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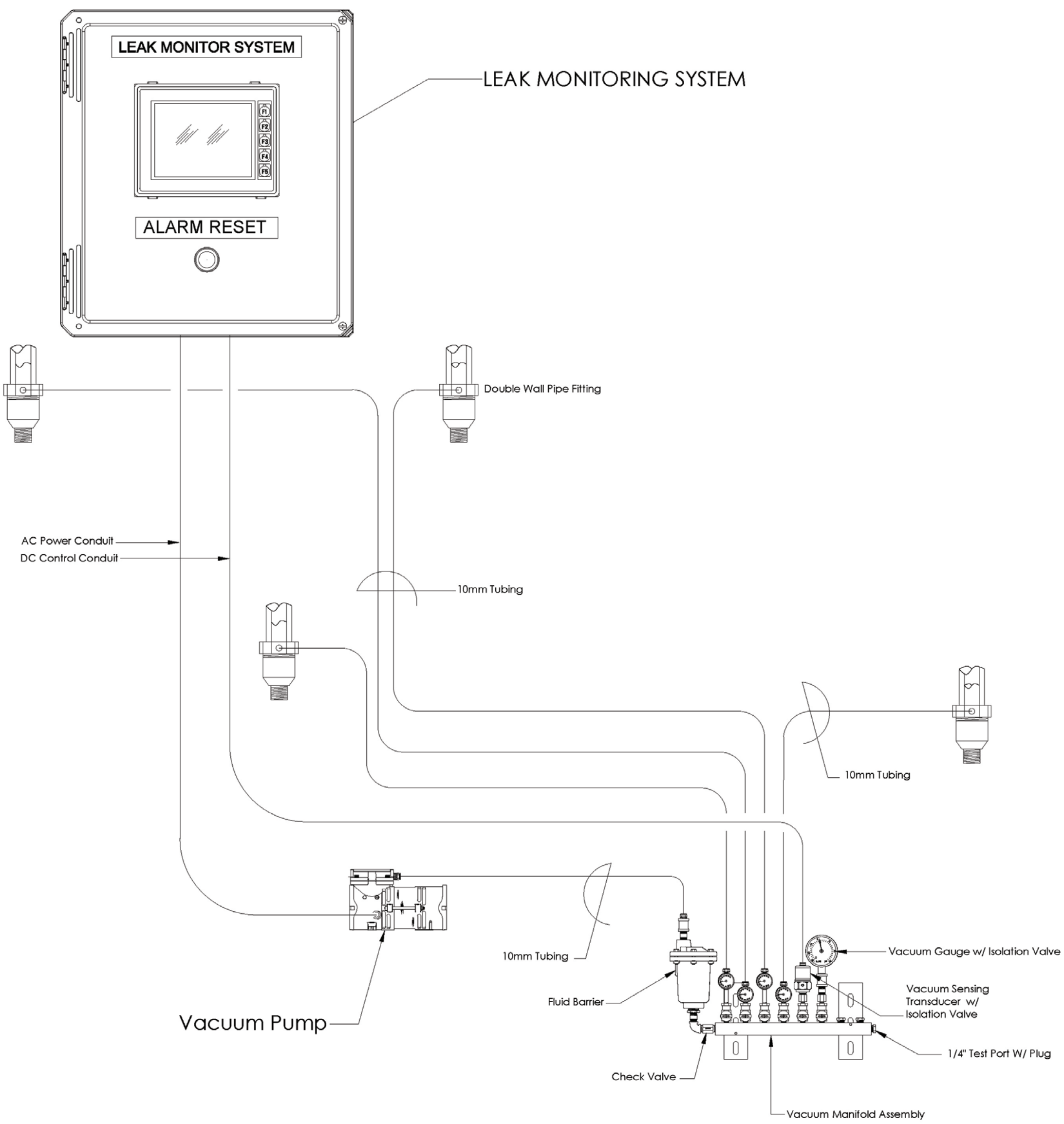
SafeSite Leak Monitoring System Manual



The Leak Monitoring System is designed to automatically test the interstitial space of double wall pipes and tanks utilizing pressure or vacuum. It bases its results on programmable set points determined specifically for your project.

Table of Contents

Leak Monitoring System Operations

Programming

The system must be programmed by a factory trained technician or by the direction of a factory representative. The following parameters will be programmed (but not limited to this list).

- System type of test (pressure or vacuum)
- Test target to start a test (PSI or inHG)
- Test duration
- Maximum loss (PSI or inHG) to fail a test
- Number of failed tests in a row to activate an alarm
- Number of failed attempts to start a test to activate an alarm
- Alarm will or will not disable the fuel pump

Automation Operating

The system is designed to run only in the automatic test mode. The system monitors and controls the test media (pressure or vacuum) for the maximum loss for a programmed length of time. When testing, the system will perform the following:

- Prepare for the test
  - The vacuum or air pump will start and a solenoid will open to control the test media (pressure or vacuum)
  - The system will stabilize before starting a test
  - The system will start a test when the test media is stable
  - The system will monitor the media for changes and either pass or fail a test based on the results
- The results of the test
  - The system will Log the results of a passed or failed test
  - Activate the alarm and send a signal to a BMS as programmed. If the alarm is activated, press the *Alarm Acknowledge* button on the front cover to silence the alarm.
  - Disable the fuel pump(s) if programmed to do so
- Automatically prepare for the next test as programmed

Leak Monitoring System Maintenance

Maintenance

The system should not need any maintenance unless a component fails to perform as designed. The following is a list of components that can affect the results of the test.

- There are three types of systems with three types of pumps and compressors used to create the test media for testing:
  1. Vacuum pump
  2. Submersible pump with a solenoid valve
  3. Air compressor with a solenoid valve
- All systems are using an inline check valve to maintain the test media
- All systems are using a pressure/vacuum transmitter

If the system fails to create or maintain the test media (vacuum or pressure), perform the following test:

1. Turn off the power to the LMS unit.
2. On the test manifold, turn off all the branch valves connecting all of the equipment or pipe that is being tested. Leave on the valves going to the large gauge and transmitter.
3. Turn on the power to the system. A test will start in about one minute. The system will test only the test manifold and the performance of the pump or compressor.
4. Let the system run a test as programmed.
5. If the test passes, go to step #6. If the test fails, the problem is with your test manifold for the test media pump. Consult a factory authorized representative.
6. **Passed Test.** The problem is with your pipe or tanks equipment that is being tested or the tubing connecting the equipment to the test manifold.
7. Make sure all the tubing is connected properly.
8. Inspect the tubing for leaks.
9. To help identify where the leak is, isolate (test) one piece of equipment at a time by opening one valve on the test manifold and restart the test. Turn off and on the power to the controller to begin a new test.
10. Repeat #9 until the leak or leaks are isolated.

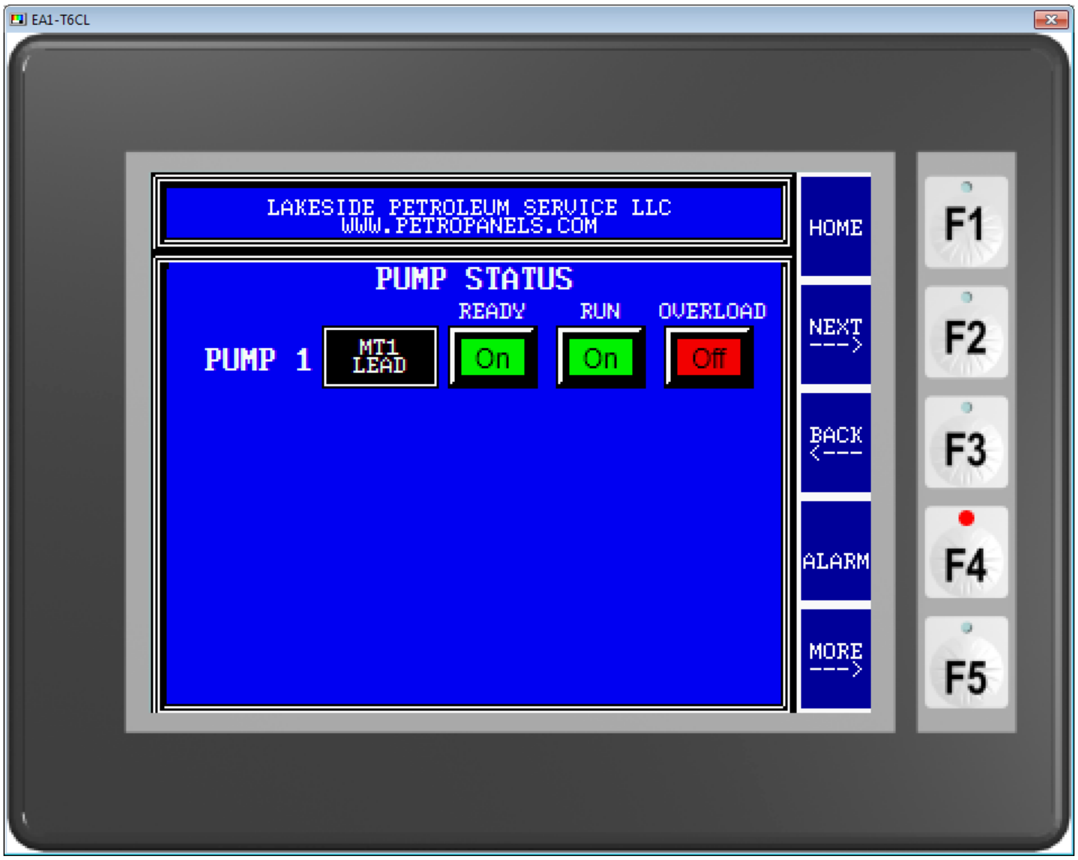
Contact a factory authorized representative for assistance.

Home

F1 HOME　　F2 NEXT　　F3 BACK　　F4 ALARMS　　F5 MORE

MAN START LINE LEAK	Manually start line leak monitoring test
SYSTEM STATUS	Indicates whether the test is in operation mode or the test is about to start
FULL VIEW	Displays more information

Pump Status

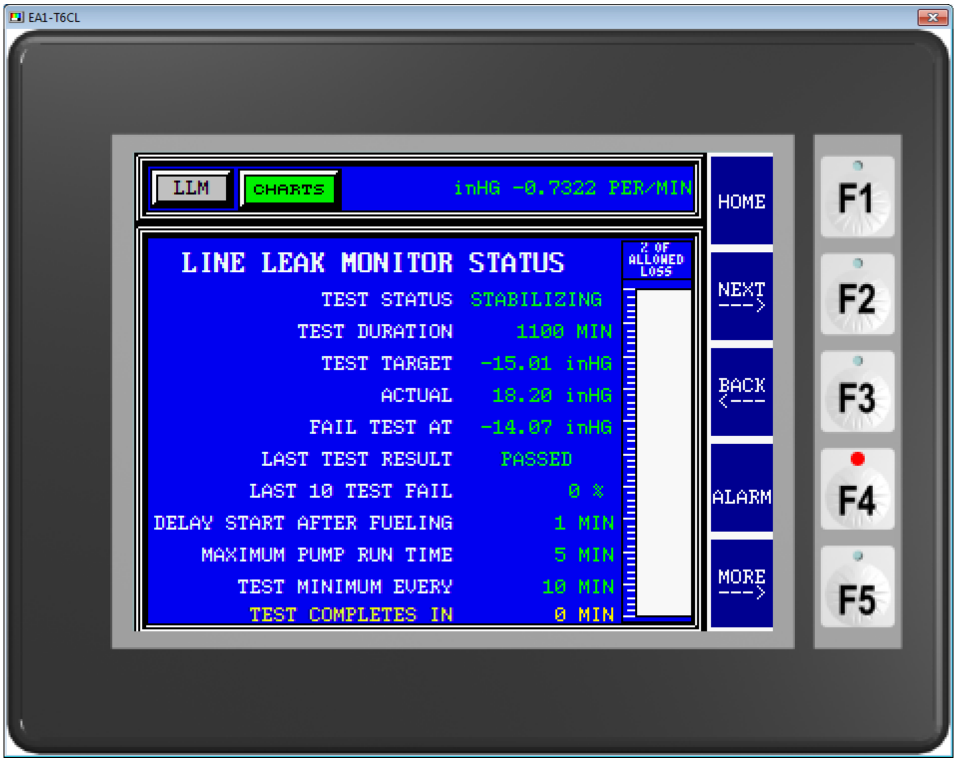


F1 HOME F2 NEXT F3 BACK F4 ALARMS F5 MORE

This window demonstrates the status of the pumps

READY	Pump is in ready state
RUN	Pump is in operation
OVERLOAD	Driving motor is drawing excess current

Full View



F1 HOME F2 NEXT F3 BACK F4 ALARMS F5 MORE

TEST STATUS – Indicates the current status of test (i.e., if test is in progress or stabilization mode)

TEST DURATION – Indicates the total duration for line leak monitor test

TEST TARGET – Indicates the target pressure which we are trying to produce and above which the pump will shut off

ACTUAL – Indicates the current pressure we observe

FAIL TEST AT – Indicates the value of pressure below which Line Leak Monitoring test will fail

LAST TEN TEST FAIL – Percentage of test failed in the last ten test

DELAY START AFTER FUELING – Delay in between test and fueling

MAXIMUM PUMP RUN TIME – Mazimum duration for which the pump will run

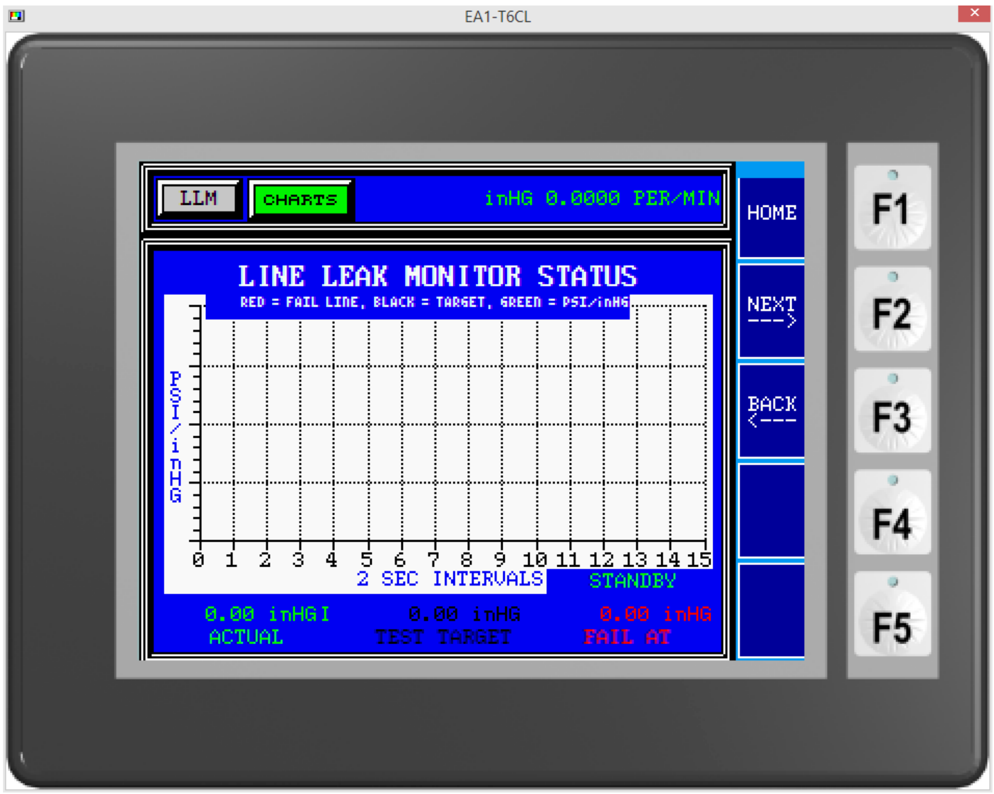
TEST MINIMUM EVERY – Delay time between consecutive tests

TEST COMPLETES IN – Time duration in which test is completed

CHARTS – Displays information graphs

LLM – Go to Home

Charts



F1 HOME F2 NEXT F3 BACK

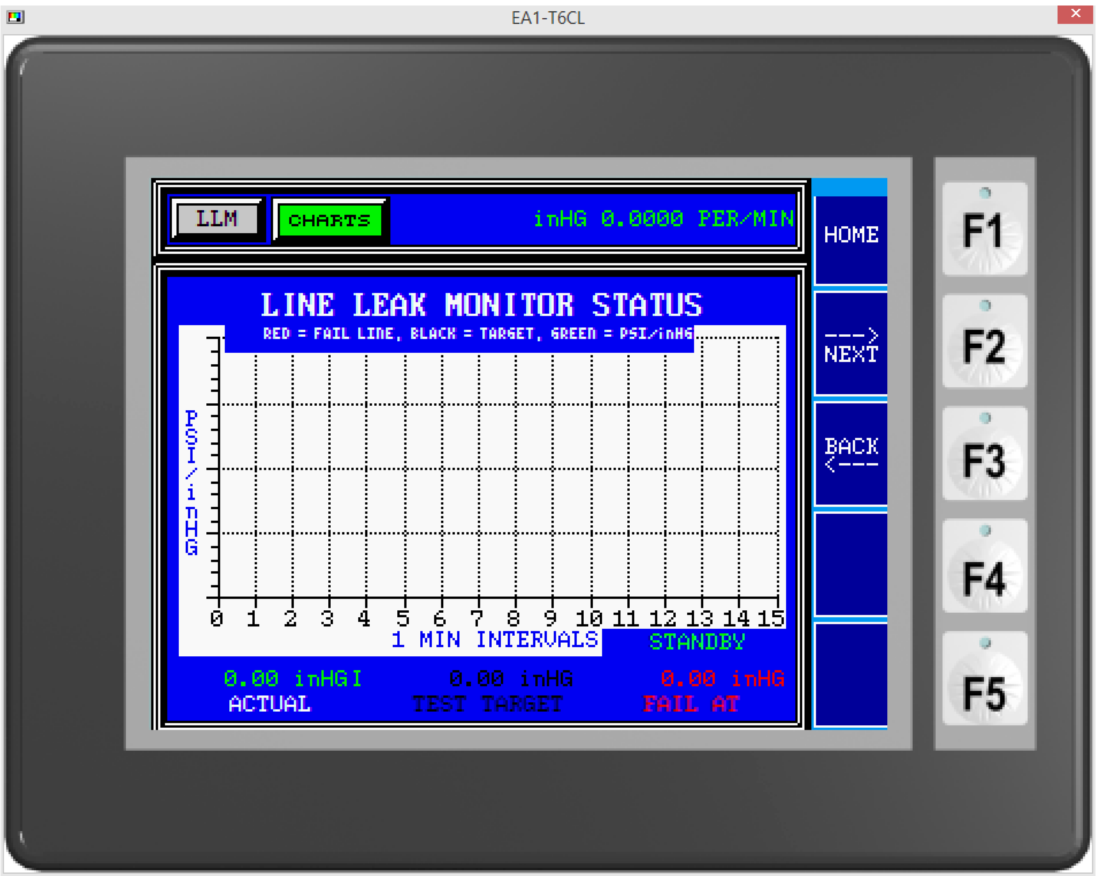
CHARTS – Displays information graphs

LLM – Go to Home

LINE LEAK MONITOR STATUS – Displays graph showing the pressure behavior compared to target pressure and the pressure at which the test fails.

2 SEC INTERVALS – Refers to the grid size from 0-1 as two seconds.

Charts (next tab)



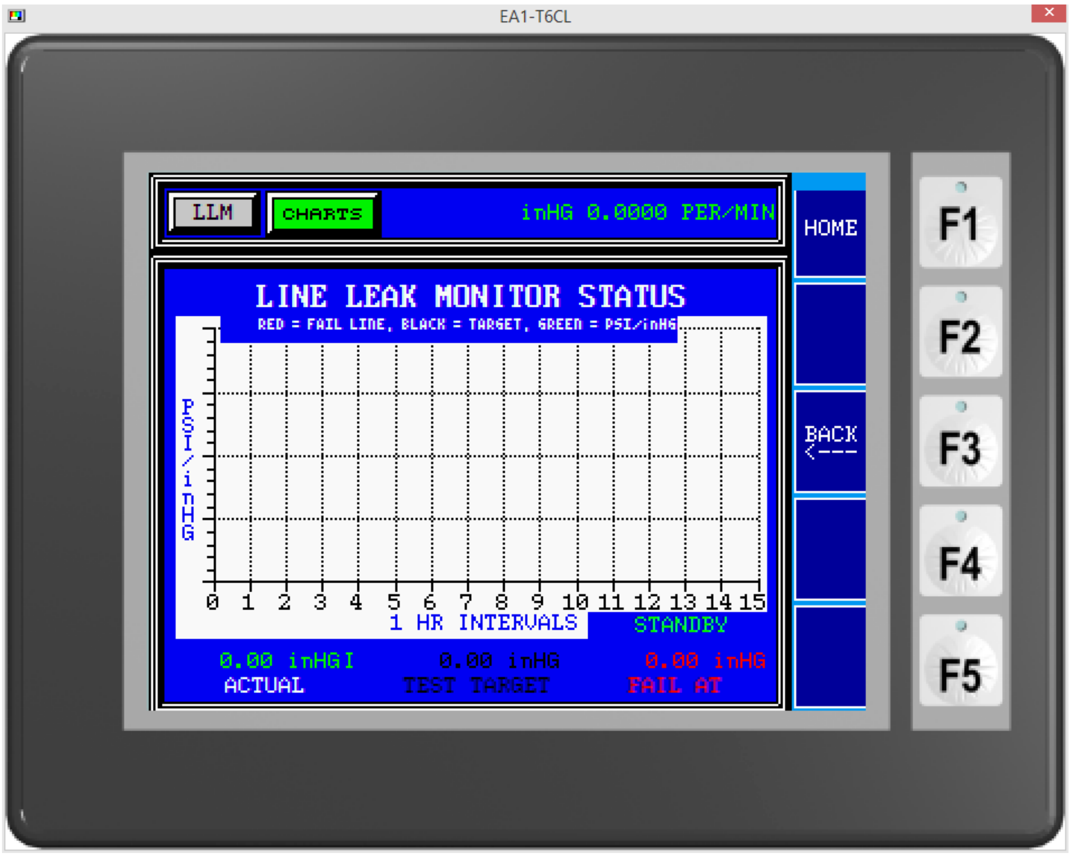
F1 HOME F2 NEXT F3 BACK

CHARTS – Displays information graphs

LLM – Go to Home

1 MIN INTERVALS – Refers to the grid size from 0-1 as one minute

Charts (next tab 2)



F1 HOME F3 BACK

CHARTS – Displays information graphs

LLM – Go to Home

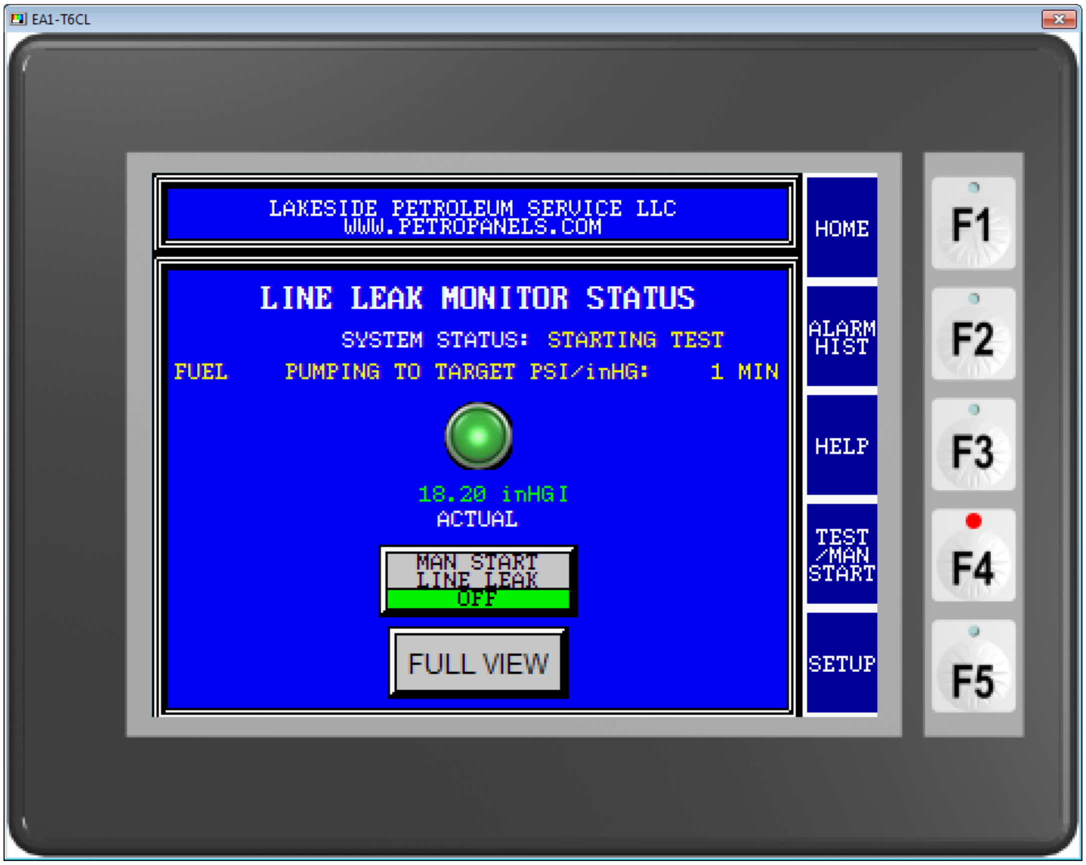
1 HR INTERVALS – Refers to the grid size from 0-1 as one hour

Alarms

F1 HOME   F3 BACK

HISTORY ALARMS – Go to HISTORY STATUS

More



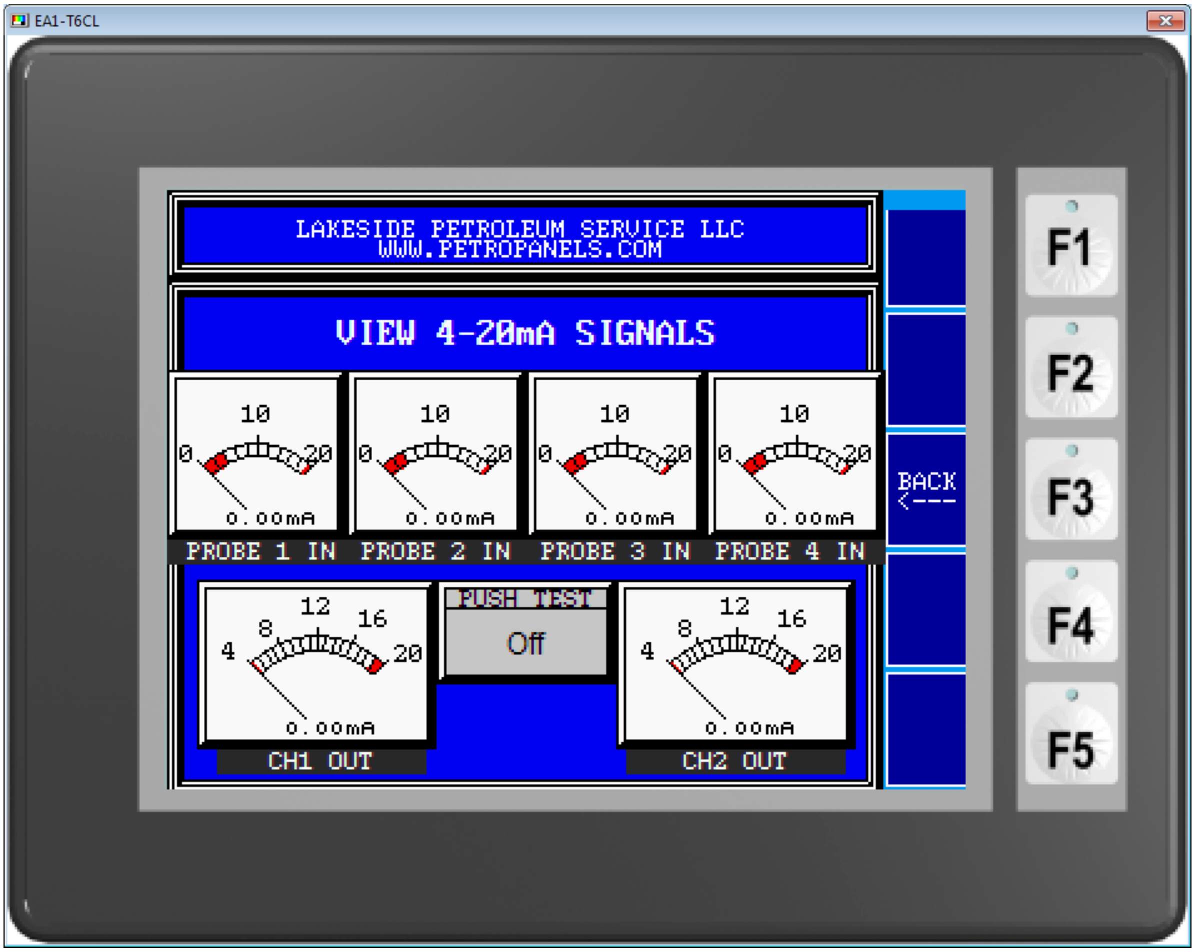
F1 HOME F2 ALARM HISTORY F3 HELP F4 TEST/MANUAL START F5 SETUP

Help

F1 HOME F2 420 Ma TEST F3 I/O TEST F4 SWITCH TEST F5 BACK

Help Screen displays the options for service screens

420 mA Test

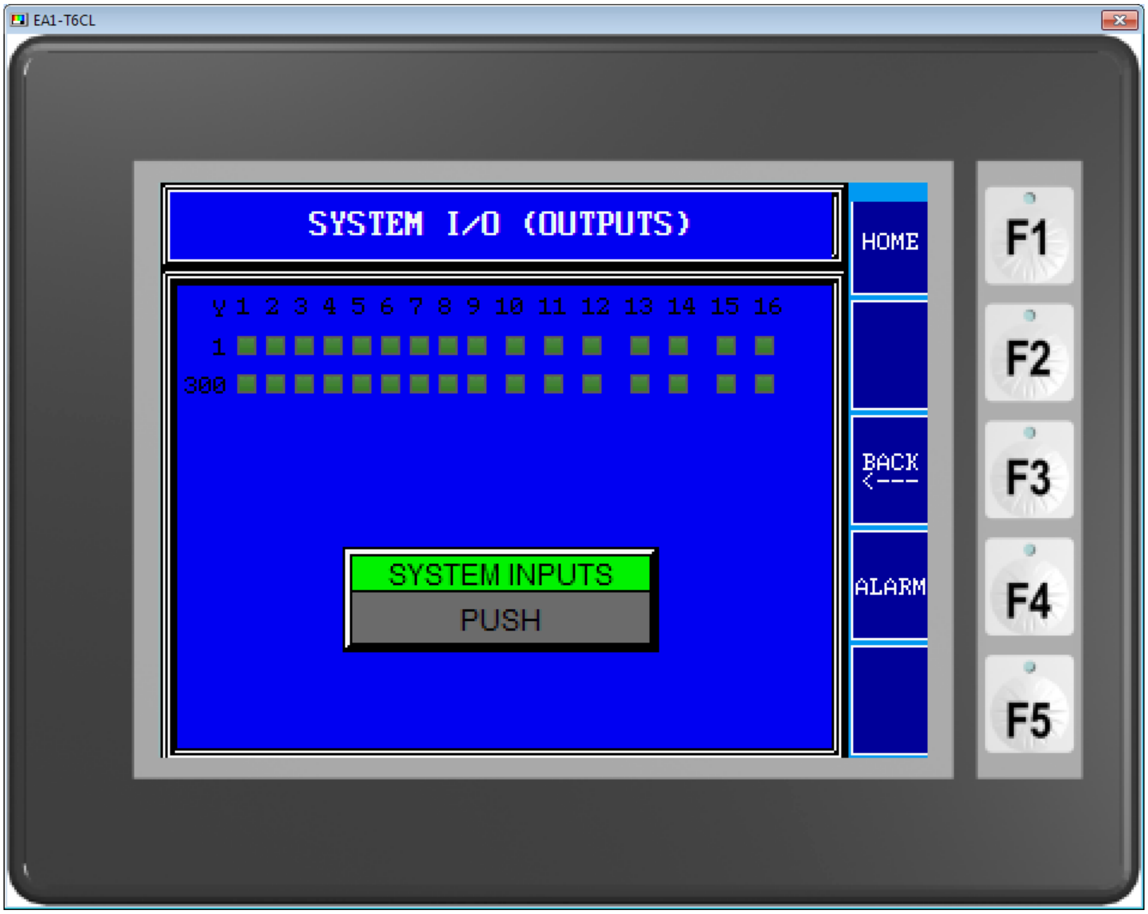


F5 BACK

Meters 1, 2, 3, and 4 (top row) corresponds to the signal received in input channels 1, 2, 3, and 4.

The other two meters (bottom row) correspond to output meters from channel 1 and channel 2.

System I/O Test (Output Screen)

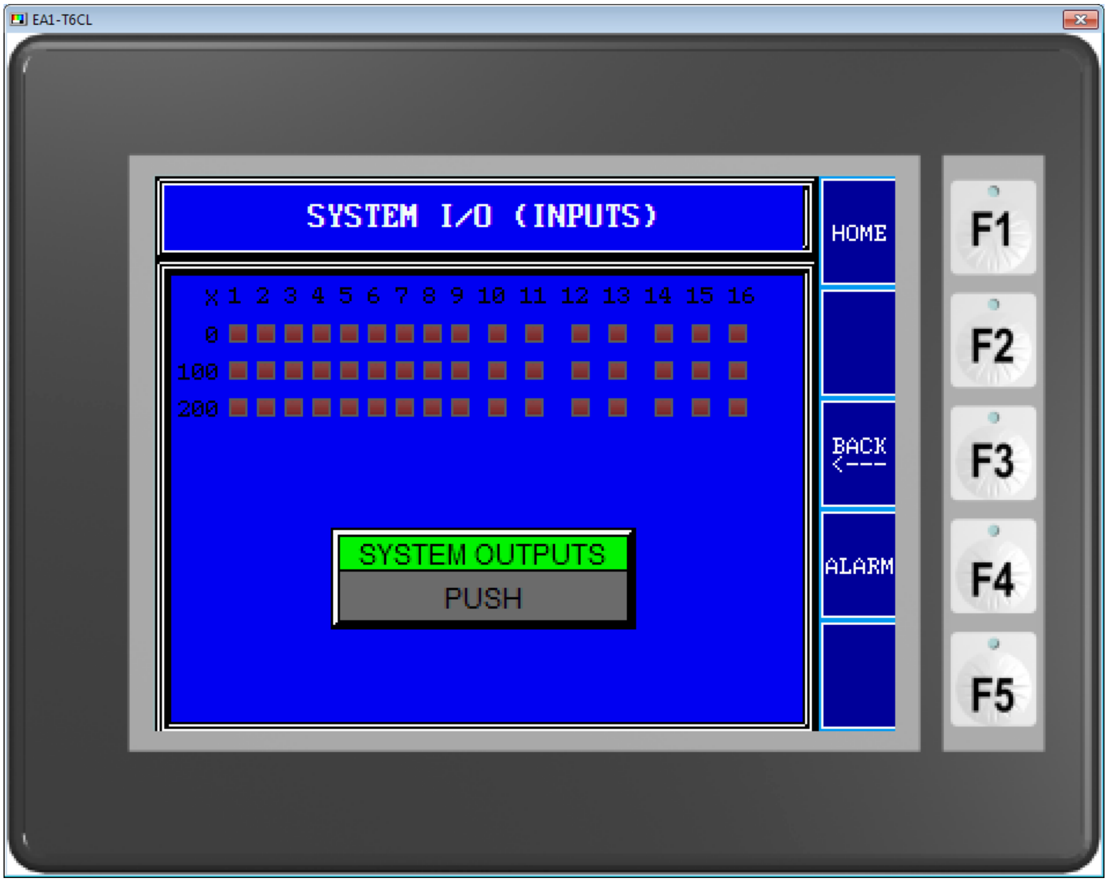


F1 HOME F3 BACK F4 ALARM

SYSTEM INPUTS – go to SYSTEM INPUT screen

This screen is a service screen displaying the system outputs from the PLC.

System I/O Test (Input Screen)



F1 HOME F3 BACK F4 ALARM

This screen is a service screen displaying the system inputs from the PLC.

Switch Test

F1 HOME   F2 420 Ma TEST   F3 I/O TEST   F4 SWITCH TEST   F5 BACK

ESTOP – Indicates whether Emergency Stop has been pressed

RESET – Indicates whether Reset has been pressed

SYS AUTO – Indicates if the system is in Automatic mode

SYS MAN – Indicates if the system in in Manual Run Operation mode

P1 HAND – Indicates if the pump1 is in Manual mode

P1 AUTO – Indicates if the pump1 is in Automatic mode

P1 OL – Indicates if pump1 is in overload mode or not and indicates whether to turn off motor starter switch

P1 AUX – Indicates if auxiliary contact on motor (i.e., the relay monitoring the motor is pulled in or not)

continued next page ...

Switch Test

P2 HAND – Indicates if the pump 1 is in manual mode

P2 AUTO – Indicates if the pump 1 is in automatic mode

P2 OL – Indicates if pump 1 is in overload mode or not and indicates whether to turn off motor starter switch

P2 AUX – Indicates if auxiliary contact on motor (i.e., the relay monitoring the motor is pulled in or not)

P3 OL – Indicates if pump 1 is in overload mode or not and indicates whether to turn off motor starter switch

P3 AUX – Indicates if auxiliary contact on motor (i.e., the relay monitoring the motor is pulled in or not)

P4 OL – Indicates if pump 1 is in overload mode or not and indicates whether to turn off motor starter switch

P4 AUX – Indicates if auxiliary contact on motor (i.e., the relay monitoring the motor is pulled in or not)

DT1 HAND – Indicates if the day tank 1 is in manual operation mode

DT1 AUTO – Indicates if the day tank 1 is in automatic operation mode

DT2 HAND – Indicates if the day tank 2 is in manual operation mode

DT12AUTO – Indicates if the day tank 2 is in automatic operation mode

DT3 HAND – Indicates if the day tank 3 is in manual operation mode

DT3 AUTO – Indicates if the day tank 3 is in automatic operation mode

MT1 REMOTE BP – Main Tank Remote Push button indicates the Main Tank high Level alarm during fueling operation

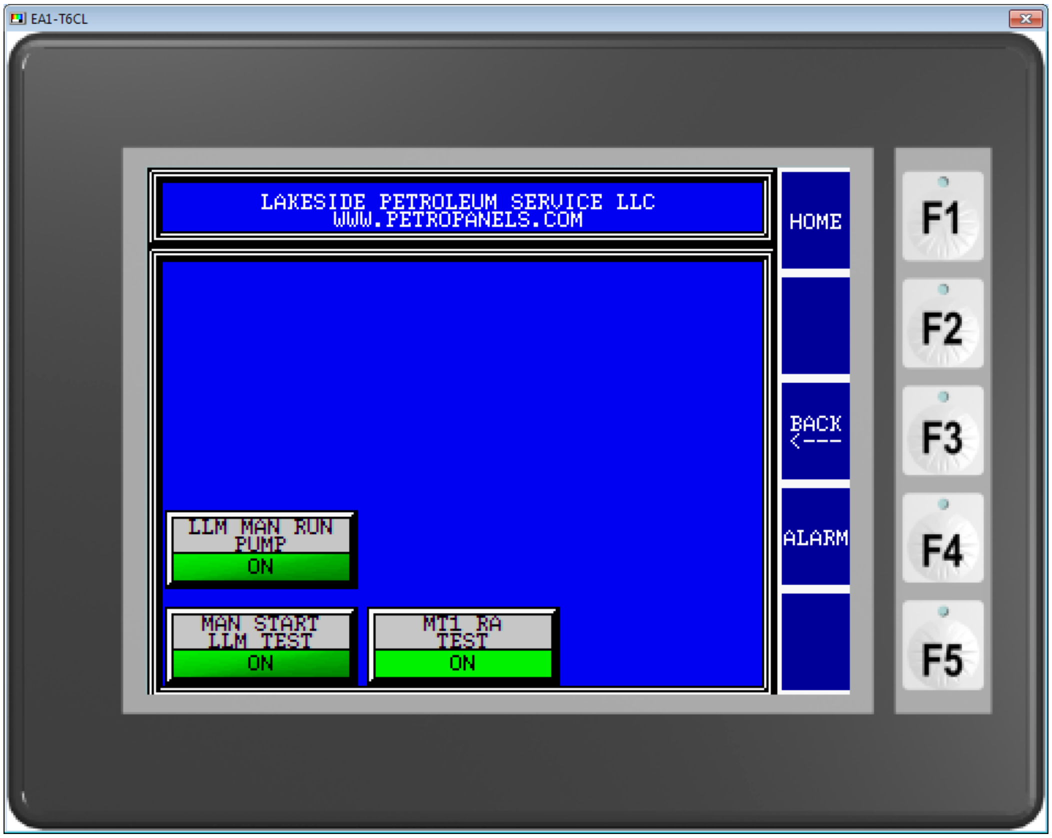
Main Tanks and History Status

F1 HOME   F3 BACK

Screen shows all the previous alarms

Press RESET ALL HISTORY to reset all the previous history of alarms

Test/Man Setup



F1 HOME F3 BACK F4 ALARM

LLM MAN RUN PUMP – Press this button to manually start or switch off the pump

MAN START LLM TEST – Press this button to manually start the line leak monitoring test

MT1 RA TEST – Press the Main Tank 1 Remote annunciator test to start the main tank 1 high level alarm test

Setup Screen

F1 HOME F2 NEXT F3 BACK F4 ALARM F5 MORE

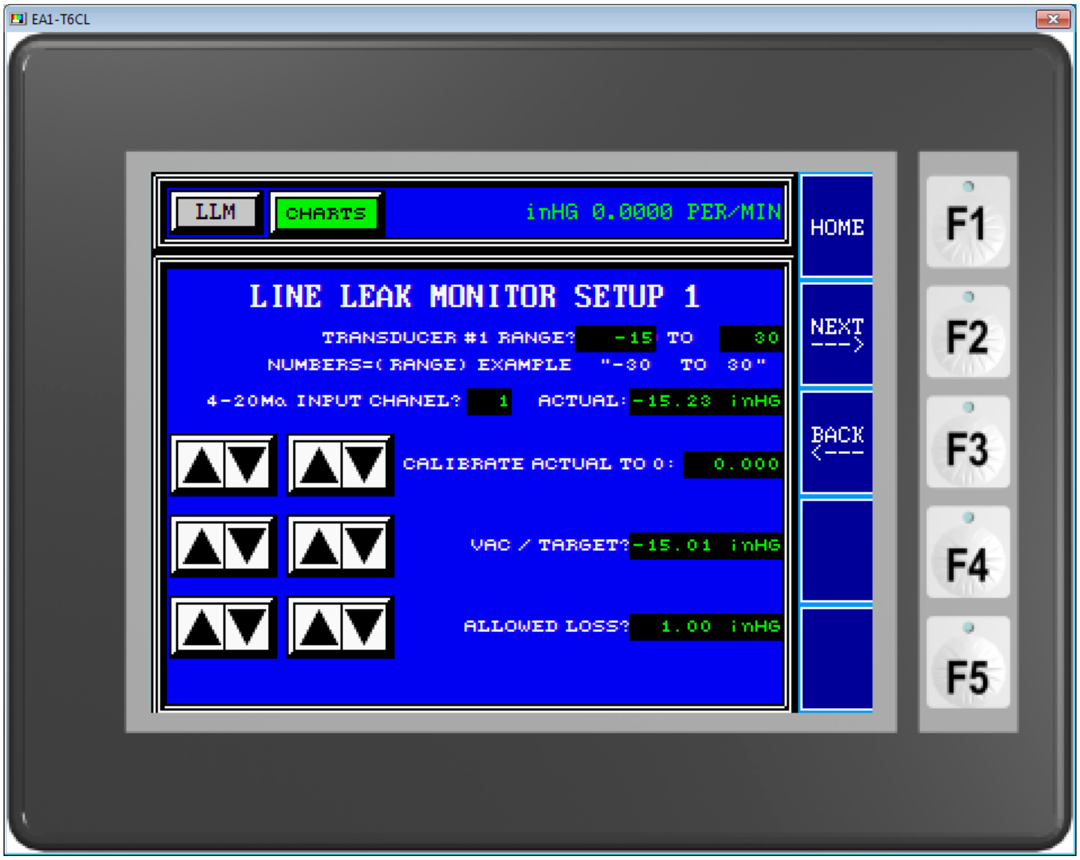
Press USE LLM to enter details regarding line leak monitoring system

You can adjust the contrast through ADJUST CONTRAST button

Press USE LLM to enter Leak Line Monitor Setup window to set up the test properties

Enter password 246 to enter

Use Line Leak Monitor Setup



F1 HOME F2 NEXT F3 BACK

TRANSDUCER RANGE – You can enter the pressure range of the transducer used in LLM test

INPUT CHANNEL – Which channel is being used in PLC

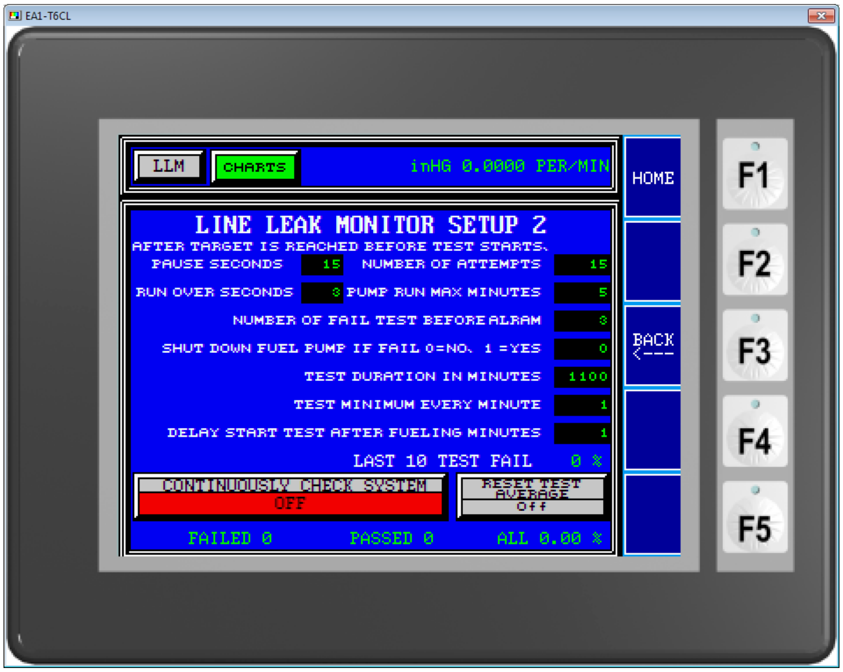
ACTUAL – Displays current pressure reading

CALIBRATE ACTUAL TO 0 – You can calibrate the default pressure as 0

TARGET – You can set the target pressure which we are trying to produce and above which the pump will shut off

ALLOWED LOSS – You can set the allowed loss value relative to the target pressure below which the pump will shut down

Leak Monitor Setup 2



F1 HOME F3 BACK

PAUSE SECONDS – Press to set up value for the delay i.e., pause seconds after pump shuts off so that pressure can be stabilized

RUN OVER SECONDS – Press to enter value for pump to run an additional time after reaching target

PUMP RUN MAX MINUTES – Press to enter the value of maximum time for pump to run

NUMBER OF FAIL TEST BEFORE ALARM – Press to enter the number of fail tests before line leak alarm will sound

SHUT DOWN FUEL PUMP IF FAIL – Press to enter 0 if you want to shut down the fuel pump when the test fails; otherwise, enter 0

TEST DURATION IN MINUTES – Press to enter the values of total test duration in minutes

TEST MINIMUM EVERY MINUTE – Press to enter minimum number of tests system should perform every minute

DELAY START TEST AFTER FUELING MINUTES – Press to enter the time duration in minutes the system should wait before it can start new test

LAST TEN TEST FAIL – Displays the value of the percentage of tests failed in last ten test

CONTINUOUSLY CHECK SYSTEM – Press to switch on the continuously check system button

RESET TEST AVERAGE – Press to reset the last values of test average