Introduction

Product Overview

The Oil Alert Simplex control system is designed and approved for the safe operation of pumping, alarming and monitoring elevator sump pits, transformer vaults and leachate well applications. The Oil Alert will activate a pump to remove water from elevator pits in accordance with ASME A17.1. The Oil Alert stops the pump before oil or other harmful substances enter our water supply.

A menu system with a rotary encoder interface and a front facing RGB indicator beacon provide indication of the current system state as well as access to the application configurations. Hand-Off-Auto controls for each pump are provided via push button control or via optional toggle switches mounted on the inner door of the panel.

The panel also has several auxiliary dry contact outputs. They are as follows:

Auxiliary Contact	Meaning	Function/Trigger
C1	Common 1	This is the common connection for the O and W contacts
O	Oil Alarm Contact	Oil Alarms
W	Water Alarm Contact	Water Alarms, Input Errors, and Power Loss
C2	Common 2	This is the common connection for the T1, P1, T2, and P2 contacts
T1	Trouble Alarm 1 Contact	P1 Overload, P1 Under Current, P1 Over Current, P1 Fail, P1 Contactor Latched
P1	Pump 1 Run Contact	P1 Run

Operation

The Oil Alert control system has two modes of operation; Standard Oil Alert for Sump Applications and Pump Station for Lift Station Applications. The panel will be programmed at the factory for one mode or the other based

on the sensors purchased with the panel. However, this setting can still be changed in the field by the user. See the Settings section for further details.

Standard Oil Alert for Sump Applications

This mode uses the standard preset level sensor (three water probes and one float) for elevator sump applications. In this mode, when water rises up to the start probe (middle probe), the pump will activate and stay active until water leaves the stop probe (longest probe). If water continues to rise and touches the alarm probe (shortest probe), a high water alarm will be activated. If the Oil Check float activates while there is no water touching the alarm probe (implying a thick layer of oil is preset) the system will initiate an Oil Alarm.

In addition to the above described behaviors, there is an extra digital input (PCB Input FLT 2) on the Oil Alert circuit board that can be configured to operate as either a fire system input or as a redundant off/low level alarm. The fire system input will cause ALL inputs to start the pump in order to ensure the pit is emptied during an emergency. The low alarm/redundant off configuration will cause it to act as a low level alarm float. If this float is down (inactive), a low level alarm will trigger and the pump will deactivate.

Fig.1 - Standard Oil Alert for Sump Applications

Pump Station for Lift Station Applications

This mode uses 3 or 4 floats and a single water detecting probe for use in lift station applications.

In 3 float mode, there is a water detecting probe (PCB Input G), a stop float (PCB Input Y), a start float (PCB Input R), and an alarm float (PCB Input W). As water rises and activates the start float, the pump will activate and stay

active until the stop float goes down. If water continues to rise and activates the alarm float, a high level alarm will be triggered. In this mode, the extra digital input (PCB Input FLT 2) will configured as a fire system alarm input. If the fire input is active, ANY sensor input will activate the pumps in order to empty the pit during emergencies.

In 4 float mode, the extra digital input (FLT 2) is configured to act as a low alarm/redundant off float. If the low level alarm float is down (inactive) a low level alarm will trigger and the pumps will turn off.

The system detects oil by checking the water detection probe whenever any float is active; if the water probe does not detect water when any float is active (implying a thick layer of oil), an Oil Alarm will be generated.
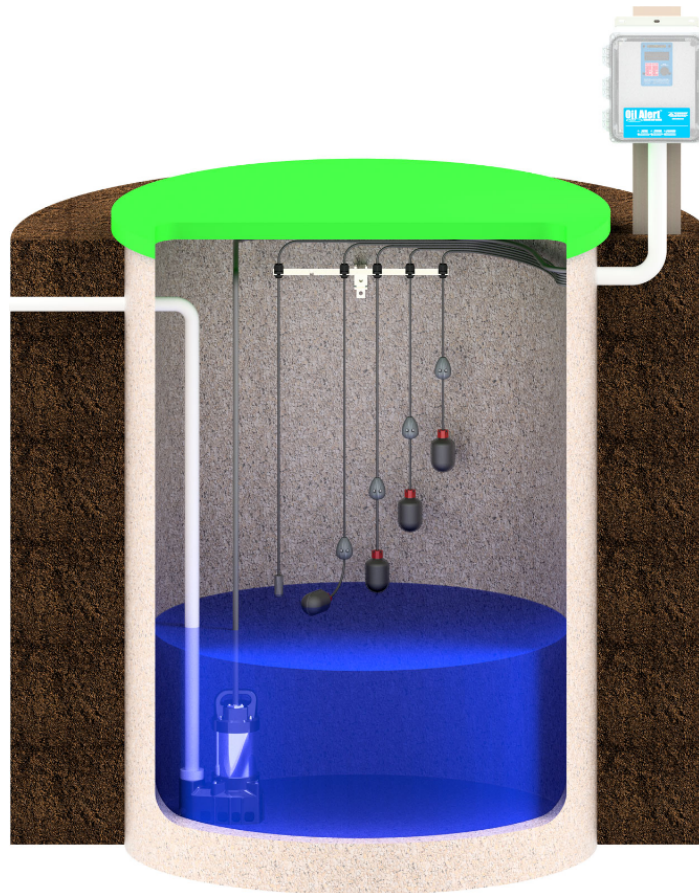

Fig.2 - Pump Station for Lift Station Applications

Pump Monitoring

In addition to the above mentioned pump control features, the Oil Alert also features current sensing for the pump. This allows the system to detect undercurrent, overcurrent, contactor latching, and contactor failure to close events.

Before Installation

Before proceeding with the installation or operation of the control panel read all instructions thoroughly, as well as comply with all Federal, State and Local Codes, Regulations and Practices. The control panel must be installed by qualified personnel familiar with all applicable local electrical and mechanical codes. Refer to the National Electrical Code (NFPA 70). Failure to properly install and test this product can result in personal injury or equipment malfunction. All conduit connected to the panel must be sealed with conduit sealant to prevent

moisture or gases from entering the panel. NEMA 1 enclosures are for indoor use only while NEMA 4X panel enclosures may be used indoor or outdoor. Refer to panel model name plate on inside of door for enclosure rating. Note: If options are ordered that affect the number of floats, refer to the panel schematic for complete information.

Safety Guidelines

1. DO NOT USE WITH FLAMMABLE OR EXPLOSIVE FLUIDS SUCH AS GASOLINE, FUEL OIL, KEROSENE, ETC. DO NOT USE IN EXPLOSIVE ATMOSPHERES. CONTROL PANEL SHOULD ONLY BE USED IN WATER AND WASTEWATER APPLICATIONS THAT ARE NOT RATED AS A HAZARDOUS LOCATION.

2. DO NOT WORK ON THE CONTROL PANEL WITH LIVE VOLTAGE APPLIED TO THE CONTROL PANEL WITH WET HANDS OR WHEN STANDING ON A WET SURFACE.

3. DISCONNECT ALL ELECTRICAL SERVICE BEFORE WORKING ON OR HANDLING THE CONTROL PANEL

4. INCOMING VOLTAGE MUST MATCH THE CONTROL PANEL VOLTAGE. REFER TO THE PANEL SCHEMATIC FOR COMPLETE INFORMATION.

Input Wiring

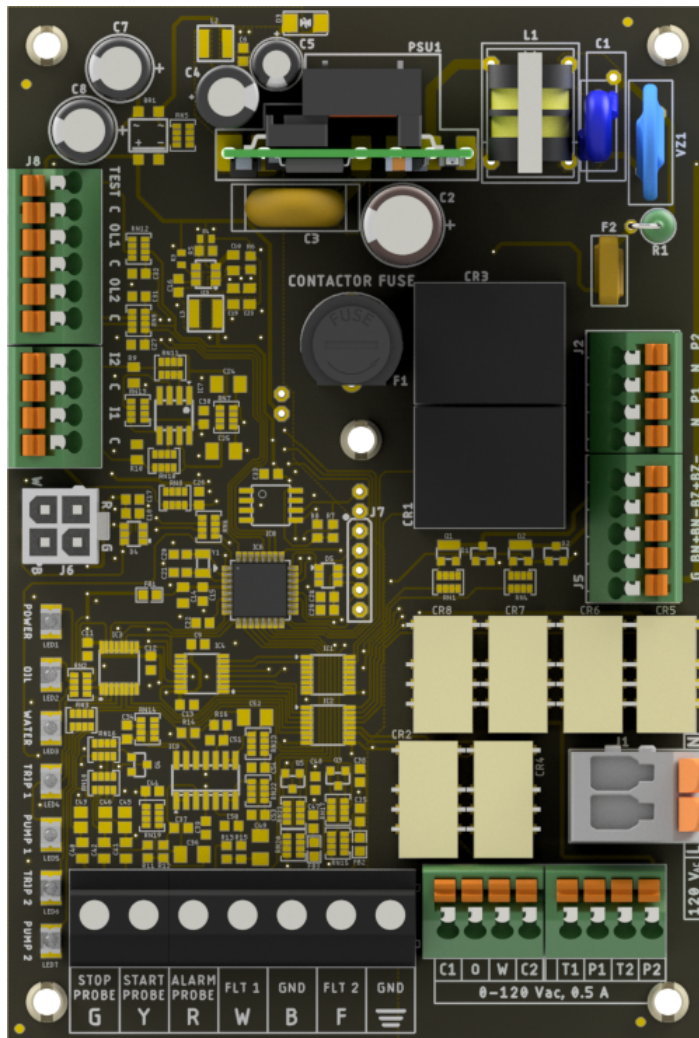Below is a brief guide for wiring power and sensors to the Oil Alert PCB.

Fig.3 - Oil Alert PCB

Board Power

Board power for the Oil Alert PCB is wired directly into the L and N terminals in the lower right quadrant of the PCB pictured above. The PCB is connected to earth ground via the aluminum backplate of the panel. Therefore, earth ground from both the pump and control power inputs MUST be connected to the backplate using the provided ground connection points to ensure proper operation of the product.

Sensor Inputs

The sensor inputs (float and water probes) are wired into the black terminal block on the bottom of the Oil Alert PCB shown above.

When using the standard preset level sensor, simply match the colors from the preset level sensor cable to the color designations on the input terminal (G for green, Y for yellow, and so on). The F input (FLT 2) is the extra digital input that can be used as either a redundant off input or as a fire alarm input, as described in the Operation section of this manual. The factory default is for it to be configured as a fire alarm input.

Standard Oil Alert Input Configurations

FLT 2 Configuration	Input G	Input Y	Input R	Input W	Input F
Fire Input (Default)	Stop Probe	Start Probe	High Water Probe	Oil Float	Fire Input
Low Alarm	Stop Probe	Start Probe	High Water Probe	Oil Float	Low Alarm/Redundant Off Float

When using the pump station mode (3-4 floats with a single water detecting probe), all of the floats must have a common return connected to either (B) or the GND terminal. This connection is a direct connection with earth ground through the backplate of the panel. The float functions are as described in the table below, based on how the system is configured:

Pump Station Input Configurations

FLT 2 Configuration	Input G	Input Y	Input R	Input W	Input F
Fire Input (Default)	Water Detect Probe	Stop Float	Start Float	High Alarm Float	Fire Input
Low Alarm	Water Detect Probe	Stop Float	Start Float	High Alarm Float	Low Alarm/Redundant Off Float

Menu System

Interface

The user interface of the Oil Alert comprises a 16x2 OLED display, three RGB indicator LEDs, and a rotary knob (scroll wheel) used to navigate the menu system. While the system is idle, the menu screen will be turned off to conserve the life of the display. To wake it up, simply make any input on the menu navigation knob.

Navigating the Menu

The scroll wheel is used for all user inputs to the menu system. This includes navigation, configuration inputs, alarm clears, and so on. Below is a table summarizing the interface to the menu system.

Action	Result
Pressing the Knob	Navigate Forward, Select, Commit a Change, Clear an Alarm

Action	Result
Scrolling Clockwise	Navigate to the Right, Increase a Config Value
Scrolling Counter-Clockwise	Navigate to the Left, Decrease a Config Value
Activating Test/Silence Switch	Cancel Input; Silence Alarm; Exit Menu; Start Test Routine

Test/Silence Switch Note

The Test/Silence switch on the side of the panel can be used to:

▸ Silence the buzzer

▸ Cancel user inputs

▸ Exit the menu system

▸ Start an indicator test routine

There are different priorities for each of these functions, so sometimes up to three presses of the test/silence switch may be needed to get the desired result. The first press will always silence the buzzer (if active) and cancel any inputs (if active); the next press will exit the menu system; the final press will activate the test routine.

Menu Conventions

There are a set of arrow indicators that will appear on the bottom line of the display to aid with menu navigation. Below is a table summarizing these indicators:

Indicator	Image	Meaning
Right Arrow on Bottom Right	MENU →	The user can navigate forward or select a config from here. Press the scroll wheel to take this action.
Left Arrow on Bottom Right	BACK ←	The user can navigate backwards from here. Press the scroll wheel to take this action.
Blinking Right Arrow on Bottom Left	CONFIG TYPE →CONFIG VALUE	A config is being modified when this is shown. Scroll the wheel to change the config. Press the scroll wheel to commit the change. To cancel the input, either wait for the timeout OR press the test/silence switch to exit the menu.
Enter Arrow on Bottom Right	CONFIG TYPE →CONFIG VALUE ↵	This arrow indicates a config can be committed. Press the knob to commit OR cancel the input as described in the entry above.

To Change a Setting

Configurations on the Oil Alert are organized into a config path type structure similar to a file path on a computer. All configuration "paths" are of the type shown below.

MENU →	SETTINGS →	ENTER PASSWORD 0000	CONFIG GROUP SET UP →	INDIVIDUAL CONFIG →

All configurations are located behind the password in the menu. After the password, configurations are organized into groups, sub-groups, and individual configurations. The config "path" for every configuration is displayed in the table in Available Settings.

▸ **NOTE: To cancel an input, press the test/silence switch on the side of the panel. This will cancel any active input and let you re-enter the setting. This will also cancel the Setup Wizard (detailed below) and let you start over.**

Please see the Settings section of this document for an exhaustive list of all available configurations.

To Clear an Alarm

To clear an alarm, simply scroll to it in the main screen (press the test/silence switch to jump there) and then press the rotary knob. A confirmation screen will appear and ask if the alarm should be cleared. Press the knob again to clear the alarm.

```
ALARM EVENT
→CLEAR ALARM?      ↵
```

Note that if the alarm immediately re-activates and the buzzer activates again, this means that the alarm condition is still present and the system cannot clear the alarm. If this happens, check for the source of the alarm.

Quick Setup Guide

This section will cover all of the information needed to get a panel up and running for its specific application. It will cover running the Setup Wizard, which will configure the most important configurations, as well as several examples of optional configurations that can be used to customize the application. An exhaustive list of configurations can be found in the Settings section of the Wiki (https://wiki.aind.co/ ⤢).

System Setup with the Setup Wizard

The Setup Wizard will set the critical system configurations and get a system up and running quickly.

▸ **NOTE:** The Setup Wizard can be restarted at any point in its execution by pressing the Test/Silence switch once.

Step 1

Run the Setup Wizard by following the menu path shown below. This will configure the type of sensors the system is set up for, what the configurable FLT2 input should be used for, as well as the high and low amp trip levels for the pump.

```
MENU                SETTINGS            ENTER PASSWORD      SETUP
              →                   →     1919                WIZARD           →
```

Step 2 (In Setup Wizard)

Set System Type. This tells the system which type of inputs it is using and determines how it uses those inputs. The options are:

▸
```
SYSTEM TYPE
→3 PROBE & FLOAT
```

    ▸ This is the standard Oil Alert Sensor configuration for sump applications.

▸ `SYSTEM TYPE`
  `→3-4FLTS & PROBE`

▸ This is for lift station applications where three or four floats are used with a suspension oil probe

Step 3 (In Setup Wizard)

Enter Full Load Amps (FLA) for the pump. This will configure the high and low amps alarm points for the pump. The system will set the trip points at 25% above and below the FLA entered here. Note that both high and low amps can be field modified individually in the Pump Set Up section of the menu.

▸ `P1 FLA`
  `12.3 Amps`

Optional Configurations

These configurations are not absolutely critical for each application, but can be useful for customizing the behavior of the panel.

Step 4 (Optional)

Set Pump Exercise Timer for the pump. If set, the exercise timer will run the pump for a set amount of time after it has been idle for the configured number of days. By default, the exercise timer is disabled.

Name	Menu Path	Value	Description
Pump One Exercise Interval	MENU->SETTINGS->PASSWORD->PUMP SET UP->PUMP 1->P1 EXERCISOR INT	Disabled - 45 Days	This is the exercise timer for pump one. If the pump has been inactive for the indicated number of days, the system will briefly run the pump to maintain long term pump health.
Pump One Exercise Time	MENU->SETTINGS->PASSWORD->PUMP SET UP->PUMP 1->P1 EXERCISOR TIME	0:00 - 5:00	This is how long in minutes and seconds pump one will run during an exercise event.

Step 5 (Optional)

Change The System Password. This will change the password from the system default of 1919.

Name	Menu Path	Value	Description
Password Change	MENU->SETTINGS->PASSWORD->SYSTEM SET UP->PASSWORD	0000 - 9999	This is the system password. It can be changed from here.

Step 6 (Optional)

Review the Settings section of this manual for any other configurations that may be relevant to the application. The system at this point is configured for a basic application. However, there are several other configurations available in the system that may be useful depending on the specific system requirements.

Stats

The Oil Alert panel tracks several statistics for the system. These are accessed through the menu system by following the menu path template shown below. Specific paths for each event's stats are described in the Viewable Events section of the Wiki page.

Alternatively, to view basic system stats such as pump total run times and counts, simply activate and hold the test/silence switch. The menu will cycle through basic system status until the user releases the switch.

Settings

Available Settings

General System Configurations

These settings modify general system behaviors, such as how long the buzzer stays silenced, how bright the pump run LEDs are, etc.

Name	Menu Path	Range	Description
Automatic Error Reset	MENU->SETTINGS->PASSWORD->SYSTEM SET UP->AUTO ERROR RESET	Disabled, Enabled	If enabled, system error events will clear themselves once the error conditions are resolved. Note that this does not apply to pump errors; pump errors will always require user interaction.
Silence Time	MENU->SETTINGS->PASSWORD->SYSTEM SET UP->SILENCE TIME	0 - 99:59:59	This controls how long the buzzer will stay silenced after the silence button is pressed.
Pump Run LED Brightness	MENU->SETTINGS->PASSWORD->SYSTEM SET UP->PUMP RUN LED	High, Med, Low, Off	This controls how bright the pump run indicator LEDs are.

Name	Menu Path	Range	Description
System Normal LED Brightness	MENU->SETTINGS->PASSWORD->SYSTEM SET UP->NORMAL LED	High, Med, Low, Off	This controls how bright the system normal indicator LEDs are.
Password Change	MENU->SETTINGS->PASSWORD->SYSTEM SET UP->PASSWORD	0000 - 9999	This is the system password. It can be changed from here.

General Pump Configurations

These configurations modify the behavior of the pumps in the system.

Name	Menu Path	Range	Description
High Amps Alarm Configuration	MENU->SETTINGS->PASSWORD->PUMP SET UP->HIGH AMP ALARM	Alarm Only, Alarm + Stop	This controls whether or not high amp alarms shut off their pump. Note that this is only visible if at least one of the pumps has its current sensor enabled.

Pump One Configurations

Name	Menu Path	Range	Description
Pump One Enable	MENU->SETTINGS->PASSWORD->PUMP SET UP->PUMP 1->P1 ENABLE	Disabled, Enabled	This enables or disables pump one. If disabled, the HOA inputs will be unresponsive and the pump will never turn on.
Pump One Current Sensor Enable	MENU->SETTINGS->PASSWORD->PUMP SET UP->PUMP 1->P1 CURRENT SENSE	Disabled, Enabled	This enables or disables the current sensor for pump one. Note that this is option is only available on systems shipped with a current sensor.
Pump One Over Current Level	MENU->SETTINGS->PASSWORD->PUMP SET UP->PUMP 1->P1 OVER CURRENT	0 - 50 Amps	This is the over current threshold for pump one. This is only visible if the current sensor is enabled.
Pump One Under Current Level	MENU->SETTINGS->PASSWORD->PUMP SET UP->PUMP 1->P1 LOW AMP LVL	0 - 50 Amps	This is the under current threshold for pump one. This is only visible if the current sensor is enabled.

Name	Menu Path	Range	Description
Pump One Exercise Interval	MENU->SETTINGS- ->PASSWORD->PUMP SET UP->PUMP 1->P1 EXERCISOR INT	Disabled - 45 Days	This is the exercise timer for pump one. If the pump has been inactive for the indicated number of days, the system will briefly run the pump to maintain long term pump health.
Pump One Exercise Time	MENU->SETTINGS- ->PASSWORD->PUMP SET UP->PUMP 1->P1 EXERCISOR TIME	0:00 - 5:00	This is how long in minutes and seconds pump one will run during an exercise event.
Pump One Extended Run Alarm	MENU->SETTINGS- ->PASSWORD->PUMP SET UP->PUMP 1->P1 EXT RUN ALARM	00:00:00 - 99:59:59	This is how long the system will run the pump before triggering an extended run time alarm. To disable this, set the time to zero.

Input Configurations

These configurations change the behavior of the inputs of the system.

General Input Configurations

Name	Menu Path	Range	Description
Input Preset	MENU->SETTINGS- ->PASSWORD->INPUT SET UP->INPUT PRESET	1 - 4	This selects the input preset for the system and determines the behavior of the system. See the "Input Presets" section for further details
Probe Sensitivity	MENU->SETTINGS- ->PASSWORD->INPUT SET UP->RPOBE SENSITIVITY	10K - 100K	This is the sensitivity of system's water sensors. It represents the approximate resistance at which the input will activate. 100K is the most sensitive, and 10K is the least sensitive
Input Errors	MENU->SETTINGS- ->PASSWORD->INPUT SET UP->INPUT ERRORS	Disabled, Enabled	If enabled, the system will alarm if the inputs activate out of order. For example, if the start probe activates before the stop probe an error will be activated for the stop probe.

Input Presets

The Oil Alert can be configured for a variety of different input behaviors via a set of input presets. Note that after running the Setup Wizard, one of these presets will have been selected depending on user input. Even though this

was initially set in the Setup Wizard, it can be changed at any time with this setting instead of using the Wizard. Below is a table detailing each of the available presets.

Option Number	Name	Description
1) S-OA w/FA	Simplex Oil Alert with Fire Alarm Input	This sets the system up to work with the standard Oil Alert preset level sensor and configures the FLT2 (F) input as a fire alarm input for interfacing with a building automation system.
2) S-OA w/RO	Simplex Oil Alert with Redundant Off Input	This sets the system up to work with the standard Oil Alert preset level sensor and configures the FLT2 (F) input to function as a redundant off float.
3) S-PS w/FA	Simplex Pump Station with Fire Alarm Input	This sets the system up to work as a Pump Station and configures the FLT2 (F) input as a fire alarm input for interfacing with a building automation system.
4) S-PS w/RO	Simplex Pump Station with Redundant Off Input	This sets the system up to work as a Pump Station and configures the FLT2 (F) input to function as a redundant off float.

Config Code

Config codes on this product can be decoded by customer support to provide a snap-shot for how the system is configured. The code itself is a base 32 number that must be decoded to yield the system configurations.