LIFT STATION VARIABLE SPEED CONTROL SYSTEM

(LSC-V SERIES)

OPERATIONAL SCREEN GUIDE AND INSTRUCTIONS

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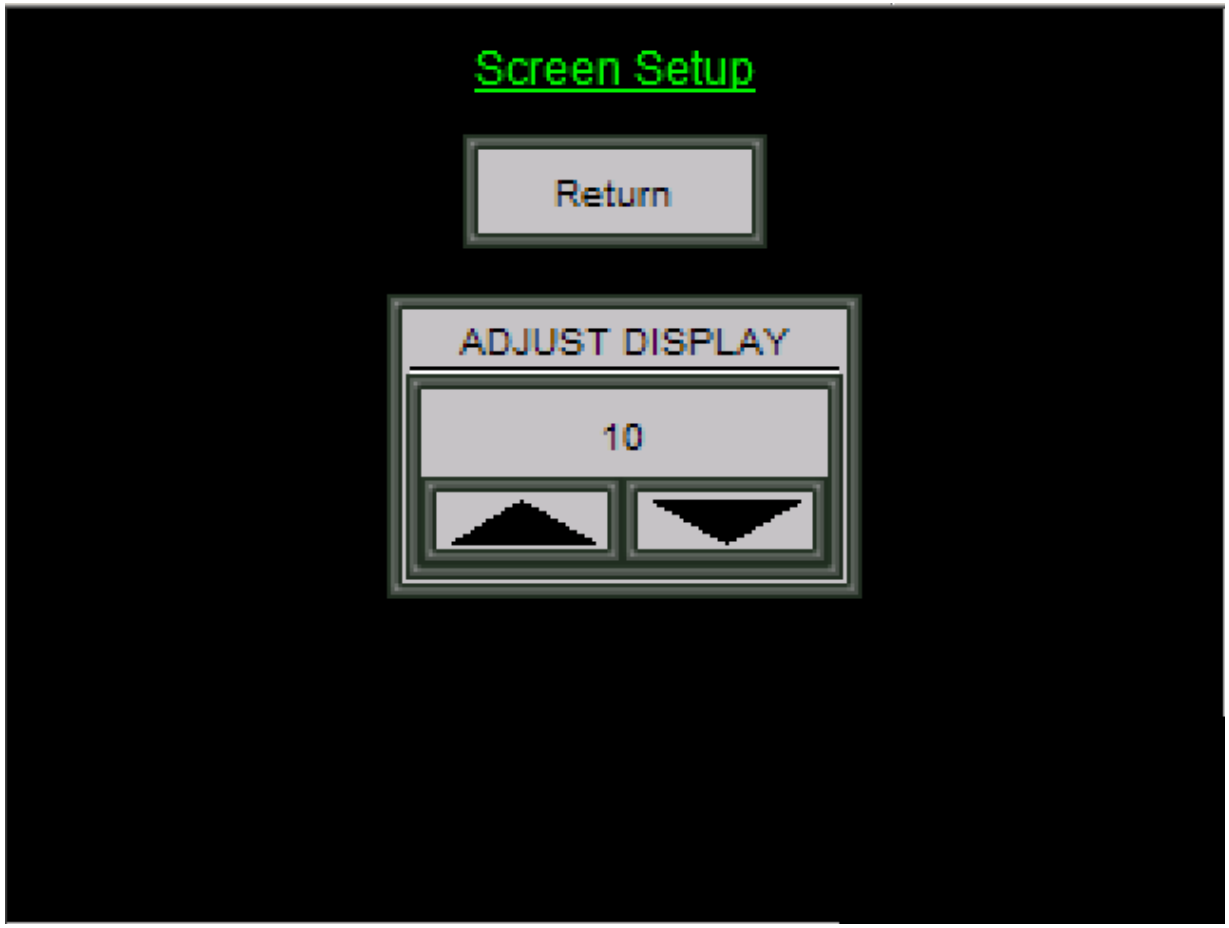
INTRODUCTION

The LSC-V series has two standard models specifically designed for variable speed, lift station applications: LSC-V-200 for two pumps and LSC-V-300 for three pumps. There are 30 color soft touch information and control screens within the system which graphically and digitally display all of the operating information for a variable speed pump station. These screens allow the operation to be customized by feature selections and setpoint entries. The system is designed with the operator's needs in mind and will run smoothly and efficiently once the appropriate parameters and setpoints have been selected and entered.

This screen guide reflects a (3) pump or triplex configuration. Duplex configuration screens will look the same but will display information and icons for two pumps instead of three.

The actual screens contained in this book "walk the user through the LSC-V system". This guide will explain the functionality of each screen and can be used as ready reference tool for specific questions that may develop as you use the screens.

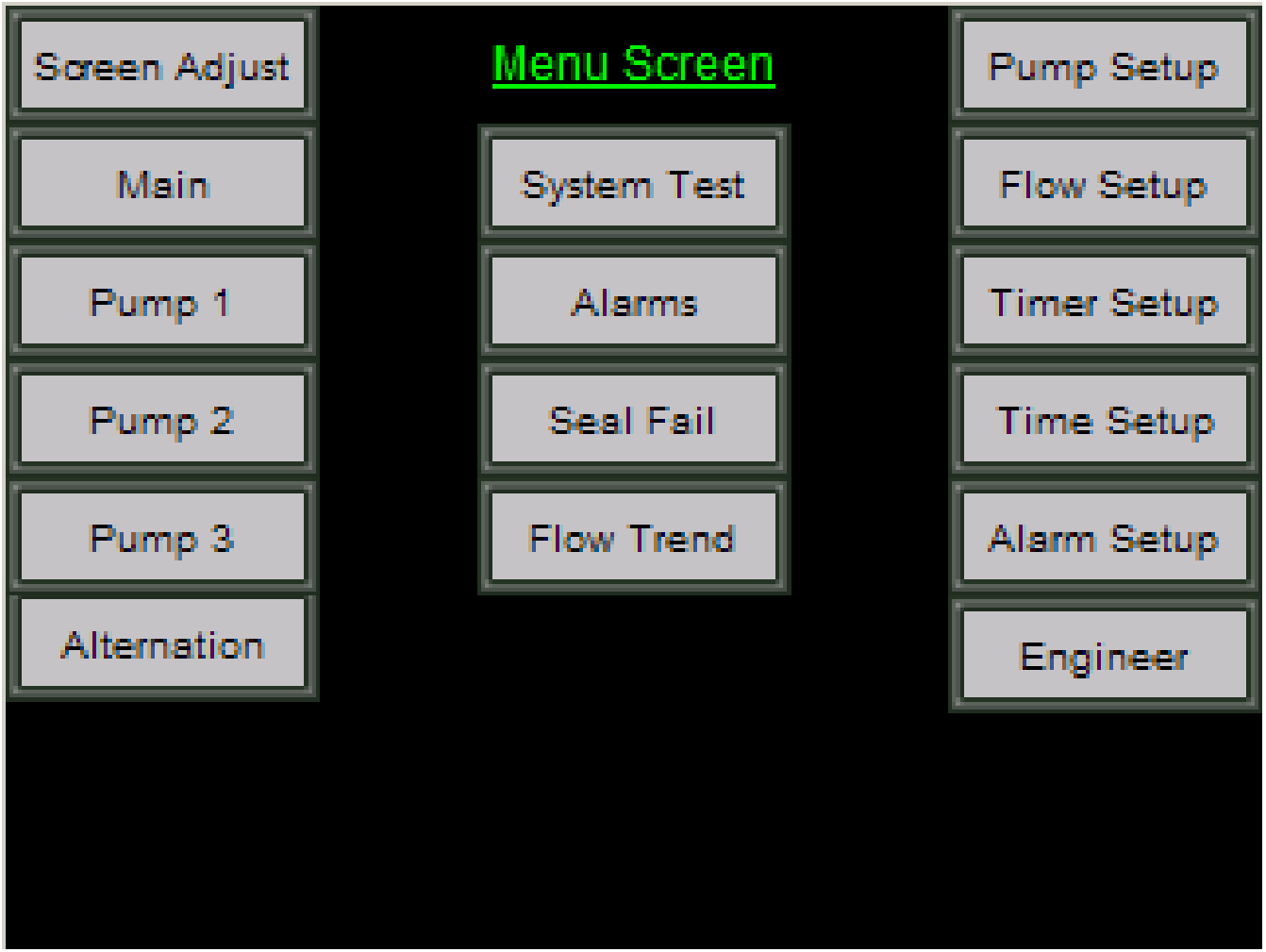
SCREEN SET UP



The **Screen Set Up Screen** allows the operator to adjust the contrast on the screen.

Touch RETURN to go back to the prior screen.

MENU SCREEN



The **MENU Screen** is your road map to the various displays within your system. Touch the appropriate button to take you to any of the different screens indicated.

Menu Buttons are organized into three columns.

Informational and Operating Screens (left column) – These screens will be the screens most frequently used by operators.

Screen Adjustment	Allows adjustment of screen brightness
Main Screen	Provides a control system overview.
Pump Screens	Gives detailed information about the operating conditions of each pump.
Alternation	Allows the user to view and change the current alternating set up.

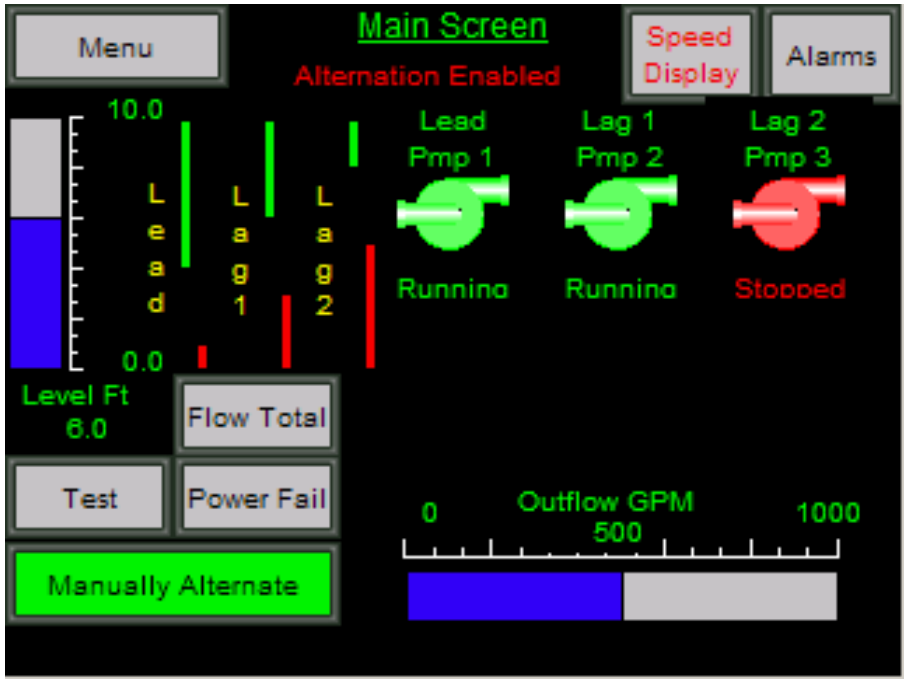
Informational and Operating Screens (center column)

System Test	Provides an easy way to simulate conditions and test your system
Alarms	Shows current and historical alarm conditions
Seal Fail	Select seal fail actions
Flow Trend	Displays “external” flow input if available to the controller

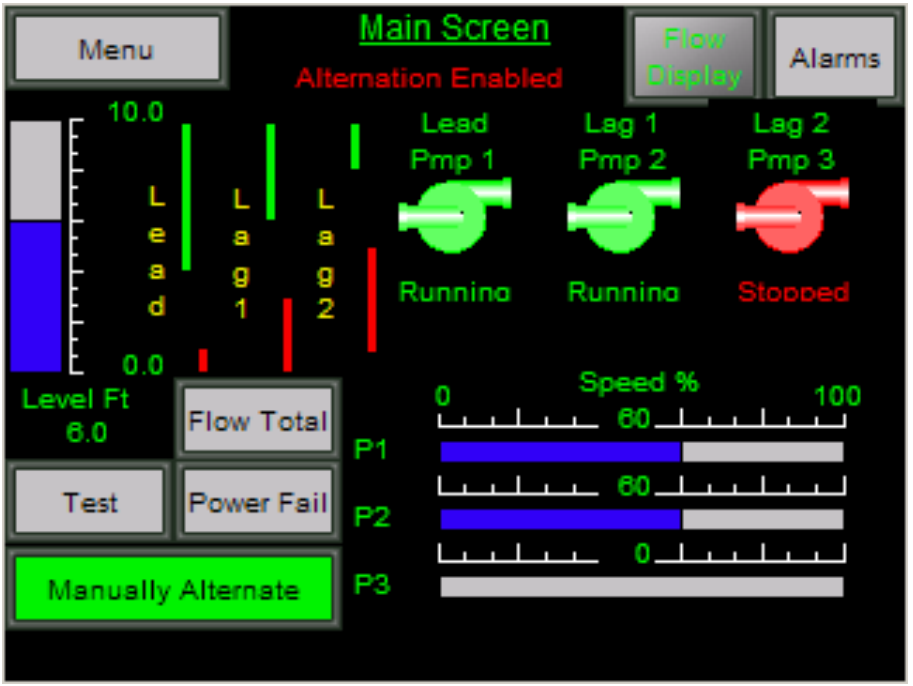
Set Up/Data Entry Screens (right column)

Pump Set Up	Defines the level parameters and operational settings for the operation of the variable speed pumps
Timer Set Up	Timer adjustment to custom tune your system
Time Set Up	Allows date and time changes
Alarm Set Up	Enter alarm set points
Engineer	Field Transmitter scaling

MAIN SCREEN



Main Screen with Flow Display



Main Screen with Speed Display

The **Main Screen** is an informational screen designed to give you an overview of your pump station operations. Changes in pump operating conditions cannot be made from this screen. It constantly displays and updates the following information:

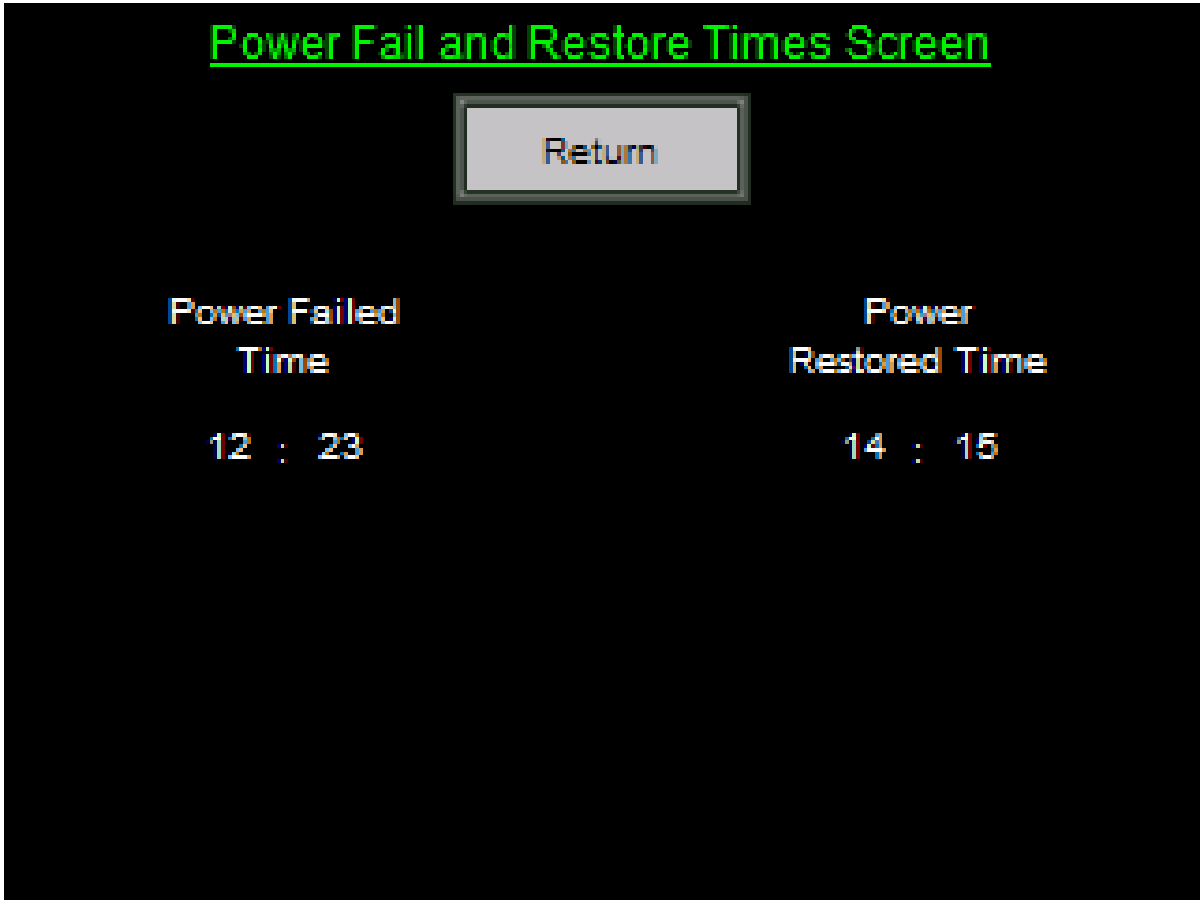
1)	Wet Well Level (in feet)	Displayed as a digital readout with a vertical bargraph
2)	Wet Well Transmitter Range	Displayed as a digital readout at bottom right and top right of the Level bargraph
3)	Lead , Lag 1 and 2 Start/Stop Setpoints	Displayed as a vertical bargraph beside the wet-well level indicator. The bottom of the green bar indicates the start setpoint and the top of the red bar indicates the stop setpoint.
4)	Alternation Condition	Displayed in text below the Screen Title (Enabled or Disabled)
5)	Pump Line Up (Lead, Lag 1 or 2)	Displayed in text above each pump graphic
6)	Pump Run Status	Each pump graphic is RED for stopped or GREEN for run.
7)	Pump Status	Displayed as text below each pump graphic (Running/Stopped/Fail)
8)	Pump # 1 Percent of Speed	Displayed as a digital readout with bargraph -- scaling is indicated at the top left and right above the bargraph
9)	Pump # 2 Percent of Speed	Displayed as a digital readout with bargraph – scaling is indicated at the top left and right above the bargraph.
10)	Pump # 3 Percent of Speed	Displayed as a digital readout with bargraph – scaling is indicated at the top left and right above the bargraph.
11)	Flow Total Display	Displayed as a digital readout when an external flow signal is available to be Monitored and displayed.
12)	Manual Alternate Button	With alternation enabled, this button will allow the operator to manually alternate pumps at any time.

Note: Speed and flow display cannot be shown simultaneously. You must select which one you desire to display. The selection button is located next to the Alarms button.

Special Note: All LSC-V systems are equipped with the Demand Charge Avoidance (DCA) feature used to prevent a surge in current usage after a power outage. When power is restored, DCA initially allows only one pump to be turned back on and monitors the well level before activating additional pumps. The Lead pump icon will display RUNNING and the others will indicate TEMPORARY for a temporary HOLD condition. If the well levels do not decrease quickly enough, the system will activate additional pumps. Once the appropriate levels have been reached, the temporary HOLD will end and the pumps will display either RUNNING or STOPPED.

Touch any of the buttons to move to other LSC-V screens: MENU, ALARMS, TEST, FLOW TOTAL and POWER FAIL will all navigate to the appropriate screens. Touching a pump icon will go directly to the respective Pump Status Screen.

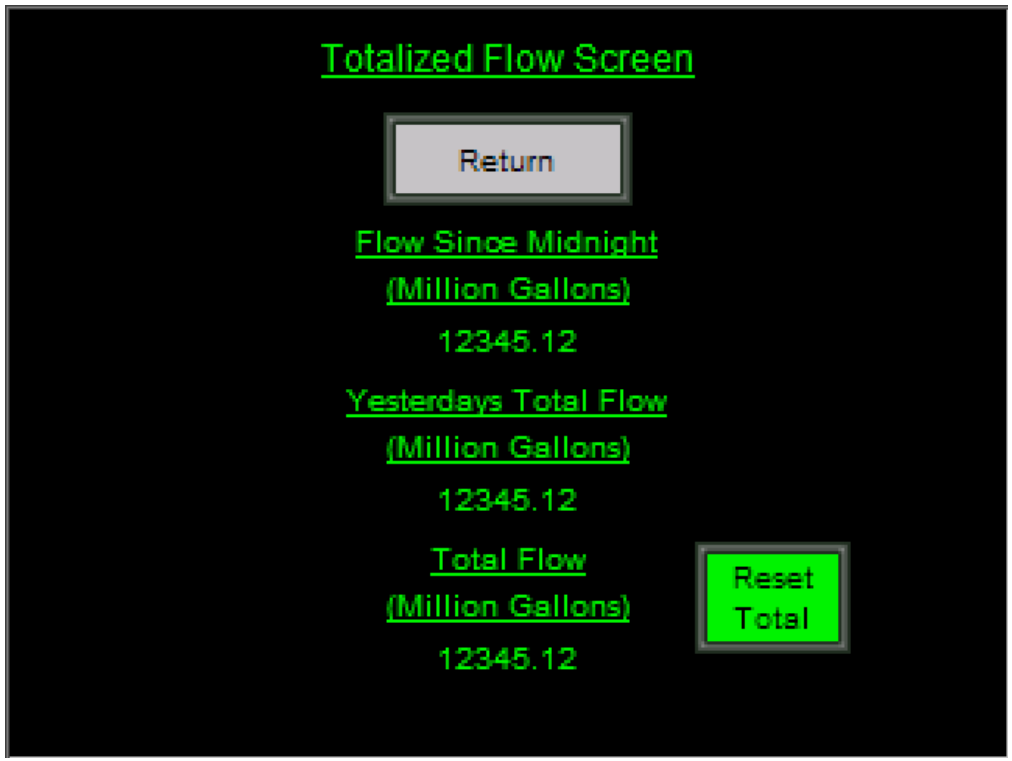
POWER FAIL SCREEN



The **Power Fail and Restore Times Screen** is used in the event of a power failure to be able to determine the time of failure and the time of restoration.

Touch RETURN to go back to the prior screen.

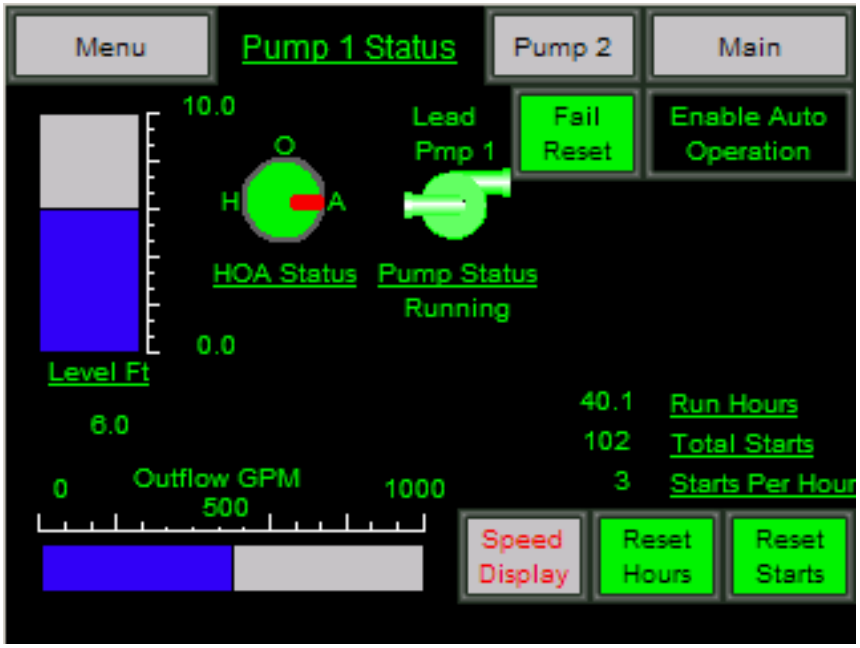
TOTALIZED FLOW SCREEN (REQUIRES EXTERNAL FLOW INPUT)



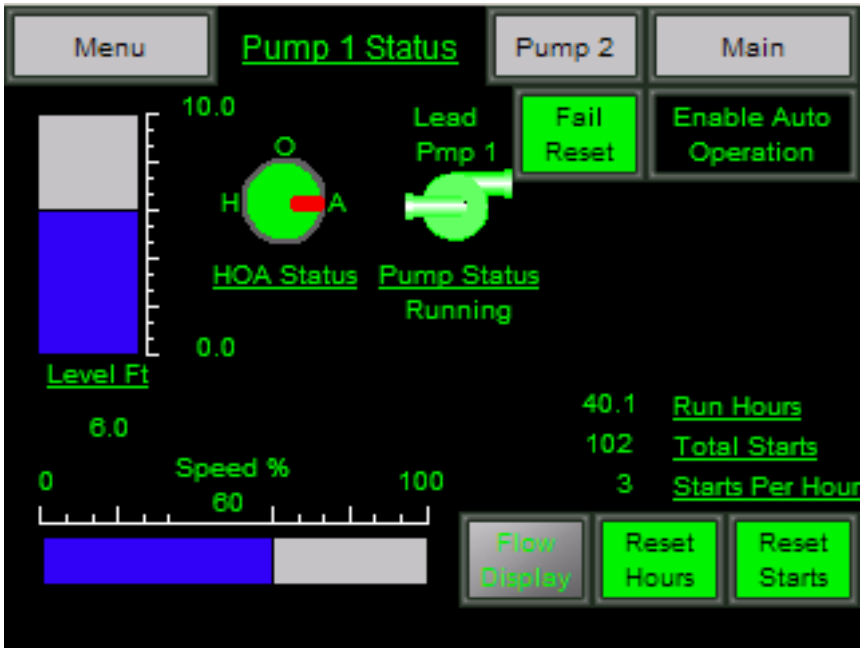
The **Totalized Flow Screen** displays the total flow since midnight (in million gallons); yesterday's total flow (in million gallons) and a running total flow (in million gallons). Monitoring these changes allows the operator to evaluate the operating conditions by displaying the current "actual" flow rates. You can also use this screen to determine if there have been changes in the pump station flow.

The Reset button allows the operator to reset for another day. Touch the RETURN button to go back to the prior screen.

PUMP STATUS SCREEN



Pump Status with Flow Display



Pump Status with Speed Display

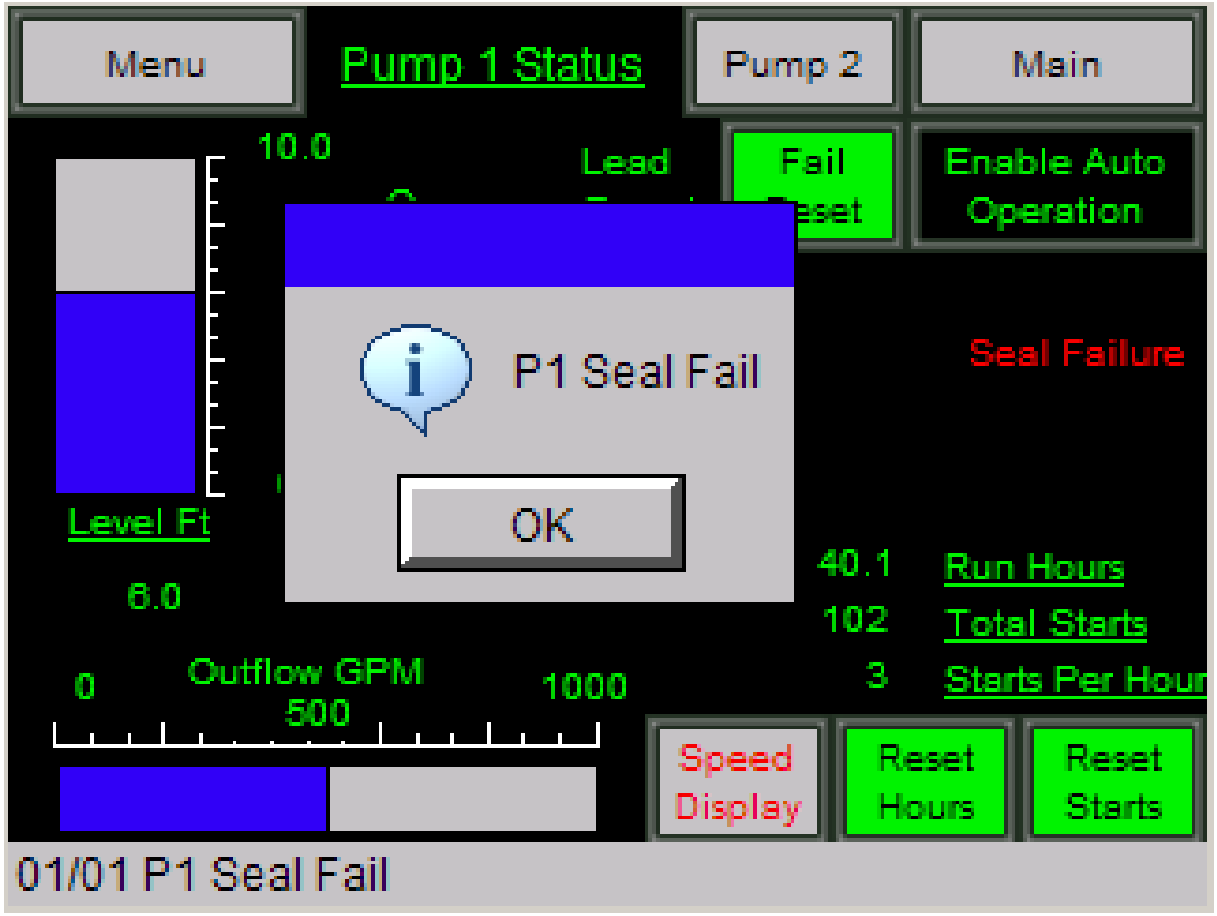
The **Pump Status Screen** is designed to give you a complete and up-to date status for each pump in your system. Each Pump Information Screen uses pump icons, vertical and horizontal bargraphs, digital readouts and display buttons to provide and update the following information.

1)	Wet Well Level (in feet)	Displayed as a digital readout with vertical bargraph
2)	Wet Well Transmitter Range	Displayed as a digital readout at bottom right and top right of Level bargraph
3)	HOA Status	Indicates the position of the panel mounted HAND/OFF/AUTO switch
4)	Pump Line Up (Lead, Lag 1 or 2)	Lead, Lag 1 or 2 shown above the pump graphic
5)	Pump Run Status	Each pump graphic is RED for stopped or GREEN for run
6)	Pump Status	Displayed as text below the pump graphic (Running/Stopped/Fail)
7)	Fail Reset	Used to reset a pump "Fail to Start" alarm
8)	Enable/Disable Auto Operation	Used to either enable or disable automatic operation of the pumps following a preset alternation sequence. ***Note: Pumps can still be operated in Manual from the HOA Switch.***
9)	Alarm Text	Each text pump alarm will describe the alarm and flash RED when the alarm is active
10)	Run Hours	Displays a running total of the pump operating hours
11)	Total Starts	Displays a running total of the pump starts
12)	Starts per Hour	Displays the number of pump starts per hour
13)	Reset Hours Pushbutton	Resets the RUN hours to 0
14)	Reset Starts Pushbutton	Resets the Total Starts to 0
15)	Pump Percent Of Speed	Displayed as a digital readout with bargraph -- scaling is indicated at the top left and right above the bargraph

<u>Pump Operation</u>

The Pump Status Screen allows the operator to reset at "Fail to Start" alarm and to lock out a pump from automatic operation. *WARNING!! Please remember that the HOA Switch will override an automatic pump disable.*

Menu, Main and Pump 1, 2 or 3 buttons appear at the top of this screen for easy navigation to other screens. Touch the Pump button to move to the pump screen that you are not currently viewing. Touching the pump icon moves you to the Main Screen.



Pump Status Screen with an active alarm

Note: The active alarm icon will display on any screen that the operator is viewing.

The **Pump Status Screen in an Alarm Condition** will have a pop up window in the center of the screen with the alarm and a box for the operator to acknowledge the alarm by touching OK.

The standard pump related alarms included on the Pump Status Screen are, as follows:

Start Fail Alarm A "Start Fail" alarm indicates that the Automated System attempted to start a pump but never received a run confirmation. Pushing "Fail Reset" will attempt another start.

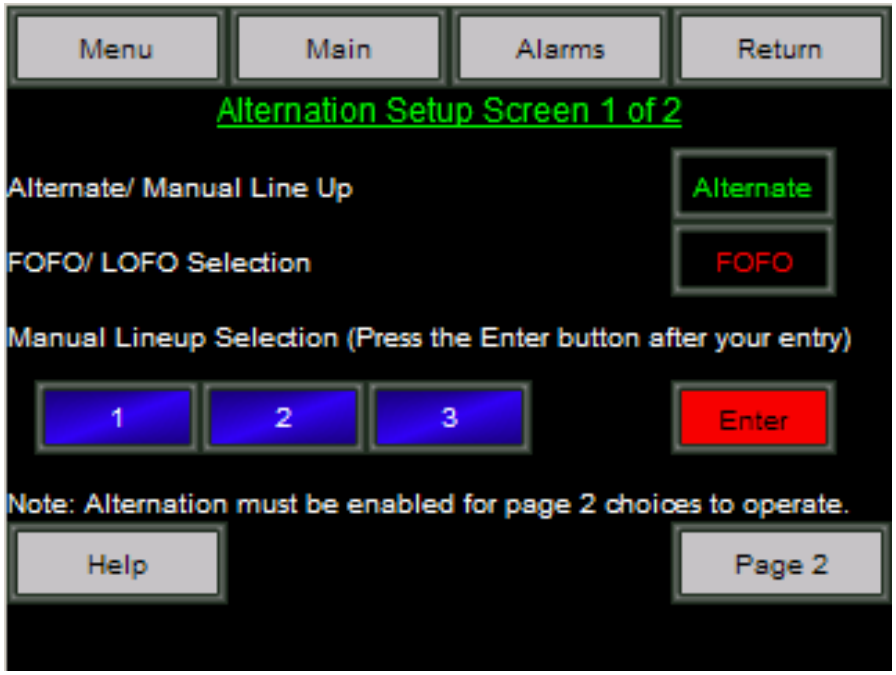
Seal Fail Alarm This alarm indicates a pump seal problem. When setting up this alarm, select from two options:
1) Allow the pump to continue to operate 2) Stop on Seal Failure

Over-temp Alarm This alarm indicates an over temperature condition exists. The pump cannot be restarted until the condition is corrected.

Overload Alarm This alarm indicates an overload condition. The pump cannot be restarted until the condition is corrected.

Menu, Main and Pump 1, 2 or 3 buttons appear at the top of this screen for easy navigation to other screens. Touch the Pump button to move to any other Pump Status Screen that you desire to view.

ALTERNATION SET UP SCREENS



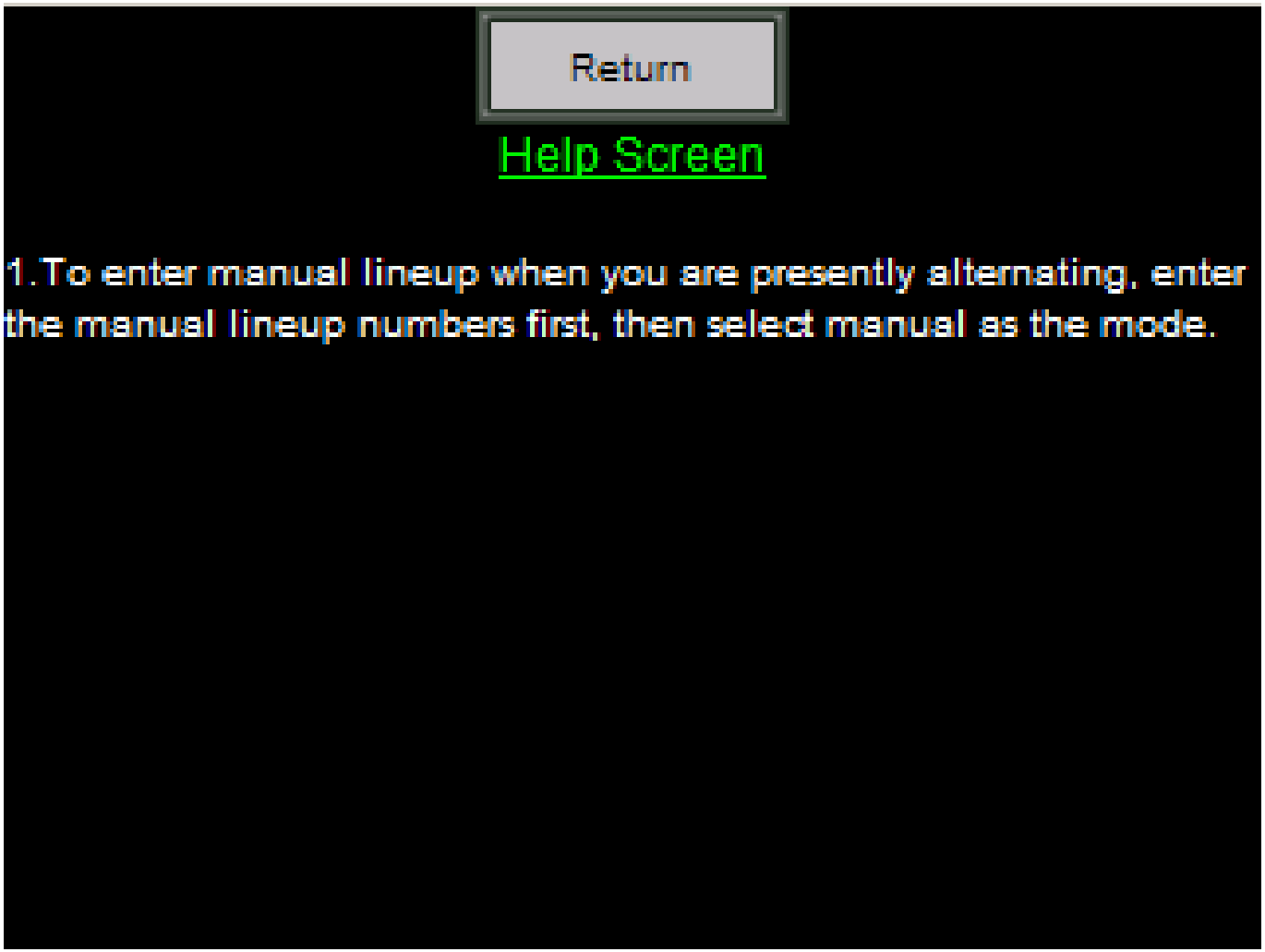
The **Pump Alternation Set up Screen** was designed to allow you to select the required type of alternation.

Set Up Screen #1 offers a choice between Manual Line Up and Automatic Alternation, as well as FOFO (First On, First Off) or LOFO (Last On, First Off). If you choose Manual, you must also determine the Manual Line Up Order (1,2,3; 2,3,1 pr 3,1,2) and press ENTER (red button) to confirm the selection.

Set Up Screen #2 is only used if you have selected Automatic Alternation. On this screen, you must indicate Alternation sequence and times. You can specify exact times for alternation or have the system alternate after a certain number of hours.

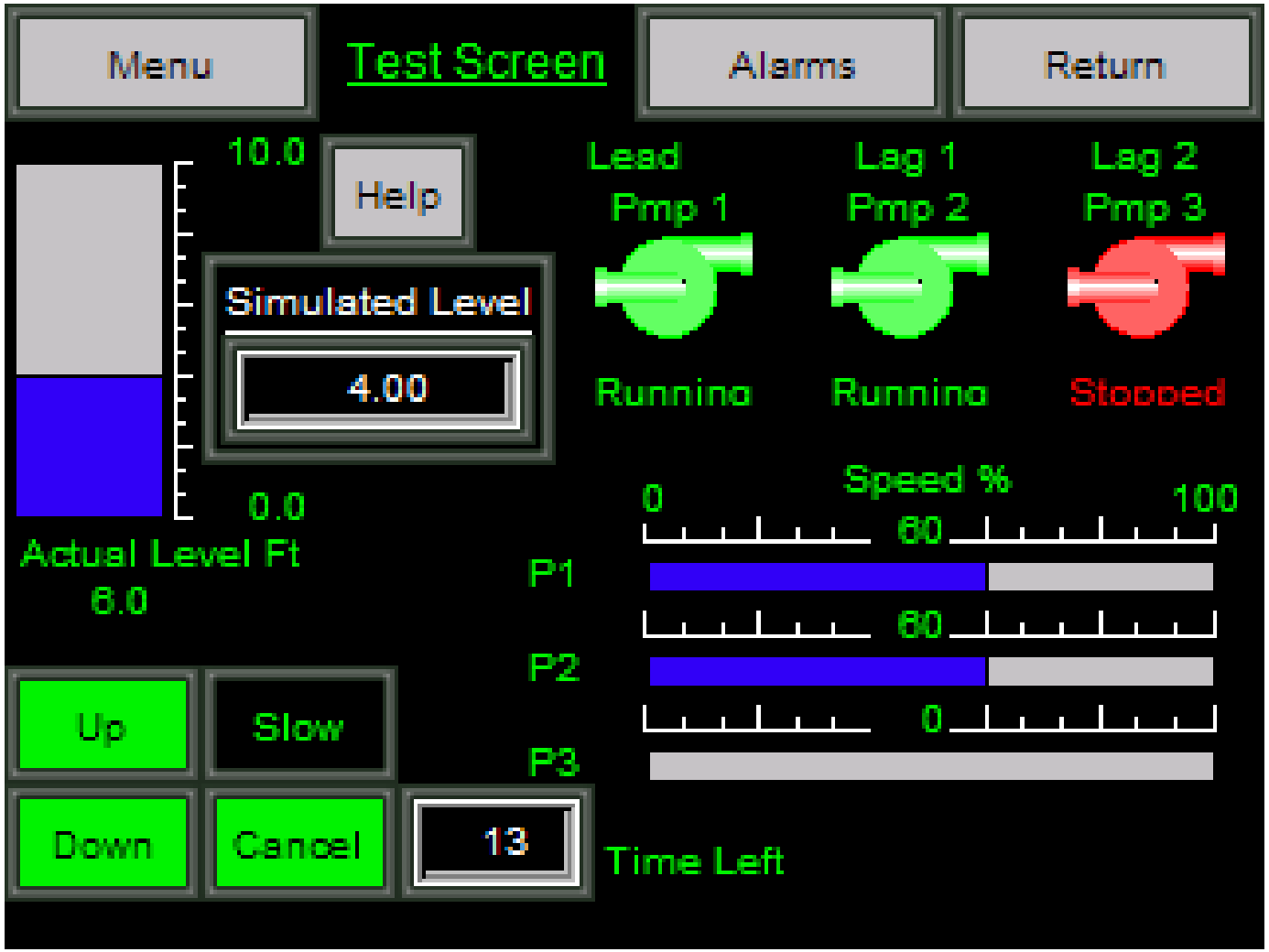
Menu, Main, Alarms and Return (to prior screen) appear at the top of this screen for easy navigation to other screens.

ALTERNATION HELP SCREEN



Touch RETURN to go back to the prior screen.

SYSTEM TEST SCREEN



The **System Test Screen** simulates a well level to test pumps and alarms. All of the simulated data that you need for a complete operations test of your system is found on one screen.

The System Test Screen displays and updates the following information during your system test:

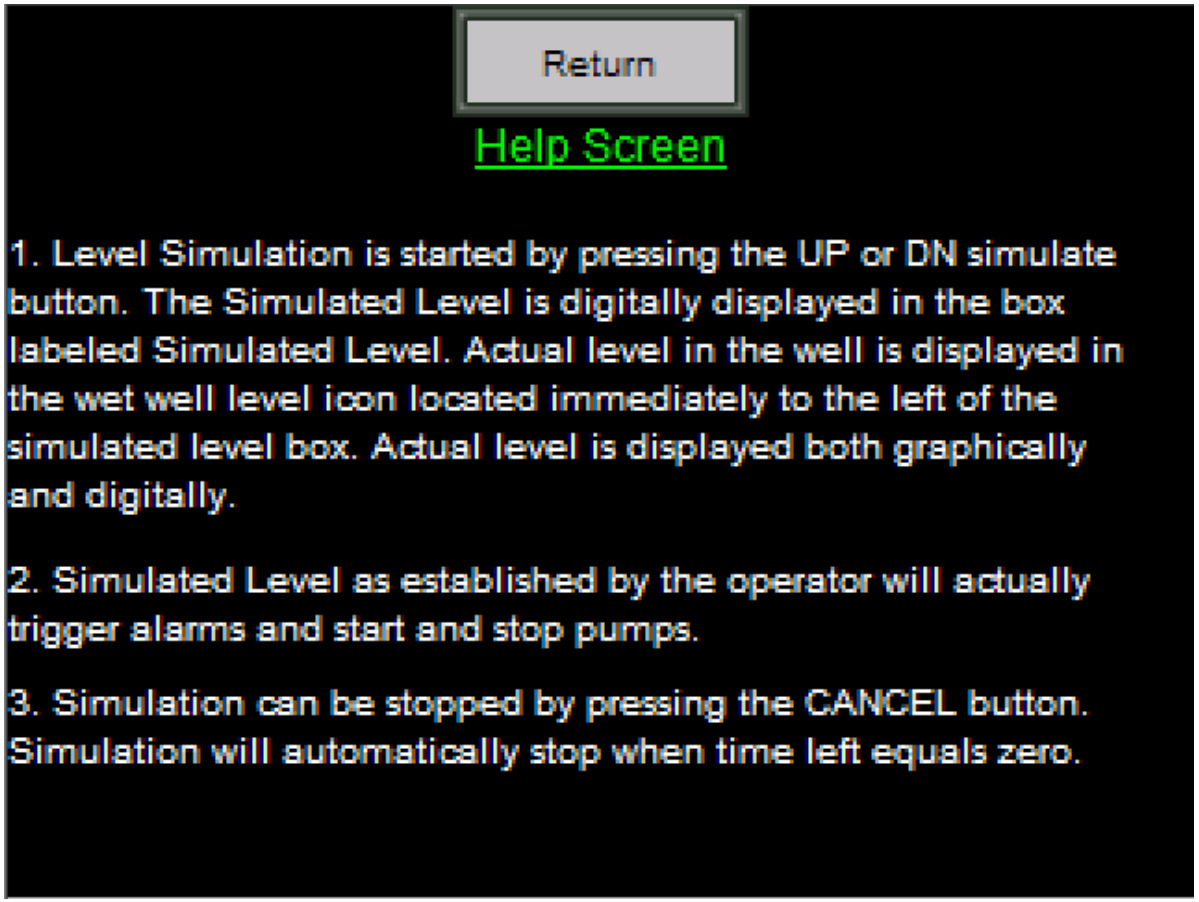
1)	Wet Well Level (Simulated)	Displayed in digital readout box
2)	Wet Well Level (Actual)	Displayed in vertical bargraph and digitally on the bottom of the graph
3)	Pump Line Up (Lead, Lag 1 or Lag 2)	Displayed in text above each pump graphic
5)	Pump Run Status	Each pump graphic is RED for stopped or GREEN for run.
6)	Pump Status	Displayed as text below each pump graphic (Running/Stopped/Fail)
7)	Pump # 1 Percent of Speed	Displayed as a digital readout with bargraph -- scaling is indicated at the top left and right above the bargraph
8)	Pump # 2 Percent of Speed	Displayed as a digital readout with bargraph – scaling is indicated
9)	Pump # 3 Percent of Speed	Displayed as a digital readout with bargraph – scaling is indicated
10)	Alarms	Displayed in text form (pop ups) as they occur

<u>Testing</u>

1) Touch the UP or DOWN button to activate your simulate test. You can terminate the test and revert to normal operation at any time by touching the CANCEL button.
2) If the CANCEL button is not touched, the system will automatically return to normal operation after the "Time Left" returns to zero. (Duration is configured on the Set Up Screens.)
3) The FAST/SLOW toggle button determines the ramping speed for the UP and DOWN buttons.
4) The UP button will ramp up the simulated level and the DOWN button will ramp the level down.
5) During simulation, the pumps will actually START and STOP and alarms will occur.
6) Touching the HELP button will take you to a Simulation Help Screen.

Menu, Main and Pump 1, 2 or 3 buttons appear at the top of this screen for easy navigation to other screens. Touch the Pump button to move to any other Pump Status Screen that you desire to view.

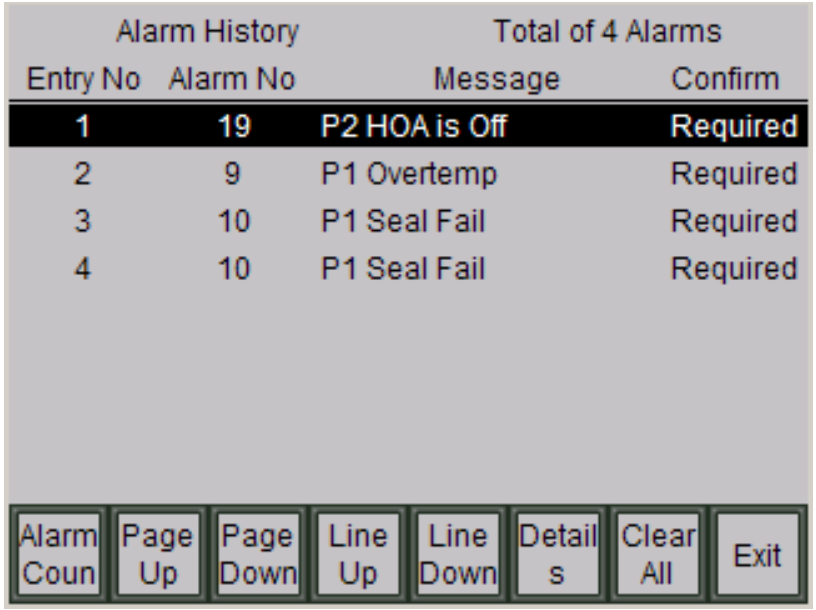
SYSTEM TEST/SIMULATION HELP SCREEN



The **Simulation Help Screen** provides instructions on how to implement the System Test feature of the LSC-V-200/300.

Touch RETURN to go back to the prior screen.

ALARM HISTORY SCREENS



The **Alarm History Screen** shows all alarms as an overview. By using the scrolling buttons at the bottom of the screen, you can select a specific alarm and go to the "details" screen. The Detailed Screen displays one specific alarm with complete information about when the alarm occurred, when it was cleared and when it was acknowledged.

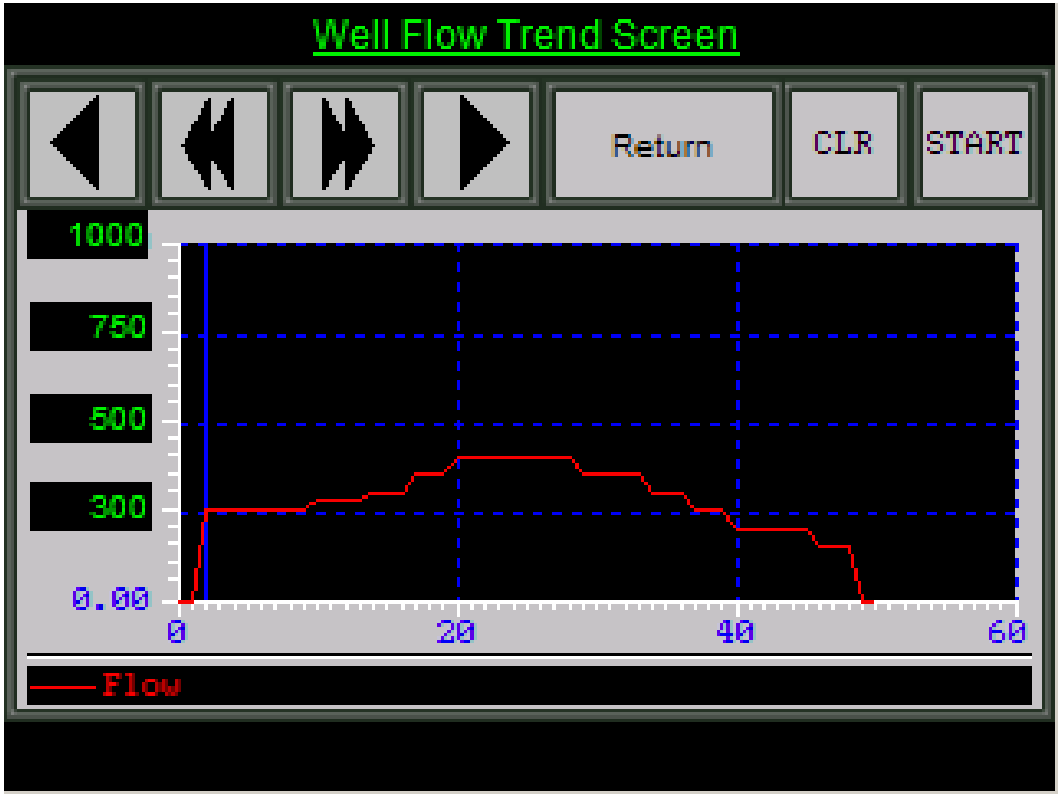
Navigation buttons at the bottom of the screen allow the user to move through the Alarms Section of the system by one line or page at a time, moving UP or DOWN, as desired. You can also move to the Details Screen or EXIT by touching any of these navigation buttons.

SEAL FAIL ENABLE SCREEN

The **Seal Fail Enable Screen** directs your system whether or not to stop the pumps when a Seal Failure occurs. When the "Pump 1, 2 or 3 Seal Fail" Button is ENABLED, the pump will stop when a seal fail occurs. If the button for Pump 1, 2 or 3 is disabled, the alarm will occur, but the pump will continue to run.

Menu, Main, Alarms and Return (to prior screen) buttons appear at the top of this screen for easy navigation to other screens.

WELL FLOW TREND SCREEN

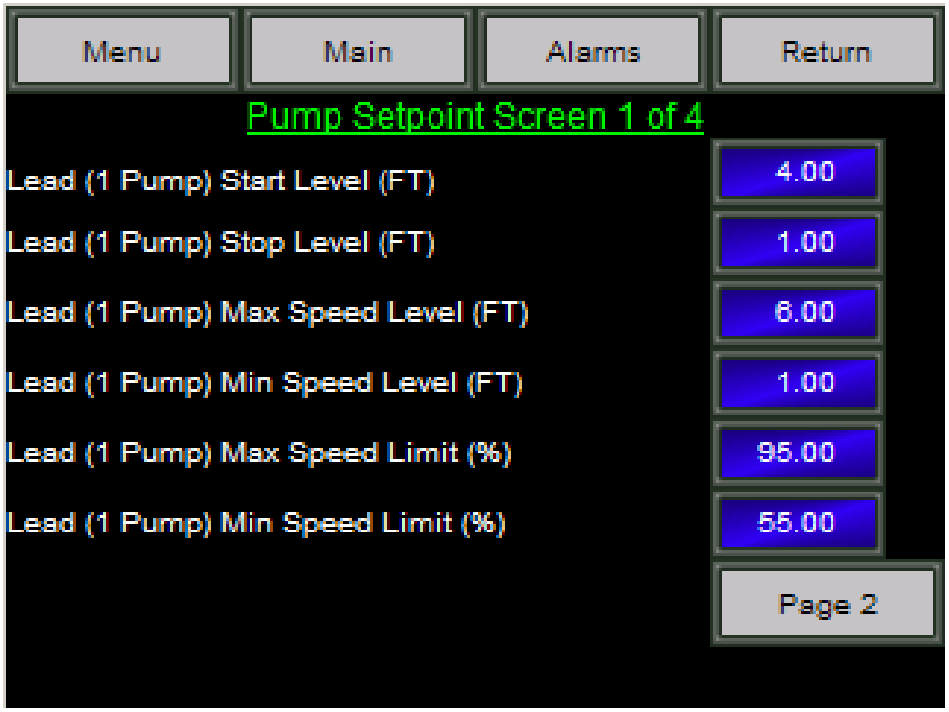


The **Well Flow Trends Screen** displays the station outflow supplied by an external flow meter.

Note: You will not be able to use this function unless your station is equipped with an external flow meter to provide a signal.

Touch RETURN (to prior screen), CLR (to clear the data) and START (to begin trending) to navigate the system.

PUMP SETPOINT SCREENS (1 THROUGH 3)

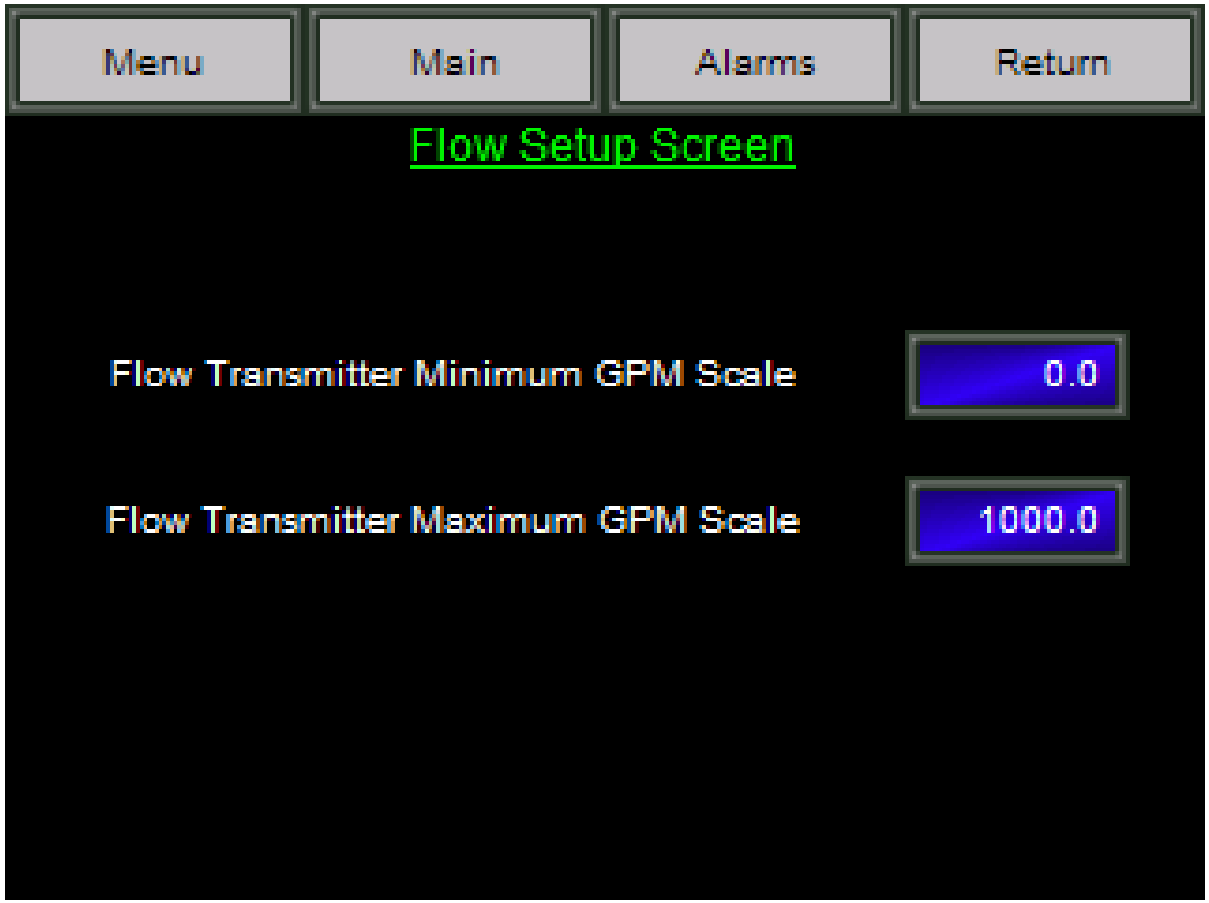


The **Pump Setpoint Screens** enable the operator to establish setpoints for both pumps through four different screens:

Set Up Screen #1 (pictured above) allows you to set the levels for the LEAD pump including START/STOP settings and MIN and MAX speed levels and percentages for the VFD'S. Similar Set Up Screens #2 and #3 allow you to create the same settings for the Lag 1 and 2 pumps.

Menu, Main, Alarms and Return buttons appear at the top of this screen for easy navigation to other screens.

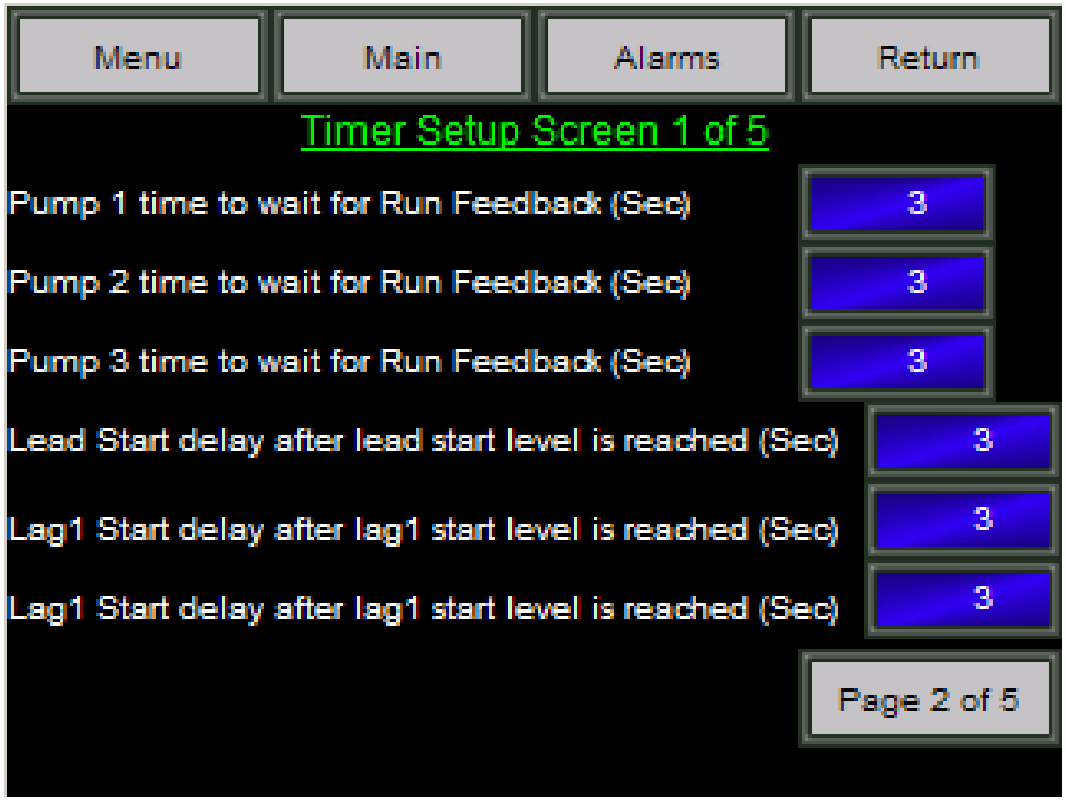
FLOW SET UP SCREEN



The **Flow Set Up Screen** allows the user to set the minimum (MIN) and maximum (MAX) gallons per minute scale.

Touch the MENU, MAIN, ALARMS and the RETURN Button (to go back to prior page) to navigate the system.

TIMER SET UP SCREENS (1 THROUGH 5)

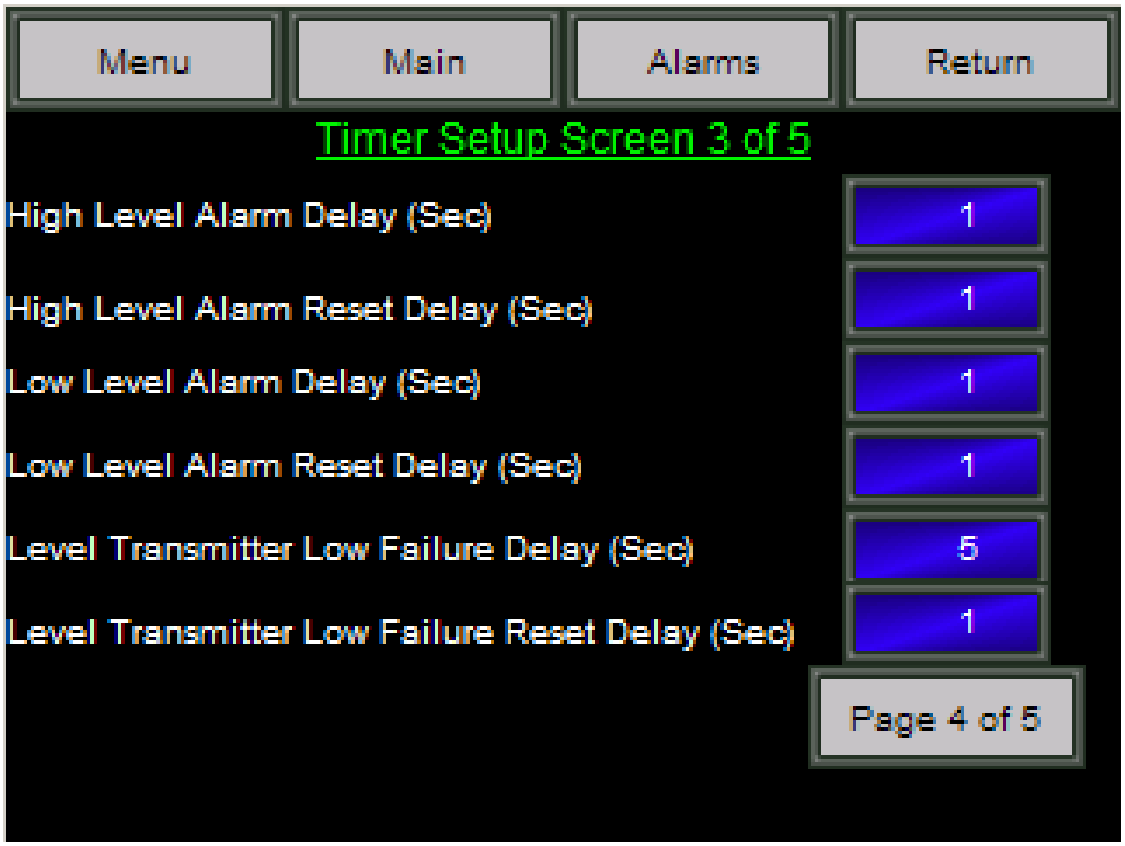


The **Timer Set Up Screen #1** allows the operator to indicate the specific time delay for Run Feedback or Pumps Start. Times should be entered in seconds.

Touch the MENU, MAIN, ALARMS and the RETURN Button (to go back to prior page) to navigate the system.

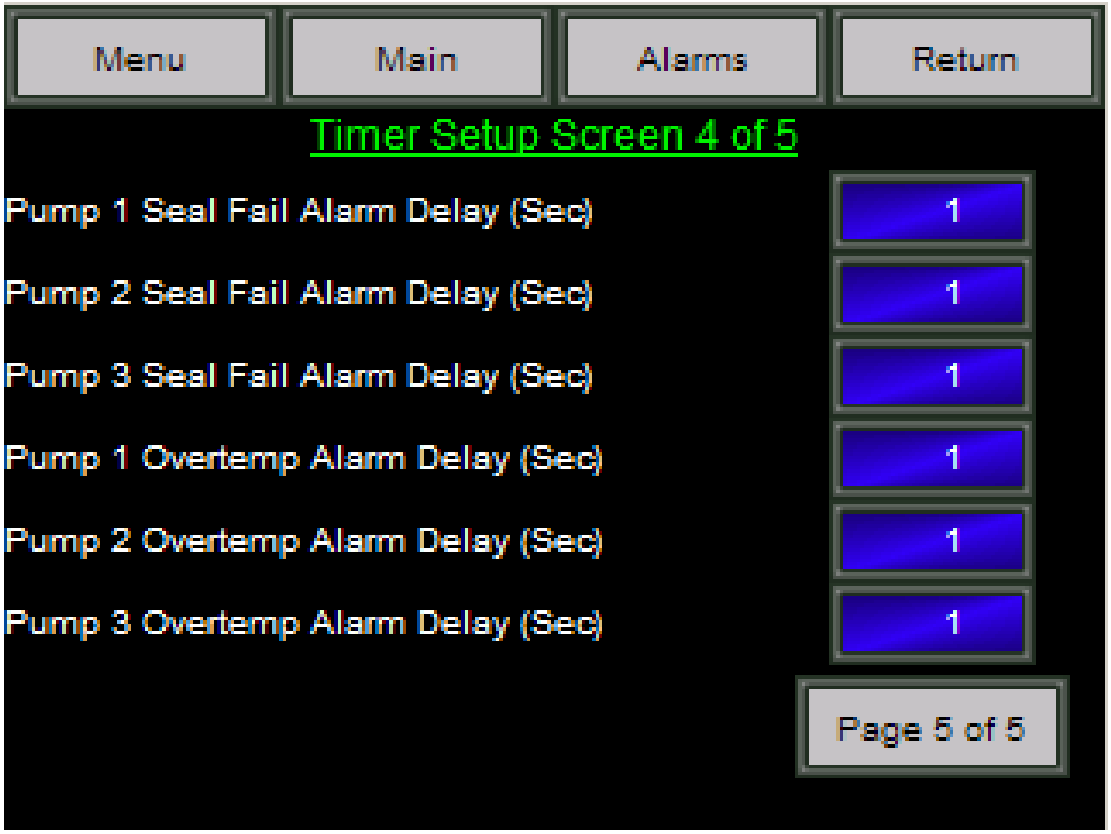
The **Timer Set Up Screen #2** allows the operator to specify a minimum time delay between Lead and Lag 1 calls. Enter time in seconds.

Touch the MENU, MAIN, ALARMS and the RETURN Button (to go back to prior page) to navigate the system.



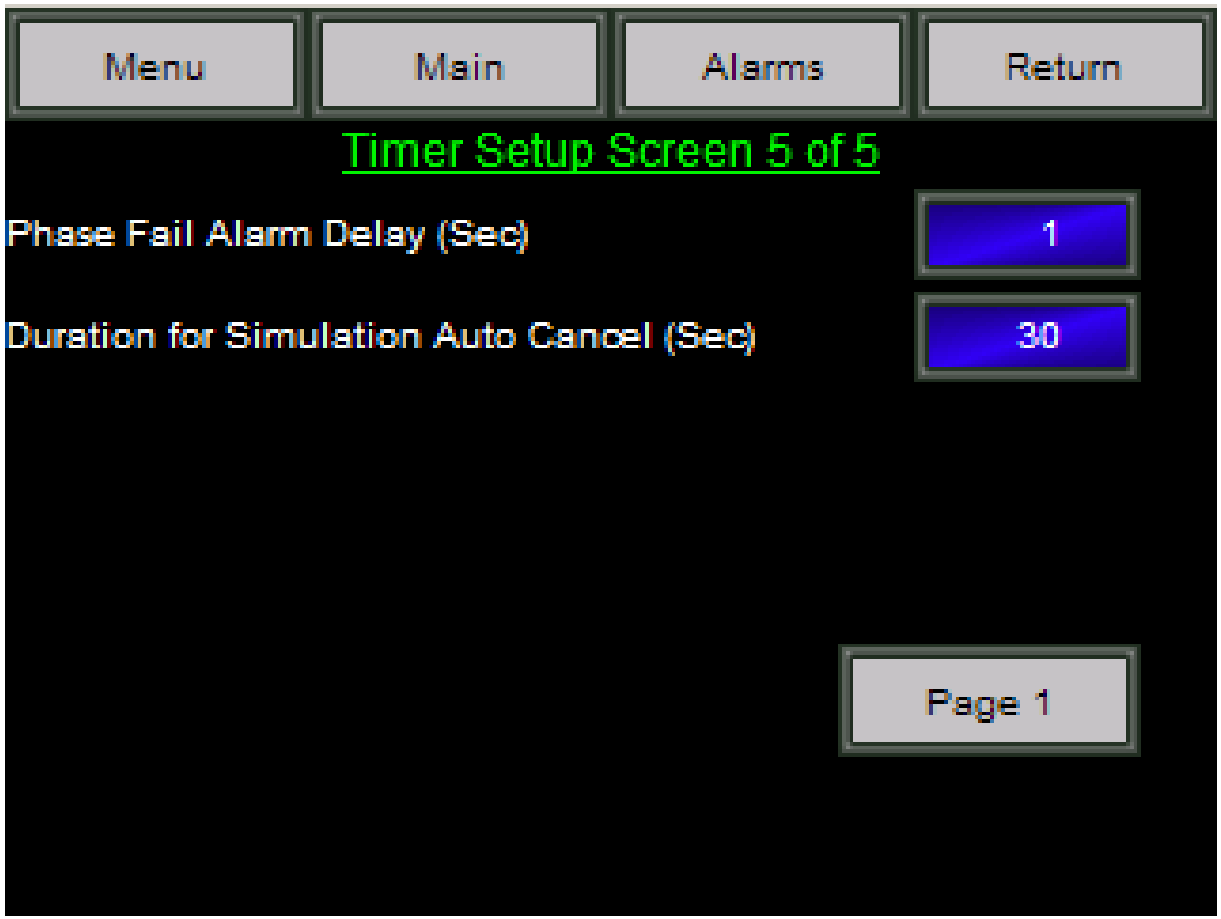
The **Timer Set Up Screen #3** enables the operator to specify the time delay before triggering Alarms for High and Low Level or Level Transmitter Low Failure. All times are entered in seconds.

Touch the MENU, MAIN, ALARMS and the RETURN Button (to go back to prior page) to navigate the system.



The **Timer Set Up Screen #4** allows the operator to specify time delays before triggering the Alarms for Seal Failure or Overtemp. All times are entered in seconds.

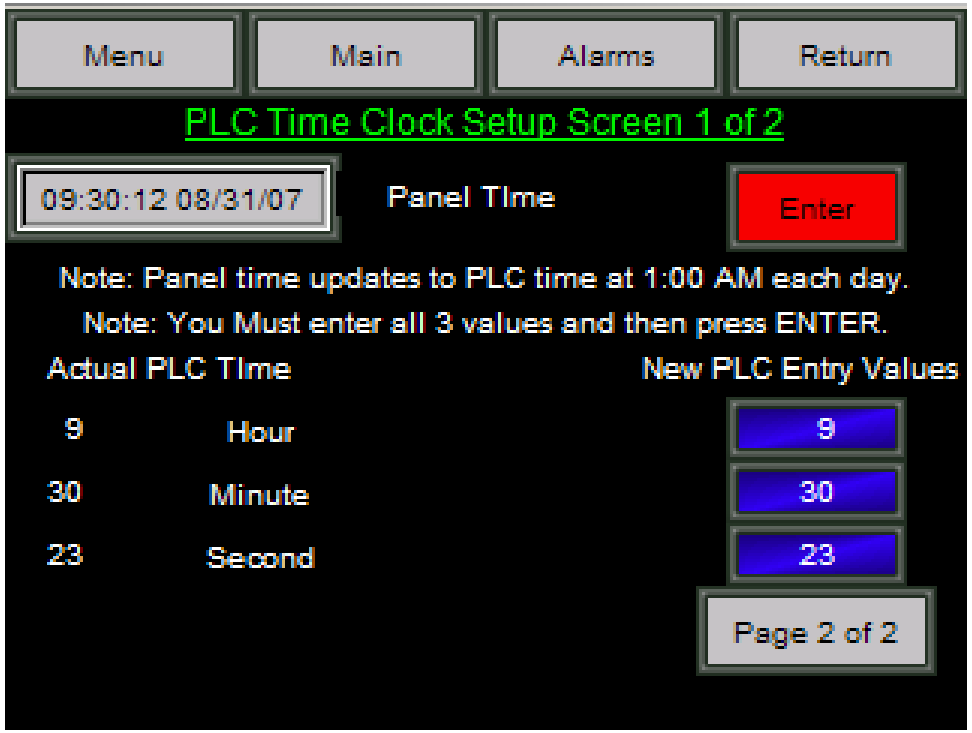
Touch the MENU, MAIN, ALARMS and the RETURN Button (to go back to prior page) to navigate the system.



The **Timer Set Up Screen #5** enables the operator to specify time delay for the Phase Fail Alarm and to determine the time allowed for the Simulation Test. All times are entered in seconds.

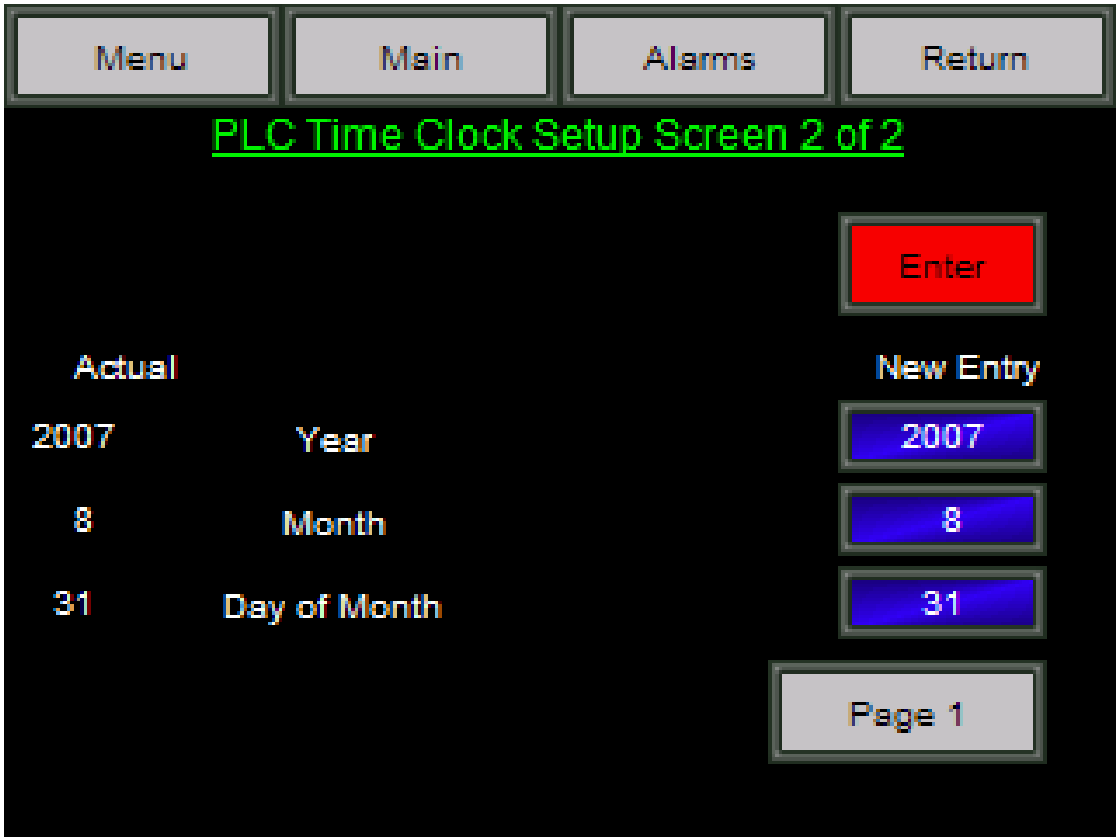
Touch the MENU, MAIN, ALARMS and the RETURN Button (to go back to prior page) to navigate the system.

PLC TIME SET UP SCREENS



The **Time Set Up Screen #1** is designed to allow the operator to communicate with the PLC to specify the time and date. The time must be set in hours, minutes and seconds. Enter the desired values in the blue box and touch the red ENTER button to confirm. You must enter all three values before you press ENTER, because the three values are simultaneously written to the PLC. The Panel Real Time Clock (shown in the gray box) will synchronize with the PLC at 1:00 a.m. each day.

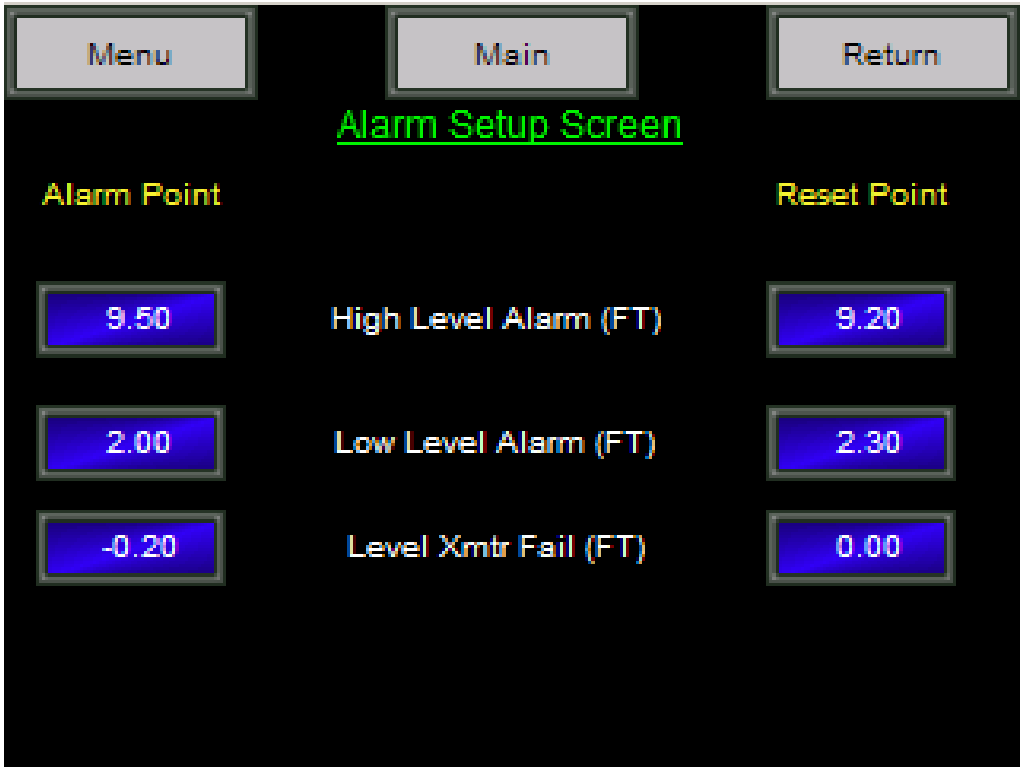
Touch the MENU, MAIN, ALARMS and the RETURN Button (to go back to prior page) to navigate the system.



The **Time Set Up Screen #2** enables the operator to set the year, month and day. Operation is the same as in Set Up Screen #1.

Touch the MENU, MAIN, ALARMS and the RETURN Button (to go back to prior page) to navigate the system

ALARM SET UP SCREENS



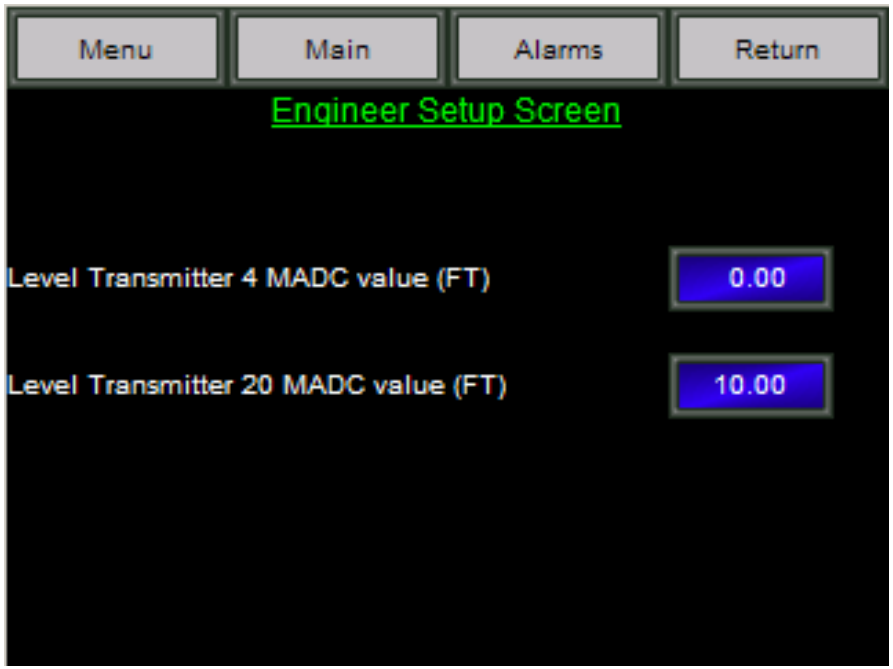
On the **Alarm Set Up Screen**, you can indicate the desired level setpoints for the following alarm conditions:

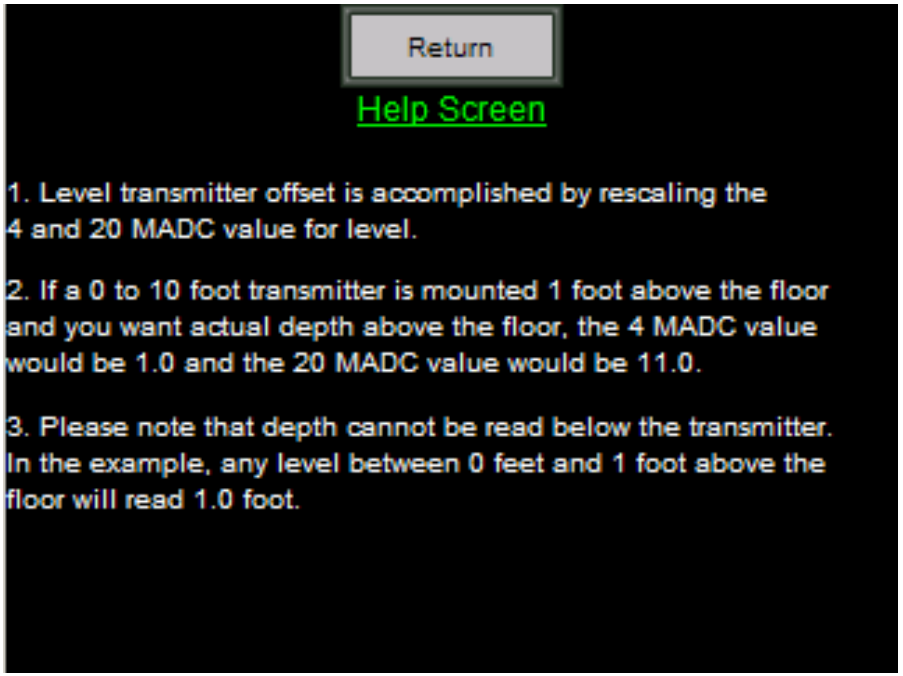
1) HIGH level alarms 2) LOW level alarms 3) Level Transmitter Failure

These setpoints include both the level at which the alarm should be triggered, as well as a reset point.

Touch the Menu, Main and Return buttons at the top of this screen for easy navigation to other screens.

ENGINEER SET UP AND HELP SCREENS

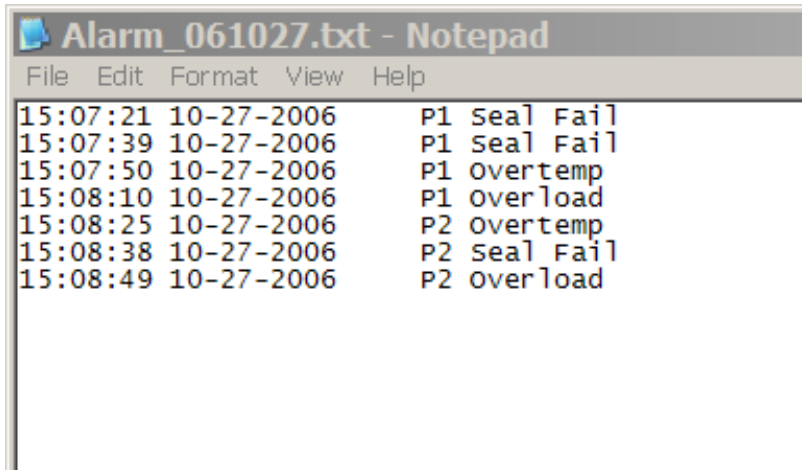


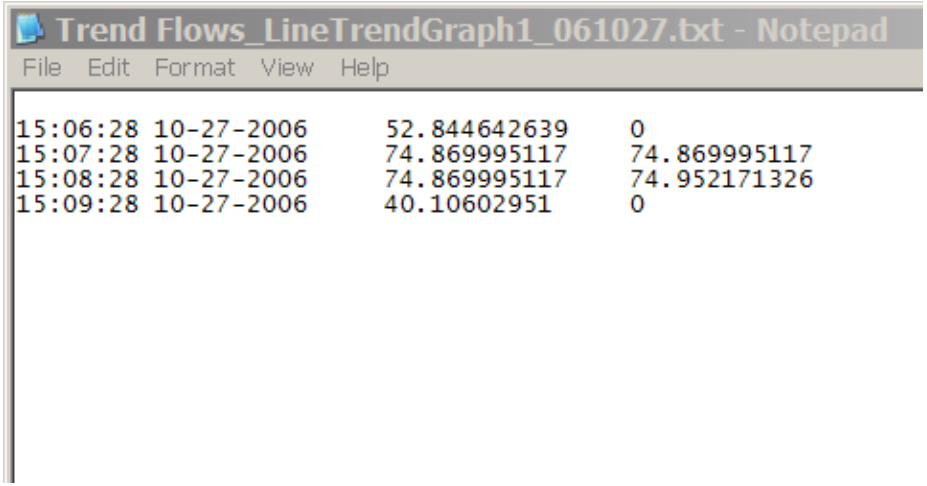


The **Engineer Set up Screen** is designed to set up the transmitter range values. Enter the desired value in feet.

Touch the MENU, MAIN, ALARMS and the RETURN Button (to go back to prior page) to navigate the system.

DATA LOGGING SCREENS





These Data Logging Screens log two types of data: Alarms and Trends (in Flow). You can use this function to download this data to your computer for record keeping.

SUMMARY

The LSC-V series is designed to make it easier for you to observe the constantly changing conditions of your pump station and head off problems before they become costly failures.

The easy to follow screens make it easy to experiment and try different settings. The simulation feature allows you to create conditions that you might otherwise never see. Consider the LSC-V-200/300 your own personal training tool and improve both your system's performance and your professional skills.

Please consult the factory at 904-292-0110 or sales@egcontrols.com if you have additional questions not answered in this Guide.