

## WaveLinx Wireless Area Controller (WAC)

### **WARNING**



**Risk of Fire, Electrical Shock, Cuts or other Casualty Hazards-** Installation and maintenance of this product must be performed by a qualified electrician. This product must be installed in accordance with the applicable installation code by a person familiar with the construction and operation of the product and hazards involved.



Before installing or performing any service, the power **MUST** be turned **OFF** at the branch circuit breaker. According to NEC 240-83(d), if the branch is used as the main switch for a fluorescent lighting circuit, the circuit breaker should be marked with "SWD". All installations should be in compliance with the National Electric Code and all state and local codes.



**Risk of Fire and Electric Shock-** Make certain power is **OFF** before starting installation or attempting any maintenance. Disconnect power at fuse or circuit breaker.



**Risk of Burn-** Disconnect power and allow fixture to cool before handling or servicing.

**Risk of Personal Injury-** Due to sharp edges, handle with care.

Failure to comply with these instructions may result in serious injury (including death) and property damage.

**DISCLAIMER OF LIABILITY:** Cooper Lighting Solutions assumes no liability for damages or losses of any kind that may arise from the improper, careless, or negligent installation, handling or use of this product.

**IMPORTANT:** Read carefully before installing product. Retain for future reference.

**NOTICE:** Product/component may become damaged and/or unstable if not installed properly.

**Note:** Specifications and dimensions subject to change without notice.

**ATTENTION Receiving Department:** Note actual fixture description of any shortage or noticeable damage on delivery receipt. File claim for common carrier (LTL) directly with carrier. Claims for concealed damage must be filed within 15 days of delivery. All damaged material, complete with original packing must be retained.

**NOTICE:** All new wiring must be fully verified before applying power.

**NOTICE:** Designed for indoor installation and use only. Dry location rated.

# WaveLinx Wireless Area Controller (WAC)



## SAVE THESE INSTRUCTIONS

This installation instruction is for the Wireless Area Controller (WAC-POE) which enables user control of the WaveLinx system and devices via local control or through the WaveLinx Mobile application.

The purpose of this document is to provide sufficient detailed instructions for installation and basic troubleshooting.

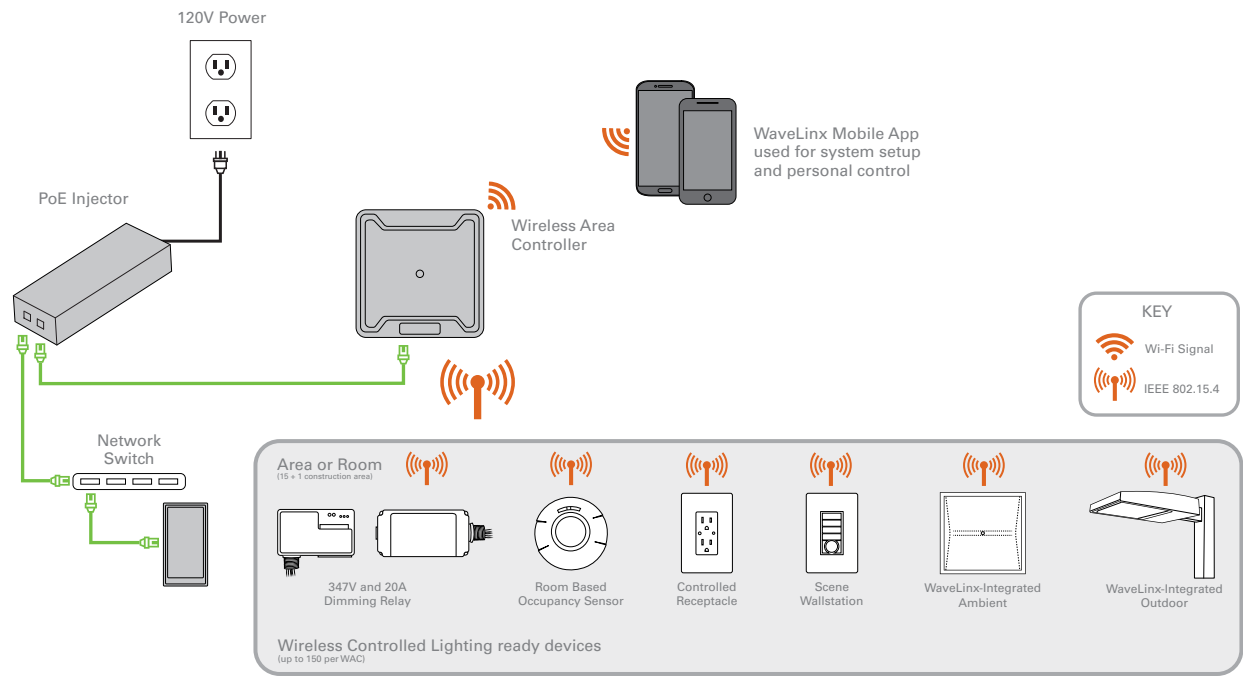
## This document covers installation of the following products.

- WAC-POE Wireless Area Controller, POE powered
- WAC-120 Wireless Area Controller, 120V (includes PoE injector for power)

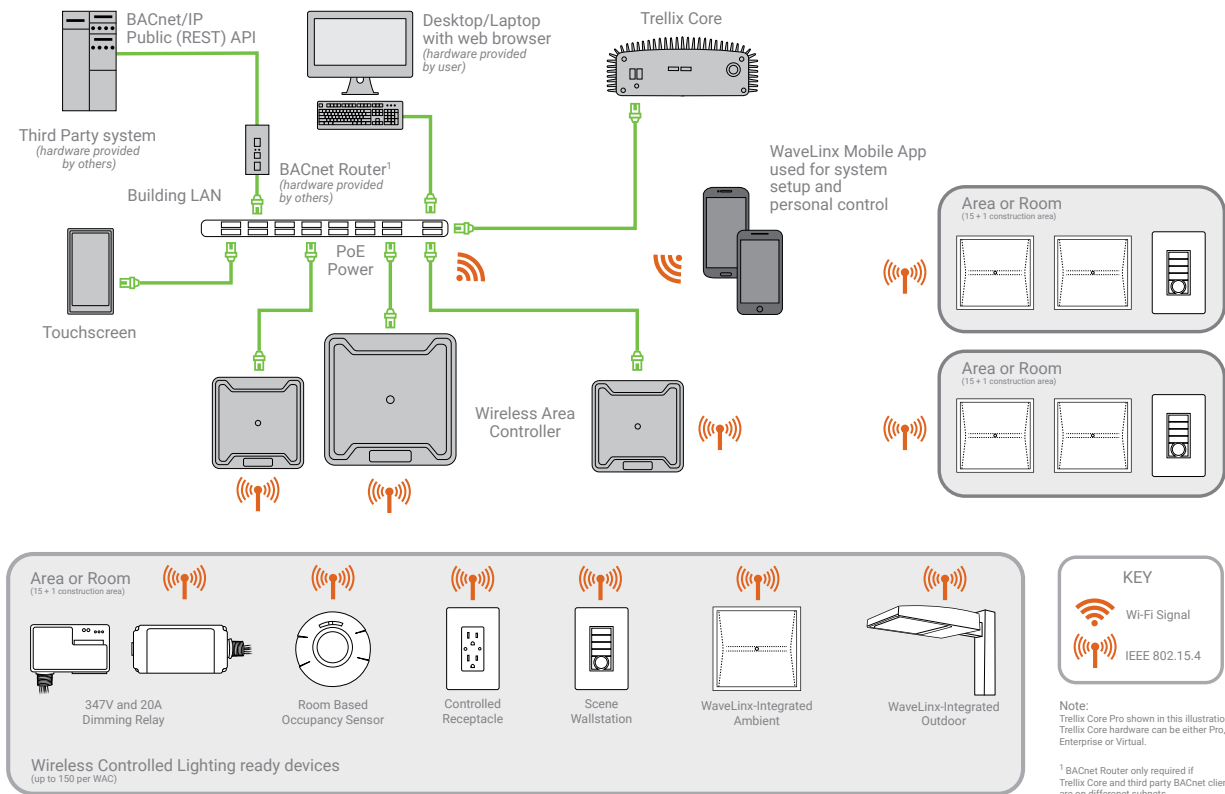
Note: For WAC-120, customer require a power supply that should be order directly from Cooper Lighting Solutions. Power Supply P/N: WPOE-120

## WaveLinx System Architecture

Figure 1. Stand Alone WAC installation



**Figure 2. Enterprise installation**



## Overview

The Wireless Area Controller (WAC) is the main component of the WaveLinx Connected Lighting system. WaveLinx eliminates the cost and complexity of typical wireless control system commissioning while providing a wired, flexible, and reconfigurable wireless topology for on the fly space adjustments. The WaveLinx system meets modern code and utility requirements, delivers energy and cost savings, while enabling buildings to become smart buildings.

The WAC coordinates between the WaveLinx Mobile App and various WaveLinx devices to create communications and a building ecosystem that provides out of the box functionality and leverages our patent pending automatic code commissioning features. Using standards-based wireless mesh compliant topology the WAC communicates to various WCL standards-based devices to provide area, lighting zone configuration, monitoring, and control.

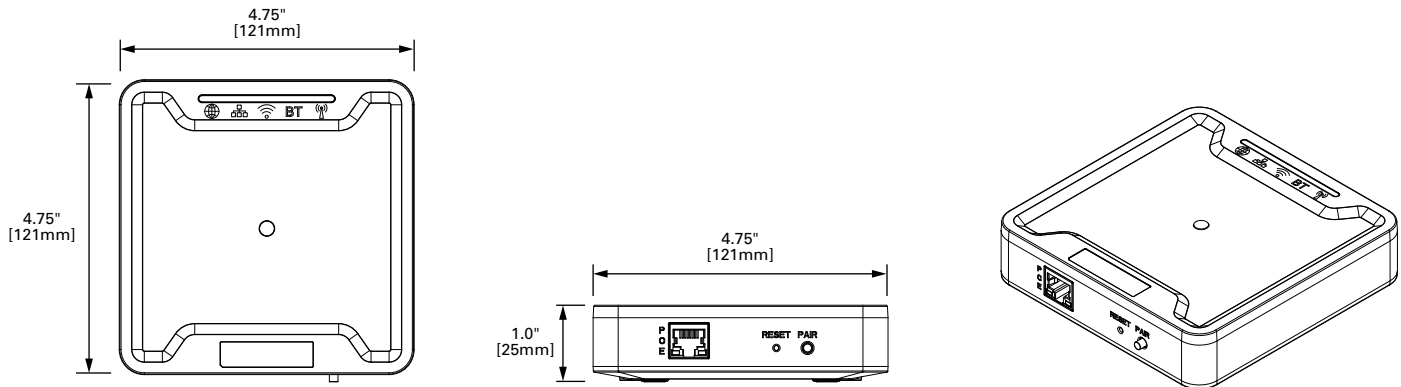
The WAC provides centralized coordination of multiple areas for partial ON/partial OFF scheduling, demand response, lighting, occupancy and daylight settings and scene control. A single WAC can be connected to the building LAN to coordinate up to 15 user-defined areas and 1 construction area, or multiple WAC's can exist on a building LAN to scale the system to hundreds of areas all accessible for setup, configuration and control through the WaveLinx Mobile App.

## WaveLinx system components

- Wireless Area Controller (gateway)
- WaveLinx Mobile App (commissioning and user personal control)
- WaveLinx Wallstation - wired or battery (manual lighting and scene control)
- WaveLinx Touchscreen
- Wireless INstinct Sensor (fixture integrated occupancy sensor, ambient light sensor and control)
- WaveLinx Relay Switchpacks with 0-10V
- WaveLinx Receptacles (wall mounted power outlet)
- WaveLinx Room Based Sensor (ceiling mounted PIR occupancy sensor)

# WaveLinx Wireless Area Controller (WAC)

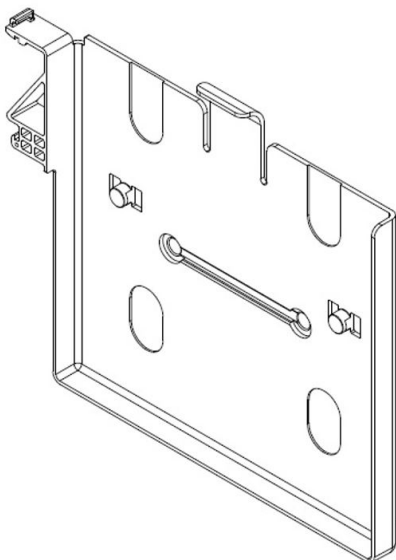
## Wireless Area Controller



## Installation

The Wireless Area Controller (WAC) must be installed in accordance with all local, state, and national electrical codes and requirements. Before mounting the WAC in its final location:

1. Install Wavelinx wireless devices and verify out-of-the-box functionality
2. Mount the Wireless Area Controller (WAC)
  - Ensure the WAC is roughly central to the devices with which it is communicating.
  - Review the "Where to Mount" section of this installation instruction.
  - The WAC can be mounted on a shelf, wall, DIN rail or ceiling using the included mounting bracket
  - Ensure the surface the WAC is mounted against is not made of concrete, metal or other material that would reduce the wireless communication.



- Mounting hole locations 1.5" (38mm)
- Use #6 screws (provided by others) for mounting

3. Power the Wireless Area Controller (WAC).
  - The WAC is a PoE powered device. Using either the included Cat5e Ethernet cable or user provided Cat5e cable connect the WAC to the user provided PoE switch.
  - If the installed location does not provide PoE switches the WAC can be powered by a 120V to PoE injector accessory. This requires a standard 120V receptacle located within 3ft (0.9m) of the WAC. Connect the provided Cat5e Ethernet cable from the WAC to the 120V to PoE injector then connect another Cat5E cable from the PoE injector to the building network LAN. Ethernet cable runs must be less than 300 feet (91 meters).
4. Document the IEEE address found on the bottom of the WAC on the site floor plans.
5. Connect to building network
6. Create Construction Group
7. Finalize programing using the WaveLinx Mobile App
  - See WaveLinx Mobile Application user manual for more information

### Where to Mount the WAC

- Typically installed above the drop ceiling or high on the wall in the center of the space it will be controlling
- The WAC should be located so it has a good line-of-sight with its communicating devices
- Within 300ft (91m) of the PoE switch or building LAN connection point
- At least 10ft (3m) away from the building WiFi access points
- At least 15ft (5m) away from concrete or metal structures

### Where NOT to Mount the WAC

- Inside a metal enclosure or near large metal objects or walls
- Inside or near large concrete walls or spaces
- Do not mount inside electrical closet

### WaveLinx design best practices

Design Consideration	Best Practice	Maximum Capability
WCL devices per WAC	100	150
User-defined areas per WAC	15	15
Construction areas per WAC	1	1
Zones per Area	3	16
Scenes per Area	16	16
WAC range (indoor WCL devices)	150ft (45m) LOS <sup>1</sup>	300ft (91m) LOS <sup>2</sup>
WAC range (outdoor WCL devices)	See sensor spec sheets	
Device hops beyond WAC (indoor / outdoor)	4 / 10	5 / 10

**Note:**

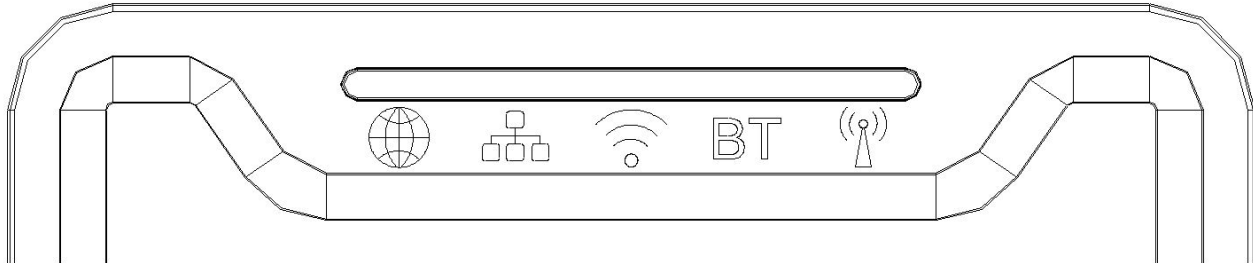
<sup>1</sup> Considering two (2) interior walls of standard construction

<sup>2</sup> Considering no LOS obstructions (walls, columns, etc.)

# WaveLinx Wireless Area Controller (WAC)

## Wireless Area Controller LED Indicators

The LED indicators can be used for diagnostics and troubleshooting diagnostics of the WaveLinx system. The table below gives you more information.



	LED Color	On	Off	Blink	Fast Blink
<b>WAN</b>	Green	Connection to OpenADR or 3rd party	Normal	Communications from 3rd party	
<b>LAN</b>	Green	Connected to building LAN and received IP address	No connection or IP address from building LAN	Communications from LAN. During internal webpage setup	
<b>WiFi</b>	Blue	Connected to building LAN and received IP address	No connection or IP address from building LAN	Communications from LAN. During internal webpage setup	When login UN/PW are reset
<b>PAN</b>	Blue	Future functionality	Future functionality	Future functionality	Future functionality
<b>802.15.4</b>	Blue	WaveLinx network is formed	No WaveLinx devices are paired	During Construction Grouping and WaveLinx Communications	When WAC is set to Factory Defaults
<b>Cooper Lighting Solutions</b>	Blue	WAC is powered and running	WAC has no PoE connection		

**Wireless Area Controller rear panel**



- Ethernet Port for power in and connection to building LAN for communications.
- PoE is required to supply power to the device
- PoE port does not supply power out to other devices
- RESET Button
- Resets the Wireless Area Controller, does not impact settings
- PAIR Button
- Construction Group
- Removing devices
- Reset login UN/PW
- Factory Defaults

**PAIR button functionality**

Using the PAIR button on the Wireless Area Controller allows you to add or remove devices to the WaveLinx system, reset building network login information and restore factory defaults.

	PAIR button press	Device outcome	WAC LED feedback
<b>Enter Construction Group</b>	1 press	Dim to 10%	IEEE 802.15.4 LED blinks
<b>Leave Construction Group</b>	1 press (after enter Construction group)	Raise to 75%	IEEE 802.15.4 LED ON
<b>Remove Devices Default Area</b>	Press and hold for 4 seconds	Devices in Default Area leave WaveLinx network	
<b>Reset administrator and WiFi UN/PW</b>	Press and Hold for 20 seconds		Wi-Fi LED fast blink
<b>Factory Defaults</b>	Power cycle WAC Press and hold for 30 seconds	All devices and programming cleared from WAC	All LEDs fast blink for 1 minute

# WaveLinx Wireless Area Controller (WAC)

## Construction Grouping

With the patent-pending Construction Grouping mode, installers can now complete a quick system start-up to confirm that the devices have been installed correctly, instead of waiting for factory-trained technicians to get the lights on a project in working order. Installers follow a simple process to pair the wireless devices and assign addresses with the appropriate WAC and initiate occupancy-based lighting control functionality. This saves lighting energy during the construction phase of the project by ensuring that the lights are turned off when the area is unoccupied.

1. Locate the Wireless Area Controllers on the site floorplan
2. Identify which WaveLinx devices should be in range and assigned to each Wireless Area Controller
3. Identify the circuit breakers that control WaveLinx devices that are intended to be assigned to the Wireless Area Controller by performing Construction Grouping
4. Cycle power to each circuit breaker for the identified WaveLinx devices
  - WaveLinx devices will search for the Wireless Area Controller for 30 minutes after each power cycle, unless they have already paired with a WAC
5. On the Wireless Area Controller press and release the "PAIR" button to enter Construction Grouping Mode
  - The 802.15.4 wireless network LED on the WAC will blink while in Construction Group mode
  - The WAC will leave Construction Grouping after 30 minutes
6. WaveLinx devices will start communicating to the Wireless Area Controller
7. As devices pair with the Wireless Area Controller creating the Construction Group, they will illustrate the following default behavior. If a device has already been added to an area, it will not be affected.
  - Luminaires with integrated sensors
    - Luminaire dims to 10%
  - Tile Mount Sensor
    - Connected luminaire dims to 10%
  - Relay with 0-10V
    - Connected luminaires will dim to 10% and receptacles will turn OFF for 5 minutes
    - The controlled outlet will turn OFF for 5 minutes
  - Wallstation
    - All LEDs blink
    - All wallstations in the default area control all luminaires together.
8. After all WaveLinx devices have joined the Construction Group and illustrated the above behavior.
  - Press the "PAIR" button on the WAC a second time to leave the Construction Grouping mode,
  - The WAC will leave Construction Grouping automatically after 30 minutes if the "PAIR" button is not pressed a second time.
  - The IEEE 802.15.4 wireless network LED on the WAC will be ON
9. After leaving the Construction Group mode the WaveLinx devices will behave in the following manner.
  - Luminaires with integrated sensors
    - Luminaire dims to 75%
    - All luminaires turn ON when the first occupancy sensor senses motion
    - All luminaires turn OFF when the last occupancy sensor times out unoccupied
    - All wallstations in the default area control all luminaires together.
    - All integrated sensors, Tile Mount and Ceiling sensors create an occupancy group
  - Tile Mount Sensor.
    - Connected luminaire dims to 75%



- All luminaires turn ON when the first occupancy sensor senses motion
- All luminaires turn OFF when the last occupancy sensor times out unoccupied
- All wallstations in the default area control all luminaires together.
- All integrated sensors, Tile Mount and Ceiling sensors create an occupancy group
- Relay with 0-10V
  - Connected luminaires dim to 75%
  - All wallstations in the default area control all luminaires together.
  - All luminaires turn ON when the first occupancy sensor senses motion
  - All luminaires turn OFF when the last occupancy sensor times out unoccupied
  - Relay turns ON/OFF based on occupancy
- Receptacle
  - The controlled outlet will turn ON/OFF based on occupancy
- Wallstation
  - All wallstations in the default area will control all luminaires in the default area based on out-of-the-box scene definitions.
- Ceiling Sensor
  - The LED on the sensor will flash when detecting occupancy
  - All integrated sensors, Tile Mount and ceiling sensors create an occupancy group

### Connecting the Wireless Area Controller to the Building LAN

#### 1. Wired Connection - Building LAN connection

- Connect the WAC to the building PoE switch or PoE injector into the normal network.
- Physical connection to the building LAN and receiving an IP address will automatically disable the wireless connection method
- WAC's will automatically receive a DHCP IP address when connected to the building LAN
- WAC device name will be: Cooper Lighting Solutions-xxxxxxxxxxx
  - (where \*\*\*\* are all twelve characters of the unit MAC address found on the label at the bottom front of the WAC plus 1)
- Using the WAC internal web page,
  - Change the default name of the WAC
  - Statically assigning the IP address of the WAC

#### 2. Wireless Connection - Building Wireless connection

- WAC device name will be: Cooper Lighting Solutions-xxxxxxxxxxx
  - (where \*\*\*\* are all twelve characters of the unit MAC address found on the label at the bottom front of the WAC plus 1)
- Using the WAC internal web page,
  - Enter the building wireless login credentials.
    - Building wireless login credentials are secured in the WAC by secure web pages and encryption during storage.
  - Change the default name of the WAC
  - Statically assigning the IP address of the WAC

#### FCC Statement

• 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.

(2) This device must accept any interference received, including interference that may cause undesired operation.

**Note:** The grantee is not responsible for any changes or modifications not expressly approved by the party responsible for compliance. Such modifications could void the user's authority to operate the equipment.

**Note:** The equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off an on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons.

#### Declaración de la FCC

• Este dispositivo cumple con la Parte 15 de las Normas de la FCC. Su funcionamiento está sujeto a las siguientes dos condiciones:

(1) Este dispositivo no debe causar interferencia dañina.

(2) Este dispositivo debe aceptar cualquier interferencia recibida, incluidas las interferencias que puedan causar un funcionamiento no deseado.

**Nota:** El concesionario no es responsable por los cambios o modificaciones que no estén expresamente aprobados por la parte responsable de su cumplimiento. Tales modificaciones podrían anular la autoridad del usuario para operar el equipo.

**Nota:** El equipo ha sido probado y cumple con los límites para un dispositivo digital de Clase B, de conformidad con la parte 15 de las Normas de la FCC. Estos límites están diseñados para proporcionar una protección razonable contra las interferencias dañinas en una instalación residencial. Este equipo genera usos y puede emitir energía de radiofrecuencia y si no se instala y utiliza de acuerdo con las instrucciones, puede causar interferencia dañina en las comunicaciones de radio. Sin embargo, no se puede garantizar que dicha interferencia no ocurra en una instalación determinada. Si este equipo causa interferencia dañina en la recepción de radio o televisión, lo que puede determinarse apagando y encendiendo el equipo, se recomienda al usuario que intente corregir la interferencia mediante una o más de las siguientes medidas:

- Reorientar o reubicar la antena receptora.
- Aumentar la separación entre el equipo y el receptor.
- Conectar el equipo a una toma de corriente en un circuito diferente al que está conectado el receptor
- Consultar con el distribuidor o con un técnico de radio/TV experimentado para obtener ayuda.

Este equipo cumple con los límites de exposición a la radiación de la FCC establecidos para un entorno no controlado. Este equipo debe instalarse y operarse de acuerdo con las instrucciones proporcionadas y la(s) antena(s) utilizada(s) para este transmisor deben instalarse para proporcionar una distancia de separación de al menos 20 cm de todas las personas.

#### ISED RSS

This device complies with Industry Canada's licence-exempt RSSs. Operation is subject to the following two conditions:

(1) This device may not cause interference; and

(2) This device must accept any interference, including interference that may cause undesired operation of the device.

CAN ICES-3 (B)/NMB-3(B)

#### ISED RSS

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1) l'appareil ne doit pas produire de brouillage;

2) l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

CAN ICES-005 (B)/NMB-005(B)

## Warranties and Limitation of Liability

Please refer to [www.cooperlighting.com](http://www.cooperlighting.com) for our terms and conditions.

## Garanties et limitation de responsabilité

Veuillez consulter le site [www.cooperlighting.com](http://www.cooperlighting.com) pour obtenir les conditions générales.

## Garantías y Limitación de Responsabilidad

Visite [www.cooperlighting.com](http://www.cooperlighting.com) para conocer nuestros términos y condiciones.



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