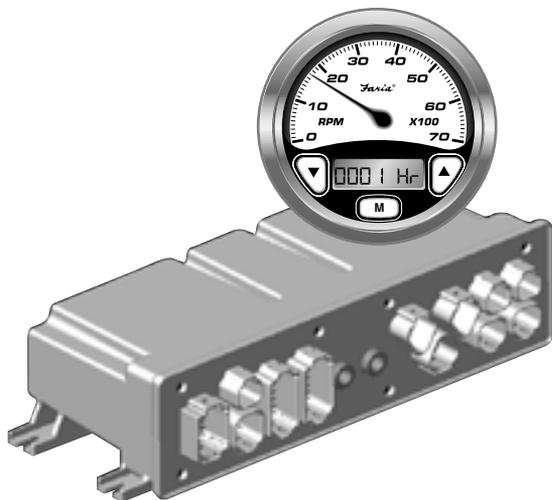


Garmin®

**MARINE
INSTRUMENTS**



Serial Bus for Navy Gateway GW0016

Owners's Manual

- Visual/Audible Alert messages
- Easy Installation
- Waterproof Connections
- Easy to read Digital displays
- Multiple Interfaces

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Navy Gateway (GW0016) System Manual

The system consists of:

- One Gateway box to interface with engine and external senders and sensors.
- One 4" Tachometer with Fuel Monitor
- Various 2" instruments, including but not limited to
 - Voltmeter
 - Oil Pressure gauge
 - Fuel gauge
 - Engine Temperature gauge
 - Transmission Temperature

Quick operation:

1. **To turn on the system:** Turn the ignition key to "ON" position.

2. **To turn off the system:** Turn the ignition key to "OFF" position.

3. **To turn on instrument lighting:** Turn on the light switch on the vehicle instrument panel.

4. **To turn off instrument lighting:** Turn off the light switch on the vehicle instrument panel.

5. **To change the lighting intensity, (requires the light switch be turned on):**

a. Turn on the light switch as described in item 3 above.

b. Pushing the "UP" button on the tachometer will increase the intensity of the instrument lighting. When maximum intensity is reached no further changes can be effected by pushing the "UP" button.



c. Pushing the "DOWN" button on the tachometer will decrease the intensity of the instrument lighting. When minimum

intensity is reached no further changes can be made by pressing the "DOWN" button.



6. **To disable the audible alarm in normal mode: PUSH and HOLD both the "UP" and the "DOWN" buttons** on the tachometer until the beeping stops.



7. **To change the LCD display (engine hour meter, system voltage):**

a. Pressing the "Mode" button on the tachometer will select the next LCD display.



b. Press the "Mode" button repeatedly until desired function is displayed. The gateway will switch to a screen displaying the function data within 2 seconds after the button is pressed.



8. **To reset Trip Fuel Consumed:**

a. Use quick operation 7 above to show "CLR TRP" on the LCD. Hold the "M" button for more than one second while the LCD displays "CLR TRP" to clear the trip amount.

Gateway System Specifications:

Operation voltage:

+12 V DC or +24 V DC

+12 V DC (10 V DC (Min.) to 16 V DC (max.))

+24 V DC (20 V DC (Min.) to 32 V DC (max.))

Maximum Current with maximum

backlight: < 1500 mA @ 12 V DC

Minimum Current at switch off status:

< 10 mA @ 12 V

Operational temperature:

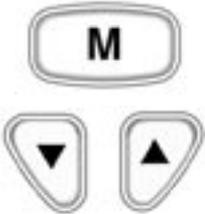
-40° F to 185° F (-40° C to 85° C)

Storage temperature:

-40° F to 185° F (-40° C to 85° C)

System Description

- ◆ There are three push buttons (Mode, UP, and DOWN) for selecting different message screens, changing the instrument lighting intensity, disabling audible alarm, etc.



- ◆ Audible and visual alarms. The LCD will display Warning messages while an audible “beep” occurs.
- ◆ The Gateway is environmentally sealed, and is water resistant per SAE J1960 paragraphs 4.6.2, 4.7.1.2 and 4.8.1.2.
- ◆ Faria® serial bus gauges/light arrays can be connected up to 120 feet (40 meters) from the gateway box.

Turning the Gateway System ON/OFF

When the “ignition” switch is turned to the “on” position, the system is turned on. When “ignition” switch is turned to the “off” position, the system will turn off.

When the system is turned on, the pointer on each of the instruments will be driven to its most counter clockwise position, all positions in warning arrays will light, and all LCD segments on the 5” tachometer are activated for 2 seconds. These actions provide a quick check of system operation. After this “boot-up” display, all instruments, warning light arrays and LCD screen will change to normal operating mode.

Installation

See Appendix 1: “Installation and Wiring” at the end of this manual.

System Operation:

After installation in accordance with the instructions and recommendations in the Installation section (see Appendix 1), the system is functional.

Tachometer / Fuel Management

The Serial Bus Tachometer / Fuel Monitor instrument provides both the functions of a tachometer and a fuel and engine monitoring system.

The analog tachometer is a stepper motor instrument which looks like a standard analog device but which is actually a digital instrument. On small pointer movements you may occasionally see the pointer moving in the one-third degree “steps” that represent the accuracy of the instrument.



The LCD shows messages, like engine hours, system voltage, and engine alarm conditions.

In order to minimize “false” alarms, the “low voltage” alarm only functions when the engine is known to be running based on the presence of tachometer data.

Several alarm conditions may also be displayed in the LCD display when needed:

- 1 Low fuel
- 2 Low oil pressure
- 3 Low voltage

Alarm messages will be displayed on the tachometer LCD display. Messages will also include a flashing red light. All messages will be displayed until either the problem is corrected or the operator manually cancels the warning message.

Canceling system alarms

To manually cancel system warning messages, simultaneously press both the “Up” and “Down” buttons on the tachometer.



This will disable the warning message temporarily. If the problem is not corrected in 1 minute (5 minutes for low fuel), the warning will be displayed again. The operator can cancel as often as desired.

Engine Hour meter

Displays the number of hours that the engine has been operated. The display will show “XXXX.XHr”.



There are no adjustments for this function.

Total Fuel Consumed

“Total Fuel Consumed” is provided to allow monitoring of fuel usage over a longer period of time, like a month or the season. In order to prevent accidental reset, this function must be accessed only using a special “power on mode.”

The LCD screen displays the data for the remainder of the functions. If there are no alarm conditions, “Instantaneous Fuel Consumption” is displayed on start-up. A short press of the “Mode” button advances the display through the five normally available functions.



There are four functions displayed by the Fuel Management system in normal mode.

Instantaneous Fuel Consumption

Displays the actual amount of fuel being consumed per hour under the current operating conditions. Default display will show “G/H XX.X.”

Pressing the “Mode” button for more than one second will allow selecting the units of measure.



Default display will show “G/H XX.X.”



A short press of the “Mode” button advances the display through the options.



Options are:

- a) US gallons



b) Imperial gallons. Display will show



c) Liters. Display will show



Leaving the display in one of the items above while the “Mode” button is pressed and held for more than one second will save the selected units.



Trip Fuel Consumed

Displays fuel consumed since last reset. This function can be reset to zero before a trip to show fuel consumed during the trip. Display shows “TRPXXX.X.”



Pressing the “Mode” for more than one second will access the options that are available for this function.



A short press of the “Mode” button advances the display through the options. Display will show “TRPXXX.X.”

Options are:

a) Clear Trip Fuel Consumed. Display will show “CLR TRP.”



Pressing the “Mode” button for more than one second while the display shows “CLR TRP” will clear the trip amount and set the menu back to the Trip Fuel Consumed function.



A quick press of the “Mode” button will skip this feature.

b) Adjust Trip Fuel Consumed, (fuel flow calibration). Display will show “ADJ TRP.”



Pressing the “Mode” button for more than one second will cause the display to go into the Trip Fuel Consumed adjustment menu.



The display will show “ADJXXX.X.”



Pressing and holding the “Up” button will



increase the amount and pressing and holding the “Down” button will decrease the amount.



Holding the “Mode” button for more than one second while the display is showing “ADJXXX.X” will set the amount in the display “XXX.X” into the Trip Fuel Consumed and return to the Trip Fuel Consumed function.



The difference between the original and the new amount of fuel will be used to change the calibration of the instant and accumulated fuel data.

This feature allows the fuel flow system to be calibrated by accurately filling the fuel tank at the beginning and end of a trip. When the tank is refilled at the end of the trip, record the exact amount of fuel placed in the tank.

Using the above method, adjust the amount of fuel shown in the “ADJ TRP” to match the amount of fuel recorded. Save the corrected amount as described above. The “Trip Fuel Consumed” in the previous menu can then be cleared for reuse or left to continue to accumulate fuel usage.

Fuel Remaining

Displays the fuel remaining based on a manually entered amount of fuel minus the amount of “Trip Fuel Consumed.”

Display shows “REMXXX.X.” This reading is independent of the fuel “gauge” reading.



In normal use, the amount of fuel in the fuel tank is adjusted manually when the fuel tank is filled so that this display shows the total amount of fuel in the tank. The “Trip Fuel Consumed” is then reset to zero. As fuel is used (displayed in the “Trip Fuel

Consumed” display) this display will show the decreasing amount of fuel remaining.

Pressing the “Mode” for more than one second will access the option available for this function.



a) Add to or remove gallons from the Fuel Remaining. Display shows “R+-XXX.X.”



Holding the “Up” button will increase the



amount and holding the “Down” button will decrease the amount.



Holding the “Mode” button for more than one second will set the remaining fuel to the value shown in the display and return the menu to the Fuel Remaining alarm Setting function.



This feature allows the operator to accurately set the amount of fuel in the fuel tank when adding fuel. The accuracy of this manually entered value directly affects the Fuel Remaining and Fuel Remaining Alarm functions, and should be done carefully.

Fuel Remaining Alarm Setting

Displays the setting for the “Low Fuel” alarm. The display shows “ALRXXX.X.”



When the “Fuel Remaining” reaches this amount, the “Low Fuel” alarm will sound and a warning LED will flash in the display.

The display will automatically go into “set” mode to allow the operator to reset the alarm value to a lower value to turn off the alarm if desired. If the option is set to zero, the “Low Fuel” alarm will be disabled.

Pressing the “Mode” button for more than one second while in the REM display will access the option available for this function.



a) Set the amount of fuel remaining when the alarm will go off. The display shows “A+—XXX.X.”



Holding the “Up” button will increase the amount



and holding the “Down” button will decrease the amount.



Voltmeter

Displays the System Voltage. There are no adjustments available.



Tachometer Display Sequence

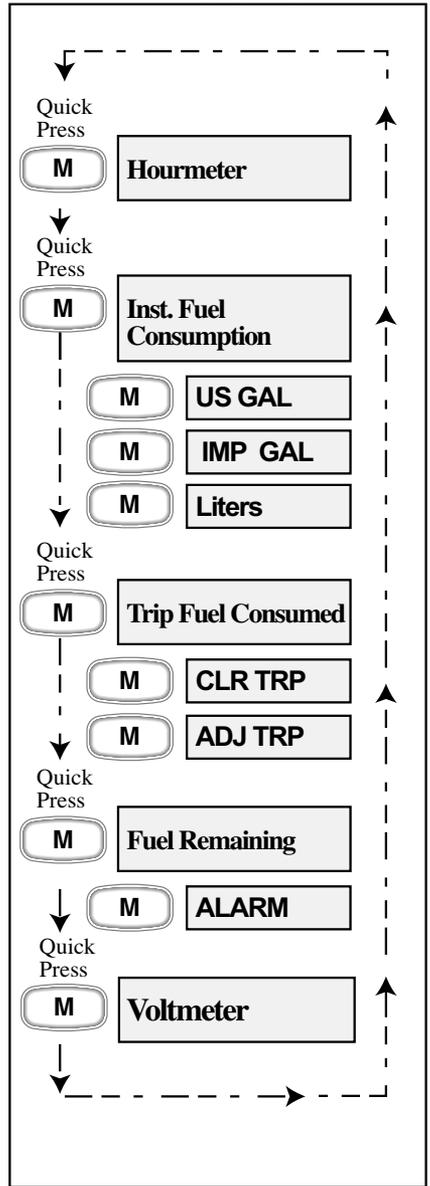


Figure 1

LCD Alarm Condition Displays.

Alarm messages will be displayed on the Tachometer LCD display. All messages will be displayed until the problem is corrected, or the operator cancels the warning message.

Severe conditions includes a flashing red light.

Low Battery Voltage (Flashing Red Light)



Low Oil Pressure (Flashing Red Light)



Low Fuel Level (Flashing Red Light)



Canceling System Alarms

To cancel system warnings messages, simultaneously press both the “Up” and “Down” buttons on the tachometer.



This will disable the warning message temporarily. If the problem is not corrected in 1 minute (5 minutes for low fuel), the warning will be displayed again. The operator can cancel as often as desired.

Faria® Serial Bus Installation and Wiring Guide

The system consists of:

- One Gateway box to interface with the engine and external senders and sensors.
- One 4” Tachometer with Fuel Monitor
- Various 2” instruments, including but not limited to
 - Voltmeter
 - Oil Pressure gauge
 - Engine Temperature gauge
 - Fuel Level gauge
 - Transmission Temperature

Installation

Installation of the Fari® Serial Bus system is accomplished as follows:

Gateway Box

The Gateway™ box is the central unit of the system. As all of the senders and other information source peripherals connect to the Gateway™, the Gateway™ box should be mounted in a protected area in the best location to provide the maximum cabling benefit.

The Gateway™ box power cable must be installed to allow connection to “battery positive” (always on), “battery negative” (ground), and a source of “switched power” which turns on with the engine ignition switch (see Figure 2 and Table 1).

The “Faria® Bus” cable must be routed from the Gateway™ box to the instrument panel area to connect the instruments to the data bus and instrument power (see Figure 3).

The remainder of the connections to the Gateway™ box are described below.

Instruments

The instruments are mounted using the provided back-clamps and mounting hardware. Each instrument comes with a bus connection cable (12”). The main “Faria® Bus” cable from the Gateway™ box is connected to the most convenient instrument using either of the two four (4) pin connectors provided on the instrument case.

Each additional instrument is connected to the previous instrument using one of the 12” bus connection cables. The cable may be connected to either of the two connectors provided on the instrument case (see Figure 3).

Appendix 1. Installation and Wiring

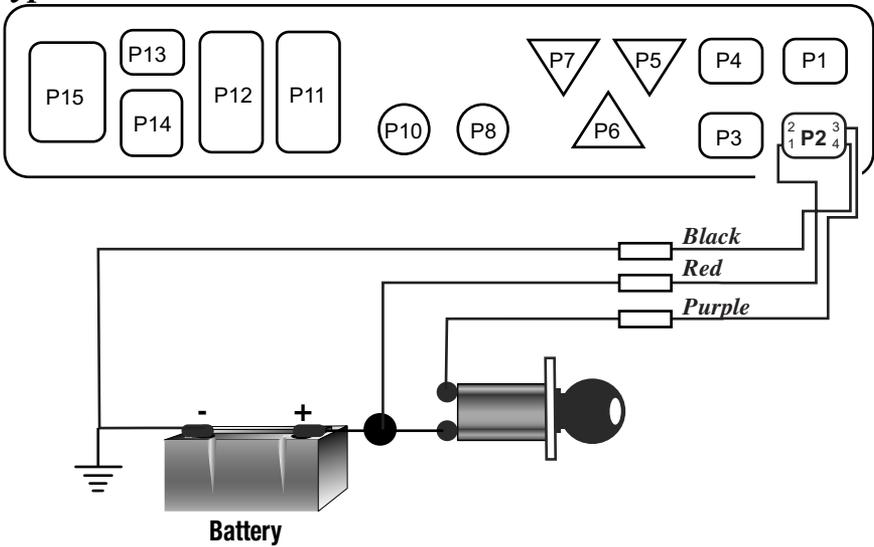
Table1

Connector	Contacts	Pin	Pin Function	Wire Color
P1	2		Not used	
P2	4	1	Battery Positive (always on)*	Red
		2	Ground	
		3	Switched Power from Ignition switch circuit	Purple
		4	Ground	Black
P3	4	All	Faria® Bus Data and Instrument Power	N/A
P4	2		Not Used	(PJ0015)
P5	3		Not Used	(PJ0016)
P6	3		Not Used	
P7	3		Not Used	
P8	PP		Not Used	
P9	PP		Not Used	
P10	PP		Not Used	
P11	12	3	Navigation Lights Input	Dk. Blue
		4	Tachometer Input	Grey
P12	12	5	Fuel Flow Sensor Power	Black
		6	Fuel Flow Input	White
		7	Fuel Flow Ground	Shield w/ heat shrink
P13	2		Not Used	
P14	6	1	Oil Pressure Sender	Lt. Blue
		2	Fuel Tank Sender	Pink
		5	Engine Temperature	
		6	Transmission Temperature	
P15	8		Not Used	

*5 amp Fuse Recommended

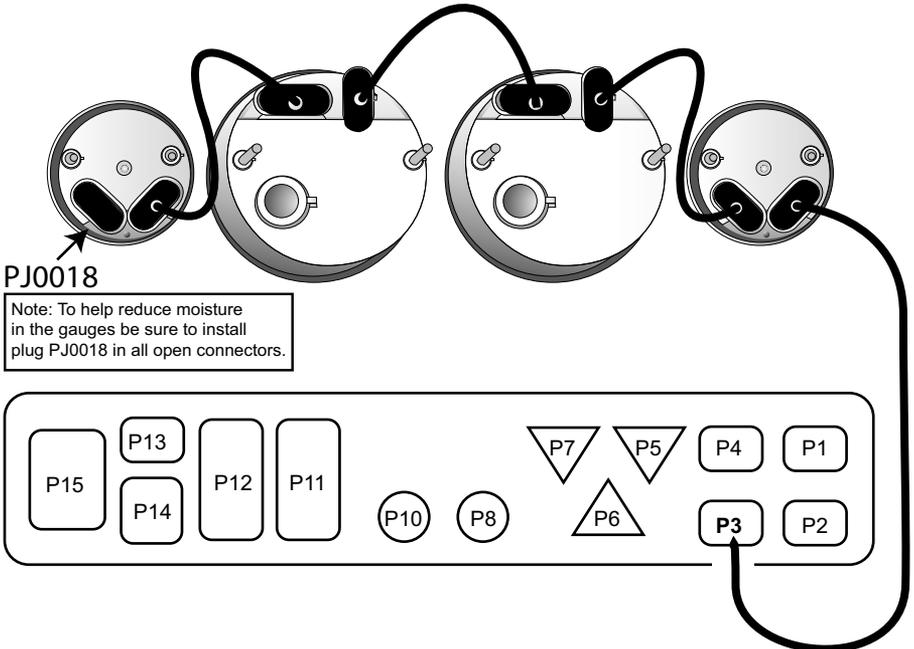
Typical Power Connections

Figure 2



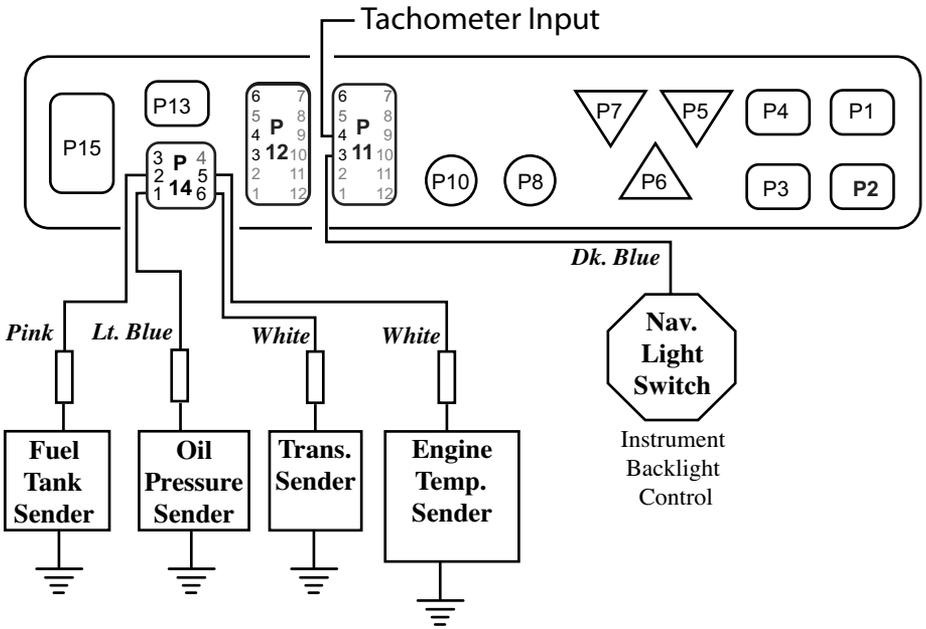
Typical Instrument Connections

Figure 3



Miscellaneous Connections

Figure 4



Fuel Flow Connections

Figure 5

