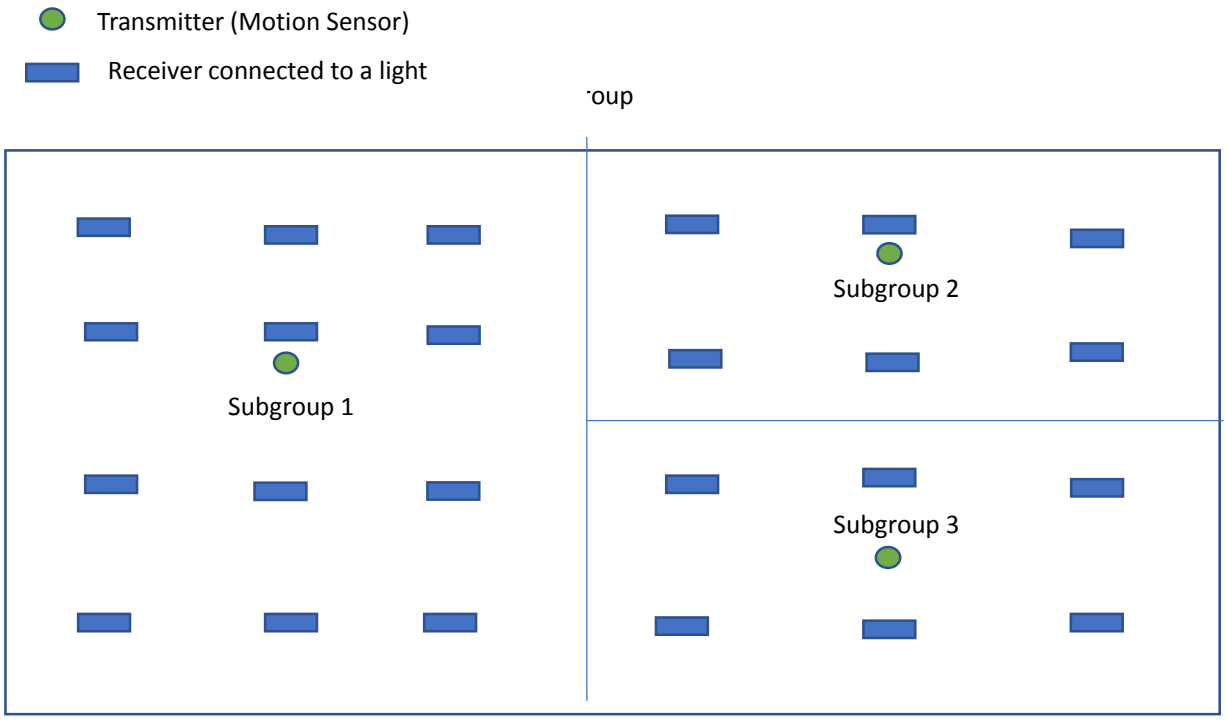
# LMenergy LMIC Lighting Controller

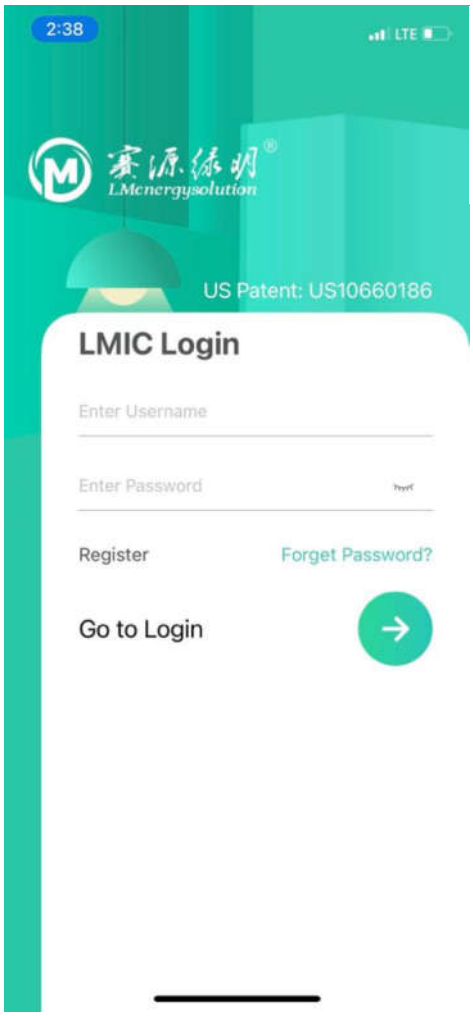
The LMenergysolution Lighting Company, Ltd, LMIC Lighting Controller is a Bluetooth based mesh system for controlling on/off and 0-10VDC dimming of LED products. The system consists of a Transmitter (includes an onboard motion sensor) and a Receiver. The Receiver is connected to the light. An optional part of the system is an Ambient Light Sensor (ALS) that is required if 0-10VDC dimming control is desired. An iPhone app is used to controller the LMIC. Each device is a node, nodes form a mesh.
The LMIC is activated when the Transmitter's motion sensor receives a motion signal which causes the transmitter to calculate an action according to the user's settings. The Transmitter then transmits the associated action to the Receiver by Bluetooth. The Light Sensor is connected to the Receiver. In this configuration, the Receiver outputs 0-10V control voltage to the light to achieve the set brightness.

**LMIC Lighting Control Process**

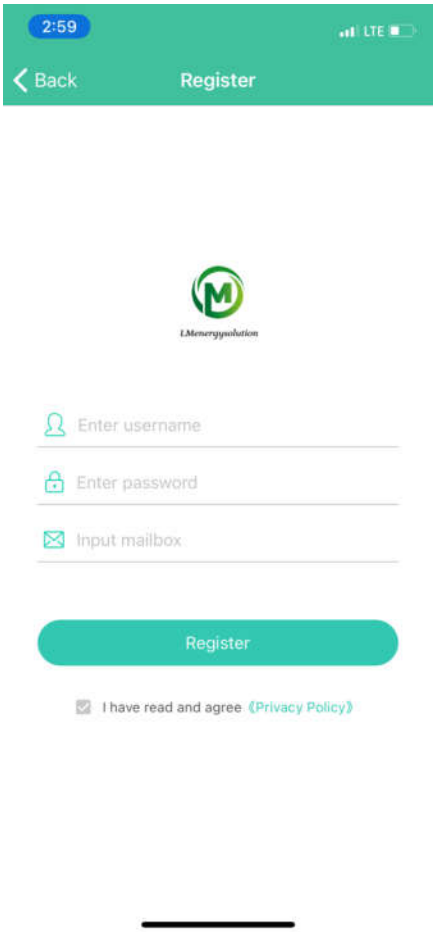
1. Create Lighting Control Plan
    a. Identify Control Groups - Building/Areas
    b. Identify Control Subgroups - Areas/Rooms
    c. Identify needed devices
        i. Transmitters (T) - motion sensors
        ii. Receivers (R) - light fixture controllers and ambient sensors
2. Download LMIC app and create an account
3. Configure/Provision installed LMIC devices that are listed in the Unconfigured Device tab
4. Create Groups and Subgroups in the app
5. Populate Subgroups with installed LMIC devices listed in the Ungrouped Device tab
6. Set Subgroup control parameters
    a. If needed, set individual device control parameters



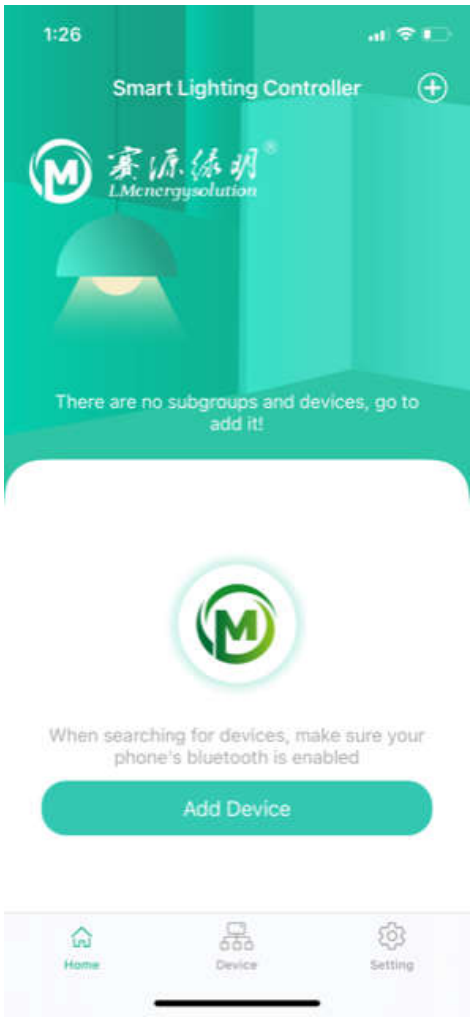
## LMIC Account Setup




- Download LMIC app from the iPhone App Store.
- Create an account using the “Register” link.
- Password reset is though the “Forgot Password” link.
- A device (Transmitter or Receiver) can be controlled by only one account.

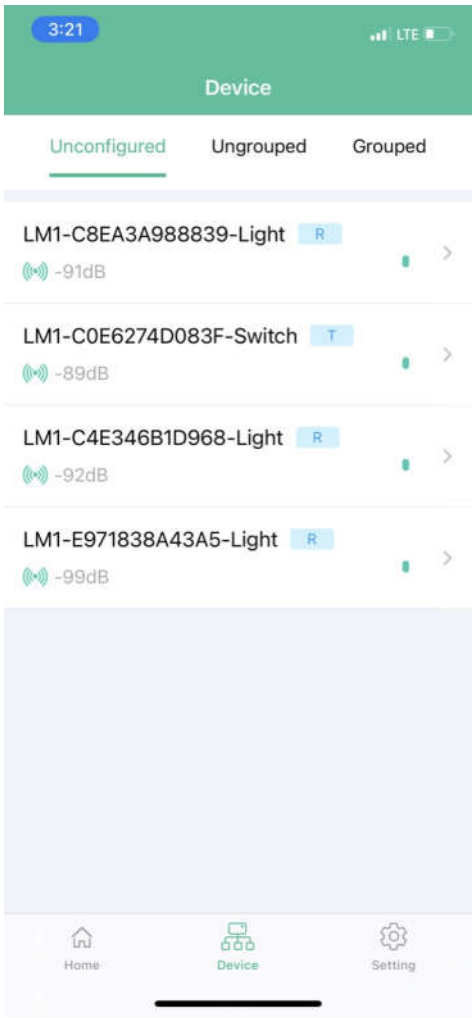


## Getting Started




- Touch “Add Devices” to find the Unconfigured devices that are available to Configured/Provisioned.

## Configuring/Provisioning Devices




When power is applied to installed Transmitters (T) and Receivers (R) will initially show up in the Device's page under the Unconfigured tab.

A device is either a Transmitter (motion sensor) or a Receiver (light controller with ambient sensor).

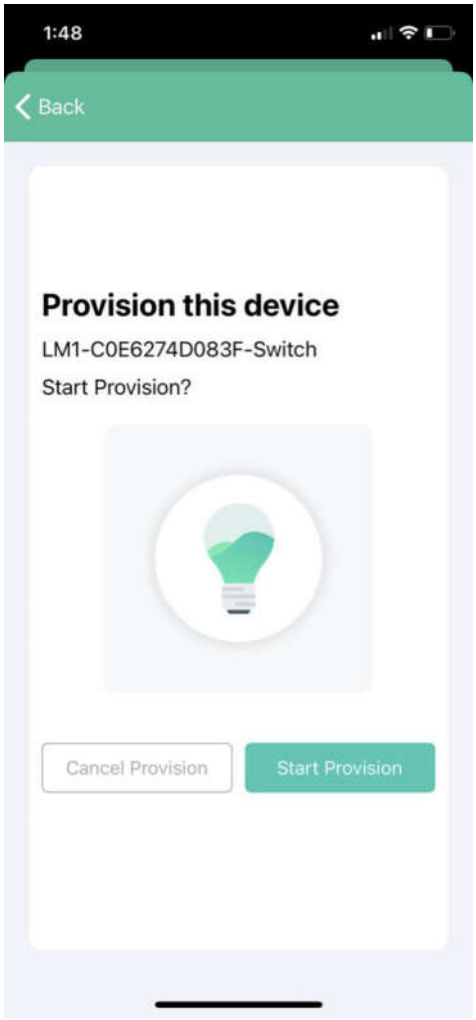
If power is applied to a Transmitter (T) or Receiver (R), the device will be displayed in the "Unconfigured" tab.

If a installed device is not listed in the Unconfigured tab, check the power connection to the devise. If the device is still not listed, a reset of the device is required. See the "Reset Device Instructions" at the end of this document

To "Configure/Provision" a device, touch the desired T or R to initiate the sequence.

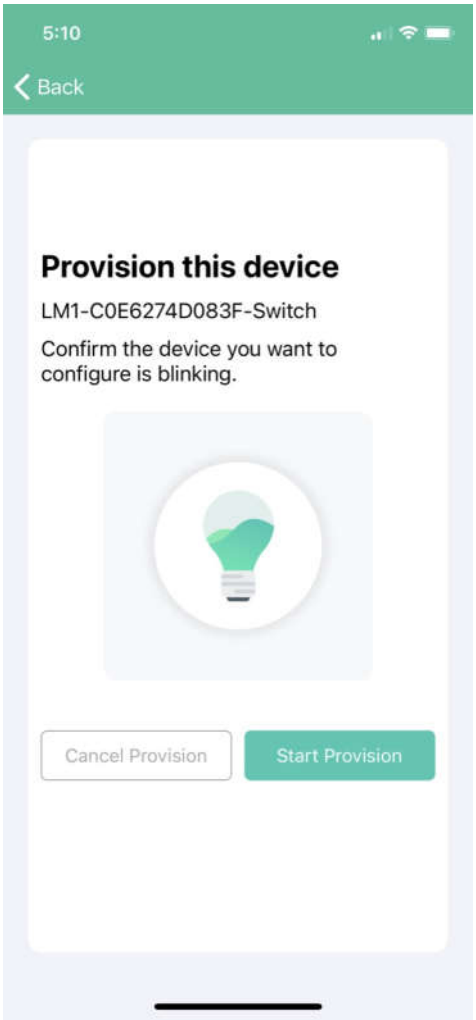
Repeat the action for each device that is needed for the project.

## Configuring/Provisioning Devices

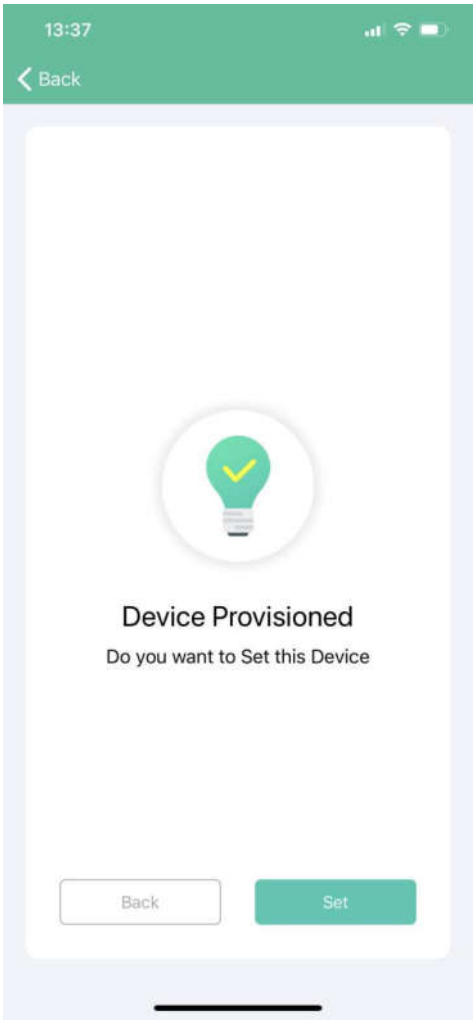



- Touch “Start Provision”.

## Configuring Devices

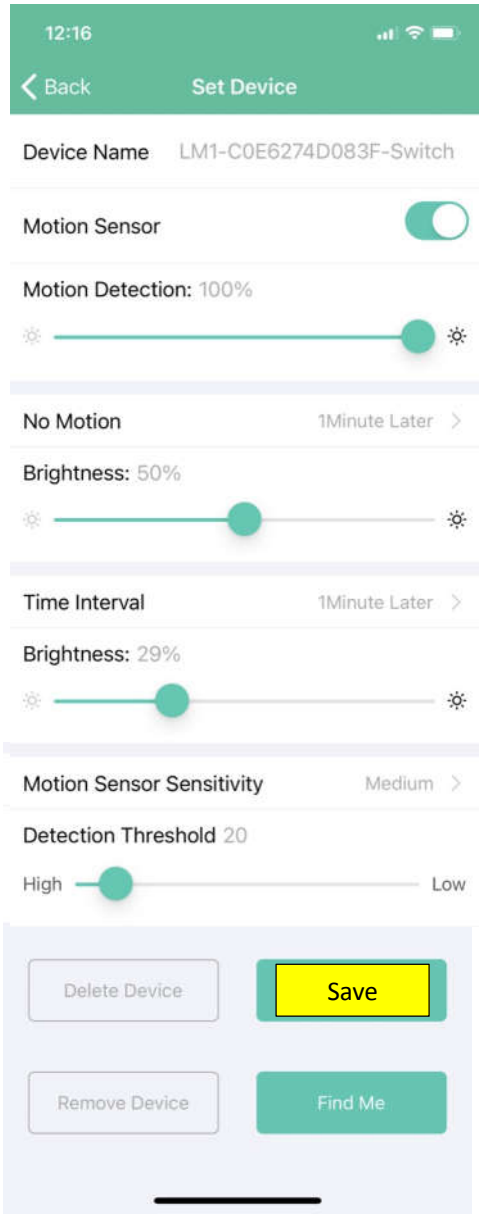



- When this screen appears, the selected device will begin to flash.
    - A Receiver (R) will cause the connected light to flash.
    - A Transmitter (T) will cause the blue light inside of the motion sensor to flash.
- After confirming the identity of the intended device, touch “Start Provision”.



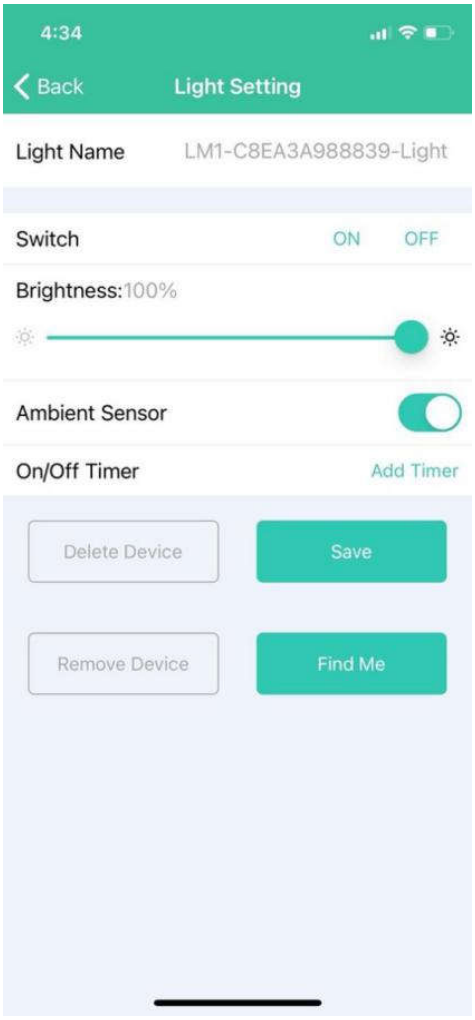

Touch Set

## Set Device - Transmitter




- The device name can be edited.
- The Motion Sensor and other settings will be addressed in the Set Parameters section.
- Touch "Save" to confirm the configuration - this needs to be changed to "Save"
- Find Me - For Transmitters, the motion sensor light will flash. For Receivers the LED light will flash.
- Delete Device - the device will reset to the Unconfigured condition and displayed in the Device Page Unconfigured tab. It will take 25 seconds for a deleted Receiver to visible on the Device page.
- Remove Device - If a device has been replaced or is not functioning, and the app still has the device information, but the device cannot be connected, click on this to remove the device from the app. The removed device will need to be reprogrammed before being recognized by the LMIC app. See the Reprogramming section for details
- Touch "< Back" to get back to the Unconfigured page.

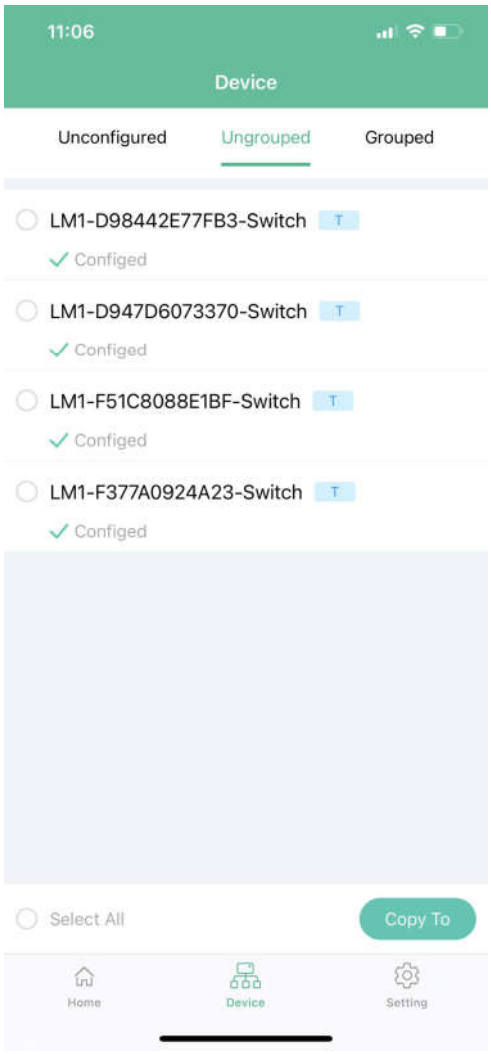
## Set Devices - Receiver




- The device name can be edited.
- Setting parameters will be addressed in the Set Parameters section.

- Touch “Save”” to confirm the configuration.
- Touch “< Back” to get back to the Unconfigured page.

## Configured Devices - Ungrouped

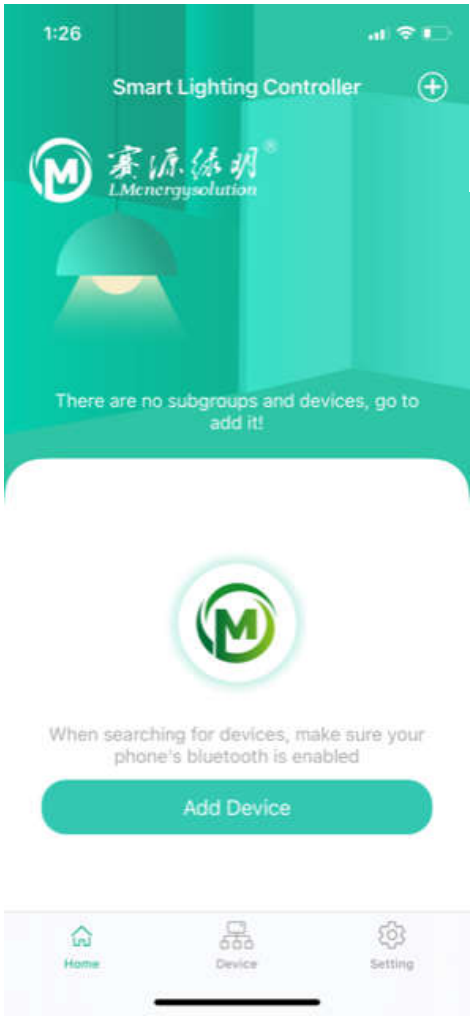



Devices that were Configured/Provisioned will be displayed on the Device page in the Ungrouped tab.

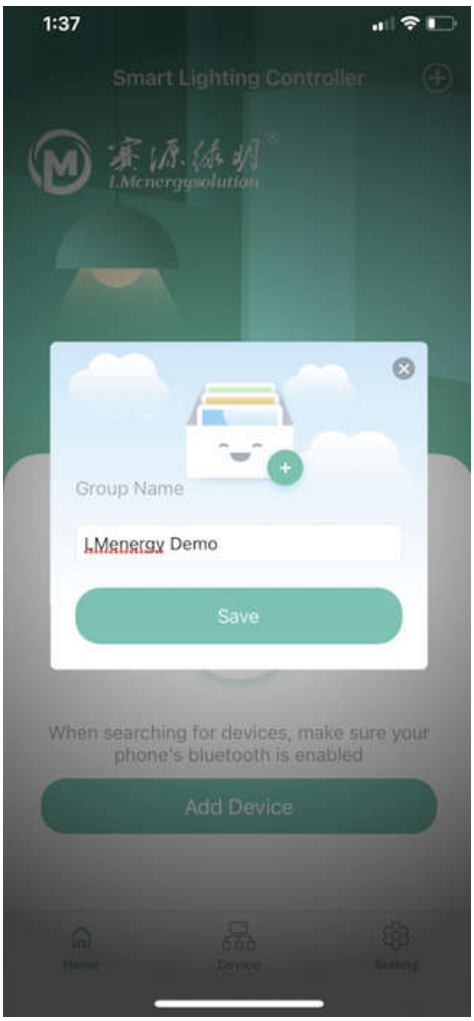
- Select the Ungrouped devices that you want and copy them to a subgroup you set up.
- Ungrouped Receiver (R) devices may be programmed according to the Set Parameters section (as individual - stand alone devices).
- Ungrouped Transmitters may be programmed according to the Set Parameters section but will not communicate with Receivers until included in a Subgroup.
- Receivers may be assigned to up to three (3) Subgroups. A Transmitter can only be assigned to one (1) Subgroup.
- Touch the “Home” icon to go to the Home Page to begin creating Groups and Subgroups.

**An R can be assigned to three different subgroups, and a t can only be assigned to one subgroup**

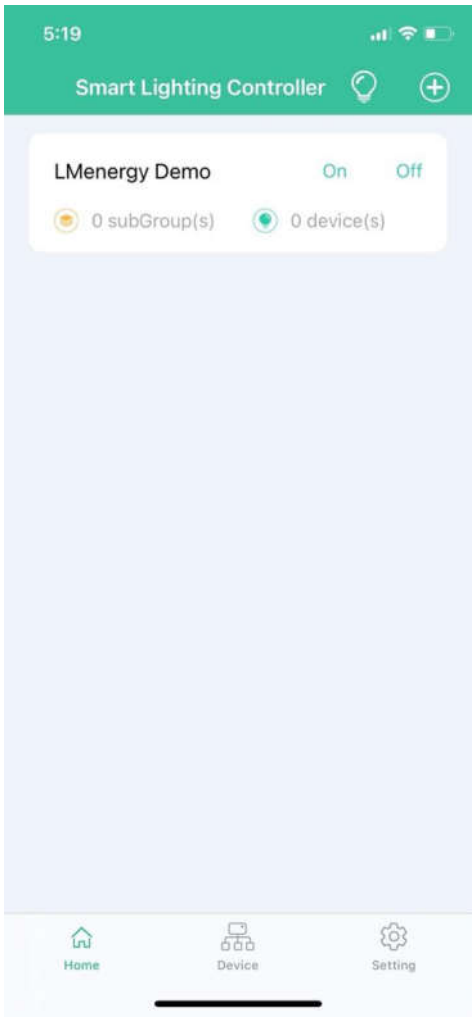
## Adding Groups



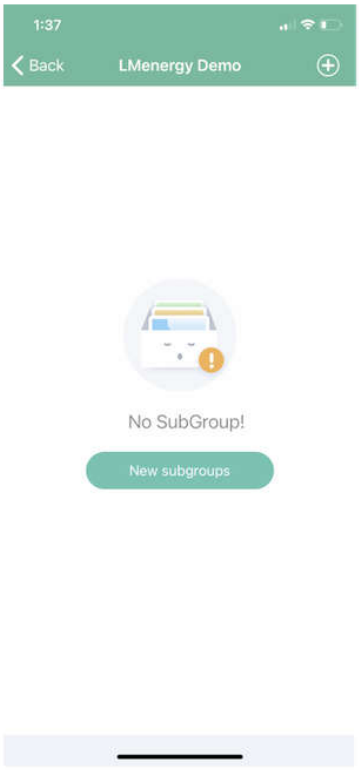

- Add a Group by touching the + sign in the top right corner of the screen.

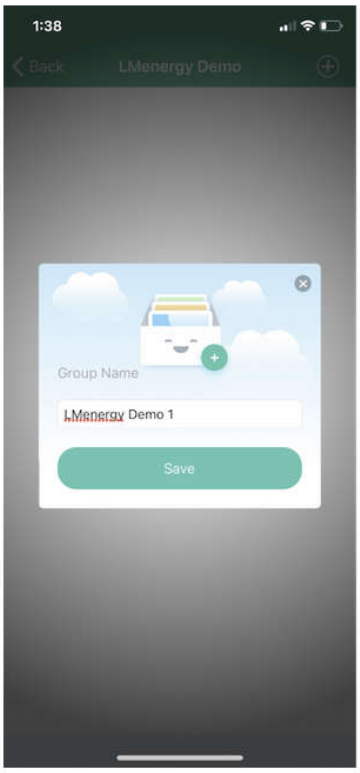


## Add a Subgroup

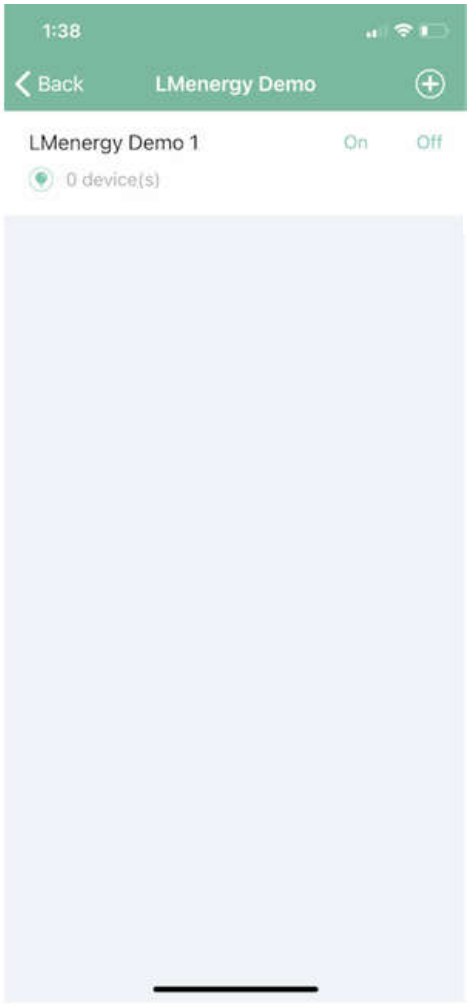



- Touch the Group name to add a Subgroup.
- Additional Subgroups may be added by touching the + in the upper right corner of the screen.

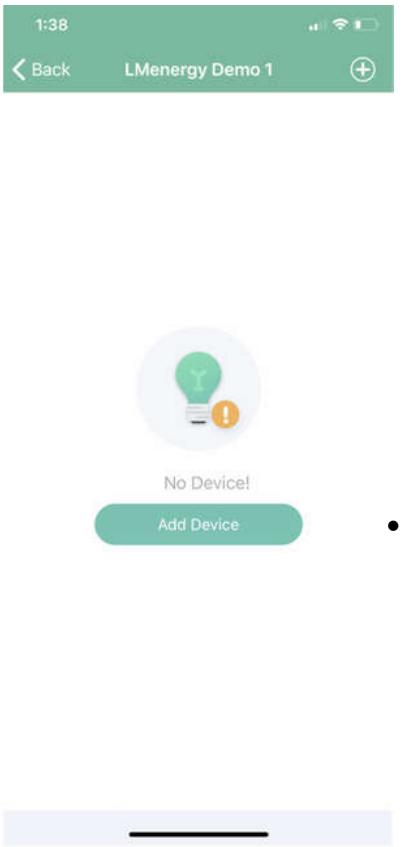


## Add Devices to the Subgroup

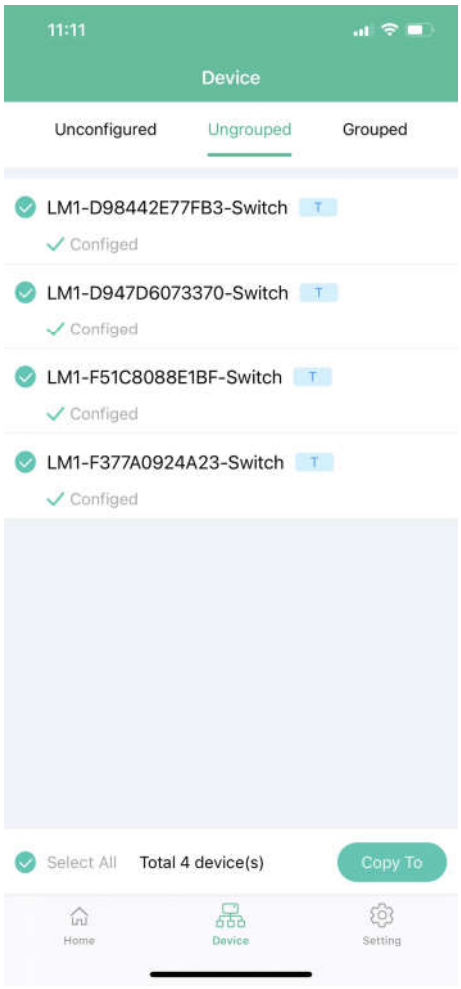



- Touch the Subgroup name to add devices.



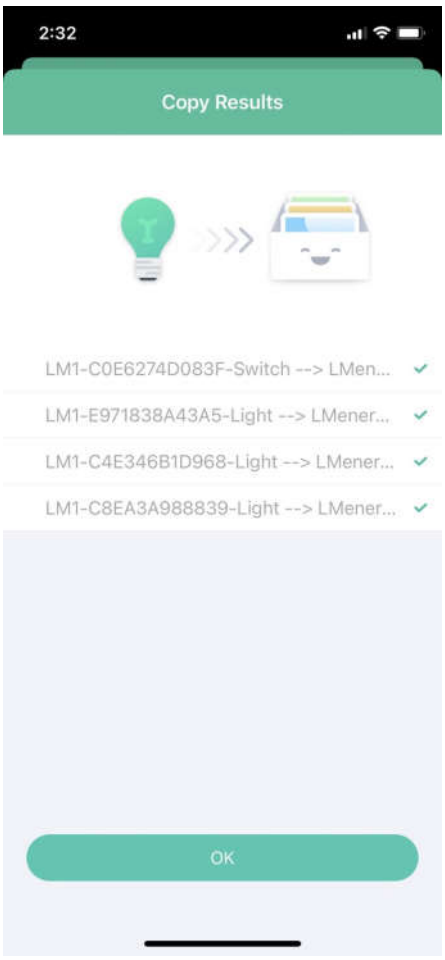

- Touch Add Devices.

## Add Devices to the Subgroup - Ungrouped Tab

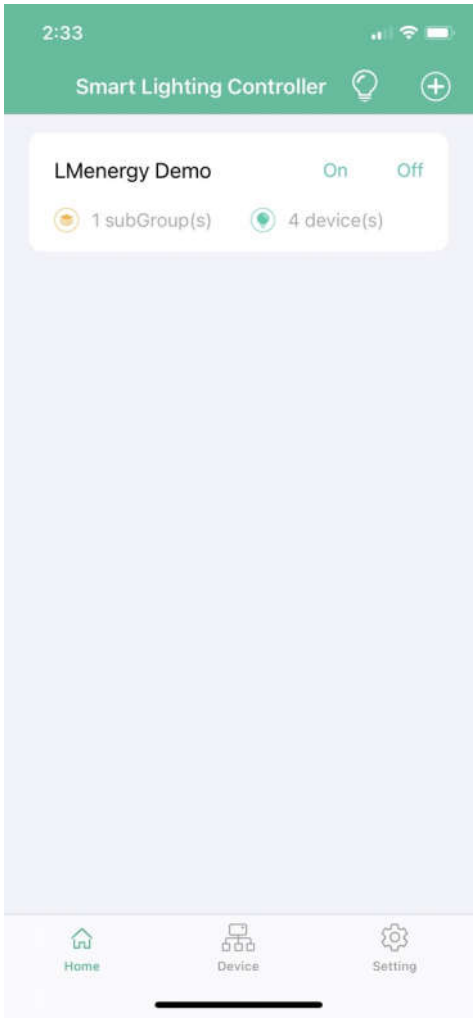



- Select the devices that you want to add to the subgroup

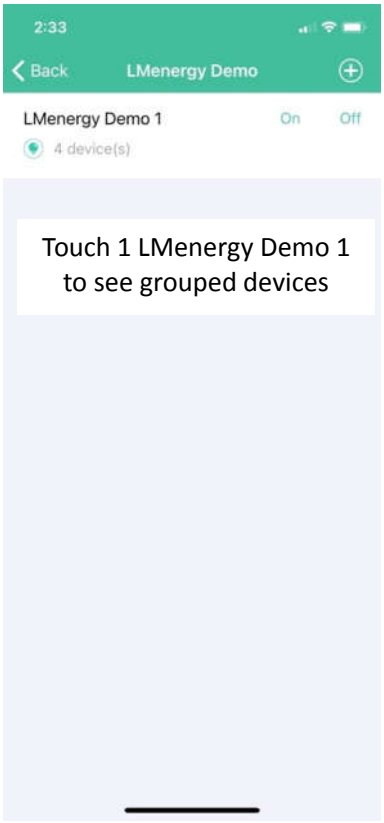
- Touch “Copy To”



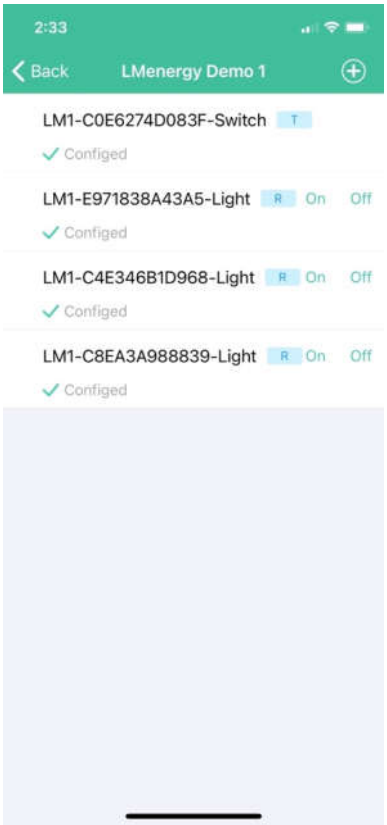
## Reviewing with the Group/Subgroup/Devices



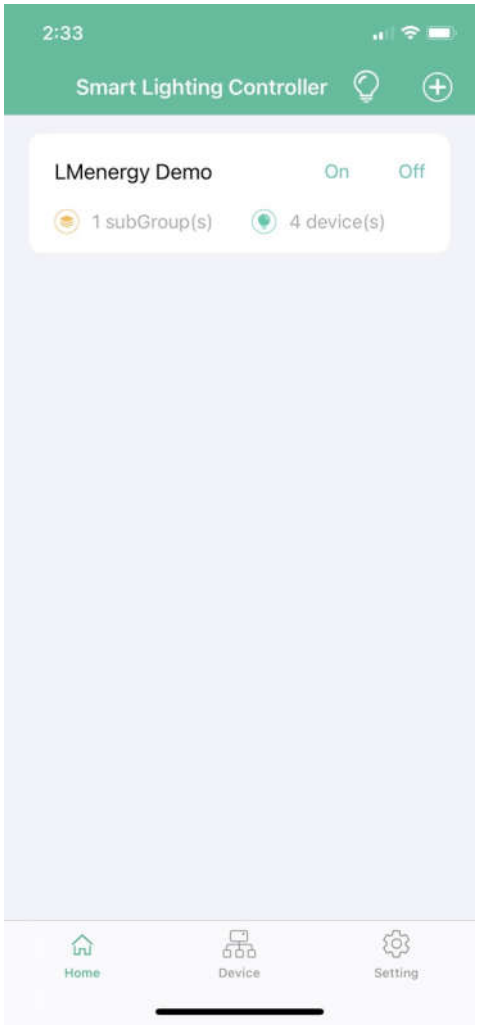

Touch 1 SubGroup to see the Subgrou



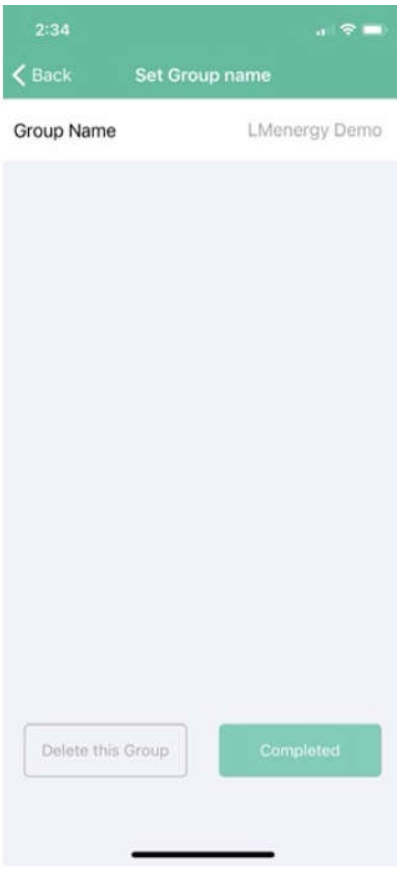

Touch 1 LMenergy Demo 1 to see grouped devices

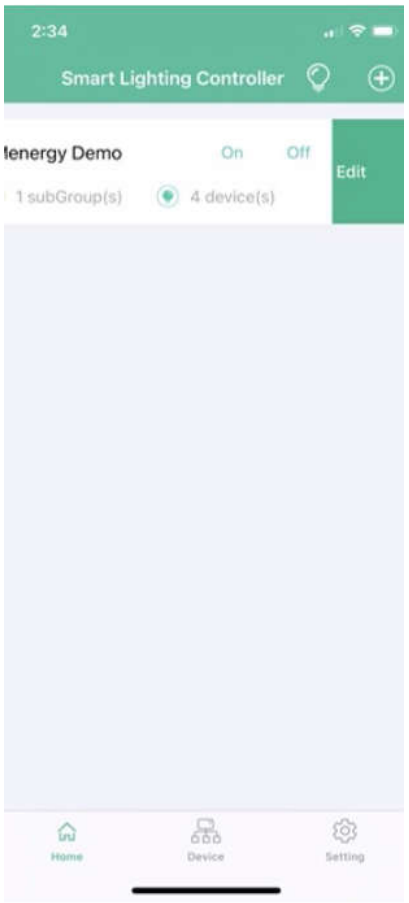


## Set and Edit Group Settings

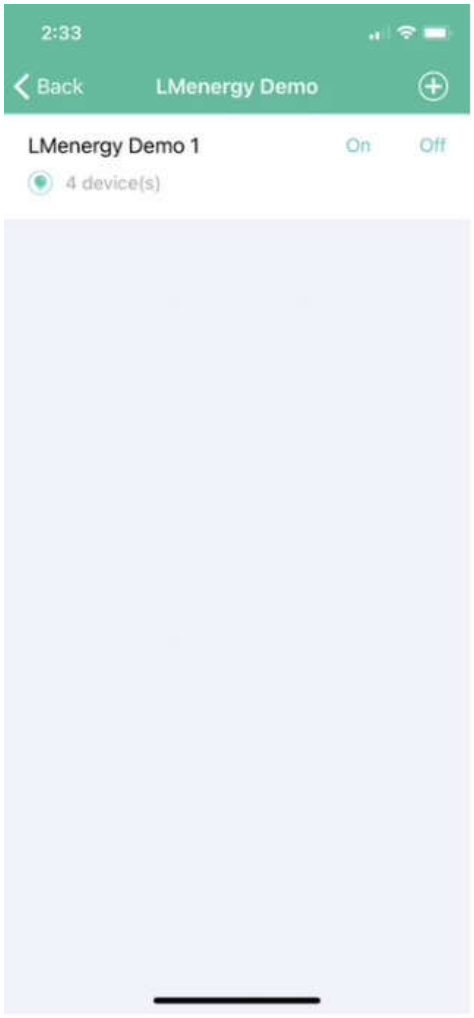



- Swipe left to edit Group Name

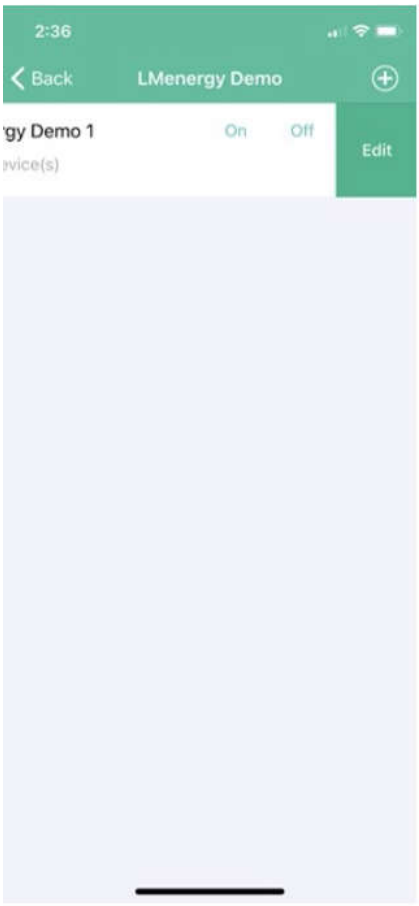


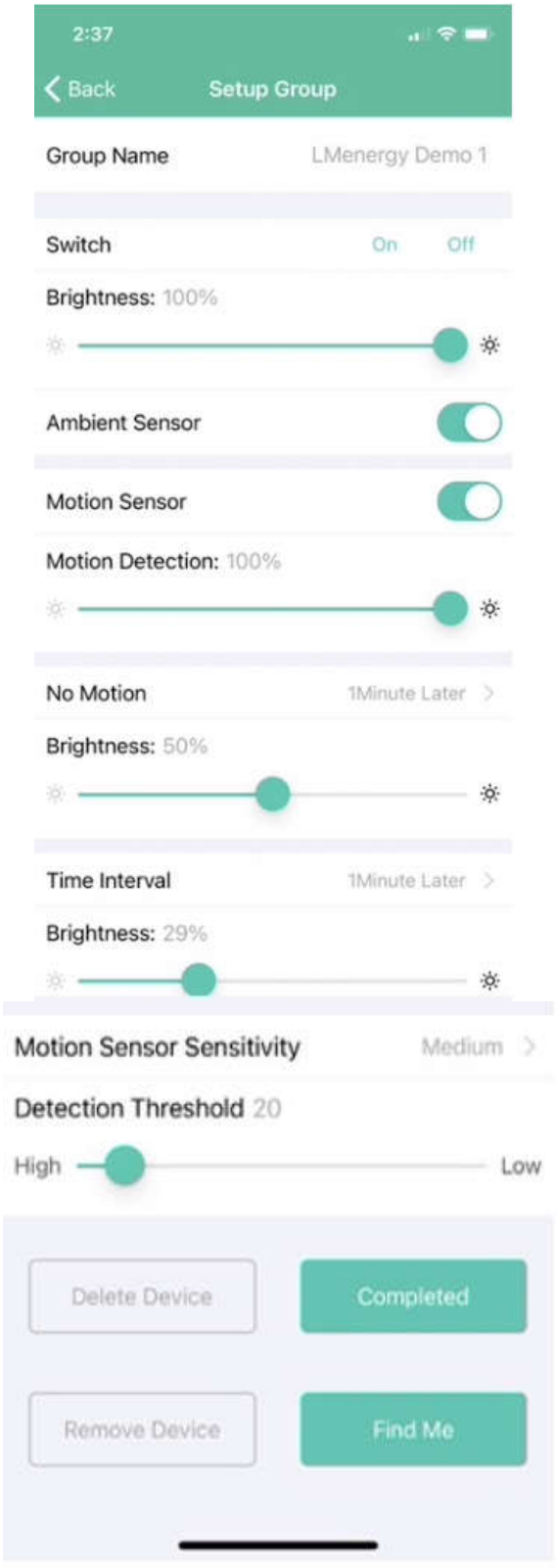
## Set and Edit Subgroup Parameters




- Swipe left to edit Subgroup parameters



## Set Subgroup Parameters




Subgroup name may be edited

Subgroup lights may be turned On and Off

Set value represents the percentage of total available lumens that will be used when Power is turned On. Value should be set based on desired foot candles measured in undimmed lights.
Initial Brightness value will be used to determine the percentage of Brightness calculated for Motion Detected,

On - Subgroup controls will account for ambient light. LMIC will hold with 10% of set brightness.

On - Light output is based on Motion Detected, No Motion and Additional Time set parameters.

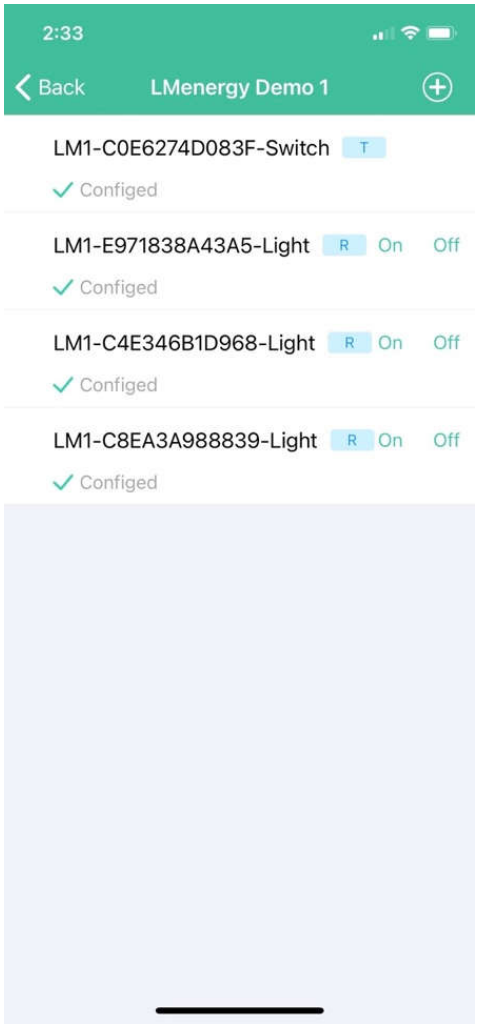
When no motion is detected within the set time, the LMIC will calculate light output based on Initial Brightness setting multiplied by the No Motion Detected Brightness and ambient light.
Example - 50% x 100% = 50% will be the brightness. Brightness will be adjusted based on ambient light.

When no motion is detected within the set time, the LMIC will calculate light output based on Initial Brightness setting multiplied by the No Motion Detected Brightness and ambient light.
Example - 50% x 100% = 50% will be the brightness. Brightness will be adjusted based on ambient light.

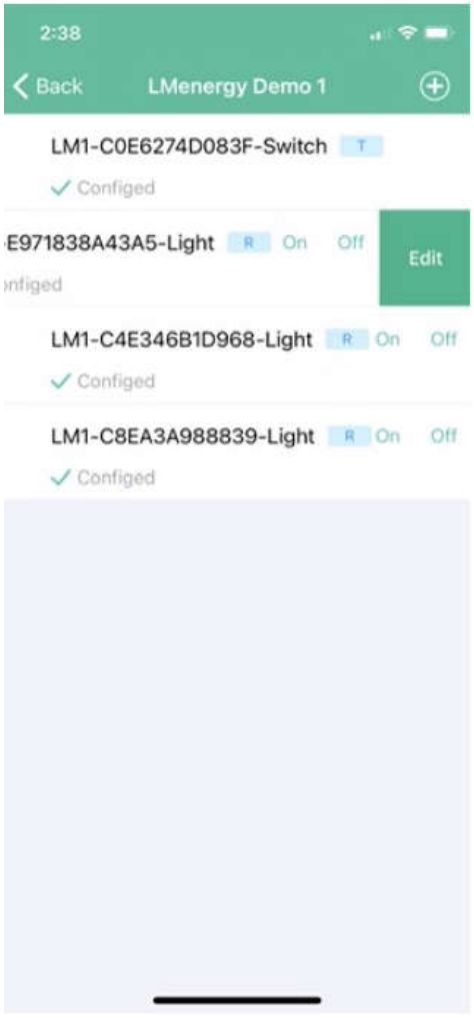
When the No Motion Detected time is expired, the LMIC will calculate light output based on the Initial Brightness setting multiplied by the Additional Time Brightness and ambient light.
Example - 38% x 80% = 30.4% will be the brightness. Brightness will be

Motion Sensor Sensitivity - Low + _____, Medium = _____ and High = _____

## Set Device Parameters




- Swipe left to edit a device parameter



## Set Device Parameters - Transmitter with Motion Sensor


**Subgroup setting are mirrored in all devices. Changing a device setting will only affect the individual device, not the entire subgroup. If there is only Transmitter in the subgroup, a change will affect all devices.**

Device name may be edited

On - Light output is based on Motion Detected, No Motion and Additional Time set parameters.

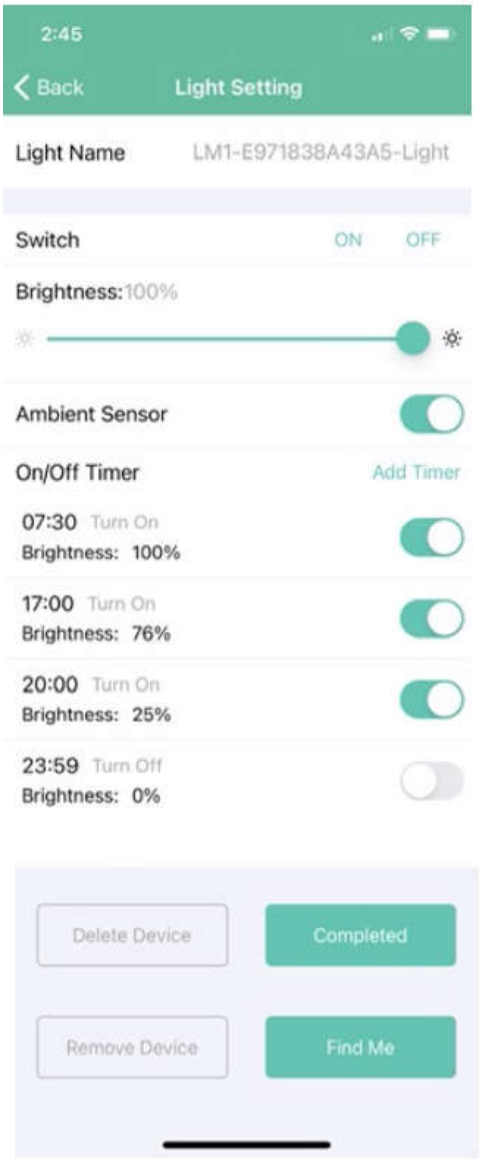
When motion is detected, the LMIC will calculate light output based on the Initial Brightness setting on the Set Subgroup page, multiplied by the Motion Detected Brightness and ambient light.

When no motion is detected within the set time, the LMIC will calculate light output based on Initial Brightness setting multiplied by the No Motion Detected Brightness and ambient light.
Example - 50% x 100% = 50% will be the brightness. Brightness will be adjusted based on ambient light.

When the No Motion Detected time is expired, the LMIC will calculate light output based on the Initial Brightness setting multiplied by the Additional Time Brightness and ambient light.
Example - 25% x 100% = 25% will be the brightness. Brightness will

Motion Sensor Sensitivity - Low + [redacted], Medium = [redacted] and High = [redacted]

## Set Device Parameters - Receiver (with Optional Timer Settings)

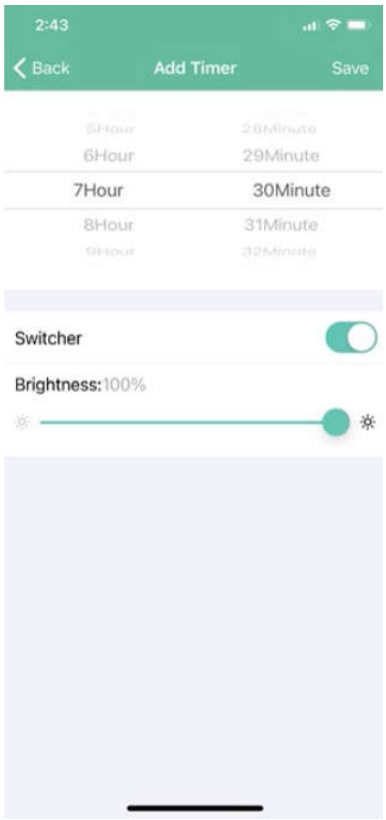



- The device name can be edited.

- Switch - Lights can be turned on and off.
- Brightness - Overrides Subgroup parameter. Set device light level as a percentage of available lumens/watts.

- Ambient Sensor - Overrides Subgroup parameters. Set brightness is maintained when ambient light changes

- On/Off Timer - Allows for up to 10 On or Off parameters to be set for a 24-hour period. Each On/Off parameter may have a different Brightness setting. Applies to individual device.

If the ambient light sensor off is selected, the brightness percentage only indicates that the brightness opening of the light is independent of the ambient light.

When the ambient light sensor is selected, the brightness accuracy will be kept at ± 10% LX.

Each time the power is turned on to a Receiver, the R will self-calibrate for about 25 seconds. It is suggested that after setting the Subgroup parameters, to turn on all the light switches in the Subgroup at the same time, to calibrate the lights in one or more rooms together. It is important that there be no motion or light lever changes in the area during the calibration. Motion or light level changes may adversely affect the accuracy of calibration.

The calibration process is to run the dimming light from the brightest to the darkest. If the light received by the equipment does not change, the non dimming light control program will be automatically executed. Therefore, it is recommended that the dimming light and the non dimming light should not be installed in a mixed way, which will cause control confusion. Of course, dimming and non dimming can be calibrated separately, or a single light can be calibrated once, which takes a long time.