



# *Electronic Design Service*

## SLM-010 Salt Level Monitor

### User Guide

## Revision History

The Table below displays revision history for the chapters in this User Guide

Date	Version	Change Made
April 04, 2023	1.0	Original release
May 07, 2024	2.0	30% alarm indication and message added

## Contact Us

For the most up-to-date information about Electronic Design Service products, go to Electronic Design Service website at [www.eldesignservice.com](http://www.eldesignservice.com).

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## About SLM-010 Salt Level Monitor

SLM-010 is a Bluetooth Low Energy Salt Level Monitor. SLM-010 provides water softener salt level data and operational status information. This device communicates with a smartphone or a tablet, which indicates salt level, operational status and audible alarm. Alarm is activated when water softener salt level dropped below 40% and 30%. (30% is a second and final alarm). Alarm text messaging can be sent to any phone number with device ID indication. Device ID allows salt delivery service company to recognize your device (address of your home/business). For example, if you allow the messaging service, the salt delivery company will automatically schedule the salt delivery based on message alarm information.

Typical operation screen is shown on Figure 1.

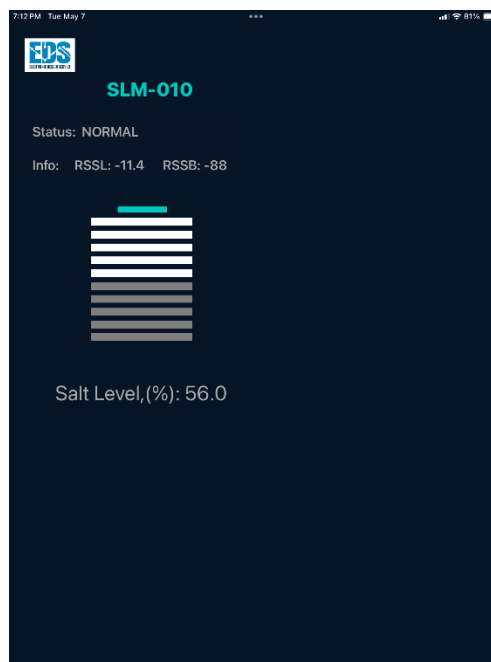


Figure 1 Normal Operation Screen Example (iPad)

## Specifications

**Operating Temperature:** 32°F – 110°F (0° – 45°C)

**Operating Humidity:** 0 – 95%, non-condensing

**Salt Level Measurement Accuracy:** ±6cm (it is ±5% for 120cm tank length)

**LiDAR Sensor:** SJ-GU-TF-Luna A01 (UART Communication Interface)

**Input Power:** 5VDC, 200mA

**Bluetooth:** 2.4-GHz RF Transceiver Compatible with Bluetooth low energy (BLE) 4.2 Specification

**Antenna:** Integrated Antenna

**FCC Compliance:** FCC CFR47, Part 15 and ARIB STD-T-66

**Contains FCC ID:** ZAT26M1

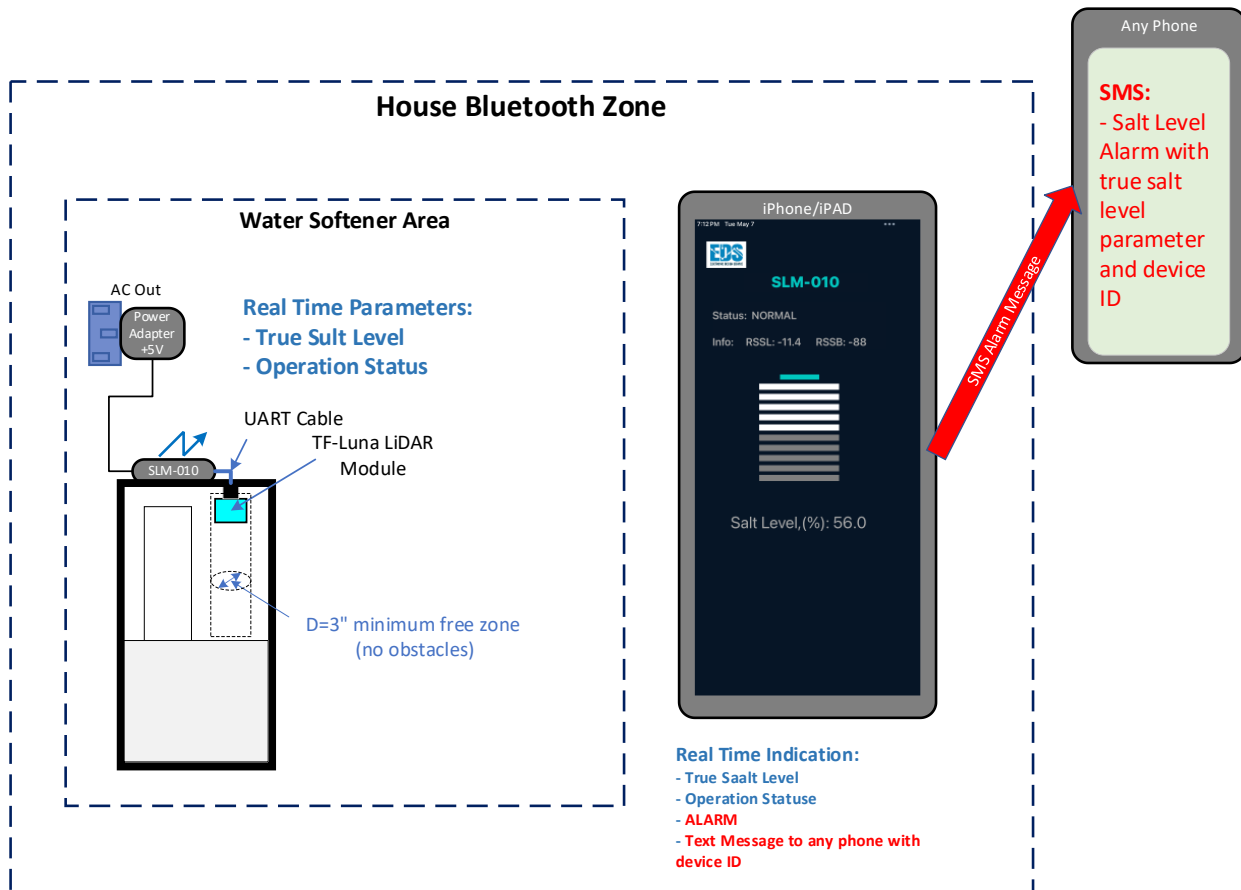
**Contains IC:** 451H-26M1

**SLM-010 Application SW:** iOS 15 or newer version devices

1. Inside Box SLM-010 device with UART cable connected.
2. SJ-GU-TF-Luna A01 LiDAR Module.
3. 120VAC / +5VDC Power adapter (with cable).
4. Two screws for LiDAR module installation.
5. Pair of Hanging Strips for SLM device installation

*Note: SLM-010 Serial Number is located on enclosure backside.*

## Components and Applications

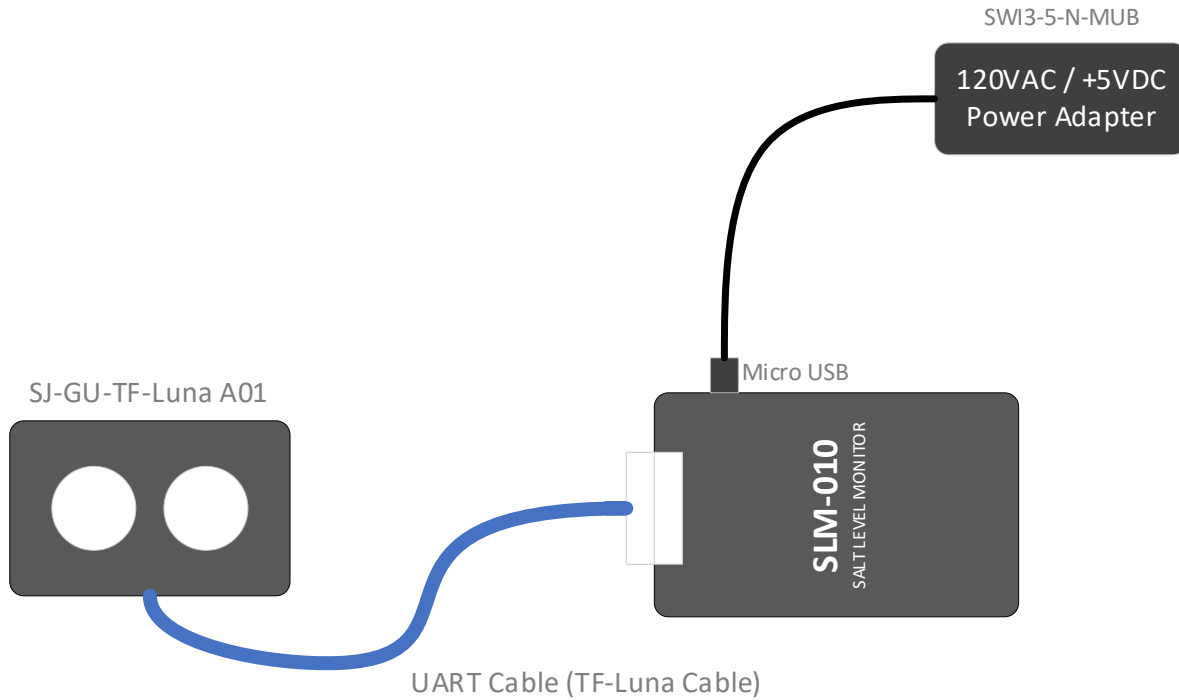


## Water Softener Salt Level Monitoring

Figure 2 Water Softener SLM-010 Application

## Connection

SLM-010 device, Luna LiDAR module and power connections is shown in Figure 3.



**Figure 3 Connection Diagram**

See installation instruction in Installation and Adjustment section.



## Installation and Adjustment

Luna LiDAR module and SLM-010 needs to be installed on water softener salt tank cover.

The following tools are required for installation:

1. Phillips screwdriver
2. Power Drill with 1/2 in bit
3. Two screws: M2.0 - 4
4. Pair of Hanging Strips

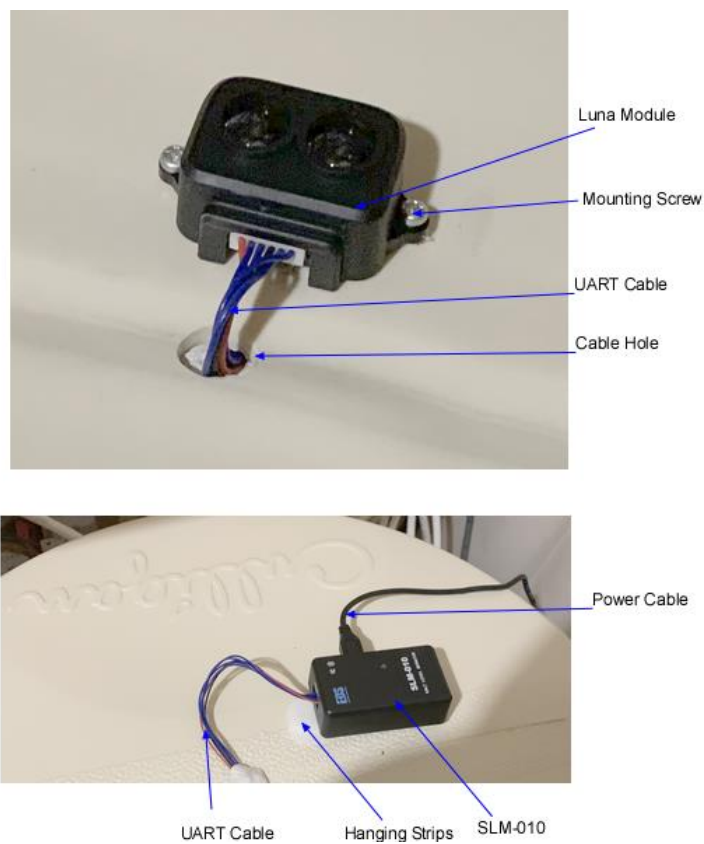


Figure 4 SLM-010 and Luna LiDAR Installation

## Installation Guide

1. Remove lid from water softener salt tank.
2. Mark position of Cable Hole (see Figure 4) on salt tank lid. It can be center of lid, but be sure that the space under position (3" diameter) does not have any obstacles (see Figure 2).
3. Drill ½" Cable Hole in marked position.
4. Connect power cable and install SLM-010 on external side of salt tank lid (near Cable Hole) as it is shown in Figure 4 by using pair of hanging strips.
5. Pull UART cable through Cable Hole.
6. Connect UART cable to Luna module.
7. Install Luna module on internal side of salt tank cover by using two screws as it is shown in Figure 4.
8. Put lid on salt tank.

## Operation

### SLM-010 Front Panel

Front panel is shown in Figure 5.

LED indicator will be blinking within 1.5s intervals approximately with 1.5s period of time. This indicates normal device operation.



Figure 5 SLM-010 Front Panel

## SLM-010 iOS Application Installation and Operation

### Installation

Install SLM-010 Application on iPhone or iPad from App store.

#### Before starting the application:

Enable background refresh for iPhone SLM-010 application: >**Settings>Salt Level Monitor>Background App Refresh**

Enable Notification for iPhone SLM-010 application: >**Settings>Salt Level Monitor>Notifications>Allow Notifications/Sounds/Badges**

Enable Contacts for iPhone SLM-010 application: >**Settings>Salt Level Monitor>Contacts**

Enable Accessories for allow application access when lock: >**Settings>Face ID & Passcode>Accessories**

Application is able to send alarm messages by using Remote Messaging Service (RMS).

Enable Bluetooth for iPhone SLM-010 application: >**Settings>Salt Level Monitor>Bluetooth**

“New contact” **shall** be created in “Contact” list of your iOS device. The following information shall be added in “Contact” list:

First name field: SLM-010

Last name field: “Phone number”

Company field: “tank height”

#### ***The information shall follow the required format:***

**SLM-010** - for “First name” field – device name

**+1XXXXXXXXXX** - for “Last name” field - receiver phone number

**XXX** - for “Company” field - water softener tank height (centimeters)

If RMS is not needed, there is no need to fill out “First name” and “Last name” fields in Contacts.

New SLM-010 contact example is shown on Figure 6.

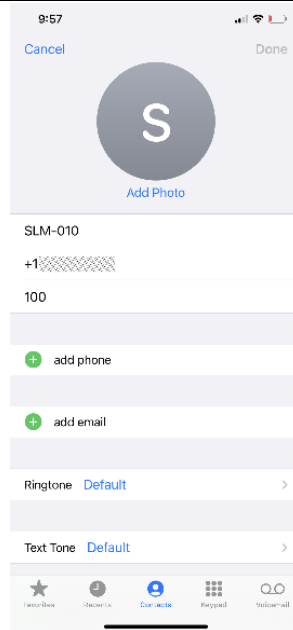


Figure 6 Contact example for SLM-010

During application start up, the activation message will be sent to your indicated phone number (see Figure 7) and the phone number will be shown on application front panel for approximately 5 seconds (see Figure 8).

## Operation

During first application start:

1. Allow Bluetooth - (if it was not done before start)
2. Allow Notifications - (if it was not done before start)
3. Allow access to contact list (application uses SLM-010 contact to read message phone and salt tank height only) - (if it was not done before start)

**Note: Restart application again after all access has been allowed.**

4. Confirm "Pair" with device. *Note: Password is not required for pairing.*
5. If phone number is presented in SLM-010 contacts, the activation message will be sent to indicated phone number (see Figure 7) and the phone number will be shown on application front panel for approximately 5 seconds (see Figure 8).

**Note: Do not report junk for this phone number. It is messaging service.**

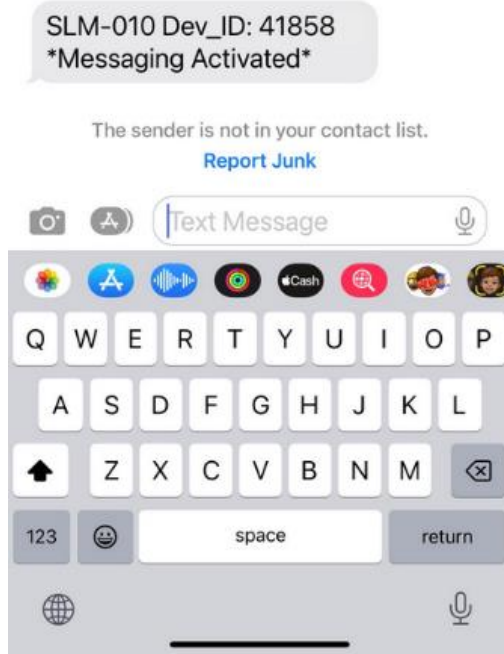


Figure 7 Activation Message

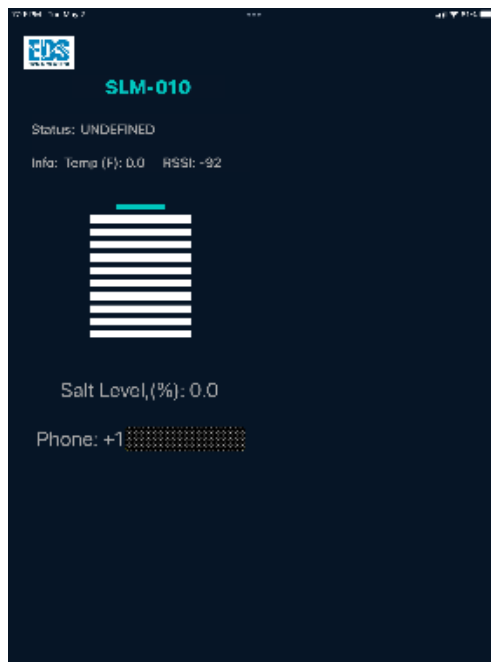


Figure 8 Message Phone number indication at start (iPad screenshot)

## iOS Application Screenshot

The Figure 9 shows screenshot of SLM-010 Application.

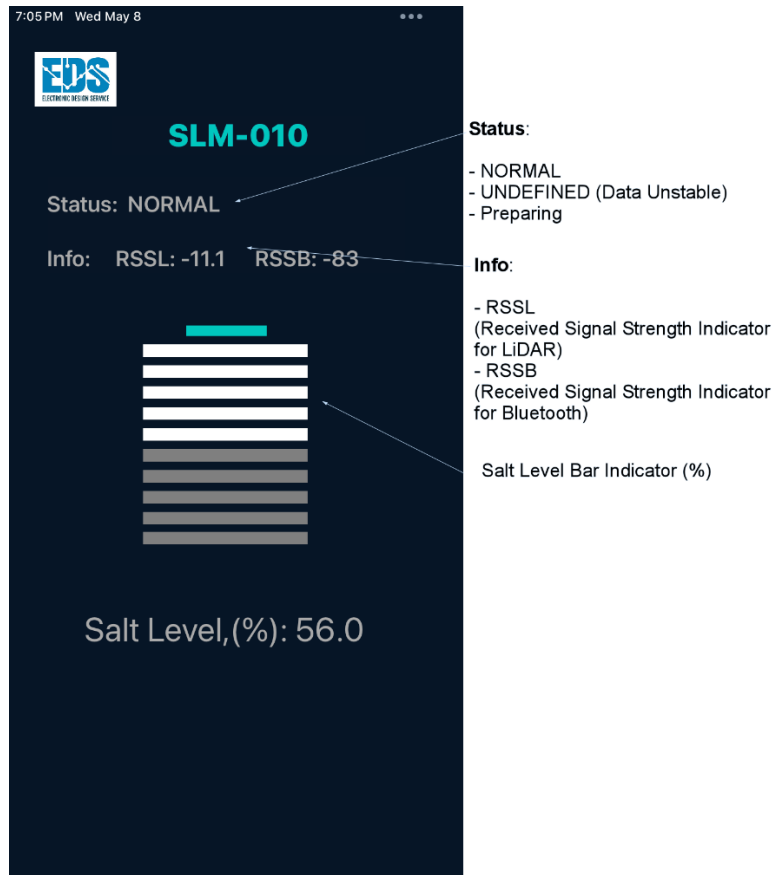


Figure 9 iOS Application Screenshot

Application receives data steadily from device if RSSB is more than -92dBm. The location of device shall guaranty that RSSB more than -92dBm for continuous operation. However, if your iPhone (or iPad) periodically losses communication with your device due to being out of receiving zone, it will be automatically reconnected when your iPhone (or iPad) is moved inside of zone where RSSB more than -92dBm (Usually within reachable distance of your Bluetooth connection)

Troubleshooting note: The “Data Unstable” status means that LiDAR signal is less than -55dB. In this case, possibly the Luna module sensor operation is in failure condition.

“Preparing” status indicates that device is in loading mode.

### Start and Operation Conditions with Messaging

Connect power adapter to your 110v wall outlet. A front LED will start blinking with 1.5sec Intervals. This indicates normal operation.

Start SLM-010 application on iPhone or iPad.

These are the following operation conditions:

**Normal Operation** (status id "NORMAL" and Salt level is more than 40%):

See Figure 9 for this mode of operation

**Alarm** (salt level is less than 30%):

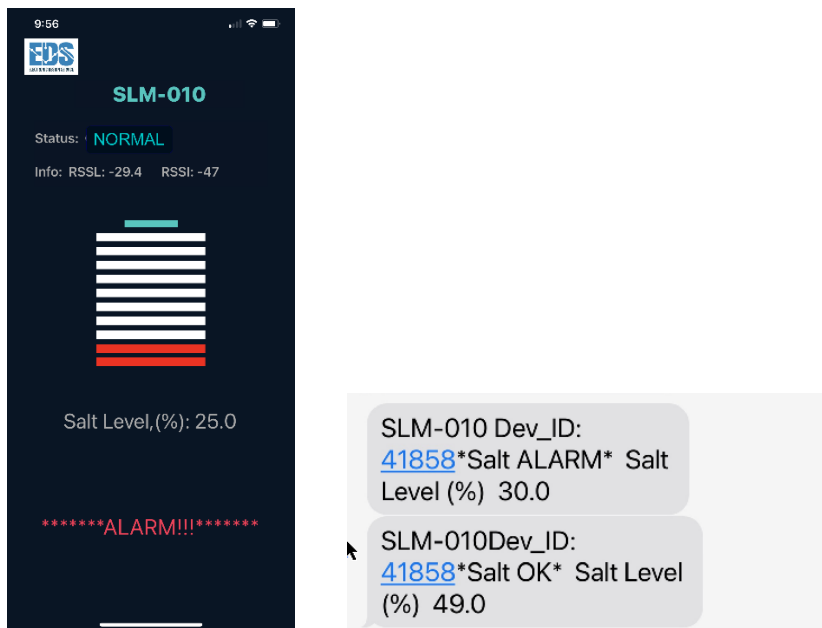


Figure 10 Alarm state and messages examples



## Warranty

When used and maintained in normal use and in accordance with the Installation and Operating Instructions, your SLM-010 product is warranted against original defects in material and workmanship for a one full year from the date of purchase (the "Warranty Period"). During the warranty period, SLM-010 will be repaired or replaced at no cost to you. EDS will inspect and diagnose the failure, at which point we will determine whether root cause of this failure is due to defective materials or workmanship. If that is the case, EDS will repair/replace your product at no cost to the customer.

This warranty does not cover use of the product in improper installation and/or improper maintenance of the product, damage due to misuse, owner's acts or omissions, use outside the country in which the product was initially purchased. This warranty does not cover pick up, delivery, transportation or house calls. However, if you mail your product to EDS for warranty service, cost of shipping will be paid one way. This warranty does not cover products purchased from a party that is not an authorized retailer, dealer, or distributor of EDS products

## Troubleshooting

### Bluetooth will not stay connected:

- a) Device out of range. Move iOS device to the zone where RSSB is more than -90dBm. *Note: reconnection could take around 6 minutes.*

### Bluetooth will not connect:

- a) Assuming the iOS device is within Bluetooth range of the SLM-010. Use “Forget This Device” function in iOS device Setting > Bluetooth>SumpSaltMonitorV010> Forget This Device and turn off and turn on power of SLM-010 device.
- b) Restart application

### No Activation Message after device connection:

- a) Check spelling of iOS device “Contacts” setting.

### Salt Level Graph and Value Not Indicated Properly or status is “Data Unstable”:

- a) Restart power of SLM-010

## Support

Send us an email to: [support@eldesignservice.com](mailto:support@eldesignservice.com) or submit a request through our webpage: <https://eldesignservice.com/contacts-html/>