

SMART SWITCH TECHNOLOGIES



AL-8000 Alarm Monitor

Installation Manual

Model AL-8000

Installation Manual

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AL-8000 Alarm Monitor

Introduction

Thank you for purchasing the AL-8000 Alarm Monitor. SS Technologies is very proud to be able to provide this product to you. You have selected a capable system designed to provide years of reliable service under the most demanding conditions.

SS Technologies is a pioneer in the design and development of distributable intelligence controller systems for the marine industry. The AL-8000 Alarm Monitor is a versatile, compact, modern, stylish, user-friendly intelligent network system. Our Research and Development Team has developed this system specifically for the marine environment using proven techniques and materials, which will ensure a long life at sea.

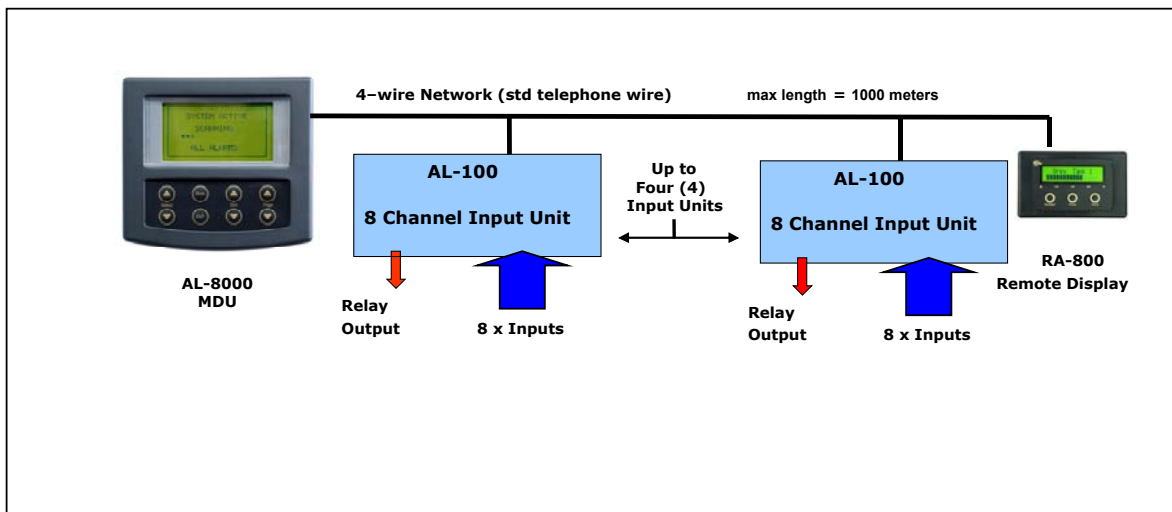
The AL-8000 provides features found only in expensive computer-based systems on mega-yachts, but does so for a fraction of the cost. It is an economical and capable alternative to simplistic monitoring systems. The AL-8000 allows builders and retrofitters to offer a system with maximum functionality thereby providing boat owners with excellent visibility into any alarm condition.

System Overview

The AL-8000 Alarm Monitor has been developed to allow monitoring of up to 32 alarms. It is a network system consisting of the AL-8000 Master Display Unit and up to 4 Input/Output Units located any where on the vessel. In addition, and as an option, any number of RA-800 Remote Display Units may be added to provide additional displays throughout the vessel.

A 4-wire network cable similar to that used for telephone installations interconnects all devices. The Master Display Unit (MDU) controls communication with all attached I/O Units. System components may be located anywhere on the network cable and the cable may be up to 1000 meters in length.

These features, unique to the AL-8000, provide boat builders and retrofitters maximum flexibility in locating components onboard the vessel while minimizing wiring costs.



AL-8000 Master Display Unit: (MDU)

Provides the following functions:

- Provides latched display for up to 32 Alarms
 - All names are user programmable
 - Network communication fault
 - Visual alarm with tone
 - Visual alarm with-out tone
 - Visual alarm with repeating tone

RA-800 Remote Display Unit Option:

Allows for remote displays any where on the vessel.

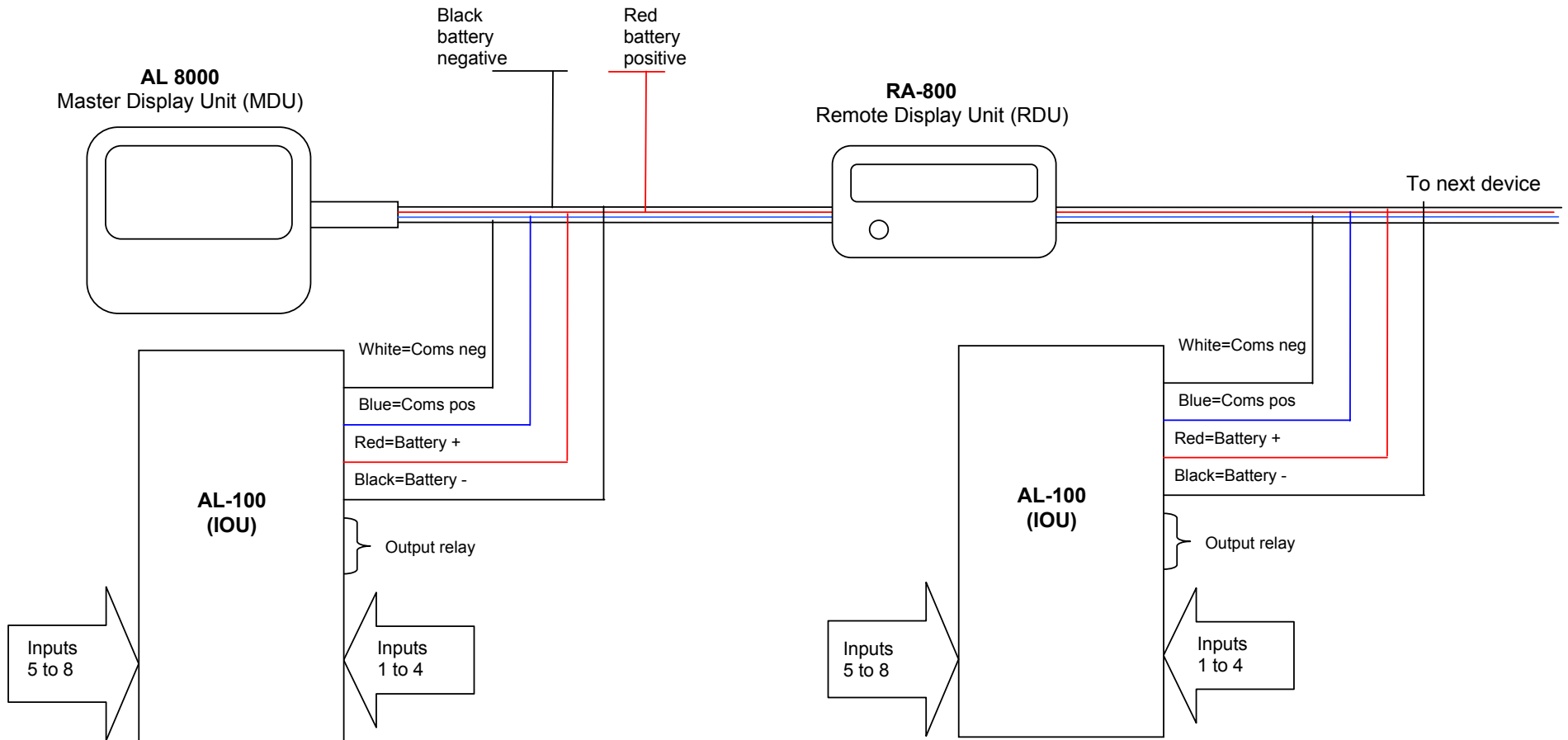
AL-100 Input Unit: (I/O Box)

The AL-100 has 8 inputs and one output relay.

- Each input can be configured as follows.
 - normally open & closing to + vdc on fault
 - normally open & closing to ground on fault
 - normally ground & opening on fault
 - 2k2 end of line resistor for supervised line

- Output Relay
 - 3 amp inductive
 - closes on any fault

Wiring Block Diagram



Installation Steps

Smart Switch Technologies Ltd recommends a Qualified Marine or Auto-Electrician installs this product.

Step 1:

Install and connect the Master Display Head Unit (AL-8000) [page 3](#).

Step 2:

Install and connect the Input Units (AL-100) [page 6](#).

Step 3:

Setup Rotary Switches [page 7](#).

Step 4:

Program the Display Unit (AL-8000) [page 9](#).

Electrical Specifications AL-8000

Supply Voltage	12 to 32 Volts DC (Auto-sensing)
Quiescent Current	0.028 Amps (backlight off)
Data Retention	50 years (without power)

Electrical Specifications RA-800

Supply Voltage	12 to 32 Volts DC (Auto-sensing)
Quiescent Current	0.03 Amps
Data Retention	50 years (without power)

Electrical Specifications AL-100

Supply Voltage	12 to 32 Volts DC (Auto-sensing)
Quiescent Current	0.024 Amps
Input Voltage (max)	30 vdc
High Relay Load	3 amps Inductive
Data Retention	50 years (without power)

Network Cable

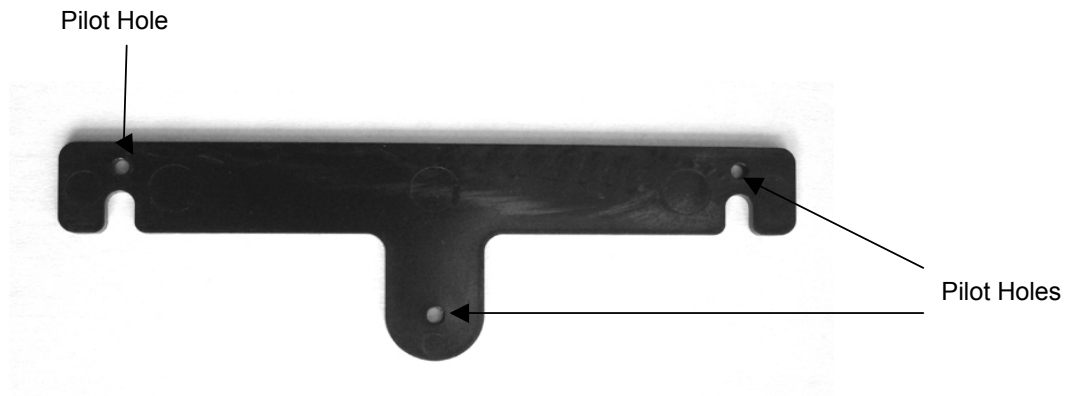
The cable connecting the Display Unit to the Input/Output Units is referred to as the network cable and may run up to 1000 meters in total length.

Mounting the AL-8000 Display Unit

Position the mounting template tool provided and mark all three pilot holes. Drill a 3mm hole on the two outside holes and fit the mounting screws provided. Place the template tool back over the screws and tighten the screws until the template tool can just slip on and off the tool (ensure the tool is not too loose).

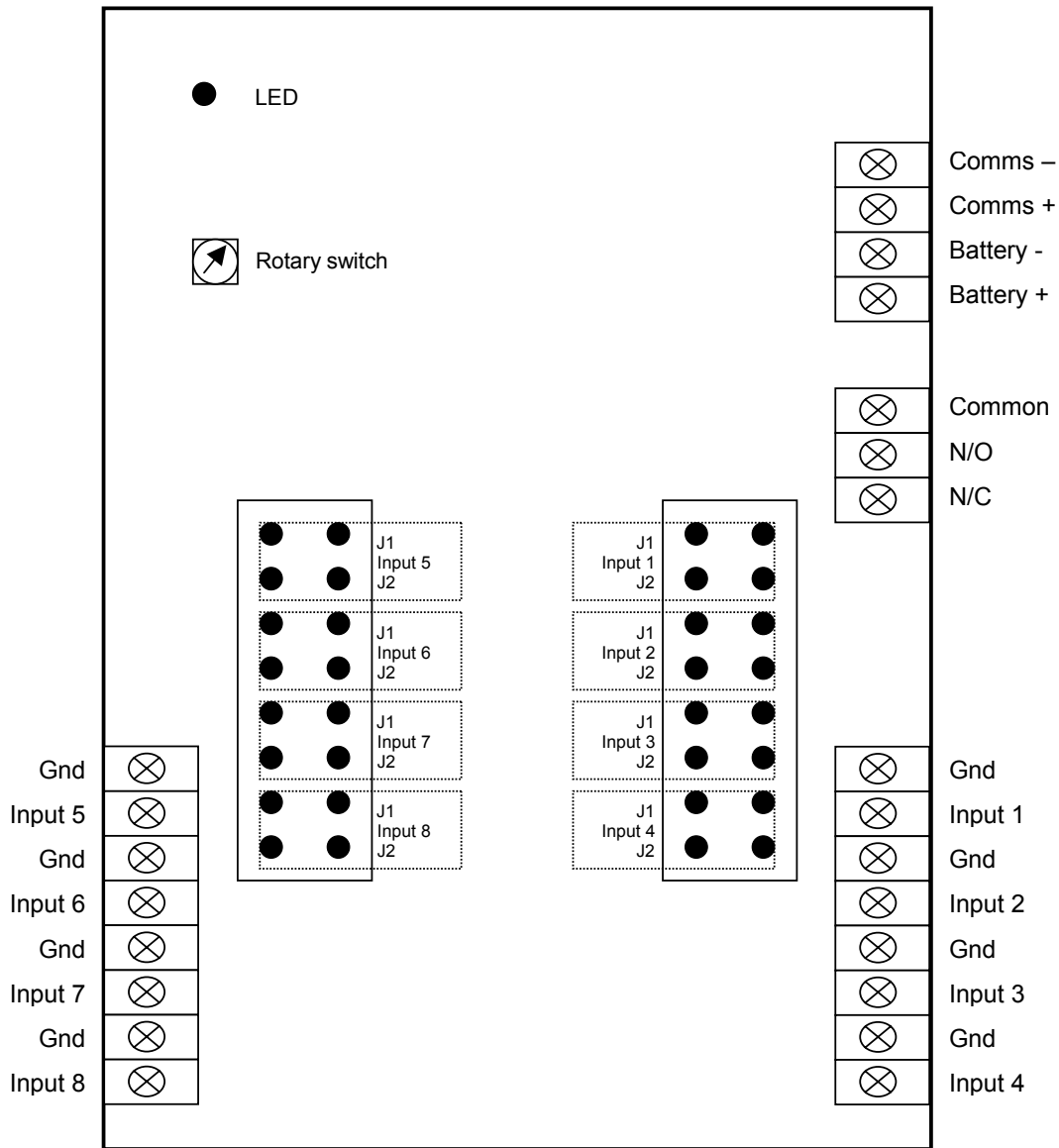
Drill the bottom hole to 12 mm (cable hole).

Place the Display Unit keyholes over the two screws and gently pull down. If the screws have been tightened to the correct depth the Display will clip down and self tighten.



. See page 3 (Wiring Block Diagram) for wiring details.

Wiring Diagram for Model AL-100



Jumper Setting	J1	J2
Normally Open & Shorting to +VDC On Fault	Off	Off
2k2 End of line resistor = Opening or Closing on Fault	On	Off
Normally Shorted to Gnd & Open On Fault	Off	On
Normally Open & Shorting to Gnd On Fault	On	On

NOTE

Once all jumpers have been placed or removed as per user requirements turn the rotary switch to position 0, the LED will flash once (indicating settings have been stored into memory).
Place rotary switch to either position 2,3,4 or 5 depending on the network address as per page 7.

Setting Rotary Switch (Network Address)

To enable the MDU to remotely monitor, each I/O (AL-100) unit must have a unique network address. This is accomplished by setting the rotary switch inside the I/O unit to either switch position 2, 3, 4 or 5 (ref to page 6).

Important: Each Input Unit AL-100 on the network must have the Rotary Switch set to a unique number. Two I/O units may NOT share the same Rotary Switch number. Each AL-100 installed must use the next switch number available. e.g. if three are installed then switch settings must be 2,3,4. (NOT 2,4,5)

For ease of reference please use the chart provided below, as this will enable quick reference when programming the Display Unit.

NOTE: I/O Unit set to Switch Position 2: (Override groups)

This system provides for Four Override functions.

If the override feature is required (see program instructions step 4 for details) then override signal One MUST be connected to I/O box switch position 2, Input 1.

If Two are required, then override signal Two MUST be connected to I/O box switch position 2, Input 2. If Three are required, then override signal Three MUST be connected to I/O box switch position 2, Input 3. If Four are required, then override signal Four MUST be connected to I/O box switch position 2, Input 4.

AL-100 (IOU) Rotary Switch position 2

Switch Position 2 Input	Alarm Input
1	<i>Override 1 Signal (if used)</i>
2	<i>Override 2 Signal (if used)</i>
3	<i>Override 3 Signal (if used)</i>
4	<i>Override 4 Signal (if used)</i>
5	
6	
7	
8	

AL-100 (IOU) Rotary Switch position 3

Switch Position 3 Input	Alarm Input
1	
2	
3	
4	
5	
6	
7	
8	

AL-100 (IOU) Rotary Switch position 4

Switch Position 4 Input	Alarm Input
1	
2	
3	
4	
5	
6	
7	
8	

AL-100 (IOU) Rotary Switch position 5

Switch Position 5 Input	Alarm Input
1	
2	
3	
4	
5	
6	
7	
8	

Programming Instructions

Explanation of override groups:

There are four Override groups 1, 2, 3, and 4

If this option is selected then any input (alarm) that is joined to the override group will **ONLY** be active when that override input is active (typically used for engine override).

Example: If input 5, 6 & 7 are joined to the override one group and the override one signal is connected to the Port engine running signal then the system will only look at these inputs when the Port engine is running.

Override groups are attached to I/O rotary switch 2 inputs 1, 2, 3 and 4

Explanation of inputs with timers:

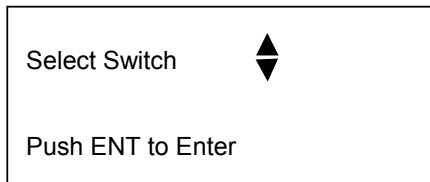
There are 8 timers available and may be programmed from 5 seconds to 10 minutes. Once an input attached to a timer has been activated the programmed timer will start but the system will not look at the input until the timer has expired. These timers are attached to I/O Box switch position 2 Input 5, 6, 7, 8 and I/O Box switch position 3 Input 1, 2, 3, and 4. See step 8

Step 1: Placing the unit in Program Mode

Press and hold down the Mute & Select Up keys together for three seconds. This will place the unit in program mode.

Step 2: Selecting Which AL-100 to program (Rotary Switch see page 7/8)

The display will now show

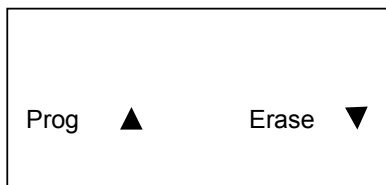


Use the Select Up or Down keys to change the switch number, which corresponds to the I/O unit being programmed (refer to page 7/8) for switch numbers.

Once the switch number has been selected push the "ENT" key to accept.

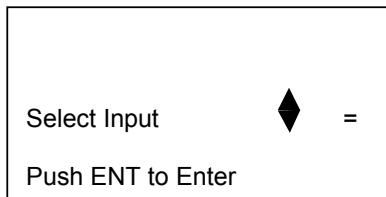
Step 3: Program or Erase

The display will now show



Use the Select Up key to program or the Select Down key to erase. If Select Up is pushed go to step 4 if Select Down is pushed see Step 12.

Step 4: Select Input



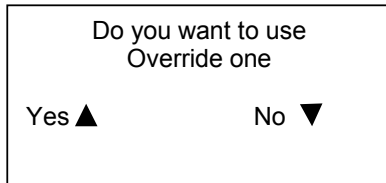
Use the Select Up or Down keys to change the input number, which corresponds to the input being programmed.

Once the switch number has been selected push the “ENT” key to accept.

Step 5: Override Feature

The overrides are only attached to I/O Box switch position 2 Input 1, 2, 3, and 4

The following will be displayed when the above I/O Box is being programmed.



If no is selected the system will NOT ask about override 2, 3 or 4 if yes is selected then the question will be asked about override two when you are programming input 2 and the same for input three and input four. If No is selected go to step 6.

One override only (Single engine vessel):

If this feature is required then the override one group must be on.

When programming I/O Box switch position 2 Input 1

Answer **YES** to “ DO YOU WANT TO USE OVERRIDE ONE”

When programming I/O Box switch position 2 Input 2

Answer **NO** to “ DO YOU WANT TO USE OVERRIDE TWO”

The engine running signal MUST be connected to **I/O Unit Switch Position 2, Input 1**

Two overrides (Twin-engine vessel):

If this feature is required for both Port and Starboard engines, then both override one and override two groups must be on.

When programming I/O Box switch position 2 Input 1

Answer **YES** to “ DO YOU WANT TO USE OVERRIDE ONE”

When programming I/O Box switch position 2 Input 2

Answer **YES** to “ DO YOU WANT TO USE OVERRIDE TWO”

When programming I/O Box switch position 2 Input 3

Answer **NO** to “ DO YOU WANT TO USE OVERRIDE THREE”

When programming I/O Box switch position 2 Input 4

Answer **NO** to “ DO YOU WANT TO USE OVERRIDE FOUR”

The Port engine running signal MUST be connected to **I/O Unit Switch Position 2, Input 1**

The Stb engine running signal MUST be connected to **I/O Unit Switch Position 2, Input 2**

Three overrides (Two engine vessel & Aux):

When programming I/O Box switch position 2 Input 1
Answer **YES** to “ DO YOU WANT TO USE OVERRIDE ONE”
When programming I/O Box switch position 2 Input 2
Answer **YES** to “ DO YOU WANT TO USE OVERRIDE TWO”
When programming I/O Box switch position 2 Input 3
Answer **YES** to “ DO YOU WANT TO USE OVERRIDE THREE”
When programming I/O Box switch position 2 Input 4
Answer **NO** to “ DO YOU WANT TO USE OVERRIDE FOUR”

The engine one running signal **MUST** be connected to **I/O Unit Switch Position 2, Input 1**
The engine two running signal **MUST** be connected to **I/O Unit Switch Position 2, Input 2**
The engine three running signal **MUST** be connected to **I/O Unit Switch Position 2, Input 3**

Four overrides (Four engine vessel):

When programming I/O Box switch position 2 Input 1
Answer **YES** to “ DO YOU WANT TO USE OVERRIDE ONE”
When programming I/O Box switch position 2 Input 2
Answer **YES** to “ DO YOU WANT TO USE OVERRIDE TWO”
When programming I/O Box switch position 2 Input 3
Answer **YES** to “ DO YOU WANT TO USE OVERRIDE THREE”
When programming I/O Box switch position 2 Input 4
Answer **YES** to “ DO YOU WANT TO USE OVERRIDE FOUR”

The engine one running signal **MUST** be connected to **I/O Unit Switch Position 2, Input 1**
The engine two running signal **MUST** be connected to **I/O Unit Switch Position 2, Input 2**
The engine three running signal **MUST** be connected to **I/O Unit Switch Position 2, Input 3**
The engine four running signal **MUST** be connected to **I/O Unit Switch Position 2, Input 4**

Two overrides joined:

Override one and two can be interconnected by selecting option 5 in Step 8.

Both override one and two will need to be active before any input attached to them will be scanned by the system.

Setting Delay Time:

The delay time is the time it takes (approx) to start the engine (and is programmable from 1 to 20 seconds) during this time the inputs are looked at by the system but NOT latched as genuine faults. If for example the delay time is set for 5 seconds and the engine is started, the oil pressure alarm will display and the buzzer will sound, if after 5 seconds the oil pressure is OK the buzzer will turn off and the display oil pressure fault will disappear. If however after 5 seconds (or any other time while the engine is running) the oil pressure is NOT OK the buzzer will keep sounding and the display will flash the text “Oil Pressure” or whatever text has been programmed.

Use the Select Up or Down keys to scroll through the delay times. Push the “ENT” key to accept, this will take you back to Step 4.

Set Delay Time	
Override ?	
Seconds =	00
Push ENT to Enter	

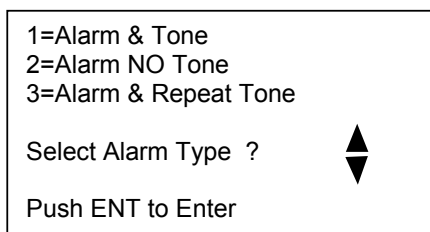
Step 6: Setting Alarm Tones

There are three alarm tones available

- 1/ Alarm & Tone. Gives an audible alarm tone on fault
- 2/ Alarm NO Tone. Does **NOT** give an audible alarm tone on fault
- 3/ Alarm & Repeat Tone. Gives an audible alarm tone on fault & after muting will return in 1 minute

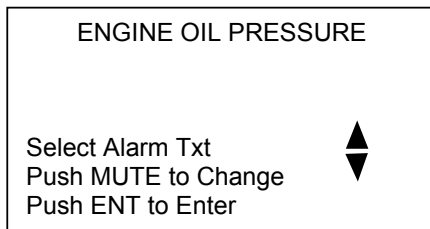
Use the “Select Up” and “Select Down” keys to scroll through the options.

The display will now show:



Step 7: Selecting /Creating Tank Name

The display will now show:



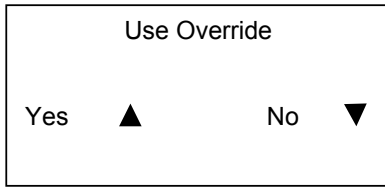
Use the Select Up or Down key to scroll through the pre-named Alarms. Once you have found the one required push the “ENT” key.

If you would like to create your own name push the “MUTE” key. Use the Select up or down key to scroll through the alphabet and the Dim up or down keys to change to the next character.

When finished push the “ENT” key. If Ignition Override has been set as per Step 5 this will take you to Step 8. If not and the input as a timer attached if not it will take you to Step 10, if no timer is attached it will take you to Step11.

Step 8: Use Override

The display will now show:

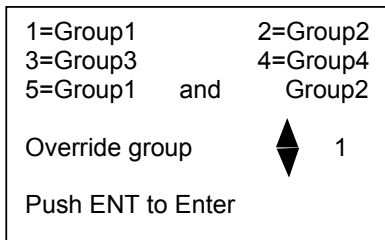


If YES is selected and only ONE override group has been selected as per Step 5 (one override only) it will take you to Step 10 if the input as a timer attached other wise it will take you to Step 11.

If more than one override group has been selected it will take you to Step 9.

Step 9: Which Override Group

The display will now show:



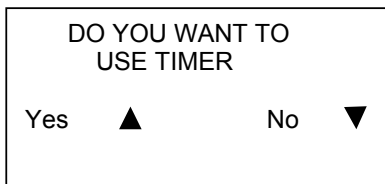
Push Select Up or Select Down to scroll thought the override groups.

Upon pushing the "Ent" key the input that you have just setup now belongs to whichever group you selected and will only be active when the override input is active.

Step 10: Timers

There are 8 timers available and may be programmed from 5 seconds to 10 minutes. These timers are attached to I/O Box switch position 2 Input 5, 6, 7, 8 and I/O Box switch position 3 Input 1, 2, 3, and 4.

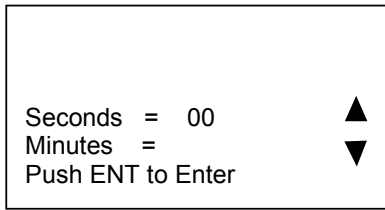
If one of these inputs are being programmed the display will now show, if not it will take you to Step 11.



Note: This will only be asked if I/O Box switch position 2 Input 5, 6, 7, 8 or I/O Box switch position 3 Input 1, 2, 3, and 4 are being programmed.

If No is selected this will take you to Step11.

If Yes is selected the display will now show.



Use the “Select Up” and “Select Down” keys to scroll through the times.
 If zero seconds are required push the “ENT” key, this will take you to the minute’s field
 If zero minutes are required push the “ENT” key, this will take you to Step 11.

Step 11: Next or End

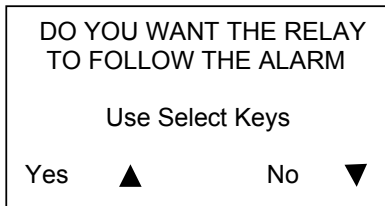
The display will now show:



Push the Select Up key to set-up the next input or Select Down key to exit set-up mode.

Step 12: Relay Output

The display will now show:



If “Yes” is selected the relay located in the I/O Box will follow the audible alarm on the AL-8000 (MDU). Eg. If the alarm is sounding the relay will be ON, if the alarm is muted the relay will be OFF. If “Alarm NO Tone” is selected in Step 6 the relay will not activate upon a fault. This feature could be used for an external light or alarm.

If “No” is selected the relay located in the I/O Box will come ON when ANY input has been activated and OFF when no inputs are activated.

Step 13: Erase

Selecting Erase will erase all settings associated with the AL-100 (IOU).

If a mistake is made on any input a complete erase is not required just reprogram the input.

Operating Instructions

Keyboard:

Select Up or Down – used in program mode.

Mute - mutes the alarm.

Ent – used in program mode.

Dim Up and Down - adjusts the display contrast.

Page Up or Down – used for scrolling up or down a page if more than 8 alarms exist at once.

Alarms:

Should an alarm trigger the alarm text will flash on the display. The audible alarm will sound if either option 1 or 3 was set for the input (see Setting Alarm Tones page 12)

Pushing the mute button will mute all alarms. If the fault condition is still present the alarm text will stop flashing and stay on, should another fault occur the alarm would start again. If the fault condition has gone the fault text will disappear from the screen.

Normal Operation Screen:

```
SYSTEM ACTIVE
SCANNING ALL ALARMS
*****
```

Interrogating the System:

Press and hold the “Ent” key for three seconds (you will hear the a bleep every second) the system will now display each input, the text and any association.
e.g.

```
Checking Input 1
Programmed as
Override One
Alarm not programmed
```

```
INPUT CHECKED  OK
```

```
Checking Input 2
OIL PRESSURE
Override One
Alarm with Tone
```

```
INPUT CHECKED  OK
```
