

BOOSTER STATION VARIABLE PRESSURE
& TANK CONTROL SYSTEM
(BSC - V SERIES)

OPERATIONAL SCREEN GUIDE AND INSTRUCTIONS



11790 PHILIPS HIGHWAY

JACKSONVILLE, FLORIDA 32256

TELEPHONE: 904-292-0110 FAX: 904-292-0119

EMAIL: SALES@EGCONTROLS.COM VISIT OUR WEBSITE AT WWW.EGCONTROLS.COM

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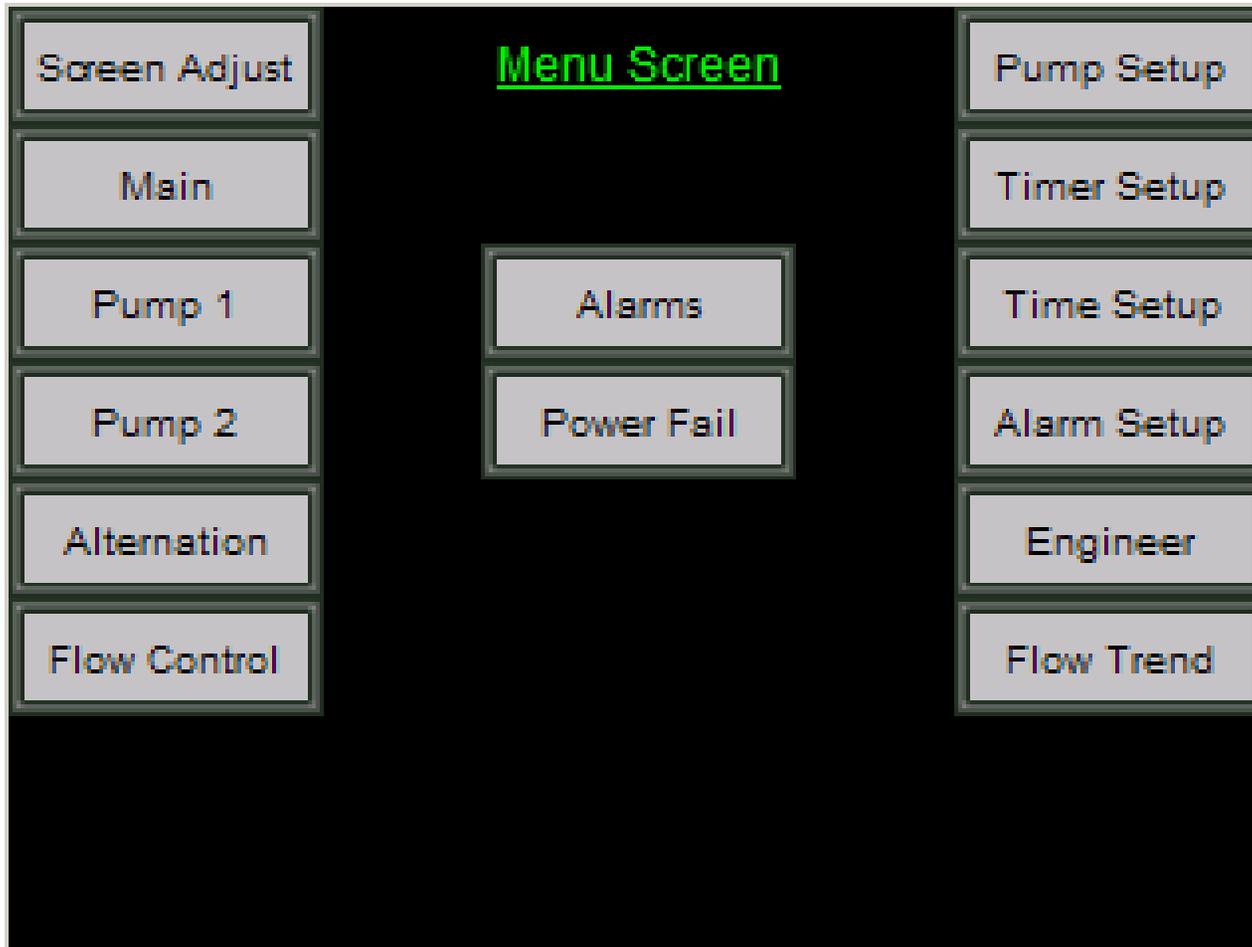
INTRODUCTION

The BSC - V 200 series is specifically designed for a two pump, variable speed, fresh water tank application. There are 23 color soft touch and information and control screens within the system. The screens graphically and digitally display all of the operating information for an elevated tank booster pumping station. The screens allow for the operation to be customized via feature selections and set-point entries. The BSC - V 200 includes graphical trend screens that help you get “inside” your system, detailed pump information screens and allows you to evaluate all operational functions quickly and easily.

The system is designed with the operator’s needs in mind and is able to run smoothly and efficiently once the appropriate set points have been designated. Operators can set pump speed settings using the minimum and maximum speed levels, as well as the percent speed for each pump. All of the system parameters can be accessed and changed through password protected touch screens.

The actual screens contained in this book “walk the user through the BSC - V 200 system”. The BSC - V 300 system is similar with the screens operating in the same ways but modified to work for three pumps. For both systems, ninety percent of the features can be used without referring to this guide or attending any special training. This guide will help explain the application and functionality of each screen and is a ready reference tool for specific questions that may develop as you use the screens.

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 an overview of all operating conditions
Pump 1 and 2 screens	Offer detailed information about the operating conditions of each pump
Alternation	Allows the user to view and change the current alternating condition
Flow Control	Enables the user to establish flow set points

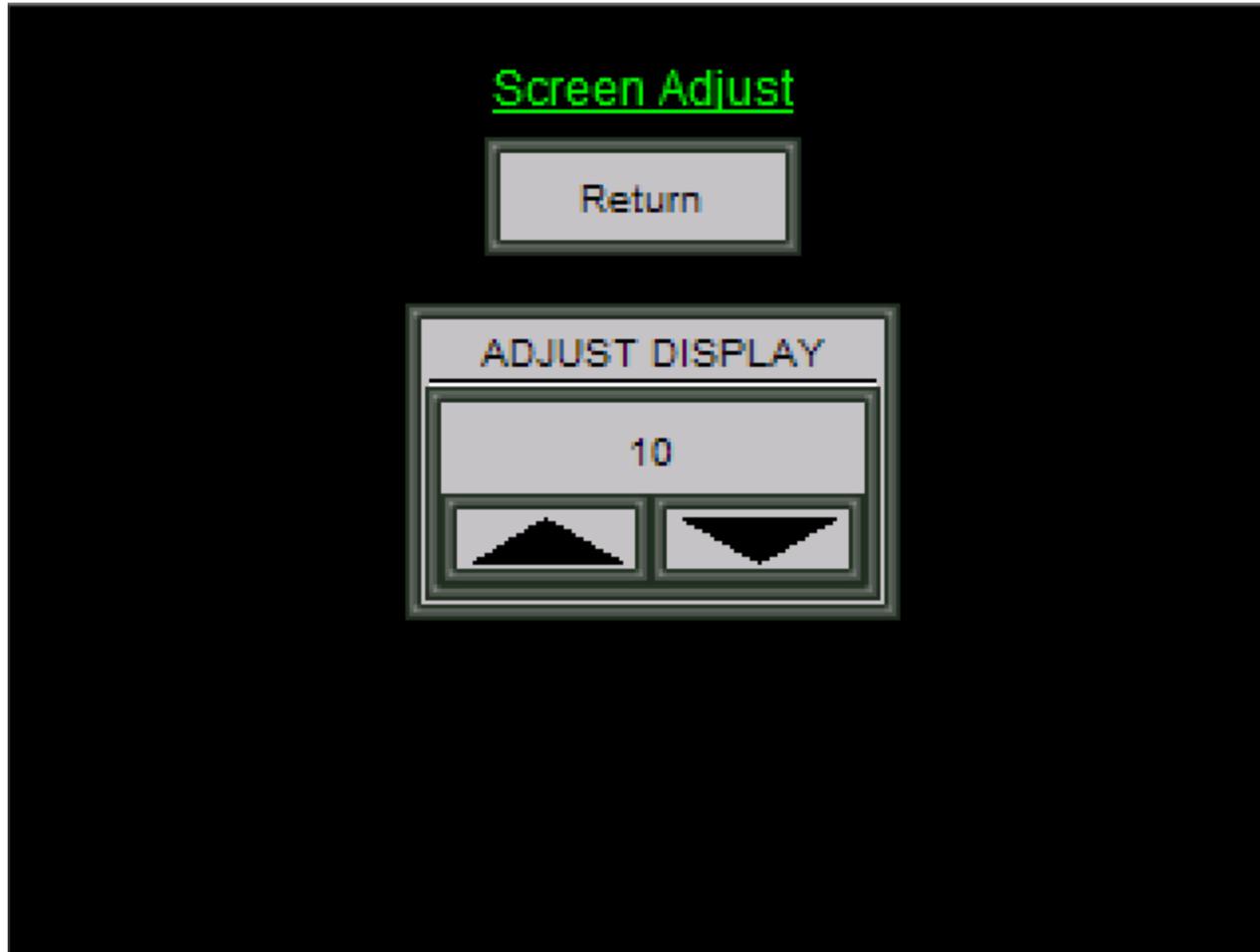
Informational and Operating Screens (center column)

Alarms	Shows current and historical alarm conditions
Power Fail	Displays the time power failed and the time it was restored

Set Up/Data Entry Screens (right column)

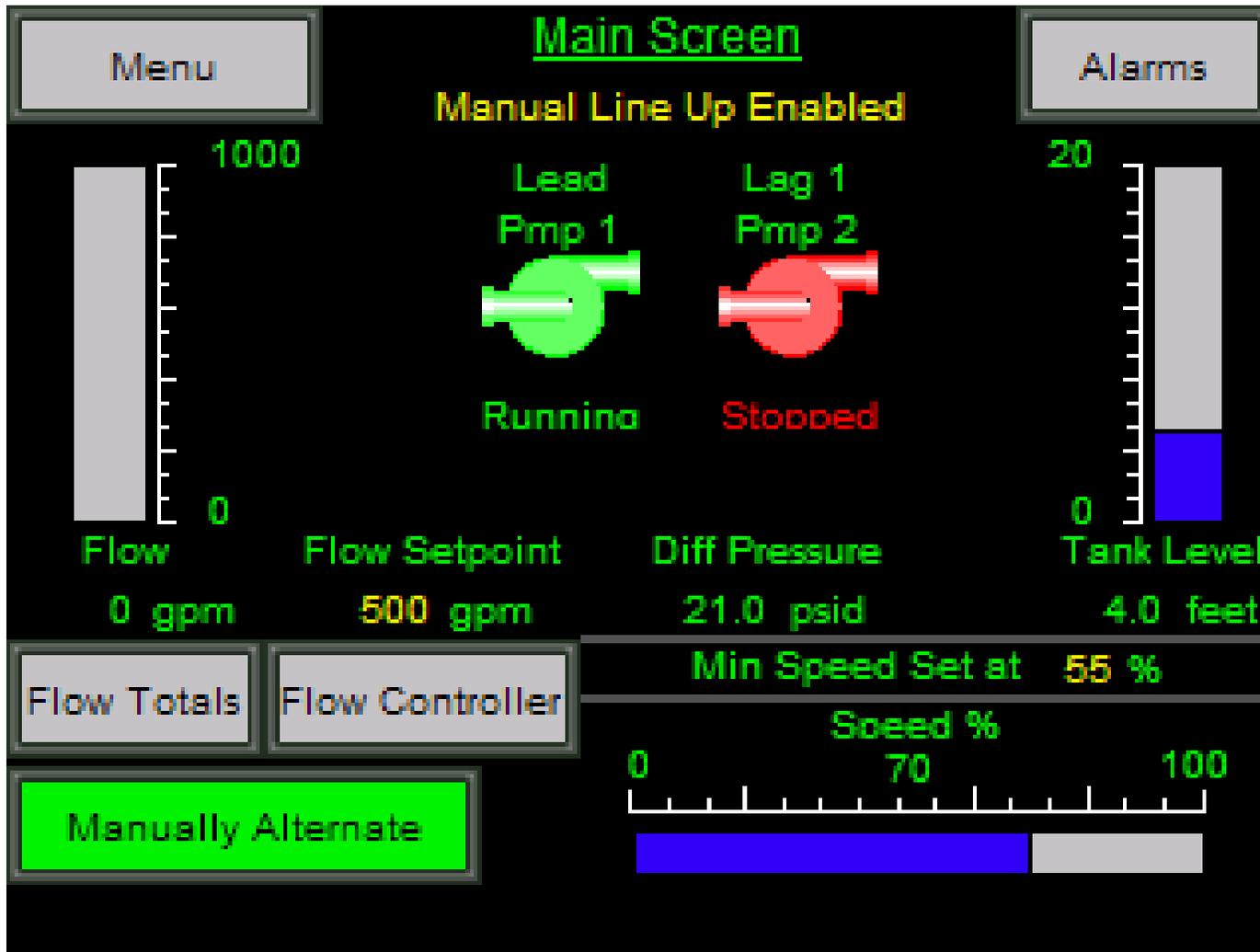
Pump Set Up	Defines the level parameters and operational settings for the operation of the variable speed pumps
Timer Set Up	Timer adjustment to custom tune your system
Time Set Up	Allows date and time changes
Alarm Set Up	Enter alarm set points
Engineer	Allows Field Transmitter scaling
Flow Trend	Displays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

SCREEN ADJUSTMENT



The **Screen Adjustment Screen** allows the operator to adjust the contrast on the screen for better contrast. Touch the return button to return to the menu screen.

MAIN SCREEN



The Main Screen is an informational screen designed only 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) | Flow (in GPM) | Displayed as a digital readout with a vertical bar graph on far left of the screen. |
| 2) | Flow Totals Button | Interactive button that takes you to the totalized flow screen |
| 3) | Flow Set point | Displayed as a digital readout above the Flow Controller button |
| 4) | Flow Controller Button | Interactive button that takes you to the Flow Control screen |
| 5) | Alternation/Manual Selection | Displays the type of alternation selected on the Alternation set up screen, automatic or manual, and is displayed in text located below the Main Screen Title. |
| 6) | Pump Line Up (Lead or Lag) | Displayed in text above each pump graphic |
| 7) | Pump Identification | Displayed in text above each pump graphic (Pump #1 and Pump #2) |
| 8) | Pump Run Status | Each pump graphic is RED for stopped or GREEN for run. |
| 9) | Pump Status | Displayed as text below each pump graphic (Running/Stopped/Fail) |
| 10) | Pump # 1 Percent Of Speed | Displayed as a digital readout with bar graph -- scaling is indicated at the top left and right above the bar graph |
| 11) | Pump # 2 Percent Of Speed | Displayed as a digital readout with bar graph - scaling is indicated at the top left and right above the bar graph. |
| 12) | Differential Pressure (PSID) | Displayed as a digital readout |
| 13) | Tank Level (in feet) | Displayed as a digital readout with bar graph on far right of screen -- scaling is indicated at the top left and bottom left of the bar graph. |
| 14) | Speed Percentage Low Limit | Displayed as a digital read out . |
| 15) | Manually Alternate | With alternation enabled, this button will allow the operator to manually alternate the pumps at any time. |

Easy to use navigation buttons will help you move throughout the BSC - V 200 systems, as follows:

Touch the MENU button to go to the Menu Screen.

Touch the ALARM button to go to the Alarm History Screen.

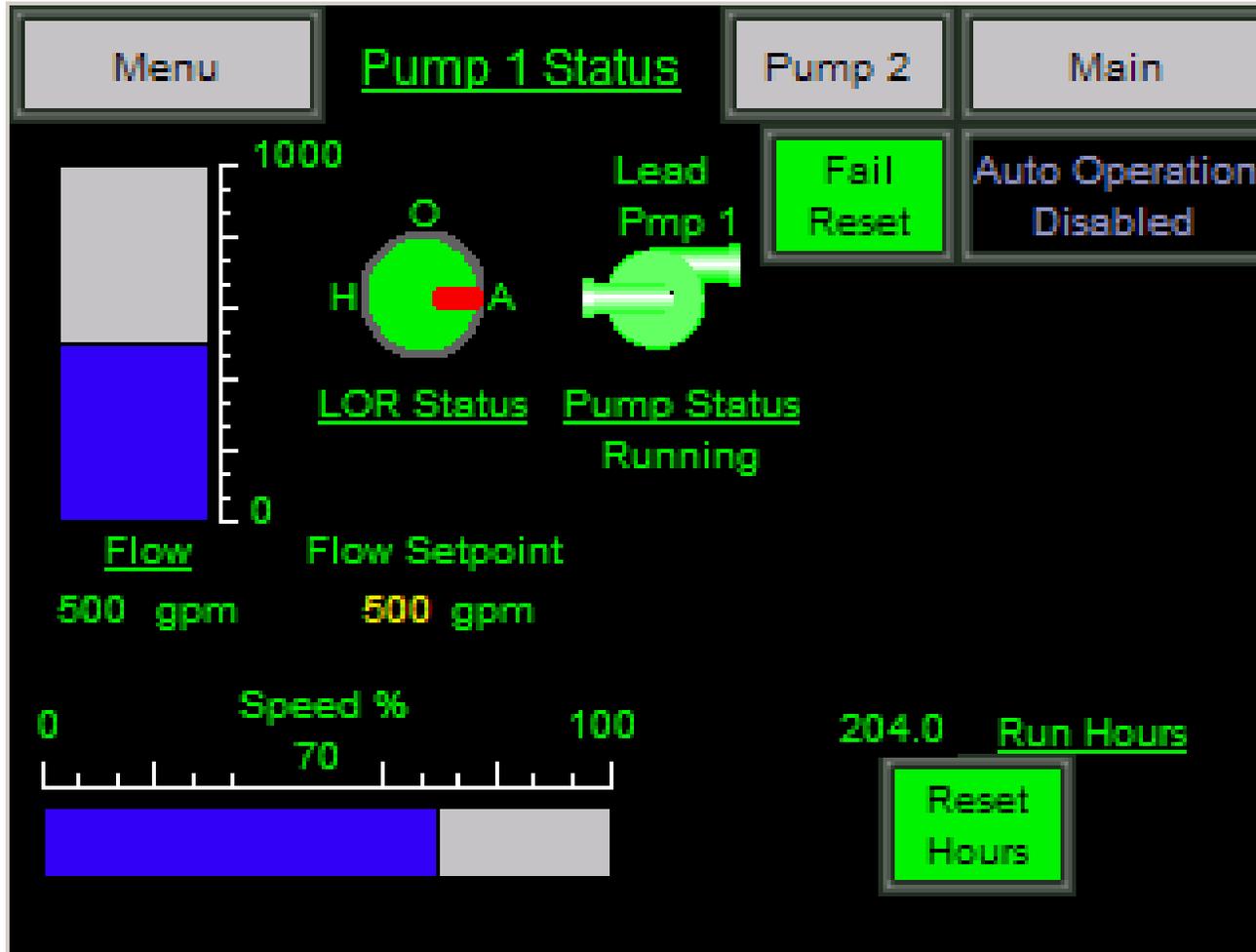
Touch the PUMP 1 pump icon to go to the Pump 1 Status Screen.

Touch the PUMP 2 pump icon to go to the Pump 2 Status Screen.

Touch the vertical tank level bar graph and go to the pump set point screen.

Touch the horizontal speed % bar graph and go to the pump set point screen

PUMP STATUS SCREEN



^ Pump Status Screen with no Active Alarms

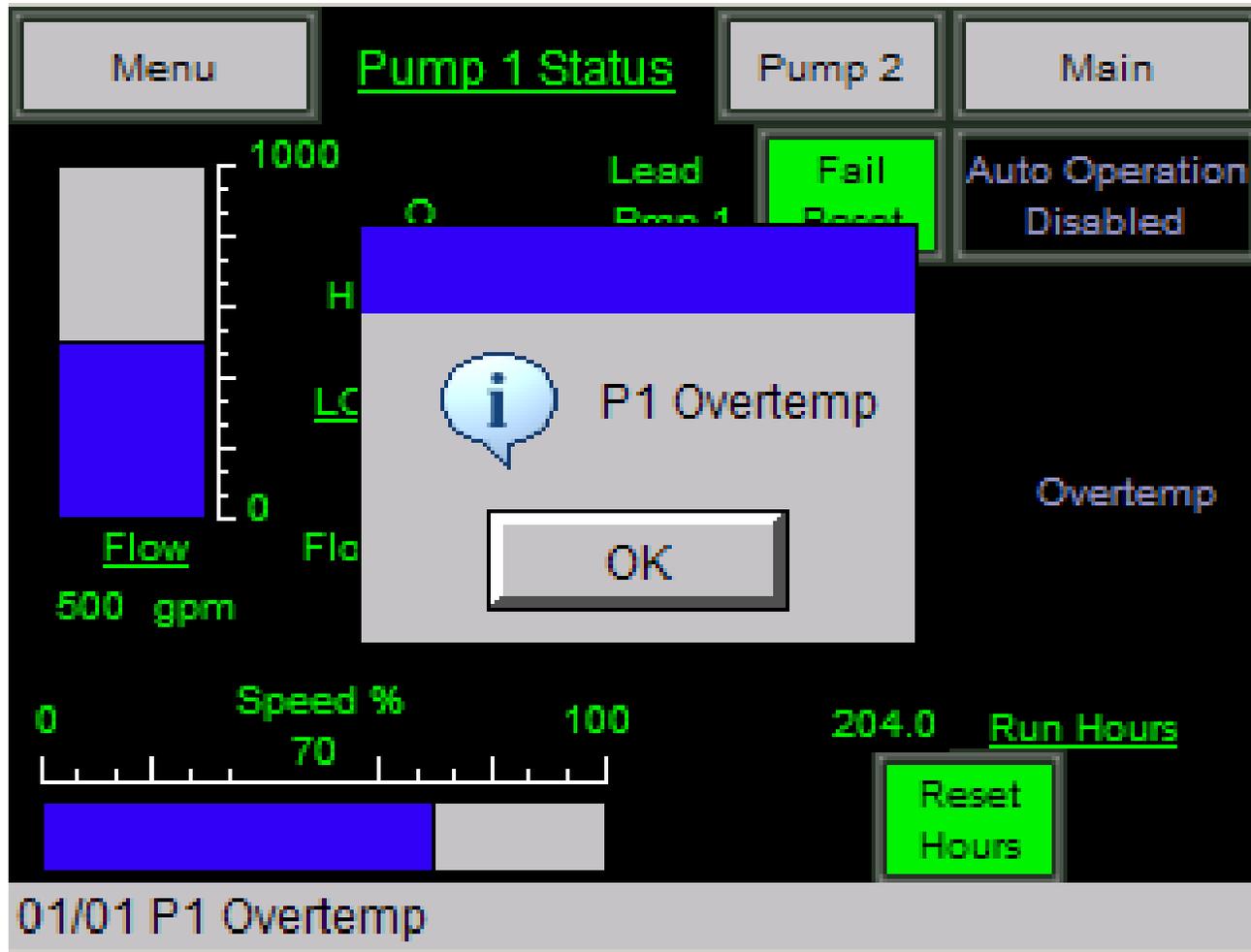
The **Pump Status Screen** is designed to give you a complete and up-to date status for each pump in your system. Each Pump Status Screen uses pump icons, vertical and horizontal bar graphs, digital readouts and display buttons to provide and update the following information.

- | | | |
|-----|-------------------------------|---|
| 1) | Flow (in GPM) | Displayed as a digital readout with a vertical bargraph, located on the far left of the screen. |
| 2) | HOA Status | Indicates the position of the panel mounted HAND/OFF/AUTO switch |
| 3) | Pump Line Up (1 or 2) | PUMP 1 or 2 shown above the pump graphic |
| 4) | Pump Run Status | Each pump graphic is RED for stopped or GREEN for run |
| 5) | Pump Status | Displayed as text below the pump graphic (Running/Stopped/Fail) |
| 6) | Fail Reset | Used to reset a pump "Fail to Start" alarm or high discharge pressure, located at the upper right of the screen. |
| 7) | Disable Auto Operation Button | "Locks out" a pump from automatic operation or allows normal operations.
IMPORTANT - Please note that the Lock Out Button does not prevent the pump from being manually operated from the HOA switch. |
| 8) | Alarm Text | Each pump alarm, pop up window, will describe the alarm and light the RED beacon when the alarm is active. The pump status if changed will flash beneath the pump and the alarm condition will flash to the right of the pump until the alarm is reset. |
| 9) | Run Hours | Displays a running total of the pump operating hours |
| 10) | Reset Hours Pushbutton | Resets the RUN hours to 0 |
| 11) | Pump Percent Of Speed | Displayed as a digital readout with bargraph -- scaling is indicated at the top left and right above the bargraph |

Pump Operation

The Pump Status Screen allows the operator to reset a "Fail to Start" alarm or high discharge pressure and to lock out a pump from automatic operation.

Menu, Main and Pump 1 or 2 buttons appear at the top of this screen for easy navigation to other screens. Use 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.

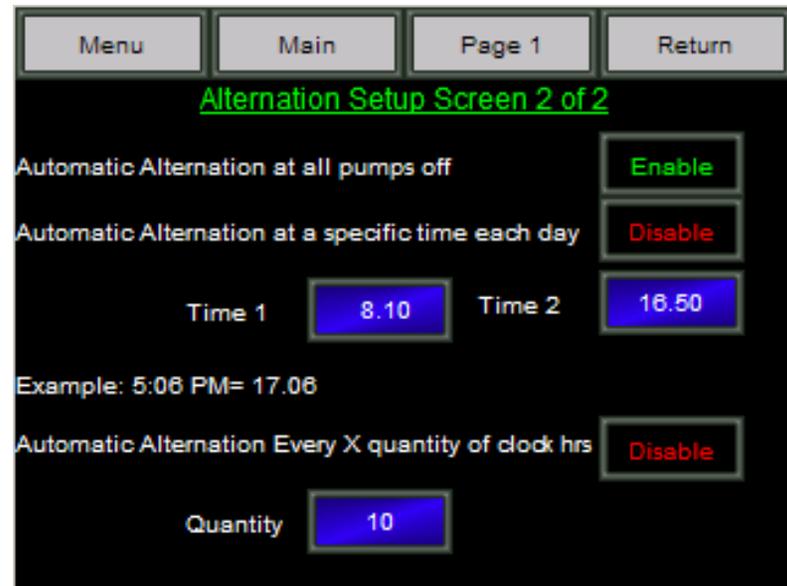
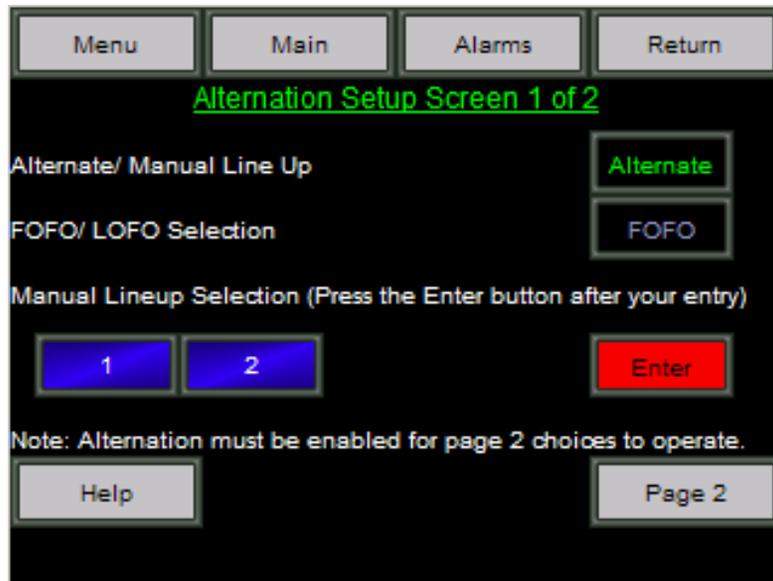
The **Pump Status Screen in an Alarm Condition** will have a pop up window in the center of the screen with the alarm with a box for the operator to acknowledge the alarm by touching OK.

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. |
| VFD Fail Alarm | This alarm indicates the VFD has issued a VFD failed Condition.
1) Correct the failed condition at the VFD. |
| Overtemp 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. |
| High Discharge Alarm | This alarm indicates a high discharge pressure. The pump will not be able to be restarted until the condition has been corrected and the "failed reset" button has been pushed. |

Menu, Main and Pump 1 or 2 buttons appear at the top of this screen for easy navigation through your system. Use the Pump button to move to the pump screen that you are not currently viewing.

PUMP ALTERNATION SET UP SCREENS



The Pump Alternation Set up Screens were designed to allow you to select the desired type of alternation considered most suitable for your station.

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). Should you choose Manual, you can also specify the Manual Line Up Order (1-2 or 2-1)

Set Up Screen #2 is only used if you have selected Automatic Alternation. On this screen, the operator has three possible settings:

- 1) Automatic Alternation at all pumps ON or OFF
- 2) Automatic Alternation at a specific time each day
- 3) Automatic Alternation at hourly intervals between alternations

Use MENU, MAIN or RETURN (go back to prior screen) for easy navigation through your system. ALARM or HELP will take you to the appropriate related screens. You can also return to PAGE 1 directly from PAGE 2.

PUMP SETPOINT SCREEN

The screenshot displays the 'Pump Setpoint Screen' with a navigation bar at the top containing 'Menu', 'Main', 'Alarms', and 'Return' buttons. The screen title 'Pump Setpoint Screen' is centered in green. Below the title, four parameters are listed, each with a corresponding blue numeric input field:

Parameter	Value
Pumps Max Speed Limit (%) when in Auto PID	95
Pumps Min Speed Limit (%) when in Auto PID	55
Lead (1 Pump) Elev Tank Start Level (FT)	4.00
Lead (1 Pump) Elev Tank Stop Level (FT)	16.00

The Pump Setpoint Screen enables you to create setpoints for two different parameters:

- 1) The pump MIN or MAX speed percentages when in Auto PID
- 2) The Lead Pump Elevated Tank START and STOP levels

Use the MENU, MAIN, Alarms and the Return Button to easily navigate through your system .

TIMER SET UP SCREENS

Menu	Main	Alarms	Return
Timer Setup Screen 1 of 3			
Pump 1 time to wait for Run Feedback (Sec)			4
Pump 2 time to wait for Run Feedback (Sec)			4
Pump 1 Overtemp Delay (Sec)			1
Pump 2 Overtemp Delay (Sec)			1
Pump 1 Overload Delay (Sec)			1
Pump 2 Overload Delay (Sec)			1
			Page 2 of 3

Menu	Main	Alarms	Return
Timer Setup Screen 2 of 3			
Pump 1 VFD Fail Delay (Sec)			1
Pump 2 VFD Fail Delay (Sec)			1
Elevated Tank Pump Call Delay (Sec)			1
High Level Alarm Delay (Sec)			5
Low Level Alarm Delay (Sec)			5
			Page 3 of 3

Menu	Main	Alarms	Return
Timer Setup Screen 3 of 3			
Low Suction Pressure Alarm Delay (Sec)			2
High Discharge Pressure Alarm Delay (Sec)			2
Low Differential Pressure Alarm Delay (Sec)			2
			Page 1

The **Timer Set Up Screens** allows the operator to do the following:

Note: All times should be entered in seconds.

Set Up Screen #1 allows you to select specific pump time delays for the following alarms:

- a) Run Feedback,
- b) Overtemp
- c) Overload conditions

Set Up Screen #2 allows you to specify a minimum pump time delays due to following alarms:

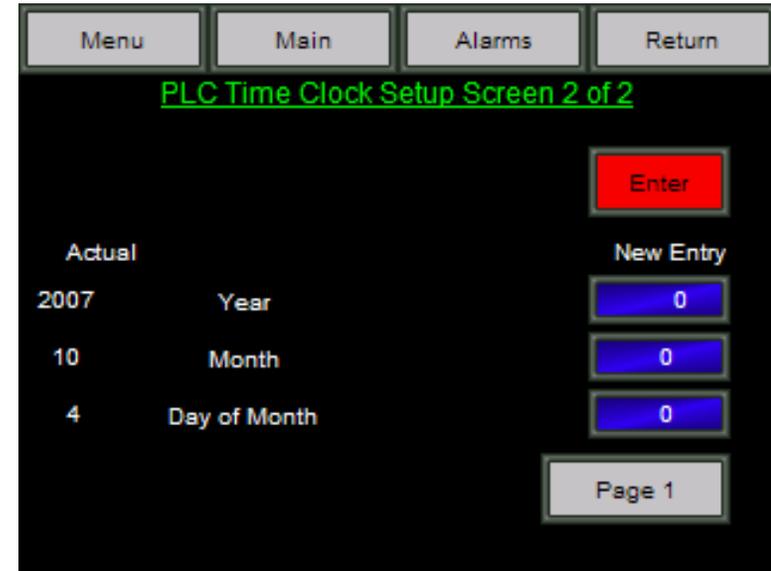
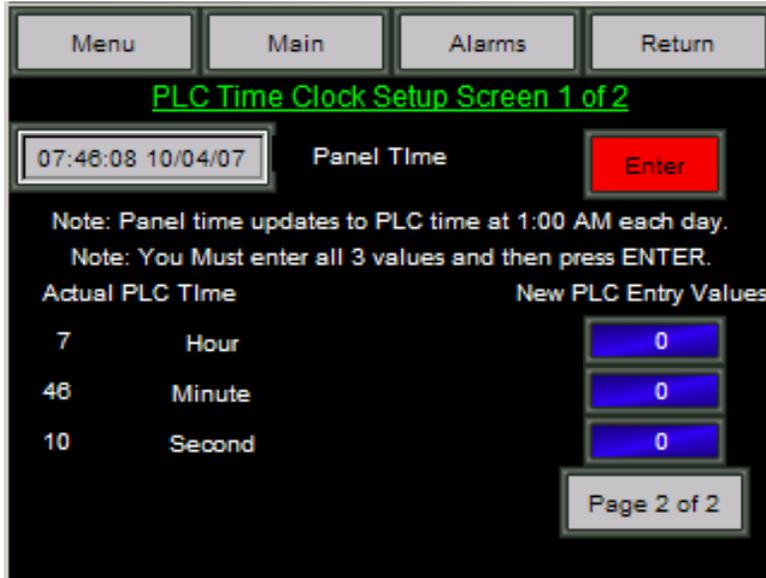
- b) VFD Failure
- b) Elevated Tank Pump Call
- c) High/Low Level Alarms

Set Up Screen #3 allows you to establish specific time delays for the following alarms:

- a) Low Suction Pressure
- b) High Discharge Pressure
- c) Low Differential Pressure

MENU, MAIN, ALARMS and RETURN (go back to prior screen) appear at the top of the screen to allow for easy navigation through the system. Bottom left of screen allows you to select and move quickly to page1, 2 or 3 of the Timer setup screens.

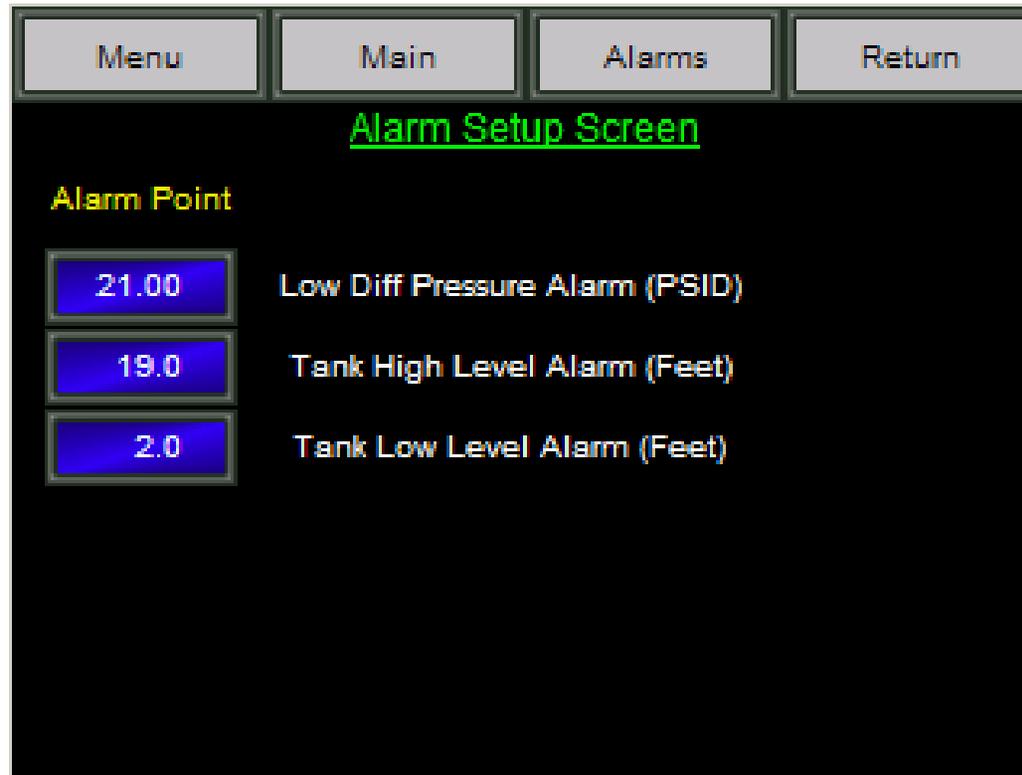
TIME SET UP SCREENS



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 located at the lower right of the screen 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) located at the upper left of the screen will synchronize with the PLC at 1:00 a.m. each day.

The Time Set Up Screen Page #2 enables the operator to set the year, month and day. To enter data data the operation is the same as is on Set Up Screen page #1.

MENU, MAIN, ALARMS or RETURN (go back to prior screen) appear at the top of the screen for easy navigation through your system.

ALARM SET UP SCREENS

On the **Alarm Set Up Screen**, you can select the desired differential pressure setpoints for the following alarm conditions:
1) Low Differential Pressure Alarm (PSID). 2) Tank High Level Alarm (Feet). 3) Tank Low Level Alarm (Feet).

Menu, Main, Alarms and Return buttons appear at the top of this screen to allow for easy navigation through your system.

ALARM HISTORY and HISTORY DETAILS SCREENS

Alarm History		Total of 1 Alarms	
Entry No	Alarm No	Message	Confirm
1	15	P2 Overtemp	Required

Alarm Coun	Page Up	Page Down	Line Up	Line Down	Details	Clear All	Exit
------------	---------	-----------	---------	-----------	---------	-----------	------

Alarm History Details	
Entry No:	1
Message:	P2 Overtemp
Activated:	03-OCT-2007 15:52:35
Cleared:	03-OCT-2007 15:56:30
Actual Value:	On
High/Low/Dis:	Discrete
Low:	
High:	
Confirm Cleared:	03-OCT-2007 16:15:06

Prev	Next	Confirm	Exit
------	------	---------	------

The **Alarm History Screen** shows all alarms as an overview. By using the scrolling buttons at the bottom of the screen, you can page down a complete page at a time, page up a complete page at a time, line up or line down a line at a time, select a specific alarm and go to the Alarm History Details Screen (see next page) or clear all alarms and exit the alarm screen.

The **Alarm History Details Screen** displays one specific alarm with complete information relating to the alarm such as; when the alarm occurred, when it was cleared and when it was acknowledged.

Navigation buttons at the bottom of the screen enable the user to move to other alarms (PREV for Previous or NEXT), you can confirm the alarms as well as exit from the details section.

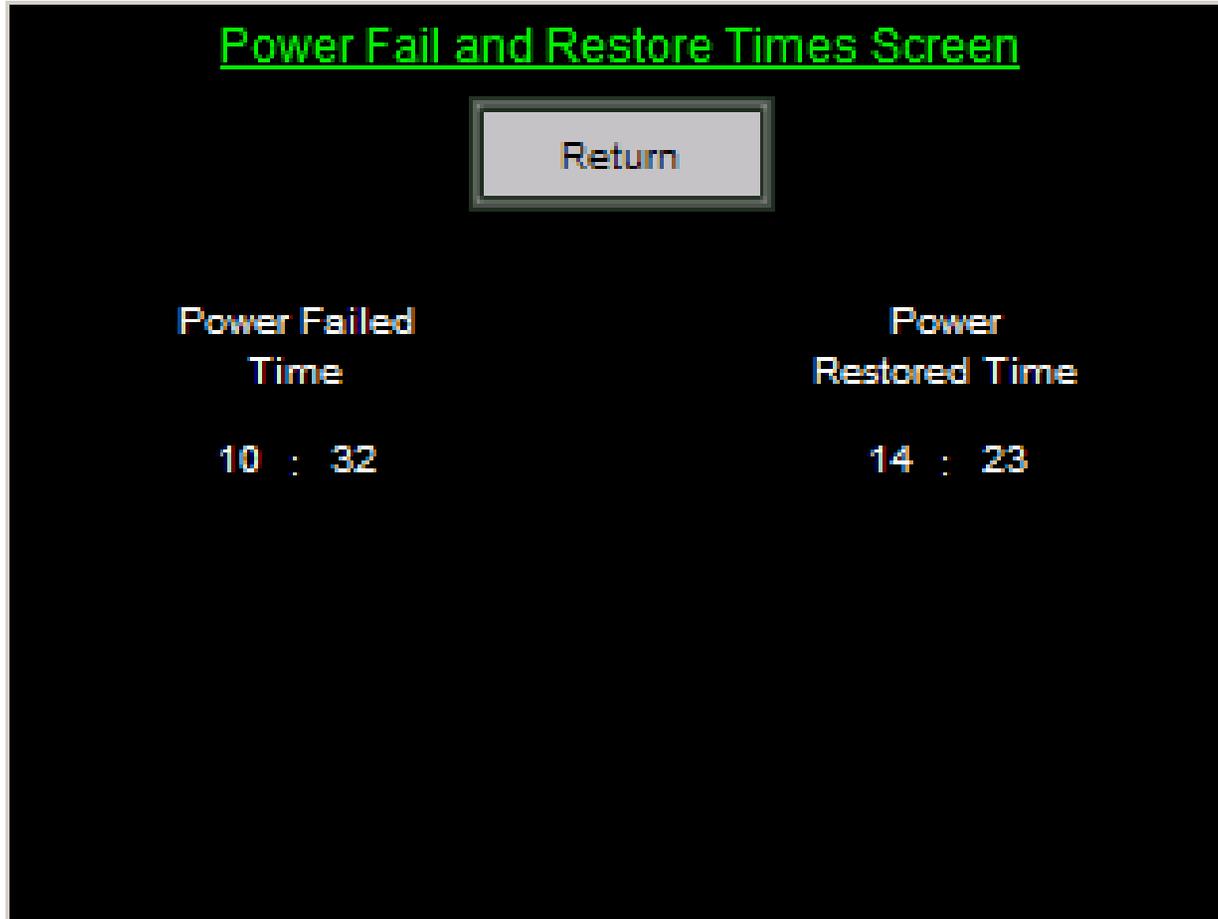
ENGINEER SET UP SCREEN

Menu	Main	Alarms	Return
<u>Engineer Setup Screen</u>			
Differential Pressure Xmtr 4 MADC value (PSID)			0.00
Differential Pressure Xmtr 20 MADC value (PSID)			50.00
Flow Xmtr 4 MADC value (GPM)			0.0
Flow Xmtr 20 MADC value (GPM)			1000.0
Level Xmtr 4 MADC value (Feet)			0.0
Level Xmtr 20 MADC value (Feet)			20.0

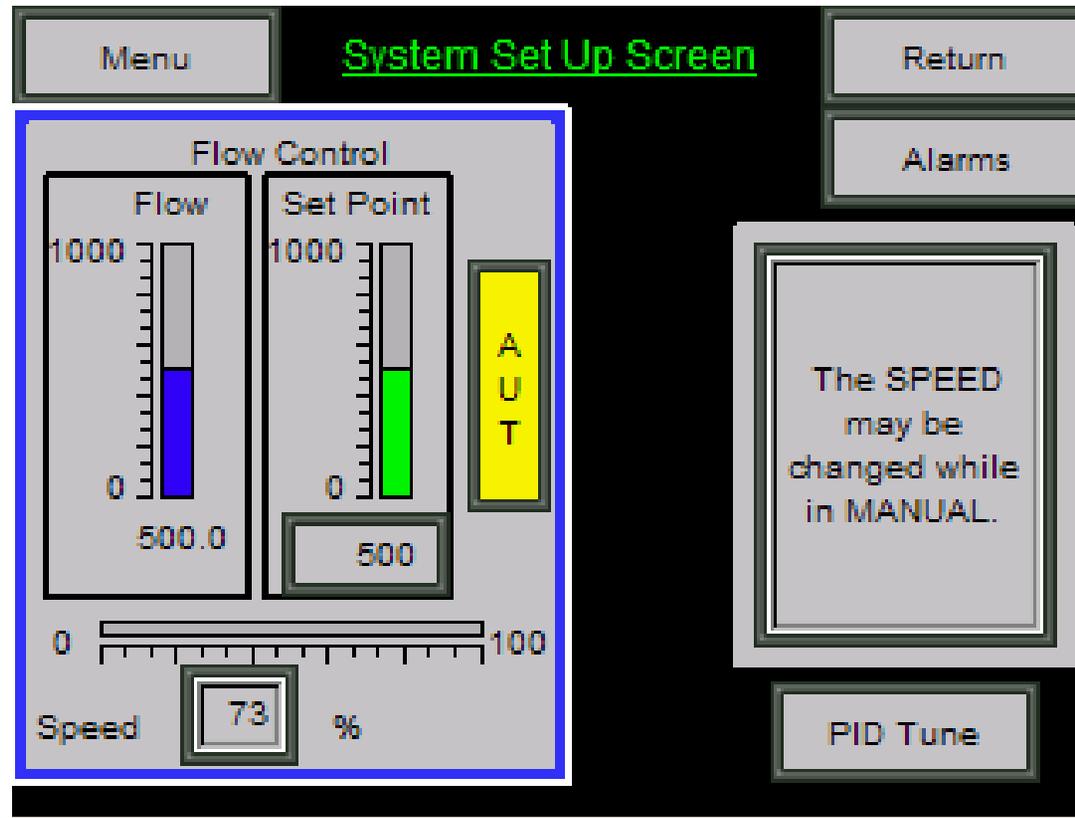
The Engineer Set up Screen is designed to allow entry of transmitter range values. Enter the desired value in pressure, feet and GPM.

Menu, Main, Alarms and Return buttons appear at the top of this screen for easy navigation through your system.

POWER FAIL SCREEN



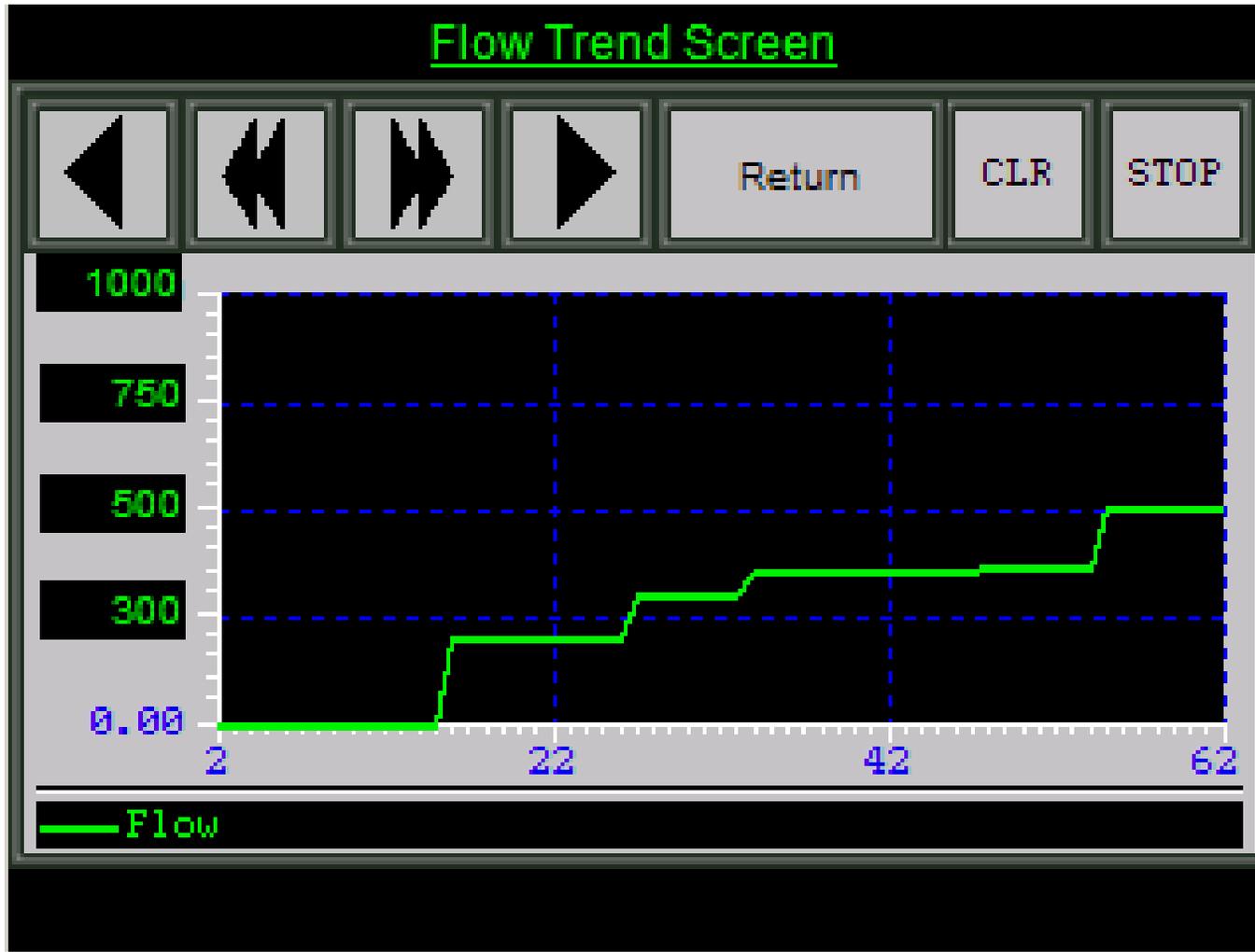
The Power Fail and Restore Times Screen is used in the event of a power failure to be able to determine the time of failure and the time of restoration.

FLOW CONTROL SCREEN

The FLOW CONTROL SCREEN enables the operator to establish flow control setpoints.

Menu, Alarms and Return buttons appear at the top of this screen for easy navigation Through your system. You can also move to the PID Tune Screen by using the PID Tune button in the lower right corner.

FLOW TREND SCREEN



The Flow Trends Screen displays a real time trend of pump discharge flow as measured by the installed inline flow meter.

IMPORTANT - The trends on this screen are real-time trends and not historical trends. Each trend screen represents a 60 minute time segment. Time 0 is the line where the trend was started and Time 60 is sixty minutes later. If you started the trend at noon on one day and examined it again at 6 PM, you would see Time 360 in the lower right hand corner based on 6 hours at 60 minutes. You can scroll back through time to look at values until you reach Time 0.

Continuous capacity is approximately one month.

Touch Return to go back to the prior screen.

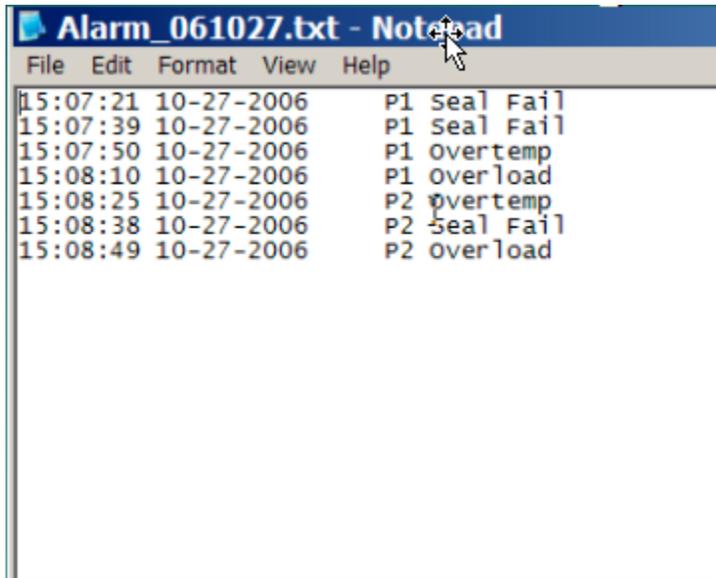
TOTALIZED FLOW SCREEN



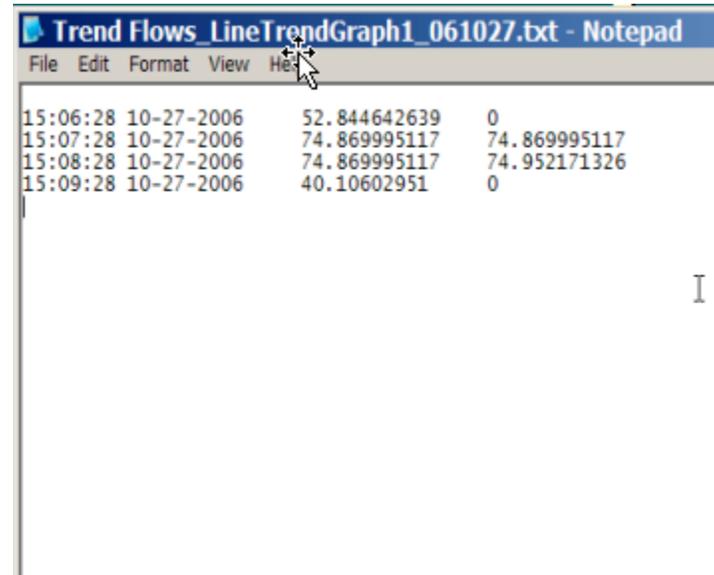
The **Totalized Flow Screen** displays real time data for the pump station flow for three different timeframes: the current flow since midnight; the total flow for the last day (24 hour period) and the total flow to date. Use the reset button to clear the totals to get data for a new period of time. All data is displayed in digital readouts up to the second decimal point.

Touch RETURN to go back to the prior screen.

DATA LOGGING SCREENS



```
Alarm_061027.txt - Notepad
File Edit Format View Help
15:07:21 10-27-2006 P1 Seal Fail
15:07:39 10-27-2006 P1 Seal Fail
15:07:50 10-27-2006 P1 Overtemp
15:08:10 10-27-2006 P1 Overload
15:08:25 10-27-2006 P2 Overtemp
15:08:38 10-27-2006 P2 Seal Fail
15:08:49 10-27-2006 P2 Overload
```



```
Trend Flows_LineTrendGraph1_061027.txt - Notepad
File Edit Format View Help
15:06:28 10-27-2006 52.844642639 0
15:07:28 10-27-2006 74.869995117 74.869995117
15:08:28 10-27-2006 74.869995117 74.952171326
15:09:28 10-27-2006 40.10602951 0
```

These Data Logging Screens log two types of data: Alarms are logged to one file and process data. Flow and Tank Level are logged to another file. This data can be directly downloaded to Excel on your computer and used for analysis or kept for record keeping.

SUMMARY

The BSC - V 200 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. Consider the BSC - V 200 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. We are confident that you will see a significant improvement in how you operate your system after you have installed and used the BSC - V 200 by EG Controls.