High Level) or falls below (Low level) the selected percentage of tank capacity.

To set a fuel warning:

1. Press **MENU**, select **SYSTEM SETUP** and press **MENU**.

2. Highlight **BUS DEVICES** and press **MENU** to display the Bus Devices list. Select **STRG DEV** (Storage Device) and press **MENU**. The Configuration Options menu will appear with two options: Fuel Wrng and Reset.

3. Select **FUEL WRNG** (Fuel Warning) and press **MENU**. If your unit is set to a multiple engine configuration, the Select Engine menu will appear with up to three options. *(If your unit is configured for a single engine, you will not see the Select Engine menu. You will be taken directly to the Select Level menu.)*

4. Select the desired engine and press **MENU**. The Select Level menu will appear with two options: High Level and Low Level.

5. Select **LOW LEVEL** or **HIGH LEVEL** and press **MENU**. The Level Percentage window will appear. It will be set to Off by default.

6. Use the **UP** and **DOWN** keys to input the desired percentage of tank capacity and press **MENU**. If the fuel falls below that percentage, the alarm will go off. Let the menus time out to return to the main display.

NOTE:

To turn off a fuel warning, repeat Steps 1-4, then select **OFF** from the Level Percentage window mentioned in Step 5. Press **MENU**. Repeat these steps for each warning you want to turn off. Let the menus time out and you will be directed to the main display.

Reset

The Reset command in the storage device menu will clear all stored data from EP-85R memory.

NOTE:

After using the Reset command to clear data from EP-85R memory, you will have to re-enter your engine-tank configuration. The Reset command will not affect the configuration or calibration of other devices on the network.

To use reset command:

1. Press **MENU**, select **SYSTEM SETUP** and press **MENU**.

2. Highlight **BUS DEVICES**, select **STRG DEV** (Storage Device) and press **MENU**. The Configuration Options menu will appear with two options: Fuel Wrng and Reset.

3. Select **RESET** and press **MENU**. The following message will appear: *Hit Menu to Rst Values.*

4. Press **MENU**, then let the menus time out to return to the main display.

Notes

LMF-400: EP-85R Operation

This section covers how to use the EP-85R Storage Device with a LMF-400 Multi-function gauge.

LMF-400 Multi-function Digital gauge.

Boat Setup

If this is the first time you have turned on your LMF-400, you will have to complete Boat Setup before you will be able to set a fuel warning or clear EP-85R Storage Device memory.

To execute Boat Setup:

1. With Boat Setup highlighted on the screen, press **ENTER**. A menu will appear, allowing you to choose the number of engines and fuel tanks on your vessel. The Boat Setup menu options are: 1 Eng/1 Tank, 1 Eng/2 Tank, 2 Eng/1 Tank, 2 Eng/2 Tanks, 3 Eng/1 Tank or 3 Eng/3 Tanks.
2. Use the **UP** and **DOWN** keys to select the engine-tank configuration that applies to your vessel and press **ENTER**. After setting the engine/tank configuration, the Tank Size menu will appear with up to three options. (If you are using a single tank configuration, you will be taken directly to the Setting Tank Size Window in Step 4.)
3. Select the desired tank and press **ENTER**, which will open the Setting Tank Size window.
4. Use the **UP** and **DOWN** keys to input the number of gallons the tank will hold and press **ENTER**. Press **EXIT** and repeat steps 3 and 4 for each of the remaining tanks.
5. After all tanks on your vessel have been set up, press **EXIT** repeatedly to return to the main display.

Fuel Remaining Source

The Fuel Remaining source function allows you to select the device used to measure the amount the fuel remaining in the tank. It will be set to fluid level by default. The Fuel Remaining Source should be set to fuel flow (Eng/FFlow) if you are going to use the EP-85R to monitor the fuel remaining.

To set Fuel Remaining Source to fuel flow:

1. Press **MENU**, use the **UP** and **DOWN** keys to select **SYSTEM SETUP** and press **ENTER**.

2. Highlight **FUEL SETUP** and press **ENTER**.

3. Select **FUEL REM SRC** (Fuel Remaining Source) and press **ENTER**.

4. Highlight **ENG/FFLOW** (Fuel Flow) and press **ENTER**.

NOTE:

If you select Fuel Level (Fluid Level) as the Fuel Remaining Source, the EP-85R WILL NOT calculate Fuel Range.

Fuel Setup

The Fuel Setup menu allows you to adjust options used to measure fuel economy. The following options can be set or reset through the Fuel Setup menu: Refill Tank, Partial Fill, Economy Speed Source, Fuel Remaining Source, Reset Trip Fuel and Reset Seasonal Fuel.

Refill Tank

Since the EP-85R is not connected to the tank, its fuel information is not automatically updated when the tank is filled up. You must use the Refill Tank command to ensure the fuel information in the EP-85R stays consistent with the amount of fuel actually in the tank.

The Refill Tank command will NOT be used when the EP-65R Fluid Level is set as the Fuel Remaining Source.

To refill tank:

1. Press **MENU**, use the **UP** and **DOWN** keys to select **SYSTEM SETUP** and press **ENTER**.

2. Highlight **FUEL SETUP** and press **ENTER**.

3. Select **REFILL TANK** and press **ENTER**. The select Tank menu will appear with up to three options. Select the tank you refilled and press **ENTER**. (If you have one tank, you will be taken directly to the recalibration window mentioned in step 4.)

4. A recalibration window will appear with two options: Yes and No. Select **No** and press **ENTER**. The following message will appear: *Press Enter after refilling the fuel tank*.

5. Press **ENTER**. You will be directed back to the main display.

Partial Fill

Since the EP-85R is not connected to the tank, its fuel information is not automatically updated when fuel is added to the tank. When you add fuel to a tank without completely filling it up, you must use the Partial Fill command. This will ensure the fuel information in the EP-85R stays consistent with the amount of fuel actually in the tank.

NOTE:

When using the Partial Fill command, you will only be able to input a fuel amount less or equal to the fuel used figure. The unit will not allow you to input a fuel amount greater than the fuel used figure.

To use Partial Fill:

1. Press **MENU**, use the **UP** and **DOWN** keys to select **SYSTEM SETUP** and press **ENTER**. Highlight **FUEL SETUP** and press **ENTER**.

2. Select **PARTIAL FILL** and press **ENTER**. The Select Tank menu will appear with up to three options. (If you have one tank, you will be taken directly to the Adding Fuel window.)

3. Select the desired tank and press **ENTER**. The Adding Fuel window will appear.

NOTE:

When using the Partial Fill command, you will only be able to input into the gauge, an amount of fuel less or equal to the fuel used figure. The unit will not allow you to enter a fuel amount greater than the fuel used figure.

4. Use the **UP** and **DOWN** keys to input the amount of fuel added to the tank and press **ENTER**. You will be taken back to the main display.

Economy Speed Source

The Economy Speed menu allows you to choose what speed source (Water Speed, Pitot Speed or Ground Speed) the LMF-400 will use to calculate Fuel Economy. Ground Speed is the default speed source.

To change Economy Speed source:

1. Press **MENU**, use the **UP** and **DOWN** keys to select **SYSTEM SETUP** and press **ENTER**. Select **FUEL SETUP** and press **ENTER**.

2. Highlight **ECO SPEED SRC** and press **ENTER** to open the Economy Speed

menu. The menu has three options: Water Speed (Paddlewheel), Pitot Speed and Ground Speed (GPS).

3. Select the desired speed source and press **ENTER**. You will be taken back to the main display.

Reset Trip Fuel

The EP-85R Storage Device keeps a running total of fuel used for a trip. By using the Reset Trip command, you can reset to zero the running total of fuel used on a trip.

To reset trip fuel:

1. Press **MENU**, use the **UP** and **DOWN** keys to select **SYSTEM SETUP** and press **ENTER**. Select **FUEL SETUP** and press **ENTER**.

2. Highlight **RST TRIP FUEL** and press **ENTER**. The Select Engine menu will appear with up to four options. (If you have one tank, the *Press Enter to reset Trip Fuel* message will appear.)

3. Select the desired engine or All Engines and press **ENTER**. The following message will appear: *Press Enter to reset Trip Fuel.*

4. Press **ENTER**, which will reset the trip fuel to zero and take you back to the main display.

Reset Seasonal

The EP-85R Storage Device keeps a running total of fuel used for a season. By using the Reset Seasonal command, you can reset to zero the running total of fuel used for a season.

To reset seasonal fuel:

1. Press **MENU**, select **SYSTEM SETUP** and press **ENTER**.

2. Highlight **FUEL SETUP** and p ress **ENTER**.

3. Select **RST SEASONAL** (Reset Seasonal) and press **ENTER**. The Select Engine menu will appear with up to four options. (If you have one engine, the reset seasonal fuel message will appear.)

4. Select the desired engine or All Engines and press **ENTER**. The following message will appear: *Press Enter to reset Seasonal Fuel.*

5. Press **ENTER** to reset seasonal fuel. You will be taken back to the main display.

Displaying Storage Device data:

You can display storage device data on the Single Digital, Dual Digital, Quad Digital and Fuel Manager pages.

Page Screen Rotation

The Page Screen Rotation consists of multiple pages that have been set up for display. Once pages have been added to the page screen rotation, they can be set to scroll across the screen automatically or manually. Use the **ENTER** and **EXIT** keys to manually scroll pages across the

screen. Pressing the **ENTER** key moves the scroll in one direction. Pushing the **EXIT** key moves the scroll in the other direction. You will use the Page Scrolling if you want pages to automatically scroll across the screen. Refer to your LMF-400 manual for more information about Page Scrolling.

To add a page to the display:

1. Press **MENU**, use the **UP** and **DOWN** keys to select **PAGES** and press **ENTER**. A menu will pop up with four options: Add Page, Remove Page, Page Scrolling and Pop-Ups Setup.

2. Select **ADD PAGE** and press **ENTER**.

3. Highlight Single Digital, Dual Digital, Quad Digital or Fuel Manager and press **ENTER**. The following message will appear: *Press Enter to add the selected page*.

4. Press **ENTER**, which will take you back to the main display, where the page you selected will be shown on the screen.

Customizing Pages

The customizing pages feature allows you to choose what data will be displayed on selected pages. You can use the Single Digital, Dual Digital, Quad Digital or Fuel Manager pages to display storage device data (Fuel Used, Trip Fuel Used and Seasonal Fuel Used).

To customize Single Digital page:

1. After the Single Digital page has been added to the page screen rotation, use the **ENTER** and **EXIT** keys to display it on the main screen.

2. Press **MENU**, use the **UP** and **DOWN** keys to select **CUSTOMIZE** and press **ENTER**. The data menu will appear.

3. Select **FUEL USED**, **TRIP FUEL USED** or **SEASONAL FUEL USED** and press **ENTER**. A menu will appear, allowing you to display data from a single engine or from all engines on the vessel. (If your unit is configured for one engine, you will be directed to the main display.)

4. Select the desired engine or, to display data from all engines, highlight Vessel and press **ENTER**. You will be taken back to the main display, where the data you selected will be shown.

To customize Dual Digital page:

1. After the Dual Digital page has been added to the page screen rotation, use the **ENTER** and **EXIT** keys to display it on the main screen.

2. Press **MENU**, use the **UP** and **DOWN** keys to select **CUSTOMIZE** and press

ENTER. The Position menu will appear with two options: Top Data and Bottom Data.

3. Highlight the desired data position and press **ENTER**.

4. Select **FUEL USED**, **TRIP FUEL USED** or **SEASONAL FUEL USED** and press **ENTER**. A menu will appear, allowing you to display data from a single engine or from all engines on the vessel. (If your unit is configured for one engine, you will be directed to the Position menu.)

5. Select the desired engine or, to display data from all engines, highlight Vessel and press **ENTER**. You will be taken back to the Position menu. To display data in the other data box, repeat Steps 3-5.

6. Press **EXIT** twice to return to the main display.

To customize Quad Digital page:

1. After the Quad Digital page has been added to the page screen rotation, use the **ENTER** and **EXIT** keys to display it on the main screen.

2. Press **MENU**, use the **UP** and **DOWN** keys to select **CUSTOMIZE** and press **ENTER**. The Position menu will appear with four options: Data Box 1, Data Box 2, Data Box 3 and Data Box 4.

3. Highlight the desired data position and press **ENTER**.

4. Select **FUEL USED**, **TRIP FUEL USED** or **SEASONAL FUEL USED** and press **ENTER**. A menu will appear, allowing you to display data from a single engine or from all engines on the vessel. (If your unit is configured for one engine, you will be directed to the Position menu.)

5. Select the desired engine or, to display data from all engines, highlight Vessel and press **ENTER**. You will be taken back to the Position menu. To display data in another data box, repeat Steps 3-5.

6. Press **EXIT** twice to return to the main display.

To customize Fuel Manager page:

1. After the Fuel Manager page has been added to the page screen rotation, use the **ENTER** and **EXIT** keys to display it on the main screen.

2. Press **MENU**, use the **UP** and **DOWN** keys to select **CUSTOMIZE** and press **ENTER**. The Position menu will appear with three options: Top Data, Center Data and Bottom Data.

3. Highlight the desired data position and press **ENTER**.

4. Select **FUEL USED**, **TRIP FUEL USED** or **SEASONAL FUEL USED** and press **ENTER**. A menu will appear, allowing you to display data from a single engine or from all engines on the vessel.(If your unit is configured for one engine, you will be directed to the Position menu.)

5. Select the desired engine or, to display data from all engines,

highlight Vessel and press **ENTER**. You will be taken back to the Position menu. To display data in another data box, repeat Steps 3-5.

6. Press **EXIT** twice to return to the main display.

Fuel Warning

The Fuel Warning feature allows you to set a Low level or High level alarm for each fuel tank. A pop-up window will appear and an alarm will sound if the amount of fuel rises above (High Level) or falls below (Low level) the selected percentage of tank capacity.

To set a fuel warning:

1. Press **MENU**, highlight **SYSTEM SETUP** and press **ENTER**.

2. Select **BUS DEVICES** and press **ENTER**. Highlight **STORAGE DEV** and press **ENTER**. The Storage Device menu will appear. Select **FUEL WARNING** (Fuel Wrng) and press **ENTER**.

3. If you have more than one engine, the Select Engine menu will appear with up to three options. Select the desired engine and press **ENTER**. The Select Level menu will appear with two options: High Level and Low Level. (If your unit is set to a single-engine configuration, you will not see the Select Engine menu. You will be taken directly to the Select Level menu.)

4. Highlight **LOW LEVEL** or **HIGH LEVEL** and press **ENTER**. The Set Percentage window will appear. It will be set to Off by default.

5. Use the **UP** and **DOWN** keys to input the desired percentage of tank capacity that will trigger the alarm. If the amount of fuel falls below the percentage you choose, the alarm will go off.

6. Press **ENTER** and you will be taken back to the Bus Devices list. Press **EXIT** repeatedly to return to the main display.

NOTE:

To turn off a fuel warning, repeat Steps 1-3, then select **OFF** from the Level Percentage window mentioned in Step 4. Press **ENTER**. Repeat these steps for each warning you want to turn off. Press **EXIT** repeatedly to return to the main display.

Reset Values

Use the Reset Values command to clear all data stored in EP-85R memory.

NOTE:

After using the Reset Values command to clear EP-85R memory, you will have to re-enter your engine-tank configuration. The Reset Values command will not affect the configuration or calibration of other devices on the network.

To reset values:

1. Press **MENU**, select **SYSTEM SETUP** and press **ENTER**.

2. Highlight **BUS DEVICES** and press **ENTER**. Select **STRG DEV** (Storage Device) and press **ENTER**. The Configuration Options menu will appear with two options: Fuel Wrng and Reset Values.

3. Select **RESET VALUES** and press **ENTER**. The following message will appear: *Press Enter to Reset Device Values*. Press **ENTER**.

4. Press **EXIT** repeatedly to return to the main display.

Display Unit: EP-85R Operation

This section covers how to use an EP-85R Storage Device with a display unit.

The LMS-525cDF is one of many Lowrance display units that may be used with the EP-85R Storage Device.

NOTE:

Your unit may have a NMEA 2000 menu or a Networking menu, depending on the software version installed in your unit. Both menus allow you to perform the same NMEA 2000-related functions.

Bus Setup

Selecting Bus Setup from the NMEA 2000 or Networking menu will open the Bus Configuration menu, giving you access to the Engine-Tank Configuration menu and the NMEA 2000 Devices list. The list, located in the top half of the Bus Configuration menu, shows all devices connected to the network. The Engine-Tank Configuration menu is located in the bottom half of the Bus Configuration menu.

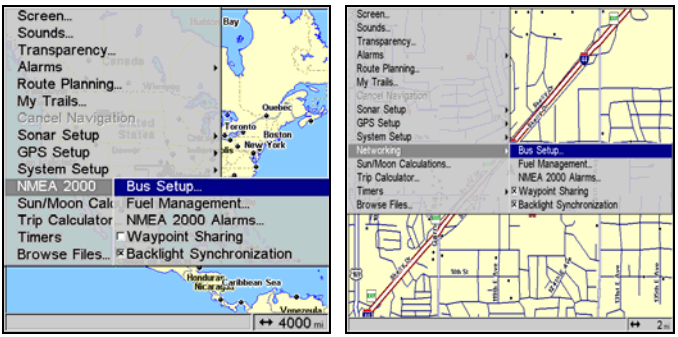
NOTE:

Some of the menus shown in this section may differ slightly from the menus in your display unit, but your unit will perform the same functions in a similar manner.

Engine & Tank Configuration

The Engine-Tank configuration menu is located below the NMEA 2000 Devices list, but will only be accessible if engine- or fuel-related devices are on the network.

When choosing an engine-tank configuration you will use the Tank Select menu, Tank Size dialog box and Set Configuration button.



Bus Setup highlighted on the NMEA 2000 menu (left). Bus Setup selected on Networking menu (right).

Setting Engine-Tank Configuration:

1. Press **MENU** twice, highlight **NMEA 2000** or **NETWORKING** and press **ENTER**.

2. The NMEA 2000 menu will appear with five options: Bus Setup, Fuel Management, NMEA 2000 Alarms, Waypoint Sharing and Backlight Synchronization. Choose **BUS SETUP** and press **ENTER**.

3. Select **ENGINE & TANK CONFIG** and press **ENTER**, which will open the Engine & Tank Configuration menu with the following configuration options: 1 Engine/1 Tank, 1 Engine/2 Tanks, 2 Engines/1 Tank, 2 Engines/2 Tanks, 3 Engines/1 Tank, 3 Engine/3 Tanks and Unconfigured Bus.

4. Choose the configuration that matches the number of engines and tanks on your vessel and press **ENTER**.

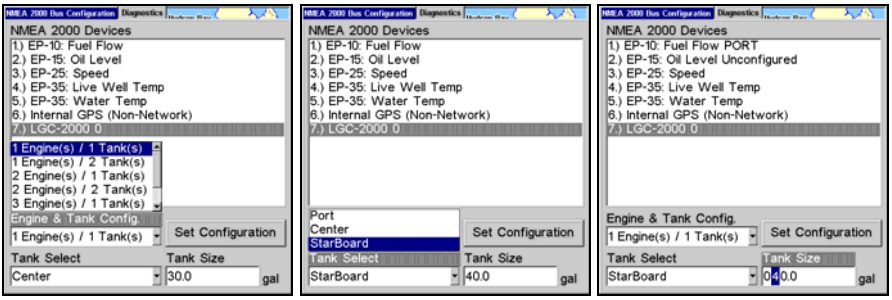
5. Highlight **TANK SELECT** and press **ENTER**, which will open the Tank Select menu.

6. Select the tank you want to set up and press **ENTER**. Highlight the Tank Size dialog box and press **ENTER**.

7. Input the capacity (gallons) of the tank you chose from the Tank Select menu and press **ENTER**.

8. Repeat Steps 5-7 for each remaining tank.

9. When all tanks have been configured, highlight the **SET CONFIGURATION** button and press **ENTER**. The following confirmation message will appear: *Are you sure you wish to change the bus configuration?* Choose **YES** and press **ENTER**, Press **EXIT** to return to the main display.



1 Engine/1Tank highlighted on Engine and Tank Configuration menu (left). Starboard highlighted on Tank Select menu (center). Tank Size set to 40 gallons (right).

9. When all tanks have been configured, highlight the **SET CONFIGURATION** button and press **ENTER**. The following confirmation message will appear: *Are you sure you wish to change the bus configuration?* Choose **YES** and press **ENTER**, Press **EXIT** to return to the main display.

Device Name

You can change how your storage device will be displayed on your unit's NMEA 2000 Devices list by inputting a customized device name in the Device Name dialog box.

NOTE:

Changing the Device Name only will affect the way the EP-85R is shown on your display unit. The customized device name will not be seen by other devices or display units on the NMEA 2000 network.

To change Device Name:

1. Press **MENU** twice, select **NMEA 2000** or **NETWORKING** and press **ENTER**.

2. Highlight **BUS SETUP** and press **ENTER**. Select the desired storage device from the Bus Devices list and press **ENTER**.

3. Device Name will be highlighted. Press **ENTER** to access the Device Name dialog box.

4. Use the **UP** and **DOWN** keys to change the Device Name. When you have finished inputting the desired Device Name, press **ENTER**. Press **EXIT** repeatedly to return to the main display.

To reset device name to default setting:

1. Press **MENU** twice, select **NMEA 2000** or **NETWORKING** and press **ENTER**. A menu will appear with five options: Bus Setup, Fuel Management, NMEA 2000 Alarms, Waypoint Sharing and Backlight Synchronization.

2. Highlight **BUS SETUP** and press **ENTER**, which will open the Bus Configuration menu. A list of network devices will be at the top of the page.

3. Select the storage device with the device name you want to reset and press **ENTER**. The Device Configuration menu will appear with the Device Name dialog box highlighted.

4. Press **ENTER**. Depress the left arrow key until the device name disappears. Press **ENTER**, then press **EXIT** to return to the NMEA 2000 menu.

5. Highlight the device and press **ENTER**. The Device Configuration menu will open. The device name will be reset to its default setting. Press **EXIT** repeatedly to return to the main display.

Restore Defaults

Located on the Advanced Options menu, the Restore Defaults command allows you to reset EP-85R Storage Device settings to factory defaults.

NOTE:

Using the Restore Defaults command will clear your engine-tank configuration. After restoring default settings, access the Bus Setup menu to re-enter the configuration. The Restore Defaults command will not affect the configuration or calibration of other devices on the network.

To restore default settings:

1. Press **MENU** twice, select **NMEA 2000** or **NETWORKING** and press **ENTER**. A menu will appear with five options: Bus Setup, Fuel Management, NMEA 2000 Alarms, Waypoint Sharing and Backlight Synchronization.

2. Highlight **BUS SETUP** and press **ENTER**, which will open the Bus Configuration menu. A list of network devices will be at the top of the page.

3. Select the storage device and press **ENTER**. The Device Configuration menu will appear.

4. Highlight **ADVANCED OPTIONS** and press **ENTER**.

5. Select **RESTORE DEFAULTS** and press **ENTER**. The following message will appear: *Are you sure you wish to change this device's configuration?*

6. Highlight **YES** and press **ENTER**. Press **EXIT** repeatedly to return to the main display.

Fuel Management Menu

The Fuel Management menu gives you access to the following options: Tank Location, Fuel Added, Add Fuel, Fill Tank, Engine Select, Reset Calibration, Reset Trip and Reset Seasonal. The menu is divided into two parts: Tank Operations and Engine Operations.

Fuel Management highlighted on Networking menu (left). Fuel Management menu (right).

Tank Operations

The top half of the Fuel Management menu covers Tank Operations, which include Tank Location, Fuel Added, Add Fuel and Fill Tank.

Adding Fuel to Tank

Tank Location, Fuel Added and Add Fuel commands work together to keep NMEA 2000 fuel data consistent with the actual amount of fuel added to the fuel tank(s).

1. Press **MENU** twice, select **NMEA 2000** or **NETWORKING** and press **ENTER**.

2. A menu will appear with five options: Bus Setup, Fuel Management, NMEA 2000 Alarms, Waypoint Sharing and Backlight Synchronization. Select **FUEL MANAGEMENT** and press **ENTER**.

3. Highlight **TANK LOCATION** and press **ENTER**. The Tank Location menu will appear with up to three options.

4. Select the tank you refueled and press **ENTER**.

5. Follow the steps below that apply to your tank.

If you filled up the tank:

A. Press the **FILL TANK** button and press **ENTER**. The following message will appear: *Are you sure you wish to Fill Tank?* Press **ENTER**. Another message will appear: *Do you wish to re-calibrate the device?* Highlight **NO** and press **ENTER**.

If you did not fill up the tank:

B. Highlight **FUEL ADDED** and press **ENTER** to access the **FUEL ADDED** dialog box. Use ↑ ↓ , ← → to input the amount of fuel added to the tank and press **ENTER**. Select the **ADD FUEL** button and press **ENTER**. The following message will appear: *Are you sure you wish to Add Fuel?* Highlight **YES** and press **ENTER**.

6. Press **EXIT** repeatedly to get back to the main display.

Engine Operations

The lower half of the Fuel Management menu covers Engine Operations, which include: Engine Select, Reset Calibration, Reset Trip and Reset Seasonal.

Engine Select

Engine Select allows you to choose the desired engine when resetting trip fuel and seasonal fuel.

To Reset Trip:

The Reset Trip function allows you to reset to zero the running total of fuel used on a particular trip.

1. Press **MENU** twice, select **NMEA 2000** or **NETWORKING** and press **ENTER**.

2. Highlight **FUEL MANAGEMENT** and press **ENTER**. The Fuel Management menu will appear.

3. To reset trip fuel used for a particular engine, highlight **ENGINE SELECT** and press **ENTER**. Select the desired engine or All Engines and press **ENTER**.

4. Highlight **RESET TRIP** and press **ENTER**. The following confirmation message will appear: *Are you sure you wish to Reset Trip?*

5. Highlight **YES** and press **ENTER**. The Trip Fuel Used figure has been reset to zero.

To Reset Seasonal:

Your unit can track fuel usage not only for trips, but also for entire seasons. The reset seasonal command allows you to reset to zero the running total of fuel used during a season.

1. Press **MENU** twice, select **NMEA 2000** or **NETWORKING** and press **ENTER**.

2. Highlight **FUEL MANAGEMENT** and press **ENTER**. The Fuel Management menu will appear.

3. To reset seasonal trip fuel used for a particular engine, highlight **ENGINE SELECT** and press **ENTER**. Select the desired engine or All Engines and press **ENTER**.

4. Highlight **RESET SEASONAL** and press **ENTER**. The following confirmation message will appear: *Are you sure you wish to Reset Seasonal?*

5. Highlight **YES** and press **ENTER**. The Seasonal Fuel Used figure has been reset to zero.

Displaying Storage Device data

The Overlay Data function will be used to show EP-85R Storage Device data on your unit's main display. The storage device tracks Fuel Used, Trip Fuel Used and Seasonal Fuel Used.

To add storage device as overlay data:

1. Press **MENU**, highlight **OVERLAY DATA** and press **ENTER**.

2. Select **(PRESS ENT TO ADD…)** and press **ENTER**.

3. Highlight **NMEA 2000** and press **ENTER**. A list of devices on the network will appear.

4. Select the desired storage device and press **ENTER**. Fuel Used, Trip Fuel Used and Seasonal Fuel Used categories will appear for each engine.

5. Highlight the data you want to display and press **ENTER**, which will place a checkmark in its enabled box. It now will be shown as overlay data on your unit's main display.

6. Repeat step 5 to display another data category, or press **EXIT** repeatedly to return to the main display.

NMEA 2000 Alarms

The NMEA 2000 Alarms menu allows you to set Full and Empty fuel alarms for a number of NMEA 2000 devices. The alarms may be set to a percentage (0-100%) of tank capacity.

To turn on/off NMEA 2000 Alarm:

1. Press **MENU** twice, select **NMEA 2000** or **NETWORKING** and press **ENTER**.

2. Highlight **NMEA 2000 ALARMS** and press **ENTER**.

3. Highlight **FLUID LEVEL DEVICE** and press **ENTER**. Select the desired storage device and press **ENTER**.

4. Highlight the **ENABLED** box next to the desired alarm (Full Alarm or Empty Alarm) and press **ENTER** to turn on the alarm. When the alarm is on an "X" will be placed in the Enabled Box.

5. To set the alarm percentage, press → to highlight **PERCENT** and press **ENT**.

6. Use the arrow keys to input the desired percentage and press **ENTER**. Repeat Steps 3-4 to set the other alarm.

7. Highlight **SET CONFIGURATION** and press **ENTER** to finalize alarm settings. Press **EXIT** repeatedly to get back to the main display.

NOTE:

To turn off (uncheck) an alarm, select its **ENABLED BOX** and press **ENTER**. Highlight the **SET CONFIGURATION** button and press **ENTER**.

Alarm Status Tab

The Alarm Status tab is the second tab at the top of the NMEA 2000 Alarms page. When an alarm has been set for a device, the alarm and its current status will be shown on the Alarm Status window.

To view Alarm Status:

1. Press **MENU** twice, select **NMEA 2000** or **NETWORKING** and press **ENTER**.
2. Select **NMEA 2000 ALARMS** and press **ENTER**.
3. Highlight the Alarm Status tab.
4. Press **EXIT** repeatedly to return to the main display.

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FULL ONE-YEAR WARRANTY

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