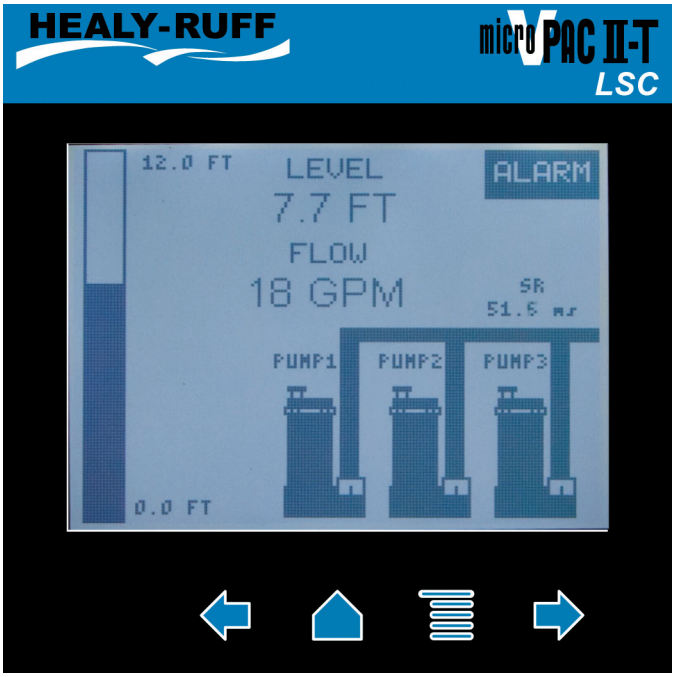
HEALY-RUFF

Micro-VPAC IIT LSC - Lift Station Controller



User Manual

Version 1.0.2

Table of Contents

Contents

1

Introduction

General

The Micro-VPAC IIT LSC lift station controller is a preprogrammed, microprocessor based, controller capable of monitoring 4-20mA signals and automatic control up to three pumps. The controller comes standard for pump down applications.

The Micro-VPAC IIT LSC has integrated I/O for connecting digital and analog signals.
For applications that have higher voltage signals, interposing relays are used to translate the field signal voltage levels to voltage levels compatible with the controller.

The Micro-VPAC IIT LSC can be mounted through the front door of the cabinet or DIN rail mounted for more security. The operator interface on the Micro-VPAC IIT LSC has a 3.5" touch screen display and four keys for additional screen navigation.

Control Description

The Micro-VPAC IIT LSC is designed to provide manual and automatic control of three pumps for pump down applications to maintain a level in the wet well. The pumps are controlled automatically as the wet well level rises and falls. The level in the wet well is sensed by a milliamp signal to the Micro-VPAC IIT LCS Controller. The controller performs the control functions to start and stop the pumps according to the adjustable set points and alternates the pumps automatically after each pump cycle or based on a predefined time. The operator may manually turn on all three pumps in Hand mode.

Manual Operation

The three pumps are equipped with soft Hand-Off-Auto (HOA) switches accessible through the touch screen display to select the status of the respective pump. If the soft HOA switch is placed in the Hand position, the selected pump will operate and remain in operation for as long as the soft HOA switch is in the Hand position. (Note: External interlocks may prevent the pump from running in the Hand mode). If in the Off position, no operation will occur, and in the Auto position, the pump is controlled by the logic in the Micro-VPAC IIT LSC Controller.

Automatic Operation

Based on three pump constant speed operation, in the Auto position of the soft HOA switch, the Micro-VPAC IIT LSC Controller will have control of the pumps.

When the level in the wet well rises to the lead pump start setpoint, the lead pump will be started. If the capacity of the lead pump running is greater than the influent flow, the level will fall to the lead pump stop setpoint and the pump will be called to stop.

If the capacity of the lead pump is less than the influent flow, the level will continue to rise to the Lag 1 start setpoint and the 1st lag pump will be called to start. If the influent flow is less than the capacity of both pumps running in parallel, the level will fall to the Lag 1 stop setpoint and the 1st lag pump will be called to stop.

If the capacity of two pumps is less than the influent flow, the level will continue to rise to the Lag 2 start setpoint and the level the 2nd lag pump will be called to start. If the influent flow is less than the capacity of three pumps running in parallel, the level will fall to the Lag 2 stop setpoint and the 2nd lag pump will be called to stop.

Note: All start/stop and delay set points are configured through the display of the LSC controller.

Alternation

An alternation sequence selector is available through the touch screen display of the LSC to select how the pumps are alternated. The selector allows for either Auto alternation or fixed operation. In the Auto position, the pumps will alternate the lead position after each pump cycle. If in a fixed position of 1-2-3, 2-3-1 or 3-1-2, the pumps start in the same sequence for every pump cycle. A timed function is available to cycle the pumps based on a period of time, i.e. every 8 hours.

Pump Failure

If a pump is called to start and the LSC does not receive a run signal within a adjustable amount of time and the alternator is in the Auto mode, the pump is taken out of service and the next pump in the sequence is started. If the alternator is in Fixed mode, the next pump will start when it's predetermined level is reached and a pump failure alarm event will occur.

Overtemp

If a pump overtemp condition occurs and the alternator is in the Auto mode, the pump is taken out of service and the next pump in the sequence is started. If the alternator is in Fixed mode, the next pump will start when it's predetermined level is reached. Triggers an overtemp alarm.

Seal Failure

Pump continues to run. Triggers a seal failure alarm.

OL/VFD Failure

If a pump overload or VFD fault condition occurs and the alternator is in the Auto mode, the pump is taken out of service and the next pump in the sequence is started. If the alternator is in Fixed mode, the next pump will start when it's predetermined level is reached. Triggers either an overload alarm or a VFD fault alarm based on controller configuration.

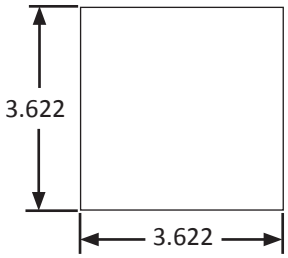
2

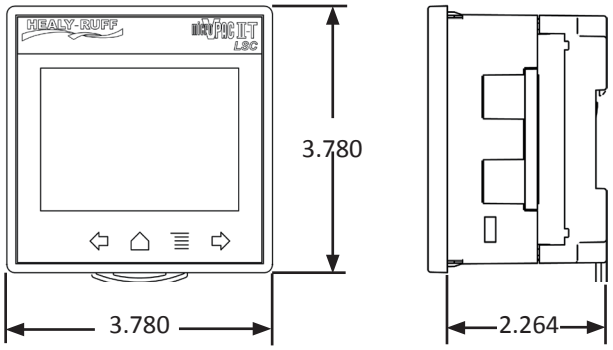
Installation

SPECIFICATIONS	
Required Power (steady)	130 mA @ 24 VDC
Max. Input Voltage	30 A for 1 ms @ 24 VDC
Primary Power Range	10 - 30 VDC
Relative Humidity	5 to 95% Non-condensing
Operating Temp	-10°C to + 60°C
INPUTS	
No. of Inputs	24
Input Voltage Range	12 / 24 VDC
Absolute Max. Voltage	35 VDC Max.
Input Type	Positive Logic
Max Upper Threshhold	8 VDC
Min. Lower Threshold	3VDC
OFF to ON / ON to OFF Response	1 ms
OUTPUTS	
No. of Outputs	16
Output Type	Sourcing / 10 K Pull Down
Absolute Max Voltage	28 VDC Max.
Output Protection	Short Circuit
Max. Output Current per Point	0.5 A
Max. Total Current	4 A Countinuos
Max. Output Supply Voltage	30 VDC
Min. Output Supply Voltage	10 VDC
Max. Inrush Current	650 mA per Channel
OFF to ON / ON to OFF Response	1 ms
ANALOG INPUTS	
No. of Channels	2
Input Range	4 - 20 mA

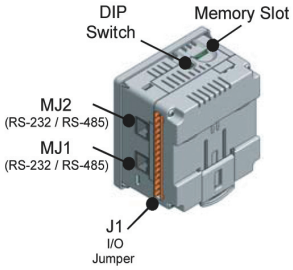
Panel Cutout and Dimensions

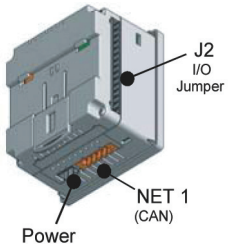
Note: Max. panel thickness: 5 mm.



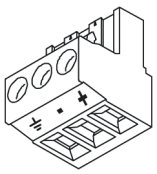


Ports and Connections



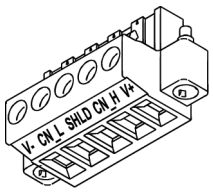


Wiring Connectors (J1 - J4)



Power Connector

Observer Polarity and connect to Earth Ground Apply 10 - 30 VDC



CAN Connector

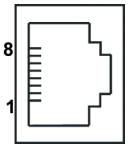
Use the CAN Connector when using remote I/O

Memory Slot:

Uses Removable Memory (MicroSD) for data logging.

Serial Communications:

MJ1: (RS-232/RS-485) reserved for SMS option or defined communications.
MJ2: (RS-232/RS-484) used for application-defined communications.



Pin	MJ1 Pins		MJ2 Pin	
8	TXD	OUT	TXD	OUT
7	RXD	IN	RXD	IN
6	0 V	GND	0 V	GND
5	+5V 60 mA	OUT	+5V 60mA	OUT
4	RTS	OUT	TX+	OUT
3	CTS	IN	TX+	OUT
2	RX- / TX-	IN / OUT	RX+	IN
1	RX- / TX-	IN / OUT	RX +	IN

Wiring and Jumpers

The LSC comes factory configured for your application. Jumper settings are preset and should not require repositioning.

Wiring Specifications

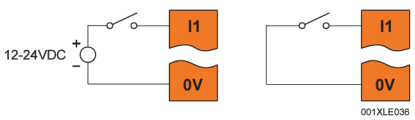
For discrete I/O wiring, use the following wire type or equivalent:
Belden 9918, 18 AWG (0.8 mm^2) or larger.

For analog I/O wiring, use the following wire type or equivalent:
Belden 8441, 18 AWG (0.8 mm^2) or larger.

For CAN network (remote I/O) wiring, use the following wire type or equivalent:
Belden 3084, 24 AWG ((0.2 mm^2) or larger.

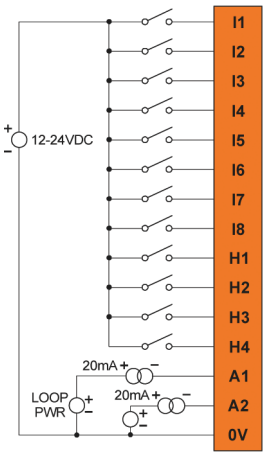
Postive Logic vs Negative Logic

The LSC is shipped for Positive Logic. An example below shows the difference between Positive and Negative Logic.



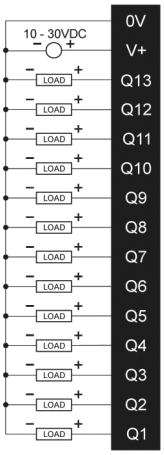
J1 ORANGE	LSC	Name
I1	DI1	PUMP 1 RUNNING
I2	DI2	PUMP 1 HOA IN AUTO
I3	DI3	PUMP 1 SEAL FAILURE
I4	DI4	PUMP 1 OVERTEMP
I5	DI5	PUMP 1 OL/VFD FAULT
I6	DI6	PUMP 2 RUNNING
I7	DI7	PUMP 2 HOA IN AUTO
I8	DI8	PUMP 2 SEAL FAILURE
H1	DI9	PUMP 2 OVERTEMP
H2	DI10	PUMP 2 OL/VFD FAULT
H3	DI11	PUMP 3 RUNNING
H4	DI12	PUMP 3 HOA IN AUTO
A1	AI1	WET WELL LEVEL
A2	AI2	STATION FLOW
0V	OV	0V

J1 Orange
Positive Logic
Digital In



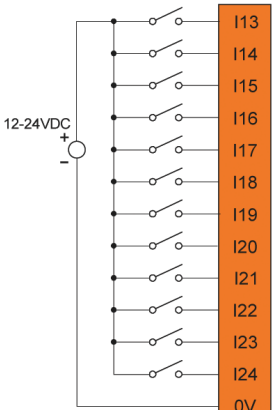
J2 BLACK	LSC	Name
0V	0V	0V
V+	V+	V+ (10 - 30 VDC)
Q13	DO13	BACKUP RESET
Q12	DO12	ALARM HORN SILENCE
Q11	DO11	ALARM HORN
Q10	DO10	COMMON ALARM
Q9	DO9	PUMP 3 VFD FAULT RESET
Q8	DO8	PUMP 3 FAILURE
Q7	DO7	PUMP 3 CALL
Q6	DO6	PUMP 2 VFD FAULT RESET
Q5	DO5	PUMP 2 FAILURE
Q4	DO4	PUMP 2 CALL
Q3	DO3	PUMP 1 VFD FAULT RESET
Q2	DO2	PUMP 1 FAILURE
Q1	DO1	PUMP 1 CALL
V+ SUPPLY FOR SOURCING OUTPUTS		

J2 Black
Positive Logic
Digital Out



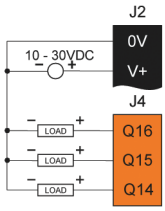
J3 BLACK	LSC	Name
I13	DI13	0V
I14	DI14	PUMP 3 OVERTEMP
I15	DI15	PUMP 3 OL/VFD FAULT
I16	DI16	BACKUP ACTIVE
I17	DI17	HIGH LEVEL FLOAT
I18	DI18	LOW LEVEL FLOAT
I19	DI19	CONTROL POWER FAILURE
I20	DI20	GENERATOR RUNNING
I21	DI21	PHASE FAILURE
I22	DI22	STATION INTRUSION
I23	DI23	FLOW PULSE
I24	DI24	TEMP ALARM HI/LOW
0V	OV	OV

J3 Orange
Positive Logic
Digital In



J3 BLACK	LSC	Name
Q16	DO16	RESERVED
Q15	DO15	RESERVED
Q14	DO14	RESERVED

J3 Orange
Positive Logic
Digital Out

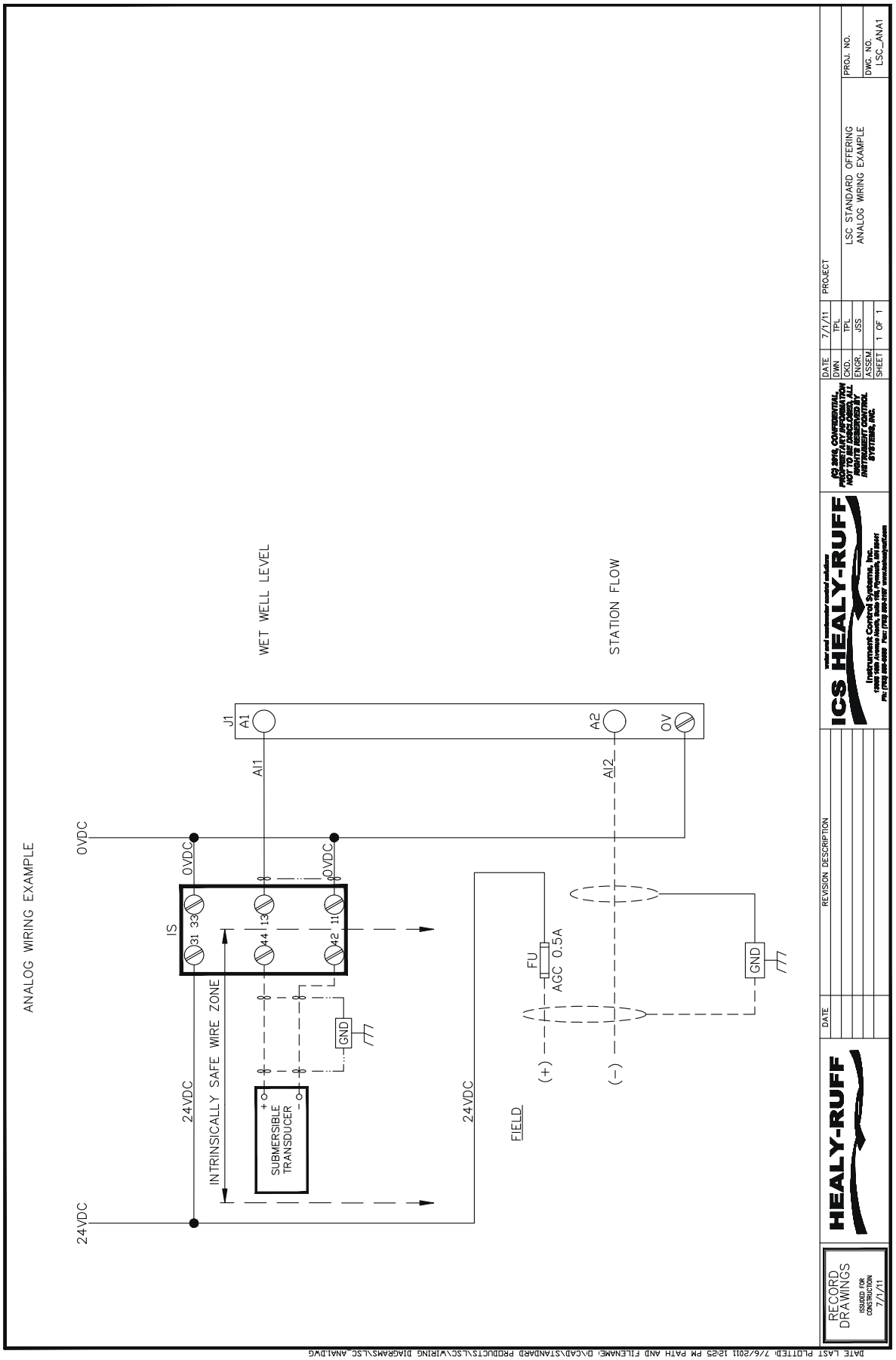


LSC PREDEFINED I/O

The Micro-VPAC IIT LSC comes with the I/O predefined for pump down applications. Not all of the inputs are required to be used and when the controller is shipped from the factory the controller ships pre-configured based on the application to help speed up installation and setup. Below lists the predefined I/O.

STANDARD I/O OFFERING			
DISCRETE INPUTS		**DISCRETE OUTPUTS**	
DI1	P1 RUNNING	DO1	P1 CALL
DI2	P1 HOA IN AUTO	DO2	P1 FAILURE
DI3	P1 SEAL FAILURE	DO3	P1 VFD FAULT RESET
DI4	P1 OVERTEMP	DO4	P2 CALL
DI5	P1 OL/VFD FAULT	DO5	P2 FAILURE
DI6	P2 RUNNING	DO6	P2 VFD FAULT RESET
DI7	P2 HOA IN AUTO	DO7	P3 CALL
DI8	P2 SEAL FAILURE	DO8	P3 FAILURE
DI9	P2 OVERTEMP	DO9	P3 VFD FAULT RESET
DI10	P2 OL/VFD FAULT	DO10	COMMON ALARM
DI11	P3 RUNNING	DO11	ALARM HORN
DI12	P3 HOA IN AUTO	DO12	ALARM HORN SILENCE
DI13	P3 SEAL FAILURE	DO13	BACKUP RESET
DI14	P3 OVERTEMP	DO14	SPARE
DI15	P3 OL/VFD FAULT	DO15	SPARE
DI16	BACKUP ACTIVE	DO16	SPARE
DI17	HIGH LEVEL FLOAT	**ANALOG INPUTS**	
DI18	LOW LEVEL FLOAT	AI1	WET WELL LEVEL
DI19	CONTROL POWER FAILURE	AI2	STATION FLOW
DI20	GENERATOR RUNNING		
DI21	PHASE FAILURE		
DI22	STATION INTRUSION		
DI23	FLOW PULSE		
DI24	TEMP ALARM HI/LO		

OPTIONAL REMOTE I/O	
SS1/AI1	P1 VFD SPEED
SS1/AI2	P2 VFD SPEED
SS1/AI3	P3 VFD SPEED
SS1/AI4	STATION TEMP
SS1/AI5	P1 CURRENT
SS1/AI6	P2 CURRENT
SS1/AI7	P3 CURRENT
SS1/AI8	SPARE
SS1/AO1	P1 VFD SPEED COMMAND
SS1/AO2	P2 VFD SPEED COMMAND
SS1/AO3	P3 VFD SPEED COMMAND
SS1/AO4	SPARE

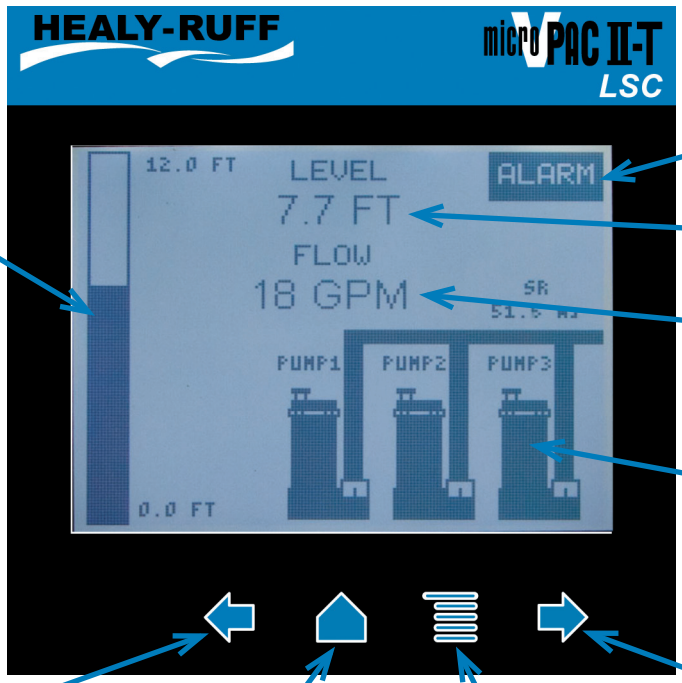

ANALOG WIRING EXAMPLE
WET WELL LEVEL
STATION FLOW
J1
A1
AI1
A2
AI2
0V
0VDC
IS
31
33
44
13
42
11
INTRINSICALLY SAFE WIRE ZONE
SUBMERSIBLE TRANSDUCER
+
-
GND
24VDC
FIELD
FU
AGC 0.5A
(+)
(-)
REVISION DESCRIPTION
DATE
HEALY-RUFF
ICS HEALY-RUFF
RECORD DRAWINGS
ISSUED FOR CONSTRUCTION 7/1/11
PROJECT
DATE 7/1/11
DWN TPL
CKD. TPL
ENGR. JSS
ASSEM.
SHEET 1 OF 1
LSC STANDARD OFFERING
ANALOG WIRING EXAMPLE
PROJ. NO.
DWG. NO. LSC_ANA1
DATE LAST PLOTTED: 7/6/2011 12:25 PM PATH AND FILENAME: D:\CAD\STANDARD PRODUCTS\LSC\WIRING DIAGRAMS\LSC_ANA1.DWG

3

Overview and Main Menu

Overview Screen

The Overview screen is a dynamic representation of the wet well. From this screen the wet well level and station flow (if applicable) can be viewed as well as status for each pump. High and low level float status can be viewed from this screen as well when in that alarm condition.



Bar Graph: dynamic representation of the wet well level. Touching here takes you to the trend screen.

Alarm Notification: Toucing here takes you to the Current Alarm screen.

Level: indicates the current level in feet.

Station Flow: indicates current station flow.

Pump Graphic: the graphic defines the status for each pump. There are four pump conditions: Off, Called, Running and Out of Service.

Previous: soft key to previous screen or main menu. An arrow symbol in the upper left indicates a valid screen can be navigated to.

Overview: soft key to Overview screen

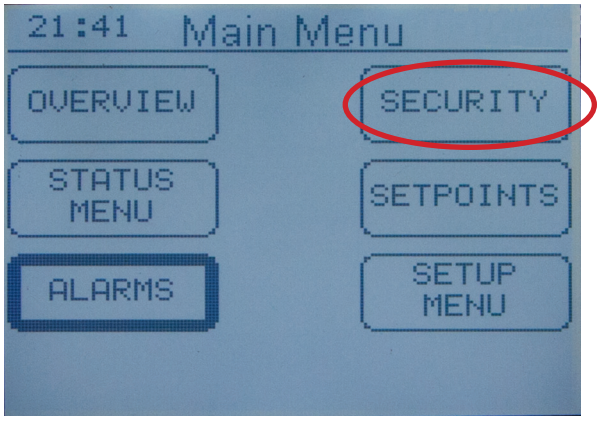
Main Menu: soft key to Main Menu.

Previous: soft key to next screen. An arrow symbol in the upper right indicates a valid screen can be navigated to.

4

Security

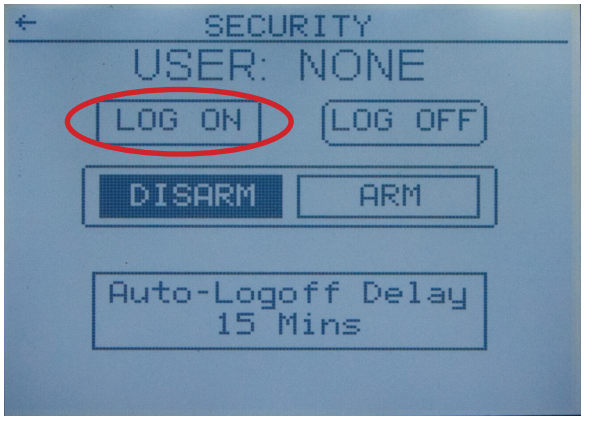
Security has been added to the PLC to limit setpoint edits and alarm acknowledgements to a user with the ability to log-on. All setpoint edits and alarm acknowledgement privileges are disallowed when no user is logged onto the PLC.



There are two levels of security: **OPER** and **SUPER**

OPER – operator access
- allowed to edit setpoints and acknowledge alarms

SUPER – supervisor access
- all privileges as the **OPER**
- right to change the passwords of both **SUPER** and **OPER** users
- ability to set lifetime pump runtime and start totals
- change port from **COMM** to **PROGRAM**

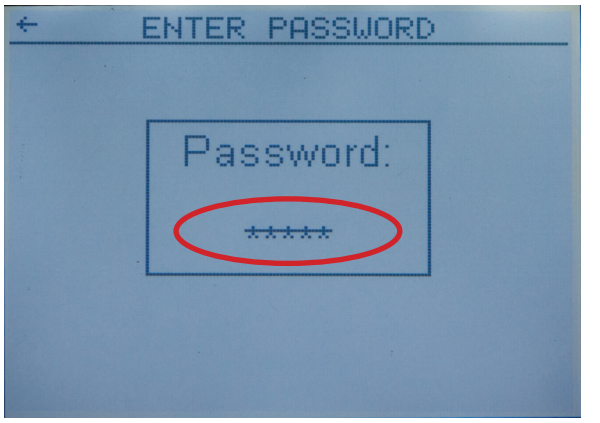


The factory default passwords are:

OPER	**1234**
SUPER	**1234**

To log onto the PLC:

1. Navigate to the Security screen from the Main Menu.
2. Press the **LOG ON** button. The Password Entry screen will be shown.
3. Touch the password entry field, a keypad will then be displayed.
4. Enter the password of the user (**OPER** or **SUPER**) that is to be logged on, then press **ENTER**.
5. If successful, the Security screen will be shown and show "**USER LOGGED ON**: {**OPER**/**SUPER**}". If unsuccessful, the Password entry screen will be re-shown.



To change a user security password:

1. The **SUPER** user must be currently logged on to change the password.

2. Navigate to the Security screen.

3. Press the **CHANGE PASSWORDS** button on the Security screen. The **ENTER NEW PASSWORDS** screen will be shown.

4. Touch the new password entry field for the user requiring a new password, a keypad will be displayed.

5. Enter the new password using the keypad, then hit **ENTER**. Maximum of five numbers.

6. The new password will be set and will be required on the next log-on attempt.

7. **NOTE: A password of 0 (ZERO) is invalid. If a password of 0 (ZERO) is entered as a new password, the factory default will become the new password for that user.

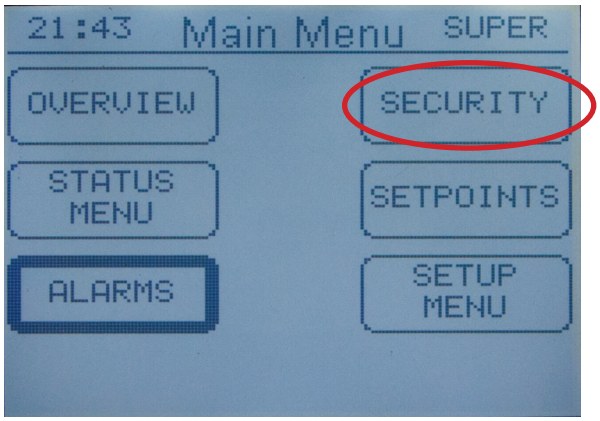
The Auto Log-Off Delay setpoint enables the PLC to automatically log-off the current user after an adjustable period (minutes). The setpoint is shown and adjustable on the Security Log-On screen. After the set delay period passes without a screen change on the PLC, the user will be logged off. If the setpoint value is zero minutes, the auto log-off will be disabled. This timer also reverts the screen back to the Overview screen.

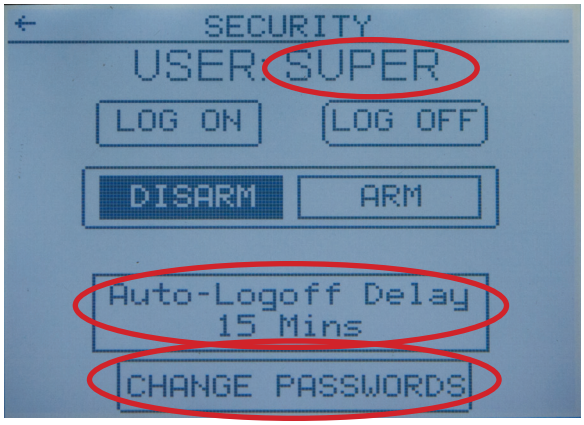
To log-off of the PLC:

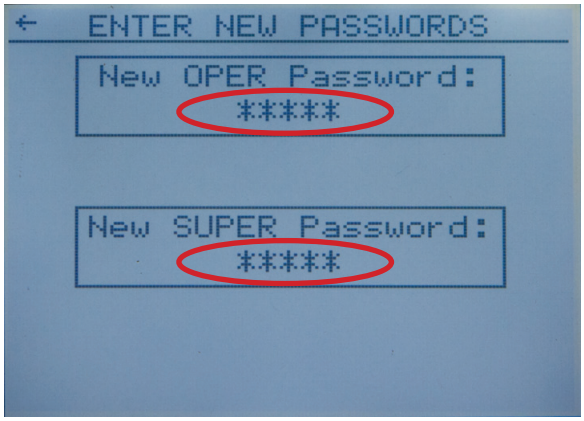
1. Navigate to the Security screen.

2. Press the **LOG OFF** button.

3. If successful, the Security screen will show "USER LOGGED ON: NONE".







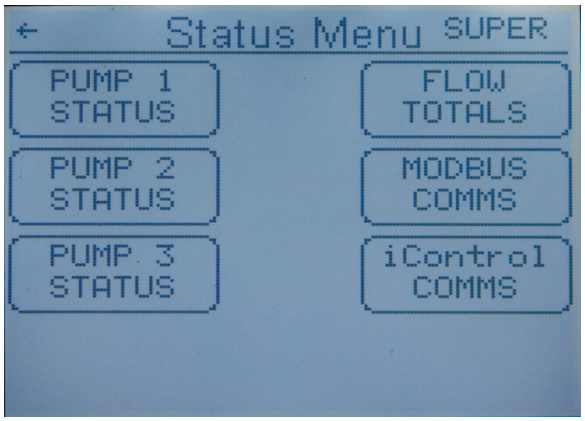
5

Status Menu

The Status Menu provides the user access to a variety of status screens that include pump status, HOA status, Flow Totals, MODBUS COMMS and iControl COMMS. Some screens require a higher user level for added security to get access.

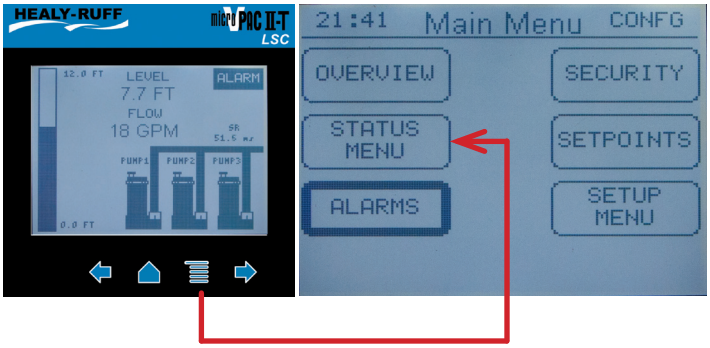
To access a particular screen, touch the screen button to display the respective screen.

Some status screens may go more than one screen deep so a small identifier is provided to let the user know there is another screen to navigate to. The small identifier is a arrow in either the upper left or upper right corner or both of the current screen.



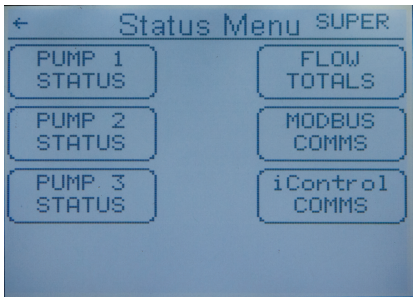
PUMP STATUS

More detailed information on pump status can be found in one of two ways. The quickest way is to touch the pump graphic on the Overview screen and the respective pump status screen is displayed. Or, the Pump Status screens can also be accessed through the Main Menu by pressing the Menu key and then selecting the STATUS MENU button on the screen.



STATUS MENU

In the Status Menu the pump status for each available pump is displayed. Selecting the button for the desired pump; PUMP 1 STATUS, PUMP 2 STATUS or PUMP 3 STATUS, brings up the status screens for that respective pump. Flow Totals, MODBUS COMMS and iControl COMMS are accessible from this menu as well with the correct logon.



STATUS

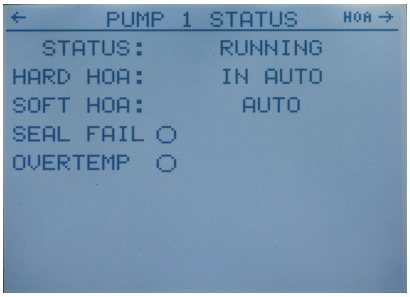
Displays the current pump status; i.e. OFF, CALLED and RUNNING.

HARD HOA

Displays the status of the external HOA switch on the door of the enclosure. If the HARD HOA is in OFF or HAND (Manual), then NOT IN AUTO will be displayed. If this switch is not wired to the LSC it should then be tied high and will then always show IN AUTO.

SOFT HOA

Displays the status of the internal HOA switch in the LSC controller; IN AUTO or NOT IN AUTO.

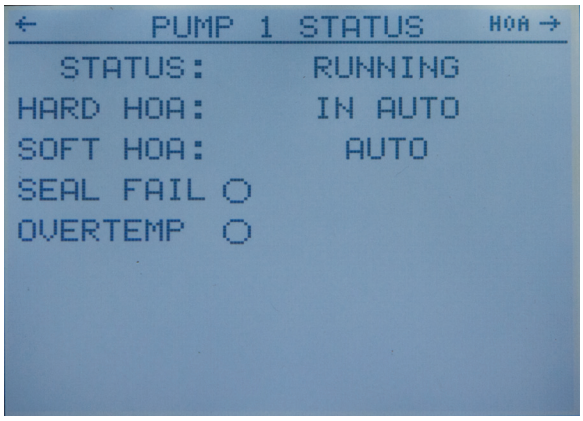


SEAL FAIL

Shows the Seal Failure status. If the circle to the right is solid, a Seal Failure has occurred. Pump continues to run. Triggers a seal failure alarm.

OVERTEMP

Shows the Overtemp status. If the circle to the right is solid, an Overtemp condition has occurred. If a pump overtemp condition occurs and the alternator is in the Auto mode, the pump is taken out of service and the next pump in the sequence is started. If the alternator is in Fixed mode, the next pump will start when it's predetermined level is reached. Triggers a overtemp alarm.



Note the arrows in the upper left and right corners. This indentifier indicates another screen is present on the next screen or previous to the Main Meun.

NOT SHOWN

OL/VFD Failure
If a pump overload or VFD fault condition occurs and the alternator is in the Auto mode, the pump is taken out of service and the next pump in the sequence is started. If the alternator is in Fixed mode, the next pump will start when it's predetermined level is reached. Triggers either a overload alarm or a VFD fault alarm based on controller configuration.

VFD Speed
VFD speed is optional and dispalyed in %.

Current
Current is optional and dispalyed in Amps.

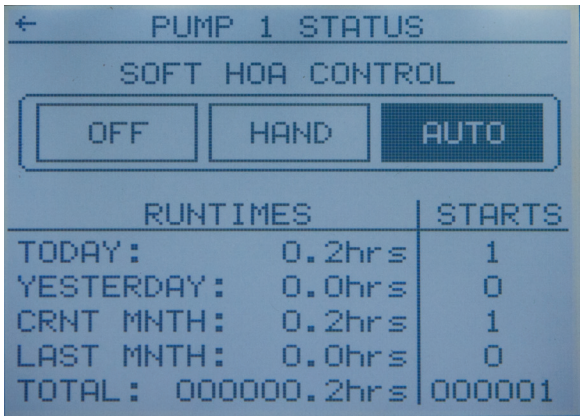
VFD RESET
A VFD fault reset button is also provided on this screen to reset any VFD faults with the VFD option.

Pump Status - Continued

Pressing the Next ➡ button brings up the next status screen.

This screen allows control of the SOFT HOA when the user has the proper login privileges. When a mode is selected, it stays in that mode indefinitely or until a user changes it to another mode.

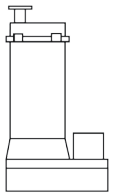
Run times, starts and totals are provided from this screen for documenting and tracking pump performance.



Pump Graphic Status Indication
The pump graphic on the overview screen has four different states that identify what status the pump is currently in. There are four modes that a pump can be in; Off, Called, Running and Out of Service. The four different modes are described below along with the specific graphic representing that respective mode.

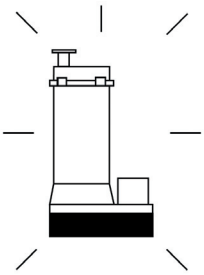
OFF

In this mode the pump is idle and the pump is neither faulted nor being called to run. The graphic symbol is a steady state and looks transparent or hollow.



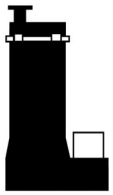
CALLED

A flashing transparent pump indicates the pump is being called to run. With the alternator in Auto, if the pump run signal is not received in an adjustable period of time the pump call will be taken away and the next pump in the sequence will be called to start. With the alternator in Fixed mode, if the pump run signal is not received in an adjustable period of time the pump call will be removed and the next pump in the sequence will be called when its level setpoint is reached.



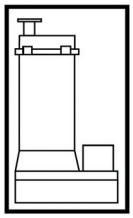
RUNNING

A solid, non-transparent graphic represents the pump is running.



OUT OF SERVICE

A box around a transparent pump indicates the pump is out of service for one or more reasons stated below.



- Hard HOA Not In Auto
- Soft HOA Not In Auto
- Pump Overtemp (if enabled)
- Pump Overload tripped (if enabled)
- Pump VFD Fault (if enabled)

6

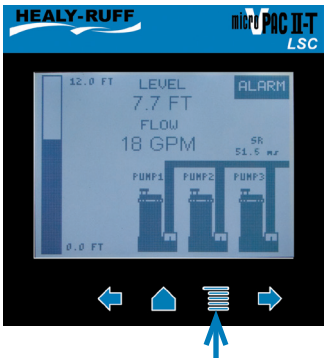
Setpoints

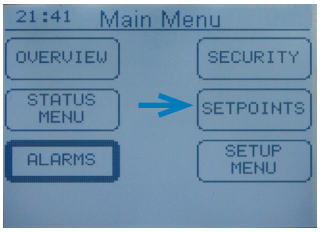
The LSC comes pre-configured with default setpoints already loaded. The default setpoints and delays will need to be reviewed before startup of the system.

This section will go through the various setpoints and delays that are accessible to the user that has the proper privileges to change setpoints.

To access setpoints Log On to the controller with the SUPER password. Once logged on, press the Menu key then press the SETPOINTS button on the screen.

Use the Next key to increment to the next setpoint screen. Use the Previous key to go back a screen.

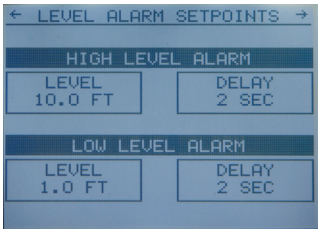




Note: the setpoint screens available will depend on how the controller was configured at that factory. Some screens may not be enabled or editable.

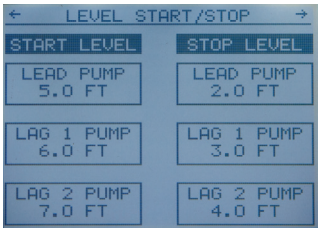
LEVEL ALARM SETPOINTS

The LEVEL ALARM SETPOINTS set the high and low level alarms for the analog transducer. Additionally, there are high and low level delays to reduce nuisance tripping as the level settles in. To change a setpoint, touch the boxed area to pull up a numeric keypad to enter a new value in the respective field.



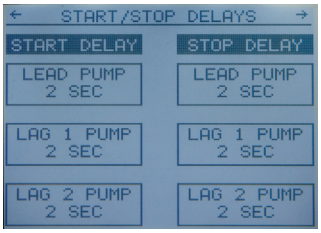
LEVEL START / STOP

From this screen the start and stop levels are setup for the lead and lag pumps if enabled.

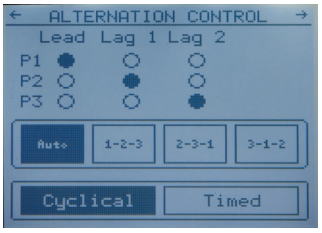


START / STOP DELAYS

From this screen the start and stop delays are setup for the lead and lag pumps if enabled. A delay for each pump is recommended in order to prevent the pumps from slamming on and off repeatedly.



ALTERNATION CONTROL



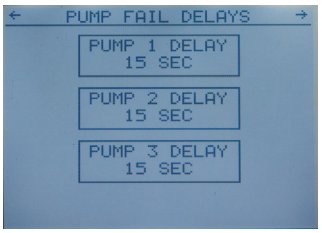
From this screen the pump alternation is setup. There are two modes of alternation: Auto and fixed mode alternation with the ability to alternate at the end of each cycle (Cyclical) or after an adjustable period of time (Timed). Default is set for Auto-Cyclical.

In Auto-Cyclical mode, the pumps are called and stopped based on their pre-defined setpoints and alternated at the end of each cycle.

In Auto-Timed mode, the lead pump is called to run and once the adjustable timer has been reached, the current lead pump gets moved to the last position and the 1st lag pump is now the lead pump.

In Fixed mode (1-2-3, 2-3-1, 3-1-2, or 1-2, 2-1), the pumps can be placed into a fixed mode of alternation, thereby, making one pump always the lead pump, the next pumps always the lag pumps, respectively.

PUMP FAIL DELAYS



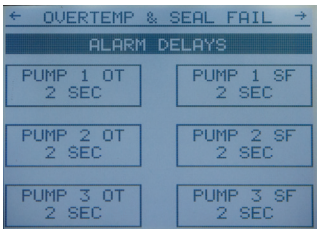
Pump failure is derived from “pump call - no run” events.

In Auto mode, if a pump is called and a run signal is not received by the LSC in the period of time that has been predefined in the PUMP FAIL DELAYS, the pump call will be removed from the current pump and the next pump in the sequence will be called to run.

In Fixed mode, if a pump is called and a run signal is not received by the LSC in the period of time that has been predefined in the PUMP FAIL DELAYS, the call is removed and the next pump will be called to run when the next level setpoint has been reached.

Note: In order for pump failures to be monitored, a run signal must be wired to the LSC controller’s respective pump run input. If no run signal is provided, the pump run input should be tied high.

OVERTEMP & SEAL FAIL



This screen sets up delays for the overtemp and seal fail signals received by the controller from external circuits.

Touching a box on the screen brings up a numeric keypad for the user to enter a delay, in seconds, for each overtemp and seal fail signal.

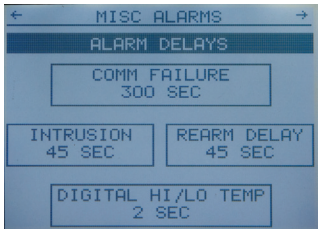
Overtemp (optional)

If a pump overtemp condition occurs and the alternator is in the Auto mode, the pump is taken out of service and the next pump in the sequence is started. If the alternator is in Fixed mode, the next pump will start when it's predetermined level is reached and triggers an overtemp alarm and logs this condition in the current alarm log. The alarm remains in the current alarm log while still active or unacknowledged.

Seal Failure (optional)

If a pump seal failure occurs the pump continues to run and the LSC triggers a seal failure alarm and logs the failure in the alarm history. The seal failure alarm remains in the current alarm log while still active or unacknowledged.

MISC ALARMS



This screen contains miscellaneous alarm delays for communications failure, intrusion, rearming (related to intrusion) and digital high or low temperature alarm.

COMM FAILURE

This delay is required for telemetry and allows the telemetry system to make multiple re-tries before a communications failure occurs.

INTRUSION (optional)

An input on the LSC is reserved for an intrusion signal. If this input is true, the value entered is how much time a user has to dis-arm the intrusion alarm.

REARM

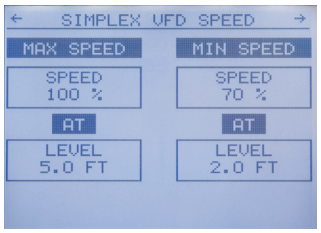
This value is the amount of time a person has to exit before the intrusion alarm is re-armed.

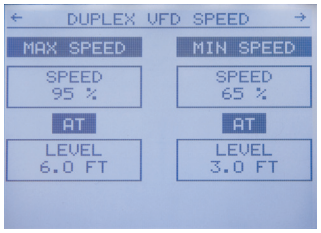
DIGITAL HI/LO TEMP (optional)

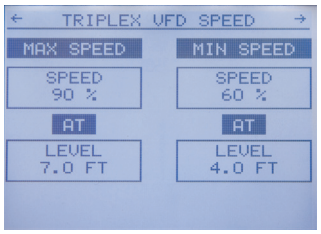
A delay is provided for an external temperature alarm.

SIMPLEX-DUPLEX-TRIPLEX VFD SPEED (optional)

A dedicated screen for each pump is provided to set up the maximum and minimum VFD speeds and the levels at which these speeds are enabled.

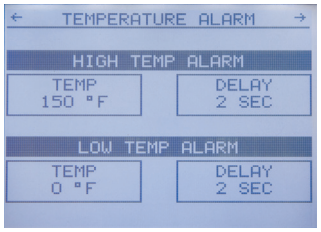






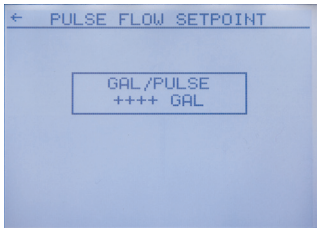
TEMPERATURE ALARM (optional)

An 4 - 20 mA analog input is provided for an external temperature transmitter. This screen provides the ability to scale the input and setup alarm delays for high and low temperatures.



PULSE FLOW SETPOINT (optional)

An input is reserved for an external flow meter with a pulsed output. Units are based on gallons per pulse (GAL/PULSE). To enter a value for the number of gallons per pulse, touch the rectangle on the screen and a numeric keypad will pop up. Enter the number of gallons per pulse and press the Enter button on the screen.



7

Alarms

Alarm logs

The alarm manager maintains two alarm logs that are referred to as the Current Alarms and History log. The differences between the two logs are detailed below. Generally, the Current Alarms log contains the **current** active and unacknowledged alarms and the History log contains a **history** of alarm state changes. Each alarm log entry contains the alarm identifier, time, date and state of the alarm. The time and date indicates the moment the alarm transitioned to the current state.

The **summary** log provides a single entry for each alarm whose current state is active or unacknowledged. Entries are cleared on a power-cycle or program download. Entries contained in the summary log contain an alarm in one of the following states:

ALM – Active alarm not yet acknowledged or cleared by operator
ACK – Active alarm was acknowledged by operator
RTN – Alarm returned to inactive without being acknowledged

The history log provides an entry for each transition of an alarm state (history of changes). The history log length is limited to 128 entries and is stored in non-volatile memory. Entries are only cleared at program download or through operator intervention. Once the log becomes filled, the least current entry is deleted when a new alarm event occurs. Notice that re-occurring alarms can quickly fill the history log. Entries contained in the history log show alarm transitions to the following alarm state:

ALM – Alarm went active
ACK – Active alarm was acknowledged by operator.
CLR – Active alarm was cleared by operator.
RTN – Alarm returned to inactive without being acknowledged.
Note that transitions from either ACK or RTN to CLR are not logged.

The LSC monitors the following alarms:

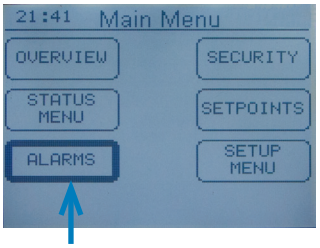
- Low Level Alarm
- High Level Alarm
- Pump Seal Failure
- Pump Over Temp
- Pump Over Load
- VFD Failure (if applicable)
- Pump Failure (internal to controller, Call No Run)
- Backup Active
- Low Level Cutout (from floats)
- High Level Alarm (from floats)
- Control Power Failure
- Generator Running
- Phase Failure
- Station Intrusion
- Temp Alarm (discrete input unless VFD option, then includes analog)

ALARMS

All alarms are logged in the Alarm History log screen. All alarms that are active or unacknowledged reside also in the Current Alarms log screen. Once an alarm clears and is unacknowledged it is removed from the Current Alarm log.

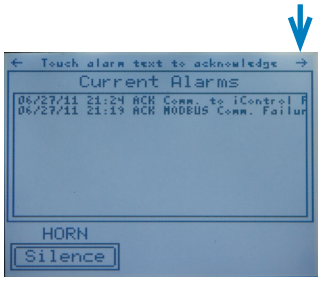
There are two ways to access alarm screens.
From the Overview screen, select the ALARM in the upper right corner of the screen. This is only visible if there is currently an unacknowledged or acknowledged active alarm.

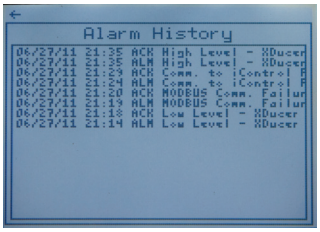
The other way to access alarm screens is to navigate to it. From any screen, press the Menu key and then press the ALARMS button.



Current Alarms Screen

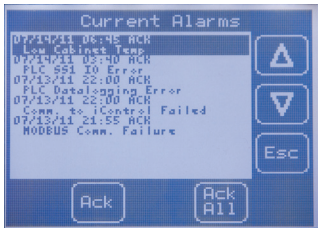
The first alarm screen displayed is for Current Alarms. By pressing the Next key, the Alarm History screen is dispayled.





Acknowledging Alarms

New alarms show up as blinking in the Current Alarm log. To acknowledge a blinking alarm, navigate to the Current Alarms screen as shown above. Touch the text area where the alarms are logged. A new Current Alarm screen is displayed. This screen allows the user to scroll down or up to select the alarm to be acknowledged. When the alarm is selected, press the Ack button on the screen to acknowledge the selected alarm and the alarm will stop blinking.



To acknowledge all alarms at once, press the Ack All button on the screen and all the blinking alarms will stop blinking but will remain in the current alarm log until the event has cleared.

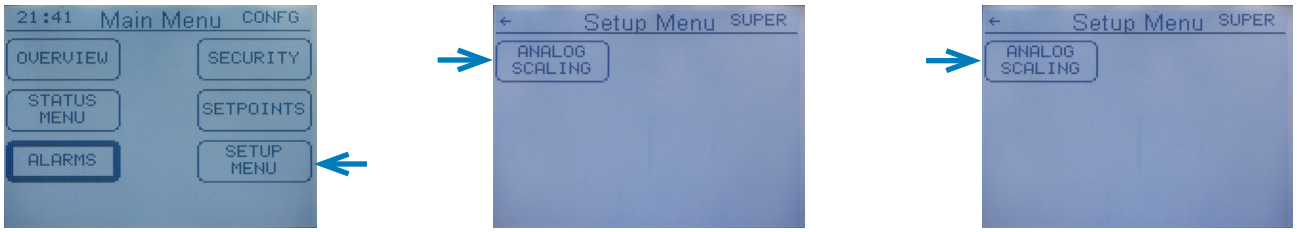
8

Analog Scaling

ANALOG SCALING

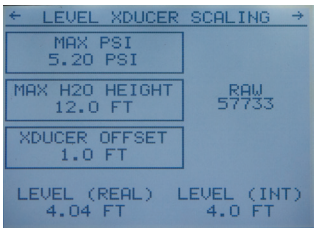
The Micro-VPAC IIT LSC provides analog inputs that are dedicated for a predefined use. Most analog signals need to be scaled so their values are represented correctly on the screen. The following steps and screens show how to setup the various analog inputs on the LSC. To access the analog scaling screens from any screen press the Menu key then the touch the SETUP MENU button on the Main Menu screen. With the Setup Menu displayed, touch the ANALOG SCALING button on the screen.

With the first screen of the Analog Scaling menus displayed from here you can use the Next ➡ Key to navigate to the next screen and the Previous ⬅ key to go back a screen or to the Setup Menu.



LEVEL XDUCER SCALING

This screen sets up the level transducer for the wet well.



MAX PSI

Enter the maximum range of the transducer in PSI by touching the rectangle box to pull up the numeric keypad. Enter the PSI and touch the Enter button on the screen.

MAX H2O HEIGHT

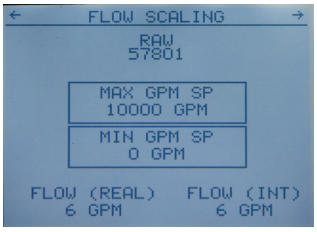
Enter the maximum level of the liquid in the wet well. This should not be confused with the maximum depth of the well. This height should not conflict with the high level setpoint.

XDUCER OFFSET

This is the distance the transducer is off the bottom of the wet well.

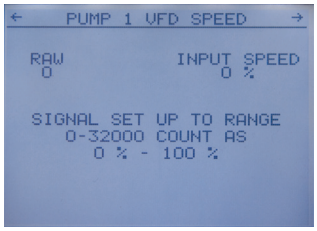
FLOW SCALING

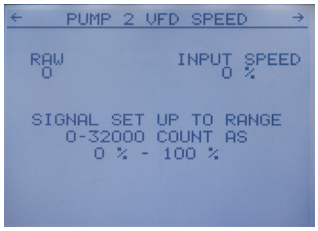
This screen sets up the flow meter scaling. To set this up the min and max values of the flow meter are entered here. This only needs to be setup of there is an external flow meter with a 4 - 20 mA output.

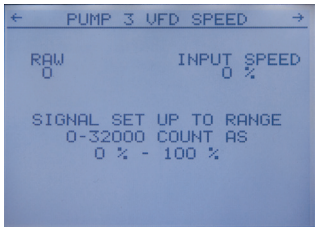


PUMP VFD SPEED

The next screens setup the analog input for VFD speed. The speed is based on %. Where 0% = 0 mA or 0 RPMs, and 100% equals 20 mA or maximum speed. There is no scaling required for this input.

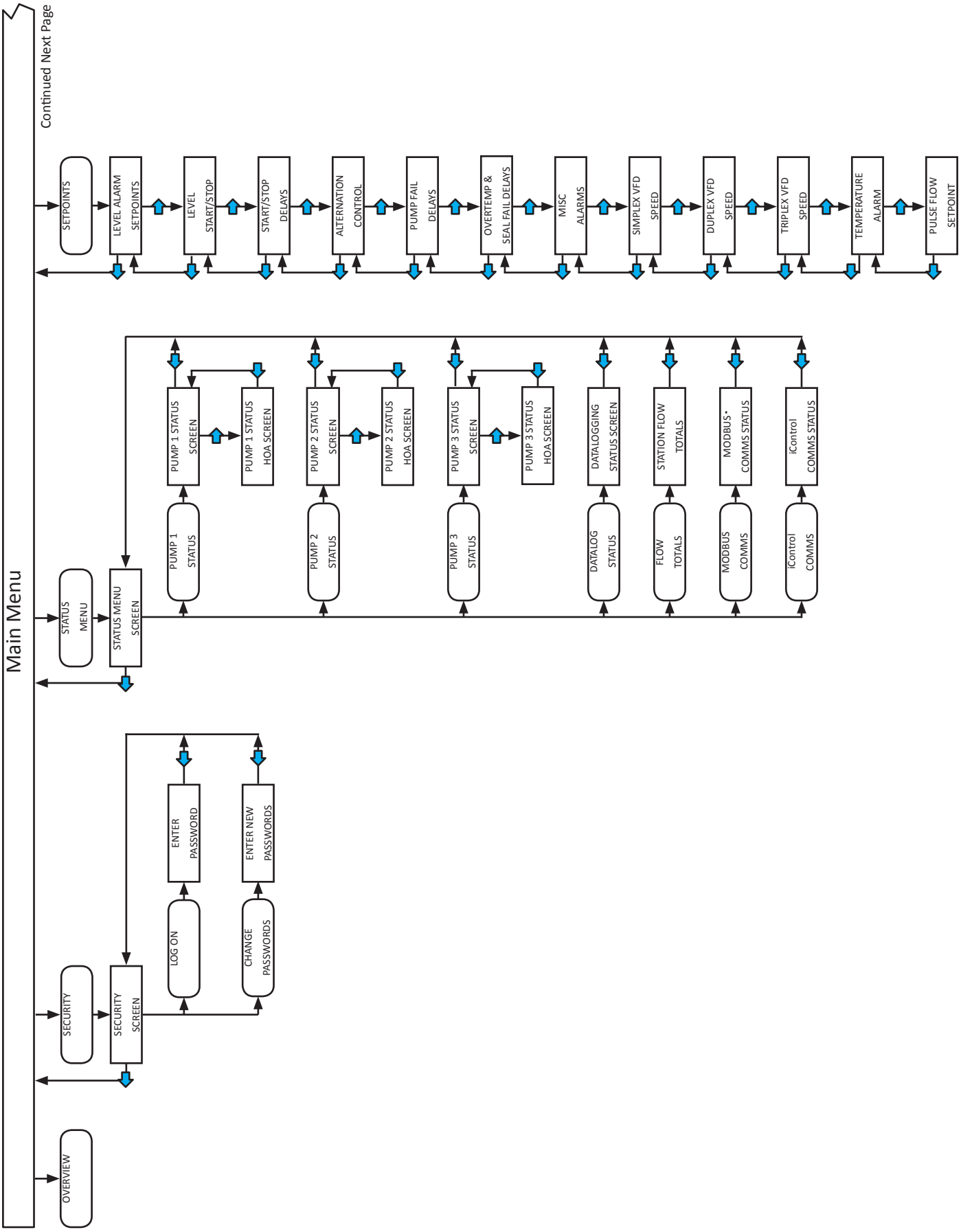


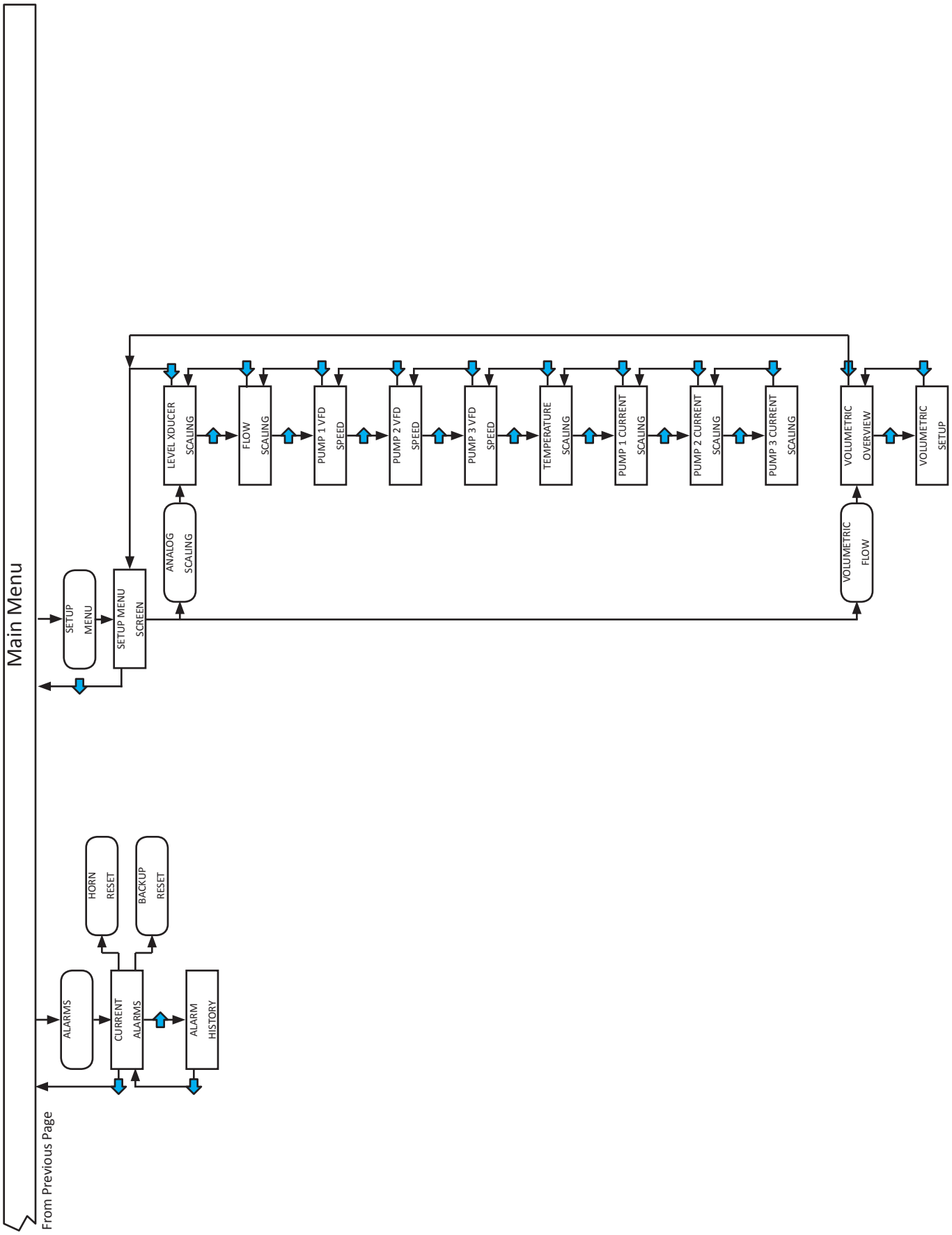




APPENDIX A

Flow Chart


Main Menu
Continued Next Page
SETPOINTS
LEVEL ALARM SETPOINTS
LEVEL START/STOP
START/STOP DELAYS
ALTERNATION CONTROL
PUMP FAIL DELAYS
OVERTEMP & SEAL FAIL DELAYS
MISC ALARMS
SIMPLEX VFD SPEED
DUPLEX VFD SPEED
TRIPLEX VFD SPEED
TEMPERATURE ALARM
PULSE FLOW SETPOINT
STATUS MENU
STATUS MENU SCREEN
PUMP 1 STATUS
PUMP 1 STATUS SCREEN
PUMP 1 STATUS HOA SCREEN
PUMP 2 STATUS
PUMP 2 STATUS SCREEN
PUMP 2 STATUS HOA SCREEN
PUMP 3 STATUS
PUMP 3 STATUS SCREEN
PUMP 3 STATUS HOA SCREEN
DATALOG STATUS
DATALOGGING STATUS SCREEN
FLOW TOTALS
STATION FLOW TOTALS
MODBUS COMMS
MODBUS COMMS STATUS
iCONTROL COMMS
iControl COMMS STATUS
SECURITY
SECURITY SCREEN
LOG ON
ENTER PASSWORD
CHANGE PASSWORDS
ENTER NEW PASSWORDS
OVERVIEW

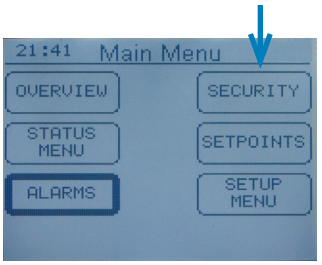

Main Menu
From Previous Page
SETUP MENU
SETUP MENU SCREEN
ANALOG SCALING
LEVEL XDUCER SCALING
FLOW SCALING
PUMP 1 VFD SPEED
PUMP 2 VFD SPEED
PUMP 3 VFD SPEED
TEMPERATURE SCALING
PUMP 1 CURRENT SCALING
PUMP 2 CURRENT SCALING
PUMP 3 CURRENT SCALING
VOLUMETRIC FLOW
VOLUMETRIC OVERVIEW
VOLUMETRIC SETUP
ALARMS
CURRENT ALARMS
ALARM HISTORY
HORN RESET
BACKUP RESET

APPENDIX B

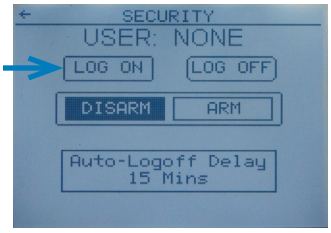
How Do I...

Log On to the controller

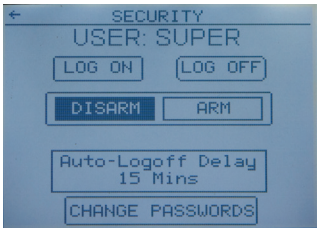
From any screen, press the Menu key and then press the SECURITY button on the screen on the Main Menu screen.



With the SECURITY screen displayed, press the LOG ON button on the screen which will then bring up the ENTER PASSWORD screen.

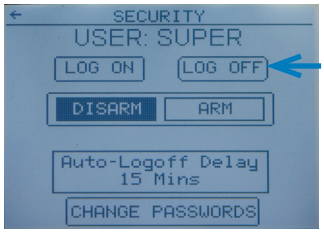


Enter the user password for either OPER (Operator) or SUPER (Supervisor) using the screen keypad and press the Enter button on the screen to accept the password. If the password is correct the will revert back to the SECURITY screen with respective user logged on depending on the password entered. If the password entered is incorrect, the screen will revert back to the ENTER PASSWORD screen for the process to be retried.



Change User

To change the user you must first log off the current user. Follow the steps above to navigate to the SECURITY screen. From the SECURITY screen, press the LOG OFF button on the screen. USER should then show NONE. Once the current user is logged off follow the steps above to log on with a different user password.

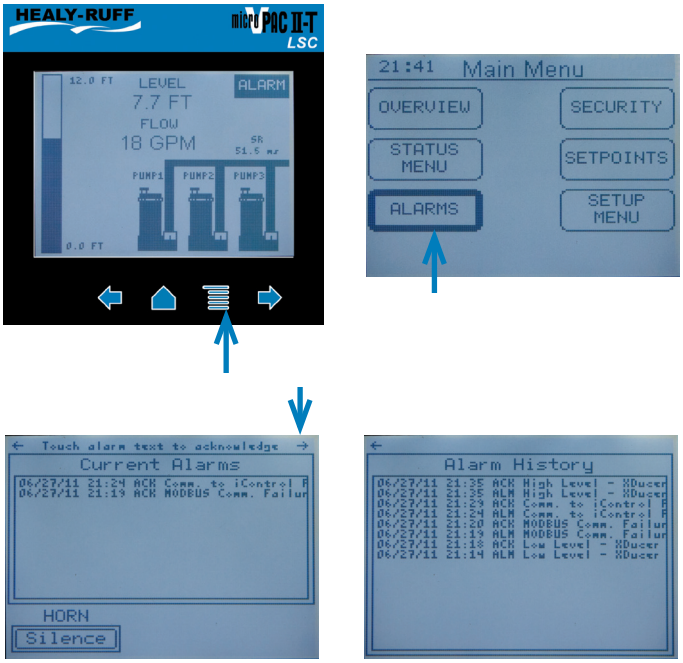


View Alarm History

There are two ways to access the alarm screens. From the Overview screen, select the ALARM in the upper right corner of the screen. This is only visible if there is currently an unacknowledged or acknowledged active alarm.

The other way to access the alarm screens is to navigate to it. From any screen, press the Menu key and then press the ALARMS button.

The first alarm screen displayed is for Current Alarms. By pressing the Next key, the Alarm History screen is dispayled.



APPENDIX C

Interface Modules

LSC INTERFACE MODULES

The Micro-VPAC IIT LSC incorporates 24VDC discrete inputs and outputs. In order to accommodate alternate voltage levels, the LSC Interface modules are available to match the field voltage levels with the controllers voltage levels. The LSC Interface modules also help speed up and simplify field integration.

The LSC Interface modules come standard with a 2 meter cable to run up to the door. Contact the factory for availability of different length cables.

The are two types of interface modules. One for the inputs and one for the outputs. Each module can handle 8 points.

LSC PLC INPUT INTERFACE MODULE - 8 PT

A diagram has been created to assist in field wiring and mapping the field signals to the inputs on the LSC. Up to three input modules per controller may be required depending on the application.

To map the field signals to the LSC inputs follow these steps:

1. Print out as many INPUT INTERFACE diagrams that are required to meet the input requirements. If there are only four signals to monitor then only one sheet is required. If ten signals, two sheets required, etc.

2. Give the module a unique number like TB1 or TBA and write it in the box above the module on the diagram. [TB 1, TB 2...]

3. Using the chart in the middle, select the signals to monitor and fill in the empty blanks on the RIGHT hand side of the diagram. Signals can be in any order.

Example:	TBx: 0:A1	DI1	[P1 RUNNING]
	TBx: 1:A1	DI6	[P2 RUNNING]
	TBx: 2:A1	DI4	[P1 OVERTEMP]
	TBx: 3:A1	DI9	[P2 OVERTEMP]

4. Insert the pre-printed terminal markers provided onto each point (black tab on top of each green relay), matching the order to the list just created.

5. Fill in the blanks on the LEFT matching the ones on the RIGHT.

Example:	TBx.0	I1	[P1 RUNNING]
	TBx.1	I6	[P2 RUNNING]
	TBx.2	I4	[P1 OVERTEMP]
	TBx.3	I9	[P2 OVERTEMP]

INSTALLATION - INPUT MODULE

Below are step-by-step instructions for installing an input interface module.

1. With the inputs mapped and labeled, the module is ready for installation. Locate a place with enough room to mount the input module and a DC power supply (usually provided).

2. Run the cable to the LSC controller and land wire numbers 1 thru 8 to the inputs mapped out above.

   Example: TBx.0 I1 --> #1 BK (black) Wire --> I1 LSC orange connector
   TBx.1 I6 --> #2 BN (brown) Wire --> I6 LSC orange connector
   TBx.2 I4 --> #3 RD (red) Wire --> I4 LSC orange connector
   TBx.3 I9 --> #4 OR (orange) Wire --> I1 LSC orange connector

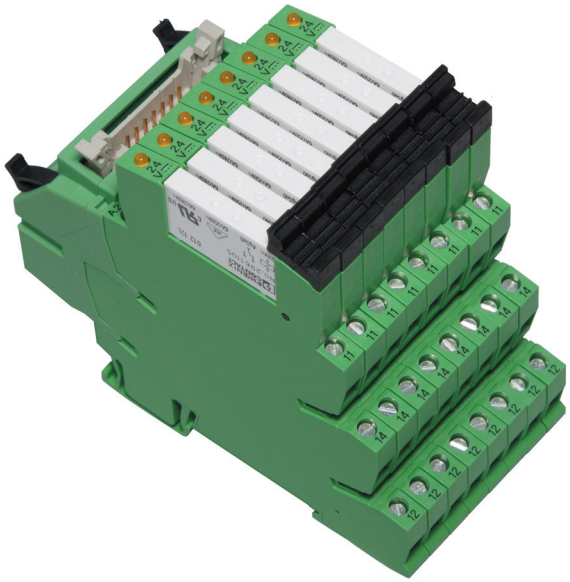
3. Wire numbers 9, 11, and 13 are +24VDC, and can be used to power the LSC controller and I/O. Connect wire #9 GY (grey) to the + symbol on the LSC power connector. Note: the power connector has three (3) terminals.

4. Connect wire #11 WT/BK (white/black) to V+ on the black I/O connector for the outputs.

5. Cap off wire #13 WT/RD (white/red) if it is not being used to prevent it from shorting out and damaging equipment.

6. From the 24VDC power supply, run +24VDC to the positive (+) terminal connection on the INPUT INTERFACE module. Note: the power connection on the module is located under the cable connector.

7. From the 24VDC power supply, run 0V (-) to the negative (-) terminal connection on the INPUT INTERFACE module. Note: the power connection on the module is located under the cable connector.



LSC PLC OUTPUT INTERFACE MODULE - 8 PT

Just like the input module the output module has a separate diagram to assist in field wiring and mapping the LSC output signals to the various field devices. Up to two output modules per controller may be required depending on the application.

To map the LSC output signals to the field devices follow these steps:

1. Print out as many OUTPUT INTERFACE diagrams that are required to meet the field requirements. If only four signals are required then only one sheet is required. If ten signals, two sheets are required.

2. Give the module a unique number like TB1 or TBA and write it in the box above the module on the diagram. [TB 1, TB 2...]. The output module ID should be unique and not match any input module ID.

3. Using the chart in the middle, select the outputs signals and fill in the empty blanks on the RIGHT hand side of the diagram. Signals can be in any order.

Example:	TBx: CR1.0	DO1	[PUMP 1 CALL]
	TBx: CR1.1	DO4	[PUMP 2 CALL]
	TBx: CR1.2	DO2	[PUMP 1 FAILURE]
	TBx: CR1.3	DO5	[PUMP 2 FAILURE]

4. Insert the pre-printed terminal markers provided onto each point (black tab on top of each green relay), matching the order to the list just created.

5. Fill in the blanks on the LEFT matching the ones on the RIGHT.

Example:	TBx.0	Q1	[PUMP 1 CALL]
	TBx.1	Q4	[PUMP 2 CALL]
	TBx.2	Q2	[PUMP 1 FAILURE]
	TBx.3	Q5	[PUMP 2 FAILURE]

INSTALLATION - OUTPUT MODULE

Below are step-by-step instructions for installing an output interface module.

1. With the outputs mapped and labeled, the module is ready for installation. Locate a place with enough room to mount the output module and a DC power supply if it has not already been mounted (usually provided).

2. Run the cable to the LSC controller and land wire numbers 1 thru 8 to the outputs mapped out above.

Example:	TBx.0	DO1 --> #1 BK (black) Wire --> Q1 LSC black connector
	TBx.1	DO4 --> #2 BN (brown) Wire --> Q4 LSC black connector
	TBx.2	DO2 --> #3 RD (red) Wire --> Q2 LSC black connector
	TBx.3	DO5 --> #4 OR (orange) Wire --> Q5 LSC orange connector

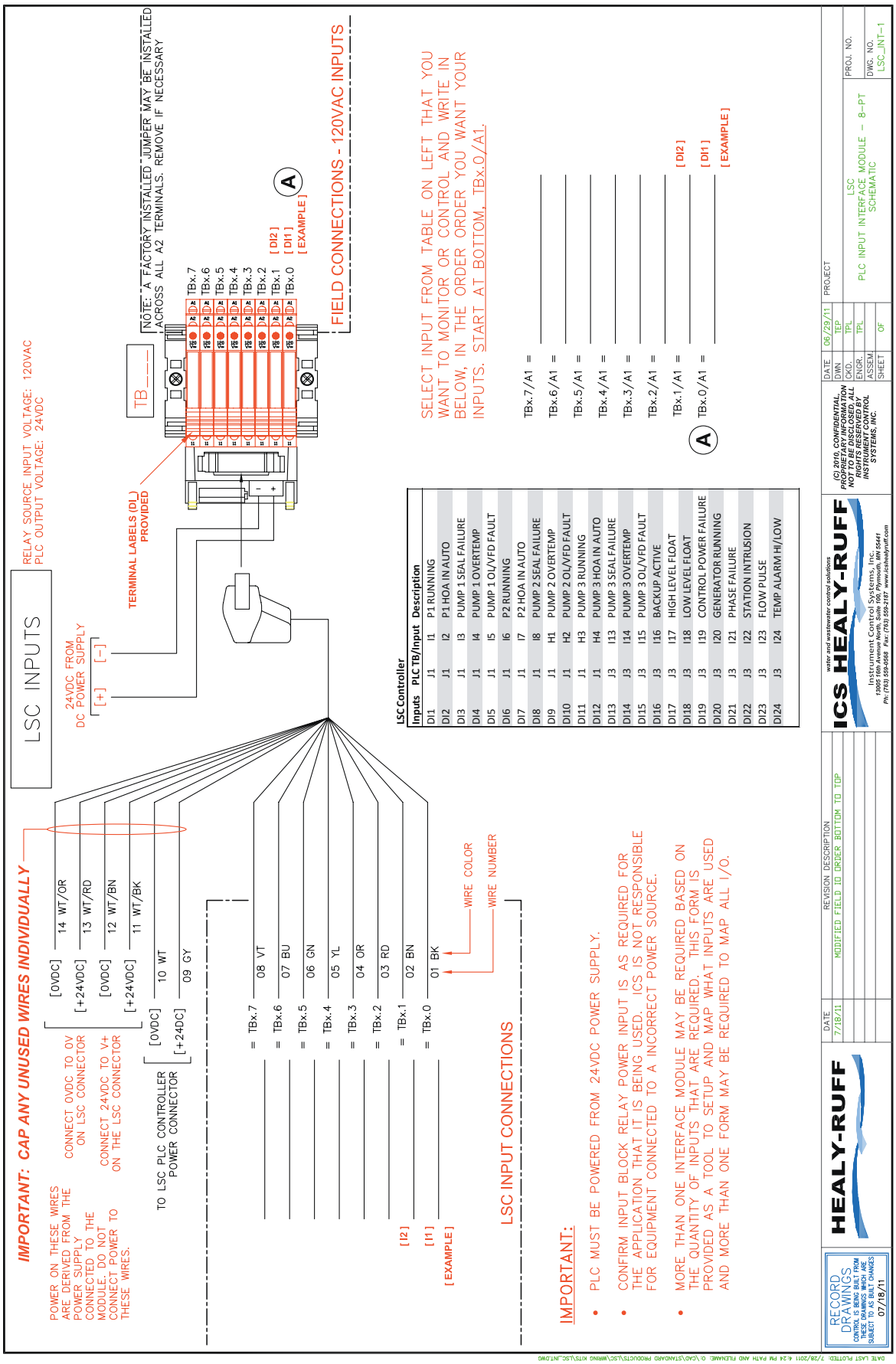
3. Wire numbers 9, 11, and 13 are +24VDC, and can be used to power the LSC controller and I/O. Connect wire #9 GY (grey) to the + symbol on the LSC power connector. Note: the power connector has three (3) terminals.

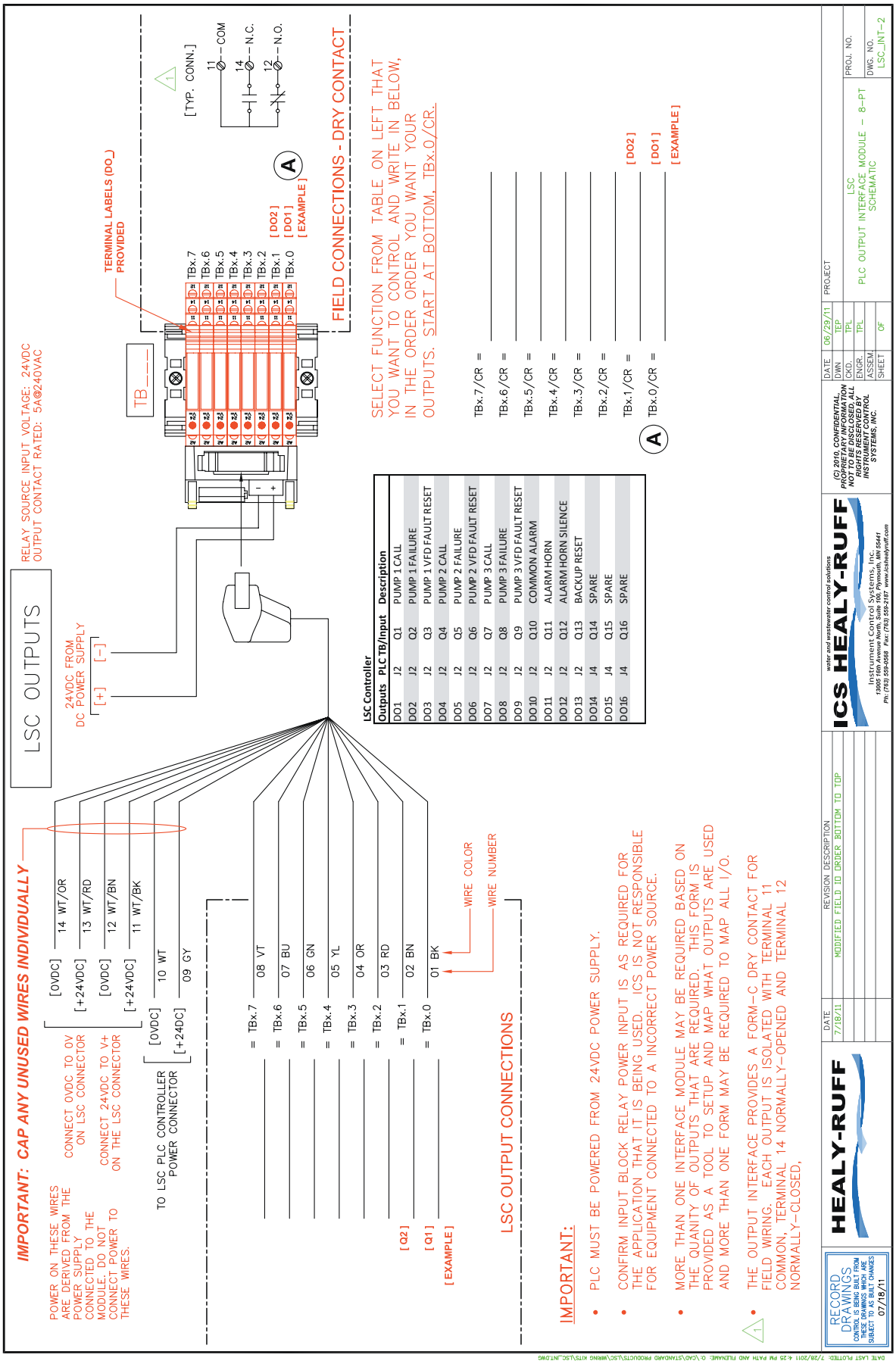
4. Connect wire #11 WT/BK (white/black) to V+ on the black IO connector for the outputs.

5. Cap off any unused wires individually to prevent it from shorting out and damaging equipment.

6. From the 24VDC power supply, run +24VDC to the positive (+) terminal connection on the OUTPUT INTERFACE module. Note: the power connection on the module is located under the cable connector.

7. From the 24VDC power supply, run 0V (-) to the negative (-) terminal connection on the OUTPUT INTERFACE module. Note: the power connection on the module is located under the cable connector.


LSC INPUTS
RELAY SOURCE INPUT VOLTAGE: 120VAC
PLC OUTPUT VOLTAGE: 24VDC
IMPORTANT: CAP ANY UNUSED WIRES INDIVIDUALLY
POWER ON THESE WIRES ARE DERIVED FROM THE POWER SUPPLY CONNECTED TO THE MODULE. DO NOT CONNECT POWER TO THESE WIRES.
CONNECT 0VDC TO 0V ON LSC CONNECTOR
CONNECT 24VDC TO V+ ON THE LSC CONNECTOR
TO LSC PLC CONTROLLER POWER CONNECTOR
[0VDC] 14 WT/OR
[+24VDC] 13 WT/RD
[0VDC] 12 WT/BN
[+24VDC] 11 WT/BK
[0VDC] 10 WT
[+24DC] 09 GY
= TBx.7 08 VT
= TBx.6 07 BU
= TBx.5 06 GN
= TBx.4 05 YL
= TBx.3 04 OR
= TBx.2 03 RD
= TBx.1 02 BN
= TBx.0 01 BK
[I2]
[I1]
[EXAMPLE]
WIRE COLOR
WIRE NUMBER
LSC INPUT CONNECTIONS
24VDC FROM DC POWER SUPPLY
[+] [-]
TERMINAL LABELS (DL) PROVIDED
TB____
NOTE: A FACTORY INSTALLED JUMPER MAY BE INSTALLED ACROSS ALL A2 TERMINALS. REMOVE IF NECESSARY
TBx.7 TBx.6 TBx.5 TBx.4 TBx.3 TBx.2 TBx.1 TBx.0
[DI2] [DI1] [EXAMPLE]
A
FIELD CONNECTIONS - 120VAC INPUTS
SELECT INPUT FROM TABLE ON LEFT THAT YOU WANT TO MONITOR OR CONTROL AND WRITE IN BELOW, IN THE ORDER ORDER YOU WANT YOUR INPUTS. START AT BOTTOM, TBx.0/A1.
TBx.7/A1 = _____
TBx.6/A1 = _____
TBx.5/A1 = _____
TBx.4/A1 = _____
TBx.3/A1 = _____
TBx.2/A1 = _____ [DI2]
TBx.1/A1 = _____ [DI1]
TBx.0/A1 = _____ [EXAMPLE]
A
LSC Controller
Inputs PLC TB/Input Description
DI1 J1 I1 P1 RUNNING
DI2 J1 I2 P1 HOA IN AUTO
DI3 J1 I3 PUMP 1 SEAL FAILURE
DI4 J1 I4 PUMP 1 OVERTEMP
DI5 J1 I5 PUMP 1 OL/VFD FAULT
DI6 J1 I6 P2 RUNNING
DI7 J1 I7 P2 HOA IN AUTO
DI8 J1 I8 PUMP 2 SEAL FAILURE
DI9 J1 H1 PUMP 2 OVERTEMP
DI10 J1 H2 PUMP 2 OL/VFD FAULT
DI11 J1 H3 PUMP 3 RUNNING
DI12 J1 H4 PUMP 3 HOA IN AUTO
DI13 J3 I13 PUMP 3 SEAL FAILURE
DI14 J3 I14 PUMP 3 OVERTEMP
DI15 J3 I15 PUMP 3 OL/VFD FAULT
DI16 J3 I16 BACKUP ACTIVE
DI17 J3 I17 HIGH LEVEL FLOAT
DI18 J3 I18 LOW LEVEL FLOAT
DI19 J3 I19 CONTROL POWER FAILURE
DI20 J3 I20 GENERATOR RUNNING
DI21 J3 I21 PHASE FAILURE
DI22 J3 I22 STATION INTRUSION
DI23 J3 I23 FLOW PULSE
DI24 J3 I24 TEMP ALARM HI/LOW
IMPORTANT:
• PLC MUST BE POWERED FROM 24VDC POWER SUPPLY.
• CONFIRM INPUT BLOCK RELAY POWER INPUT IS AS REQUIRED FOR THE APPLICATION THAT IT IS BEING USED. ICS IS NOT RESPONSIBLE FOR EQUIPMENT CONNECTED TO A INCORRECT POWER SOURCE.
• MORE THAN ONE INTERFACE MODULE MAY BE REQUIRED BASED ON THE QUANTITY OF INPUTS THAT ARE REQUIRED. THIS FORM IS PROVIDED AS A TOOL TO SETUP AND MAP WHAT INPUTS ARE USED AND MORE THAN ONE FORM MAY BE REQUIRED TO MAP ALL I/O.
RECORD DRAWINGS
CONTROL IS BEING BUILT FROM THESE DRAWINGS, WHICH ARE SUBJECT TO AS BUILT CHANGES
07/18/11
HEALY-RUFF
DATE 7/18/11
REVISION DESCRIPTION
MODIFIED FIELD TO ORDER BOTTOM TO TOP
water and wastewater control solutions
ICS HEALY-RUFF
Instrument Control Systems, Inc.
13005 16th Avenue North, Suite 100, Plymouth, MN 55441
Ph: (763) 559-0568 Fax: (763) 559-2187 www.icshealyruff.com
(C) 2010, CONFIDENTIAL, PROPRIETARY INFORMATION NOT TO BE DISCLOSED, ALL RIGHTS RESERVED BY INSTRUMENT CONTROL SYSTEMS, INC.
DATE 06/29/11
DWN TEP
CKD. TPL
ENGR. TPL
ASSEM.
SHEET OF
PROJECT
LSC
PLC INPUT INTERFACE MODULE – 8-PT
SCHEMATIC
PROJ. NO.
DWG. NO. LSC_INT-1
DATE LAST PLOTTED: 7/28/2011 4:24 PM PATH AND FILENAME: O:\CAD\STANDARD PRODUCTS\LSC\WIRING KITS\LSC_INT.DWG


LSC OUTPUTS
RELAY SOURCE INPUT VOLTAGE: 24VDC
OUTPUT CONTACT RATED: 5A@240VAC
TERMINAL LABELS (DO_) PROVIDED
TB ____
TBx.7
TBx.6
TBx.5
TBx.4
TBx.3
TBx.2
TBx.1
TBx.0
[DO2]
[DO1]
[EXAMPLE]
A
[TYP. CONN.]
11 COM
14 N.C.
12 N.O.
24VDC FROM DC POWER SUPPLY
[+] [-]
FIELD CONNECTIONS - DRY CONTACT
SELECT FUNCTION FROM TABLE ON LEFT THAT YOU WANT TO CONTROL AND WRITE IN BELOW, IN THE ORDER ORDER YOU WANT YOUR OUTPUTS. START AT BOTTOM, TBx.0/CR.
TBx.7/CR =
TBx.6/CR =
TBx.5/CR =
TBx.4/CR =
TBx.3/CR =
TBx.2/CR =
TBx.1/CR = [DO2]
TBx.0/CR = [DO1]
[EXAMPLE]
LSC Controller
Outputs PLC TB/Input Description
DO1 J2 Q1 PUMP 1 CALL
DO2 J2 Q2 PUMP 1 FAILURE
DO3 J2 Q3 PUMP 1 VFD FAULT RESET
DO4 J2 Q4 PUMP 2 CALL
DO5 J2 Q5 PUMP 2 FAILURE
DO6 J2 Q6 PUMP 2 VFD FAULT RESET
DO7 J2 Q7 PUMP 3 CALL
DO8 J2 Q8 PUMP 3 FAILURE
DO9 J2 Q9 PUMP 3 VFD FAULT RESET
DO10 J2 Q10 COMMON ALARM
DO11 J2 Q11 ALARM HORN
DO12 J2 Q12 ALARM HORN SILENCE
DO13 J2 Q13 BACKUP RESET
DO14 J4 Q14 SPARE
DO15 J4 Q15 SPARE
DO16 J4 Q16 SPARE
IMPORTANT: CAP ANY UNUSED WIRES INDIVIDUALLY
POWER ON THESE WIRES ARE DERIVED FROM THE POWER SUPPLY CONNECTED TO THE MODULE. DO NOT CONNECT POWER TO THESE WIRES.
CONNECT 0VDC TO 0V ON LSC CONNECTOR
CONNECT 24VDC TO V+ ON THE LSC CONNECTOR
TO LSC PLC CONTROLLER POWER CONNECTOR
[0VDC] [+24DC]
[0VDC] 14 WT/OR
[+24VDC] 13 WT/RD
[0VDC] 12 WT/BN
[+24VDC] 11 WT/BK
10 WT
09 GY
= TBx.7 08 VT
= TBx.6 07 BU
= TBx.5 06 GN
= TBx.4 05 YL
= TBx.3 04 OR
= TBx.2 03 RD
= TBx.1 02 BN
= TBx.0 01 BK
[Q2]
[Q1]
[EXAMPLE]
WIRE COLOR
WIRE NUMBER
LSC OUTPUT CONNECTIONS
IMPORTANT:
PLC MUST BE POWERED FROM 24VDC POWER SUPPLY.
CONFIRM INPUT BLOCK RELAY POWER INPUT IS AS REQUIRED FOR THE APPLICATION THAT IT IS BEING USED. ICS IS NOT RESPONSIBLE FOR EQUIPMENT CONNECTED TO A INCORRECT POWER SOURCE.
MORE THAN ONE INTERFACE MODULE MAY BE REQUIRED BASED ON THE QUANITY OF OUTPUTS THAT ARE REQUIRED. THIS FORM IS PROVIDED AS A TOOL TO SETUP AND MAP WHAT OUTPUTS ARE USED AND MORE THAN ONE FORM MAY BE REQUIRED TO MAP ALL I/O.
1 THE OUTPUT INTERFACE PROVIDES A FORM-C DRY CONTACT FOR FIELD WIRING. EACH OUTPUT IS ISOLATED WITH TERMINAL 11 COMMON, TERMINAL 14 NORMALLY-OPENED AND TERMINAL 12 NORMALLY-CLOSED.
RECORD DRAWINGS
CONTROL IS BEING BUILT FROM THESE DRAWINGS WHICH ARE SUBJECT TO AS BUILT CHANGES
07/18/11
DATE 7/18/11
REVISION DESCRIPTION
MODIFIED FIELD ID ORDER BOTTOM TO TOP
HEALY-RUFF
water and wastewater control solutions
ICS HEALY-RUFF
Instrument Control Systems, Inc.
13005 16th Avenue North, Suite 100, Plymouth, MN 55441
Ph: (763) 559-0568 Fax: (763) 559-2187 www.icshealyruff.com
(C) 2010, CONFIDENTIAL, PROPRIETARY INFORMATION NOT TO BE DISCLOSED. ALL RIGHTS RESERVED BY INSTRUMENT CONTROL SYSTEMS, INC.
DATE 06/29/11
DWN TEP
CKD TPL
ENGR TPL
ASSEM
SHEET OF
PROJECT
LSC
PLC OUTPUT INTERFACE MODULE - 8-PT SCHEMATIC
PROJ. NO.
DWG. NO. LSC_INT-2
DATE LAST PLOTTED: 7/28/2011 4:25 PM PATH AND FILENAME: O:\CAD\STANDARD PRODUCTS\LSC\WIRING KITS\LSC_INT.DWG