



Users Guide, Version Gen 4 – 3

(Oct 1st, 2020)



A large graphic with a blue background. At the top right, a lifebuoy is shown floating in water. On the left, a yellow warning sign with a black exclamation mark is superimposed over the word 'STOP'. Below 'STOP' is the phrase 'electrical drowning' in a large, bold, dark blue font. Underneath that, the text 'It's your responsibility to have a safe dock.' is written in a smaller, dark blue font. At the bottom left, the Dock Lifeguard logo is repeated. At the bottom right, a smaller image of the Dock Lifeguard device is shown.

About this User's Guide

Introduction

This Dock Lifeguard electricity detection system is an important part of your family's safety on or around your boat dock.

Dock Lifeguard will continuously monitor for electricity in the water around your dock and on your dock and will display the level of voltage being detected on an array of LEDs. A warning strobe with audible alarm will warn you of trouble when a set level of voltage is detected.

Thank you for making Dock Lifeguard a part of your dock safety program. With proper installation and use, Dock Lifeguard should provide you with years of dependable service.



Figure 1, The Dock Lifeguard System

Electricity Detection Safety Tips

Follow safety rules and prevent hazardous situations. Schedule annual electrical inspections of your dock to ensure local codes are met.

Keep detectors clean and test them regularly. Replace detectors immediately if they are not working properly. Electricity Detectors that do not work cannot alert you to dangerous electricity.

Before You Install Your Dock Lifeguard Unit

IMPORTANT! Read “Recommended Locations for Dock Lifeguard” and “Locations to Avoid for Detector” before beginning. This unit monitors AC and DC electricity on the frame of your dock and in the water when it reaches its sensing probe. This unit can ONLY give detection if it is installed, maintained and located where stray electricity can reach it, and where all residents can hear it, as described in this manual. This unit cannot stop or prevent stray electricity.

Know Where to Install Your Detector

Dock Lifeguard has a radius range of approximately 40'. It is recommended that the Dock Lifeguard be centrally located with ease of view to ensure proper coverage of your dock. For commercial or oversized residential docks, it is recommended that multiple units be installed on the dock, keeping maximum distance between detectors to under 80'. Placement near under water bracing and anchor winch cabling should try to be avoided, as stray electricity will find the easiest way to ground and these items may shield the probe from sensing the stray voltage.

Lake environment (clarity of water and ambient voltage) and dock construction will affect detection range. On wood pier construction docks on lakes with ambient voltage of less than 0.2 volts we have detected voltages at over 100' away from the probe.

By using a method to test the Dock Lifeguard, proper probe placement on the dock can be determined. On large docks or docks constructed on metal piers, multiple Dock Lifeguards may be needed to ensure proper coverage.

Note: Many factors such as clarity of water and underwater structures can affect the sensing range of the system. It is recommended that your environment be tested to see how stray electricity would flow.

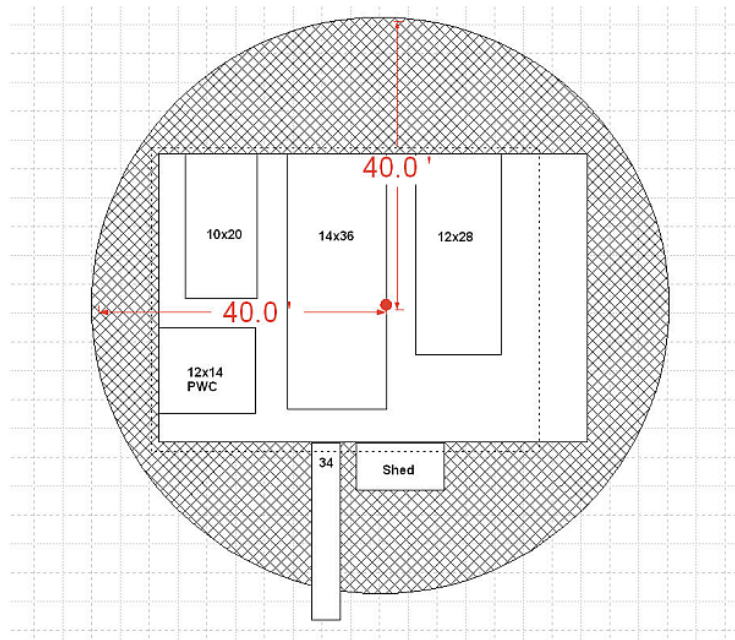


Figure 2, Typical Detection Range

Know What a Stray Electricity Detector Can and Cannot Do

A Stray Electricity Detector can alert you to stray electricity on or around your dock. It can only sound an alarm once electricity reaches the detection probe. See “Limitations of Stray Electricity Detectors” for details.

Caution

- Do not paint over the unit. Paint may clog the openings to the siren and prevent the unit from operating properly.
- Do not stand too close to unit when the alarm is sounding. It is loud to alert you in an emergency. Exposure to horn at close range may harm your hearing.

Recommended Locations for Dock Lifeguard

Install your Dock Lifeguard with an unobstructed view to allow viewing of the warning strobe when electricity is detected. Place in a location that is visible from the swimming area around your dock as well as being easily viewed from the dock and shore. When possible install unit under roof.

Locations to Avoid for Detector

For best performance, it is recommended you AVOID installing the Dock Lifeguard sensing probe in these areas:

- Placement of sensing probe directly next to an underwater brace or anchor cabling. The bracing and cables may reduce the range that the probe can detect.
- Avoid running probe sensing wire parallel to other wires to avoid cross coupling.

Quick Setup Guide

Installation Location

CAUTION: This alarm will only indicate the presence of electricity in the range of the sensor. Stray Electricity may be present in other areas.

IMPORTANT: Improper installation location can affect the sensitive electronic components in this alarm.

Sensing Probe Location

The Sensing Probe lead wire can be lengthened to allow for placement of the probe in the optimal location on your dock. (It is suggested positioning the probe closer to the location under the dock near the side of the dock where people are swimming or using the ladder.) Place the probe deep enough in the water so that it will still be submerged when your lake is in a low water situation. (Avoid running sensing wire to probe parallel to other wires to avoid cross coupling.)

Metal Floating Docks



Installation of the Dock Lifeguard unit should be done by mounting the unit on a roof support system (Metal Post) under roof if possible, near an outlet by using metal screws installed through the upper and lower mounted points on the unit. Dock Lifeguard needs to be bonded to the safety ground system of the dock; this is accomplished through the green ground reference wire on lower installation point on the unit. It is recommended to bond the ground lead (green wire) of the Dock Lifeguard unit to the frame of the grounded dock and to the ground of the electrical system of the dock. **Note:** You must have a proper bond of the Dock



Lifeguard green wire to the dock safety ground for correct operation.

Pier Docks with Wood Pilings

Installation of Dock Lifeguard unit should be done by mounting the unit near an outlet under roof if possible, by using screws installed through the upper and lower mounted points on the unit. Dock Lifeguard needs to be bonded to the safety ground system of the dock; this is accomplished through the lower installation point on the unit (green ground reference wire). It is recommended to connect the ground lead (green wire) of the Dock Lifeguard unit to the electric common ground of the receptacle being used to power the Dock Lifeguard unit. **Note:** You must have a proper bond from the Dock Lifeguard to the dock electrical safety ground.



Pier Docks with Metal Pilings

Installation of Dock Lifeguard unit should be done by mounting the unit near an outlet under roof if possible, by using screws installed through the upper and lower mounted points on the unit. Dock Lifeguard needs to be bonded to the safety ground system of the dock; this is accomplished through the lower installation point on the unit (green ground reference wire). It is recommended to connect the ground lead (green wire) of the Dock Lifeguard unit to the electric common ground of the receptacle being used to power the Dock Lifeguard unit. **Note:** Docks constructed with metal pilings may require multiple Dock Lifeguard systems to get full coverage on the dock as the metal pilings will act as a return

path to ground for stray electricity, thus not allowing the electricity to travel to the probe install location. **Note:** You must have a proper bond from the Dock Lifeguard to the dock electrical safety ground.

Where not to install

Do not install in a location which would inhibit viewing the warning strobe or inside a shed, which could muffle the sound of the warning siren.

Do not install probe directly next to a metal underwater structure such as underwater bracing, sea anchor cables or steel underwater dampening structures.

Non-Detection Zones

Underwater structures such as sea anchors with metal extruding from them or steel pilings can result in a non-detection zones for the Dock Lifeguard. Electricity is very lazy and will find the easiest path to ground which may be one of these structures. It is recommended that you determine if these structures are around your dock and if so, warn people that swimming in these areas is not safe as these structures may attract electricity and shield it from getting to the Dock Lifeguard probe and being detected.

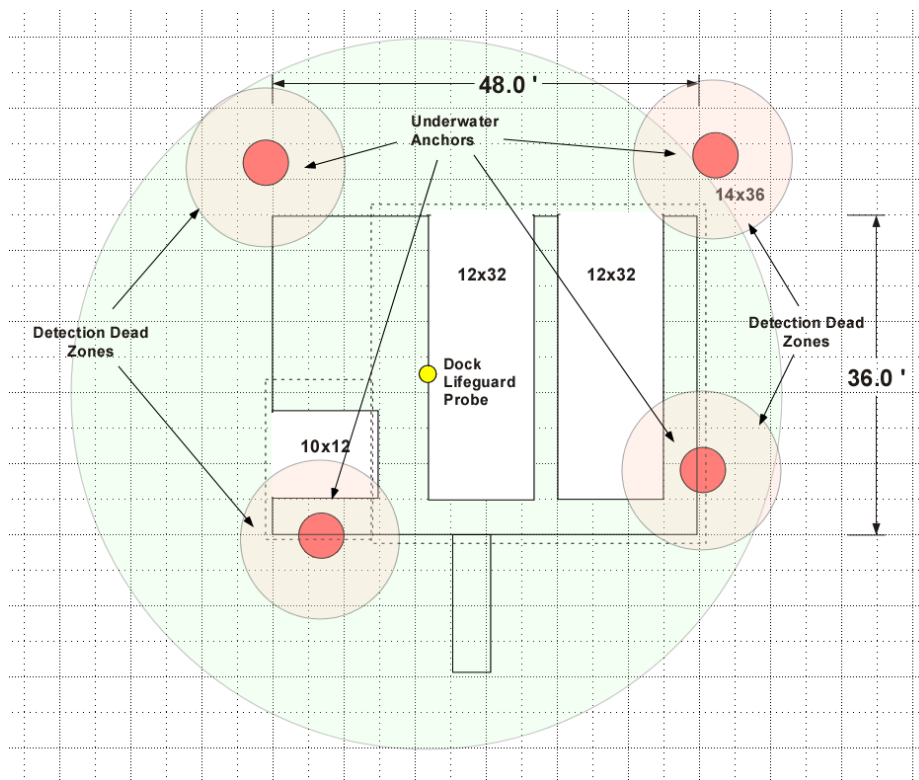


Figure 3, Floating Dock with Underwater Anchors

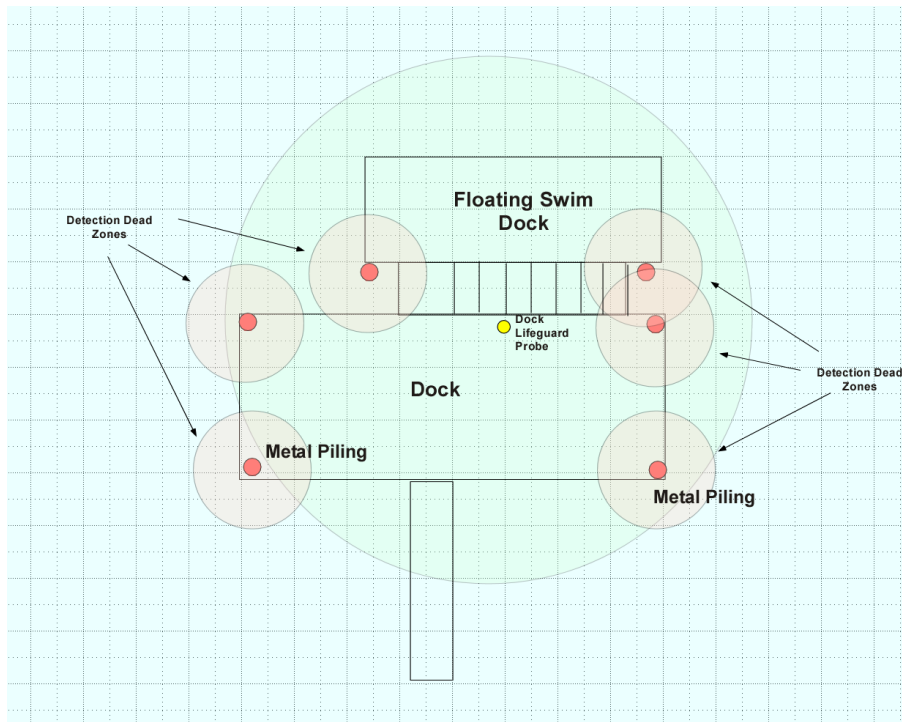


Figure 4, Steel Piling Dock

Depending on your environment, more than one Dock Lifeguard system may be needed to provide entire coverage of your dock area.

Having a professional test your environment using a Dock Lifeguard Testing Probe can help determine dead zones in your environment.

Regular Maintenance

This unit has been designed to be as maintenance free as possible, but there are a few simple things you can do to ensure its continued usefulness. For instance, the probe may gather algae after a long time in the water. Wiping it clean annually will ensure that the range of the probe stays as consistent as possible. In addition, testing the unit to ensure that all of the LED lights are working properly should be done regularly. In order to ensure proper functioning of the system, inspect the sensing probe annually and the “Test” mode of system should be initiated monthly.

About Your Alarm

Test Button

Pressing and holding the Test button will initiate the unit into a test mode during which the siren will sound, the strobe will light, and the LED bar graph will display bars. If unit fails the test, check to ensure there is power to the unit. If the unit still fails, please contact Dock Lifeguard for a repair or replacement unit. Starting with Generation 4 units, pressing and holding the “Test” button for longer than three seconds will initiate sending a signal to trip the GFCI breaker if this feature is connected.

LED Display

The unique feature of your Dock Lifeguard device is its LED bar display of the level of stray electricity.

The continuous digital display shows you the level of voltage the unit is sensing. The Voltage value of each LED is dependent on the sensitively jumper settings on the mother board.

Siren Volume

The volume of the siren can be adjusted by twisting the clear plastic dial on the outside of the Red Light/Siren. While pressing the test button, rotate clear dial to the desired level.



Figure 5, Rotate Clear Ring Over Red Light to change Volume Level

What to Do When Unit Alarms

Responding to an Alarm

During an alarm you will hear a loud, repeating horn pattern and the red strobe light will flash.

WARNING!

- If the unit alarms and you are not testing the unit, it is a warning of potentially dangerous situation that requires immediate attention. NEVER ignore any alarm. Ignoring the alarm may result in injury or death.

What to Do in Case of Alarm

Someone in the Water

- Don't panic; stay calm.
- Do not touch the dock structure
- Turn off Power to Your Dock
- Swim away from the electrical source
- Do NOT jump in the water to help. Throw Life Preserver and instruct party to swim away from source. Parties may then be picked up by boat
- Do not swim to shore as this can be hazardous when stepping out of water to ground.

Out of the Water

- Don't panic
- Proceed to Shore
- Kill Power to the dock via the circuit break on the shore
- Call 911 and your local electrician

WARNING!

Alarms have various limitations. See "Limitations of Stray Electricity Detectors" for details.

Calling a Qualified Electrician to Find and Repair the Problem

If the Dock Lifeguard unit detects stray electricity in the water, contact a local electrician that is familiar with local electrical codes on boat docks to diagnose and solve the problem.

If You Suspect a Problem

Dock Lifeguard may not operate properly because of faulty power supply or installation in an improper location. Clean the Dock Lifeguard as described in "Regular Maintenance", then test the detector again. If it fails to test properly when you use the test button, or if the problem persists, replace the Dock Lifeguard unit immediately.

- If you experience frequent non-emergency alarms:
 - Check and Measure for electricity in the water using a Volt Meter
 - Verify installation for proper safety ground bonding of your dock.

Technical Information

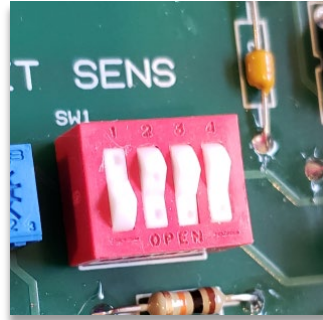
Lethal Voltage is 2 volts AC per foot. The Dock Lifeguard units are setup from factory to trigger at approximately 1500 millivolts. To see exact settings of your system, you need to reference the sensitivity dip switch settings on the mother board and trigger level of the alarm, as these items are configurable.

The following link is a reference to the USCG In-Water Shock Hazard Mitigation Strategies.

<http://www.boatus.com/seaworthy/assets/pdf/in-water-shock-hazard-mitigation-strategies.pdf>

Product Specifications

Sensitivity level can range from 0.08 to 0.5 volts based on the sensitivity dip switch settings. Sensitivity can be increased by setting the dip switches on the motherboard. With all the switches set to the open position (down), the sensitivity is set to the least sensitive position, 0.5 volts. With all switches set to the closed position (up), the sensitivity is set to the most sensitive position, 0.08 volts. Note: It does not matter what specific switch is set.



	Switch 1	Up = Closed 2	Down = Open 3	4
0.5 Volts	Open	Open	Open	Open
0.25 Volts	Closed	Open	Open	Open
0.16 Volts	Closed	Closed	Open	Open
0.12 Volts	Closed	Closed	Closed	Open
0.08 Volts	Closed	Closed	Closed	Closed

Figure 6, Sensitivity Dip Switches

How the Unit Determines When to Alarm

The default factory setting of the Dock Lifeguard will trigger the alarm when stray electricity is detected in the water above the unit threshold of approximately 1500 millivolts. This alarm trigger will vary with increased levels sensitivity via the sensitivity dip switches and trigger point adjustments made on the motherboard.

- **Alarm Trigger Level:** The trigger level of the alarm can be adjusted to help filter out alarming at higher levels of ambient voltage in the water or to alarm at a lower levels of detected stray voltage. Trigger level is based on the number of LEDs lit, not voltage being read. Value of voltage for each lit LED is based on the sensitivity dip switch settings.



Adjusting Alarm Trigger Level

Factory setting is set to trigger alarm when 4 to 5 LEDs are lit. The Alarm trigger point can be raised by turning the potentiometer counterclockwise and lowered by turning the potentiometer clockwise. Around a 10 to 15-degree turn will change trigger level by one LED. The voltage that corresponds to the number of lit LEDs can be determined by sensitivity dip switch settings on the motherboard. Avoid turning the Alarm potentiometer to the full extent counter clockwise, as this may result in the system not triggering the alarm when stray voltage is detected.

- **Sensitivity:** Internal switches allow for adjusting the sensitivity level of the Dock Lifeguard unit. The more sensitive the setting, the further out the Dock Lifeguard will detect stray voltage.

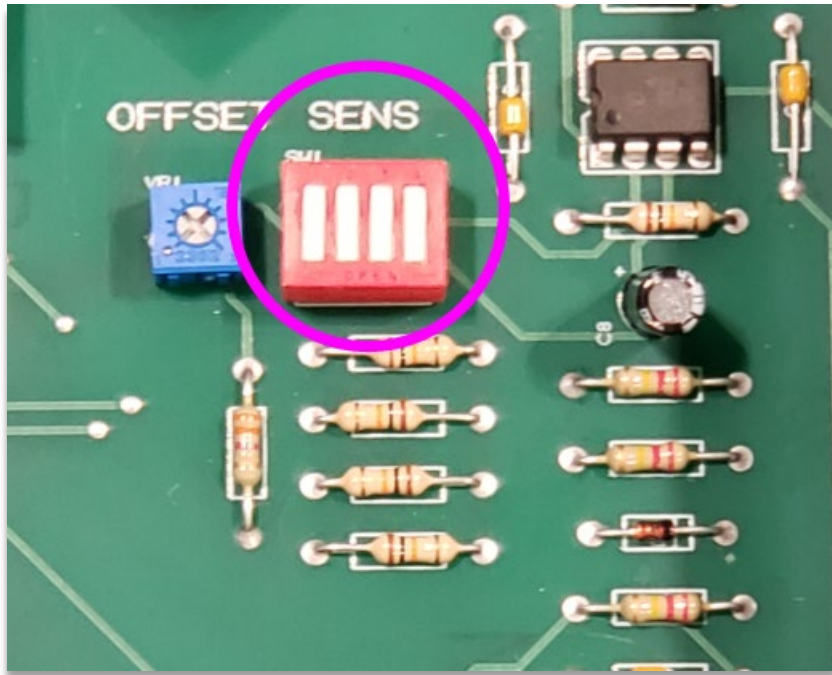
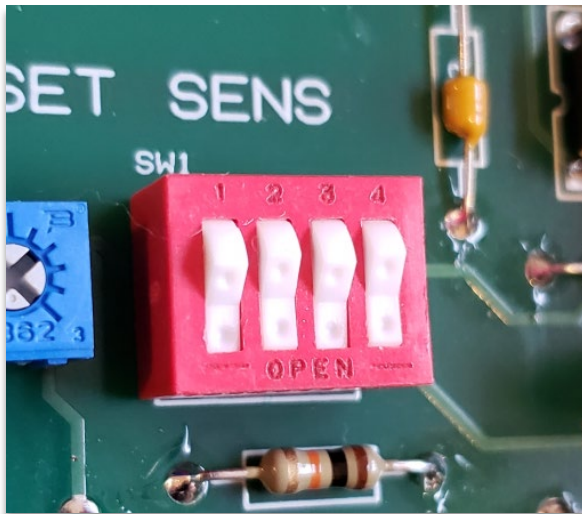
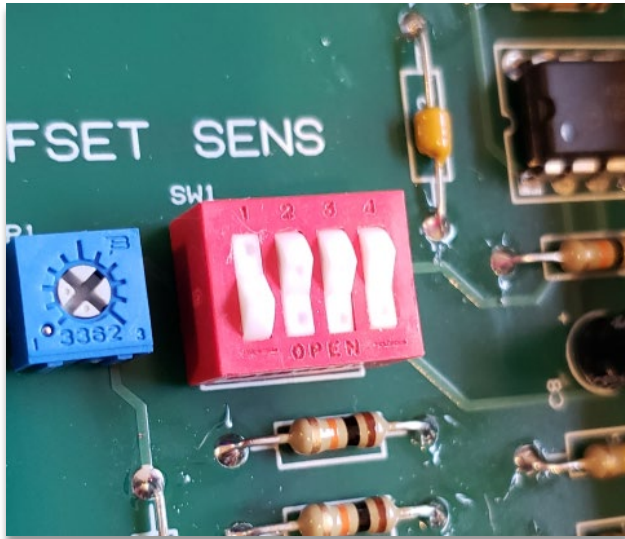


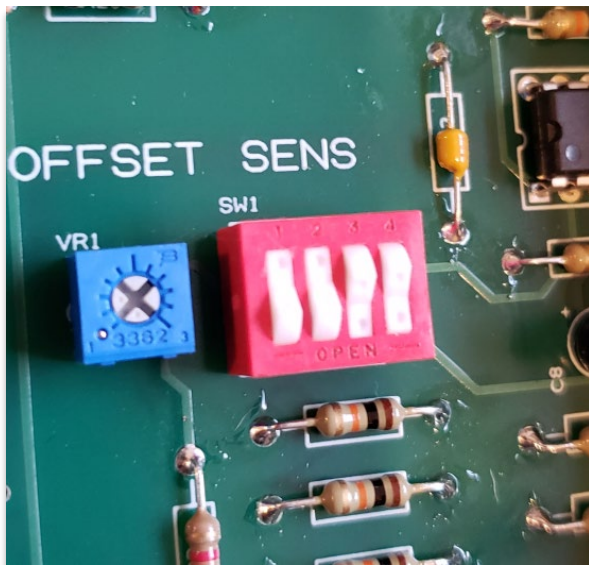
Figure 7, Sensitivity Dip Switch Block



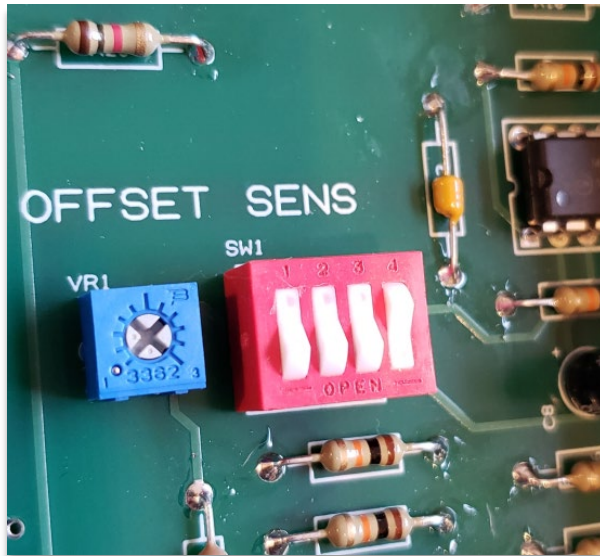
All Switches in Open Position, each LED = 0.5 Volts



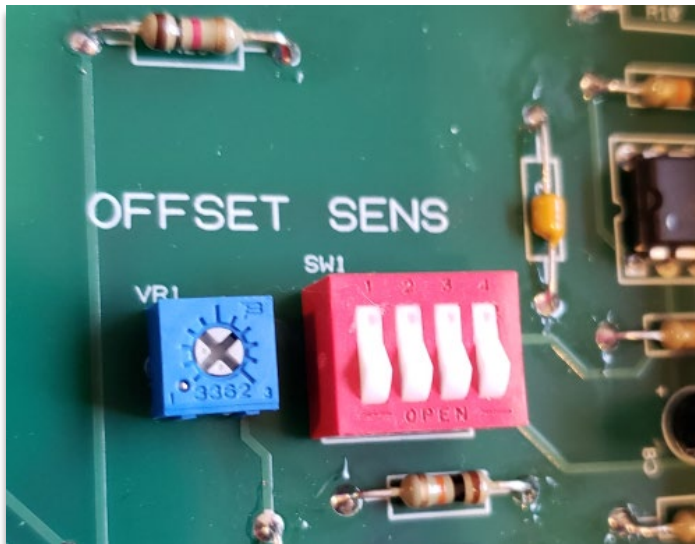
One Switch in Closed Position, each LED = 0.25 Volts



Two Switches in Closed Position, each LED = 0.16 Volts



Three Switches in Closed Position, each LED = 0.12 Volts



Four Switches in Closed Position, each LED = 0.08 Volts

Note: For bodies of water that have higher amounts of Ambient Voltage (for example, 2 Volts is common on some lakes in the south east area). Sensitivity will need to be decreased and the alarm level raised in order to filter out the ambient voltage. With decreased sensitivity comes decreased range of detection. It is recommended to install the Dock Lifeguard sensing probe closer to the area of the dock where the ladder is and where swimming activity takes place.

Adjusting Zero Reference Point

The Dock Lifeguard systems that are equipped with an Adjustable Zero Reference potentiometer which can be used to adjust the baseline reference voltage. Factory setting uses a 0 offset (turned full extent counterclockwise). Scenario: If your environment has a 2-volt ambient voltage, this will normally show multiple LEDs lit on the display and possibly the Alarm being triggered (this depends on what your alarm trigger point is set at). By turning the potentiometer clockwise, the LEDs on display will incrementally go away. You can adjust the potentiometer when power is on the unit so you can see and monitor the front LEDs when making the adjustments. Stop the adjustment once the last LED becomes unlit. Now your LEDs on the front of the panel represent your offset voltage (in this case 2 Volts) plus the voltage level of each LED that is lit. For example if sensitivity is set to 0.5 Volts and 3 LEDs are displayed, the Voltage level of the LED would represent (2 Volts baseline + 3* 0.5 Volts per LED = 3.5 Volts being detected). Remember that the Alarm Trigger is based off of the numbers of LEDs lit, not Voltage being detected. So, if you want the alarm to trigger at 4 volts, set the Alarm trigger point to alarm when the first yellow LED is lit. With the Offset Potentiometer turned all the way counterclockwise, the offset is Zero.

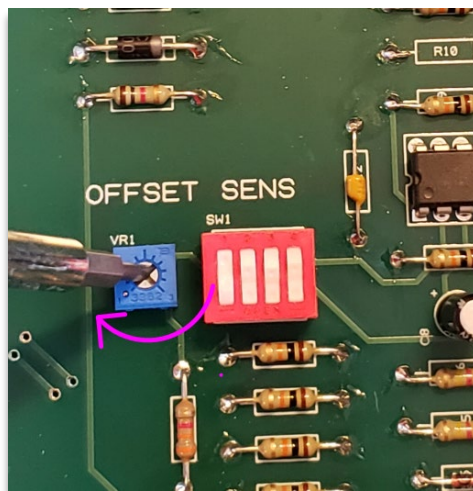


Figure 8, Zero Reference Point Potentiometer

Internal Battery Backup

A lithium ion battery can be installed internally in the Dock Lifeguard case to provide power to the device when AC power is lost to the system or the circuit powering the unit has been disabled by tripping the GFCI breaker. How long the unit will operate on internal battery is dependent on the battery capacity and if the alarm is sounding. When there is power supplied to the system via the Transformer plugged into an AC outlet, the internal battery will be charged by the system.

If using the internal battery, the jumper on the mother board needs to be moved from “LOCAL” to the “BATT” position.

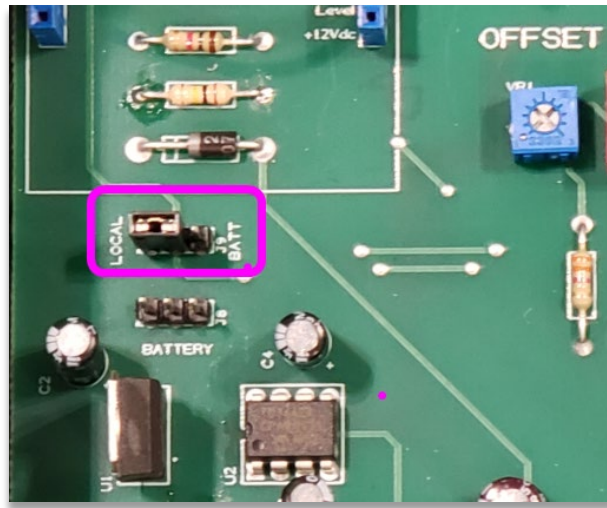


Figure 9, Internal Battery Jumper

External Battery Powered/Backup

A 12-volt DC battery can be connected to the Dock Lifeguard to provide Battery Backup capability when AC power is lost to the system. How long the unit will operate on battery is dependent on the battery capacity and if the alarm is sounding. It is suggested you attach a solar panel charging panel to the battery for continuous uninterrupted operation of your Dock Lifeguard System. When there is power supplied to the Dock Lifeguard system by the Transformer plugged into an AC outlet, the external battery will be charged by the system.



Figure 10, Battery Backup Option

Triggering External Devices

External relays may be triggered by connecting to the Common and Normally Open (NO) tab.

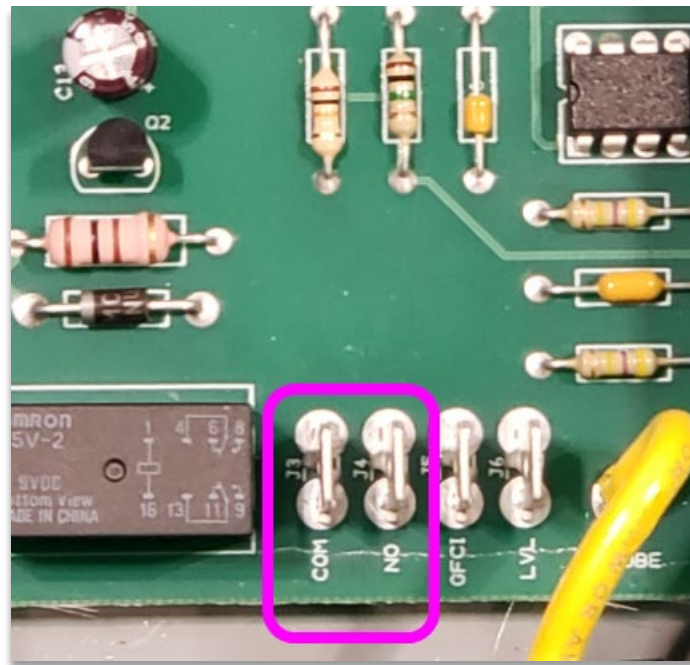


Figure 11, Trigger external Devices

Phone Notification: With Third Party Z Wave hardware such as Samsung's Smarthings and internet access, you can setup you Dock Lifeguard to push alerts to your phone when the Dock Lifeguard alarms. This YouTube video will show you what you need, and how-to setup your system:

<https://youtu.be/ymd08Uichlo>



Figure 12, Sending Push Notifications

Monitoring Voltage Levels

Detected Voltage can be monitored (in DC Volts) via the Voltage Level tab (LVL). This is digital voltage and needs to be multiplied by the Sensitivity Settings factor to get actual Voltage.

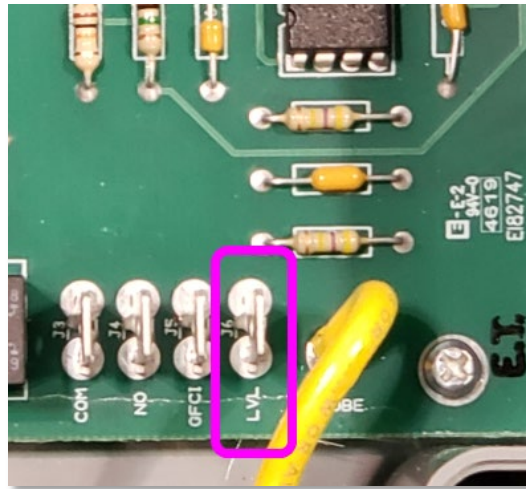


Figure 13, Monitoring detected Voltage Level

Switch 1 thru 4 OFF(open) = /4	(Actual = Level Value * 4)
Switch 1 ON and 2 thru 4 OFF = /2	(Actual = Level Value * 2)
Switch 1 and 2 ON and 3 thru 4 OFF = /1.25	(Actual = Level Value * 1.25)
Switch 1 thru 3 ON and 4 OFF = X1.25	(Actual = Level Value / 1.25)
Switch 1 thru 4 ON = X2	(Actual = Level Value / 2)

Max voltage at the level pin is clamped at 7.5Vdc. This assumes that the offset control is fully counterclockwise. The offset effectively raises the voltage floor linearly from 0 to approx. 2.5Vdc.

GFCI Trip Wire: Units equipped with a GFCI trip feature are capable of tripping the GFCI breaker that is associated with the circuit that the trip wire is used on. Connect a wire from the trip tab on the mother board to the Common Ground line of the outlet. **Caution:** Connecting to the Positive line will cause damage to the Dock Lifeguard and void the warranty.

The GFCI Trip function can be tested by pressing and holding the “Test” button for ~5 seconds.

Note: For docks that have floating ground (i.e. dock not bonded to common ground) due to high amount of Voltage put on the common ground by the electric company (docks at Lewis Smith Lake in AL this is very common), the GFCI should be connected to the neutral line.

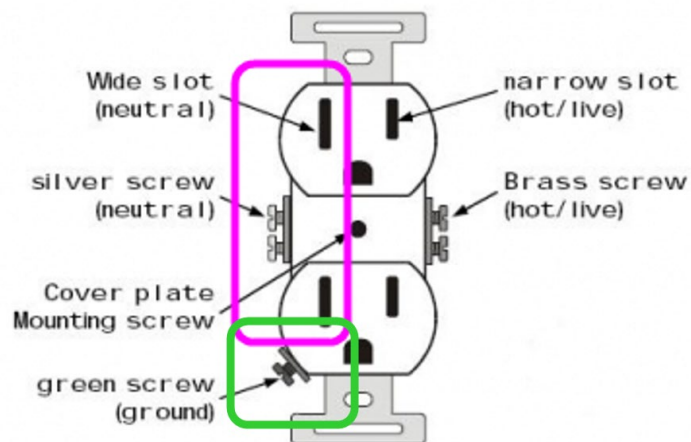
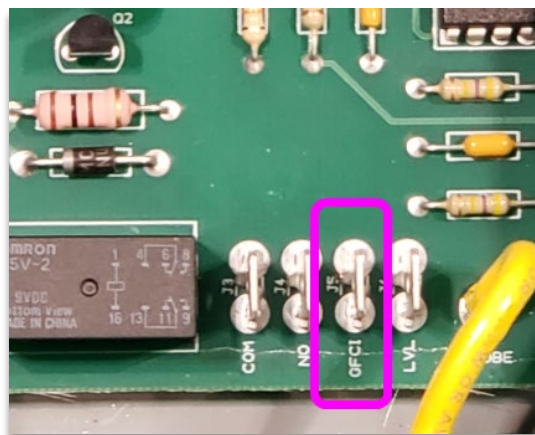


Figure 14, GFCI Trip Wire

Data Logging

With the optional DLG Data Logging Module, near real time data can be viewed over an internet connection. This can trigger email notification when the unit is alarming.

Note: Wifi Internet service is needed in order for the Data Logging to be monitored remotely.

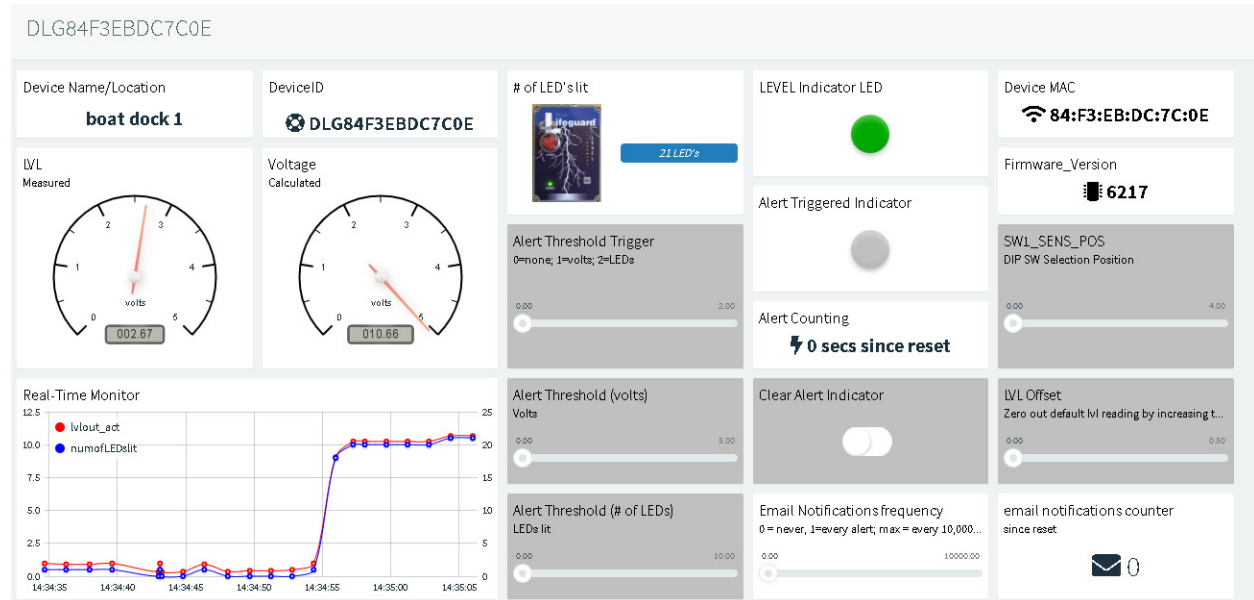


Figure 15. Data Logging - Real Time Display

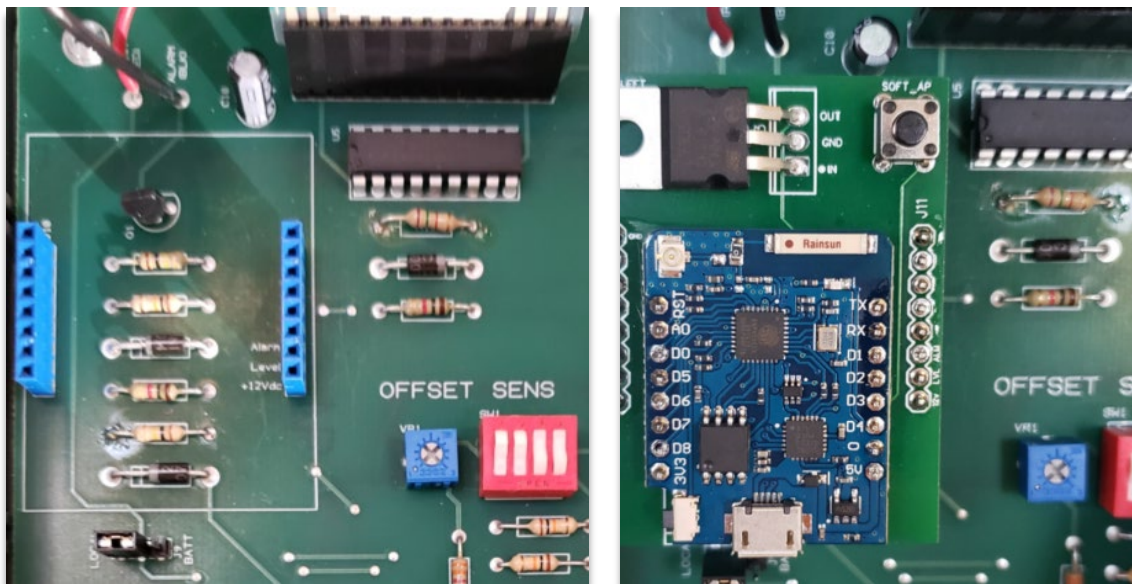


Figure 16, Real Time Data Logging Module

Limitations of Stray Electricity Detectors

A Stray Electricity Detector can play a key role in reducing deaths resulting from stray electricity. However, like any warning device, Dock Lifeguard can only work if it is properly located, installed, and maintained, and if stray electricity reaches it. They are not foolproof. The Dock Lifeguard system is a monitoring system only and does not prevent water from being energized by stray voltage.

Dock Lifeguard cannot work without power. The Dock Lifeguard unit is powered with an AC power plug delivering 12-volt DC power to the unit, or a 12 Volt DC Battery. In the case of AC power plug failure or a discharged 12 Volt DC battery, the unit will be inoperable. There is a Power LED that is lit when power the unit is powered on. If the unit is powered by a 12 Volt battery, the battery should be periodically checked to insure proper output voltage. Lower voltages may result in the unit not having enough power to sound the alarm siren

Dock Lifeguard cannot detect electricity if electricity does not reach the probe. Proper placement of the sensing probe on your dock is crucial to the detection of electricity in the water around your dock. Electricity is lazy, it will find the easiest path to ground. If the probe is located on the opposite side of a cable or brace, the stray electricity in the water may find its way to ground through the bracing or cabling on not reach the probe for the Dock Lifeguard to emit a warning. If you may want to install multiple units on the dock to insure proper coverage. Proper testing in each environment should take place upon installation to determine coverage area.

Dock Lifeguard may not be heard. Though the alarm horn in this units meets or exceeds current standards, it may not be heard if: 1) the unit is located inside a closed shed, 2) residents recently consumed alcohol or drugs, 3) the alarm is drowned out by noise from stereo, TV, traffic or other loud ambient noise, 4) residents are hearing impaired.

Dock Lifeguard requires proper wiring environment. The Dock Lifeguard system is not meant to be used in lieu of properly wiring. Proper wiring and grounding of your electrical service is required for proper operation of the Dock Lifeguard system.

Stray Electricity Detectors are not foolproof. Like any electronic device, Dock Lifeguard is made of components that can wear out or fail at any time. You must test the unit weekly to ensure your continued protection. Dock Lifeguard cannot prevent leaking electricity from other sources. It is not a substitute for property or life insurance.

Current Detectors have a limited life. The unit should be replaced immediately if it is not operating properly. A qualified electrician using proper test equipment can test the operation of the unit by temporarily injecting stray electricity into the water around your dock. **WARNING:** In water testing should never be performed if any human or animals are in the water within 100 yards of your dock.

Limited Warranty

Dock Lifeguard, LLC, the maker of Dock Lifeguard warrants that the following model be free from defects in material and workmanship:

Dock Lifeguard, LLC, at its option, will repair or replace this product or any component of the product found to be defective during the three-year warranty period. Replacement will be made with a new or remanufactured component of the product. If the product is no longer available, replacement may be made with a similar product of equal or greater value. This is your exclusive warranty.

This warranty is valid for the original retail purchaser from the date of initial retail purchase and is not transferable. Keep the original sales receipt. Proof of purchase is required to obtain warranty performance. Dock Lifeguard dealers, service centers, or retail stores selling Dock Lifeguard products do not have the right to alter, modify or any way change the terms and conditions of this warranty.

This warranty does not cover normal wear of parts or damage resulting from any of the following: neglect use or misuse of the product, use on improper voltage or current, use contrary to the operating instructions, disassembly, repair, or alteration by anyone other the Dock Lifeguard, LLC or an authorized service center. Further, the warranty does not cover Acts of God, such as fire, flood, lightning strikes, hurricanes and tornadoes or any batteries that are included with this unit.

Dock Lifeguard, LLC shall not be liable for any incidental or consequential damages caused by the breach of any express or implied warranty. Except to the extent prohibited by applicable law, any implied warranty of merchantability or fitness of a particular purpose is limited in duration to the duration of the above warranty. Some states, provinces or jurisdictions do not allow the exclusion or limitation of incidental or consequential damages or limitation on how long a implied warranty lasts, so the above limitations or exclusion may not apply to you. This warranty gives you specific legal right, and you may also have other rights that vary from state to state or province to province.

Your Dock Lifeguard Alarm is not a substitute for property, disability, life or other insurance of any kind. Appropriate insurance coverage is your responsibility. Consult your insurance agent.

For Warranty Service: In many cases the quickest way to exchange your alarm is to return it to the original place of purchase. If you have questions, call the Dock Lifeguard customer service department at 1-573-434-6453 for assistance.

Frequently Asked Questions

How many detectors do I need on my Dock?

Dock Lifeguard will monitor for electricity in the water within a forty-foot radius from the sensing probe. For docks that are wider or longer than 80 feet it is recommended to install multiple detectors to ensure adequate coverage. If your dock has underwater cabling or a lot of steel underwater bracing or constructed on metal piers, more units may be needed to ensure detection as these structures will reduce the detection range. It is strongly recommended to have a complete analysis of your environment to determine number of units required for proper coverage. Note: Range can vary upon the concentration of ions and minerals in the water.

My detector sounds when I turn on my boat lift control box?

When brushes for blower motors start to wear, they can leak electricity back to equipment ground which is detected and displayed on the Dock Lifeguard unit. Replacing worn blower motors should correct the issue.

Can the sensitivity be changed on the Dock Lifeguard Unit?

Yes, the Dock Lifeguard units have five levels of sensitivity which can be set by a qualified Dock Lifeguard technician.

Can the alarm trigger point be changed on the Dock Lifeguard Unit?

Yes, the Dock Lifeguard alarm point can be changed by a qualified Dock Lifeguard technician.

In dry weather situations, I see a couple of the LEDs displayed on the unit, why?

Weak or improper bonding situations will be reported by the Dock Lifeguard units. In dry weather conditions, the soil around the ground rod can dry up and cause in a degradation of your Ground Rods performance. Add moisture around your ground rod to lower ground rod resistance in these conditions. Make sure the safety ground bonding system of your home and docks electrical system is up to code.

Upon installation, my unit is showing detection LEDs but I know my dock is wired correctly, why is this?

Most likely it is an improper bonding issue or stray electricity is being back fed on the equipment ground. Have your ground bonding system checked by a qualified electrician.

My unit shows several LED's lit, and I have checked my safety ground bonding system. Where is the stray electricity coming from?

The Dock Lifeguard Unit is designed to detect any stray electricity whether it is at a lethal or non-lethal level. Below are listed a few scenarios which may add in determining where your stray electricity is coming from:

- **Dock De-Icers:** Water aerators placed in the water are susceptible to leaking stray electricity in the water. If your unit is detecting stray electricity around your dock, try isolating the De-Icer unit that is causing the problem by unplugging your or your neighbors De-Icer and seeing if the stray electricity goes away.
- **Underwater Water Pumps:** Underwater water pumps are subject to leaking electricity in the water. A lot of these underwater pumps are 220Volt and are ran on non-GFCI'd breakers. If you are using a submersible water pump, it may be a good time to change it out to an above water pump. Current trend of governing bodies of lakes is to disallow underwater pumps and only allow above water pumps.
- **Ambient Voltage of Water:** Each body of water will inherently have some small level of electricity in it. In most lakes this is between 0.05 and 1 volt. Depending on your sensitivity settings of your unit, then number of LEDs shown on the front of the display will reflect this ambient voltage. i.e. Your sensitivity dip switch setting is set to 0.25 volts and you have 0.8 volts of ambient voltage in the water, then 3 LEDs will be lit on the Dock Lifeguard. Note: Ambient voltage of your lake can be checked by using a

standard voltmeter and placing one lead in the water and the other touch the GROUND plug of an outlet or the frame of your dock if it is bonded.

- **Back Feed from your Home:** If you have a well-grounded dock with a grounding rod < 25 ohms, but your homes grounding rod is above the 25 ohm threshold, your electrical system may run into the situation where non-lethal stray electricity from your home (i.e. From a A/C Unit or Heat Pump, or Water Heater) may bypass the home's grounding rod and feed down to the docks grounding rod with lower resistance (The Dock) which is bonded to your dock. To correct this situation, you will need to correct the ground resistance of your home's grounding rod. In certain areas of the country where hard water is prevalent, the heating element of your (or your neighbors) hot water heater may calcify to the extent of stray electricity back on the ground wire which can be back fed down to your dock.
- **It may not be your house or dock:** Any nearby equipment or dock that shares the same safety ground from a shared transformer has the potential of putting hazardous electricity back on the ground wire and then having it back fed to your dock. When the ground is moist, stray electricity may bleed from a neighboring house to your safety ground. Not only check your house, but check surrounding houses and docks for stray electricity.