

LED-lamps

# LED-lamps Overview

The GreenWave Reality LED-lamps includes a wireless smart lighting system that helps make the lighting in your home more energy efficient and easier to manage.



## Basic Concepts of Wireless Lighting

Before setting up your wireless lighting network, you should take a few minutes to read through these basic concepts to understand how wireless

lighting works and how it is different from standard lighting. Wireless light bulbs work with your light fixtures the same way as standard light bulbs. They are different, however, in a couple of ways:

- The lighting element in the light bulb uses energy-efficient CFL technology or the more efficient LED technology.

- The light bulb includes wireless technology that allows the light bulb to connect to a network and be managed remotely.

Because the light bulbs can be connected to a network, you have greater flexibility in how you use them. For example, you can program your lighting network so that when you press a button upon arriving home, an entryway and a hallway light turn on. Or when you go to bed, your remote control can turn off all lights on the network.

## Planning Your Lighting Network

Whether you have only one wireless light bulb or you are replacing your entire home with wireless light bulbs, you should plan how you want the lighting on your network to behave. For example, if you only have one light bulb you might want to place it in a central location that would be optimum for turning on and off when you are away or arrive home. If you have multiple light bulbs, however, you might want to set them up in lighting groups to be able to better manage them across your home.

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**Note:** Light fixtures that have dimmer controls are not recommended for your network light bulbs. However, they can be used if the dimmer level is set to 100%.

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## Lighting Groups

A lighting group is a set of network light bulbs that you can control together through your remote control. For example, you might have a lighting group that includes light bulbs on the same floor. Or you might have a group that includes hallway and entryway lights, making it easy to turn on or off as you arrive or leave home. All light

bulbs in the same group turn on and off together and brighten or dim to the same level. The following limitations apply when working with network light bulbs and lighting groups in a system using remote control only:

- One light bulb can belong to only one lighting group.
- One remote control can control up to four different lighting groups.
- One lighting group can contain up to 40 light bulbs (the maximum light bulbs allowed in a remote control only network).

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**Note:** By default, each light bulb in your lighting kit is pre-assigned to a lighting group. Numbering on the lighting kit package shows the lighting group to which each light bulb is assigned.

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## Multi-fixture Lights

When installing light bulbs or setting up lighting groups, you should consider how you want multi-fixture lights to behave. Since power to the light has to remain on (so the remote control can access the light bulb) you would use either all network light bulbs in a multi-fixture light or no network light bulbs at all. If you are using network light bulbs in a multi-fixture light, you should add them all to the same lighting group so that they turn on and off together (though you do not have to).

### Network Range

As with any remote control, your lighting kit's remote control must be within range of your lighting network to be able to control your lighting. However, this does not mean that it has to be within range of all network light bulbs. Since the light bulbs are interconnected across the network, they can pass commands to each other as long as they are within network range of each other. This means that a nearby light bulb can receive your remote control command and pass that command across the network of connected light bulbs, ultimately to a light bulb you want to control in a distant room. Because of this effect, larger homes would make better use of having more network light bulbs spread across the home, maintaining a distance that allows each light bulb to communicate with one another.

### Maximum Number of Light Bulbs

You can install up to 40 light bulbs on the same network to work with your remote control.

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**Note:** Networks that use a Lighting Gateway can hold more light bulbs. If you are interested in upgrading, you should refer to the *Optional Lighting Gateway* chapter for more information about its features.

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### Power Failure with Wireless Light Bulbs

Wireless light bulbs are powered through light fixtures the same way standard light bulbs are. However, you must leave the light fixtures in the on position so that power is available when using your remote control to turn the wireless light bulbs on and off. If power is removed from a light bulb, whether from power failure or from manually

# Installation

Installation of your lighting kit includes installing the light bulbs into light fixtures and preparing the remote control.

## Installation Steps

Before installing the light bulbs, determine the appropriate locations in your home for installing them. The *Lighting Kit Overview* chapter provides information on planning your lighting network. When you are ready to install the light bulbs, perform the following steps:

1. Turn power **OFF** to the light fixtures where you will be installing the network light bulbs.
2. Remove any existing light bulbs from the light fixtures.
3. Install each network light bulb into the light fixtures as you would any standard light bulb. When removing each light bulb from the package, note the pre-assigned lighting group number on the package and install the bulbs in the light fixtures based on your lighting group plan.
4. Turn power on to the light fixtures. The light bulbs turn on to full brightness. If a light fixture has a dimmer control (not recommended), set the dimmer level to full brightness.

5. Remove the battery compartment cover from the back of the remote control, and insert two AA alkaline batteries (included). The first time you insert batteries, the primary LED light flashes while the remote control determines the best signal for your lighting system. When this process is complete, the LED light will remain on for approximately five seconds. When the LED light turns off, your remote control is ready. Note that this process occurs only during initial battery installation and does not occur when you replace batteries in the future unless a factory reset is performed.
6. Leave the light fixture switches **ON** so that power is available when using your remote control to turn the light bulbs on and off.

Once these steps are complete, you can use the remote control as discussed in the *Remote Control Operation* chapter to operate your lighting network.

## Installation Tips

**Review the safety information.** Be sure to review the information contained in the *Safety Information* chapter for important safety information you should follow.

**Keep radio signals clear.** The hardware in your lighting kit has antennas built-in for radio communication. Just as you might experience reception problems on your mobile phone inside a building, the hardware in your lighting kit can have trouble communicating if their radio signals are blocked by obstacles such as large metal panels or walls containing wire mesh. When placing these devices in your home, imagine invisible lines connecting between them. Try to keep these lines clear from obstruction as much as possible.

# Light Bulb Tasks

There are additional network tasks that you may find you must perform with your light bulbs, including:

- Adding light bulbs to your network
- Removing light bulbs from the network

## Adding Light Bulbs to the Network

Your remote control can manage up to 40 light bulbs on the same lighting network. When you add a light bulb to the network, you also assign it to a lighting group. To add light bulbs to the network:

1. Make sure your remote control is in range of the light bulb you are adding. Remove the battery cover from the back of the remote control so that you have access to the **Program** button.
2. Make sure power to the fixture where you are installing the light bulb is turned **OFF**.
3. Remove any existing light bulb from the light fixture.



4. Install the network light bulb into the light fixture as you would any standard light bulb. If the light fixture has a dimmer control (not recommended), set the dimmer level to full brightness.
5. Turn power to the light fixture on. The light bulb begins to brighten and dim while finding the remote control's network.

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**Note:** If for any reason the light bulb does not brighten and dim (if it remains full bright), then turn power to the light fixture on and off five times consecutively to reset the light bulb. During this process, only leave the power on or off for less than two seconds. The light bulb should then start to brighten and dim.

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6. On the remote control:
  - a. Press and hold the **Program** button.
  - b. While pressing the **Program** button, press the **Group Number** button for the lighting group you want assigned to the light bulb.
  - c. Release both buttons. The group number LED indicator flashes slowly while the light bulb is added.

When the light bulb is found and is being configured by the remote control, the remote control's primary LED indicator flashes rapidly. When the light bulb has been successfully added to the network, it will turn on at full brightness and the remote control's primary indicator will turn on solid. The LED group number LED indicator on the remote control will continue to flash for up to five minutes to give you time to install any additional light bulbs to that lighting group.

7. To add more light bulbs, repeat these steps. Remember, if the group number LED indicator on the remote control is still flashing from step 6, then it will automatically find the new light bulb without you

pressing any buttons, and it will add the bulb to the same lighting group. However, if the LED indicator has stopped flashing, then you must repeat step 6. Repeat this for each additional light bulb you are adding.

8. When you are finished adding all new light bulbs, you can return the remote control back to normal operation by pressing the **Program** button. Otherwise the remote control will automatically return to normal operation in five minutes. Both the primary LED indicator and the group number LED indicator turn off when the remote control returns to normal operation.
9. Leave the light fixture switches **ON** so that power is available when using your remote control to turn the light bulbs on and off.

## Removing Light Bulbs from the Network

When you remove light bulbs from the network, you remove all of its network settings. If you are removing light bulbs assigned to different lighting groups, you must work with one lighting group at a time. However, if you are removing light bulbs from **ALL** lighting groups, you can remove them all at the same time. To remove light bulbs from the network:

1. Make sure your remote control is in range of the light bulb you are removing. Remove the battery cover from the back of the remote control so that you have access to the **Program** button.
2. Make sure power to the fixtures containing the light bulbs you want to remove is turned **ON**. If there are other light bulbs on the network that are assigned to the same lighting group, but you do **NOT** want to remove those light bulbs from the network, then turn power to those light fixtures **OFF** (you can turn them back on after you have finished removing light bulbs). If you do not turn the other light bulbs off,

then they will also be removed from the network since the action applies to the entire lighting group. If you accidentally remove a light bulb from the network, you can simply add it back again using the procedure in this chapter for adding light bulbs to the network.

3. On the remote control:
  - a. Press and hold the **Program** button.
  - b. While pressing the **Program** button, press and release the **On/Off** button (keep the **Program** button pressed).
  - c. While still pressing the **Program** button, press and release the **Group Number** button for the lighting group assigned to the light bulbs you want to remove; or, if you are removing light bulbs from **ALL** lighting groups, press and release the **All Groups** button (keep the **Program** button pressed, regardless of the group button you press).
  - d. While still pressing the **Program** button, press and release the **On/Off** button again.
  - e. Release the **Program** button. The group number LED indicator (or all group number LED indicators if removing all groups) and the primary LED indicator flash slowly for 30 seconds while the light bulbs are removed.

When the light bulbs have been removed from the network, they will brighten and dim.

4. Repeat these steps to remove light bulbs from another lighting group.

### Removing a Light Bulb Without the Remote Control

If your remote control is not available you can remove a light bulb from the network by turning power to the light fixture off and on five times consecutively to reset the light bulb. During this process, only leave the power on or off for less than two seconds. When the light bulb has been removed from the network, it will brighten and dim.

# Optional Lighting Gateway

This user guide explains how to use lighting kits that do **not** have a Lighting Gateway. A Lighting Gateway is an optional device, similar to your home network router, that extends the range, features, and functionality of your lighting network. You can upgrade your network to operate with a Lighting Gateway to gain the following benefits:

- The lighting network can support up to 250 light bulbs on the same network.
- Network light bulbs can be configured to remember their previous state when power is cycled.
- You can use a smartphone application or your Web browser to perform many tasks with your lighting network and bulbs.

# Troubleshooting

If you are having problems with your lighting system, refer to the following sections for possible troubleshooting solutions.

## Light Bulb Not Responding During Installation

When you add a new light bulb to the network (or if you add a previously existing light bulb that you removed from the network), the light bulb should brighten and dim during the installation process to indicate that it is searching for a network. If for any reason the light bulb does not brighten and dim (if it remains full bright), then turn power to the light fixture on and off five times consecutively to reset the light bulb. The light bulb should then start to brighten and dim once it is reset.

## Light Bulb Accidentally Removed from Network

It is possible for a network light bulb to be accidentally removed from the network. For example, if someone turns power on and off five times consecutively to the light fixture, the attached light bulb will reset and remove itself

from the network. If this happens, follow the procedure in the *Light Bulb Tasks* chapter to add a new light bulb to the network.

### Resetting Your Light Bulbs

If you are unable to fix issues that arise with your lighting system, you can reset your light bulbs as a last resort. To do so, follow the procedure in the *Light Bulb Tasks* chapter to remove light bulbs from the network, followed by the procedure to add a new light bulb to the network.



### **Indoor Use Only**

The hardware in your lighting kit should be used only in dry, indoor locations. Do not use the hardware in high-humidity locations such as greenhouses, saunas, washrooms, or patios. Do not use the hardware in locations where it can get wet such as near aquariums or running water.

### **Do Not Disassemble**

The hardware in your lighting kit has no user-serviceable parts inside. In case of persisting malfunction, please contact Customer Service to arrange for repair at a certified service location. Do not attempt to disassemble the hardware for any reason.



# About GreenWave

GreenWave Reality is a global innovator in the emerging Home Energy Management market. GreenWave Reality provides an affordable, easy-to-use, standards-based platform that allows utilities to enhance their relationship with consumers and better balance energy on the grid while consumers can conserve energy with a minimal impact to their lifestyle by easily monitoring and controlling their appliances and adding intelligent LED lighting. GreenWave Reality is led by a diverse team of proven leaders with global experience.

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## Product Specifications

### Light Bulbs

	LED	CFL
<b>Radio Frequency</b>	2.4GHz	2.4GHz
<b>Features</b>	On, Off, Dim	On, Off, Dim
<b>Light Intensity</b>	470lm	1100lm
<b>Color Temperature</b>	Warm White (2700K)	Warm White (2700K)
<b>Color Range Index</b>	82	82
<b>Wattage</b>	8.5W	23W
<b>Equivalent Wattage (Incandescent Replacement)</b>	40W	100W
<b>Voltage</b>	120V/60Hz	120V/60Hz


For Lighting Gateway (GL30000 / GL30002-A / GL32200 / GL32202-A)



**Federal Communication Commission Interference Statement**

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

(Back Cover)