MURPHY®

by ENOVATION CONTROLS

CE*

PowerView® PV380-R3
Murphy Standard Configuration

Operations Manual

*Products covered in this document comply with European Council electromagnetic compatibility directive 2004/108/EC and electrical safety directive 2006/95/EC.

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

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Introduction

Congratulations on purchasing the PowerView® Model PV380 R3. This advanced tool provides monitoring of Tier 4/Euro Stage 4 compliant electronic engines. The PV380 monitors multiple J1939 parameters and provides basic engine alarm/shut-down information.

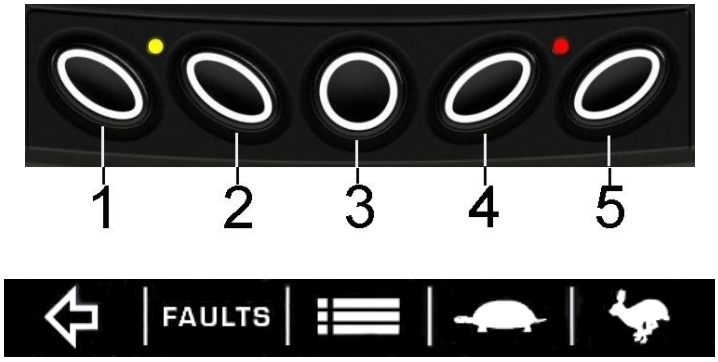
This manual was developed to help you become familiar with the PV380 display, identify navigation basics and recognize useful options and features. The clear 3.8-inch monochrome screen makes it easy to see parameters in the display, especially in bright sunlight.

Engine and Transmission Parameters

The following are some of the engine and transmission parameters that can be displayed in standard units.

- Engine Speed
- Engine Temperature
- Engine or Machine Hours of Operation
- Total Machine Hours
- Battery Voltage
- Coolant Temperature
- Engine Oil Pressure
- Engine Fuel Level
- Discharge Pressure
- Suction Pressure
- Diesel Exhaust Fluid (DEF) Level (Tier 4 only)
- Active Fault Codes
- Stored Fault Codes

Navigation and Keypad Functions



(Main page buttons)

When directed to press a symbol within the procedural steps, it is referring to the button below the displayed symbol. Each display button is contextual and may have alternating functions within the configuration. The following table shows some of the functions each button may represent.

Key 1	Function
	Alternates between parameter screen sets or moves the cursor one position to the left
	Moves highlight up when in certain Menu selections
	Decreases the number when in various screens

Key 2	Function
FAULTS	Displays Diagnostic Messages (Faults) and Stored Codes
	Moves highlight down when in certain Menu selections
	Increases the number when various screens

Key 3	Function
	Displays the Main Menu entrance point
	Serves as the Escape/Return to Previous Menu button

Key 4	Function
	Decreases the Throttle set point
STORED CODES	Displays the Stored Codes when in Diagnostic Messages
—	Decreases various settings
	Moves the cursor one slot at a time to the right

Key 5	Function
	Increases the Throttle set point
ACTIVE FAULTS	Displays the Active Faults
	Serves as the Enter key for menu selections
+	Increases various settings
	Moves the cursor to the next cell when customizing parameters on the home screen
	Moves the cursor one slot at a time to the right and displays alternate menu choices/screens
ACK	Acknowledges active faults

First-Time Startup

When power is applied to the PV380, the **Warning** and **Shutdown** lights illuminate and the Murphy logo displays.

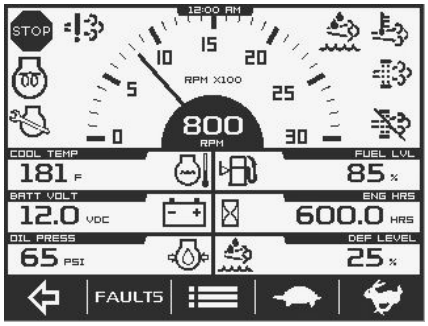
On electronic engines only, if a preheat message is being actively broadcast from the Engine Control Unit (ECU), a **Wait to Start** symbol displays below the Murphy logo as shown in the next image.

The PV380 will skip the Wait to Start (WTS) screen if the ECU stops transmitting the wait to start message or if the engine speed is >500 RPM. If the ECU never transmits the wait to start message, the splash screen is displayed for three seconds after key on, then the main gauge screen is shown.

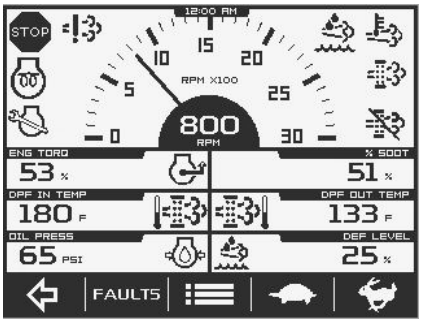
Once the engine is running (> 500 RPM), the engine information (electronic or mechanical) will display on the main gauge screen and additional parameters on the second screen. The second screen is accessed when the ⇦ key is pressed.

> **NOTE**: For electronic engines, if the ECU does not transmit engine speed (SPN 190) for the first five seconds after key-on, a warning message ⚠ will be displayed and the amber light will turn on.

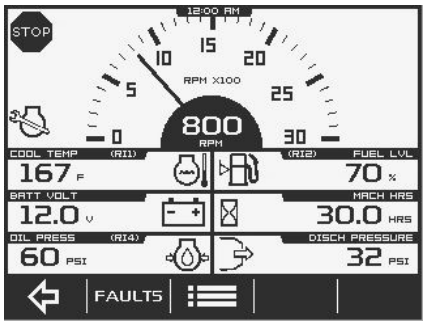
Main gauge screen (Electronic)



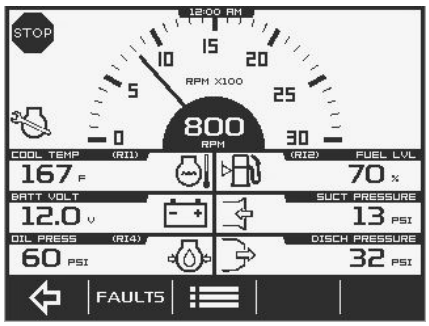
Second gauge screen (Electronic)



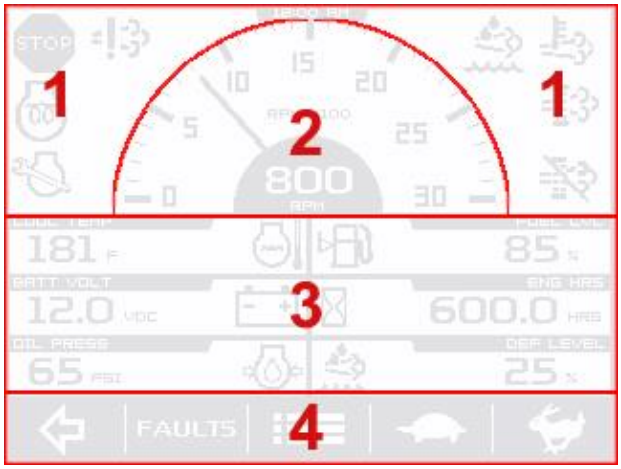
Main gauge screen (Mechanical)



Second gauge screen (Mechanical)



Parameter Gauge Settings



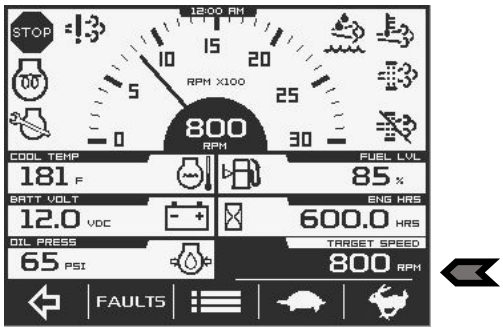
1. Alert and Warning Icon area: Up to eight symbols can be shown at one time in the icon area to represent warnings, Tier 4 status and service indicators. The most important symbol will be shown in the upper left area. The following symbols can be shown in this area:

Icon(s)	Function(s)
	Shutdown indicator
	Warning displays when an active and unacknowledged DTC warning or internal set point exists. Disappears when fault is acknowledged and no longer active.
	Displays when High Exhaust System Temperature (HEST) is active and exhaust temperature is above normal operating condition.
	Regen Inhibit (Regen Inhibit is restricted when a HEST alarm is present) displays when the engine ECU has inhibited a regeneration or a manual inhibit has been requested.
	Displays when engine after-treatment requires regeneration. This is because of the after-treatment filter reaching the engine manufacturer's set soot level.
	Low diesel exhaust fluid. Displays when the ECU transmits a low DEF level.
	Engine Emissions System Failure displays when an emissions after-treatment malfunction has occurred. Contact your local engine manufacturer's service department for direction.
	Service indicator

2. **Tachometer Area:** Displays the engine speed gauge with an option to choose a 3000, 4000 or 6000 RPM dial (See Display Setup on page 18 for more information).

3. **Parameter Area:** The following parameters are the electronic engine defaults until other parameters are selected from the menu. Only the bottom four parameters on the second screen can be changed:

   - Engine Oil Pressure
   - Engine Temperature
   - Engine Hours
   - Battery Voltage Fuel Level
   - DEF Level (Tier 4 only) / Target Speed (when SCR is disabled)



NOTE: Target Speed gauge appears for 5 seconds when the user throttles the engine (see arrow above)

4. **Button Selection Display:** The button functions can change depending on the screen displayed.

Adjusting Menu Selections

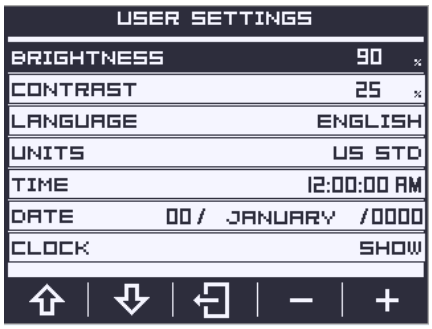
NOTE: Once parameters are changed, back out of all menus and initiate a power cycle for changes to take effect.

User Settings

Brightness and Contrast

Follow these steps to adjust the Brightness and Contrast:

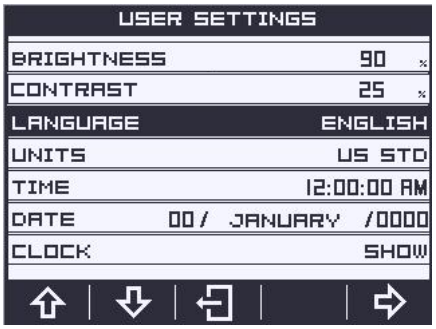
1. Press ☰ to display the Menu.
2. Arrow to **USER SETTINGS.** Press ↵ and arrow to the desired selection.
3. Press + and − to adjust the selection.
4. Press ⏎ to save and exit the menu.



Language

Follow these steps to change the Language:

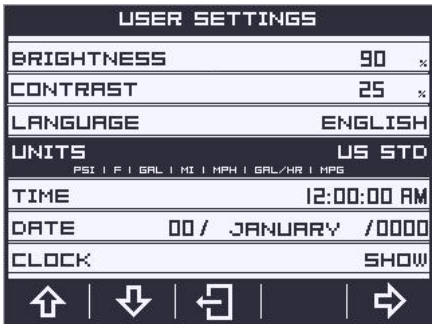
1. Press ☰ to display the Menu.
2. Arrow to **USER SETTINGS** and then press ↵ to enter, then arrow to **LANGUAGE**.
3. Press ⇨ to cycle through the available languages (English, French, German, Spanish and Italian).
4. Press ⏎ to save and exit the menu.



Units

Follow these steps to adjust the Units:

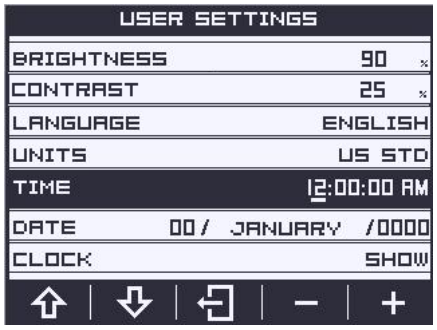
1. Press ☰ to display the Menu.
2. Arrow to **USER SETTINGS.** Press ↵ and then arrow to **UNITS**.
3. Press ⇨ to choose US STD, Metric KPA or Metric BAR.
4. Press ⏎ to save and exit the menu.



Time

Follow these steps to adjust the Time:

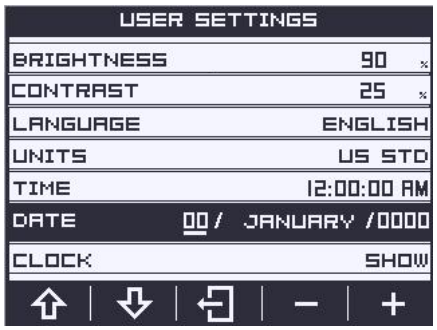
1. Press ☰ to display the Menu.
2. Arrow to **USER SETTINGS.** Press ↵ and then arrow to **TIME**. The cursor will be beneath the hour.
3. Press **+** and **−** to adjust the selection.
4. To adjust the minutes, press ⇩, and the cursor will move to the right.
5. Repeat steps 3 and 4 to adjust the minutes and seconds.
6. Press ⏎ to save and exit the menu.



Date

Follow these steps to adjust the Date:

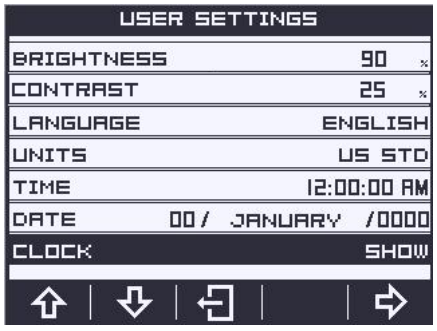
1. Press ☰ to display the Menu.
2. Arrow to **USER SETTINGS.** Press ↵ and then arrow to **DATE**.
3. Press **+** and **−** to adjust the day.
4. Press ⇩, and the cursor will move to the month.
5. Repeat steps 3 and 4 to adjust the month and year.
6. Press ⇦ to save and exit the menu.



Clock

Follow these steps to display or hide the Clock:

1. Press ☰ to display the Menu.
2. Arrow to **USER SETTINGS.** Press ↵ and then arrow to **CLOCK**.
3. Press ⇨ to alternate between **SHOW** and **HIDE**.
4. Press ⇦ to save and exit the menu.

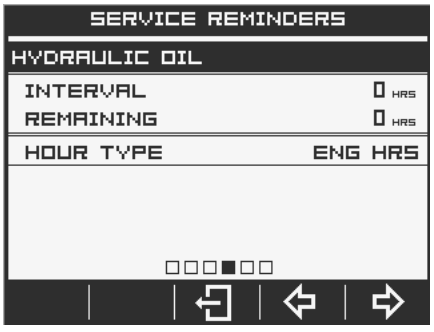


Service Reminders

Available service reminders: Engine Oil, Fuel Filter, Engine Air Filter, Hydraulic Oil, Service Engine and Service Machine.

Press ☰ to display the Menu.

1. Press ⇩ to Service Reminders. Press ↵ to enter.
2. Press ⇨ or ⇦ to scroll through the read-only screens.



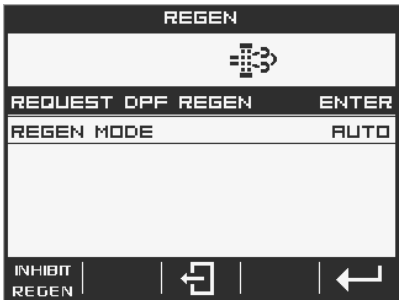
Regen

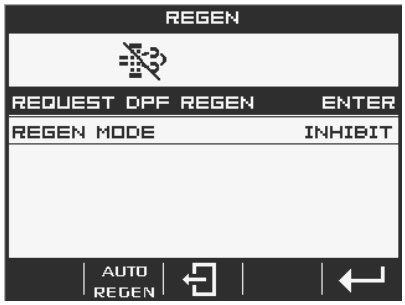
Follow these steps to initiate a Regen:

1. Press ☰ to display the Menu.
2. Press ⇩ to Regen. Press ↵ to enter.
3. Press ↵ once more on Request DPF Regen.
4. In answer to the question “Request Diesel Particulate Filter Regen?” use Key 3 for Yes and Key 5 for No.

Follow these steps to change the Regen mode:

1. Press ☰ to display the Menu.
2. Press ⇩ to Regen. Press ↵ to enter.
3. If the engine ECU has inhibited a regeneration, the Regen Mode will display the current mode of the engine regeneration as Inhibit.
4. The AUTO REGEN button will be available to switch the engine to automatically regenerate.
5. If the engine ECU is currently on AUTO regeneration, the Regen Mode will display the current mode of the engine regeneration as Auto.
6. The INHIBIT REGEN button will be available to inhibit a regeneration if the engine is in Active Regen.
7. The regen mode will display N/A when ECU does not transmit a regen mode (SPN 3703)
8. Press ⮌ to return to the Menu.

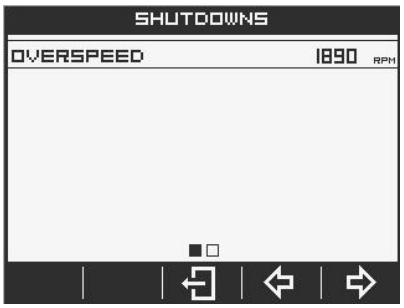




Set Points

Follow these steps to view the Set Points:

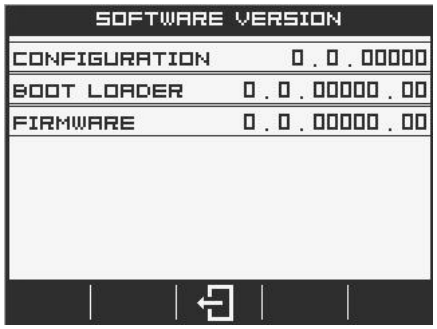
1. Press ☰ to display the Menu.
2. Press ⇩ to Set Points. Press ↵ to enter.
3. The first screen will display configured Shutdowns and the specified criteria. Press ⇨ to view the second screen listing Warnings and the specified limits.



Software Version

To display the software version information (useful for Enovation Controls' personnel to identify which configuration the customer is using), follow these steps:

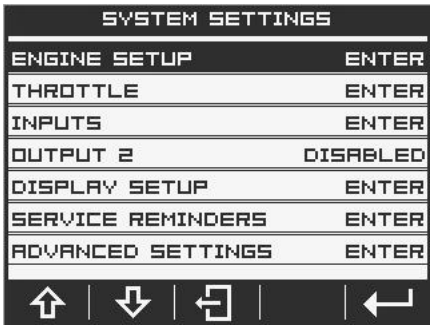
1. Press ☰ to display the Menu.
2. Arrow to **Software Version** and press ↵. The screen to the right will appear:
3. Press ⇦ to exit the Menu.



System Settings

Follow these steps to enter System Settings:

1. Press ☰ to display the Menu.
2. Press ⇩ to System Settings. Press ↵ to enter.
3. Utilize keys 1, 2 and 3 to input the password (3482) and press ↵ to enter the category.



Engine Setup

Use the following to configure engine settings.

1. Highlight Engine Type and press ↵ to toggle between Electronic or Mechanical engine types.

NOTE: Selecting Electronic engine type will enable the Throttle menu to appear in System Settings. The Throttle menu is disabled for Mechanical engine type.

2. See the table below to configure remaining settings

Engine Type	Configurable Settings

Electronic	• DPF (Default: enabled)
	• SCR (Default: enabled)
	• ECU Source Address (Default: ALL)
	• Display Source Address (Default: 43)
	• Overspeed
	  ○ Shutdown (Default)
	  ▪ % Over High Speed (Default: 5%)
	  ▪ Fault at High Speed (Default: 1890 RPM)
	  ○ Warning
	  ▪ % Over High Speed
	  ▪ Fault at High Speed
	  ○ Disabled
	• Machine Hours
	  ○ Set Machine Hours
	  ○ Clear Machine Hours

Engine Type	Specific Parameters Available

Mechanical	• Speed Calibration
	• Overspeed
	  ○ Shutdown
	  ▪ % Over High Speed
	  ▪ Fault at High Speed
	  ○ Warning
	  ▪ % Over High Speed
	  ▪ Fault at High Speed
	  ○ Disabled
	• Machine Hours
	  ○ Set Machine Hours
	  ○ Clear Machine Hours

Throttle Setup

Use the following to configure throttle settings.

System Setting	Specific Parameters Available
Throttle	• Throttle (Default: enabled) ○ Throttle Type ▪ Display (Default) ▪ Switch (Resistive Input 1 will be Throttle Switch UP, Resistive Input 3 will be Throttle Switch DOWN) ▪ Knob (Resistive Input 1 will be disabled, Resistive Input 3 will be Throttle Knob) ○ Throttle Mode ▪ For Types Display and Switch: Manual, Preset ▪ For Type Knob: Manual ○ Setpoints ▪ Ramp Rate Per Second ▪ Inc/Dec Step Size ○ Low Speed Limit ○ High Speed Limit (with Overspeed at 5%)

Inputs

Follow these steps to change the Inputs:

1. Press to display the Menu.
2. Press to System Settings. Press to enter.
3. Utilize keys 1, 2 and 3 to input the password (3482) and key 5 to enter.
4. Arrow to highlight Inputs. Press to enter.
5. Highlight the appropriate Resistive Input and press to enter.
6. Choose the appropriate Function, Sender, Fault and Set Point for each Resistive Input.
7. Press to return to the previous Menu
8. Highlight with the arrow keys the Analog input and press to enter
9. Choose the appropriate Function, Sender, Fault and Calibration for each Analog Input.
10. Press to return to the Menu.

Output 2

Follow these steps to change the Output 2:

1. Press to display the Menu.
2. Press to System Settings. Press to enter.
3. Utilize keys 1, 2 and 3 to input the password (3482) and key 5 to enter.
4. Arrow to highlight Output 2. Press to choose Disabled, Comm Alarm or Air Shutoff.

   Comm Alarm: When the Digital Output 2 is configured as Comm Alarm, Digital Output 2 will turn ON for any CAN or internal diagnostic shut-down message. Digital Output 2 will turn back OFF when all the shut-down messages are cleared.

   Air Shutoff: The Digital Output 1 is disabled, the Digital Output 2 is turned on, and an internal Diagnostic Message (red lamp) is displayed when the following conditions are met:

   - Air Shutoff is chosen
   - Throttle is Enabled
   - Pressure Shutdown, Temp Shutdown or Overspeed Shut (Type of Shutdown) is chosen
   - Engine speed is greater than Overspeed Shutdown or 100 RPM more than the target speed
5. Press to return to the Menu.

Display Setup

Follow these steps to change the Display Setup:

1. Press to display the Menu.
2. Press to System Settings. Press to enter.
3. Utilize keys 1, 2 and 3 to input the password (3482) and key 5 to enter.
4. Arrow to highlight Display Setup. Press to enter.
5. Highlight Gauge Setup and press to enter.
6. To establish the default settings for the unit, highlight Use Defaults and press . A Restoring Default Gauge Setup message will appear for approximately 6 seconds.
7. For an alternate gauge display other than the default, highlight Customize Gauges and press .
8. The gauge screen will appear with a check mark beside the upper left selectable gauge. Press display keys 1 or 2 to cycle through the available options for that portion of the screen.

   NOTE: The available parameter options are limited to parameters that are currently available on the CAN bus.

9. To move to the next portion of the screen to customize, press . The check mark will move.
10. Repeat steps 8 and 9 until all gauges have been customized. Press to return to the Menu.
11. Highlight Engine Speed Dial and press to alternate between 3000, 4000 and 6000 RPM.
12. Highlight Hour Meter Type and press to alternate between Engine Hours and Machine Hours.

    NOTE: If the type is set to Engine Hours, the unit must be connected to an ECU and be receiving data to reset the service reminder. If Engine Hours data is not being received, the service reminder will not reset.

    NOTE: The interval remaining time may be negative when the service reminder is expired.

13. Press to be returned to the Display Setup menu.
14. Highlight Fault Conversion and press to alternate between J1939 V1, V2, V3 or V4.
15. Highlight Auto Ack Fault and press to alternate between Disabled or Enabled.
16. Highlight Clear Fault Codes and press to enter. A message will appear stating "Request Sent to Clear Fault Codes."
17. WARNING: this step will take effect immediately after pressing . Highlight Factory Reset and press . A message appears stating "Restoring Factory Defaults. The display will power cycle in 2 seconds." The unit will then begin a power cycle, and all previous customized settings will be restored to the original default settings.

Service Reminders

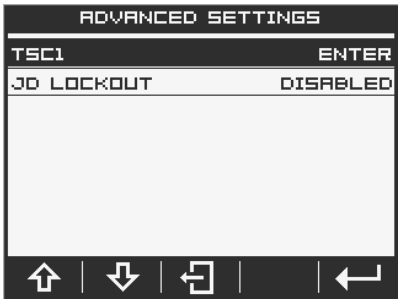
Follow these steps to view and reset Service Reminders:

1. Press to display the Menu.
2. Press to System Settings. Press to enter.
3. Utilize keys 1, 2 and 3 to input the password (3482) and to enter.
4. Arrow to highlight Service Reminders. Press to enter.
5. Service Reminders exist for Engine Oil, Fuel Filter, Engine Air Filter, Hydraulic Oil, Service Engine and Service Machine. Press or to view each one.
6. To change the Interval time, highlight the selection with or and press − or + to adjust the hours. Each press of the button will decrement or increment the hours by 10.
7. Highlight Hour Type and press − or + to alternate between Engine Hours and Machine Hours.
8. To simply reset the hours, highlight Reset and press (OK).

9. Press to be returned to the System Settings menu.

Advanced Settings

Follow these steps to enter and review the Advanced Settings:



1. Press to display the Menu.
2. Press to System Settings. Press to enter.
3. Utilize keys 1, 2 and 3 to input the password (3482) and to enter.
4. Arrow to highlight Advanced Settings. Press to enter.
5. Utilize keys 1, 2 and 3 to input the password (1802) and to enter.
6. TSC1 and JD Lockout are available to configure in Advanced Settings. Press to select TSC1 settings.
7. Highlight each SPN and press − or + to cycle through the available options for each. Refer to the following table:

SPN	Available Options
695 (Eng Override Control Mode)	0 – Override Disabled 1 – Speed Control
696 (Eng Req Speed Control Conditions)	0 – Transient Optimized for driveline disengaged and non-lockup conditions* 1 – Stability Optimized for driveline disengaged and non-lockup conditions* 2 – Stability Optimized for driveline engaged and/or in lockup condition 1 (vehicle driveline)* 3 – Stability Optimized for driveline engaged and/or in lockup condition 2 (PTO driveline)* *(The above descriptions taken from SAE International document J1939-71 May2012)
897 (Override Control Mode Priority)	0 – Highest Priority 1 – High Priority 2 – Medium Priority 3 – Low Priority

Continued

SPN	Available Options
3349 (TSC1 Transmission Rate)	0 – 1000 mS 1 – 750 mS 2 – 500 mS 3 – 250 mS 4 – 100 mS 5 – 50 mS 6 – 20 mS 7 – 10 mS

8. To configure the JD Lockout, repeat steps 1 – 5 and Press ⇩ to highlight the JD Lockout selection then press ⇨ to Enable/Disable.
   NOTE: The JD Lockout message allows the engine to regenerate when an external interlock switch to the ECU is not present.

Faults

Follow these steps to display the Active Faults:

1. Press **FAULTS** on the main page to display active faults. The screen to the right will appear:

   Press the ⇦ and ⇨ to scroll through additional messages if any are present. Each saved code shows the SPN (Suspect Parameter Number), FMI (Failure Mode Identifier) and OC (Occurrence Count). The OC indicates if the same fault occurred more than once. If available, a text explanation of the Warning or Shutdown and the Device ID Address also displays.

   To view the Stored Codes, press **Stored Codes**. Stored codes are requested from the ECU. While the data is being requested, REQUESTING and RECEIVING DATA will be displayed. If data is not received from the ECU, TIMEOUT will be displayed. Pressing **Stored Codes** once more will request data from the ECU again. If data is received, the Diagnostic Message screen (#) of (#) will appear. Press the ⇩ and ⇧ to scroll through additional messages if any are present. Press **Get Faults** to receive additional Stored Faults. Press ⇦ to return to the Faults screen.

Diagnostics and Service

LED Indicators

The PV380 features amber (Warning) and red (Shutdown) colored LEDs on the front keypad. These are illuminated according to the J1939 error definition for alarms and shut-down conditions.

Indicator Lamps

On each gauge screen and menu (where space allows), the following indicator lamps shall be shown:

Icon	PGN	SPN	Description
	DM1		**Stop Diagnostic Lamp**: indicates an active DM1 stop fault
	DM1		**Warning Diagnostic Lamp**: indicates an active DM1 fault
	64892	3698	**High Exhaust Temperature (HEST) Lamp:** indicates regeneration in process
	64892	3697	**DPF Particulate Filter Restricted Lamp**: indicates a Regen is needed
	64892	3703	**DPF Inhibit Lamp**: indicates an inhibited Regen status
	65110	1761	**Diesel Exhaust Fluid** (DEF) **Lamp**: displays when the fluid level drops below 12%
	–	–	**Service Indicator**
	65110	5246	**Engine Emissions System Failure**

Supported PGNs

The following table of parameters shall be available for selections based on being actively broadcast on the CAN bus:

	Description	PGN	Icon
1	**Accelerator Pedal Position 1**	61443	ACCEL PED1
2	**Percent Load at Current RPM**	61443	
3	**Actual Engine Torque**	61444	
4	**Engine Speed**	61444	
5	**Trip Distance**	65248	TRIP DIST
6	**Total Vehicle Distance**	65248	VEH DIST
7	**Total Engine Hours**	65253	ENG HRS
8	**Trip Fuel**	65257	TRIP FUEL
9	**Total Fuel Used**	65257	FUEL USED
10	**Engine Coolant Temperature**	65262	
11	**Fuel Temperature**	65262	
12	**Engine Oil Temperature**	65262	
13	**Engine Intercooler Temp**	65262	INTC TEMP
14	**Fuel Delivery Pressure**	65263	
15	**Engine Oil Level**	65263	
16	**Engine Oil Pressure**	65263	
17	**Coolant Pressure**	65263	
18	**Coolant Level**	65263	

	Description	PGN	Icon
19	**Wheel Based Vehicle Speed**	65265	VEH SPD
20	**Fuel Rate**	65266	FUEL RATE
21	**Instantaneous Fuel Economy**	65266	FUEL ECON
22	**Average Fuel Economy**	65266	AVG ECON
23	**Barometric Pressure**	65269	BARO PRES
24	**Air Inlet Temperature**	65269	
25	**Boost Pressure**	65270	BST PRES
26	**Intake Temperature**	65270	
27	**Air Filter Dif. Pressure**	65270	
28	**Exhaust Gas Temperature**	65270	
29	**Alternator Potential**	65271	ALT VOLT
30	**Electrical Potential**	65271	
31	**Battery Potential Voltage**	65271	
32	**Transmission Oil Pressure**	65272	
33	**Transmission Oil Temp**	65272	
34	**Fan Drive**	65213	
35	**Auxiliary Temperature**	65164	AUX TEMP
36	**Auxiliary Pressure**	65164	AUX PRES
37	**Selected Gear**	61445	SLECT GEAR
38	**Current Gear**	61445	CURNT GEAR
39	**Output Shaft Speed**	61442	OUT SFT SP

	Description	PGN	Icon
40	**Input Shaft Speed**	61442	IN SFT SPD
41	**Torque Converter Lockup**	61442	TORQ LOCK
42	**Auxiliary IO Status 1**	65241	AUX IO 1
43	**Accelerator Pedal Switch**	61443	PEDAL SWT
44	**Engine Desired Op Speed**	65247	DES ENG SP
45	**Throttle Position**	65266	THROTTLE
46	**Air Inlet Pressure**	65270	
47	**Actual Engine Timing**	65159	ENG TIMING
48	**Total Engine Revolutions**	65253	ENG REVOLU
49	**Requested Gear**	65256	REQ GEAR
50	**Fuel Level**	65276	
51	**Hydraulic Pressure**	61448	
52	**Hydraulic Temp**	65128	
53	**Machine Hours**	61444	
54	**Diesel Exhaust Fluid Level**	65110	DEF LVL
55	**% Soot**	64891	% SOOT
56	**% Ash**	64891	% ASH
57	**Exhaust Filter Temp**	64947	
58	**Exhaust Filter Inlet Temp**	64948	
59	**Discharge Pressure**	Analog Input #1	
60	**Suction Pressure**	Analog Input #2	

Specifications

Electrical

Display	3.8” (9.65 cm) QVGA (320x240 pixels); monochrome transflective LCD with heater, MTFB 50,000 hours
Resolution	QVGA, 320 x 240 pixels
Backlighting	White LED
Communications	(1) CAN 2.0B (J1939 protocol and proprietary messaging), (1) RS-485 serial (Modbus)
Protocols	J1939, NMEA 2000
Connection	Deutsch DT Series 6- and 12- pin
Keyboard	5 tactile buttons
Input	(4) resistive analog (3) analog; 0-5V / 4-20 mA (1) frequency; 2-10,000Hz, 3.6-120VAC
Output	(2) 500mA; switched low-side
Voltage	6-36 VDC; reverse polarity protected

Environmental

Operating Temperature	-40º C to +85º C (-40° F to +185° F)
Storage Temperature	-40º C to +85º C (-40° F to +185° F)
Protection	IP66 and 67 (IEC/EN 60529)

Standards Compliance	Electrical Safety: 2006/95/EC
	Electromagnetic Compatibility:
	• 2004/108/EC:
	  • EN 61000-6-4:2001 (emission)
	  • EN 61000-6-2:2001 (immunity)
	  • EN 50121-3-2 and EN 12895
	• SAE J1113/2, 4, 11, 12, 21, 24, 26 and 41

Vibration	7.86g random vibe (5-2,000Hz)
Shock	±50g shock in 3 axes

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