WaveLinx (WCL)
Installation Instructions

WaveLinx Wireless Area Controller (WAC)

Read all of the instructions thoroughly before installing or operating this product.
This manual provides information on the installation and operation of the WaveLinx Wireless Area Controller (WAC). For proper operation it is important to follow the instructions.

Wireless Area Controller

⚠ SAFETY INSTRUCTIONS ⚠

IMPORTANT SAFEGUARDS

READ AND FOLLOW ALL SAFETY INSTRUCTIONS

- Installation should be performed by a qualified electrician
- Installation shall be in accordance with all applicable local and NEC codes
- Turn the power off at circuit breakers before wiring
- Designed for indoor installation and use only
- All new wiring must be fully verified before applying power
- Servicing of equipment should be performed by qualified service personnel

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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)

WaveLinx System Architecture

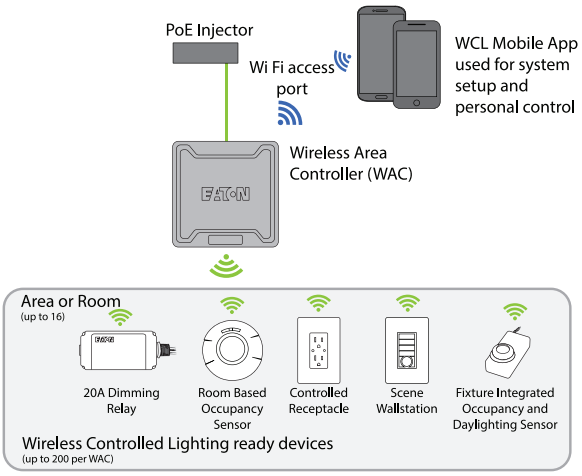


Figure 1. Stand Alone WAC installation

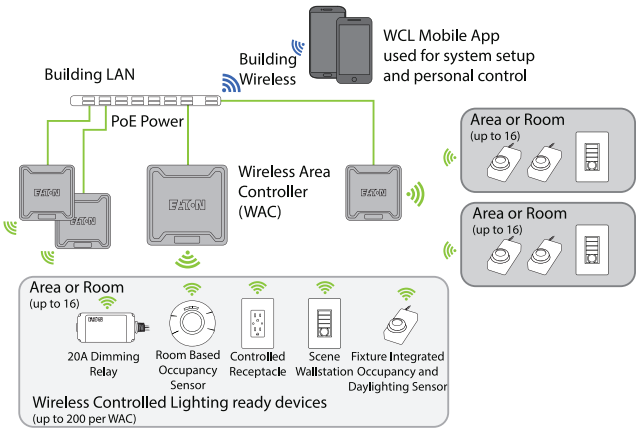


Figure 1. Multiple WAC installation

Overview

The Wireless Area Controller (WAC) is the main component of the Eaton WaveLinx Wireless 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.

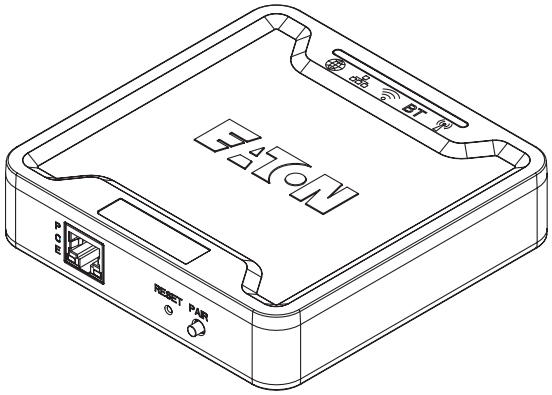
The WAC coordinates between the WaveLinx Mobile App and various WaveLinx devices to create communications and a building ecosystem that provides out of the box functionality and leverages our patent pending automatic code commissioning features. Using standards-based wireless mesh compliant topology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

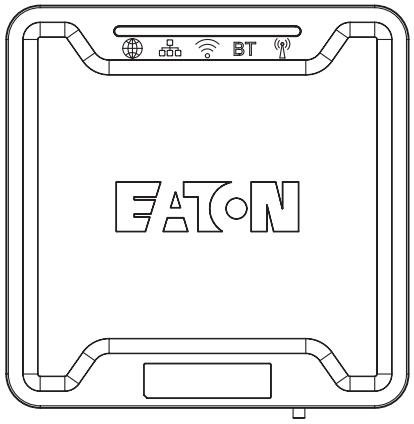
The WAC provides centralized coordination of multiple areas for partial ON/partial OFF scheduling, demand response, lighting, occupancy and daylight settings and scene control. A single WAC can be connected to the building LAN to coordinate up to 16 areas, or multiple WAC's can exist on a building LAN to scale the system to hundreds of areas all accessible for setup, configuration and control through the WaveLinx Mobile App.

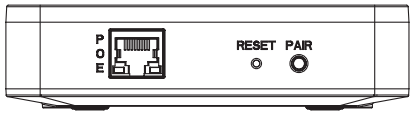
WaveLinx system components

- Wireless Area Controller (Gateway)
- WaveLinx Mobile App (Commissioning and user personal control)
- WaveLinx Wallstation (Manual lighting and scene control)
- Wireless INstinct Sensor (Fixture integrated occupancy sensor, ambient light sensor and control)
- WaveLinx Relay Switchpack with 0-10V
- WaveLinx Receptacle (Wall mounted power outlet)
- WaveLinx Room Based Sensor (Ceiling mounted PIR occupancy sensor)

Wireless Area Controller



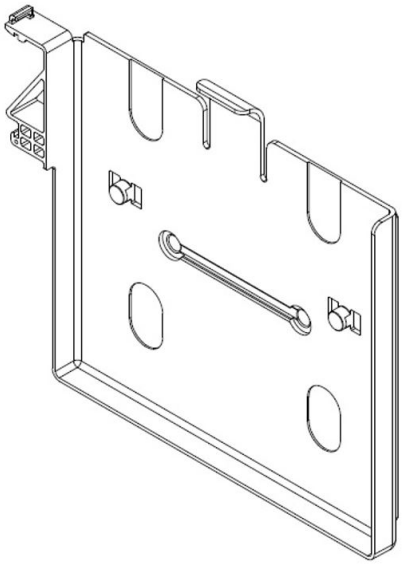




Installation

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 in the center of the spaces and devices it is communicating to.
   - 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 concreate, metal or other material that would reduce the wireless communication.



- Mounting hole locations 1.5"
- 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 3 feet 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.
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 view of devices it will be communicating to.
- Within 300ft of the PoE switch or building LAN connection point
- At least 10 feet away from the building WiFi access points
- At least 15 feet away from concreate or metal structures

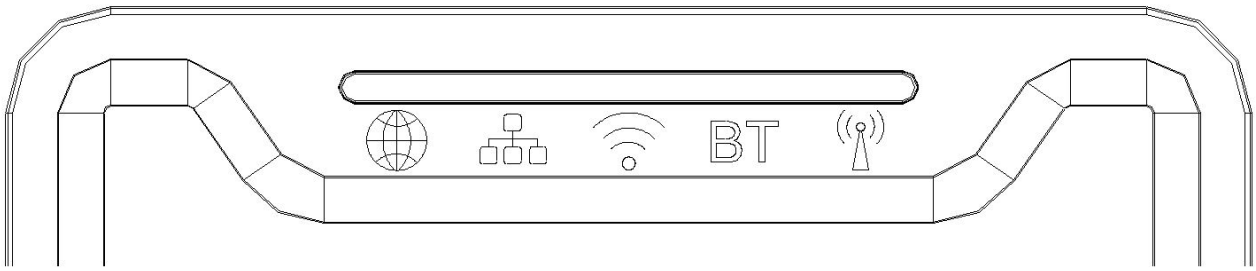
Where NOT to Mount the WAC

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

WaveLinx design best practices

Design Consideration	Best Practice	Maximum Capability
Gateway/WAC Range	150 feet-250 feet LOS (no walls)	300 feet LOS
Number of Interior Walls	2 walls	3 walls
Distance from WAC to 1st WCL Device	150 feet	200 feet
Distance between WCL Devices	75 feet	150 feet
Number of Hops from WAC	4 hops	5 hops
Number of Areas per WAC	16	16
Number of Zones per Area	3	16
Number of Scenes per Area	6	10

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
WAN	Green	Connection to OpenADR or 3rd party	Normal	Communications from 3rd party	
LAN	Green	Connected to building LAN and received IP address	No connection or IP address from building LAN	Communications from LAN. During internal webpage setup	
WiFi	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
PAN	Blue	Future functionality	Future functionality	Future functionality	Future functionality
802.15.4	Blue	WaveLinx network is formed	No WaveLinx devices are paired	During Construction Grouping and WaveLinx Communications	When WAC is set to Factory Defaults
Eaton	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
Enter Construction Group	1 press	Dim to 10%	IEEE 802.15.4 LED blinks
Leave Construction Group	1 press (after enter Construction group)	Raise to 75%	IEEE 802.15.4 LED ON
Remove Devices Default Area	Press and hold for 4 seconds	Devices in Default Area leave WaveLinx network	
Reset administrator and WiFi UN/PW	Press and Hold for 20 seconds		Wi-Fi LED fast blink
Factory Defaults	Power cycle WAC Press and hold for 30 seconds	All devices and programming cleared from WAC	All LEDs fast blink for 1 minute

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 minutesReceptacle
     - 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: Eaton-xxxxxxxxxxxx on the building network
     - (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: Eaton-xxxxxxxxxxxx
     - (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

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

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.

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, et
2. l™utilisateur de l™appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d™en compromettre le fonctionnement.

To maintain compliance with the RF exposure guidelines, place the unit at least 20cm from nearby persons.

Pour assurer la conformité aux directives relatives à l'exposition aux frequencies radio, le jouet doit êtreplacé à au moins 20_cm des personnes à proximité.

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

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