In-Station Diagnostics (ISD) Pressure Management Control (PMC)

TLS-450PLUS Consoles

Troubleshooting Guide



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DAMAGE CLAIMS / LOST EQUIPMENT

Thoroughly examine all components and units as soon as they are received. If any cartons are damaged or missing, write a complete and detailed description of the damage or shortage on the face of the freight bill. The carrier's agent must verify the inspection and sign the description. Refuse only the damaged product, not the entire shipment.

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- 1. Contact Veeder-Root Customer Service at 800-873-3313 with the specific part numbers and quantities that were missing or received damaged.
- 2. Fax signed Bill of Lading (BOL) to Veeder-Root Customer Service at 800-234-5350.
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- 3. If "lost" equipment is delivered at a later date and is not needed, Veeder-Root will allow a Return to Stock without a restocking fee.
- 4. Veeder-Root will NOT be responsible for any compensation when a customer chooses their own carrier.

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For the parts return procedure, please follow the appropriate instructions in the "General Returned Goods Policy" pages in the "Policies and Literature" section of the Veeder-Root **North American Environmental Products** price list. Veeder-Root will not accept any return product without a Return Goods Authorization (RGA) number clearly printed on the outside of the package.

FCC INFORMATION

This equipment complies with the requirements in Part 15 of the FCC rules for a Class A computing device. Operation of this equipment in a residential area may cause unacceptable interference to radio and TV reception requiring the operator to take whatever steps are necessary to correct the interference.

INSTALLATION IN THE STATE OF CALIFORNIA

Please refer to the California Air Resources Board Vapor Recover Certification Phase II EVR Executive Order web site (*www.arb.ca.gov/vapor/eo-evrphaseII.htm*) for the latest manual revisions pertaining to VR 204 (VST Phase II EVR System Including ISD System).

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Warranty

This warranty applies only when the product is installed in accordance with Veeder-Root's specifications by Veeder-Root certified installers. This warranty will not apply to any product which has been subjected to misuse, negligence, accidents, systems that are misapplied or are not installed per Veeder-Root specifications, modified or repaired by unauthorized persons, or damage related to acts of God. Veeder-Root is not liable for incidental, consequential, or indirect damages or loss, including, without limitation, personal injury, death, property damage, environmental damages, cost of labor, clean-up, downtime, installation and removal, product damages, loss of product, or loss of revenue or profits. This warranty applies to the initial purchaser and any subsequent purchaser for the duration of the warranty period. THE WARRANTY CONTAINED HEREIN IS EXCLUSIVE AND THERE ARE NO OTHER EXPRESS, IMPLIED, OR STATUTORY WARRANTIES. WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED.

TLS-450PLUS MONITORING SYSTEM

We warrant that this product shall be free from defects in material and workmanship and is compliant with all applicable performance standards and specifications for which it has been certified, for a period of one (1) year from the date of installation when proof of date of installation is provided or twenty-four (24 months) from the date of manufacture when proof of date of installation is not provided. During the warranty period, we or our representative will repair or replace the product, if determined by us to be defective, at the location where the product is in use and at no charge to the purchaser. **LAMPS, FUSES, AND LITHIUM BATTERIES ARE NOT COVERED UNDER THIS WARRANTY.**

If "Warranty" is purchased as part of the Fuel Management Service, Veeder-Root will maintain the equipment for the life of the contract in accordance with the written warranty provided with the equipment. A Veeder-Root Fuel Management Services Contractor shall have free site access during Customer's regular working hours to work on the equipment. Veeder-Root has no obligation to monitor federal, state or local laws, or modify the equipment based on developments or changes in such laws.

MODULES, KITS, OTHER COMPONENTS (PARTS PURCHASED SEPARATE OF A COMPLETE CONSOLE)

We warrant that this product shall be free from defects in material and workmanship and is compliant with all applicable performance standards and specifications for which it has been certified, for a period of one (1) year from the date of installation when proof of the date of installation is provided or fifteen (15) months from the date of manufacture when proof of date of installation is not provided. We warrant that the lithium batteries (excluding EVR BATTERY PACK) shall be free from defects in material and workmanship for a period of three (3) months from date of invoice. We will repair or replace the product if the product is returned to us; transportation prepaid by user, within the warranty period, and is determined by us to be defective. **LAMPS AND FUSES ARE NOT COVERED UNDER THIS WARRANTY.**

IN STATION DIAGNOSTICS (ISD)

For components used in ISD systems (Vapor Flow Sensor, Vapor Pressure Sensor, Software, TLS RF, Wireless Repeater, Wireless Transmitter & Wireless Receiver), excluding **LAMPS, FUSES, AND LITHIUM BATTERIES**, the following warranty applies:

We warrant that this product shall be free from defects in material and workmanship and is compliant with all applicable performance standards and specifications for which it has been certified, for a period of one (1) year from the date of ISD start-up when proof of the date of install is provided or twenty-four (24) months from the date of manufacture when proof of date of installation is not provided. During the warranty period, we and or our representative will repair or replace the product, if determined by us to be defective, at the location where the product is in use, at no charge to the purchaser.

For ISD components installed after the initial ISD start-up, we warrant that these products shall be free from defects in material and workmanship and is compliant with all applicable performance standards and specifications for which it has been certified, for a period of one (1) year from the date of installation when proof of the date of install is provided or fifteen (15) months from date of manufacture when proof of date of installation is not provided. We will repair or replace the product if the product is returned to us; transportation prepaid by user, within the warranty period, and is determined by us to be defective.

EVR BATTERY PACK

We warrant that this product shall be free from defects in material and workmanship and is compliant with all applicable performance standards and specifications for which it has been certified, for a period of one (1) year from the date of installation when proof of the date of install is provided or fifteen (15) months from the date of manufacture when proof of date of installation is not provided. The replacement EVR Battery Pack warranty period will be the REMAINING warranty period of the original EVR Battery Pack. LAMPS, FUSES, AND LITHIUM BATTERIES OTHER THAN THE EVR BATTERY PACK, ARE NOT COVERED UNDER THIS WARRANTY.

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Introduction

This manual contains suggested troubleshooting procedures for Veeder-Root In-Station Diagnostics (ISD)/ Pressure Management Control (PMC). This is not intended to replace required testing procedures required by any California Air Resource Board Executive Orders, or any local regulations. This manuals' objective is to be a guide to show what "tools" are available to assist in troubleshooting possible issues pertaining to ISD/PMC. Further assistance can be obtained by contacting Veeder-Root Technical Support.

Contractor Certification Requirements

Veeder-Root requires the following minimum training certifications for contractors who will install and setup the equipment discussed in this manual:

Service Technician Certification (Previously known as Level 2/3): Contractors holding valid Technician Certifications are approved to perform installation checkout, startup, programming and operations training, system tests, troubleshooting and servicing for all Veeder-Root Series Tank Monitoring Systems, including Line Leak Detection. This certification includes TLS-3xx and TLS4xx certification training.

In-Station Diagnostics (ISD-PMC) Technician Certification: ISD PMC Contractors holding a valid ISD/PMC Certification are approved to perform (ISD/PMC) installation checkout, startup, programming, and operations training. This training also includes troubleshooting and service techniques for the Veeder-Root In-Station Diagnostics system. A current Veeder-Root Technician Certification is a prerequisite for the ISD/PMC course.

All service personal on site must comply with all recommended safety practices identified by OSHA and your employer.

Review and comply with all the safety warnings in this and any related documents, and any other Federal, State or Local requirements.

Warranty Registrations may only be submitted by selected Distributors.

Related Manuals

577013-796	Vapor Flow Meter Installation Manual
577013-797	Pressure Sensor Installation Manual
577013-401	TLS Consoles Point-of-Sale (POS) Application Guide
577014-073	TLS-450PLUS Site Prep and Installation Manual
577014-033	TLS-XB Site Prep and Installation Manual
577014-461	In-Station Diagnostics (ISD) TLS-450PLUS Consoles for Healy and ARID Assist Install, Setup, & Operation Manual
577014-460	Pressure Management Control TLS-450PLUS Consoles for VR Polisher Install,
	Setup & Operation Manual
577014-484	In-Station Diagnostics (ISD) TLS-450PLUS Consoles for Veeder-Root Polisher, Healy CAS and Hirt VCS 100 Install, Setup, & Operation Manual
577014-075	TLS450PLUS Troubleshooting Guide
577014-110	TLS-450PLUS/TLS4 Operator's Manual
577013-950	Veeder - Root Serial Interface Manual for TLS4 Series TLS-450 Series TLS-450Plus Series

Safety Warnings

AWARNING FAILURE TO COMPLY WITH THE FOLLOWING WARNINGS AND SAFETY PRECAUTIONS COULD CAUSE DAMAGE TO PROPERTY, ENVIRONMENT, RESULTING IN SERIOUS INJURY OR DEATH.

The following safety symbols are used throughout this manual to alert you to important safety hazards and precautions.

(C)	EXPLOSIVE Fuels and their vapors are extremely explosive if ignited.		FLAMMABLE Fuels and their vapors are extremely flammable.
4	ELECTRICITY High voltage exists in, and is supplied to, the device. A potential shock hazard exists.		TURN POWER OFF Live power to a device creates a potential shock hazard. Turn Off power to the device and associ- ated accessories when servicing the unit.
A WARNING	WARNING WARNING indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.	NOTICE	NOTICE NOTICE is used to address practices not related to physical injury.
	READ ALL RELATED MANUALS Knowledge of all related procedures before you begin work is important. Read and understand all manuals thoroughly. If you do not understand a procedure, ask someone who does.		

ISD Post-Installation Checklist

Refer to Post Installation Checklist to review installation. If you should experience Low Or No A/L Ratio during the Operability test, additional information on those results is discussed after the checklist.

	DATE					
SERVICE COMPANY NAME	TELEPHONE					
SERVICE TECHNICIAN	VEEDER-ROOT TECH CERTIFICATION #					
TRAINING LEVEL (CIRCLE ONE): Serv. Tech. or ISD Tech.	ISD TRAINED?					
STATION NAME						
STATION ADDRESS	CITY STAT	E ZIP				
WARNING!						
Before installing any vapor recovery equipment the installer must be familiar with all state and federal regulations regarding the safe installation and operation of each component. (NFPA 30A).						
A Certified Veeder-Root contractor or Authorized Service Contractor (ASC) with Veeder-Root In-Station Diagnostics training must be available (on-site) to over-see this post-installation checklist.						
Review and comply with all the safety warnings in the installation manuals and any other national, State or Local requirements.						
For a complete list of precautions, please consu	It the Veeder-Root ISD manuals.					
Required Reference Manuals						
TLS-450PLUS Console Site Prep and Installation	on Manual - P/N 577014-073					
Pressure Management Control Install, Setup, & Operation Manual - P/N 577014-460						
In-Station Diagnostics (ISD) TLS-450PLUS Consoles for Healy and ARID Assist Install, Setup, & Operation Manual - P/N 577014-461						
In-Station Diagnostics (ISD) TLS-450PLUS Cor Healy CAS and Hirt VCS 100 Install, Setup, & C	nsoles for Veeder-Root Polisher, Dperation Manual - P/N 577014-484					
TLS-450PLUS/TLS4 Operator's Manual - P/N 5	577014-110					
Laptop Recommended						
Laptop connection to console will allow ASC to the Veeder-Root WEB access.	access Pressure Graphs, Hose Histograms, etc. us	ing				

ISD with Healy Assist System Checklist

Procedure The followi	eng recommended procedure can be followed at TLS GUI upon completion of the ISD software setup:	
STEP 1.	EVR TYPE is set to VACUUM ASSIST? - Check in Setup> Vapor Collection> General screen	
STEP 2.	VACUUM ASSIST TYPE is set to HEALY VAC? - Check in Setup> Vapor Collection> General screen	
STEP 3.	NOZZLE A/L RANGE MAX is set to 1.15 and MIN is set to 0.95? - Check in Setup> Vapor Collection> General screen	
STEP 4.	VAPOR PROCESSOR TYPE is set to NONE - Check inSetup> Vapor Management> Processor screen	
Step 5	Is there an Enabled Vapor Pressure Sensor to be used for PMC? Check in Setup> Devices> Pressure Sensor screen first.	
STEP 6.	There is an installed and ENABLED "AIRFLOW METER" (i.e. ISD Vapor Flow Meter) in each vapor recovery dispenser? - Check in Setup> Devices> Air Flow Meter screen	
STEP 7.	Is the Vapor Pressure Sensor in Step 5, assigned to be used for vapor management? Check in Setup> Vapor General> General screen.	
STEP 8.	There is a Hose configured and Enabled for each vapor recovery hose? - Check in Setup> Vapor Collection> Hose Settings screen	
STEP 9.	Each vapor recovery gasoline hose is assigned and mapped correctly in the Hose Mapping screen: Setup> Vapor Collection> Hose Mapping .	
STEP 10	Are all the required shutdown alarms assigned via Setup> Automatic Events> Device Tasks ? Use Online Help if assistance is needed.	
STEP 11.	Enter into setup and then exit out (this will cause a TLS console System Self Test).	
STEP 12.	Using Online Help and the Troubleshooting Guide, respond to all ISD Setup ALARMS posted on the console.	
STEP 13.	Repeat Steps 11 & 12 until there are no ISD setup or self-test alarms. The TLS Console display reads SYSTEM STATUS.	
STEP 14.	Turn the ISD Vapor Pressure Sensor valve so that the sensor is reading ambient pressure. Navigate to Menu> Diagnostics> Vapor Pressure Sensor> Calibrate . If the ambient pressure reading offset is greater than +/- 0.20 IWC call Veeder-Root Technical Support for assistance. Do not calibrate at this time.	
STEP 15.	Returned the ISD Vapor Pressure Sensor calibration valve so that the sensor is reading UST vapor pressure? - Check in Diagnostics> Vapor Pressure Sensor> Calibrate screen and verify that UST vapor pressure is now being read.	
STEP 16.	After dispensing via GUI: Diagnostics> Vapor Monitor> Hose Events: or WEB: Diagnostics> Vapor Monitor> Hose Diagnostics> Hose Events: An ISD A/L reading is coming in for each gasoline hose at the location?	
STEP 17.	The TLS console clock is set to the correct date, time and to U.S. Pacific Time Zone?	

ISD with VST Balance System/V-R Vapor Polisher Checklist

Procedure

The following recommended procedure can be followed at the completion of the ISD software setup for VST Balance Systems with Veeder-Root Vapor Polisher:

STEP 1.	EVR TYPE is set to BALANCE? - Check in Setup> Vapor Collection> General screen	
STEP 2.	The Balance Nozzle Type is VST? - Check in Setup> Vapor Collection> General screen	
STEP 3.	The Vapor Processor set to Veeder-Root Polisher? - Check in Setup> Vapor Management> Processor screen	
Step 4.	Verify in Setup> Vapor Management> Processor that the Vapor Valve field shows the assigned Vapor Valve. If not, go to Setup> Devices> Vapor Valve configure and enable the installed Vapor Valve.	
STEP 5.	There is an installed and enabled "AIRFLOW METER" (i.e. ISD Vapor Flow Meter) in each vapor recovery dispenser? - Check in Setup> Devices> Air Flow Meter screen.	
STEP 6.	Is there an enabled Vapor Pressure Sensor assigned for PMC? Check in Setup> Vapor General> General screen. If not, check in Setup> Devices> Vapor Pressure Sensor.	
STEP 7.	There is a Hose configured and Enabled for each vapor recovery hose? - Check in Setup> Vapor Collection> Hose Settings screen	
STEP 8.	Each vapor recovery hose is assigned and mapped correctly in the Hose Mapping screen": Setup>Vapor Collection> Hose Mapping .	
STEP 9.	Enter into setup and then exit out (this will cause a TLS console System Self Test).	
STEP 10.	Using Online Help and the Troubleshooting Guide, respond to all ISD Setup ALARMS posted on the console.	
STEP 11.	Repeat Steps 9 & 10 until there are no ISD setup or self-test alarms. The TLS Console display reads SYSTEM STATUS.	
STEP 12.	Turn the ISD Vapor Pressure Sensor valve so that the sensor is reading ambient pressure. Navigate to Menu> Diagnostics> Vapor Pressure Sensor> Calibrate . If the ambient pressure reading offset is greater than +/- 0.20 IWC call Veeder-Root Technical Support for assistance. Do not calibrate at this time.	
STEP 13.	Returned the ISD Vapor Pressure Sensor calibration valve so that the sensor is reading offset is UST vapor pressure? - Check in Diagnostics> Vapor Pressure Sensor> Calibrate screen and verify that UST vapor pressure is now being read.	
	After dispensing via GUI: Diagnostics> Vapor Monitor> Hose Events: or WEB: Diagnostics>	
STEP 14.	Vapor Monitor> Hose Diagnostics> Hose Events: An ISD A/L reading is coming in for each	
	gasoline hose at the location?	
STEP 15.	The TLS console clock is set to the correct date, time and to U.S. Pacific Time Zone?	

ISD with VST Balance System/V-R HIRT VCS 100

Procedure The followi	• and recommended procedure can be followed at the completion of the ISD software setup for VST Balance	
Systems w	ith HIRT Vapor Processor	
STEP 1.	EVR TYPE is set to BALANCE? - Check in Setup> Vapor Collection> General screen	
STEP 2.	The Vapor Processor set to HIRT? - Check in Setup> Vapor Management> Processor screen	
STEP 3.	Verify in Setup> Vapor Management> Processor that the Ext Input 1 field shows the assigned External Input. If not, go to Setup> Devices> External Input; Select External Input. Configure the following External Input (Fault signal) as follows: • Configured = Enabled, • Label = HIRT VP Fault, • Type = Vapor Processor, • Orientation = Normally Closed, • Save	
Step 4.	There is an installed and enabled "AIRFLOW METER" (i.e., ISD Vapor Flow Meter) in each vapor recovery dispenser? Check in Setup> Devices> Air Flow Meter screen.	
STEP 5.	Is there an enabled Vapor Pressure Sensor assigned for PMC? Check in Setup> Vapor General> General screen. If not, check in Setup> Devices> Vapor Pressure Sensor .	
STEP 6.	There is a Hose configured and Enabled for each vapor recovery hose? - Check in Setup> Vapor Collection> Hose Settings screen.	
STEP 7.	Each vapor recovery hose is assigned and mapped correctly in the Hose Mapping screen? Check in Setup>Vapor Collection> Hose Mapping .	
STEP 8.	Enter Setup and then exit out (this will cause a TLS console System Self-Test).	
STEP 9.	Using Online Help and the Troubleshooting Guide, respond to all ISD Setup ALARMS posted on the console.	
STEP 10.	Repeat Steps 8 & 9 until there are no ISD setup or self-test alarms. The TLS Console display reads SYSTEM STATUS .	
STEP 11.	Turn the ISD Vapor Pressure Sensor valve so that the sensor is reading ambient pressure. Navigate to Menu> Diagnostics> Vapor Pressure Sensor> Calibrate . If the ambient pressure reading offset is greater than +/- 0.20 IWC call Veeder-Root Technical Support for assistance. Do not calibrate at this time.	
STEP 12.	Returned the ISD Vapor Pressure Sensor calibration valve so that the sensor is reading offset is UST vapor pressure? - Check in Diagnostics> Vapor Pressure Sensor> Calibrate screen and verify that UST vapor pressure is now being read.	-
STEP 13.	After dispensing via GUI: Diagnostics> Vapor Monitor> Hose Events : or WEB: Diagnostics> Vapor Monitor> Hose Diagnostics> Hose Events : An ISD A/L reading is coming in for each gasoline hose at the location?	
STEP 14.	The TLS console clock is set to the correct date, time and to U.S. Pacific Time Zone?	

Question

Why are the A/L extremely low or non existent when running tests via **Diagnostics>Vapor Monitor>Hose Events** immediately after installation?

EXPLANATION

- 1. Refer to Post Installation Checklist (on page 3) to review installation.
- 2. If the A/L are non-existent or extremely low (50%) for all nozzles during the Operability Test it indicates an air flow meter problem.
 - a. If using the BirProtocolDim protocol make sure"Units Reported is set to "US": **Setup>Communications>Serial Port**.
 - b. Healy Vacuum pump V/L needs to be set.

- c. Check the ball valve between the Healy pump and air flow meter is not closed or partially closed.
- d. Check that the installed meter does not still have the dust caps on. This will significantly reduce airflow for both all nozzles on the dispenser.
- 3. See fnn: CHK VAPOR FLOW MTR troubleshooting procedures (on page 31).

ISD ShutDown Requirements

For ISD on the TLS450PLUS, the gasoline lines must be able to be shut down for required ISD Site/Hose Alarms. Dispenser relays may be used to shut down gasoline dispensers for Hose Alarms.

The TLS 450 setup requires at least one Line to shut down for required ISD Shutdown Alarms, otherwise the 'Missing Relay' warning will post. Ensure that all gasoline Lines/Hoses are configured to shut down on required ISD Site/Hose Alarms. Hoses may also be shut down using dispenser relays. ISD Shutdown requirements are accomplished using Automatic Events Setup. Refer to Table 1 for required ISD Shutdown Alarms.

Alarm	Days to Failure	Shutdown Required				
ISD DEGRD PRES WARN	30	Optional				
ISD DEGRD PRES FAIL	-	Yes				
ISD GROSS PRES WARN	7	Optional				
ISD GROSS PRES FAIL	-	Yes				
ISD VAPOR LEAK WARN	7	Optional				
ISD VAPOR LEAK FAIL	-	Yes				
ISD SENSOR OUT WARN	7	Optional				
ISD SENSOR OUT FAIL	-	Optional ¹				
ISD SETUP WARN	7	Optional				
ISD SETUP FAIL	-	Optional ¹				
hnn: DEGRD COLLECT WARN	7	Optional				
hnn: DEGRD COLLECT FAIL	-	Yes				
hnn: GROSS COLLECT WARN	1	Optional				
hnn: GROSS COLLECT FAIL	-	Yes				
hnn: FLOW COLLECT WARN	1	Optional				
hnn: FLOW COLLECT FAIL	-	Yes				
ISD VP STATUS WARN	1	Optional				
ISD VP STATUS FAIL ²	-	Yes				
ISD VP PRES WARN	1	Optional				
ISD VP PRES FAIL ²	-	Yes				
	·					
Assist EVR Systems Only						
Balance EVR Systems Only						
Vapor Processor Required						
¹ Shutdown is optional for these alarm conditions and it is recommended that they be enabled. ² Shutdown applies to HIRT and ARID Permeator.						

Table 1: ISD Shutdown Alarms

ISD Alarm Message Diagnostics

The TLS console is continuously monitoring the vapor recovery system and ISD sensors for alarm conditions such as excessively high or low vapor collection, containment system vapor leakage and equipment problems.

ALARM MESSAGES

ISD monitoring tests operate once each day. Warning and failure conditions are posted at the designated posting time after the tests are complete.

WARNINGS

WARNINGS indicate when attention is required. When a WARNING is posted a warning alarm event is logged in the ISD reports, posted on the status bar of the GUI and printed to the printer if setup in Automatic Events. If the condition persists, a WARNING will remain active for a 1, 7 or 30 day warning period depending on the test type.

FAILURES

If a WARNING condition persists, a FAILURE alarm will be posted after the warning period and THE SITE DISPENSING EQUIPMENT IS SHUTDOWN (see RESTARTING STATION AFTER ISD SHUTDOWN for instructions on restarting dispensing). When a FAILURE is posted a failure alarm event is logged in the ISD reports, posted on the status bar of the GUI and printed to the printer if setup in Automatic Events.

RESTARTING STATION AFTER ISD SHUTDOWN ALARMS

NOTICE Consult state and local regulations prior to restarting equipment.

After one of the ISD Shutdown Alarms occurs press **Menu>Diagnostics>Vapor Monitor>Clear Test After Repair**, to display the screen below and press the **Override Shutdown** button, then touch the Confirm message to continue operation of the site after the alarm has posted (see Figure 1). If the site or dispenser(s) is not shutdown, this button is grayed out, otherwise touch it to override the shutdown and resume dispensing.

Dispensing resumes, the alarm light continues to flash, and any alarm messages display until the alarm has been cleared. A 'PUMPS MANUALLY RE-ENABLED' event is entered in the 'Shutdown & Misc Event Log'.

	Vp 1: ISD VP PRES	SURE 10/18/2019 08:26 PM
	Diagnostics Vapor M	onitor Clear Test After Repair 🕥 💿 Print (0)
Home		
	Test Type	Containment Pressure
Favorites	FP Label	FP01-h 2,h 4
Menu	Last Clear	Never
		Clear Test
Actions		Override Shutdown

Figure 1. Example Clear Test After Repair Screen

ISD VAPOR LEAK WARN/FAIL

ISD VAPOR LEAKAGE

Vapor Leakage Detection test failure occurs when the vapor recovery containment system leaks at 2 times the allowable CARB standard defined in the TP-201.3. For a typical 12-hose site, that means it exceeds 8.5cfh (limit ranges over 8-10 cfh for <6 to >24 hoses).

ISD MONITORING CATEGORY

Vapor Containment Monitoring as implemented by over-pressurization and Vapor Leakage Detection tests, is responsible for ensuring that UST ullage pressure and system leak rate stay within regulatory boundaries. The Vapor Leakage Detection test will check all components for leaks including: P/V valves, dispenser piping, vacuum assist motors, nozzles, hoses, breakaways, vapor processor piping and elements as well as any other piping and fitting or component connected into the UST ullage space.

DIAGNOSTIC PROCEDURE

- Run a TP 201.3 test and use common field techniques for determining the source of the containment system leak.
- Fix all FLOW COLLECT alarms in a balance site first prior to diagnosing this alarm.

COMMON CAUSES

- 1. Phase I equipment, including but not limited to: dry breaks, spill buckets, tank inventory gauge caps, P/V valves, fill caps.
- 2. Phase II equipment, including but not limited to: breakaways, hoses, nozzles, whips, vacuum assist motors, solenoid valves, vapor shear valves.
- 3. Check drop tubes for leaks.
- 4. Tank(s) have the Thermal Coefficient incorrectly set.

Refer to the Clear Test Repair Menu (on page 68) for clearing this alarm on the TLS after repairs are complete.

ISD GROSS PRES WARN/FAIL

ISD GROSS PRESSURE

Gross over-pressure failure occurs when the 95th percentile of 7-days' ullage pressure data exceeds the gross over-pressure requirement. That means the pressure is greater than 1.3"wc for more than 1.2 hours a day on average or more than 8.4 hours for 7 days.

ISD MONITORING CATEGORY

Vapor Containment Monitoring as implemented by over-pressurization and Vapor Leakage Detection tests, is responsible for ensuring that UST ullage pressure and system leak rate stay within regulatory boundaries. The Vapor Leakage Detection test will check all components for leaks including: P/V valves, dispenser piping, vacuum assist motors, nozzles, hoses, breakaways, vapor processor piping and elements as well as any other piping and fitting or component connected into the UST ullage space.

COMMON CAUSES

- 1. Failure of pressure management control devices (e.g. check to make that the Healy Clean Air Separator is properly connected to UST's vapor space)
- 2. Failure of ORVR blocking Vapor Collection systems, including but not limited to: ORVR detecting assist nozzles
 - a. Check nozzle flow rates, change fuel filters on dispensers with low flow rates.
 - b. Check nozzle boots to make sure they are not torn
- 3. Faulty Phase I equipment leading to persistent over pressure conditions during bulk deliveries. (Refer maintenance personnel to EVR manufacturer troubleshooting guides for diagnostic procedures.)
- 4. Failure of ISD pressure sensor.

Refer to the Clear Test Repair Menu (on page 68) for clearing this alarm on the TLS after repairs are complete.

FIELD NOTES

- 1. Check that the EVR fittings are tight in the dispenser.
 - a. Loose fittings caused excessive leaks between the nozzle and vacuum pump which led to over collection, and the nozzle not identifying ORVR vehicles. These conditions lead to an overpressure condition.
 - b. If the nozzle hoods are broken or worn this can lead to an over pressure condition. It can also lead to Gross Collect alarms on nozzles that do not have a problem.
 - If the nozzle that triggered the alarm checks out OK, check the boots on the other nozzles at the site and repair the damaged ones. If the rubber boot on a nozzle is broken or worn, or the fuel filter is clogged lowering the fuel flow rate, it will cause the nozzle to not correctly identify ORVR vehicles. When there are several broken at the site, nozzles with good boots looked blocked to ISD and trigger this alarm.
 - This condition will also lead to ISD Gross Pressure warning also. When nozzles fail to identify ORVR vehicles because of the worn boot or clogged fuel filter, too much air is ingested into the underground tank which lead to an over pressure condition.
 - Clogged fuel filters will reduce fuel flow rate can contribute to overpressure conditions.
- 2. Some regulator tests can cause warning.

Check if a 2 inch pressure decay test on the day the ISD Gross Pressure alarm posted. If that is the case - the alarm will clear on its own in 7 days unless there is another contributing problem. We do not recommend using Clear Test Repair Menu to reset test data unless a repair has been documented.

ISD DEGRD PRES WARN/FAIL

ISD DEGRADATION PRESSURE

A degradation over-pressure failure occurs when the 75th percentile of 30-days' ullage pressure data exceeds the degradation over-pressure requirement. That means the pressure is greater than 0.3"wc for more than 6 hrs a day on average or more than 7.5 days for 30 days.

ISD MONITORING CATEGORY

Vapor Containment Monitoring as implemented by over-pressurization and Vapor Leakage Detection tests, is responsible for ensuring that UST ullage pressure and system leak rate stay within regulatory boundaries. The Vapor Leakage Detection test will check all components for leaks including: P/V valves, dispenser piping, vacuum assist motors, nozzles, hoses, breakaways, vapor processor piping and elements as well as any other piping and fitting or component connected into the UST ullage space.

DIAGNOSTIC PROCEDURE

Perform an operability test on the pressure sensor to ensure the ISD system is not causing the fault. See ISD Setup & Operation Manual in Related Manuals.

COMMON CAUSES

- See ISD Gross Pressure (page 10)
- Refer to the Clear Test Repair Menu (on page 68) for clearing this alarm on the TLS after repairs are complete.

FIELD NOTES

1. Check that the EVR fittings are tight in the dispenser (see ISD GROSS PRESSURE, Field Note 1 on page 10).

hnn: GROSS COLLECT WARN/FAIL

GROSS COLLECT

1-Day Gross A/L Test failure occurs when the A/L ratio is at least 75% below the lower certified A/L ratio or at least 75% above the upper certified ratio.

ISD MONITORING CATEGORY

Vapor Collection Monitoring for sites equipped with assist vapor recovery systems is responsible for ensuring that proper front-end vapor capture is occurring during fueling events. Among other components, front-end equipment includes the nozzle, hose and the breakaway. Vapor collection is assisted by vacuum motor(s) located inside the dispenser vapor return piping.

DIAGNOSTIC PROCEDURE

1. Find the hose that triggered the alarm by looking at the Collection Tests in the ISD CARB Daily Report.

COLLECTION TESTS	
GROSS DGRD	
A/L (#) A/L(#)	These lines appear if
	EVR type=VACUUM ASSIST
FP 1: BLEND3 PASS	
BLKD(265)\ 0.00 (284)\	
FP 2: BLEND3 FAIL	W - Warning is on FP 1 Blend3 hose
0.93(179) 0.93(179)	

2. A certified technician for the EVR equipment manufacturer must inspect the equipment.

Refer to the Clear Test Repair Menu (on page 68) for clearing this alarm on the TLS after repairs are complete.

COMMON CAUSES

- Failure of the EVR equipment.
- Gross Collect All Hoses: All hoses have extremely high A/L.

The most common cause of High A/L on all Nozzles at the same time is the dispenser events are artificially Low. The TLS-450PLUS utilizes a dual RS-232 board (0332868-001 RS-232 Dual Interface Module (Comm. Slots 1,2,3) that can be configured for one of its ports to be configured as a VR BIR protocol DIM (EDIM). This protocol requires a "G" in the DIM setup string.

FIELD NOTES

- If the nozzle that triggered the alarm checks out OK, check the boots on the other nozzles at the site and repair the damaged ones.
- This alarm should not occur at a VST Balance site. If it does check EVR Type setup in the Setup> Vapor Collection> General screen
- Verify Hose Mapping is correct via **Setup> Vapor Collection>Hose Mapping**.
- Verify Hose Events via **Diagnostics>Vapor Monitor>Hose Events** (WEB: Hose Diagnostics).

hnn: DEGRD COLLECT WARN/FAIL

DEGRADATION COLLECT

A 7-day Degradation A/L Test failure occurs when the A/L ratio is at least 25% below the lower certified A/L ratio or at least 25% above the upper certified ratio.

ISD MONITORING CATEGORY

Vapor Collection Monitoring for sites equipped with assist vapor recovery systems is responsible for ensuring that proper front-end vapor capture is occurring during fueling events. Among other components, front-end equipment includes the nozzle, hose and the breakaway. Vapor collection is assisted by vacuum motor(s) located inside the dispenser vapor return piping.

DIAGNOSTIC PROCEDURE

- Perform the TP 201.5 A/L test. To find the hose that triggered the alarm by looking at the Collection Tests in the ISD CARB Daily Report.
- Refer to the Clear Test Repair Menu (on page 68) for clearing this alarm on the TLS after repairs are complete.

FIELD NOTES

This alarm should not occur at a VST Balance site. If it does check EVR Type setup in the **Setup>Vapor Collection> General** screen.

hnn: FLOW COLLECT WARN/FAIL

FLOW COLLECT

A 1-Day Vapor Collection Flow Performance Test failure occurs when the vapor collection flow performance is less than 50%.

ISD MONITORING CATEGORY

Vapor Collection Monitoring for sites equipped with balance vapor recovery systems is responsible for ensuring that front-end vapor collection is operating within certified range with respect to the baseline collection performance during fueling events. The baseline collection performance is established by CARB and is the A/L standard for the system. Among other components, front-end equipment includes the nozzle, hose and the breakaway. A balance vapor recovery system relies upon a tight bellows seal in order to allow displaced vapors to return to the UST during fueling events.

DIAGNOSTIC PROCEDURE

- Perform the TP201.4 test.
- Find the hose that triggered the alarm by looking at the Collection Tests in the ISD CARB Daily Report.

COLLECTION TESTS GROSS							
V∕L(#)		The EVR	se lines type=Bal	appea lance	r if		
FP 1: BLEND3 V∕L = 1.06(221)	PASS						
FP 2: BLEND3 V∕L = 0.53(201)₩	NOTEST	W -	Warning	is on	FP 2	Blend3	hose.
FP 2: BLEND3 V/L = 0.53(201)W	NOTEST	W -	Warning	is on	FP 2	Blend3	hos

• Refer to the Clear Test Repair Menu (on page 68) for clearing this alarm on the TLS after repairs are complete.

FIELD NOTES

This alarm should not occur at a Healy Assist site. If it does check EVR Type setup in the **Setup>Vapor Collection> General** screen.

ISD VP STATUS WARN/FAIL

ISD VAPOR PROCESSOR STATUS

1-Day Processor Test

ISD MONITORING CATEGORY

Vapor Processor Monitoring is responsible for ensuring that the vapor processor is operating within normal parameters with no risk of releasing excessive HC effluent emissions.

DIAGNOSTIC PROCEDURE

- Refer the problem to a certified technician for the processor manufacturer.
- Refer to the Clear Test Repair Menu (on page 68) for clearing this alarm on the TLS after repairs are complete.

COMMON CAUSES

- TLS Console Controlled Processor
 VP EMISSIONS WARN, VP EMISSIONS FAIL (Veeder-Root Polisher)
- Non-TLS Console Controlled Processor
 Inn: EXTERNAL INPUT ALARM (ARID, HIRT)

ISD VP PRES WARN/FAIL

ISD VAPOR PRESSURE

1 Day Over-Pressure Test

ISD MONITORING CATEGORY

Vapor Processor Monitoring is responsible for ensuring that the vapor processor is operating within normal parameters with no risk of releasing excessive HC effluent emissions.

DIAGNOSTIC PROCEDURE (HIRT AND ARID)

- TLS controlled processor (ARID):
 - Put the processor in manual ON mode and see if the pressure drops. Perform the operability test required by the processor.
- Non-TLS controlled processor (HIRT):
 - Fix all hoses that have active collection alarms prior to resolving ISD VP Pres WARN/FAIL.
 - Verify processor operation.

Refer to the Clear Test Repair Menu (on page 68) for clearing this alarm on the TLS after repairs are complete.

ISD SENSOR OUT WARN/FAIL

ISD SENSOR OUT

System Setup Self-Test

ISD MONITORING CATEGORY

System Self-Test Monitoring algorithms are designed to ensure the proper setup and operation of the ISD monitor. Among other items, the self-test algorithms will check for a properly configured TLS Console monitor as well as the correct number of functioning sensors and interface modules.

System Self-Test Monitoring algorithms are broken down into two types of tests:

- 1. ISD sensor out self-test, designed to monitor for properly functioning sensors.
- 2. Setup self-test, designed to verify the monitor configuration.

DIAGNOSTIC PROCEDURE

Verify that the ISD setup is complete.

COMMON CAUSES

The following low level TLS conditions will generate high level ISD SENSOR OUT alarms at assessment time:

Tnn: PROBE OUT (Tank Inventory device) Mnn: DISABLED DIM ALARM (MDIM Module device) Enn: DISABLED DIM ALARM (EDIM Module device) Enn: COMMUNICATION ALARM (EDIM Module device) Afnn: COMMUNICATION ALARM (Air Flow Meter device) Atnn: COMMUNICATION ALARM (Atmospheric Pressure Sensor device) Vpnn: COMMUNICATION ALARM (Vapor Pressure Sensor device) VVnn: COMMUNICATION ALARM (Vapor Valve device) fnn: CHK VAPOR FLOW MTRPMC SENSOR FAULT

Refer to the Clear Test Repair Menu (on page 68) for clearing this alarm on the TLS after repairs are complete.

ISD SETUP WARN/FAIL

ISD SETUP

One or more of the ISD setup requirements have not been started.

ISD MONITORING CATEGORY

ISD Setup Diagnostic self-tests are designed to monitor and ensure that ISD setup requirements have started. It does not imply that it is complete. Setup self-test will verify:

- 1. That the ISD system is properly setup to shutdown affected fueling point(s) as required by CP-201 regulations.
- 2. At least one tank contains gasoline. Thermal coefficients on the gasoline tanks are in the correct range greater than or equal to 0.00060 and less than or equal to 0.00079. (Typically gasoline coefficients are programmed to 0.000700).
- 3. At least one Gasoline Hose is mapped (Setup> Vapor Collection> Hose Mapping).
- 4. At least one Air Flow Meter is configured and Mapped to a gasoline Hose (Setup> Vapor Collection> Hose Mapping).
- 5. One Vapor Pressure Sensor is configured and assigned to ISD in Setup>Vapor General> General.
- An external input(s) is setup if a non-TLS Console Controlled Processor (HIRT, ARID) is installed (Setup> Vapor Management> Processor).

Setup self-testing occurs following a power-up, when exiting Setup, as well as at Assessment Time. A failure will result in a ISD SETUP WARN and warning event recording. Consecutive failures over a 7-day period will result in a ISD SETUP FAIL alarm, failure event recording, and attempted shutdown of the affected fueling point(s).

DIAGNOSTIC PROCEDURE

- 1. Look for one of the Common Cause alarm conditions (See below).
- 2. Once all the conditions are removed, enter into setup and then exit out (this will cause a TLS console System Self Test. The condition should clear..

There are two times when the ISD system setup is checked:

- 1. Just prior to the programed ISD Assessment Time (Setup>Vapor General>General)
- 2. When exiting the SETUP MENU via the TLS GUI or WEB access.

Refer to the Clear Test Repair Menu (on page 68) for clearing this alarm on the TLS after repairs are complete.

COMMON CAUSES

The following conditions will generate this warning:

- MISSING RELAY SETUP
- MISSING HOSE SETUP
- MISSING TANK SETUP
- MISS VAPOR FLOW MTR
- MISS VAPOR PRESS SEN
- MISSING VP INPUT
- hnn: VAPOR FLOW MTR SETUP
- PMC SETUP FAIL

MISSING RELAY SETUP

MISSING RELAY SETUP

At least one gasoline line to shut down on required ISD alarms. Hose Alarms may also be shut down using dispenser relays.

ISD MONITORING CATEGORY

ISD Setup Diagnostic self-tests (ref. page 18) are designed to monitor and ensure proper configuration setup has been initiated. Setup self-test will verify that the ISD system is properly setup to shut down affected fueling point(s) as required by CP-201 regulations.

DIAGNOSTIC PROCEDURE

Once all common causes are resolved, enter into setup and then exit out (this will cause a TLS console System Self Test. The condition should clear.

Understanding TLS-450PLUS ISD Shutdown Requirements Setup for Selected Pump Modes

AUTOMATIC EVENTS SETUP: (SHUTDOWN REQUIREMENTS (ISD)

These instructions will illustrate the minimum setup requirements as per Pump Mode to complete the ISD Shutdown Requirements.

For In-Station Diagnostics (ISD), the California Air Resources Board (CARB) requires that gasoline dispensing be shut down for specific ISD Site Alarms and Hose Alarms (See Table 3, Page 5). This can be accomplished by assigning the required ISD Site Alarms and Hose Alarms to an Automatic Event for each gasoline line. For Hose alarms this can also be accomplished by assigning the required Hose Alarms to an Automatic Event for each dispenser relay.

NOTICE ISD only applies to gasoline tanks:

- 1. The TLS-450PLUS considers a tank to be a gasoline tank if its thermal coefficient is greater than or equal to 0.00060 and less than or equal to 0.00079. (Typically, the thermal coefficient for a gasoline tank is programmed to 0.000700.)
- 2. All gasoline tanks must be assigned to a pump and that pump has to be assigned to a line. A tank cannot be assigned to a relay in the TLS-450PLUS.

Pump Mode Setups

These steps are required for ISD Shutdown **as per pump mode**.

Available Pump Modes in **Setup > Pumps and Lines> Pumps**:

Setup > Automatic Events: (Pump Mode = TLS Pump Control): Pump is controlled locally by the console. There are two ways of controlling a pump: 1) with a relay or 2) with a Pump Controller (**This includes PLLD**).

<u>Setup > Automatic Events: (Pump Mode = Pump Sense)</u>: The console senses if the pump is active when a pump request signal is sent to turn on/off the pump (this signal also acts as a tank "active" signal to the console).

Setup > Automatic Events: (Pump Mode = External Pump Control): Pump is controlled externally to the console and identifies tanks that are line manifolded together.

AUTOMATIC EVENTS: (PUMP MODE = TLS PUMP CONTROL) - THIS INCLUDES PLLD

These are the steps required for ISD Shutdown if pump mode selected = **TLS Pump Control**

Available Pump Modes in **Setup > Pumps and Lines > Pumps**:

TLS Pump Control: Pump is controlled or actuated locally by the console. This includes control by Intelligent Pump Control. There are two ways of controlling a pump: 1) with a relay or 2) with a Pump Controller.

Pump Mode = TLS Pump Control

1. For each Pump on a Gasoline line:

a. Via: Setup > Devices > Relay:

- i. Configure/Enable a Relay
- ii. Set the Type to Pump Control Output

b. Via: **Setup > Devices > External Input**:

- i. Configure/Enable an External Input
- ii. Set the Type to Pump Sense
- iii. Set the Orientation to Normally Open

c. Via: Setup > Pumps and Lines > Pumps:

- i. Configure/Enable a Pump
- ii. Set the Mode to TLS Pump Control
- iii. Assign the appropriate Tank to the Pump
- iv. Set the Pump Control to the appropriate Relay
- v. Set the Pump Sense to the appropriate External Input

2. For each Gasoline Line:

a. Via: Setup > Pumps and Lines > Lines:

- i. Configure/Enable a Line
- ii. Assign the appropriate gasoline Pump(s) to the Line

b. Via: Setup > Automatic Events > Device Tasks:

Add a task for required ISD Site Alarms

NOTICE California Air Resources Board (CARB) requires that gasoline dispensing shut down for specific ISD Site Alarms and Hose Alarms (See Table 1 on page 7).

- i. Set the Device to the Gasoline Line
- ii. Select each required ISD Site Alarm as a Trigger
- iii. Hose Site Shutdown Option (if available): select the Hose Alarms for each Gasoline Hose as a Trigger

0	System Status	0 Warning(s) 0 Alarm(s)	10/23/2023 07:43 PM		System Status		0 Warning(s) 0 Alarm(s)	10/23/2023 07:47 PM
	Edit Task		× •e 🛇	Ed	it Task			× re 🔘
Hor	Device	LINE 1: Regular Unleaded 🔹		Hor	Device	LINE 1: Regular U	nleaded 🔻	
Favor	Event	ISD ISD GROSS PRES WARN ISD GROSS PRES FAIL ISD DEGRD PRES WARN ISD DEGRD PRES FAIL ISD VAPOR LEAK WARN ISD VAPOR LEAK FAIL ISD VAPOR LEAK FAIL ISD VP PRES WARN		Favor	Event	HOSE GROSS GROSS GROSS GROSS DEGRD GROSS DEGRD	COLLECT WARN COLLECT FAIL COLLECT WARN COLLECT FAIL	×
		System Sta	atus		0 Warning(s) 10 0 Alarm(s)	0/23/2023 07:42 PM		
		Setup A	utomatic Events Device Tas	sks	0	< Share Or		
		Home Even	nt ID Event		Device/Connecti	on Mode		
		Favorites	 ISD GROSS PRES I ISD DEGRD PRES I ISD VAPOR LEAK I GROSS COLLECT F h2, h3, h4, h5, h6 DEGRD COLLECT F h2, h3, h4, h5, h6 	FAIL FAIL FAIL : h1, FAIL : h1,	Ln1 : Regular	r Unleaded		
		Actions						

Figure 2. Example Device Task - TLS Pump Control (No Dispenser Relay(s))

3. Dispenser Relay Shutdown Option: For each Dispenser Relay:

a. Via: **Setup > Devices > Relay**:

- i. Configure/ Enable Relay
- ii. Set the Type to Standard
- iii. Set the Orientation to Normally Closed

b. Via: Setup > Automatic Events > Device Tasks:

- a. Add a task for each Dispenser Relay:
 - i. Set the Device to the Relay
 - ii. Select each required Hose Alarm for the appropriate Gasoline Hose(s) as a Trigger



Figure 3. Example Device Task - TLS Pump Control (With Dispenser Relay(s))

AUTOMATIC EVENTS: (PUMP MODE = PUMP SENSE)

These are the steps required for ISD Shutdown If pump mode selected = Pump Sense.

Available Pump Modes in **Setup > Pumps and Lines > Pumps**:

Pump Sense: The console senses if the pump is active when a pump request signal is sent to turn on/off the pump (this signal also acts as a tank "active" signal to the console).

Pump Mode = Pump Sense

- 1. For each Pump on a Gasoline Line:
 - a. Via: **Setup > Devices > Relay**:
 - i. Configure/Enable a Relay to supply power to pump control device
 - ii. Set the Type to Standard
 - iii. Set the Orientation to Normally Closed

b. Via: **Setup > Devices > External Input**:

- i. Configure/Enable an External Input (Pump Sense) for the pump
- ii. Set the Type to Pump Sense
- iii. Set the Orientation to Normally Open

c. Via: Setup > Pumps and Lines > Pumps:

- i. Configure/Enable a Pump
- ii. Set the Mode to Pump Sense
- iii. Assign the appropriate Tank to Pump
- iv. Set the Pump Sense to the appropriate External Input

2. For each Gasoline Line:

a. Via: Setup >Pumps and Lines > Lines:

- i. Configure / Enable a Line
- ii. Assign the appropriate gasoline Pump(s) to the Line

b. Via: Setup > Automatic Events > Device Tasks:

Add a task for required ISD Site Alarms

NOTICE California Air Resources Board (CARB) requires that gasoline dispensing shut down for specific ISD Site Alarms and Hose Alarms (See Table 1 on page 7).

- i. Set the Device to the Gasoline Line
- ii. Select each required ISD Site Alarm as a Trigger

iii. Hose Site Shutdown Option: Select the Hose Alarms for each Gasoline Hose as a Trigger



Figure 4. Example Device Task - Pump Sense (No Dispenser relay(s))

3. For each Relay setup in Step 1a above:

a. Via: Setup > Automatic Events > Device Tasks:

Add a Task for LINE OUT alarm:

- i. Set the Device to the Relay
- ii. Select LINE OUT for the appropriate Line as a Trigger





4. Dispenser Relay Shutdown option: For each Dispenser Relay:

a. Via: Setup > Devices > Relay:

- i. Configure/Enable Relay
- ii. Set the Type to Standard
- iii. Set the Orientation to Normally Closed

b. Via: Setup > Automatic Events > Device Tasks:

Add a task for each Dispenser Relay:

i. Set the Device to the Relay



ii. Set each required Hose Alarm for the appropriate Gasoline Hose(s) as a Trigger

Figure 6. Example Device Task - Pump Sense (With Dispenser Relay(s))

AUTOMATIC EVENTS: (PUMP MODE = EXTERNAL PUMP CONTROL)

These are the minimal steps required for ISD Shutdown if pump mode selected = External Pump Control. Refer to the appropriate manual(s) for further information as needed.

Available Pump Modes in **Setup > Pumps and Lines > Pumps**:

External Pump Control: Pump is controlled externally to the console.

Pump Mode = External Pump Control

1. For each Pump on a Gasoline Line:

- a. Via: Setup > Devices > Relay:
 - i. Configure/Enable a Relay to supply power to pump control device
 - ii. Set the Type to Standard
 - iii. Set the Orientation to Normally Closed

b. Via: Setup > Pumps and Lines > Pumps:

- i. Configure/Enable a Pump
- ii. Set the Mode to External Pump Control
- iii. Assign the appropriate Tank to Pump
- 2. For each Gasoline Line:
 - a. Via: Setup > Pumps and Lines > Lines:
 - i. Configure/Enable a Line
 - ii. Assign the appropriate gasoline Pump(s) to the Line
 - b. Via: Setup > Automatic Events > Device Tasks:

Add a task for required ISD Site Alarms:

NOTICE California Air Resources Board (CARB) requires that gasoline dispensing shut down for specific ISD Site Alarms and Hose Alarms (See Table 1 on page 7).

i. Set the Device to the Gasoline Line

- ii. Select each required ISD Site Alarm as a Trigger
- iii. Hose Site Shutdown Option: Select the Hose Alarms for each Gasoline Hose as a Trigger



Figure 7. Example Device Task - External Pump Control (No Dispenser Relay(s))

- 3. For each Relay setup in Step 1a above:
 - a. Via: Setup > Automatic Events > Device Tasks:

Add a task for a LINE OUT alarm:

- i. Set the Device to the Relay
- ii. Select LINE OUT for the appropriate Line as a Trigger





4. Dispenser Relay Shutdown option: For each Dispenser Relay:

a. Via: Setup > Devices > Relay:

- i. Configure/Enable Relay
- ii. Set the Type to Standard
- iii. Set the Orientation to Normally Closed
- b. Via: Setup > Automatic Events > Device Tasks:

Add a task for each Dispenser Relay:

i. Set the Device to the Relay

ii. Select each required Hose Alarm for the appropriate Gasoline Hose(s) as a Trigger



Example Device Tasks - External Pump Control (With Dispenser Relay(s)

MISSING TANK SETUP

MISSING TANK SETUP

There are no vapor recovery (gasoline) tanks defined, or at least one gasoline pump (STP) does not have a gasoline tank assigned to it.

ISD MONITORING CATEGORY

ISD Setup Diagnostic self-tests (ref. page 18) are designed to monitor and ensure proper monitor configuration. Setup self-test will verify at least one tank contains gasoline.

DIAGNOSTIC PROCEDURE

Via Setup>Tank>General

Verify Thermal Coefficient: Thermal coefficients on the gasoline tanks are in the correct range greater than or equal to 0.00060 and less than or equal to 0.00079. (Typically gasoline coefficients are programmed to 0.000700)

- 1. Each Gasoline tanks must be assigned to a pump. Setup>Pump and Lines>Pumps
- 2. Pump must be assigned to a Line. **Setup>Pump and Lines>Line**
- 3. Then assign all the required ISD alarms to the controlling device. See Missing Relay Setup page 19.

Once all causes are removed, enter into setup and then exit out (this will cause a TLS console System Self Test. The condition should clear.
MISSING HOSE SETUP

MISSING HOSE SETUP

The Hose Mapping needs at least one hose mapped.

ISD MONITORING CATEGORY

ISD Setup Diagnostic self-tests (ref. page 18) are designed to monitor and ensure proper monitor configuration. Setup self-test will verify at least one fuel position and gas hose is setup.

DIAGNOSTIC PROCEDURE

- This warning indicates the mapping of the hose devices to the dispensed products has not been started. Complete hose setup in Setup > Vapor Collection > Hose Setup and complete its mapping in Setup > Vapor Collection > Hose Mapping. Refer to the ISD Setup manual (P/N 57701-484 or 577014-461).
- The absence of this alarm does not mean the Hose Mapping is correct. The alarm indicates that the Hose Mapping has no hoses assigned.
- Once all the hoses are mapped, enter into setup and then exit out (this will cause a TLS console System Self Test. The condition should clear.

MISSING VAPOR FLOW MTR

MISSING VAPOR FLOW METER

There is no Air Flow Meter (AFM) assigned to a configured/enabled hose.

ISD MONITORING CATEGORY

ISD Setup Diagnostic self-tests (ref. page 18) are designed to monitor and ensure proper monitor configuration. Setup self-test will verify at least one Air Flow Meter is setup.

DIAGNOSTIC PROCEDURE

The absence of this alarm does not mean the Hose Setup/Mapping is correct. The alarm indicates that Hose Setup is has not been started.

WEB/GUI PROCEDURE



RS232 Command Verification:

IV430000: Set Sensor Table ISD In Use Flag

MISSING VAPOR PRES SEN

MISSING VAPOR PRESSURE SENSOR

There is no Vapor Pressure Sensor (VPS) configured Enabled or assigned to ISD.

ISD MONITORING CATEGORY

ISD Setup Diagnostic self-tests (ref. page 18) are designed to monitor and ensure proper monitor configuration. Setup self-test will verify at least one Vapor Pressure Sensor is setup.

DIAGNOSTIC PROCEDURE

WEB/GUI PROCEDURE



RS232 Command Verification:

IV430000: Set Sensor Table ISD In Use Flag

fnn: CHK VAPOR FLOW MTR

CHECK VAPOR FLOW METER

Failure of locked rotor test - possible locked Air Flow Meter.

ISD MONITORING CATEGORY

System Diagnostic Procedure



Field Notes - See "Removing & Replacing Air Flow Meters" on page 48

hnn: VAPOR FLOW MTR SETUP

VAPOR FLOW METER SETUP

Incoming transaction from a hose with an unavailable Air Flow Meter.

ISD MONITORING CATEGORY

ISD Setup Diagnostic self-tests (ref. page 18) are designed to monitor and ensure proper monitor configuration. Setup Self-Test will verify that an incoming transaction of a mapped hose has an available Air Flow Meter.

DIAGNOSTIC PROCEDURE

- 1. Using GUI/WEB, go to Setup> Vapor Collection> Hose Mapping. Find the AFM assigned to Hose nn.
- 2. Go to Hose Setup, select the Hose nn assigned the AFM. If there is an "!" next to the AFM number, the AFM is not enabled.
- 3. Go to Setup> Devices: Enable the AFM.
- 4. After the next dispense from the hose, the alarm condition will clear.

PMC Alarm Message Diagnostics

PMC SETUP FAIL

PMC SETUP

Incomplete PMC Setup requirements

ISD MONITORING CATEGORY

ISD Setup Diagnostic self-tests (ref. page 18) are designed to monitor and ensure proper monitor configuration. Setup self-test will verify that the Pressure Management Control is configured.

WEB/GUI VEEDER-ROOT VAPOR POLISHER DIAGNOSTIC PROCEDURE



PMC Sensor Fault

Table 2 contains a listing of the device generated alarms including their cause and suggested troubleshooting. TLS Console PMC alarms may be interspersed amongst non-PMC alarms, please see TLS Series manuals for more information.

Fault Message	Devices	Cause	Suggested Troubleshooting
	Vapor Valve, Vapor	r	Check wiring and connections from USM to the device in alarm.
Communication	Pressure Sensor, Tank Probe,	Device not	Power cycle the TLS
Alarm	Atmospheric Pressure Sensor	communicating with TLS	Verify device addressing in Setup>Devices
			Wireless application: Verify TLS RF functionality.
Pressure Fault Alarm	Atmospheric Pres- sure Sensor	The pressure readings are invalid (out-of-range, or have not changed for an extended period of time).	Power cycle console power. If alarm does not clear, contact VR Technical Support for further assistance.
Valve Command Fault		The valve fails calibration	
Valve Noise Fault		The valve fails calibration due to data noise. If successful, calibration cannot be completed in 24 hours the alarm posts.	
Cap (Capacitor) Not Charging	Vapor Valve	Vapor valve capacitor does not initially charge within 60 minutes, or subsequent recharges after 15 minutes.	
Cap (Capicator) Not Holding Fault		Vapor valve capacitor discharges when idle (i.e., not resulting from an open/close request) more than 3 times in 24 hours.	Check installation of all Vapor Valve components including Thermal Probe and Vapor Sensor Assembly. Refer to manual 577013-920. Call V-R Technical Support if further assistance is needed.
Reference Register Fault		At least 1 of the 4 reference resistors is out- of-range repeatedly.	
Vapor Sensor Resistance Fault		The vapor sensor resistance reads out-of- range repeatedly.	
Temperature Range Fault		Outlet temperature reads out-of-range repeatedly.	
Data Noise Fault		Frequent noise is affecting sensor readings for more than 30 minutes.	

Table 2. PMC Device Fault Summary

Vapor Valve diagnostics can be obtained via the GUI or WEB: Diagnostics> Vapor Valve> Overview, or via RS232 command IB6100 (see examples below).

IB6100 SEP 4, 2022 1:09 PM s 2:Vapor valve VAPOR VALVE SERIAL NUMBER 123456 VALVE POSITION: OPEN OPEN CAP: CHARGED CLOSE CAP: CHARGED

AMBNT TMP: 65.08 F OUTLET TMP: 75.05 F SENSOR FAULTS: VALVE COMMAND FAULT

IB6100 SEP 4, 2022 1:09 PM s 2:Vapor valve
VAPOR VALVE SERIAL NUMBER 123456 VALVE POSITION: OPEN
CLOSE CAP: CHARGED AMBNT TMP: 65.08 F
OUTLET TMP: 75.05 F SENSOR FAULTS: CAP NOT CHARGING

IB6100 SEP 4, 2022 1:09 PM s 2:Vapor valve VAPOR VALVE SERIAL NUMBER 123456 VALVE POSITION: OPEN OPEN CAP: CHARGED CLOSE CAP: CHARGED 65.08 F AMBNT TMP: OUTLET TMP: 75.05 F SENSOR FAULTS: CAP NOT HOLDING

IB6100 SEP 4, 2022 1:09 PM s 2:Vapor valve
VAPOR VALVE
SERIAL NUMBER 123456
VALVE POSITION: OPEN
OPEN CAP: CHARGED
CLOSE CAP: CHARGED
AMBNT TMP: 65.08 F
OUTLET TMP: 75.05 F
SENSOR FAULTS:
TEMPERATURE RANGE

MISSING VP INPUT

MISSING VAPOR PROCESSOR INPUT

An external input for the HIRT and ARID vapor processor cannot be found.

ISD MONITORING CATEGORY

System Self-Test Monitoring algorithms are designed to ensure the proper setup and operation of the ISD monitor. Among other items, the self-test algorithms will check for a properly configured TLS Console monitor as well as the correct number of functioning sensors and interface modules.

System Self-Test Monitoring algorithms are broken down into two types of tests:

- 1. ISD sensor out self-test, designed to monitor for properly functioning sensors.
- 2. Setup self-test, designed to verify the monitor configuration.

DIAGNOSTIC PROCEDURE

- This warning only applies to EVR systems with an HIRT or ARID vapor processor.
- Ensure that the external inputs are properly configured in **Setup> Devices> External Input**:

HIRT: One External Input

Indicates a fault from the vapor processor.

Type: Vapor Processor

Orientation: Normally Closed

Verify in Setup> Vapor Management< Processor that Ext Input 1 field is populated.

NOTICE Reference to the Fields " Ext Input 1 " and " Ext Input 2" does not refer to the External Input ID. It refers to the number of external inputs needed as per the vapor processor installed on site.

ARID: Two External Inputs

First External Input;

Indicates a fault from the Vapor Processor.

Type: Vapor Processor

Orientation: Normally Closed

Second External Input;

Indicates Vapor Processor is active.

Type: Vapor Processor 2

Orientation: Normally Open

Verify in **Setup> Vapor Management< Processor** that Ext Input 1 and Ext Input 2 fields are populated.

NOTICE Reference to the Fields " Ext Input 1 " and " Ext Input 2" does not refer to the External Input ID. It refers to the number of external inputs needed as per the vapor processor installed on site.

 Once all the causes are removed, enter into setup and then exit out (this will cause a TLS console System Self Test).

VP EMISSIONS

VAPOR PROCESSOR EMISSIONS

The effluent emissions concentration test occurs at daily intervals at the daily assessment time after at least one day's HC%, processor run time and station throughput has been collected. A failure occurs when the mass emission exceeds the defined threshold for the system. A failure of the effluent emissions concentration test will result in a warning and warning event recording. Two consecutive 1-day periods of effluent emissions concentration test failures will result in a failure alarm, failure event recording, and shutdown of the site. The processor is not allowed to operate while the emission FAILURE is active

ISD MONITORING CATEGORY

Vapor Processor Monitoring is responsible for ensuring that the vapor processor is operating within normal parameters.

DIAGNOSTIC PROCEDURE

Veeder-Root Polisher:

- Ensure Polisher is in Automatic Mode.
- Resolve any Vapor Valve, Atmospheric Pressure Sensor, Vapor Pressure Sensor Fault Alarms.
- Resolve Vapor Leakage and Collection alarm conditions.
- Exhibit 11: Veeder-Root Vapor Polisher; Operability Test Procedure
- Exhibit 12: Veeder-Root Vapor Polisher; Hydrocarbon Emissions Verification Test Procedure

ARID:

VR-202: Exhibit 15

ARID Technologies AT-150 Permeator Compliance Test Procedure

Refer to the Clear Test Repair Menu (on page 68) for clearing this alarm on the TLS after repairs are complete.

VP PRESSURE

VAPOR PROCESSOR PRESSURE

The processor over-pressure test occurs at daily intervals at the daily assessment time after at least 1-day's UST ullage vapor pressure data has been collected. A VST ECS Membrane Processor failure occurs when the 90th percentile of 1-day's ullage pressure data (i.e. 10% of the pressure data) is equal to or exceeds 1" wc. A Veeder-Root Polisher failure occurs when the 90th percentile of 1-day's ullage pressure data (i.e. 10% of the pressure data) is equal to or exceeds 1" wc. A Veeder-Root Polisher failure occurs when the 90th percentile of 1-day's ullage pressure data (i.e. 10% of the pressure data) is equal to or exceeds 2.3" wc. A failure of the processor over-pressure test will result in a warning and warning event recording. Two consecutive 1-day periods of processor over-pressure test failures will result in a failure alarm, failure event recording, and shutdown of the site.

ISD MONITORING CATEGORY

Vapor Processor Monitoring is responsible for ensuring that the vapor processor is operating within normal parameters with no risk of releasing excessive HC effluent emissions.

DIAGNOSTIC PROCEDURE

• Refer to the Clear Test Repair Menu (on page 68) for clearing this alarm on the TLS after repairs are complete.

Exhibit 11 Failures

NOTICE Reference current CARB Executive Order's for up to date testing procedures and requirements.

PRESSURE INTEGRITY TEST

- Check that lockable three way valve is in the test position. If not in test position switch valve to test position and rerun Pressure Integrity test.
- Verify the Polisher solenoid control valve is in the closed position by accessing the TLS PMC Diagnostics. If Control valve is in open position, close Valve by accessing PMC Diagnostics and rerun Pressure Integrity test.
- Check for leaks on your test equipment. Find leaks using leak detection solution (I.E. Soap and Water) and repair. Rerun Pressure Integrity test.
- Check all fittings and connections on the VR Vapor Polisher for leaks. Find leaks using leak detection solution (I.E. Soap and Water) and repair. Rerun Pressure Integrity test.
- Check the Filter basket for leaks Tighten four filter basket screws and check filter o-ring and replace if necessary. Rerun Pressure Integrity test
- Check for leaks around the manifold If leaks found call Veeder-Root Technical support at 800-323-1799.

FLOW TEST

- Verify all test equipment has current calibrations. Have equipment calibrated per NIST specifications.
- Check that lockable three way valve is in the test position If not in test position switch valve to test position and rerun Pressure Integrity test.
- Verify the Polisher solenoid control valve is in the open position by accessing the TLS PMC Diagnostics. If Control valve is in closed position, put valve in manual mode, and then open the valve. Rerun Pressure Integrity test.
- Verify your nitrogen flow rate is at 18.0 SFCH Adjust flow rate per test procedure and rerun Flow test. If flow test continues to fail contact Veeder-Root Technical support at 800-323-1799.

THERMOMETER TEST

- Replace Tank probe if gas tank thermometer fails all tests.
- Replace Vapor Valve thermometer if Vapor Valve thermometer fails all tests.
- Replace ambient temperature sensor if ambient temperature sensor is out of range.

Exhibit 12 Failures

- Run Vapor Polisher operability test as outlined in Executive Order 203/204 Exhibit 11 to check for leaks. Run only the pressure integrity portion of Exhibit 11 at this time.
- If the Vapor Polisher fails any part of the test run the force purge procedure as outlined in Executive Order 203/ 204 Exhibit 12 Appendix A.
- Perform Vapor Pressure Sensor operability test as outlined in Executive Order 203/204 Exhibit 10.

Operation Alarms

The TLS console is continuously monitoring the vapor recovery system and ISD sensors for alarm conditions such as excessively high or low vapor collection, containment system vapor leakage and equipment problems.

ALARM MESSAGES

ISD monitoring tests operate once each day. Warning and failure conditions are posted at the designated posting time after the tests are complete.

Warnings

WARNINGS indicate when attention is required. When a WARNING is posted a warning alarm event is logged in the ISD reports, posted on the status bar of the GUI. A printout can occur if setup in Automatic Events. If the condition persists, a WARNING will remain active for a 1, 7 or 30 day warning period depending on the test type.

Failures

If a WARNING condition persists, a FAILURE alarm will be posted after the warning period and THE SITE DISPENSING EQUIPMENT IS SHUTDOWN (see RESTARTING STATION AFTER ISD SHUTDOWN for instructions on restarting dispensing). When a FAILURE is posted a failure alarm event is logged in the ISD reports, posted on the status bar of the GUI. A printout can occur if setup in Automatic Events.

RESTARTING STATION AFTER ISD SHUTDOWN ALARMS

NOTICE Consult state and local regulations prior to restarting equipment.

After one of the ISD Shutdown Alarms occurs press Menu>Diagnostics>Vapor Monitor>Clear Test After Repair, to display the screen below and press the **Override Shutdown** button, then touch the **Confirm** message to continue operation of the site after the alarm has posted (see Figure 9). If the site or dispenser(s) are not shutdown, this button is grayed out, otherwise press to override a shutdown in effect and resume dispensing. Dispensing resumes, the alarm light continues to flash, and any alarm messages display until the alarm has been cleared. A 'PUMPS MANUALLY RE-ENABLED' event is entered in the 'Shutdown & Misc Event Log'.

	Vp 1: ISD VP PRESSURE 10/18/2019 08:26 PM		
	Diagnostics Vapor M	onitor 🛛 Clear Test After Repair 🕥 🛛 🖶 Print (0)
Home			
\bigcirc	Test Type	Containment Pressure	
Favorites	FP Label	FP01-h 2,h 4	
Menu	Last Clear	Never	
		Clear Test	
Actions		Override Shutdown	

Figure 9. Clear Test After Repair Screen

ALARM LOGS

Alarms will be recorded in the Warning Log or Failure Log of the monthly reports, which can be viewed electronically or via the integral printer (if queued in the most recent 10 events). The following example shows an excerpt from an electronically accessed monthly report.

Warni	ng Alarms			
Date	Time	Description	Reading	Value
2022/0	01/023:59	VAPOR VAPOR CONTAINMENT LEAKAGE	CFH@2"WC	14
2022/0	01/023:59	A/L RATIO DEGRADATION	FP2 MID	0.69
2022/1	12/3 23:59	VAPOR VAPOR CONTAINMENT LEAKAGE	CFH@2"WC	13
2022/1	12/3 23:59	A/L RATIO DEGRADATION	FP2 MID	0.67
Failu	re Alarms			
Failu : Date	re Alarms <u>Time</u>	Description	Reading	Value
Failu : <u>Date</u> 2022/0	Time	Description A/L RATIO GROSS BLOCKAGE	<u>Reading</u> FP1 REG	Value 0.06
Failu : <u>Date</u> 2022/0 2022/0	Time 01/0 23:59 01/0 23:59	Description A/L RATIO GROSS BLOCKAGE A/L RATIO DEGRADATION	<u>Reading</u> FP1 REG FP1 REG	<u>Value</u> 0.06 0.14
Failu: Date 2022/0 2022/0 2022/0	Time 01/0 23:59 01/0 23:59 01/0 23:59	Description A/L RATIO GROSS BLOCKAGE A/L RATIO DEGRADATION A/L RATIO GROSS BLOCKAGE	<u>Reading</u> FP1 REG FP1 REG FP1 MID	<u>Value</u> 0.06 0.14 0.13
Failu: <u>Date</u> 2022/0 2022/0 2022/0 2022/0	Time 01/0 23:59 01/0 23:59 01/0 23:59 01/0 23:59 01/0 23:59	Description A/L RATIO GROSS BLOCKAGE A/L RATIO DEGRADATION A/L RATIO GROSS BLOCKAGE A/L RATIO DEGRADATION	<u>Reading</u> FP1 REG FP1 REG FP1 MID FP1 MID	Value 0.06 0.14 0.13 0.15

Figure 10. Monthly Report Warning & Failure Log Example

ALARM SEQUENCE

Each ISD monitoring test operates once a day on sensor data gathered over a fixed time interval and with a minimum required number of monitored events. The interval is a fixed number of calendar days depending on the test being run. As an example, the A/L degradation Vapor Collection Monitoring test requires seven calendar days of data and at least 30 fueling events. In this example, each daily test result represents a test based on the prior seven days' time period. When a test first fails, a warning is posted and a warning event is logged. If this condition persists for seven more consecutive days, an alarm is posted, a failure alarm event is logged and the site is shutdown. If the condition continues, additional failure events are logged and the site will continue to be shutdown each day.

ISD Alarm Summary

Table 3 summarizes the ISD Alarms.

NOTICE Alarms with footnote 2 will result in a site shutdown.

Displayed Message	ISD Monitoring Category	Cause	Suggested Troubleshooting ¹	
ISD VAPOR LEAK WARN	Containment	Vapor Leakage Detection test warning	•Exhibit 7 Nozzle Bag Test •Exhibit 9/10 Operability Test •T.P. 201.1E-PVV Test •Exhibit 4 Clean Air Separator Test •TP-201.3	
ISD VAPOR LEAK FAIL ²	Containment	Vapor Leakage Detection test - 8th consecutive failure		
ISD GROSS PRESS WARN	Containment	Gross Over-Pressure test warn- ing	•Are ball valves for the clean air sep- arator in the correct position?	
ISD GROSS PRESS FAIL ²	Containment	Gross Over-Pressure test - 8th consecutive failure	•Is the ball valve hear the pressure sensor in the correct position? •Exhibit 7 Bag Test	
ISD DEGRD PRESS WARN	Containment	Degradation Over-Pressure test warning	 T.P. 201.1E-PW Test T.P. 201.3 Look for problems using one or more of the following VR-202 procedures/ tests: Dispenser Integrity Test B-3 (i.e. 'Plumbing Tightness' test), Exhibit 4, Exhibit 5, Exhibit 9 (pressure sensor only) or Flow Rate Verification per section 1.2.3. 	
ISD DEGRD PRESS FAIL ²	Containment	Degradation Over-Pressure test - 30th consecutive failure	•T.P. 201.3 •Look for problems using one or more of the following VR-202 procedures/ tests: Dispenser Integrity Test B-3 (i.e. 'Plumbing Tightness' test), Exhibit 4, Exhibit 5, Exhibit 9 (pressure sensor only) or Flow Rate Verification per sec- tion 1.2.3.	
ISD VP STATUS WARN ^{4,5}	Processor	Failure of Vapor Processor Effluent Emissions	•Troubleshooting Guide •VP Emissions Test	
ISD VP STATUS FAIL ^{2,4,5}	Processor	2nd Consecutive Failure of Vapor Processor Status test		
ISD VP PRESS WARN ⁶	Processor	90 th percentile of 1 day ullage pressure exceeds 2.3 IWC	Exhibit test for HIRT or ARID	
ISD VP PRESS FAIL ⁶	Processor	2 nd consecutive failure of Vapor Processor Over-Pressure test		
VP EMISSION WARN ^{3,4,6}	Processor	Mass emission exceeded the certified threshold	•Troubleshooting Guide	
VP EMISSION FAIL ^{3,4,6}	Processor	2nd Consecutive Mass Emis- sion test failure	•Exhibit 11	

Table 3. ISD Alarm Summary

Displayed Message	ISD Monitoring Category	Cause	Suggested Troubleshooting ¹	
hnn: FLOW COLLECT WARN	Collection	1-Day Gross A/L Test warning		
hnn: FLOW COLLECT FAIL ²	Collection	1-Day Gross A/L Test failure - 2nd consecutive failure		
hnn: GROSS COLLECT WARN	Collection	1-Day Gross A/L Test warning	•Visually inspect hanging hardware at	
hnn: GROSS COLLECT FAIL ¹	Collection	1-Day Gross A/L Test failure - 2nd consecutive failure	• Exhibit 7 Nozzle Bag Test • VR-202 Exhibit 5	
hnn: DEGRD COLLECT WARN	Collection	7-Day Degradation A/L Test warning		
hnn: DEGRD COLLECT FAIL ²	Collection	7-Day Degradation A/L Test - consecutive failure	•	
ISD SENSOR OUT WARN Self-Test ISD Sensor Out Self-Test warn- ing		Confirm ISD sensor & module installa-		
ISD SENSOR OUT FAIL	Self-Test	ISD Sensor Out Self-Test 8th failure	tion / communication per Setup sec- tion.	
ISD SETUP WARN Self-Test Failure of Setup Test		Confirm EVP/ISD programing per Setup		
ISD SETUP FAIL Self-Test 8		8th consecutive failure of Setup Test	section.	

Table 3.	ISD Alarm	Summary	(Continued)
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¹ See TLS-450PLUS ISD Troubleshooting Manual P/N 577014-463 for a complete list of suggestions.

² ISD Shutdown Alarms - see "Restarting Station After ISD Shutdown Alarms" on page 40.

³ This warning will result in an ISD VP Status Warn.

⁴Veeder-Root Polisher

⁵Does not apply to Healy CAS or Hirt VCS 100

⁶Hirt VCS 100

OTHER ALARMS

Table 4 summarizes additional alarms that may be posted by ISD related equipment. These alarms are not critical to vapor recovery functionality, but could indicate erroneous setup or equipment malfunction. Table 5 lists a wireless related sensor alarm.

NOTICE Additional TLS console alarms listed in the TLS-450PLUS Console Troubleshooting Guide (P/N 577014-075) may be posted and may lead to an ISD shutdown alarm if persistent.

Displayed Message	Set Condition	Clear Condition
MISSING RELAY SETUP	At least one gasoline line/relay to shut down on required ISD alarms.	Complete required shutdown alarms via Settings> Automatic Events> Device Tasks for all vapor recovery (gasoline) products.
MISSING TANK SETUP	There are no vapor recovery (gasoline) tanks defined, or at least one gasoline pump (STP) does not have a gasoline tank assigned to it.	Complete gasoline tank setup, verify ther- mal coefficients. Ensure ISD shutdown requirements are complete.
MISSING HOSE SETUP	The Hose Mapping needs at least one Hose mapped.	Complete the Hose Mapping.
hnn: AIR FLOW MTR SETUP	Incoming transaction from a hose with an unavailable Air Flow Meter.	Ensure assigned Air Flow Meter is config- ured Enabled for the specific hose.
MISSING VAPOR PRES SEN	There is no Vapor Pressure Sensor configured Enabled or assigned to ISD.	Complete Vapor Pressure Setup and assign VPS in Setup> Vapor General> General .
MISSING AIR FLOW MTR	At least one AFM must be assigned to a Config- ured/Enabled Hose.	Assign an AFM to all Configured/ Enabled Hose(s) in Hose Settings.
afnn: CHK VAPOR FLOW MTR	Failure of locked rotor test - possible locked Air Flow Meter.	Locked rotor test passes or Air Flow Meter deconfigured, or test cleared.

Table 4. Other Alarms

Table 5. Wireless Related Sensor Alarm

Displayed Message	Devices	Description	Suggested Troubleshooting
BATTERY WARNING	Vapor Valve, VPS, AFM and Probe	Device transmitter reports battery status as 'Replace' for 24 hours	Remove and replace battery pack

Table 6 summarizes Hose Setup warning messages.

Message	Cause	Action	
Label Not Assigned	Missing hose label selection		
FP Label Not Set	Fuel Position label not set.	Check hose settings in Setup>Vapor	
Air Flow Meter Not Assigned	Air Flow Meter not selected and assigned to the hose.		
Assigned Air Flow Meter Not Configured	Air flow meter is assigned to a hose but is disabled in Device Setup.	Check Air Flow Meter setup in Setup>Device>Air Flow Meter	
Meter Not Mapped	Fuel meter not mapped to hose.	Check meter mapping in Setup>Vapor Collection>Hose Mapping	

Table 6. Hose Setup Data Warning Messages

PMC ALARM SUMMARY

Table 7 contains a listing of the PMC generated alarms including their displayed message and cause. TLS Console PMC alarms may be interspersed amongst non-PMC alarms.

Displayed Message	ISD Monitoring Category	Cause	Suggested Troubleshooting
PMC SETUP FAIL	Self-Test	PMC setup is incomplete. Check configuration. [ISD Only] When a PMC SETUP FAIL is posted, an ISD SETUP WARN will be posted at assessment time. If the condition exists for 8 consecutive days an ISD SETUP FAIL will be posted	 Verify that all required components are installed and operational. PMC Only configuration requires: •At least one Gasoline Probe/Tank installed and configured. •One Vapor Pressure Sensor installed and configured. •One Vapor Valve installed. •One Vapor Valve. •ATM Sensor configured and enabled. [Veeder-Root Polisher] •ATM Sensor configured. <li< td=""></li<>
PMC SENSOR FAULT	Self-Test	This fault will post along with an alarm for specific components used by PMC that has failed or reported a fault condition. See below. COMMUNICATION ALARM Sensor: Vapor Valve, Vapor Pressure Sensor, Atmospheric Pressure Sensor PRESSURE FAULT ATM Sensor: Atmospheric Pressure Sensor PROBE OUT Device Tank (If all gasoline tanks have PROBE OUT alarm)	 Check for Sensor Device Alarm or Fault. Vapor Valve, Vapor Pressure Sensor, Atmospheric Pressure Sensor, posting a fault condition. Follow Actions listed in TLS-450PLUS online Help to resolve issue.
MISSING VP INPUT	Self-Test	An external input for the vapor processor cannot be found.	 Check setup in Devices> External Input HIRT requires 1 External Input: Type as Vapor Processor ARID requires 2 External Inputs: Types as Vapor Processor and Vapor Processor 2 Check setup in Setup > Vapor Management > Processor Type as Vapor Processor 2 Orientation Normally Open
VP EMISSIN WARN	Processor	90th percentile of 1 day ullage pressure exceeds 2.3 IWC	Exhibit test for ARID Permeator Proces-
VP EMISSION FAIL	Processor	2nd consecutive failure of vapor processor	

Table 7: TLS-450PLUS (PMC) Alarm Troubleshooting Summary

PMC Setup Fail

A PMC Setup Fail warning occurs when the PMC setup is incomplete. Check configuration. Follow the diagnostic steps in Table 8 below to resolve this issue.

Step	Procedure			
1	Gasoline Probe/Tank installed and configured?			
2	ATM Sensor installed and configured? (Veeder-Root Polisher only)			
3	Vapor Valve installed and configured? (Veeder-Root Polisher only)			
4	Vapor Pressure Sensor installed and configured?			
5	In Setup>Vapor Management>Processor: Is the Vapor Processor Type assigned?			
6	In Setup>Vapor General>General: Is the Vapor Pressure Sensor assigned?			
7	For ARID and HIRT processors, are the required External Inputs con- figured?			
8	Exiting out of Setup will cause the TLS Console System Self-Test.			
9	If alarm does not clear, contact Veeder-Root Technical Support at (800) 323-1799.			

Table 8. PMC Setup Fail Diagnostic Procedure

Miscellaneous Maintenance

Repairing Collection Vapor Recovery Equipment

ALL SYSTEMS (HEALY)

Check common vapor recovery piping both before and after the ISD Air Flow Meter.

ASSIST SYSTEMS (HEALY)

Check common vacuum assist electronics

BALANCE SYSTEMS

Check hose liquid extraction

Removing & Replacing Air Flow Meters

When removing and replacing a Air Flow Meter follow these steps:

- 1. Power down the console.
- 2. Replace the air flow meter according to the instructions in the Related Manuals.
- 3. Power up the console.

No changes are required to the ISD Setup.

ISD/PMC Diagnostic Menus

Air Flow Meter Overview

Select **Menu>Diagnostics>Air Flow Meter>Overview** to display the Air Flow Meter overview screen This screen provides a report with general and communication diagnostic information for air flow meters.

GENERAL COLUMN DESCRIPTIONS

Column	Descriptions		
Туре	Sensor type description		
Status	Displays one or more of the following messages: • NORMAL • SETUP DATA WARNING • COMMUNICATION ALARM • BATTERY WARNING (Wireless Only) • CHK VAPOR FLOW MTR		
Serial Number	Console auto-detected serial number of this device		
Flow Volume	The volume of air flow measured		
Battery Status	[Wireless Device Only]Indicates the status of the battery in a wireless device. Possible battery status messages: • Unknown • Full • Medium • Low • Replace		

CONSTANTS COLUMN DESCRIPTIONS

Column	Descriptions
Device Code	The device code for the sensor, i.e., 1 = AIRFLOW METER
Counts Per MilliGallon	The number of counts the meter records per milligallons of air
Seconds Between Samples	The air flow meter typically collects samples every 5 seconds

COMMUNICATION COLUMN DESCRIPTIONS

Column	Descriptions		
Samples Read	The number of times attempts have been made to read the sensor		
Samples Used	The number of samples that were read without errors		
Parity Errors	The number of samples that had parity or CRC (data corruption) errors		
Partial Read	The number of samples with only a partial response		
Comm. Errors	The number of communication errors (e.g., when the sensor did not respond to a poll)		
Restarts	The number of restarts		

CHANNEL REPORT DESCRIPTION

The Channel Report lists the raw data (in hex format) of each communication channel of the sensor and provides an indication of the sensor's current state. The number of channels and what each channel represents is specific to each sensor.

Atmospheric Sensor Overview

Select **Menu>Diagnostics>Atmospheric Sensor>Overview** to display the Atmospheric Sensor overview screen.

This screen provides a report with general and communication diagnostic information for atmospheric pressure sensors.

GENERAL COLUMN DESCRIPTIONS

Column	Descriptions
Туре	Sensor type description
Status	Possible messages: • NORMAL • SETUP DATA WARNING • COMMUNICATION ALARM • PRESSURE FAULT ALM
Serial Number	Console auto-detected serial number of this device/USM
Date	Sensor date code (always 00/01)
Pressure	The current pressure reading for the sensor

CONSTANTS COLUMN DESCRIPTIONS

Column	Descriptions		
Model	Not applicable to this sensor type		
Device Code	The device code for the sensor, i.e., 18 = Atmospheric Sensor.		
Slope	Factory calibrated pressure slope		
Offset	Factory calibrated pressure offset		

COMMUNICATION COLUMN DESCRIPTIONS

Column	Descriptions		
Samples Read	The number of times attempts have been made to read the sensor		
Samples Used The number of samples that were read without errors			
Parity Errors	The number of samples that had parity or CRC (data corruption) errors		
Partial Read	The number of samples with only a partial response		
Comm. Errors	The number of communication errors (e.g., when the sensor did not respond to a poll)		
Restarts	Not applicable to this sensor type		

CHANNEL REPORT DESCRIPTION

The Channel Report lists the raw data (in hex format) of each communication channel of the sensor and provides an indication of the sensor's current state. The number of channels and what each channel represents is specific to each sensor.

Vapor Pressure Sensor Overview

Select **Menu>Diagnostics>Vapor Pressure Sensor>Overview** to display the Vapor Pressure Sensor overview.

This screen provides a report with general and communication diagnostic information for vapor pressure sensors. These sensors measure the pressure in the ullage space of underground storage tanks. The values can be used to evaluate vapor containment or perform vapor management. A pressure sample is read every 10 seconds on 24 channels (35 channels for wireless vapor sensors).

GENERAL COLUMN DESCRIPTIONS

Column	Descriptions		
Туре	Sensor description		
Status	Possible messages: • NORMAL • SETUP DATA WARNING • COMMUNICATION ALARM • BATTERY WARNING [Wireless Vapor Pressure Sensor only] - battery on wireless vapor pressure sensor needs to be replaced.		
Serial Number	Console auto-detected serial number of this device		
Battery Status [Wireless Device Only]	Indicates the status of the battery in a wireless device. Possible bat- tery status messages: • Unknown • Full • Medium • Low • Replace		
Date Not applicable to this sensor type			
Pressure [iwc] [kPa]	The vapor pressure reported by the vapor pressure sensor in inches water column [iwc] for ISD and RAP, kilopascal [kPa] for APM NOTICE This is the current pressure reading. It is the reading using the factory calibration. To see any calibrated pressure readings, see: Diagnostics > Vapor Pressure > Sensor > Calibrate .		

CONSTANTS COLUMN DESCRIPTIONS

Column	Descriptions		
Model	Not applicable to this sensor type		
Device Code	The device code for the sensor, i.e., 4 = Wired Pressure Sensor, and 20 = Wireless Pressure Sensor.		
Slope	Factory calibrated vapor pressure slope		
Offset	Factory calibrated vapor pressure offset		

COMMUNICATION COLUMN DESCRIPTIONS

Column	Descriptions		
Samples Read	The number of times attempts have been made to read the sensor		
Samples Used	The number of samples that were read without errors		
Parity Errors	The number of samples that had parity or CRC (data corruption) errors		
Partial Read	The number of samples with only a partial response		
Comm. Errors	The number of communication errors (e.g., when the sensor did not respond to a poll)		
Restarts	The number of times a sensor has been jump-started		

CHANNEL REPORT DESCRIPTION

The Channel Report lists the raw data (in hex format) of each communication channel of the sensor and provides an indication of the sensor's current state. The number of channels and what each channel represents is specific to each sensor.

Diagnostics> Vapor Pressure Sensor> Calibrate

This screen allows you to manage the calibration of a vapor pressure sensor (VPS).

NOTICE Do not attempt to calibrate the Vapor Pressure Sensor without contacting Veeder Root Technical support first.

SELECTION CRITERIA

FIELD DESCRIPTIONS

Field	Descriptions	
Address	The address of the vapor pressure sensor, selected in Setup> Devices> Vapor Pressure Sensor .	
Label The description for the vapor pressure sensor, entered in Setup> De Pressure Sensor.		
Serial Number	The serial number of the vapor pressure sensor, detected from the device.	
Factory Pressure	The current pressure reading using the factory settings of the vapor pressure sense (iwc). This is continually updated as the pressure changes.	
Calibrated Pressure	The current calibrated value (iwc) using the stored calibration and date/time it was last calibrated. If the sensor was never calibrated outside of the factory, this field does not display. Calibrated Pressure = (Factory Pressure * Slope) + Offset	
Zero Reference	The reference pressure that will be applied to the sensor while at atmosphere, typically 0. To the right of this field is the Zero Measured Reading, which is recorde when the Accept button is pressed.	
Accept	Records the current Factory Pressure as the Measured Reading for Zero Reference (Wait until the Factory Pressure is stable.) You must still save the screen for the calibration to be performed.	
	This optional field is used when calibrating the sensor at a Span pressure measured with a calibrated test manometer.	
Span Reference	The reference pressure that will be applied to the sensor by the test device, typically $+2$ iwc.	
	To the right of this field is the Span Measured Reading, which is recorded when the Accept button is pressed.	
Accept Records the current Factory Pressure as the Measured Reading at Span Ref (Wait until the Factory Pressure is stable.) You must still save the screen for calibration to be performed.		

CALIBRATING THE VAPOR PRESSURE SENSOR

- 1. Expose the sensor to atmospheric pressure by opening the valve at the bottom of the sensor.
- 2. Wait for the Factory Pressure to settle.
- 3. The Zero Reference should display the default of zero (0).
- 4. Press the Accept button. Press the Accept button. The Zero Measured Reading value will be recorded.
- 5. Save the screen. If the calibration is successful, the Calibrated Pressure field displays using the new calibration and the date/time of the calibration is updated. If the calibration fails, a pop-up informs you. Check the Zero Reference and Zero Measured reading fields and try the calibration procedure again.
- 6. You can use the **Share** button to print the calibration history, including any cleared calibrations.

	System Status		0 Warning(s) 0 Alarm(s)	07/11/2021 05:33 AM
	Diagnostics Vapor Press	ure Sensor Calibrate 🗢		< Share 🔾
Home	Address	B1.S3.4		
*	Label	VaporSensor1		
Favorites	Serial Number	0105062884		
Menu	Factory Pressure [iwc]	2.099		
	Calibrated Pressure [iwc]			×
Actions	Zero Reference [iwc]	0 0.010	Accept	
	Span Reference [iwc]	2 2.099	Accept	
VP Sensor				
	7его Меа	sured Reading Span	Measured Read	ing

Figure 11. Example Vapor Pressure Sensor Calibration Screen - Calibration Displayed

0	Diagnostics Vapor Pressure Sensor C	alibrate 🖸	< Share O
Home	Address B1.S3.4		
•	Label VaporSensor	r1	
Favorites	Serial Number 0105062884	1	
Menu	Factory Pressure [iwc] 2.099		
	Calibrated Pressure 2.000 07/ [iwc]	11/2021 05:33 AM	
Actions	Zero Reference [iwc]	Accept	
	Span Reference [iwc] 0	Accept	
Sensor			

Calibrated Pressure after saving Zero and Span Measured Readings



CALIBRATING THE VAPOR PRESSURE SENSOR WITH A CALIBRATED TEST DEVICE

- 1. Expose the sensor to atmospheric pressure by opening the valve at the bottom of the sensor.
- 2. Wait for the Factory Pressure to settle.
- 3. The Zero Reference should display the default of zero (0).
- 4. Press the **Accept** button. The Zero Measured Reading value will be recorded.
- 5. Enter the Span Reference that you intend to expose the sensor to using the test device. This is generally +2 iwc.
- 6. Connect the test device to the ambient port and establish the desired pressure, as measured with a calibrated test manometer.
- 7. Wait for the Factory Pressure to settle.
- 8. Press the Accept button. The Span Measured Reading value will be recorded.
- Save the screen. If the calibration is successful, the Calibrated Pressure field displays using the new calibration and the date/time of the calibration is updated. If the calibration fails, a pop-up informs you. Check the Zero Reference, Span Reference, and Zero and Span Measured Readings fields and try the calibration procedure again.
- 10. You can use the print button to print the calibration history, including any cleared calibrations.

CLEARING THE CALIBRATION

If you want to reset the calibration to the factory settings, you can clear the calibration:

1. Use Actions > Clear Calibration. [Web: Click Clear Calibration button.]

2. Confirm that you want to clear the calibration.

The Calibrated Reading value is now equal to the Factory Pressure value.

SCREEN PRINTOUT: VAPOR PRESSURE SENSOR CALIBRATION HISTORY

This printout shows the Vapor Pressure Calibration History which includes all successfully completed and cleared calibrations of the Vapor Pressure Sensor selected on the screen. This history will show the sensor's description (Label), date and time of the calibration, sensor's serial number along with the Slope and Offset which may be requested by technical support.

FIELD DESCRIPTIONS

Field	Descriptions
Sensor	The description (Label) for the vapor pressure sensor, entered in Setup> Devices> Vapor Pressure Sensor .
Date	Date and Time of the calibration.
S/N	The serial number of the vapor pressure sensor, detected from the device.
Slope	Slope adjusts the Calibrated Pressure over the span of readings as they move away from 0. Calibrated Pressure = (Factory Pressure * Slope) + Offset
Offset	Offset adjusts the Calibrated Pressure for a constant offset of readings (e.g. from 0). Calibrated Pressure = (Factory Pressure * Slope) + Offset .

```
07/11/21 5:34 AM

TLS_450 UST

VEEDER-ROOT TEST LAB

125 POWDER FOREST DR

SIMSBURY, CT 06070

VAPOR PRESSURE CALIBRATION HISTORY

SENSOR: 1 - VaporSensor1

DATE S/N SLOPE OFFSET

21/07/11 05:33 105062884 0.957 -0.010

21/07/11 05:35 105062884 1.000 0.000 Calibration
```

Figure 13. Example VPS Calibration History Printout

Vapor Valve Overview

Select Menu>Diagnostics>Vapor Valve>Overview to display the Vapor Valve overview screen.

This screen provides a report with general and communication diagnostic information for vapor valves. Vapor valves release excess air pressure from a carbon canister during Pressure Management Control (PMC).

GENERAL COLUMN DESCRIPTIONS

Column	Descriptions
Туре	Sensor type description
Status	Displays one or more of the following messages: • NORMAL • SETUP DATA WARNING • Device Setup Data Problem • Address Not Set • COMMUNICATION ALARM • BATTERY WARNING (Wireless Only) • CAP NOT CHARGING (Capacitor) • CAP NOT CHARGING (Capacitor) • CAP NOT HOLDING (Capacitor) • VALVE COMMAND FAULT • TEMP RANGE FAULT • REF RESISTOR FAULT (REF - Resistor) • RESISTOR RANGE FAULT • DATA NOISE FAULT • VALVE NOISE FAULT
Serial Number	Console auto-detected serial number of this device
Valve Position	Indicates whether the valve is open or closed
Battery Status [Wireless Device Only]	Indicates the status of the battery in a wireless device. Possible battery status mes- sages: • Unknown • Full • Medium • Low • Replace
Open Capacitor	Indicates whether the capacitor that opens the valve is charged or discharged
Closed Capacitor	Indicates whether the capacitor that closes the valve is charged or discharged
Ambient Temp	Indicates the temperature of the atmosphere
Outlet Temp	Indicates the temperature of the outlet on the vapor valve

CONSTANTS COLUMN DESCRIPTIONS

Column	Descriptions
Device Code	The device code for the sensor, i.e., 14 = Vapor Valve
Model	The model number for this sensor
Firmware Version	The firmware version for the sensor

COMMUNICATION COLUMN DESCRIPTIONS

Column	Descriptions
Samples Read	The number of times attempts have been made to read the sensor
Samples Used	The number of samples that were read without errors
Parity Errors	The number of samples that had parity or CRC (data corruption) errors
Partial Read	The number of samples with only a partial response
Comm. Errors	The number of communication errors (e.g., when the sensor did not respond to a poll)
Restarts	The number of times this sensor restarted

CHANNEL REPORT DESCRIPTION

The Channel Report lists the raw data (in hex format) of each communication channel of the sensor and provides an indication of the sensor's current state. The number of channels and what each channel represents is specific to each sensor.

Hose Events

Via console GUI: Menu>Diagnostics>Vapor Monitor> Hose Events

Via WEB: Menu>Diagnostics>Vapor Monitor>Hose Diagnostics>Hose Events Tab

This is a diagnostic screen used to understand how well vapor collection is performing. It is used to verify A/L's to see over a period of time how well vapor collection is on a particular hose.

In-Station Diagnostics (ISD) hose events shows the hose events that are qualified gasoline dispenses used by this screen:

- Single hose dispense from the selected dispenser.
- Fuel dispensed >3.0 gallons.
- A/L Ratio > 0.0 and A/L Ratio < 5.0

HOSE EVENTS STATUS MESSAGES

Status Message	Description
#	Transaction number
Transaction Date/Time	Date and time of dispense
Duration	Duration in seconds of dispense
A/L	Air/Liquid ratio
Vapor	Amount of Vapor collected in gallons
Fuel	Amount of gasoline dispensed in gallons

It may take a few minutes after a dispense for the event to show in the data.

- If there was a recent Clear Test After Repair (CTAR) performed, the data shown will be the data since the last CTAR.
- The data seen on this screen is the same as shown on the Hose Histogram.
- Via WEB; The data on this screen is the same as shown in **Diagnostics>Vapor Monitor>Hose Diagnostics>Hose Event** Tab.

To refresh the data shown on the screen in the GUI, Select **Actions/FP Label**, and the Hose # again. [Refresh data in the Web by selecting Refresh].

1. Select Menu>Diagnostics>Vapor Monitor (Figure 14), then touch Hose Events (Figure 15).



Figure 14. Clearing Vapor Collection Test By Hose

00	T 3: SETUP DATA WARNING		4 Warning(s) 13 Alarm(s)	Jul 11 20	22 10:55 AM
	Diagnostics Vapor Monitor	Hose Events	0		< Share 🔿
Home	# Date/Time	Duration	A/L	Vapor	Fuel
Favorites Menu Actions					

Figure 15. Vapor Monitor Hose Events Screen

2. Touch the Actions button, then select a FP hose (item 1 Figure 16), Hose # (item 2) and touch the ✓ button to display the vapor collection events for the selected hose (Figure 17.



Figure 16. Clearing Vapor Collection Test By Hose

000	L 1: SENSOR OUT ALARM							4 Warnii 13 Alarn	4 Warning(s) 13 Alarm(s) Jul 11 2022 10:53 A		
	Dia	gnosti	cs	Vapo	r Monito	r)	Hose Events	s C	>	< Share	e 🔿
Home							FP: 1 - h	1: BLEND3			
nome	#	Date	/Tin	ne			Duration	A/L	Vapor	Fuel	
A	1	Jul	04	2022	07:21	AM	118	4.23	59.18	14.00	
Equaritas	2	Jul	04	2022	07:31	AM	181	1.49	17.90	12.00	
ravorites	3	Jul	04	2022	07:42	AM	133	0.35	3.19	9.00	
	4	Jul	04	2022	07:49	AM	97	0.22	1.35	6.00	
Menu	5	Jul	04	2022	07:59	AM	157	1.59	34.91	22.00	
	6	Jul	04	2022	08:08	AM	97	0.22	1.35	6.00	
	7	Jul	04	2022	08:12	AM	97	0.45	5.46	12.00	
Actions	8	Jul	04	2022	08:21	AM	151	1.66	33.20	20.00	
	9	Jul	04	2022	08:41	AM	109	0.29	2.06	7.00	
	10	Jul	04	2022	09:05	AM	145	1.87	41.25	22.00	
	11	Jul	04	2022	09:12	AM	181	0.51	6.63	13.00	
	12	Jul	04	2022	09:19	AM	145	0.38	3.83	10.00	
	13	Jul	04	2022	09:25	AM	157	0.75	15.10	20.00	-

Figure 17. Vapor Collection Hose Events Screen

The data on the GUI screen above is the same as shown in **Diagnostics>Vapor Monitor>Hose Diagnostics>Hose Events** Tab via the WEB.

() VEEDER-ROOT	TLS450P V.BB.333.69 TLS_450 UST	9/28/22 12:52 PM	O (1) (2)	admin1	Log Out 🕜 Help
Main Menu	ome Diagnostics ► Vapor Monito	or ► Hose Diagnostics	5		🕒 Print
🔊 Diagnostics	EP Label: 1 V Hose #: Hose 1	1: BLEND3 ¥			Refresh
 AccuChart 					
 Air Flow Meter 	Histogram Hose Events				
💩 Mag Sensor	# Date/Time	Duration	A/L	Vapor	Fuel 🔷
🕑 LPR Sensor	1 09/21/2022 09:40 AM	76	0.80	17.61	22.00
• 🕲 Meter	2 09/21/2022 09:48 AM	76	0.80	19.20	24.00
🕨 🖉 Tank Test	3 09/21/2022 09:51 AM	64	0.92	16.58	18.00
🕨 🍈 Tank	4 09/21/2022 09:56 AM	64	0.31	2.77	9.00
• 🛞 PLLD	5 09/21/2022 10:00 AM	52	0.73	11.66	16.00
Probes	6 09/21/2022 10:24 AM	52	0.36	2.91	8.00
B Relays and Inputs	7 09/21/2022 11:49 AM	70	0.83	16.61	20.00
Sensors	8 09/21/2022 11:53 AM	82	0.20	2.56	13.00
Module	9 09/21/2022 12:00 PM	70	0.90	19.91	22.00
• @ BIR	10 09/21/2022 12:05 PM	70	0.49	4.92	10.00
Vapor Pressure Se	11 09/21/2022 12:29 PM	46	0.92	12.89	14.00
- Grapor Pressure Se	12 00/21/2022 01:25 DM	40	0.53	5 31	10.00

Figure 18. WEB - Vapor Collection Hose Events Screen

HOSE HISTOGRAM

Via WEB only: Menu>Diagnostics>Vapor Monitor>Hose Diagnostics>Histogram Tab

The Hose Histogram provides a visual representation of the overall performance of the hose. Information provided includes the A/L ratio of dispenses since the last Clear Test After Repair (CTAR), a status based on A/L data with suggested actions for possible issues (see Figure 19).

SELECTION CRITERIA

FP Label: Select the Fueling Point number on the dispenser that has the hose to be examined for A/L dispense Hose # : Select the Hose #/Hose Label

HOSE HISTOGRAM STATUS MESSAGES

Status Message	Description				
Normal	Transaction number				
Hose Needs Adjusting	Check for proper A/L adjustment per Executive Order VR-202, Exhibit 5 test. EVR Type is Assist.				
Hose Needs Replacement	Check with Nozzle Manufacturer for information regarding A/L shift, indicating possible need for replacement. EVR Type is Assist.				
Hose Need Inspecting	Inspect nozzle for damage and work or torn boots. Check for proper dispensing fuel flow rates. Check dispenser fuel filters.				
Insufficient Data	Not enough A/L data to process. There must be a minimum of 100 qualified dispenses.				




Diagnostics>Vapor Monitor>Pressure Graphs

This is only available via the WEB: Menu>Diagnostics>Vapor Monitor>Pressure Graphs

This screen lets you view a graphic representation of the vapor pressure, and ullage readings of the gasoline tanks which are used by In-Station Diagnostics. Vapor pressure, and ullage are illustrated with the corresponding time and date stamp, and represent what is occurring with the tank pressure and ullage during delivery and dispensing for that time period (see Figure 20).

- The time frame represented in the graph is approximately 30 hours.
- The Refresh button is used to provide the most recent data available.

CHART DESCRIPTION

The information on this chart provides:

- Vapor Pressure vs Time Plots individual vapor (ullage) pressure samples (in inches of water column) versus time.
- Ullage vs Time Plots individual ullage volume samples (in gallons) versus time



Figure 20. Example Vapor Monitor Pressure Graphs Screen - Web Only

Diagnostics>PMC>Status

The PMC Status screen provides a status report of Pressure Management Control (PMC).

1. Select Menu>Diagnostics>PMC>Status (Figure 21) to open the PMC Status screen (Figure 22).



Figure 21. Accessing PMC Status Diagnostic Screen

2. Field display is dependent on the vapor processor installed.

Diagnostics PMC Stat	\ \		
	us		< Sha
PMC Version	01.04		
Vapor Pressure [iwc]	0.000		
Load [%]	12.7		
Effluent Emissions [LB/KGAL]	0.00		
Daily Throughput [GALS]	1		
Vapor Processor Mode	Automatic		
Position Requested	Closed		
	Vapor Pressure [iwc] Load [%] Effluent Emissions [LB/KGAL] Daily Throughput [GALS] Vapor Processor Mode Position Requested	Vapor Pressure [iwc]0.000Load [%]12.7Effluent Emissions [LB/KGAL]0.00Daily Throughput [GALS]1Vapor Processor ModeAutomaticPosition RequestedClosed	Vapor Pressure [iwc]0.000Load [%]12.7Effluent Emissions [LB/KGAL]0.00Daily Throughput [GALS]1Vapor Processor ModeAutomaticPosition RequestedClosed

Figure 22. PMC Status Diagnostic Screen (Scroll Down to View Additional Fields)

Veeder-Root Polisher PMC Status

Vapor Processor PMC Status - General Column Descriptions

Column	Descriptions
PMC Version	The version of PMC installed (e.g., 1.04)
Vapor Pressure [iwc]	The vapor pressure reported by the vapor pressure sensor in inches water column
[Veeder-Root Polisher] Load [%]	The percentage of hydrocarbons reported by the Veeder-Root Polisher, which determines if the canister is open or closed.
[Veeder-Root Polisher] Effluent Emissions Test Status [LB/KGAL]	The amount of emissions (lbs per 1000 gallons) of dispensing.
[Veeder-Root Polisher] Daily Throughput [GALS]	Gallons of gasoline dispensed per day
[Veeder-Root Polisher] Vapor Processor Mode	Current mode of the vapor processor. • Automatic • Manual Use Actions > Set VP Mode to change the mode. [Web: Click Set VP Mode button].
[Veeder-Root Polisher] Position Requested	Position of the Vapor Valve that is requested next. • Open • Closed
[Veeder-Root Polisher] Position Current	Current position of the Vapor Valve • Open • Closed
[ARID Processor] VP State	Current state of the vapor processor: • On • Off
[ARID Processor] Vapor Processor Fault	Status of Vapor Processor • Normal • Fault
[Veeder-Root Polisher] Temp [DEG F]	Temperature of the ullage space.

NOTICE A site with no Vapor Processor will only show the version of PMC installed (e.g., 1.04).

PMC (Non-ISD) Status Report

1. You can access and view the PMC Status report from the TLS console front panel by selecting **Menu>Reports>PMC>Status** (see Figure 23 and Figure 24).



Figure 23. Accessing PMC Report

	System Status		0 Alarm(s	^{g(5)} 04	/02/2021 04:0
	Reports PMC Status				< Sha
e	General				
	PMC Version	01.04			
	Effluent Emissions Test	PASS	(0.00 LB	S/1KG)	
tes	PMC Sensor Self Test	PASS			
	PMC Setup Self Test	PASS			
	Daily Throughput	4432	GALS		
u	PMC MONITORING TEST PASS/FAIL T	HRESHOLDS			
			PERIOD	BELOW	AB
ns	VAPOR PROCESSOR MASS EMISSION	FAIL	1DAYS		0.32 LBS/
	•				•

Figure 24. PMC Status Report Example

Clear Test After Repair - ISD

[Available with In-Station Diagnostics (ISD)]

Diagnostics>Vapor Monitor>Clear Test After Repair

Since ISD monitoring tests operate on sensor data gathered over a fixed time interval (calendar days), in normal operation, following a repair, it will be necessary for an Authorized Service Contractor (ASC) to perform a CLEAR TEST AFTER REPAIR (CTAR). This function clears prior failure condition data, warnings and alarms for selected ISD tests. The result will be a "No Test" until the correct amount (days) of new data are available for the cleared test(s). Using this feature will result in a logged entry in the ISD "Shutdown & Misc. Event Log". The customer would be expected to retain evidence that a repair was performed.



Figure 25. Clear Test After Repair Screen - Example with ISD

SELECTION CRITERIA

When a Clear Test After Repair is performed with a test type for various test types, the following alarms will be cleared:

FIELD DESCRIPTIONS

Field	Description
Test Type	Select the type of test you want to clear.Choices are: Containment Pressure ISD GROSS PRES FAIL ISD GROSS PRES FAIL ISD DEGRD PRES FAIL VP PRESSURE WARN ISD DEGRD PRESS FAIL VP PRESSURE WARN VP PRESSURE WARN VP PRESSURE FAIL Vapor Collection hnn: GROSS COLLECT WARN hnn: DEGRD COLLECT WARN hnn: DEGRD COLLECT WARN hnn: FLOW COLLECT FAIL hnn: RFLOW COLLECT FAIL hnn: RFLOW COLLECT FAIL hnn: RFLOW COLLECT FAIL hnn: AIRFLOW MTR SETUP Yapor Leak ISD VAPOR LEAK WARN ISD VAPOR LEAK WARN ISD VAPOR LEAK KARL Yapor Processor ISD VP PRES WARN ISD VP PRES WARN ISD VP PRES WARN ISD VP PRES WARN SUD VP STATUS WARN VP EMISSIONS WARN VP EMISSIONS FAIL Sensor Out ISD SENSOR OUT WARN ISD SENSOR OUT FAIL Setup ISD SETUP WARN ISD SETUP FAIL
Last Clear	If a Clear Test After Repair was performed on the selected Test Type, the date and time of that Last Clear is posted here. If no test has been cleared, it will state "Never".
FP label	[Available for Vapor Collection test type only] Select the fueling position label to be cleared, clear by checking the box to the left of the label. If there is only one hose assigned to this fuel position label, the last cleared date displays to the right. If there is more than one hose assigned to the fuel position label, expand the list to show each hose. This allows selection of individual hoses to be cleared. The last cleared date for each individual hose displays. Once the fuel position label/hose(s) to be cleared are selected, press the <u>Clear Test</u> button.
Clear Test	Press to clear the test. This function clears prior failure condition data, warnings, and alarms for the selected ISD tests. Using this feature will result in a "TEST MANUALLY CLEARED" logged entry in the ISD "Shutdown & Misc Event Log". the Last Clear field will also update.
Override Shutdown	If the site or dispenser(s) are not shutdown, this button is greyed out, otherwise press to override a shutdown in effect and resume dispensing. Dispensing resumes, the alarm light continues to flash, and any alarm messages display until the alarm has been cleared. A "PUMPS MANUALLY RE-ENABLED" event is entered in the "Shutdown & Misc Event Log".

CLEAR TEST AFTER REPAIR - PMC (NON-ISD)

[Available with Pressure Management Control (PMC)]

Since monitoring tests operate on sensor data gathered over a fixed time interval, in normal operation, following a repair, it will be necessary for an Authorized Service Contractor (ASC) to perform a CLEAR TEST AFTER REPAIR (CTAR). This function clears prior, failure condition data, warnings and alarms for selected Vapor Processor tests. Using this feature will result in a logged entry on this screen. The customer would be expected to retain evidence that a repair was performed.

When a Clear Test After Repair is performed with a test type of Vapor Processor, the following alarms will be cleared:

- VP EMISSIONS WARN
- VP EMISSIONS FAIL

000	T 1: SETUP DA	ATA WARNING		2 Warning(s) 3 Alarm(s)	02/14/2021 08:01 AM
Favorites Menu Actions	Diagnostics	Vapor Monito Test Type Last Clear	or Clear Test After Repair Vapor Processor 02/14/2021 08:00 AM Clear Test	3 Alarm(s)	Share

Figure 26. Clear Test After Repair Screen - Example PMC w/o ISD

FIELD DESCRIPTIONS

Field	Description
Test Type	Select the type of test you want to clear. • Vapor Processor
Last Clear	If a Clear Test After Repair was performed on the selected Test Type, the date and time of that Last Clear is posted here. If no test has been cleared, it will state "Never".
Clear Test	Press to clear the test. This function clears prior, failure condition data, warnings, and alarms for the selected test. The Last Clear field will also update.

Reports

There are two main reports (CP-201 required) that are stored by the ISD system: the Monthly Status Report (CARB Monthly), stored for 12-months, and the Daily Status Report (CARB Daily), stored for 365 days. You can access and view or print out ISD reports from the TLS console front panel by selecting **Menu>Reports>ISD** (see Figure 27).



Figure 27. Accessing ISD Reports

- The Daily Status Report (CARB Daily) includes:
 - Maximum and minimum ullage pressures
 - Results of the Vapor Containment Monitoring Gross (75th percentile), Degradation (95th percentile) ullage pressure test and Vapor Leakage Detection (CVLD) tests
 - Vapor collection monitoring test results for each fueling position
 - Vapor Processor monitoring test results
- The Monthly Status Report (CARB Monthly) includes:
 - ISD operational up-time (as a percentage)
 - EVR/ISD system pass time (as a percentage)
 - Last 10 Warnings log
 - Last 10 Failures log
 - Last 10 Misc. Events log
- Daily Collection Report includes daily results of:
 - ISD EVR Status
 - % Up Time
 - Vapor Collection Monitoring test results for each gasoline fueling position.
 - The printout will also include the ISD Status Report.

• Daily Containment Report includes daily results of:

-ISD EVR Status

- -Vapor Containment Monitoring Gross (75th percentile), Degradation (95th percentile) with Max and Min daily pressures.
- Vapor Leakage Detection (CVLD)
- Vapor Processor Monitoring tests results
- The printout will also include the ISD Status Report
- Status Events (Monthly) Report (The selected day range: Status Report includes:
 - Status report
 - Warning Alarms
 - Failure Alarms
 - Shutdown & Misc. Event Log

NOTICE Additional report details can viewed within reports by touching the Actions button and then touching Help.

Viewing ISD Reports via RS-232 Connection

COMM MODULES

Table 9 lists Comm Modules for the TLS-450PLUS designed and manufactured by Veeder-Root.

Part No.	Item
332818-001	SiteFax/Modem Single Port Module
333460-001	Ethernet Module (Factory Installed Slot 4 Only)
333477-001	USB module (Factory installed Slot 5 Only)
332866-001	RS-232 Single Port Module (also used for EDIM or Satellite S-SAT or Satellite H-JBox Modules apps.)
332868-001	RS-232 Dual Port Module (also used for EDIM or Satellite S-SAT or Satellite H-JBox Modules apps.)
332867-001	RS-485 Single Port Module
332869-001	RS-485 Dual Port Module
333807-002	Tri-Comm Module
333140-001	CDIM Module
333651-001	IFSF LON Module

Table 9. Communication Bay Modules

COMM MODULE SLOTS

The Comm Bay is divided into 5 slots numbered from 1 to 5 going from left to right. Only slots 1-3 are available for user selectable Comm Modules. Slots 4 and 5 are fixed and cannot be changed (see Figure 28).



Figure 28. TLS-450PLUS Console - Fixed Comm Modules

COMM MODULE PORT CONFIGURATIONS

NOTICE To avoid attaching a Comm Module cable to a non-configurable (NC) port, identify the configurable (C) ports of any Comm Module being installed. Also verify the Comm cable port connections to Comm Modules in slots 4 and 5. Record all Comm port connections for use at setup.

User-selectable Comm Port configurations will depend on features ordered. Slots 1-3 (Figure 28) can be used for any combination of Comm Modules found in Table 10 or Table 10 as appropriate.

		Comm Slot 1		(Comm Slot	2	Comm Slot 3			
	Comm	N	Module Port		Module Port		Module Port			
Comm Module	Туре	1	2	3	1	2	3	1	2	3
RS-232 Single Port (also EDIM, Satellite S-SAT and Satellite H-JBox apps.)		NC	C	NC	NC	С	NC	NC	С	NC
RS-232 Dual Port (also EDIM, Satellite S-SAT and Satellite H-JBox apps.)*		С	C	NC	С	С	NC			
RS-485 Single Port	1	NC	С	NC	NC	C	NC	NC	C	NC
RS-485 Dual Port*	Serial	C	С	NC	С	C	NC			
RS-232/RS-485 Dual Port*		C (RS-232)	C (RS-485)	NC	C (RS-232)	C (RS-485)	NC			
Tri-Comm		C* (RS-232) (RS-485)	C (RS-485)	C (Mini USB inquiry only)	C* (RS-232) (RS-485)	C (RS-485)	C (Mini USB inquiry only)	NC	C (RS-485)	NC
SiteFax / Modem	1	NC	С	NC	NC	С	NC	NC	С	NC
CDIM	ым	C	NC	NC	С	NC	NC			
IFSF LON		С	NC	NC	С	NC	NC	С	NC	NC
= An unclearable alarm will be posted if this Comm Module is in Slot 3.										

Table 10. Configurable (C) / Non-Configurable (NC) Ports for Selectable Comm Modules (Comm Bay Slots 1 - 3 Only)

If using a Tri-Comm Module (slots 1 or 2 only), refer to Figure 29 for Port/Jumper locations and to Table 11 for Tri-Comm Module port configurations.



Figure 29. Tri-Comm Module Ports/Jumper Locations

Item	Port 1		Port 2	Port 3
Communication Type	RS-232 or RS-485 (Dependent upon jumper positioning)		RS-485 (Only)	Mini USB/Inquiry Only
Connector Type	RJ-45 RJ-45		RJ-45	Mini USB
Cable Pin Outs	RS-232 • Pin 1 – DCD • Pin 2 – RXD • Pin 3 – TXD • Pin 4 – DTR • Pin 5 – GND • Pin 6 – DSR • Pin 7 – RTS • Pin 8 – CTS	RS-485 • Pin 2 – RS-485B • Pin 3 – RS-485A • Pin 5 – GND	RS-485 •Pin 5 – GND •Pin 6 – RS-485 A •Pin 7 – RS-485 B	
Data Bit Parity Stop Bit Data Rate	Configurable		Configurable	Fixed at: • 8 Data Bits, • No Parity, • 1 Stop Bit. • Data Rate (configurable)

Table 11. Tri-Comm Module Port Configuration

Typical TLS-450PLUS RS-232 DB9 connector pin outs are shown in Figure 30.

Pin	Signal	Pin	Signal	1234
1	Data Carrier Detect	6	Data Set Ready	\rightarrow
2	Received Data	7	Request to Send	
3	Transmitted Data	8	Clear to Send	
4	Data Terminal Ready	9	Ring Indicator	
5	Signal Ground			6789

Figure 30. TLS-450PLUS RS-232 Connector Pin Outs

CONNECTING LAPTOP TO TLS-450PLUS

1. Connect your laptop to one of the TLS-450PLUS RS-232 Comm port using one of the methods shown in the in Figure 31 below.



Figure 31. Connecting Laptop to TLS-450PLUS for Serial Communication

If using a USB to DB9 Serial adapter cable (P/N 576040-170), or equivalent, you will need to follow the instructions shipped with the adapter cable.

SETTING UP THE TLS-450PLUS SERIAL PORT FOR ISD REGULATOR ACCESS

\bigcirc	System Status		0 Warning(s) 0 Alarm(s)	02/28/2024 07:52 AM
	Setup Communication	Serial Port		< Share C
Home	ID	3		-
Favorites	Configured	● Enabled ○ Disabled		
0	Label	Laptop Communication		
(E)	Usage	R5232	•	
Actions	Baud Rate	9600	•	
3	Data Bits	7	•	
Serial		the the	R	

1. On the TLS-450PLUS touch Menu>Setup>Communication>Serial Port. (Figure 32).

Figure 32. Example Serial Port Setup Screen

2. Verify that the Usage entry is RS-232 and copy the settings, especially Baud Rate, Data Bits, Parity and Stop Bits which you will use to set up a terminal emulator such as PuTTY.

000	System Status		0 Warning(s) 0 Alarm(s)	02/28/20	24 07:52 AM
	Setup Communication	Serial Port		<	< Share 🔘
Home	ID	3		-	
Favorites	Configured	● Enabled ○ Disabled			
0	Label	Laptop Communication)	
Menu	Usage	R5232	•		
Actions	Baud Rate	9600	•		
	Data Bits	7	•		
	Parity	ODD PARITY	•		
	Stop Bits	1	•		
	Use Handshaking	NO HANDSHAKING	•		
	Serial Command Security	O Enabled () Disabled			
	Security Code				
	RS232 End of Message	🔵 Enabled 💿 Disabled			
	ETX Characters Computer	[0x03]	6	-	

Figure 33. Example Serial Port 3 Setup Screen

If installing a Tri-Comm module, the serial ID for Port 3 (Mini-USB / Inquiry Only) will usually show as ID 5 or 9 (see Figure 34). Fields that are specific and non-configurable for this port are pre-populated and grayed out.

000	System Stat	us		0 Warning(s) 0 Alarm(s)	May 28 20	24 04:48 PM
0	Setup Cor	mmunication	Serial Port		<	< Share 🔾
Home		ID	9		-	
Favorites		Configured	● Enabled ○ Disabled			
0		Label	Laptop /Inquiry Only			
Menu		Usage	Mini-USB/Inquiry Only	•		X
Actions		Baud Rate	9600	•		
9		Data Bits	8	•		
Serial		Parity	NO PARITY		-	

Figure 34. Example of Tri-Comm Module Mini-USB / Inquiry Only Setup Screen

SETTING UP COMMUNICATION BETWEEN LAPTOP AND TLS-450PLUS

1. There are many free, open source, terminal emulator, serial console, and network file transfer applications that work with Windows computers. PuTTY is such a program it can be downloaded using the link below:

https://www.chiark.greenend.org.uk/~sgtatham/putty/latest.html

- 2. Determine which laptop COM port you will use to connect to the TLS-450PLUS and ensure to use the proper cables and connectors as per the TLS console communication and laptops port types. (See Figure 92)
 - a. Right click Start and then click Device Manager.
 - b. In the Device Manager screen click the expand arrow (>) next to Ports (COM & LPT). If Ports (COM & LPT) is not showing in 'Device Manager', look for unknown devices or a yellow exclamation point (see Figure 35).



Figure 35. Laptop Device Manager

- i. Right click choose "Uninstall" this device.
- ii. Scan for new devices.

- iii. If the yellow exclamation point reappears install the manufacturer's driver for the device.
- iv. If there are no unknown devices and the port is a USB device unplug and plug the device back in.
- v. If no change, try another port if available.
- vi. If still no change, reboot the machine.
- c. Open your preferred terminal program. be sure to select the correct serial port and set the proper baud rate data bits stop bits and parity.
- d. Open a new session with the correct settings.

After clicking the Open button, the terminal window opens in which you enter desired commands (see Figure 97).



Figure 36. PuTTY Terminal Window

SENDING CONSOLE COMMANDS

Table 12 shows four important ISD console commands: IV0700, IV0200, IV0100, and IB6100. The <SOH> shown in the table means that you must press and hold the **Ctrl** key while you press the **A** key.

For example, you want to see the Daily Report Details for the last 10 days.

If the RS-232 Security Code is disabled - press and hold the **Ctrl** key while you press the **A** key, then type in IV0700010. If the RS-232 Security Code is enabled (e.g., 000016) you must enter the security code before the command - press and hold the **Ctrl** key while you press the **A** key, then type in 000016IV0500010.

If you have local echo enabled you will see the typed command on the screen: ©IV0700010 followed by the response (report) from the console. The ⊙ symbol indicates Ctrl A and the ♥ symbol indicates the end of the response.

If the console recognizes the command the response displays as soon as the command is typed in.

If the console does not recognize the command you would see something like ©IV0700010 ©9999FF1B' which indicates the console did not recognize the command.

All responses (Reports) can be printed or saved to a file. See the terminal program's help file for instructions.

Report Type	Serial Command (PC to Console) ¹
Daily Report Details	<soh>IV0700ddd Where ddd = number of days, 001 = yesterday and today, 002 = two days ago, etc.</soh>
Monthly Status Report	<soh>IV0200yyyymm Where yyyy = year number, e.g. 2003, mm = month number, 01 = Jan- uary, 02 = February, etc.</soh>
Alarm Status	<soh>IV0100</soh>
Vapor Processor Runtime Diagnostic Report ²	<soh>IV8000</soh>
Vapor Processor Status Report ²	<soh>IV8200</soh>
Vapor Valve Diagnostic Report ²	<soh>IB6100</soh>
Daily Vapor Polisher Diag- nostic Report	<soh>IV8800yyyymmddnnnn Where: yyyy = year number, e.g., 2003, mm = month number (01 = January, 02 = February, etc.), dd = day of the month, nnnn = num- ber of records after the date entered (9999 = all).</soh>
Non-Priority Alarm History Report	<soh>I11100</soh>
Priority Alarm History Report	<soh>I11200</soh>

Table 12: Serial	Commands	for ISD Alarm.	Monthly, an	d Daily Reports
	•••••			

¹<SOH> = CTRL+A. For more information on TLS console serial commands, refer to the V-R Serial Interface Manual. ²Not available for FFS-CAS Processor or HIRT VCS 100.

Troubleshooting Commands for Technical Support

Below are suggested commands to pull data for Technical Support assistance when there are no remote communications available to the console. The lists below will provide a starting point for assisting in diagnosing the issue.

NOTICE Most of the ISD serial commands work with the TLS350 and TLS450PLUS.

Please refer to VEEDER-ROOT SERIAL INTERFACE MANUAL TLS4 Series Manual 577013-950 for a further reference.

ISD COLLECTION ISSUES

Code	Function
111100	Priority Alarm History Report
111200	Non-Priority Alarm History Report
111300	Active Alarm Report
120100	In-Tank Inventory Report
IV0200	ISD Monthly Status Report
IV0700030	ISD Daily Report Details (30 DAYS)
IV1200030	Vapor Collection Test Results (30 RECORDS)
IV4200	Set Clear Sensor/AFM/Hose Maps
IV430000	Set Sensor Table ISD In Use Flag
IV4A00	Read Hose Table Data
IV4E00	Set ISD EVR TYPE
I@A002	Meter Map Diagnostics

Additional if available:

Hose Event printout of hose in alarm:

Diagnostics>Vapor Monitor>Hose Events (WEB: Hose Diagnostics)

Hose Histogram (WEB ONLY) of hose in alarm:

Diagnostics>Vapor Monitor>Hose Diagnostics>Histogram

ISD CONTAINMENT ISSUES

Code	Function
111100	Priority Alarm History Report
111200	Non-Priority Alarm History Report
111300	Active Alarm Report
120100	In-Tank Inventory Report

IV0200	ISD Monthly Status Report
IV0700030	ISD Daily Report Details (30 DAYS)
IV1200030	Vapor Collection Test Results (30 RECORDS)
IS6400	Get Vapor Pressure Sensor Serial Number
IV430000	Set Sensor Table ISD In Use Flag

Additional if available: Pressure Graph (WEB only) Printout: Diagnostics>Vapor Monitor>Pressure Graph

ISD WITH VAPOR PROCESSOR

Code	Function
IB6100	Vapor Valve Diagnostic
IS6400	Get Vapor Pressure Sensor Serial Number
IS7700	Get Atmospheric Pressure Sensor Status Report
IB6100	Vapor Valve Diagnostic
IV8000	Vapor Processor Report
IV8100	Percent Hydrocarbon Report
IV8200	Vapor Processor Status Report
IB6100	Vapor Valve Diagnostic
IB3U00	Vapor Valve Constants Data
IB3V00	Vapor Valve Diagnostic Overview
IVC000	Automatic/Manual Vapor Processor Control

Additional if available: Pressure Graph (WEB only) Printout:

Diagnostics>Vapor Monitor>Pressure Graph

PMC (NON-ISD)

Code	Function
111100	Priority Alarm History Report
111200	Non-Priority Alarm History Report
111300	Active Alarm Report
120100	In-Tank Inventory Report
IS6400	Get Vapor Pressure Sensor Serial Number
IV430000	Set Sensor Table ISD In Use Flag
IS7700	Get Atmospheric Pressure Sensor Status Report

IVC000	Automatic/Manual Vapor Processor Control
IVC100	Manual Override of Vapor Processor
IV8000	Vapor Processor Report
IV8100	Percent Hydrocarbon Report
IV8200	Vapor Processor Status Report
IVC000	Automatic/Manual Vapor Processor Control
IB6100	Vapor Valve Diagnostic
IB3U00	Vapor Valve Constants Data
IB3V00	Vapor Valve Diagnostic Overview

Additional if available: Pressure Graph (WEB only) Printout:

Diagnostics>Vapor Monitor>Pressure Graph

Reports FAQ

DAILY DETAIL REPORT

A Daily Detail example report is shown below: TV0700 MMMDDYYYY HH:MM XM S--- STATION HEADER ---ISD DAILY REPORT DETAILS EVR TYPE: VACUUM ASSIST ISD TYPE: 01.03 VAPOR PROCESSOR TYPE: NO VAPOR PROCESSOR OVERALL STATUS EVR VAPOR COLLECTION : PASS :WARN EVR VAPOR CONTAINMENT :WARN ISD MONITOR UP-TIME : 99% STAGE I TRANSFERS: 9 of 20 PASS EVR/ISD PASS TIME : 90% Status Codes: (W)Warn (F)Fail (D)Degradation Fail (G)Gross Fail (ISD-W) ISD Self-Test Warning (ISD-F) ISD Self-Test Fail (N) No Test ISD ISD ---CONTAINMENT TESTS--- STAGE ---COLLECTION TESTS-DAILY AVERAGE HOSE A/L RATIO------____ EVR %UP GROSS DGRD MAX MIN LEAK I VAPOR FP1 FP2 FP3 FP4 DATE STATUS TIME 95% 75% "WC "WC CFH XFR PRCSR BLEND BLEND BLEND BLEND 12/16 PASS 100% 3.2N 2.8N 3.0 -5.0 0 PASS 0.88 1.04 0.98 0.91 12/17 PASS 100% 3.5N 3.2N 3.6 0.4 0 0.93 0.96 0.95 1.01 12/18 PASS 100% 3.5N 3.2N 3.8 2.4 0 0.88 0.90 0.90 1.01 12/19 PASS 100% 3.5N 3.3N 3.7 2.2 0 0.92 0.95 0.96 0.97 0.95 0.91 0.97 1.01 12/20 PASS 100% 3.5N 3.3N 5.0 -5.0 0 FAIL 12/21 W 99% 3.5W 3.2N 0.3 -2.9 0 FAIL 0.83 1.02 0.93 1.02 12/22 PASS 100% 0.3N 0.2N 0.4 -0.2 0 0.97 0.99 0.93 0.95 12/23 PASS 100% 3.4N 3.2N 3.6 0.0 0 0.93 0.93 0.89 1.05 12/24PASS 100% 3.4N 3.1N 3.7 1.8 1 0.94 1.00 0.92 0.84 0 PASS 12/25 PASS 100% 3.4N 3.1N 3.4 -5.0 0.94 0.82 0.94 0.98 12/26 PASS 100% 3.4N 3.2N 3.9 1.9 0 0.96 0.95 0.92 1.01 12/27 PASS 100% 3.5N 3.2N 3.7 2.4 0 0.92 0.97 0.94 0.99 12/28 W 100% 3.5W 3.2N 5.0 -1.8 0 PASS 0.95 1.01 0.95 0.98 12/29PASS 100% 0.4N 0.2N 0.5 -0.2 17N 0.95 0.98N 0.95 0.99 3N FAIL 12/30 PASS 100% 0.4N 0.2N 0.7 -5.0 0.96 1.00 0.93 0.90 ЗN 12/31PASS 100% 0.3N 0.1N 0.4 -0.7 0.94 0.99 0.95 1.01 01/01 PASS 100% 0.3N 0.1N 0.3 -0.4 2N 0.96 0.98 0.93 1.00 01/02 PASS 100% 0.3N 0.1N 0.3 -0.3 2N 0.98 1.04 1.00 1.03 01/03 PASS 100% 0.3N 0.1N 0.5 -0.3 3N 0.95 1.01 0.93 1.03 01/04 PASS 100% -0.0N -0.3N 0.0 -0.8 3 0.92 0.89 0.93 0.98 01/05 PASS 100% -0.1N -0.3N 0.5 -5.0 2 PASS 0.95 0.99 0.92 1.03 01/06 PASS 100% -0.2N -0.5N -2.1 -5.0 0.96 0.98 0.88 1.04 2 01/07 PASS 100% -0.2N -0.7N -0.4 -2.1 0.98 1.00 0.94 1.01 1 PASS 100% 0.0N -0.4N 0.3 -1.2 01/08 0.96 0.97 0.93 1.01 2 01/09 PASS 100% 0.1N -0.1N 0.3 -0.3 2 0.98 1.00 0.87 1.02 01/10 PASS 100% 0.2 0.0N 0.3 -0.4 2 0.97 0.98 0.90 0.98 PASS 100% 0.2 0.0N 0.8 -4.3 0.98 1.00 0.93 01/11 2 PASS 1.02 01/12 PASS 100% 0.2 0.0N 0.3 -3.2 2 0.99 1.02 0.92 1.00 01/13 PASS 100% 0.2 0.0N 0.4 -0.4 3 0.96 1.00 0.92 0.97 01/14 PASS 100% 0.6 0.0N 3.7 -0.9 3 PASS 0.99 0.99 0.93 1.01 01/15 W 100% 3.5W 0.1N 4.1 2.0 1 0.95N 1.01 0.95 0.97N

REPORTS> ISD> DAILY DETAIL STATUS CODES

Assist Daily Detail Status Codes

Question

When and why do the status codes appear? (see example below.)

Status Codes: (W)Warn (F)Fail (D)Degradation Fail (G)Gross Fail (ISD-W)ISD Self-Test Warning (ISD-F)ISD Self-Test Fail (N)No Test ---COLLECTION TESTS-DAILY AVERAGE HOSE A/L RATIO--ISD ---CONTAINMENT TESTS---TSD STACE FP2 EVR &UP GROSS DGRD MAX MIN LEAK T VAPOR FP1 FP3 FP4 TIME XFR PRCSR BLEND BLEND BLEND DATE STATUS 95% 75% "WC "WC CFH 2.8N 3.2N 3.0 -5.0 12/15 PASS 100% 0 PASS NN 1.04 0.98 0.91 No Test, no events 12/16 PASS 100% 3.2N 2.8N 3.0 -5.0 0 PASS 0.88N 1.04 0.98 0.91 No Test, low events 12/17 WARN 100% 3.5N 3 2N 3 6 0.4 0 BLKDW 0.96 0.95 1.01 Stat Warn BLKDF 0.90 12/18 FAIL 100% 3.5N 3.2N 3.8 2.4 0 0.90 1.01 Stat Fail 12/19 100% 3.5N 2.2 0 0.788 0.95 0.96 0.97 Degr Warn WARN 3.3N 3.7 WARN 12/20 3.5N 0 0.300 0.95 0.97 100% 3.3N 2.2 0.96 Gross Warn 3.7 12/21 100% 3.5N 0.30G 0.95 0.97 Gross Fail FAIL 3.3N 3.7 2.2 0 0.96 12/22 100% 3.5N 3.7 0.78D 0.95 0.97 FAIL 3.3N 2.2 0 0.96 Degr Fail 12/23 PASS 100% 3.5N 3.3N 3.7 2.2 0 0.95 0.96 0.97 All Pass 0.92 12/24 ISD-W 100% 3.5N 3.3N 3.7 2.2 0 0.92 0.95 0.96 0.97 ISD Self Test Warn ISD-F 100% 3.5N 3.3N 3.7 ISD Self Test Fail 12/25 2.2 0 0.92 0.95 0.96 0.97

Explanation

Assist Systems - Hose W,F,G,D Results

Next to each hose collection daily average A/L result there is an assessment. The absence of any of the results listed above indicates a pass. If any of the listed conditions **W**,**F**,**G**, **D** or **N** exist, they will post before a pass. The assessment can indicate the result for one (or combination,) of three tests called Statistical Test, Gross Test and Degradation Test.

- W Warning for Statistical (BLKD), Gross (A/L) and/or Degradation (A/L).
 - Indicates a statistical warning if BLKD appears instead of the A/L value.
 - Indicates either a Gross or Degradation warning if the A/L value appears next to it. You can distinguish which of the two warning conditions it is by comparing the A/L value with the gross and degradation ranges defined in the IV00 or IV02 reports. It is important to make this distinction as a gross test will convert to a failure and shutdown on the 2nd day and the degradation test will convert to a failure and shutdown on the 8th day.
- **F** Statistical Failure A BLKD is posted instead of an A/L value.
 - Automobiles equipped with ORVR equipment appear as a blocked dispensing event (A/L very low). ISD separates out this type of activity from blockages that are caused by something other than ORVR vehicles. It does this statistically using multiple dispensing events. When there are more blockages than would be expected from normal ORVR traffic, a BLKD warning is issued.

BELOW ABOVE

PERTOD

- **G** Failure for Gross Test and will appear with A/L value.
- **D** Failure for Degradation Test and will appear with A/L value.
- N No Test.

ISD MONITORING TEST PASS/FAIL THRESHOLDS

VAPOR	COLLECTION	ASSIST	SYSTEM	A/L	GROSS FAIL		1DAYS	0.33	1.90
VAPOR	COLLECTION	ASSIST	SYSTEM	A/L	DEGRADATION	FAIL	7DAYS	0.81	1.32
VAPOR	CONTAINMENT	GROSS	FAIL, 9	5th	PERCENTILE		7DAYS		1.30"wcg
VAPOR	CONTAINMENT	DEGRA	DATION,	75th	n PERCENTILE		SODAYS		0.30"wcg
VAPOR	CONTAINMENT	LEAK	DETECTIC	N F7	AIL @2"WCG		7DAYS		8.00cfh
STAGE	I VAPOR TRA	ANSFER	FAIL, 50	th I	PERCENTILE		20MINS		2.50"wcg

Assist Systems - Hose N No Test Result

- If the Degradation test did not run and the Gross test did not run, then an **N** is posted.
- If there were no events received to make any conclusion about the A/L value for the hose, the A/L value is replaced with N.
- If there are some events received, enough to calculate an average, but not enough to complete a test, the No Test result will appear with an A/L average.

Assist Systems - Hose Pass Result

- When none of the above results W,F,G,D,N appear then it is a PASS.
- If the Degradation test did not run (no test), but the Gross test passed, the result is a PASS.
- If the Gross test did not run (no test), but the Degradation test passed, the result is a PASS.

Assist Systems - Code Precedent (listed high to low)

- 1. G, F Gross Failure (A/L) and Gross Stat Failure (BLKD)
- 2. D Degradation Failure (A/L)
- 3. W Gross Warning (A/L) and Gross Stat Warning (BLKD)
- 4. W Degradation Warning (A/L)
- 5. **PASS** Pass Gross and/or Degradation test.
- 6. **N** No Test Neither Gross nor Degradation test complete.

Assist Systems - Self Test Codes

- ISD-W A self test warning condition exists. See ISD SETUP
- ISD-F A self test warning condition persisted for 7 days and resulted in a Failure.

BALA NCE: DAILY STATUS CODES

Question

When and why do the status codes appear? (see example below.)

Status Codes: (W)Warn (F)Fail (D)Degradation Fail (G)Gross Fail (ISD-W)ISD Self-Test Warning (ISD-F)ISD Self-Test Fail (N)No Test

	ISD	ISD	CON	TAINME	NT TH	ISTS	-	STAGE		CO	LLECTI	ON TES	TS-DAILY	AVERAGE HOSE A/L RATIO-
	EVR	SUP	GROSS	DGRD	MAX	MIN	LEAK	I	VAPOR	FP1	FP2	FP3	FP4	
DATE	STATUS	TIME	95%	75%	"WC	"WC	CFH	XFR	PRCSR	BLEND	BLEND	BLEND	BLEND	
12/15	PASS	100%	3.2N	2.8N	3.0	-5.0	0	PASS		N N	1.04	0.98	0.91	No Test, no events
12/16	PASS	100%	3.2N	2.8N	3.0	-5.0	0	PASS		0.88N	1.04	0.98	0.91	No Test, low events
12/17	WARN	100%	3.5N	3.2N	3.6	0.4	0			BLKDW	0.96	0.95	1.01	Stat Warn
12/18	FAIL	100%	3.5N	3.2N	3.8	2.4	0			BLKDP	0.90	0.90	1.01	Stat Fail
12/19	PASS	100%	3.5N	3.3N	3.7	2.2	0			0.78	0.95	0.96	0.97	All Pass
12/20	WARN	100%	3.5N	3.3N	3.7	2.2	0			0.301	0.95	0.96	0.97	FLOW Warn
12/21	FAIL	100%	3.5N	3.3N	3.7	2.2	0			0.30G	0.95	0.96	0.97	FLOW Fail
12/22	PASS	100%	3.5N	3.3N	3.7	2.2	0			0.78	0.95	0.96	0.97	All Pass
12/23	PASS	100%	3.5N	3.3N	3.7	2.2	0			0.92	0.95	0.96	0.97	All Pass
12/24	ISD-W	100%	3.5N	3.3N	3.7	2.2	0			0.92	0.95	0.96	0.97	ISD Self Test Warn
12/25	ISD-F	100%	3.5N	3.3N	3.7	2.2	0			0.92	0.95	0.96	0.97	ISD Self Test Fail

Explanation

Balance Systems - Hose W, F, G, N Results

Next to each hose collection daily average A/L result, there is an assessment. The absence of any of the results listed above indicates a pass. If any of the listed conditions, W, G, or F exist, they will post before a pass. The assessment can indicate the result for one of two tests called Statistical Test or Flow Performance Test.

- W Warning for Statistical (BLKD).
 - Indicates a statistical warning if BLKD appears instead of the A/L value.
 - Indicates a Flow Collect warning if the A/L value appears next to it.
- **W** Warning for Flow Performance Test and will appear with A/L value. A Flow Collect warning will convert to a failure and shut down on the 2nd day.
- **F** Statistical Failure- A BLKD is posted instead of an A/L value. Automobiles equipped with ORVR equipment appear as a blocked dispensing event (A/L very low). ISD separates out this type of activity from blockages that are caused by something other than ORVR vehicles. It does this statistically using multiple dispensing events. When there are more blockages than would be expected from normal ORVR traffic, a BLKD warning is issued.

DEBIOD

BELOW ABOVE

- **G** Failure for Flow Performance Test and will appear with A/L value.
- N No Test.

ISD MONITORING TEST PASS/FAIL THRESHOLDS

	T BIGTOD	DITOU	THEOTH
VAPOR COLLECTION BALANCE SYS FLOW PERFORMANCE	1DAYS	0.60	
VAPOR CONTAINMENT GROSS FAIL, 95th PERCENTILE	7DAYS		1.30"wcg
VAPOR CONTAINMENT DEGRADATION, 75th PERCENTILE	30DAYS		0.30"wcg
VAPOR CONTAINMENT LEAK DETECTION FAIL @2"WCG	7DAYS		12.50cfh
STAGE I VAPOR TRANSFER FAIL, 50th PERCENTILE	20MINS		2.50"wcg
VAPOR PROCESSOR SELF TEST FAIL	1DAYS		
VAPOR PROCESSOR MASS EMISSION FAIL (LB/KGAL)	1DAYS		0.32

Balance Systems - Hose N No Test Result

- If the Flow performance did not run, then an **N** is posted.
- If there were no events received to make any conclusion about the A/L value for the hose, the A/L value is replaced with an **N**.
- If there are some events received, enough to calculate an average, but not enough to complete a test, the No Test result will appear with an A/L average.

Balance Systems - Hose Pass Result

• When none of the above results W, F, G or N appear, then it was a pass.

Balance Systems - Code Precedent (Listed high to low)

- 1. **G**, **F** Flow Collect Failure (A/L) and Statistical Failure (BLKD).
- 2. W Flow Collect Warning (A/L and Statistical Warning (BLKD).
- 3. **Pass** Pass Flow Performance Test.
- 4. **N** No Test Flow Performance Test not completed.

Balance systems - Self Test Codes

- **ISD-W** A self test warning condition exists. See ISD SETUP.
- **ISD-F** A self test warning condition persisted for 7 days and resulted in a Failure.

COLLECTION REPORT FP ORDERING

Question

Should I be concerned if the fueling position numbers are out of order in the header?

Explanation

When using a Gilbarco current loop DIM the fueling position numbers may not be in order in the header. The fueling position numbers come from the current loop and may not match the numbers on the side of the dispenser or on the POS.

See following example:

100/00		
MMMDDYYYY HH:MM XM		
STATION 1 HEADER		
ISD DAILY REPORT DETAILS		
EVR TYPE: VACUUM ASSIST		
ISD TYPE: 01.03		
VAPOR PROCESSOR TYPE: NO VAPOR	R PROCESSOR	
OVERALL STATUS	:WARN	EVR VAPOR COLLECTION : PASS
EVR VAPOR CONTAINMENT	:WARN	
ISD MONITOR UP-TIME	: 99%	STAGE I TRANSFERS: 23 of 23 PASS
EVR/ISD PASS TIME	: 86%	

Status Codes: (W)Warn (F)Fail (D)Degradation Fail (G)Gross Fail (ISD-W)ISD Self-Test Warning (ISD-F)ISD Self-Test Fail (N)No Test

	ISD	ISD	CO1	MAINM	ENT TH	STS		STAGE		COLLECTION	TESTS-DAILY	AVG.HOSE A/L	RATIO
	EVR	\$UP	GROSS	DGRD	MAX	MIN	LEAK	Ι	VAPOR	FP4	FP1	FP2	FP3
DATE	STATUS	TIME	95%	75%	"WC	"WC	CFH	XFR	PRCSR	BLEND	BLEND	BLEND	BLEND
02/01	PASS	100%	0.2N	0.0N	0.4	-0.0	ON	PASS		N N	N N	N N	N N
02/02	PASS	100%	0.2N	0.1N	0.2	-0.0	10N			N N	N N	N N	N N
02/03	PASS	100%	0.2N	0.0N	0.3	-0.8	33N			0.89	0.96	0.95	0.98

CONTAINMENT DEGRADATION RESULTS

Question

Why is the Degradation Test Result a No Test?

Explanation

Containment Degradation Results will not post until after the system has been running 7 Days.

When the containment pressure remains at or below -5"wc for most of the day (Look at MAX "WC and MIN "WC) there may not be enough samples available over the past 7 days to perform an assessment, so a N test is reported.

ISD STATUS MISSING TEXT

Question

Why are the ISD EVR status and % Up time sometimes missing for the last day in the report?

Explanation

The daily detail report sometimes does not have the ISD Average and ISD EVR STATUS and ISD % UP TIME for the last day, but it does have all the other results for the day (containment and collection). If there is a post delay configured in ISD, the daily detail report will not show ISD EVR STATUS or % UP TIME if it is pulled during the time period between the assessment and the post. The ISD EVR STATUS and % UP TIME are part of the daily post and have not occurred yet. After the post time the ISD EVR STATUS or % UP TIME will show up in the daily detail report.

The post delay is not to be used in ISD. Instead of using the post delay the assessment time must be scheduled for the time they want the alarms to post.

MISSING ALL REPORTS FOR ONE DAY

Question

Why am I missing all the results for one day?

Explanation

In the example report below there is one day where all the reports are missing.

- 1. One possible cause is the assessment time was programmed for a new hour. The assessment time may not be reached until the next day, so it looks like a day is missing. However, the test has been done, but more than 24 hours were included in the test following the missing one. You can tell this has happened by looking at the time warnings were posting previously and the time they are posting presently. The time will be different.
- 2. The TLS clock time was changed to a time beyond the assessment time, skipping the test for that day. The Miscellaneous Event log will show the time change.
- 3. The TLS was not powered during the programmed assessment time and the assessment was skipped for that day. The Miscellaneous Event log will show an ISD SHUTDOWN and ISD STARTUP event that will show it was down during the assessment time.

IV0700 MMMDDYYYY HH:MM XM --STATION HEADER--ISD DAILY REPORT DETAILS EVR TYPE: VACUUM ASSIST ISD TYPE: 01.03 VAPOR PROCESSOR TYPE: NO VAPOR PROCESSOR

OVERALL STATUS	:WARN	EVR VAPOR COLLECTION : PASS							
EVR VAPOR CONTAINMENT	:WARN								
ISD MONITOR UP-TIME	:100%	STAGE I TRANSFERS: 26 of 26 PASS							
EVR/ISD PASS TIME	: 96%								

Status Codes: (W)Warn (F)Fail (D)Degradation Fail (G)Gross Fail (ISD-W)ISD Self-Test Warning (ISD-F)ISD Self-Test Fail (N)No Test

	ISD	ISD	C01	MAINM	ENT T	ESTS		STAGE		C0	LLECTI	ON TES	TS-DAI	LY AVE	RAGE H	OSE A/	L RATIO
	EVR	%UP	GROSS	DGRD	MAX	MIN	LEAK	I	VAPOR	FP7	FP8	FP4	FP5	FP6	FP1	FP2	FP3
DATE	STATUS	TIME	95%	75%	"WC	"WC	CFH	XFR	PRCSR	BLEND	BLEND	BLEND	BLEND	BLEND	BLEND	BLEND	BLEND
02/17	PASS	100%	-5.0	-5.0N	-4.1	-5.0	1			0.99	NN	0.93	0.85	0.91	0.92	1.06	0.91
02/18	PASS	100%	-5.0	-5.0N	-5.0	-5.0	1N	PASS		1.00	NN	1.00	0.86	0.88	0.96	1.08	0.89
02/19	PASS	100%	-4.6	-5.0N	0.7	-5.0	1	PASS		0.98	NN	0.96	0.84	0.87	0.90	1.04	0.88
02/20	PASS	100%	-4.7	-5.0N	-5.0	-5.0	1N			0.99	0.93	0.96	0.85	0.90	0.90	1.04	0.90
02/21	PASS	100%	-2.6	-5.0N	-0.5	-5.0	1N	PASS		0.98	0.98	0.92	0.86	0.92	0.92	1.02	0.88
02/22	PASS	100%	-2.4	-5.0N	2.6	-5.0	1	PASS		0.96	0.94	0.92	0.86	0.85	0.91	1.02	0.92
02/23	PASS	100%	-2.2	-5.0N	0.8	-5.0	1	PASS		0.96	0.90	0.92	0.87	0.88	0.94	1.07	0.88
02/24	PASS	100%	-1.6	-5.0N	-0.0	-5.0	1	PASS		0.95	0.89	0.91	0.85	0.95	0.90	0.98	0.86
02/25	PASS	100%	-1.4	-5.0N	1.0	-5.0	1	PASS		0.95	0.83	0.95	0.91	0.92	0.93	1.07	0.85
02/26	PASS	100%	-2.4	-5.0N	-2.7	-5.0	2	PASS		0.95	0.89	0.93	0.93	0.99	0.96	1.07	0.91
02/27	PASS	100%	-2.4	-5.0N	-3.9	-5.0	2			0.99	0.90	0.97	0.88	0.89	0.91	1.04	0.91
02/28	PASS	100%	0.0	-5.0N	5.0	-5.0	3	PASS		0.98	0.91	0.90	0.91	0.97	0.96	1.05	0.95
03/01	PASS	100%	0.1	-5.0N	0.2	-5.0	4			0.95	0.96	0.88	0.87	0.90	0.89	1.05	0.97
03/02	PASS	100%	0.1	-5.0N	0.8	-5.0	5	PASS		0.96	0.95	0.95	0.84	0.92	0.94	1.01	1.04
03/03	W	100%	0.1	-5.0N	-2.9	-5.0	13W			1.00	0.91	0.94	0.82	0.94	0.93	1.08	1.03
03/04	PASS	100%	0.1	-5.0N	-4.3	-5.0	4	PASS		0.95	0.90	0.94	0.88	0.89	0.94	1.08	1.03
03/05	PASS	100%	0.1	-4.9N	-3.1	-5.0	4			0.99	0.92	0.98	0.88	0.90	0.94	1.03	1.02
03/06	PASS	100%	0.1	-4.9	-5.0	-5.0	4	PASS		0.95	0.83	0.93	0.85	0.91	0.91	1.08	1.08
03/07	PASS	100%	-0.0	-4.9	-4.9	-5.0	0			0.99	0.86	0.95	0.91	0.91	0.94	1.09	1.02
03/08	PASS	100%	-3.5	-4.9	0.0	-5.0	2	PASS		0.99	0.94	0.97	0.89	0.93	0.93	1.13	1.07
03/09	PASS	100%	-3.5	-4.8	-1.7	-5.0	2			0.99	0.92	0.96	0.89	0.94	0.92	1.05	1.06
03/10	PASS	100%	-2.9	-4.6	-2.1	-5.0	2	PASS		1.01	0.93	0.96	0.89	0.91	0.89	1.08	1.02
03/11	PASS	100%	-2.9	-4.8	-5.0	-5.0	2			0.99	0.88	0.98	0.91	0.89	1.02	1.04	1.05
03/12	PASS	100%	-2.9	-4.9	-5.0	-5.0	2			0.99	0.91	1.00	0.90	0.91	1.00	1.07	1.07
03/13	PASS	100%	-2.9	-4.9	-0.0	-5.0	2	PASS		0.99	0.90	0.97	0.93	0.90	1.00	1.01	1.06
03/14	PASS	100%	-2.9	-4.9	-2.5	-5.0	2	PASS		0.91	0.86	1.00	0.93	0.89	0.95	1.14	1.03
03/15	PASS	100%	-3.0	-4.9	-5.0	-5.0	2	PASS		0.97	0.90	0.96	0.94	0.84	0.98	1.12	1.02
03/16	PASS	100%	-4.3	-4.9	-3.8	-5.0	2			0.91	0.91	0.99	0.91	0.94	1.00	1.10	1.02
03/17																	
03/18	PASS	100%	-5.0N	-4.9	-4.9	-5.0	ON			0.97	0.91	1.00	0.89	0.91	1.00	1.09	1.09
03/19	PASS	100%	-5.0N	-4.9	-4.7	-5.0	ON			0.98	0.94	0.97	0.90	0.90	1.01	1.04	1.05

HIGH A/L ON ALL NOZZLES

Question

Why is my report is showing large A/L for all Dispensers?

Explanation

- The most common cause of High A/L on all Nozzles at the same time is the dispenser events are artificially low. This can be caused by the DIM not having a 'G' in the DIM setup string. The only DIM that requires this is the BIR Protocol Dispenser Interface Module P/N 330280-001.
- Gross Collect warnings and alarms can result from this condition. See example reports from two sites below.

-----Example Site Report with High A/L-----

IV0500		
MMMDDYYYY HH:MM XM		
STATION HEADER		
ISD DAILY REPORT DETAILS		
FUR TYDE . VARIAN ASSIST		
ISD TYPE: 01.03		
VAPOR PROCESSOR TYPE: NO	VAPOR PROCESS	OR
OVERALL STATUS	:FAIL	EVR VAPOR COLLECTION : FAIL
EVR VAPOR CONTAINMENT	: WARN	
ISD MONITOR UP-TIME	: 99%	STAGE I TRANSFERS: 30 of 30 PASS
EVR/ISD PASS TIME	: 50%	
Status Codes: (W)Warn (F)Fail (D)Degra	dation Fail (G)Gross Fail
(ISD-W)ISD Self-Test War	ning (ISD-F)IS	D Self-Test Fail (N)No Test
ISD ISDCON	TAINMENT TESTS	STAGE
EVR &UP GROSS	DGRD MAX MI	N LEAK I VAPOR

	EVR	\$UP	GROSS	DGRD	MAX	MIN	LEAK	I	VAPOR			
DATE	STATUS	TIME	95%	75%	"WC	"WC	CFH	XFR	PRCSR			
05/24	ISD-W	100%	0.0N	0.0N	0.0	0.0	ON	PASS				
05/25	ISD-W	100%	0.1N	0.0N	5.0	-5.0	N	PASS		NN	N N	N N
05/26	PASS	99%	0.0N	0.0N	0.4	-0.2	ON	PASS		N N	N N	NN
05/27	PASS	100%	0.1N	0.0N	0.0	-0.0	N			N N	N N	N N
05/28	PASS	100%	0.1N	0.0N	0.0	-0.0	N			NN	N N	N N
05/29	PASS	100%	0.0N	0.0N	0.0	-0.0	N			NN	NN	N N
05/30	PASS	100%	0.1N	0.0N	0.7	-0.3	N			7.93N	8.00N	N N
05/31	PASS	99%	0.1N	0.0N	0.4	-0.4	N			5.54N	6.39N	1.94N
06/01	W	99%	0.1	0.0N	0.3	-0.3	W			4.91N	6.22N	3.12N
06/02	W	100%	0.1	0.0N	2.7	-1.1	14N	PASS		4.41W	6.35N	3.25N
06/03	F	100%	0.2	0.0N	0.9	-0.8	8N			4.40G	6.23W	2.90N
06/04	W	100%	0.1N	-0.4N	0.2	-2.9	1N			4.14N	5.00N	2.71W

C01	LLECTIO	N TES	rs-DAIL	Y AVE	RAGE H	OSE A/L	RATIO	D		
05/24										
05/25										
05/26	N N	NN	N N	N N	N N					
05/27	N N	NN	N N	N N	N N	N N	N N	N N	N N	
05/28	N N	NN	N N	N N	N N	NN	N N	N N	N N	
05/29	N N	NN	N N	N N	N N	NN	N N	N N	N N	
05/30	3.74N	4.17N	4.02N	N N	4.26N	NN	4.23N	1.08N	N N	
05/31	3.62N	3.91N	3.90N	2.82N	4.26N	3.79N	3.28N	1.65N	4.06N	
06/01	3.70N	2.92N	3.90N	1.92N	2.86N	3.02N	3.54N	2.18N	4.06N	
06/02	3.12N	2.56W	3.80N	2.28N	2.25N	2.81W	3.29N	2.05W	2.50N	
06/03	2.51W	2.35G	3.06N	2.17W	2.21N	2.92G	3.22W	2.32G	2.57N	
06/04	3.09N	1.90N	2.94N	2.99N	2.20N	2.20N	3.81N	2.86N	2.70N	

DIAGNOSING CVLD REPORTS

Question

NO TEST is reported every day. What can cause this?

Explanation

- The first 7 days after startup CVLD will always report NO TEST.
- If the pressure is below -5 " wc every day (look at max min value in Daily Detail Report under Containment) a test is not performed.
- If there is pressure above -5 " wc check and make sure the thermal coefficients on the gasoline tanks are in the correct range greater than or equal to 0.00060 and less than or equal to 0.00079. (Typically gasoline coefficients are programmed to 0.000700).

IV0700 MMMDDYYYY HH:MM XM --STATION HEADER--ISD DAILY REPORT DETAILS EVR TYPE: VACUUM ASSIST ISD TYPE: 01.03 VAPOR PROCESSOR TYPE: NO VAPOR PROCESSOR

OVERALL STATUS	:WARN	EVR VAPOR COLLECTION : PASS
EVR VAPOR CONTAINMENT	:WARN	
ISD MONITOR UP-TIME	:100%	STAGE I TRANSFERS: 26 of 26 PASS
EVR/ISD PASS TIME	: 96%	

Status Codes: (W)Warn (F)Fail (D)Degradation Fail (G)Gross Fail (ISD-W)ISD Self-Test Warning (ISD-F)ISD Self-Test Fail (N)No Test

	ISD	ISD	C01	NTAINMI	ENT TH	ESTS	-	STAGE		C01	LECTIO	ON TES	rs-dai	LY AVE	RAGE H	OSE A/1	L RATIO
	EVR	%UP	GROSS	DGRD	MAX	MIN	LEAK	I	VAPOR	FP7	FP8	FP4	FP5	FP6	FP1	FP2	FP3
DATE	STATUS	TIME	95%	75%	"WC	"WC	CFH	XFR	PRCSR	BLEND	BLEND	BLEND	BLEND	BLEND	BLEND	BLEND	BLEND
02/17	PASS	100%	-5.0	-5.0N	-4.1	-5.0	1			0.99	N N	0.93	0.85	0.91	0.92	1.06	0.91
02/18	PASS	100%	-5.0	-5.0N	-5.0	-5.0	1N	PASS		1.00	N N	1.00	0.86	0.88	0.96	1.08	0.89
02/19	PASS	100%	-4.6	-5.0N	0.7	-5.0	1	PASS		0.98	N N	0.96	0.84	0.87	0.90	1.04	0.88
02/20	PASS	100%	-4.7	-5.0N	-5.0	-5.0	1N			0.99	0.93	0.96	0.85	0.90	0.90	1.04	0.90
02/21	PASS	100%	-2.6	-5.0N	-0.5	-5.0	1N	PASS		0.98	0.98	0.92	0.86	0.92	0.92	1.02	0.88
02/22	PASS	100%	-2.4	-5.0N	2.6	-5.0	1	PASS		0.96	0.94	0.92	0.86	0.85	0.91	1.02	0.92
02/23	PASS	100%	-2.2	-5.0N	0.8	-5.0	1	PASS		0.96	0.90	0.92	0.87	0.88	0.94	1.07	0.88
02/24	PASS	100%	-1.6	-5.0N	-0.0	-5.0	1	PASS		0.95	0.89	0.91	0.85	0.95	0.90	0.98	0.86
02/25	PASS	100%	-1.4	-5.0N	1.0	-5.0	1	PASS		0.95	0.83	0.95	0.91	0.92	0.93	1.07	0.85
02/26	PASS	100%	-2.4	-5.0N	-2.7	-5.0	2	PASS		0.95	0.89	0.93	0.93	0.99	0.96	1.07	0.91
02/27	PASS	100%	-2.4	-5.0N	-3.9	-5.0	2			0.99	0.90	0.97	0.88	0.89	0.91	1.04	0.91
02/28	PASS	100%	0.0	-5.0N	5.0	-5.0	3	PASS		0.98	0.91	0.90	0.91	0.97	0.96	1.05	0.95
03/01	PASS	100%	0.1	-5.0N	0.2	-5.0	4			0.95	0.96	0.88	0.87	0.90	0.89	1.05	0.97
03/02	PASS	100%	0.1	-5.0N	0.8	-5.0	5	PASS		0.96	0.95	0.95	0.84	0.92	0.94	1.01	1.04
03/03	W	100%	0.1	-5.0N	-2.9	-5.0	13W			1.00	0.91	0.94	0.82	0.94	0.93	1.08	1.03
03/04	PASS	100%	0.1	-5.0N	-4.3	-5.0	4	PASS		0.95	0.90	0.94	0.88	0.89	0.94	1.08	1.03
03/05	PASS	100%	0.1	-4.9N	-3.1	-5.0	4			0.99	0.92	0.98	0.88	0.90	0.94	1.03	1.02
03/06	PASS	100%	0.1	-4.9	-5.0	-5.0	4	PASS		0.95	0.83	0.93	0.85	0.91	0.91	1.08	1.08
03/07	PASS	100%	-0.0	-4.9	-4.9	-5.0	0			0.99	0.86	0.95	0.91	0.91	0.94	1.09	1.02
03/08	PASS	100%	-3.5	-4.9	0.0	-5.0	2	PASS		0.99	0.94	0.97	0.89	0.93	0.93	1.13	1.07
03/09	PASS	100%	-3.5	-4.8	-1.7	-5.0	2			0.99	0.92	0.96	0.89	0.94	0.92	1.05	1.06
03/10	PASS	100%	-2.9	-4.6	-2.1	-5.0	2	PASS		1.01	0.93	0.96	0.89	0.91	0.89	1.08	1.02
03/11	PASS	100%	-2.9	-4.8	-5.0	-5.0	2			0.99	0.88	0.98	0.91	0.89	1.02	1.04	1.05
03/12	PASS	100%	-2.9	-4.9	-5.0	-5.0	2			0.99	0.91	1.00	0.90	0.91	1.00	1.07	1.07
03/13	PASS	100%	-2.9	-4.9	-0.0	-5.0	2	PASS		0.99	0.90	0.97	0.93	0.90	1.00	1.01	1.06
03/14	PASS	100%	-2.9	-4.9	-2.5	-5.0	2	PASS		0.91	0.86	1.00	0.93	0.89	0.95	1.14	1.03
03/15	PASS	100%	-3.0	-4.9	-5.0	-5.0	2	PASS		0.97	0.90	0.96	0.94	0.84	0.98	1.12	1.02
03/16	PASS	100%	-4.3	-4.9	-3.8	-5.0	2			0.91	0.91	0.99	0.91	0.94	1.00	1.10	1.02
03/17																	
03/18	PASS	100%	-5.0N	-4.9	-4.9	-5.0	ON			0.97	0.91	1.00	0.89	0.91	1.00	1.09	1.09
03/19	PASS	100%	-5.0N	-4.9	-4.7	-5.0	ON			0.98	0.94	0.97	0.90	0.90	1.01	1.04	1.05

HIGH A/L ON ALL NOZZLES

Question

Why is my report is showing large A/L for all Dispensers?

Explanation

- The most common cause of High A/L on all Nozzles at the same time is the dispenser events are artificially low. This can be caused by the DIM not having a 'G' in the DIM setup string. The only DIM that requires this is the BIR Protocol Dispenser Interface Module P/N 330280-001.
- Gross Collect warnings and alarms can result from this condition. See example reports from two sites below.

Example Site Report with High A/L											
IV0500	IV0500										
MMMDDYYYY HH:MM XM	MMMDDYYYY HH:MM XM										
STATION HEADER											
ISD DAILY REPORT DETAILS											
EVR TYPE: VACUUM ASSIST											
ISD TYPE: 01.03											
VAPOR PROCESSOR TYPE: NO	VAPOR PROCESSOR										
OVERALL STATUS	:FAIL EV	VR VAPOR COLLECTION :FAIL									
EVR VAPOR CONTAINMENT	:WARN										
ISD MONITOR UP-TIME	: 99% SI	TAGE I TRANSFERS: 30 of 30 PASS									
EVR/ISD PASS TIME : 50%											
Status Codes: (W)Warn (F)Fail (D)Degradation Fail (G)Gross Fail											
(ISD-W)ISD Self-Test Warr	ning (ISD-F)ISD Self-1	Iest Fail (N)No Test									
ISD ISDCONT	FAINMENT TESTS	STAGE									
EVR %UP GROSS	DGRD MAX MIN LEAK	I VAPOR									
DATE STATUS TIME 95%	75% "WC "WC CFH	XFR PRCSR									
05/24 ISD-W 100% 0.0N	0.0N 0.0 0.0 0N	PASS									
05/25 ISD-W 100% 0.1N	0.0N 5.0 -5.0 N	PASS N N N N N N									
05/26 PASS 99% 0.0N	0.0N 0.4 -0.2 ON	PASS N N N N N N									
05/27 PASS 100% 0.1N	0.0N 0.0 -0.0 N	N N N N N N									
05/28 PASS 100% 0.1N	0.0N 0.0 -0.0 N	N N N N N N									
05/29 PASS 100% 0.0N	0.0N 0.0 -0.0 N	N N N N N N									
05/30 PASS 100% 0.1N	0.0N 0.7 -0.3 N	7.93N 8.00N N N									
05/31 PASS 99% 0.1N	0.0N 0.4 -0.4 N	5.54N 6.39N 1.94N									
06/01 W 99% 0.1	0.0N 0.3 -0.3 W	4.91N 6.22N 3.12N									
06/02 W 100% 0.1	0.0N 2.7 -1.1 14N	PASS 4.41W 6.35N 3.25N									
06/03 F 100% 0.2	0.0N 0.9 -0.8 8N	4.40G 6.23W 2.90N									
06/04 W 100% 0.1N -	-0.4N 0.2 -2.9 1N	4.14N 5.00N 2.71W									



