



M00-20-8321-LIM Line Interface Module

Procedure Guide (for Integra 500 only)



NOTE: Before you use this guide, make sure you have the latest revision. Check the revision level of this document against the most current revision found at <http://www.opwglobal.com/opw-fms/tech-support/manuals-how-to-videos>. Download the latest revision if necessary.



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Section 1 Introduction

The LIM is an external device that controls submersible turbine pumps (STP) and monitors the input/output status of fuel dispenser hook signals and STP relays.

You can install a maximum of four (4) LIM modules in a system. Each LIM module can monitor up to four (4) STP motors for a total of 16 STP motors. For manifold tank installations, when one (1) Volumetric Line Leak Detector (VLLD) sensor is installed, the system must use one (1) LIM position for each STP pump.

Usually, the dispenser sends a “hook signal” (110 VAC) to the submersible pump controller. The LIM intercepts this hook signal and communicates with the console through Petro-Net™. The LIM sends a 110/220 signal to the STP controller to turn the submersible pump ON (unless an alarm condition is sensed, then no signal is sent). An HV feedback signal will make sure that the submersible pump is turned ON.

The LIM operates with the console to do a test of the lines during periods of inactivity to constantly monitor the site for leaks in the line(s).

1.1 LIM Specifications

LIM Specifications	
Monitors:	Nozzle Signal and STP Relays
Dimensions (W x H x D):	8" x 8" x 4" (20.3 cm x 20.3 cm x 10.2 cm)
Power Requirements:	110/220 VAC, 50/60 Hz, 0.5A Max.
Temperature Range:	-40°F to 158°F (-40°C to 70°C)

1.2 Items Included with the 20-8321-LIM

Item	OPW Part Number
Noise Suppressors (qty 4)	02-4002
Fuel-Type Stickers	54-0538
LIM Line Leak Interface Procedure Guide	M00-20-8321-LIM

Section 2 LIM Installation

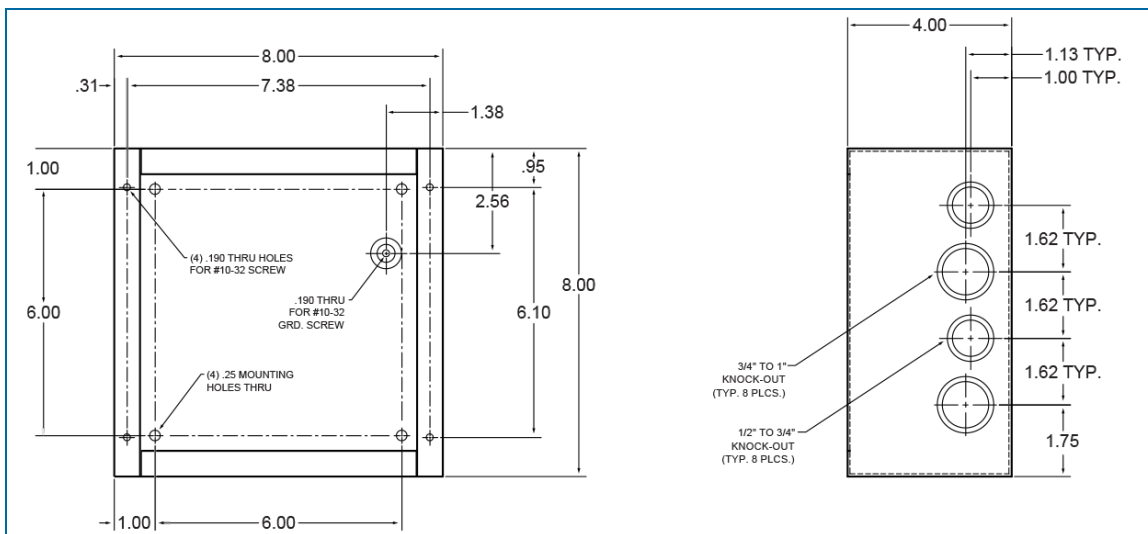
The LIM must be installed on a wall. Use only the supplied installation holes. Knockout locations are shown below. LIMs must have communication connections to the console and AC power.



IMPORTANT: The LIM module is not NEMA-rated and must not be installed outdoors.



IMPORTANT: DO NOT DRILL HOLES IN THE ENCLOSURE. Only use the supplied knockouts. Seal all unused knockouts.



LIM Dimensions and Knockout Positions



NOTE: The knockout pattern of the bottom panel of the enclosure is the opposite from the top and sides.

2.1 LIM Wiring

To watch the instructional video “LIM Wiring Instructions,” use one of the links that follow:

- If you have a smartphone with a QR code scanner, scan this QR Code:



- If you are viewing this manual on a PC or laptop click this link:

[Click here to see the LIM Wiring Instructions video](#)



NOTE: LIM modules must have dedicated AC power and two (2) ground connections for the module and barrier.

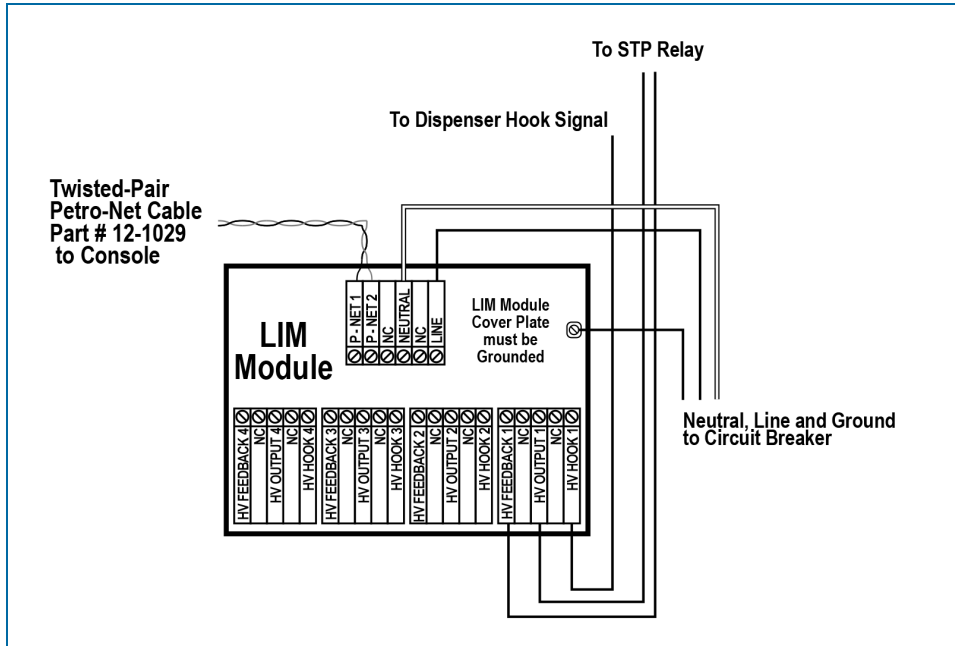
Noise suppressors are necessary with each LIM installation to decrease the electrical “noise” when the STP coil contact closes (sends the noise back through the HV Feedback and HV Output).

1. Pull two (2) AC power wires and one (1) ground wire (14-AWG minimum) from the circuit breaker to each LIM module.
2. All AC power must be in the same phase.



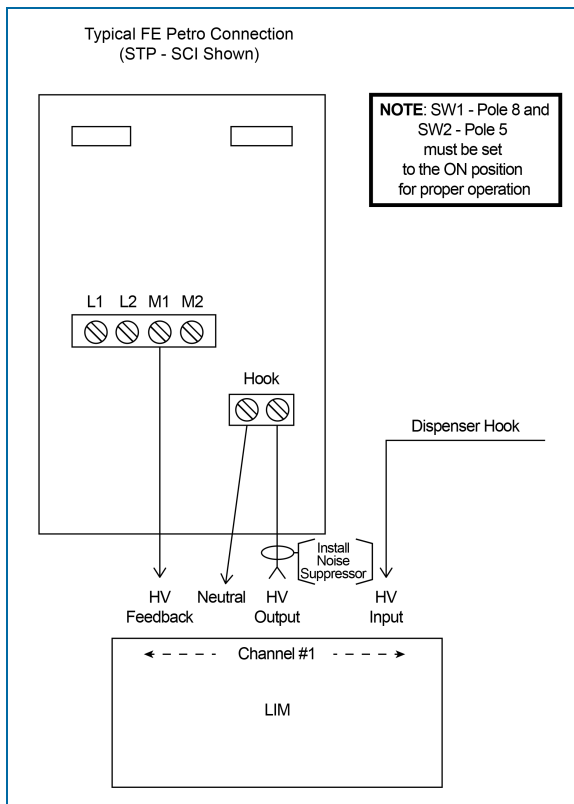
NOTE: The phase that the LIM relay is on is connected to the STP terminal motor. The LIM must be on the STP HV Feedback phase, as shown in the illustration below (the type of STP on site can change this. See the STP manufacturer's instructions).

3. Install the noise suppressor across the Neutral and Hot of the STP coil (refer to the Integra 500 Field Wiring Diagram).

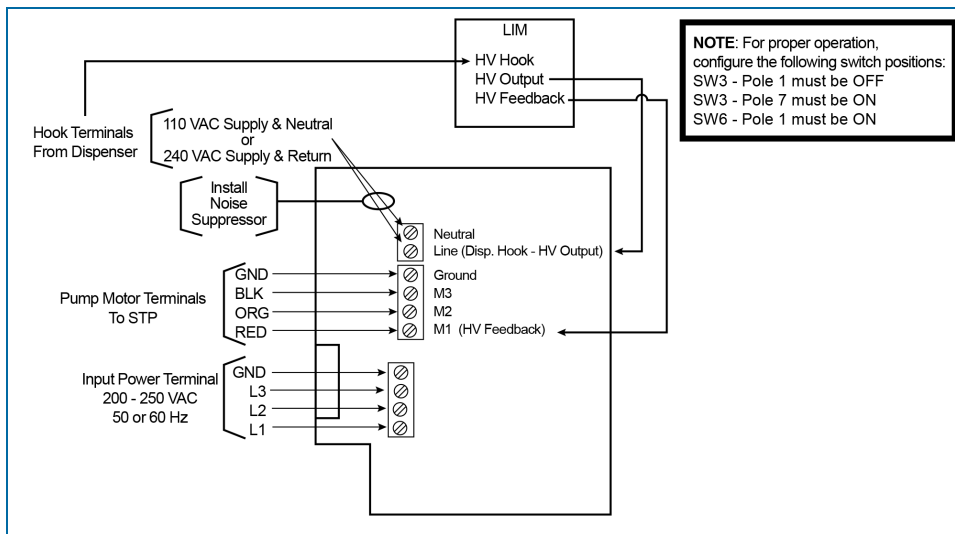


LIM Wiring

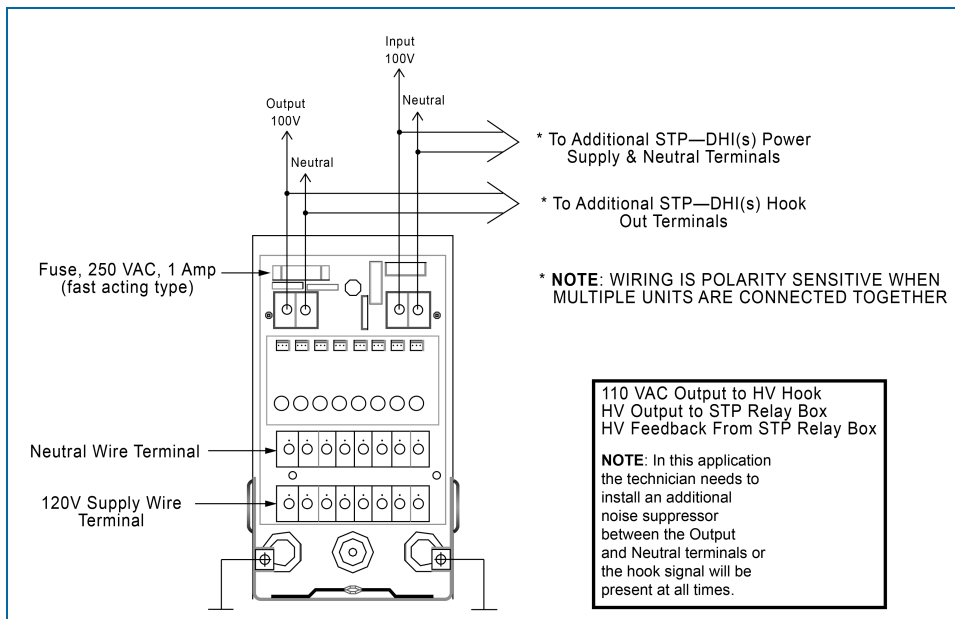
2.1.1 Typical FE Petro Wiring Connections



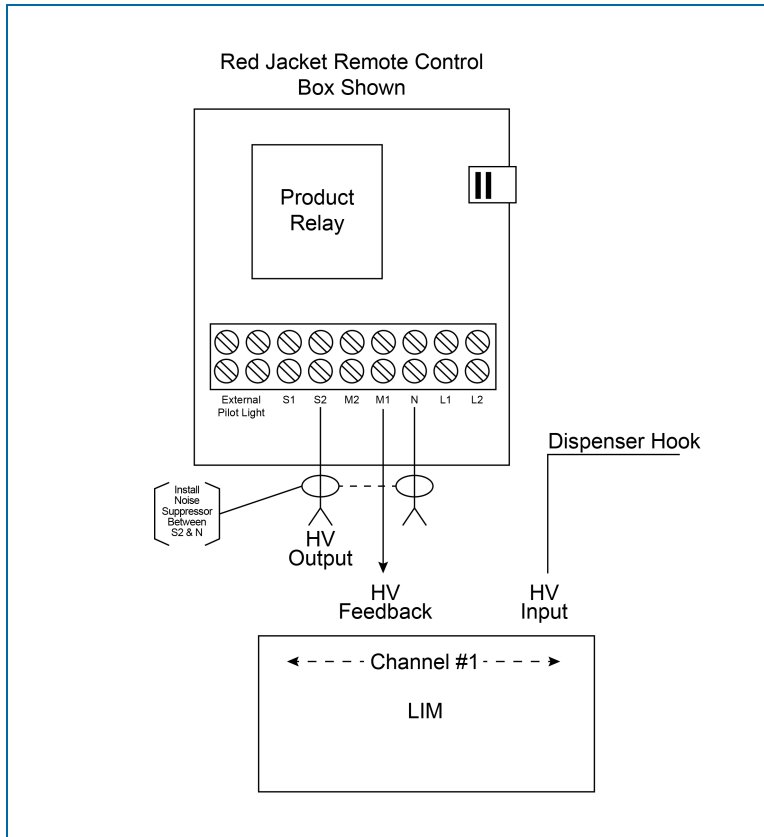
2.1.2 Variable Speed Control for FE Petro



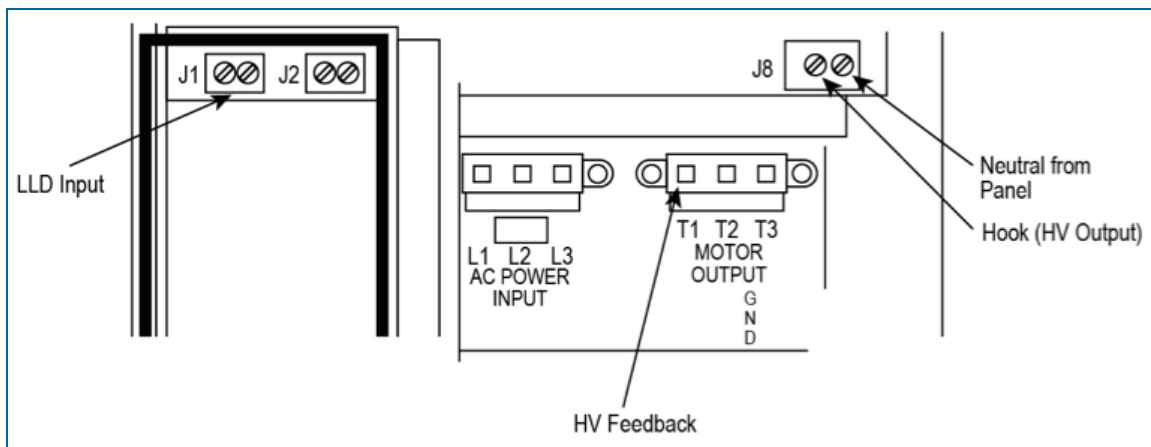
2.1.3 FE Petro STP-DHI (used in conjunction with Fe Petro STP-SCI or FE Petro VFC)



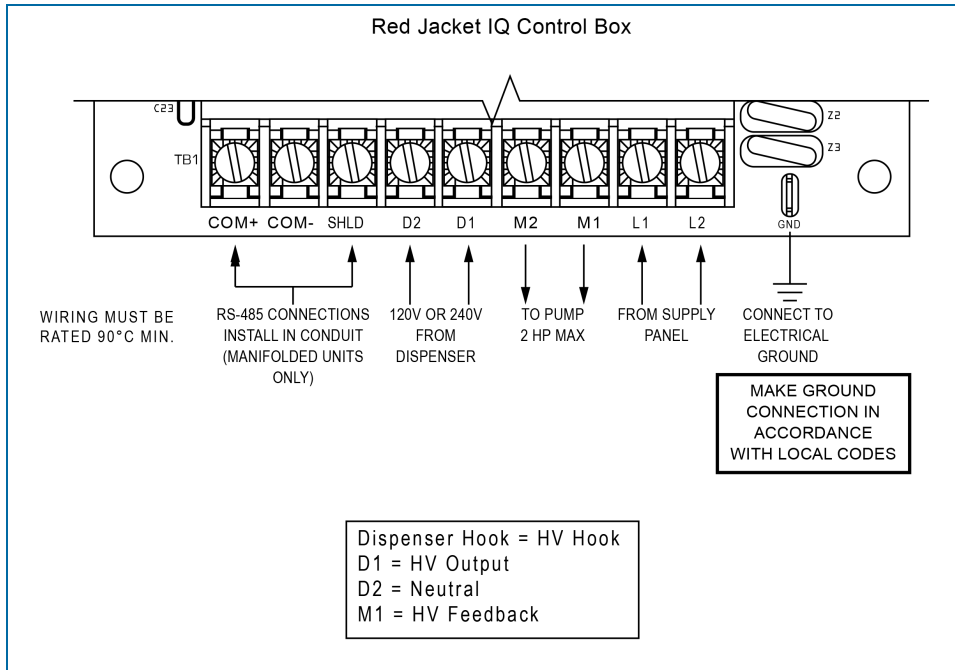
2.1.4 Typical Red Jacket Wiring Connections



2.1.5 Variable Speed Control Wiring for Red Jacket



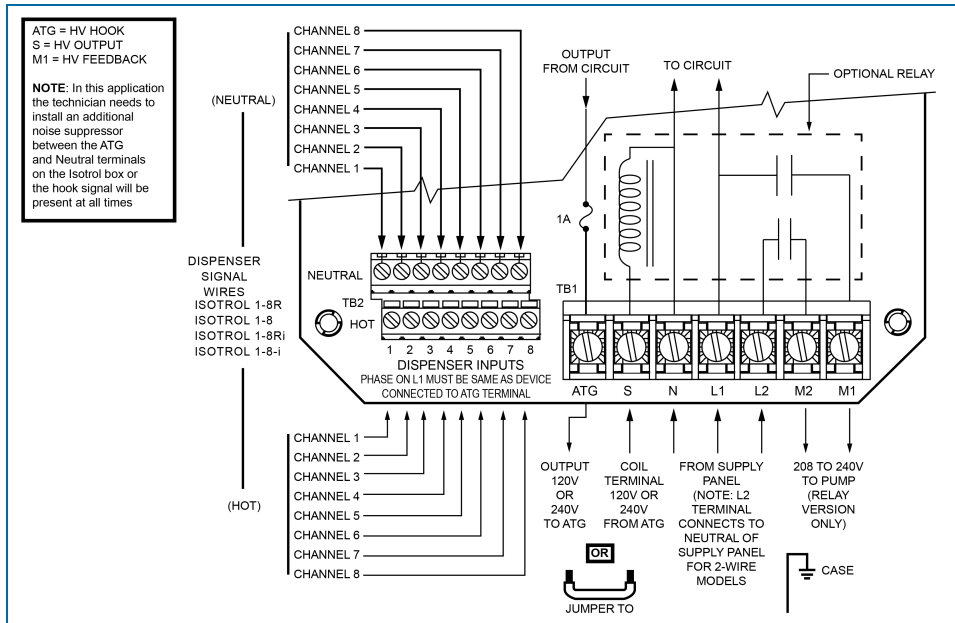
2.1.6 Red Jacket IQ Control Box



2.1.7 Red Jacket Isotrol



DANGER: To prevent the possibility of electrical shock, check for multiple power disconnects at your site. Be sure all power is off before installing or maintaining this unit.



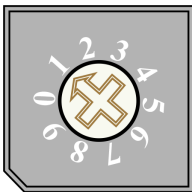
2.2 LIM Addressing

LIM modules must be given an identification number. Module numbers must be different in each **Module Group** (it is possible to give the same number to a LIM Module and an OM4 Module. It is NOT possible to give the same number to more than one LIM Module or to more than one OM4 Module. The module numbers are used during system configuration. Refer to the [M2021 Integra Configuration Guide](#) for information about system setup.

A small, white rotary switch is located at the top of the PC board inside each module. The switch has 10 positions, marked "0" to "9." A small arrow on the switch points to the current position. The default switch setting is "1."



IMPORTANT: Although the switch has 10 settings, only settings 1-8 are applicable. DO NOT set the switch to "0" or "9" – the module will NOT be sensed by the system.



LIM Address Rotary Switch

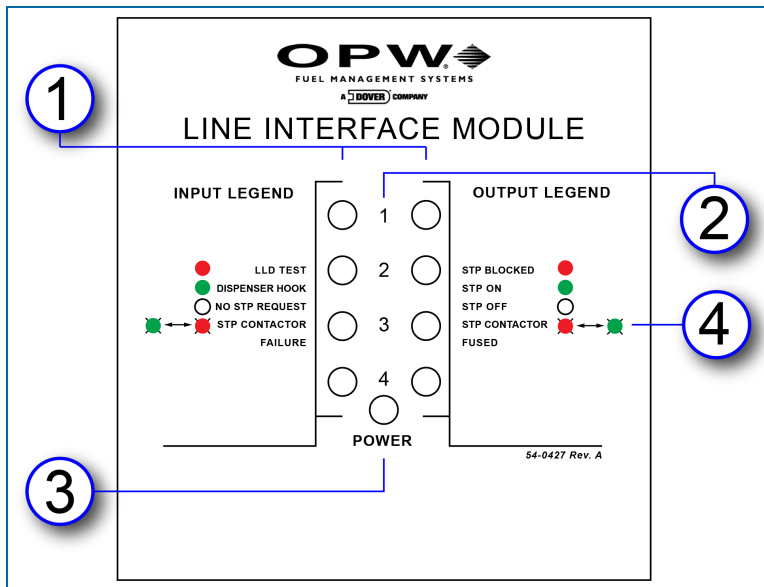
Use this procedure to set the Petro-Net™ address:

1. Turn the module power OFF.
2. Use a 1/4-inch (6-mm) blade screwdriver to carefully turn the rotary switch to the correct position.
3. Turn the module power to ON.





NOTICE: Do not change the module number while the LIM module power is ON.

Section 3 LIM Labels



LIM Front Panel Label

The LED lights on the front panel of the LIM show the status of the various LIM functions. Each channel is shown with input (left) and output (right) status LEDs. The Input Legend and Output Legend describe what each LED light indicates.

1. Input (nozzle signal) and output (STP contractors) LED lights.
2. LIM channel numbers.
3. Power indicator LED.
4. Blinking lights on the legend are indicated by these symbols:  

LED Legend for LIM Diagnostics

The LIM Diagnostics screen displays the current LIM status refreshing automatically every five (5) seconds. Under normal conditions of use, the LIM module LED input/output status lights will show the following:

- GREEN/GREEN: The dispenser hook signal is activated and the STP controller signals the pump to turn on. If the input LED shows RED, this indicates that the tank gauge system is in control and performing line diagnostics.
- RED/GREEN: The tank gauge system is performing a line leak test. During 0.2 or 0.1 GPH scheduled precision tests, the RED LED will stay on longer (maybe several hours).
- GREEN/RED: Indicates that the dispenser hook signal is detected, but an alarm condition was identified. The LIM blocks the signal to the STP and the pump will not turn ON.
- If the HV INPUT does not detect high voltage feedback from the STP contactor when the relay is closed, the LIM module will flash, indicating contactor failure.
- If the HV INPUT continues to detect high voltage feedback from the STP after the relay is opened, the LIM module will flash, indicating contactor fused off and there is a problem with the line.

A 3.0 GPH catastrophic test is performed after activation of the STP if there is no customer hook request for the product associated.



NOTE: Please be aware that the customer always takes priority if no problem is detected in the line. This cancels any test in progress.

3.1 Fuel-Type Stickers

<i>Gas-Reg</i>	<i>Gas-Reg</i>	<i>Gas-Reg</i>	<i>Gas-Reg</i>
<i>Gas-Mid</i>	<i>Gas-Mid</i>	<i>Gas-Mid</i>	<i>Gas-Mid</i>
<i>Gas-Prem</i>	<i>Gas-Prem</i>	<i>Gas-Prem</i>	<i>Gas-Prem</i>
<i>Diesel</i>	<i>Diesel</i>	<i>Diesel</i>	<i>Diesel</i>
<i>LPG</i>	<i>LPG</i>	<i>LPG</i>	<i>LPG</i>
<i>E10</i>	<i>E10</i>	<i>E10</i>	<i>E10</i>
<i>E15</i>	<i>E15</i>	<i>E15</i>	<i>E15</i>
<i>E85</i>	<i>E85</i>	<i>E85</i>	<i>E85</i>
<i>Bio Fuel</i>	<i>Bio Fuel</i>	<i>Bio Fuel</i>	<i>Bio Fuel</i>

Fuel Type Stickers

A sheet of “peel and stick” fuel-type stickers is provided with each LIM. These can be used to adhere to the front label in place of the numbers 1 – 4 to identify the fuel type that is assigned for each position.

Section 4 LLD Warning Tag (OPW p/n 54-0531)

WARNING: Disconnect power to the LIM, Submersible Turbine Pump (STP) and tank-gauge console before any system maintenance. Failure to disconnect the power can result in product spray if a line-leak test is done by the system.



Make sure applicable dispenser shear valves are closed. Test for proper valve shutoff before dispenser hydraulic service.

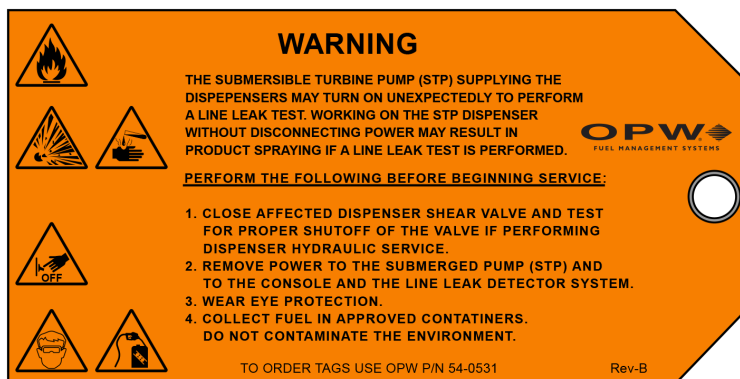


Wear approved eye protection and complete any applicable lockout/tagout procedures required by site, local or state regulations.



Collect fuel spills only in approved containers to prevent environmental contamination.

Several LLD Warning tags with cable ties (OPW p/n 54-0531) are provided in the parts kit (OPW p/n 20-6206) that is supplied with the VLLD Sensor. Use a cable tie to attach a tag at each LIM, STP, dispenser and console as a reminder to follow the precautions above prior to system maintenance.



LLD Warning Tag



Warranty

OPW Fuel Management Systems warrants that all OPW Tank Gauge and Petro Vend Fuel Control systems supplied by OPW Fuel Management Systems to the Original Purchaser will be free from defects in material and/or workmanship under normal use and service for a period of 12 months from the date of installation or 15 months from the date of shipment from OPW. Additionally, OPW Fuel Management Systems warrants that all upgrades and replacement parts (new and remanufactured) supplied by OPW Fuel Management Systems will be free from defects in material and workmanship under normal use and serviced for a period of 90 days from the date of installation or for the remainder of the system's original warranty, whichever is greater, as set forth in the first sentence of this statement. The foregoing warranties will not extend to goods subjected to misuse, neglect, accident, or improper installation or maintenance or which have been altered or repaired by anyone other than OPW Fuel Management Systems or its authorized representative. The buyer's acceptance of delivery of the goods constitutes acceptance of the foregoing warranties and remedies, and all conditions and limitations thereof.

If a claim is made within the warranted time period that any equipment and/or remanufactured part is defective in material or workmanship under normal use and service, such equipment and/or remanufactured part shall be returned to OPW Fuel Management Systems, freight prepaid. If such equipment or remanufactured part is found by OPW Fuel Management Systems in its sole judgment to be defective in material or workmanship under normal use and service, OPW Fuel Management Systems shall, at its sole option, repair or replace such equipment and/or remanufactured part (excluding, in all instances, fuses, ink cartridges, batteries, other consumable items, etc.) OPW Fuel Management Systems shall not be held responsible for data loss or retrieval on returned products.

The warranties, as set forth above, are made expressly in lieu of all other warranties, either expressed or implied (including, without limitation, warranties of merchantability and fitness for any particular purpose and of all other obligations or liabilities on OPW Fuel Management Systems' part.) Further, OPW Fuel Management Systems neither assumes, nor authorizes any other person to assume for it, any other liability in connection with the sale of the systems, or any new/replacement part that has been subject to any damage from any act of nature or any force majeure. Any terms proposed by the Original Purchaser either orally or in writing are expressly rejected. The terms and conditions expressed in this document may only be changed upon the express written consent of OPW Fuel Management Systems.

The term "Original Purchaser" as used in these warranties shall be deemed to mean the authorized OPW Fuel Management Systems' distributor to which the system or any new/replacement part was originally sold. These warranties may be assigned by the original purchaser to any of its customers who purchase any OPW Fuel Management Systems' systems or new/replacement parts. This document shall be governed by and construed in accordance with the law of the State of Illinois. OPW Fuel Management Systems and Original Purchaser agree that any legal action or proceeding under or with respect to this document may ONLY be brought in the courts of the State of Illinois, or the United States District Court having jurisdiction in the City of Hodgkins, Illinois. Original Purchaser expressly consents to personal jurisdiction in any of the above-mentioned forums and agrees to waive all defenses based on improper venue or inconvenient form should an action be brought therein.

The sole liability of OPW Fuel Management Systems, for any breach of warranty, shall be as set forth above. OPW Fuel Management Systems does not warrant against damage caused by accident, abuse, faulty or improper installation or operation. In no event shall manufacturer's liability on any claim for damages arising out of the manufacture, sale, delivery or use of the goods exceed the original purchase price of the goods. In no event shall OPW Fuel Management Systems be liable for any direct, indirect, incidental or consequential damage or loss of product.

TERMS

Ex-works our factory, Hodgkins, Illinois, USA

Installation not included.

All trade names are registered. Patents pending.

Subject to engineering improvement and/or other changes.

Revisions

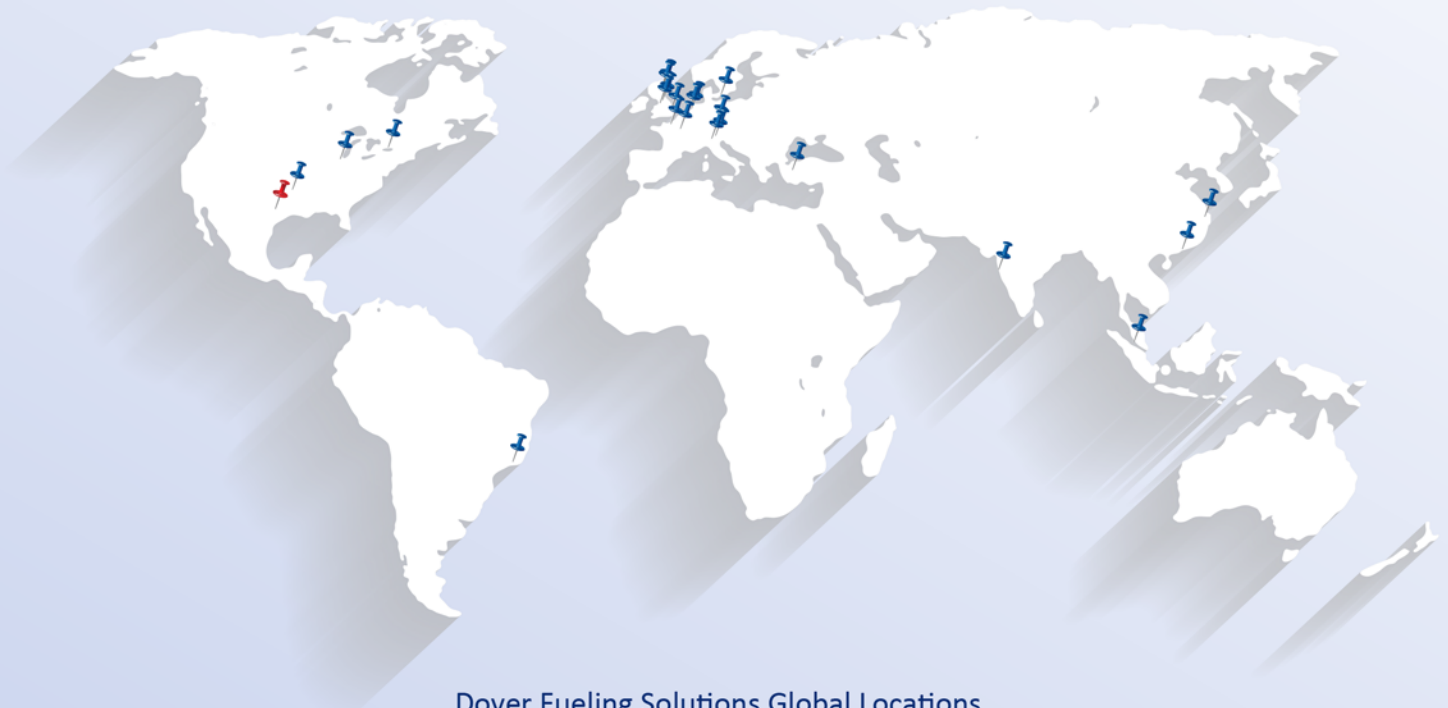
Revision #	ECO	Effective	Software Version	Key Changes
0	598	11/21/14	NA	Initial Release
1	1501	1/29/19		Update VLLD Tag 54-0531 Image file



NOTE: It is possible that older software versions might not support all features



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