

OVM-LMS

INSTALL & OPERATIONS

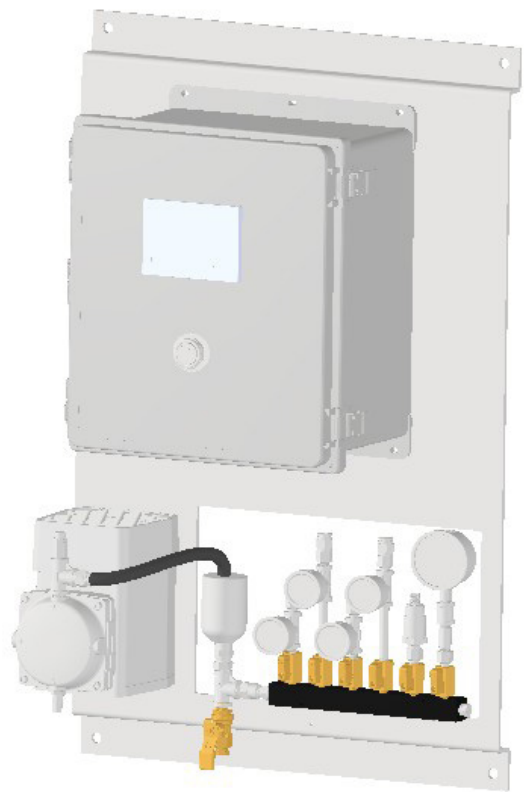
LEAK-VACUUM MONITORING SYSTEM

REV 0726

PRODUCT SUMMARY

Product general description

The SafeSite OVM-LMS Leak Vacuum Monitoring System is designed to create, maintain, and monitor a vacuum within the interstitial space of compatible double-wall tanks and piping systems. The system continuously monitors vacuum conditions and provides notification when the vacuum cannot be established or maintained within the programmed operating limits.



PRODUCT FEATURES

Main Characteristics

- 01** Furnished as a standalone control and monitoring system or integrated with another compatible SafeSite control system (e.g., SafeSite FOITP)
- 02** May utilize either a dedicated compressor or vacuum-pump assembly, or the siphon port of a compatible submersible turbine pump
- 03** Provides 24/7 monitoring coverage, continuous and immediate detection of your contained piping or other system components
- 04** Eliminates requirement for multiple low-point collection systems and associated pitching of your piping system

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GENERAL INFORMATION

System Description

The SafeSite OVM-LMS Leak Vacuum Monitoring System is designed to create, maintain, and monitor a vacuum within the interstitial space of compatible double-wall tanks and piping systems. The system continuously monitors vacuum conditions and provides notification when the vacuum cannot be established or maintained within the programmed operating limits.

The OVM-LMS may be furnished as a standalone control and monitoring system or integrated with another SafeSite Fuel Oil System component, including a SafeSite FOITP or SafeSite MCP controller. System configuration, control functions, alarm sequences, wiring requirements, and graphic display information may vary by project.

Where the OVM-LMS is integrated with another controller, portions of this manual may still apply. However, the system-specific as-built panel drawings and documentation supplied with the equipment shall govern all wiring, terminal assignments, control sequences, alarm functions, and operator display information.

Electrical Requirements

The standard SafeSite OVM-LMS control panel is designed for a 120 VAC, single-phase, 10-amp electrical supply. Do not apply any other voltage, phase, frequency, or power source to the system unless the equipment nameplate and project-specific drawings expressly indicate otherwise.

Applying an incorrect power supply may cause equipment damage, electric shock, fire, system malfunction, or loss of monitoring capability.

All electrical installation, wiring, grounding, inspection, and service work shall be performed by qualified personnel in accordance with the project drawings, equipment nameplate, applicable electrical codes, and all federal, state, and local requirements.

Disconnect and verify removal of all electrical power before opening the enclosure or performing installation, inspection, or service work.

Interstitial Space & Product Compatibility

Depending upon the system configuration, the OVM-LMS may utilize either:

The siphon port of a compatible submersible turbine pump; or
A dedicated compressor or vacuum-pump assembly.

Before connecting or operating the OVM-LMS, verify that the tank, piping, fittings, seals, containment system, and interstitial space are suitable for vacuum monitoring.

Refer to the applicable tank or piping-system manufacturer's installation instructions and technical documentation for allowable vacuum and pressure limitations. Do not exceed the maximum permissible vacuum, pressure, or differential-pressure rating of any connected component.

Improper application of vacuum may damage the monitored equipment, compromise containment integrity, or prevent the leak monitoring system from operating correctly.

GENERAL INFORMATION (CONT'D)

Configuration & Adjustment

The OVM-LMS is factory configured for the intended project application. Operating parameters, alarm thresholds, timing functions, control sequences, and communication settings shall only be modified by an authorized service technician.

IMPORTANT

Do not change system settings without prior authorization from the manufacturer or an authorized factory representative.

Unauthorized modifications may:

- Damage the control panel or connected equipment;
- Create incompatibility with the monitored tank or piping system;
- Prevent alarms or control functions from operating as intended;
- Cause nuisance alarms or loss of monitoring capability;
- Affect coordination with integrated SafeSite controllers; or
- Void the equipment warranty.

The operator shall not bypass, disable, or alter any alarm, interlock, protective device, or monitoring function

Replacement Components

Although replacement of system components is not normally required, all replacement parts, electrical devices, instruments, sensors, relays, vacuum components, and related accessories shall be approved by the manufacturer before installation.

Contact an authorized factory representative when replacement components or service parts are required.

The use of unauthorized or incompatible components may cause equipment damage, improper operation, system incompatibility, loss of monitoring capability, or failure of the system and may void the equipment warranty.

Owner & Operator Responsibilities

The OVM-LMS is a monitoring and control system and does not eliminate the need for routine inspection, testing, maintenance, or compliance with applicable regulatory requirements.

The owner or operator is responsible for:

- Maintaining access to the control panel and associated equipment;
- Keeping all system documentation and as-built drawings available;
- Responding promptly to alarms and abnormal operating conditions;
- Arranging for inspection or service by qualified personnel when required; and
- Maintaining the connected tank or piping system in accordance with the equipment manufacturer's requirements.

Do not operate the system when known damage, improper wiring, incompatible equipment, or an unresolved alarm condition exists.

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MECHANICAL INSTALLATION

Equipment Mounting

The SafeSite OVM-LMS is available as either a standalone system or an integrated system component.

When integrated with a fuel oil pump set or equipment enclosure, the OVM-LMS will be factory-mounted. Refer to the owner's manual and project-specific as-built drawings for the associated fuel oil pump set or enclosure for mounting and installation requirements applicable to the base equipment.

The standalone OVM-LMS is supplied mounted to an 11-gauge stainless-steel backplate. The backplate includes four (4) 1/2-inch-diameter mounting holes, one at each corner, and may be secured to strut, a wall, or another suitable supporting structure using 3/8-inch bolts.

Install the assembly on a rigid, stable surface capable of supporting the equipment. Mounting hardware and anchors shall be appropriate for the supporting structure and installation environment. Ensure adequate clearance is provided for electrical connections, vacuum tubing, inspection, operation, and service.

Pneumatic Tubing

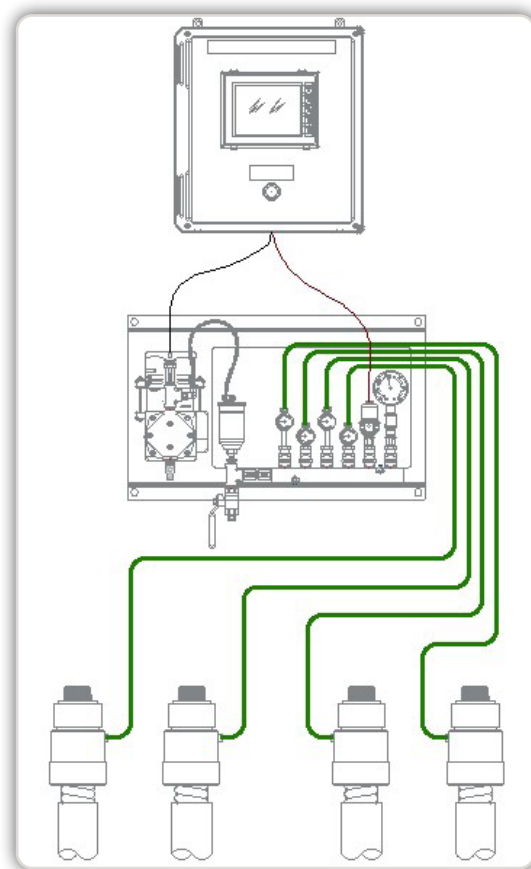
The OVM-LMS will be equipped with a push-to-connect fitting for each monitored piping branch. The system will also be supplied with the following loose components for field installation:

Fifty feet (50 ft) of 10 mm polyurethane pneumatic tubing;

Four (4) 1/8-inch × 10 mm push-to-connect adapters for connection to the piping interstitial spaces.

For each monitored piping branch, remove the interstitial plug from the end of the piping located nearest the OVM-LMS and install the supplied push-to-connect adapter. The interstitial opening at the opposite end of the piping shall remain securely plugged so that the system can establish and maintain the required vacuum.

The installing contractor shall route and connect the pneumatic tubing between the applicable OVM-LMS branch connection and the corresponding piping interstitial adapter. Tubing shall be cut squarely, fully seated within each push-to-connect fitting, adequately supported, and protected from kinking, crushing, abrasion, excessive heat, and physical damage.



ELECTRICAL INSTALLATION

Incoming Service

The OVM-LMS operates on 120 VAC, single-phase power and requires the following field wiring:

One (1) ungrounded conductor (hot);
One (1) grounded conductor (neutral); and
One (1) equipment-grounding conductor.

The system shall be supplied from a 10-amp circuit. Do not apply any other voltage, phase, or power source unless specifically indicated on the equipment nameplate or project-specific as-built drawings.

All power wiring and grounding shall be completed by qualified personnel in accordance with the as-built panel drawings and applicable electrical codes. Disconnect and verify removal of power before opening the control panel or performing installation or service work.

Pump

The OVM-LMS utilizes a 1/8-horsepower compressor/vacuum pump, which is normally factory-wired to the control system unless otherwise indicated on the equipment or project-specific as-built drawings.

When the vacuum pump is not factory-wired, or when a replacement pump is installed, connect it as follows:

Pump hot conductor to the VPH terminal;
Pump neutral conductor to the VPN terminal; and
Pump equipment-grounding conductor to the control panel grounding bar.

Verify that all power has been disconnected before performing wiring or replacement work. All electrical connections shall be completed by qualified personnel in accordance with the system as-built drawings and applicable electrical codes.

Vacuum Transmitter

The OVM-LMS utilizes a 4–20 mA vacuum/pressure transmitter with an M12 connection. The transmitter is normally factory-wired to the control system unless otherwise indicated on the equipment or project-specific as-built drawings.

When the vacuum transmitter is not factory-wired, or when a replacement transmitter is installed, connect it as follows:

Signal conductor to terminal F4; and
Common conductor to terminal 010+.

Use shielded instrumentation cable where necessary to prevent electrical noise or signal interference. Route transmitter wiring separately from line-voltage wiring where practicable, and complete all shield connections in accordance with the project-specific as-built drawings. Verify transmitter polarity and terminal designations before applying power.

CONTROL INSTALLATION

Control Relay

The OVM-LMS includes two normally open control relay outputs for connection to external monitoring and control systems:

Shutdown Alarm Relay: Terminals 1000 and 1001, intended to provide a shutdown alarm signal to an external controller.

General Alarm Relay: Terminals 1002 and 1003, intended to provide general alarm status to a building management system, building automation system, or other remote monitoring equipment.

These connections are provided for field wiring. Refer to the project-specific as-built drawings for relay logic, operating sequence, and contact ratings before making any connections. Do not apply a voltage or current exceeding the rated capacity of the relay contacts.

Modbus TCP/IP

The OVM-LMS includes Modbus TCP/IP communications for transmitting system status, operating conditions, and alarm information to a building management system, building automation system, or other compatible remote monitoring equipment.

Unless otherwise indicated on the project-specific as-built drawings, the standard network configuration is:

IP Address: 10.0.1.1

Subnet Mask: 255.255.255.0

Default Gateway: 10.0.1.254

The facility controls contractor shall coordinate network settings with the owner's information technology or building automation personnel before connecting the OVM-LMS to the facility network. Verify that the assigned IP address does not conflict with another network device. Changes to the factory-programmed network configuration shall be performed only by authorized personnel.

The following standard Modbus registers and data points may be furnished to the external monitoring system. Available registers, point descriptions, data formats, and address assignments may vary based on the project-specific system configuration.

ADDRESS	DATA TYPE	REGISTER	ALARM
Y001	BIT	8193	VACUUM PUMP START
C201	BIT	16585	ALARM ACTIVE
C203	BIT	16587	ATTEMPTS TO REACH VACUUM EXCEEDS SETPOINT
DS10	INT	400010	MOST RECENT TEST - PASS = 1 / FAIL = 0
DF14	FLOAT	428699	VACUUM INHG

HMI TOUCHSCREEN - GENERAL



Home-Overview

The Home/Overview screen displays the current system condition and the results of the most recently completed test sequence, including:

- Result of the most recent test;
- Applicable test target and failure threshold;
- Vacuum level at the beginning and end of the most recent test;
- Current vacuum level;
- Total vacuum loss during the test;
- Calculated vacuum-loss rate per minute;
- Number of consecutive failed tests;
- Number of stabilization attempts; and
- Percentage of the allowable vacuum loss used during the current test sequence.

The Home/Overview screen also includes a graphical indicator showing the percentage of allowable vacuum loss occurring during the active test sequence.

A Start touch-button is provided to manually initiate a test sequence. A Navigation touch-button provides access to the primary Navigation screen.

From the Navigation screen, only touch-buttons filled in red or blue may be accessed without first entering the six-digit password. All other screens and functions are password protected and are intended for use by authorized service personnel.

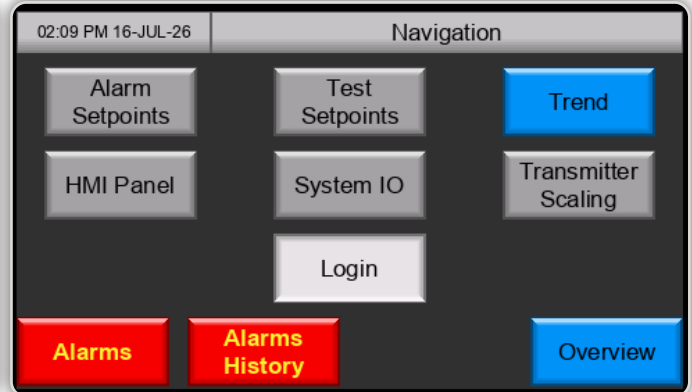
Password-protected screens contain parameters that are factory- or field-calibrated by an authorized service representative. These settings shall not be adjusted without the presence or direction of an authorized service representative. Unauthorized changes may affect system operation, test accuracy, alarm functions, compatibility with the monitored equipment, or void equipment warranty.

Press the Trend touch-button to display a 24-hour trend chart showing recorded vacuum-loss rates. Use the on-screen arrow controls to scroll through and review additional available time ranges.

Press the Overview touch-button from any applicable screen to return to the Home/Overview screen.

Press the Alarms touch-button to review currently active system alarms.

Press the Alarm History touch-button to review previously recorded alarm conditions.



Navigation



Trend

HMI TOUCHSCREEN - ALARMS

08:55 PM 29-JUL-26		Active Alarms			
Alarm Summary			Total of 0 Alarms		
☐	☐	Message			Activated
☐	☐				
☐	☐				
☐	☐				
☐	☐				
☐	☐				
Page Up		Page Down	Line Up	Line Down	Detail
Alarms History		Navigation		Overview	

Active Alarms

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Alarm History

The Active Alarms screen displays all alarm conditions that are currently active within the system. The Alarm History screen provides a record of previous alarm occurrences.

For each alarm occurrence, the system records:

**The specific alarm condition;
The date and time the alarm was activated; and
The date and time the alarm was deactivated.**

These records are useful for system troubleshooting and for providing information to an authorized service technician during remote technical support.

Use the Page Up, Page Down, Line Up, and Line Down touch-buttons to scroll through the active alarm list or alarm history and review additional alarm occurrences.

HMI TOUCHSCREEN - TECH SETUP

Alarm Setpoints	
Allowed Attempts	Max Pump Runtime
0	0 sec.
Test Attempts	Reset Button Hold Time
0	0 ms.

Pump Runtime Alarm Disabled

Setpoints Navigation Overview

Alarm Setpoints

Test Setpoints		
Run Over Time	Pause Time	Test Duration
0 sec.	0 sec.	0 min.
Target Level	Allowable Loss	
0.00 inHg	0.00 inHg	

Alarm Setpoints Navigation Overview

Test Setpoints

Vacuum Transmitter Settings		
Transmitter Raw Min	Transmitter Raw Max	Transmitter Raw Offset
0.00 %	0.00 %	0.00 %
Transmitter EU Min	Transmitter EU Max	Transmitter EU Offset
0.00 inHg	0.00 inHg	0.00 inHg

Navigation Overview

Vacuum Transmitter Settings

Change System Time			
Set Year (yyyy)	Change Year	Set Hour (24hr)	Change Hour
0		0	
Set Month	Change Month	Set Minute	Change Minute
0		0	
Set Day	Change Day	Set Second	Change Second
0		0	
Change All	Set Clock	Navigation	Overview

Change System Time

After entering the six-digit service password, an authorized service representative may access additional system configuration, calibration, and time-setting screens. These screens are intended for qualified service personnel only.

System settings shall not be modified except by, or under the direction of, an authorized service representative. Incorrect settings may affect test performance, alarm operation, transmitter accuracy, or overall system reliability.

The Alarm Setpoints screen allows the authorized technician to adjust the following parameters:

Allowed Attempts (Factory=3); Maximum Pump Run Time (Factory=2000 Sec.); Test Attempts (Factory=3); Reset Button Hold Time (Factory=30ms.); and Pump Runtime Alarm (Factory=Enabled).

The Test Setpoints screen allows the authorized technician to adjust the following test parameters:

Run Over Time (Factory=30 sec.); Pause Time (Factory=30 sec.); Test Duration (Factory=60 min.); Target Level (-10.00 inHg); and Allowable Loss (Factory=2.00 inHg).

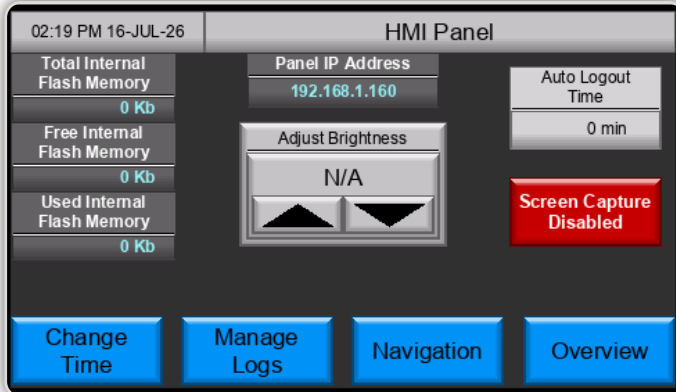
The Vacuum Transmitter Settings screen allows the authorized technician to calibrate the vacuum transmitter and verify the displayed vacuum reading against the system's manual vacuum gauge.

Calibration shall be performed using appropriate test equipment and in accordance with the system's commissioning and service procedures.

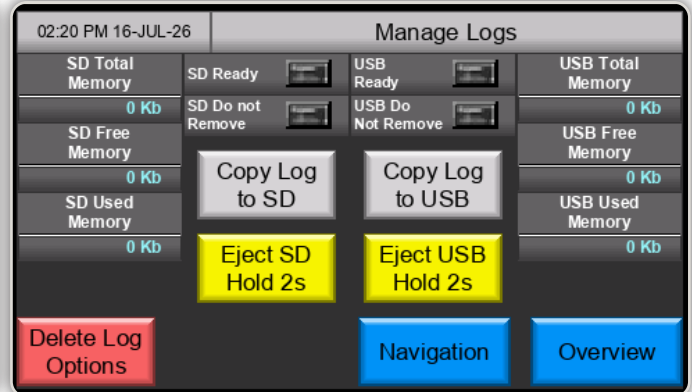
The Change System Time screen allows the authorized technician to adjust the system date and time.

The system date and time should be verified during commissioning and after any extended loss of power to ensure that trend data, test records, and alarm-history entries are accurately time-stamped.

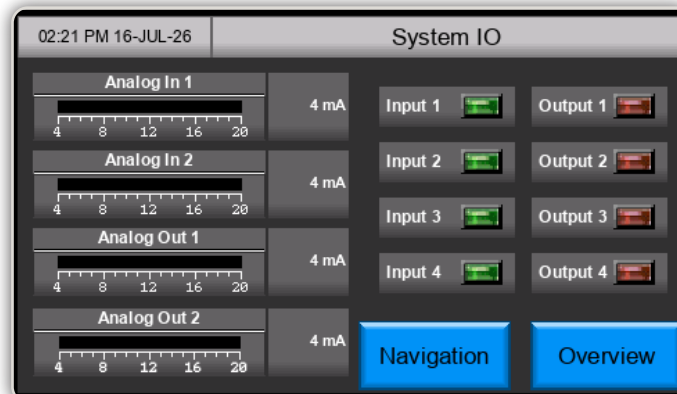
HMI TOUCHSCREEN - TECH SYSTEM



HMI Panel



Manage Logs



System IO

The HMI Panel screen allows an authorized technician to:

Adjust the display brightness; Review available and used system memory; Adjust the automatic logout time; and Access the Manage Logs screen.

The automatic logout setting determines how long a password-protected service session may remain inactive before the system returns to the standard operator access level.

The Manage Logs screen allows an authorized technician to copy system log files to a compatible SD card or USB storage device. Exported logs may be used for external review, troubleshooting, technical support, or record retention.

Do not remove the storage device while files are being copied. Confirm that the export process is complete before removing the SD card or USB device.

The System I/O screen allows an authorized technician to review the present status and values of the system's analog and discrete inputs and outputs. This screen may be used during commissioning, calibration, troubleshooting, and functional testing to verify that connected devices and control outputs are operating as intended.

Installer Notes:
