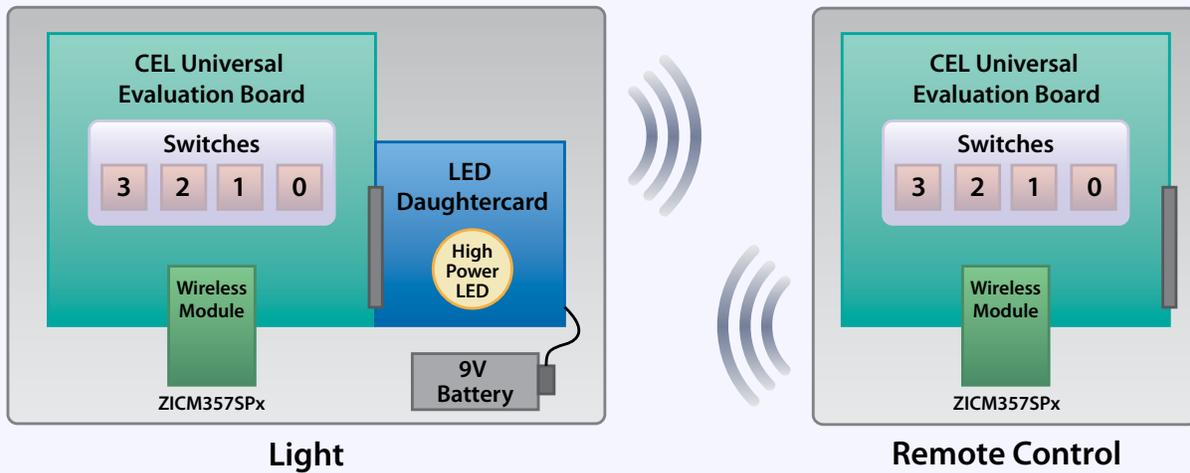


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ZigBee® Light Link Demo User Guide

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INTRODUCTION

This User Guide describes how to run the ZigBee® Light Link Demo. The ZigBee Light Link Demo is a lighting solution based on the ZigBee Light Link standard. The demo consists of dimmable lights (i.e., the lamps) and a remote control; together, these components form a complete mesh network without the need for a coordinator or any network installation. This is all facilitated via Touchlinking, a method of finding devices in the neighborhood based on received signal strength. In these types of networks, the remote control effectively manages the network and assigns the node IDs. If the remote control encounters a new light that is in its original, ‘factory reset’ condition, then the remote control will initiate the Touchlinking process where the closest light is identified and instructed to form a network. If a network is already established, the remote control will simply invite the light to join.

DIMMABLE LIGHT DESCRIPTION

The dimmable lights are normally mains powered and can act as routers. Each dimmable light uses two push-buttons:

1. SW0 is used to enable the Light Link Network formation.
2. SW1 is used to (1) force the device to leave the network and (2) return to ‘factory reset’. Upon the first button push the device will leave the network if it is linked. Upon the second button push it will go back to the factory default settings. After pushing, you will need to push SW0 to enable light link formation.

By default, the Light Link Network formation is automatically enabled immediately after power up.

REMOTE CONTROL DESCRIPTION

The remote control is a battery powered end device that will go to sleep to conserve battery power. The light remote control uses four push-buttons:

1. SW0 to initiate the Touchlinking.
2. SW1 to toggle the light (if light was off, then it turns it on and vice versa).
3. SW2 to increase the light level in 10% increments (the total light intensity range consists of 255 steps, and each button press equates to 25 steps or 10% of the total range).
4. SW3 to dim the light level by 10% (the total light intensity range consists of 255 steps, and each button press equates to 25 steps or 10% of the total range).

TARGET AUDIENCE

Customers interested in lighting applications.

REQUIREMENTS

1. CEL Universal Evaluation Board to act as the light remote control.
2. CEL Universal Evaluation Board with an LED light (attached to it) to act as the light; multiple boards will be needed if it is desired to show multiple lamps.

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DEMO SETUP

- Step 1. Set up the lights by powering them on (turn ON CEL Universal Evaluation Board(s) with LED light). If you need instructions for setting up the hardware, reference the *CEL Universal Evaluation Board User Guide*. If you are unsure whether the lights are in their 'factory reset' mode, press SW1 twice and then the Reset button on the Universal Evaluation Board, to force a return to the original factory settings. Lights should be a few yards apart and the remote control should be closest to the light that is being added to the network.
- Step 2. Set up the remote control by powering it up (turn ON the CEL Universal Evaluation Board that acts as the Light Remote Control).
- Step 3. Move the remote control very close to the light that will form the network and press SW0; there is no defined spacing. The remote control will detect that particular light's signal but not the other(s). The LED light will blink during network formation and stop when done. Once the network has formed, LED0 on the remote control will light up. The default state of the LED light is OFF when it joins the network.

If you want to add another LED light to the network, first make sure that all other lights are off. Move the remote control close to the next LED light and press SW0 to repeat Step 3. Repeat until all LED lights have joined the network.

At this point the remote control is still awake.

RUNNING THE DEMO

Now that the Light Link Network is set up, you can use the remote control to control all lights on the network.

The following actions are managed through the remote control:

- SW1 – Press to wake up the remote control (if it was asleep) and toggle the lights. If the lights are ON, they will turn OFF. If they were OFF, they will turn ON at the level set using the SW2/SW3 push-buttons. If the level was never set, then the lights will turn ON at 100%. The remote control will go to sleep after the command is completed.
- SW2 – Press to wake up the remote control (if it was asleep), increase the light level by 10% and then turn ON the lights. This will also set the ON level for SW1 the next time SW1 is pressed to turn ON the lights (e.g., if the lights are ON and are at 10%, pressing SW2 would turn ON the lights at 20%). Press SW1 to turn OFF the lights. Press SW1 again to turn lights back ON. The lights should be ON at 20%. The remote control will go to sleep after each button press command is completed.
- SW3 – Press to wake up the remote control (if it was asleep) and dim the light level by 10% (when the lights are ON). If the lights are OFF, SW3 will change the ON percentage for SW1 the next time SW1 is pressed to turn ON the lights. The remote control will go to sleep after the command is completed.

RETURNING THE LIGHT TO THE 'FACTORY RESET' STATE

Remote Control

For the remote control, press SW0 to initiate a Touchlink. This will wake up the remote control if it was asleep. Next, hook up a serial console to the Universal Evaluation Board via the USB port. *(Note: Follow the instructions from the CEL Universal Evaluation Board User Guide to download the driver for the USB port which allows it to act as a serial port if one does not exist.)* The serial connection is 115200 baud, no parity, 8 bit data, 1 stop bit and no flow control. Press enter until you get the following prompt:

```
Controller>  
Controller>
```

Enter `plugin zll reset` at the prompt to force the remote control back to its original 'factory reset' state (e.g., `Controller>plug zll reset`).

Dimmable Light

For the light, press SW1 twice to force the light back to its original 'factory reset' state.

REFERENCES

Reference Documents	Download
California Eastern Laboratories	
0000-01-08-00-000 CEL Universal Evaluation Board User Guide	Link
ZigBee	
ZigBee Light Link Profile Specification Version 1.0	

REVISION HISTORY

Previous Versions	Changes to Current Version	Page(s)
0011-00-17-05-000 (Issue A) May 13, 2013	Initial Release	N/A

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