MURPHY®

PowerView™ Model PV1000

Operations Manual

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Section 78

In order to consistently bring you the highest quality, full featured products, we reserve the right to change our specifications and designs at any time. The latest version of this manual can be found at www.fwmurphy.com.

Warranty - A limited warranty on materials and workmanship is given with this FW Murphy product. A copy of the warranty may be viewed or printed by going to www.fwmurphy.com/support/warranty.htm

Please read the following information before installing.

BEFORE BEGINNING INSTALLATION OF THIS MURPHY PRODUCT:

- Read and follow all installation instructions.
- Please contact FW MURPHY immediately if you have any questions.

Table of Contents

Product Information **1**

Display Features 1

Mounting Options 2

PV1000 Navigation **3**

Fixed Buttons 3

Virtual Buttons 4

Menu 5

Popup 5

Setting Up your PV1000 Display for the First Time **6**

Product Features **8**

Power Up 8

Main Menu 8

Gauge Display 9

GPS Display 12

Engine Diagnostics 15

Fault Code Popups 17

User Settings 18

Utilities 20

GPS Utilities 29

Reprogramming the PV1000 Display **34**

Specifications **35**

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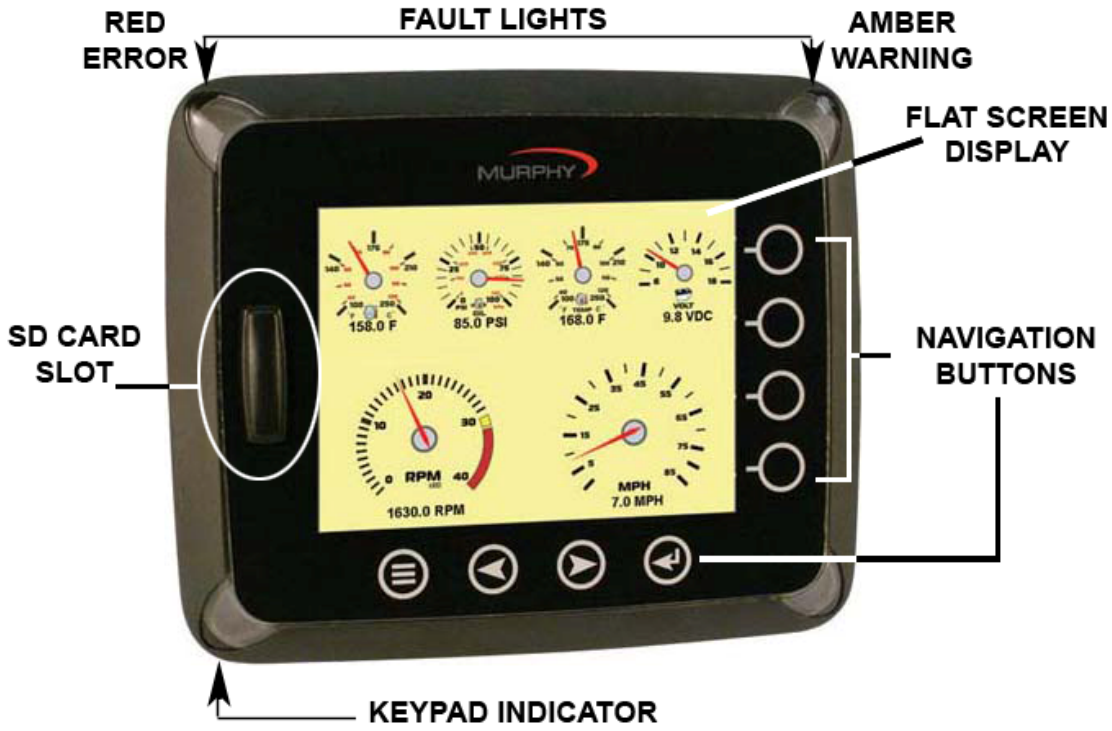
Product Information

The PowerView™ Model PV1000 display is designed for instrumentation and control on electronically controlled engines communicating using SAE J1939 and NMEA 2000. The PV1000 display is a multifunction tool that enables equipment operators to view many different engine, transmission, and equipment parameters and service codes.

Display Features



Fault Lights

These indicators, located in the top two corners of the unit, will light up when a fault occurs. The unit will display an amber light for a warning or a red light for a shutdown condition. A corresponding popup message describing the fault may also be displayed on the screen.

Keypad Indicator Light

Located on the bottom left of the unit, the keypad indicator lights up each time one of the touch capacitive buttons is pressed.

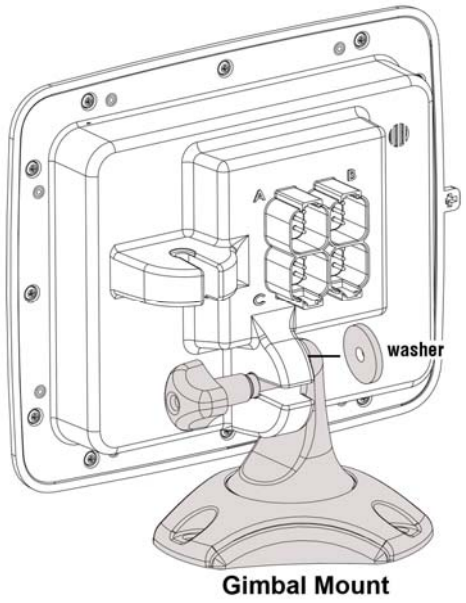
SD Card Slot

This slot is used for reprogramming the unit. It is sealed from the rest of the unit. It should remain covered to keep out water, dust, and other contaminants.

Mounting Options

Two mounting options are provided for the PV1000 display. The in-dash mounting option will require a hole to be cut for insertion of the display. A template is provided with the depth and dimensions of the display for easy installation. The gimbal-mount method enables the display to be installed on top of the dash. The gimbal design allows rotating and tilting the unit for the best display position for the operator's viewing.

For complete installation and wiring instructions, refer to the "PowerView Installation Manual" included with your PV1000 display.



Gimbal Mount

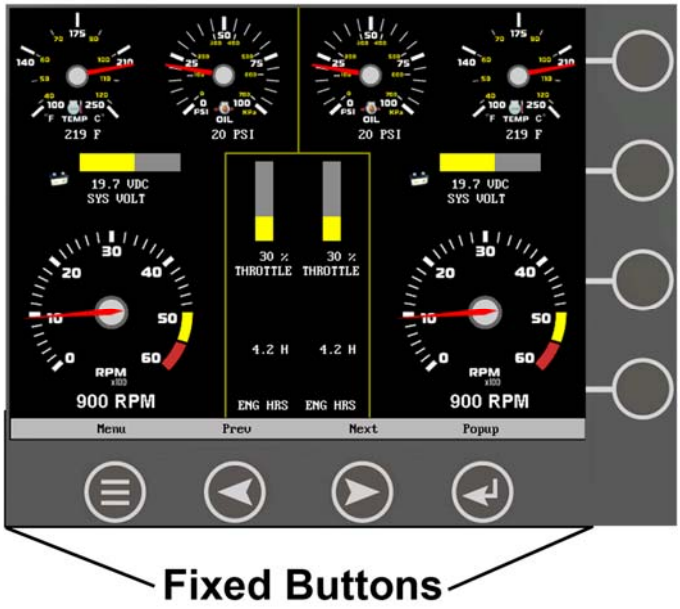
> **NOTE:** Do not leave plastic installation template installed with the display. This will create a condition where the protective cover will engage too tightly.

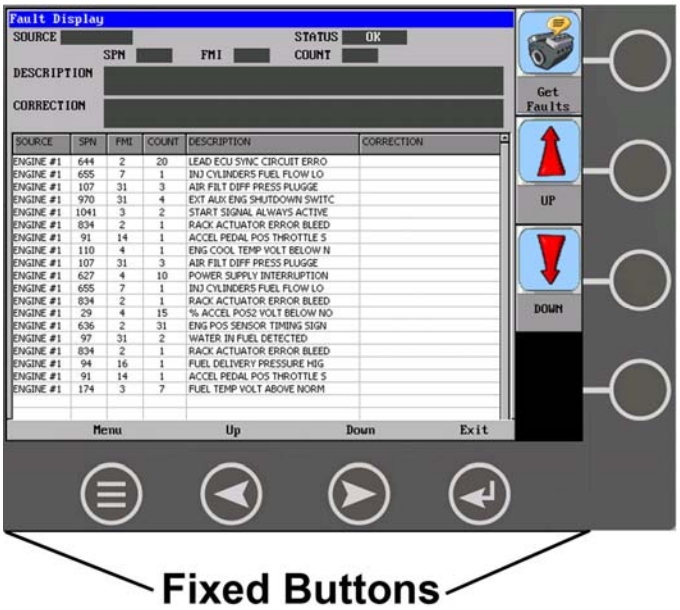
PV1000 Navigation

Navigating the PV1000 display is accomplished using two sets of buttons - one fixed and one virtual - to access menus, popups, and make selections from available options. Each time a button is pressed, confirmation of the button press is indicated by the amber light at the lower left corner of the display.

Fixed Buttons

The fixed buttons run across the bottom of the display for **Menu**, **Previous**, **Next**, and **Select** options. On some screens, **Select** may be replaced by other options such as **Save**, **Exit**, or **Popup**. **Previous** and **Next** may also be represented as **Up** and **Down**.

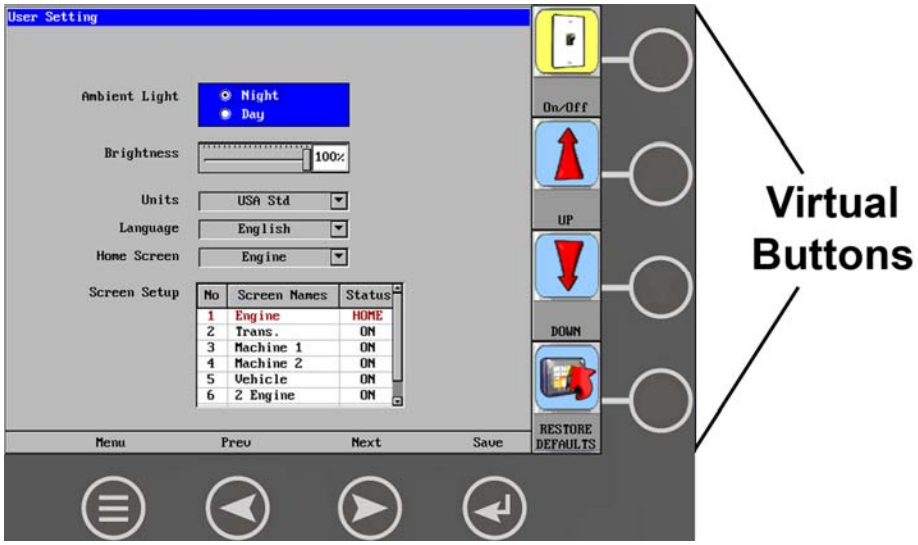


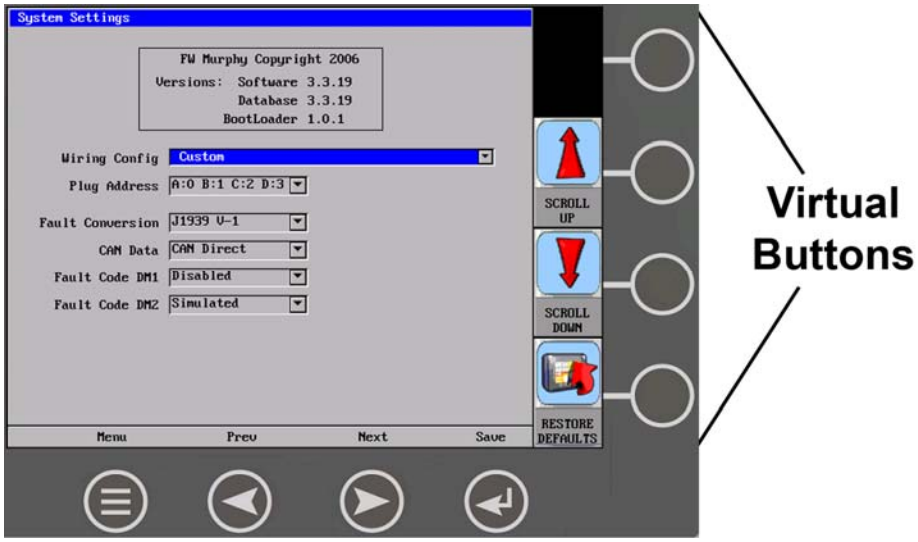


SOURCE	SPN	FMI	COUNT	DESCRIPTION	CORRECTION
ENGINE #1	644	2	20	LEAD ECU SYNC CIRCUIT ERRO	
ENGINE #1	655	7	1	INJ CYLINDERS FUEL FLOW LO	
ENGINE #1	107	31	3	AIR FILT DIFF PRESS PLUGGE	
ENGINE #1	970	31	4	EXT AUX ENG SHUTDOWN SWITC	
ENGINE #1	1041	3	2	START SIGNAL ALWAYS ACTIVE	
ENGINE #1	834	2	1	RACK ACTUATOR ERROR BLEED	
ENGINE #1	91	14	1	ACCEL PEDAL POS THROTTLE S	
ENGINE #1	110	4	1	ENG COOL TEMP VOLT BELOW N	
ENGINE #1	107	31	3	AIR FILT DIFF PRESS PLUGGE	
ENGINE #1	627	4	10	POWER SUPPLY INTERRUPTION	
ENGINE #1	655	7	1	INJ CYLINDERS FUEL FLOW LO	
ENGINE #1	834	2	1	RACK ACTUATOR ERROR BLEED	
ENGINE #1	29	4	15	% ACCEL POS2 VOLT BELOW NO	
ENGINE #1	636	2	31	ENG POS SENSOR TIMING SIGN	
ENGINE #1	97	31	2	WATER IN FUEL DETECTED	
ENGINE #1	834	2	1	RACK ACTUATOR ERROR BLEED	
ENGINE #1	94	16	1	FUEL DELIVERY PRESSURE MIG	
ENGINE #1	91	14	1	ACCEL PEDAL POS THROTTLE S	
ENGINE #1	174	3	7	FUEL TEMP VOLT ABOVE NORM	

Virtual Buttons

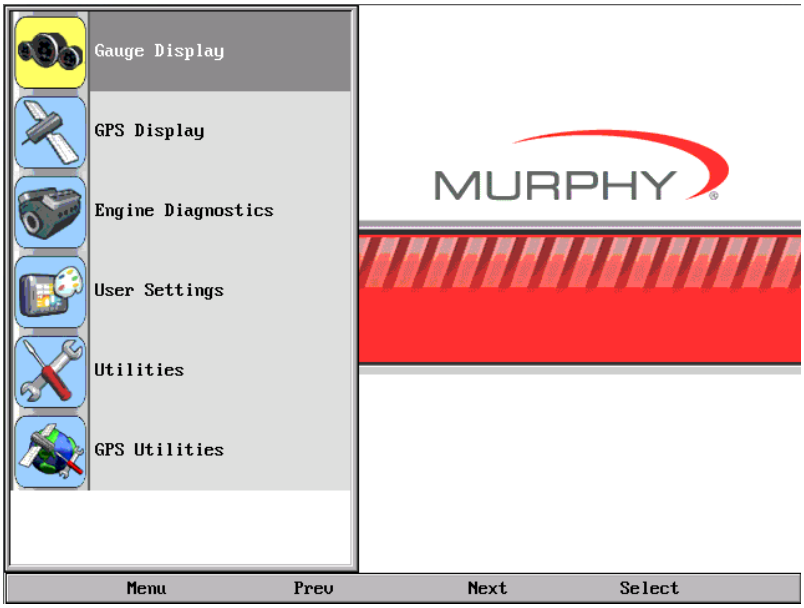
A column of vertical buttons located to the right of the display are virtual buttons. They will change according to the options available for the screen being displayed.





Menu

The Menu can be accessed at any time, from any screen being displayed, by pressing the **Menu** button.



The **Menu** button symbol ☰ is always located in the first position of the fixed buttons.

Popup

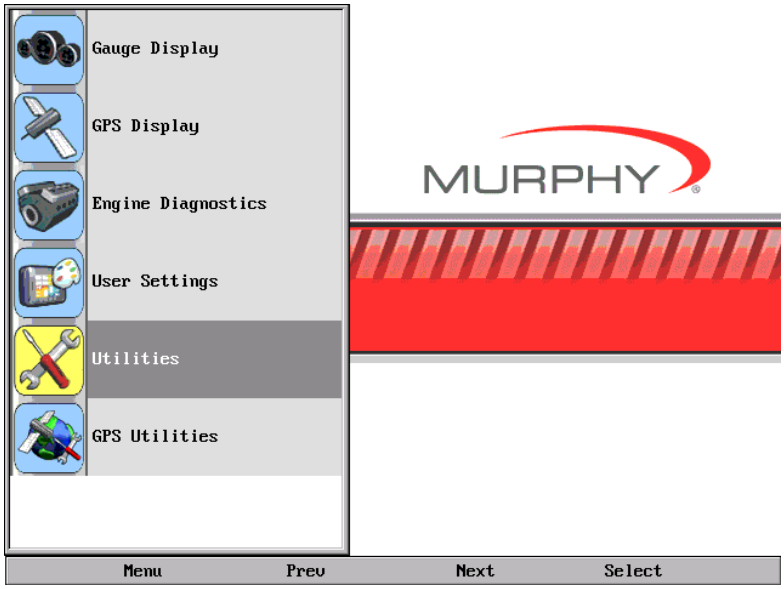
The **Popup** button utilizes the virtual keys to the right of the display to provide shortcuts for navigation and display options.

Setting Up your PV1000 Display for the First Time

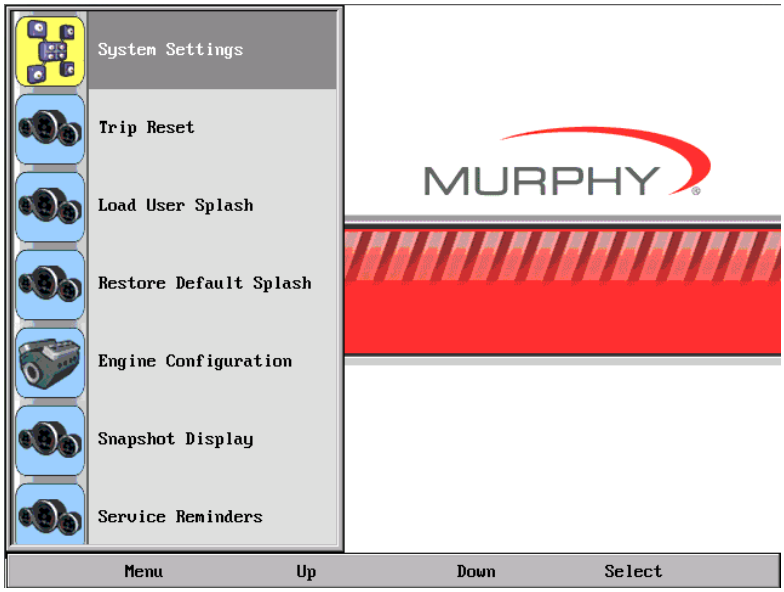
The guidelines presented below are intended for setting up the PV1000 display for the first time. Once the configuration is set up, there is no need to revisit or change any of the settings.

> **NOTE:** If you require assistance during the set up process, contact FW Murphy customer support at (918) 317-4100.

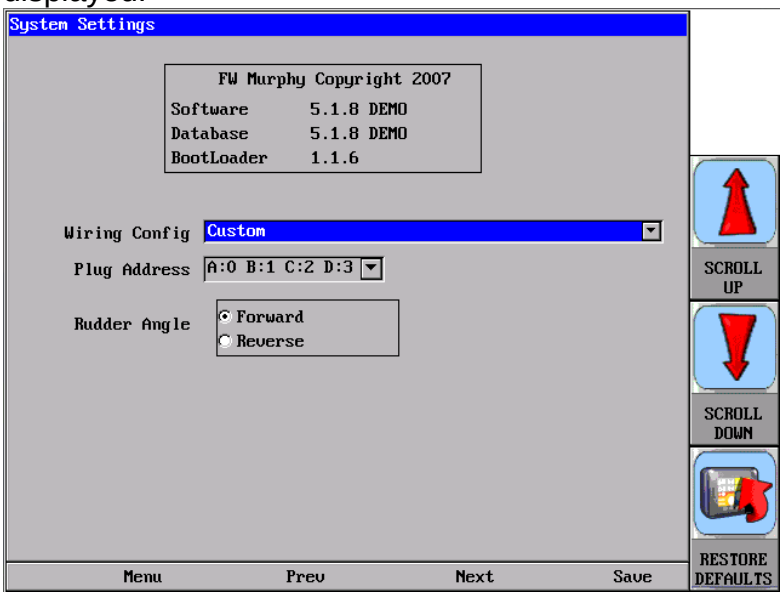
1. At the main menu, press the **Next** button to move the highlight bar through the options until 'Utilities' is highlighted.



2. Press **Select**. The Utilities sub-menu is displayed.



3. From the ‘Utilities’ sub-menu, select ‘System Settings’. The following screen is displayed.



4. With the cursor highlighting the ‘Wiring Config’ field, press the **Scroll Up** or **Scroll Down** virtual buttons (located to the right of the display), to scroll through the list of options. The field options consist of the following:

   - Custom
   - (A) Engine(s) – Single Harness Plug A, standard for most applications
   - (B) Engine(s) – Single Harness Plug A
   - (C) Engines – Dual Harness Plug A&B
   - (D) Engines – Dual Harness Plug A&B
   - (E) NMEA – Plug D
   - (F) NMEA – Plug D

   > **NOTE:** This setting needs to match the wiring configuration for how your PV1000 display was installed. Refer to the “**Wiring Instructions**” section of the “PowerView Model PV1000 Installation Manual” for the associated wiring diagrams for each of these options.

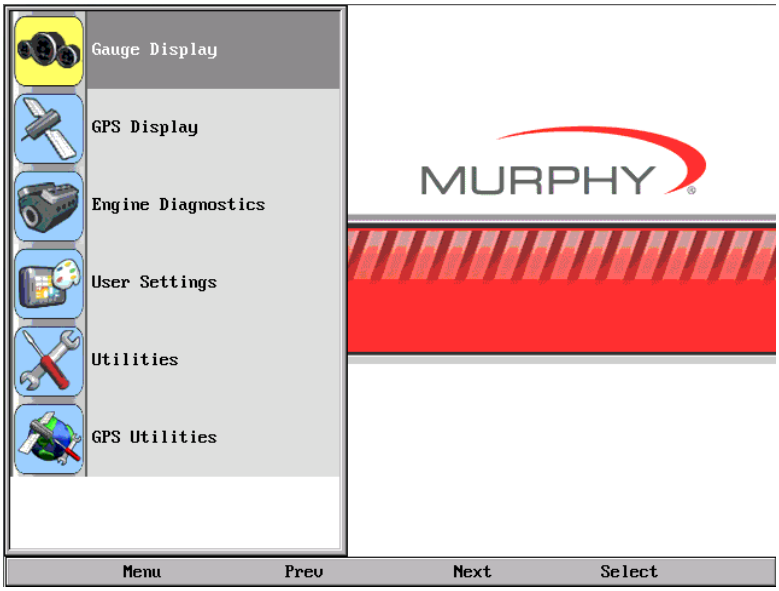
Product Features

Power Up

The PowerView display is most frequently installed with power connected to the ignition. When the ignition is turned on, the PowerView display powers up and the engine health statistics can be viewed via preset gauges. To see more gauge screens, press the **Next** or **Previous** buttons.

Main Menu

The main menu is activated at any time by pressing the **Menu** key on the display.



The following features are accessed through the main menu:

- **Gauge Display** – provides a series of screens that display engine and auxiliary information in a variety of formats.
- **GPS Display** – provides latitude, longitude, course and speed settings as well as a visual compass and speedometer when a GPS antenna is installed.
- **Engine Diagnostics** – displays a list of engine fault codes and descriptions.
- **User Settings** – allows you to customize the display options for ambient light and brightness, set US or metric units, specify the Home screen and screen setup status.
- **Utilities** – allows configuration of the unit including wire configuration, plug address, fault conversion, CAN data, and fault codes. Also displays software version information at the top of the page.
- **GPS Utilities** – contains options to set up track and position, chart and time, and waypoint manager. Also displays satellite status.

Gauge Display

The Gauge Display screen consists of several predefined layouts that contain combinations of analog gauges, curved bar (half-moon) gauges, straight bar gauges, or digital (text) readouts. These screens are displayed upon startup.

You can scroll through the various gauge screens by pressing the **Next** and **Previous** buttons. This can be repeated until all screens have been viewed. The currently displayed screen will stay active until another button is pressed.

Gauge Display Popup

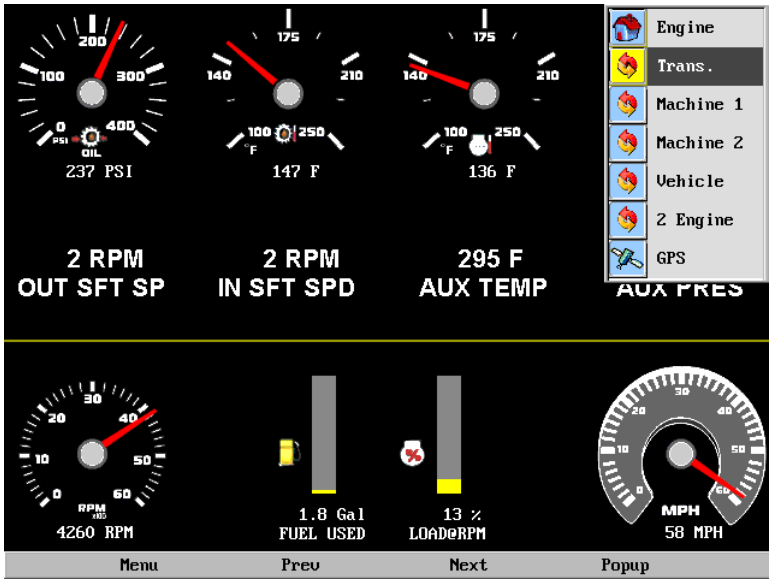
Pressing the **Popup** button on any of the Gauge Display screens will provide additional virtual buttons, as shown below.

These virtual buttons provide quick navigation and access to the following features:

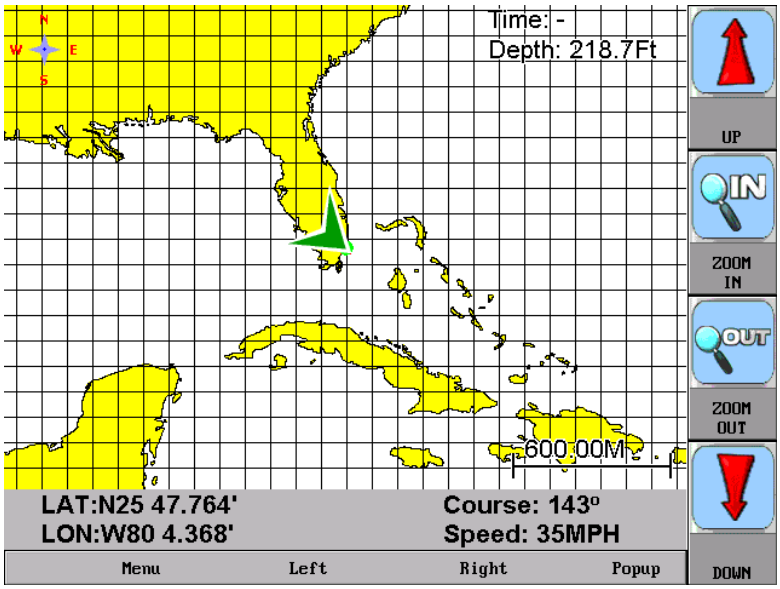
- Screen Names
- GPS Display
- Day/Night
- Home

Screen Names - When selected, a small window appears at the top right of the display. This window contains the names of each of the screens that are currently "Turned ON". Using the **Previous** and **Next** buttons allows you to scroll through and display the various gauge configurations.

> **NOTE:** For instructions on how to turn screens ON or OFF, refer to the **"User Settings"** section of this manual.



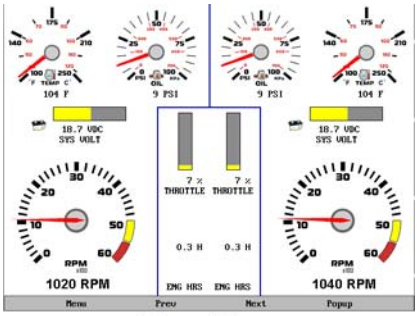
GPS Display – When selected, the GPS screen is displayed.



> **NOTE:** Refer to the **"GPS Display"** section of this manual for additional information.

Day/Night - Allows you to toggle the display screen between Day View and Night View.

> **NOTE:** This feature can also be changed in the **"User Settings"** section of this manual.



Day View

Night View

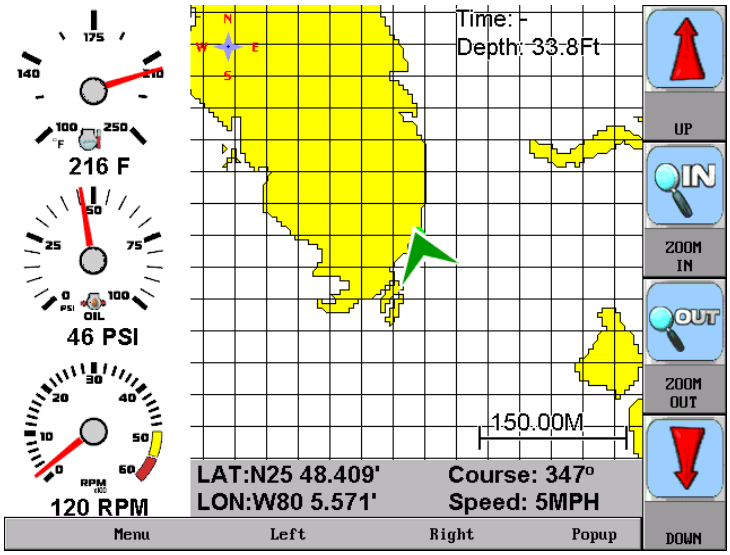
Home - This one-touch navigation feature allows a pre-defined Home screen to be accessed from the available Gauge Display screens. Once selected, the Home screen will be displayed anytime the **Home** button is pressed.

> **NOTE:** For instructions on how to setup the Home screen, refer to the **"User Settings"** section of this manual.

GPS Display

If you have a GPS antenna included with your system, you will have access to the GPS Display feature. The GPS Display is accessed by selecting it from the Main menu or Gauge Display popup.

The GPS feature displays a grid map and up to 3 configurable gauges. Latitude and Longitude coordinates are listed, as well as course and speed.



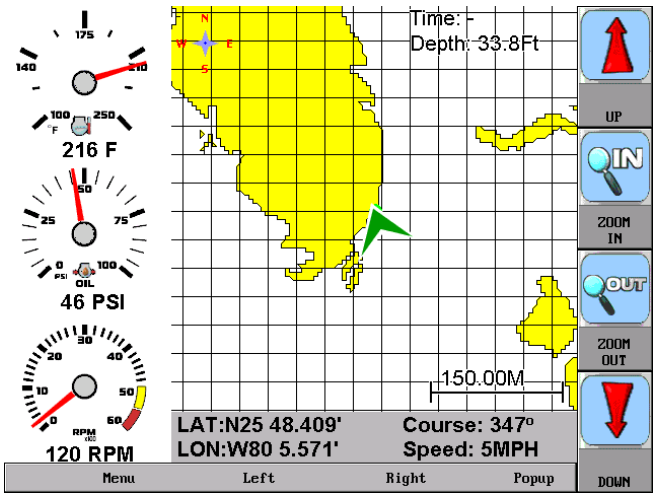
> **NOTE**: See "**GPS Utilities"** for information on setting GPS display options.
>
> **NOTE:** In order for this information to be available on the PV1000, a GPS antenna (P/N 78-70-0250) that is NMEA2000 compatible must be installed. This NMEA2000 device (along with any others) should be networked using valid NMEA2000 cabling and terminating resistors (Installation Kit P/N 78-70-0261). The NMEA2000 cabling should ALWAYS be plugged into Plug D (Port D) on the back of the display. See the "PV1000 Installation Manual" for further information.

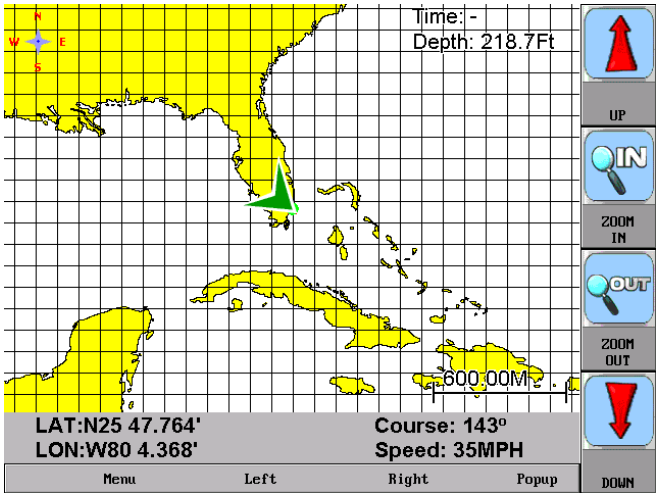
GPS Display Popups

When the GPS Display is on, a **Popup** button provides quick access to additional features. These features are distributed between 3 screens of Popups. Continuing to press **Popup** rotates through all the available popup features, which include:

- Split Mode
- Current Position
- WPT
- Course Up/North Up
- Up
- Zoom In
- Zoom Out
- Down
- Save Track
- Gauge Display
- Day/Night
- Delete Track

Split Mode – toggles between a split screen with up to 3 gauges, or a full grid screen without gauges, as shown below.





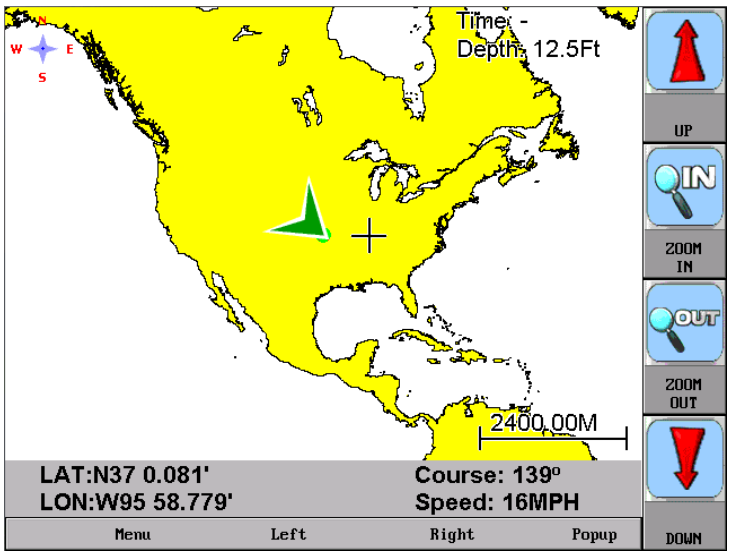
Current Position – is used to return to the current machine/satellite position after having moved the cross-hairs to another location on the map.

WPT – places a marker or "waypoint" on the map to mark a favorite location.

> **NOTE**: Refer to the chapter "GPS Utilities" for more information on WPT management.

North Up / Course Up – determines how the orientation of the map is displayed; either conventional "North Up", or according to the current course heading, "Course Up".

You can navigate the GPS map by pressing the **Up**, **Down**, **Left**, and **Right** buttons to move the cross-hairs on the map. **Zoom Out** for a larger view or **Zoom In** for more detail and tracking.



Tracking shows the current route and any waypoints you have set. A green arrow indicates your current position, while the red square indicates the initial point of tracking. The green dot represents a waypoint.

Save Track – saves the current track line.

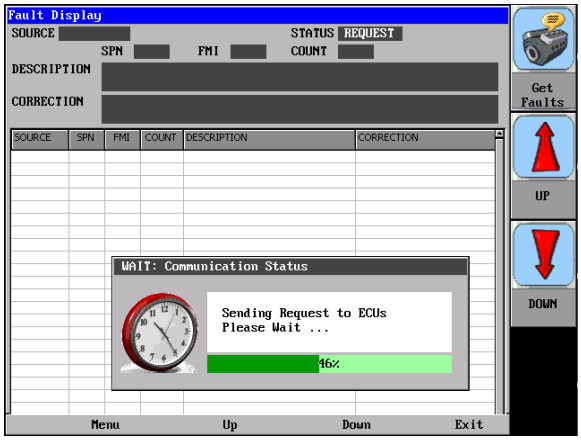
Gauge Display – shows the first of a series of predefined gauge screens.

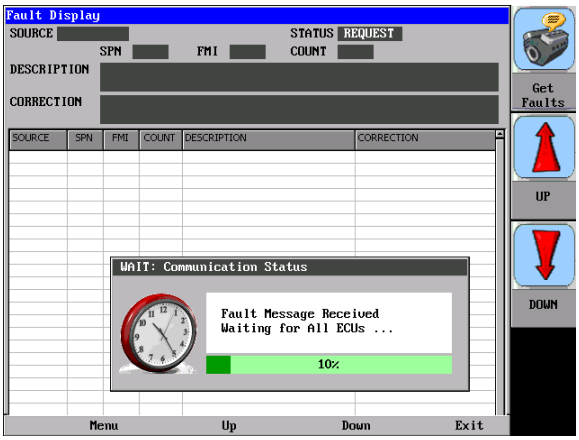
Day/Night - toggles the display screen between Day View and Night View

Delete Track – deletes the current track line.

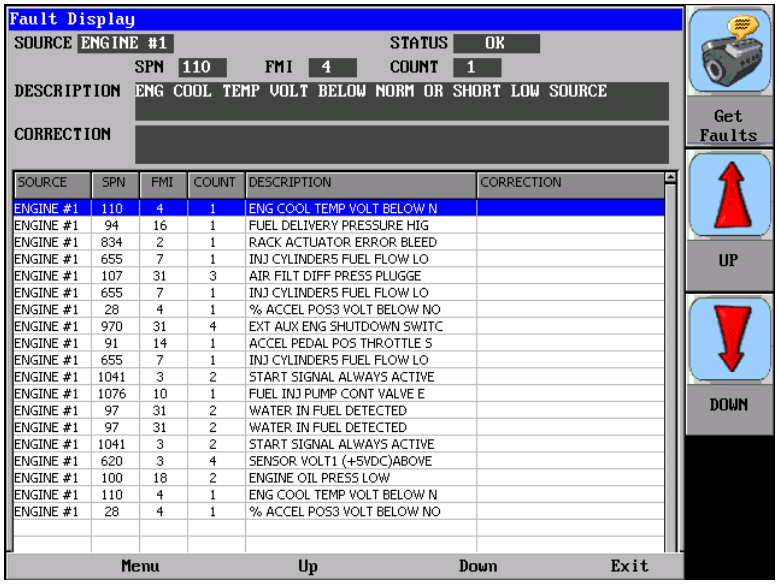
Engine Diagnostics

When choosing this selection, the display will query the engine(s) ECU and provide feedback on any diagnostic codes that have been activated and stored in the ECU for service needs.





The Engine Diagnostics option displays faults based on engine or auxiliary source.



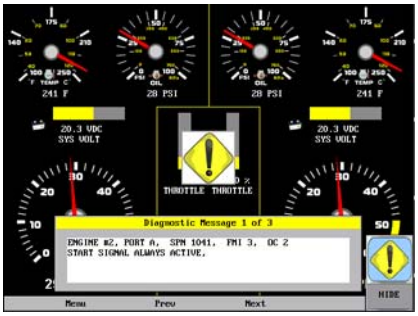
The following is a list of field definitions contained on the ENGINE DIAGNOSTICS screen:

- **Source** – identifies the component having the fault; engine 1, 2, or auxiliary.
- **Status** – indicates whether the fault has been corrected.
- **SPN** –"Suspect Parameter Number" - fault code
  If not translated into text by the PV1000 display, see the engine manufacturer's literature for the definition of the SPN number.
- **FMI** – “Failure Mode Indicator” - fault code
  The FMI is defined by SAE J1939. If not translated into text, see the SAE standard, or the engine manufacturer's literature.
- **Count** – The number of times the event has been flagged.
- **Description** – Most common SPN's and FMI's have text for the description stored in the PV1000 display. If there is no text, then this SPN and FMI must be defined by referring to the engine manufacturer, or the SAE J1939 standard.
- **Correction** – Trouble-shooting guidelines for corrective action to take in addressing the fault.

  NOTE: This field is only used with certain brands and models of engines.

Fault Code Popups

A fault condition will trigger a popup dialog box on the screen describing the nature of the fault. Corresponding red or amber fault lights on the corners of the unit are also activated to indicate the severity of the fault. The following screens are examples of warning and shutdown fault code popups.



Warning

Shutdown

How to Hide/Show Faults

To hide the fault code popup being displayed on the screen, press the virtual button on the right next to the “Hide” icon. The popup will disappear, however the “Warning” or “Stop” icon will remain on the screen to indicate there is still a fault. Pressing “Hide” does not clear the fault, it only hides the popup message.

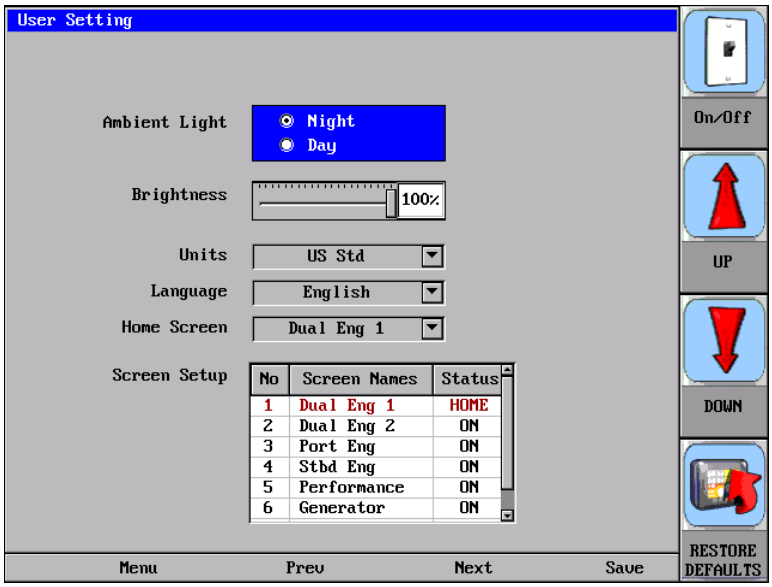
When a fault code has been hidden, a “Show” icon will remain in the bottom right corner. When this virtual button is pressed, the fault code will again be displayed.

Scrolling Through Multiple Messages

The title-bar of the fault code popup may indicate multiple messages, as in ‘Diagnostic Message 1 of 3’. You may press the **Prev** and **Next** buttons to scroll through the different messages.

User Settings

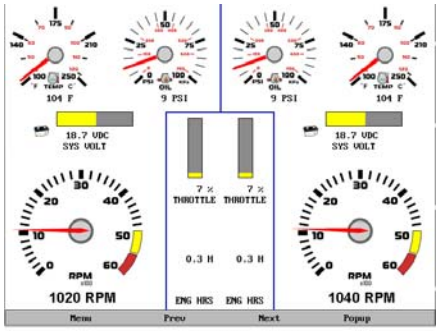
User Settings provides options to specify viewing preferences for the PV1000 DISPLAY. Pressing **Prev** and **Next** navigates through the options, and **Up** and **Down** scrolls through the selections for each option.



Ambient Light

Night and Day options are provided for ambient lighting. The screens below illustrate these options. When the ambient lighting settings are changed in User Settings, the power-on default is changed.

Night View



Day View

> **NOTE:** The ambient lighting option is also accessible through a popup menu on the gauge display and GPS display screens. When the popup is activated, selecting the **Day/Night** virtual button changes the display to the opposite mode.

Brightness

You can set the brightness control by using the **UP** and **DOWN** virtual buttons to change the settings in 5% increments until the desired brightness is achieved.

Units

Select how units are displayed by using the **UP** and **DOWN** virtual buttons to select:

- US Std (US Standard)
- Metric KPa
- Metric Bar
- English Imp (English Imperial)
- Nautical

Language

This option allows you to select the language that will be displayed on the PowerView. As an example, by using the **UP** and **DOWN** virtual buttons, you may select English, French, Italian, German, or Spanish to display the text.

> **NOTE:** The list of language options varies by model.

Home Screen

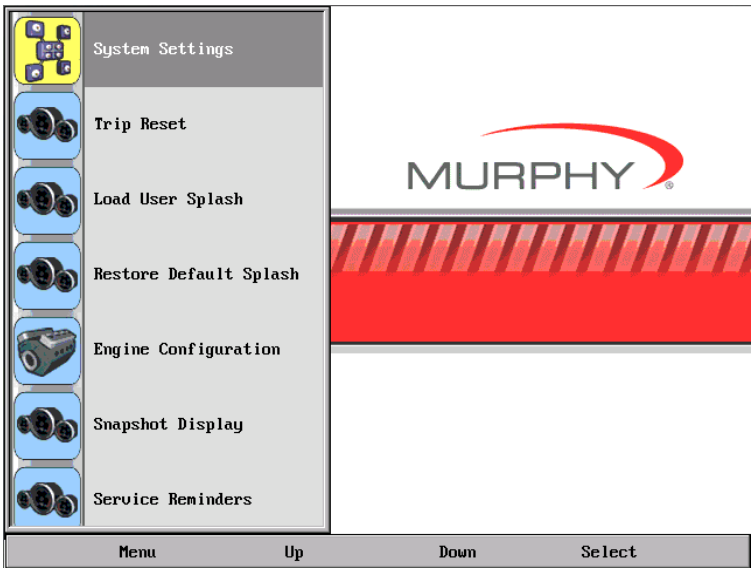
The Home Screen option allows you to specify a favorite screen from the Screen Names list that can be used as a shortcut back to that screen. The Home Screen will also be the first screen shown when Gauge Display is selected from the User Setting menu. Use the **UP** and **DOWN** virtual buttons to scroll through the list until the desired screen is listed. This will be the Home Screen.

Screen Setup

The Screen Setup option provides a list of screens that may be shown when accessing the Gauge Display screens. The 'Status' field will indicate which screen has been specified as the HOME screen. It also provides the user the ability to turn the screens ON or OFF by pressing the **ON/OFF** virtual button. If a screen is turned OFF, it will not show up when Gauge Display is activated.

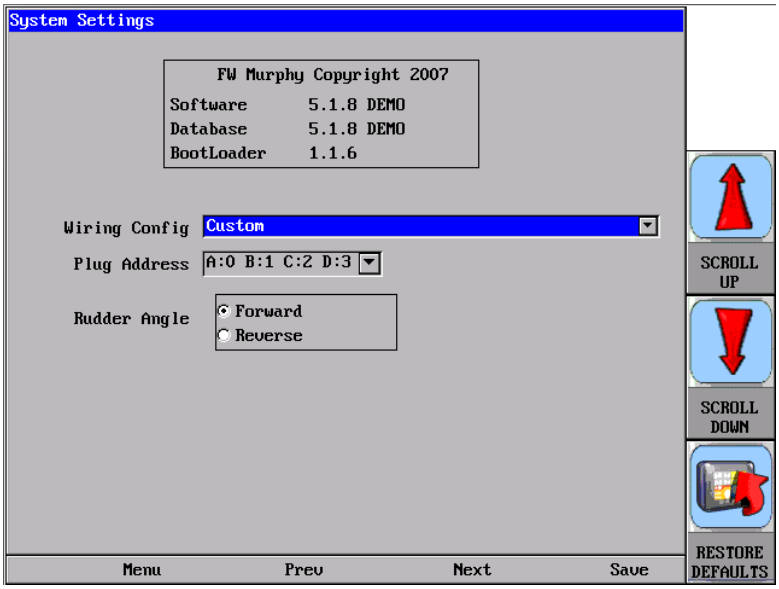
Utilities

Utilities allow you to reset external gauges and configure wiring and communication settings. It is typically only accessed when the unit is first installed in order to configure the unit. The following sub-menu is displayed when Utilities is selected.



System Settings

The System Settings screen displays the current software version loaded on the PV1000 DISPLAY. You can set individual settings for the available options, or choose to select "Restore Defaults" for the factory settings.



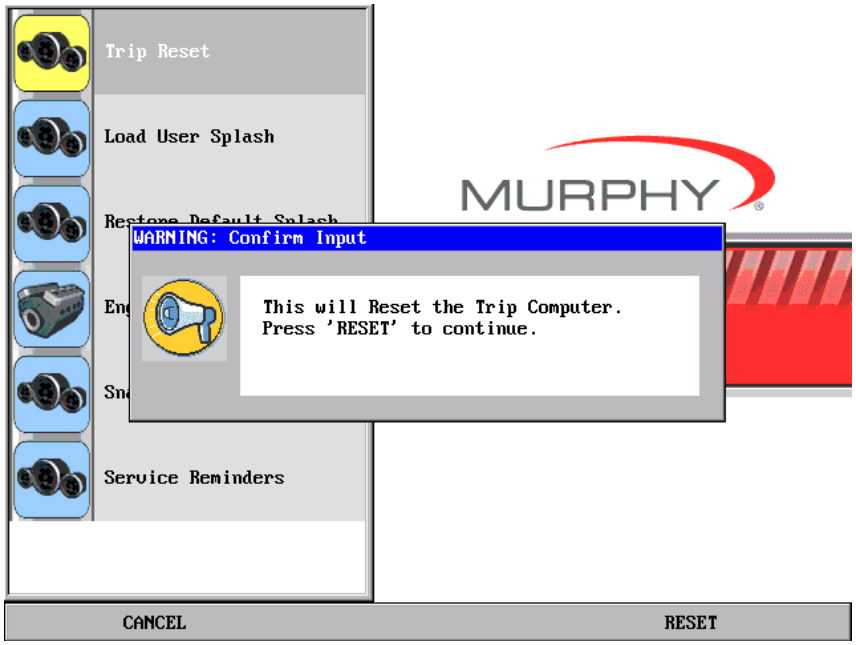
> **NOTE**: Refer to the chapter "Setting Up Your PV1000 Display for the First Time" for more information.

The **Prev** and **Next** buttons allow you to move from field to field. While the cursor is highlighting a field, the **Scroll Up** and **Scroll Down** buttons display available options. Once all the options have been selected, press Save.

> **NOTE:** For guidelines to configure your PV1000 display, refer to the "**Setting Up your PV1000 Display for the First Time**" section of this manual.

Trip Reset

This option resets the trip computer and fuel economy calculations. A DST or GPS device must be installed to receive speed data in order for the fuel economy calculations to work.



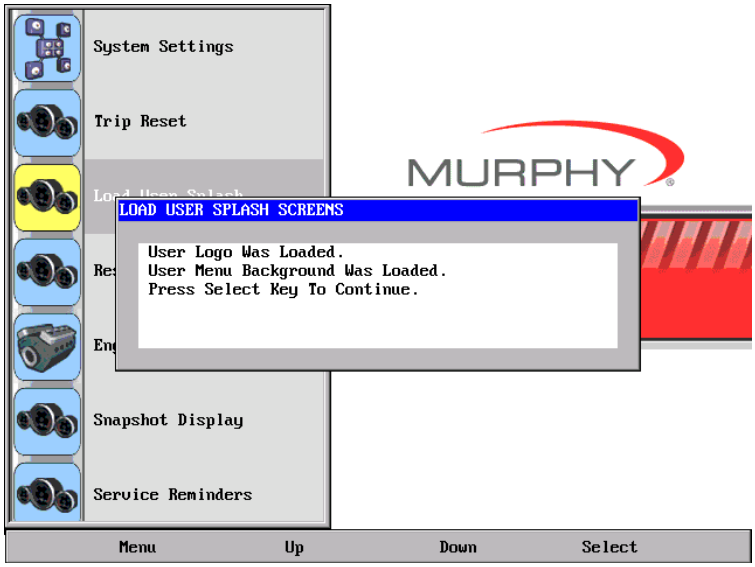
Load User Splash

Splash screens contain the graphics that are displayed during start-up and also to the right of the menus. There are default splash screens with the Murphy logo and user splash screens that allow you to load your own custom pictures or graphics to display.

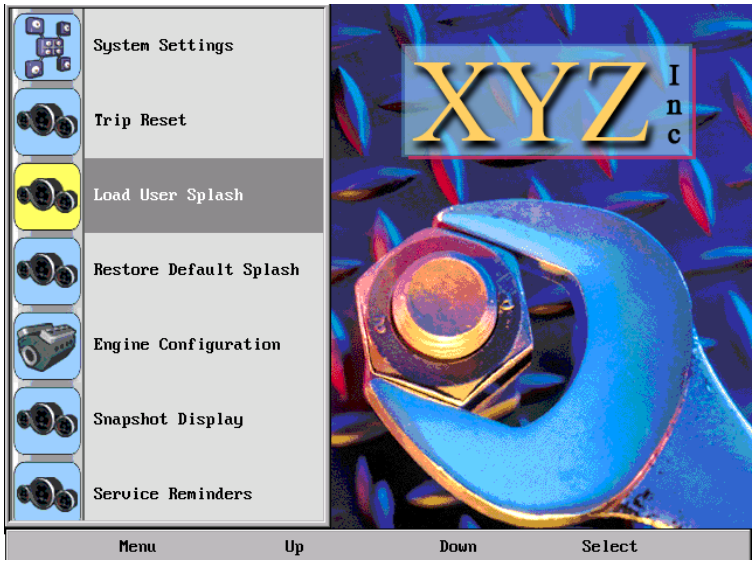
The user splash files are loaded from the root directory of the SD card. (Refer to the "**Reprogramming the PV1000 Display**" section for instructions on saving files to the SD card.) The files must be named and formatted in a specific way in order for the PowerView to recognize them.

- File format must be a bmp with 256 colors and uncompressed
- The menu splash file name must be **UserMenuBackground.bmp** with a file size of 360x480, and no larger than 170KB.
- The full screen splash file name must be **UserSplash.bmp** with a file size of 640x480 and no larger than 302KB.

Once the custom files have been loaded onto the SD card, you can select “Load User Splash” from the Utilities menu.



Press **Select** to display the custom graphic.

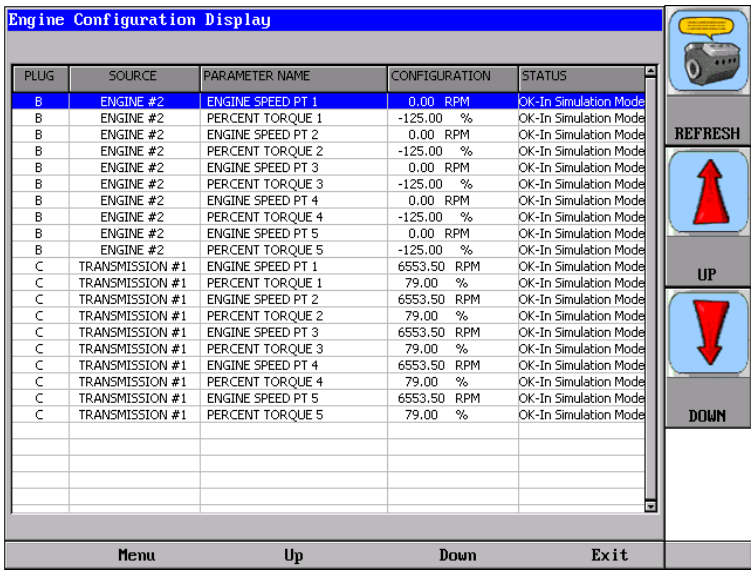


Restore Default Splash

If custom user graphics have been loaded and are currently being displayed, selecting this option will restore the default splash screens with the Murphy logo.

Engine Configuration

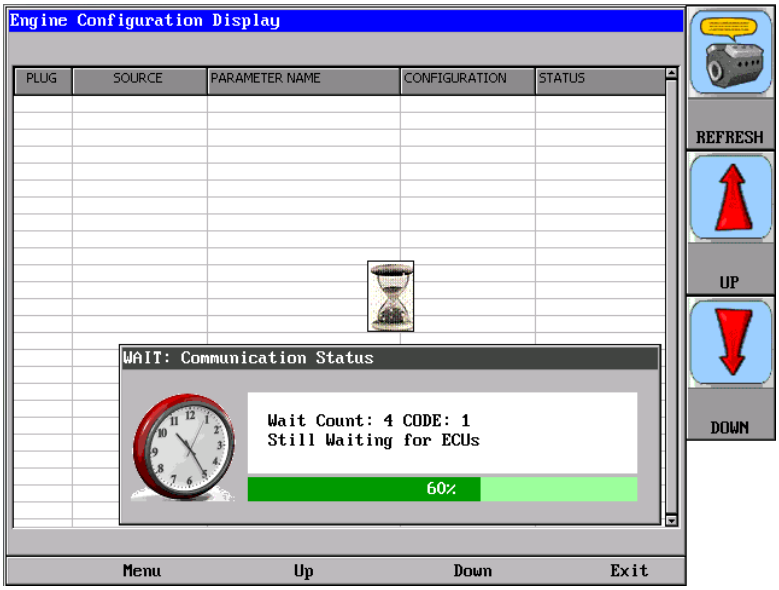
This features provides a quick look at your engine configuration and current status of each source parameter.



The following is a list of field definitions contained on the ENGINE CONFIGURATION screen:

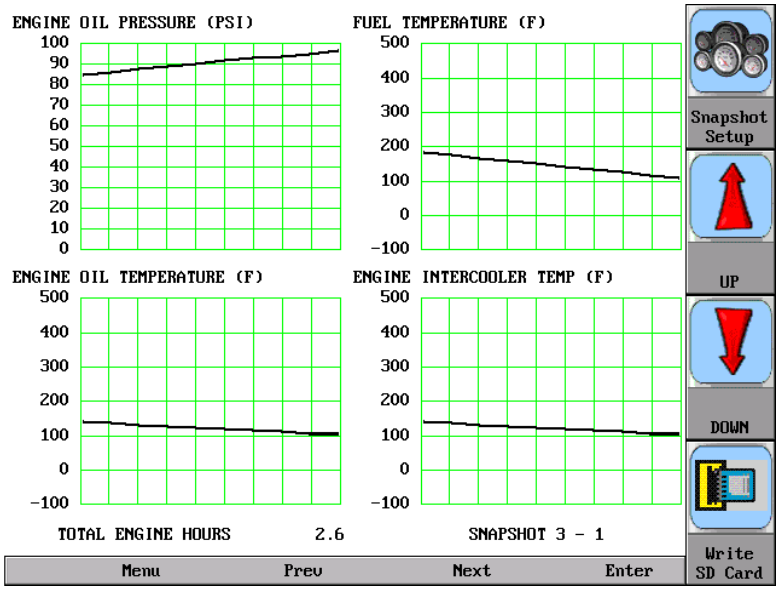
- Plug – identifies the connector plug (A,B,C, or D) on back of the PowerView unit.
- Source – identifies the component (engine 1, 2, transmission, etc.)
- Parameter Name – descriptor of the parameter
- Configuration – contains the configuration setting for the source parameter
- Status – displays the current status

Pressing **REFRESH** initiates a fresh download of information from the ECU to be displayed.

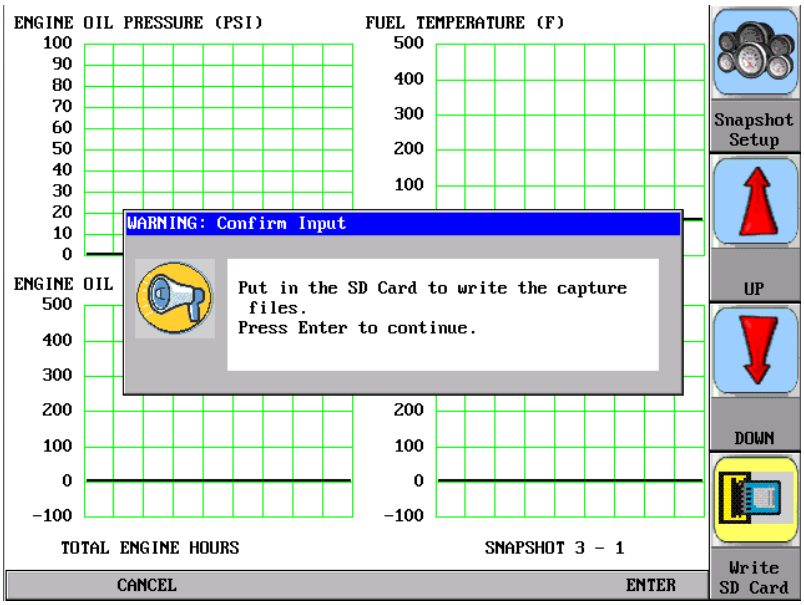


Snapshot Display

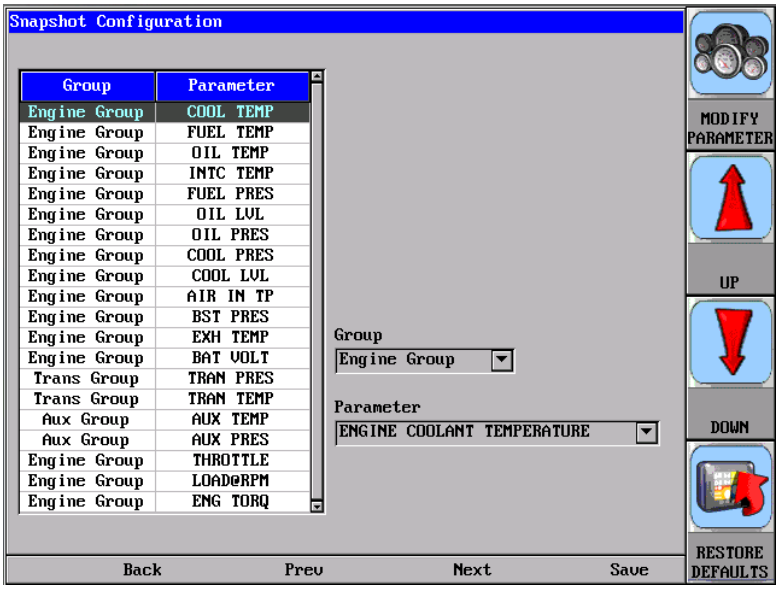
The Snapshot feature contains several screens of graphs representing current readings for various parameters such as Engine Oil Pressure, Fuel Temperature, and Fuel Delivery Pressure. Four graphs are displayed at a time. Use **UP** and **DOWN** to navigate to the other snapshot screens.



You can save the snapshot data to the SD card by pressing **Write SD Card**. Make sure the SD card is inserted into the unit before pressing **Enter** to continue.

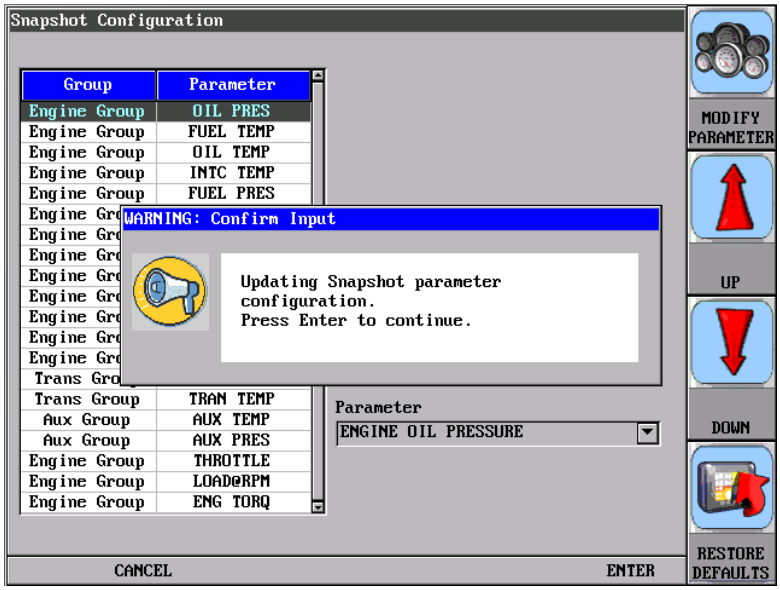


Use **Snapshot Setup** to determine which parameters are displayed on the snapshot graphs.

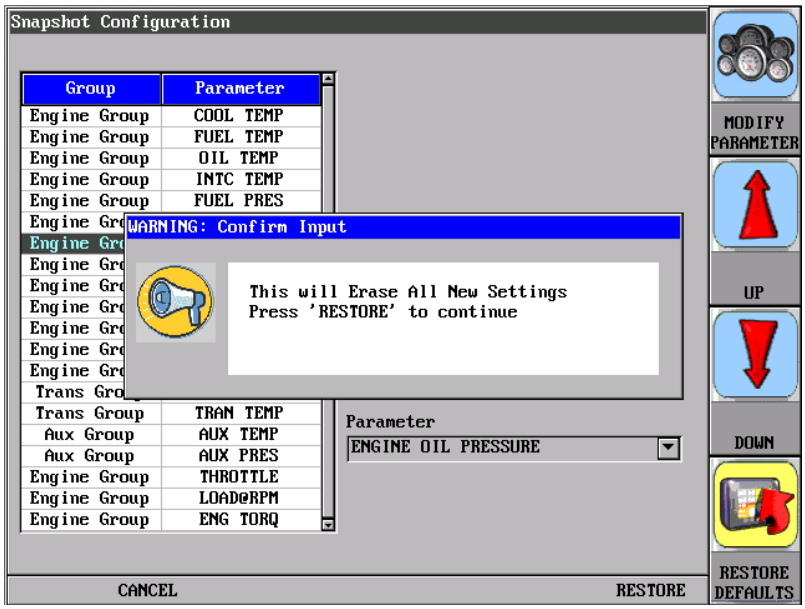


Press **UP** and **DOWN** to highlight the desired parameter in the list and press **MODIFY PARAMETER**. Then press **Next** to move the cursor to the “Group” field and press **UP** or **DOWN** to scroll through the options.

Press **Next** again to move the cursor to the Parameter field and again press **UP** or **DOWN** to scroll through the options. When all the changes have been made, press **Save**.

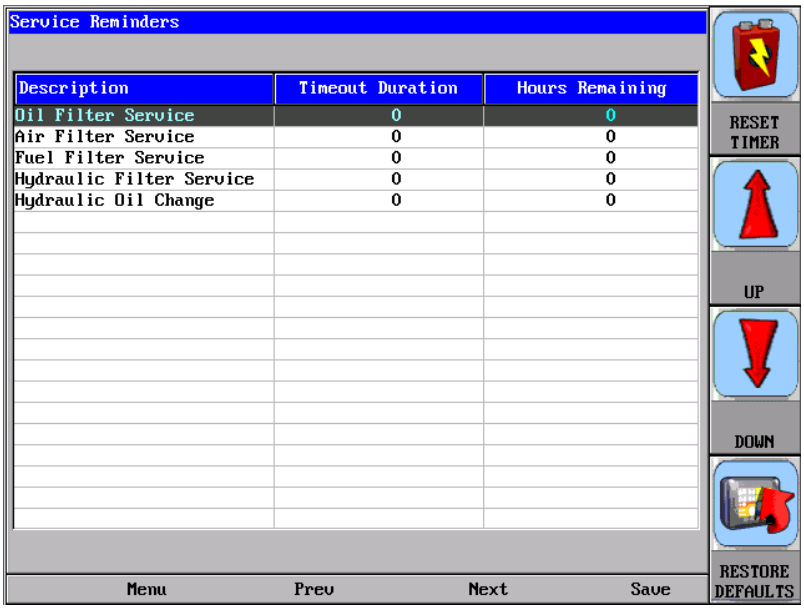


Press **RESTORE DEFAULTS** to replace all user selected settings with factory default settings.



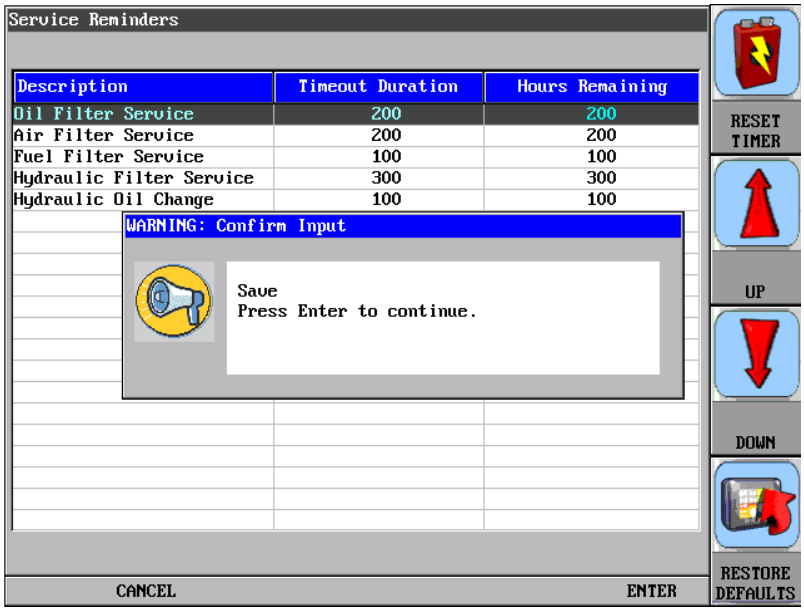
Service Reminder

This feature allows the configuration of several countdown timers that indicate when to perform preventative maintenance.

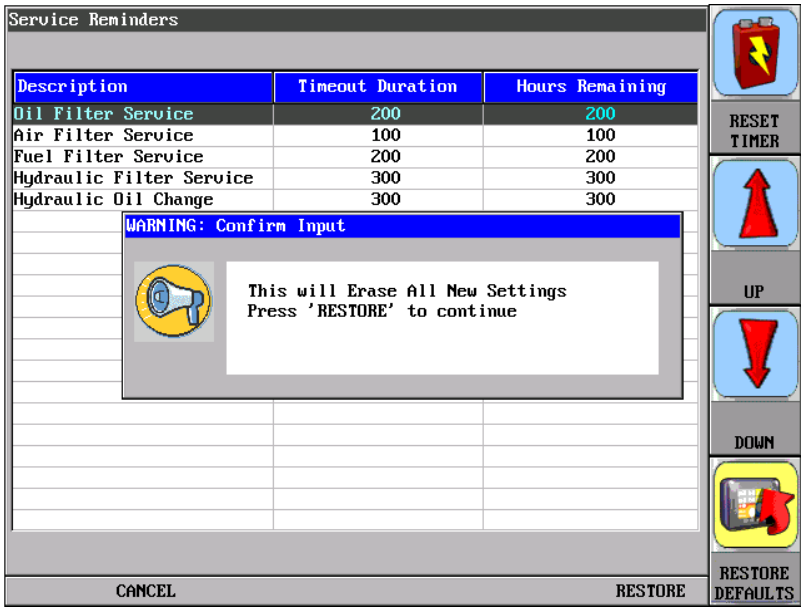


To set the 'Timeout Duration' field, press **Next** to highlight the desired item in the list, then press **UP** and **DOWN** to increase the timeout duration in 100 hour increments.

Once set, pressing **RESET TIMER** starts the clock countdown and is shown in the 'Hours Remaining' field. When all timeouts have been set, press **Save**.

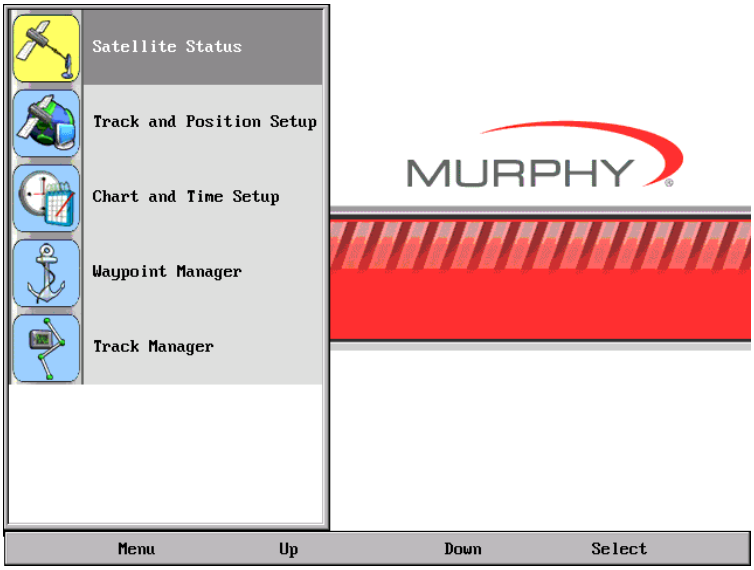


Pressing **RESTORE DEFAULTS** will reset all values in the 'Timeout Duration' and 'Hours Remaining' fields to zero. To complete the action press **RESTORE**, or **CANCEL** to abort.



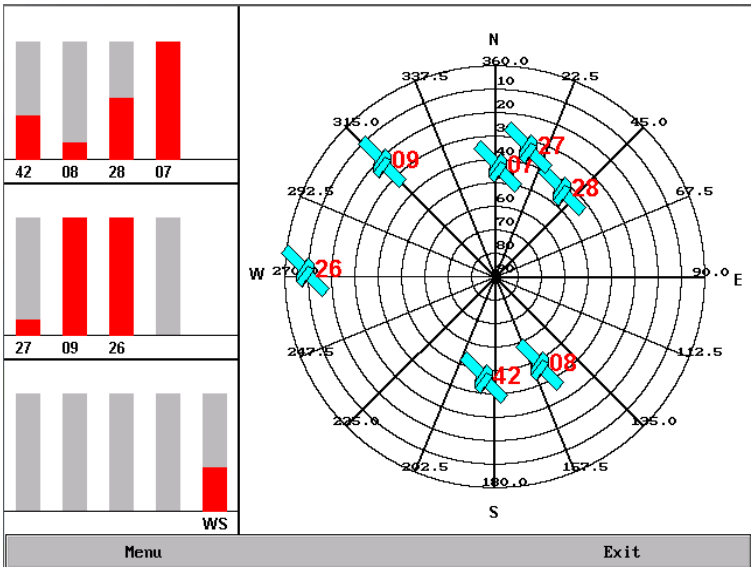
GPS Utilities

When using a GPS device, GPS Utilities will allow you to configure and monitor satellite tracking data. The following sub-menu is displayed when GPS Utilities is selected.



Satellite Status

This feature displays a graphic indicating the satellites currently visible in orbit and the signal strength of each satellite.



Track and Position Setup

This feature allows you to define the amount of detail to display, including longitude and latitude information, on the GPS map.

Position Format Selection – determines how longitude and latitude information is displayed.

Chart Presentation – select US or International chart presentation.

Press **Prev** or **Next** to move from field to field, then press **UP** and **DOWN** to scroll through the options. When all fields have been set, press **Save**.

Pressing **Restore Defaults** will reset the factory default settings.

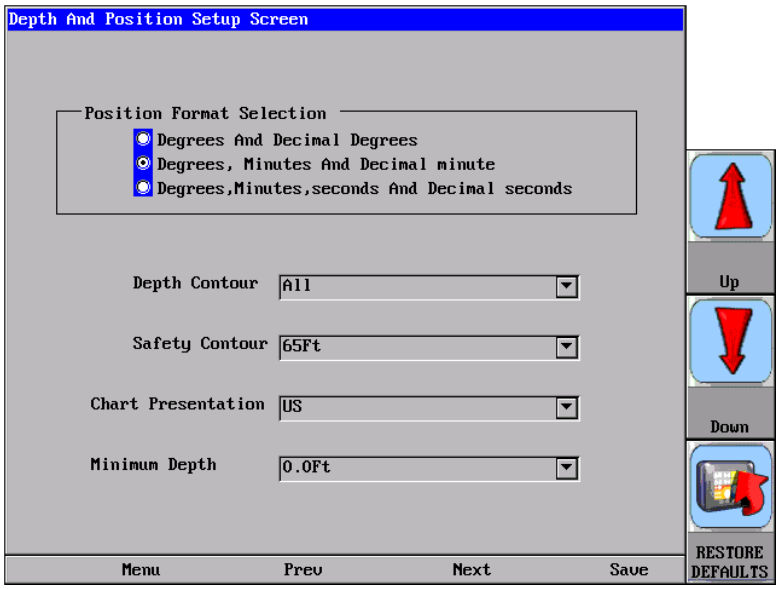


Chart and Time Setup

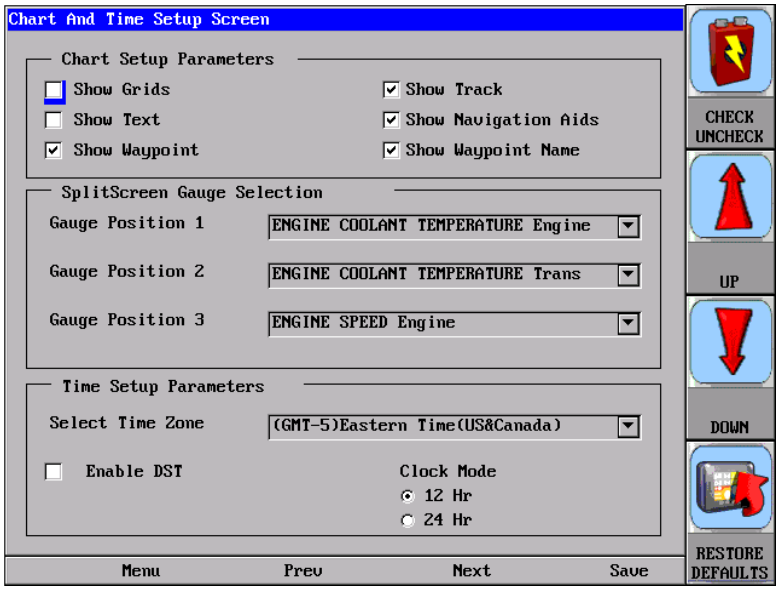
This menu option allows you to set up viewing options for the GPS Display.

Chart Setup Parameters – use the **Check/Uncheck** button to select the information you want displayed on the GPS screen.

Splitscreen Gauge Selection – allows you to custom configure the type of gauges you want to display in split screen mode.

Time Setup Parameters – is used to select correct time zone and clock mode for either 12-hour or 24-hour time formats. You can also enable DST (Daylight Savings Time) by using the **Check/Uncheck** button to select the box.

Pressing **Restore Defaults** will reset the factory default settings.



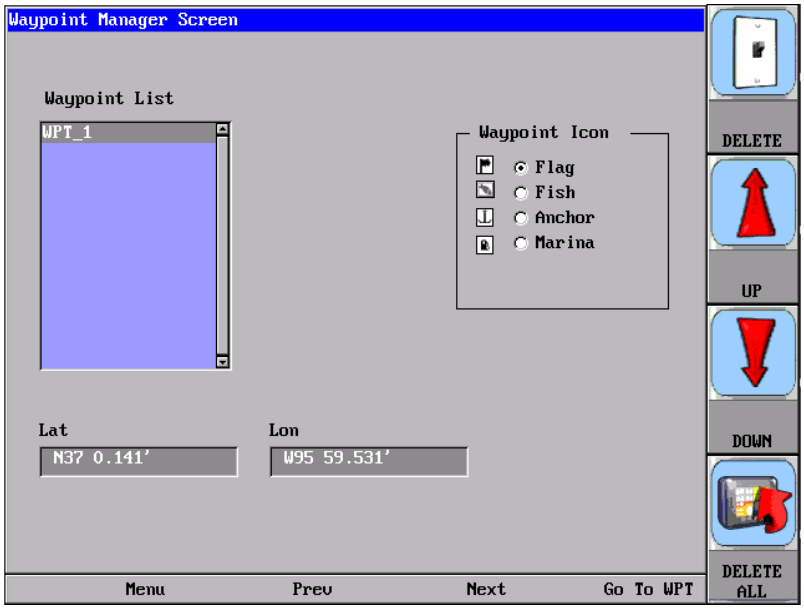
Waypoint Manager

Waypoints allow you to mark specific locations by latitude and longitude. Once the waypoints are established, the Waypoint Manager allows you to associate an icon with them for identification. You can delete a single waypoint by using the **Delete** button, or all of them at once with **Delete All**. Pressing the **Go to WPT** button displays the GPS screen containing the currently highlighted waypoint.

Waypoint List – displays a list of the waypoints that have been set. Use the **Up** and **Down** buttons to highlight the desired waypoint.

Waypoint Icon – allows you to assign one of four different icons to any of the waypoints listed.

Lat/Lon – Displays Latitude and Longitude values for the currently highlighted waypoint on the list.



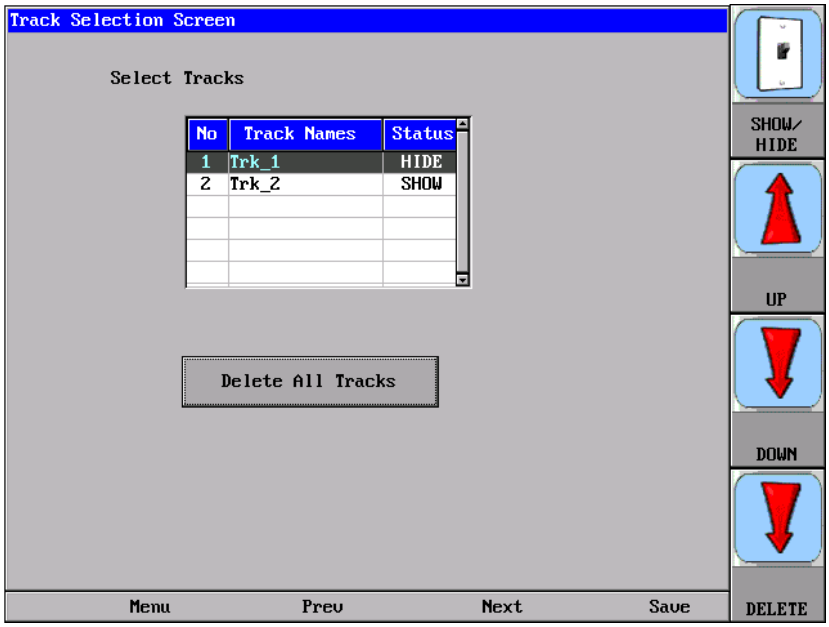
Track Manager

The Track Manager feature allows you to show and hide tracks on the GPS map. You can selectively delete tracks or delete all tracks at once.

Press **UP** or **DOWN** to select the desired track, then press **SHOW/HIDE** to toggle the status of the track or **DELETE** to delete it.

Press **Next** to move the cursor to '**Delete All Tracks**'.

When done, press **Save**.



Reprogramming the PV1000 Display

The SD card slot on the front of the unit is used for reprogramming the unit.

If you have been asked to create the card to reprogram the unit, you should:

1. Insert card into reader/writer.
2. Unzip the file provided into a directory on the PC.
3. Format the card to erase all current files residing on the card.
4. Copy all of the files in the directory to the SD card. Copy only the files to the card, not the directory or the zip file.
5. Remove card and place into display for programming.

The following steps guide you through using the SD card slot to reprogram your PowerView unit.

1. Turn off power to the display.
2. Carefully remove the slot cover.
3. Insert the SD card into the slot until it locks in.
4. The power should be turned on.
5. A screen will appear prompting you to reprogram the unit. Select “INSTALL” to continue. It will take about 6-8 minutes to reprogram the unit.
6. When done, remove the card from the slot and replace the cover.
7. Restart the power. The new software should be installed and available.

Specifications

Electrical

Display	6.4” Color transmissive TFT LCD
Resolution	VGA, 640 x 480 pixels
Orientation	Landscape
Backlighting	CCFL, 350 cd/m² (50,000 h lifetime) not replaceable
Processor	Sharp ARM9 LH7A404, 200 MHz Philips ARM7 LPC2194 70 MHz
Flash Memory	16 Mbytes
RAM	32 Mbytes SDRAM
EEPROM	32 Kbytes
Operating Voltage	6 to 32 VDC, protected against reverse polarity and load-dump
Power Consumption	10 W full backlight 22 W full backlight with heater (< -10º C)
CAN	4 CAN ports according to CAN specification 2.0B. One port isolated according to NMEA 2000
RS-485	2 MODBUS Master ports at 38.4 Kbaud
Protocols	J1939, NMEA 2000, proprietary
Connection	4 Deutsch DT04-6P 6-pin connectors
Keyboard	8 Capacitive Touch Keys

Mechanical

Mounting Variants	Panel Mounting – Mounts with eight screws into the lip of the bezel. Gimbal Mounting – Uses an articulating gimbal.
Dimensions	(W x H) 8.74 x 7.23 in Panel Mount Depth – 0.605 in Unit Depth – 3.265 in
Cutout for panel mounting	(W x H) 7.15 x 5.65 in
Case Material	High impact acrylic front case Polycarbonate back case
Weight	2 lb

Environmental

Operating Temperature	-20º C to +85º C (-40º C with optional heater)
Storage Temperature	-40º C to +85º C
Protection	IP68
Emissions	IEC 60945, 95/54/EC
Immunity	SAE J1113, ISO 11452

PV1000 Implementation of SAE J1939 Parameters

Source: SAEJ1939-71 Surface Vehicle Recommended Practice

Description	PGN	Parameter	Display Value
Elec Eng Cont #2 - EEC2	61443	Accelerator Pedal Position	THROTTLE
		Percent Load at Current RPM	LOAD@RPM
Elec Eng Cont #1 - EEC1	61444	Actual engine % torque	ENG TORQ
		Engine Speed	ENG RPM
Engine hours, Revolutions	65253	Total Engine Hours	ENG HRS
Fuel Consumption	65257	Trip Fuel	TRIP FUEL
		Total Fuel Used	FUEL USED
Engine Temperature	65262	Engine Coolant Temp	COOL TEMP
		Fuel Temperature	FUEL TEMP
		Engine Oil Temperature	OIL TEMP
		Engine Intercooler Temperature	INTC TEMP
Engine Fluid Level/Pressure	65263	Fuel Delivery Pressure	FUEL PRES
		Engine Oil Level	OIL LVL
		Engine Oil Pressure	OIL PRES
		Coolant Pressure	COOL PRES
		Coolant Level	COOL LVL
Fuel Economy	65266	Fuel Rate	FUEL RATE
		Instantaneous Fuel Economy	FUEL ECON
		Average Fuel Economy	AVG ECON
Ambient Conditions	65269	Barometric Pressure	BARO PRES
		Air Inlet Temperature	AIR IN TP
Inlet/Exhaust Conditions	65270	Boost Pressure	BST PRES
		Intake Manifold Temp	MANI TEMP
		Air Filter Differential Pressure	AIR DIF PR
		Exhaust Gas Temperature	EXH TEMP
Engine Fluid Level/Pressure #2	65243	Injector Metering Rail 1 Pres	INJ PRES1
		Injector Metering Rail 2 Pres	INJ PRES2
Fan Drive-FD	65213	Estimated Percent Fan Speed	FAN SPD
Diagnostic Messages	65226	DM1 - Active Diagnostic	SRVCCODE
	65227	DM2 - Previously Act Diag Codes	STORCODE
	65228	DM3 - Diagnostic Clear	
Machine Hours (PowerView Calculated)	N/A	Machine Hours	MACH HRS
Engine Conf.	65251	Engine Configuration	ENG CONF
Hydraulic Pressure Governor Info-HPG	61448	Hydraulic Oil Pressure	HYD PRES
Electronic Transmission Controller #1	61442	Output Shaft Speed	OUT SFT SP
Electronic Transmission Controller #1	61442	Input Shaft Speed	IN SFT SPD
Electronic Transmission Controller #1	61442	Torque Converter Lockup Engaged	TORQ LOCK
Electronic Transmission Controller #2	61445	Selected Gear	SLECT GEAR
	61445	Current Gear	CURNT GEAR
Transmission Fluids	65272	Transmission Oil Pressure	TRAN PRES
		Transmission Oil Temperature	TRAN TEMP
Transmission Control 1-TC1	256	Requested Gear	REQ GEAR
Auxiliary Pressures & Temperatures	65164	Auxiliary Temperature	AUX TEMP
		Auxiliary Pressure	AUX PRES
Auxiliary Input/Output Status	65241	Auxiliary I/O #1	AUX 10 1
Cruise Control /Vehicle Speed	65265	Wheel Based Vehicle Speed	VEH SPD
Vehicle Electrical Power	65271	Alternator Voltage	ALT VOLT
		Electrical Potential (Voltage)	SYS VOLT
		Battery Pot. Voltage (Switched)	BAT VOLT
Vehicle Distance	65248	Trip Distance	TRIP DIST
		Total Vehicle Distance	VEH DIST
Vehicle Fluids-VF	65128	Hydraulic Oil Temperature	HYD TEMP
Dash Display-DD	65276	Fuel Level	FUEL LEVEL
Rudder	127245	Rudder Angle	RUD ANG
Speed	128259	Water Referenced	H20 REF.SP
Small Craft Status, Port Trim	130576	Port Trim Tab	P TRIM TAB
Small Craft Status, Starboard Trim	130576	Starboard Trim Tab	S TRIM TAB
Support Allison DTCs		Retarded Temperature Above Normal (SPN=120, FMI=15)	RETARDED OIL TEMPERATURE ABOVE NORMAL
		Transmission Oil Temperature Above Normal (SPN=177, FMI=15)	TRANSMISSION OIL TEMPERATURE ABOVE NORMAL
		Unknown General Transmission Fault (SPN=2003, FMI=31)	GENERAL TRANSMISSION FAULT UNKNOWN

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