


Console Description	<p>The TLS-450PLUS Automatic Tank Gauge (ATG) is a powerful tool that allows fueling operations to run at peak efficiency, with easy to understand navigation, streamlined inventory and compliance reporting, and powerful business analytics. It can monitor up to 64 tanks, or 32 tanks with Business Inventory Reconciliation (BIR). Frequent releases of operating software for the TLS-450PLUS tank gauge assures that data is secure and software features are routinely updated and enhanced.</p>	
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TLS-450PLUS Consoles, Standard Hardware & Software	Part # & Description	Standard Hardware & Application Software
	0860091-302 TLS-450PLUS Console with 8" Color Touch Screen Display, Printer, 3 Ethernet and Dual USB/Expansion, Dual RS-232/RS-485, UL/cUL	<p>Software – 0333545-001 Application Software (must be ordered with Console) includes Web-enabled, Custom Alarm, On-Console Help, Extended Storage, TLS-Expansion, Static Leak Detection, 3 GPH DPLLD</p> <p>Hardware – 8" Color Touch Screen Display, Printer, 3 Ethernet and Dual USB/Expansion, Dual RS-232/RS-485</p>

Devices																			
Module Compatibility	Inputs Per Module	Power Modules	Console				TLS-XB 1				TLS-XB 2				TLS-XB 3				Modules Per System
			Slots				Slots				Slots				Slots				
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
TLS-450PLUS System																			
USM	16		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	16
UIOM	14 ¹		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	16
10-Amp Relay	6					•				•				•				•	4
MDIM	12		•	•	•	•	•												5
LVDIM	12		•	•	•	•	•												5

¹ (14) total inputs include (5) AC Inputs, (5) Relay Contracts, (4) 12VDC Inputs

Communications																	
Module	Console										Modules Per System	Type					
	1 ⁴		2		3		4		5								
	P1	P2	P1	P2	P1	P2	P1	P2	P1	P2							
TLS-450PLUS System																	
RS-232		•		•		•							3	Hardware			
Dual RS-232	•	•	•	•									3	Hardware			
RS-485		•		•		•							3	Hardware			
Dual RS-485 ¹	•	•	•	•									3	Hardware			
RS-232/RS-485 ¹	•	•	•	•									3	Hardware			
Internal Modem		•		•		•							3	Hardware			
CDIM	•		•										1	Hardware			
EDIM ²	•	•	•	•		•							3	Software			
IFSF LON ³		•		•		•							1	Hardware			

¹ When placed in Slot 3, only Position 2 will be functional
² EDIM can be programmed in any position with an RS-232 port – up to 3 per system
³ Can be combined with EDIM
⁴ Console ships standard with dual RS-232 or dual RS-232/RS-485 card in Slot 1

	Part # & Description		Maximum # of Modules per Console	# of Inputs per Module	Availability
	TLS-450PLUS Device Modules	Universal Sensor Module (USM) Interface for all Probes, Sensors, and DPLLD	0332812-001 – Factory Installed Module 0330020-619 – Spare Part Module	Up to 4 for each TLS-450PLUS and/or TLS-XB or a maximum of 16 modules per system	16
USM Interface for all Probes, Sensors, and DPLLD with ATM Module – TLS-450PLUS Installed		0332812-006 – Factory Installed Module 0330020-619 – Spare Part Module	Up to 4 for each TLS-450PLUS and/or TLS-XB or a maximum of 16 modules per system	16 inputs + 1 Atmospheric Module (ATM)	
Universal Input/Output Interface Module (UIOM) for Relay Control and Input Signal Monitoring		0332813-001 – Factory Installed Module 0330020-620 – Spare Part Module	Up to 4 for each TLS-450PLUS and/or TLS-XB or a maximum of 16 modules per system	5 dry contact output relays / 4 low voltage dry contact inputs / 5 high voltage inputs (<=240 VAC)	
10-Amp Relay Module has 6 high power outputs / 6 low voltage inputs / must be installed in slot 4 of TLS-450PLUS and TLS-XB		0333564-001 – Factory Installed Module 0330020-814 – Spare Part Module	Up to 1 for each TLS-450PLUS and/or TLS-XB or a maximum of 4 modules per system – <i>* Required to be installed in slot 4 only</i>	4	
BIR/AccuChart™ LVDIM for TLS-450PLUS, 12 Inputs		0333581-001 – Factory Installed Module 0330020-800 – Spare Part Module	Up to 3 per System		
BIR/AccuChart MDIM for TLS-450PLUS, 12 Inputs		0333582-001 – Factory Installed Module 0330020-799 – Spare Part Module	Up to 3 per System		
TLS-450PLUS Communications Modules	Part # & Description		Maximum # of Modules per System	Availability	
	RS-232 Dual Interface Module (Comm. Slots 1,2,3), for TLS-450PLUS Max # of Modules per System: Up to 3 per system, 2 per console maximum	0332868-001 – Factory Installed Module 0330020-617 – Spare Part Module	Up to 3 per System	Sold Separately (either Factory Installed or as a Spare Part Module) For Spare Part “upgrade” kits, the BIR/AccuChart Feature Enhancement will be shipped on a Veeder-Root iButton adapter – P/N 0330020-659	
	Single RS-232 Interface Module (Comm. Slots 1,2,3), for TLS-450PLUS	0332866-001 – Factory Installed Module 0330020-613 – Spare Part Module			
	Single RS-485 Interface Module	0332867-001			
	Dual RS-485 Interface Module	0332869-001			
	RS-232/RS-485 Dual Interface Module (Comm. Slots 1,2,3), for TLS-450PLUS	0332870-001 – Factory Installed Module 0330020-618 – Spare Part Module	1 per System		
	SiteFax™ Interface Module (Comm. Slots 1,2,3), for TLS-450PLUS	0332818-001 – Factory Installed Module 0330020-612 – Spare Part Module			
	BIR/AccuChart EDIM for TLS-450PLUS	0333149-001 – Factory Installed 0330020-801 – Upgrade Kit			
	BIR/AccuChart CDIM for TLS-450PLUS, 3 Inputs	0333580-001 – Factory Installed 0330020-802 – Upgrade Kit			
IFSF LON Interface Module (Comm. Slots 1,2,3), for TLS-450PLUS	0333659-001 – Factory Installed Module 0330020-828 – Spare Part Module				

Part # & Description		
TLS-450PLUS Optional Software	Centralized Device Management (CDM) Software	0349889-001
	CDM Backup Feature	0334054-001
	CDM Change Management	0334054-002
	In-Station Diagnostics (ISD) / PMC for TLS-450PLUS Console	0332972-102
	Vapor Pressure Management Control (PMC for Carbon Canister Vapor Polisher) for TLS-450PLUS Console	0332972-101
	Continuous Statistical Leak Detection (CSLD) for TLS-450PLUS	0332972-006
	Ultimate Testing: Digital Line Leak Detection for TLS-450PLUS	0332972-007
	Risk Management: Digital Line Leak Detection for TLS-450PLUS	0332972-008
	Base Compliance: Digital Line Leak Detection for TLS-450PLUS	0332972-009
	Timed Sudden Loss Detection for TLS-450PLUS	0332972-018
	Vapor Collection Monitor for TLS-450PLUS	0332972-021
	DEF Recirculation Software Feature for TLS-450PLUS & DEF Temperature Sensor Installation Kit	0332972-026 – Software 0332972-027 – Temperature Control Relay 0794380-210 – Installation Kit
Secondary Containment Vacuum Monitoring (SCVS)	0332972-029	
Specifications		
Operating Temperature	+32°F to +104°F (0°C to +40°C)	
Storage Temperature	-40°F to +158°F (-40°C to +70°C)	
Installation Location	Indoors, climate-controlled space	
Relative Humidity	0-90% (non-condensing)	
External Dimensions	18.4" x 11" x 8.8" (46.74cm x 27.94cm x 22.35cm)	
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"> 1. 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. 2. Wire Length – Maximum 1,000ft (304.8m) to meet intrinsic safety requirements. Improper system operation could result for runs over 1,000ft (304.8m). 3. 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. 	
System Power Requirements	AC Input – Universal AC power supply: 100 to 249 VAC, 50/60Hz, 2A max	
Display Specifications	8" (20.32cm) Color touch screen display	
Connectivity Methods	Ethernet, Web Browser, Modem, Fax, Serial	
Data Storage Features	SD card	
Software Security Features	Centralized Device Management to protect your network of TLS-450PLUS and TLS4 Series consoles	
Custom User Access	Front Panel Display control through user specific log-in; User defined roles to restrict access / functionality. Screen permissions can be limited to view, edit, perform.	
System Security	<ol style="list-style-type: none"> 1. Partitioned Ethernet Ports that can be used to separate user network from the internet 2. Port availability control: SSH Port (22), HTTPS Port (443), Serial Command Port (10001) 3. Ports may be reassigned (i.e., HTTPS on 50443) 4. System Integrator Common Vulnerabilities and Exposures (CVE) Scans & Fixes 5. Periodic console software updates are available to protect against persistent threats 	
Customized Alarm Features	Customize select alarms	
Approvals	UL cUL, ATEX, IECEx, NEPSI, FCC, FMC, PESO, ANZEx, ULC, INMETRO, IQC, EAC, NWGLDE, and CEN	
Third Party Evaluations	http://www.nwglde.org/evals/veeder_root_zf.html	
Product Installation Guide	https://www.veeder.com/us/technical-document-library	

System Compatibilities Guide

Feature/Console	TLS-450PLUS	Feature/Console	TLS-450PLUS	TLS-450PLUS with TLS-XB **
CONSOLE DESIGN		DATA COMMUNICATIONS		
Modular/Expandable Features	•	RS-232	5	5
8" Color Touch Screen	•	RS-485	3	3
Integral Roll Printer	•	Fax Transmittal (SiteFax)	Optional	Optional
Universal Power Supply	•	External USB 2.0	2	2
INVENTORY CONTROL		Ethernet Ports	3	3
Graphical Inventory Status	•	International Forecourt Standards Forum (IFSF)	1	1
Complete Inventory Reports	•	SYSTEM CAPABILITIES		
Programmable Auto Report Times	•	Manifold Tank Capability (Line & Siphon)	•	•
Inventory Increase Report	•	Height-Based Pump Priority Control for Manifolded Tanks	•	•
Timed Sudden Loss Detection	Optional	Pump Alternate on the Fly	•	•
BUSINESS INVENTORY RECONCILIATION		Self-Diagnostics	•	•
Shift-Based Reconciliation	Optional	Emergency Generator Capability	•	•
Reconciliation by Tank	Optional	Up to 3 Years Data Storage	•	•
TANK CALIBRATION		FAX Notification On-Time or Event	Optional	Optional
Multi-Pass Tank Calibration	Optional	Email Notification On-Time or Event	•	•
Single-Pass / Metered Drop	Optional	LCD with Touch Screen	Optional	Optional
Limited Range Calibration	Optional	On-Board Help	•	•
Supports Multiple Tank Charts per Tank	Optional	Custom Help	•	•
Supports Multiple Line Manifold Tanks	Optional	Custom Alarms	•	•
Graphical / Text Calibration Diagnostics	Optional	Environmental Reports (Compliance Reports Summary)	•	•
Automatic and Manual Meter Mapping	Optional	Sensor Reports	•	•
IN-TANK LEAK TEST		Sensor History Report by Period, Month, Week, or Custom	•	•
0.1 GPH Tank Tightness Testing	•	Web-Enabled	•	•
0.2 GPH Tank Tightness Testing	•	System Duplicate	•	•
Continuous Statistical Leak Detection	Optional	SYSTEM CAPACITIES *		
Selectable Test Rates	•	External Inputs	64	256
Programmable Automatic Test Schedules	•	In-Tank Probes (Including Density)	64	64
PASS, FAIL, or INVALID Indicators	•	In-Tank Probes with BIR	32	32
LINE LEAK DETECTION		Digital Pressurized Line Leak Detectors (Additional Software Req'd)	16	16
Integral Line Leak Detector	Optional	2-WIRE SENSORS		
Programmable Line Test Features	Optional	Magnetostrictive Discriminating Level Indicating Sump Sensor	64	99
INTERSTITIAL/SUMP LEAK SENSING		Discriminating Dispenser Pan & Containment Sensors	64	99
Tank Annulus	•	Solid-State Non-Discr. Dispenser Pan & Containment Sensors	64	99
Sump	•	Sump Sensors	64	99
Dispenser Pan	•	Position Sensitive Pan/Sump Sensor	64	99
MAG Sump	•	Interstitial Sensor for Fiberglass Tanks	64	99
Sensor Location Identifiers	•	Solid-State Discr. Interstitial Sensors for Fiberglass Tanks	64	99
VAPOR WELL MONITORING		Alt. Ethanol Fluid Interstitial Sensors for Fiberglass Tanks	64	99
Hydrocarbon Vapor Detection	•	Interstitial Sensors for Steel Tanks	64	99
High Water Level Alarm	•	Microsensors	64	99
GROUNDWATER MONITORING		Position Sensitive Interstitial Sensor for Steel Tanks	64	99
Hydrocarbon Liquid Detection	•	Alt. Ethanol Fluid Solid-State Interstitial Sensor for Steel Tanks	64	99
Low Water Alarm	•	Hydrostatic Sensors for Brine-Filled Double-Wall Tanks	64	99
SECONDARY CONTAINMENT VACUUM SENSING SYSTEM (SCVS)		Hydrostatic Sensor for Brine-Filled Double-Wall Sumps	64	99
Vacuum Sensors	•	Vacuum Sensor	64	99
AIR VAPOR MONITORING		Air Flow Meter (AFM)	18	18
In-Station Diagnostics (ISD)	Optional	Vapor Pressure Sensor	1 Per Site	1 Per Site
Vapor Collection Monitor	Optional	Vapor Valve	1 Per Site	1 Per Site
Carbon Canister Vapor Polisher	Optional	3-WIRE SENSORS		
Vapor Pressure Sensor	Optional	Solid-State Discr. Dispenser Pan & Containment Sump Sensors	32	99
Vapor Flow Meter	Optional	Groundwater Sensor	32	99
ALARMS		Vapor Sensor for Monitoring Wells	32	99
Leak	•	INPUT & OUTPUT		
Overfill	•	Output Relays	21	32
High Level	•	External Inputs Low Voltage	16	32
Sudden Loss	•	External Inputs High Voltage	20	32
High Water	•	10-Amp Relay	1	4
Low Inventory	•	* Indicates the maximum number of devices the system can handle if all slots/ positions are filled with that type of device		
Programmable Alarm Limits	•	** TLS-450PLUS with (3) three TLS-XB Expansion Boxes		

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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>