User and Programming Manual

WaveLinx

This document is intended for installers, set-up technicians and IT professionals of the WaveLinx Connected Lighting System

⚠ ATTENTION

Engage appropriate network security professionals to ensure all lighting control system hardware and servers are secure for access.

Ensure IT professionals review the WaveLinx network architecture document found at the end of the WaveLinx User and Programming manual.

Network security is an important issue. Typically, the IT organization must approve configurations that expose networks to the Internet. Be sure to fully read and understand customer IT Compliance documentation.

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 the products.

IMPORTANT: This manual provides information on the installation and operation of WaveLinx Wireless Connected Lighting System. For proper operation it is important to follow the installation instructions for each product/component.

PRELIMINARY

COOPER
Lighting Solutions

WaveLinx User Manual - Table of contents

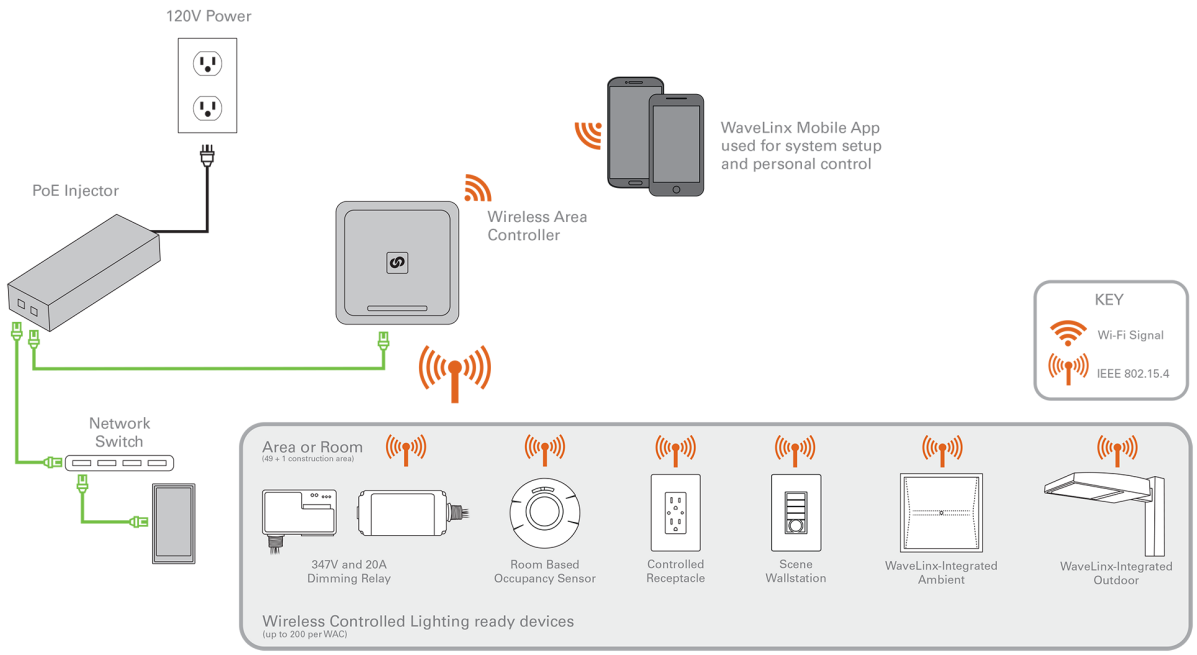
Becoming Familiar with WaveLinx System Components 10
WaveLinx Device Reference Sheets 12
WaveLinx Wireless Area Controller 2 (Gen 2) 13
WaveLinx Wireless Area Controller (Gen 1) 20
Ambient Integrated Sensor Reference Sheet 26
Industrial Integrated Sensor Reference Sheet 28
Outdoor Integrated Sensor Reference Sheet 30
Outdoor Sensor Extender/Multiplier Reference Sheet 32
Wireless Tilemount Sensor Reference Sheet 34
WaveLinx Outdoor Lighting Control Module 37
WaveLinx Wireless Fixture Reference Sheet 39
WaveLinx Universal Voltage Dimming Switchpack 40
WaveLinx Universal Voltage Dimming Switchpack with Emergency 42
WaveLinx Universal Voltage Dimming Switchpack with Dry Contact Input 44
WaveLinx Low-Voltage Power Module 47
Low-Voltage Fixture with Integrated Sensor Reference Sheet 52
Low-Voltage Fixture 54
WaveLinx Receptacle 55
WaveLinx Ceiling Sensor 57
WaveLinx Wallstation 59
WaveLinx Battery Powered Wallstation 61
WaveLinx Touchscreen 63
ISHH-01 Integrated Sensor Programming Remote 64

Welcome and Introduction

The WaveLinx Wireless Connected Lighting System offers wireless, code-compliant control in a simple, easy to install and manage format.

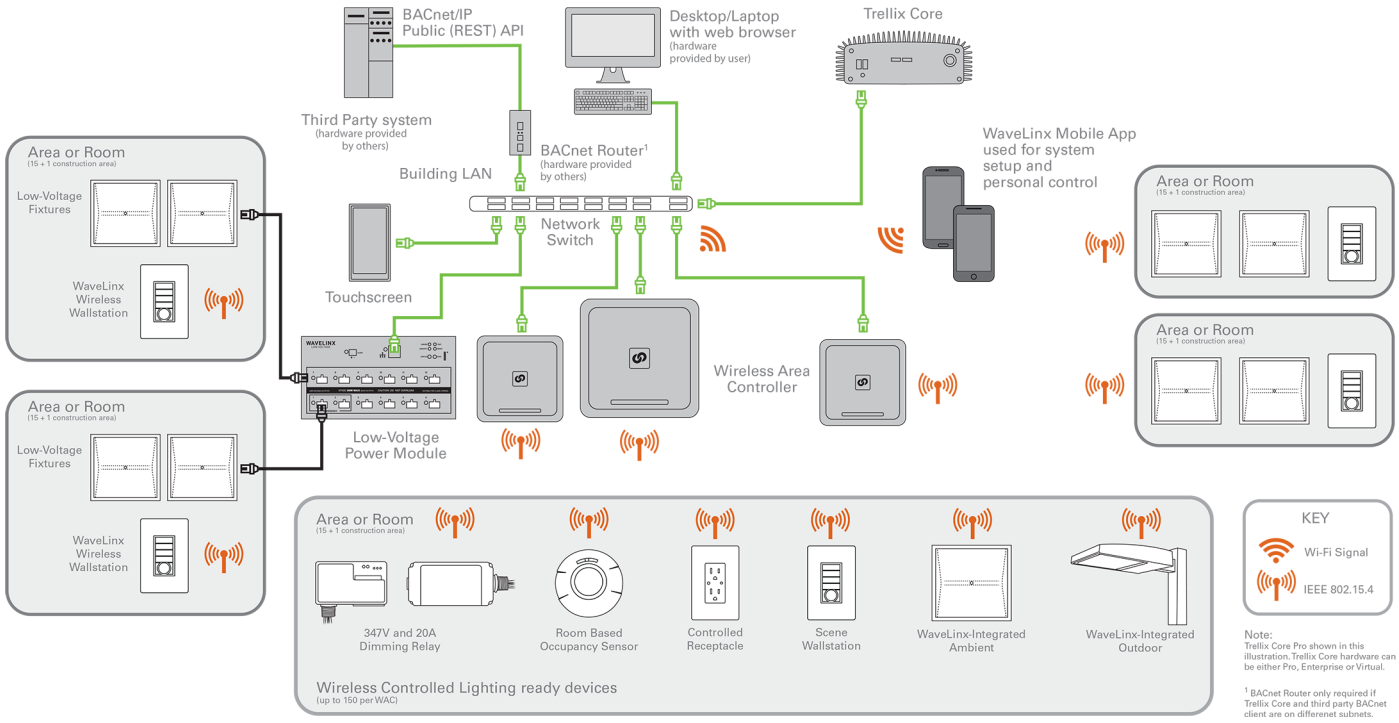
Designed with ease of use in mind, the WaveLinx wireless system installs and configures quickly to capture immediate energy and cost savings. The WaveLinx wireless system is fully scalable with options for smaller, stand-alone operation, and options for larger networked based systems that may optionally interface with Trellix.

Stand-alone solution example



Entire building solution example:

This solution shows optional interface to a Trellix Core using a Desktop/Laptop with web browser, and a Third-Party system.



Regardless of what size system is being implemented, it will be necessary to start by adding the devices to the appropriate Wireless Area Controller. Use this user manual to:

- Become familiar with WaveLinx System devices
- Prepare the WaveLinx Mobile App for first use
- Understand navigation and device organization in the WaveLinx Mobile App
- Set up a new WaveLinx system
- Control lighting from the WaveLinx Mobile App
- Customize the WaveLinx default programming
- Configure a WaveLinx Touchscreen
- Perform administrator tasks to set the Wireless Area Controller system time, date, and location, change usernames and passwords, backup and restore databases (replacing a Wireless Area Controller), update software and firmware, and perform advanced network connection functions.
- Perform administrator tasks to update the Mobile App and replace WaveLinx devices.
- Perform administrator tasks to setup WaveLinx Low-Voltage Power Modules including changing or updating Ethernet settings, reconnecting communications to the Wireless Area Controller after IP Address changes, replacing a Low-Voltage Power Module, and unpairing and rebooting information.

Becoming Familiar with WaveLinx System Components

All WaveLinx Connected Lighting Systems regardless of size require the use of a Wireless Area Controller.

Wireless Area Controller

WAC2

WAC

The Wireless Area Controller (WAC2 [Gen 2] or WAC [Gen 1]) is the central communications coordinator for the WaveLinx system. It coordinates communication to and from paired WaveLinx devices.

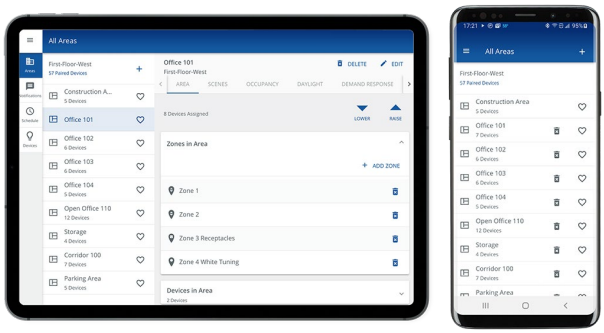
The Wireless Area Controller can operate as a stand-alone coordinator or may be connected to a building network with other Wireless Area Controllers to meet larger building requirements.

Installed as a stand-alone system, the Wireless Area Controller may use its internal wireless Wi-Fi access point to communicate to the WaveLinx Mobile App installed on a user provided iOS or Android smart phone or tablet.

Installed in an Ethernet connected system or connected to the building network by Wi-Fi, each Wireless Area Controller operates independently for its paired devices, using the connected building network to communicate to the WaveLinx Mobile App.

Administration and setup of the WaveLinx Connected Lighting System is performed using the WaveLinx Mobile App.

WaveLinx Mobile App



Use the WaveLinx Mobile App to setup the WaveLinx Connected Lighting System. Once the system is operational, the WaveLinx Mobile App can be used to control specific areas and zones in the facility, or to change the programmed behavior.

The WaveLinx Mobile App is supported on mobile devices running iOS 13+ or Android™9+ operating systems. Download the latest version of the WaveLinx Mobile App on the App Store® or get it on Google Play™. Install the mobile app on a smartphone or tablet.

Download on the App Store

GET IT ON Google Play

Trellix

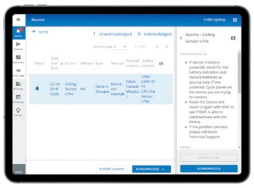
Larger systems may optionally use Trellix, an IoT platform with smart applications for commercial spaces. Trellix uses the Trellix Core to communicate with WaveLinx Wireless Area Controllers and their paired devices to centralize data, manage alarms and events, allow Third Party integration via BACnet and Public API (REST), and provide user management and backup tools. Trellix applications allow for system administration as well as real-time location, harnessing the power of WaveLinx sensors to provide valuable data and insight.

In a Trellix based architecture, the initial Wireless Area Controller configuration and device management can be performed using the Mobile App discussed in this manual. Further use of Trellix Core and Trellix applications software is beyond the scope of this user guide. Refer to the specific materials for these products for information.

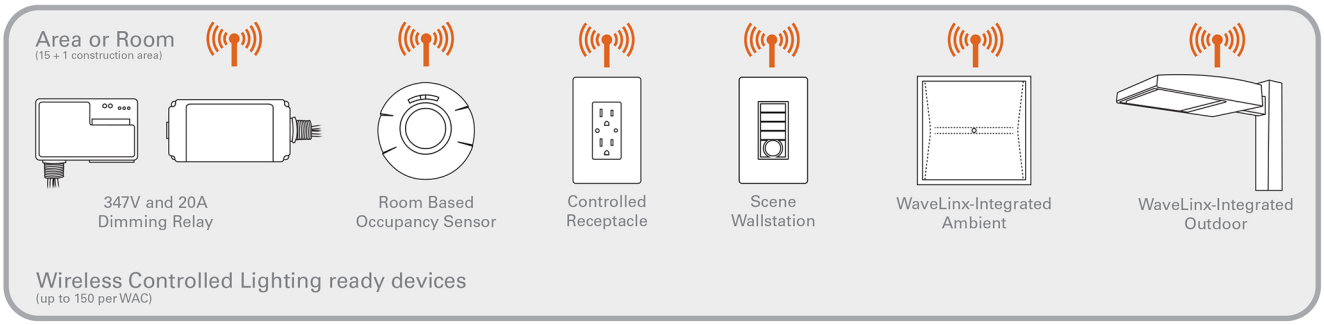
Trellix Core Pro

Trellix Core Enterprise

Trellix Applications



Other WaveLinx System Components



WaveLinx Devices communicate to the WaveLinx Wireless Area Controller for control and to provide information. There are a multitude of device types that communicate with the Wireless Area Controller using IEEE 802.15.4 wireless communications. Other devices such as Touchscreens and WaveLinx Low-Voltage Power Modules connected to Low-Voltage devices communicate using Ethernet communications.

WaveLinx devices will vary by facility. Refer to the WaveLinx Device Reference Sheets for specific device information.

WaveLinx Device Reference Sheets

This section contains information about each device used in the WaveLinx System. Each device will have a reference sheet describing the device and its general functionality. Additional details include specific information that will be used for reference throughout the manual. Once familiar with the general programming steps, the reference sheets can act as a quick reference guide for specific device behavior or programming details.

Each device reference sheet may include:

- A general description
- Out-of-the-box behavior
- Paired default behavior
- Loss of communications behavior
- Return of power operation or battery change operation
- LED behavior
- How to place the device into pairing mode and pairing mode behavior
- Supported identification methods and 'Blink to Identify' behavior
- Specific details for programming supported device functions including but not limited to daylight calibration recommendations, white tuning configuration, input configuration, wallstation button default operations, etc.
- Special operating modes supported by the device
- Factory reset instructions (returning to out-of-the-box unprovisioned state)
- Required initial configuration steps

WaveLinx Wireless Area Controller 2 (Gen 2)

WaveLinx Wireless Area Controller 2 (Gen 2)

Features

- Coordinates communication between WaveLinx Devices and the Mobile App
- Optionally connects to Trellix Core for use with:
  - Trellix Applications
  - BMS,
  - Other Third-Party systems.

Power:
- Powered from PoE or PoE Injector

Typical Applications

- Required for communication to WaveLinx Devices

Models:

WAC2: Wireless Area Controller (Gen 2)

Mobile App Details:

- Default Device Name:
  - CooperWAC-XX-XX

Icon Displayed in Mobile App:

The Wireless Area Controller 2 (WAC2) is the central communications coordinator for the WaveLinx system. A Wireless Area Controller 2 can coordinate communication to up to 200 devices within its wireless range.

The Wireless Area Controller2 can operate as a stand-alone coordinator or may be connected to a building network with other Wireless Area Controllers to meet larger building requirements.

WAC2 Details

Feature	Details

Supported Devices	The WAC2 supports up to 200 WaveLinx Devices.
	• All 200 devices may be WaveLinx Wireless Devices OR
	• Up to 140 of the devices may be WaveLinx Low Voltage
	  • Example: 140 Low-Voltage + 60 WaveLinx Wireless = 200 Devices
	• Up to 50 of the devices may be actively using RTLS functionality
	  • Example: 50 RTLS Devices + 150 WaveLinx Wireless = 200 Devices
	  • Example: 50 RTLS Devices +140 Low-Voltage + 10 WaveLinx Wireless = 200 Devices

Areas	The WAC2 supports up to 50 areas. • 49 user defined areas plus 1 default construction area.
Zones	• The WAC2 creates one default dimmable zone per area. • The WAC2 supports up to 200 zones total amongst all defined areas. Areas are not limited to a certain quantity of zones.
Scenes	The WAC2 supports up to 16 scenes per area.
Occupancy Sets	The WAC2 supports up to 100 occupancy sets amongst all defined areas. Areas are not limited to a certain quantity of occupancy sets.
Open Loop Daylight Sets	The WAC2 supports up to 6 open loop daylight sets per area.

Out-of-the-Box

- Once power is applied, after a 1-minute boot-up period (approximate), the Power/Health LED, the 802.15.4 LED, and the Wi-Fi LED should illuminate and remain ON.[1]

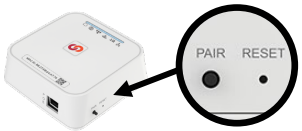
Loss of Communications Operation

Please refer to the device reference sheets for the devices in the facility for the expected behavior upon loss of communications with the Wireless Area Controller.

Operation upon Return of Power

Upon return of power, after a 1-minute power up period (approximate), the Wireless Area Controller 2 will begin re-establishing connection with controlled devices. This process may take several minutes depending on the quantity of devices being controlled. Controlled devices will remain in their return of power state until the connection is re-established.

How to Place in Pairing Mode:

Method	Description
PAIR button	Press and release (1 second press) the PAIR button located on the side panel of the Wireless Area Controller. 
Mobile App	• Login to the Wireless Area Controller. • From the menu, select 'Devices'. • With the Wireless Area Controller selected, tap 'Actions' or locate the actions bar at the bottom of the mobile device screen. • Select 'Enable Discover Devices'.

The blue 802.15.4 LED on the Wireless Area Controller and the green LAN LED will blink at a rate of one blink per second to indicate the Wireless Area Controller is in pairing mode.

The Wireless Area Controller pairing mode automatically times-out after 60 minutes or can be manually exited by pressing and releasing (1 second press) the PAIR button or by selecting 'Disable Discover Devices' from the Mobile App.

[1] The green LAN LED may also illuminate if the controller is connected to a building LAN with a DHCP server. Other LEDs should remain OFF.

WaveLinx Wireless Area Controller 2 (Gen 2) continued

LED Operations

After power is applied, wait approximately 1 minutes for the Wireless Area Controller to fully boot before reviewing the LED status.

LED	Color/Pattern	Description
Connection Port LEDs	Green LED ON/Flashing	The Wireless Area Controller 2 is connected to the Ethernet and is connected to a 10/100Mb network.
	Orange LED ON/Flashing	The Wireless Area Controller 2 is connected to the Ethernet and is connected to a Gigabyte network.
	OFF	There is no connection to the Ethernet
Power/Health LED	Solid BLUE	The Wireless Area Controller is powered and operational.
	OFF	There is no power on the PoE connection or, if power is verified, the WAC2 is unable to boot due to a system error.
	Blinking BLUE	• Short single blink then OFF: This occurs approximately 10-15 seconds after initial powerup or reboot. • 50ms ON/50ms OFF repeated: This occurs while the WAC2 is rebooting. • Flash three times 50ms ON/50ms OFF followed by 2 seconds OFF and then repeated: The WAC2 has received a firmware file and a firmware upgrade to the WAC2 is in process. • 2 seconds ON/2 seconds OFF repeated: The WAC2 is performing firmware upgrades in connected devices.
WAN LED	OFF	Normal condition in stand-alone use. If used in a Trellix system, the WAC2 has lost its connection to Trellix.
	Solid GREEN	The Wireless Area Controller is connected to s Trellix system.
	Blinking GREEN	The WAC2 is performing a data sync with the connected Trellix system.
LAN LED	OFF	There is no connection from the building LAN, or the connection has been disabled or failed.
	Solid GREEN	The Wireless Area Controller is connected to the building LAN, has a static or dynamically assigned IP address, and is ready to communicate.
	Blinking GREEN	The LED will blink 1 second ON/ 1 second OFF repeated when the WAC2 is in pairing mode.
Wi-Fi LED	OFF	The Wi-Fi Access Point or Client have been disabled.
	Solid BLUE	The Wi-Fi Access Point has been enabled. The Wi-Fi Client is disabled.
	Blinking BLUE	• Slow blink (1 second ON/1 second OFF repeated): The Wi-Fi Client is enabled and has an IP address. The Wi-Fi Access Point is disabled. • Fast blink (250ms ON/250ms OFF repeated): Wi-Fi Access Point and Wi-Fi Client are both enabled and available.
PAN LED (BT)	OFF	LED should be OFF. This functionality is not currently in use.
802.15.4 LED	Solid BLUE	The 802.15.4 network communication is normal.
	OFF	The 802.15.4 network is not functional. The 802.15.4 LED should not be OFF. Verify unit is powered and has had time to fully power up (approx. 1 minute).
	Blinking BLUE	• Slow blink (1 second ON/1 second OFF repeated): The WAC2 is in pairing mode. • Fast blink (250ms ON/250ms OFF repeated): The WAC2 is in process of removing (unpairing) devices still in the construction area.

WaveLinx Wireless Area Controller 2 (Gen 2) continued

Wireless Area Controller Pushbutton Functions

The WaveLinx Wireless Area Controller 2 has two pushbuttons that allow for several administrative functions. These functions should be used with caution!

Function	Button	Press Length	WAC LED feedback	Device outcome
Enter Pairing Mode	Pair	Press and release (1 second)	802.15.4 and LAN LEDs flash	Paired devices will exhibit paired behavior described in the device reference sheets. Unpaired devices can pair with the Wireless Area Controller if they are in pairing mode.
Exit Pairing Mode (if pairing mode is still active)	Pair	Press and release (1 second)	802.15.4 LED ON steady LAN LED returns to OFF or ON dependent on connection to Ethernet and configuration.	Paired devices will start operation within the construction grouping. Lighting still in the default construction area will turn on to a 100% level or operate from paired wallstations and occupancy sensor controls.
Remove Unassigned Devices	Pair	Press and hold for 4 seconds recommended (>2 sec. to <=10 sec.)	802.15.4 LED flashes rapidly (.25 sec ON/.25 sec OFF) when the button is held for the allotted time and continues until the devices have been commanded to leave the network. 802.15.4 LED will turn ON steady once there are no devices remaining in the Construction Area.	Devices still in the default construction area will leave the WaveLinx network.
Reboot/Soft Reset	Reset (Inset Button)	Press and release (1 second)	All LEDs turn OFF after button release. As device reboots, LEDs may turn ON and OFF during reboot. Once reboot completes (approximately 1 minute), Power/Health LED and 802.15.4 LED should be ON steady. Other LEDs may also be on dependent on WAC2 configuration.	Devices will remain in previous commanded state during reboot, rejoin the WAC2 upon reboot completion and continue their normal behavior. Programmed settings are retained during a reboot.
Authentication and Wi-Fi Configuration Reset	Reset (Inset Button)	Press and hold for 4 seconds recommended (>2 sec. to <= 5 sec.)	Wi-Fi LED flashes rapidly (.25 sec ON/.75 sec OFF) when the button is held for the allotted time. Wi-Fi LED turns OFF for 1 second when button is released and then blinks .5sec ON/ .5 sec OFF for 5 seconds while the WAC2 clears the settings. Wi-Fi LED turns ON steady when process is complete.	No effect on devices. The following data will be cleared and reset to factory defaults: • Wi-Fi Access Point settings • Wi-Fi Client settings • Admin password
Reset factory defaults	Reset (Inset Button)	Press and hold for 8 seconds recommended (>5 sec. to <=10 sec.)	The Wi-Fi LED starts flashing after 2 seconds. All the LEDs except for BT will flash (.5 seconds ON/ .5 seconds OFF) when the button is held for the allotted time. The Power/Health LED will turn OFF when the button is released, and other LEDs will stop flashing. After a short delay, additional LEDs may turn OFF and the WAC will reboot. Once reboot completes (approximately 1 minute), Power/Health LED and 802.15.4 LED, and the Wi-Fi LED should be ON steady. Other LEDs may also be on dependent on connections.	All programming will be cleared for the Wireless Area Controller and reset to factory defaults including: • Removing all 802.15.4 device pairing • All user accounts • Clearing user-uploaded custom certificates • Network configuration including: • Wi-Fi client settings • Wi-Fi access point settings • Ethernet settings • Clearing all programming including area and zone designations • Resetting WAC name to default

Initial Configuration Steps for the Wireless Area Controller 2 (Gen 2)

WaveLinx Wireless Area Controller 2 (Gen 2) continued

Initial Configuration Steps for WAC2 (Gen 2)

The steps in this section should be completed before pairing devices to the Wireless Area Controller 2.

Use this section to:

- Connect to the Wireless Area Controller Webpage
- Set the Clock Parameters
- Set the IP address of the Wireless Area Controller 2

Step 1: Connect to the Wireless Area Controller 2 Webpage

The steps in this section assume that the Wireless Area Controller 2 has not been connected to a building network and is still in its factory default state for wireless name and username/password. If the Wireless Area Controller is connected to the building network, or the wireless name and password has been changed from the default, please refer to the network administrator for access information.

1: Make sure that the computer being used has wireless connectivity and has a compatible web browser installed. The WaveLinx internal webpage configuration is accessed using Google Chrome version 70 or higher, Internet Explorer version 11 or higher, and Mozilla Firefox version 63 or higher.

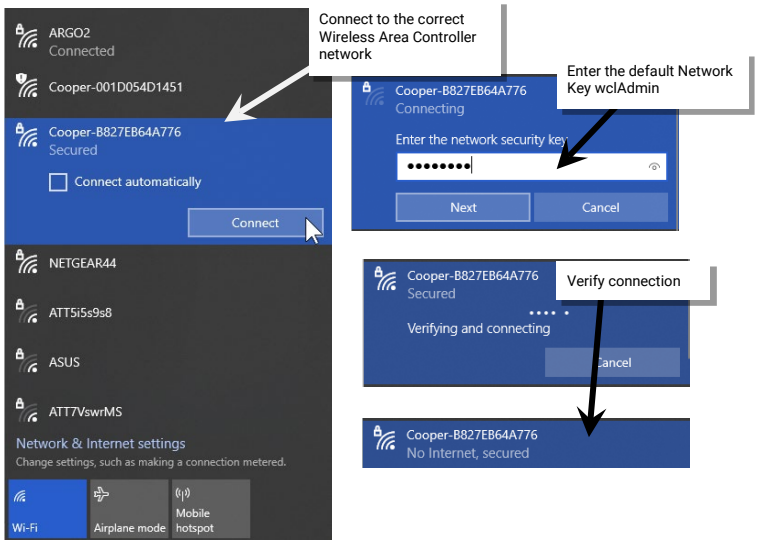
2: Go to the location of the Wireless Area Controller. Verify that the unit is powered and that the Power/Health LED, 802.15.4 LED and Wi-Fi LED are illuminated (other LEDs may also be illuminated depending on connections).

On the front plate of the Wireless Area Controller locate the label with the MAC ID. Make note of the MAC ID shown.

3: Ensure that the computer's Wi-Fi is active, and then navigate to the list of available Wi-Fi networks. Locate the Wi-Fi network with the name Cooper-XXXXXXXXXXXX (where X is a string of letters and numbers).

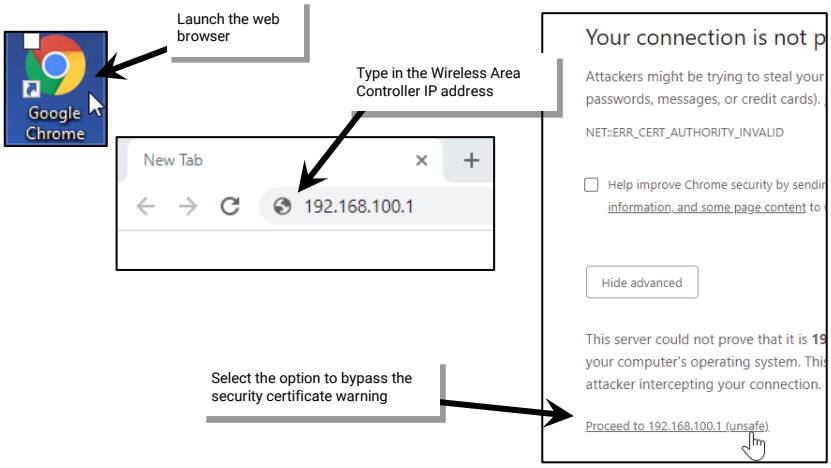
Select the Wi-Fi network Cooper-XXXXXXXXXXXXX where the X characters match the MAC ID noted in the last step. The last number will be one digit higher than the MAC ID noted.

Enter the Network Key wclAdmin when prompted matching the case shown and join the network



4: Open the web browser and enter the IP address of the Wireless Area Controller in the address bar. (The default IP address is 192.168.100.1.)

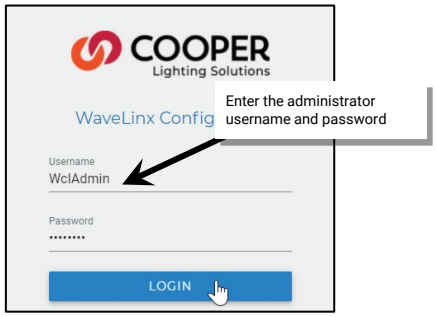
The first time the Wireless Area Controller is accessed, the browser may display message windows regarding the site security certificate. The display and wording of these messages may differ between web browsers. Locate the option to bypass the warning to proceed to the site.



WaveLinx Wireless Area Controller 2 (Gen 2) continued

5: In the log in screen, enter the username and password for the administrator user.[2]

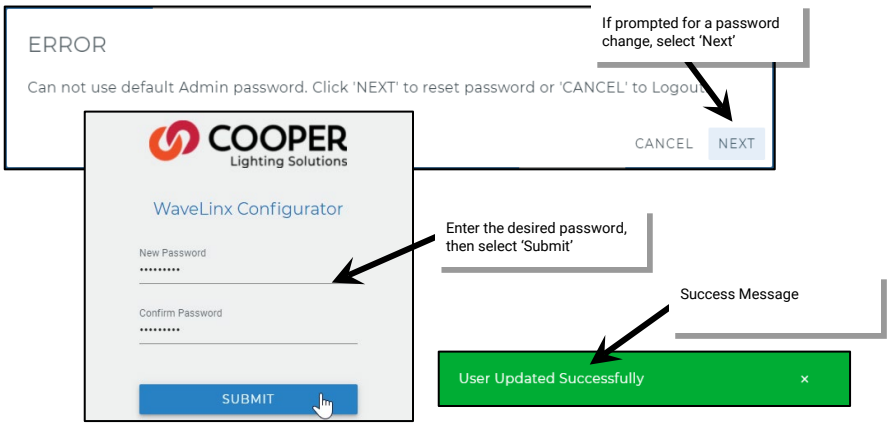
- Default Username: **WclAdmin**
- Default Password: **wclAdmin**



6: If this is the first login, the system will force a password change. When prompted, submit a new password for the administrative user.

Set a complex password when changing passwords, making sure it is something that can be remembered.

IMPORTANT! REMEMBER THE NEW PASSWORD AS IT WILL BE USED FOR ALL FUTURE ADMINISTRATOR LOGINS FOR THE INTERNAL WEBPAGE AND FOR THE MOBILE APPLICATION.

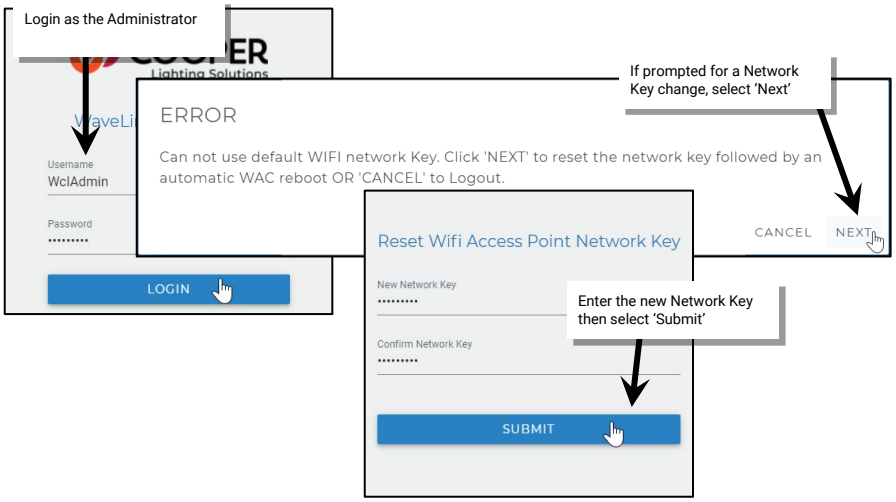


7: Next, login using the WclAdmin user with the newly assigned password.

The system will force a Wi-Fi Access Point Network Key (password) change.

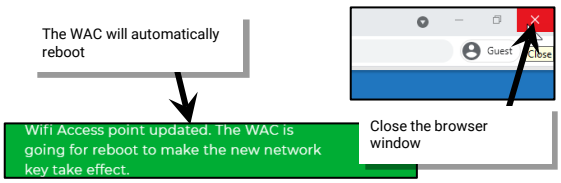
When prompted, submit a new Network Key. Set a complex Network Key when changing it, making sure it is something that can be remembered.

IMPORTANT! REMEMBER THE NEW NETWORK KEY AS IT WILL BE USED FOR ALL MOBILE DEVICE OR COMPUTER CONNECTIONS TO THE WI-FI ACCESS POINT ON THIS WIRELESS AREA CONTROLLER.



8: The Wireless Area Controller will automatically reboot. Close the web browser window.

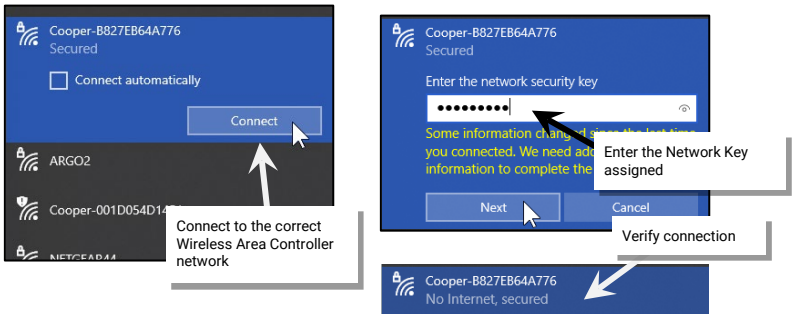
Wait until the reboot is complete. The Power/Health LED, 802.15.4 LED and Wi-Fi LED will be ON indicating it is ready (other LEDs may also be illuminated depending on connections).



[2] If the username and password have been changed, use the updated username or password when logging in.

WaveLinx Wireless Area Controller 2 (Gen 2) continued

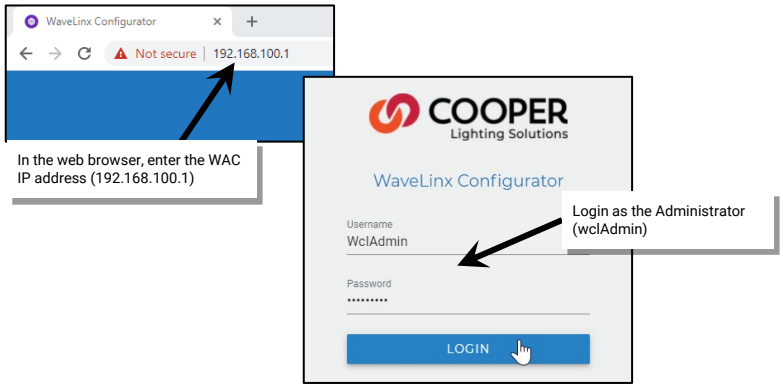
9: Re-connect to the Wireless Area Controller's Wi-Fi Access Point. When prompted, enter the new Network Key assigned. (Any devices previously connected to the WAC's Wi-Fi Access Point will need to reconnect using the new Network Key).



10: Re-open the web browser and enter the IP address of the Wireless Area Controller in the address bar. (The default IP address is 192.168.100.1.)

Login using the WclAdmin administrator user, entering the newly assigned password.

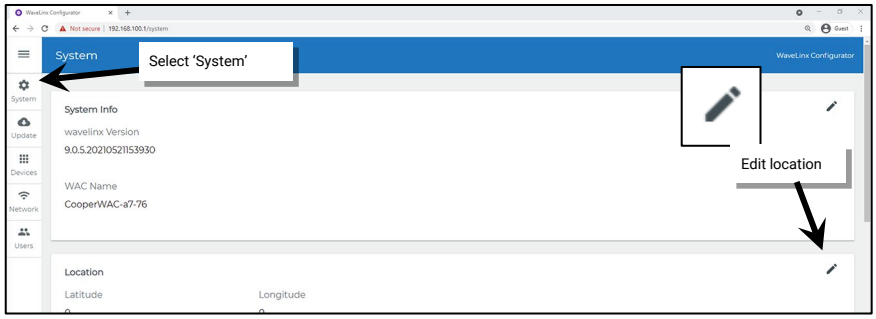
Proceed to the next step.



Step 2: Set the Wireless Area Controller Clock

The Wireless Area Controller clock settings need to be set for the site. This includes the location, time, date, and time zone settings. These settings are found within the system webpage. In event of a power loss, the time and date will be retained for up to 48 hours. If power is lost longer than a 48-hour period, the settings will need to be refreshed once power is restored.

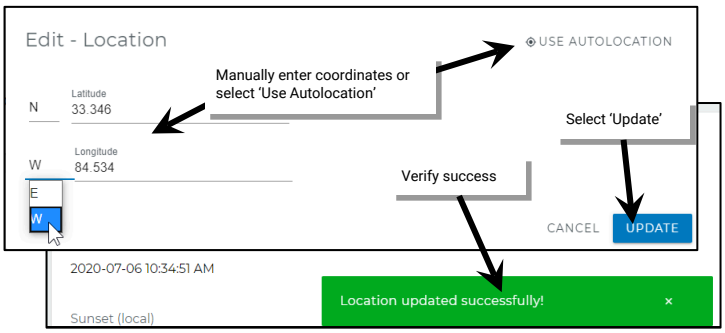
1: In the Wireless Area Controller's webpage, select the 'System' page and then select the pencil icon in the location section to open it for editing.



2: Set the location using either the auto location feature or by manually entering the coordinates.

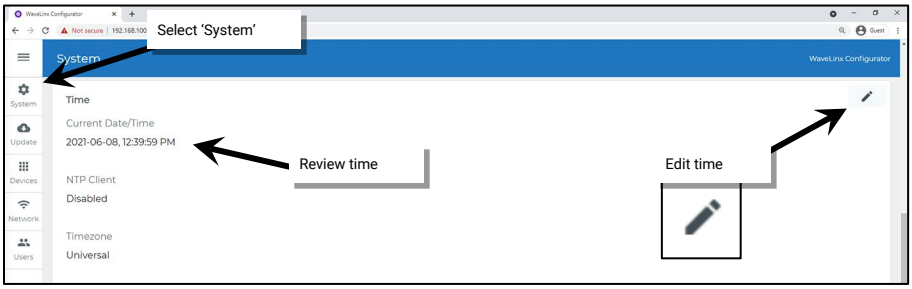
- Auto-Location: Can be used if the computer is connected to a network that allows for GPS location. Fields will automatically populate with the coordinates.
- Manually enter: Manually enter the coordinates after determining the latitude and longitude for the site.

Select 'Update' to save the coordinates. A success message will appear once completed.



WaveLinx Wireless Area Controller 2 (Gen 2) continued

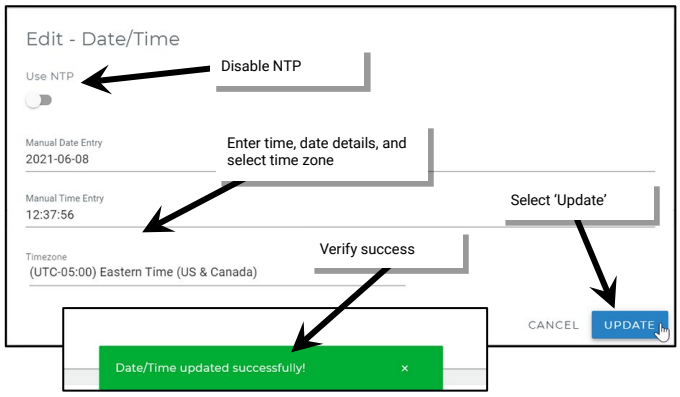
3: In the system page, review the current time, date, and time zone. If they are not correct, select the pencil icon to edit.

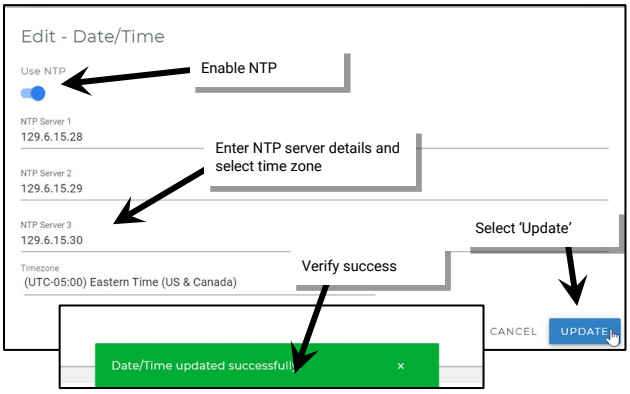


4: Update the time information by either entering the data manually or entering the NTP server details.

- **Enter manually**: Disable the 'Use NTP' slider and enter the date (year-month-day YYYY-MM-DD format) and time fields (Use 24-hour military clock format to distinguish AM from PM). Click the time zone drop down and select the proper time zone.
- **Use NTP**: If the Wireless Area Controller is connected to a building network that uses a network time protocol (NTP) server, enable the 'Use NTP' slider and fill in the NTP server address details. NTP servers do not set the time zone field. Manually set the time zone using the provided time zone drop down.

  Click 'Update' to save the coordinates to the Wireless Area Controller. A success message will appear once completed.





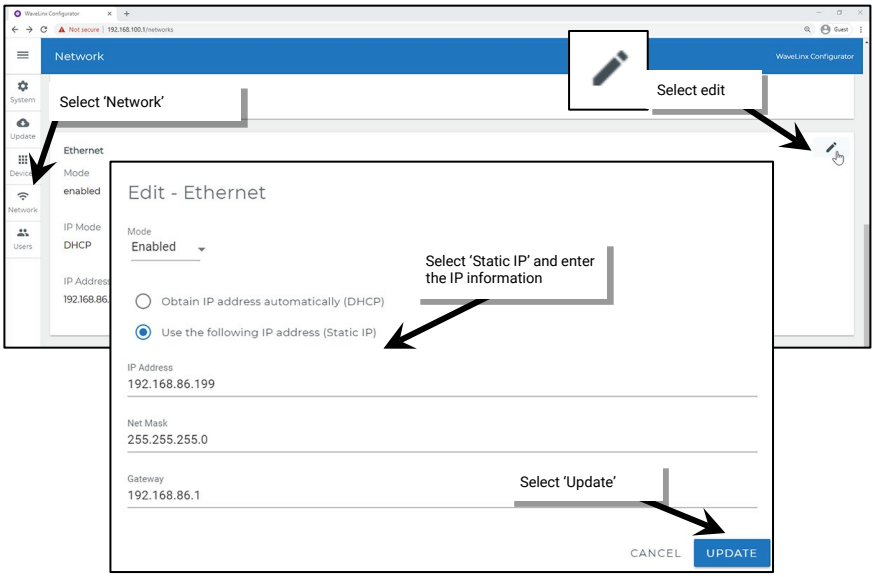
Step 3: Set the IP Address of the Wireless Area Controller

The Wireless Area Controller is set to DHCP by default. If using DHCP for IP addressing, skip this step. Follow the steps below only if assigning a static IP address.

1: Select the 'Network' page and then click on the pencil icon in the 'Ethernet' section to edit.

2: Disable 'DHCP' and manually enter the desired IP address, subnet mask and default gateway. Select 'Update' to send the settings to the Wireless Area Controller.

Verify that the Wireless Area Controller is properly connected to the Building LAN.



The Wireless Area Controller initial setup is complete.

WaveLinx Wireless Area Controller (Gen 1)

WaveLinx Wireless Area Controller (Gen 1)

Features

- Coordinates communication between WaveLinx Devices and the Mobile App
- Optionally connects to Trellix Core for use with:
  - Trellix Applications
  - BMS,
  - Other Third-Party systems.

Power:
- Powered from PoE or PoE Injector

Typical Applications

- Required for communication to WaveLinx Devices

Models:

WAC: Wireless Area Controller

Mobile App Details:

- Default Device Name:
  - CooperWAC-XX-XX

Icon Displayed in Mobile App:

The Wireless Area Controller (WAC) is the central communications coordinator for the WaveLinx system. A Wireless Area Controller (Gen 1) can coordinate communication to up to 150 devices within its wireless range (for best performance, connect up to 100 devices).

The Wireless Area Controller can operate as a stand-alone coordinator or may be connected to a building network with other Wireless Area Controllers to meet larger building requirements.

WAC (Gen 1) Details

Feature	Details

Supported Devices	The WAC (Gen 1) supports up to 150 WaveLinx Devices (for best performance, connect up to 100 devices).
	• All devices may be WaveLinx Wireless Devices OR
	• Up to 100 of the devices may be WaveLinx Low Voltage
	  • Example: 100 Low-Voltage = 100 Devices
	• Up to 50 of the devices may be actively using RTLS functionality
	  • Example: 50 RTLS Devices + 50 WaveLinx Wireless = 100 Devices
	  • Example: 50 RTLS Devices +40 Low-Voltage + 10 WaveLinx Wireless = 100 Devices

Areas	The WAC (Gen 1) supports up to 16 areas. • 15 user defined areas plus 1 default construction area.
Zones	• The WAC (Gen 1) creates two default dimming zones per area (Zone 1 and Zone 2), and one default receptacle zone per area (Zone 3). • The WAC (Gen 1) supports up to 16 zones per area.
Scenes	The WAC (Gen 1) supports up to 16 scenes per area.
Occupancy Sets	The WAC (Gen 1) supports up to 6 occupancy sets per area.
Open Loop Daylight Sets	The WAC (Gen 1) supports up to 6 open loop daylight sets per area.

Out-of-the-Box

- Once power is applied, after approximately 1-2 minutes, the blue power/health LED on top of the unit and the 802.15.4 LED should illuminate.[3]

Loss of Communications Operation

Please refer to the device reference sheets for the devices in the facility for the expected behavior upon loss of communications with the Wireless Area Controller.

Operation upon Return of Power

Upon return of power, after approximately a 1-2-minute power up period, the Wireless Area Controller will begin re-establishing connection with controlled devices. This process may take several minutes depending on the quantity of devices being controlled. Controlled devices will remain in their return of power state until the connection is re-established.

How to Place in Pairing Mode:

Method	Description	
PAIR button	Press and release (1 second press) the PAIR button located on the rear panel of the Wireless Area Controller.	
Mobile App	• Login to the Wireless Area Controller. • From the menu, select 'Devices'. • With the Wireless Area Controller selected, tap 'Actions' or locate the actions bar at the bottom of the mobile device screen. • Select 'Enable Discover Devices'.	

The blue 802.15.4 LED on the Wireless Area Controller will blink at a rate of one blink per second to indicate the Wireless Area Controller is in pairing mode.

The Wireless Area Controller pairing mode automatically times-out after 60 minutes or can be manually exited by pressing and releasing (1 second press) the PAIR button or by selecting 'Disable Discover Devices' from the Mobile App.

[3] The green LAN LED may also illuminate if the controller is connected to a building LAN with a DHCP server. Other LEDs should remain OFF.

WaveLinx Wireless Area Controller (Gen 1) continued

LED Operation

After power is applied, wait approximately 1 minutes for the Wireless Area Controller to fully boot before reviewing the LED status.

LED	Color/Pattern	Description
Connection Port LEDs	Green LED ON/Flashing	The Wireless Area Controller is connected to the Ethernet and is connected to a 10/100Mb network.
	Orange LED ON/Flashing	The Wireless Area Controller is connected to the Ethernet and is connected to a Gigabyte network.
	OFF	There is no connection to the Ethernet
Power/Health LED	Solid BLUE	The Wireless Area Controller is powered from the PoE connection.
	OFF	There is no power on the PoE connection.
	Blinking BLUE	The Wireless Area Controller may be running a firmware update, may be running firmware updates on connected devices, or may be processing a factory reset.
WAN LED	OFF	Normal condition in stand-alone use. If used in a Trellix system, the WAC has lost its connection to Trellix.
	Solid GREEN	The Wireless Area Controller is connected to a Trellix, OpenADR or a Third-Party system.
	Blinking GREEN	The connected system is communicating.
LAN LED	OFF	There is no connection or IP address from the building LAN.
	Solid GREEN	The Wireless Area Controller is connected to the building LAN and has received an IP address
	Blinking GREEN	There are communications from the building LAN connection.
Wi-Fi LED	OFF	There is no connection to the Wi-Fi.
	Solid BLUE	There is an active connection to the Wi-Fi and the unit has received an IP address.
	Blinking BLUE	There are communications through the Wi-Fi connection.
802.15.4 LED	Blinking BLUE	The Wireless Area Controller is in pairing mode.
	Solid BLUE	The 802.15.4 network communications are normal.
	OFF	The 802.15.4 LED should not be OFF. Verify unit is powered and has had time to fully power up (approx. 1-2 minutes).

WaveLinx Wireless Area Controller (Gen 1) continued

Wireless Area Controller Pushbutton Functions

The WaveLinx Wireless Area Controller pushbutton options allows for several administrative functions. These functions should be used with caution!

Function	PAIR button press	Device outcome	WAC LED feedback
Enter Pairing Mode	1 press (1 second)	Paired devices will exhibit paired behavior described in the device reference sheets. Unpaired devices can pair with the Wireless Area Controller if they are in pairing mode.	802.15.4 LED flashes
Exit Pairing Mode (if pairing mode is still active)	1 press (1 second)	Paired devices will start operation within the construction grouping. Lighting still in the default construction area will turn on to a 100% level or operate from paired wallstations and occupancy sensor controls.	802.15.4 LED ON steady
Remove Unassigned Devices	Press and hold for 4 seconds	Devices still in the default construction area will leave the WaveLinx network.	No LED feedback
Authorization Reset	Press and hold for 20 seconds	No effect on devices. The following data will be cleared and replaced with factory defaults: • Admin user accounts • User-uploaded custom certificates • Network configuration • Wi-Fi settings • Ethernet settings • Wi-Fi access point settings	After the 20 second press, the Wi-Fi LED will begin flashing. As the command continues to process, different combinations of LEDs may flash or turn ON and OFF, including the power/health LED. After approximately 2-3 minutes, the power/health LED and blue 802.15.4 LED will be ON steady indicating that the process is complete (other LEDs may be ON depending upon connections).
Reset factory defaults	Power cycle the Wireless Area Controller and wait approx. 2 to 4 minutes for the reboot to occur. The power/health LED will be ON, and the 802.15.4 LED illuminated when the reboot is complete (other LEDs may be on depending on connections). Within 15 minutes of the power cycle, press and hold the PAIR button for 30 seconds.	All programming will be cleared for the Wireless Area Controller and reset to factory defaults including: • Removing all 802.15.4 device pairing • All user accounts • Clearing user-uploaded custom certificates • Network configuration including: • Wi-Fi settings • Ethernet settings • Wi-Fi access point settings • Clearing programming including area and zone designations • Resetting WAC name to default	During the 30 second press, the Wi-Fi LED will start flashing for approx. 10 seconds, and then all LEDs start flashing at the 30 second mark. As the command continues to process, different combinations of LEDs may flash or turn ON and OFF, including the power/health LED. After approximately 2-3 minutes, the power/health LED and blue 802.15.4 LED will be ON steady indicating that the process is complete (other LEDs may be ON depending upon connections).

The Wireless Area Controller Reset button issues a soft reset to the Wireless Area Controller. A soft reset will not impact the Wireless Area Controller's settings.

Initial Configuration Steps for the Wireless Area Controller (Gen 1)

WaveLinx Wireless Area Controller (Gen 1) continued

Initial Configuration Steps for WAC (Gen 1)

The steps in this section should be completed before pairing devices to the Wireless Area Controller.

Use this section to:

- Connect to the Wireless Area Controller Webpage
- Set the Clock Parameters
- Set the IP address of the Wireless Area Controller

Step 1: Connect to the Wireless Area Controller Webpage

The steps in this section assume that the Wireless Area Controller has not been connected to a building network and is still in its factory default state for wireless name and username/password. If the Wireless Area Controller is connected to the building network, or the wireless name and password has been changed from the default, please refer to the network administrator for access information.

1: Make sure that the computer being used has wireless connectivity and has a compatible web browser installed. The WaveLinx internal webpage configuration is accessed using Google Chrome version 70 or higher, Internet Explorer version 11 or higher, and Mozilla Firefox version 63 or higher.

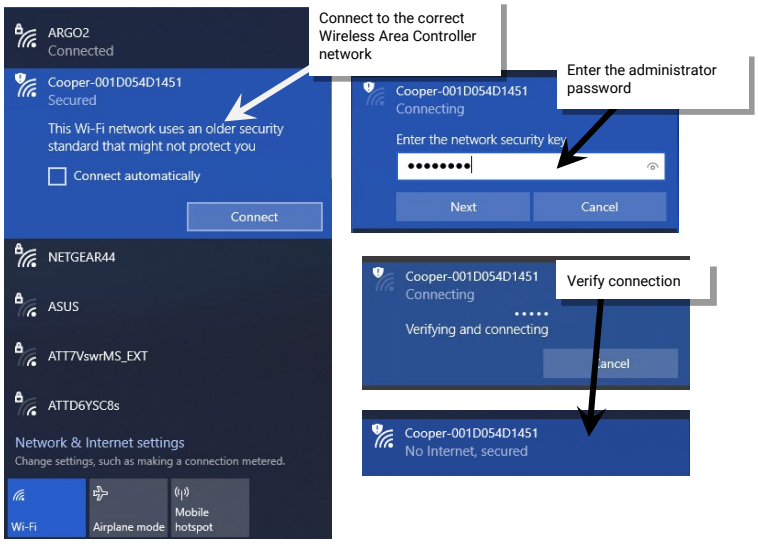
2: Go to the location of the Wireless Area Controller. Verify that the unit is powered and has the Blue Power/Health LED and the 802.15.4 LED illuminated (other LEDs may also be illuminated depending on connections).

On the front plate of the Wireless Area Controller below the blue power/health LED, locate the label with the MAC ID. Make note of the MAC ID shown.

3: Ensure that the computer's Wi-Fi is active, and then navigate to the list of available Wi-Fi networks. Locate the Wi-Fi network with the name Cooper-XXXXXXXXXXXX (where X is a string of letters and numbers).

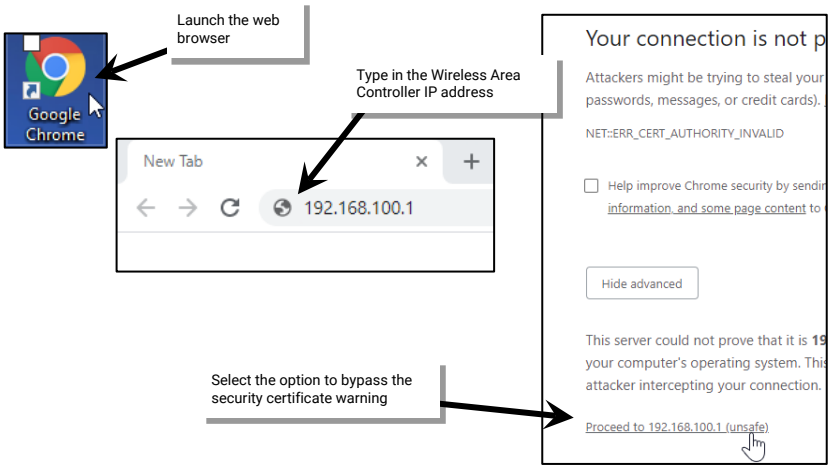
Select the Wi-Fi network Cooper-XXXXXXXXXXXXXX where the X characters match the MAC ID noted in the last step. The last number will be one digit higher than the MAC ID noted.

Enter the password wclAdmin when prompted matching the case shown and join the network



4: Open the web browser and enter the IP address of the Wireless Area Controller in the address bar. (The default IP address is 192.168.100.1.)

The first time the Wireless Area Controller is accessed, the browser may display message windows regarding the site security certificate. The display and wording of these messages may differ between web browsers. Locate the option to bypass the warning to proceed to the site.



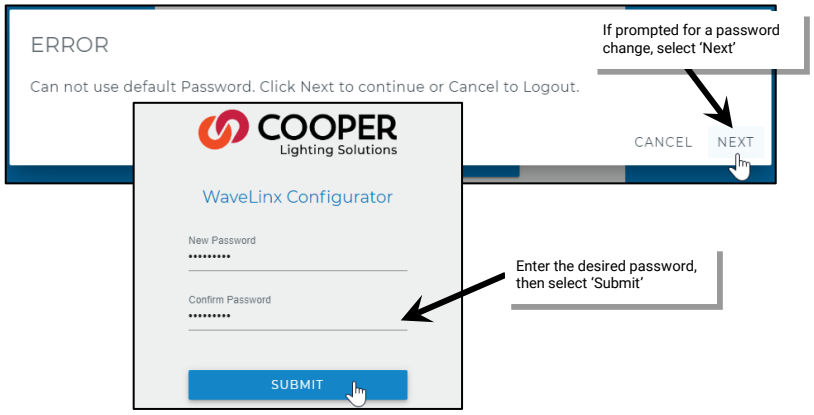
WaveLinx Wireless Area Controller (Gen 1) continued

5: In the log in screen, enter the username and password for the administrator user.[4]
- Default Username: **WclAdmin**
- Default Password: **wclAdmin**

6: If this is the first login, the system will force a password change. When prompted, enter a new password for the administrative user.

Set a complex password when changing passwords, making sure it is something that can be remembered.

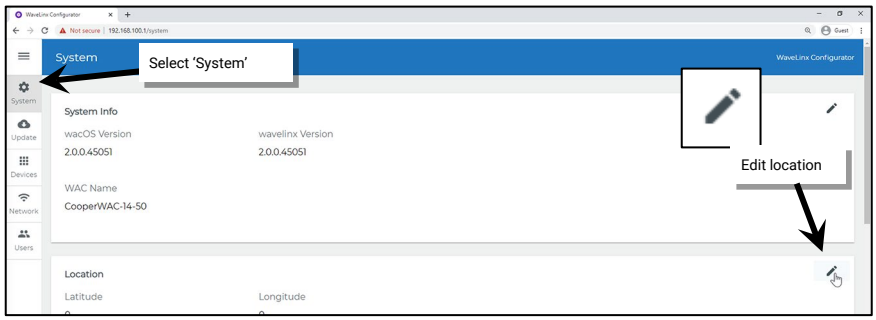
IMPORTANT! REMEMBER THE NEW PASSWORD AS IT WILL BE USED FOR ALL FUTURE ADMINISTRATOR LOGINS FOR THE INTERNAL WEBPAGE AND FOR THE MOBILE APPLICATION.



Step 2: Set the Wireless Area Controller Clock

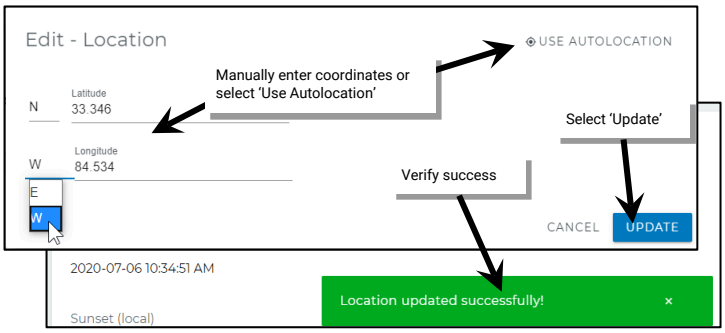
The Wireless Area Controller clock settings need to be set for the site. This includes the location, time, date, and time zone settings. These settings are found within the system webpage. In event of a power loss, the time and date will be retained for up to 48 hours. If power is lost longer than a 48-hour period, the settings will need to be refreshed once power is restored.

1: In the Wireless Area Controller's webpage, select the 'System' page and then select the pencil icon in the location section to open it for editing.



2: Set the location using either the auto location feature or by manually entering the coordinates.
- Auto-Location: Can be used if the computer is connected to a network that allows for GPS location. Fields will automatically populate with the coordinates.
- Manually enter: Manually enter the coordinates after determining the latitude and longitude for the site.

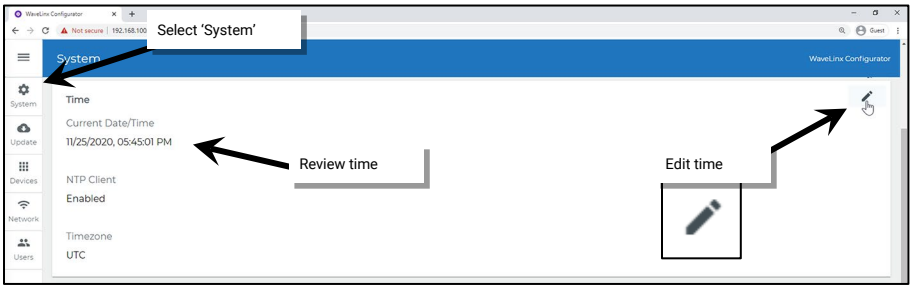
Select 'Update' to save the coordinates. A success message will appear once completed.



[4] If the username and password have been changed, use the updated username or password when logging in.

WaveLinx Wireless Area Controller (Gen 1) continued

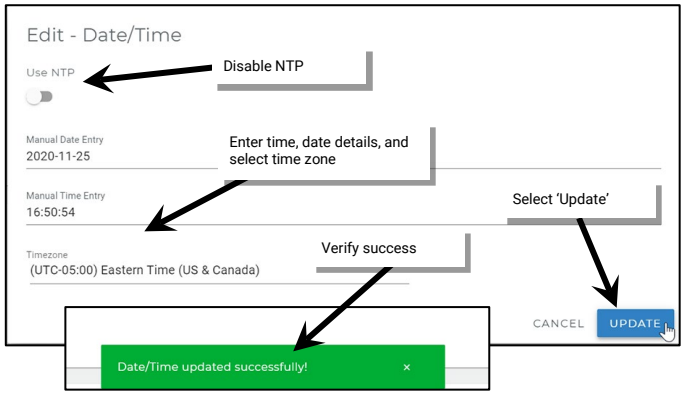
3: In the system page, review the current time, date, and time zone. If they are not correct, select the pencil icon to edit.

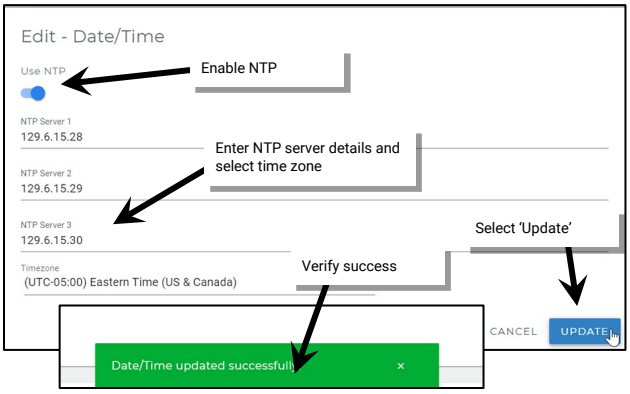


4: Update the time information by either entering the data manually or entering the NTP server details.

- **Enter manually**: Disable the 'Use NTP' slider and enter the date (year-month-day YYYY-MM-DD format) and time fields (Use 24-hour military clock format to distinguish AM from PM). Click the time zone drop down and select the proper time zone.
- **Use NTP**: If the Wireless Area Controller is connected to a building network that uses a network time protocol (NTP) server, enable the 'Use NTP' slider and fill in the NTP server address details. NTP servers do not set the time zone field. Manually set the time zone using the provided time zone drop down.

  Click 'Update' to save the coordinates to the Wireless Area Controller. A success message will appear once completed.





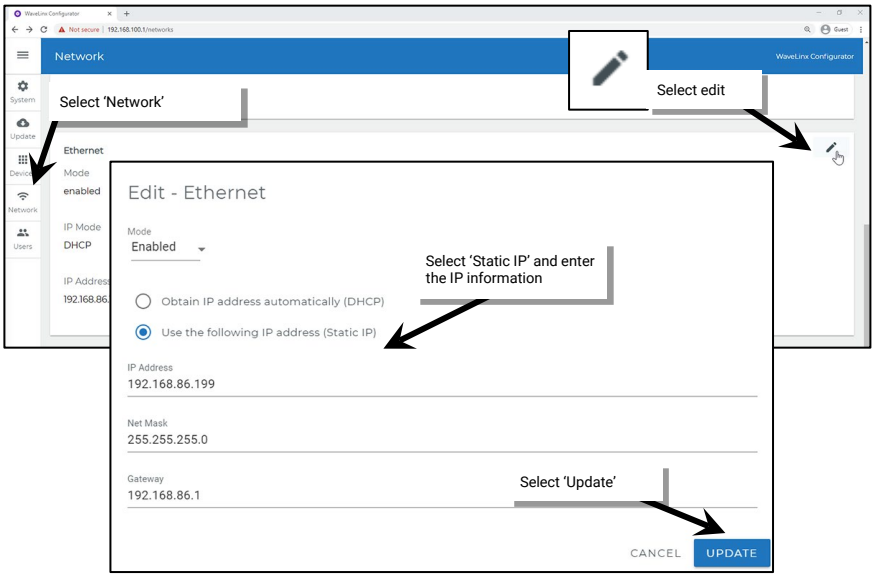
Step 3: Set the IP Address of the Wireless Area Controller

The Wireless Area Controller is set to DHCP by default. If using DHCP for IP addressing, skip this step. Follow the steps below only if assigning a static IP address.

1: Select the 'Network' page and then click on the pencil icon in the 'Ethernet' section to edit.

2: Disable 'DHCP' and manually enter the desired IP address, subnet mask and default gateway. Select 'Update' to send the settings to the Wireless Area Controller.

Verify that the Wireless Area Controller is properly connected to the Building LAN.



The Wireless Area Controller initial setup is complete.

Ambient Integrated Sensor Reference Sheet

Ambient Integrated Sensor

Features

- Integrated photocell for closed loop daylighting
- Integrated Passive Infrared (PIR) motion sensor for occupancy or vacancy sensing
- IEEE 802.15.4, (router and end point)
- Bluetooth beacon, RTLS capabilities[5,6]

Typical Applications

- Education, office, and other interior spaces

Models:

- **WAA:** Ambient Integrated Sensor

Available option on many Cooper Lighting luminaires.

Mobile App Details:

- Default Device Name:
  - Integrated Sensor (non-BLE)
  - BLE Integrated Sensor
  - Integrated Sensor PRO
  - Integrated Sensor Economy
- Unassigned Device Category:
  - Integrated Sensor

Icon Displayed in Mobile App:

The WaveLinx Ambient Integrated Sensor provides wireless control within the light fixture to reduce wiring, design, and installation time. The sensor provides both occupancy and daylight control that can be easily configured using the WaveLinx Mobile App.

Out-of-the-Box Operation

- Once power is applied, the attached fixture operates via the motion sensor.
  - The occupancy sensor is set for high sensitivity.
  - If occupied, the fixture will turn ON to 100%[7]
  - The fixture will dim to OFF (0%) after 20 minutes when the space is unoccupied.
- The daylight sensor is disabled.
- LED flashes green (in sensor window) for 100ms once every 3 seconds when motion is detected.

Construction Area Default Operation	Assigned to an Area Default Operation
Once paired, the device operates as part of the Construction Area. • The daylight sensor remains disabled.	Once assigned to a created area, the device operates as part of the area. • **WAC (Gen 1):** The daylight sensor is enabled and set for closed loop daylighting. • **WAC2 (Gen 2)**: The daylight sensor is disabled.

• All occupancy sensors report to the area's occupancy set.
  • If occupied, the fixtures will turn ON to 50% (Scene 3).
  • The occupancy set default hold time is 20 minutes.
  • If the space remains unoccupied for 20 minutes, the fixture will dim to 0% (Scene 0).
• Sensor LED flashes white for 100ms once every 3 seconds when motion is detected.	

Loss of Communications Operation

If the device has not communicated with the Wireless Area Controller for longer than approx.15 minutes, it will revert to its out-of-the-box behavior and display loss of communications LED operation until communications are re-established.[7, 8]

Operation upon Return of Power

Upon return of power, the fixture will resume its last known light level. If not able to communicate with the Wireless Area Controller for more than approx. 15 minutes, loss of communications operation will begin.[7]

LED Operation (The LED is located beneath the sensor lens.)

LED conditions	Meaning
Flashes green for 100ms, once every 3 seconds	Device is unpaired (out-of-the-box) and is detecting motion.[8]
Flashes white for 100ms, once every 3 seconds	Device is paired to a Wireless Area Controller and is detecting motion
Flashes green 300ms, then white for 300ms, once every 3 seconds[8]	The device has lost communication with the Wireless Area Controller for longer than 15 minutes and is detecting motion.
Flashes white for 10ms every 250ms (fast blink)	The daylight sensor has exceeded 150% of the calibrated light level for 30 minutes.[9]
LED is OFF	Device is not detecting motion. If motion is occurring, ensure device is powered and that the LED has not been disabled through the mobile app.[10]
LED flashes magenta one time	The flashlight method has been used to identify the device.
LED flashes blue one time	The ISHH-01 remote has been used to identify the device.

[5] Older WAA models may not have Bluetooth beacon capabilities.

[6] RTLS capability may require additional license or firmware purchase.

[7] Devices with older firmware may go to 75% light output when occupied in out-of-the-box operation and may take up to 1 hour to enter loss of communication operation.

[8] Devices with older firmware may flash green for 100ms, once every 3 seconds, 15 minutes after loss of communication.

[9] The LED will stop flashing if the light level drops but stays between 50% and 100% of the calibrated light level for 10 minutes OR if the light level falls below 50% of the calibrated light level for 30 seconds.

[10] The LED may be difficult to see in very bright areas.

Ambient Integrated Sensor continued

How to Place in Pairing Mode:

Method	Description
Power Cycle Method[11]	Using the circuit breaker, perform the following power cycle sequence: • Turn OFF power for 30 seconds, and then turn ON power for 5 seconds • Turn OFF power for 30 seconds, and then turn ON power and leave ON
ISHH-01 Remote Method[12]	Integrated Sensor Remote Control: Standing beneath the sensor, point the ISHH-01 remote at the sensor, and then press and release the power button. If the sensor that has not been paired, this will trigger pairing mode. The LED in the sensor window will briefly flash blue.

The device will stay in pairing mode for 60 minutes and then time out automatically if a connection with Wireless Area Controller is not made. Only unpaired devices will enter pairing mode with these methods.

Successful Paired Device Behavior: (While WAC is still in or is placed in pairing mode)

- Fixture dims to 10%.
- LED in sensor window should blink WHITE with motion detection.

Supported Identification Methods:

- **ISHH-01** Integrated Sensor Remote Control: Standing beneath the sensor, point the ISHH-01 remote at the sensor, and then press and release the power button ⏻. For a sensor that has been paired with a Wireless Area Controller, this will trigger identification mode for that device. The LED in the sensor window will briefly flash blue.
- **Laser pointer or focused flashlight beam**: For fixtures mounted at reasonable mounting heights, use a laser pointer or bright, focused beam flashlight to trigger identification mode. Standing beneath the sensor, shine the light directly into the sensor lens for 3-4 seconds. The timing needs to be precise for the identification mode to respond. The LED in the sensor window will briefly flash magenta at the end of this 3-4 second period.
- **'Blink to Identify'**: Use the Mobile App's 'Blink to Identify' feature to identify the device. Select the '' icon in a device row to place the device in 'Blink to Identify' mode. The icon will appear to pulse and a load matching that type should respond.

'Blink to Identify' Behavior

When placed in 'Blink to Identify' mode:

- The fixture will turn ON for 1 second, turn OFF for 1 second and repeats this cycle for 15 seconds.

Daylight Operation (closed loop)

- Once assigned to an area and enabled (daylight operation is enabled automatically if paired with WAC Gen 1), the sensor will begin closed loop daylight dimming operation to a reasonable light level. If a specific light level (target) is expected at the surface, then calibration is required.
- When the measured light exceeds the calibrated level, the fixture will dim lighting to reduce the light level.
- When the measured light level exceeds 150% of the calibrated light level for more than 30 minutes, the sensor will dim to OFF.
- Lighting will be turned back ON when one of the two conditions occurs:
  - The measured light level falls between 100% and 50% of the calibrated light level for more than 10 minutes
  - The measured light level falls below 50% of the calibrated light level for longer than 30 seconds

Daylight Calibration Details

It is best to calibrate indoor applications when there is a moderate to low level of daylight. If the daylight level is too high, it may be difficult to obtain the desired level of light at the task surface, even if the fixtures are completely off.

During calibration, use the 'Calibrate All' feature and adjust slider bars to change the light level to the desired light level for each controlled fixture. Once all fixtures are adjusted, use a light meter on the surface to ensure the reading is in the desired range and then send the 'Calibrate' command.

If the light level in the space is still too bright when electric lighting is fully dimmed, use available shading to adjust the amount of incoming daylight or postpone calibration until the amount of incoming daylight has decreased.

Factory Reset Instructions

CAUTION: The factory reset will set the device back to factory settings (out-of-the-box behavior) removing pairing and programmed settings.

Integrated Sensor/BLE Integrated Sensor/Integrated Sensor Economy	Integrated Sensor PRO
• Cycle the power (switch **OFF 4 seconds** and then **ON 4 seconds**) the device's circuit **six times**.	• Cycle the power (switch **OFF 30 seconds** and then **ON 5 seconds**) the device's circuit **six times**.

This removes pairing for ALL devices of this type on the affected circuit. After a short period of time, the device should exhibit out-of-the-box behavior and may be paired as a new device.[13]

[11] Devices with older firmware (prior to Integrated Sensor 01.07.13.00, BLE Integrated Sensor 2.04.19.00, Integrated Sensor Pro 1.01.04.00 and older Integrated Sensor Economy devices) may only require a single power cycle to place in pairing mode (30 seconds OFF, and then turn back ON).

[12] Devices with older firmware (prior to Integrated Sensor 01.07.13.00, BLE Integrated Sensor 2.04.19.00, Integrated Sensor Pro 1.01.04.00 and older Integrated Sensor Economy devices) do not support this method. Use the power cycle method to invoke pairing mode.

[13] The device may flash the light to indicate the reset was successful. If the light was ON prior to the reset, the light will flash twice then remain ON. If OFF prior to reset, the flash behavior may not be observed, but lighting will turn ON.

Industrial Integrated Sensor Reference Sheet

Industrial Integrated Sensor

Features

- Integrated photocell for closed loop daylighting
- Integrated Passive Infrared (PIR) motion sensor for occupancy or vacancy sensing
- IEEE 802.15.4, (router and end point)
- Bluetooth beacon, RTLS capabilities[14,15]

Typical Applications

- Industrial and Manufacturing facilities

Models:

- **SWPD2:** Low mount: 7-15ft (2.1-4.5m)
- **WIA:** BLE Low mount: 7-15ft (2.1-4.5m)[16]
- **SWPD3**: High mount: 15-40ft (4.5-12.2m)
- **WIE:** BLE High mount: 15-40ft (4.5-12.2m)[16]

Available option on many Cooper Lighting luminaires.

Mobile App Details:

- Default Device Name:
  - Industrial Low Mount Integrated Sensor (SWPD2)
  - Industrial High Mount Integrated Sensor (SWPD3)
  - Industrial Low Mount Integrated Sensor BLE (WIA)[16]
  - Industrial High Mount Integrated Sensor BLE (WIE)[16]
- Unassigned Device Category:
  - SWPD2 & WIA:[16] Lowbay Sensor
  - SWPD3 & WIE:[16] Highbay Sensor

Icon Displayed in Mobile App:

The WaveLinx Industrial Fixture High/Low Bay Mount Integrated Sensor uses a simple tool-less twist lock method to connect to a Cooper Lighting fixture with WaveLinx compatible 4-pin Zhaga Book 18 socket. The sensor has an IP66 rating for warehouse and manufacturing environments and provides both occupancy and daylight control that can be easily configured using the WaveLinx Mobile App.

Out-of-the-Box Operation

- Once power is applied, the attached fixture operates via the motion sensor.
  - The occupancy sensor is set for high sensitivity.
  - If occupied, the fixture will turn ON to 100%[17]
  - The fixture will dim to 10% after 20 minutes when the space is unoccupied.
- The daylight sensor is disabled.
- LED flashes green (in sensor window) for 100ms once every 3 seconds when motion is detected.

Construction Area Default Operation	Assigned to an Area Default Operation
Once paired, the device operates as part of the Construction Area. • The daylight sensor remains disabled.	Once assigned to a created area, the device operates as part of the area. • **WAC (Gen 1)**: The daylight sensor is enabled and set for closed loop daylighting. • **WAC2 (Gen 2):** The daylight sensor is disabled.

• All occupancy sensors report to the area's occupancy set.
  • If occupied, the fixtures will turn ON to 50% (Scene 3).
  • The occupancy set default hold time is 20 minutes.
  • If the space remains unoccupied for 20 minutes, the fixture will dim to 0% (Scene 0).
• Sensor LED flashes white for 100ms once every 3 seconds when motion is detected.	

Loss of Communications Operation

If the device has not communicated with the Wireless Area Controller for longer than approx. 15 minutes, it will revert to its out-of-the-box behavior and display loss of communications LED operation until communications are re-established until communications are re-established.[17, 18]

Operation upon Return of Power

Upon return of power, the fixture will resume its last known light level. If not able to communicate with the Wireless Area Controller for more than approx. 15 minutes, loss of communications operation will begin.[17]

LED Operation (The LED is located beneath the sensor lens.)

LED conditions	Meaning
Flashes green for 100ms, once every 3 seconds	Device is unpaired (out-of-the-box) and is detecting motion.[18]
Flashes white for 100ms, once every 3 seconds	Device is paired to a Wireless Area Controller and is detecting motion
Flashes green 300ms, then white for 300ms, once every 3 seconds[18]	The device has lost communication with the Wireless Area Controller for longer than 15 minutes and is detecting motion.
Flashes white for 10ms every 250ms (fast blink)	The daylight sensor has exceeded 150% of the calibrated light level for 30 minutes.[19]
LED is OFF	Device is not detecting motion. If motion is occurring, ensure device is powered and that the LED has not been disabled through the mobile app.[20]
LED flashes magenta one time	The flashlight method has been used to identify the device.
LED flashes blue one time	The ISHH-01 remote has been used to identify the device.

[14] SWPD2 and SWPD3 models do not have Bluetooth beacon capability.

[15] RTLS capability may require additional license or firmware purchase.

[16] WIB & WIF WaveLinx Lite sensor models may be updated through firmware to allow operate with a standard WaveLinx system.

[17] Devices with older firmware may go to 75% light output when occupied in out-of-the-box operation and may take up to 1 hour to enter loss of communication operation.

[18] Devices with older firmware may flash green for 100ms, once every 3 seconds, 15 minutes after loss of communication.

[19] The LED will stop flashing if the light level drops but stays between 50% and 100% of the calibrated light level for 10 minutes OR if the light level falls below 50% of the calibrated light level for 30 seconds.

[20] The LED may be difficult to see in very bright areas.

Industrial Integrated Sensor continued

How to Place in Pairing Mode:

Method	Description
Power Cycle Method[21]	Using the circuit breaker, perform the following power cycle sequence: • Turn OFF power for 30 seconds, and then turn ON power for 5 seconds • Turn OFF power for 30 seconds, and then turn ON power and leave ON
ISHH-01 Remote Method[22]	Integrated Sensor Remote Control: Standing beneath the sensor, point the ISHH-01 remote at the sensor, and then press and release the power button. If the sensor that has not been paired, this will trigger pairing mode. The LED in the sensor window will briefly flash blue.

The device will stay in pairing mode for 60 minutes and then time out automatically if a connection with Wireless Area Controller is not made. Only unpaired devices will enter pairing mode with these methods.

Successful Paired Device Behavior: (While WAC is still in or placed in pairing mode)

- Fixture dims to 10%.
- LED in sensor window should blink WHITE with motion detection.

Supported Identification Methods:

- **ISHH-01** Integrated Sensor Remote Control: Standing beneath the sensor, point the ISHH-01 remote at the sensor, and then press and release the power button ⏻. For a sensor that has been paired with a Wireless Area Controller, this will trigger identification mode for that device. The LED in the sensor window will briefly flash blue.
- **Laser pointer or focused flashlight beam**: For fixtures mounted at reasonable mounting heights, use a laser pointer or bright, focused beam flashlight to trigger identification mode. Standing beneath the sensor, shine the light directly into the sensor lens for 3-4 seconds. The timing needs to be precise for the identification mode to respond. The LED in the sensor window will briefly flash magenta at the end of this 3-4 second period.
- **'Blink to Identify'**: Use the Mobile App's 'Blink to Identify' feature to identify the device. Select the '' icon in a device row to place the device in 'Blink to Identify' mode. The icon will appear to pulse and a load matching that type should respond.

'Blink to Identify' Behavior

When placed in 'Blink to Identify' mode:
- The fixture will turn ON for 1 second, turn OFF for 1 second and repeats this cycle for 15 seconds.

Daylight Operation (closed loop)

- Once assigned to an area and enabled (daylight operation is enabled automatically if paired with WAC Gen 1), the sensor will begin closed loop daylight dimming operation to a reasonable light level. If a specific light level (target) is expected at the surface, then calibration is required.
- When the measured light exceeds the calibrated level, the fixture will dim lighting to reduce the light level.
- When the measured light level exceeds 150% of the calibrated light level for more than 30 minutes, the sensor will dim to OFF.
- Lighting will be turned back ON when one of the two conditions occurs:
  - The measured light level falls between 100% and 50% of the calibrated light level for more than 10 minutes
  - The measured light level falls below 50% of the calibrated light level for longer than 30 seconds

Daylight Calibration Details

It is best to calibrate indoor applications when there is a moderate to low level of daylight. If the daylight level is too high, it may be difficult to obtain the desired level of light at the task surface, even if the fixtures are completely off.

During calibration, use the 'Calibrate All' feature and adjust slider bars to change the light level to the desired light level for each controlled fixture. Once all fixtures are adjusted, use a light meter on the surface to ensure the reading is in the desired range and then send the 'Calibrate' command.

If the light level in the space is still too bright when electric lighting is fully dimmed, use available shading to adjust the amount of incoming daylight or postpone calibration until the amount of incoming daylight has decreased.

Factory Reset Instructions

CAUTION: The factory reset will set the device back to factory settings (out-of-the-box behavior) removing pairing and programmed settings.

Industrial Low Mount Integrated Sensor (SWPD2) Industrial High Mount Integrated Sensor (SWPD3)	Industrial Low Mount Integrated Sensor BLE (WIA) Industrial High Mount Integrated Sensor BLE (WIE)
• Cycle the power (switch **OFF 4 seconds** and then **ON 4 seconds**) the device's circuit **six times**.	• Cycle the power (switch **OFF 30 seconds** and then **ON 5 seconds**) the device's circuit **six times**.

This removes pairing for ALL devices of this type on the affected circuit. After a short period of time, the device should exhibit out-of-the-box behavior and may be paired as a new device.[23]

[21] Devices with older firmware (prior to 01.08.17.00 for non-BLE models or 01.01.05.00 for BLE models) may only require a single power cycle to place in pairing mode (30 seconds OFF, and then turn back ON).

[22] Devices with older firmware (prior to 01.08.17.00 for non-BLE models or 01.01.05.00 for BLE models) do not support this method. Use the power cycle method to invoke pairing mode.

[23] The device may flash the light to indicate the reset was successful. If the light was ON prior to the reset, the light will flash twice then remain ON. If OFF prior to reset, the flash behavior may not be observed, but lighting will turn ON.

Outdoor Integrated Sensor Reference Sheet

Outdoor Integrated Sensor

Features

- Integrated photocell for closed loop daylighting
- Integrated Passive Infrared (PIR) motion sensor for occupancy sensing
- IEEE 802.15.4, (router and end point)
- Bluetooth beacon, RTLS capabilities[24,25]

Typical Applications

- Outdoor, parking areas, and pathways

Models:

- **SWPD4:** Low mount: 7-15ft (2.1-4.5m)
- **WOA:** BLE Low mount: 7-15ft (2.1-4.5m) [26]
- **SWPD5**: High mount: 15-40ft (4.5-12.2m)
- **WOE:** BLE High mount: 15-40ft (4.5-12.2m)[26]

Available option on many Cooper Lighting luminaires.

Mobile App Details:

- Default Device Name:
  - Outdoor Low Mount Integrated Sensor (SWPD4)
  - Outdoor High Mount Integrated Sensor (SWPD5)
  - Outdoor Low Mount Integrated Sensor BLE (WOA)[26]
  - Outdoor High Mount Integrated Sensor BLE (WOE)[26]
- Unassigned Device Category:
  - SWPD4 & WOA:[26] Lowbay Sensor
  - SWPD5 & WOE:[26] Highbay Sensor

Icon Displayed in Mobile App:

The WaveLinx Outdoor Fixture High/Low Mount Integrated Sensor uses a simple tool-less twist lock method to connect to a Cooper Lighting fixture with WaveLinx compatible 4-pin Zhaga Book 18 socket. The sensor has an IP66 rating and provides both easily configurable occupancy and daylight control.

Out-of-the-Box Operation

- Once power is applied, the attached fixture operates via the daylight and motion sensors.
  - ON at dusk / OFF at dawn via daylight sensor.
  - If fixture is ON at dusk, the occupancy sensor determines the light level.
    - If occupied, the fixture will go to 100%.
    - The fixture will dim to 50% within 15 minutes when the space is unoccupied.
- The occupancy sensor is set for high sensitivity.
- LED flashes green (in sensor window) for 100ms once every 3 seconds when motion is detected.

Construction Area Default Operation	Assigned to an Area Default Operation
Once paired, the device operates as part of the Construction Area. • The daylight sensor remains disabled.	Once assigned to a created area, the device operates as part of the area. • **WAC (Gen 1)**: The daylight sensor is enabled and set for closed loop daylighting. • **WAC2 (Gen 2):** The daylight sensor is disabled.

• All occupancy sensors report to the area's occupancy set.
  • If occupied, the fixtures will turn ON to 50% (Scene 3).
  • The occupancy set default hold time is 20 minutes.
  • If the space remains unoccupied for 20 minutes, the fixture will dim to 0% (Scene 0).
• Sensor LED flashes white for 100ms once every 3 seconds when motion is detected.	

Loss of Communications Operation

If the device has not communicated with the Wireless Area Controller for longer than approx. 15 minutes, it will revert to its out-of-the-box behavior and display loss of communications LED operation until communications are re-established.[27, 28]

Operation upon Return of Power

Upon return of power, the fixture will resume its last known light level. If not able to communicate with the Wireless Area Controller for more than approx. 15 minutes, loss of communications operation will begin.[27]

LED Operation (The LED is located beneath the sensor lens.)

LED conditions	Meaning
Flashes green for 100ms, once every 3 seconds	Device is unpaired (out-of-the-box) and is detecting motion.[28]
Flashes white for 100ms, once every 3 seconds	Device is paired to a Wireless Area Controller and is detecting motion
Flashes green 300ms, then white for 300ms, once every 3 seconds[28]	The device has lost communication with the Wireless Area Controller for longer than 15 minutes and is detecting motion.
Flashes white for 10ms every 250ms (fast blink)	The daylight sensor has exceeded 150% of the calibrated light level for 30 minutes.[29]
LED is OFF	Device is not detecting motion. If motion is occurring, ensure device is powered and that the LED has not been disabled through the mobile app.[30]
LED flashes magenta one time	The flashlight method has been used to identify the device.
LED flashes blue one time	The ISHH-01 remote has been used to identify the device.

[24] SWPD4 and SWPD5 models do not have Bluetooth beacon capability.

[25] RTLS capability may require additional license or firmware purchase.

[26] WOB & WOF WaveLinx Lite sensor models may be updated through firmware to allow operate with a standard WaveLinx system.

[27] Devices with older firmware may take up to 1 hour to enter loss of communications operation.

[28] Devices with older firmware may flash green for 100ms, once every 3 seconds, 15 minutes after loss of communication.

[29] The LED will stop flashing if the light level drops but stays between 50% and 100% of the calibrated light level for 10 minutes OR if the light level falls below 50% of the calibrated light level for 30 seconds.

[30] The LED may be difficult to see in very bright areas.

Outdoor Integrated Sensor continued

How to Place in Pairing Mode:

Method	Description
Power Cycle Method[31]	Using the circuit breaker, perform the following power cycle sequence: • Turn OFF power for 30 seconds, and then turn ON power for 5 seconds • Turn OFF power for 30 seconds, and then turn ON power and leave ON
ISHH-01 Remote Method[32]	Integrated Sensor Remote Control: Standing beneath the sensor, point the ISHH-01 remote at the sensor, and then press and release the power button. If the sensor that has not been paired, this will trigger pairing mode. The LED in the sensor window will briefly flash blue.

The device will stay in pairing mode for 60 minutes and then time out automatically if a connection with Wireless Area Controller is not made. Only unpaired devices will enter pairing mode with these methods.

Successful Paired Device Behavior: (While WAC is still in or placed in pairing mode)

- Fixture dims to 10%.
- LED in sensor window should blink WHITE with motion detection.

Supported Identification Methods:

- **ISHH-01** Integrated Sensor Remote Control: Standing beneath the sensor, point the ISHH-01 remote at the sensor, and then press and release the power button ⏻. For a sensor that has been paired with a Wireless Area Controller, this will trigger identification mode for that device. The LED in the sensor window will briefly flash blue.
- **Laser pointer or focused flashlight beam**: For fixtures mounted at reasonable mounting heights, use a laser pointer or bright, focused beam flashlight to trigger identification mode. Standing beneath the sensor, shine the light directly into the sensor lens for 3-4 seconds. The timing needs to be precise for the identification mode to respond. The LED in the sensor window will briefly flash magenta at the end of this 3-4 second period.
- **'Blink to Identify'**: Use the Mobile App's 'Blink to Identify' feature to identify the device. Select the ' ' icon in a device row to place the device in 'Blink to Identify' mode. The icon will appear to pulse and a load matching that type should respond.

'Blink to Identify' Behavior

When placed in 'Blink to Identify' mode:

- The fixture will turn ON for 1 second, turn OFF for 1 second and repeats this cycle for 15 seconds.

Daylight Operation (closed loop)

- Once assigned to an area and enabled (daylight operation is enabled automatically if paired with WAC Gen 1), the sensor will begin closed loop daylight dimming operation to a reasonable light level. If a specific light level (target) is expected at the surface, then calibration is required.
- When the measured light exceeds the calibrated level, the fixture will dim lighting to reduce the light level.
- When the measured light level exceeds 150% of the calibrated light level for more than 30 minutes, the sensor will dim to OFF.
- Lighting will be turned back ON when one of the two conditions occurs:
  - The measured light level falls between 100% and 50% of the calibrated light level for more than 10 minutes
  - The measured light level falls below 50% of the calibrated light level for longer than 30 seconds

Daylight Calibration Details

It is recommended that the daylight sensor be calibrated at night. During the day, there is too much daylight to accurately calibrate.

At night (full dark), use the 'Calibrate All' feature and adjust slider bars to 100% to turn lighting full ON. Once all fixtures are adjusted send the 'Calibrate' command.

Factory Reset Instructions

CAUTION: The factory reset will set the device back to factory settings (out-of-the-box behavior) removing pairing and programmed settings.

Outdoor Low Mount Integrated Sensor (SWPD4) Outdoor High Mount Integrated Sensor (SWPD5)	Outdoor Low Mount Integrated Sensor BLE (WOA) Outdoor High Mount Integrated Sensor BLE (WOE)
• Cycle the power (switch **OFF 4 seconds** and then **ON 4 seconds**) the device's circuit **six times**.	• Cycle the power (switch **OFF 30 seconds** and then **ON 5 seconds**) the device's circuit **six times**.

This removes pairing for ALL devices of this type on the affected circuit. After a short period of time, the device should exhibit out-of-the-box behavior and may be paired as a new device.[33]

[31] Devices with older firmware (prior to 01.08.17.00 for non-BLE models or 01.01.05.00 for BLE models) may only require a single power cycle to place in pairing mode (30 seconds OFF, and then turn back ON).

[32] Devices with older firmware (prior to 01.08.17.00 for non-BLE models or 01.01.05.00 for BLE models) do not support this method. Use the power cycle method to invoke pairing mode.

[33] The device may flash the light to indicate the reset was successful. If the light was ON prior to the reset, the light will flash twice then remain ON. If OFF prior to reset, the flash behavior may not be observed, but lighting will turn ON.

Outdoor Sensor Extender/Multiplier Reference Sheet

Outdoor Sensor Extender/Multiplier

Features

- Integrated photocell for closed loop daylight switching
- Integrated Passive Infrared (PIR) motion sensor for occupancy sensing
- IEEE 802.15.4, (router and end point)

Typical Applications

- Outdoor, parking areas, and pathways

Models:

WaveLinx Remote Wireless Extender:

- **RSWPD4-WE:** (low mount only)
  - **-U**: 120VAC-277VAC
  - **-9**: 347VAC
  - **-8**: 480VAC

WaveLinx Control Multiplier:

- **RSWPD4-CM:** Low mount: 7-15ft (2.1-4.5m)
- **RSWPD5-CM:** High mount: 15-40ft (4.5-12.2m)
  - **-1**: 120VAC (16A, 1800W)
  - **-3**: 240VAC (8A, 1800W)
  - **-4**: 277VAC (8A, 2100W)

Mobile App Details:

- Default Device Name:
  - Outdoor Low Mount Integrated Sensor (RSWPD4 models)
  - Outdoor High Mount Integrated Sensor (RSWPD5 models)
- Unassigned Device Category:
  - RSWPD4: Lowbay Sensor
  - RSWPD5: Highbay Sensor

Icon Displayed in Mobile App:

The WaveLinx Outdoor Sensor Extender/Multiplier can be used to extend WaveLinx Wireless signal outdoors or to add WaveLinx control from motion and daylight switching to non-WaveLinx luminaires. The device mounts to a pole or wall mounted junction box, allowing it to be located wherever it is necessary.

Out-of-the-Box Operation

Used as a Control Multiplier: Once power is applied, the attached fixture(s) operates via the daylight sensor.

- ON at dusk / OFF at dawn via daylight sensor.
- The occupancy sensor will not switch lighting ON or OFF until the device is paired.
- Occupancy sensor is set for high sensitivity.
- LED flashes green (in sensor window) for 100ms once every 3 seconds when motion is detected.

Used as a Wireless Extender: Once power is applied, the LED flashes green (in sensor window) for 100ms once every 3 seconds if motion is detected.

Construction Area Default Operation	Assigned to an Area Default Operation
Control Multiplier: Once paired, the device operates as part of the Construction Area. • The daylight sensor remains disabled.	**Control Multiplier**: Once assigned to a created area, the device operates as part of the area. • **WAC (Gen 1)**: The daylight sensor is enabled and set for closed loop daylighting. • **WAC2 (Gen 2):** The daylight sensor is disabled.

• All occupancy sensors report to the area's occupancy set.
  • If occupied, the fixtures will turn ON (Scene 3).
  • The occupancy set default hold time is 20 minutes.
  • If the space remains unoccupied for 20 minutes, the fixture will turn OFF (Scene 0).
• Sensor LED flashes white for 100ms once every 3 seconds when motion is detected.	

Connected as a Wireless Extender: Once paired, even though it is not being utilized for control, the onboard occupancy sensor and daylight sensor will operate in the Construction Area until the device is configured.

Loss of Communications Operation

If the device has not communicated with the Wireless Area Controller for longer than approx.15 minutes, it will revert to its out-of-the-box behavior and display loss of communications LED operation until communications are re-established.[34, 35]

Operation upon Return of Power

Upon return of power, connected fixtures will resume the last known light level. If not able to communicate with the Wireless Area Controller for more than 15 minutes, loss of communications operation will begin.[34]

LED Operation (The LED is located beneath the sensor lens.)

LED conditions	Meaning
Flashes green for 100ms, once every 3 seconds	Device is unpaired (out-of-the-box) and is detecting motion.[35]
Flashes white for 100ms, once every 3 seconds	Device is paired to a Wireless Area Controller and is detecting motion
Flashes green 300ms, then white for 300ms, once every 3 seconds[35]	The device has lost communication with the Wireless Area Controller for longer than 15 minutes and is detecting motion.
Flashes white for 10ms every 250ms (fast blink)	The daylight sensor has exceeded 150% of the calibrated light level for 30 minutes.[36]
LED is OFF	Device is not detecting motion. If motion is occurring, ensure device is powered and that the LED has not been disabled through the mobile app.[37]
LED flashes magenta one time	The flashlight method has been used to identify the device.
LED flashes blue one time	The ISHH-01 remote has been used to identify the device.

[34] Devices with older firmware may take up to 1 hour to enter loss of communications operation.

[35] Devices with older firmware may flash green for 100ms, once every 3 seconds, 15 minutes after loss of communication.

[36] The LED will stop flashing if the light level drops but stays between 50% and 100% of the calibrated light level for 10 minutes OR if the light level falls below 50% of the calibrated light level for 30 seconds.

[37] The LED may be difficult to see in very bright areas.

Outdoor Sensor Extender/Multiplier continued

How to Place in Pairing Mode:

Method	Description
Power Cycle Method[38]	Using the circuit breaker, perform the following power cycle sequence: • Turn OFF power for 30 seconds, and then turn ON power for 5 seconds • Turn OFF power for 30 seconds, and then turn ON power and leave ON
ISHH-01 Remote Method[39]	Integrated Sensor Remote Control: Standing beneath the sensor, point the ISHH-01 remote at the sensor, and then press and release the power button. If the sensor that has not been paired, this will trigger pairing mode. The LED in the sensor window will briefly flash blue.

Successful Paired Device Behavior: (While WAC is still in or placed in pairing mode)

- LED in sensor window should blink WHITE with motion detection.
- If controlling lighting, the light should turn ON.

Supported Identification Methods:

- **ISHH-01** Integrated Sensor Remote Control: Standing beneath the sensor, point the ISHH-01 remote at the sensor, and then press and release the power button ⏻. For a sensor that has been paired with a Wireless Area Controller, this will trigger identification mode for that device. The LED in the sensor window will briefly flash blue.
- **Laser pointer or focused flashlight beam**: For fixtures mounted at reasonable mounting heights, use a laser pointer or bright, focused beam flashlight to trigger identification mode. Standing beneath the sensor, shine the light directly into the sensor lens for 3-4 seconds. The timing needs to be precise for the identification mode to respond. The LED in the sensor window will briefly flash magenta at the end of this 3-4 second period.
- **'Blink to Identify'**: (Control Multiplier only) Use the Mobile App's 'Blink to Identify' feature to identify the device. Select the ' ' icon in a device row to place the device in 'Blink to Identify' mode. The icon will appear to pulse and a load matching that type should respond.

'Blink to Identify' Behavior

When placed in 'Blink to Identify' mode:

- (**Control Multiplier only**) The connected fixture will turn ON for 1 second, turn OFF for 1 second and repeats this cycle for 15 seconds.

Configuring the Device as a Wireless Extender:

It is recommended to add the device to an area it is located near/in. Assign it to the chosen area but do not assign it to a zone.[40] Give the device a name that will identify it as an extender so that it can be easily recognized. No further configuration is necessary.

Configuring the Device as a Control Multiplier

The Control Multiplier switches the load it is connected to and does not dim the lighting. It is recommended that the Control Multiplier be assigned to a zone that is set with a non-dimmable zone type.

Configuring the Device Daylight Operation (closed loop) for a Control Multiplier

- Once assigned to an area and enabled (daylight operation is enabled automatically if paired with WAC Gen 1), the sensor will begin closed loop daylight operation to a reasonable light level. If a specific light level (target) is expected at the surface, then calibration is required.
- When the measured light level exceeds 150% of the calibrated light level for more than 30 minutes, the sensor will turn OFF connected lighting.
- Lighting will be turned back ON when one of the two conditions occurs:
  - The measured light level falls between 100% and 50% of the calibrated light level for more than 10 minutes
  - The measured light level falls below 50% of the calibrated light level for longer than 30 seconds

Daylight Calibration for a Control Multiplier

It is recommended that the daylight sensor be calibrated at night. During the day, there is too much daylight to accurately calibrate.

At night (full dark), use the 'Calibrate All' feature and adjust slider bars to 100% to turn lighting ON. Once all fixtures are adjusted send the 'Calibrate' command.

Factory Reset Instructions

CAUTION: The factory reset will set the device back to factory settings (out-of-the-box behavior) removing pairing and programmed settings.

- Cycle the power to (switch **OFF 4 seconds** and then **ON 4 seconds**) the device's circuit **six times**.

This removes pairing for ALL devices of this type on the affected circuit. After a short period of time, the device should exhibit out-of-the-box behavior and may be paired as a new device.[41]

[38] Devices with older firmware (prior to 01.08.17.00 for non-BLE models or 01.01.05.00 for BLE models) may only require a single power cycle to place in pairing mode (30 seconds OFF, and then turn back ON).

[39] Devices with older firmware (prior to 01.08.17.00 for non-BLE models or 01.01.05.00 for BLE models) do not support this method. Use the power cycle method to invoke pairing mode.

[40] Assigning it to an area but not a zone prevents the occupancy sensor from being assigned to the area's occupancy set. This prevents the extender from issuing occupancy signals to the area it is assigned to.

[41] The device may flash the light to indicate the reset was successful. If the light was ON prior to the reset, the light will flash twice then remain ON. If OFF prior to reset, the flash behavior may not be observed, but lighting will turn ON.

Wireless Tilemount Sensor Reference Sheet

Wireless Tilemount Sensor

Features

Tilemount Sensor:
- Integrated photocell for closed loop daylighting (when connected to a Control Module)
- Integrated Passive Infrared (PIR) motion sensor for occupancy or vacancy sensing
- IEEE 802.15.4, (router and end point)
- Bluetooth beacon, RTLS capabilities[42,43]

Control Module:
- Universal voltage input (120V-277V)
- Output control (120V-277V):
  - Electronic ballast/driver 3 amps
- 0-10V dimming output
  - Sinks up to 20mA (approximately 10 ballasts/drivers [2mA each])

Power Supply:
- Universal voltage input (120V-277V)
- Output 40W (2.67A @ 9-15VDC)
  - Supports up to 16 sensors (2 parallel strings of 8 sensors)

Typical Applications

- Education, office, and other interior spaces

Models:

- **WTA**: WaveLinx Tilemount Sensor Kit
- **WTE**: WaveLinx Tilemount Sensor

Mobile App Details:

- Default Device Name:
  - Integrated Sensor (non-BLE)
  - BLE Integrated Sensor
- Unassigned Device Category:
  - Integrated Sensor

Icon Displayed in Mobile App:

When connected to a WaveLinx Tilemount Sensor Control Module the WaveLinx Tilemount Sensor provides occupancy sensing, daylight dimming and wireless control for connected 0-10V luminaires that do not support the WaveLinx Integrated Sensors.

When connected to a WaveLinx Tilemount Sensor Power Supply the WaveLinx Tilemount Sensors provide additional occupancy sensing coverage where it may be necessary and/or Real Time Location Sensing (RTLS) points for use with Trellix Locate. [43]

Out-of-the-Box Operation

Connected to a Control Module	Connected to a Power Supply

Once power is applied:
• The attached fixture(s) operates via the motion sensor.
  • The occupancy sensor is set for high sensitivity.
  • If occupied, the connected fixture(s) will turn ON to 100%[44]
  • The fixture will dim to OFF (0%) after 20 minutes when the space is unoccupied.
• The daylight sensor is disabled.
• LED flashes green (in sensor window) for 100ms once every 3 seconds when motion is detected.
	Once power is applied:
	• LED flashes green (in sensor window) for 100ms once every 3 seconds when motion is detected.

Construction Area Default Operation

Connected to a Control Module or Connected to a Power Supply

Once paired, the device operates as part of the Construction Area.
• The daylight sensor remains disabled.
• All occupancy sensors report to the area's occupancy set.
  • If occupied, the fixtures will turn ON to 50% (Scene 3).
  • The occupancy set default hold time is 20 minutes.
  • If the space remains unoccupied for 20 minutes, the fixture will dim to 0% (Scene 0).
• Sensor LED flashes white for 100ms once every 3 seconds when motion is detected.

Assigned to an Area Operation

Connected to a Control Module	Connected to a Power Supply
Once assigned to a created area, the device operates as part of the area. • All occupancy sensors report to the area's occupancy set. • **WAC (Gen 1)**: The daylight sensor is enabled and set for closed loop daylighting. • **WAC2 (Gen 2)**: The daylight sensor is disabled.	Once assigned to a created area, the device operates as part of the area. • If the device is assigned to a zone that is controlled by an occupancy set, the sensor will work with other sensors to control the area lighting.
• If occupied, the fixtures will turn ON to 50% (Scene 3). • The occupancy set default hold time is 20 minutes. • If the space remains unoccupied for 20 minutes, the fixture will dim to 0% (Scene 0). • Sensor LED flashes white for 100ms once every 3 seconds when motion is detected.	

Loss of Communications Operation

If the device has not communicated with the Wireless Area Controller for longer than approx.15 minutes, it will revert to its out-of-the-box behavior and display loss of communications LED operation until communications are re-established.[44, 45]

Operation upon Return of Power

Upon return of power, if connected to a WaveLinx Control Module, the connected fixtures will resume the last known light level. If not able to communicate with the Wireless Area Controller for more than approx. 15 minutes, loss of communications operation will begin.[44]

[42] Older models may not have Bluetooth beacon capabilities.
[43] RTLS capability may require additional license or firmware purchase.
[44] Devices with older firmware may go to 75% light output when occupied in out-of-the-box operation and may take up to 1 hour to enter loss of communication operation.
[45] Devices with older firmware may flash green for 100ms, once every 3 seconds, 15 minutes after loss of communication.

Wireless Tilemount Sensor continued

LED Operation (The LED is located beneath the sensor lens.)

LED conditions	Meaning
Flashes green for 100ms, once every 3 seconds	Device is unpaired (out-of-the-box) and is detecting motion and is detecting motion.[46]
Flashes white for 100ms, once every 3 seconds	Device is paired to a Wireless Area Controller and is detecting motion
Flashes green 300ms, then white for 300ms, once every 3 seconds[46]	The device has lost communication with the Wireless Area Controller for longer than 15 minutes and is detecting motion.
Flashes white for 10ms every 250ms (fast blink)	The daylight sensor has exceeded 150% of the calibrated light level for 30 minutes.[47]
LED is OFF	Device is not detecting motion. If motion is occurring, ensure device is powered and that the LED has not been disabled through the mobile app.[48]
LED flashes magenta one time	The flashlight method has been used to identify the device.
LED flashes blue one time	The ISHH-01 remote has been used to identify the device.

How to Place in Pairing Mode:

Method	Description
Power Cycle Method[49]	Using the circuit breaker, perform the following power cycle sequence: • Turn OFF power for 30 seconds, and then turn ON power for 5 seconds • Turn OFF power for 30 seconds, and then turn ON power and leave ON
ISHH-01 Remote Method[50]	Integrated Sensor Remote Control: Standing beneath the sensor, point the ISHH-01 remote at the sensor, and then press and release the power button. If the sensor that has not been paired, this will trigger pairing mode. The LED in the sensor window will briefly flash blue.

The device will stay in pairing mode for 60 minutes and then time out automatically if a connection with Wireless Area Controller is not made. Only unpaired devices will enter pairing mode with these methods.

Successful Paired Device Behavior: (While WAC is still in or placed in pairing mode)

Connected to a Control Module	Connected to a Power Supply
• Connected fixtures will turn ON and dim to 10%. • LED in sensor window should blink WHITE with motion detection.	• LED in sensor window should blink WHITE with motion detection.

Supported Identification Methods:

- **ISHH-01** Integrated Sensor Remote Control: Standing beneath the sensor, point the ISHH-01 remote at the sensor, and then press and release the power button ⏻. For a sensor that has been paired with a Wireless Area Controller, this will trigger identification mode for that device. The LED in the sensor window will briefly flash blue.
- **Laser pointer or focused flashlight beam**: For sensors mounted at reasonable mounting heights, use a laser pointer or bright, focused beam flashlight to trigger identification mode. Standing beneath the sensor, shine the light directly into the sensor lens for 3-4 seconds. The timing needs to be precise for the identification mode to respond. The LED in the sensor window will briefly flash magenta at the end of this 3-4 second period.
- **'Blink to Identify'**: Use the Mobile App's 'Blink to Identify' feature to identify the device. Select the '' icon in a device row to place the device in 'Blink to Identify' mode. The icon will appear to pulse.

'Blink to Identify' Behavior

Connected to a Control Module	Connected to a Power Supply
• When placed in 'Blink to Identify' mode the connected fixture(s) will turn ON for 1 second, turn OFF for 1 second and repeats this cycle for 15 seconds.	• No visible response. Use ISHH-01 remote or Laser pointer/flashlight method for identification.

[46] Devices with older firmware may flash green for 100ms, once every 3 seconds, 15 minutes after loss of communication.

[47] The LED will stop flashing if the light level drops but stays between 50% and 100% of the calibrated light level for 10 minutes OR if the light level falls below 50% of the calibrated light level for 30 seconds.

[48] The LED may be difficult to see in very bright areas.

[49] Devices with older firmware (prior to 01.07.13.00 for non-BLE models or 2.04.19.00 for BLE models) may only require a single power cycle to place in pairing mode (30 seconds OFF, and then turn back ON).

[50] Devices with older firmware (prior to 01.07.13.00 for non-BLE models or 2.04.19.00 for BLE models) do not support this method. Use the power cycle method to invoke pairing mode.

Wireless Tilemount Sensor continued

Daylight Operation for Tilemount Sensors Connected to WaveLinx Control Modules (closed loop)

- Once assigned to an area and enabled (daylight operation is enabled automatically if paired with WAC Gen 1), the sensor will begin closed loop daylight dimming operation to a reasonable light level. If a specific light level (target) is expected at the surface, then calibration is required.
- When the measured light exceeds the calibrated level, the connected fixture(s) will dim lighting to reduce the light level.
- When the measured light level exceeds 150% of the calibrated light level for more than 30 minutes, the sensor will dim to OFF.
- Lighting will be turned back ON when one of the two conditions occurs:
  - The measured light level falls between 100% and 50% of the calibrated light level for more than 10 minutes
  - The measured light level falls below 50% of the calibrated light level for longer than 30 seconds

Daylight Calibration Details for Tilemount Sensors Connected to WaveLinx Control Modules

The sensor should be mounted where it can view the reflected light level from the surface including light contributed by the electric lighting it controls and the daylight that falls within the sensor's view.

It is best to calibrate indoor applications when there is a moderate to low level of daylight. If the daylight level is too high, it may be difficult to obtain the desired level of light at the task surface, even if the fixtures are completely off.

During calibration, use the 'Calibrate All' feature and adjust slider bars to change the light level to the desired light level for each controlled fixture. Once all fixtures are adjusted, use a light meter on the surface to ensure the reading is in the desired range and then send the 'Calibrate' command.

If the light level in the space is still too bright when electric lighting is fully dimmed, use available shading to adjust the amount of incoming daylight or postpone calibration until the amount of incoming daylight has decreased.

Special Consideration for Tilemount Sensors Connected to a Power Supply

If using Occupancy Sensor functionality:
- Create the necessary control zones in the area and assign the appropriate control devices.
- Identify the Tilemount Sensors and assign them to the correct zone.
- Ensure that the zone is assigned for control from the occupancy set (see page 125).

If using for RTLS functionality:[51]
- Create the necessary control zones in the area and assign the appropriate control devices.
- Identify the Tilemount Sensors and assign them to the area or, if desired, to a zone in the area.
- If not using the occupancy sensor functions, ensure that the occupancy sensor is 'disabled' to prevent the sensor from operating the area's lighting (see page 127).

Factory Reset Instructions

CAUTION: The factory reset will set the device back to factory settings (out-of-the-box behavior) removing pairing and programmed settings.

- Cycle the power to (switch **OFF 4 seconds** and then **ON 4 seconds**) the device's power circuit **six times**.

This removes pairing for ALL devices of this type on the affected circuit. After a short period of time, the device should exhibit out-of-the-box behavior and may be paired as a new device.[52]

[51] RTLS capability may require additional license or firmware purchase.

[52] The device may flash the light to indicate the reset was successful. If the light was ON prior to the reset, the light will flash twice then remain ON. If OFF prior to reset, the flash behavior may not be observed, but lighting will turn ON.

WaveLinx Outdoor Lighting Control Module

Outdoor Lighting Control Module (WOLC)

Features

- Integrated photocell for open loop daylight switching
- IEEE 802.15.4, (router and end point)

Typical Applications

- Outdoor, parking areas, and pathways

Models:

- **WOLC:** WaveLinx Outdoor Lighting Control Module

Available option on many Cooper Lighting luminaires.

Mobile App Details:

- Default Device Name:
  - Outdoor Control Module
- Unassigned Device Category:
  - Integrated Sensor

Icon Displayed in Mobile App:

The WaveLinx Outdoor Lighting Control Module (WOLC) offers control of outdoor luminaires from the WaveLinx system or to add basic open loop daylight switching capability to outdoor applications.

Out-of-the-Box Operation

- Once power is applied:
  - The attached fixture will turn ON to 100% and then re-evaluate the ON/OFF status based on the available light per the photosensor.
  - From then on, the fixture will turn ON at dusk / OFF at dawn via daylight sensor.

Construction Area Default Operation	Assigned to an Area Default Operation
Once paired, the device operates as part of the Construction Area.	Once assigned to a created area, the device operates as part of the area.

• The daylight sensor remains disabled. It must be assigned to an area and be configured to operate.
• It will respond to the occupancy set from any occupancy sensors in the area.
  • If occupied, the fixtures will turn ON to 50% (Scene 3).
  • The occupancy set default hold time is 20 minutes.
  • If the space remains unoccupied for 20 minutes, the fixture will dim to 0% (Scene 0).
• It will respond to any wallstations added to the area per the default wallstation programming.	

Loss of Communications Operation

If the device has not communicated with the Wireless Area Controller for longer than approx.15 minutes, it will revert to its out-of-the-box behavior until communications are re-established.[53]

Operation upon Return of Power

Upon return of power, the fixture will turn ON to 100% until communications are re-established with the Wireless Area Controller after which the lighting state is re-evaluated. If not able to communicate with the Wireless Area Controller for longer than approx. 15 minutes, the device will begin loss of communications operation.[53]

LED Operation

Not applicable. The WaveLinx Outdoor Lighting Control Module has no onboard LED indicator.

How to Place in Pairing Mode:

Method	Description
Automatic	Once powered, an unpaired Outdoor Lighting Control Module will automatically be in pairing mode. It will reinitiate a pairing search command every 20 minutes until a Wireless Area Controller is found. A power cycle (switch OFF and then ON) will cause the search to start again approximately 20 seconds after the power up.

Successful Paired Device Behavior: (While WAC is still in or placed in pairing mode)

- When initially paired, the fixture will dim briefly and then turn full ON and remain ON (this can make it difficult to review paired devices. See next recommendation).
- To verify pairing, make sure to EXIT the Wireless Area Controller pairing mode. Then, place the Wireless Area Controller back in pairing mode. All Outdoor Lighting Control Modules paired with the Wireless Area Controller will dim to 10%.

Supported Identification Methods:

- **'Blink to Identify'**: Use the Mobile App's 'Blink to Identify' feature to identify the device. Select the ' ' icon in a device row to place the device in 'Blink to Identify' mode. The icon will appear to pulse and a load matching that type should respond.

'Blink to Identify' Behavior

When placed in 'Blink to Identify' mode, the fixture will turn ON for 1 second, turn OFF for 1 second and repeats this cycle for 15 seconds.

[53] Devices with older firmware may take up to 1 hour to enter loss of communications operation.

Outdoor Lighting Control Module continued

Daylight Operation (open loop)

Once the Outdoor Lighting Control Module open loop daylight set is created and enabled, lighting will turn ON at dusk and turn OFF at dawn.

If the controlled area contains more than one Outdoor Lighting Control Module, one module may be assigned to control daylighting for the connected fixture or may be assigned to control daylighting for a group of fixtures if it is desired to have them respond to daylighting in the exact same manner.

If fixtures in the zones that are assigned to the open loop daylight set contain Integrated Sensors, closed loop daylighting will automatically be disabled for these sensors.

Open Loop Daylight Set Configuration

- Create the open loop daylight set.
- Assign the zones that should be controlled by the daylight set.[54]
- Assign the sensor to the daylight set.

Daylight Calibration Details

Once the open loop daylight set is configured, the WaveLinx Outdoor Lighting Control Module does not require calibration. The WaveLinx Outdoor Lighting Control Module is hardcoded for ON at dusk / OFF at dawn operation based on optimal performance factors for outdoor application. These settings cannot be modified. Lighting will turn OFF if the light level has exceeded 65 lux for a period of 180 seconds (3 minutes). Lighting will turn ON if the light level falls below 16 lux for a period of 30 seconds.

Factory Reset Instructions

CAUTION: The factory reset will set the device back to factory settings (out-of-the-box behavior) removing pairing and programmed settings.

- **Preferred method:** Cycle the power to (switch **OFF 6 seconds** and then **ON 6 seconds**) the device's circuit **six times**.[55]
- **Alternate method:** Cycle the power to (switch **OFF 4 seconds** and then **ON 4 seconds**) the device's circuit **twenty times**.

This removes pairing for ALL devices of this type on the affected circuit. After a short period of time, the device should exhibit out-of-the-box behavior and may be paired as a new device.

[54] If fixtures in the zones that are assigned to open loop daylight sets contain integrated or Tilemount Sensors, closed loop daylighting will automatically be disabled for these sensors.

[55] Outdoor Lighting Control Modules prior to firmware version 0x2050560 (v2050560) will not respond to the 6-power cycle method. Use the alternate 20-cycle method for these devices.

WaveLinx Wireless Fixture Reference Sheet

Wireless Fixture

Features

- IEEE 802.15.4, (router and end point)

Typical Applications

- Interior spaces where individual fixture sensor controls are not needed

Models:

- **WN:** WaveLinx Wireless Fixture, No Sensor

Available option on many Cooper Lighting luminaires.

Mobile App Details:

- Default Device Name:
  - Dimmable Light
- Unassigned Device Category:
  - Dimmable

Icon Displayed in Mobile App:

The WaveLinx Wireless Fixture is preconfigured with a wireless radio without an Integrated Sensor providing wireless control within the light fixture to reduce wiring, design, and installation time. The fixture can be easily configured to be controlled from WaveLinx devices using the WaveLinx Mobile App.

Out-of-the-Box Operation

- Once power is applied, the attached fixture turns ON and remains ON at a 100% light level.[56]

Construction Area Default Operation	Assigned to an Area Default Operation
Once paired, the device operates as part of the Construction Area.	Once assigned to a created area, the device operates as part of the area.

• It will respond to the occupancy set from any occupancy sensors in the area.
  • If occupied, the fixtures will turn ON to 50% (Scene 3).
  • The occupancy set default hold time is 20 minutes.
  • If the space remains unoccupied for 20 minutes, the fixture will dim to 0% (Scene 0).
• It will respond to any wallstations in the area per the default wallstation programming.	

Loss of Communications Operation

If the device has not communicated with the Wireless Area Controller for longer than approx.15 minutes, it will revert to its out-of-the-box behavior until communications are re-established.[56]

Operation upon Return of Power

Upon return of power, the fixture will resume its last known light level. If not able to communicate with the Wireless Area Controller for more than approx. 15 minutes, loss of communications operation will begin.[56]

LED Operation

Not applicable. The WaveLinx Wireless Fixture has no onboard LED indicator.

How to Place in Pairing Mode:

Method	Description
Power Cycle Method	Cycle the power once (switch OFF and then ON) using the circuit breakers. Device will stay in pairing mode for 60 minutes and then time out automatically if a connection with Wireless Area Controller is not made. Only unpaired devices will enter pairing mode on the power cycle.

Successful Paired Device Behavior: (While WAC is still in or placed in pairing mode)

- Fixture dims to 10%.

Supported Identification Methods:

- **'Blink to Identify'**: Use the Mobile App's 'Blink to Identify' feature to identify the device. Select the '' icon in a device row to place the device in 'Blink to Identify' mode. The icon will appear to pulse and a load matching that type should respond.

'Blink to Identify' Behavior

When placed in 'Blink to Identify' mode, the fixture will turn ON for 1 second, turn OFF for 1 second and repeats this cycle for 15 seconds.

Factory Reset Instructions

CAUTION: The factory reset will set the device back to factory settings (out-of-the-box behavior) removing pairing and programmed settings.

- Cycle the power to (switch **OFF 4 seconds** and then **ON 4 seconds**) the device's circuit **six times**.

This removes pairing for ALL devices of this type on the affected circuit. After a short period of time, the device should exhibit out-of-the-box behavior and may be paired as a new device.[57]

[56] Devices with older firmware may go to 75% light output in out-of-the-box operation and may take up to 1 hour to enter loss of communication operation.

[57] The device may flash the light to indicate the reset was successful. If the light was ON prior to the reset, the light will flash twice then remain ON. If OFF prior to reset, the flash behavior may not be observed, but lighting will turn ON.

WaveLinx Universal Voltage Dimming Switchpack

WaveLinx Universal Voltage Dimming Switchpack

General Features

- Universal voltage
  - **WSP-MV-010:** (120V-277V)
  - **WSP-UV-010:** (120V-347V)
- Output control
  - Electronic ballast/driver 16A
  - General purpose (receptacle) 20A
  - Motor loads up to 1.5 HP (120VAC)
- Class 2, 0-10V dimming output
  - Sinks up to 120mA *(approximately 60 ballasts/drivers [2mA each])*
- IEEE 802.15.4, (router and end point)

Special Features

- White Tuning Control for Cooper Lighting Solutions VividTune fixtures

Typical Applications

- Office, education, and other indoor applications
- White Tuning Control

Models:

- **WSP-MV-010:** Wireless Relay Switchpack with 0-10V
- **WSP-UV-010:** Wireless Universal Voltage Dimming Switchpack

Mobile App Details:

- Default Device Name:
  - Relay Switchpack
- Unassigned Device Category:
  - Relay Switch Pack

Icon Displayed in Mobile App:

Use the WaveLinx Universal Voltage Dimming Switchpack to wirelessly control a zone of switched loads, 0-10V dimmable lighting loads, or for 0-10V control of tunable white lighting.

Out-of-the-Box Operation

Connected for Lighting Control	Connected for White Tuning Control
Once power is applied: • Connected loads will turn ON and 0-10V dimmable loads will go to 100%.[58] • Onboard commissioning button can be pressed (less than 4 seconds) to turn load OFF and ON. • White LED on switchpack indicates load state.	Once power is applied: • If controlling white tuning, the color temperature of the attached load will default to the cool white side of the color temperature spectrum. (Actual color temperature is dependent on the color temperature range of attached load).

Construction Area Default Operation

Connected for Lighting Control	Connected for White Tuning Control
Once paired, the device will respond per the default operation of any occupancy sensors or wallstations that are in the Construction area.	White tuning operation may have unexpected operation until configured for White Tuning in the Mobile App due to operation of occupancy sensors and wallstations in the Construction area.

Assigned to an Area Default Operation

Connected for Lighting Control	Connected for White Tuning Control

Once assigned to a created area, the device operates as part of the area.
• It will respond to the occupancy set from any occupancy sensors in the area.
  • If occupied, the fixtures will turn ON to 50% (Scene 3).
  • The occupancy set default hold time is 20 minutes.
  • If the space remains unoccupied for 20 minutes, the fixture will dim to 0% (Scene 0).
• It will respond to any wallstations added to the area per the default wallstation programming.
	Once the device is assigned to a created area, configured for White Tuning, and assigned to a White Tuning Zone:
	The White Tuning Response defaults to 3500K for all programmed scenes.

Loss of Communications Operation

If the device has not communicated with the Wireless Area Controller for longer than approx.15 minutes, it will revert to its out-of-the-box behavior until communications are re-established.[58]

Operation upon Return of Power

Upon return of power, the device will resume its last known light level. If not able to communicate with the Wireless Area Controller for more than approx. 15 minutes, loss of communications operation will begin.[58]

LED Operation

LED conditions	Meaning
ON (white)	The device relay is closed
OFF	The device relay is opened
Flashes ON and OFF approximately 1 time per second for 10 seconds	Onboard commissioning button has been pressed for longer than 4 seconds, placing the device in pairing mode.

[58] Devices with older firmware may go to 75% light output in out-of-the-box operation and may take up to 1 hour to enter loss of communication operation.

WaveLinx Universal Voltage Dimming Switchpack continued

How to Place in Pairing Mode:

Method	Description
Power Cycle Method[59]	Using the circuit breaker, perform the following power cycle sequence: • Turn OFF power for 30 seconds, and then turn ON power for 5 seconds • Turn OFF power for 30 seconds, and then turn ON power and leave ON
Onboard Commissioning Button	Press the onboard commissioning button for more than 4 seconds. The onboard LED will blink for 10 seconds to indicate the device has entered pairing mode.

The device will stay in pairing mode for 60 minutes and then time out automatically if a connection with Wireless Area Controller is not made. Only unpaired devices will enter pairing mode with these methods.

Successful Paired Device Behavior: (While WAC is still in or placed in pairing mode)

Connected for Lighting Control	Connected for White Tuning Control
Connected loads will turn ON and 0-10V dimmable loads will go to 10%.	Connected tunable white fixtures will assume a warm white color temperature. (Actual color temperature is dependent on the color temperature range of attached load).

Supported Identification Methods:

- **'Blink to Identify'**: Use the Mobile App's 'Blink to Identify' feature to identify the device. Select the ' ' icon in a device row to place the device in 'Blink to Identify' mode. The icon will appear to pulse and a load matching that type should respond.

'Blink to Identify' Behavior

Connected for Lighting Control	Connected for White Tuning Control
• When placed in 'Blink to Identify' mode, the connected fixture(s) will turn ON for 1 second, turn OFF for 1 second and repeats this cycle for 15 seconds.	• When placed in 'Blink to Identify' mode, the connected tunable white fixture(s) will cycle between cool and warm color temperatures for 15 seconds.

White Tuning Configuration Details

For proper white tuning control, the device must be configured for white tuning control and assigned to a white tuning zone.

- Create a new zone in the area with the White Tuning zone type.
- Identify which Universal Voltage Dimming Switchpack device is connected to the tunable white control wiring.
- Assign the device to the area (do not assign to a zone).
- Open the device and change the type to 'White Tuning', entering the fixture's supported color temperature range.
- Assign the device to the area's White Tuning zone.

Factory Reset Instructions

CAUTION: The factory reset will set the device back to factory settings (out-of-the-box behavior) removing pairing and programmed settings.

- Cycle the power to (switch **OFF 4 seconds** and then **ON 4 seconds**) the device's circuit **six times**.

This removes pairing for ALL devices of this type on the affected circuit. After a short period of time, the device should exhibit out-of-the-box behavior and may be paired as a new device.[60]

[59] Devices with older firmware (prior to 01.08.12.00 for WSP-MV models or 01.01.05.00 for WSP-UV models) may only require a single power cycle to place in pairing mode (30 seconds OFF, and then turn back ON).

[60] The device may flash the light to indicate the reset was successful. If the light was ON prior to the reset, the light will flash twice then remain ON. If OFF prior to reset, the flash behavior may not be observed, but lighting will turn ON.

WaveLinx Universal Voltage Dimming Switchpack with Emergency

WaveLinx Universal Voltage Dimming Switchpack with Emergency

General Features

- Universal voltage input (120V-347V)
- Output control (120V-347V):
  - Electronic ballast/driver 16A
  - General purpose (receptacle) 20A
  - Motor loads up to 1.5 HP (120VAC)
- Class 2, 0-10V dimming output
  - Sinks up to 120mA *(approximately 60 ballasts/drivers [2mA each])*
- IEEE 802.15.4, (router and end point)

Special Features

- UL924 approved control of Emergency Lighting

Typical Applications

- Emergency fixture control
- Office, education, and other indoor applications

Models:

- **WSP-UV-010-EM**: Wireless Universal Voltage Dimming Switchpack with Emergency

Mobile App Details:

- Default Device Name:
  - Relay Switchpack Emergency
- Unassigned Device Category:
  - Relay Switch Pack

Icon Displayed in Mobile App:

Use the WaveLinx Universal Voltage Dimming Switchpack with Emergency to wirelessly control Emergency lighting, including switched or 0-10V emergency lighting loads.

Out-of-the-Box Operation

Once power is applied:

- Connected loads will turn ON and 0-10V dimmable loads will go to 100%.[61]
- Onboard commissioning button can be pressed (less than 4 seconds) to turn load OFF and ON.
- White LED on switchpack indicates load state.

Construction Area Default Operation	Assigned to an Area Default Operation
Once paired, the device operates as part of the Construction Area.	Once assigned to a created area, the device operates as part of the area.

• It will respond to the occupancy set from any occupancy sensors in the area.
  • If occupied, the fixtures will turn ON to 50% (Scene 3).
  • The occupancy set default hold time is 20 minutes.
  • If the space remains unoccupied for 20 minutes, the fixture will dim to 0% (Scene 0).
• It will respond to any wallstations in the area per the default wallstation programming.	

Loss of Communications Operation

If the device has not communicated with the Wireless Area Controller for longer than approx.15 minutes, it will revert to its out-of-the-box behavior until communications are re-established.

Emergency Mode Operation & Operation upon Return of Power

To ensure proper operation for Emergency Mode:

- The WSP-UV-010-EM **MUST** be wired to an emergency circuit
- The paired Wireless Area Controller **MUST** be powered from a normal circuit. Do not place the Wireless Area Controller on a UPS backup or other emergency backup power supply.

If the WSP-UV-010-EM loses power for more than 30 milliseconds, the device will turn ON to 100% output. The switchpack will ignore all WaveLinx system messages for 20 seconds and then will try to communicate with the Wireless Area Controller. The switchpack will remain in Emergency Mode until communications are re-established. It will then go to the last known light level and resume normal operation.

LED Operation

LED conditions	Meaning
ON (white)	The device relay is closed
OFF	The device relay is opened
Flashes ON and OFF approximately 1 time per second for 10 seconds	Onboard commissioning button has been pressed for longer than 4 seconds, placing the device in pairing mode.

[61] Devices with older firmware may go to 75% light output in out-of-the-box operation and may take up to 1 hour to enter loss of communication operation.

WaveLinx Universal Voltage Dimming Switchpack with Emergency continued

How to Place in Pairing Mode:

Method	Description
Power Cycle Method[62]	Using the circuit breaker, perform the following power cycle sequence: • Turn OFF power for 30 seconds, and then turn ON power for 5 seconds • Turn OFF power for 30 seconds, and then turn ON power and leave ON
Onboard Commissioning Button	Press the onboard commissioning button for more than 4 seconds. The onboard LED will blink for 10 seconds to indicate the device has entered pairing mode.

The device will stay in pairing mode for 60 minutes and then time out automatically if a connection with Wireless Area Controller is not made. Only unpaired devices will enter pairing mode with these methods.

Successful Paired Device Behavior: (While WAC is still in or placed in pairing mode)

- Connected loads will turn ON and 0-10V dimmable loads will go to 10%.

Supported Identification Methods:

- **'Blink to Identify'**: Use the Mobile App's 'Blink to Identify' feature to identify the device. Select the ' ' icon in a device row to place the device in 'Blink to Identify' mode. The icon will appear to pulse and a load matching that type should respond.

'Blink to Identify' Behavior

- When placed in 'Blink to Identify' mode, the connected fixture(s) will turn ON for 1 second, turn OFF for 1 second and repeats this cycle for 15 seconds.

Factory Reset Instructions

CAUTION: The factory reset will set the device back to factory settings (out-of-the-box behavior) removing pairing and programmed settings.

- Cycle the power to (switch **OFF 4 seconds** and then **ON 4 seconds**) the device's circuit **six times**.

This removes pairing for ALL devices of this type on the affected circuit. After a short period of time, the device should exhibit out-of-the-box behavior and may be paired as a new device.[63]

[62] Devices with older firmware (prior to 01.01.05.00 for WSP-UV models) may only require a single power cycle to place in pairing mode (30 seconds OFF, and then turn back ON).

[63] The device may flash the light to indicate the reset was successful. If the light was ON prior to the reset, the light will flash twice then remain ON. If OFF prior to reset, the flash behavior may not be observed, but lighting will turn ON.

WaveLinx Universal Voltage Dimming Switchpack with Dry Contact Input

Universal Voltage Dimming Switchpack with Dry Contact Input

General Features

- Universal voltage input (120V-347V)
- Output control (120V-347V):
  - Electronic ballast/driver 16A
  - General purpose (receptacle) 20A
- Class 2, 0-10V dimming output
  - Sinks up to 30mA *(approximately 15 ballasts/drivers [2mA each])*
- IEEE 802.15.4, (router and end point)

Special Features

- One input terminal can connect to an external maintained contact closure (dry) or one Greengate occupancy sensor (max. 40mA).

Typical Applications

- Office, education, or other indoor applications
- Where interface to Greengate occupancy sensors or external input is required

Models:

- **WSP-CA-010:** Wireless Universal Voltage Dimming Switchpack with Dry Contact Input

Mobile App Details:

- Default Device Name:
  - Relay Switchpack CCI
- Unassigned Device Category:
  - 347V Relay Switch Pack

Icon Displayed in Mobile App:

Dimmable Output

Input (dependent on configuration)

Not Used

Contact Closure

Occupancy Sensor

Use the WaveLinx Universal Voltage Dimming Switchpack with Dry Contact Input to wirelessly control a zone of switched loads or 0-10V dimmable lighting loads. It can also be used to connect an external maintained dry-contact closure or a Greengate low-voltage occupancy sensor (one per switchpack) to the WaveLinx system.

Out-of-the-Box Operation

Connected for Lighting Control	Connected Contact Input
Once power is applied: • Connected loads will turn ON and 0-10V dimmable loads will go to 100%[64]	If the optional contact closure is connected, the contact closure will not function until configured through the WaveLinx Mobile App.

Construction Area Default Operation

Connected for Lighting Control	Connected Contact Input
Once paired, the device will respond per the default operation of any occupancy sensors or wallstations that are in the Construction area.	If the optional contact closure is connected, the contact closure will not function until configured through the WaveLinx Mobile App.

Assigned to an Area Default Operation

Connected for Lighting Control	Connected Contact Input

Once assigned to a created area, the device operates as part of the area.
• It will respond to the occupancy set from any occupancy sensors in the area.
  • If occupied, the fixtures will turn ON to 50% (Scene 3).
  • The occupancy set default hold time is 20 minutes.
  • If the space remains unoccupied for 20 minutes, the fixtures will dim to 0% (Scene 0).
• It will respond to any wallstations added to the area per the default wallstation programming.
	If the optional contact closure is connected, the contact closure will not function until configured through the WaveLinx Mobile App.

Loss of Communications Operation

If the device has not communicated with the Wireless Area Controller for longer than approx.15 minutes, it will revert to its out-of-the-box behavior until communications are re-established.[64]

Operation upon Return of Power

Upon return of power, the connected lighting will turn ON to 100% until communications are re-established with the Wireless Area Controller after which the lighting state is re-evaluated. If not able to communicate with the Wireless Area Controller for longer than approx. 15 minutes, the device will begin loss of communications operation.[64]

LED Operation

Not applicable. The WSP-CA-010 Wireless Universal Dimming Switchpack has no onboard LED indicator.

How to Place in Pairing Mode:

Method	Description
Automatic	Once powered, an unpaired Universal Dimming Switchpack will automatically be in pairing mode. It will reinitiate a pairing search command every 20 minutes until a Wireless Area Controller is found. A power cycle (switch OFF and then ON) will cause the search to start again approximately 20 seconds after the power up.

[64] Devices with older firmware may go to 75% light output in out-of-the-box operation and may take up to 1 hour to enter loss of communication operation.

Universal Dimming Switchpack with Dry Contact Input continued

Successful Paired Device Behavior: (While WAC is still in or placed in pairing mode)

Connected for Lighting Control	Connected Contact Input
• When initially paired, the connected fixture(s) will dim briefly and then turn full ON and remain ON (this can make it difficult to review paired devices. See next recommendation). • To verify pairing, make sure to EXIT the Wireless Area Controller pairing mode. Then, place the Wireless Area Controller back in pairing mode. All fixtures connected to Universal Dimming Switchpacks that are paired with the Wireless Area Controller will dim to 10%.	If used only for a contact input device, there is no visual feedback that pairing is successful.

Supported Identification Methods:

Connected for Lighting Control	Connected Contact Input Greengate Occupancy Sensor	Connected Contact Input Maintained Closure
• **'Blink to Identify'**: Use the Mobile App's 'Blink to Identify' feature to identify the device. Select the ' ' icon in the device row or from the device's dimmable screen to place the device in 'Blink to Identify' mode. The icon will appear to pulse and a load matching that type should respond.	**Requires configuration as an 'Occupancy Sensor' through the mobile app:** • Once configured, in the device's 'occupancy' screen, use the 'Blink to Identify' option by tapping the ' ' icon. The 'Blink to Identify' mode cannot be manually cancelled and will time out on its own after a 1-minute period.	**Requires configuration as a 'Contact Closure Input' through the mobile app:** • If the device is still in the construction area, manually open or close the contact to reverse identify the device on the Mobile App. • If the device is assigned to an area, navigate to the device's 'Maintained CCI' screen. Manually open or close the contact while watching the 'Current Status' field to see if it reflects the activity. If it does, the device has been identified. Repeat as needed.

'Blink to Identify' Behavior

Connected for Lighting Control	Connected Contact Input Greengate Occupancy Sensor	Connected Contact Input Maintained Closure
• When placed in 'Blink to Identify' mode, the connected fixture(s) will turn ON for 1 second, turn OFF for 1 second and repeats this cycle for 15 seconds.	• The Universal Dimming Switchpack will cycle power to the Greengate sensor, causing the sensor to flash its LEDs and to issue an occupied command.[65] The 'Blink to Identify' mode cannot be manually cancelled and will time out on its own after a 1-minute period.	• Not applicable for contact closure input devices.

Contact Input Configuration Details

For operation of from the onboard contact input, the device must be configured for contact input control. The output of the device can be used to control a dimmable load while the input is used for contact closure devices.

- If connected to a lighting load, identify, and assign the Universal Dimming Switchpack to the zone and area it should operate with. (Skip this if the device is not connected to a lighting load and is only being used for a contact input connection).
- Open the device and in the 'Optional Input' screen, select the device behavior.
- Identify the device by using the supported identification methods described in this section based on the type of input being used.
- If not already in the area, assign the device to the area.
- Occupancy sensors will automatically be assigned to the default occupancy set of the area.
- Contact inputs will need to be defined with the desired behavior for the open and closed commands.

Factory Reset Instructions

CAUTION: The factory reset will set the device back to factory settings (out-of-the-box behavior) removing pairing and programmed settings.

- **Preferred method:** Cycle the power to (switch **OFF 6 seconds** and then **ON 6 seconds**) the device's circuit **six times**.[66]
- **Alternate method:** Cycle the power to (switch **OFF 4 seconds** and then **ON 4 seconds**) the device's circuit **twenty times**.

This removes pairing for ALL devices of this type on the affected circuit. After a short period of time, the device should exhibit out-of-the-box behavior and may be paired as a new device.

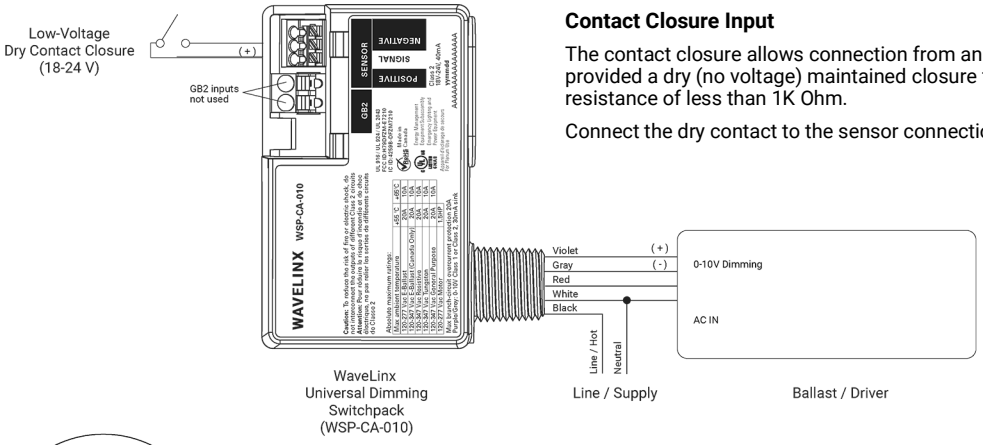
[65] Greengate sensors not approved for use with WaveLinx or not directly connected for power from the WaveLinx Universal Voltage Dimming Switchpack may not exhibit the described behavior.

[66] Universal Voltage Dimming Switchpacks prior to firmware version 0x2180560 (v2180560) will not respond to the 6-power cycle method. Use the alternate 20-cycle method for these devices.

Universal Dimming Switchpack with Dry Contact Input continued

Contact Closure Details

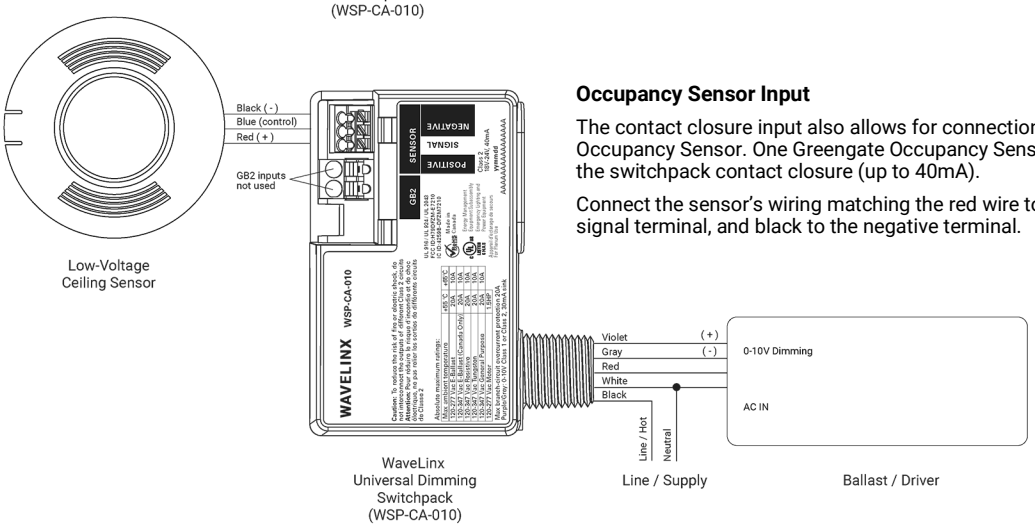
The WSP-CA-010 model WaveLinx Universal Voltage Dimming Switchpacks supports connection to an external contact closure or a Greengate Occupancy Sensor.



Contact Closure Input

The contact closure allows connection from an external system or device that can provided a dry (no voltage) maintained closure from a contact with a contact resistance of less than 1K Ohm.

Connect the dry contact to the sensor connection's positive and signal terminals.



Occupancy Sensor Input

The contact closure input also allows for connection to a supported Greengate Occupancy Sensor. One Greengate Occupancy Sensor may be powered directly from the switchpack contact closure (up to 40mA).

Connect the sensor's wiring matching the red wire to the positive terminal, blue to the signal terminal, and black to the negative terminal.

Greengate Sensor Onboard Selection Switch Settings

Greengate Occupancy Sensors have onboard configuration switches for configuration in a non-WaveLinx application. **For best operation with the WaveLinx system, set the configuration switches for the settings shown.** Refer to the installation instructions for the sensor being used to identify the switch locations. If sensors have additional option switches, leave them at the defaults described in the sensor installation instructions

Setting	Default	Recommended Setting
Time Delay	Auto	**5 minutes**
Activation Mode[67]	Auto	**Auto**
Override Mode	Disabled	**Disabled**
Daylight Options	Disabled	**Disabled**

[67] Not all supported Greengate sensor types will have this option.

WaveLinx Low-Voltage Power Module

WaveLinx Low-Voltage Power Module

Features

- 12 Class 2 low-voltage DC circuit connection ports
- Supports up to 36 Low-Voltage Fixtures
- Two low-voltage ports can optionally wire to operate from an emergency circuit for UL924 operation.
- Communicates to the Wireless Area Controller via Ethernet connection
  - Up to 5 Low-Voltage Power Modules may be paired with 1 Wireless Area Controller.[68]

Power:

- Input Voltage 120VAC-277VAC, 50/60Hz
- Output: 12 Class 2 Outputs (90W MAX)
- Hot swapping/plugging not supported. Power down before connecting Low-Voltage Fixtures.

Typical Applications

- Education, office, and other interior spaces

Models:

LVPM-12-100-64-2E: WaveLinx 1200W Low-Voltage Power Module

Mobile App Details:

- Power Module (Only visible in the Devices menu)

Icon Displayed in Mobile App:

(only visible in the Devices menu)

The WaveLinx Low-Voltage Power Module communicates between connected Low-Voltage Fixtures and the WaveLinx Wireless Area Controller, allowing WaveLinx control of low-voltage lighting loads. The Low-Voltage Power Module converts line voltage alternating current to Class 2 low-voltage DC circuits. Twelve onboard low-voltage connection ports allow for easy, daisy-chain connection to up to thirty-six Low-Voltage Fixtures. If needed, two low-voltage output ports can be wired for operation from an emergency circuit for UL924. The WaveLinx Low-Voltage Power Module communicates via Ethernet to the Wireless Area Controller.

Out-of-the-Box Operation

- Not applicable for this device. Refer to the Low-Voltage Load Reference Sheets for load operation details.
- Once power is applied, status LED should flash orange, the output channel LEDs should illuminate green,[69] the alert LED and diagnostic LEDs should remain OFF, and the LAN LED may flash green if connected to a DHCP server.

Loss of Communications Operation

If the Low-Voltage Power Module is not communicating with the Wireless Area Controller, connected loads will remain at their current light level for approx..15 minutes and then revert to out-of-the-box behavior until communication is reestablished.[70] Refer to the Low-Voltage Load Reference Sheet for expected behavior.

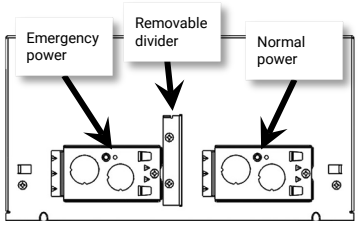
Emergency Mode Operation

The WaveLinx Low-Voltage Power Module comes with a normal power and an emergency power connection. If emergency power is not connected, normal power may be wired to both the normal and emergency connections by removing the separator between the two wiring compartments.

When wired to an emergency power source and normal power is lost, output channels 1 and 2 will remain powered by the connected Emergency circuit.

Lighting connected to these two channels will be forced FULL ON, until normal power is restored.

This UL924 approved solution allows Low-Voltage lighting to provide minimum illumination levels for egress and safety as required by NFPA 101 Life Safety Code or other local building codes and standards.



Operation upon Return of Power

Upon return of power, the connected fixture(s) will return to the last known light level until the Low-Voltage Power Module reboots and communications are re-established with the Wireless Area Controller. If not able to communicate with the Wireless Area Controller for more than approx. 15 minutes, loss of communications operation will begin.[70]

Alert Mode Operation

If an external dry contact closure is connected to the ALERT terminal and the contact closes, the Low-Voltage Power Module will enter Alert Mode. The Alert is locally processed and is not reported to the Wireless Area Controller.

In alert mode:

- All Low-Voltage Fixtures connected to this Low-Voltage Power Module will turn FULL ON, bypassing control.
- The Alert status LED will illuminate RED.

Once the contact closure opens, the Low-Voltage Power Module resumes normal operation, and all lighting will revert to the commanded lighting level.

Pairing Information:

Before pairing the Low-Voltage Power Module to the Wireless Area Controller, the Low-Voltage Power Module must be configured with an IP address in the same subnet. See the initial configuration steps beginning on page 49 for these details. Once on the same subnet, when the Wireless Area Controller is placed in pairing mode, the Low-Voltage Power Module should pair with it. **When the Low-Voltage Power Module pairs, all connected Low-Voltage Fixtures will automatically be paired with the Wireless Area Controller**.

Successful Paired Device Behavior: (While WAC is still in or placed in pairing mode)

- The Status LED illuminates solid green.
- Connected fixtures dim to 10% and display paired behavior. See the Low-Voltage Fixture reference sheets for further details.

[68] For best results, do not pair more than 100 devices to Wireless Area Controller (Gen 1) or 140 low-voltage devices to a Wireless Area Controller 2 (Gen 2). Low-Voltage Fixture with Integrated Sensor: fixture + sensor = 1 device.

[69] If output channel LED is blinking, the power is out of spec. Resolve before continuing.

[70] Devices with older firmware may take up to 1 hour to enter loss of communications operation.

WaveLinx Low-Voltage Power Module

Supported Identification Methods:

If there is more than one Low-Voltage Power Module paired with the Wireless Area Controller, the Low-Voltage Power Modules can be identified.

- **Identify Button:** Press the onboard 'Identify' button. For a Low-Voltage Power Module that has been paired with a Wireless Area Controller, this will trigger identification mode, causing the device icon to flash in the Mobile App's 'Device' menu. The Status LED on the Low-Voltage Power Module will flash blue for 15 seconds.
- **'Blink to Identify'**: Use the Mobile App's 'Blink to Identify' feature to identify the Low-Voltage Power Module. In the 'Device' menu, select the ' ' icon in the Low-Voltage Power Module's row to start 'Blink to Identify' mode.

'Blink to Identify' Behavior

When placed in 'Blink to Identify' mode:

- **ALL** Low-Voltage Fixtures connected to this Low-Voltage Power Module will cycle ON for 1 second, turn OFF for 1 second and repeats this cycle for 15 seconds.
- The Status LED on the Low-Voltage Power Module will flash blue for 15 seconds.

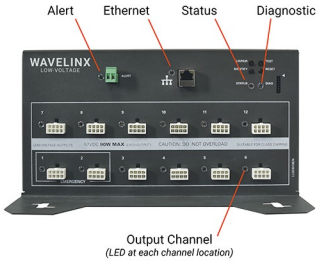
Factory Reset Instructions

CAUTION: The factory reset will set the device back to factory settings (out-of-the-box behavior) removing pairing and programmed settings.

- Press the Low-Voltage Power Module **RESET** button for **more than 10 seconds**.

This removes IP address settings and pairing for ALL Low-Voltage Fixtures and devices connected to the Low-Voltage Power Module. After a short period of time, the device should exhibit out-of-the-box behavior and may be paired as a new device.

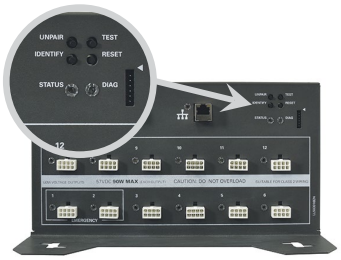
LED Operation



LED	Color/Pattern	Description
Output Channel LEDs (1-12)	Solid GREEN	Output is operating normally
	Blinking GREEN	Output voltage is out of specification (too low or too high)
Status LED	Solid GREEN	The Low-Voltage Power Module is operating and paired with a WaveLinx Wireless Area Controller.
	Solid RED	Error condition
	Blinking GREEN	The Low-Voltage Power Module is in test mode from the onboard test button. Connected Lights and the LED will flash for 15 seconds.
	Blinking BLUE	The Low-Voltage Power Module is in 15 second identify mode, triggered from the onboard pushbutton, or from the web portal or Mobile App.
	Blinking ORANGE	The Low-Voltage Power Module is not yet paired with a Wireless Area Controller.
Diagnostic LED	OFF	Normal condition (Not currently used. For future options)
Ethernet LED	Blinking GREEN	Blinks with Ethernet network activity.
Alert LED	OFF	The unit is in normal operation.
	Solid RED	The unit is in ALERT mode from an external dry contact closure signal into the alert terminal.

Low-Voltage Power Module Pushbuttons

The WaveLinx Low-Voltage Power Module has several onboard pushbuttons that perform specific functions.



Pushbutton	Function
Unpair	Push and hold for greater than (>) 10 seconds to unpair the Low-Voltage Power Module from the WaveLinx Wireless Area Controller.
Identify	If pressed, the status LED will flash blue for 15 seconds. In the Mobile App's 'Device' menu, the icon for the Low-Voltage Power Module will appear to pulse, identifying the device in the Mobile App.
Test	Press and release to place the Low-Voltage Power Module into test mode. All lights connected to the Low-Voltage Power Module will cycle between OFF and ON for 15 seconds.
Reset	Soft Reset: Press and release to issue a soft reset (reboot) the Low-Voltage Power Module. A soft reset takes approximately 1 ½ minutes to complete.
	Factory Reset: Push and hold for more than 10 seconds to issue a factory reset. **Use with extreme caution.** All settings to be removed, resetting the unit to factory defaults. Pairing information will also be removed.

Initial Configuration Steps for the Low-Voltage Power Module

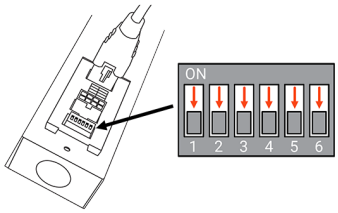
WaveLinx Low-Voltage Power Module continued

Initial Configuration Steps

The steps in this section must be done before pairing the Low-Voltage Power Module to the Wireless Area Controller.

Use this section to:

- Confirm Device Installation
- Prepare the Low-Voltage Power Module for Pairing



Step 1: Confirm Device Installation

IMPORTANT. Low-Voltage Fixtures have onboard selector switches. When used in a WaveLinx Connected Lighting System, all fixture selector switches must be in the OFF or down position (default).

1: Connect Low-Voltage fixtures to the Low-Voltage Power Module before power is applied.[71]

2. If connected, disconnect the Ethernet port cable.

3. Apply power and ensure that the Low-Voltage Power Module is ready by verifying the LED operation. The status LED should flash orange, the output channel LEDs should illuminate green, the alert LED, diagnostic LED, and LAN LED should remain OFF.

4: Next, run a connection test for the Low-Voltage Fixtures. Press and release the Low-Voltage Power Module's 'Test' button.

The status LED will flash green (1 second ON, 1 second OFF) when the 15 second test mode is active.

All lighting connected to the Low-Voltage Power Module should respond, cycling between 100% light output and OFF during the 15 second test period. Verify that all connected lighting responds properly.

5: Next, verify the Low-Voltage Fixtures display the correct default Out-of-the-Box functionality. Refer to the Low-Voltage Fixture with Integrated Sensor or Low-Voltage Fixture Reference Sheets for the expected behavior.

Step 2: Prepare the Low-Voltage Power Module for Pairing

The WaveLinx Low-Voltage Power Module communicates to the WaveLinx Wireless Area Controller over the building LAN. Before the Low-Voltage Power Module can be paired with the WaveLinx Wireless Area Controller, it must be configured with a unique IP address within the same network range as the Wireless Area Controller. By default, the WaveLinx Low-Voltage Power Module is set to obtain an IP address automatically using DHCP. Alternatively, the IP address can be statically assigned.

IMPORTANT NOTE: If using DHCP to assign the IP address, reserve the IP on the DHCP server. If the IP addresses of the WaveLinx Wireless Area Controller or WaveLinx Low-Voltage Power Module changes after the devices are paired, they will lose communication and the Low-Voltage Lighting will be offline until the connection is repaired (see "Reconnecting after IP Address Changes" on page 222).

Access the Low-Voltage Power Module's internal webpages to administer the IP Address by using a compatible web browser. Google Chrome is currently the supported web browser for the Low-Voltage Power Module.

The steps in this section assume that the WaveLinx Low-Voltage Power Module is still in its factory default state for the administrate user and password and has not been connected to a DHCP server for IP address assignment. If these items have been changed, please refer to the network administrator for access information.

Use the steps in this section to:

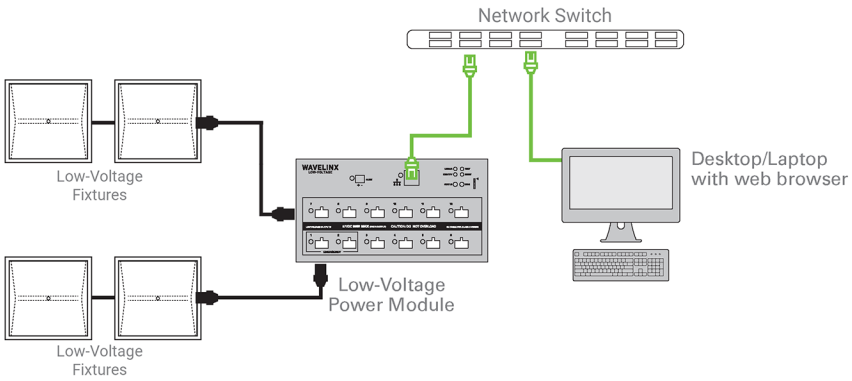
- Verify the Ethernet settings of the WaveLinx Low-Voltage Power Module, including setting a static IP address if needed
- Enter the WaveLinx Wireless Area Controller IP that should connect to this WaveLinx Low-Voltage Power Module (recommended)

Before performing these steps, determine the IP address of the Wireless Area Controller that will connect to this Low-Voltage Power Module.

1: **If a DHCP Server is not being used**, the default IP address of a Low-Voltage Power Module that has not been configured is 192.168.1.254 on the 255.255.255.0 subnet.

Connect a laptop that is configured with an IP address on the same subnet directly to the Low-Voltage Power Module or to the router or switch connected to the Low-Voltage Power Module.

If a DHCP Server is being used, Connect the Building LAN to the Low-Voltage Power Module's Ethernet port and verify the Ethernet LED is ON or flashing. Refer to the network administrator to obtain the IP address that has been assigned to the Low-Voltage Power Module. Ensure that the laptop being used is connected to and given an IP address on the same network.

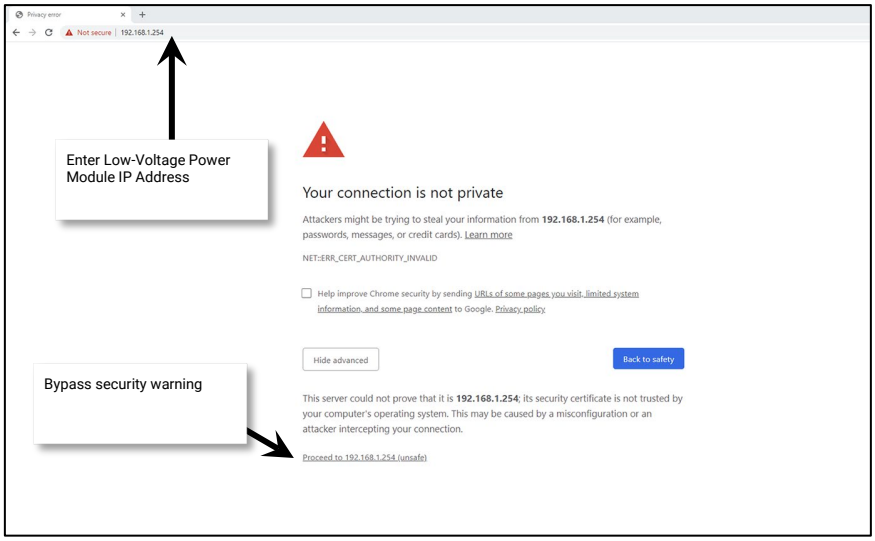


[71] Always power down the WaveLinx Low-Voltage Power Module before connecting Low-Voltage Fixtures. The WaveLinx Low-Voltage Power Module does not support hot-swapping/plugging.

WaveLinx Low-Voltage Power Module continued

Initial Configuration Steps (continued)

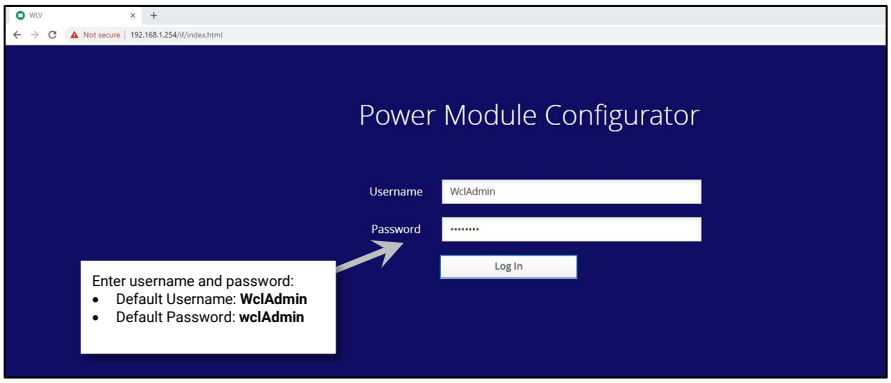
2: Open Google Chrome. In the address bar, enter the IP address of the WaveLinx Low-Voltage Power Module (default 192.168.1.254). The browser may display a warning regarding site security. The display and wording of this message may differ. Locate the option to bypass the warning and proceed to the site.



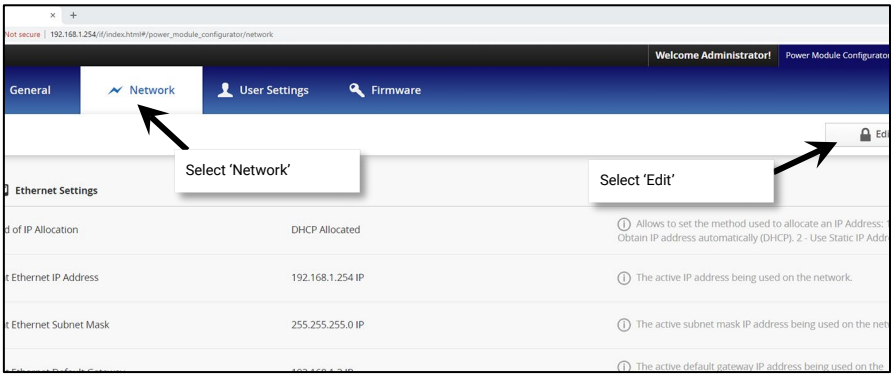
3: In the log in screen, enter the username and password for the administrator user.

- Default Username: **WclAdmin**
- Default Password: **wclAdmin**[72]

The internal webpage will open to the 'General' tab after a reminder to change the default password.



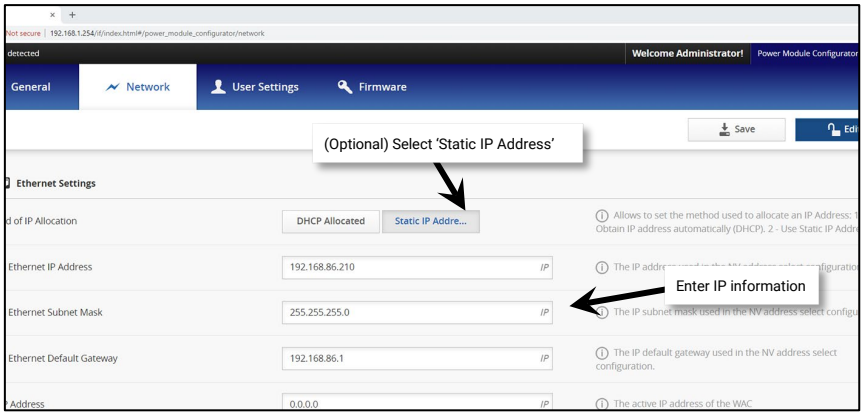
4: Select the 'Network' tab, and then choose 'Edit'.



[72] For security purposes, after the initial configuration is complete, change the default password. Users should set a complex password when changing passwords. See "User Settings Administration" on page 202 for this procedure.

WaveLinx Low-Voltage Power Module continued

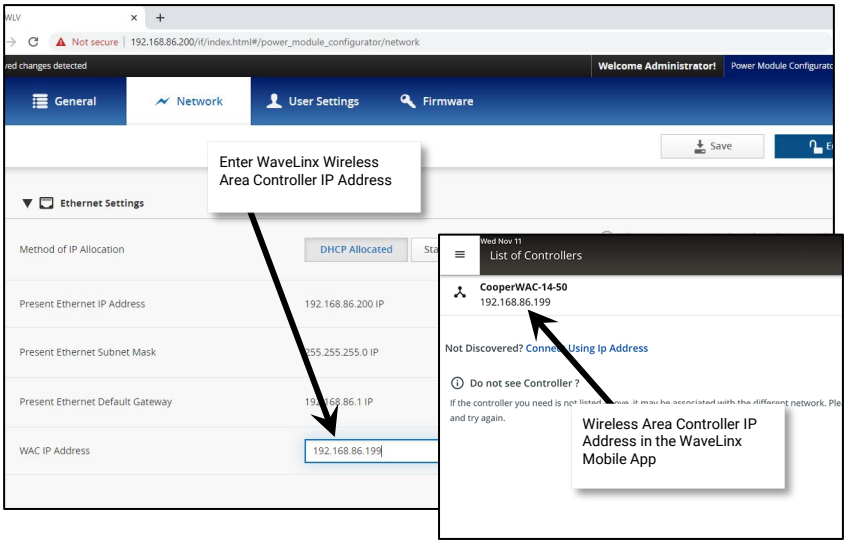
Initial Configuration Steps (continued)



5: **If assigning a static IP address**, select 'Static IP Address' and then type in the desired IP address, the appropriate subnet mask, and the default Gateway IP.

6: In the appropriate tab (either DHCP or Static IP depending on which the site is using) **enter the IP address of the Wireless Area Controller that should be paired with this Low-Voltage Power Module in the 'WAC IP Address' field. This ensures that the Low-Voltage Power Module will pair with the correct Wireless Area Controller.**

To find the Wireless Area Controller's IP address, open the WaveLinx Mobile App. The Wireless Area Controller's IP address will show under the device name in the Wireless Area Controllers list.



7: Click on 'Save'. The WaveLinx Low-Voltage Power Module will automatically reboot if the IP address settings other than the 'WAC IP Address' have been changed. If the web browser has been left open, it will be disconnected. A Low-Voltage Power Module reboot takes approximately 1 ½ minutes to complete.

If just the 'WAC IP Address' has been entered, the Low-Voltage Power Module will not reboot. Click on 'Welcome Administrator' and then select 'Log Out' before closing the web browser.

8. Connect the Building LAN cable to the Low-Voltage Power Module Ethernet port.

The Low-Voltage Power Module is now ready for pairing with the Wireless Area Controller.

Low-Voltage Fixture with Integrated Sensor Reference Sheet

Low-Voltage Fixture with Integrated Sensor

Features

- Integrated photocell for closed loop daylighting
- Integrated Passive Infrared (PIR) motion sensor for occupancy or vacancy sensing
- Class 2, low-voltage connection to a WaveLinx Low-Voltage Power Module for easy installation

Typical Applications

- Education, office, and other interior spaces

Models:

- **LV1-SLVPD1:** Available option on many Cooper Lighting luminaires.
- **WLA:** Available option on many Cooper Lighting luminaires

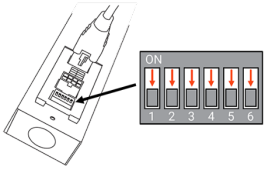
Mobile App Details:

- Default Device Name:
  - IS-LV
- Unassigned Device Category:
  - Integrated Sensor

Icon Displayed in Mobile App:

The WaveLinx Low-Voltage Fixture with Integrated Sensor communicates through the WaveLinx Low-Voltage Power Module to the WaveLinx Connected Lighting System. The onboard Integrated Sensor provides both occupancy and daylight control that can be easily configured using the WaveLinx Mobile App.

Important Installation Details:



- Low-Voltage Fixtures have onboard selector switches. Ensure that all fixture selector switches are in the OFF or down position (default).
- Always power down the WaveLinx Low-Voltage Power Module before connecting Low-Voltage Fixtures.

Out-of-the-Box Operation

- Once power is applied, the attached fixture operates via the motion sensor.
  - The occupancy sensor is set for high sensitivity.
  - If occupied, the fixture will turn ON to 100%.
  - The fixture will dim to OFF (0%) after 20 minutes when the space is unoccupied.
- The daylight sensor is disabled.
- The LED flashes red or green (tri-color LED) for 100ms once every 3 seconds when motion is detected.[73]

Construction Area Default Operation	Assigned to an Area Default Operation
Once paired, the device operates as part of the Construction Area. • The daylight sensor remains disabled.	Once assigned to a created area, the device operates as part of the area. • **WAC (Gen 1)**: The daylight sensor is enabled and set for closed loop daylighting. • **WAC2 (Gen 2)**: The daylight sensor is disabled.

• All occupancy sensors report to the area's occupancy set.
  • If occupied, the fixtures will turn ON to 50% (Scene 3).
  • The occupancy set default hold time is 20 minutes.
  • If the space remains unoccupied for 20 minutes, the fixture will dim to 0% (Scene 0).
• LED: Flashes red (single color) or white (tricolor) for 100ms once every 3 sec. with motion detection.	

Loss of Communications Operation

The lighting will remain in its last known state. If the connected WaveLinx Low-Voltage Power Module has not communicated with the Wireless Area Controller for longer than approx. 15 minutes, the fixture will revert to its out-of-the-box behavior until communications are re-established.[73]

Operation upon Return of Power

Upon return of power, the device will return to the last known light level until communications are re-established between the Low-Voltage Power Module and the Wireless Area Controller.[74] If communications cannot be established for more than approx. 15 minutes, loss of communications operation will begin.[73]

LED Operation (The LED is located beneath the sensor lens.)

LED conditions	Meaning
Flashes green (tricolor)/red (single color) for 100ms, once every 3 sec.	Device is unpaired (out-of-the-box) and is detecting motion or the connected Low-Voltage Power Module lost communication with the Wireless Area Controller and the device is detecting motion.
Flashes white (tricolor)/ red (single color) for 100ms, once every 3 sec.	Device is paired to a Wireless Area Controller and is detecting motion
Fast blink 10ms every 250ms: white (tricolor) or red (single color)	The daylight sensor has exceeded 150% of the calibrated light level for 30 minutes.[75]
LED is OFF	Device is not detecting motion. If motion is occurring, ensure device is powered and that the LED has not been disabled.[76]
LED flashes magenta (tricolor) one time	The flashlight method has been used to identify the device. The LED will flash red in Single-color LED sensors.

[73] Devices with older firmware may go to 75% light output when occupied in out-of-the-box operation and may take up to 1 hour to enter loss of communication operation.

[74] If closed loop daylighting is enabled, when powering up the fixture may flash ON, then OFF, and then flash again as it resumes the last known level.

[75] The LED will stop flashing if the light level drops but stays between 50% and 100% of the calibrated light level for 10 minutes OR if the light level falls below 50% of the calibrated light level for 30 seconds.

[76] The LED may be difficult to see in very bright areas.

Low-Voltage Fixture with Integrated Sensor continued

Pairing Information

The Low-Voltage Fixture with Integrated Sensor will automatically pair when its WaveLinx Low-Voltage Power Module is paired with the Wireless Area Controller. If a Low-Voltage device is attached after the initial pairing was completed (always power down before the connection) or a Low-Voltage device is deleted in error from the mobile app, manually refresh the pairing. Press and release (1 second press) the PAIR button on the Wireless Area Controller to start pairing mode. The Low-Voltage Power Module will refresh the connected devices to the Wireless Area Controller and will pair any unpaired devices.

Successful Paired Device Behavior: (While WAC is still in or placed in pairing mode)

- Fixture dims to 10%.
- Single Color LED Sensor: LED flashes red for 100ms once every 3 seconds when motion is detected.
- Tri-color LED Sensor: LED flashes white for 100ms once every 3 seconds when motion is detected.

Supported Identification Methods:

- **Laser pointer or focused flashlight beam**: For fixtures mounted at reasonable mounting heights, use a laser pointer or bright, focused beam flashlight to trigger identification mode. Standing beneath the sensor, shine the light directly into the sensor lens for 3-4 seconds. The timing needs to be precise for the identification mode to respond. The LED in the sensor window will briefly flash violet (tri-color LED sensor) or red (single color LED sensor) at the end of this 3-4 second period.
- **'Blink to Identify'**: Use the Mobile App's 'Blink to Identify' feature to identify the device. Select the ' ' icon in a device row to place the device in 'Blink to Identify' mode. The icon will appear to pulse and a load matching that type should respond.

'Blink to Identify' Behavior

When placed in 'Blink to Identify' mode, the fixture will turn ON for 1 second, turn OFF for 1 second and repeats this cycle for 15 seconds.

Daylight Operation (closed loop)

- Once assigned to an area and enabled (daylight operation is enabled automatically if paired with WAC Gen 1), the sensor will begin closed loop daylight dimming operation to a reasonable light level. If a specific light level (target) is expected at the surface, then calibration is required.
- When the measured light exceeds the calibrated level, the fixture will dim lighting to reduce the light level.
- When the measured light level exceeds 150% of the calibrated light level for more than 30 minutes, the sensor will dim to OFF.
- Lighting will be turned back ON when one of the two conditions occurs:
  - The measured light level falls between 100% and 50% of the calibrated light level for more than 10 minutes
  - The measured light level falls below 50% of the calibrated light level for longer than 30 seconds

Daylight Calibration Details

It is best to calibrate indoor applications when there is a moderate to low level of daylight. If the daylight level is too high, it may be difficult to obtain the desired level of light at the task surface, even if the fixtures are completely off.

During calibration, use the 'Calibrate All' feature and adjust slider bars to change the light level to the desired light level for each controlled fixture. Once all fixtures are adjusted, use a light meter on the surface to ensure the reading is in the desired range and then send the 'Calibrate' command.

If the light level in the space is still too bright when electric lighting is fully dimmed, use available shading to adjust the amount of incoming daylight or postpone calibration until the amount of incoming daylight has decreased.

Factory Reset Instructions

To factory reset a single Low-Voltage Fixture with Integrated Sensor, use the Mobile App to delete the device from the app. The device should then display out-of-the-box behavior and may be paired as a new device.

There is no manual method of factory resetting a single low-voltage device. Refer to the Low-Voltage Power Module's reference sheets for details on performing a factory reset on the Low-Voltage Power Module.[77]

[77] Factory resetting a Low-Voltage Power Module will remove pairing and configuration for ALL Low-Voltage Devices that are connected to the Power Module.

Low-Voltage Fixture

Low-Voltage Fixture

Features

- Class 2, low-voltage connection to a WaveLinx Low-Voltage Power Module for easy installation

Typical Applications

- Education, office, and other interior spaces

Models:

- **LV1:** (with no SLVPD1) Available option on many Cooper Lighting luminaires.

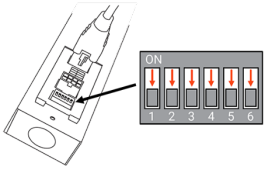
Mobile App Details:

- Default Device Name:
  - DM-LV
- Unassigned Device Category:
  - Dimmable

Icon Displayed in Mobile App:

The WaveLinx Low-Voltage Fixture contains an internal control module that communicates through the WaveLinx Low-Voltage Power Module to the WaveLinx Connected Lighting System. The fixture can be easily configured to be controlled from WaveLinx devices using the WaveLinx Mobile App.

Important Installation Details:



- Low-Voltage Fixtures have onboard selector switches. Ensure that all fixture selector switches are in the OFF or down position (default).
- Always power down the WaveLinx Low-Voltage Power Module before connecting Low-Voltage Fixtures.

Out-of-the-Box Operation

- Once power is applied, the Low-Voltage Fixture turns ON and remains ON at a 100% light level.[78]

Construction Area Default Operation	Assigned to an Area Default Operation
Once paired, the device operates as part of the Construction Area.	Once assigned to a created area, the device operates as part of the area.

• It will respond to the occupancy set from any occupancy sensors in the area.
  • If occupied, the fixtures will turn ON to 50% (Scene 3).
  • The occupancy set default hold time is 20 minutes.
  • If the space remains unoccupied for 20 minutes, the fixture will dim to 0% (Scene 0).
• It will respond to any wallstations in the area per the default wallstation programming.	

Loss of Communications Operation

The lighting will remain in its last known state. If the connected WaveLinx Low-Voltage Power Module has not communicated with the Wireless Area Controller for longer than approx. 15 minutes, the fixture will revert to its out-of-the-box behavior until communications are re-established.[78]

Operation upon Return of Power

Upon return of power, the device will return to the last known light level until communications are re-established between the Low-Voltage Power Module and the Wireless Area Controller. If communications cannot be established for more than approx. 15 minutes, loss of communications operation will begin.[78]

LED Operation

Not applicable. The WaveLinx Low-Voltage Fixture has no onboard LED indicator.

Pairing Information

The Low-Voltage Fixture will automatically pair when its WaveLinx Low-Voltage Power Module is paired with the Wireless Area Controller. If a Low-Voltage device is attached after the initial pairing was completed (always power down before the connection) or a Low-Voltage device is deleted in error from the mobile app, manually refresh the pairing. Press and release (1 second press) the PAIR button on the Wireless Area Controller to start pairing mode. The Low-Voltage Power Module will refresh the connected devices to the Wireless Area Controller and will pair any unpaired devices.

Successful Paired Device Behavior: (While WAC is still in or placed in pairing mode)

- Fixture dims to 10%.

Supported Identification Methods:

- **'Blink to Identify'**: Use the Mobile App's 'Blink to Identify' feature to identify the device. Select the ' ' icon in a device row to place the device in 'Blink to Identify' mode. The icon will appear to pulse and a load matching that type should respond.

'Blink to Identify' Behavior

When placed in 'Blink to Identify' mode, the fixture will turn ON for 1 second, turn OFF for 1 second and repeats this cycle for 15 seconds.

Factory Reset Instructions

To factory reset a single Low-Voltage Fixture, use the Mobile App to delete the device from the app. The device should then display out-of-the-box behavior and may be paired as a new device.

There is no manual method of factory resetting a single low-voltage device. Refer to the Low-Voltage Power Module's reference sheets for details on performing a factory reset on the Low-Voltage Power Module. [79]

[78] Devices with older firmware may go to 75% light output in out-of-the-box operation and may take up to 1 hour to enter loss of communication operation.

[79] Factory resetting a Low-Voltage Power Module will remove pairing and configuration for ALL Low-Voltage Devices that are connected to the Power Module.

WaveLinx Receptacle

WaveLinx Receptacle

WR-15

WR-20

Features

- Top outlet is wirelessly controlled through WaveLinx while bottom outlet remains constantly powered
- IEEE 802.15.4, (router and end point)
- Input/Output 120VAC
  - WR-15: 15A
  - WR-20: 20A

Typical Applications

- Education, office, and other interior spaces

Models:

- **WR-15:** WaveLinx Receptacle 15A
- **WR-20**: WaveLinx Receptacle 20A

Mobile App Details:

- Default Device Name:
  - Receptacle
- Unassigned Device Category:
  - Receptacle

Icon Displayed in Mobile App:

The WaveLinx Receptacle enables energy savings by turning OFF the top outlet when the area is unoccupied or with other programmed actions, simplifying plug load control requirements. The bottom outlet remains constantly powered.

Out-of-the-Box Operation

- Once power is applied, the wirelessly controlled outlet will turn ON.
- LED will illuminate green to indicate that the controlled outlet is ON.
- The manual pushbutton can be pressed (short press) to toggle the controlled outlet ON and OFF. (The LED will follow the state of the controlled outlet.)

Construction Area Default Operation (WAC Gen 1)	Assigned to an Area Default Operation (WAC Gen 1)
Once paired, the device operates as part of the Construction Area.	Once assigned to a created area, the device operates as part of the area.

• All paired occupancy sensors in the area report to the area's occupancy set.
  • If occupied, controlled WaveLinx Receptacles will turn ON (Scene 3).
  • The occupancy set default hold time is 20 minutes.
  • If the space remains unoccupied for 20 minutes, controlled WaveLinx Receptacles will turn OFF (Scene 0).
• All paired wallstations will operate the area devices per their default programming (WaveLinx Receptacles turn OFF with Scene 0 and ON with other scenes).	

Construction Area Default Operation (WAC2 Gen 2)	Assigned to an Area Default Operation (WAC2 Gen 2)

The controlled outlet will remain in current state (ON/OFF) unless the onboard pushbutton is pressed.	If assigned to Area: The controlled outlet will remain in current state (ON/OFF) unless the onboard pushbutton is pressed.
	If assigned to a Receptacle Zone in the Area:
	• All paired occupancy sensors in the area report to the area's occupancy set.
	  • If occupied, controlled WaveLinx Receptacles will turn ON (Scene 3).
	  • The occupancy set default hold time is 20 minutes.
	  • If the space remains unoccupied for 20 minutes, controlled WaveLinx Receptacles will turn OFF (Scene 0).
	• All paired wallstations will operate the area devices per their default programming (WaveLinx Receptacles turn OFF with Scene 0 and ON with other scenes).

Loss of Communications Operation

If communication is lost with Wireless Area Controller, the controlled outlet will remain in the last commanded state. The manual pushbutton may be used to toggle the controlled outlet ON and OFF until communications are re-established.

Operation upon Return of Power

Upon return of power, the controlled outlet will remain in the last known state until a command is received.

LED Operation

LED conditions	Meaning
Solid green	The controlled outlet is currently ON
OFF	The controlled outlet is currently OFF, or the device is not powered.
Flashing for 15 seconds • Green/Amber: controlled outlet is ON • Red/Off: controlled outlet is OFF	This can occur in the following situations: • The onboard pushbutton is used to place the WaveLinx Receptacle in pairing mode. • The onboard pushbutton is used to Factory Reset the WaveLinx Receptacle. • The onboard pushbutton is pressed and released when the WaveLinx Receptacle is paired but still in the Construction Area. • The Mobile App is used to place the WaveLinx Receptacle in 'Blink to Identify' mode.

WaveLinx Receptacle continued

WR-15

WR-20

How to Place in Pairing Mode:

Method	Description
Onboard Pushbutton	Press and hold the manual push button for 5 seconds. Release the push button when the LED starts flashing.[80]

Successful Paired Device Behavior: (While WAC is still in or placed in pairing mode)

- **During pairing:** the outlet LED may flash red/OFF or green/amber. The outlet may turn OFF for a period of time and then turn back ON. The duration of the OFF period should not last longer than 5 minutes.
- **If previously paired and the Wireless Area Controller is placed back in pairing mode:** All paired WaveLinx Receptacles still in the default construction area will turn OFF for 5 minutes. After 5 minutes, the WaveLinx Receptacles will turn back ON.

If previously paired and the Wireless Area Controller is NOT in pairing mode: Press the manual push button to toggle the controlled outlet. A paired WaveLinx Receptacle still in the default construction area will flash its LED between red/OFF or green/amber for 15 seconds.

Supported Identification Methods:

- **Onboard Pushbutton**: Press and release (1 second press) the manual push button on the front of the controlled outlet. The WaveLinx Receptacle may toggle state when the push button is pressed, and the LED may flash red/OFF or green/amber.
- **Blink to Identify'**: Use the Mobile App's 'Blink to Identify' feature to identify the device. Select the ' ' icon in a device row to place the device in 'Blink to Identify' mode. The icon will appear to pulse and a load matching that type should respond.

'Blink to Identify' Behavior

When placed in 'Blink to Identify' mode:

- The outlet LED will flash for a period of 15 seconds.
  - If the outlet is OFF, the LED will flash between red and off.

If the outlet is ON, the LED will flash between green and amber.

Factory Reset Instructions

CAUTION: The factory reset will set the device back to factory settings (out-of-the-box behavior) removing pairing and programmed settings.

- Press and hold the manual push button for **5 seconds**. Release the push button when the LED starts flashing.

The device should exhibit out-of-the-box behavior and may be paired as a new device.

[80] The LED may flash red or cycle between green and amber during the pairing process.

WaveLinx Ceiling Sensor

Ceiling Sensor

Features

- Integrated photocell for open loop daylighting
- Integrated Passive Infrared (PIR) motion sensor for occupancy or vacancy sensing
- IEEE 802.15.4, (end point)

Power:

- 2-replaceable AA Alkaline batteries
  - 7-year life (occupancy only)
  - 6-year life (occupancy + daylighting)

Typical Applications

- Education, office, and other interior spaces

Models:

- **CWPD-1500:** WaveLinx Ceiling Sensor

Mobile App Details:

- Default Device Name:
  - Ceiling Sensor xxxx (MAC ID)
- Unassigned Device Category:
  - Ceiling Sensor

Icon Displayed in Mobile App:

The WaveLinx Ceiling Sensor provides motion sensing and/or open loop daylight dimming to the WaveLinx system. In open loop daylighting applications, the sensor can control multiple zones in the same space. The WaveLinx Ceiling Sensor is battery powered, mounting easily where needed without the need for wiring.

Out-of-the-Box Operation

- Once the batteries are installed:
  - The LED may flash red once approximately every 10 seconds to indicate the unit is powered.
  - The daylight sensor and occupancy sensor will have no control functionality out-of-the-box.

Construction Area Default Operation	Assigned to an Area Default Operation
Once paired, the device operates as part of the Construction Area.	Once assigned to a created area, the device operates as part of the area.

• The daylight sensor remains disabled. It must be assigned to an area and be configured to operate.
• All occupancy sensors report to the area's occupancy set.
  • If occupied, the fixtures will turn ON to 50% (Scene 3).
  • The occupancy set default hold time is 20 minutes.
  • If the space remains unoccupied for 20 minutes, the fixture will dim to 0% (Scene 0).
• Sensor LED flashes red approximately once every 10 seconds to indicate the sensor is powered.	

Loss of Communications Operation

Not applicable for this device type. If communication is lost with Wireless Area Controller, the sensor will not control the assigned loads until communications are re-established.

LED Operation (The LED is located between the two sensor pushbuttons)

LED conditions	Meaning
Flashes red approximately once every 10 seconds	Device is powered.
Flashes red one time when the wireless PAIR button ('ᯤ') is pressed	The device is paired with a Wireless Area Controller
Flashes red approximately 10 times	Will occur when the wireless PAIR button ('ᯤ') is pressed OR if a flashlight shines into the sensor lens and the device is not paired with a Wireless Area Controller yet. This flash sequence indicates that the device has entered pairing mode.[81]

How to Place in Pairing Mode:

Pair line powered devices first as they support communications to the battery powered devices. If no line powered devices are paired, the Wireless Area Controller will only allow six battery powered devices to pair.

Method	Description
PAIR button (Preferred Method)	Press the wireless PAIR button (identified with 'ᯤ' symbol) onboard the sensor to initiate pairing mode.
Flashlight Method	Shine a bright flashlight into the lens of the battery powered sensor.[82]

The LED in the sensor window may flash ON and OFF for 10 seconds (approximately 10 times) to indicate that the sensor is in pairing mode before returning to its normal blink pattern.

Successful Paired Device Behavior: (While WAC is still in or placed in pairing mode)

There is not immediately feedback that the device paired successfully.[83] If paired, the device will be visible in the Mobile App.

[81] The LED may flash slowly two times (3 seconds ON, 3 seconds OFF) as the device pairs with the Wireless Area Controller.
[82] Motion activity may also trigger PAIR mode although this method is not reliable.
[83] The LED may flash slowly two times (3 seconds ON, 3 seconds OFF) as the device pairs with the Wireless Area Controller.

Ceiling Sensor continued

Supported Identification Methods:

- **Laser pointer or focused flashlight beam**: For sensors mounted at reasonable mounting heights, use a laser pointer or bright, focused beam flashlight to trigger identification mode. Standing beneath the sensor, shine the light directly into the sensor lens for 3-4 seconds to identify the device in the Construction Area.

Battery powered devices do not support 'Blink to Identify' mode.

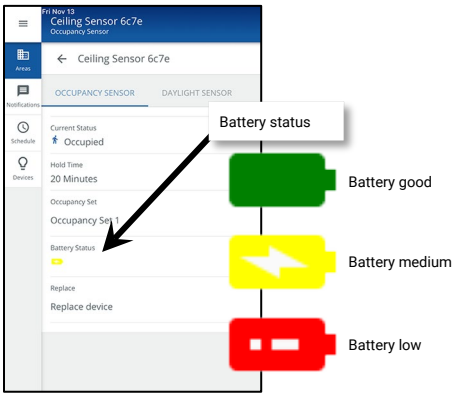
Battery Charge Indicator

The Mobile App will give indication of the current charge of the batteries in the sensor within the Ceiling Sensor page.

- Battery good: >2.6V
- Battery medium: <= 2.6V – 2.4V
- Battery low: <2.4V

Operation upon Battery Change

- Upon battery change, after the device automatically reconnects to the Wireless Area Controller, the device will operate with the last programmed settings. (device retains programming in unpowered state).



Daylight Operation (open loop)

Daylighting will not operate until an open loop daylight set is created and configured.

- Once configured and calibrated, the controlled zones will dim in response to entering daylight.
  - When the measured daylight contribution increases or decreases, the controlled zones will dim or raise lighting to reduce or increase the light level.
  - When the measured light level exceeds 150% of the calibrated gain for more than 30 minutes, the sensor will dim to OFF.
- If lighting has dimmed to OFF and the area is still occupied, lighting will be turned back ON when one of the two conditions occurs:
  - The measured light level falls between 100% and 50% of the calibrated gain for more than 10 minutes
  - The measured light level falls below 50% of the calibrated gain for longer than 30 seconds

Open Loop Daylight Set Configuration

- Create the open loop daylight set.
- Assign the zones that should be controlled by the daylight set.[84]
- Assign the sensor to the daylight set
- Calibrate the sensor

Important Mounting Considerations

- Open loop daylight sensors should be mounted so that the sensor lens views mainly daylight, not the electric light being controlled in the area.
- The optimal mounting location for occupancy sensing may not be optimal for open loop daylighting. Separate sensors may be necessary.

Daylight Calibration Details

Perform calibration during daylight hours when electric lighting should be reduced but not fully dimmed. The use of a light meter is recommended. With electric lighting turned OFF, verify with a light meter at the work surface that the reading with daylight alone is within 50% to 75% of the desired target light level. If the light level is too high or too low, return at a time when the daylight level is within this optimal range. (For example, if the desired light level at the work surface is 500 lux, the reading with electric lighting OFF should be between 250 to 375 lux for best results.)

In the daylight set's 'Calibrate' screen, adjust the slider bar to change the light level to the desired light level, then tap the back button to save the change.

Factory Reset Instructions

CAUTION: The factory reset will set the device back to factory settings (out-of-the-box behavior) removing pairing and programmed settings.

- Remove the battery for exactly 5 seconds then replace.
- Wait for the LED to illuminate on power up and then turn OFF.
- Immediately press the radio button ('ᯤ') ten times at 1 second intervals.
- Wait a few seconds and then press the radio button ('ᯤ') one time. After the button is released, the LED should remain OFF for about 3 seconds, flash slowly 2 times and then quickly 1 time (3 flashes total) to indicate that the reset was successful.

The device may be paired as a new device.

[84] If fixtures in the zones that are assigned to open loop daylight sets contain Integrated Sensors or Tilemount Sensors, closed loop daylighting will automatically be disabled for these devices.

WaveLinx Wallstation

WaveLinx Line Voltage Wallstation

Features

- Multi-scene selection, raise/lower, and toggle ON/OFF control
- Single or multi-gang mounting
- Faceplate and buttons changeable
- IEEE 802.15.4, (router and end point)

Power:
- Line voltage powered 120-277VAC (neutral required)

Typical Applications

- Education, office, and other interior spaces

Models:

- Large Button Configurations:
  - W1L, W1L-RL, W2L, W2L-RL, W3L
- Small Button Configurations:
  - W2S, W2S-RL, W4S, W4S-RL, W5S, W6S

Mobile App Details:

- Default Device Name:
  - Wall Station
- Unassigned Device Category:
  - Wall Station

Icon Displayed in Mobile App:

Programmable options:

- Scene Selection
- Scene Toggle
- Save Scene
- Zone Toggle
- Zone Level
- Raise
- Lower
- Hold/Release Occupied
- No Action

Use the WaveLinx Wallstations to manually operate connected loads and provide customized light levels for each controlled space.

Out-of-the-Box Operation

- Once power is applied, if a button is pressed, the button's LED will flash slowly for 10 seconds.
- The WaveLinx Wallstation will have no control functionality out-of-the-box.

Construction Area Default Operation	Assigned to an Area Default Operation
Once paired, the device operates as part of the Construction area.	Once assigned to a created area, the device operates as part of the area.
• All WaveLinx Wallstations will operate all lighting devices and WaveLinx Receptacles in the area per the default scenes and programming (see chart next page). • The button LED indicator will illuminate to indicate the currently active scene.	

Loss of Communications Operation

If communication is lost with Wireless Area Controller, the WaveLinx Wallstation will not control the assigned loads until communications are re-established. If a button with an LED indicator is pressed, the LED will flash quickly for 5 seconds to indicate its offline status.

Operation upon Return of Power

Upon return of power and connection to the Wireless Area Controller, the WaveLinx Wallstation will wait for a button press before issuing commands.

Button LED Operation

LED conditions	Meaning
Button LED ON	The button's command is currently active.
Button LED OFF	The button's command is not active or not programmed. If button LEDs are OFF, and buttons are not responsive, verify the station is powered.
Button LED Flashes slowly for 10 sec. when pressed	The WaveLinx Wallstation has been placed in pairing mode and is searching for a Wireless Area Controller. The WaveLinx Wallstation will remain in pairing mode for 60 minutes.
Button LED Flashes quickly for 5 sec. when pressed	The WaveLinx Wallstation was paired with a Wireless Area Controller but is no longer communicating with it.
All LEDs flash in a cycle for 15 sec.	The WaveLinx Wallstation is in 'Blink to Identify' mode.
All LEDs flash in a cycle pattern, continuously	The WaveLinx Wallstation has successfully paired, is in the Construction Area, and the Wireless Area Controller is in pairing mode.

How to Place in Pairing Mode:

Method	Description
Press button (Preferred Method)	Press any button on the WaveLinx Wallstation to initiate a pairing request from an unpaired wallstation. The LED on the button should flash slowly for approximately 10 seconds.
Power Cycle Method[85]	Using the circuit breaker, perform the following power cycle sequence: • Turn OFF power for 30 seconds, and then turn ON power for 5 seconds • Turn OFF power for 30 seconds, and then turn ON power and leave ON.

The device will stay in pairing mode for 60 minutes and then time out automatically if a connection with Wireless Area Controller is not made. Only unpaired devices will enter pairing mode with these methods.

Successful Paired Device Behavior: (While WAC is still in or placed in pairing mode)

Once successfully paired, all button LEDs will flash in a top to bottom and then bottom to top pattern until pairing mode is exited.

[85] Wallstations with older firmware (prior to 01.07.10.00) may only require a single power cycle to place in pairing mode (30 seconds OFF, and then turn back ON).

WaveLinx Line Voltage Wallstation continued

Supported Identification Methods:

- **Button Press**: Press any button on the WaveLinx Wallstation. If the wallstation is still in the Construction Area, the LED will flash for 15 seconds.
- **Blink to Identify'**: Use the Mobile App's 'Blink to Identify' feature to identify the device. Select the ' ' icon in a device row to place the device in 'Blink to Identify' mode. The icon will appear to pulse, and a WaveLinx Wallstation LEDs should respond.

'Blink to Identify' Behavior

When placed in 'Blink to Identify' mode the WaveLinx Wallstation with flash all button LEDs in a cycle pattern for a period of 15 seconds.

Factory Reset Instructions

CAUTION: The factory reset will set the device back to factory settings (out-of-the-box behavior) removing pairing and programmed settings.

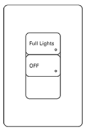
- Cycle the power to (switch **OFF 4 seconds** and then **ON 4 seconds**) the device's circuit **six times**.

This removes pairing for ALL devices of this type on the affected circuit. After a short period of time, the device should exhibit out-of-the-box behavior and may be paired as a new device.

Default WaveLinx Wallstation Operation

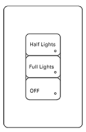
W1L-*
(* = W,V,G,B)

W1L-x
- Button #1: Toggle Scene (Scene 0/Scene1)



W2L-*
(* = W,V,G,B)

W2L-x
- Button #1: Scene 1
- Button #2: Scene 0



W3L-*
(* = W,V,G,B)

W3L-x
- Button #1: Scene 3
- Button #2: Scene 1
- Button #3: Scene 0

W2S-RL-*
(* = W,V,G,B)

W2S-RL-x
- Button #1: Scene 3
- Button #2: Scene 1
- ON/OFF: Toggle Scene (Scene 0/Scene 1)
- Raise/Lower: Raise/Lower All Zones in Current Area[86]

W4S-RL-*
(* = W,V,G,B)

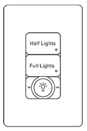
W4S-RL-x
- Button #1: Scene 3
- Button #2: Scene 1
- Button #3: Scene 2
- Button #4: Scene 4
- ON/OFF: Toggle Scene (Scene 0/Scene 1)
- Raise/Lower: Raise/Lower All Zones in Current Area[86]

W6S-*
(* = W,V,G,B)

W6S-x
- Button #1: Scene 3
- Button #2: Scene 1
- Button #3: Scene 2
- Button #4: Scene 4
- Button #5: Scene 5
- Button #6: Scene 0

W1L-RL-*
(* = W,V,G,B)

W1L-RL-x
- Button # 1: Scene 3
- ON/OFF: Toggle Scene (Scene 0/Scene 1)
- Raise/Lower: Raise/Lower All Zones in Current Area[86]



W2L-RL-*
(* = W,V,G,B)

W2L-RL-x
- Button #1: Scene 3
- Button #2: Scene 1
- ON/OFF: Toggle Scene (Scene 0/Scene 1)
- Raise/Lower: Raise/Lower All Zones in Current Area[86]

W2S-*
(* = W,V,G,B)

W2S-x
- Button #1: Scene 1
- Button #2: Scene 0

W4S-*
(* = W,V,G,B)

W4S-x
- Button #1: Scene 3
- Button #2: Scene 1
- Button #3: Scene 4
- Button #4: Scene 0

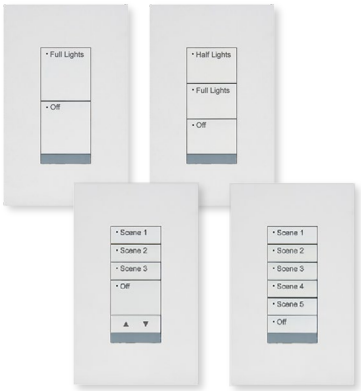
W5S-*
(* = W,V,G,B)

W5S-x
- Button #1: Scene 3
- Button #2: Scene 1
- Button #3: Scene 2
- Button #4: Scene 4
- Button #5: Scene 0

[86] White tuning zones are automatically exempted from raise/lower 'ALL' zones to prevent inadvertent adjustment of the color temperature when adjusting light levels.

WaveLinx Battery Powered Wallstation

WaveLinx Battery Powered Wallstation



Features

- Multi-scene selection, raise/lower, and toggle ON/OFF control
- Single or multi-gang mounting
- IEEE 802.15.4, (router and end point)

Power:
- 4-AAA Alkaline replaceable batteries
  - 10-year life expectancy

Typical Applications

- Education, office, and other interior spaces

Models:

- Large Button Configurations:
  - WB2L, WB3L
- Mixed Button Configuration:
  - WB5
- Small Button Configuration:
  - WB6

Mobile App Details:

- Default Device Name:
  - Battery Powered Wall Station
- Unassigned Device Category:
  - Wall Station

Icon Displayed in Mobile App:

Programmable options:

- Scene Selection
- Scene Toggle
- Save Scene
- Zone Toggle
- Zone Level
- Raise
- Lower
- Hold/Release Occupied
- No Action

Use the WaveLinx Wallstations to manually operate connected loads and provide customized light levels for each controlled space. WaveLinx Battery Powered Wallstations simplify new and retrofit installations.

Out-of-the-Box Operation

- Once power is applied, All LEDs will be off as the station is automatically in “sleep” mode to conserve battery life. A red LED below the bottom button may flash if a finger is within 2 inches (5 cm) of the buttons or a button is pressed, triggering the proximity sensor to “wake” the station and request an updated LED status. The button LEDs should remain off until the station is paired with the Wireless Area Controller.
- The wallstation will have no control functionality out-of-the-box.

Construction Area Default Operation	Assigned to an Area Default Operation
Once paired, the device operates as part of the Construction area.	Once assigned to a created area, the device operates as part of the area.
• All wallstations will operate all lighting devices and WaveLinx Receptacles in the area per the default scenes and programming (see chart next page). • The button LED will illuminate briefly to indicate the active scene when woken from “sleep” mode.	

Loss of Communications Operation

If communication is lost with Wireless Area Controller, the wallstation will not control the assigned loads until communications are re-established. The red LED below the bottom button may illuminate for about 3 seconds if a button is pressed as the station tries to communicate with the Wireless Area Controller.

Button LED Operation

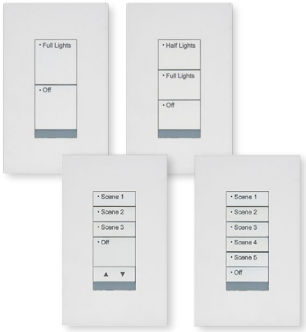
LED conditions	Meaning
Button LED ON (when hand is near wallstation)	The button’s command is currently active.
Button LED OFF	Battery wallstations automatically enter “sleep” mode turning LEDs OFF. If the red LED below the bottom button flashes but the LEDs remain OFF when a hand is near, the button’s command is not active or is not programmed. If there are no button LEDs and the red LED below the bottom button does not flash when a hand is near, verify the batteries are charged.
Red LED below the bottom button flashes once (when hand is near wallstation)	The proximity sensor has “woken” the station from “sleep” mode and requested button LED status from its paired Wireless Area Controller. • If button command is not currently active, the red LED will flash but no button LEDs will illuminate. • If button command is currently active, the red LED may not flash but the button LED(s) will illuminate.
Red LED below the bottom button flashes twice (when hand is near wallstation)	The proximity sensor has “woken” the station from “sleep” mode and requested button LED status, but the station is not paired with a Wireless Area Controller.
Red LED below bottom button: • flashes twice • then flashes 10 times	A button has been pressed on a station that has not yet been paired with a Wireless Area Controller and the Wireless Area Controller is not in pairing mode. This sequence also occurs if the device has just been Factory Reset.
Red LED below bottom button • flashes twice • then flashes several times (up to 10) • followed by two slow flashes.	A button has been pressed on a station that has not yet been paired with a Wireless Area Controller and the Wireless Area Controller is in pairing mode. The button press places the station in pairing mode. The two slow flashes at the end indicate that communication with the Wireless Area Controller as the device makes the pairing connection.

How to Place in Pairing Mode:

Pair line powered devices first as they support communications to the battery powered devices. If no line powered devices are paired, the Wireless Area Controller will only allow six battery powered devices to pair.

Method	Description
Press button (Preferred Method)	Press any button on the wallstation to initiate a pairing request from an unpaired wallstation. The red LED below the bottom button may flash when the proximity sensor detects a hand near the device and may flash intermittently during the pairing process.

WaveLinx Battery Powered Wallstation continued



Successful Paired Device Behavior:

There may not be immediate feedback that the device paired successfully.[87] If paired, the device will be visible in the Mobile App. To verify that the device paired successfully, **make sure the Wireless Area Controller is not in pairing mode.** Press one of the wallstation buttons and verify that the paired lights and WaveLinx Receptacles still in the Construction Area respond to the commands.

Supported Identification Methods:

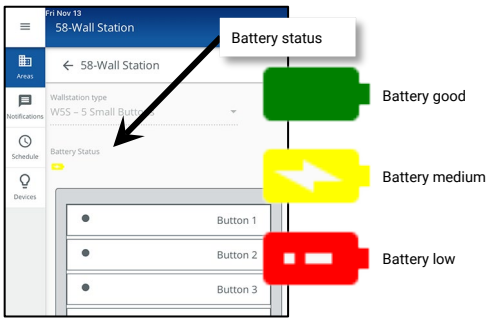
- **Button Press**: Press any button on the wallstation to identify the device in the Construction Area. The red LED below the bottom button for approximately 3 seconds.

Battery powered devices do not support 'Blink to Identify' mode.

Battery Charge Indicator

The Mobile App will give indication of the current charge of the batteries in the wallstation within the wallstation page.

- Battery good: >2.6V
- Battery medium: <= 2.6V – 2.4V
- Battery low: <2.4V



Operation upon Battery Change

Upon battery change, after the device automatically reconnects to the Wireless Area Controller, the device will operate with the last programmed settings when a button is pressed (device retains programming in unpowered state).

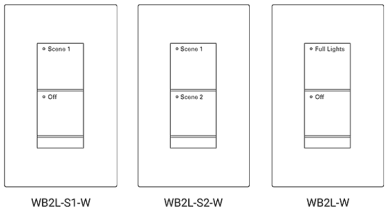
Factory Reset Instructions

CAUTION: The factory reset will set the device back to factory settings (out-of-the-box behavior) removing pairing and programmed settings.

- Remove the battery assembly for exactly 5 seconds then replace.
- Once the red LED below the bottom button illuminates, immediately press any button ten times at 1 second intervals (the red LED may flash when button is pressed).
- Wait a few seconds and then press any button one time. the red LED below the bottom button should flash slowly 2 times and then flash an additional 10 times to indicate that the reset was successful.

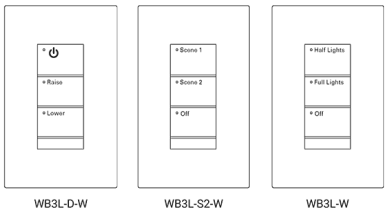
The device may be paired as a new device.

Default Battery Powered Wallstation Operation

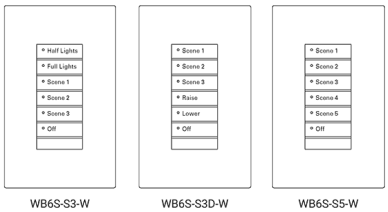


WB2L-x
- Button #1: Scene 1
- Button #2: Scene 0

WB5-S3-W
- Button #1: Scene 3
- Button #2: Scene 1
- Button #3: Scene 2
- Button #4: Toggle Scene (Scene 0/Scene 1)
- Raise/Lower: Raise/Lower All Zones in Current Area[88]



WB3L-x
- Button #1: Scene 3
- Button #2: Scene 1
- Button #3: Scene 0



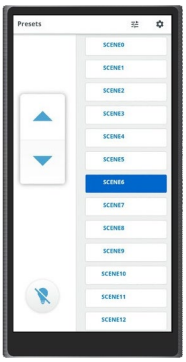
WB6S-x
- Button #1: Scene 3
- Button #2: Scene 1
- Button #3: Scene 2
- Button #4: Scene 4
- Button #5: Scene 5
- Button #6: Scene 0

[87] The LED may flash slowly two times (3 seconds ON, 3 seconds OFF) as the device pairs with the Wireless Area Controller.

[88] White tuning zones are automatically exempted from raise/lower 'ALL' zones to prevent inadvertent adjustment of the color temperature when adjusting light levels.

WaveLinx Touchscreen

WaveLinx Touchscreen



Features

- Multi-area scene selection, raise/lower, toggle ON/OFF control, and individual zone controls
- Low profile, single gang mounting
- Communicates via Ethernet connection

Power:
- PoE powered (IEEE802.3af)

Typical Applications

- Education, office, and other interior spaces

Models:

TSE57-WLX: 5.7" Touchscreen for WaveLinx

Mobile App Details:

- Not Applicable: Device is configured through the touchscreen, and does not use the Mobile App.

Icon Displayed in Mobile App:

- Not Applicable: Device is configured through the touchscreen, and does not use the Mobile App.

Programmable options:

- Specify area(s) for control
- Specify available scenes

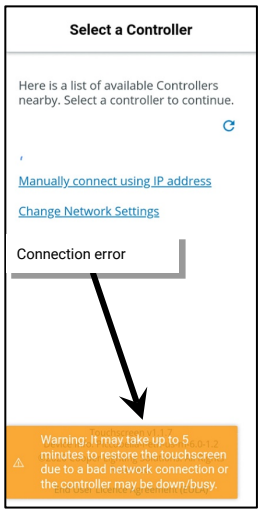
The WaveLinx Touchscreen can be used to manually operate wirelessly connected loads. Easily issue commands to scenes, raise/lower lighting levels and/or individual zone levels from the touchscreen display. The touchscreen automatically populates the screens based on the programming in the Wireless Area Controller.

Operation Details

- Once PoE connection is made, the touchscreen will illuminate to a configuration screen.
- The touchscreen will have no control functionality out-of-the-box and is not configured using the Mobile App.
- The touchscreen is configured for operation using the touchscreen display. See “Configuring the WaveLinx Touchscreen” on page 168 for configuration details.
- The touchscreen communicates with the Wireless Area Controller through an Ethernet connection.

Loss of Communications Operation

If communication is lost with Wireless Area Controller, the touchscreen will display a communications error that communications are down. The touchscreen will continue to try to re-establish communications until a successful connection is made.



Operation upon Return of Power

Once power is restored, the touchscreen will boot and attempt to reconnect to the previously connected Wireless Area Controller. Once the connection is made, the touchscreen will login with the previously defined user credentials and then will display either the areas list or the preset page of the favorite area if a favorite area has been defined.

Factory Reset Instructions

CAUTION: The factory reset will set the device back to factory settings removing Ethernet network configuration and all touchscreen settings.

- Navigate to the touchscreen’s ‘Settings’ screen, entering the passcode when prompted.
- Tap the ‘Factory Reset’ option.
- Tap the ‘Factory Reset’ link.
- Tap ‘Reset’ when prompted to confirm.

Configuration Details

This Device is not programmed through the WaveLinx Mobile App. Please see “Configuring the WaveLinx Touchscreen” on page 168 for instructions on configuring the Touchscreen for operation.

ISHH-01 Integrated Sensor Programming Remote

ISHH-01 Integrated Sensor Programming Remote

Typical Applications

- Activate Pairing Mode in supported WaveLinx Devices
- Activate Reverse Identification in supported WaveLinx Devices

Models:

ISHH-01: Integrated Sensor Programming Remote

Mobile App Details:

- Not Applicable. Device is not displayed in the Mobile App.

Icon Displayed in Mobile App:

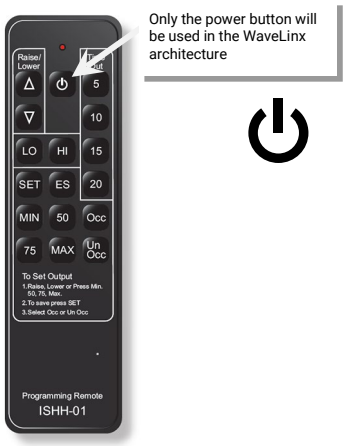
- Not Applicable: Device is not displayed in the Mobile App.

Place supported devices into pairing mode without the need to cycle power[89], or place devices into reverse identification mode using the ISHH-01 Integrated Sensor Remote Control. The use of the remote streamlines system setup, removing the need to cycle power to place supported devices in pairing mode and simplifying reverse identification activation.

Refer to the device reference sheet to determine of the device supports the use of the ISHH-01.

Only the power button ⏻ on the ISHH-01 remote will be used in the WaveLinx system.

- **If a supported device is not paired with a Wireless Area Controller**, press ⏻ to place the device into pairing mode.
- **If a supported device is paired with a Wireless Area Controller**, press ⏻ to place the device into reverse identification mode.



[89] Devices may require firmware update to activate pairing mode from the remote. Refer to the device reference sheet for that device type for further details.

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 and 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.

Warranties and Limitation of Liability

Please refer to **www.cooperlighting.com** for our terms and conditions.

Garanties et limitation de responsabilité

Veuillez consulter le site **www.cooperlighting.com** pour obtenir les conditions générales.

Garantías y Limitación de Responsabilidad

Visite **www.cooperlighting.com** para conocer nuestros términos y condiciones.

Cooper Lighting Solutions
1121 Highway 74 South
Peachtree City, GA 30269
P: 770-486-4800
www.cooperlighting.com
For service or technical assistance:
1-800-553-3879

Canada Sales
5925 McLaughlin Road
Mississauga, Ontario L5R 1B8
P: 905-501-3000
F: 905-501-3172

© 2021Cooper Lighting Solutions
All Rights Reserved
Printed in USA
Publication No. MN50345421
December 2021

Cooper Lighting Solutions is a registered trademark.

All other trademarks are property of their respective owners.

Product availability, specifications, and compliances are subject to change without notice.