Veeder Root TLS-3XX Series Console with CSLD Module

The problem: The VR TLS-3XX Series Console with CSLD Module DOES NOT go into any of the following alarm* modes even when the tank is having a large volume release:

Leak Alarm
Sudden Loss Alarm
Periodic Test Fail

*ALARM (Red Light): An alarm indicates a potentially dangerous situation may have occurred.

The Reason: The CSLD functions by collecting data while product is NOT being dispensed from the tank. While product is being dispensed the CSLD cannot collect data. When a tank is having a constant release, the CSLD recognizes this as product being dispensed.

How to Recognize a Release without an alarm: when using a VR TLS-3XX Series Console with CSLD Module

Look for these report results (examples of each are attached):

1. On the CSLD TEST RESULTS report: make sure ALL of the test dates for the tanks match the report date at the top of the tape. If any of the tank test dates are prior to the report date at the top of the tape that tank has not had enough CSLD IDLE TIME to produce a test result. (See Attachment A)

2. On the ALARM HISTORY - In-Tank Alarm report: look for NO CSLD IDLE TIME alarms. (See Attachment A)

3. On the TANK LEAK TEST HISTORY - Fullest Periodic Test Past Each Month report: check each of the twelve months listed in the report to confirm that there has been a fullest passing test result for each of the preceding 12 months. If any monthly test date is more than 12 months in the past the CSLD was unable to produce a passing test for the most recent occurrence of that month (see the tape). (See Attachment B)

If these three report conditions exist, the tank in question should be immediately removed from service and an in-tank static leak test should be started manually. (See Attachment C) Only after the tank passes the static in tank test should other causes for the lack of CSLD idle time be investigated. (See Attachments E & F)

Supporting documentation from Veeder Root is attached.

What can be done to fix this? There is a module available for the VR TLS 350 console called the Pump Sense module. This module enables the console to tell if product is actually being dispensed from the tank when there is no idle time. (See Attachments E & F)

Attachment G: how to print reports 1 thru 3 discussed above
Attachment H: more about how to print reports 1 and 2 discussed above
<table>
<thead>
<tr>
<th>Test Number</th>
<th>Type</th>
<th>Serial Number</th>
<th>Test Date</th>
<th>Test Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>T 1</td>
<td>DIESEL</td>
<td>042841</td>
<td>JAN 25, 2016</td>
<td>PASS</td>
</tr>
<tr>
<td>T 2</td>
<td>REGULAR</td>
<td>042707</td>
<td>NOV 20, 2015</td>
<td>PASS</td>
</tr>
<tr>
<td>T 3</td>
<td>REGULAR 2</td>
<td>076397</td>
<td>JAN 25, 2016</td>
<td>PASS</td>
</tr>
<tr>
<td>T 4</td>
<td>PREMIUM GOLD</td>
<td>042706</td>
<td>JAN 25, 2016</td>
<td>PASS</td>
</tr>
</tbody>
</table>

**ATTACHMENT A**

**ALARM HISTORY REPORT**

<table>
<thead>
<tr>
<th>Alarm</th>
<th>Date</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIGH WATER ALARM</td>
<td>01-09-07</td>
<td>13:57</td>
</tr>
<tr>
<td></td>
<td>05-02-05</td>
<td>14:45</td>
</tr>
<tr>
<td>OVERFILL ALARM</td>
<td>01-06-15</td>
<td>3:50</td>
</tr>
<tr>
<td>LOW PRODUCT ALARM</td>
<td>01-19-01</td>
<td>12:54</td>
</tr>
<tr>
<td></td>
<td>01-16-15</td>
<td>16:14</td>
</tr>
<tr>
<td></td>
<td>01-09-07</td>
<td>13:54</td>
</tr>
<tr>
<td></td>
<td>05-02-05</td>
<td>14:42</td>
</tr>
<tr>
<td>INVALID FUEL LEVEL</td>
<td>03-21-12</td>
<td>9:07</td>
</tr>
<tr>
<td></td>
<td>04-11-11</td>
<td>17:51</td>
</tr>
<tr>
<td></td>
<td>04-07-10</td>
<td>18:08</td>
</tr>
<tr>
<td>NO CSLD IDLE TIME</td>
<td>01-11-15</td>
<td>8:00</td>
</tr>
<tr>
<td></td>
<td>12-04-11</td>
<td>8:00</td>
</tr>
<tr>
<td></td>
<td>12-31-01</td>
<td>8:00</td>
</tr>
<tr>
<td>CSLD INCR RATE WARN</td>
<td>12-02-14</td>
<td>0:17</td>
</tr>
<tr>
<td></td>
<td>03-13-12</td>
<td>3:20</td>
</tr>
<tr>
<td></td>
<td>03-02-12</td>
<td>3:00</td>
</tr>
<tr>
<td>LOW TEMP WARNING</td>
<td>08-22-12</td>
<td>10:44</td>
</tr>
<tr>
<td></td>
<td>01-11-07</td>
<td>23:20</td>
</tr>
<tr>
<td></td>
<td>01-09-07</td>
<td>15:40</td>
</tr>
</tbody>
</table>
TANK LEAK TEST HISTORY – FULLEST PERIODIC TEST PASSED EACH MONTH

Sample Tape acquired from TLS-350 CSLD on January 29, 2016

TANK LEAK TEST HISTORY
T 2: REGULAR

LAST GROSS TEST PASSED:
NO TEST PASSED

LAST ANNUAL TEST PASSED:
NO TEST PASSED

FULLEST ANNUAL TEST PASS
NO TEST PASSED

LAST PERIODIC TEST PASS:
NOV 30, 2015 3:49 AM
TEST LENGTH 23 HOURS
STARTING VOLUME= 5732
PERCENT VOLUME = 57.2
TEST TYPE = CSLD

FULLEST PERIODIC TEST PASSED EACH MONTH:

JAN 30, 2015 4:39 AM
TEST LENGTH 23 HOURS
STARTING VOLUME= 6318
PERCENT VOLUME = 63.0
TEST TYPE = CSLD

FEB 23, 2015 3:34 AM
TEST LENGTH 23 HOURS
STARTING VOLUME= 7308
PERCENT VOLUME = 72.9
TEST TYPE = CSLD

MAR 1, 2015 10:44 PM
TEST LENGTH 27 HOURS
STARTING VOLUME= 7183
PERCENT VOLUME = 71.6
TEST TYPE = CSLD

APR 4, 2015 11:42 PM
TEST LENGTH 23 HOURS
STARTING VOLUME= 6941
PERCENT VOLUME = 69.2
TEST TYPE = CSLD

MAY 29, 2015 5:30 AM
TEST LENGTH 27 HOURS
STARTING VOLUME= 7841
PERCENT VOLUME = 78.2
TEST TYPE = CSLD

JUN 2, 2015 5:31 AM
TEST LENGTH 26 HOURS
STARTING VOLUME= 7895
PERCENT VOLUME = 78.7
TEST TYPE = CSLD

JUL 6, 2015 11:27 PM
TEST LENGTH 23 HOURS
STARTING VOLUME= 7305
PERCENT VOLUME = 72.9
TEST TYPE = CSLD

AUG 1, 2015 3:49 AM
TEST LENGTH 23 HOURS
STARTING VOLUME= 6960
PERCENT VOLUME = 69.4
TEST TYPE = CSLD

SEP 8, 2015 11:48 PM
TEST LENGTH 24 HOURS
STARTING VOLUME= 6679
PERCENT VOLUME = 66.6
TEST TYPE = CSLD

OCT 7, 2015 12:26 AM
TEST LENGTH 23 HOURS
STARTING VOLUME= 6726
PERCENT VOLUME = 67.1
TEST TYPE = CSLD

NOV 10, 2015 10:28 PM
TEST LENGTH 25 HOURS
STARTING VOLUME= 6955
PERCENT VOLUME = 69.4
TEST TYPE = CSLD

DEC 4, 2014 5:04 AM
TEST LENGTH 23 HOURS
STARTING VOLUME= 5999
PERCENT VOLUME = 59.8
TEST TYPE = CSLD

1. Note that the Last Periodic Test Pass was on November 20, 2015
2. Note that the January Fullest Periodic Test Passed Each Month is for January 2015 rather than January 2016
3. Note that the December Fullest Periodic Test Passed Each Month is for December 2014 rather than December 2015
Testing Single Tanks using Manual Control

If you start an In-Tank Leak Test manually, you will need to stop the test manually. Otherwise, the test will run for 24 hours.

To perform an In-Tank Leak Test for single tanks under manual control, press FUNCTION until you display the message:

START IN-TANK LEAK TEST
PRESS <STEP> TO CONTINUE

Press STEP to display the message:

START LEAK TEST METHOD
ALL TANKS

Press CHANGE, then press ENTER. The system displays the message:

SINGLE TANK
PRESS <STEP> TO CONTINUE

Press STEP to continue. The system displays the message:

TEST CONTROL: TANK #
TIMED DURATION

Press CHANGE, then press ENTER. The system displays the message:

MANUAL STOP
PRESS <STEP> TO CONTINUE

Press STEP. The system displays the message:

TEST CONTROL: TANK #
0.20 GAL/HR

If you want to run a 0.1 gph (0.38 Iph) test (only available with 0.1 Mag probes). Press CHANGE. Press STEP to continue. The system displays the message:

START LEAK TEST: TANK #
PRESS <ENTER>

Press ENTER to confirm that you want to run the leak test on the selected tank. The system will automatically advance to the next tank, displaying the TEST CONTROL: TANK (#) message. You can begin a test on the next tank by repeating this procedure, or press FUNCTION to exit.
21 How To Stop In-Tank Leak Tests

This section describes how to stop In-tank Leak Tests.

**Single Tank**

To stop an In-Tank Leak Test for a specific tank, press FUNCTION until you display the message:

STOP IN-TANK LEAK TEST
PRESS <STEP> TO CONTINUE

Press STEP to display the message:

STOP LEAK TEST METHOD
ALL TANKS

Press CHANGE, then press ENTER. The system displays the message:

SINGLE TANKS
PRESS <STEP> TO CONTINUE

Press STEP. The system displays the message:

STOP LEAK TEST: TANK #
PRESS <ENTER>

Press TANK to select the tank you want to stop the test on. **Be sure you have selected the correct tank**, then press ENTER. The system stops the test on the selected tank and displays the message:

STOP LEAK TEST: TANK #
LEAK TEST NOT ACTIVE

To advance to the next tank, press TANK/SENSOR. Continue until you have stopped all the tests you want to discontinue. If all active tests are stopped, the system displays the message:

LEAK TEST NOT ACTIVE
PRESS <FUNCTION> TO CONTINUE

Press FUNCTION to exit.
TLS-3XX Series Consoles

Troubleshooting Guide

Please see page 11-10 for ALARM: NO CSLD IDLE TIME information
CSLD collects information during each idle time to form a highly accurate leak detection database. Since the database is being constantly updated, leak test results are always current. Periodic leak tests are performed using the best data from up to the previous 28 days, and test results are continuously updated as new data is gathered. Invalid data is discarded and only the best data is used to ensure accurate leak test results and fewer false alarms. Test results are provided automatically every 24 hours at 8:00 a.m.

**CSLD Tank Limitations**

All applications of CSLD should conform to the following installation guidelines.

**MAXIMUM TANK CAPACITY**

Single tank - 30,000 gallons

Manifolded tanks - 30,000 gallons per manifolded set (3 tanks maximum per set).

**MONTHLY THROUGHPUT GUIDELINES**

<table>
<thead>
<tr>
<th>Product</th>
<th>Tank Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;10,000</td>
</tr>
<tr>
<td>Gasoline</td>
<td>200,000</td>
</tr>
<tr>
<td>Diesel</td>
<td>200,000</td>
</tr>
</tbody>
</table>

*Total capacity of manifolded tanks establishes the throughput restrictions for that product. Installations exceeding these limitations may not pass monthly tests.

**CSLD Alarms**

Each of the three CSLD alarms, CSLD Rate Incr Warn, No CSLD Idle Time, and Periodic Test Fail is discussed below. In addition, there is one CSLD status message, No Results Available, which is also discussed.
ALARM: CSLD RATE INCR WARN

A CSLD Rate Increase Warning indicates fluid is entering the tank during the leak test. This warning indicates a higher than acceptable positive increase in product calculated from the CSLD Rate Table. The threshold amounts are listed below.

Single tank configuration:
- PD - 95% = +0.17 gph
- PD - 99% = +0.16 gph

Manifolded Tank configuration:
- PD - 95% = +0.16 gph
- PD - 99% = +0.15 gph

You can also print out the CSLD DIAGNOSTICS from the DIAGNOSTIC Mode to see the actual calculated value (see Figure 6-7).

SOME POSSIBLE Causes of positive rate increases

1. Incorrect temperature coefficient entered during setup. Verify that the temperature coefficient of thermal expansion is set correctly according to the TLS Setup Manual specifications listing for various product grades.

2. Manifold Tank Siphon Bar Leakage
   Rate increases can occur in siphon manifolded tanks due to a leaking siphon system. Since the siphon piping is normally full of fuel this can become a source of rate increases. If the siphon does not hold, product will drain back slowly into the tanks during idle periods. The fuel from the siphon piping will increase the volume in the tank which will cause a CSLD rate increase warning. Test and repair the siphon system per the manufacturer’s recommendations.

3. Leaks In Submersible Pumps
   - Around the packer O-ring.
   - At the threads of the two-inch pipe coming from the turbine motor.
   - The gasket between the turbine motor and mounting flange.
   - At any seal which would allow the column of fuel being held in the pump by the check valve to leak back slowly into the tank.

4. Manifolded tanks are programmed incorrectly in In-Tank setup.
   Tanks in a manifolded set must be programmed as a set, and you must select CSLD as the Leak Test Frequency for each of the tanks.

5. Defective Line Check Valves
   Fluid from the line piping leaking back into the tank through a defective Line Check Valve may cause a rate increase. Verify that the line piping holds pressure after pumping stops.

6. Thermal Expansion In The Lines
   When the product temperature in the tank is lower than the ground temperature, product in the line will expand after dispensing. After pumping ceases the line check valve or pump check valve will maintain pressure in the line. As the ground warms the product in the line expands. This expansion causes a corresponding pressure increase in the line therefore the pressure relief valve opens. The relief valve, relieves this increased pressure by allowing fuel to flow back into the tank. The flow from the line back into the tank can be a source of rate increase warnings. Typically thermal expansion’s impact on CSLD is short lived. However, in extreme cases thermal expansion can be a source of CSLD rate increase warnings. If thermal expansion is suspected as the source of CSLD rate increase warnings you should inspect the site layout to determine if it is susceptible to ex-
treme thermal expansion due to site specific conditions (i.e. shallow line depth combined with extreme temperatures, etc.).

7. Stage II Vapor Recovery System Related Problems
   • Condensed vapors and liquid drawn into the vapor recovery system can leak back into the tank causing increases.
   • Check with the manufacturer of the vapor recovery system about possible solutions such as the addition of a vapor pot to collect these condensed vapors.
   • Have the Stage II vapor recovery system inspected and tested.
   • Verify that liquid product in the vapor lines cannot drain directly back into the tank. A liquid trap can be installed. The product that collects in the trap can be siphoned back to the tank via the pump siphon system. This will prevent the introduction of liquid into the tank during idle periods.

8. Water Leaking into the Tank
   • Water can leak into the tank and cause rate increase warnings.
   • Check the water level in the tank.
   • Monitor the tank for increasing water levels.
   • Check the alarm history for prior water level alarms.

9. Air eliminator tube missing from Red Jacket pump
   • Install air eliminator tube.

10. Clogged FE Petro siphon jet assembly
    • Clean assembly.

ALARM: NO CSLD IDLE TIME

The system has not detected an idle period in the last 24 hours. All tanks must have at the very least some short idle periods each day. CSLD needs to find an idle time to clear this alarm. This alarm will automatically clear when the system detects that at least one idle period has occurred (this does not require that a CSLD record get stored in the rate table).

Frequent or continuous NO CSLD IDLE TIME messages are an indication of a problem. Possible reasons for this message:

1. Very large leaks may look like a product dispense. If this occurs the system will post a NO CSLD IDLE TIME alarm since it appears that product is being continually dispensed from the tank. Stop all activities and run a Static Leak Test.

2. Very high activity. Tank capacity or throughput specifications are exceeding CSLD specifications.

3. Line leak detection is running the product pump during normally idle periods. Veeder-Root line leak equipment is designed to coordinate line testing and CSLD to prevent this disturbance however in some cases conflicts may arise.

4. The site may be having problems determining an idle period due to site specific equipment disturbing the tank level (e.g. vapor recovery equipment).

5. The pump is running continuously. Check for a defective product dispenser or pump relay that is keeping the pump turned On.

6. A defective probe will sometimes make the tank level appear as though it is changing continuously when it is actually stable. This can be determined by examining the CSLD Moving Average Table (IA5400 Command). This table displays the tank data at 30 second intervals. Increases and decreases of typically around 1 or 2
gallons when the tank is idle are indications that the probe may be the problem. Also verify the amount of samples the TLS is receiving from the probe - there should be at least 7 and as many as 31.


8. Air eliminator tube missing from Red Jacket pump
   - Install air eliminator tube.

9. Clogged FE Petro siphon jet assembly
   - Clean assembly.

ALARM: PERIODIC TEST FAIL

This message is posted when CSLD data indicates a high probability that a tank is leaking. The threshold for this determination is shown below,

Single Tanks:
PD - 95% = +0.17 gph
PD - 99% = +0.16 gph

Manifolded Tanks:
PD - 95% = +0.16 gph
PD - 99% = +0.15 gph

Review the rate table leak rates (LRATE). If the rates are not consistent (-0.83, +0.06, -0.90, -0.62, etc.) most likely the tank is not leaking.

Possible reasons for this message:

1. Tank is leaking.

2. CSLD is not recognizing the start of a busy period soon enough. These conditions are caused by small and/or slow dispenses, as in the case of operation with blenders. The solution would be to install a Pump Sense Module.

3. An external device is periodically turning On the pump power. This usually results in large negative leak rates. A Pump Sense Module will solve this problem.

4. Coefficient of expansion programmed incorrectly.

5. Tank is manifolded but programmed incorrectly.

6. Excessive compensation. Check in the IA500 report for excessive compensation by comparing the compensated value (LRATE) to the uncompensated value (AVLRTE). The most likely cause of excessive compensation is bad probe temperature readings.

7. Stuck floats. Install a collar on the probe shaft to prevent floats from entering riser.

8. Floats damaged or installed incorrectly.

9. A stuck relay is causing the pump to run continuously. This causes the fluid to heat up around the pump producing temperature compensation errors.

10. Excessive evaporation due to an air leak into the tank may be the cause of a periodic leak test failure. Check vapor recovery system, pressure vent cap, all tank sump areas and riser caps, delivery sump plunger valve, etc.
STATUS MESSAGE: NO RESULTS AVAILABLE

This message may print when the CSLD Test Results are printed or accessed via the RS-232 command. This message indicates that CSLD has not collected sufficient test data to determine whether or not the tank is leaking, and is normal until 7 - 10 days AFTER a CSLD startup. The program must be allowed to build a suitable database to calculate reliable results. At highly active sites some tanks may provide results before others. The busier tanks will take longer to produce the initial results.

Possible reasons for this message:
1. Not enough time after startup to generate results.
2. Console is being shut Off on a regular basis.
3. Tank too busy.
4. Defective probe.
5. Noisy probe wiring.
6. Not enough idle time (see message above).
7. Tests are being rejected because the test results indicate a rate increase >+0.4 gph.

Static Leak Test

If after troubleshooting the Periodic Test Fail Alarm an equipment problem has not been identified, perform a static leak test. Be sure that the product pump cannot come on during the test and that the level in the tank is within the normal operating range (i.e., the results of the static test may not be meaningful if the tank is nearly empty). If the static test verifies the CSLD result follow the procedures as established by the site owner. If the static test passes, contact Technical Support for assistance.
Because the CSLD module can interpret a release as constant dispensing, this can be overcome with the installation of another module known as the **Pump Sense Module**. This involves more than installing a Module in the Veeder Root console and programming it.

The TLS-350R Monitoring Systems brochure includes the part number for the Pump Sense Interface Module (#329999-001).

**Installing a Pump Sense module requires the following:**

- Cost of Pump Sense Module
- Conduit installation to bring a leg of the STP switch box to Dispenser hot line wire to the Veeder Root pump sense module
- Programming of the module

The conduit and wiring work effort and cost is all dependent on the location of the dispenser wiring to the STP pump relay boxes (usually Red Jacket or FE Petro boxes) in relation to the Veeder Root console. This needs to be done in rigid conduit etc.

Cost for a typical site where the STP Relays are close to the Veeder Root could be about $1000-$1500 **plus** the cost of the Module. Sites which get into a lot of conduit, wall penetrations, overhead conduit runs, etc. could easily reach $3000 to $4000 depending on the location of different units. Some sites with other features, such as alternating pumps and pump control modules for newer blending sites may already have some of the pump wiring brought to the Veeder Root console.
TLS-350R Monitoring Systems

Add value to automated tank gauging with the advanced capabilities of Business Inventory Management.

VEEDER-ROOT
TLS-350R Interface Modules
The TLS-350R monitoring console contains three compartments in which individual interface modules can be installed. Interface modules may be factory-installed in the console upon initial ordering or ordered separately as spare modules to expand an existing system.

### Low Power Compartment

**Form No.**

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>329356-002</td>
<td>Four-Input Probe Interface Module (Maximum three per console. Includes terminal connector for one ground temperature thermistor for the volumetric line leak detector).</td>
</tr>
<tr>
<td>329358-001</td>
<td>Eight-Input Interstitial/Liquid Sensor</td>
</tr>
<tr>
<td>329357-001</td>
<td>Five-Input Vapor Sensor Interface Module</td>
</tr>
<tr>
<td>329359-001</td>
<td>Five-Input Groundwater Sensor Module</td>
</tr>
<tr>
<td>329956-001</td>
<td>Eight-Input Type A Sensor Interface Module</td>
</tr>
<tr>
<td>329955-001</td>
<td>Six-Input Type B Sensor Interface Module</td>
</tr>
<tr>
<td>330643-001</td>
<td>Six-Input Pressurized Line Leak Interface Module (one per console)</td>
</tr>
<tr>
<td>329356-004</td>
<td>Eight-Input Smart Sensor Module</td>
</tr>
</tbody>
</table>

### Feature Compatibility (Where Applicable)

<table>
<thead>
<tr>
<th>Feature Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Series 8473 0.1 GPH Magnetostrictive Probe</td>
</tr>
<tr>
<td>Series 8463 Mag Plus Probe</td>
</tr>
<tr>
<td>Series 7943 Interstitial Sensor for Fiberglass Tanks and Steel Tanks</td>
</tr>
<tr>
<td>Series 7943 Piping Sump Sensor</td>
</tr>
<tr>
<td>Series 7943 Hydrostatic Sensor</td>
</tr>
<tr>
<td>Series 7943 Vapor Sensor</td>
</tr>
<tr>
<td>Series 7943 Groundwater Sensor</td>
</tr>
<tr>
<td>Series 7943 Solid State Discriminating Interstitial Sensor</td>
</tr>
<tr>
<td>Series 7943 Solid State Dispenser Pan and Containment Sensors</td>
</tr>
<tr>
<td>Series 8484 Pressurised Line Leak Detection System Requires TLS-350 Version 7.0 or higher software</td>
</tr>
<tr>
<td>Smart Sensors Requires TLS-350 Version 24.0 or higher software</td>
</tr>
</tbody>
</table>

### High Power Compartment

**Form No.**

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>329359-001</td>
<td>Four-Relay Interface Module</td>
</tr>
<tr>
<td>329360-001</td>
<td>Two-Input/Two-Relay Output Interface Module</td>
</tr>
<tr>
<td>329399-001</td>
<td>Pump Sense Interface Module</td>
</tr>
<tr>
<td>330374-001</td>
<td>Three-Output Pressurized Line Leak Controller Interface Module (Two per console)</td>
</tr>
</tbody>
</table>

### Feature Compatibility (Where Applicable)

<table>
<thead>
<tr>
<th>Feature Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepts up to four inputs</td>
</tr>
<tr>
<td>Series 8484 Pressurized Line Leak Detection System Requires TLS-350 Version 7.0 or higher software</td>
</tr>
</tbody>
</table>

### Communications Compartment

**Form No.**

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>330149-002</td>
<td>SiteFax Interface Module</td>
</tr>
<tr>
<td>330586-001</td>
<td>RS-485/232 Dual Port Communications Module (Slot 4 only)</td>
</tr>
<tr>
<td>330148-001</td>
<td>RS-232 Interface Module with Auxiliary Port (Slot 4 only)</td>
</tr>
<tr>
<td>329362-001</td>
<td>RS-232 Interface Module</td>
</tr>
<tr>
<td>330000-001</td>
<td>Remote Printer Interface Module</td>
</tr>
<tr>
<td>330026-001</td>
<td>WPLLD Communications Module</td>
</tr>
<tr>
<td>330026-24S</td>
<td>Ethernet – TCP/IP Communications Module</td>
</tr>
</tbody>
</table>

### Feature Compatibility (Where Applicable)

<table>
<thead>
<tr>
<th>Feature Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provides two 25-pin D-connectors for data transmission to P.O.S. terminal, printing device or computer</td>
</tr>
<tr>
<td>Provides a 23-pin D-connector for data transmission to P.O.S. terminal, printing device, or computer</td>
</tr>
<tr>
<td>Provides a 25-pin D-connector for data transmission to a remote serial printer</td>
</tr>
<tr>
<td>Provides connectivity to local and wide area networks (LAN/WANS)</td>
</tr>
</tbody>
</table>

Temperature Range - Operating: 32°F to 118°F (0°C to 45°C) Storage: 15°F to 118°F (10°C to 45°C)
SAMPLE REPORTS
TLS-350

Console Keypad

1. **View Inventory Information**
   a. Press **FUNCTION** until “In-Tank Inventory”
   b. Press **STEP** to view inventory in first tank
   c. Continue to press **STEP** for all other inventory information
   d. Press **TANK** for inventory in next tank

2. **Print Inventory Information**
   a. Find “All Functions Normal” on display
   b. Press **PRINT**; information for all tanks in system.

```
MMM DD, YYYY HH:MM XM
INVENTORY REPORT
T 1: UNLEADED GASOLINE
VOLUME = 8518 GALS
ULLAGE = 1482 GALS
90% ULLAGE = 482 GALS
TC VOLUME = 8492 GALS
HEIGHT = 76.26 INCHES
WATER VOL = 0 GALS
WATER = 0.00 INCHES
TEMP = 64.6 DEG F

T 2: SUPER UNLEADED
VOLUME = 7545 GALS
ULLAGE = 2455 GALS
90% ULLAGE = 1455 GALS
TC VOLUME = 7569 GALS
HEIGHT = 67.76 INCHES
WATER VOL = 0 GALS
WATER = 0.00 INCHES
```
4. **Tank Leak Test Results**

   a. Press **FUNCTION** until “In-Tank Test Results”
   b. Press **PRINT** for all tank leak tests

5. **CSLD Test Results**

   a. Press **FUNCTION** until “CSLD Test Results”
   b. Press **PRINT** for CSLD results in all tanks

---

**Alarm History Report**

   a. Press **MODE** until “Diagnostic”
   b. Press **FUNCTION** until “Alarm History Report”
   c. Press **STEP** until desired report
   d. Press **PRINT** for tank/sensor displayed
   e. Press **TANK/SENSOR** to access other tanks/sensors

---
15. Leak History Report

a. Press MODE until “Diagnostic”
b. Press FUNCTION until “In-Tank Leak Result”
c. Press STEP until “Print Leak History”
d. Press PRINT

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Test Length</th>
<th>Starting Volume</th>
<th>Percent Volume</th>
<th>Test Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>APR 30, 1998</td>
<td>4:05 AM</td>
<td>19 hours</td>
<td>13792</td>
<td>70.0</td>
<td>CSLD</td>
</tr>
<tr>
<td>MAY 31, 1998</td>
<td>4:00 AM</td>
<td>20 hours</td>
<td>11188</td>
<td>56.8</td>
<td>CSLD</td>
</tr>
<tr>
<td>JUN 29, 1998</td>
<td>4:10 AM</td>
<td>21 hours</td>
<td>16397</td>
<td>52.2</td>
<td>CSLD</td>
</tr>
<tr>
<td>JUL 31, 1998</td>
<td>4:50 AM</td>
<td>19 hours</td>
<td>15397</td>
<td>83.2</td>
<td>CSLD</td>
</tr>
<tr>
<td>AUG 30, 1998</td>
<td>4:42 AM</td>
<td>21 hours</td>
<td>11794</td>
<td>58.0</td>
<td>CSLD</td>
</tr>
<tr>
<td>SEP 29, 1998</td>
<td>2:54 AM</td>
<td>17 hours</td>
<td>11434</td>
<td>58.0</td>
<td>CSLD</td>
</tr>
<tr>
<td>OCT 31, 1997</td>
<td>4:39 AM</td>
<td>18 hours</td>
<td>11434</td>
<td>58.0</td>
<td>CSLD</td>
</tr>
<tr>
<td>NOV 4, 1996</td>
<td>12:01 AM</td>
<td>2 hours</td>
<td>17559</td>
<td>89.1</td>
<td>STANDARD</td>
</tr>
<tr>
<td>DEC 1, 1996</td>
<td>11:56 AM</td>
<td>128 hours</td>
<td>17543</td>
<td>98.0</td>
<td>CSLD</td>
</tr>
</tbody>
</table>

**Tank Leak Test History**

**Last Gross Test Passed:**
Nov 4, 1996 12:01 AM
Starting Volume = 17559
Percent Volume = 89.1
Test Type = STANDARD

**Last Annual Test Passed:**
No Test Passed

**Fullest Annual Test Passed:**
No Test Passed

**Fullest Periodic Test Passed Each Month:**

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Test Length</th>
<th>Starting Volume</th>
<th>Percent Volume</th>
<th>Test Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 31, 1998</td>
<td>3:19 AM</td>
<td>17 hours</td>
<td>12376</td>
<td>52.3</td>
<td>CSLD</td>
</tr>
<tr>
<td>Feb 28, 1998</td>
<td>4:29 AM</td>
<td>19 hours</td>
<td>14138</td>
<td>72.0</td>
<td>CSLD</td>
</tr>
<tr>
<td>Mar 31, 1998</td>
<td>3:37 AM</td>
<td>19 hours</td>
<td>14397</td>
<td>73.0</td>
<td>CSLD</td>
</tr>
</tbody>
</table>
Automatic Tank Gauging Systems For Release Detection

Reference Manual For Underground Storage Tank Inspectors
Veeder-Root
TLS-350, TLS-350R: Sample Reports (continued)

CSLD Test Results
CSLD Tests calculate a leak rate statistically using data accumulated between dispensing cycles. The system constantly evaluates all new and existing data to get a highly accurate 0.20 gph leak test. CSLD is an option and may not be installed on all systems. Test results are provided automatically every 24 hours. Users may also obtain current CSLD leak test results by pressing PRINT from within the CSLD Test Results function.

To view CSLD Leak Results:
- Press FUNCTION until you display the message:

```
CSLD TEST RESULTS
PRESS <STEP> TO CONTINUE
```

To print out a CSLD Report for tanks specified during system setup:
- Press PRINT

```
CSLD TEST RESULTS
----------------------
DD-MM-YY HH:MM XM
T 2: SUPER UNLEADED
PROBE SERIAL NUM 123002
0.2 GAL/HR TEST
PER: DD-MM-YY PASS
```
Alarm Reports

Alarm History Reports provide a record of the last three occurrences of each type of alarm or warning condition.

- Press MODE to select Diagnostic Mode
- Press FUNCTION until you display the message:

```
SYSTEM ALARM HISTORY
PRESS <STEP> TO CONTINUE
```

- Press STEP to continue.
The system displays the message:

```
SYSTEM ALARM HISTORY
PRESS <PRINT> FOR REPORT
```

- Press PRINT to generate the report

In-Tank Alarm History Report

In-Tank Alarm History Reports record alarms for the tank selected. To print an In-Tank Alarm History Report:
- Press STEP until you display the message:

```
T#: ALARM HISTORY
PRESS <PRINT> FOR REPORT
```

- Press PRINT to print the report for the tank displayed
- Press TANK/SENSOR to access other tanks in the system