


<b>Console Description</b>	<p>The TLS-350R Automatic Tank Gauge offers the benefits of in-tank inventory, leak detection, and compliance. It is intended for retail and commercial operations.</p>				
<b>TLS-350R Consoles, Standard Hardware &amp; Software</b>	<p align="center"><b>Part # &amp; Description</b></p> <ol style="list-style-type: none"> <li>848290-122 TLS-350R Console with Integral Printer- 120V UL/cUL</li> <li>848290-102 TLS-350R Console without Integral Printer- 120V UL/cUL</li> </ol> <p><b>NOTE:</b> To enable Business Inventory Reconciliation (BIR) and Variance Analysis you will need to order a Dispenser Interface Module (DIM) – see POS application guide to determine the correct DIM. Additionally a memory expansion module (333760-201) is required to support BIR for manifolded tanks or consoles with more than 8 probes.</p>		<p align="center"><b>Software Enhancement Modules</b></p> <ol style="list-style-type: none"> <li>330160-002 Continuous Statistical Leak Detection (CSLD) for TLS-350 Series Consoles</li> <li>330160-003 Fuel Manager for TLS-350 Series Consoles</li> <li>330160-010 Ultimate Testing: Pressurized Line Leak Detection (PLLD) for TLS-350 Series Consoles</li> <li>330160-060 Risk Management: Wireless/Pressurized Line Leak Detection (PLLD) for TLS-350 Series Consoles</li> <li>330160-050 Base Compliance: Wireless/Pressurized Line Leak Detection (PLLD) for TLS-350 Series Consoles</li> <li>330160-004 In-Station Diagnostics (ISD): for TLS-350 Series Consoles</li> </ol>		
<b>TLS-350R Device Modules</b>	<p align="center"><b>Low Power Compartment Interface Modules (limit 8 per console unless otherwise noted)</b></p>			<p align="center"><b>High Power Compartment Interface Modules (limit 8 per console unless otherwise noted)</b></p>	
	<p align="center"><b>Description</b></p>	<p align="center"><b>Part #</b></p>	<p align="center"><b>Interfacing Device Part #'s</b></p>	<p align="center"><b>Description</b></p>	<p align="center"><b>Part #</b></p>
	Four-Input Probe Module	329356-002	Used for interface to all Mag Probes	Four-Relay Output Module – Provides dry contact switch for 120 VAC source (used for positive shutdown or external alarms)	329359-001
	Eight-Input Smart Sensor Module	329356-004	Used to Interface with Mag Sump Sensors only	Two-Input/Two-Relay Output Interface – 2 inputs provide 12VDC - 35VDC rated input, outputs rated 120V for Generator applications and Pump Sensing	329360-001
	Vacuum Sensor Module, Seven-Input Smart Sensor w/ Embedded Pressure Sensor Interface for Vac Sensor Monitoring & ISD (min. 1 req'd for Vac Sensor Monitoring)	332250-001	Used to Interface with vacuum sensors and Mag Sump Sensors	Four-Input Pump Sense Module (1 per 4 STPs req'd for Continuous STP Run Monitor feature with software V27 or higher) – Used with Continuous STP run Monitor and CSLD, 120V	329999-001
	Eight-Input Interstitial/Liquid Sensor Module for use with Series 7943 Liquid Sensors	329358-001	Series 7943 liquid sensors include: 794380-322/352, 794380-209/209/323/333, 794390-409/420/430/460, 794380-301/303/304, 794690-xxx	Pump Relay Monitor Module (1 per 4 STPs req'd for Continuous STP Run Monitor feature with software V27 or higher). Rated for 240V – Designed to detect faulty STP control relay	847490-504
	Five-Input Vapor Sensor Module for use with Series 7943 Vapor Sensors	329357-001	Series 7943 Vapor Sensors include 794390-700	Dispenser Controller Module – 10 amp relay, 120V – controls dispenser power for shut down purposes	331408-001
	Five-Input Groundwater Sensor module for use with Series 7943 Groundwater Sensors	329357-001	Series 7943 Groundwater Sensors include 794380-621/622/624	Three-Output Pressurized Line Leak Controller Module (Max 2/console for use w/ PLLD) – Provides dispenser handle inputs and high power output to STP control relays – 120V	330374-001
	Eight-Input Type A Sensor Module for use with Series 7943 Non-Discriminating Dispenser Pan & Containment Sump Sensors	329357-001	Series 7943 Non-Discriminating Dispenser Pan & Containment Sump Sensors include 794380-321/351, 794380-343/344/345		
	Six-Input Type B Sensor Module for use with Series 7943 Discriminating Dispenser Pan & Containment Sump Sensors	329357-001	Series 7943 Discriminating Dispenser Pan & Containment Sump Sensors include 794380-320/350		
<b>TLS-350R Communications &amp; Memory Expansion Modules</b>	<p align="center"><b>Communication Compartment Modules (limit 4 per console unless otherwise noted)</b></p>			<p align="center"><b>Memory Expansion Modules</b></p>	
	<p align="center"><b>Description</b></p>	<p align="center"><b>Part #</b></p>		<p align="center"><b>Description</b></p>	<p align="center"><b>Part #</b></p>
	RS-232 Interface Module with Auxiliary Port	330148-001		Memory Expansion Module for ECPU1 board, 1 MEG	333760-102
	RS-232 Interface Module (Max 3/console)	329362-001		Memory Expansion Module for ECPU2 board, 1 MEG (req'd for V27 or higher on > 8 tanks or BIR w/ manifold tanks)	333760-201

TLS-350R Communications & Memory Expansion Modules (Continued)	Communication Compartment Modules (limit 4 per console unless otherwise noted)		Memory Expansion Modules																																																																																			
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	RS-232 Satellite Module	329362-003	Memory Expansion Module for ECPU2 board, 2 MEG (req'd for ISD or Maintenance Tracker)	333760-203																																																																																		
	RS-232 Serial Satellite Module	329362-004	<b>System Compatibilities Guide</b>																																																																																			
	RS-232 Single Port Module, DB25, w/ Maintenance Tracker ID Resistor	329362-005	<table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 70%;">Feature/Console</th> <th>TLS-350R PC-350R TLS-350PLUS PC-350PLUS</th> </tr> </thead> <tbody> <tr> <td colspan="2"><b>CONSOLE DESIGN</b></td> </tr> <tr> <td>Modular/Expandable Features</td> <td style="text-align: center;">•</td> </tr> <tr> <td>Fixed Features</td> <td></td> </tr> <tr> <td>Integral Printer</td> <td style="text-align: center;">Optional</td> </tr> <tr> <td colspan="2"><b>INVENTORY CONTROL</b></td> </tr> <tr> <td>Business Inventory Reconciliation</td> <td style="text-align: center;">•*</td> </tr> <tr> <td>Variance Analysis</td> <td style="text-align: center;">•*</td> </tr> <tr> <td>Fuel Manager</td> <td style="text-align: center;">Optional</td> </tr> <tr> <td>Complete Inventory Reports</td> <td style="text-align: center;">•</td> </tr> <tr> <td>Programmable Auto Report Times</td> <td style="text-align: center;">•</td> </tr> <tr> <td>Inventory Increase Report</td> <td style="text-align: center;">•</td> </tr> <tr> <td colspan="2"><b>IN-TANK LEAK TEST</b></td> </tr> <tr> <td>0.1 GPH Tank Tightness Testing</td> <td style="text-align: center;">•</td> </tr> <tr> <td>0.2 GPH Tank Tightness Testing</td> <td style="text-align: center;">•</td> </tr> <tr> <td>Continuous Statistical Leak Detection</td> <td style="text-align: center;">Optional</td> </tr> <tr> <td>Selectable Test Rates</td> <td style="text-align: center;">•</td> </tr> <tr> <td>Programmable Automatic Test Schedules</td> <td style="text-align: center;">•</td> </tr> <tr> <td>PASS, FAIL, or INVALID Indicators</td> <td style="text-align: center;">•</td> </tr> <tr> <td colspan="2"><b>LINE LEAK DETECTION</b></td> </tr> <tr> <td>Integral Line Leak Detector</td> <td style="text-align: center;">Optional</td> </tr> <tr> <td>Programmable Line Test Features</td> <td style="text-align: center;">Optional</td> </tr> <tr> <td colspan="2"><b>INTERSTITIAL/SUMP LEAK SENSING</b></td> </tr> <tr> <td>Tank Annulus</td> <td style="text-align: center;">•</td> </tr> <tr> <td>Sump</td> <td style="text-align: center;">•</td> </tr> <tr> <td>Dispenser Pan</td> <td style="text-align: center;">•</td> </tr> <tr> <td>Mag Sump</td> <td style="text-align: center;">•</td> </tr> <tr> <td>Sensor Location Identifiers</td> <td style="text-align: center;">•</td> </tr> <tr> <td colspan="2"><b>VAPOR WELL MONITORING</b></td> </tr> <tr> <td>Hydrocarbon Vapor Detection</td> <td style="text-align: center;">•</td> </tr> <tr> <td>High Water Level Alarm</td> <td style="text-align: center;">•</td> </tr> <tr> <td colspan="2"><b>GROUNDWATER MONITORING</b></td> </tr> <tr> <td>Hydrocarbon Liquid Detection</td> <td style="text-align: center;">•</td> </tr> <tr> <td>Low Water Alarm</td> <td style="text-align: center;">•</td> </tr> <tr> <td colspan="2"><b>SECONDARY CONTAINMENT VACUUM SENSING SYSTEM (SCVS)</b></td> </tr> <tr> <td>Vacuum Sensors</td> <td style="text-align: center;">•</td> </tr> <tr> <td colspan="2"><b>AIR VAPOR MONITORING</b></td> </tr> <tr> <td>In-Station Diagnostics (ISD)</td> <td style="text-align: center;">Optional</td> </tr> <tr> <td>Carbon Canister Vapor Polisher</td> <td style="text-align: center;">Optional</td> </tr> <tr> <td>Vapor Pressure Sensor</td> <td style="text-align: center;">Optional</td> </tr> <tr> <td>Vapor Flowmeter</td> <td style="text-align: center;">Optional</td> </tr> </tbody> </table>		Feature/Console	TLS-350R PC-350R TLS-350PLUS PC-350PLUS	<b>CONSOLE DESIGN</b>		Modular/Expandable Features	•	Fixed Features		Integral Printer	Optional	<b>INVENTORY CONTROL</b>		Business Inventory Reconciliation	•*	Variance Analysis	•*	Fuel Manager	Optional	Complete Inventory Reports	•	Programmable Auto Report Times	•	Inventory Increase Report	•	<b>IN-TANK LEAK TEST</b>		0.1 GPH Tank Tightness Testing	•	0.2 GPH Tank Tightness Testing	•	Continuous Statistical Leak Detection	Optional	Selectable Test Rates	•	Programmable Automatic Test Schedules	•	PASS, FAIL, or INVALID Indicators	•	<b>LINE LEAK DETECTION</b>		Integral Line Leak Detector	Optional	Programmable Line Test Features	Optional	<b>INTERSTITIAL/SUMP LEAK SENSING</b>		Tank Annulus	•	Sump	•	Dispenser Pan	•	Mag Sump	•	Sensor Location Identifiers	•	<b>VAPOR WELL MONITORING</b>		Hydrocarbon Vapor Detection	•	High Water Level Alarm	•	<b>GROUNDWATER MONITORING</b>		Hydrocarbon Liquid Detection	•	Low Water Alarm	•	<b>SECONDARY CONTAINMENT VACUUM SENSING SYSTEM (SCVS)</b>		Vacuum Sensors	•	<b>AIR VAPOR MONITORING</b>		In-Station Diagnostics (ISD)	Optional	Carbon Canister Vapor Polisher	Optional	Vapor Pressure Sensor	Optional	Vapor Flowmeter	Optional
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Dual Port RS-232/RS-485 Interface Module (only used in Comm. Slots 3 & 4)	330586-001																																																																																					
Dual-Port Remote Display Module RS-232	330586-011																																																																																					
Dual-Port Remote Display Module Satellite RS-485 (Amoco)	330586-015																																																																																					
Dual-Port RS-485 Module/Serial Satellite (Shell)	330586-016																																																																																					
Dual-Port RS-232/RS-485 Module DB9 with Maintenance Tracker ID resistor (only used in Comm. Slots 3 & 4)	330586-017																																																																																					
SiteFax™ Module 300/1200/2400-Baud Fax/Modem Interface (Max 3/console, phone cable included)	330149-002																																																																																					
Ethernet TCP/IP Communications Module	330020-425																																																																																					
Specifications																																																																																						
Operating Temperature	+32 to +118°F (0 to +45°C)																																																																																					
Storage Temperature	-40 to +162°F (-40 to +74°C)																																																																																					
Installation Location	Indoors, climate-controlled space																																																																																					
Relative Humidity	0-90% (non-condensing)																																																																																					
External Dimensions	19.75" x 11.25" x 7.1875" (50.165cm x 28.575cm x 18.26cm)																																																																																					
Construction	16GA (0.060 in/0.1524 cm) powder coated steel																																																																																					
Console Power Wiring Requirements	AC Power Wiring – Wires carrying 120 or 240 VAC from power panel to the console should be #14 AWG (or larger) wire for line, neutral & chassis ground (3); and 4 sq. mm, rated for at least 90C for barrier ground.																																																																																					
Probe & Sensor to Console Wiring Requirements	<ol style="list-style-type: none"> <li>Wire Type – Shielded cable required regardless of conduit material or application. It must be rated less than 100 picofarad per ft manufactured with a suitable material such as Carol C2534 or Belden 88760, 8760, or 8770.</li> <li>Wire Length – Maximum 1,000ft (304.8m) to meet intrinsic safety requirements. Improper system operation could result for runs over 1,000ft (304.8m).</li> <li>Wire Gauges – Color coded – shielded cable used in all installations. Wires should be #14 - #18 AWG stranded copper wire and installed as Class 2 circuits. As an alternate method when approved by the local authority having jurisdiction, #22 AWG wire such as 88761 may be suitable with the following requirements: wire run is less than 750ft (228.6m); Capacitance does not exceed 100 pF/ft; Inductance does not exceed 0.2 uH/ft.</li> </ol>																																																																																					
System Power Requirements	Universal AC power supply: 100 to 249VAC, 50/60Hz, 2A max.																																																																																					
Display Specifications	20 character liquid crystal display																																																																																					
Custom User Access	Front Panel Display control through user specific log-in																																																																																					
Approvals	UL cUL, ATEX, IECEx																																																																																					
Third Party Evaluations	<a href="http://www.nwglide.org/evals/veeder_root_zf.html">http://www.nwglide.org/evals/veeder_root_zf.html</a>																																																																																					
Product Installation Guide	<a href="https://www.veeder.com/us/technical-document-library">https://www.veeder.com/us/technical-document-library</a>																																																																																					

\* Standard in TLS-350R, Upgradeable in TLS-350PLUS

# Notice

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## **Example Illustrations**

Illustrations used in this guide for example sensor installations may contain components that are customer supplied and not included with the sensor. Please check with your Veeder-Root Distributor for recommended installation accessories.

## **Third Party Evaluations**

Third party evaluations of the Veeder-Root sensors contained in this application guide can be found under the Veeder-Root vendor name on the National Work Group on Leak Detection Evaluations (NWGLDE) website:

<http://www.nwglde.org>