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.

COOPER Lighting Solutions

WaveLinx User Manual - Table of contents

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.

Use this user manual to:

- Quickly bring the system online with default functionality and automatic code commissioning that meets or exceeds code requirements.
- Operate lighting from the WaveLinx Mobile Application's personal control option.
- Modify operation of automatic code commissioning to meet different operation requirements through adjustment of scenes, occupancy sensors, daylight sensors, schedule behavior, and demand response operation.
- Connect WaveLinx Touchscreens and define the area and scenes that are displayed.
- Perform administrator tasks to set the system time, date, and location, change usernames and passwords, backup and restore databases, update software and firmware, and perform advanced network connection functions.

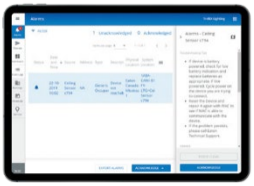
Becoming Familiar with WaveLinx System Components

The following devices may be used in a WaveLinx Wireless Connected Lighting System.

Trellix Core Pro

Trellix Core Enterprise

Trellix Applications

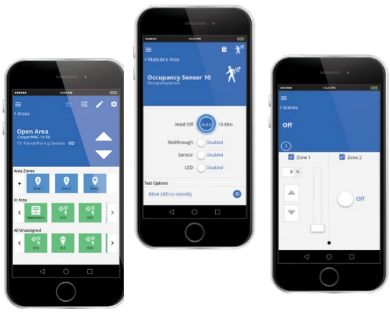


The Trellix Core and Trellix applications software are optional for sites that want to have enterprise-level functionality. This functionality includes data centralization from networked WaveLinx Wireless Area Controllers, alarms and events management, exposing the data from the Wireless Area Controllers to third party system via BACnet and Public API (REST), user management and system backup. The Trellix Core and Trellix applications software will not be discussed in this user guide. Refer to the specific materials for these products for further information.

Wireless Area Controller

The Wireless Area Controller (WAC) is the central communications coordinator for the WaveLinx system. A Wireless Area Controller can coordinate communication to up to 150 (100 best practice) devices within its wireless range. The Wireless Area Controller can operate as a standalone coordinator or may be connected to a building network with other Wireless Area Controllers to meet larger building requirements. Installed as a standalone system, the Wireless Area Controller uses its internal wireless Wi-Fi access point to communicate to the WaveLinx Mobile Application 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 Application.

WaveLinx Mobile Application



Use the WaveLinx Mobile Application to commission the WaveLinx Connected Lighting System. Once the system is operational, use the WaveLinx Mobile Application to personally control specific areas and zones in the facility, or to change the automatic code commissioning programmed behavior. The WaveLinx Mobile Application is available from the App Store or Google Play and is compatible with devices running on an iOS 11+ or Android 7+ operating system.

ANDROID APP ON Google play

Available on the App Store

WaveLinx Dimming Switchpack with 0-10V

WSP-MV-010

WSP-CA-010

Use the WaveLinx Dimming Switchpack with 0-10V to wirelessly control a zone of switched loads, 0-10V lighting loads, or for 0-10V control of tunable white lighting (WSP-MV-010 only). Each switchpack operates as a WaveLinx wireless router and endpoint. The switchpack is rated for control of LED or other electronic ballast loads of up to 16 amps and general purpose or receptacle loads of up to 20 amps. The WSP-MV-010 0-10V output sinks up to 120mA for support of approximately 60 ballasts/drivers (2mA each). The WSP-CA-010 0-10V output sinks up to 30mA for support of approximately 15 ballasts/drivers. The WSP-CA-010 model also supports connection to an external maintained contact closure as an easy interface to other systems, devices, or an external WaveLinx approved Greengate occupancy sensor (one sensor may be powered from the Switchpack). The WaveLinx relay switchpack adds power measurement capability for display in the Trellix Energy Dashboard.

WaveLinx Integrated Sensor

Cooper Lighting Solutions offers many options for luminaires pre-configured with a WaveLinx Integrated Sensor. The in-fixture sensor operates as a WaveLinx wireless communications router as well as an occupancy/vacancy sensor, closed loop daylight sensor, and can provide calculated energy information for display to the Trellix Energy Dashboard.

WaveLinx Industrial Integrated Sensor

The WaveLinx Industrial Integrated Sensor installs as an option into many Cooper Lighting Solutions industrial light fixtures. The fixture mounted sensor operates as a WaveLinx wireless communications router as well as an occupancy / vacancy sensor and closed loop daylight sensor. Different models allow for low bay mounting heights of 7-15 feet (2.1 – 4.5m) or high bay mounting heights of 15-40 feet (4.5 – 12.2m). The WaveLinx Industrial Integrated Sensor offers calculated energy usage information to the Trellix Energy Dashboard

WaveLinx Outdoor Integrated Sensor

The WaveLinx Outdoor Integrated Sensor installs as an option into many Cooper Lighting Solutions outdoor light fixtures. The fixture mounted sensor operates as a WaveLinx wireless communications router as well as an occupancy / vacancy sensor and closed loop daylight sensor. Different models allow for low mounting heights of 7-15 feet (2.1 – 4.5m) or high mounting heights of 15-40 feet (4.5 – 12.2m). The WaveLinx Outdoor Integrated Sensor offers calculated energy usage information to the Trellix Energy Dashboard.

WaveLinx Tilemount Sensor Kit

The WaveLinx Tilemount Sensor Kit paired with a control module offers wireless sensing functionality to connected 0-10V lighting loads. Like the Integrated Sensor, the Tilemounted sensor operates as a WaveLinx wireless communications router, provides occupancy / vacancy sensing, and provides closed loop daylight sensor within the WaveLinx Mobile Application. The WaveLinx Tilemount daylight sensor adds calculated energy usage information for display to the Trellix Energy Dashboard.

WaveLinx Wireless Fixtures

Cooper Lighting Solutions offers options to order luminaires pre-configured with wireless radios without integrated sensors. The WaveLinx Wireless Fixture operates as a wireless communications router and is capable of responding to other WaveLinx devices or Mobile Application commands. WaveLinx wireless fixtures offer calculated energy usage information to the Trellix Energy Dashboard.

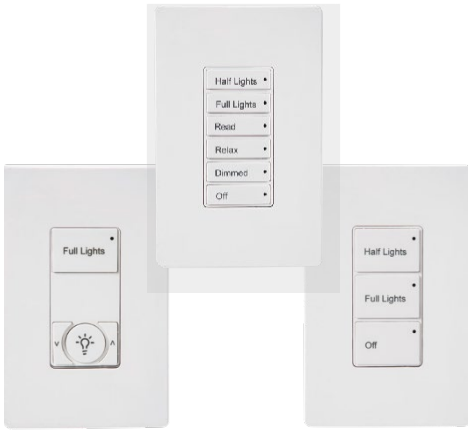
WaveLinx Ceiling Sensor

Use the WaveLinx Ceiling Sensor to add additional occupancy/ vacancy sensor functionality or to add open loop daylighting capability to the WaveLinx system. Each ceiling sensor operates as a WaveLinx wireless endpoint. The ceiling sensor uses passive infrared technology for occupancy/vacancy sensing. The ceiling sensor also contains a daylight sensor capable of controlling multiple lighting zones in an open loop daylighting application. The WaveLinx Ceiling Sensor is battery powered, mounting easily where needed.

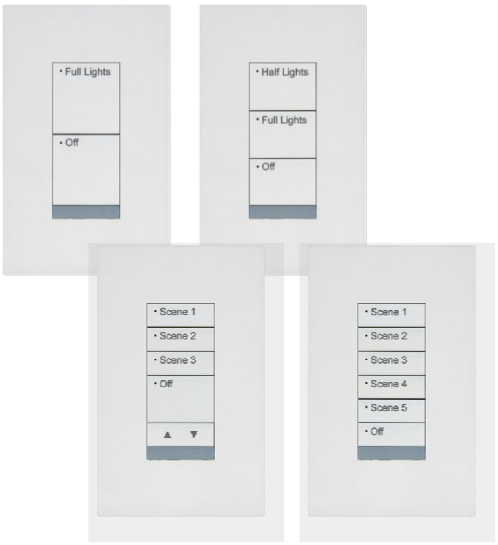
WaveLinx Wireless Outdoor Lighting Control Module

The WaveLinx Wireless Outdoor Lighting Control Module (WOLC) offers control of outdoor luminaires from the WaveLinx system or to add basic open loop daylighting to OFF capability to outdoor applications. Fixtures equipped with the wireless outdoor lighting control module and connection receptacle allow for ON/OFF and/or 0-10V dimming control from the onboard open loop daylight sensor as well as schedules and other WaveLinx system devices. The wireless outdoor lighting control module offers calculated energy usage information to the Trellix Energy Dashboard

WaveLinx Wallstation (standard line voltage powered)

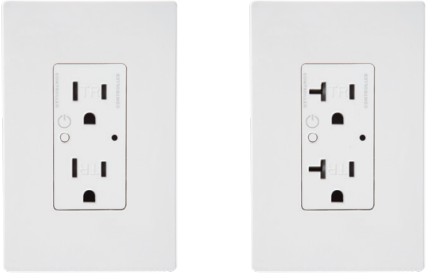


WaveLinx Battery Powered Wallstation



Use the WaveLinx Wallstations to manually operate wirelessly connected loads. Models include standard WaveLinx Wallstations that connected to line voltage power (neutral required) and WaveLinx Battery Powered Stations that simplify retrofit installations. Operation includes button configuration support for scene selection, scene raise/lower, zone level, zone raise/lower, and scene and zone toggle capability. Other supported functions for special applications include hold/release occupied and save scene capability.

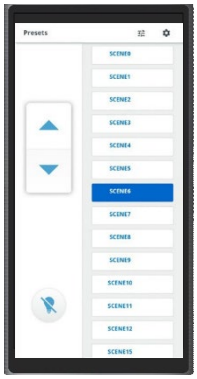
WaveLinx Receptacle



WR-15 WR-20

Use the WaveLinx Receptacle to simplify plug load control requirements. Each receptacle operates as a WaveLinx wireless communication router. The duplex receptacle provides a constantly powered bottom outlet and a wirelessly controlled top outlet that operates with other WaveLinx controls. The WaveLinx Receptacle adds calculated energy usage information to the Trellix Energy Dashboard.

WaveLinx Touchscreen



The WaveLinx Touchscreen connects to the WaveLinx system via the building LAN. The 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. Additional configuration through the touchscreen display allows customization of the areas and scene/preset commands that are shown on the screen.

Bringing the System Online

The WaveLinx Connected Lighting System configures quickly to allow immediate energy savings. Use the steps in this section to:

- Part 1: Register the WaveLinx Mobile Application (requires an internet connection)
- Part 2: Confirm that installed devices are ready for configuration
- Part 3: Complete initial construction grouping to prepare for Mobile Application use
- Part 4: Initiate communications with the WaveLinx Mobile Application
- Part 5: Organize devices into controlled areas and zones for automatic code commissioning operation

Part 1: Register the WaveLinx Mobile Application

The WaveLinx Mobile Application is used to organize and program WaveLinx devices. **An internet connection is required for the initial registration of the WaveLinx Mobile Application**. After registration, the application will remain logged in and can then be used without an external internet connection as long as the user does not log out of the application. Once registered, the WaveLinx Mobile Application can connect with any WaveLinx system.

To register the WaveLinx Mobile Application:

1: Download the latest version of the WaveLinx Mobile Application from Google Play™ or the App Store® and install it on a smartphone or tablet. The WaveLinx Mobile Application is compatible with devices running iOS 11+ or Android™ 7+ operating systems.

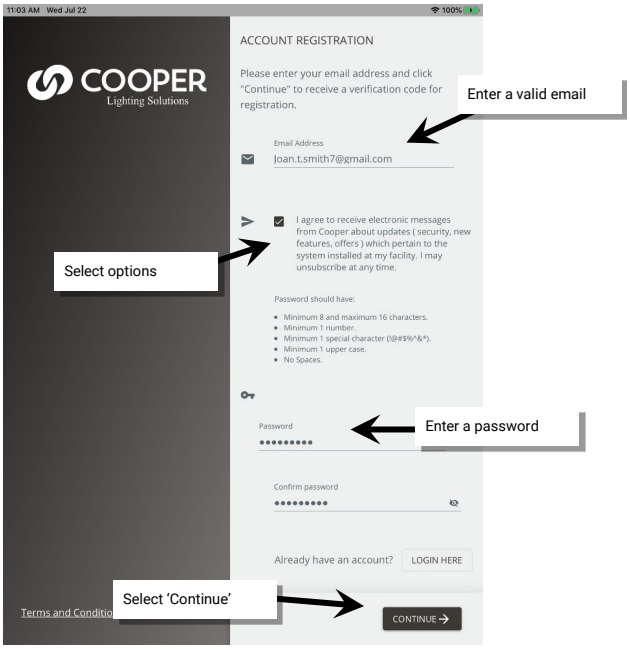
ANDROID APP ON Google play

Available on the App Store

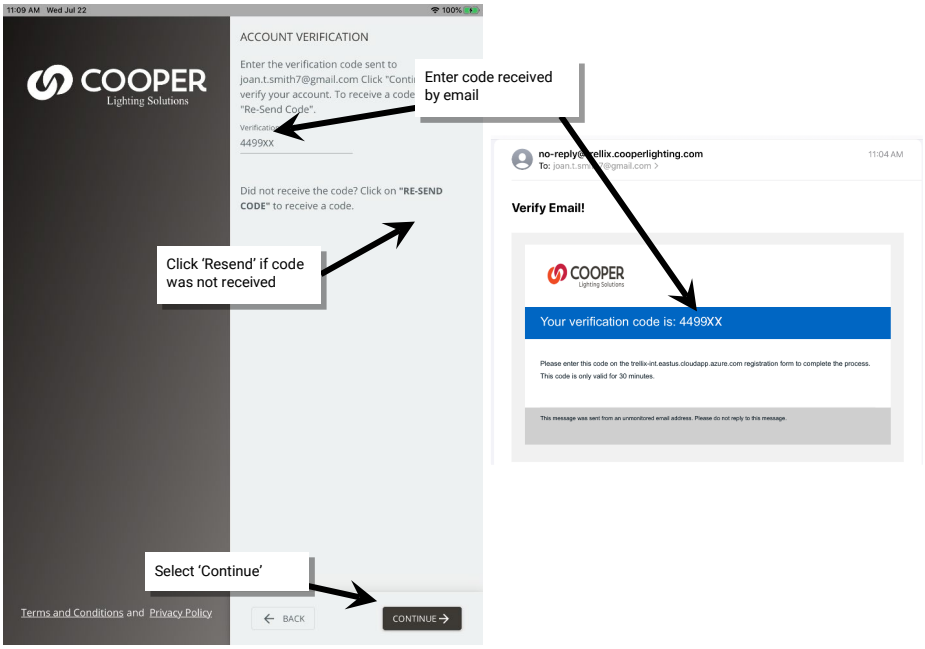
2: Tap on the WaveLinx App icon to launch the WaveLinx Mobile Application.

3: When prompted to login, select the option to register.

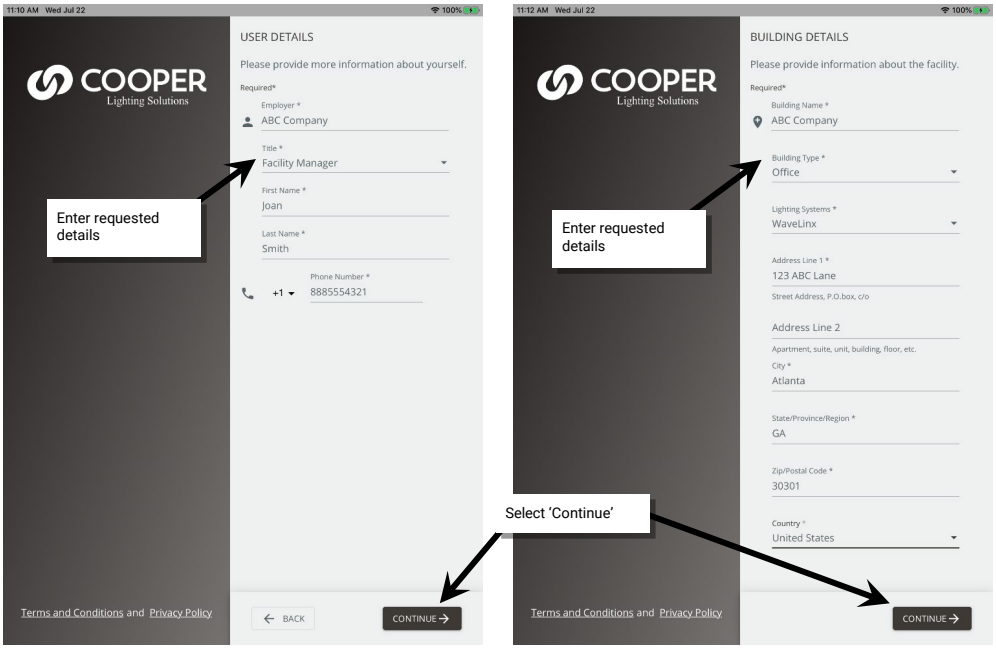
4: Enter a valid email address and password, and then select options for electronic messages. Tap ‘Continue’.



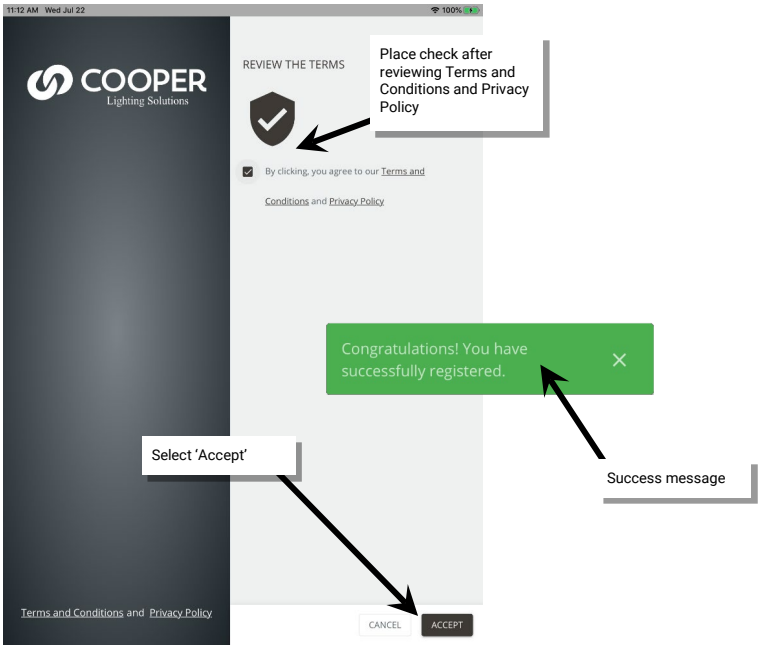
5: An email verification code will be sent to the email address entered. If not received, click ‘Resend Code’ to send it again. Make sure to check the email spam folder if the code is not received. Enter the provided code, and then tap ‘Continue’.



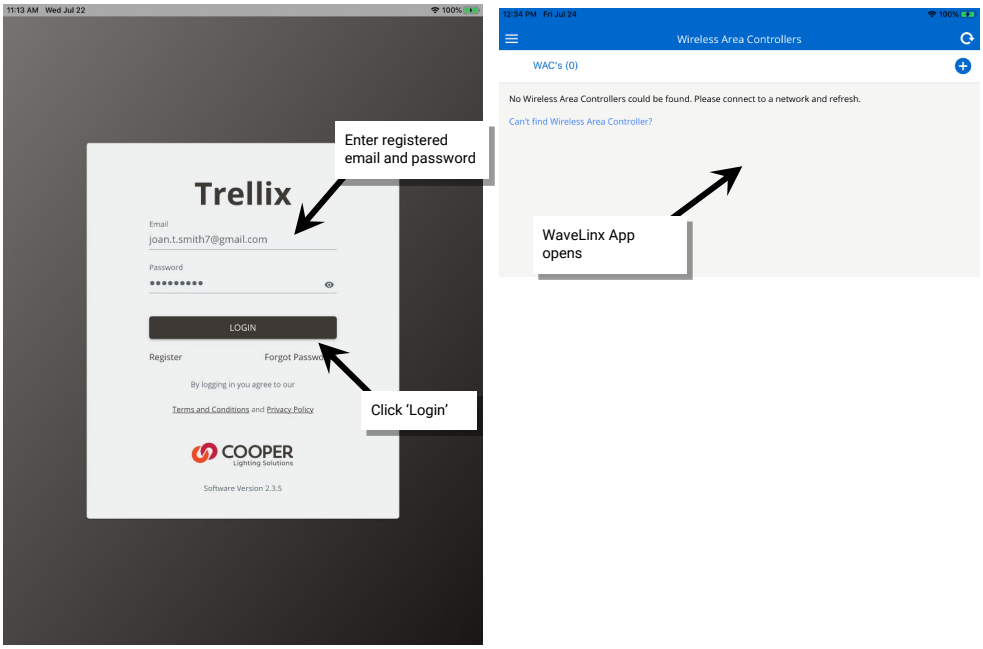
6: Enter the requested details for the person that the Mobile Application will be registered to, clicking ‘Continue’ to advance the screen.



7: After reviewing the Terms and Conditions and Privacy Policy, tap the checkbox to agree, and then tap ‘accept’ to finish registration. A confirmation of registration will appear.



8: At the login screen, enter the email address and password used for registration and then tap ‘Login’ to open the WaveLinx Mobile Application.



The application is now registered and ready for use with the WaveLinx Connected Lighting System. The app will remain logged in, even if closed unless a logout is processed.

Note: To manage the registered account or to obtain firmware updates, use a web browser to login to trellix.cooperlighting.com entering the email address and password registered through the WaveLinx Mobile Application.

Mobile Application Logout

Once logged in to the Mobile Application, it is not necessary to log out. The WaveLinx Mobile Application can be used without need of an external internet connection as long as it remains logged in. If an App logout is processed, an internet connection will be required to log back in.

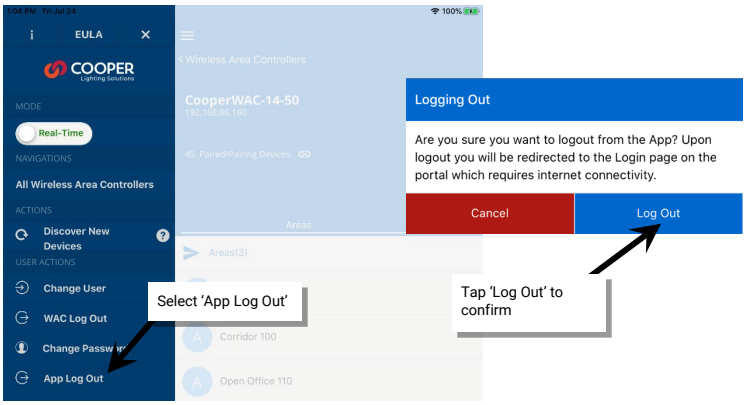
WARNING: If an App logout is processed, an internet connection will be required to log back in.

To log out of the mobile application:

1: Tap the ‘menu’ button.

2: Select ‘App Log Out’.

3: Confirm by tapping the ‘Log Out’ button.



To use the WaveLinx Mobile Application again, login as the registered user (requires an internet connection).

Note: Selecting ‘WAC Log Out’ will not have an effect on the log-in status of the Mobile Application. It simply closes the connection to the current Wireless Area Controller.

Part 2: Confirming Device Installation

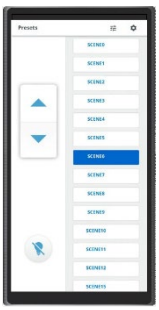
Before configuring devices, ensure that they are ready by verifying installed operation.

Device	Default LED Functionality	Operational Functionality Out-of-the-Box
Wireless Area Controller 	After a 1-minute power up period: • Blue power LED on top of unit should illuminate and remain ON. • 802.15.4 LED: Blue LED should illuminate and remain ON. **Note**: The green LAN LED may also be illuminated if the controller is connected to a building LAN with a DHCP server. Other LEDs should be OFF.	Not applicable for this device.
WaveLinx Wireless Dimming Switchpack (WSP-MV-010: 120-277VAC model) 	The white LED on this wireless Dimming Switchpack model illuminates to indicate the load is ON. If the onboard commissioning push button is pressed for less than 4 seconds, the LED and attached load will toggle state.	• Connected loads will turn ON and 0-10V dimmable loads will go to 75% once power is applied. • Load remains ON at 75% unless commissioning push button is used for manual override. • 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).
WaveLinx Wireless Dimming Switchpack (WSP-CA-010: 120-347VAC model) 	Not applicable. This wireless Dimming Switchpack model has no onboard LED indicators.	• Connected loads will turn ON and remain ON with dimmable loads at a 100% level. • If optional contact closure is connected, the contact closure will not function until it is configured using the WaveLinx Mobile App.
WaveLinx Integrated Sensor 	LED in sensor window should blink green with motion detection. The green LED color indicates that the Integrated Sensor has not yet been paired with a Wireless Area Controller. **Note**: If the LED blinks white, this indicates that the sensor has been previously paired with a Wireless Area Controller. See page 195 for information on resetting the pairing.	Fixture operates via the onboard occupancy sensor. • Occupancy turns fixture ON to 75%. • Fixture will turn OFF within 20 minutes when space is vacant. **Note**: Daylighting is disabled until the fixture is assigned to an area using the WaveLinx Mobile Application.
WaveLinx Industrial Integrated Sensor 	LED in sensor window should blink green with motion detection. The green LED color indicates that the Integrated Sensor has not yet been paired with a Wireless Area Controller. **Note**: If the LED blinks white, this indicates that the sensor has been previously paired with a Wireless Area Controller. See page 195 for information on resetting the pairing.	Fixture operates via the onboard occupancy sensor. • Occupancy turns fixture ON to 100% • Fixture will dim to 10% within 20 minutes when space is vacant **Note**: Daylighting is disabled until the fixture is assigned to an area using the WaveLinx Mobile Application.

Device	Default LED Functionality	Operational Functionality Out-of-the-Box

WaveLinx Outdoor Integrated Sensor
 
	LED in sensor window should blink green with motion detection. The green LED color indicates that the Integrated Sensor has not yet been paired with a Wireless Area Controller.
	Note: If the LED blinks white, this indicates that the sensor has been previously paired with a Wireless Area Controller. See page 195 for information on resetting the pairing.
		Fixture operates via the onboard daylight and occupancy sensors.
		• ON at dusk / OFF at dawn
		• 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.

WaveLinx Tilemount Sensor Kit 	LED in sensor window should blink green with motion detection. The green LED color indicates that the Integrated Sensor has not yet been paired with a Wireless Area Controller. **Note**: If the LED blinks white, this indicates that the sensor has been previously paired with a Wireless Area Controller. See page 195 for information on resetting the pairing.	Fixture operates via the onboard occupancy sensor which can later be disabled during configuration. • Occupancy turns connected 0-10V dimmable fixture ON to 75%. • Fixture will turn OFF within 20 minutes when space is vacant. **Note**: Daylighting is disabled until the fixture is assigned to an area using the WaveLinx Mobile Application.
WaveLinx Wireless Fixtures 	Not applicable. The WaveLinx Wireless Fixture has no onboard LED indicators.	Upon initial power-up, fixture turns ON and remains ON at a 100% light level.
WaveLinx Ceiling Sensor 	LED may flash red once approximately every 10 seconds indicating that the unit is powered.	This device does not have out-of-the-box functionality and will not operate until it is successfully paired with a Wireless Area Controller.
WaveLinx Wireless Outdoor Lighting Control Module 	Not applicable. The WaveLinx Wireless Outdoor Lighting Control Module has no onboard LED indicators.	Fixture turns ON to 100% upon power up and then after a short evaluation period begins operation from the onboard daylight sensor. The fixture will then switch ON at dusk or OFF at dawn based on the daylight sensor and availability of daylight until the device is paired with the Wireless Area Controller.

Device	Default LED Functionality	Operational Functionality Out-of-the-Box
WaveLinx Wallstation 	If a button is pressed, the LED on that button will flash slowly for approximately 10 seconds and then stop.	This device does not have out-of-the-box functionality until it is successfully paired with a Wireless Area Controller.
WaveLinx Battery Powered Wallstation 	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 WAC.	This device does not have out-of-the-box functionality and will not operate until it is successfully paired with a Wireless Area Controller.
WaveLinx Receptacle 	Green LED on controlled outlet illuminates indicating that the controlled outlet is powered. If the onboard manual push button is pressed, the LED and controlled outlet will toggle state.	The controlled and uncontrolled outlets will turn ON once power is applied. Manual push button operation toggles controlled outlet between ON and OFF state.
WaveLinx Touchscreen 	Not applicable	Not applicable. Refer to “Configuring the WaveLinx Touchscreen” on page 137 for device specific instructions.

Quick Links for Common Questions

- One or more of my devices does not display the correct out-of-the-box functionality. What should I do? See the answer on page 192.

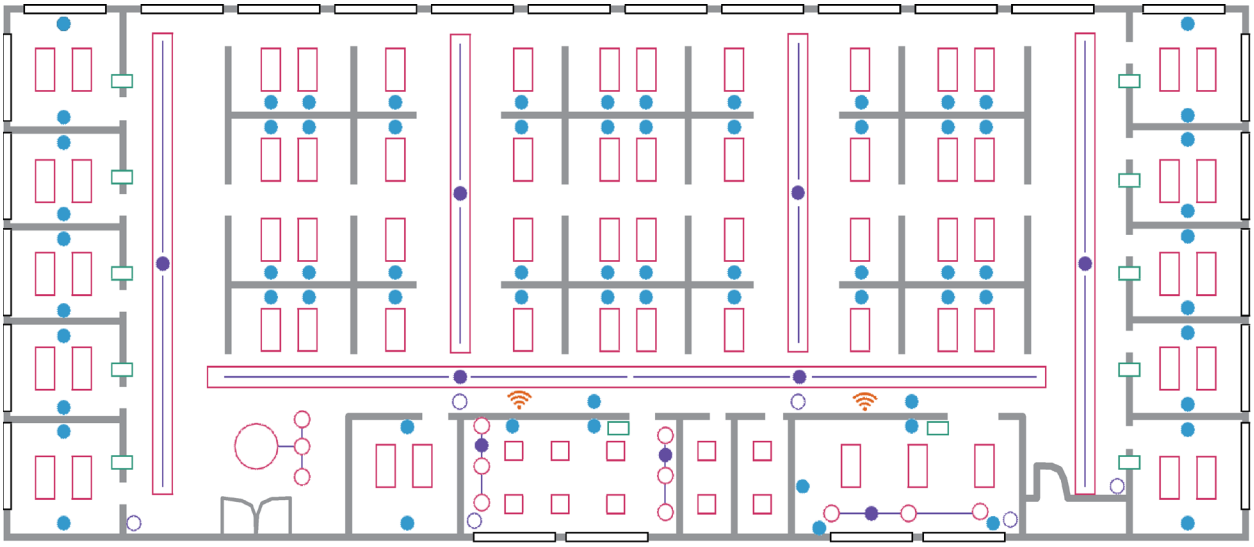
Part 3: Completing the Initial Construction Grouping

This section walks through the process to pair devices with the Wireless Area Controller. It also discusses the basic use of the Mobile Application to place the Wireless Area Controller in pairing mode and the expected behavior of devices once they are paired with the Wireless Area Controller.

Pairing Devices to the Wireless Area Controller

Once the device installation and electrical connections are confirmed, use the following steps to complete the initial construction grouping. The construction grouping process pairs devices with the Wireless Area Controller, forms one large default control group for basic operation during construction and prepares devices for configuration from the WaveLinx Mobile Application.

1: On the site floorplan, locate the WaveLinx Wireless Area Controller and identify the WaveLinx devices that should be paired to it. Sites designed to use multiple Wireless Area Controllers should identify the devices that belong to each controller so that they can be correctly paired with the appropriate Wireless Area Controller according to the design plan.



2: Identify the circuit breakers supplying power to each of the WaveLinx devices that will be paired with the first Wireless Area Controller. This includes circuits that power fixtures with WaveLinx Integrated Sensors, WaveLinx Wireless Fixtures, fixtures connected to WaveLinx Tilemount Sensors, fixtures with Wireless Outdoor Lighting Control Modules, lighting connected to WaveLinx wireless Dimming Switchpacks (including the power circuits connected to Dimming Switchpacks performing white tuning) as well as circuits connected to WaveLinx Receptacles and Wallstations.

Panel	Voltage	Phase	Wires	Mains
100 A	277 V / 480 V	Three Phase	4 Wires	100 A

Mount	Enclosure	Location
Surface	--	Mechanical 120

Load Name	Trip	Poles	Ckt. No.	A	B	C	Ckt. No.	Poles	Trip	Load Name
Lighting Open 101	20 A	1	1	512 VA / 192 VA			2	1	20 A	Lighting Office 110
Lighting Open 101	20 A	1	3		1856 VA / 192 VA		4	1	20 A	Lighting Office 111
Lighting Office 102	20 A	1	5			192 VA / 192 VA	6	1	20 A	Lighting Office 112
Lighting Office 103	20 A	1	7	192 VA / 192 VA			8	1	20 A	Lighting Office 113
Lighting Office 104	20 A	1	9		192 VA / 128 VA		10	1	20 A	Lighting Stairwell 130
Lighting Office 105	20 A	1	11			128 VA / 192 VA	12	1	20 A	Lighting Women 150
Lighting Office 106	20 A	1	13	128 VA / 192 VA			14	1	20 A	Lighting Men 140
Lighting Office 107	20 A	1	15		192 VA / 0 VA		16			
Lighting Office 108	20 A	1	17			128 VA / 0 VA	18			

Phase A	Phase B	Phase C	Total VA
1408 VA	2560 VA	832 VA	4800 VA

Mfg. / Type	Modifications	Amps RMS. Sym.
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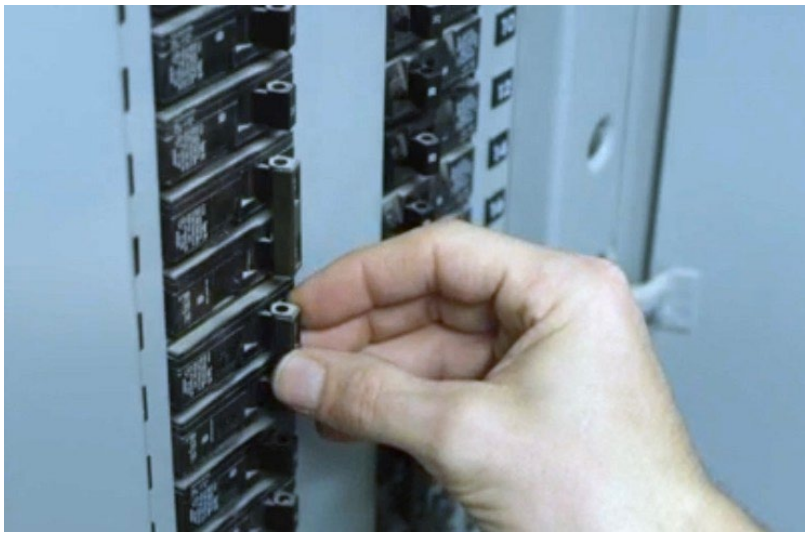
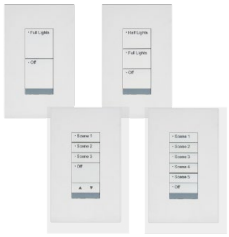
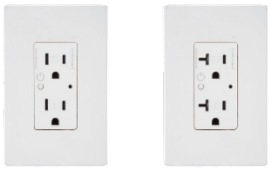
3: Press and release (1 second press) the PAIR button located on the rear panel of the Wireless Area Controller. The blue 802.15.4 LED on the Wireless Area Controller will blink at a rate of one blink per second to indicate the Wireless Area Controller is in pairing mode. The Wireless Area Controller pairing mode automatically times-out after 60 minutes or can be manually exited by pressing and releasing (1 second press) the PAIR button again.

4: Place devices into pairing mode. See the below chart for information on how to place specific devices in pairing mode:

Device Type	How to place in pairing mode
WaveLinx Wireless Dimming Switchpack (WSP-MV-010: 120-277VAC model)  WaveLinx Integrated Sensor  WaveLinx Tilemount Sensor Kit  WaveLinx Industrial Integrated Sensor  WaveLinx Outdoor Integrated Sensor  WaveLinx Wireless Fixture 	Cycle the power (switch OFF and then ON) of each identified circuit using the circuit breakers. This places the devices into pairing mode and starts their search for a Wireless Area Controller. Pairing mode automatically times-out after 60 minutes if a device does not successfully pair with a Wireless Area Controller. Only unpaired devices will enter pairing mode on the power cycle.  **Note**: Standard WaveLinx Wallstations (line voltage powered) will also respond to this pairing technique.

Device Type	How to place in pairing mode
WaveLinx Wireless Outdoor Lighting Control Module  WaveLinx Wireless Dimming Switchpack (WSP-CA-010: 120-347VAC model) 	If in an unpaired state, these devices will automatically pair when they receive the Wireless Area Controller PAIR mode signal. The search command re-initiates every 20 minutes until a pair forms. A power cycle to these devices will cause the search to start again approximately 20 seconds after the initial power up. If connected to control lighting, connected fixtures will dim briefly when paired then turn ON to a brighter light level and remain ON. It may be difficult to review paired behavior during the initial pairing cycle. Pairing can be verified after PAIR mode exits (see chart that follows this section). If used only for a contact input device, there is no immediate feedback that the pairing was successful. Pairing will be verified through the Mobile Application in a later step.
WaveLinx Wallstation  WaveLinx Battery Powered Wallstation 	**Note**: When pairing battery powered devices, ensure that line powered devices are paired first. Paired line powered devices are required to 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. Press any button on the Wallstation to initiate a PAIR request from any unpaired wallstation. • On the standard WaveLinx Wallstation (line voltage powered), the LED on the button pressed should flash slowly for approximately 10 seconds. • On the WaveLinx Battery Powered Wallstation, the red LED below the buttons may flash briefly when the proximity sensor detects someone near and may flash intermittently during the pairing process. No other feedback from button LEDs will occur.
WaveLinx Ceiling Sensor 	**Note**: When pairing battery powered devices, ensure that line powered devices are paired first. Paired line powered devices are required to 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. Within the 60-minute pairing period, use one of the following methods to place each of the Occupancy Sensors into PAIR mode. • (Preferred method) Press the wireless PAIR button onboard the sensor to initiate the pair process. • Shine a bright flashlight into the lens of each battery powered ceiling sensor to place the sensor into PAIR mode. • Motion activity may also trigger the sensor into PAIR mode although this method is less reliable. The LED in the sensor window will flash ON and OFF for 10 seconds to indicate it is in pairing mode before going back to its normal blink pattern.
WaveLinx Receptacle 	Within the 60-minute pairing period, at each receptacle location, press and hold down the manual push button for 5 seconds and then release the push button when the LED starts flashing red. **Note**: The LED may flash red or cycle between green and amber during the pairing process.

Note: During the 60-minute pairing period, devices may exhibit paired behavior. It is possible to confirm successful WaveLinx device pairing by verifying that each device's exhibits this behavior. It is also possible to confirm pairing after the pairing process is complete. Refer to the chart below to see a device's expected behavior during initial pairing.

Device	Successfully Paired Behavior (during initial pairing)
WaveLinx Wireless Dimming Switchpack (WSP-MV-010: 120-277VAC model)	Connected 0-10V dimmable fixtures dim to 10%. If connected for white tuning, attached fixtures will assume a warm white color temperature. (Actual color temperature is dependent on the color temperature range of attached load).
WaveLinx Wireless Dimming Switchpack (WSP-CA-010: 120-347VAC model)	Fixture dims briefly when paired then turns ON to a brighter light level and remains ON. It may be difficult to review paired behavior during the initial pairing cycle. Pairing can be verified after PAIR mode exits (see chart that follows this section).
WaveLinx Integrated Sensor	Fixture dims to 10%. LED in sensor window should blink WHITE with motion detection.
WaveLinx Industrial Integrated Sensor	Fixture dims to 10%. LED in sensor window should blink WHITE with motion detection.
WaveLinx Outdoor Integrated Sensor	Fixture dims to 10%. LED in sensor window should blink WHITE with motion detection.
WaveLinx Tilemounted Sensor	Connected 0-10V dimmable fixtures dim to 10%. LED in sensor window should blink WHITE with motion detection
WaveLinx Wireless Fixture	Fixture dims to 10%.
WaveLinx Ceiling Sensor	There is no immediate feedback that pairing was successful. Pairing will be verified through the Mobile Application in a later step.
WaveLinx Wireless Outdoor Lighting Control Module	Fixture dims briefly when paired then turns ON to a brighter light level and remains ON. It may be difficult to review paired behavior during the initial pairing cycle. Pairing can be verified after PAIR mode exits (see chart that follows this section.)
WaveLinx Wallstation standard line voltage powered	Once successfully paired, all button LEDs will flash in a top to bottom the bottom to top pattern until pairing mode is exited.
WaveLinx Battery Powered Wallstation	There is no immediate feedback that pairing was successful. Pairing will be verified through the Mobile Application in a later step.
WaveLinx Receptacle	During pairing, the outlet LED may flash red or may flash green to amber. The outlet may turn OFF for a period of time and then turn back ON. The duration of the OFF period may vary but should not last longer than 5 minutes. It may be difficult to review paired behavior during the initial pairing cycle. Pairing can be verified after PAIR mode exits (see chart that follows this section).

5: Either allow the pairing mode's 60-minute automatic time-out period to expire, or if all devices appear to have paired successfully, manually cancel pairing mode. To manually cancel pairing mode, if the Wireless Area Controller's blue 802.15.4 LED is still flashing, press and release the PAIR button (1 second press) to exit pairing mode. (If PAIR mode has already exited automatically, the blue 802.15.4 LED will be ON continuously.)

6: If not confirmed during the initial pairing process, verify devices paired with the Wireless Area Controller successfully. The chart below describes how to verify that items have paired after exiting the initial pairing mode. All devices in the default construction area should exhibit the behavior shown below

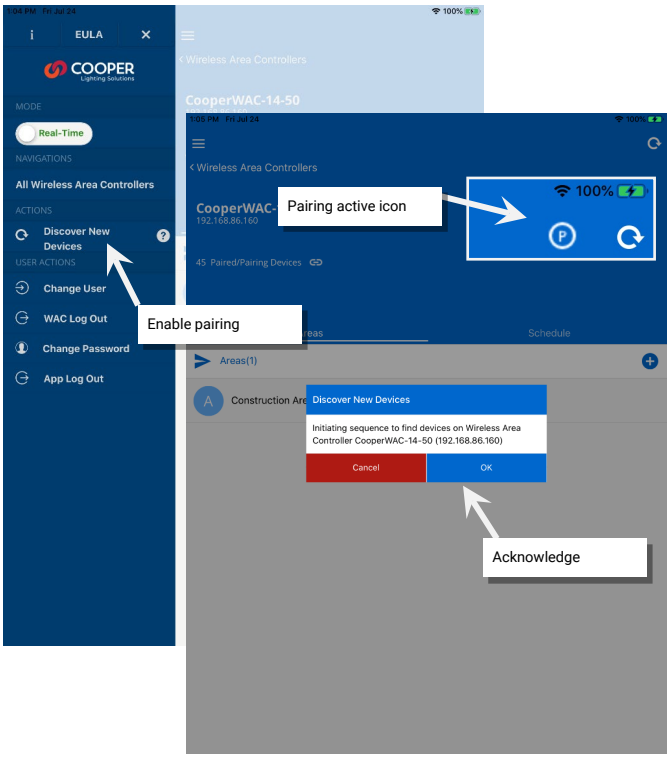
Device	Method 1: Press the PAIR mode button on the Wireless Area Controller to place the controller in PAIR mode again.	Method 2: Verify by method described below
WaveLinx Wireless Dimming Switchpack (WSP-MV-010: 120-277VAC model)	Paired device behavior: Connected 0-10V dimmable fixtures dim to 10%. If connected for white tuning, fixtures will assume a warm white color temperature. (Actual color temperature is dependent on the color temperature range of attached load).	

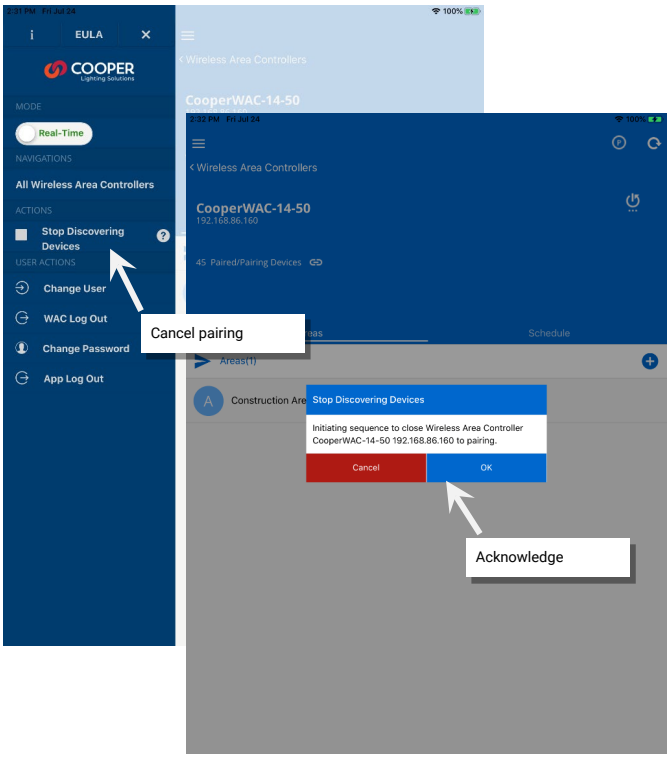
Device	Method 1: Press the PAIR mode button on the Wireless Area Controller to place the controller in PAIR mode again.	Method 2: Verify by method described below
WaveLinx Wireless Dimming Switchpack (WSP-CA-010: 120-347VAC model)	Paired device behavior: If connected to control lighting, the connected 0-10V dimmable fixtures dim to 10%. If used only for a contact input device, there is no visual feedback that pairing is successful.	
WaveLinx Integrated Sensor	Paired device behavior: Fixture dims to 10%. LED in sensor window should blink WHITE with motion detection.	
WaveLinx Industrial Integrated Sensor	Paired device behavior: Fixture dims to 10%. LED in sensor window should blink WHITE with motion detection.	
WaveLinx Outdoor Integrated Sensor	Paired device behavior: Fixture dims to 10%. LED in sensor window should blink WHITE with motion detection.	
WaveLinx Tilemounted Sensor	Paired device behavior: Connected 0-10V dimmable fixtures dim to 10%. LED in sensor window should blink WHITE with motion detection.	
WaveLinx Wireless Fixture	Paired device behavior: Fixture dims to 10%.	
WaveLinx Ceiling Sensor	Not applicable for this device.	Not applicable for this device.
WaveLinx Wireless Outdoor Lighting Control Module	Paired device behavior: Fixture dims to 10%.	
WaveLinx Wallstation standard line voltage powered	Paired device behavior: All button LEDs will flash in a top to bottom the bottom to top pattern until pairing mode is exited.	
WaveLinx Battery Powered Wallstation	Paired device behavior: There is no immediate feedback that pairing was successful. Refer to method 2.	Ensure that the Wireless Area Controller is not in pairing mode. Then, press any button on the wallstation. All lighting and receptacles paired with the Wireless Area Controller and still in the default construction area will respond to the command.
WaveLinx Receptacle	Paired device behavior: All paired receptacles still in the default construction area will turn OFF for 5 minutes. After 5 minutes, the receptacles will turn back ON. If there are too many receptacles to review in the 5-minute period, see alternate method 2.	Ensure that the Wireless Area Controller is not in pairing mode. Then, press the manual push button on the receptacle (1 second press) to toggle the controlled outlet. A successfully paired receptacle still in the default construction area will flash its LED either between red/OFF, or green/amber for a period of approximately 15 seconds.

7: Repeat the procedures in this section for each Wireless Area Controller in the facility.

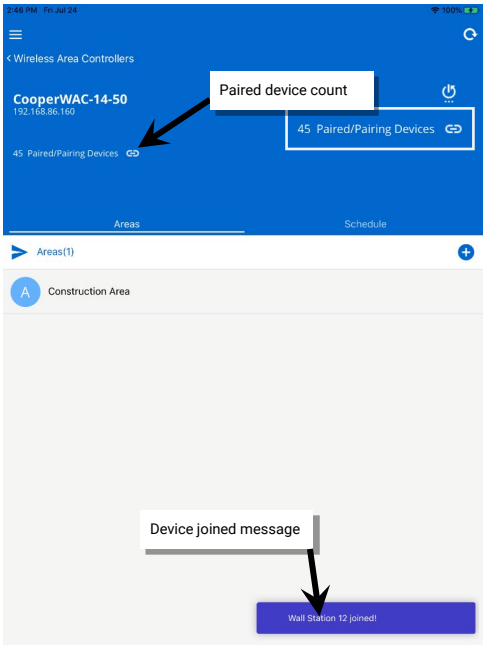
Using the Mobile Application to Pair Devices

The WaveLinx Mobile Application may be used in the pairing process as an alternative to pressing the PAIR button on the Wireless Area Controller. Log in as the administrator user and open the menu to select the option to discover new devices, acknowledging the message that appears. A pairing icon will appear at the top of the screen to indicate that they system is in pairing mode. Once pairing is complete, access the menu and select the option to stop discovering devices to end pairing mode or allow it to time out automatically.

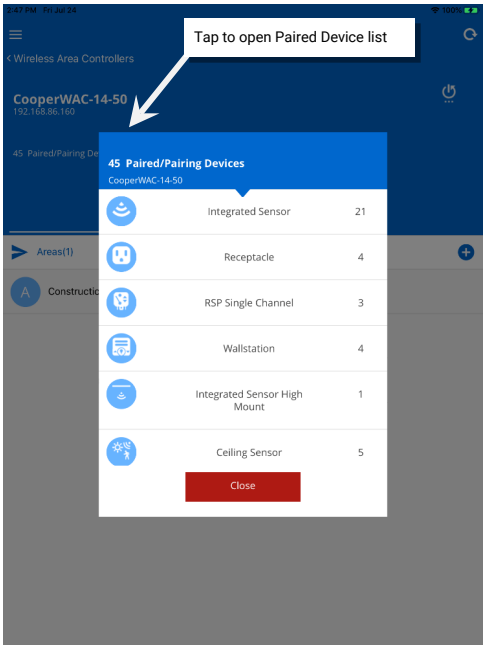




During the pairing process, as devices join, a message may be briefly displayed on the screen. The Mobile Application will also display a device count of how many devices are paired with the Wireless Area Controller.



Tap on the device count to open a link that shows a paired device list organized by device type. Scroll down to view more items within this window.



Operation of Devices within the Construction Grouping

- Once construction group pairing is complete, all paired devices will operate as one large area or room.
- Any wallstation in the group will operate all the paired lighting (standard ambient, industrial, and outdoor Integrated Sensors, Tilemount sensors, WaveLinx wireless fixture, wireless dimming switchpacks, wireless outdoor lighting control modules, and receptacles per the default scenes and programming.
- All occupancy sensors work together. Any occupancy sensor sensing motion will turn the entire group ON (default level) and will keep loads ON until no occupancy is detected throughout the entire area. Once occupancy ceases, after 20 minutes, controlled loads will turn OFF.
- Daylight dimming is disabled for all devices in the construction group. This includes interior and exterior devices.
- Contact closure devices connected to WaveLinx Wireless Dimming Switchpacks will not function until programmed in the WaveLinx Mobile Application.

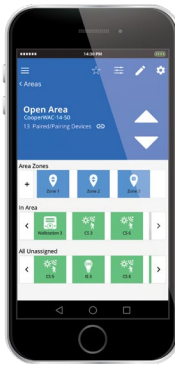
Quick Links for Common Questions

- Pairing mode timed out before I was done adding my battery powered ceiling sensors or before I confirmed my devices paired properly. What should I do? See the answer on page 195.
- One or more of my devices did not pair. What should I do? See the answer on page 195.
- I have more than one Wireless Area Controller in my facility. A device or multiple devices paired with the wrong controller. How do I resolve this? See the answer on page 195.
- My device is showing paired behavior, but it is not paired with the correct controller. I am unable to find what controller it has paired with. How do I remove its pairing to start over? See the answer on page 195.
- I installed a new device after I completed the initial construction pairing. How do I pair the new device into the existing group? See the answer on page 198.
- A device was not powered during the pairing process and did not successfully pair with the Wireless Area Controller. How do I get it to join the construction group? See the answer on page 198.
- What will my devices do if they lose communication with the Wireless Area Controller? See the answer on page 201.

Part 4: Connecting to the Mobile Application as the Administrator User

Once construction grouping is complete, the WaveLinx Mobile Application will be used to administer the system. This section describes how an administrator user connects to the Wireless Area Controller from the WaveLinx Mobile Application and gives a basic overview of the Mobile Application.

Logging into the Mobile Application as the Administrator User

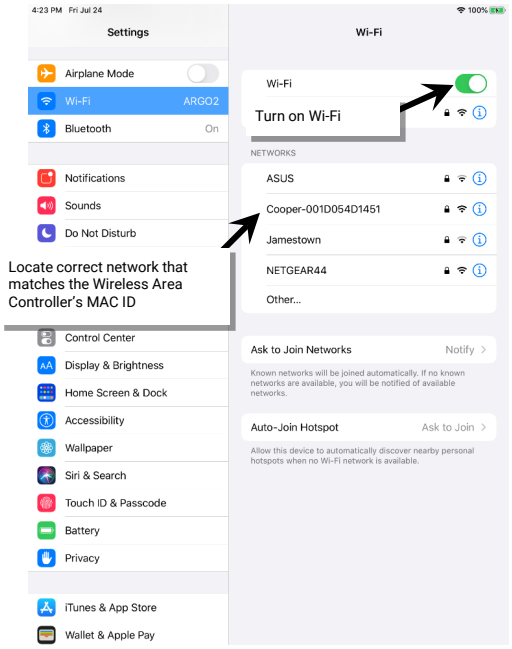


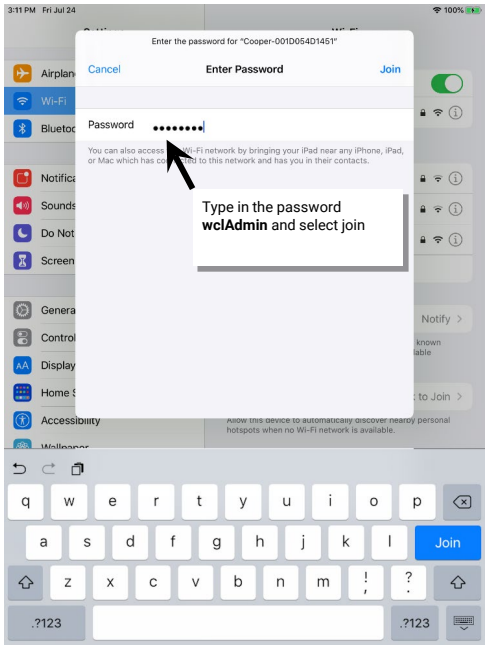
The procedures in this section assume that the Wireless Area Controller is powered up, is still in its factory default state for network settings and is not connected to the facility's network. Refer to the site's network administrator for access details if the default settings or network configuration have been modified.

Note: For security purposes, change the default password. Users should set a complex password when changing passwords. See "Modifying Existing User Accounts and Passwords" on page 165 for this procedure.

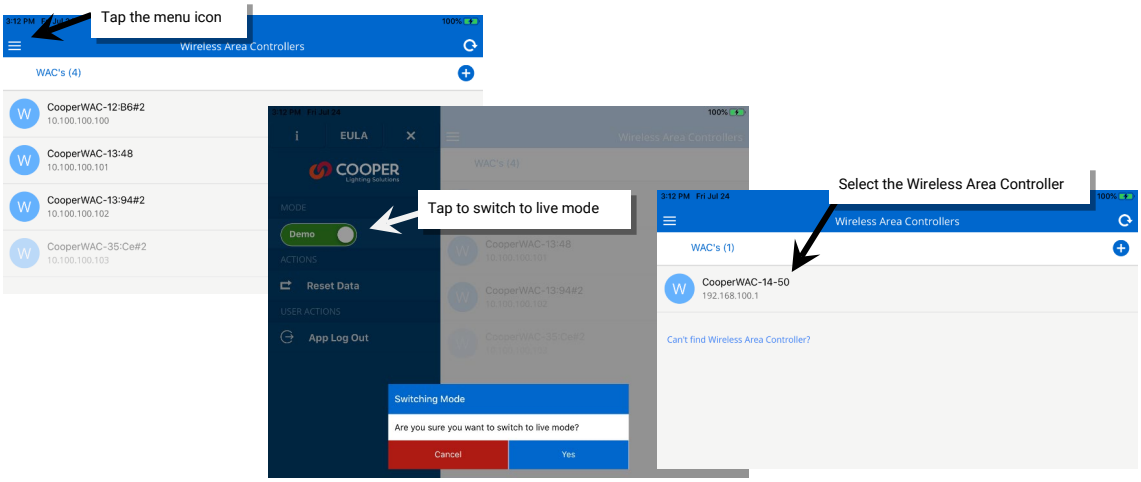
1: If there is more than one Wireless Area Controller in the facility, go to the first Wireless Area Controller location. On the front plate of the controller below the blue power LED, locate the label with the MAC ID. Make note of the MAC ID shown.

2: Ensure that Wi-Fi has been turned ON in the smartphone or tablet, and then navigate to the list of available Wi-Fi networks. Locate the Wi-Fi network with the name Cooper-XXXXXXXXXXX (where X is a string of letters and numbers). If there are multiple Wireless Area Controllers at the facility, more than one wireless network with this naming criteria may appear. Select the Wi-Fi network Cooper-XXXXXXXXXXXXX where the X characters match the MAC ID noted in the previous step. The last number will be one digit higher than the original MAC ID noted. When prompted, enter the password **wclAdmin** (case sensitive) and join the network.





3: Open the WaveLinx Mobile Application. If the application opens in demo mode, select the menu icon at the top-left corner of the screen, and then tap the demo mode button to switch to "real-time" (live) mode. After a few seconds, the Wireless Area Controller with the ID from the previous steps should appear on the screen. Select the desired Wireless Area Controller to continue.

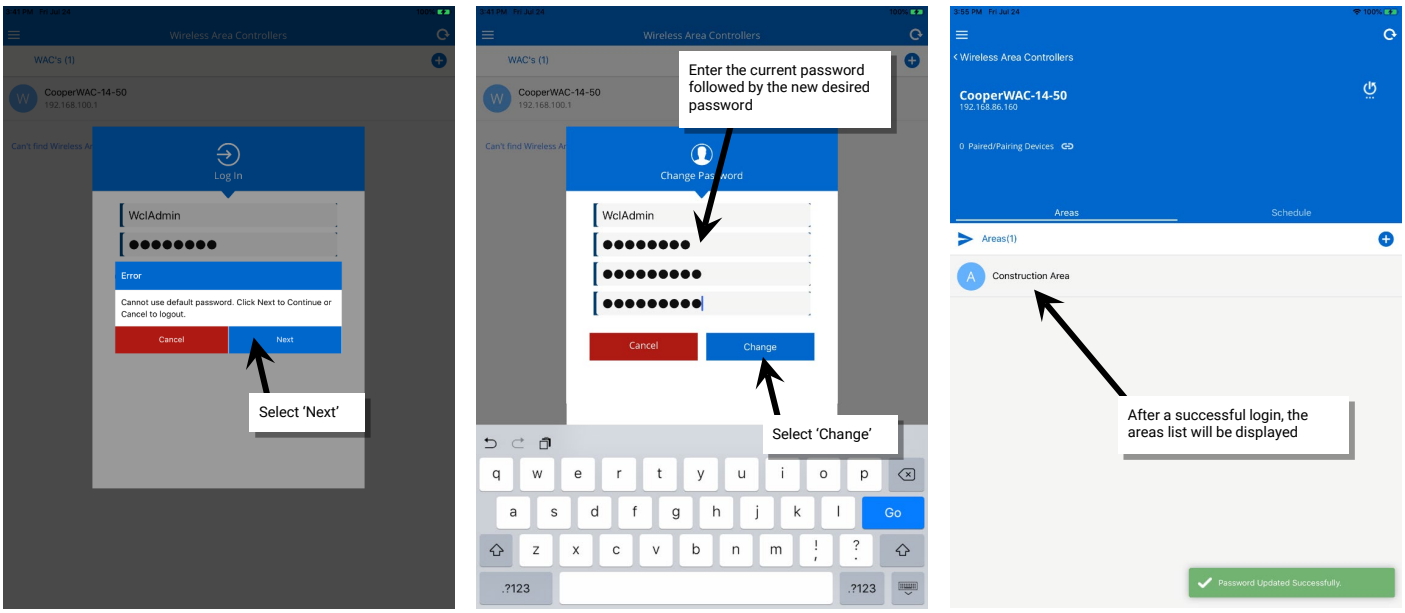


4: If this is the first time logging in to this Wireless Area Controller, in the log in screen, enter the username and password for the administrator user (these are case sensitive). If logged in previously, use the username and password used for the Wireless Area Controller.

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

Select the option to save credentials to remember the login credentials automatically on this device for future connections and then select the log in button.

5: If this is the first login for the WclAdmin user, a password change will be forced. Tap the 'Next' button. Then, enter the current password followed by the desired password (a complex password that can be easily remembered as it will be required for all future access). Click the 'change' button. After a brief refresh period, the areas list will be displayed indicating a successful connection.



Note: It is important to remember the chosen WclAdmin password as it will be used for all subsequent logins including logging into the Wireless Area Controller Internal Webpages.

Quick Links for Common Questions

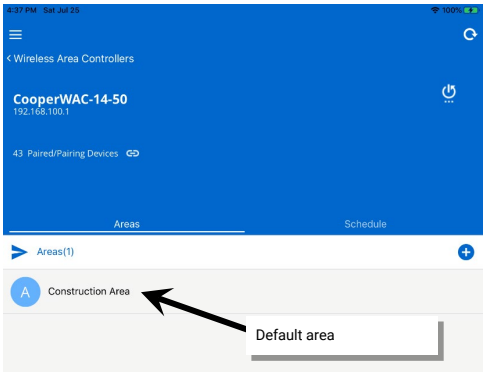
- I previously logged in on my mobile device as a personal control user and saved my credentials. Now I need to log in as the administrator user. How do I switch users? See the answer on page 198.
- How do I change the default password for the user? See the answer on page 165.
- How do I create additional users? See the answer on page 164.
- When I open the Mobile Application, I get an error message. What should I do? See the answer on page 198.

Mobile Application Basic Familiarity

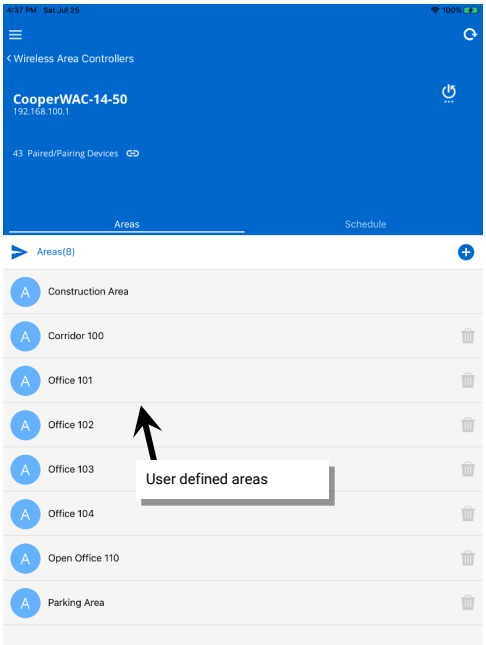
Before proceeding to the next step, become familiar with the basics of the WaveLinx Mobile Application. This section describes the terminology, icons, and basic navigation used in the Mobile Application.

Areas

Construction grouping automatically places all paired devices into a default construction area.

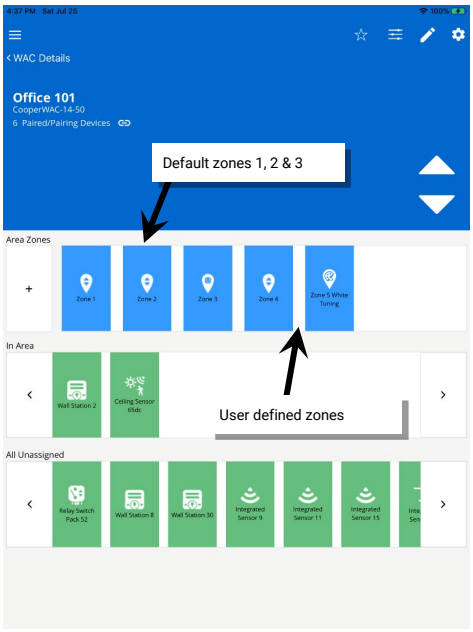


Each Wireless Area Controller allows the creation of up to 15 areas plus the default construction area. Think of an area as a room within the facility. Typically, each area will operate separately from other areas defined in the space. Select any area defined in the application to view the devices located in the area and their associated configurations/programming.

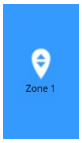
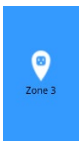
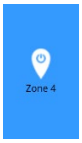
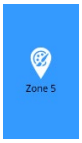


Zones

In any area, controlled loads are organized into zones. A zone is a “group” of one or more lights, receptacles or other loads that are to be controlled together in the exact same way. A zone may also be used to separate the color temperature control of tunable white devices from the ON/OFF and dimming control functionalities. The WaveLinx Mobile Application creates three zones by default. Zone 1 and 2 are automatically created for dimmable lighting devices. Zone 3 is automatically created for switched receptacle devices. Additional zones beyond this will need to be manually created. Up to 16 total zones may be used in each area to meet application needs.

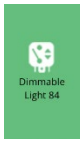
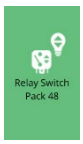
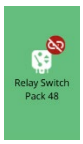
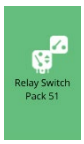
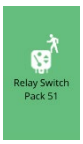
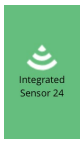


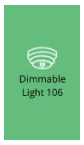
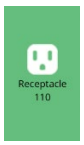
The type of zone defined is indicated by the zone icon.

Zone type	What items belong in this load type group?
Dimmable Zone 	• Integrated sensor lighting loads (standard ambient, industrial, and outdoor Integrated Sensors) • Dimmable loads connected to a WaveLinx wireless Dimming Switchpack (0-10V connection being used) • Dimmable lighting loads connected to a Tilemount sensor • WaveLinx Wireless Outdoor Lighting Control Modules
Receptacle Zone 	• WaveLinx Receptacles • Receptacles connected to a WaveLinx wireless Dimming Switchpack (0-10V connections not being used)
Non-dimmable Zone 	• Non-dim load (switched load) connected to a WaveLinx wireless Dimming Switchpack (0-10V connections not being used)
White Tuning Zone 	• White tuning control for WaveLinx Wireless Dimming Switchpack (WSP-MV-010: 120-277VAC model only) connected to the 0-10V white tuning control wires of a fixture or group of fixtures

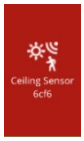
Devices

In the Mobile Application, each device type has a distinctive icon for quick identification.

Device	Icon
WaveLinx Wireless Dimming Switchpack (WSP-MV-010: 120-277VAC model) Identified in the Mobile App as an RSP Single Channel	
WaveLinx Wireless Dimming Switchpack (WSP-CA-010: 120-347VAC model) Identified in the Mobile App as a Relay Switchpack, this device may display different icons depending on how it is used or assigned. • When not assigned to an area, or assigned to an area but not a zone, the icon will show a standard switchpack icon. • When assigned to a zone in an area, the icon will display the switchpack with lighting icon.[1] • In the 'in area' section of the screen, an additional icon will display for the device's contact closure input and will vary depending on the programmed contact closure input type. [1]**Note:** The lighting output icon will not display if the device has been configured only for a contact closure input or occupancy sensor.	 Dimming switchpack when not assigned to an area or assigned to an area but not a zone  Dimming switchpack lighting output icon when assigned to a zone[1]    Contact closure input icons
WaveLinx Integrated Sensor	
WaveLinx Tilemount Sensor	 Standard tilemount sensor  BLE tilemount sensor
WaveLinx Industrial Integrated Sensor	 High mount  Low mount
WaveLinx Outdoor Integrated Sensor	 High mount  Low mount
WaveLinx Wireless Fixtures	

Device	Icon
WaveLinx Ceiling Sensors	
WaveLinx Wireless Outdoor Lighting Control Module	
WaveLinx Wallstation **Note**: Standard line voltage and battery powered wallstations will have the same icon.	
WaveLinx Receptacle	

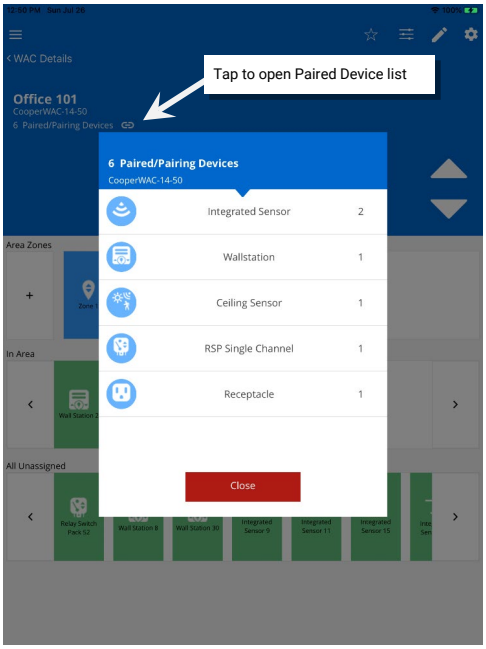
Icon colors indicate different device conditions.

Icon Color	Device Condition
Device Green 	• The device is communicating and operational
Device Gray or Red  	• The device is no longer communicating to the Mobile Application. • Upon reboot devices that do not communicate with the Wireless Area Controller after the reboot completes will remain gray. • If the device was online prior and drops offline without a reboot, the icon may turn red if the device has not communicated typically for more than 15 minutes.‡ • For ceiling sensors and battery powered wallstations, a gray or red icon may indicate that the battery may be low, or the device is not communicating.

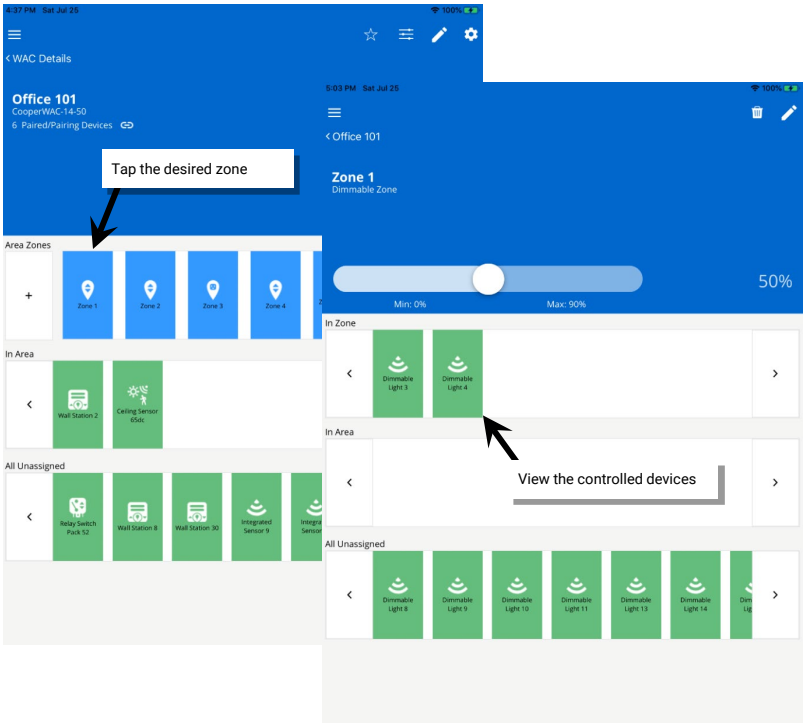
‡**Note**: Devices with older firmware may take up to 1 hour before the icon indicates an offline status.

Basic Navigation and Display Information

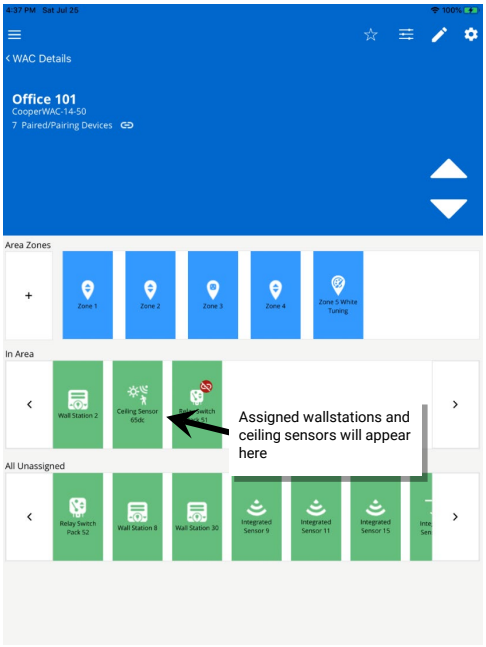
In areas that have been previously configured, at the top of the screen, the quantity of paired/pairing devices will be displayed. Tap on the paired devices link icon to display a quick list of the types of devices and quantities of devices that are assigned to this area.



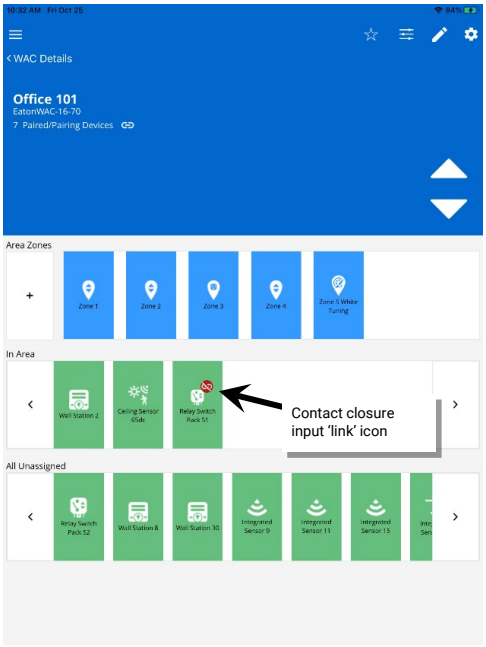
For further information, tap any zone to see the devices that are assigned to the zone.



Devices that do not directly wire to a specific load (lighting or receptacles) such as wallstations and ceiling sensors will display in the ‘in area’ section in the middle of the display screen



In addition to the wallstations and ceiling sensors, WaveLinx Wireless Dimming Switchpacks (WSP-CA-010) may display special icons in the ‘in area’ section. The ‘link’ symbol indicates that the WaveLinx Wireless Dimming Switchpacks (WSP-CA-010) has an onboard contact closure input function that may be programmed. Once programmed, the ‘link icon will change for a different icon matching the programmed contact input function. Unused contact input closures will remain with the ‘link’ icon displayed, ready for future programming.



Other icons

There are many icons used to perform functions in the Mobile Application.

Icon	Functionality
	Displays menu options.
	Refreshes the current screen. OR From the main menu, discovers new devices.
	Indicates that the Wireless Area Controller is in pairing mode.
	Restarts the Wireless Area Controller (reboot).
	Displays paired devices.
	Adds an item to the displayed list.
	Deletes the item.
	Opens an editor for the item.
	Indicates a favorite area (when solid star is displayed)
	Opens the scene editing function.
	Opens a menu within the screen or displays the attributes of an item.
	Navigates back to the current area's main screen.
	Navigates forward or backward.

The next section will discuss how to configure the areas to contain the correct zones and devices.

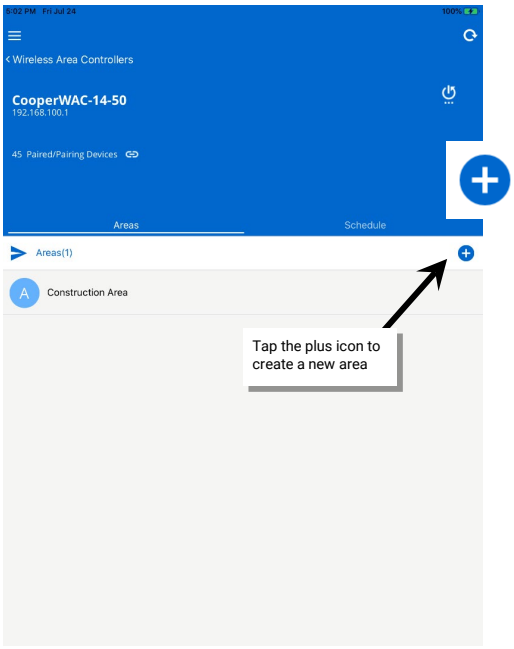
Part 5: Organizing Devices into Controlled Areas and Zones

Once the communication between the WaveLinx Mobile Application and the Wireless Area Controller is established, the organization of the system begins. In this section, the Mobile Application will be used to identify and group devices into unique areas and zones for automatic code commissioning operation.

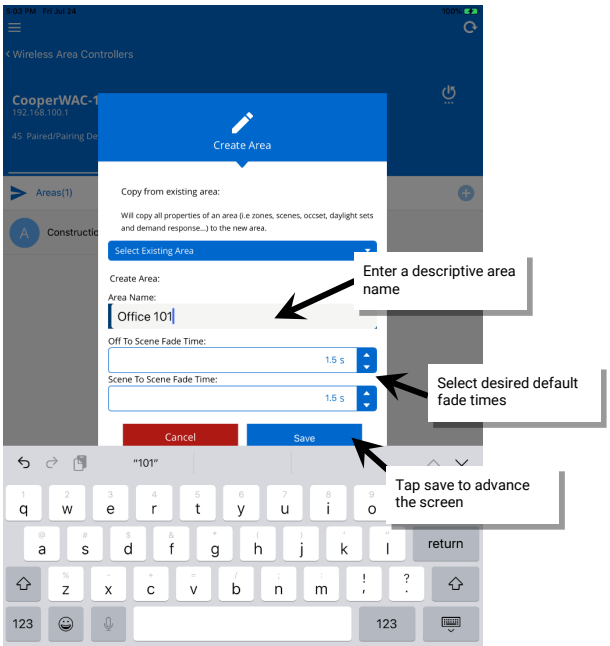
Step 1: Creating Areas and Zones

This step will walk through the process of creating the necessary area and zones for one of the spaces in the facility.

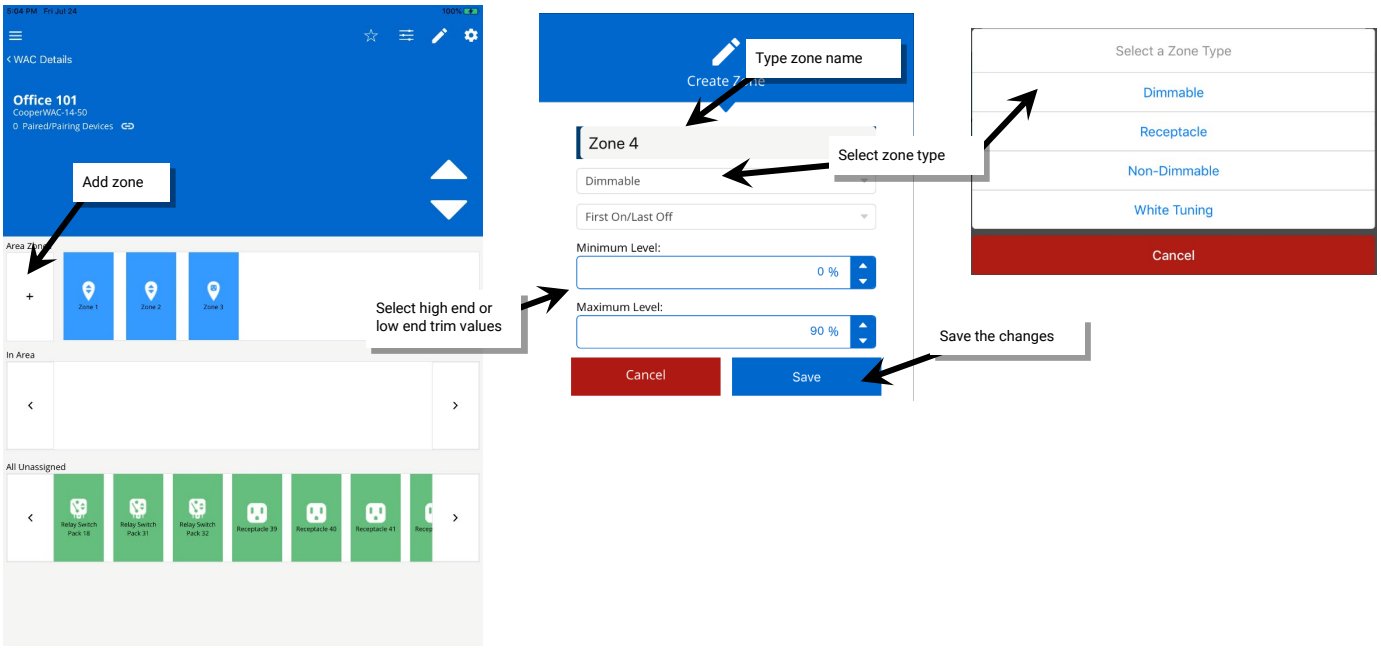
1: Go to the location in the facility that will be programmed first. Open the WaveLinx Mobile Application and establish an administrator connection with the Wireless Area Controller. Once successfully connected, create a new area in the area list by tapping the + button on the right side of the screen.



2: Enter a descriptive name for the area and select the desired default fade time behavior for how quickly light levels adjust with received commands. Tap on save to advance into the new area's configuration screen.

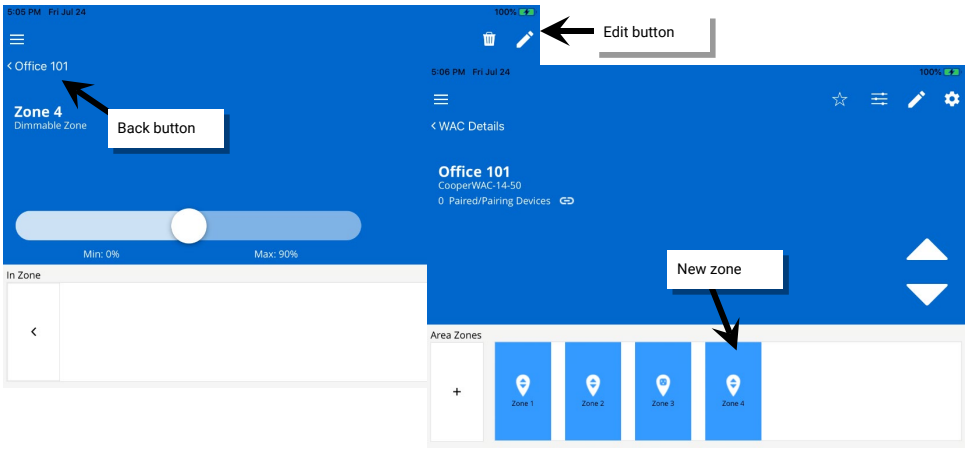


3: (Optional) If the area needs additional dimmable, receptacle or non-dimmable switched zones beyond the provided defaults (dimmable lighting zones 1 and 2, and receptacle zone 3), tap the plus sign icon in the zones section to add a new zone. Type a descriptive name for the zone, and then select the zone type (dimmable, receptacle, or non-dimmable switched) other parameters may be left at defaults or modified for the application. Save the settings to advance into the new zone's screen.

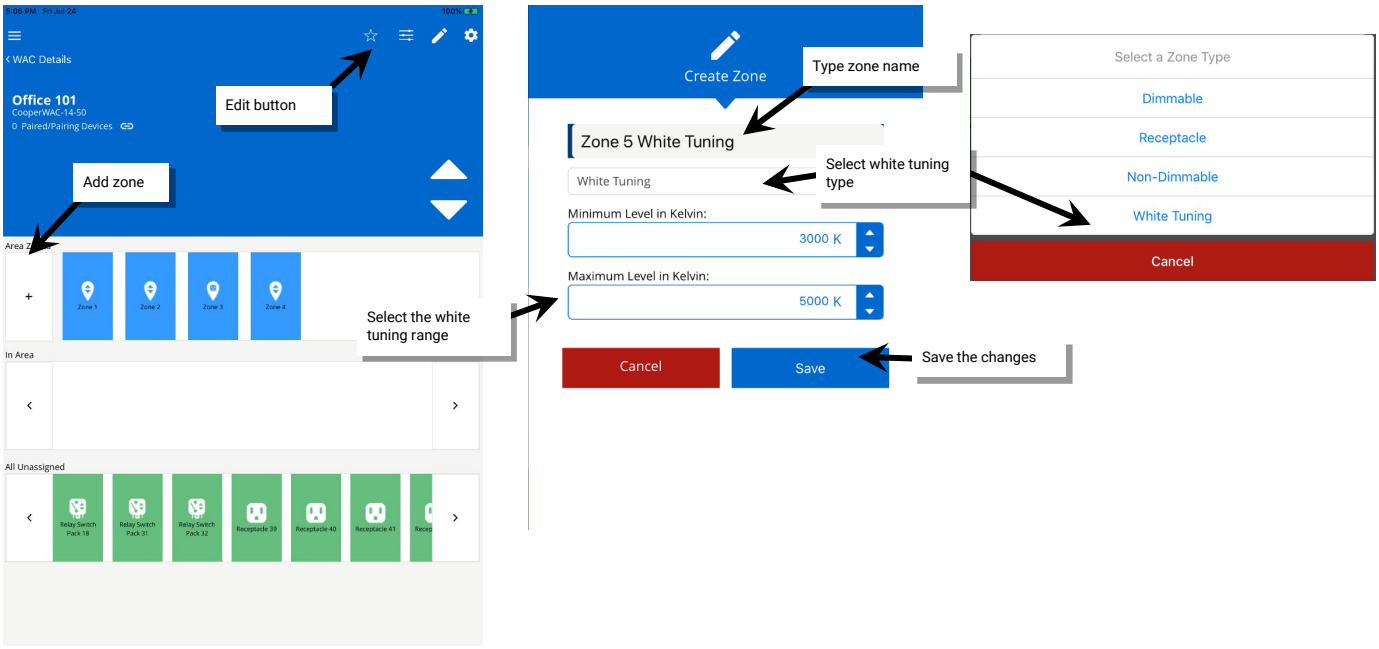


Once the zone is created, use the back button at the top-left of the screen to navigate back to the area screen. The new zone should appear in the zone list. Add additional zones as needed. Modify any zone name and behaviors by selecting the zone and tapping the edit button.

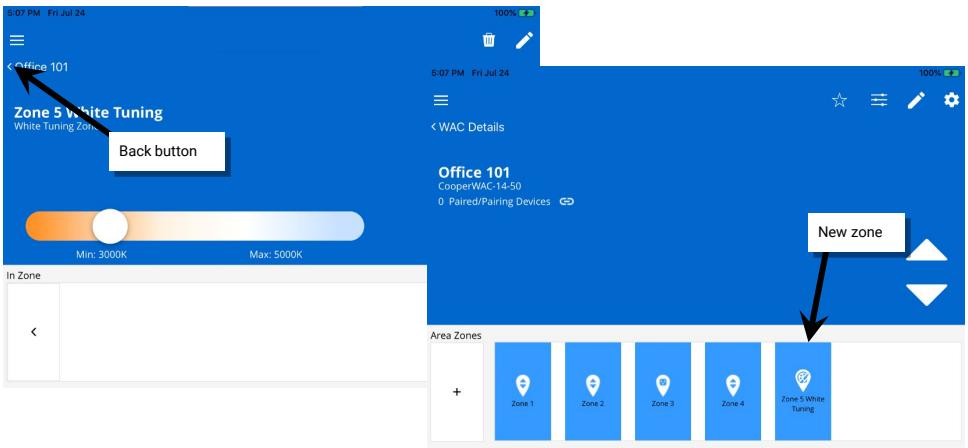
Important Note: If adding zones, after completing the full process to assign devices to the area, if the zone is to be controlled with occupancy strategies, ensure that the new zone(s) is assigned to be controlled by the occupancy set. See "Adjusting Occupancy Set Response and Controlled Zones" on page 89 for further details on adding a zone to an occupancy set.



4: (Optional) If the area has VividTune Tunable White fixtures connected to a wireless Dimming Switchpack for white tuning control, tap the plus sign icon in the zones section to add a new zone. Type a descriptive name for the zone, and then select the 'white tuning' zone type. In the max and min level fields, enter a Kelvin temperature range that all of the white tuning devices support (refer to the fixture information for the supported ranges), and then save the settings to advance into the new zone's screen.



Once the zone is created, use the back button at the top-left of the screen to navigate back to the area screen. The new zone should appear in the zone list.



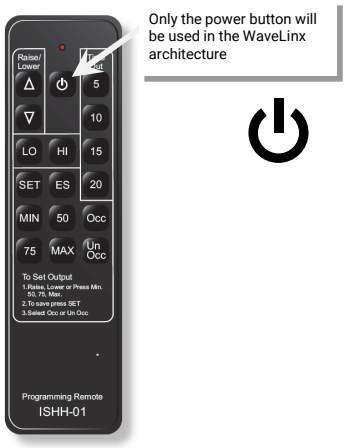
Step 2: Identify and Assign the Controlled Load Devices

This section will walk through the process of identifying and assigning the load devices to zones in the created area. This includes devices that directly control the ON/OFF and dimming functions of lighting loads and receptacles.

1: While still in the area screen for the desired space, place the first controlled load device in the room into identification mode as described in one of the methods below.

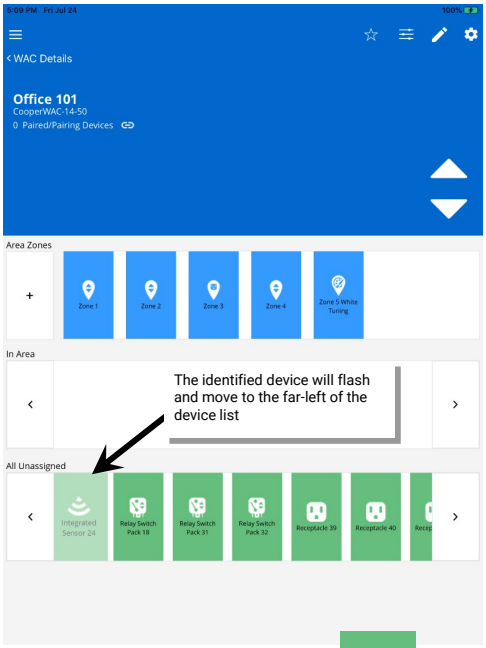
- Method 1: Reverse Identification of Integrated Sensor Controlled Loads using the ISHH-01 Remote Control.
- Method 2: Identification of All Controlled Load Types

Method 1: Reverse Identification of Integrated Sensor Controlled Loads using the ISHH-01 Remote Control.



The identification of controlled loads with integrated or Tilemount sensors is made easier through the use of the optional ISHH-01 Integrated Sensor Remote Control. This is the preferred method for identifying these load types. Only the power button ⏻ on the ISHH-01 remote will be used in the WaveLinx system.

If using an ISHH-01, follow the chart below to initiate identification in these device types.

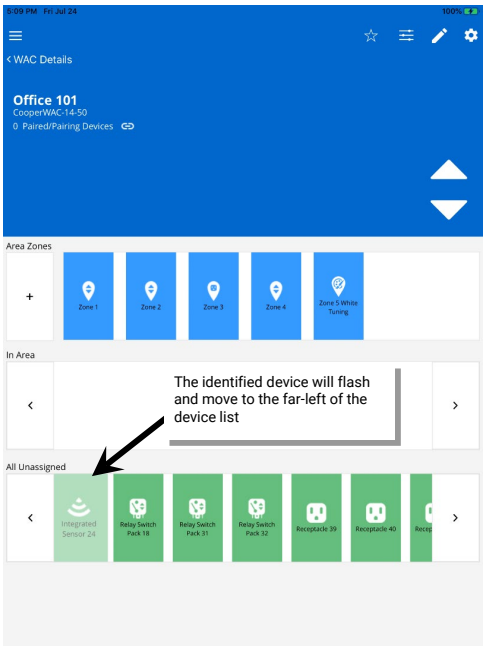
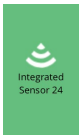
Preferred Method for these Device Types	Identification Mode – Using the ISHH-01 Remote
WaveLinx Integrated Sensor and WaveLinx Tilemount Sensor  WaveLinx Industrial Integrated Sensor - All mounting types  WaveLinx Outdoor Integrated Sensor - All mounting heights 	Standing beneath the sensor, point the ISHH-01 remote at the sensor, and then press and release the power button ⏻. This will trigger identification mode for that device. The LED in the sensor window will briefly flash blue. The load icon will begin flashing for 15 seconds on the Mobile Application screen and will move to the far-left of the unassigned device list.  IS-IHMT 12 Industrial Integrated Sensor – High Mount IS-ILMT 13 Industrial Integrated Sensor – Low Mount IS-OHMT 27 Outdoor Integrated Sensor – High Mount IS-OLMT 52 Outdoor Integrated Sensor – Low Mount Integrated Sensor 24 WaveLinx Integrated Sensor (ambient) Dimmable Light 4 WaveLinx Tilemount Sensor Dimmable Light 4 WaveLinx BLE Integrated or Tilemount Sensor

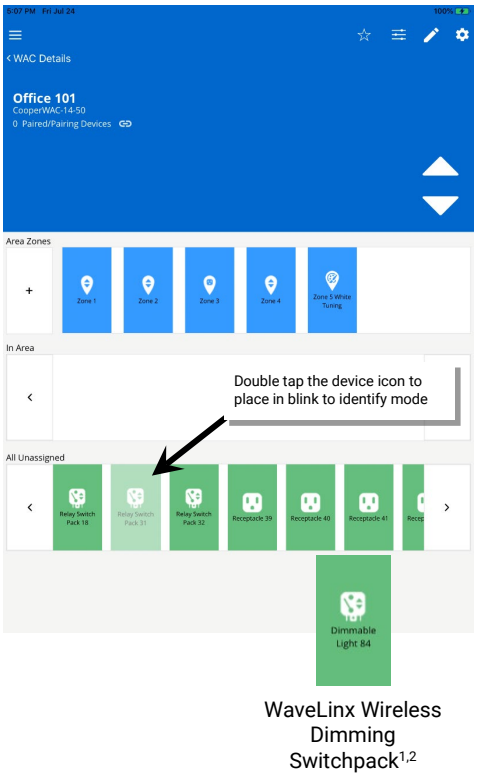
For all other load types, refer to the next section for detailed identification steps.

Method 2: Identification of All Controlled Load Types

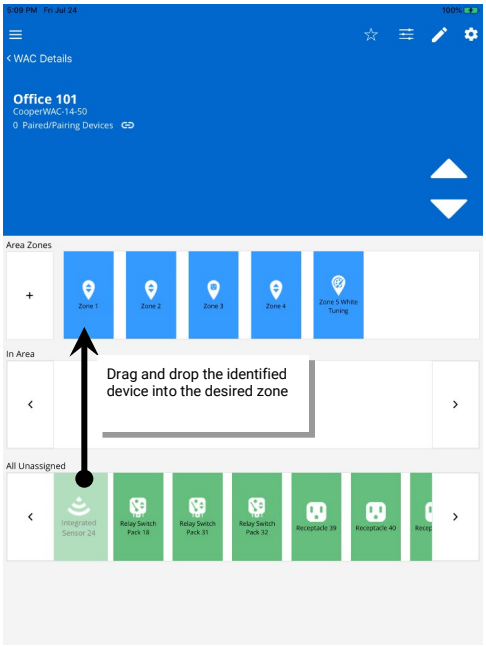
Use this section to identify all controlled load types if not using the ISHH-01 remote or load types that do not support the use of the ISHH-01 remote.

To identify controlled loads:

Device Type	Identification Mode
WaveLinx Integrated Sensor and WaveLinx Tilemount Sensor  WaveLinx Industrial Integrated Sensor - Low bay mounting  WaveLinx Outdoor Integrated Sensor - Low mounting height 	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 at the end of this 3-4 second period. The load icon will begin flashing for 15 seconds on the Mobile Application screen and will move to the far-left of the unassigned device list.   Industrial Integrated Sensor – Low Mount  Outdoor Integrated Sensor – Low Mount  WaveLinx BLE Integrated or Tilemount Sensor  WaveLinx Integrated Sensor (ambient)  WaveLinx Tilemount Sensor Note: If fixtures mounting height is beyond the range of the laser pointer or flashlight, use the blink to identify feature to identify the devices. Refer to the next section in this chart for how to use this feature for high bay and high mount fixtures.

Device Type	Identification Mode
WaveLinx Industrial Integrated Sensor - High bay mounting  WaveLinx Outdoor Integrated Sensor - High mounting height  WaveLinx Wireless Dimming Switchpack  WaveLinx Wireless Outdoor Lighting Control Modules  WaveLinx Wireless Fixture 	Use the Mobile Application blink to identify feature to identify these types of devices. Each of these devices has an icon that identifies the device type. Locate the first icon that matches the desired device type in the all unassigned devices section. Double tap the icon to place it in blink to identify mode. The icon will appear to pulse and a load matching that type should respond.  Industrial Integrated Sensor – High Mount Industrial Integrated Sensor – Low Mount Outdoor Integrated Sensor – High Mount Outdoor Integrated Sensor – Low Mount WaveLinx Wireless Dimming Switchpack[1,2] WaveLinx Wireless Outdoor Lighting Control Module WaveLinx Wireless Fixture If the desired load in the space does not cycle ON and OFF or cycle between bright and dim, repeat this process with other device icons until the correct load responds. Blink to identify mode can be cancelled prior to the 15 second automatic timeout period by double tapping on the flashing device icon[3,4]. [1]**Note 1**: If the device is a wireless Dimming Switchpack that is controlling white tuning, the load may cycle between cool and warm color temperature rather than turn ON and OFF. [2]**Note 2**: If the device is a wireless Dimming Switchpack (WSP-CA-010) that is connected only to a contact closure device, placing the dimmable device icon in blink to identify mode will not have a visible effect. Please refer to “Step 5: Identify and Assign Contact Closure Devices Connected to WaveLinx Wireless Dimming Switchpacks” on page 45 for specific instructions. [3]**Note 3**: Bluetooth enabled WaveLinx Tilemount sensors will flash the LED quickly (.5 second ON/ .5 second OFF) when placed into identify mode from the WaveLinx Mobile App. [4]**Note 4**: Blink to identify is not supported by devices that are battery powered such as the ceiling sensor and battery powered wallstation.
WaveLinx Receptacle 	Press and release (1 second press) the manual push button on the front of the controlled outlet. The receptacle may toggle state when the push button is pressed, and the LED may briefly flash red/OFF or green/amber. The load icon will begin flashing on the Mobile Application screen and will move to the far-left of the unassigned device list.

2: Once the device is identified, drag and drop the device into the desired zone.



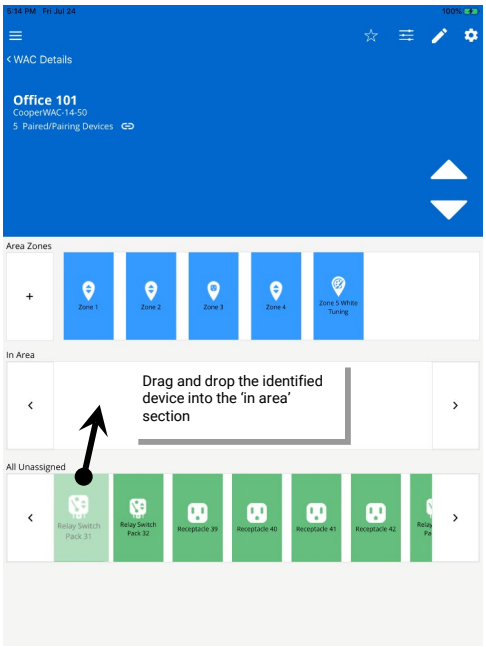
3: Repeat this step for additional controlled loads until all devices that control ON/OFF and dimming functions of loads in the area are assigned.

Step 3: Identify and Assign Tunable White Lighting Devices

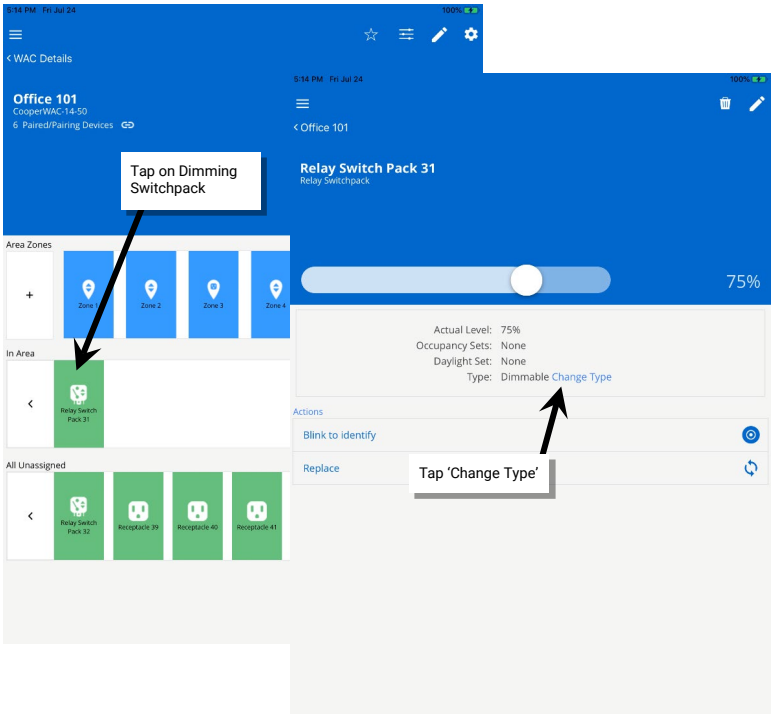
The WaveLinx system can control tunable white lighting by adjusting the correlated color temperature. WaveLinx wireless Dimming Switchpacks (WSP-MV-120-277VAC models) support white tuning when connected to the 0-10V white tuning control wires of a VividTune Tunable White fixture or other 0-10V controlled white tunable fixture. This section walks through the steps to identify and assign the white tunable devices to the area and zones.

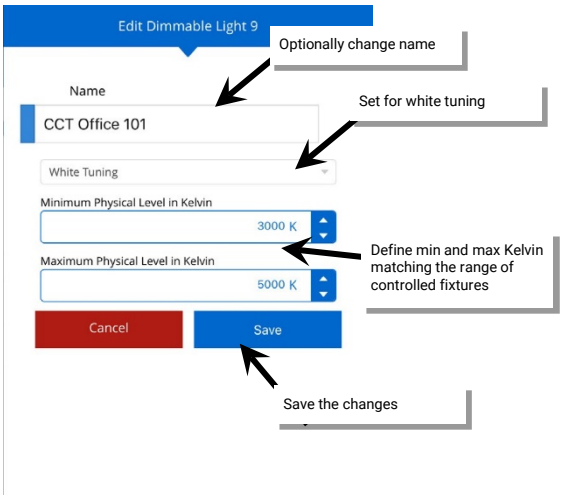
1: Before proceeding, ensure that the WaveLinx Integrated Sensors and Dimming Switchpacks connected for ON/OFF/ Dimming control of the tunable white fixtures have been identified and assigned to the proper control zones as described in the last step.

2: Identify the wireless Dimming Switchpack that is connected to the white tuning control wires. Ensure that the controlled load is ON, and then use the blink-to-identify feature (double tap of the Dimming Switchpack icon). The tunable white load should cycle between cool and warm color temperature when the white tuning Dimming Switchpack is placed in blink-to-identify mode. Drag the identified wireless Dimming Switchpack to the 'in area' portion of the screen.

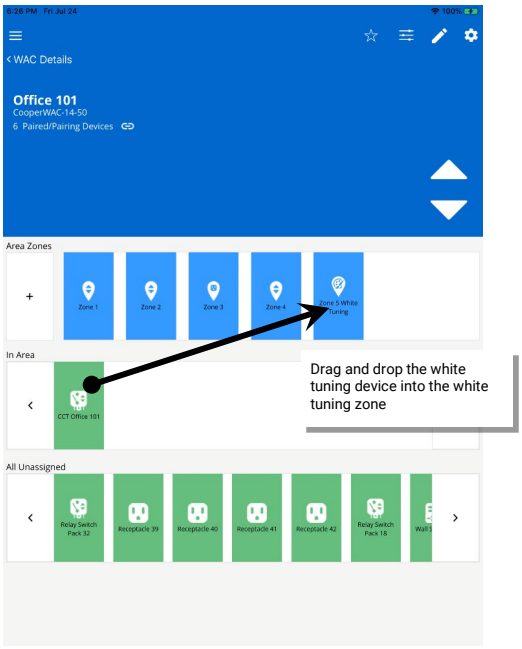


3: Next, configure the wireless Dimming Switchpack for white tuning support. Tap on the wireless Dimming Switchpack to open it and then tap on the change type option. Set the type to ‘White Tuning’. IMPORTANT: Make sure to enter the fixture’s correct supported color temperature range in the minimum and maximum physical Kelvin level fields. This can typically be found in the fixture documentation. Failure to set the proper range may result in an unexpected color temperature response. Optionally type in a more descriptive name for the device, and then save the change. Use the back button at the top-left of the screen to navigate back to the area screen.





4: Next, drag the tunable white devices from the ‘in area’ section of the screen into the previously created white tuning zone.

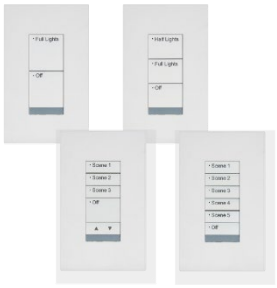


Step 4: Identify and Assign WaveLinx Wallstations and WaveLinx Ceiling Sensors

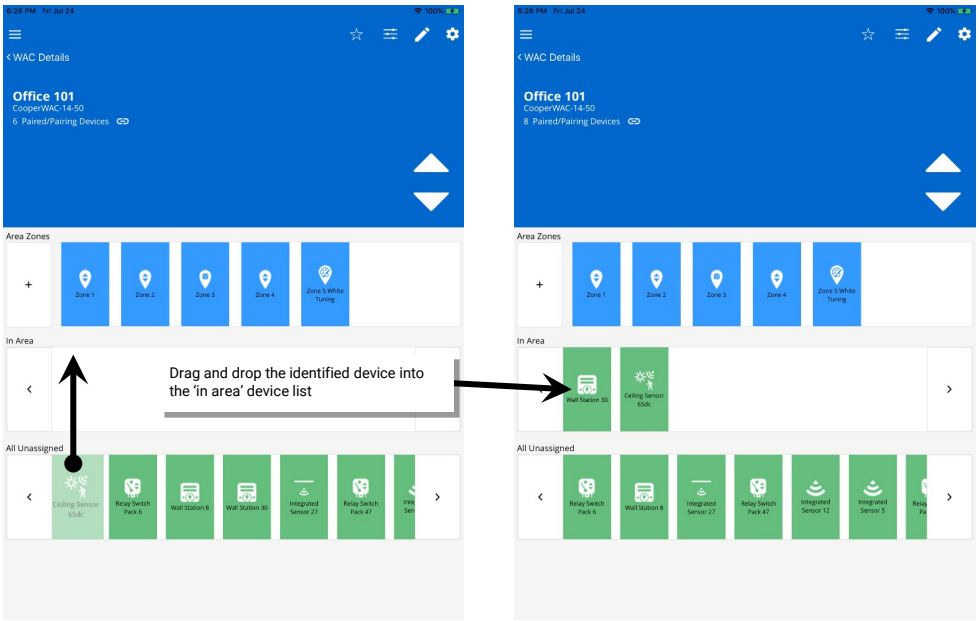
This step will walk through the process of identifying and assigning WaveLinx wallstations and WaveLinx ceiling sensors.

1: While still in the area screen for the desired space, place the first device in the room into identification mode as described below.

How to initiate identification mode for wallstations and ceiling sensors:

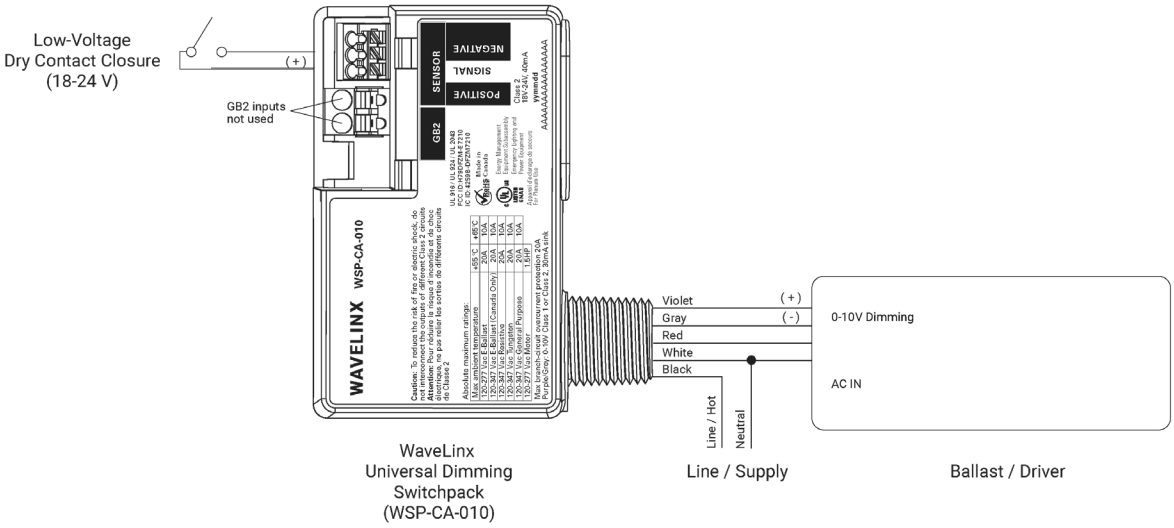
Device Type	Identification Mode
WaveLinx Wallstation 	Press any button on the desired wallstation to place it in identification mode. Standard line voltage powered wallstation: • All button LEDs should flash for approximately 15 seconds and devices in the construction area will respond to the button's command. In the Mobile Application the icon will begin flashing for 15 seconds and will move to the far-left of the unassigned device list
WaveLinx Battery Powered Wallstation 	Battery powered wallstation: • The LED on the button pressed may illuminate for approximately 3 seconds and devices in the construction area will respond to the button's command. In the Mobile Application, the icon will begin flashing for 15 seconds and will move to the far left of the unassigned device list[1]. [1]**Note**: If multiple battery powered wallstations with the same button configuration are in the same area, rename each wallstation as it is assigned to allow for easy identification for the later programming steps. To rename the device, once the device is assigned, tap on the wallstation's icon, and use the pencil icon at the top of the page to open the edit option. Name the station, then save the change.
WaveLinx Ceiling Sensor 	A laser pointer or bright, focused beam flashlight is recommended for this step. Standing beneath the sensor, shine the light directly into the sensor lens for 3-4 seconds. The ceiling sensor icon will begin flashing for 15 seconds on the Mobile Application screen and will move to the far-left of the unassigned device list.

2: Once the device is identified, drag and drop the identified device into the 'in area' device section of the screen. Repeat this step until all wallstations and WaveLinx ceiling sensors in the room are identified and assigned.

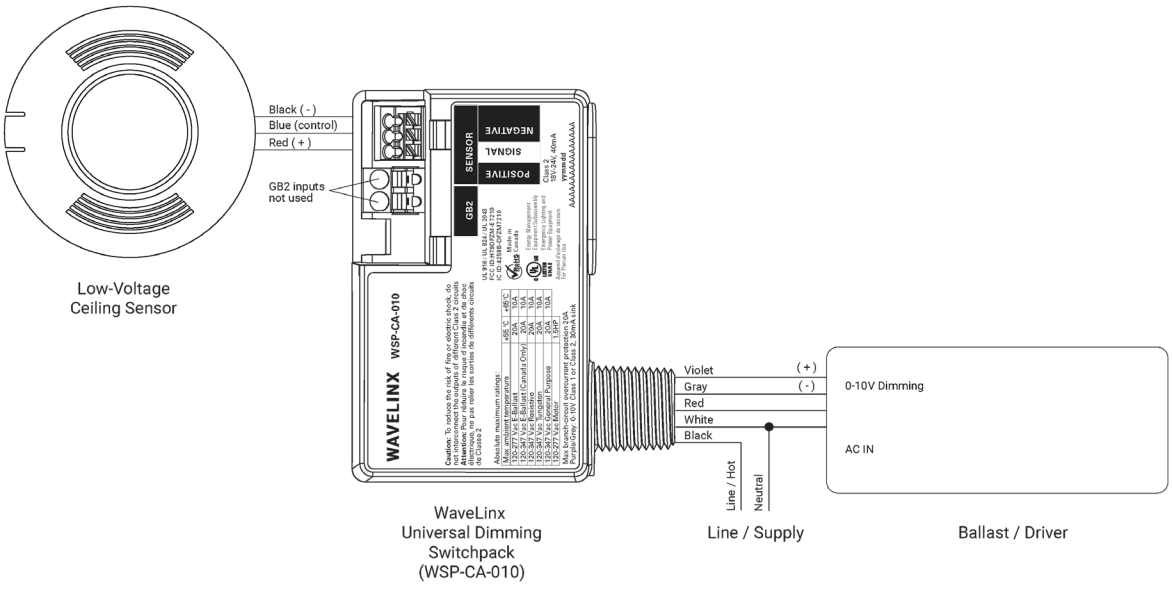


Step 5: Identify and Assign Contact Closure Devices Connected to WaveLinx Wireless Dimming Switchpacks

This section walks through the process of identifying and assigning contact closure devices to the created area. The WSP-CA-010 model WaveLinx wireless Dimming Switchpack supports connection to an external contact closure. 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.



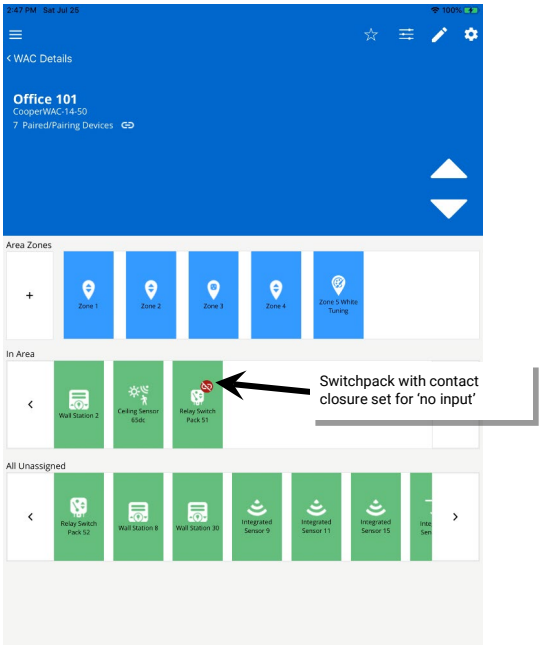
The WaveLinx wireless Dimming Switchpack contact closure input also allows for connection to a supported Greengate Occupancy Sensor. One Greengate Occupancy Sensor may be powered directly from the switchpack contact closure. It is recommended that onboard Greengate sensor configuration switches be set to a 5-minute hold time to allow for maximum configurability through the WaveLinx mobile app. Refer to the sensor's installation instructions for details on using the onboard configuration switches.



The steps to proceed will differ based on how the Dimming Switchpack is being used. Skip any sections that do not apply to how the device is connected at the site.

For Dimming Switchpacks ONLY Connected to Lighting (no contact closure device)

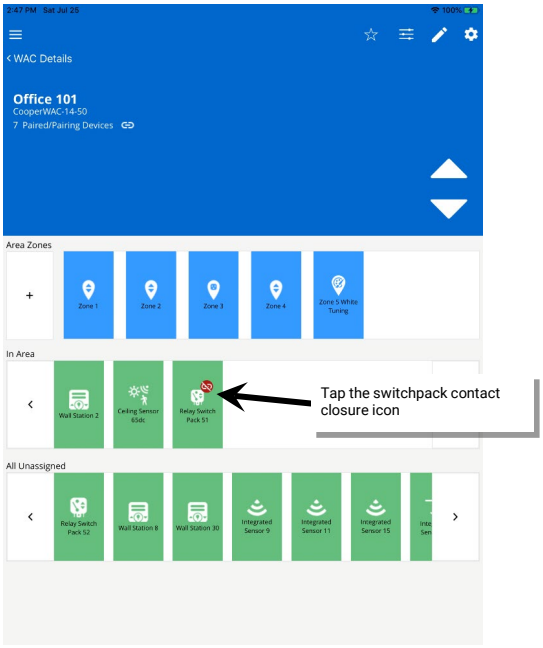
No further configuration is necessary after the switchpack has been assigned to the controlled lighting zone. Note that the device will show a second icon in the 'in area' section with the red link indicator. Simply disregard the icon with the red link indicator. If the icon is tapped, it will display 'No input' as the contact closure type.



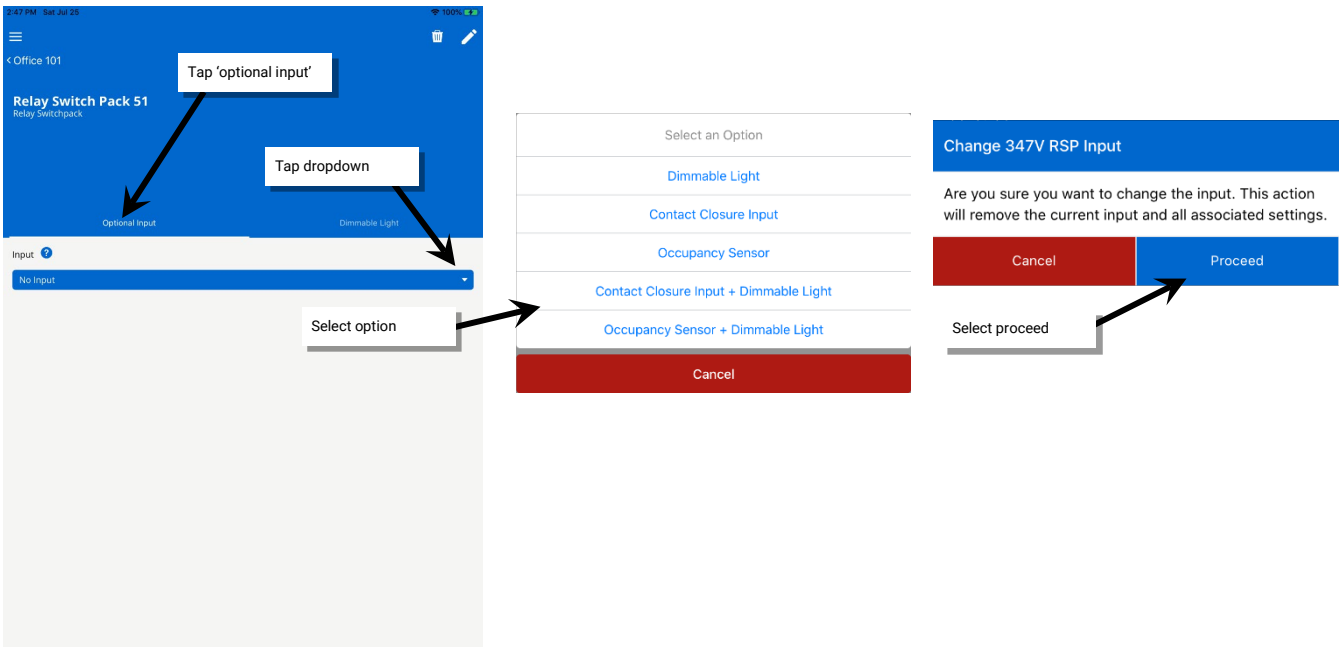
For Dimming Switchpacks Connected to Lighting AND to a Contact Closure Device/Greengate Occupancy Sensor:

The WaveLinx wireless Dimming Switchpack should already be identified and assigned to the area's zone from previous steps. Once the dimmable load is assigned to the area, an additional switchpack icon with a red link indicator will be displayed in the 'in area' section of the screen. Follow the steps below to configure the device for the type of contact closure connection.

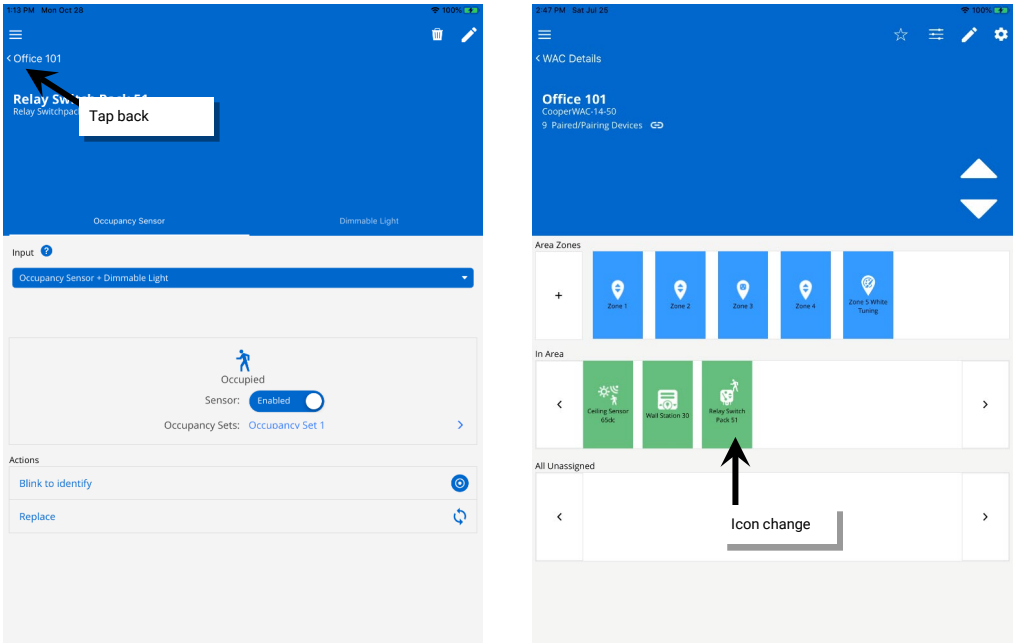
1: In the 'in area' section of the screen, tap the relay switchpack icon that has the red link indicator.



2: In the ‘optional input’ screen, tap the drop down and select the option appropriate for how the device is being used, selecting from ‘contact closure input + dimmable light’ or ‘occupancy sensor + dimmable light’ depending on what device is connected to the contact input. When prompted, select the option to ‘proceed’ with the change.



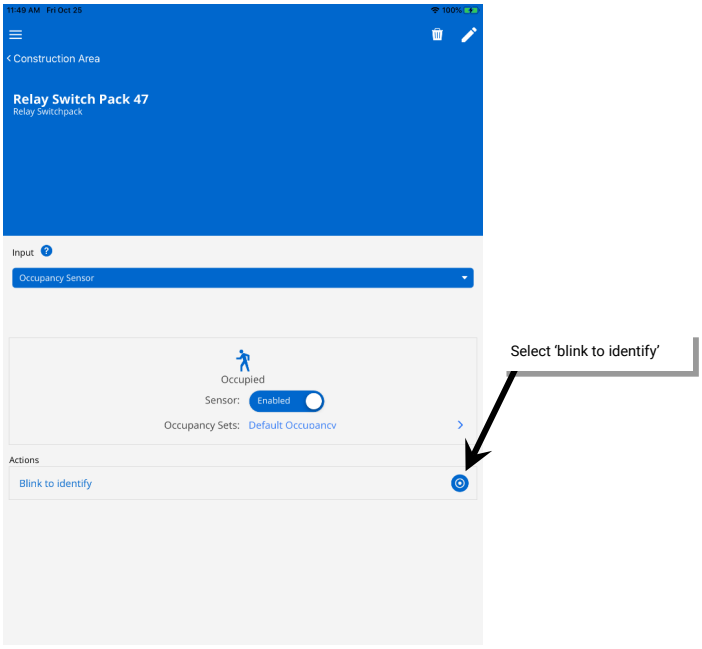
3: Once the type is set, tap the back button and note the icon change in the ‘in area’ section that reflects the selected option.



4: If there is more than one contact closure input device or occupancy sensor in the same area, to identify a specific device, follow the steps below for the appropriate device type:

Identifying Greengate Occupancy Sensors

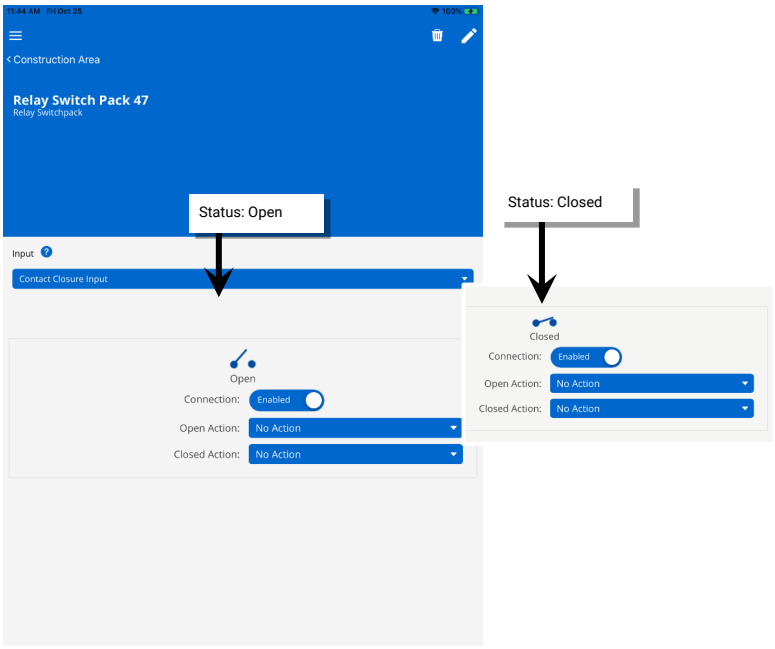
In the device's input screen, select the 'blink to identify' option and immediately look at the occupancy sensors in the space to see which occupancy sensor is flashing its LEDs rapidly[1].



[1] **Note**: When the 'blink to identify' option is used with approved Greengate sensors, the WaveLinx Dimming Switchpack will remove power from the contacts for a brief period, causing the Greengate sensor to go through a power cycle. Greengate sensors will flash their LEDs during this process and will also power up in the occupied state. Greengate sensors not approved for use with WaveLinx or not directly connected for power from the WaveLinx Wireless Dimming Switchpack may not exhibit the described behavior. The 'blink to identify' mode cannot be manually cancelled for this device type. 'Blink to identify' mode will time out on its own after a 1-minute period.

Identifying Contact Closure Devices

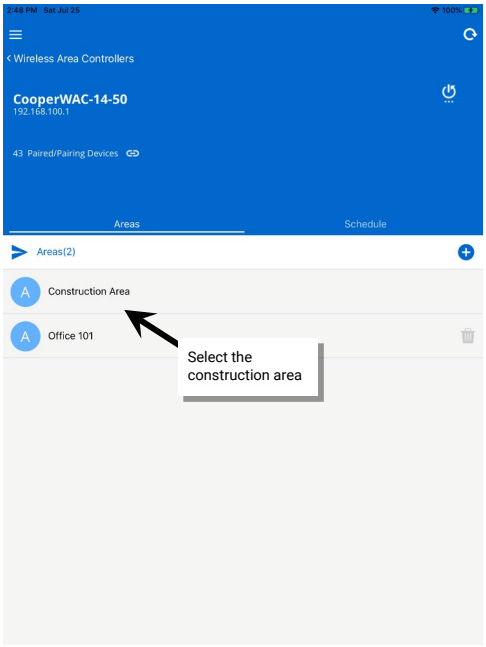
After a device connected to a contact closured device is assigned to an area, the reverse identify feature will not operate. To identify a contact closure device that is already assigned to an area, open the input display screen, and then manually trigger the closure open and closed. Watch the status display to see if the open status changes to closed and reflects the contact input activity. If the display reflects the open and close activity, then the device has been identified. Repeat as needed for additional devices.

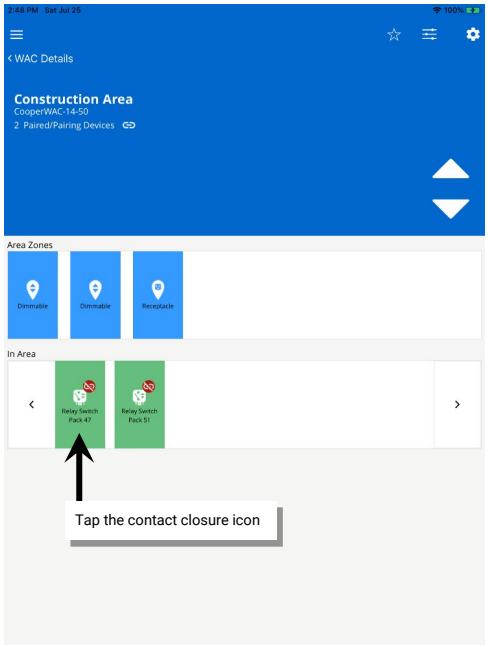


For Dimming Switchpacks ONLY Connected to a Greengate Occupancy Sensor (not connected to lighting)

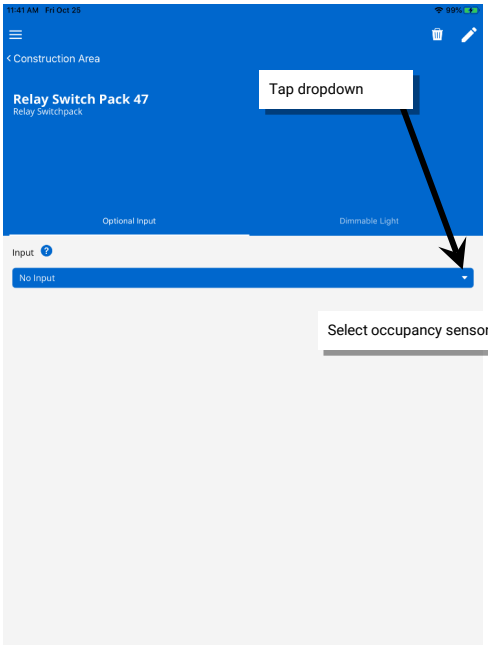
If the dimming switchpack is not connected to control lighting, it will not have been identified yet and will still be one of the devices in the construction area. To identify and assign a device that is connected to a Greengate Occupancy Sensor:

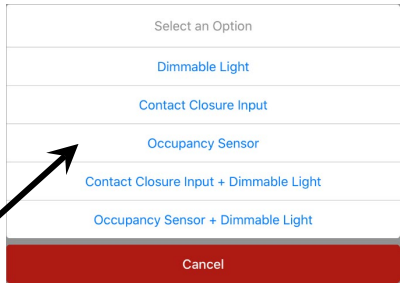
1: From the areas list, select the construction area. Within the 'in area' section of the screen, locate the first relay switchpack icon that shows the red link indicator. Tap the icon and the screen should open to the 'optional input' screen.

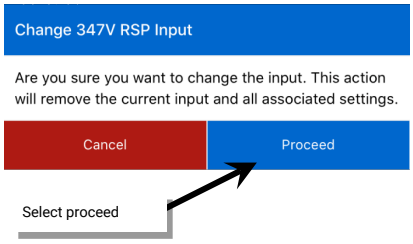




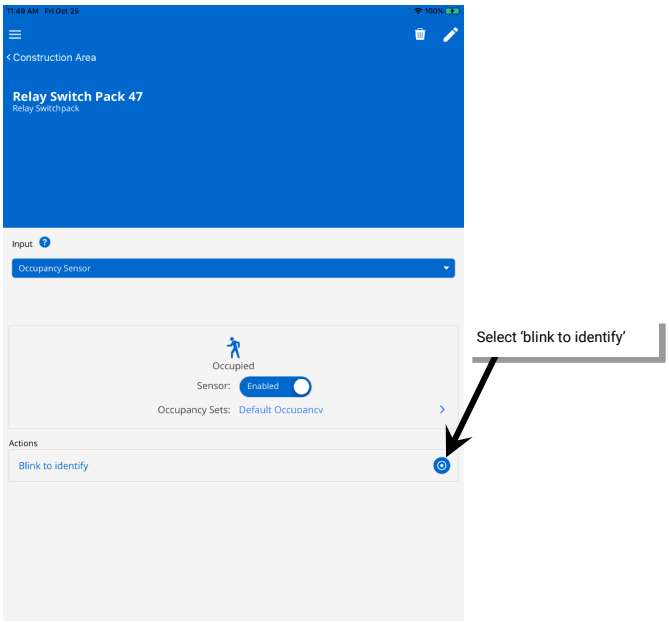
2: Use the drop down and select 'occupancy sensor'. When prompted, tap proceed.





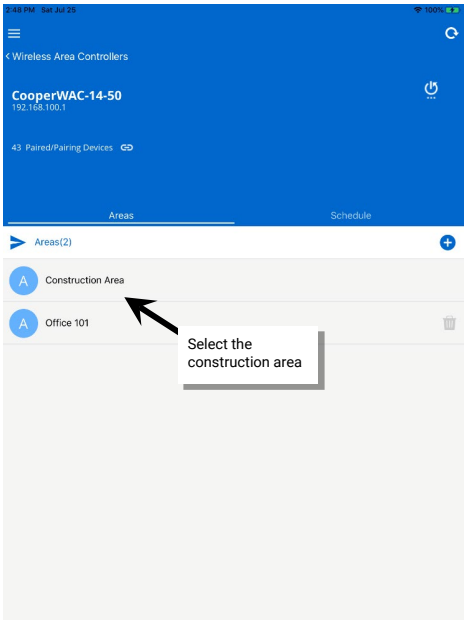


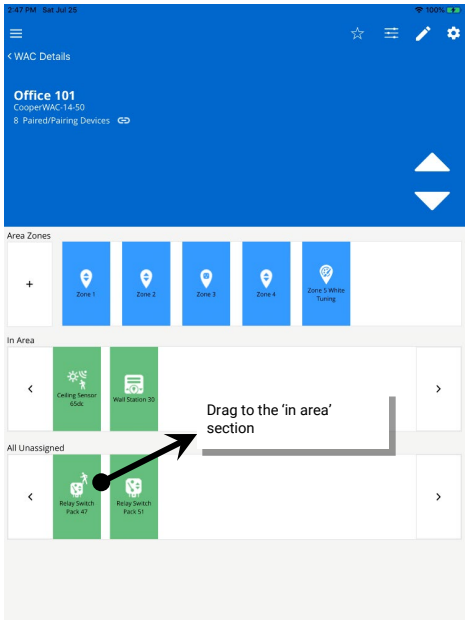
3: Still in the input display screen, select the ‘blink to identify’ option and immediately look at the occupancy sensors in the space to see which occupancy sensor is flashing its LEDs rapidly[1]. If the desired sensor does not respond by flashing its LEDs, use the drop down to set the device back to ‘dimmable light’ and repeat this process until the desired sensor is located. Leave the identified switchpack defined for the ‘occupancy sensor’ input type.



[1] **Note**: When the ‘blink to identify’ option is used with **approved** Greengate sensors, the WaveLinx Dimming Switchpack will remove power from the contacts for a brief period, causing the Greengate sensor to go through a power cycle. Greengate sensors will flash their LEDs during this process and will also power up in the occupied state. Greengate sensors not approved for use with WaveLinx or not directly connected for power from the WaveLinx Wireless Dimming Switchpack may not exhibit the described behavior. The ‘blink to identify’ mode cannot be manually cancelled for this device type. ‘Blink to identify’ mode will time out on its own after a 1-minute period.

4: Once the correct device is identified, navigate back to the ‘areas list’ and select the area that the device should be assigned to. Then, locate the device in the ‘all unassigned’ section and drag it into the ‘in area’ section of the screen.





Note: If multiple devices connected to Greengate occupancy sensors are in the same area, rename the device as it is assigned to allow for easy identification for the later programming steps. To rename the device, once the device is assigned, tap on the device’s icon, and use the pencil icon at the top of the page to open the edit option. Name the device, and then save the change.

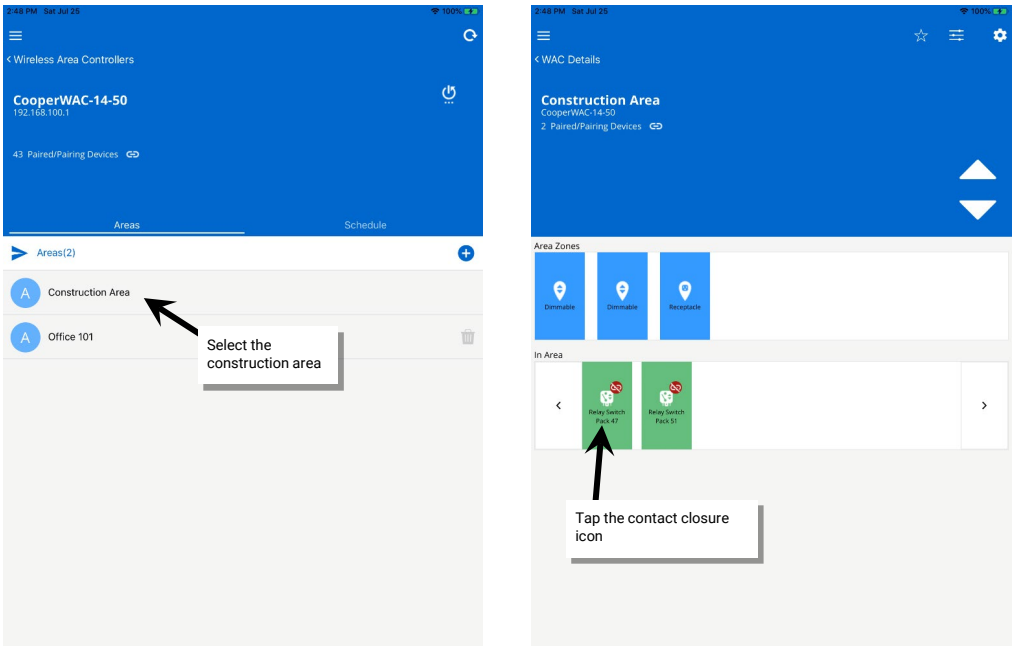
5: Repeat this process for each switchpack until all switchpacks connected to contact closure devices or Greengate occupancy sensors are identified and assigned.

For Dimming Switchpacks ONLY Connected to a Contact Closure Device (not connected to lighting)

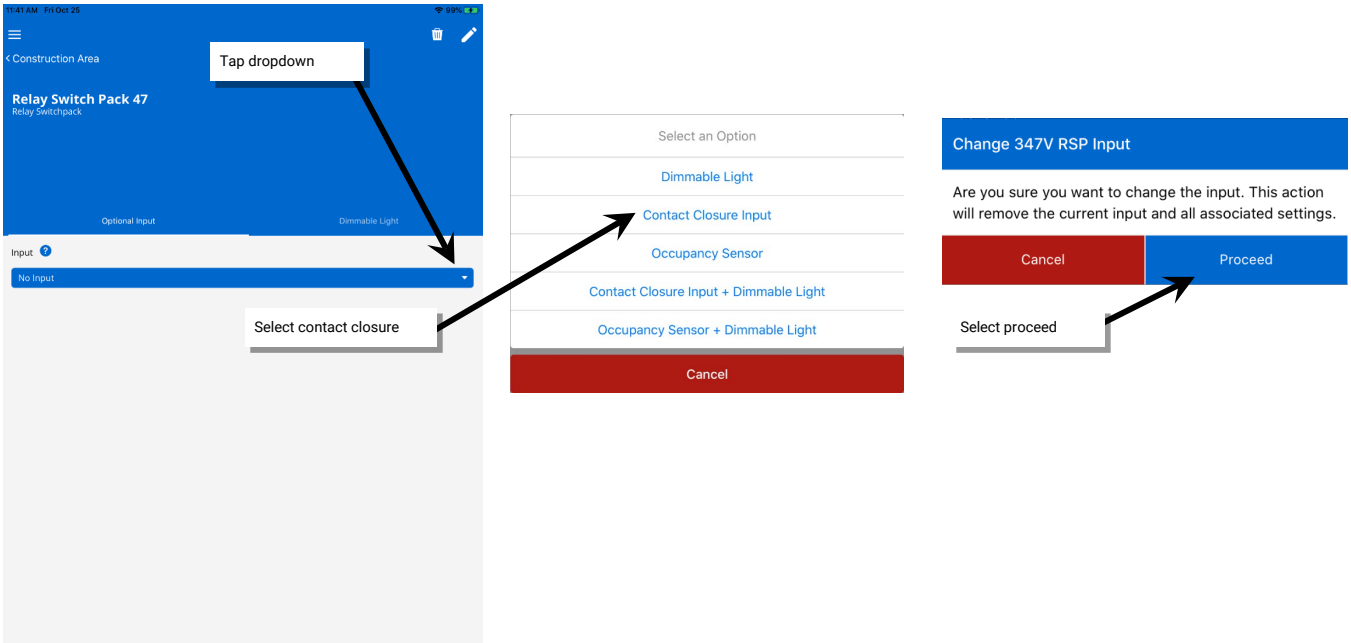
Tip: For larger projects that have more than one WaveLinx Dimming Switchpack **only** connected to contact closure devices, to streamline device identification, it may be easier to skip this step until all other devices have been assigned to all areas. Once this is done, only the dimming switchpacks connected to contact closure devices or Greengate occupancy sensors should be left in the unassigned devices allowing for faster navigation during the identification process.

If the dimming switchpack **is not connected to control lighting**, it will not have been identified yet and will still be one of the devices in the construction area. To identify and assign the device:

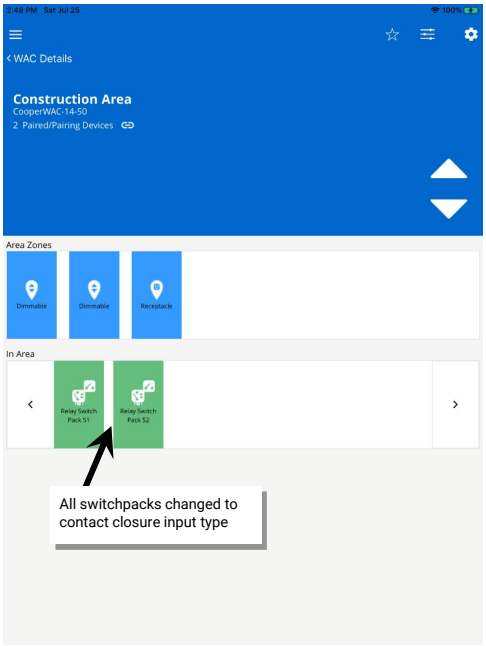
1: From the areas list, select the construction area. Within the 'in area' section of the screen, locate the first relay switchpack icon that shows the red link indicator. Tap the icon and the screen should open to the 'optional input' screen. Follow the instructions below based on the connected input type to identify the correct device.



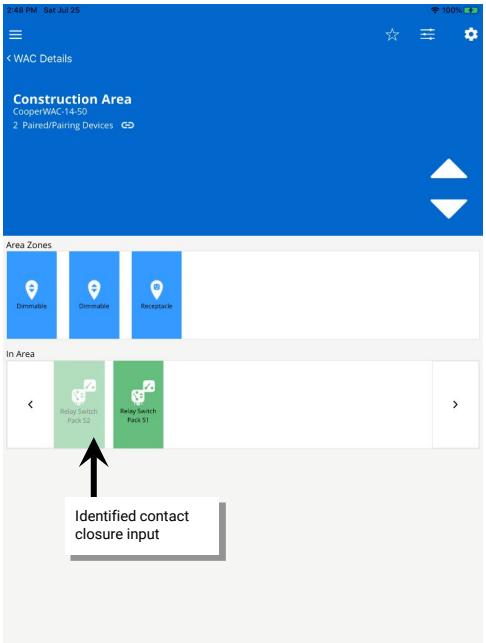
2: Use the drop down to select 'contact closure input' and select proceed.



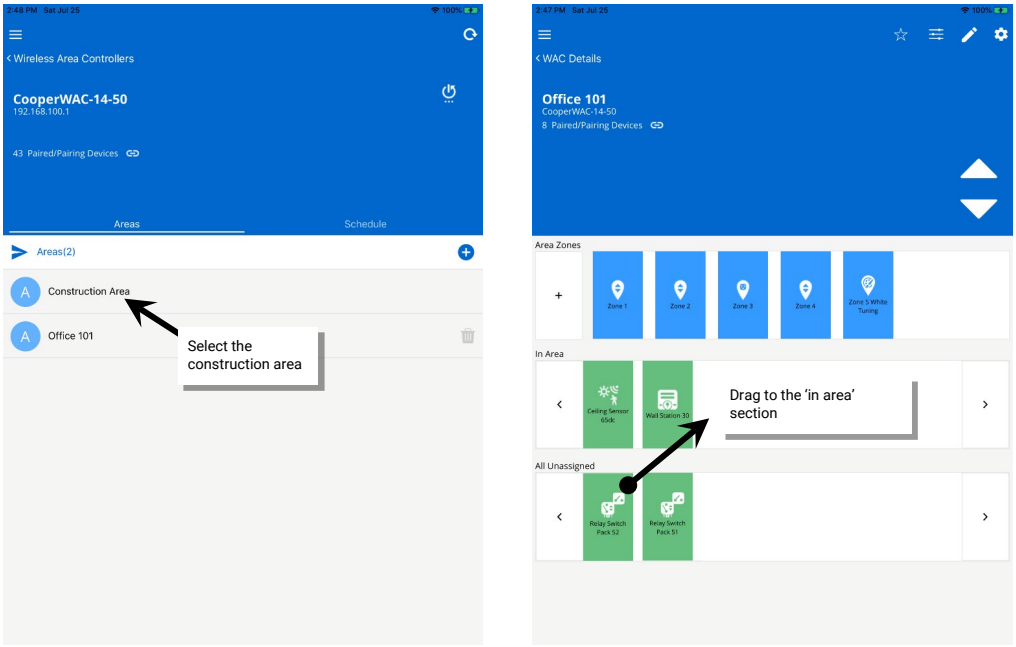
3: Make this change for all switchpack devices remaining in the construction area.



4: When the device is still in the construction area, a change to the contact closure state should cause the device to ‘reverse identify’ to the mobile application. Manually trigger the contact closure from opened to closed or from closed to open. Review the mobile app screen to make note of which device icon is ‘pulsing’.



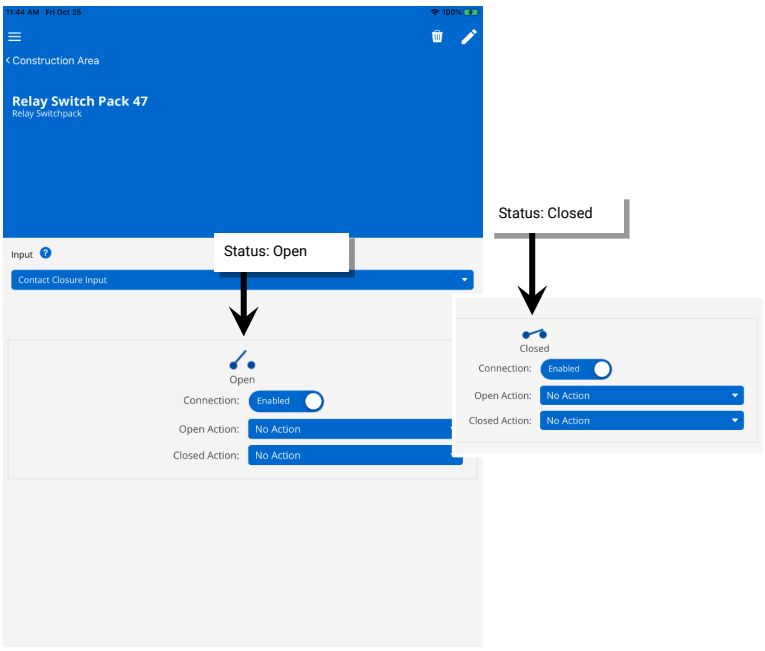
5: Once the correct device is identified, navigate back to the ‘areas list’ and select the area that the device should be assigned to. Then, locate the device in the ‘all unassigned’ section and drag it into the ‘in area’ section of the screen.



Note: If multiple devices connected to contact closure inputs are in the same area, rename each device as it is assigned to allow for easy identification for the later programming steps. To rename the device, once the device is assigned, tap on the device’s icon, and use the pencil icon at the top of the page to open the edit option. Name the device, and then save the change.

6: Repeat this process for each switchpack until all switchpacks connected to contact closure devices are identified and assigned.

Tip: After a device is assigned to an area, the reverse identify feature will not operate. To identify a contact closure device that is already assigned to an area, open the input display screen, and then manually trigger the closure open and closed. Watch the status display to see if the open status changes to closed and reflects the contact input activity. If the display reflects the open and close activity, then the device has been identified. Repeat as needed for additional devices.

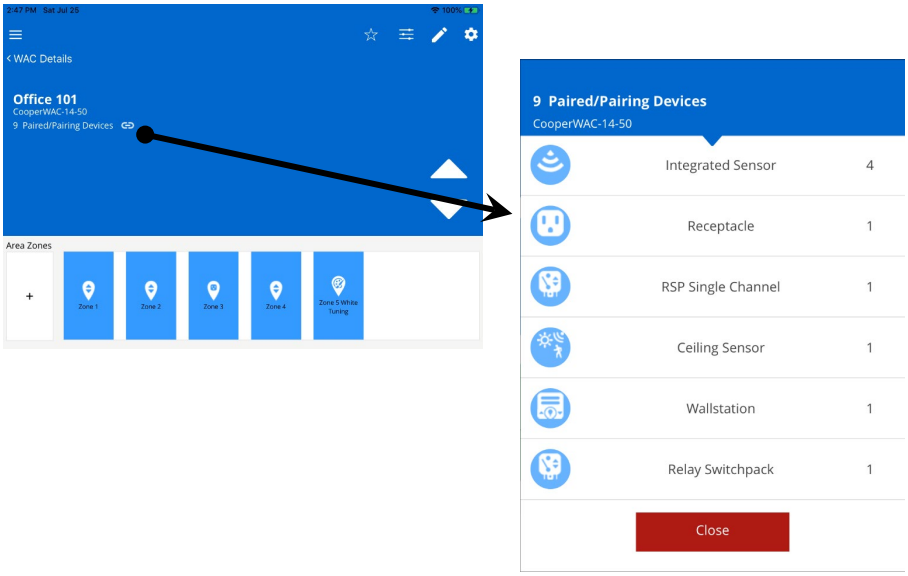


Step 6: Verify Area Assigned Device Types and Count

Once all the devices are assigned to the area, this step will walk through the process of verifying the total device count and device types assigned to the area.

1: First, review the lighting plans and obtain an accurate count of the expected devices and types for that specific room.

2: Once all devices are assigned, tap on the paired device count showing at the top of the area screen. Verify that the device types and counts match the actual quantity of devices that should be in that space.



If the device type and count are accurate to what is expected, repeat the procedures in this section to create additional areas and assign devices. Once devices are assigned, areas will begin operation with the automatic code commissioning operation.

Quick Links for Common Questions

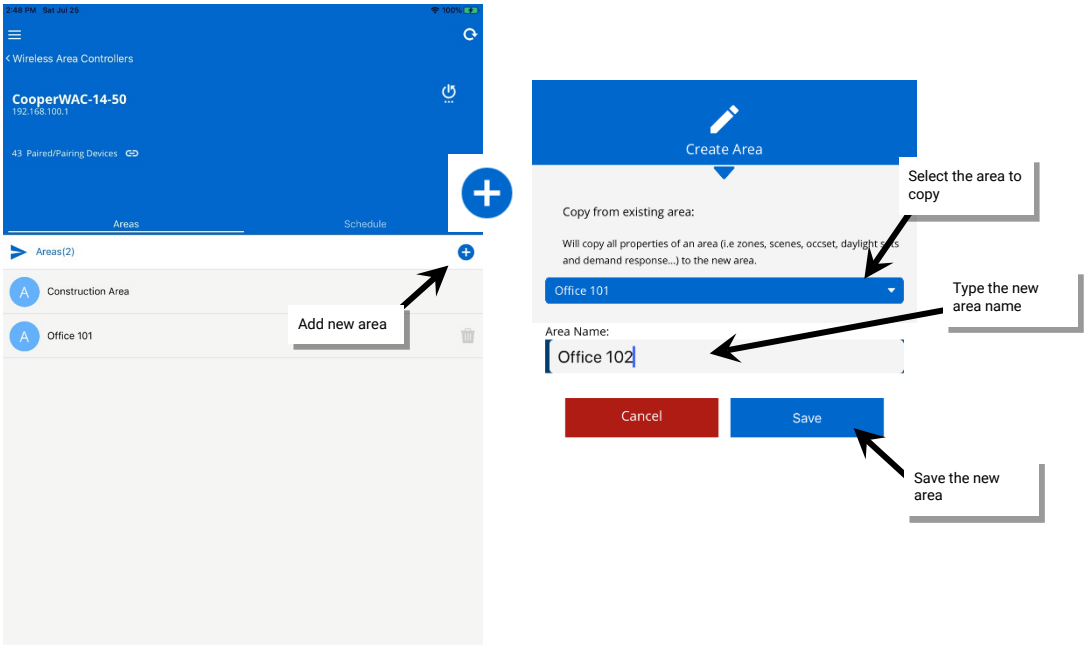
- I am done assigning my devices to areas, but I still have devices showing in my unassigned device list. What should I do? See the answer on page 198.
- During configuration, I found a device that was not powered. How do I get the device to appear in the Mobile Application so that I can assign it? See the answer on page 198.
- There is a device in the space that is not showing in the Mobile Application. How do I get the device to appear so that I can assign it? See the answer on page 195.
- I am using a Wireless Dimming Switchpack's contact closure input. My dimming switchpack does not have the additional icon showing in the 'in area' section of the mobile app or I do not see the option to set the input type. Why is this icon/input type not showing? See the answer on page 201.

Copying a Configured Area to a New Area

For sites that have rooms that are replicas with the exact same devices and zones, it may be easier to use one area as a template that can be copied to other areas. Once the original area has been created, customize the existing area with the desired programming (refer to the section on "Customizing the Automatic Code Commissioning Programming" found on page 60 of this manual). Once the area is programmed, create the new area choosing to copy the template area's settings.

To copy an area's settings to a new area:

1: In the area screen, tap the plus sign to add a new area. In the 'create area' screen, select the programmed template area in the copy section. Type in the new area name and then save the new area.



2: Once the new area is created, follow steps 2 through 6 starting on page 38 to identify and assign the desired devices to the new area.

Note: Zone quantities/parameters, scene levels, occupancy set quantities/parameters, open loop daylight set quantities/ parameters, and demand response parameters will be duplicated from the original area. Closed loop daylight sets are not copied as they are device dependent.

Automatic Code Commissioning Operation

Once devices are assigned to their appropriate areas and zones, the automatic code commissioning programming will begin operating.

- All occupancy sensors, including integrated fixture mounted sensors, battery powered ceiling sensors and Greengate occupancy sensors connected to the contact input of a WaveLinx Dimming Switchpack, are grouped to control all loads assigned to the default zones in the area (zones that have been manually added may require assignment to the occupancy set).
- Upon receiving an occupied signal from any sensor in the group, lighting will turn ON automatically to a 50% light level and controlled receptacles will turn ON.
- When they are turned ON, tunable white loads will assume a warm white color temperature (approximately 3500K).[1]
- Lighting and receptacles will turn OFF automatically after 20 minutes of vacancy (all sensors in the group must "sense" vacancy for 20 minutes).[2]
- Individual fixtures with Integrated or Tilemount sensors 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. Note that daylighting filters the fixture's response to other control commands. A command from a wallstation button or occupancy sensor to go to 100% will adjust the electric light level output to meet the originally calibrated daylight level. A command from a wallstation button or occupancy sensor to go to 50% will adjust the electric light level to meet 50% of the originally calibrated daylight level. The actual electric light level output with these commands will vary and adjust based on the available amount of daylight in the space and how much electric light needs to be contributed to maintain the commanded target.
- Open loop daylighting will not operate until configured within the Mobile Application. This includes battery powered ceiling sensors and wireless outdoor lighting control modules.
- Contact closure inputs connected to a WaveLinx Wireless Dimming Switchpack (WSP-CA-010) and programmed for a contact input type will not operate until programmed in the Mobile Application.
- Wallstations will operate the controlled lighting and receptacle zones in their assigned area according to their default button configuration. See the standard wallstation configuration information on page 72 and the battery powered wallstation configuration information on page 73 for details on the default button commands.

- All scene commands will default to the following light levels:

Scene	Dimmable Light Zone Response	On/Off Zone Response	Receptacle Response	White Tuning Response
Scene 0	0%	OFF (0%)	OFF	3500K[1]
Scene 1	100%	ON (100%)	ON	3500K[1]
Scene 2	70%	ON (100%)	ON	3500K[1]
Scene 3	50%	ON (100%)	ON	3500K[1]
Scene 4	30%	ON (100%)	ON	3500K[1]
Scene 5	10%	ON (100%)	ON	3500K[1]
Scene 6	1%	ON (100%)	ON	3500K[1]
Scene 7 through 15	Not programmed[3]	Not programmed[3]	Not programmed[3]	Not programmed[3]

- Demand Response behavior is assigned to all dimmable lighting zones. By default, if a demand response signal or test is received, all dimmable loads will reduce by 20% light output. Non dimmable, receptacle and white tuning zones are automatically exempted from demand response and will not be affected with demand response signals.

[1] **Note 1**: Actual Kelvin temperature assumed by fixture will depend on the fixture's supported Kelvin range. Number provided is for approximate reference.

[2] **Note 2**: If the occupancy set includes WaveLinx Wireless Dimming Switchpacks connected to Greengate occupancy sensors and the sensor's onboard configuration switches are set for a hold time longer than 20 minutes, the longer of the two settings will determine the amount of time before the lighting is turned OFF when unoccupied. For instance, if the WaveLinx occupancy set is left at the 20-minute default but the Greengate sensor is configured for a 30-minute hold time, the lighting will turn OFF after 30 minutes of vacancy. It is recommended that all Greengate sensors be set to 5-minute hold times to allow for maximum configurability through the WaveLinx mobile app.

[3] **Note 3**: Scenes 7 through 15 are not programmed and hidden from general users by default. The administrator must activate, and then enable the zones and programming for each zone if they are required for an application.

Using the WaveLinx Mobile Application for Personal Control

The WaveLinx Mobile Application allows occupants to have personal control of the lighting in their area. Use this section to:

- Connect to the Wireless Area Controller as a personal control user.
- Assign a favorite area to open automatically for each personal control user.
- Control the lighting as a personal control user.

Connecting with the Mobile Application as a Personal Control User

This section assumes that the Wireless Area Controller has already been setup and configured. Refer to the site's network administrator for access details if the default settings or network configuration have been modified.

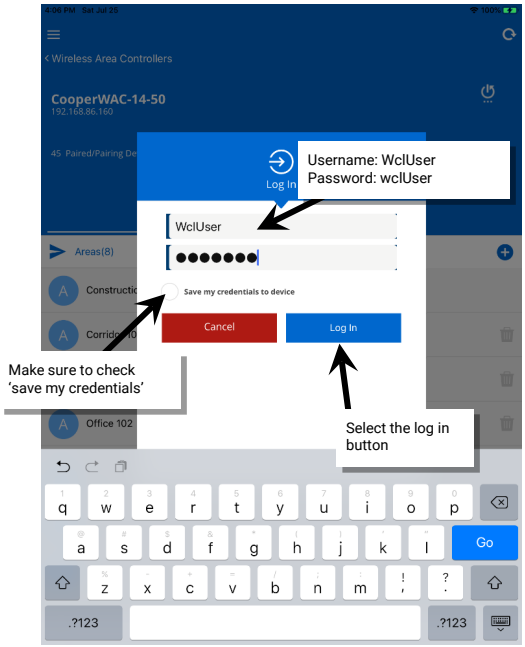
The Wireless Area Controller supports up to 31 concurrent user connections. The below procedure describes connecting with the default personal control user account. Additional users and passwords may be defined to allow users to have unique usernames and passwords for system access. Please see "Adding a New User Account" on page 164 for details on creating personal user accounts.

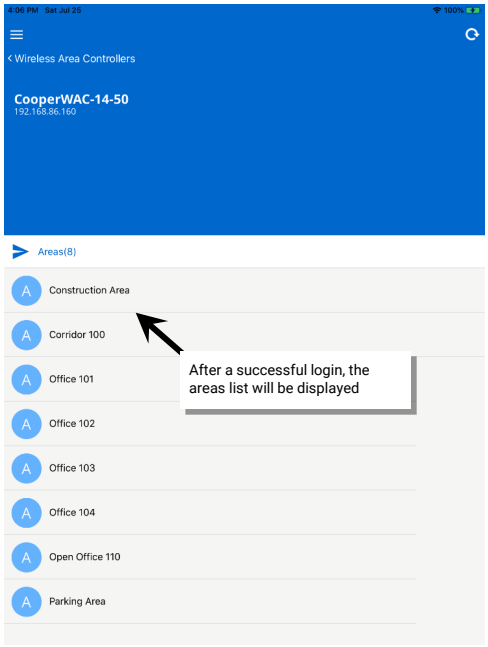
To establish an initial connection, on the user's smartphone or tablet, follow the procedures in the section "Logging into the Mobile Application as the Administrator User" on page 26 to establish a connection between the WaveLinx Mobile Application and the Wireless Area Controller. When prompted for log in credentials, instead of entering the information for the administrator, enter the username and password for the default personal control user or other defined user account (these are case sensitive).

- Default Personal Control Username: **WclUser**
- Default Personal Control Password: **wclUser**

Note: For security purposes, after the initial configuration is complete, update the default password. Users should set a complex password when changing passwords. See "Modifying Existing User Accounts and Passwords" on page 165 for this procedure.

Select the option to save credentials to remember the log in credentials automatically on this device for future connections and then select the log in button. After a brief refresh period, the areas list will be displayed indicating a successful connection.





Quick Links for Common Questions

- I previously logged in on my mobile device as an administrator user and saved my credentials. Now I need to log in as the personal control user. How do I switch users? See the answer on page 198.
- How do I change the default password for the user? See the answer on page 165.
- How do I create additional users? See the answer on page 164.
- When I open the Mobile Application, I get an error message. What do I do? See the answer on page 198.

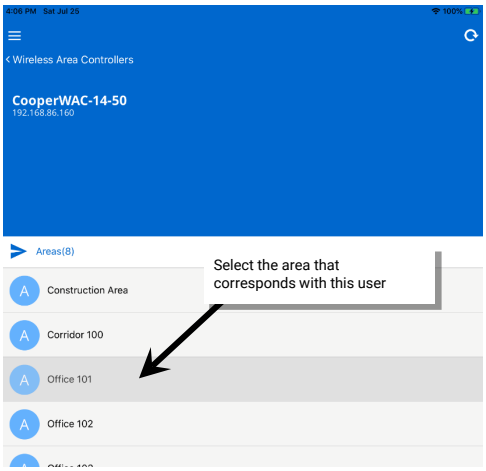
Assign a Favorite Area for Personal Control Users

It is possible to set each user's mobile device to open the WaveLinx Mobile Application to a favorite area by default for quick and easy access to lighting and receptacle loads in their location. Note that this is stored on the device and not linked to the mobile account. Any user logged in to the same mobile device will share this favorite's area.

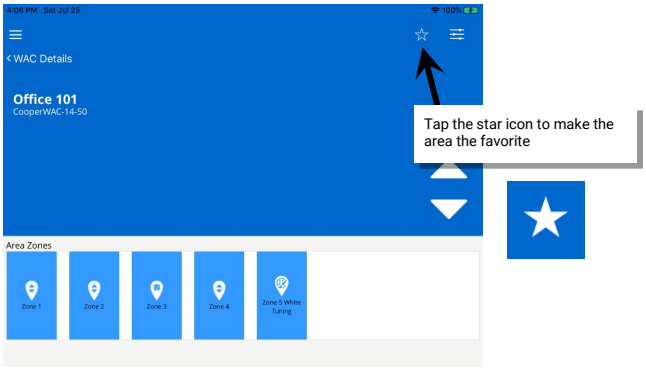
To assign a favorite area:

Step 1: On the user's mobile device, open the WaveLinx Mobile Application and establish a connection with the Wireless Area Controller as the personal control user.

Step 2: In the areas screen, select the area that corresponds with that user's location.



Step 3: In the area screen, at the top-right of the screen, touch the star icon to make the area the user's favorite. The icon should now appear as a solid star indicating that it is the favorite area.



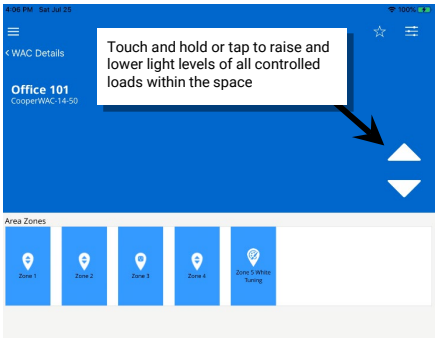
Step 4: Repeat steps 1 through 3 on each person's mobile device.

Control the Lighting as a Personal Control User

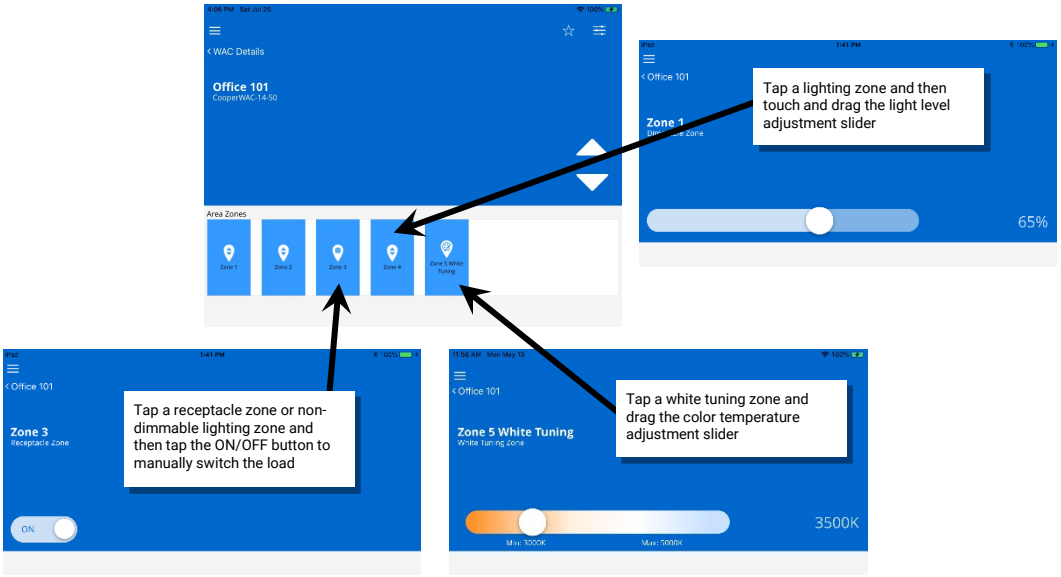
The Mobile Application's personal control feature allows the occupant of the space to control lighting in their location within defined programmed parameters. Occupancy/vacancy sensing, daylighting, and demand response settings will define the range within which the occupant can:

- Raise and lower the light level of all controlled zones in the area.
- Adjust the light level of individual dimmable zones in the area.
- Turn ON and OFF individual non-dimmable lighting zones in the area.
- Turn ON and OFF individual controlled receptacle zones in the area.
- Adjust the color temperature of tunable white lighting.
- Trigger pre-programmed scenes for the area.

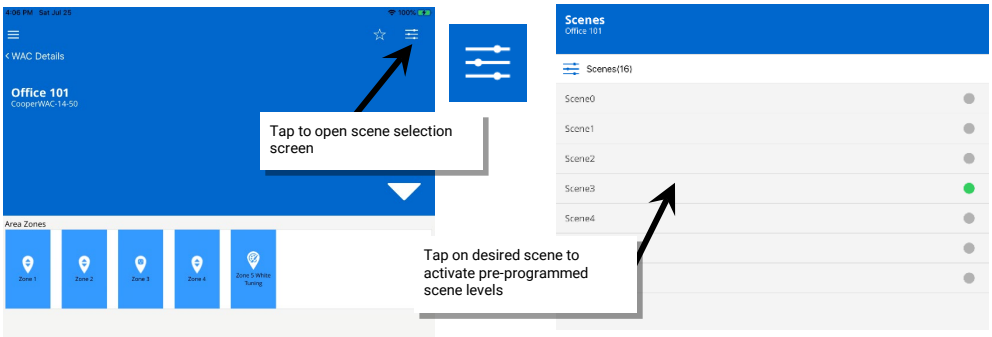
To raise or lower light levels for all area zones, use the controls on the area screen.



To control individual zones, use the controls within the zone screen.



To issue pre-programmed scenes, use the controls in the scene menu.



Quick Links for Common Questions

- When I log in as the personal control user, not all of the scenes are showing. Why is this happening? See the answer on page 199.
- In personal control, I selected a scene, but the lighting did not appear to change. Why? See the answer on page 199.
- The lights are dimmed but the personal control screen says that they are at 100%. Why? See the answer on page 199.
- The scene levels are not optimal for me and I need to adjust them. How do I customize the scene levels to what I want? See the answer on page 61.
- I work between two different spaces. Can I control both rooms through the Mobile Application? See the answer on page 199.

Customizing the Automatic Code Commissioning Programming

While many applications will operate as desired with the built-in automatic code commissioning programming, some applications may require a degree of customization. This section of the user manual will discuss how to configure and modify:

- Names of areas, zones, and devices
- Scene attributes and response
- Zone response
- Wallstation button response
- Contact closure input response
- Occupancy sensor response
- Daylight sensor calibration and light levels
- Schedule events
- Demand response behavior and testing
- White tuning application programming

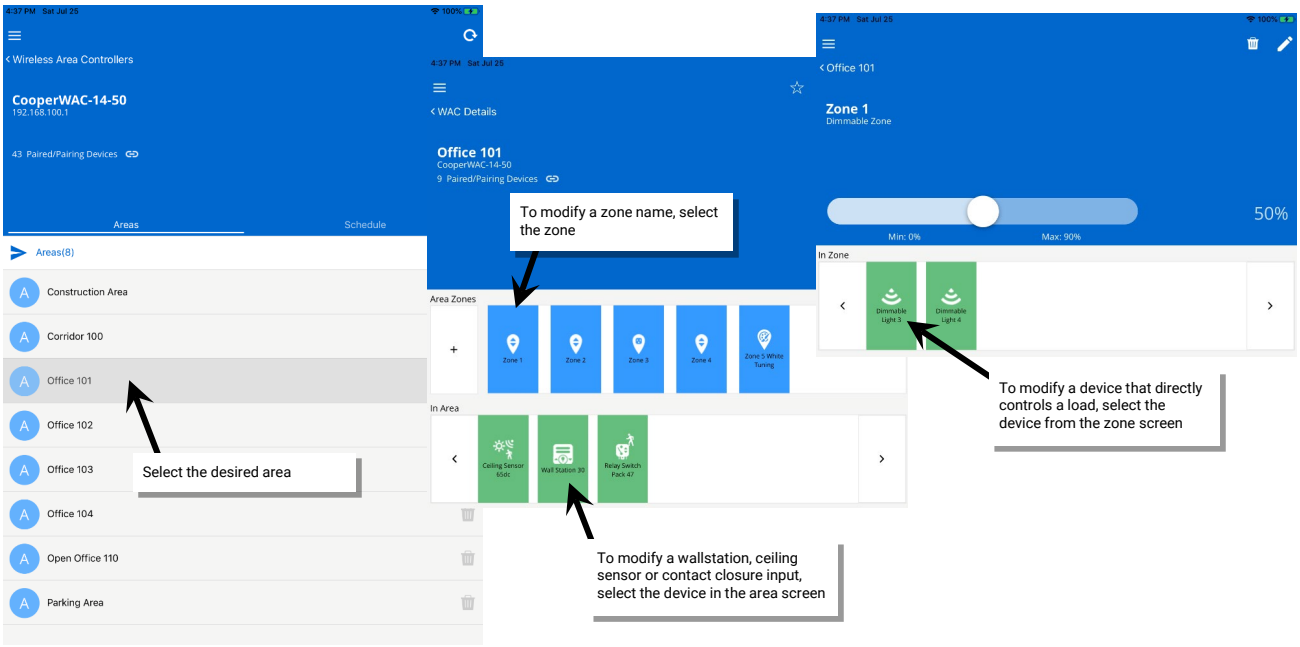
Modifying Names of Areas, Zones and Devices

Generic names will be assigned to the default zones and to devices during the configuration process. It is possible, but not required, to change the default names of areas, zones and devices at any time using the edit feature.

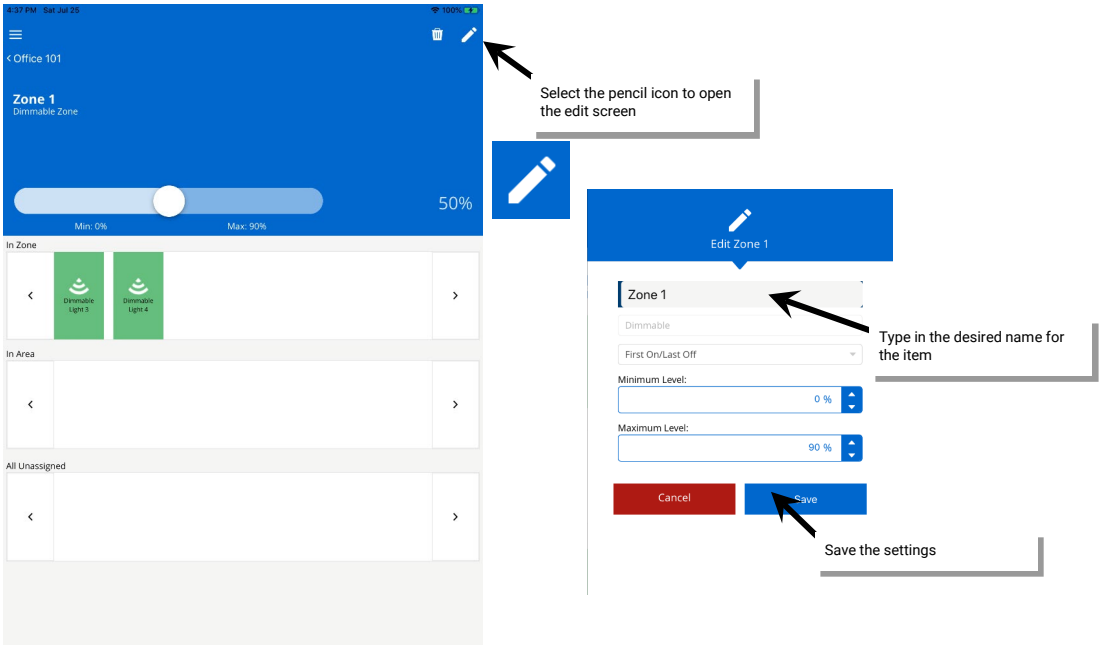
To modify the name of an area, zone, or device:

Step 1: Open the WaveLinx Mobile Application and establish a connection with the Wireless Area Controller as the administrator user.

Step 2: In the areas list, select the area that will be modified. If modifying a zone name, select the zone. If modifying a device, locate the device in either the area device section, or within a zone's device section. Tap to open the desired item.



Step 3: In the upper-right corner of the area, zone, or device screen, select the pencil icon to open an edit screen. Tap the name field and type the desired name (no more than 20 characters). Touch the save button to apply the change.



Modifying Scene Attributes and Response

The WaveLinx system allows for sixteen programmable scenes per area. These scenes are labeled scene 0 through scene 15. Each scene is pre-programmed for light levels, ON/OFF responses, or white tuning levels to allow for functionality from occupancy sensors and wallstations once devices have been PAIRED in the construction group or assigned to an area. Scenes may also be assigned to schedule events or to contact closure inputs once these items are programmed.

Default Scene Response

Scene	Dimmable Light Zone Response	On/Off Zone Response	Receptacle Response	White Tuning Response
Scene 0	0%	OFF (0%)	OFF	3500K[1]
Scene 1	100%	ON (100%)	ON	3500K[1]
Scene 2	70%	ON (100%)	ON	3500K[1]
Scene 3	50%	ON (100%)	ON	3500K[1]
Scene 4	30%	ON (100%)	ON	3500K[1]
Scene 5	10%	ON (100%)	ON	3500K[1]
Scene 6	1%	ON (100%)	ON	3500K[1]
Scene 7 through 15	Not programmed[2]	Not programmed[2]	Not programmed[2]	Not programmed[2]

[1] **Note 1**: Actual Kelvin temperature assumed by fixture will depend on the fixture's supported Kelvin range. Number provided is for approximate reference.

[2] **Note 2**: Scenes 7 through 15 are not programmed and hidden from general users by default. The administrator must activate, and then enable the zones and programming for each zone if they are required for an application.

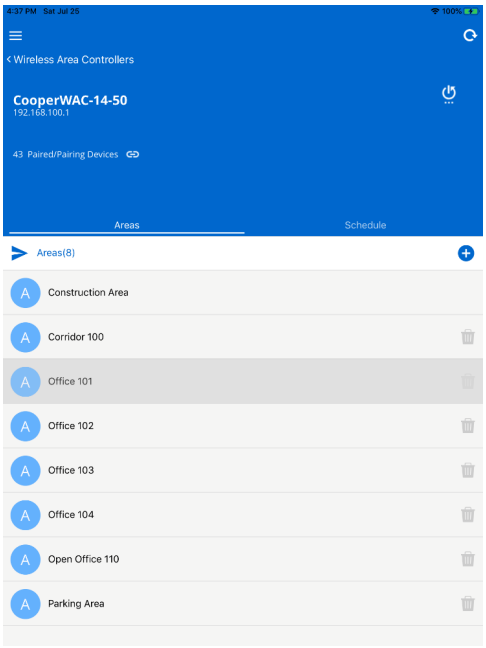
The scene defaults can be modified to respond in a different manner. Be aware that multiple devices in the space may use the same scene number (wallstation buttons, occupancy sensor commands, and schedule events). Modification of the scene levels will result in a changed response for all devices that use that scene.

Hidden scenes will not show for users logged in that are defined as "tenant" users (personal control users) but still may be viewed, issued, and assigned to programming by a user who has administrator access. It may be helpful to rename scenes to allow "tenant" users to identify scene functionality more easily. If WaveLinx Touchscreens are used in the system, hidden scenes will not be displayed. The scene names that appear on the touchscreen will be the ones defined through the WaveLinx Mobile Application.

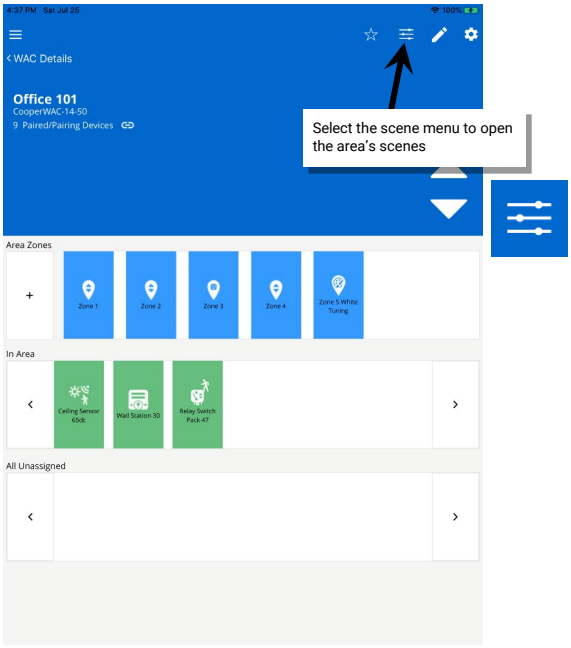
To change the scene attributes and response:

Step 1: Open the WaveLinx Mobile Application and establish a connection with the Wireless Area Controller as the administrator user.

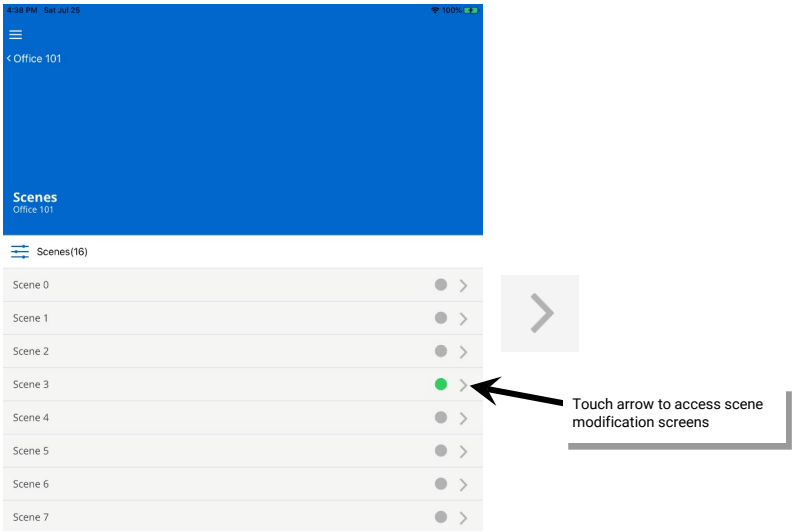
Step 2: In the areas list, select the area that contains the scenes to be modified.



Step 3: At the top-right of the area screen, tap the scene menu to display the area's scenes.

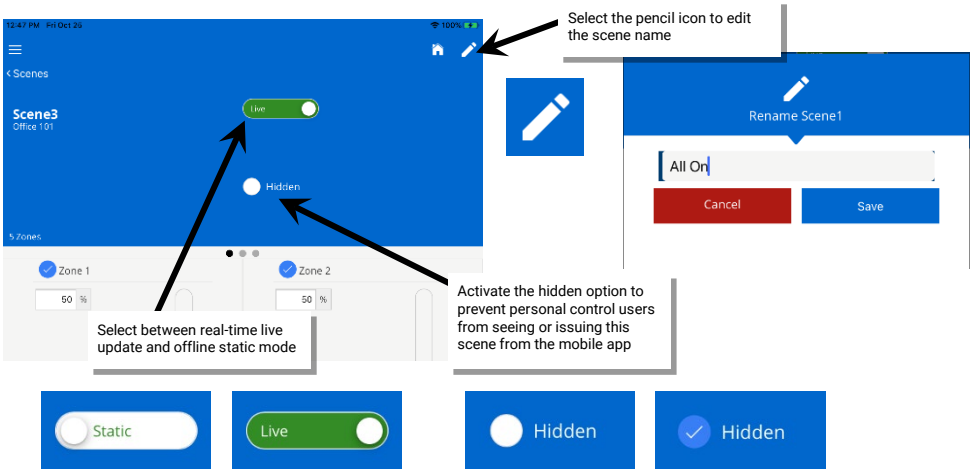


Step 4: In the area's scene list, locate the row for the desired scene. Tap the arrow in the desired row to open the scene for modification.



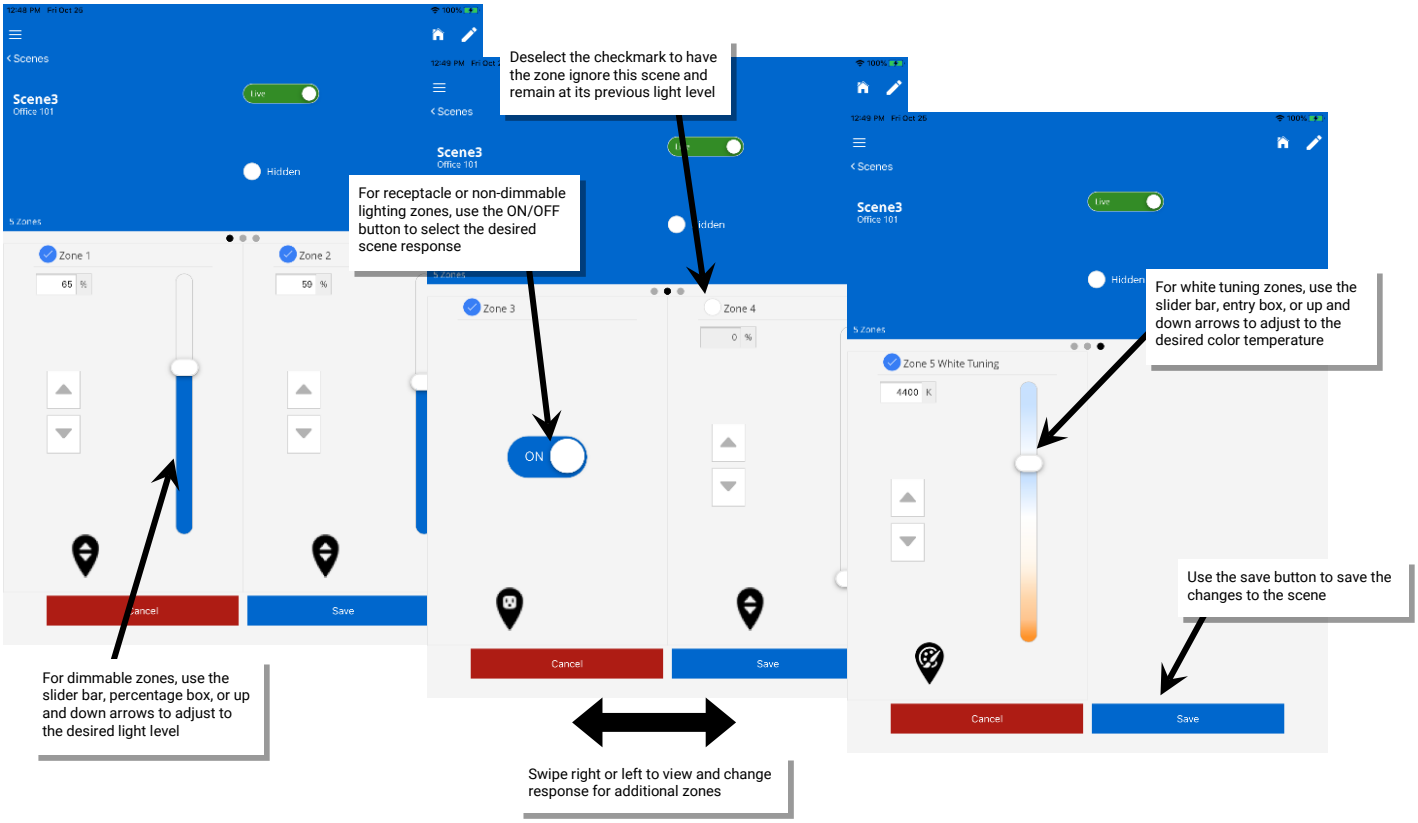
Step 5: First, set the scene attribute options:

- Optionally change the name of the scene by tapping the pencil icon and typing the desired name. If personal control users or touchscreens are being used to issue the commands, this can be helpful to identify the scene functionality.
- Select the option to hide the scene from "tenant" users (personal control users or touchscreens) by selecting the hidden option. Deselect the hidden option to make the scene visible to all user accounts.
- Select whether to adjust "live" to see changes in real-time or "static" if light levels should not change during the modification. This option is temporary during the scene's adjustment and is not stored as part of the scene.

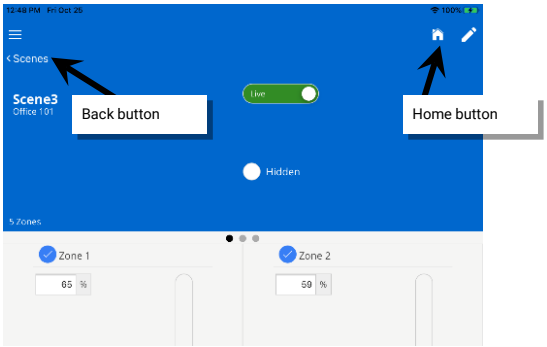


Step 6: Next, assign the desired operation for each zone.

- If a zone should not operate in the selected scene, uncheck the zone to ignore it. The ignored zone will stay at its previous light level when this scene is triggered. While the scene is active any zone command to “AFFECTED” zones will be ignored by the unchecked zones. Ensure that zones that should operate in the scene are checked.
- Use the adjustment tools within each zone to modify the scene response, adjusting the percentage for dimmable zones, selecting ON or OFF for switching zones, and adjusting the color temperature for tunable white zones. If there are more than two zones in the area, swipe left or right to navigate to additional zone pages.



Step 7: Select the back button at the top of the screen to navigate back to the scene list or tap the home button to return to the area screen. Repeat this procedure to modify additional scenes repeating as necessary for other areas.



Modifying Zone Response

Zone response may be modified by changing the default maximum and minimum Kelvin levels for white tuning zones, and by changing the default maximum and minimum light levels (high and low end trims) and operational mode default First ON/Last OFF behavior for other zone types.

Modifying Minimum and Maximum Kelvin Levels (White Tuning Zones)

A zone set for white tuning allows adjustment of the minimum and maximum Kelvin levels for the associated devices. In most cases, these should be set to accommodate the fixture's defined correlated color temperature (CCT) range. Review the fixture details for what color temperature range the fixture(s) supports and set the minimum and maximum levels to match.

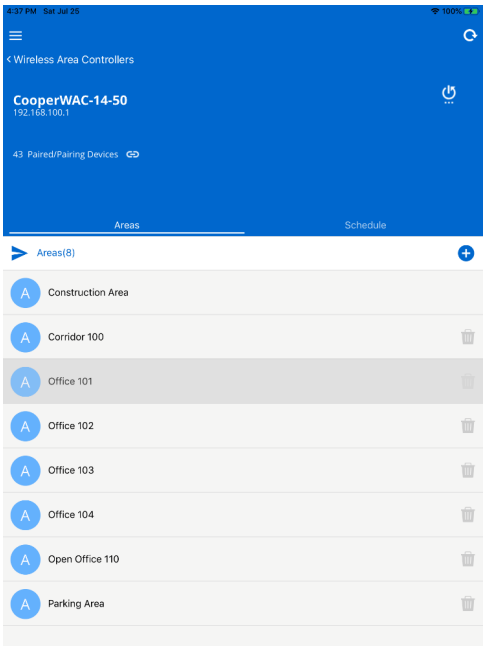
In some instances, the minimum and maximum Kelvin levels may be set differently from the published range for the fixture(s). This allows the administrator to limit white tuning operation to the specified range, even if the fixture itself supports a wider range. This can be useful if the site wants to prevent users from adjusting the lighting to very warm or very cool color temperatures that may not look ideal in the space. This feature is also helpful if there are devices in the same space that support different color temperature ranges. For instance, if one device supports 2700K-6500K, and another device supports 2700K-5000K, the white tuning zone could be set to a 2700K -5000K range to limit the response to the mutually supported range, preventing them from being adjusted to dissimilar color temperatures.

Note: Color temperature values are approximate. Color temperature may differ dependent on the type of fixture and supported range for the tunable white lighting.

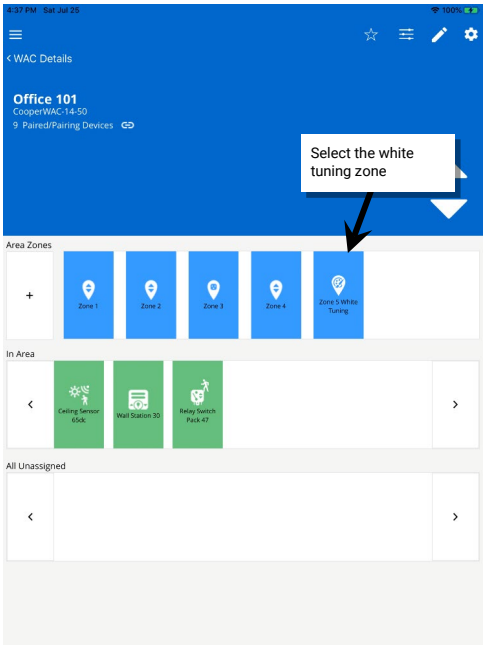
To modify minimum and maximum Kelvin levels for the white tuning zone:

Step 1: Open the WaveLinx Mobile Application and establish a connection with the Wireless Area Controller as the administrator user.

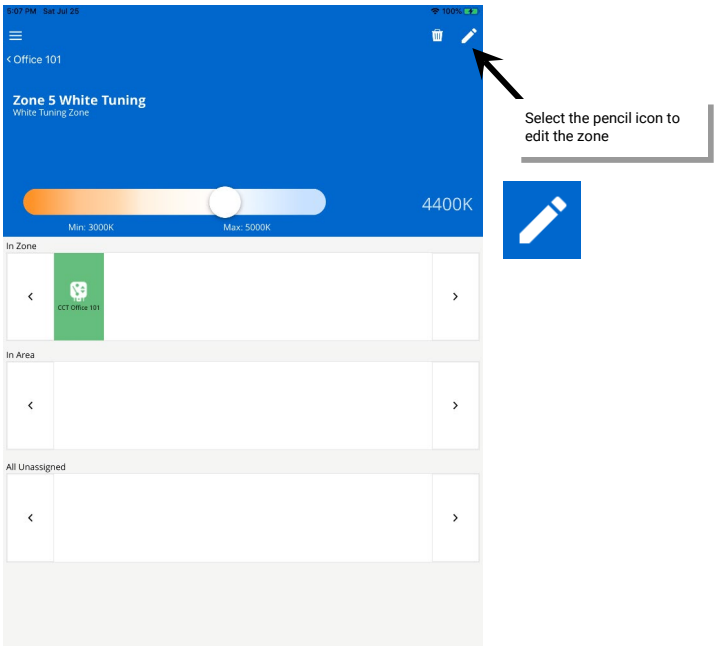
Step 2: In the areas list, select the area to be modified.



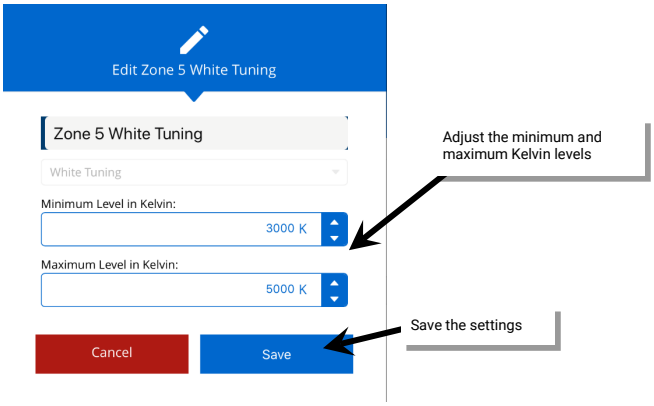
Step 3: In the area screen, select the desired white tuning zone.



Step 4: In the zone screen, select the pencil icon in the upper-right corner to open the edit function.



Step 5: Use the minimum level and maximum Kelvin level adjustments to define the desired range and then, touch the save button.



Modifying Minimum and Maximum Levels (High and Low End Trims)

(For use with zone types other than white tuning zones.) The Mobile Application's minimum and maximum level settings combined with the fixture's native driver or ballast range determines the total dimming capability of the luminaire. If minimum and maximum levels (trims) are set for a zone, dimming commands to the zone will not be able raise or lower the level beyond the levels defined. This is often referred to as setting minimum and maximum levels or setting a high end or low end trim. Commands to the affected zone that are above the maximum level or below the minimum level will result in the zone remaining at or going to the level defined (Exception: zones will still turn OFF when commanded to 0% regardless of the minimum level defined).

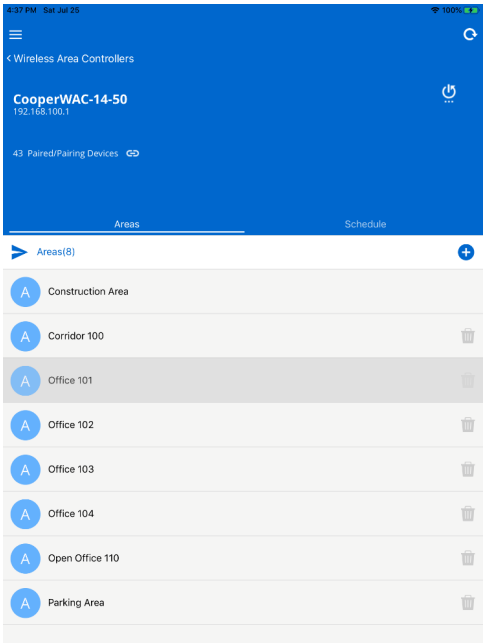
Typically, trims are used either to save energy or to provide a desired aesthetic. Lowering the maximum level (high end trim) can result in energy savings. Raising the minimum level (low end trim), while not typical, can help match dissimilar fixtures to the same cutoff level. For instance, if there is a mixture of fixtures in the same space, some with Integrated Sensors and others that are 0-10V loads controlled with WaveLinx wireless Dimming Switchpacks, the fixtures may dim to different minimum levels. The driver in the fixtures with Integrated Sensors may support dimming down to a 1% level while the 0-10V load driver may support dimming down to a 5% level. In this instance, the minimum level (low end trim) for the 1% fixtures can be raised to more closely match the cutoff to that of the 5% fixtures. In order to make this adjustment, the integrated fixtures would need to be assigned to a different zone than the 0-10V fixtures.

By default, the WaveLinx system starts with all dimmable zones set to a minimum level of 0% and a maximum level of 90%. These settings may be changed at any time by the administrator user.

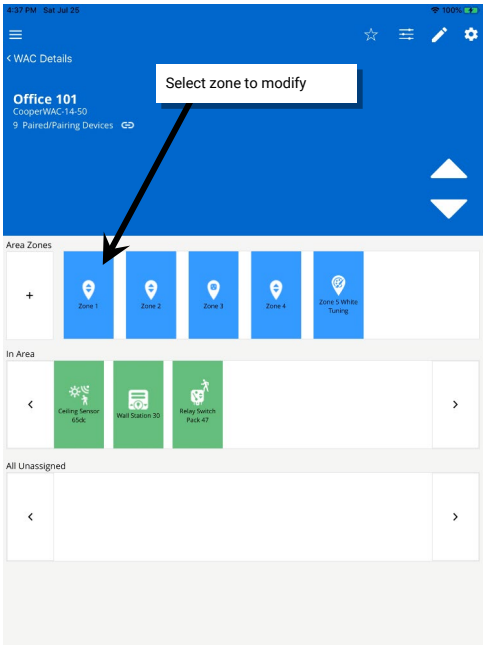
To modify minimum and maximum levels for all fixtures in the zone:

Step 1: Open the WaveLinx Mobile Application and establish a connection with the Wireless Area Controller as the administrator user.

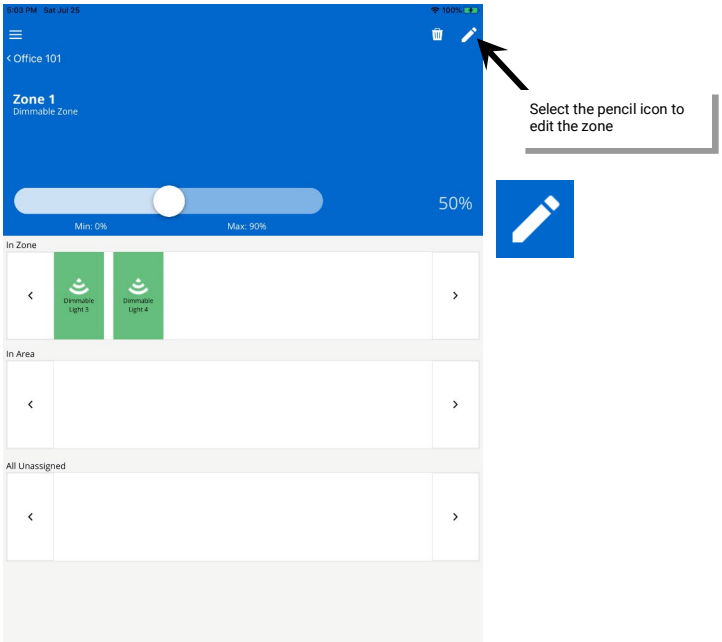
Step 2: In the areas list, select the area to be modified.



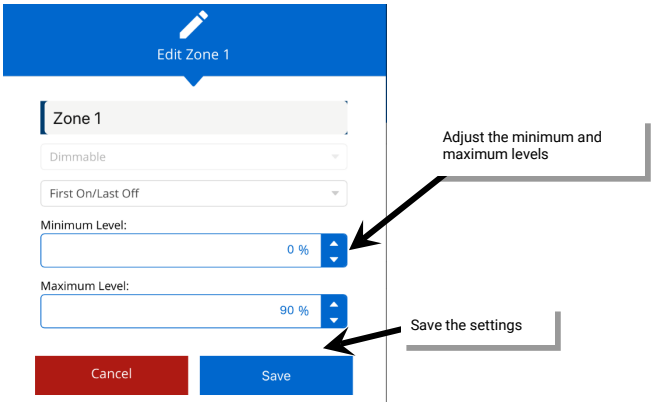
Step 3: In the area screen, select the desired zone.



Step 4: In the zone screen, select the pencil icon in the upper-right corner to open the edit function.



Step 5: Use the minimum level and maximum level adjustments to select the desired trim values, and then touch the save button.



Note: It is possible to assign a dimmable fixture to a non-dimmable zone to allow it to act like a switched load. In this instance, a maximum level may be set to set a high end trim. The dimmable fixture will turn ON to the defined maximum level when commanded to any level of 1% or higher when left in the default First On/Last Off operation mode.

Modifying Zone Operational Mode

(For use with zone types other than white tuning zones.) It is rare to adjust the zone operation mode from the First On/Last Off behavior default. This feature might be used in locations where dimming fixtures and non-dimming (switched) loads are in the same space and need to operate together in the same lighting zone. In this circumstance, the operational mode setting determines how the switched and dimmed load should operate. For instance, if a dimmable zone has a switched load assigned to it as well as dimmable loads, it may be desirable to have the switched load turn OFF when starting to dim the dimmable loads. This prevents the switched load from continuing to be ON full bright while other loads in the zone are dimming. It may also be desirable to have the switched load turn ON last so that dimmable loads in the zone can fade gradually to the chosen light level before the switched loads turn ON. This type of modification is done by adjusting the default operational mode First ON/Last OFF behavior.

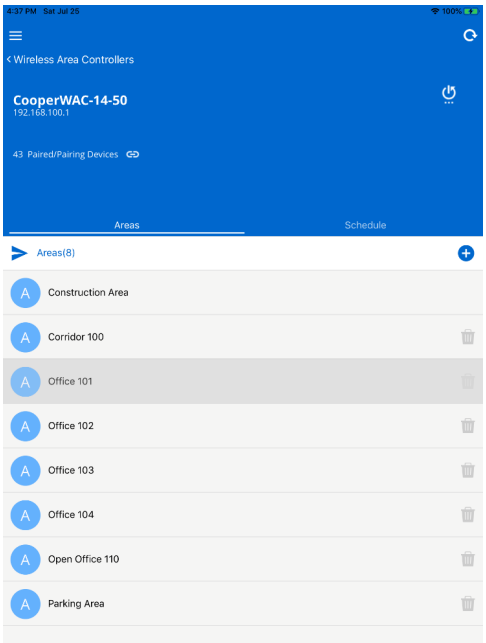
Note: Adjustment of the operational mode affects only the switched load assigned to the dimmable zone. The dimmable loads in the zone will not be affected by the change in operation mode.

To modify the default operational mode:

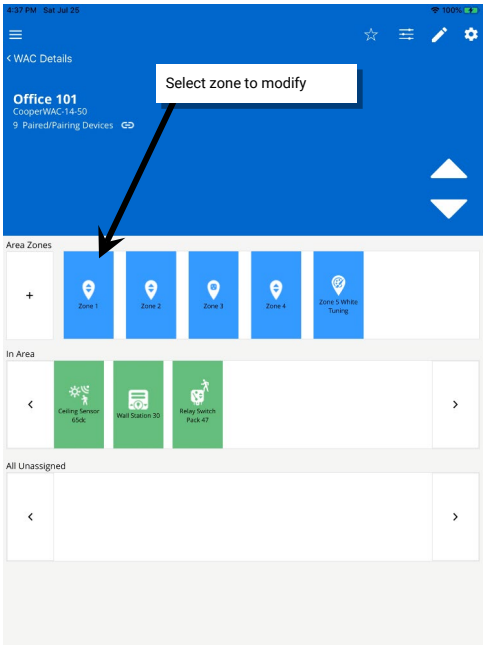
Before beginning, assign the switched load to the same zone as the dimmed lighting that it needs to operate with.

Step 1: Open the WaveLinx Mobile Application and establish a connection with the Wireless Area Controller as the administrator user.

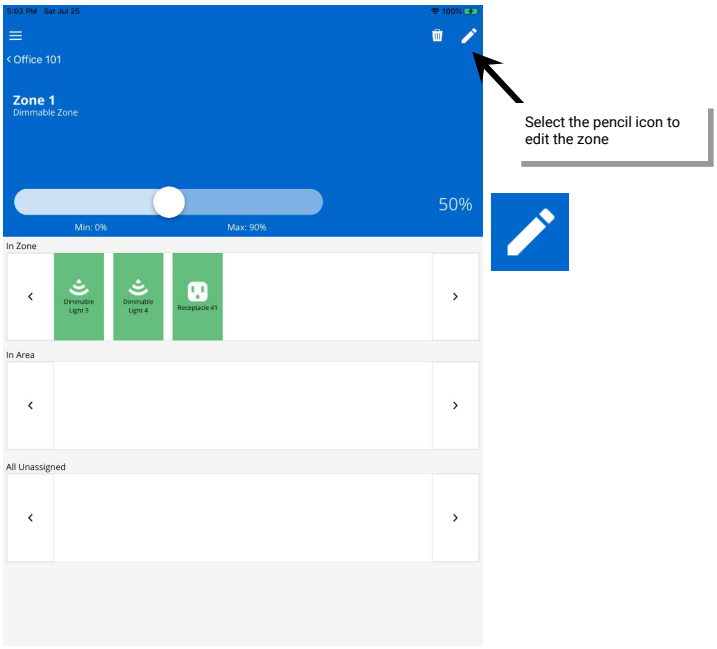
Step 2: In the areas list, select the area to be modified.



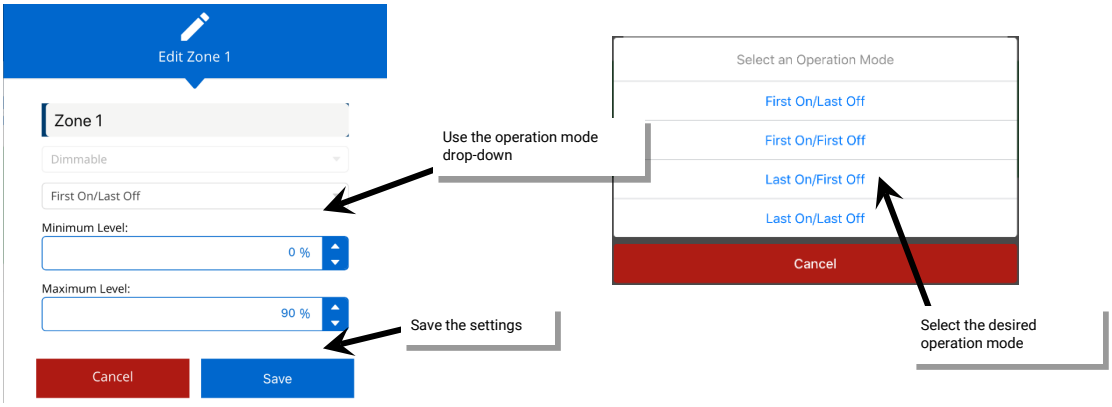
Step 3: In the area screen, select the desired zone.



Step 4: In the zone screen, select the pencil icon in the upper-right corner to open the edit function.



Step 5: Use the drop-down selection to choose the operation mode and settings. See the details below regarding the available options and resulting behavior.



Zone Operational Mode Parameter Details:

- **First On/Last Off:**

  If the zone is OFF, switched loads in the zone will respond ON when any command level other than 0% is received. If the zone is ON, switched loads within the zone will turn OFF when the zone reaches a 0% (OFF) light level.

- **First On/First Off:**

  If the zone is OFF, switched loads in the zone will respond ON when any command level other than 0% is received. If the zone is ON, switched loads in the zone will turn OFF when a command lower than the current zone level is received.

- **Last On/First Off:**

  If the zone is OFF, switched loads in the zone will respond ON when any command at or above the defined maximum level (high end trim) is received. If the zone is ON, switched loads in the zone will turn OFF when a command lower than the current zone level is received.

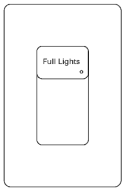
- **Last On/Last Off:**

  If the zone is OFF, switched loads in the zone will respond ON when any command at or above the defined maximum level (high end trim) is received. If the zone is ON, switched loads in the zone will turn OFF when the zone reaches a 0% (OFF) light level

Modifying Wallstation Button Response

Once assigned to their controlled area, WaveLinx Wallstations operate with default functionality. The following charts describe the default wallstation button response for the standard WaveLinx Wallstations (line voltage powered) and for the battery powered WaveLinx Wallstations.

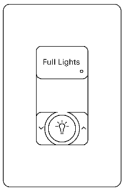
Standard Wallstation Default Button Response (Line Voltage Stations)



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

W1L-x

Button #1: Toggle Scene (Scene 0/Scene1)



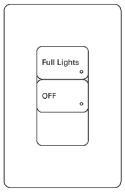
W1L-RL-*
(* = W,V,G,B)

W1L-RL-x

Button # 1: Scene 3

ON/OFF: Toggle Scene (Scene 0/Scene 1)

Raise/Lower: Raise/Lower All Zones in Current Area [1]

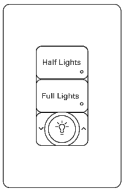


W2L-*
(* = W,V,G,B)

W2L-x

Button #1: Scene 1

Button #2: Scene 0



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

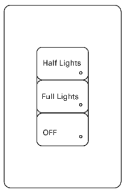
W2L-RL-x

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 [1]



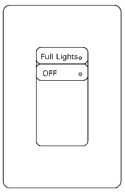
W3L-*
(* = W,V,G,B)

W3L-x

Button #1: Scene 3

Button #2: Scene 1

Button #3: Scene 0

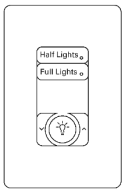


W2S-*
(* = W,V,G,B)

W2S-x

Button #1: Scene 1

Button #2: Scene 0



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

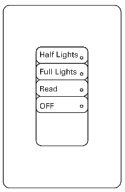
W2S-RL-x

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 [1]



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

W4S-x

Button #1: Scene 3

Button #2: Scene 1

Button #3: Scene 4

Button #4: Scene 0

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 [1]

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

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

W6S-x

Button #1: Scene 3

Button #2: Scene 1

Button #3: Scene 2

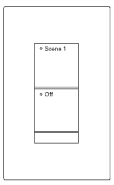
Button #4: Scene 4

Button #5: Scene 5

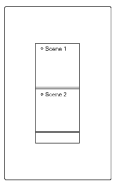
Button #6: Scene 0

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

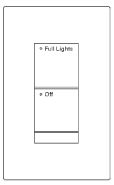
Battery Powered Wallstation Default Button Response



WB2L-S1-W



WB2L-S2-W



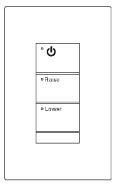
WB2L-W

WB2L-x

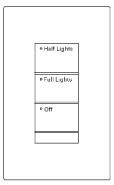
Button #1: Scene 1

Button #2: Scene 0

WB3L-S2-W



WB3L-D-W



WB3L-W

WB3L-x

Button #1: Scene 3

Button #2: Scene 1

Button #3: Scene 0

WB5-S3-W

WB5-S3-W

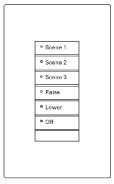
Button #1: Scene 3

Button #2: Scene 1

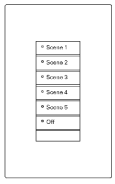
Button #3: Scene 2

Button #4: Toggle Scene (Scene 0/Scene 1)

Raise/Lower: Raise/Lower All Zones in Current Area [1]



WB6S-S3D-W



WB6S-S5-W

WB6S-S3-W

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

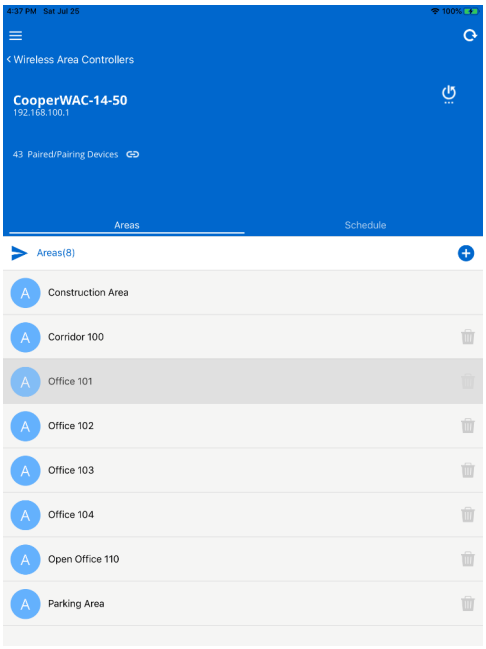
[1] **Note**: White tuning zones are automatically exempted from raise/lower 'ALL' zones to prevent inadvertent adjustment of the color temperature when adjusting light levels.

Changing Default Button Response

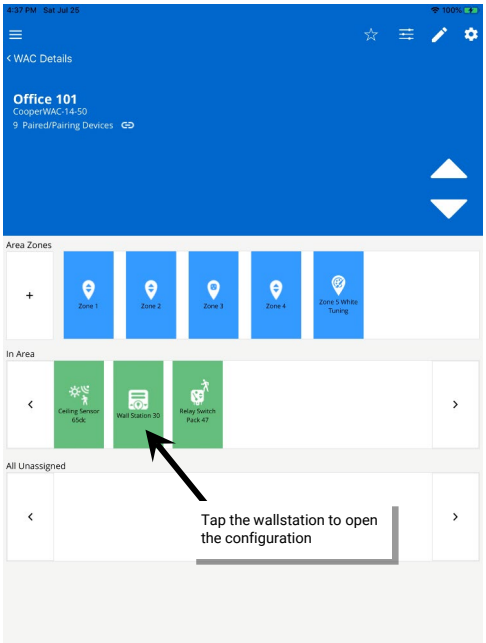
Each wallstation button's default response may be modified to customize operation. To change the response of a wallstation button:

Step 1: Open the WaveLinx Mobile Application and establish a connection with the Wireless Area Controller as the administrator user.

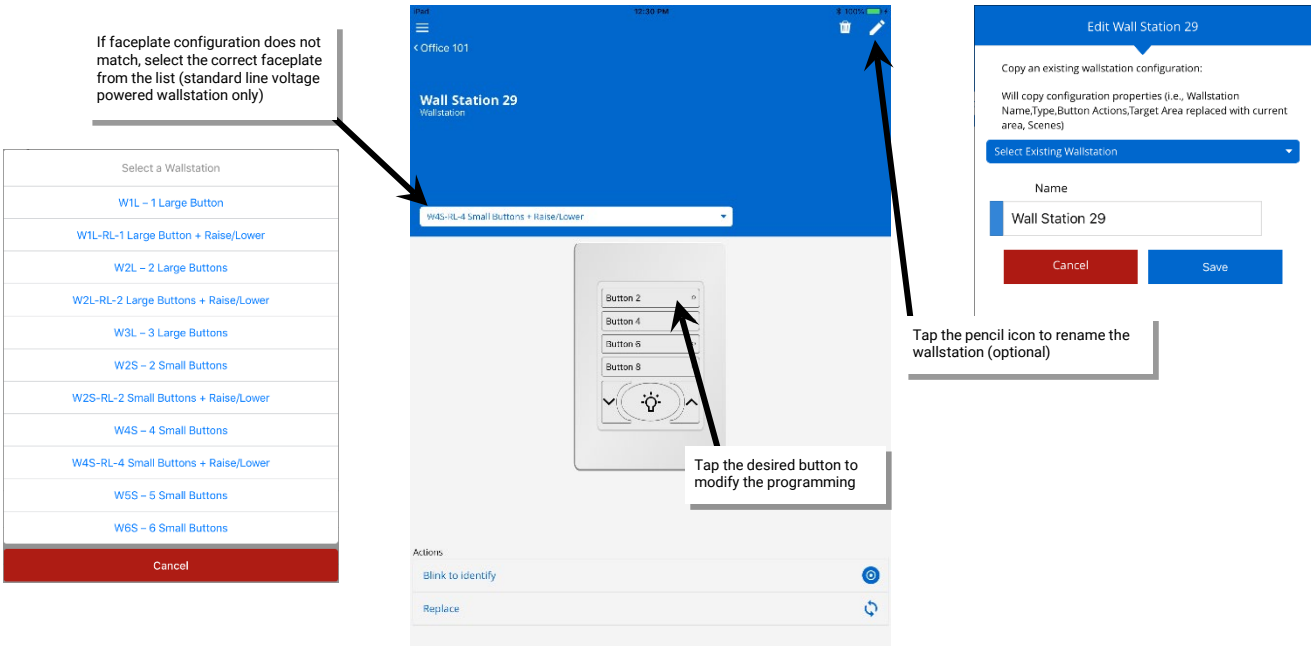
Step 2: In the areas list, select the area that contains the wallstation to be modified.



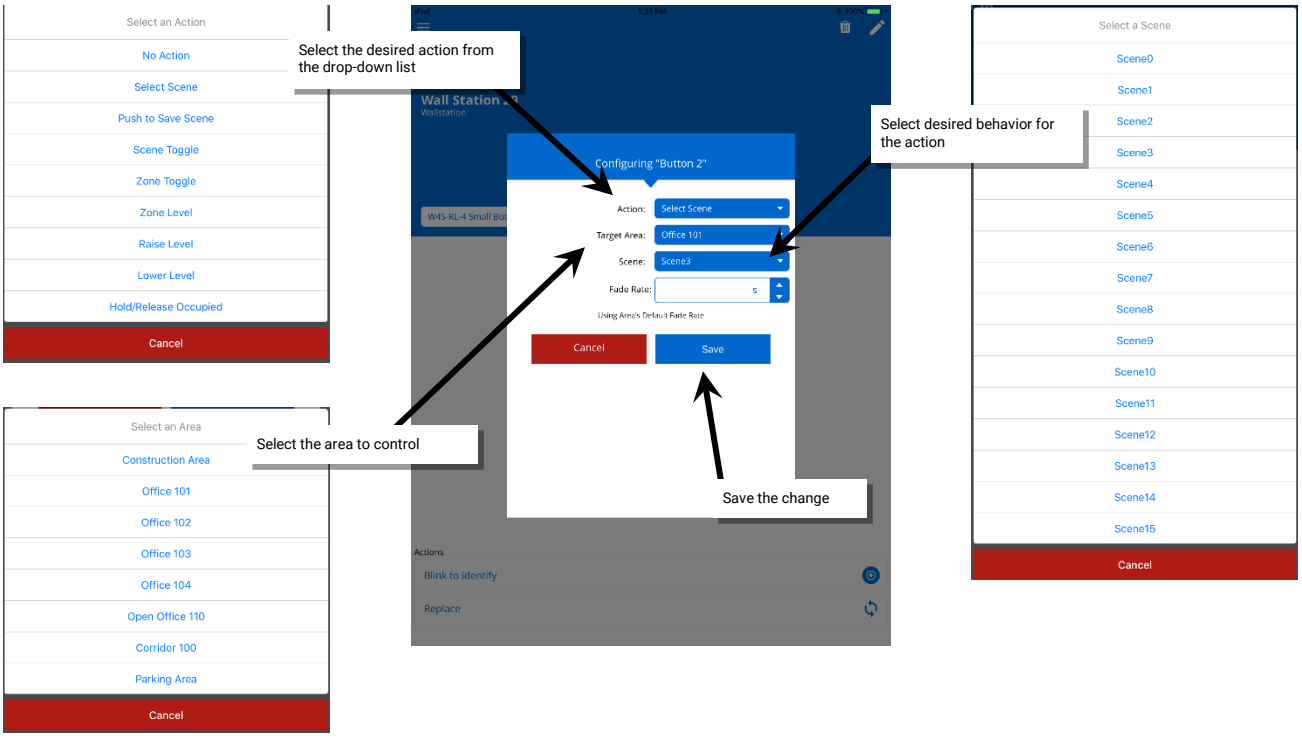
Step 3: In the area screen, tap the icon for the desired wallstation to open it for editing.



Step 4: In the wallstation screen, ensure that the faceplate configuration shown matches the faceplate of the wallstation model being configured. For standard line voltage powered wallstations only, if necessary, select the correct configuration from the drop-down list. (Battery powered wallstations will not have the option to change the faceplate configuration.) Optionally, use the pencil icon edit feature to rename the wallstation. Then, touch the desired button on the displayed wallstation graphic to modify the programming.



Step 5: Select the desired action for the button and then choose the area that the action affects. Other parameter selections will be based on the chosen action. Select the appropriate behavior, and then touch the save button.



Step 6: Repeat steps 4 and 5 for additional buttons on the selected wallstation. Repeat this procedure for additional wallstations in the space or use the copy function described in the next section.

Wallstation Parameter Definitions:

- **No action**: The button will not perform any command if pressed.
- **Select scene**: The button will issue the selected scene to the selected area using either the default area fade rate, or a uniquely defined fade rate.
- **Push to save scene**: If pressed and released (less than 5 second press), the button will issue the designated scene command. If the button is held down for at least 5 seconds, the system will save the current light levels and color temperature levels to the designated scene. This allows users to adjust the levels, and then save the modified levels for future recall.
- **Scene toggle**: The button will alternate between the two selected scenes for the selected area. If the dominant scene is not the current active scene in the space, the initial button press will issue the defined scene. Use either the default area fade rate or a uniquely defined fade rate.
- **Zone toggle**: The button will command the selected zone in the selected area, alternating between the two defined levels. The initial button press will issue the zone level defined as the dominant level. Use either the default area fade rate or a uniquely defined fade rate. Selections for zones include the ability of choosing an individual zone, 'ALL' zones in the area, or 'AFFECTED' zones. If the 'AFFECTED' zones option is used, zones that have been ignored from the active scene will not respond to the command.

  Note: White tuning zones are automatically exempted from control if the 'ALL' or ''AFFECTED' zone is selected to prevent inadvertent color temperature shifts when adjusting light levels. The white tuning zone will only respond to a zone toggle command if it is the only zone selected.
- **Zone level**: The button will operate the selected zone in the selected area to the defined level. Use either the default area fade rate or a uniquely defined fade rate. Selections for zones include the ability of choosing an individual zone, 'ALL' zones in the area, or 'AFFECTED' zones. If the 'AFFECTED' zones option is used, zones that have been ignored from the active scene will not respond to the command.

  Note: White tuning zones are automatically exempted from control if the 'ALL' or ''AFFECTED' zone is selected to prevent inadvertent color temperature shift when adjusting light levels. The white tuning zone will only respond to a zone level command if it is the only zone selected.
- **Raise level**: The button will gradually raise the light level in the selected zone in the selected area. If assigned to a white tuning zone, the button will gradually shift the color temperature to a cooler white tone. Selections for zones include the ability of choosing an individual zone, 'ALL' zones in the area, or 'AFFECTED' zones. If the 'AFFECTED' zones option is used, zones that have been ignored from the active scene will not respond to the command.

  Note: White tuning zones are automatically exempted from control if the 'ALL' or ''AFFECTED' zone is selected to prevent inadvertent color temperature shift when adjusting light levels. The white tuning zone will only respond to a zone raise command if it is the only zone selected.
- **Lower level**: The button will gradually lower the light level in the selected zone in the selected area. If assigned to a white tuning zone, the button will gradually shift the color temperature to a warmer white tone. Selections for zones include the ability of choosing an individual zone, 'ALL' zones in the area, or 'AFFECTED' zones. If the 'AFFECTED' zones option is used, zones that have been ignored from the active scene will not respond to the command.

  Note: White tuning zones are automatically exempted from control if the 'ALL' or ''AFFECTED' zone is selected to prevent inadvertent color temperature shift when adjusting light levels. The white tuning zone will only respond to a zone lower command if it is the only zone selected.
- **Hold/Release Occupied**: The initial button press will lock out occupancy sensor commands in the selected area for a period of 60 minutes. If desired, the button can be pressed before the timer expires to return the system to normal function.

Quick Links for Common Questions

- My wallstation or occupancy sensor does not appear to operate during the day but seems to work at night. Why is this occurring? See the answer on page 201.

Copying Wallstation Programming to Other Wallstations

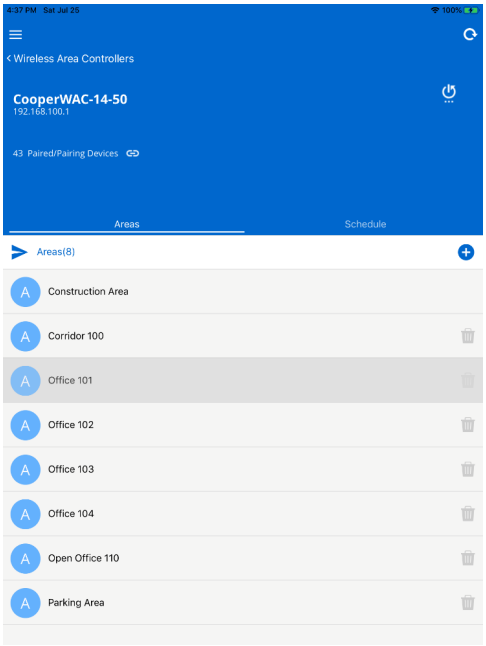
In many applications, wallstations within the same room may perform the same functions. In addition, wallstations in other rooms may have the same behavior. The Mobile Application makes it easy to copy customized wallstation programming to other wallstations.

In order to copy wallstation programming:

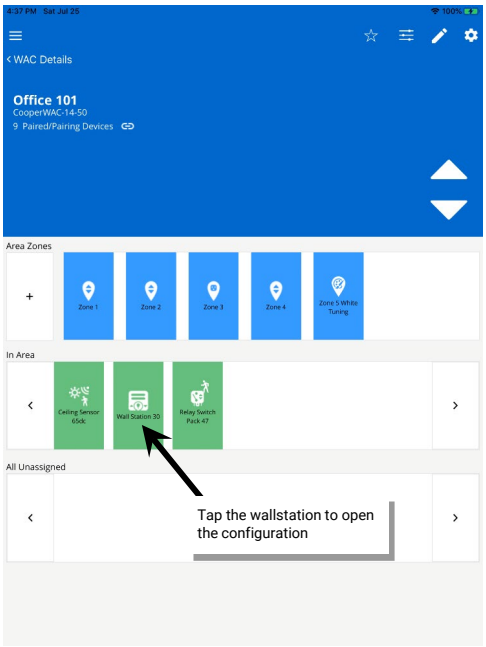
- The wallstations must be the same type and have the same faceplate configuration, i.e. if the original wallstation is a standard line voltage powered 4 small button with raise/lower, then the destination wallstation must be a standard line voltage powered 4 small button with raise/lower.
- The quantity and types of zones should match between areas.

Settings that copy include the button actions of each button and all defined parameters with the exception of the target area. When copied, the target area defined in the original wallstation will update to the area assigned to the selected wallstation.

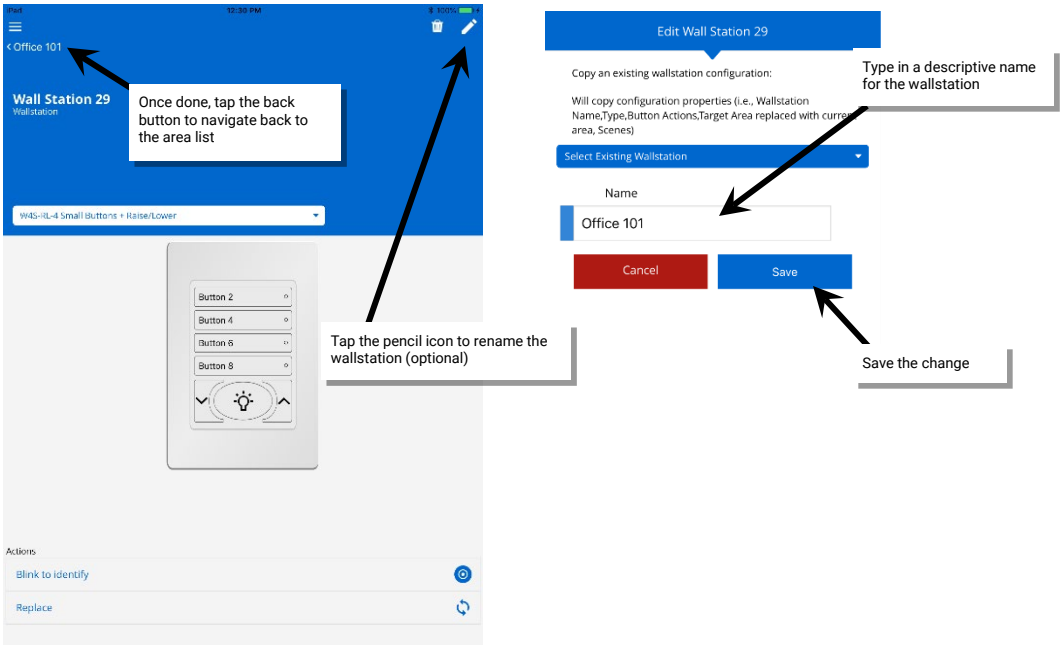
Step 1: Open the WaveLinx Mobile Application and establish a connection with the Wireless Area Controller as the administrator user.
Step 2: In the areas list, select the area that contains the wallstation that has already been programmed with the desired settings.



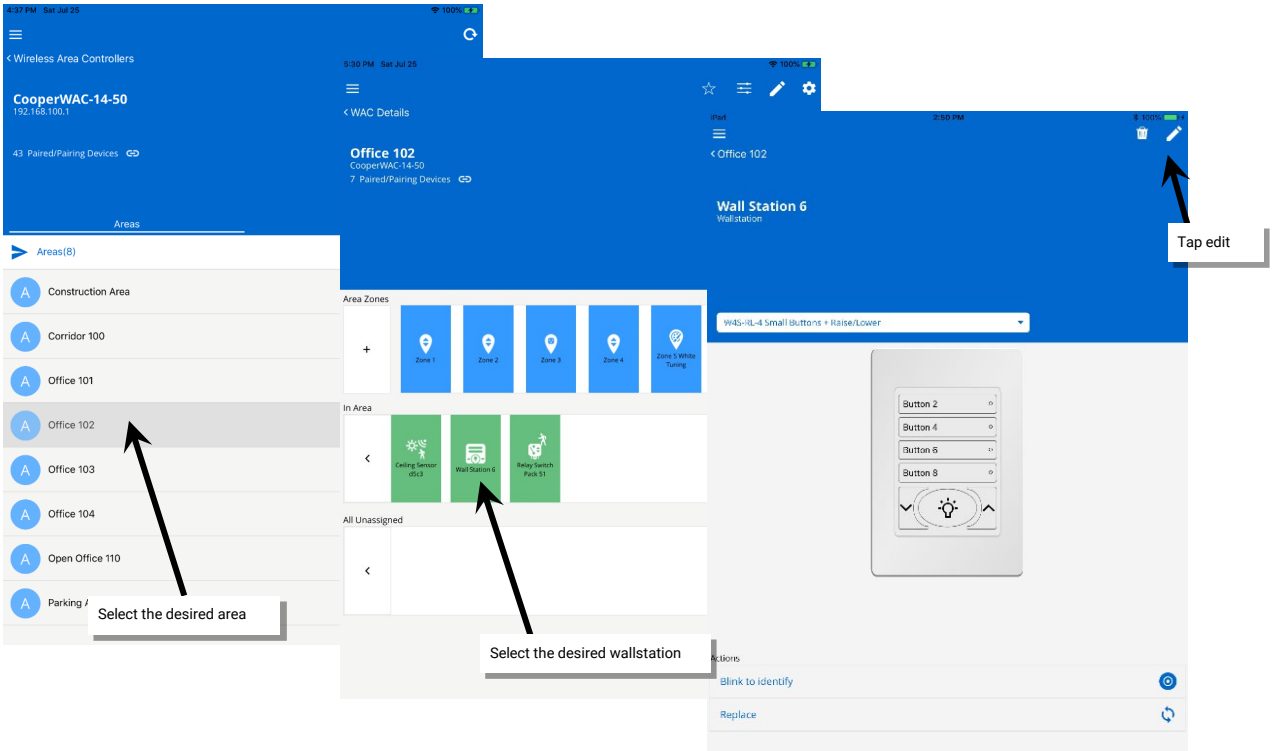
Step 3: In the area screen, tap the icon for the programmed wallstation to open it for editing.



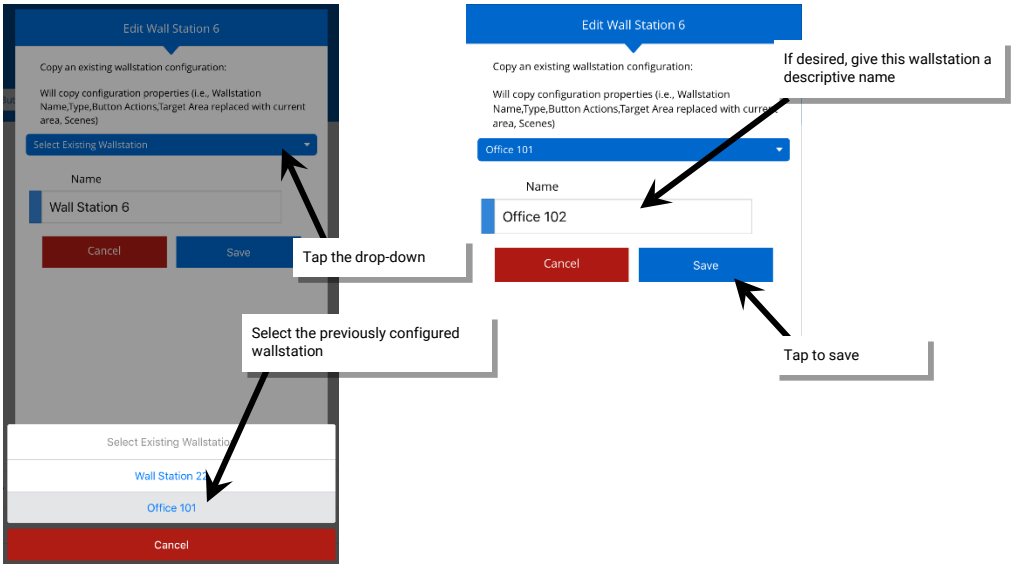
Step 4: In the wallstation screen, select the pencil icon to open the edit feature. Tap in the name field and type a unique name for this wallstation that will be easily recognized. Touch the save button to save the change and then tap the back button to return to the area list.



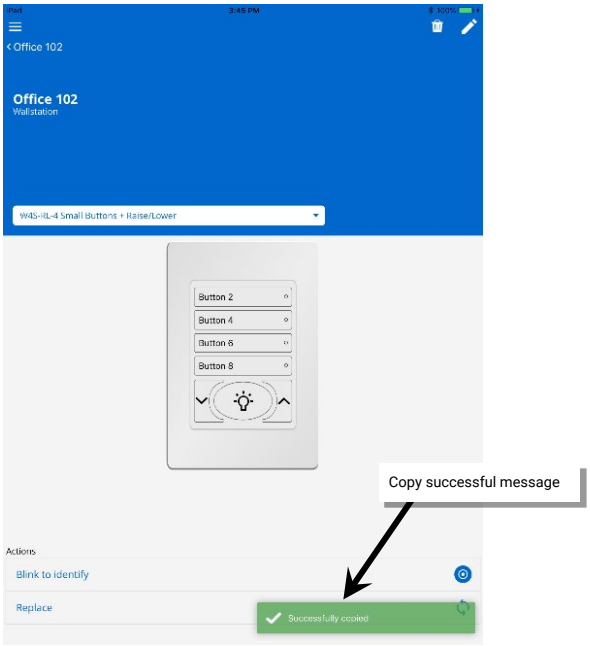
Step 5: Next select the area that the next wallstation is assigned to. Tap on the wallstation icon to open it and then select the pencil icon to open the edit feature.



Step 6: In the edit screen, tap the drop down in the copy section and select the name of the programmed wallstation. If desired, type a name for the new wallstation and then tap save.



Once the wallstation is saved, a message may appear briefly stating that the copy was successful.



Step 7: Repeat these steps to copy the wallstation settings to additional wallstations as needed.

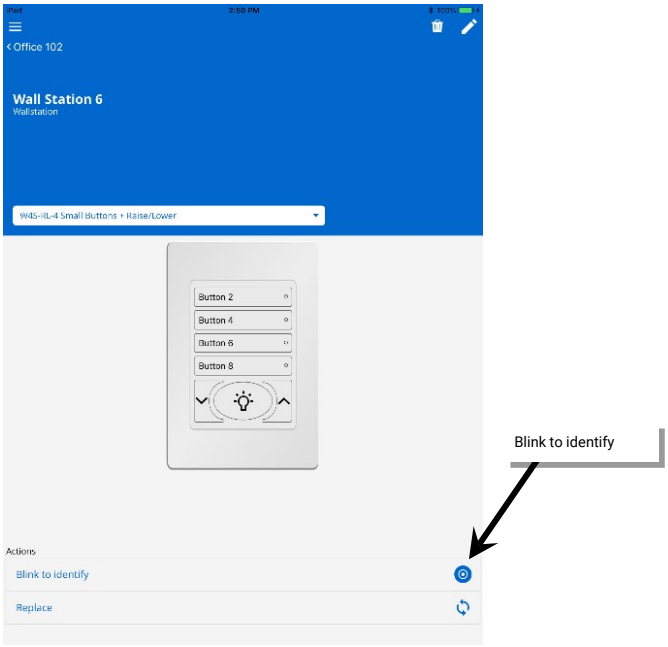
Additional Wallstation Information

There are some helpful items available in the Mobile Application to assist with wallstation identification and battery monitoring.

- **Blink to Identify**

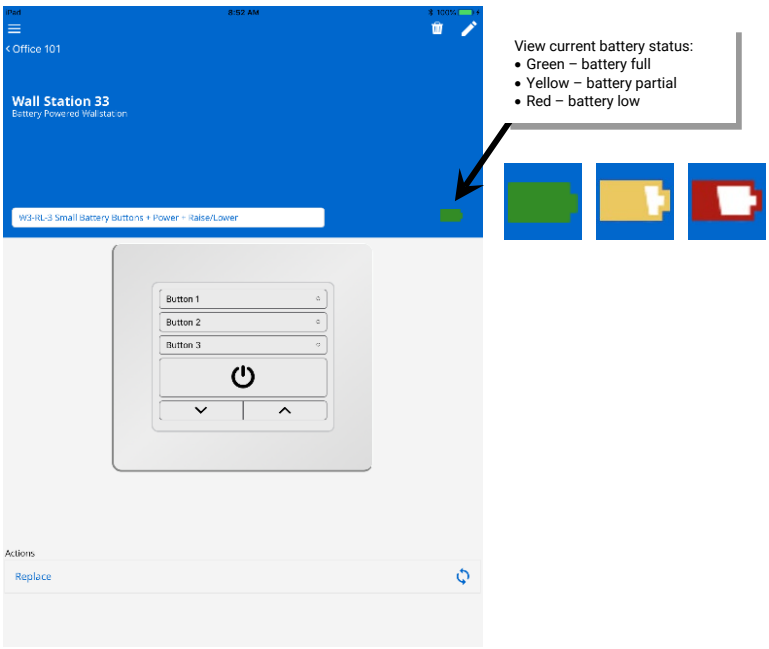
  In an area that has a large quantity of the same model of standard line voltage powered wallstations, use the Mobile Application's blink to identify feather to identify which wallstation is which. If this is activated, the designated wallstation will flash its LEDs for a period of approximately 10 to 15 seconds allowing for easy identification and the Mobile Application will display the option to 'turn off to identify' to allow identify mode to be manually cancelled.

Note: Battery powered wallstations do not offer this feature. It is recommended that a descriptive name be assigned to these devices when they are first assigned to an area to allow for easy identification.



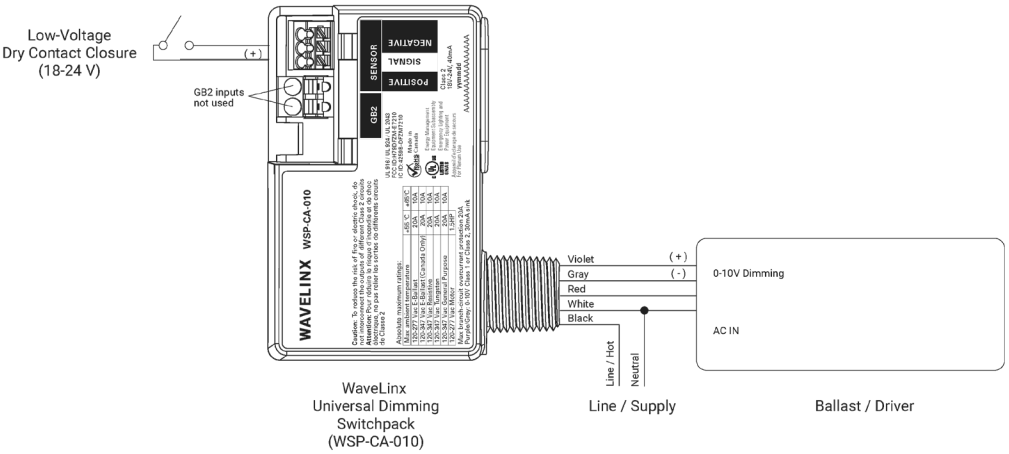
- **Battery icon**

  Battery powered wallstations will show an indication of the current battery status. The icon will be green if the battery voltage measures full, yellow if measuring partial voltage and blink red when at an extremely low voltage indicating that the batteries need to be changed.



Modifying WaveLinx Dimming Switchpack Contact Closure Input Response

The WSP-CA-010 model of the WaveLinx Dimming Switchpack supports connection to an external maintained contact closure. 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. This section discusses configuration of the commands for a dry contact closure type.



The contact closure input also allows for connection to supported Greengate occupancy sensors. If using a Greengate occupancy sensor, refer to “WaveLinx Wireless Dimming Switchpack Connected to a Supported Greengate Occupancy Sensor” on page 87 for details.

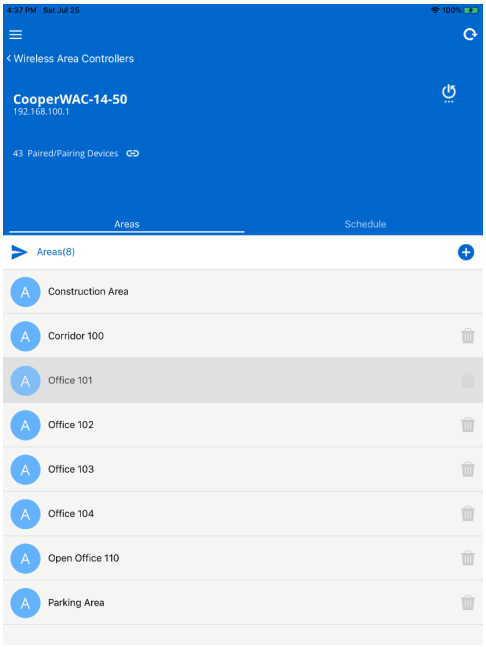
The contact closure input may be programmed to have an action associated with the contact ‘open’ and the contact ‘close’. This section discusses how to configure the actions for this input type.

Before proceeding with the following steps, make certain that the contact closure input has been identified and assigned to the area using the instructions in “Step 5: Identify and Assign Contact Closure Devices Connected to WaveLinx Wireless Dimming Switchpacks” on page 45.

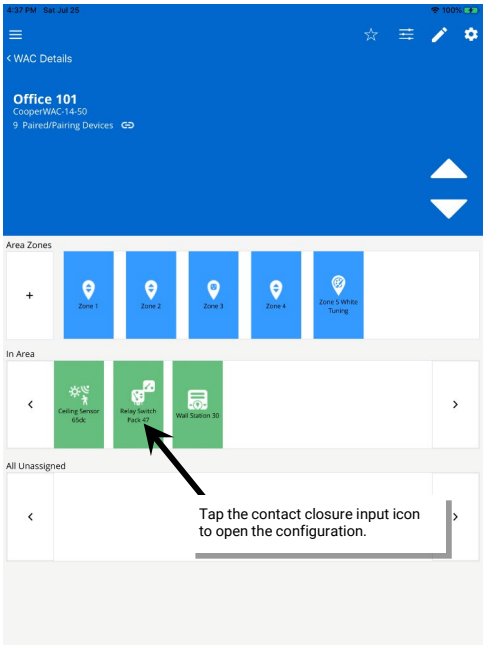
To configuring the input actions for a contact closure input:

Step 1: Open the WaveLinx Mobile Application and establish a connection with the Wireless Area Controller as the administrator user.

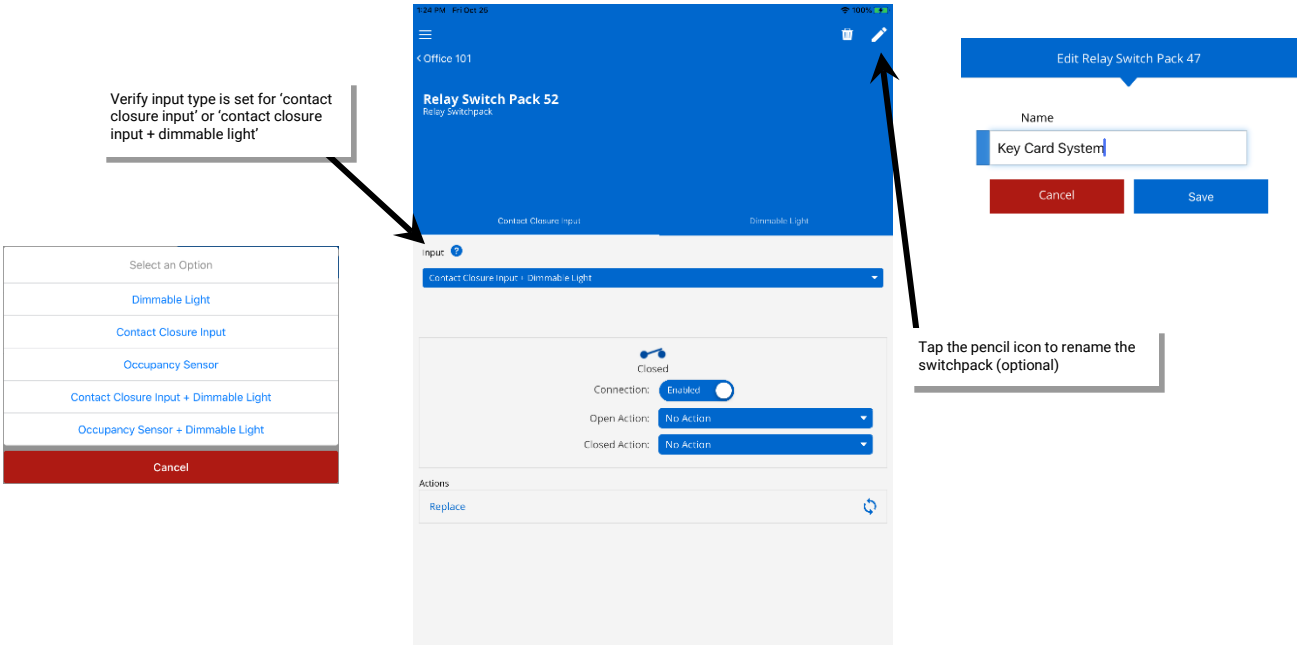
Step 2: In the areas list, select the area that contains the contact closure input to be modified.



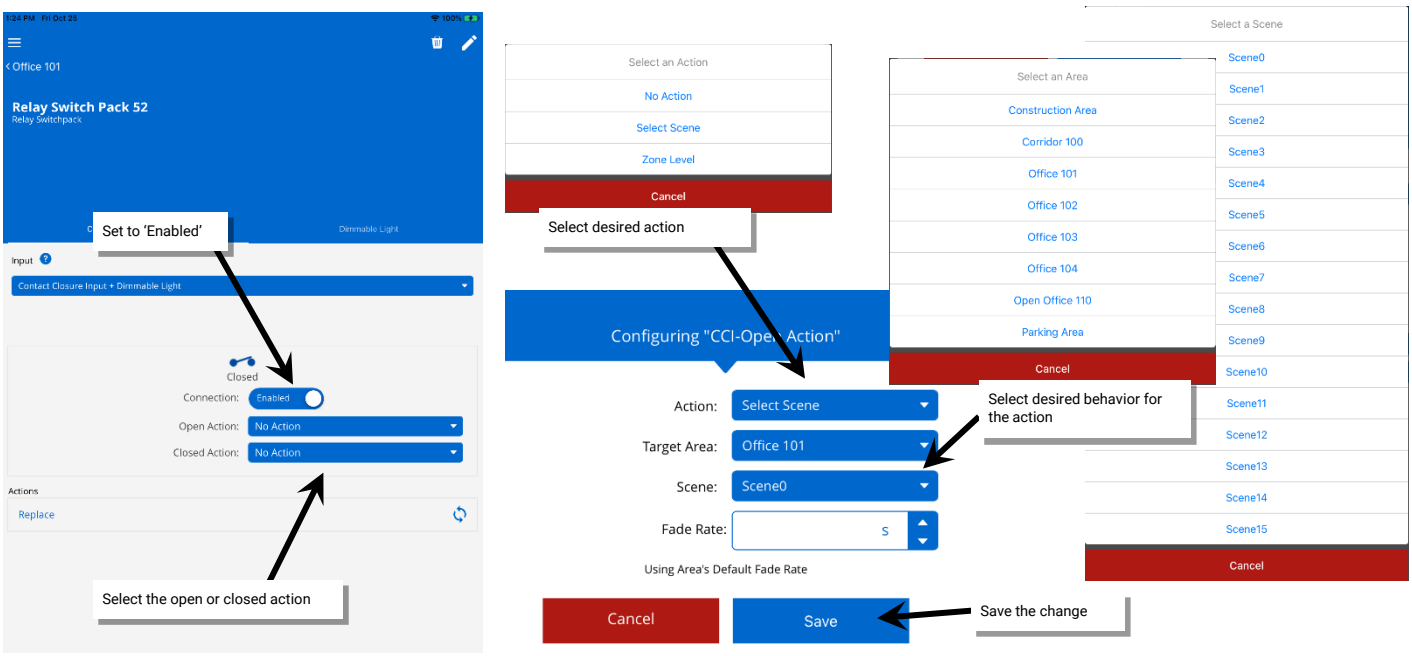
Step 3: In the area screen, tap the icon for the desired WaveLinx Dimming Switchpack contact closure input icon to open it for editing.



Step 4: In the input screen, ensure that the type is set to either ‘contact closure input’ or ‘contact closure input + dimmable light’ if the switchpack is also used to control lighting. Optionally, use the pencil icon edit feature to rename the switchpack.



Step 5: Make sure that the connection is set to ‘enabled’ and then tap to select the ‘open’ action, select the affected area, and then define the parameters. Parameter selections will be based on the chosen action. Once the appropriate behavior is defined touch the save button. Repeat step 5 to select and define the ‘close’ action.



Open and Closed Action Parameter Definitions:

- No action: The input will not perform any command if opened or closed.
- Select scene: The input will issue the selected scene to the selected area using either the default area fade rate, or a uniquely defined fade rate.
- Zone level: The input will operate the selected zone in the selected area to the defined level. Use either the default area fade rate or a uniquely defined fade rate. Selections for zones include the ability of choosing an individual zone, ‘ALL’ zones in the area, or ‘AFFECTED’ zones. If the ‘AFFECTED’ zones option is used, zones that have been ignored from the active scene will not respond to the command.

  Note: White tuning zones are automatically exempted from control if the ‘ALL’ or ‘‘AFFECTED’ zone is selected to prevent inadvertent color temperature shift when adjusting light levels. The white tuning zone will only respond to a zone level command if it is the only zone selected.

Step 6: Repeat this procedure for additional contact inputs in the space.

Quick Links for Common Questions

- I am using a Wireless Dimming Switchpack’s contact closure input. My dimming switchpack does not have the additional icon showing in the ‘in area’ section of the mobile app or I do not see the option to set the input type. Why is this icon/input type not showing? See the answer on page 201.

Modifying Occupancy Sensor Response

The WaveLinx Mobile Application allows modification of some occupancy sensor functions at the individual sensor level and other functions at a grouped level called an occupancy set. An occupancy set is a group of occupancy sensors that operate together to control the space. When an area is created, any occupancy sensor assigned to the area is automatically grouped into a default occupancy set to control the loads in the area. This includes fixture Integrated Sensors, WaveLinx battery powered ceiling sensors, and Greengate occupancy sensors connected to the contact input of WaveLinx Wireless Dimming Switchpacks.

In some applications, modification of default occupancy sensor settings may be necessary to meet the desired response. This section discusses changes that can be made, including:

- Understanding individual occupancy sensor settings (based on sensor type)
  - WaveLinx Integrated Sensor Settings
  - WaveLinx Ceiling Sensor Settings
  - WaveLinx Wireless Dimming Switchpack Connected to a Supported Greengate Occupancy Sensor
- Adjusting occupancy set response and controlled zones
  - Using occupancy set test mode
  - Specific hold time information for WaveLinx Dimming Switchpacks connected to Supported Greengate Occupancy Sensors
- Defining additional occupancy sets
- Associating occupancy sets for overlapping or cascading control
- Deleting occupancy sets

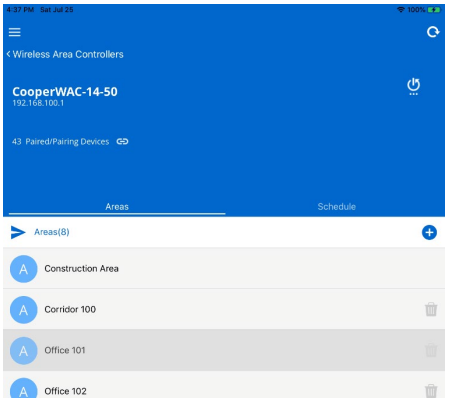
Understanding Individual Sensor Settings (Based on Sensor Type)

While most sensor settings will be assigned at to the occupancy set level, specific settings or options are available at the individual sensor level. The available settings and options will depend on the type of occupancy sensor. Occupancy sensor types include fixture Integrated Sensors, WaveLinx battery powered ceiling sensors, and WaveLinx Dimming Switchpacks that have the contact closure input wired to a supported Greengate occupancy sensor. Regardless of the sensor type, the individual sensor settings will be accessed in a similar way.

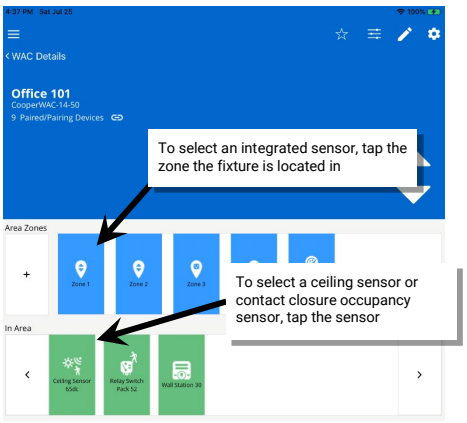
To view or adjust the individual sensor's settings:

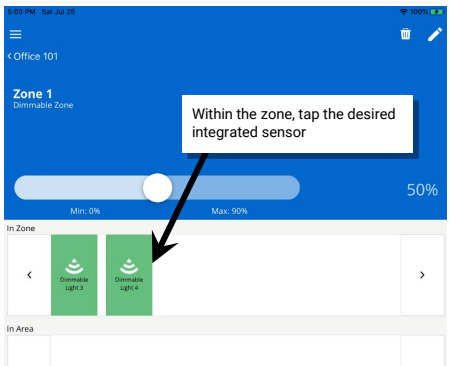
Step 1: Open the WaveLinx Mobile Application and establish a connection with the Wireless Area Controller as the administrator user.

Step 2: In the areas list, select the area that contains the desired occupancy sensor.



Step 3: In the area screen, locate the desired device. WaveLinx Ceiling Sensors and WaveLinx Dimming Switchpack connected sensors will appear in the 'in area' device section while fixture Integrated Sensors will appear within the assigned zone. Tap the desired device to open the configuration screen.

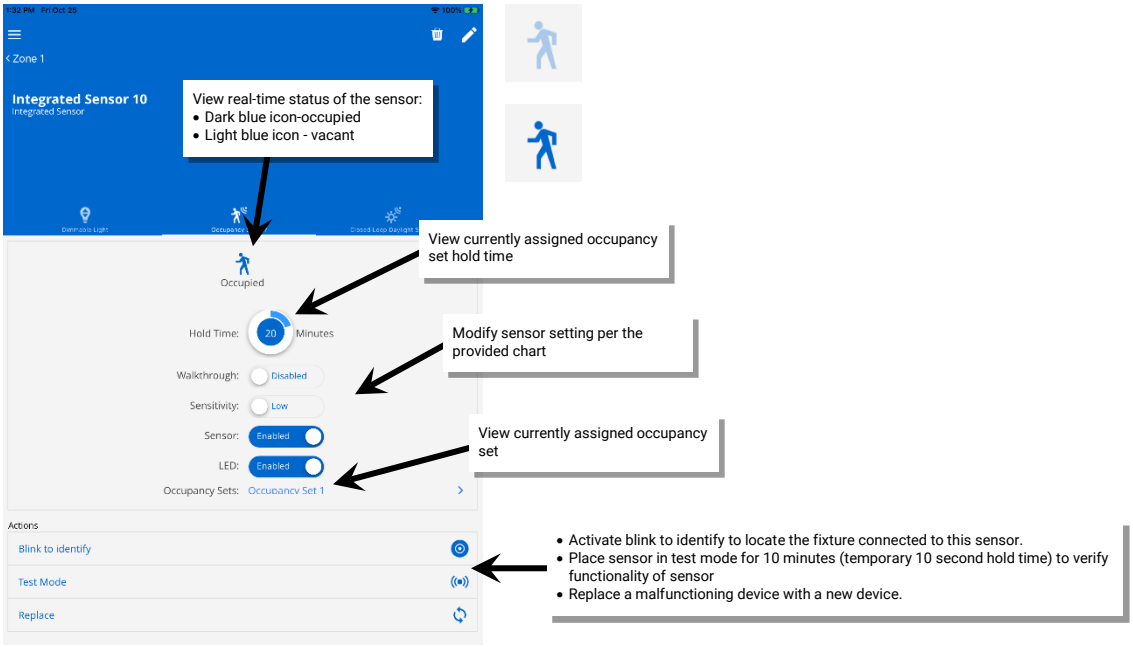




Step 4: Modify or view the desired settings within the sensor screen.

WaveLinx Integrated Sensor Settings

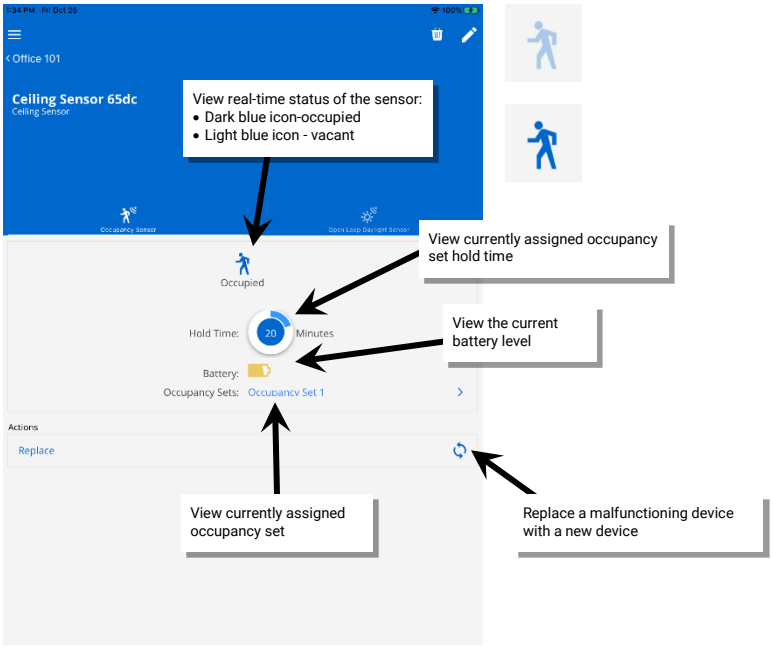
The WaveLinx Integrated Sensor has options that are settable at the individual sensor settings. See the chart below for details on the available settings.



Setting	Default	Description
Hold Time	20 Minutes	This area of the display shows the Occupancy Set's programmed hold time. It is for informational purposes only and cannot be adjusted at the individual sensor level.
Walkthrough	N/A	This is a future option and is not currently operational.
Sensitivity	High	Switch to low sensitivity if a sensor is detecting motion outside of the desired coverage area.
Sensor	Enabled	Switch to disabled to turn off occupancy detection for this sensor. This may be done to disable a sensor that false-triggers frequently due to challenging placement or for a ceiling sensor that is being used for solely for daylighting.
LED	Enabled	Switch to disabled only if the sensor LED flash is distracting. This is not recommended as the LED is often used to determine that the sensor is operational.
Occupancy Set	Occupancy Set 1	This is not a setting that is modifiable within this screen. This displays the occupancy set that the sensor is currently assigned to. Tap on the occupancy set to navigate to the occupancy set configuration.
Blink to Identify	N/A	Tap on this option to cause the connected fixture to flash on and off for a 15 second period to identify the specific device. To cancel 'blink to identify' mode before the timer expires, tap the 'turn off to identify' option.
Test Mode	N/A	If test mode is activated, the sensor will be placed in test mode for 10 minutes. During test mode, the sensor will operate with a 10 second hold time. **Note**: if more than one occupancy sensor reports to the occupancy set, use test mode at the occupancy set level to prevent other sensors from holding the lighting on.
Replace	N/A	If the sensor has been replaced, this option may be used to associate the new device to the old sensor's programming. See "Replacing and Syncing End Devices using the Mobile Application" on page 186 for further information.

WaveLinx Ceiling Sensor Settings

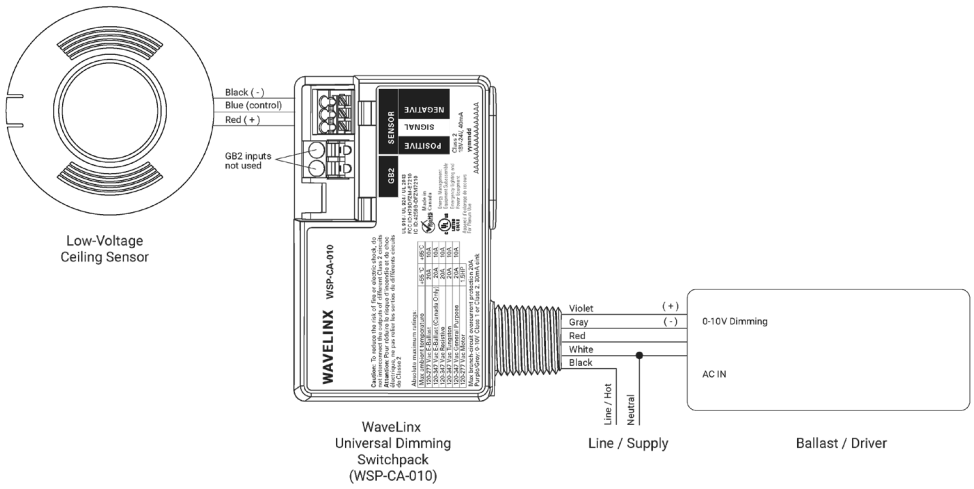
The WaveLinx Ceiling Sensor does not have options that are settable at the individual sensor level. It does have informational data for display. See the chart below for details on the available settings.



Setting	Default	Description
Hold Time	20 Minutes	This area of the display shows the Occupancy Set's programmed hold time. It is for informational purposes only and cannot be adjusted at the individual sensor level.
Battery	N/A	Battery powered ceiling sensors will show an indication of the current battery status. The icon will be green if the battery voltage measures full, yellow if measuring partial voltage and blink red when at an extremely low voltage indicating that the batteries need to be changed. 
Occupancy Set	Occupancy Set 1	This is not a setting that is modifiable within this screen. This displays the occupancy set that the sensor is currently assigned to. Click on the occupancy set to navigate to the occupancy set configuration.
Replace	N/A	If the sensor has been replaced, this option may be used to associate the new device to the old sensor's programming. See "Replacing and Syncing End Devices using the Mobile Application" on page 186 for further information.

WaveLinx Wireless Dimming Switchpack Connected to a Supported Greengate Occupancy Sensor

The WaveLinx Wireless Dimming Switchpack has an onboard contact closure input that allows for connection to one WaveLinx approved Greengate Occupancy Sensor. One sensor may be powered directly from the switchpack contact closure.



To ensure proper operation:

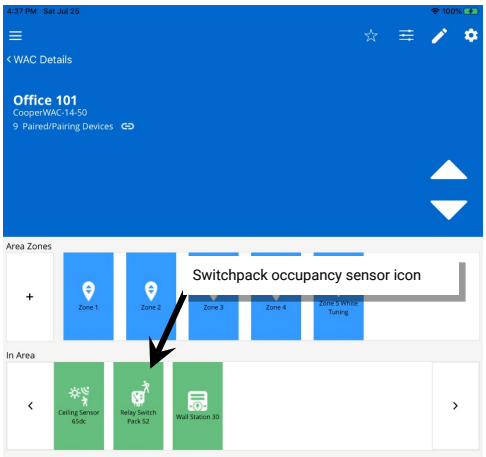
- Greengate occupancy sensors have onboard configuration switches to allow for configuration in a non-WaveLinx application. For best operation with the WaveLinx system, it is important that these setting be set for the options as shown in the chart below. Refer to the installation instructions for the sensor being used to identify the correct switches to use for these options. If sensors have additional options, leave configuration switches for other options at the defaults as described in the installation instructions.

Option	Default	Recommended Setting with WaveLinx
Time Delay	Auto	5 minutes
Activation Mode[1]	Auto	Auto
Override Mode	Disabled	Disabled
Daylight Options	Disabled	Disabled

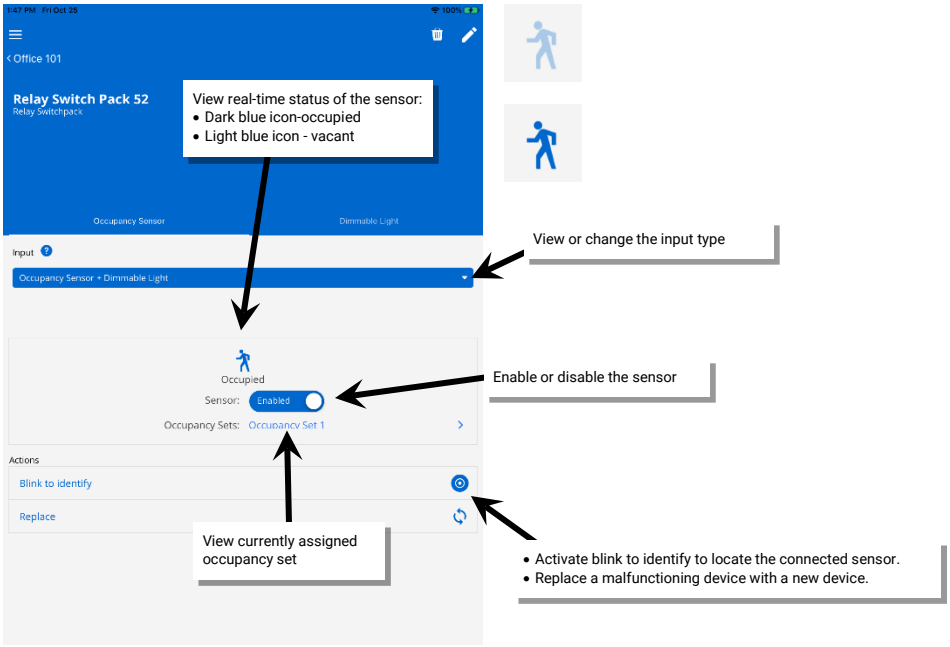
[1] **Note**: Not all supported Greengate sensor types will have this configuration option.

- The Wireless Dimming Switchpack must be configured as a ‘occupancy sensor’ or ‘occupancy sensor + dimmable light’ type. Please see the procedure “Step 5: Identify and Assign Contact Closure Devices Connected to WaveLinx Wireless Dimming Switchpacks” beginning on page 45 for a step-by-step walk through of this process.

Once configured as an ‘occupancy sensor’ type, the Wireless Dimming Switchpack will display a switchpack/occupancy icon in the ‘in area’ section of the area’s screen. Tap on the icon, and then tap the ‘occupancy sensor’ option to view the details for the occupancy sensor



The Wireless Dimming Switchpack occupancy settings have limited configurable options. Most details are display information. See the chart below for details on the available settings.



Setting	Default	Description
Sensor	Enabled	Switch to disabled to turn off occupancy detection for this sensor. This may be done to disable a sensor that false-triggers frequently due to challenging placement.
Occupancy Set	Occupancy Set 1	This is not a setting that is modifiable within this screen. This displays the occupancy set that the sensor is currently assigned to. Click on the occupancy set to navigate to the occupancy set configuration.
Blink to Identify	N/A	When the 'blink to identify' option is used with approved Greengate sensors, the WaveLinx Dimming Switchpack will remove power from the contacts for a brief period, causing the Greengate sensor to go through a power cycle. Approved Greengate sensors will flash their LEDs rapidly during the power up process and will power up in an occupied state. This allows the sensor to be visually identified. For this device type, the 'blink to identify' mode cannot be manually cancelled and will time out automatically after a 1-minute period.
Replace	N/A	If the switchpack has been replaced, this option may be used to associate the new device to the old device's programming. See "Replacing and Syncing End Devices using the Mobile Application" on page 186 for further information.

Adjusting Occupancy Set Response and Controlled Zones

The occupancy set programming defines the response for all sensors within that set for the controlled zones. Remember that when an area is created, fixture Integrated Sensors, battery powered ceiling sensors, and any occupancy sensors connected to WaveLinx Wireless Dimming Switchpack contact closure inputs that are assigned to an area are automatically grouped into a default occupancy set. The occupancy set automatically controls the default zones for the area. If zones have been manually added, it may be necessary to manually assign them to the occupancy set control group.

The automatic code commissioning programming defaults for all occupancy sets are:

- Mode: Occupancy
- Hold Time: 20 minutes
- Occupied: Select Scene 3 (default 50% level)
- Unoccupied: Select Scene 0 (default 0% or OFF level)
- Controls default zones for the area (zones 1, 2 and 3)

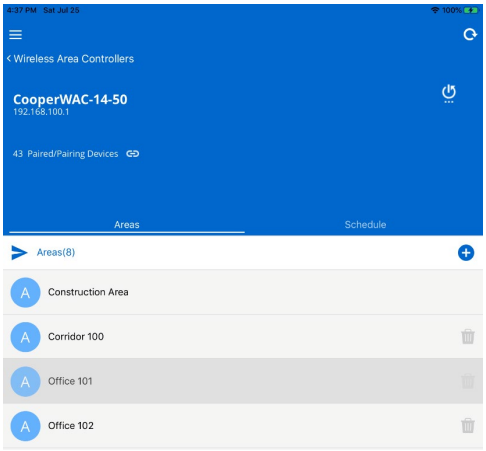
Any of these parameters may be modified for the occupancy set.

Note: For occupancy sets that contain WaveLinx Wireless Dimming Switchpacks connected to a Greengate Occupancy Sensor, please see “Hold Time Information for Wireless Dimming Switchpacks Connected to Greengate Occupancy Sensors” on page 92 for information on how hold time operates with these sensors.

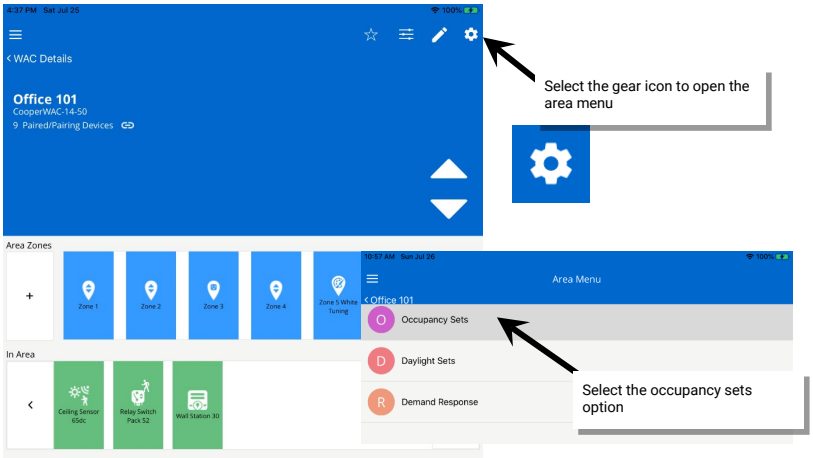
To modify the occupancy set response and controlled zones:

Step 1: Open the WaveLinx Mobile Application and establish a connection with the Wireless Area Controller as the administrator user.

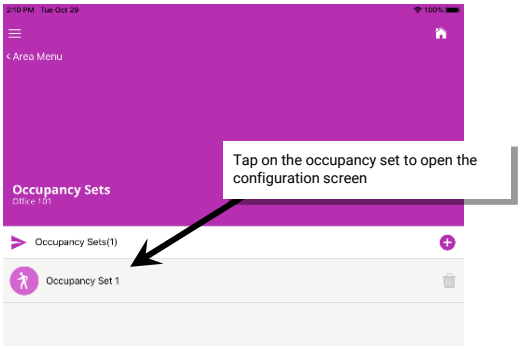
Step 2: In the areas list, select the area that contains the desired occupancy set.



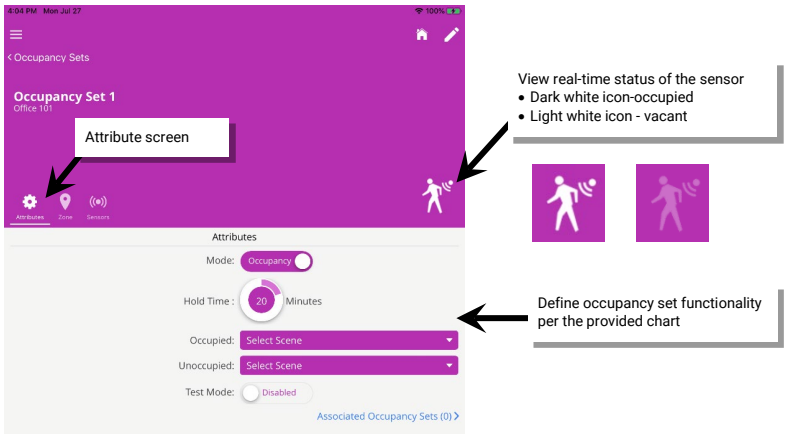
Step 3: In the area screen, select the gear icon in the upper-right corner to open the area menu and then select the occupancy set option.



Step 4: Next, select the desired occupancy set to modify. Occupancy set 1 will be there by default.



Step 5: In the attributes screen, modify the desired settings. Note that this screen also indicates if any sensor in the occupancy set is currently detecting motion.



Setting	Default	Description
Mode	Occupancy	Select the option of occupancy or vacancy mode. • Occupancy mode: The defined occupied action will occur when any sensor in the group detects initial motion. • Vacancy mode: The sensors will not perform any action upon initial motion detection. The occupant must turn ON loads manually using controls in the space.[1] For both occupancy and vacancy mode, the loads will be commanded to the unoccupied action when occupancy is not detected by any of the sensors included in the occupancy set within the time period defined by the hold time setting.
Hold Time	20 minutes	Tap on the button to choose additional hold times or to define a custom one. This defines how long the system will wait before the defined unoccupied action is issued once all sensors included in the occupancy set indicate the space is vacant.
Occupied (will not show for vacancy mode)	Select Scene 3	Tap on the drop down to select a different occupied action. Select a defined scene or zone level[2] or select to return to the last known light level.
Unoccupied	Select Scene 0	Tap on the drop down to select a different unoccupied action. Select a defined scene or zone level.[3]
Test Mode	Disabled	See "Using Occupancy Set Test Mode" on page 91 for information on using this feature.

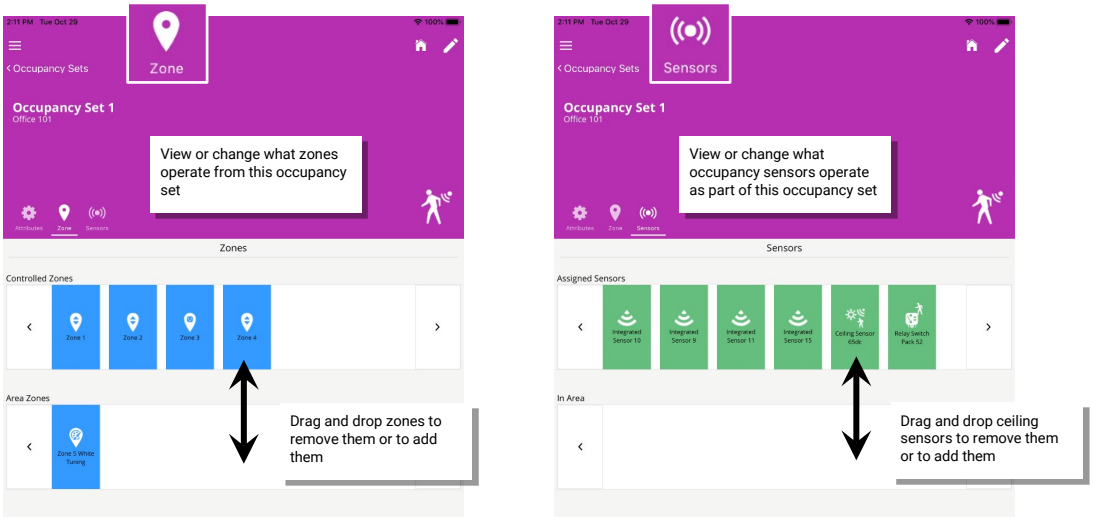
[1] **Note 1**: Not all sensors may support vacancy mode. Outdoor Integrated Sensors will continue to operate in occupancy mode if vacancy mode is set.

[2] **Note 2**: Selections for zone level include the ability of selecting that the command be issued to an individual zone, 'ALL' zones in the area, or 'AFFECTED' zones. If the 'AFFECTED' zones option is used, zones that have been ignored from the currently active scene will not respond with the command. White tuning zones are automatically exempted from control if the "ALL' or "AFFECTED' zone is selected to prevent color temperature shift when adjusting light levels. The white tuning zone will only respond to a zone level command if it is the only zone selected.

[3] **Note 3**: For occupancy sets that contain WaveLinx Wireless Dimming Switchpacks connected to a Greengate Occupancy Sensor, please see "Hold Time Information for Wireless Dimming Switchpacks Connected to Greengate Occupancy Sensors" on page 92 for information on how hold time operates with these sensors.

Step 6: Next, view the zone and sensors screens to review the devices that are affected by this occupancy set or to make changes to the controlled zones or assigned sensors.

- Remove or add controlled zones by dragging and dropping the zone icon between the controlled zones list and the area zones lists. Zones in the controlled zones list will be operated by the occupancy set. The default zones should automatically appear in this section. Newly created zones may need to be manually added to the controlled zones section. Note that the occupied and unoccupied actions will only process for the assigned zones. Even if a scene command is issued, it will be issued only to the zones assigned to the occupancy set. White tuning zones may be assigned to an occupancy set if it is desired to have the tunable white devices respond to occupancy command along with dimmable or non-dimmable switch zones. If they are not part of an occupancy set, white tuning zones will remain at the current color temperature when occupancy sensor scene commands are received.
- Remove or add battery operated ceiling sensors or Greengate sensors wired to WaveLinx Dimming Switchpack contact inputs by dragging them into or out of the assigned sensors list. Integrated sensors may not be moved in this screen as they are added or removed based on the fixture's zone assignment within the zone screen.

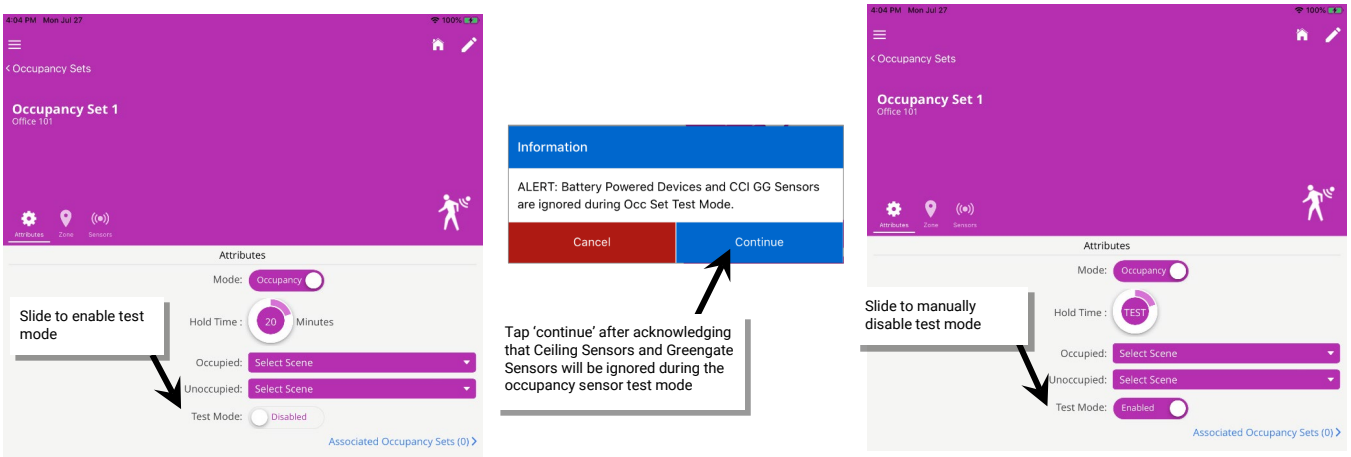


Once complete, tap the back button or the home button to exit the configuration screen.

Using Occupancy Set Test Mode

The occupancy set may be placed into a temporary test mode in order to verify sensor response to motion. If test mode is activated, all Integrated sensors and Tilemount sensors will be placed in test mode for 10 minutes. During test mode, Integrated sensors will operate with a 10 second hold time. If WaveLinx Ceiling Sensors or Greengate Occupancy Sensors connected to a WaveLinx Dimming Switchpack are included in this occupancy set, these sensors will be temporarily ignored to prevent them from holding lighting on during the test period.

Test mode will automatically revert to normal operation after a 10-minute time period or may be manually disabled prior to the 10-minute expiration using the WaveLinx Mobile Application.



Hold Time Information for Wireless Dimming Switchpacks Connected to Greengate Occupancy Sensors

If an occupancy set contains WaveLinx Wireless Dimming Switchpacks that are Connected to Greengate Occupancy Sensors, the hold time setting for the occupancy set may be affected by the Greengate Occupancy Sensor onboard configuration switch setting. For optimal results:

- Ensure that the Greengate Occupancy Sensor configuration switches are set for a 5-minute hold time. Refer to the sensor's installation instructions for details on which configuration switches to use for that sensor model.
- Do not assign a hold time of less than 5 minutes to the occupancy set in the Mobile App.
- The WaveLinx system has been configured such that when a Greengate sensor issues an occupied command, the occupancy set begins to monitor its assigned hold time.
- If all sensors in the occupancy set become unoccupied prior to the hold time timer expiring, the lighting will remain on until the WaveLinx occupancy set hold time expires.
- If the WaveLinx occupancy set hold time expires but the occupancy sensor is still issuing an occupied command, the lighting will remain on until all occupancy sensors issue an unoccupied signal. At this time, because the occupancy set's hold time has already expired, the occupancy set will immediately issue the unoccupied command.

This means that when Greengate sensors are used, the hold time will ultimately be determined by whichever hold time setting is longest. Setting the Greengate onboard configuration to 5 minutes offers the most flexibility to be able to change programming to different hold time settings without the need to make physical sensor configuration adjustments.

See the chart below for clarification:

	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7
Greengate Sensor onboard hold time	5 min.	10 min	30 min	20 min	5 min	5 min	5 min
WaveLinx Occupancy Set Hold Time	3 min	5 min	10 min	30 min	30 min	10 min	5 min
Final Unoccupied Hold Time Delay	5 min	10 min	30 min	30 min	30 min	10 min	5 min

Quick Links for Common Questions

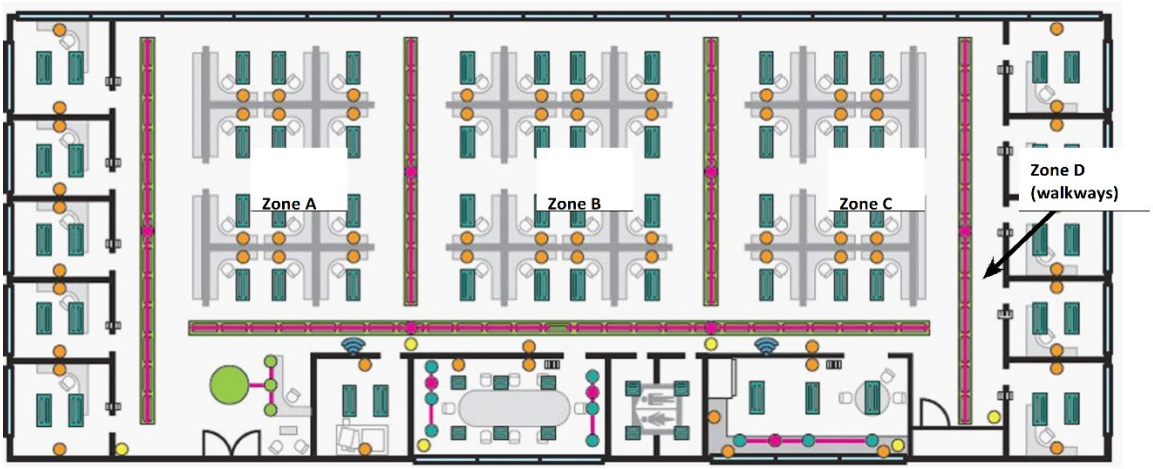
- My wallstation or occupancy sensor does not appear to operate during the day but seems to work at night. Why is this occurring? See the answer on page 201.
- I am using a Wireless Dimming Switchpack's contact closure input. My dimming switchpack does not have the additional icon showing in the 'in area' section of the mobile app or I do not see the option to set the input type. Why is this icon/input type not showing? See the answer on page 201.

Defining Additional Occupancy Sets

Although it is not typical of most applications, one area may require more than one occupancy set. Use additional occupancy sets only when necessary to meet the intended application.

An example application that highlights the use of multiple occupancy sets is an open office area. While the open office is defined as a single area for wallstation control, in this example, the owners desire greater granularity for occupancy sensor control. Occupancy sensor response is to be limited to specific zones within the open office space.

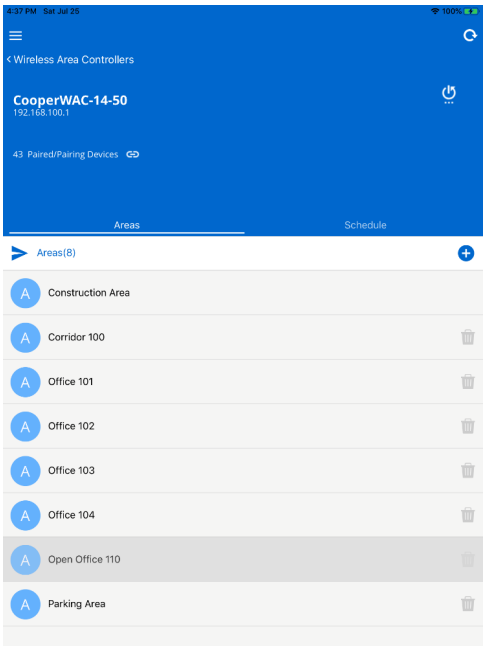
In the given application, light fixtures are grouped into unique zones to achieve the desired occupancy sensor operation. Occupancy sets need to be created for each of these unique zones



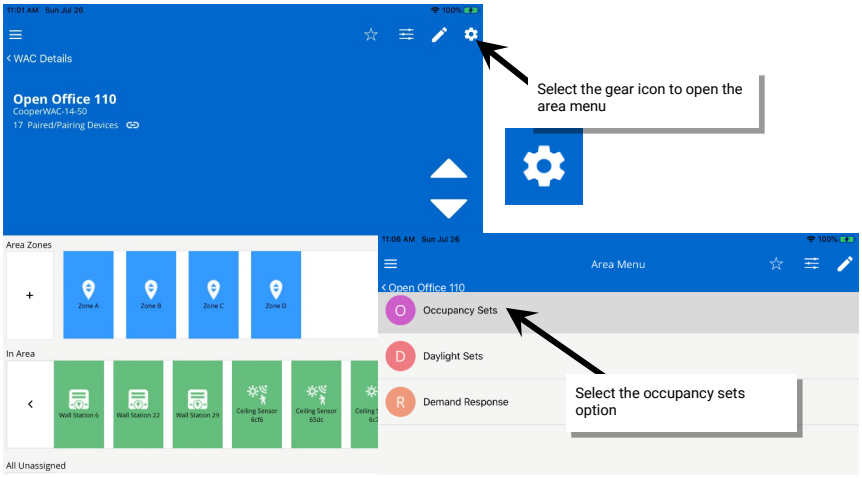
To create a new occupancy set:

Step 1: Open the WaveLinx Mobile Application and establish a connection with the Wireless Area Controller as the administrator user.

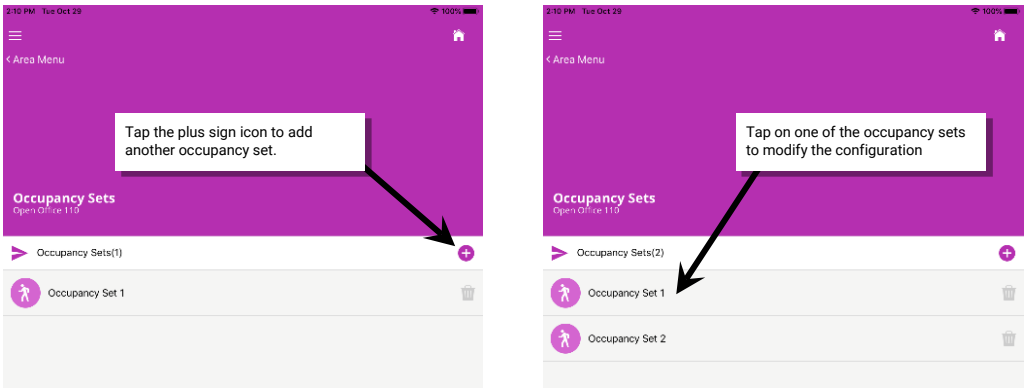
Step 2: In the areas list, select the area that requires the additional occupancy sets.



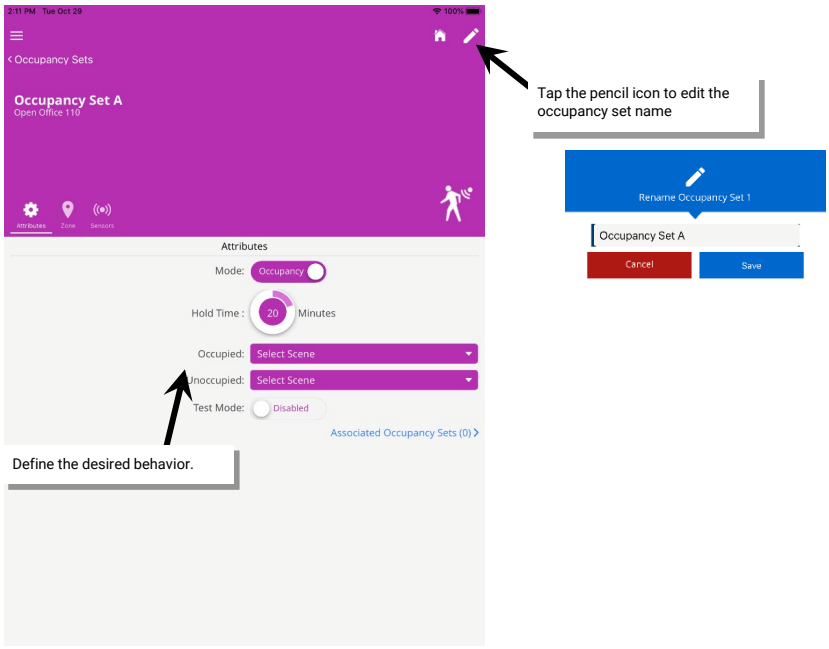
Step 3: In the area screen, select the gear icon in the upper-right corner to open the area menu and then select the occupancy set option.



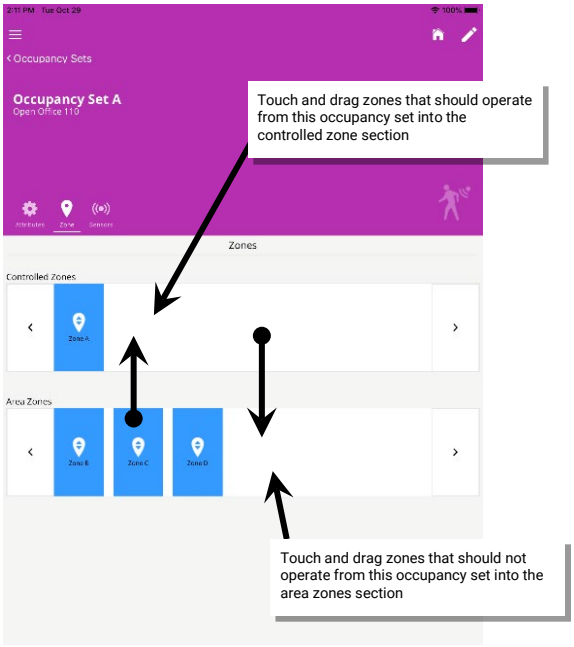
Step 4: Select the plus sign icon to create an additional occupancy set, and then select one of the occupancy sets to begin configuration.



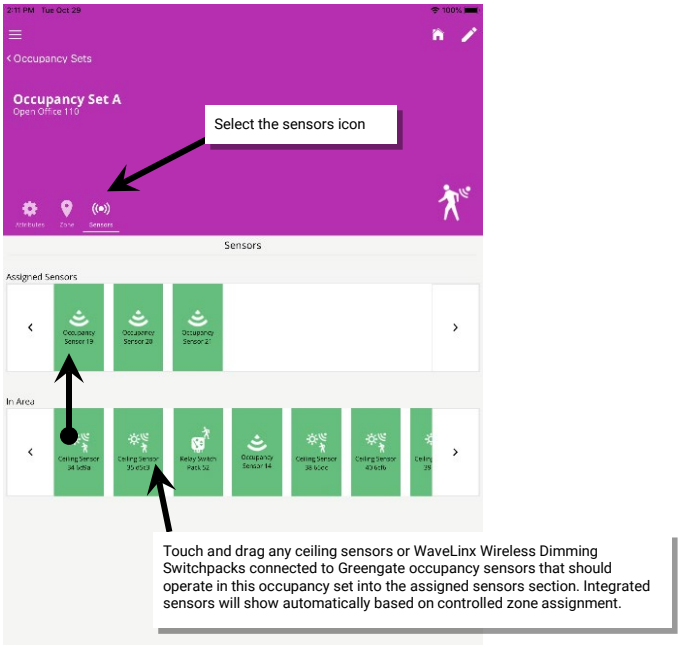
Step 5: Optionally rename the occupancy set by tapping the pencil icon. Then define the behavior for the occupancy set.



Step 6: While still in the occupancy set screen, tap the zone icon. Touch and drag the zones to be controlled into the controlled zones section. Touch and drag zones that should not be controlled into the area zones section.



Step 7: Next, tap the sensors icon. Verify that the displayed sensors are correct. If the assigned zones consist of fixtures with Integrated Sensors, the sensors will automatically be displayed. Ceiling sensors and WaveLinx Wireless Dimming Switchpacks connected to Greengate occupancy sensors may need to be manually assigned. Touch and drag the desired sensor from the 'in area' device section into the assigned sensors location. Once done, select the back button or home button to exit the screen.



Note: Although ceiling sensors and WaveLinx Dimming Switchpacks connected to a Greengate Occupancy Sensor are able to be assigned to multiple occupancy sets, in most cases assign them to one occupancy set to avoid confusion.

Step 8: Repeat steps 3 through 7 for all necessary occupancy sets.

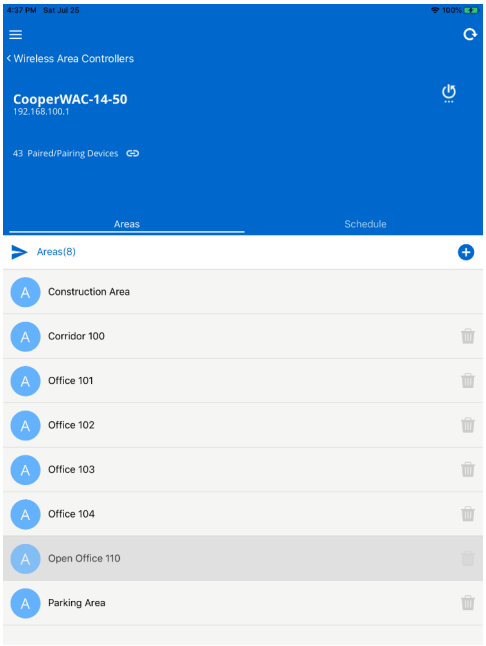
Associating Occupancy Sets for Overlapping or Cascading Control

Associating an occupancy set with other occupancy sets to overlap or cascade control is used in very specific applications. This section will first show the steps of how to create an association and then will present two examples of how an association can be used to achieve overlapping and cascading control strategies.

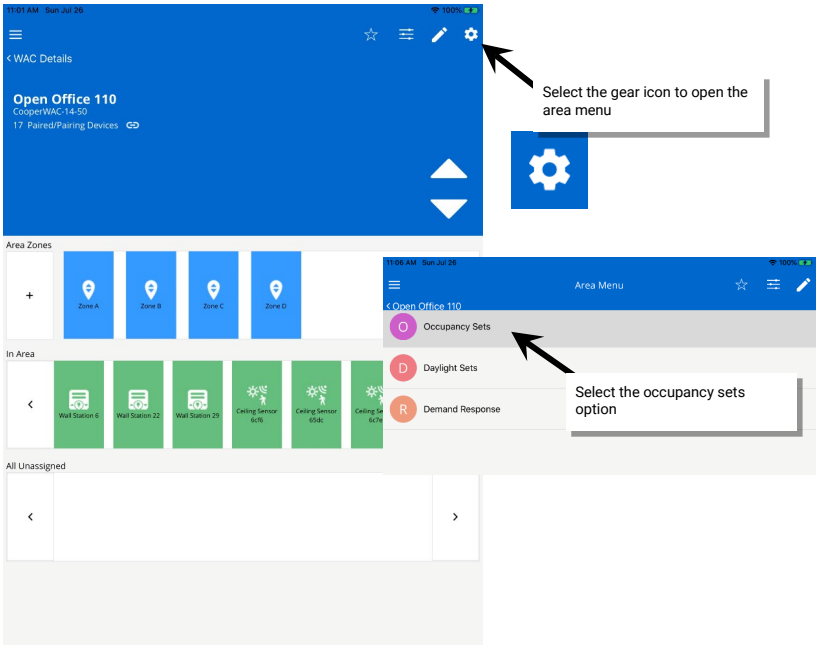
To associate the occupancy set:

Step 1: Open the WaveLinx Mobile Application and establish a connection with the Wireless Area Controller as the administrator user.

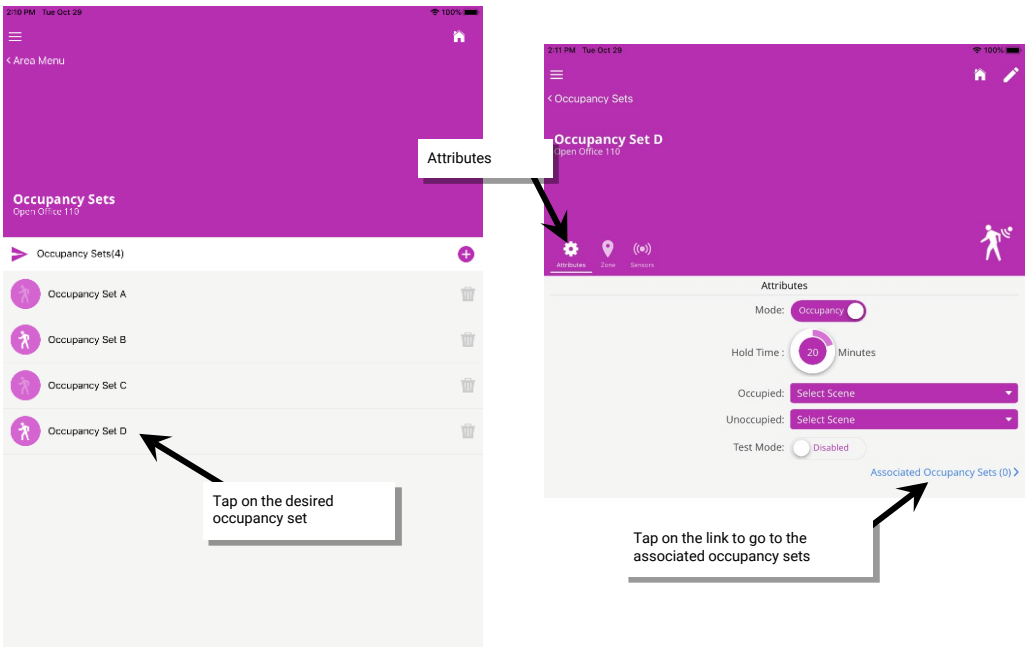
Step 2: In the areas list, select the desired area.



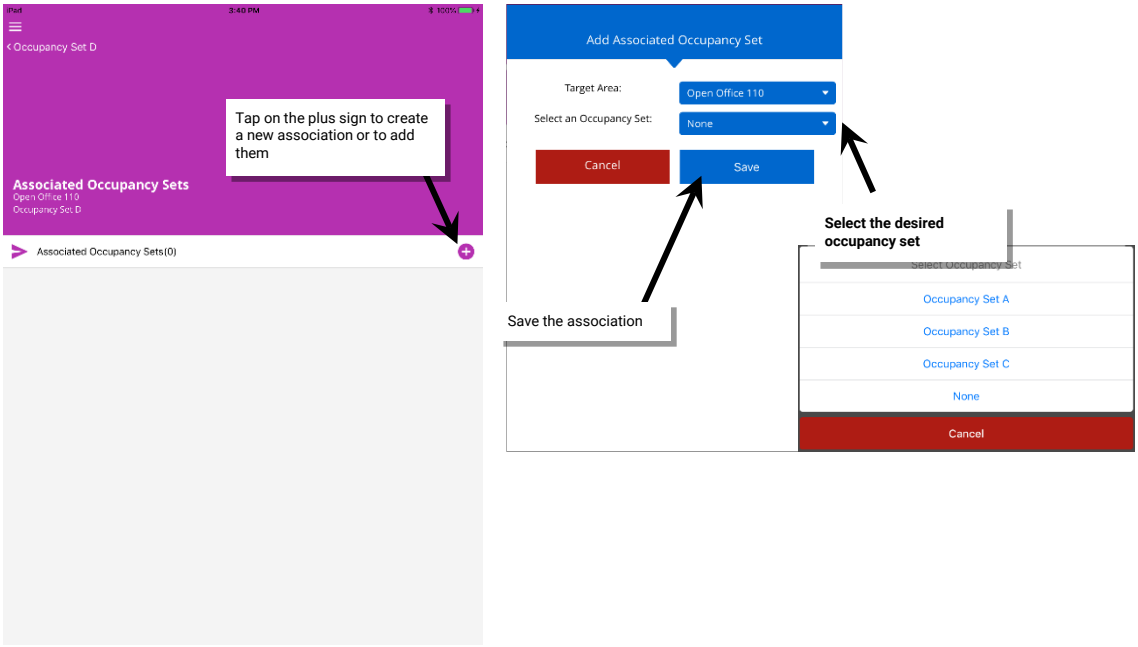
Step 3: In the area screen, select the gear icon in the upper-right corner to open the area menu and then select the occupancy set option.



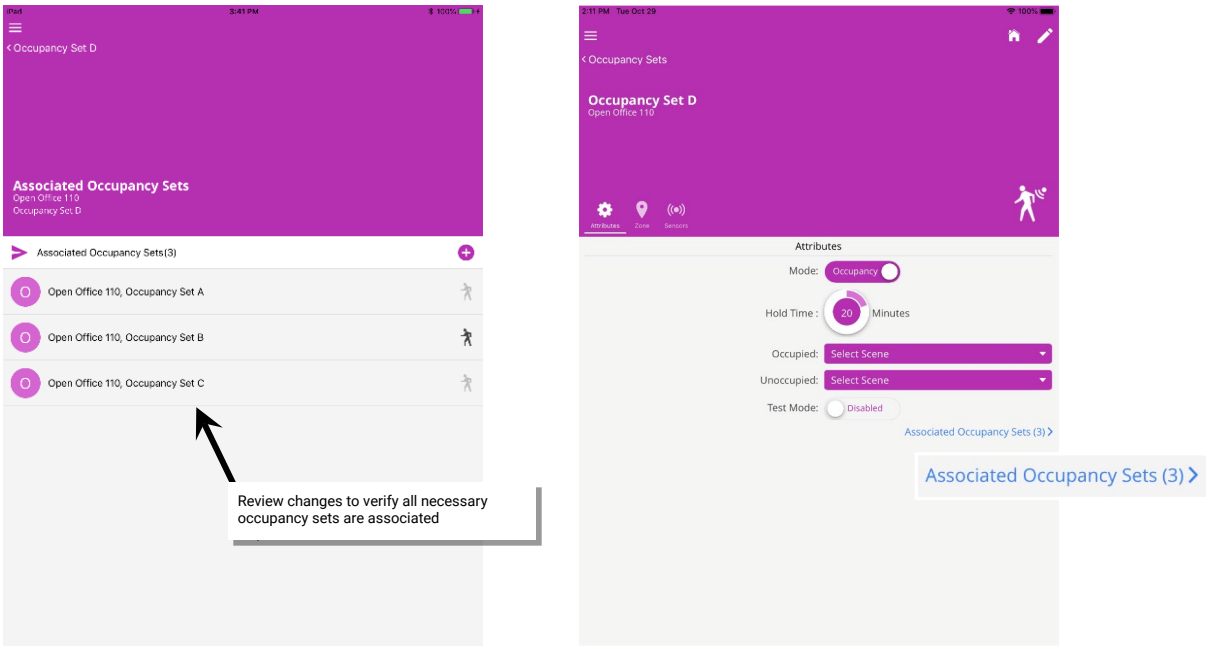
Step 4: Select the desired occupancy set. As a general rule, start by modifying the occupancy set that needs to receive signals from other occupancy sets to accomplish the desired overlapping or cascading control functionality. In the occupancy set screen's attributes, tap the link on the right side of the screen to navigate to the associated occupancy sets.



Step 5: Select the plus sign icon to associate an occupancy set. Find the desired occupancy set using the provided selection boxes, and then touch save. Repeat this step if there are additional occupancy sets to associate.

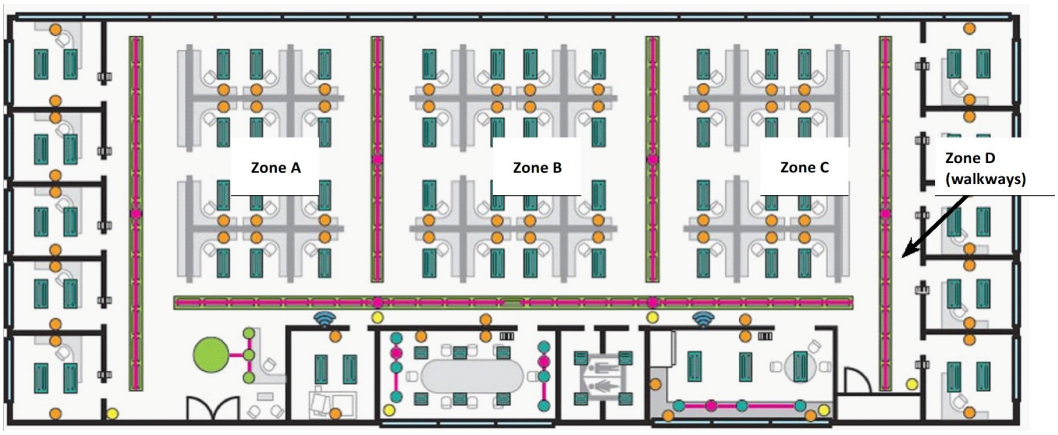


Step 6: Review the changes to verify that all desired occupancy sets have been associated. Note that the occupancy set screen should show the quantity of sets associated. In this example, any time occupancy is detected by occupancy sets A, B, or C, the occupancy signal will be forwarded to trigger occupancy set D.

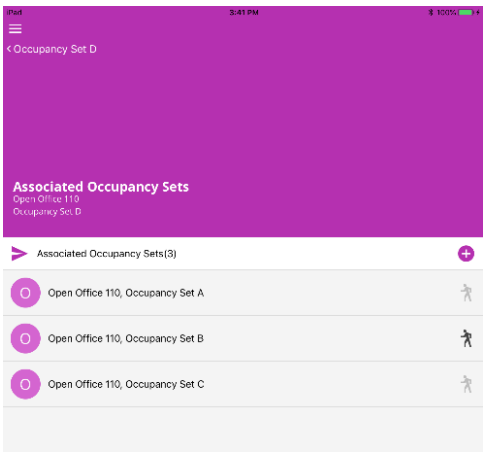


Application Example 1: Open Office

In this example, an open office has been segmented into distinct occupancy control zones. The walkway path has also been placed in a unique control zone. The walkway path zone should turn ON if anyone enters the space and should remain ON if there are occupants in any of the controlled zones. Unique occupancy sets have been programmed in the area for each of the zones shown.



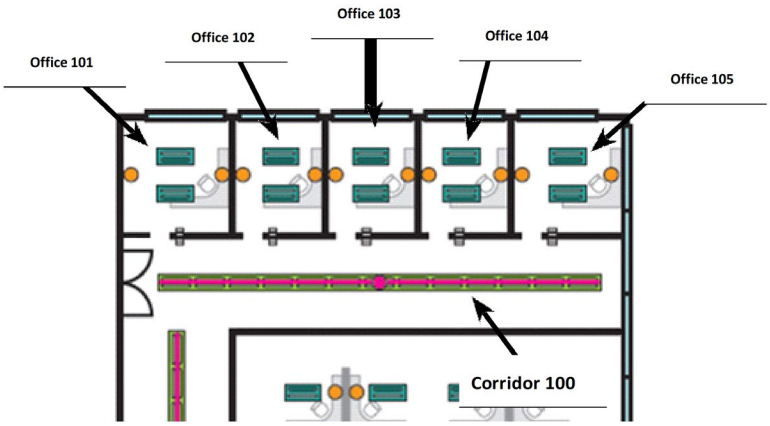
Associations are made between the occupancy sets controlling zone A, B, and C, to the walkway occupancy set D. (Remember, the general rule is to modify the occupancy set that needs to receive signals from other occupancy sets.) In this example, occupancy set D is associated with the other sets.



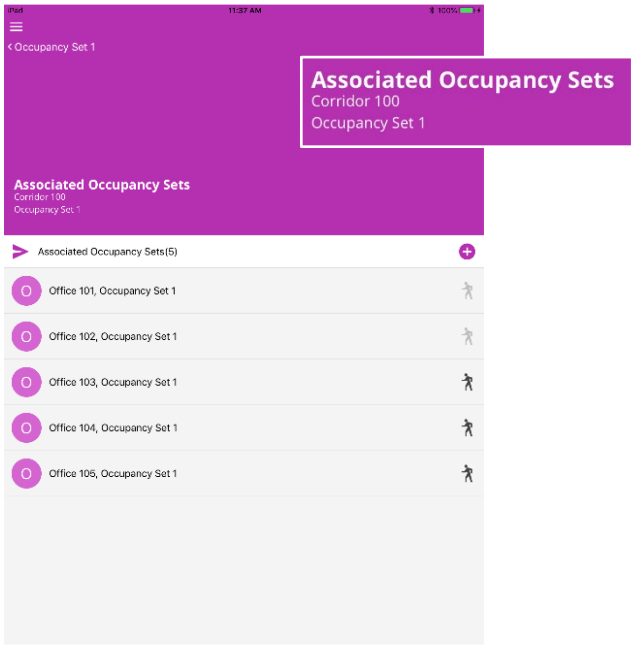
With this programming, as an occupant enters the walkway zone D, only zone D will initially respond. As the occupant enters cubicle zone A, the lighting will respond in zone A. If the occupant remains in zone A, then zone A and the walkway zone D will remain ON, even if there is no further motion in zone D.

Application Example 2: Common Area Hold On Functionality

In this example, one area of the facility consists of private offices and a shared corridor. Each private office has been configured as an area and the shared corridor has been configured as a separate area. The corridor should turn ON if anyone enters the corridor and then should remain ON if there are occupants in any of the private offices. Areas have been created as shown. Each area contains one occupancy set that is defined with a scene command for occupied and unoccupied actions.



Associations are made between the occupancy sets controlling Offices 101, 102, 103, 104, and 105, to the Corridor 100 occupancy set. (Remember, the general rule is to modify the occupancy set that needs to receive signals from other occupancy sets.) In this example, corridor 100's occupancy set will be associated with the others.



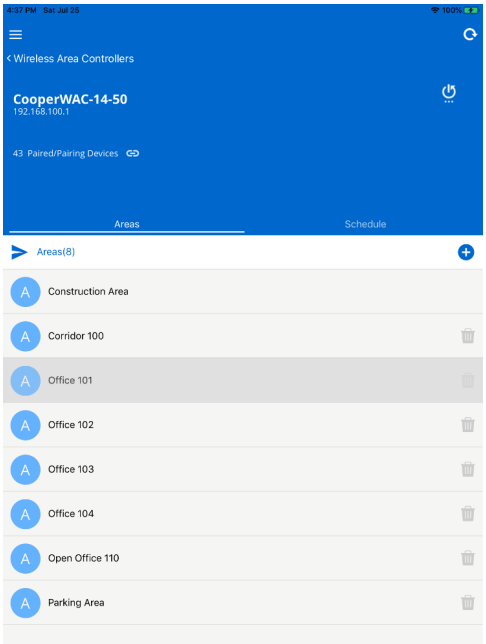
Deleting Occupancy Sets

It is possible to remove occupancy sensor control from an area by deleting the occupancy set. Areas that do not have zones assigned to occupancy sets will respond solely to other devices assigned, i.e. wallstation commands, schedule event commands, and daylight set commands.

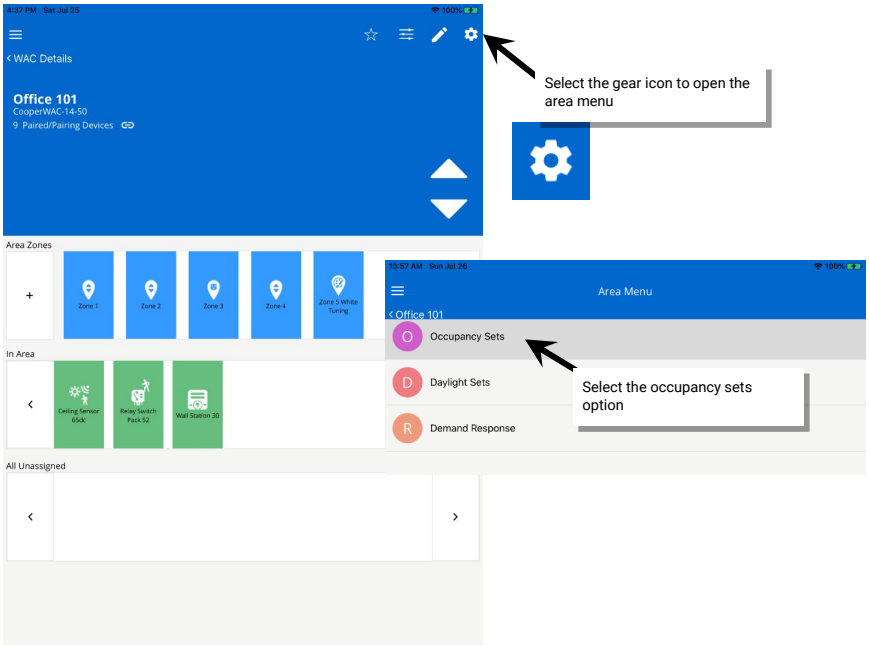
To delete an occupancy set:

Step 1: Open the WaveLinx Mobile Application and establish a connection with the Wireless Area Controller as the administrator user.

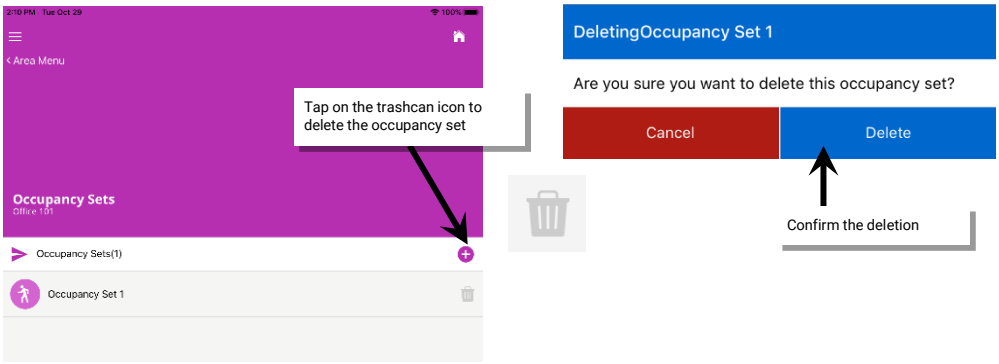
Step 2: In the areas list, select the area that contains the desired occupancy set.



Step 3: In the area screen, select the gear icon in the upper-right corner to open the area menu and then select the occupancy set option.



Step 4: Next, tap on the trash can icon in the desire occupancy set row, then confirm the deletion. The occupancy set will be removed.



Once complete, tap the back button or the home button to exit the configuration screen.

Modifying Light Levels for Daylight Sensors

The WaveLinx system supports daylight sensor control for both interior and exterior applications. In both scenarios, the daylighting functionality may be disabled for fixtures that are not located in a daylight zone or for any devices where daylight operation is not desired. Tunable white zones/devices cannot be assigned for daylight control.

The WaveLinx system supports two different daylighting approaches, closed loop, and open loop.

Closed Loop Daylighting

Standard ambient, industrial, and outdoor Integrated Sensors as well as Tilemount sensors are used for closed loop daylight control. With the closed loop approach, the sensor controls the fixture it is directly connected to. A closed loop sensor “looks” at the surface directly below the sensor. It reads the reflected light level from the surface including light contributed by the electric light and the daylight that falls within the sensor’s view. As daylight contribution increases, the sensor dims the electric light to keep the light level on the surface as consistent as possible. If bright daylight causes the surface light level to be above the desired level even after the light level has been fully dimmed, after a period of time the fixture will dim to OFF. As daylight contribution decreases and the surface light level lowers, the fixture will turn back ON and then raise the amount of electric light accordingly.

Open Loop Daylighting

The WaveLinx battery operated ceiling sensors are used for open loop daylight control in interior spaces. The WaveLinx Wireless Outdoor Lighting Control Module is used for open loop daylight control in exterior spaces. With open loop daylight control, the sensor is placed

in a spot that is optimal for sensing daylight contribution while minimizing the sensor's view of the electric light in the controlled area. A correlation is then made between the daylight level "seen" by the sensor and the desired electric light level output, adjusting how much the sensor dims the electric light in response to daylight. The sensor adjusts the electric lighting as daylight contribution increases and decreases.

Because the sensor reading is "looking" at daylight contribution and is not affected by changes in the electric light, the sensor can control multiple zones of fixtures. In interior applications, one sensor can even control different zones at different light levels. This is a common approach for primary daylight zones next to the windows which typically dim more aggressively than secondary daylight zones located further into the space. Sensor placement is critical with the open loop approach. Assigning a zone to an open loop daylight set will automatically disable closed loop daylighting for any Integrated Sensors or Tilemount sensors connected to loads in that zone.

Control Interactions with Daylighting

Daylighting filters the fixture's response to other control commands. A command from a wallstation button or occupancy sensor to go to 100% will adjust the electric light level output to meet the calibrated daylight level. A command from a wallstation button or occupancy sensor to go to 50% will adjust the electric light level to meet 50% of the calibrated daylight level. The actual electric light level output with these commands will vary based on the available amount of daylight in the space and how much electric light needs to be contributed to maintain the commanded target. If the electric light has daylight dimmed to OFF, lighting will remain OFF if wallstation, schedule event or occupancy commands are received, preventing unnecessary energy waste when adequate daylight is present.

Modifying Closed Loop Daylighting Control

This section focusses on the use of closed loop sensor control. This includes details on how to:

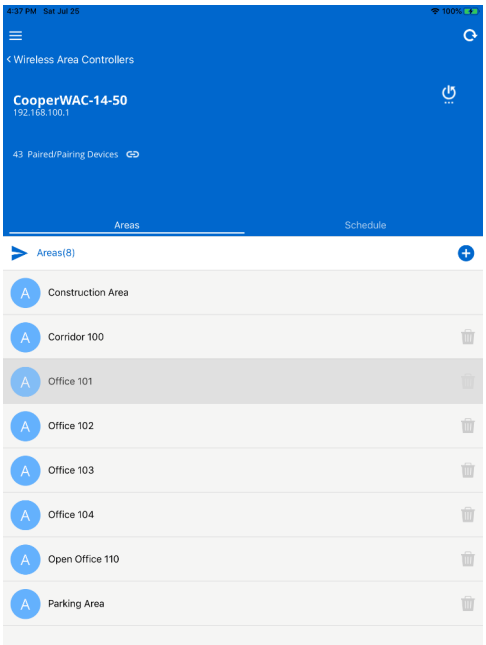
- Disabling daylighting for closed loop sensors
- Calibrate closed loop sensors located in interior spaces
- Calibrate closed loop sensors located in exterior spaces

Disabling Daylighting for Closed Loop Sensors (Interior and Exterior Sensors)

The automatic code commissioning operation causes standard ambient, industrial, and outdoor fixture Integrated Sensors as well as Tilemount sensors to begin daylight dimming as soon as the device is assigned to an area. If the devices are located in areas that should not daylight dim, disable the daylight set to avoid nuisance dimming if the electric light reflectance alone exceeds the expected target level.

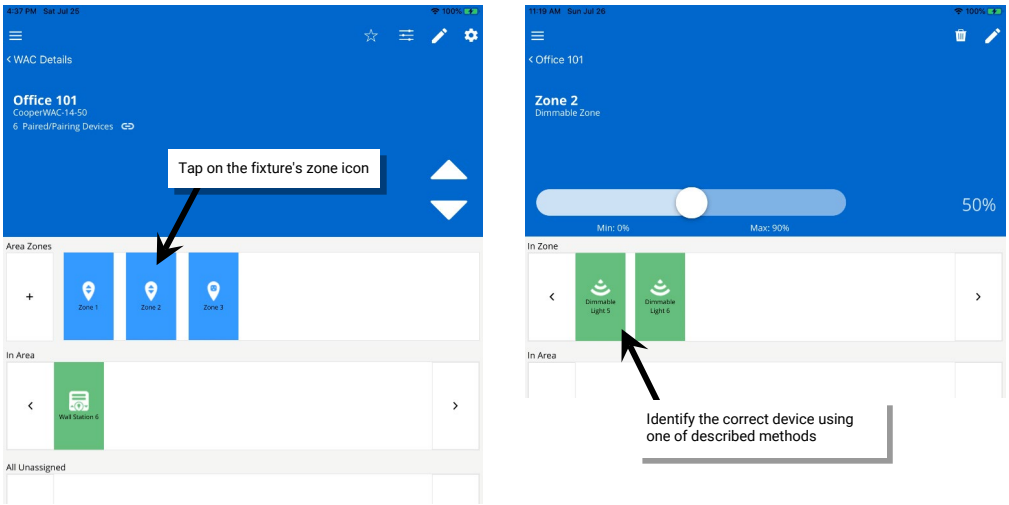
Step 1: Open the WaveLinx Mobile Application and establish a connection with the Wireless Area Controller as the administrator user.

Step 2: In the areas list, select the area that contains the controlled fixture.

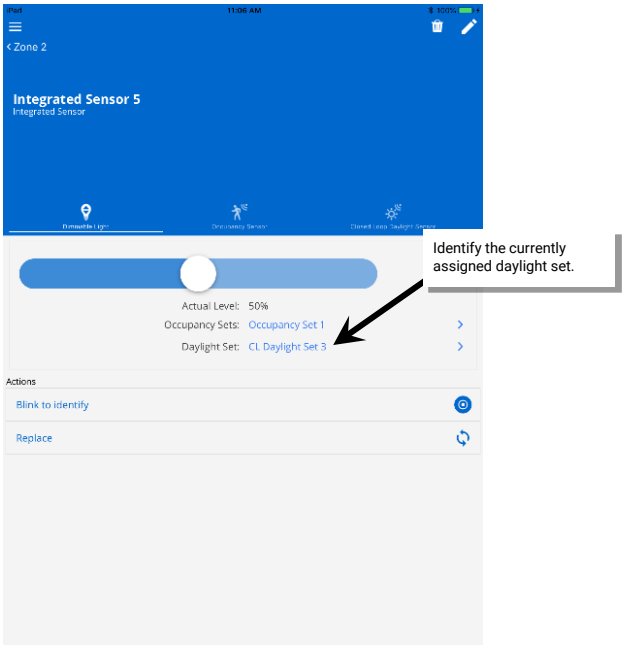


Step 3: In the area screen, tap on the zone that the controlled fixture is assigned to. If there are multiple fixtures in the zone, identify the correct device by using one of the following methods:

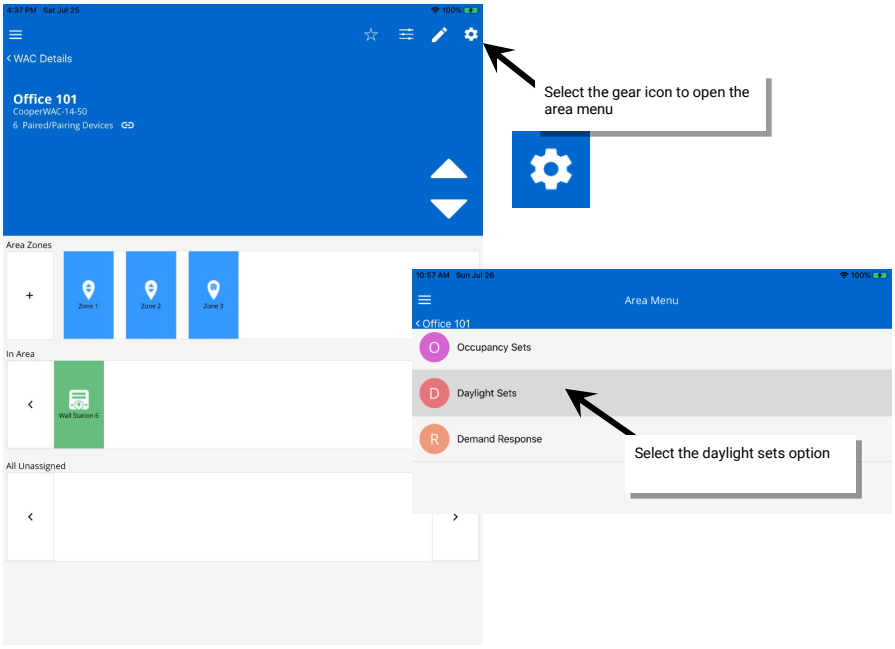
- Method 1: Using a laser pointer or flashlight, stand beneath the fixture and shine the laser pointer directly into the lens of the sensor for 3-4 seconds. The timing needs to be precise for the identification mode to respond. The LED in the sensor window will briefly flash violet at the end of this 3-4 second period. In the Mobile Application, the device's icon will move to the far-left and begin to pulse in the 'in area' device section. Note the name of the identified device.
- Method 2: Within the zone screen, double tap a fixture's icon to place the fixture into blink to identify mode for 15 seconds. Repeat with additional devices until the desired fixture load is visually identified. Note the name of the identified device.



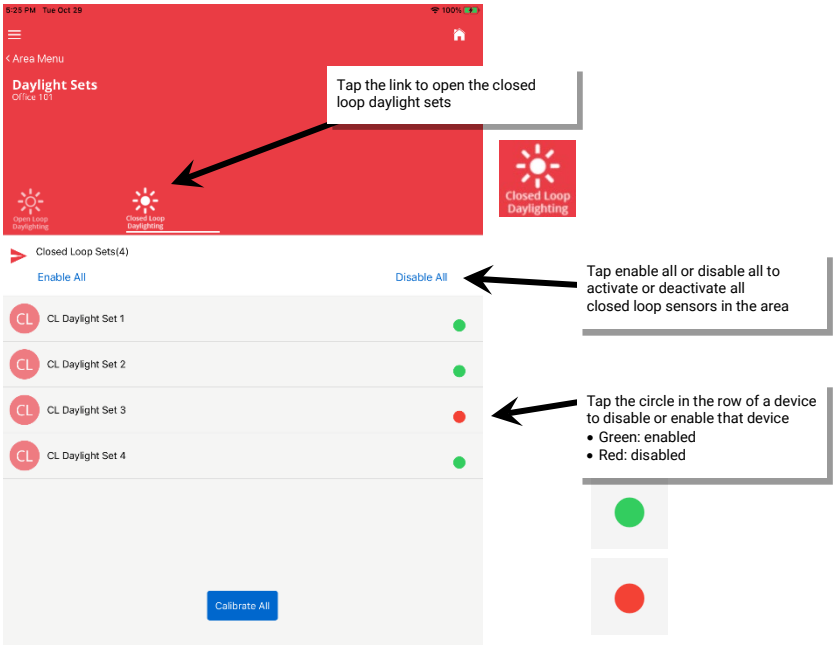
Step 4: Tap on the identified device to open its device details page. Make note of its currently assigned closed loop daylight set. Tap the back button to exit the screen, and then tap back again to exit the zone screen.



Step 5: In the area screen, select the gear icon in the upper-right corner to open the area menu and then select the daylight set option.



Step 6: Tap on the icon for closed loop daylighting. In the list of closed loop sets, locate the closed loop daylight set(s) associated with the identified load(s). Either tap on the disable all function at the top of the list to disable daylighting for all sensors in the area or tap on a colored circle on the right side of the screen until the circle turns red to disable the daylighting function for a particular fixture/device. Once complete, tap the back button or the home button to exit the configuration screen.



Note: If needed, daylighting can be re-enabled by tapping the circle again. It will turn green indicating that daylighting is enabled.

Step 7: Repeat these steps for any other areas as needed.

Calibrating and Modifying Light Levels for Interior Closed Loop Daylight Sensors

In the WaveLinx system, standard ambient and industrial fixture Integrated Sensors as well as Tilemount sensors use closed loop daylighting to directly control the physically connected load. Unlike occupancy sets, closed loop daylight sensors cannot be grouped into a single daylight set. Each daylight sensor is automatically assigned to a unique daylight set.

Each sensor has default factory settings that provide closed loop daylighting to a reasonable light level. Daylight sensor operation begins automatically once the fixture containing/connected to the sensor is assigned to an area other than the default construction group.

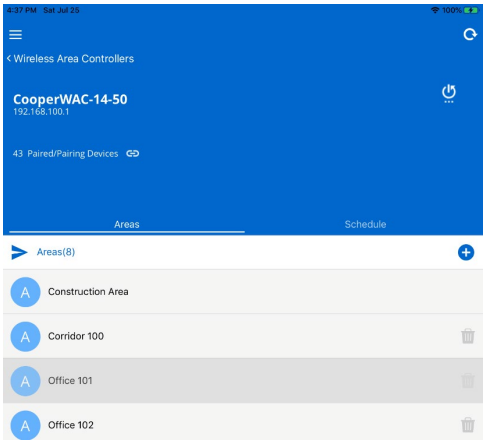
The default factory settings cannot account for all factors that affect the light level measured at the sensor. The sensor location is not at the surface but at the ceiling and therefore its reading of reflected light levels is affected by many variables, including mounting height, the surface height, and the color and reflective properties of the room décor. If a specific light level is expected at the surface, then calibration at the site is required.

It is recommended to calibrate and adjust the target level of all the sensors within one area at the same time using the Mobile Application's option to calibrate all. In this method, all of the sensors within the space (area) will be calibrated together. A light meter capable of reporting lux or foot-candles is recommended for this procedure.

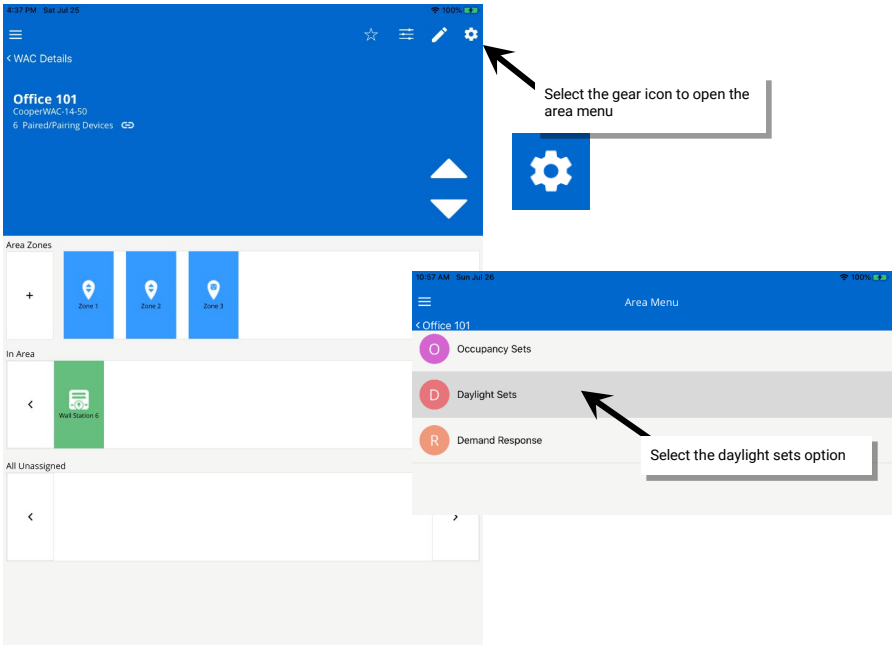
It is best to calibrate indoor application when there is a moderate to low levels of daylight. If the daylight level is too high, the user may not be able to obtain the desired level of light at the task surface, even if the fixtures are completely off.

Step 1: Open the WaveLinx Mobile Application and establish a connection with the Wireless Area Controller as the administrator user.

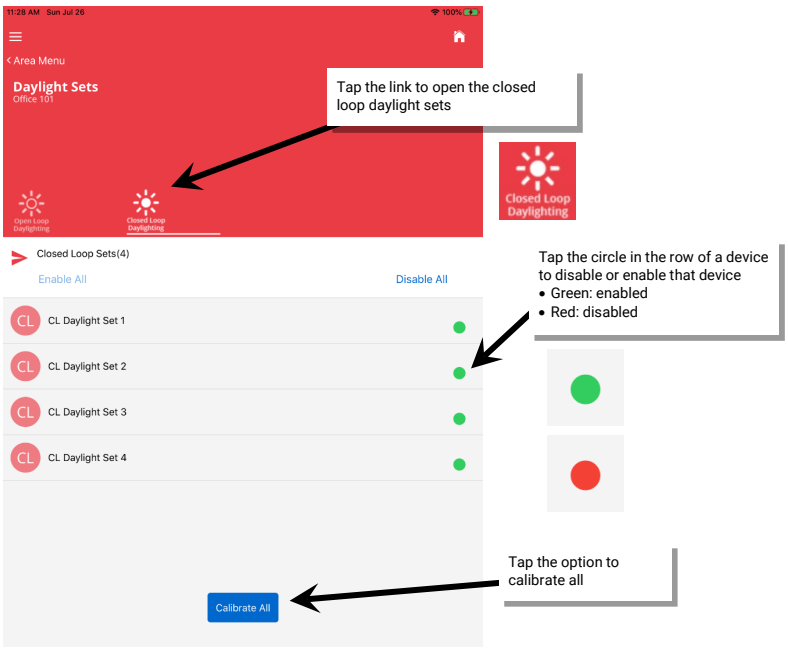
Step 2: In the areas list, select the area to calibrate.



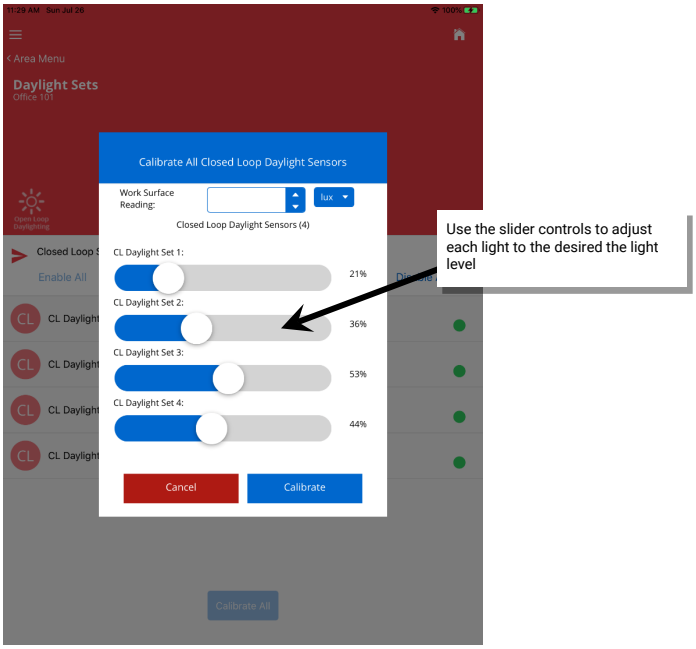
Step 3: In the area screen, select the gear icon in the upper-right corner to open the area menu and then select the daylight set option.



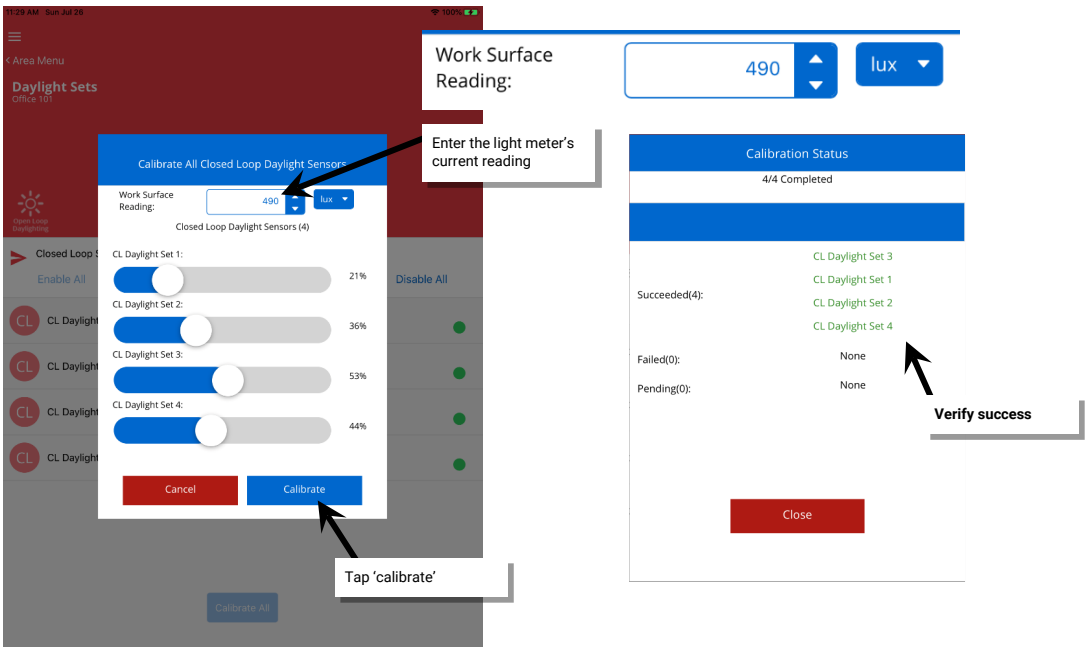
Step 4: Tap on the icon for closed loop daylighting. A list of the fixture Integrated Sensors or Tilemount sensors assigned to the area will appear. Ensure that the sensors that need to perform daylighting are enabled (green circle) and then tap the button to calibrate all at the bottom of the screen. The devices being calibrated will all go to their brightest light output.



Step 5: Use the slider bars to adjust the electric light to the desired level for each controlled fixture. Verify that the level is correct by placing the light meter on the surface beneath each of the controlled fixtures, ensuring that the reading is within the desired range. If the light level 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.



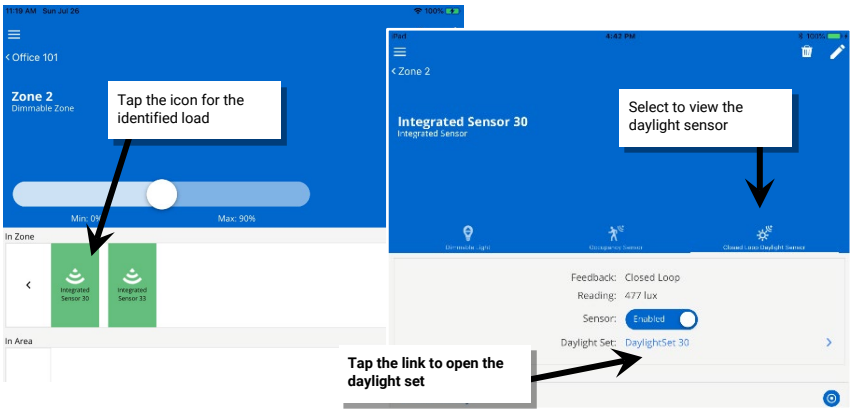
Step 6: At the top of the screen, change the display between lux and foot-candles to match the reported units of the light meter. Enter the light meter's surface reading into the work surface entry field. (The meter reading should be similar under each fixture if the fixtures are properly adjusted to maintain the same light level.) Then, tap the calibrate button to calibrate each sensor and to save the desired light level target. The Mobile Application will show whether calibration was successful. If failures are reported on this page, it will be necessary to repeat this procedure. Close the calibration status screen, and then tap the back button or the home button to exit the configuration screen.

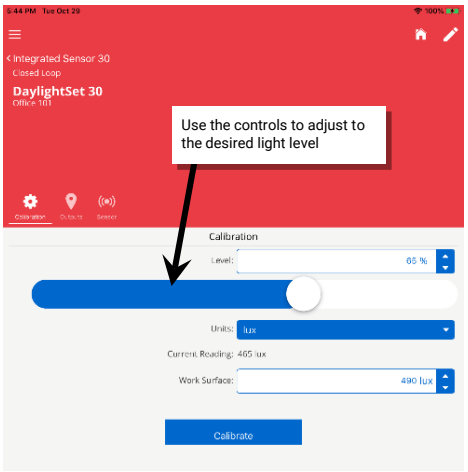


Step 7: Repeat these steps for other areas as needed for the application.

Calibrating and Modifying Light Levels for a Single Closed Loop Daylight Sensors

It is also possible to adjust the closed loop settings for an individual sensor. Open the area that the fixture is located in and then locate and tap on the icon for the identified fixture load. Tap the closed loop daylight sensor option visible in the middle of the screen and then tap on the link to open the daylight set. Once the daylight set is opened, use the calibration screen to adjust the daylighting as needed.





Quick Links for Common Questions

- After I calibrated the sensors, I noticed that the light output is different for each fixture. Why is this occurring? See the answer on page 200.
- My lights over my desk appear to adjust to different dimming levels even through the daylight does not appear to change. Why is this happening? See the answer on page 200.
- My wallstation or occupancy sensor does not appear to operate during the day but seems to work at night. Why is this occurring? See the answer on page 201.

Calibrating and Modifying Light Levels for Exterior Closed Loop Daylight Sensors

In the WaveLinx system, outdoor fixture Integrated Sensors use closed loop daylighting to directly control the physically connected load. Each daylight sensor is automatically assigned to a unique daylight set.

Each sensor has default factory settings that provide closed loop daylighting to a reasonable light level. Daylight sensor operation begins automatically once the fixture containing the sensor is assigned to an area other than the default construction group.

The default factory settings cannot account for all factors that affect the light level measured at the sensor. The sensor location is not at the surface but at the fixture and therefore its reading of reflected light levels is affected by many variables, including the mounting height and the reflective properties of the surface. If a specific daylighting behavior is expected, then calibration at the site is required.

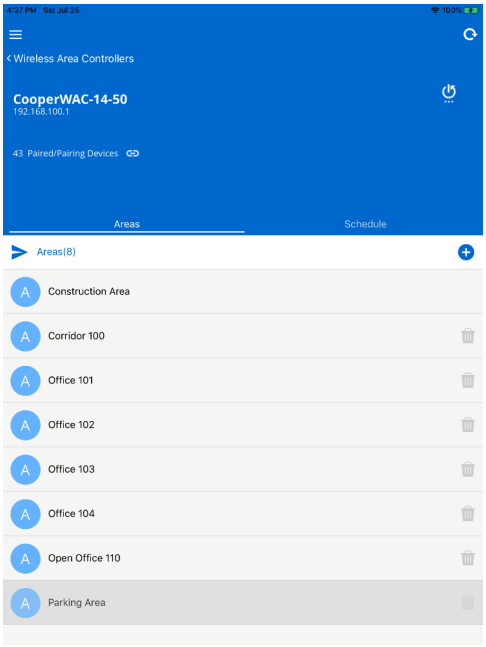
If calibration is necessary, calibrate and adjust the target level of all the sensors within one area at the same time using the Mobile Application's option to calibrate all. In this method, all of the sensors within the space (area) will be calibrated together.

Once calibrated, when the measured light level exceeds 150% of the calibrated light level for more than 30 minutes, the sensor will turn lighting OFF. When the measured light level is less than 50% of the calibrated light level for more than 10 minutes, the sensor will turn lighting ON.

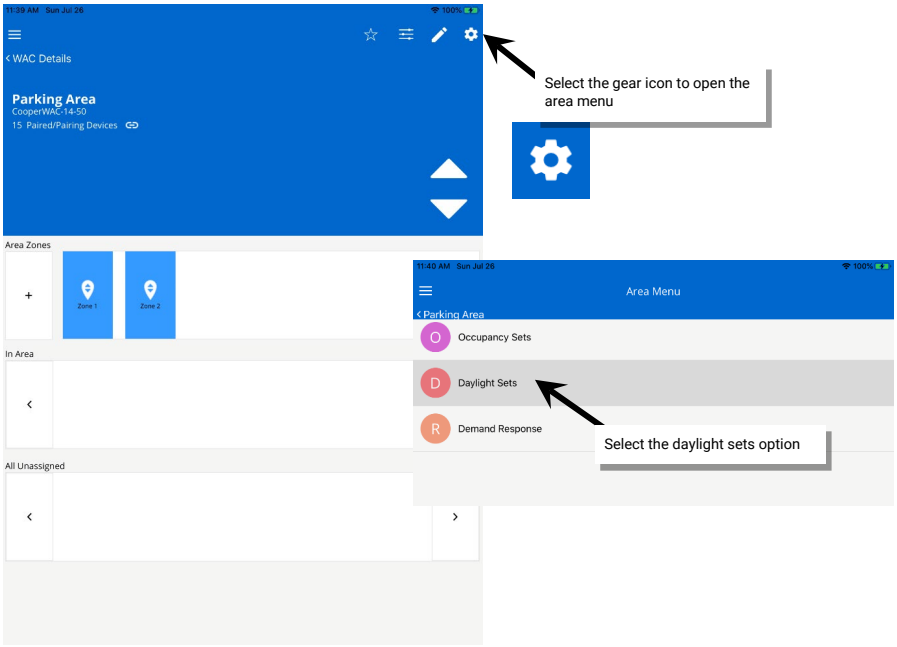
Note: Before beginning the calibration process, for best accuracy, calibrate outdoor closed loop sensors at night.

Step 1: Open the WaveLinx Mobile Application and establish a connection with the Wireless Area Controller as the administrator user.

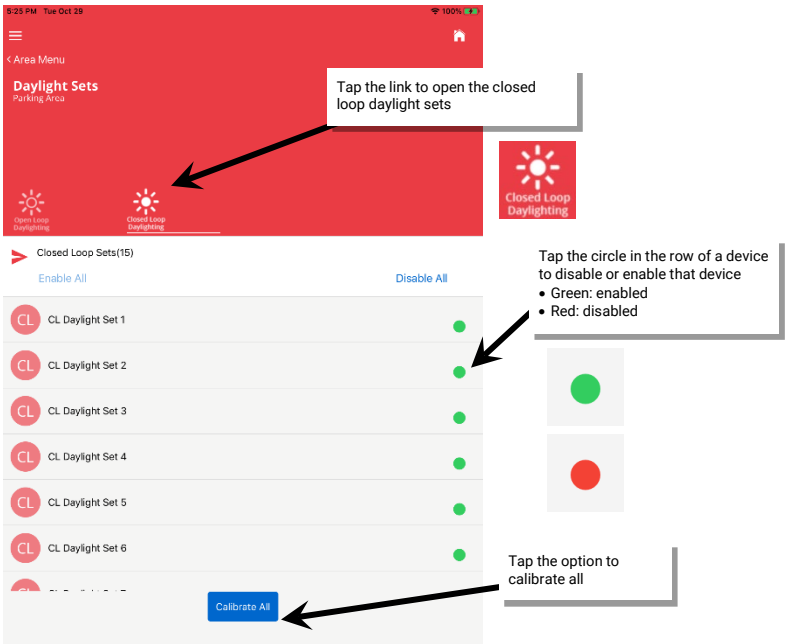
Step 2: In the areas list, select the area to calibrate.



Step 3: In the area screen, select the gear icon in the upper-right corner to open the area menu and then select the daylight set option.

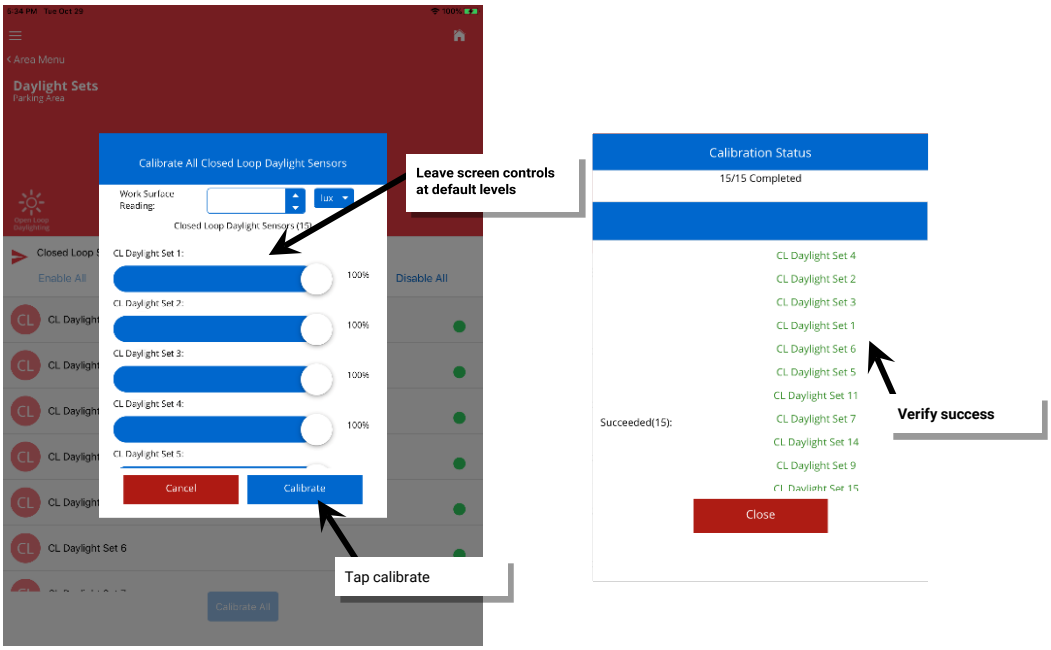


Step 4: Tap on the icon for closed loop daylighting. A list of the outdoor fixture Integrated Sensors assigned to the area will appear. Ensure that the sensors that need to perform daylighting are enabled (green circle) and then tap the button to calibrate all at the bottom of the screen. The devices being calibrated will all go to their brightest light output.



Step 5: Leaving all screen controls at the default settings, at the bottom of the calibration screen, click on the calibrate button. The current light level of each of the affected sensor will then be stored as the target light level. The Mobile Application will show whether calibration was successful. If failures are reported on this page, it will be necessary to repeat this procedure. Close the calibration status screen, and then tap the back button or the home button to exit the configuration screen.

Note: It is not necessary to adjust any of the level sliders in an outdoor application. Optionally, the work surface reading can be entered using a light meter for reference to allow the current reading fields to more closely approximate what the light level is at the desired surface. This will have no effect on the calibrated level other than for the current reading display purposes.



Step 6: Repeat these steps for other areas as needed for the application.

Note: It is also possible to adjust the closed loop settings for an individual sensor. Please refer to the procedure as described in “Calibrating and Modifying Light Levels for a Single Closed Loop Daylight Sensors” on page 107 for further details.

Quick Links for Common Questions

- My exterior lighting does not all respond ON or OFF at the same time. Why is this occurring? See the answer on page 201.
- My wallstation or occupancy sensor does not appear to operate during the day but seems to work at night. Why is this occurring? See the answer on page 201.

Configuring Open Loop Daylighting Control

This section focuses on the use of open loop daylighting control. In the WaveLinx system, open loop daylighting is not part of the automatic code commissioning operation and must be specifically configured. This process is discussed in detail for both interior and exterior open loop daylighting applications.

Configuring Interior Open Loop Daylight Sensors

Interior open loop daylighting requires the use of a battery-operated ceiling sensor.

- Open loop daylight sensors should be mounted so that the sensor lens views mainly daylight, not the electric light being controlled in the area. Refer to the battery-operated ceiling sensor’s installation guide for further information on the recommended mounting locations for this device in daylighting applications.
- The battery-operated ceiling sensor also has occupancy sensing capability. The optimal mounting location for occupancy sensing may not be the optimal location for open loop daylighting. Separate sensors may be necessary to ensure adequate occupancy sensing coverage and optimal daylight placement.
- 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.
- White tuning zones/devices cannot be assigned to an open loop daylight set.

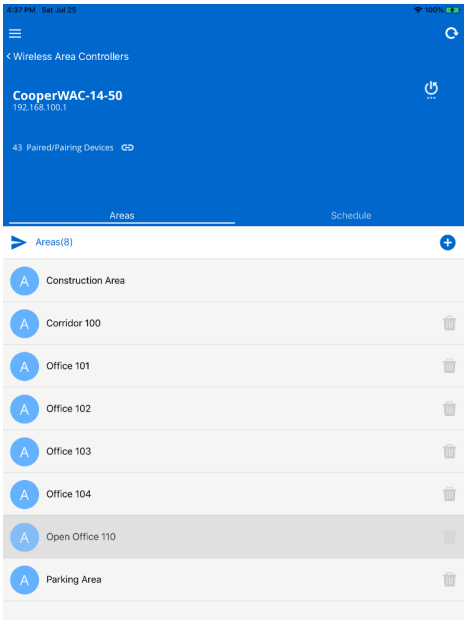
Before proceeding:

- Interior open loop sensor calibration should be performed during daylight hours when electric lighting should be reduced but not fully dimmed.
- The use of a light meter capable of reporting lux or foot-candles at the work surface is recommended.

Step 1: Verify that light levels are optimal for calibration. First, turn OFF the electric lighting in the space, and then 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.)

Step 2: Open the WaveLinx Mobile Application and establish a connection with the Wireless Area Controller as the administrator user.

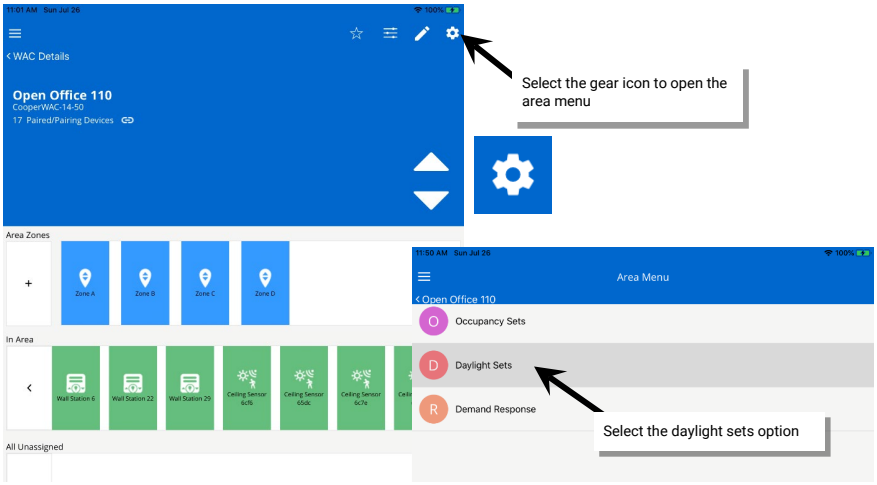
Step 3: In the areas list, select the area to calibrate.



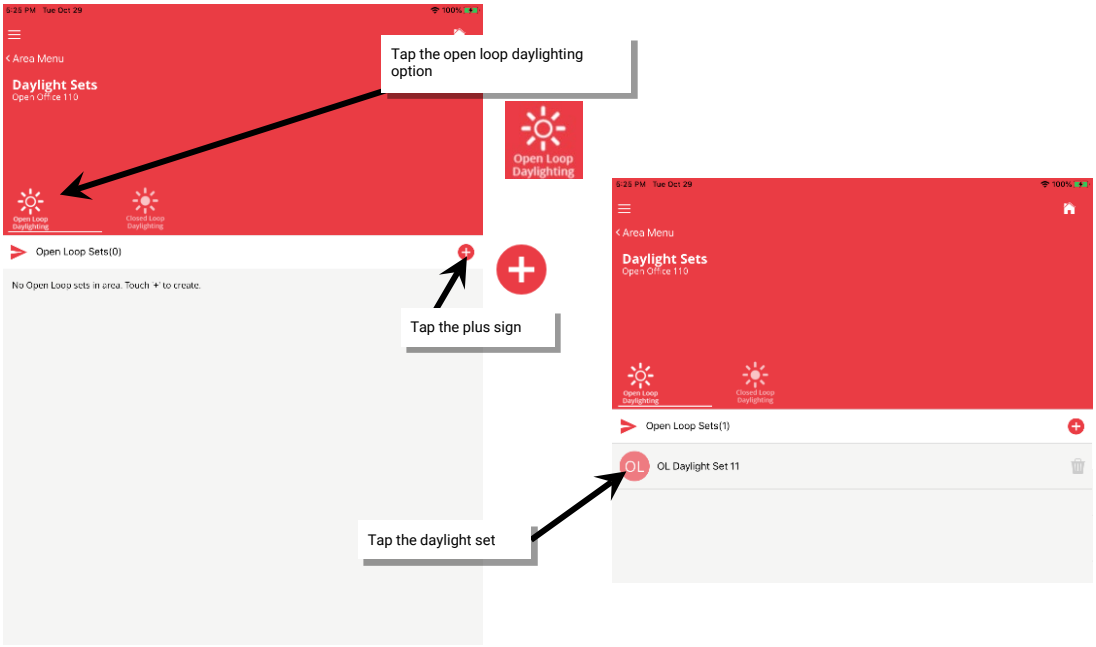
Step 4: Using a wallstation, turn ON the controlled lighting and raise the light level to the highest output.

Step 5: If multiple ceiling sensors are within the area, only one will be used for daylighting. In the Mobile Application area screen, identify the correct sensor by shining a flashlight into the lens of the sensor for 3 to 4 seconds. The sensor icon should flash or pulse. Make note of the identified sensor's name/descriptor.

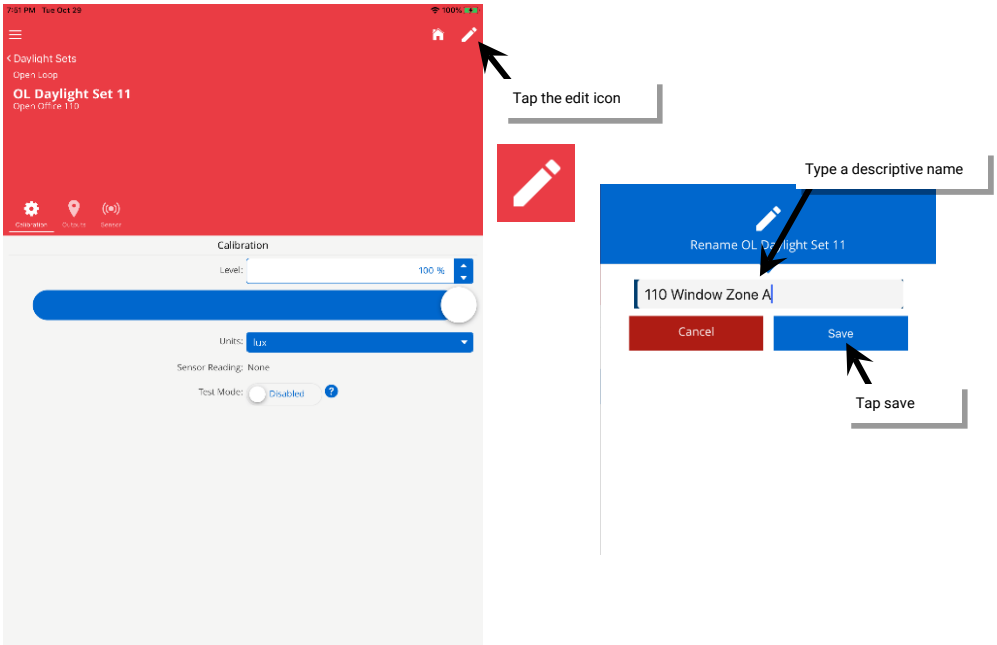
Step 6: Select the gear icon in the upper-right corner to open the area menu and then select the daylight set option.



Step 7: Tap on the icon for open loop daylighting and then tap the plus sign to create a new open loop daylight set. Tap on the new daylight set to open it.

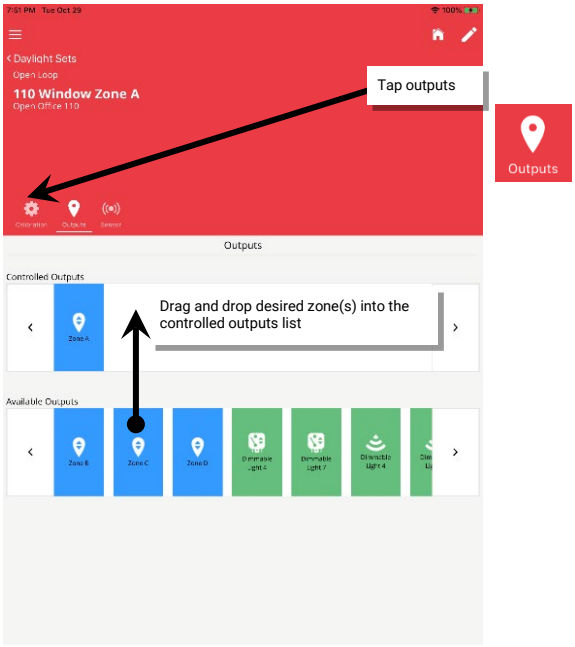


Step 8: At the top of the screen, tap the pencil icon and enter a descriptive name for this daylight set and save it.

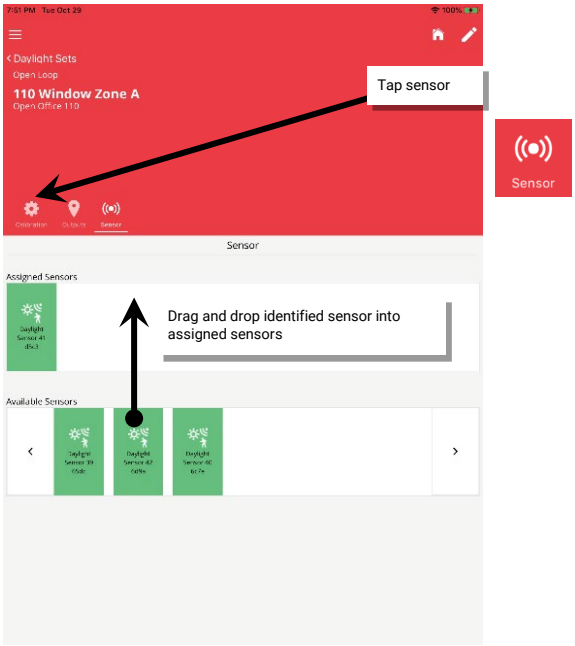


Step 9: Tap the output icon. Locate the zone or zones that should respond to this daylight sensor. Although fixtures (green icons) may be individually assigned, the use of zones (blue icons) is recommended to simplify programming. Drag and drop the identified zone(s) into the controlled outputs section.

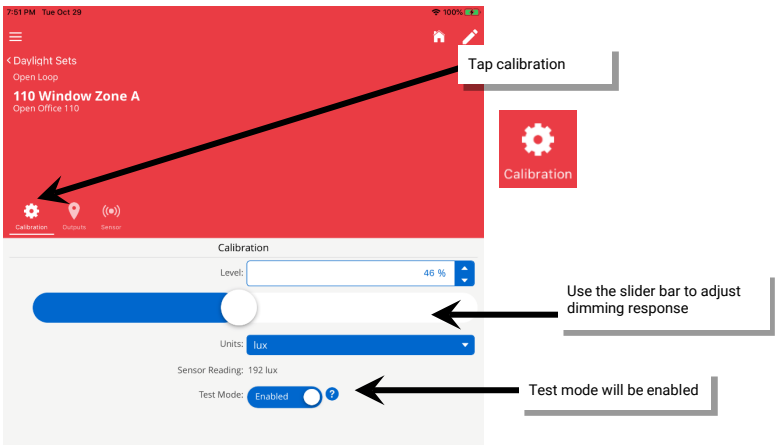
Note: If more than one zone is assigned to the same daylight set, the assigned zones will daylight dim in the same manner. Zones defined as white tuning zones and their associated devices will not appear in this screen to prevent unintentional assignment.



Step 10: Next, tap on the sensor icon. If multiple ceiling sensors are listed in the available sensors list, locate the sensor with the name/ descriptor identified earlier in this procedure. Drag and drop the identified sensor into the assigned sensor section.

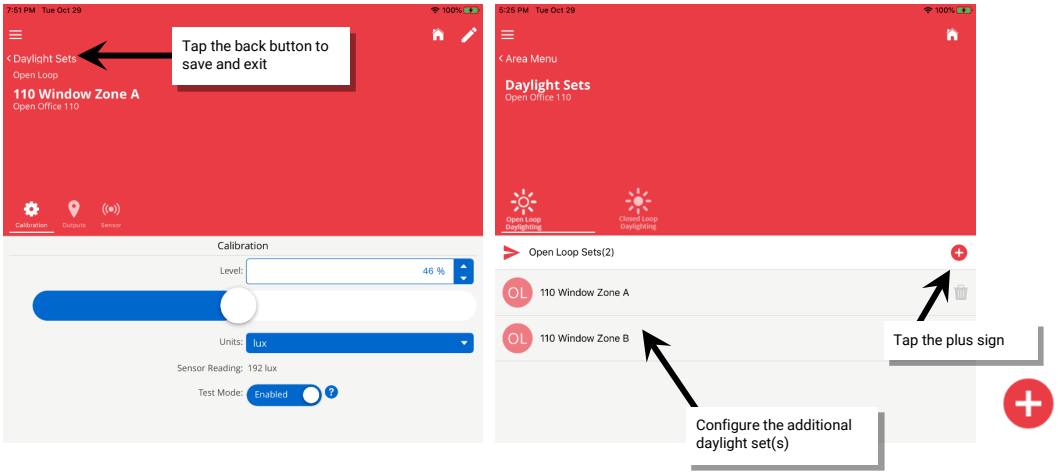


Step 11: Tap on the calibrate icon. Drag the adjustment slider to modify the zone's dimming response. Lowering the adjustment bar will lower the electric light level and increase the sensitivity to daylight. Raising the adjustment bar will raise increase the electric light level and decrease the sensitivity to daylight. The system will automatically enter test mode when adjustments are made to accelerate response.



Step 12: Wait approximately 10 seconds to allow the light level to settle and then place the light meter on the work surface to verify that the light level is within the desired range. Adjust the slider further if necessary, until the light level is in the correct range.

Step 13: Tap on the back button to save the change and go back to the main daylight sets screen. If an additional zone will operate from the same daylight sensor but with a different response, select the plus sign to create an additional open loop set. Repeat these steps to assign the appropriate zone, assign the same sensor, and calibrate the light level for the zone.



Quick Links for Common Questions

- After I programmed the open loop daylight sets, the work surface light level is not consistent over the controlled zone. Why is this occurring? See the answer on page 200.
- My lights over my desk appear to adjust to different dimming levels even through the daylight does not appear to change. Why is this happening? See the answer 200.
- My wallstation or occupancy sensor does not appear to operate during the day but seems to work at night. Why is this occurring? See the answer on page 201.

Configuring Exterior Open Loop Daylight Sensors

Exterior open loop daylighting requires the use of the WaveLinx Wireless Outdoor Lighting Control Module.

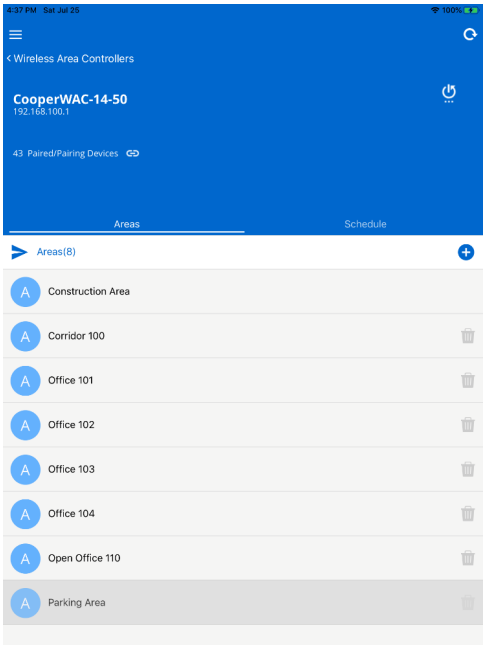
- If the controlled area contains more than one wireless outdoor lighting control module, one module may be assigned to control daylighting for the connected fixture, or may be assigned to control daylighting for a group of fixtures if it is desired to have them respond to daylighting in the exact same manner.
- If fixtures in the zones that are assigned to open loop daylight sets contain an outdoor Integrated Sensor, closed loop daylighting will automatically be disabled for these sensors.

The WaveLinx wireless outdoor 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.

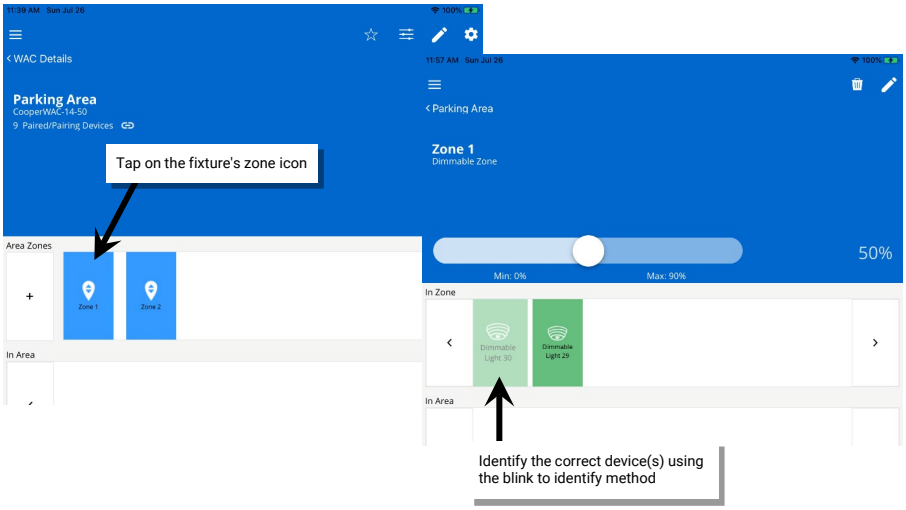
Because settings are hard coded, the configuration of an exterior open loop sensor is simplified and consists of creating the daylight set, assigning the necessary controlled zones, and assigning the sensor that perform the daylighting functions. It is also possible to view the sensor's current reading.

Step 1: Open the WaveLinx Mobile Application and establish a connection with the Wireless Area Controller as the administrator user.

Step 2: In the areas list, select the area to configure.

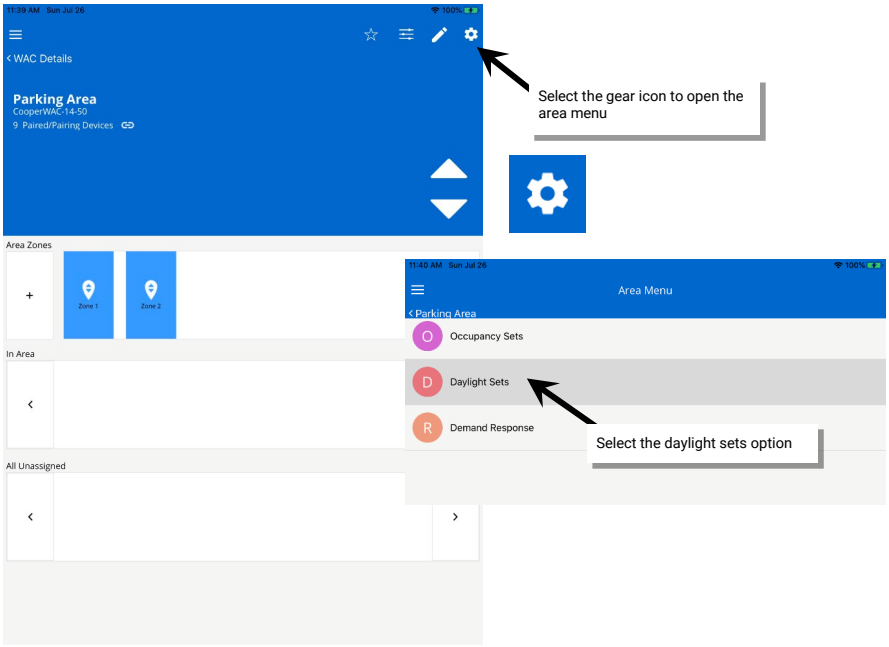


Step 3: If multiple wireless outdoor lighting control modules are within the area, decide which module will be used for daylighting. In the Mobile Application area screen, tap on the zone that contains the chosen wireless outdoor lighting control module. If unsure of which device it is, double tap the first device's icon to place it in blink to identify mode. The icon will appear to pulse.

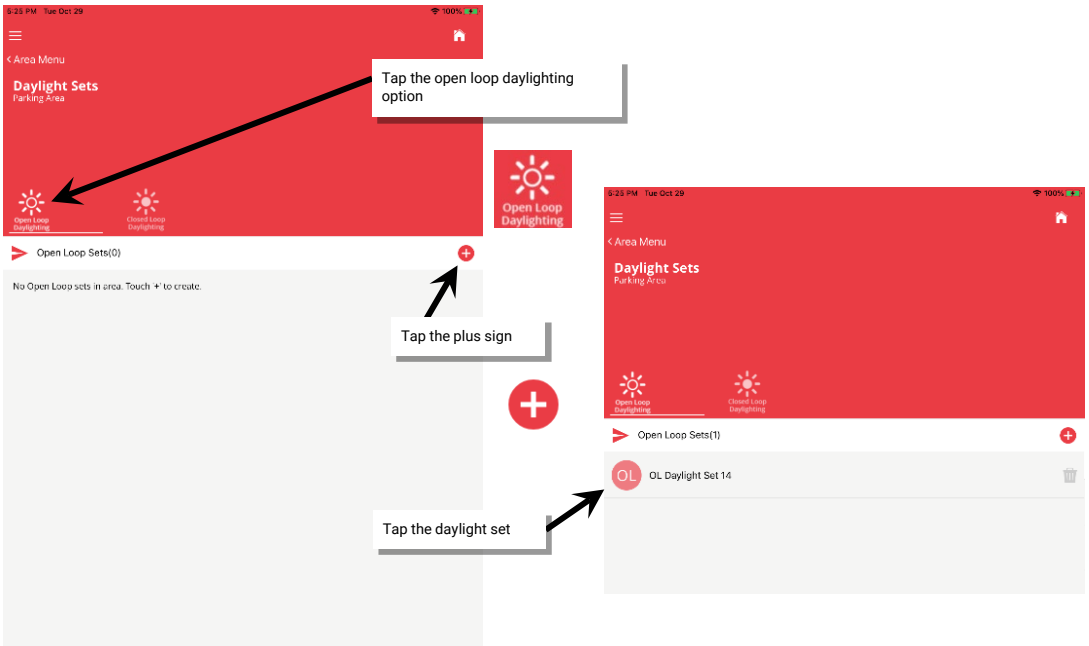


If the desired load in the location does not cycle ON and OFF or cycle between bright and dim, repeat this process with other device icons until the correct load responds. Blink to identify mode can be cancelled prior to the 15 second automatic timeout period by double tapping on the flashing device icon. Make note of the identified device's name/descriptor, then click on the zone back button to exit the zone screen.

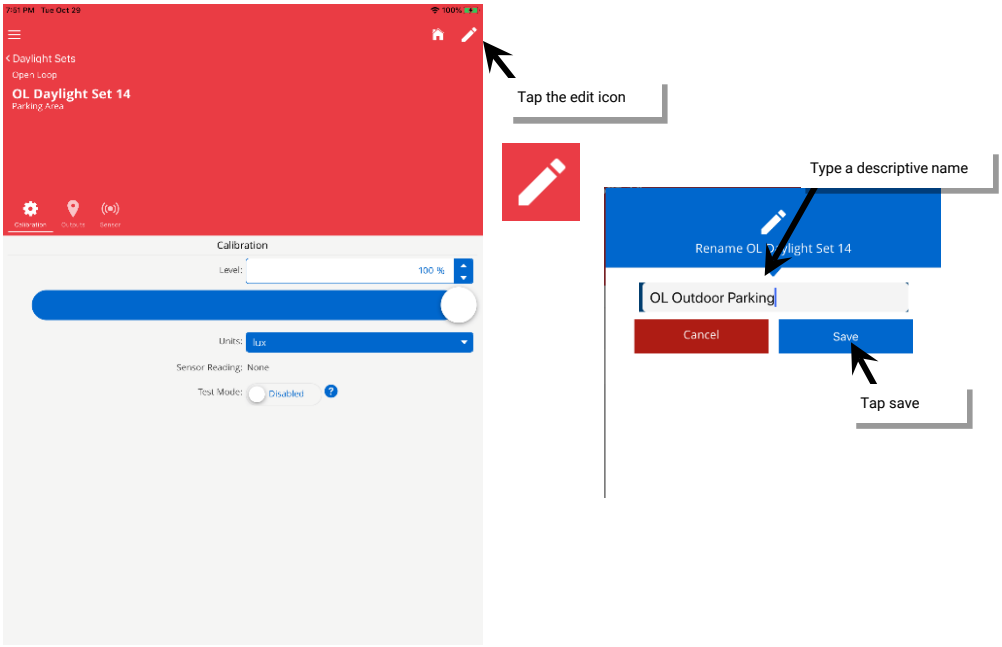
Step 4: In the area screen, select the gear icon in the upper-right corner to open the area menu and then select the daylight set option.



Step 5: Tap on the icon for open loop daylighting and then tap the plus sign to create a new open loop daylight set. Tap on the new daylight set to open it.

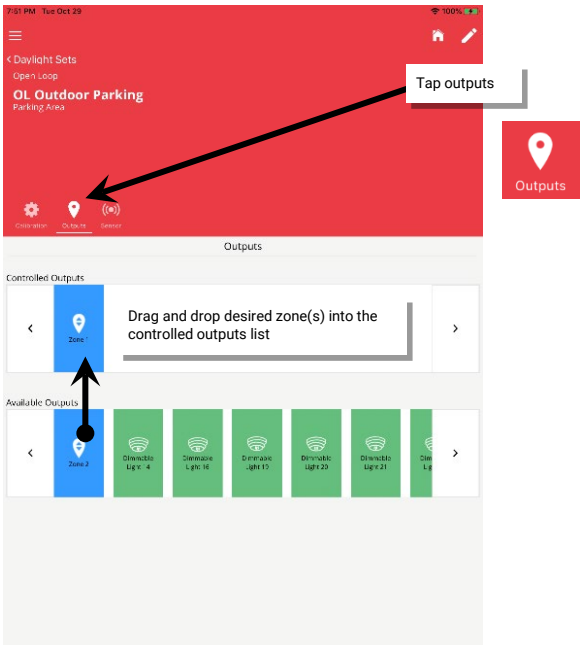


Step 6: At the top of the screen, tap the pencil icon and enter a descriptive name for this daylight set and save it.

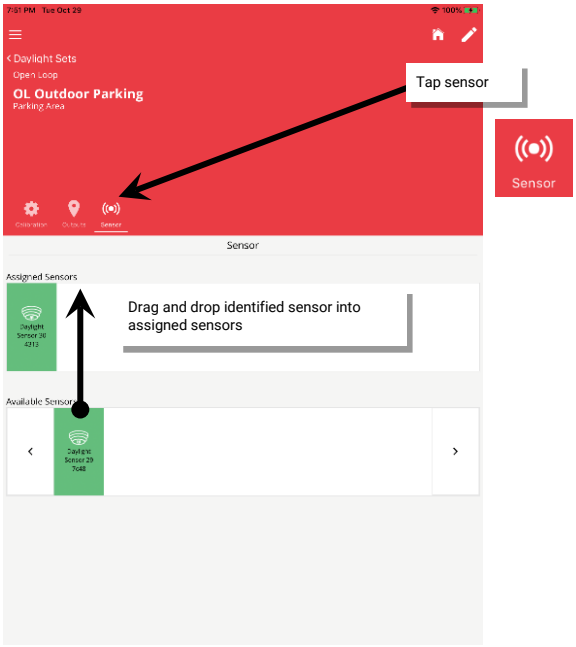


Step 7: Tap the output icon. Locate the zone or zones that should respond to this daylight sensor. Although fixtures (green icons) may be individually assigned, the use of zones (blue icons) is recommended to simplify programming. Drag and drop the identified zone(s) into the controlled outputs section.

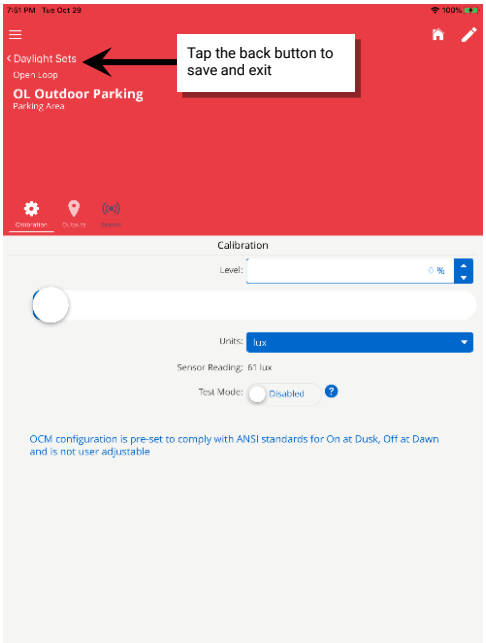
Note: If more than one zone is assigned to the same daylight set, the assigned zones will respond to daylighting in the same manner.

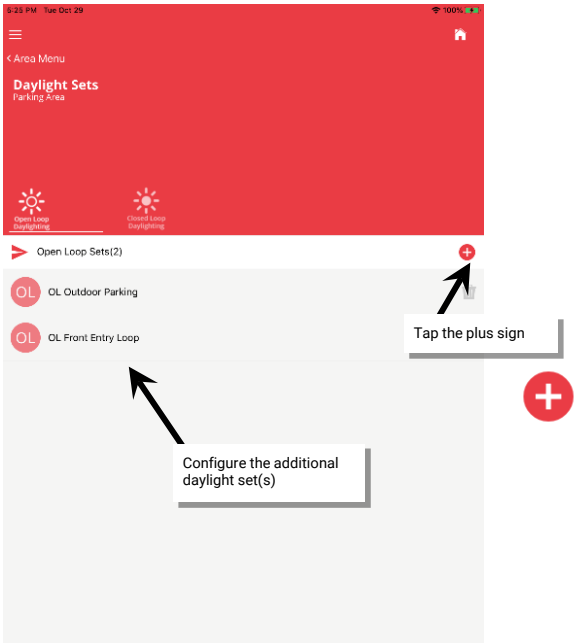


Step 8: Next, tap on the sensor icon. In the available sensors list, locate the sensor with the name/ descriptor identified earlier in this procedure. Drag and drop the identified sensor into the assigned sensor section.

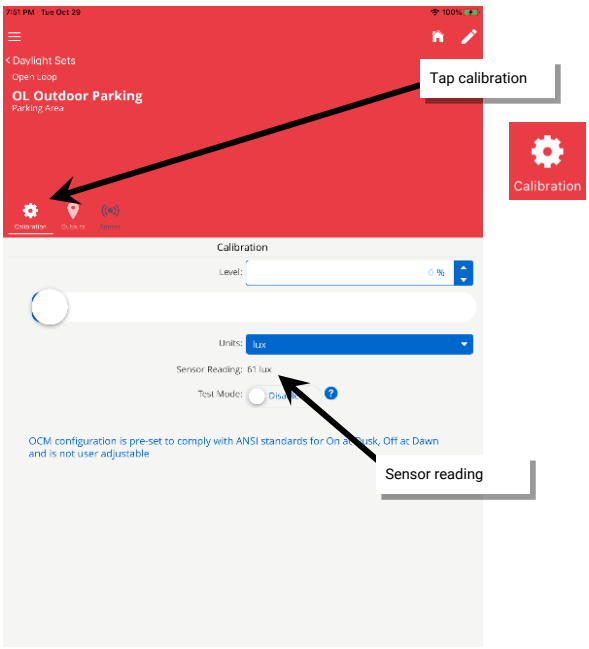


Step 9: Tap on the back button to go back to the main daylight sets screen, and then repeat the procedure if additional daylight sets are needed. Once done, tap the home button to go back to the area screen.





Once the zones and sensor are assigned to the daylight set, the daylighting will begin to operate per the hard-coded parameters. It is possible to use the calibrate tab to view the sensor's current reading. The sensor reading will be located in the middle of the calibrate page and may be switched between reading in lux or foot-candles. All other controls will not function for this sensor type.



Quick Links for Common Questions

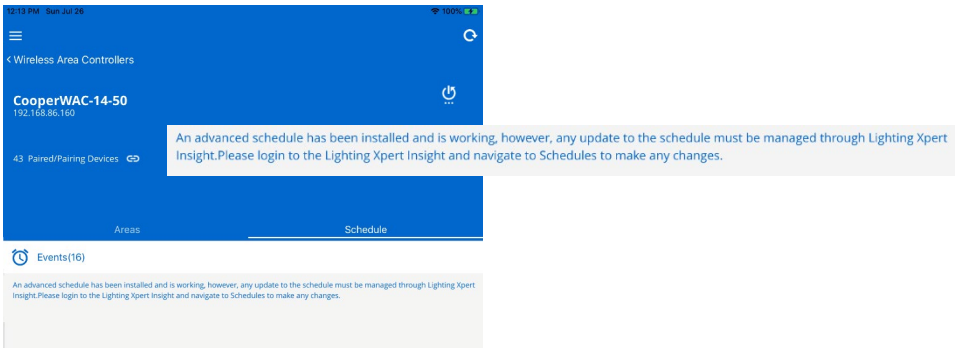
- My exterior lighting does not all respond ON or OFF at the same time. Why is this occurring? See the answer on page 201.
- My wallstation or occupancy sensor does not appear to operate during the day but seems to work at night. Why is this occurring? See the answer on page 201.

Adding Schedules to the Control Strategy

The automatic code commissioning operation does not include any default schedule events. Schedule events may be added to the control strategy if required. A schedule event may be used for two basic functions:

- To issue commands at a specific time of day or astronomic clock sunrise or sunset time.
- To change the behavior of an occupancy set beginning or ending at a specific time of day.

For sites using the Trellix Core and Trellix Lighting Application, if schedules are administered in the Trellix Lighting Application, the WaveLinx Mobile Application will not allow schedule modification and will display a message box in the scheduling screen. If this occurs, continue to administer any necessary schedule changes through the Trellix Lighting Application.



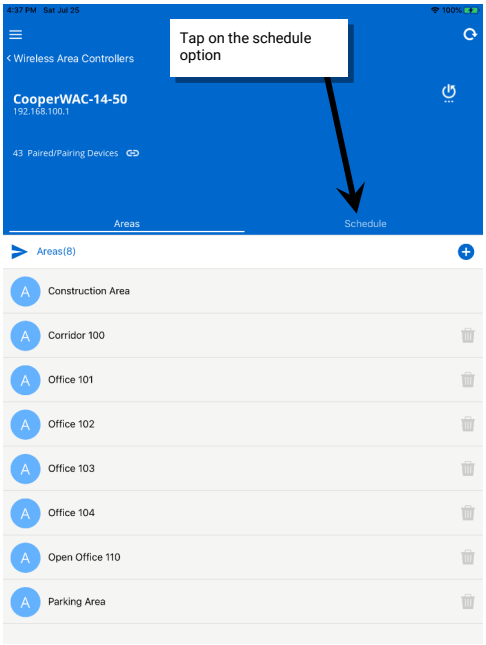
Note: If a schedule event that issues a scene or zone level command is assigned to an area that has occupancy sensors, at the time of the event if the area is occupied, the lighting and receptacle loads will go to the commanded schedule event levels. If the area is not occupied, the lighting and receptacle loads will remain at the unoccupied commanded levels.

There are sixteen configurable schedule events per Wireless Area Controller. If a schedule event is activated, it will perform the defined actions on the defined day(s) of week at the designated time. Each of the configurable schedule events can perform up to 96 different actions or commands.

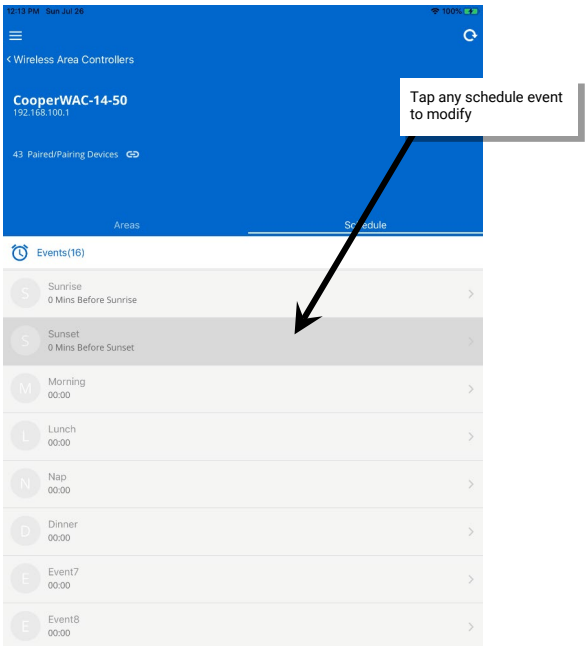
To enable and modify a schedule event:

Step 1: Open the WaveLinx Mobile Application and establish a connection with the Wireless Area Controller as the administrator user.

Step 2: In the area list screen, select the schedule option.

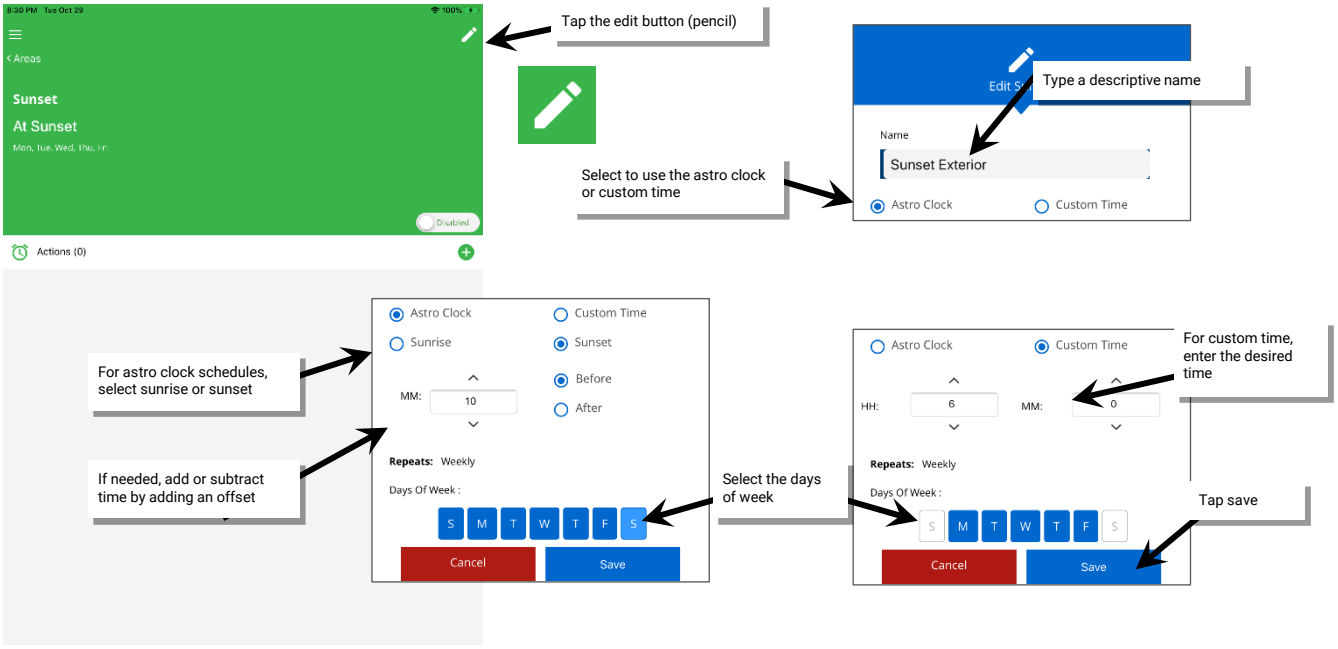


Step 3: In the schedule events list, tap any event to modify it. Note that all schedule events are disabled by default and appear grayed out. Schedule events are assigned default names which can be edited. Any event can be defined to be active for any time of day.

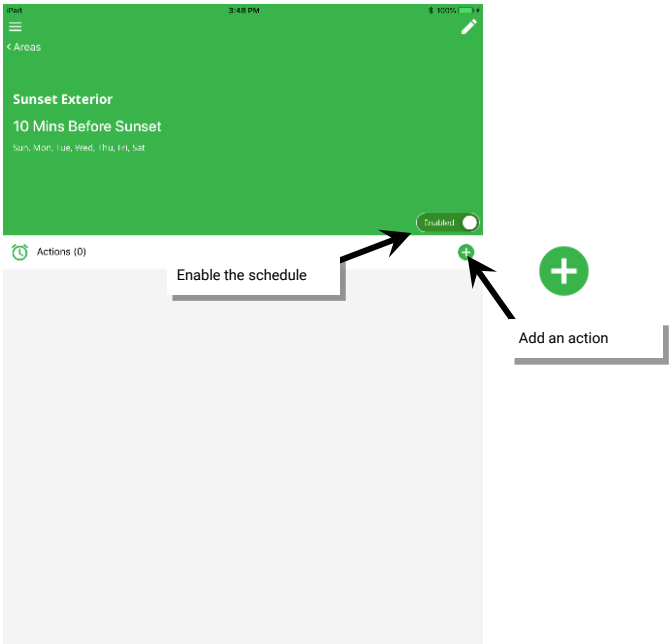


Step 4: Tap the pencil icon at the top-right of the schedule event screen to open the edit feature. Type a descriptive name for the schedule event, select the event type (astro clock or custom time), select the desired parameters and then tap the save button to continue.

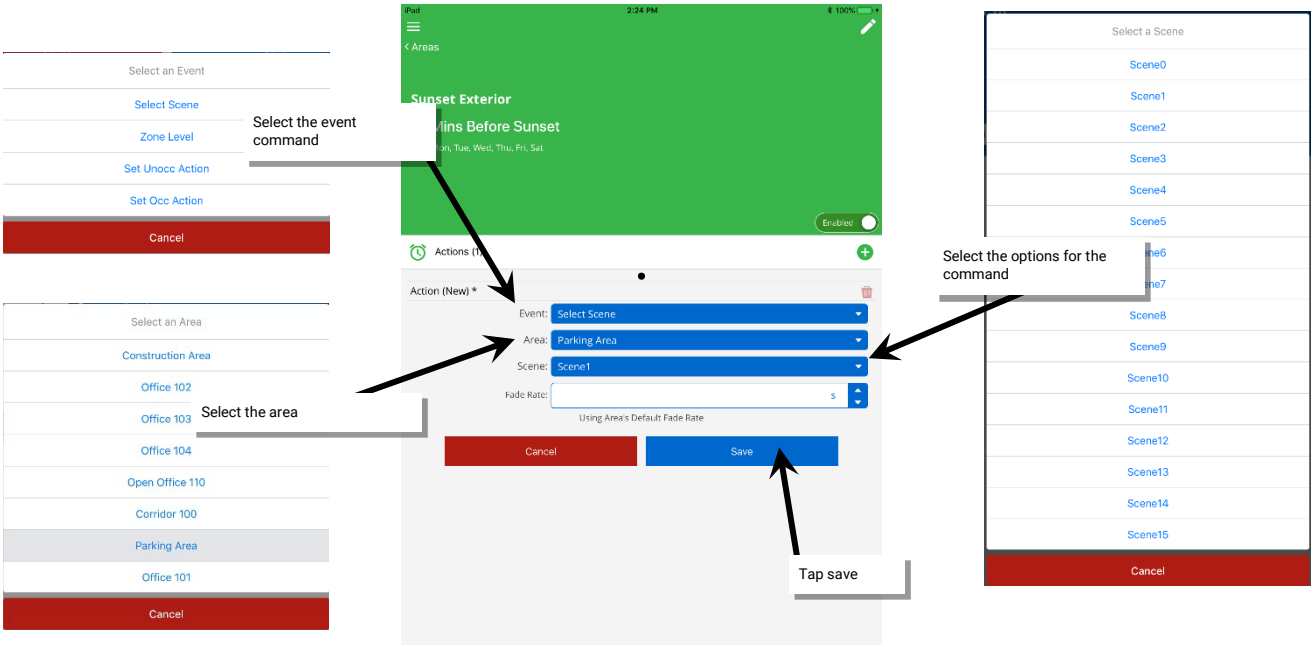
- The astro (astronomic) clock type schedule event uses latitude and longitude to determine sunset and sunrise times. Select either sunrise or sunset. If desired, add or subtract an offset time to allow lighting to respond earlier or later than the sunset or sunrise time. For instance, to have lighting turn ON 10 minutes prior to the calculated sunset time, enter 10 minutes, and select the before option.
- If defining a custom time schedule event, time is entered in 24-hour clock, military time format to distinguish morning from evening. For example, 2:00 in the afternoon would appear as 14:00.
- Select the desired days of week for the schedule event to run. If the day has a blue highlight, the event is active on that day.



Step 5: Tap the disable/enable button to enable the schedule event, and then tap the plus sign to add an action.



Step 6: In the action screen, select the desired event action and area for the command. Select other parameters based on the command chosen. Once completed, touch the save button.



Schedule Action Parameter Definitions:

- **Select scene**: The event will invoke the selected scene for the selected area using either the default area fade rate, or a uniquely defined fade rate.
- **Zone level**: The event will command the selected zone to the defined level using either the default area fade rate or a uniquely defined fade rate. Selections for zones include the ability of selecting an individual zone, 'ALL' zones in the area, or 'AFFECTED' zones. If the 'AFFECTED' zones option is selected, zones that have been defined to be ignored from the active scene will not respond to this event.

  Note: White tuning zones are automatically exempted from control if the 'ALL' or 'AFFECTED' zone is selected to prevent color temperature shift when adjusting light levels. The white tuning zone will only respond to a zone level command if it is the only zone selected.
- **Set unocc action**: The event will change the occupancy set's programmed behavior. Once the event occurs, if a space becomes unoccupied, the selected occupancy set will issue the command defined in the event action rather than what is defined in the occupancy set.
- **Set occ action**: The event will change the occupancy set's programmed behavior. Once the event occurs, if a space becomes occupied, the selected occupancy set will issue the command defined in the event action rather than what is defined in the occupancy set.

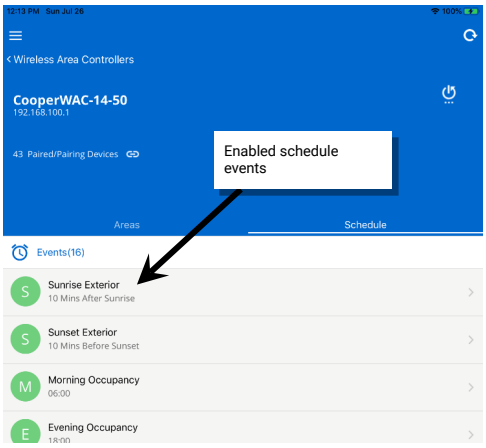
Step 7: Repeat step 5 and step 6 to define additional actions that need to occur with this schedule event. Up to 96 actions may be added to any schedule event.

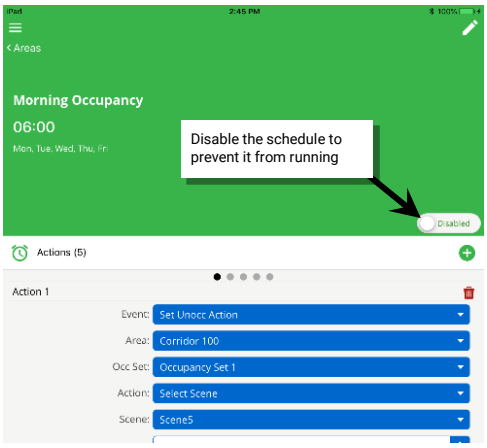
Quick Links for Common Questions

- My schedule events are running but they are running at the incorrect time. What could be causing this? See the answer on page 200.
- How do I define the astronomic clock's latitude and longitude and set my time zone? See the answer on page 200.
- I get the message "I get the message "An advanced schedule has been installed and is working …" Why is this message appearing?" Why is this message appearing? See the answer on page 201.
- My schedule event actions do not always appear to run. Why is this occurring? See a possible answer on page 201.

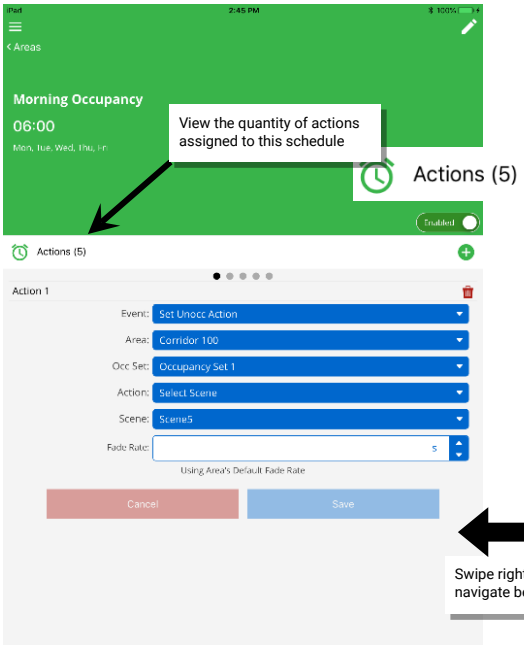
Basic Schedule Screen Information

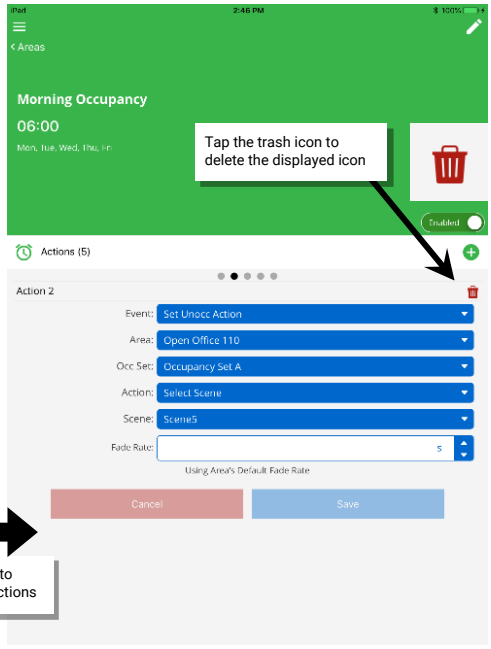
Schedule events that are enabled will show in dark text on the main schedule screen. To stop a schedule event from operating, tap on the event, and then tap on the enable/disable control. The disabled schedule event's programming remains allowing reactivation at a later time if the change is temporary.





For reference, the schedule event will display the quantity of assigned actions. Swipe right or left to access additional defined actions. Use the delete button at the top-right of the action area to delete that specific action from the event.





Swipe right and left to navigate between actions

Modifying and Testing Demand Response Behavior

Once devices are paired with the WAC, the WaveLinx system operates with default demand response functionality. This section describes how to adjust the default response and how to initiate a test to verify the demand response functionality. For information on integration and connection to the demand response system, refer to the Trellix manual.

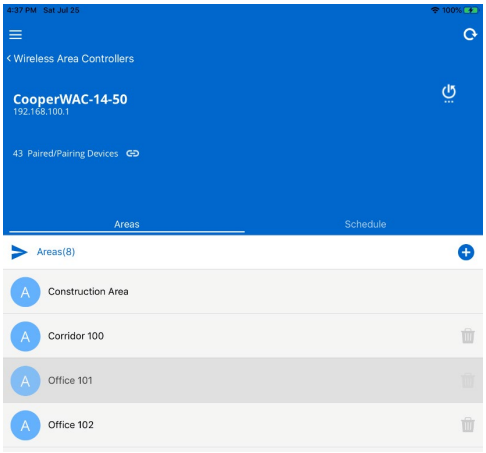
Demand response signals affect only dimmable loads. Demand response signals will have no effect on switched loads, receptacles, and tunable white zones/devices. By default, upon receipt of the demand response signal, all dimmable zones will reduce their light level by 20%. Commands from other controls will operate within the reduced range until the demand response signal is released. Once released, the lighting returns to the correct level for the active command. Use the WaveLinx Mobile Application to adjust demand response reduction levels and to exempt zones from responding. Use the Mobile Application's built-in test function to verify that demand response levels are appropriate.

Modifying Demand Response Behavior

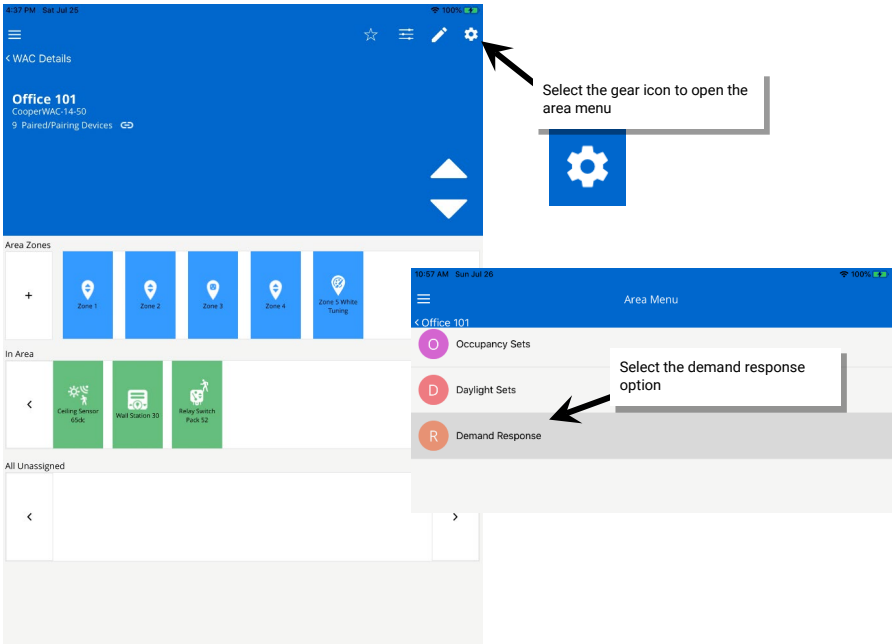
To modify or test demand response behavior:

Step 1: Open the WaveLinx Mobile Application and establish a connection with the Wireless Area Controller as the administrator user.

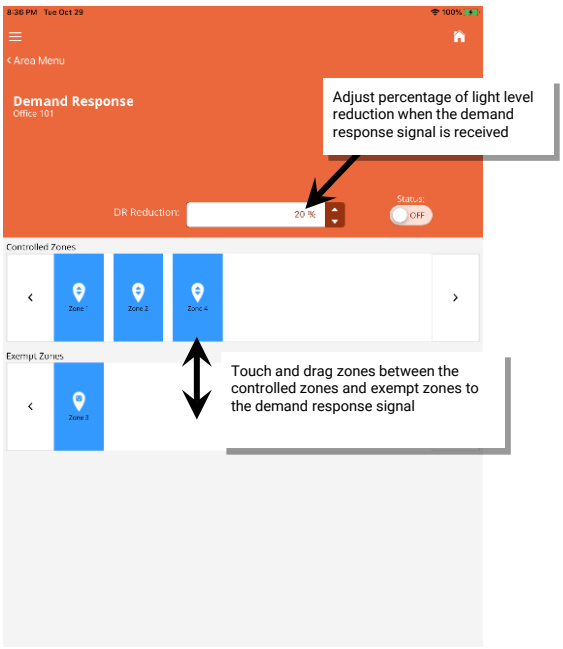
Step 2: In the areas list, select the first area to modify.



Step 3: Select the gear icon in the upper-right corner to open the area menu screen, and then in the area menu, select the demand response option.



Step 4: Use the DR reduction controls to enter the desired amount of reduction. Drag and drop zones between the controlled zones section and the exempt zones section to change the loads that respond (Only dimmable zones will respond to demand response signals. White tuning zones will not appear in this screen). Once complete, tap the back button or the home button to exit the configuration screen.



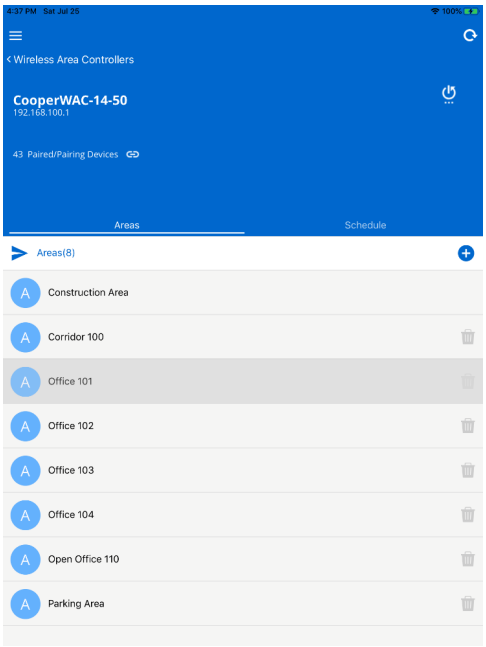
Testing Demand Response

The WaveLinx Mobile Application contains a built-in test feature for verifying that demand response levels are set correctly. When activated, all areas with zones assigned to respond to demand response will respond with the defined reductions.

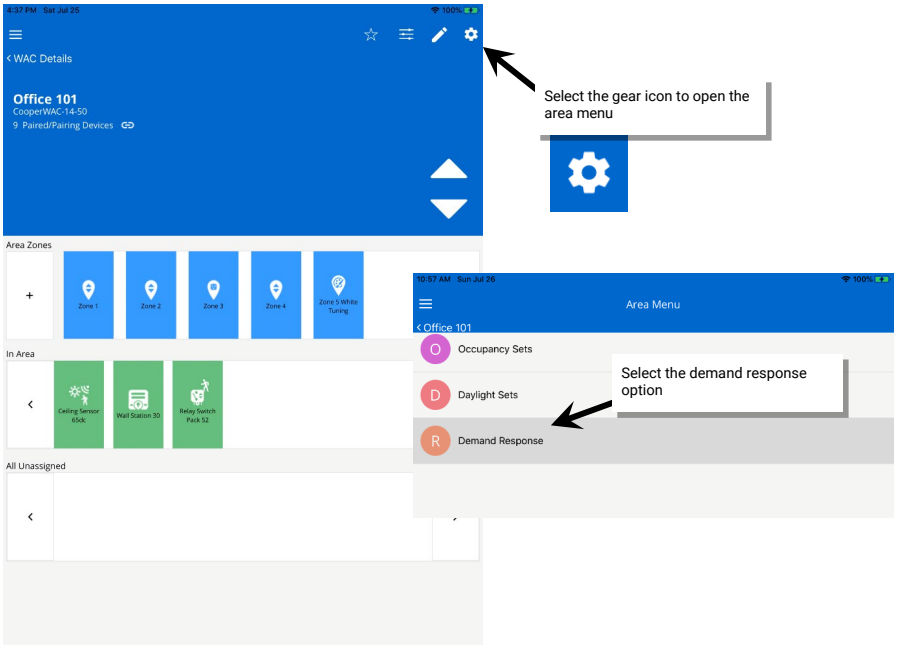
To test demand response:

Step 1: Open the WaveLinx Mobile Application and establish a connection with the Wireless Area Controller as the administrator user.

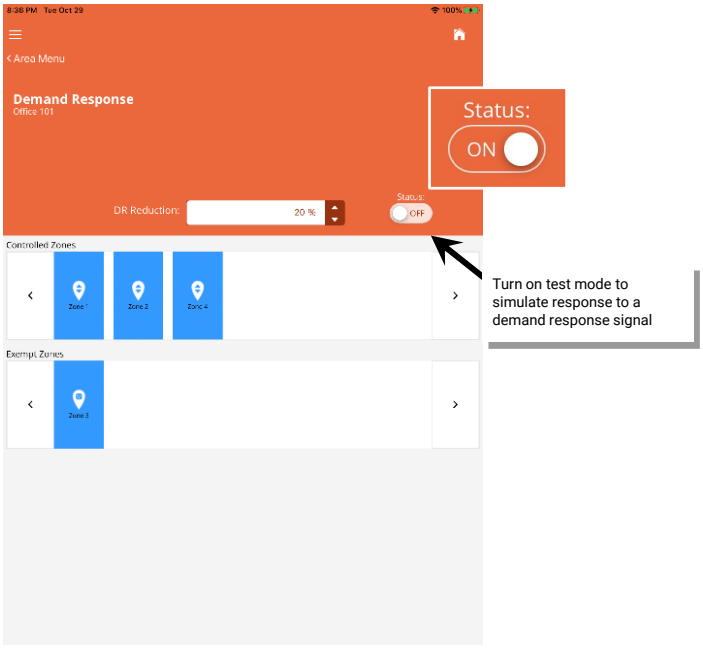
Step 2: In the areas list, select ANY area.



Step 3: Select the gear icon in the upper-right corner to open the area menu screen, and then in the area menu, select the demand response option.

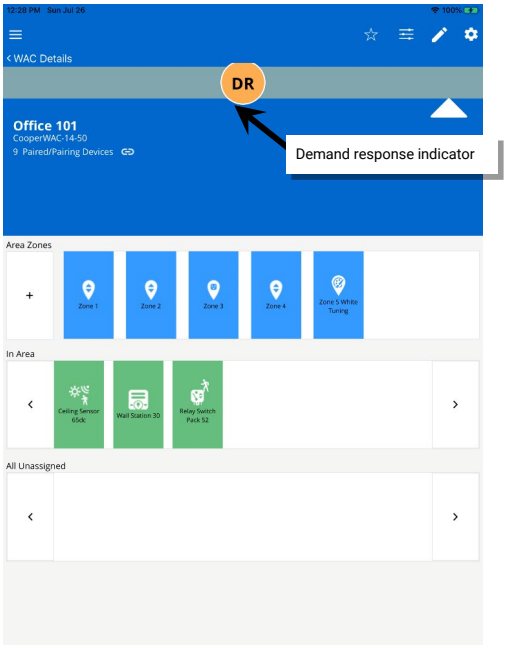


Step 4: Switch the ON/OFF status button to the ON position to place the system in demand response test mode. All areas defined in the Wireless Area Controller will respond with the defined demand response behavior. Once complete, tap the back button or the home button to exit the screen.



Test mode will automatically time out after 30 minutes or may be manually cancelled by switching the status button to the OFF position.

When demand response is active, all areas will show a demand response indicator at the top of the screen. This will show during test mode or during an active demand response signal.



Quick Links for Common Questions

- I am not using demand response. How do I disable it? See the answer on page 199.
- I want to use demand response. How do I make the connection to my demand response equipment? See the answer on page 200.

Practical Implementation of White Tuning Control

The WaveLinx system controls tunable white lighting by adjusting the correlated color temperature (CCT). Artificial light sources emit different tones of white light, ranging from warm to cool. In terms of lighting, CCT is measured in degrees Kelvin (K). Warmer, yellower tones of light will have a lower CCT while cooler, bluer tones of light will have a higher CCT. Tunable white lighting fixtures may vary in the supported color temperature range. Refer to the fixture's information for the expected supported range.

Allowing adjustment of color temperature along with the lighting intensity means that lighting can be fully customized to meet the specific needs of the intended task. Tunable white lighting can help maintain alertness and productivity in educational and office environments, assist with recovery and comfort in healthcare facilities, and provide flexibility in retail or other environments that require constant modification to showcase items in the best light.

The WaveLinx system controls tunable white lighting using the following devices:

- **WaveLinx wireless Dimming Switchpack**: The WaveLinx wireless Dimming Switchpack (WSP-MV-010: 120-277VAC model only) supports white tuning when connected to the white tuning control wires of a 0-10v fixture. One wireless Dimming Switchpack typically controls the color temperature for an entire room of fixtures if they are the same fixture type (the switching leads on the white tuning control Dimming Switchpack will not be used).
  - Some applications may have more than one Dimming Switchpack connected for white tuning control if fixtures have different supported color temperature ranges, or for ease of routing wiring.
  - The ON/OFF/dimming of white tunable fixtures may be done using wireless Dimming Switchpacks (WSP-MV-010 or WSP-CA-010). Generally, one Dimming Switchpack for CCT and one or more for control zones.

Note: When using wireless Dimming Switchpacks (WSP-MV-010 or WSP-CA-010), installation should be on a junction box and NOT installed on fixture wiring compartment.

Setting Up for Success

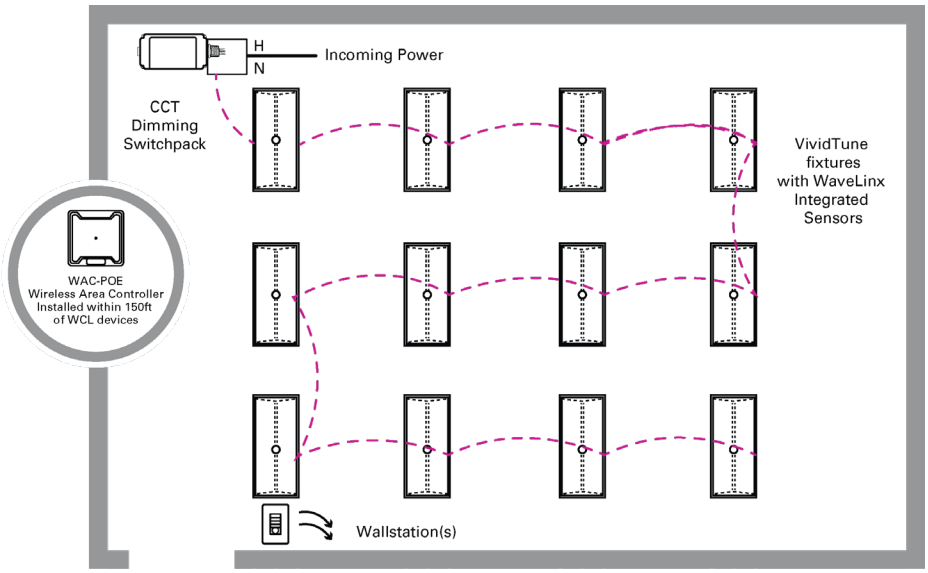
Before applying additional programming, make sure to follow the below steps to ensure a successful white tuning application:

- Step 1: Identify and then assign the ON/OFF/Dimming devices to the appropriate area and dimming zone.
- Step 2: Create a white tuning zone in the area, defining a color temperature range that is supported by all of the fixtures that will be assigned.
- Step 3: If Dimming Switchpacks are used to control the white tuning, identify the device(s) that control the white tuning in the area. Change the Dimming Switchpack(s) device type to white tuning. Enter the color temperature range of the that the attached fixture(s). Assign the white tuning Dimming Switchpack(s) to the white tuning zone.

For step-by-step instructions on performing the above procedures, review “Part 5: Organizing Devices into Controlled Areas and Zones” on page 36.

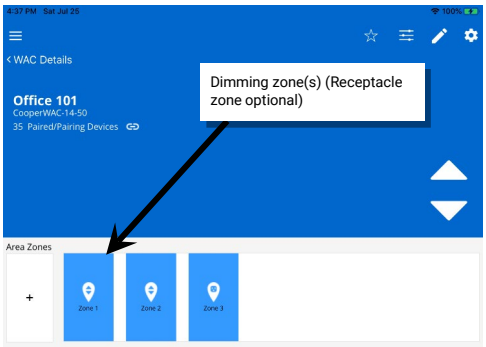
Using VividTune with WaveLinx

VividTune is a color tuning solution already built-In to many Cooper Lighting Solutions fixture models. VividTune fixtures support the use of WaveLinx Integrated Sensors to control lighting intensity and the use of a separate WaveLinx wireless Dimming Switchpack to control the color temperature of the space. In the below example, each fixture is equipped with a WaveLinx Integrated sensor. The color temperature (CCT) control wires from each VividTune fixture are connected to a WaveLinx wireless Dimming Switchpack.

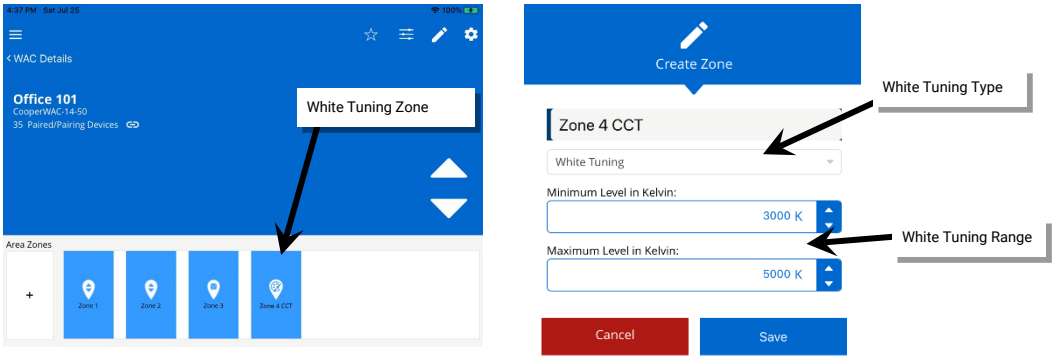


When using the VividTune solution, program the devices as you would other WaveLinx devices:

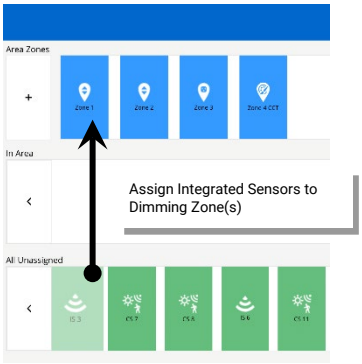
Step 1: Create the area and then create the dimming zone(s) needed for the application.



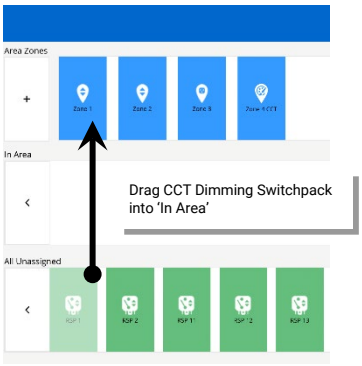
Step 2: Add an additional zone and configure it for the white tuning.



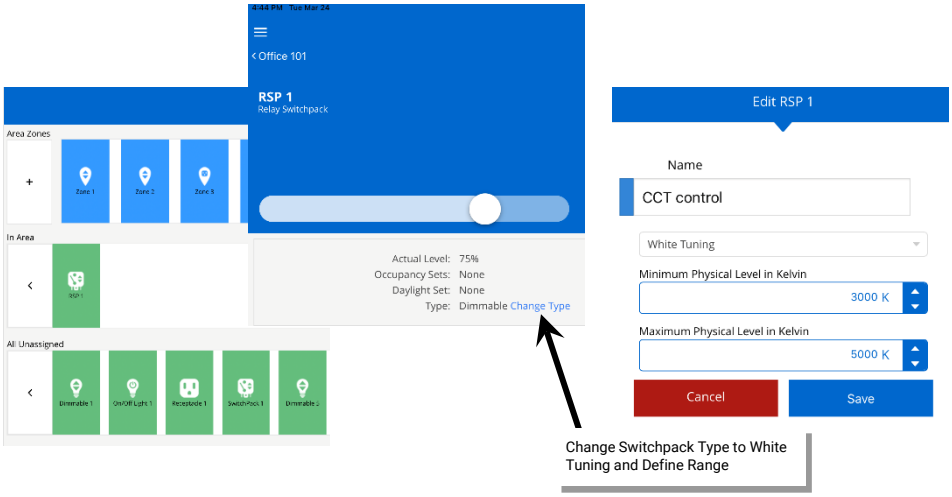
Step 3: Identify all fixture's Integrated Sensors in the room and assign the identified devices to the dimming zone(s).



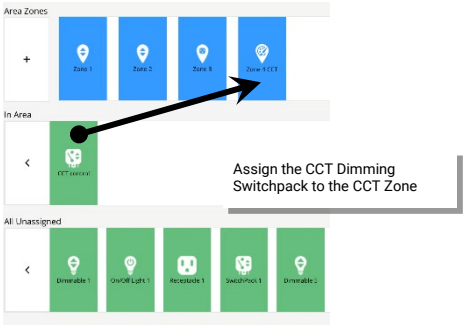
Step 4: Identify the WaveLinx wireless Dimming Switchpack that is connected to the color temperature control wires and drag the icon into the area.



Step 5: Change the switchpack device type to white tuning, defining the correct color temperature range for the fixture.



Step 6: Assign the white tuning Dimming Switchpack to the white tuning zone.



Step 7: Proceed with programming control devices to meet the application. Review the application examples in this section for further details.

Understanding WaveLinx White Tuning Zone Behavior

The WaveLinx system has specific characteristics for how white tuning zones natively operate and how programming should be applied:

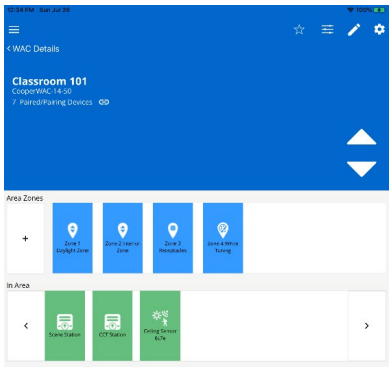
- A single area will typically have one white tuning zone. It is rare (although possible) to desire to have fixtures within the same space at different color temperatures at the same time.
- If there are different supported color temperature ranges amongst fixtures within the same space, the white tuning zone can be limited to a range that is supported amongst all of the devices. For instance, if one device supports a range of 2700K-6500K and another device supports a range of 3000K-5000K, first, set the individual devices to their actual ranges. Then, at the white tuning zone, set the zone to a range of 3000K to 5000K. By limiting the zone to a range that all of the devices support, the lighting will have a uniform color temperature response, despite the different device ranges.
- White tuning zones may be programmed to respond to scenes along with dimmable and non-dimmable lighting loads. Scenes may be used to control intensity and to change color temperature to meet a specific application.
- White tuning zones may be ignored from scenes to allow for separation of the intensity control and the color tuning control. This can aid in preventing unintentional color temperature shifts when lighting intensity is adjusted.
- WaveLinx allows commands to be issued to lighting zones through the use of zone level, zone raise, and zone lower commands. Zone commands can be issued to a specific zone, to 'ALL' zones in an area, or to 'AFFECTED' zones in the area. If a zone command is issued to 'ALL' or 'AFFECTED' zones, white tuning zones automatically ignore the command and will remain at the previous color temperature. A white tuning zone will respond to a zone command if it is specifically programmed to control only the white tuning zone. This helps ensure that color temperature changes occur only when intended.
- White tuning zones are automatically excluded from being controlled by daylighting and demand response strategies. They may optionally be programmed to respond to occupancy sensor commands.

The following sections highlight some practical applications on implementing white tuning control.

Application 1: Separate Manual Controls for Intensity and White Tuning

One approach to implementing lighting and white tuning control is to provide manual controls that separate the lighting intensity from the white tuning. Intensity and ON/OFF response might be controlled by standard occupancy and daylighting strategies in addition to traditional manual wallstation scene and raise/lower controls. White tuning is controlled from a different manual wallstation that allows the occupant to adjust to the color temperature to meet their needs. This is a common application in classrooms and conference rooms.

Here is a sample of how this might be programmed in the WaveLinx system:

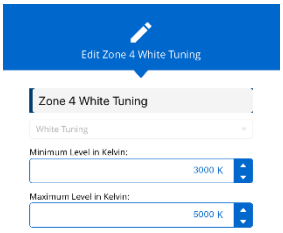
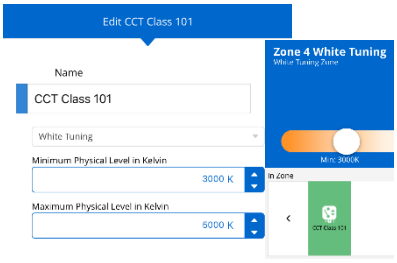
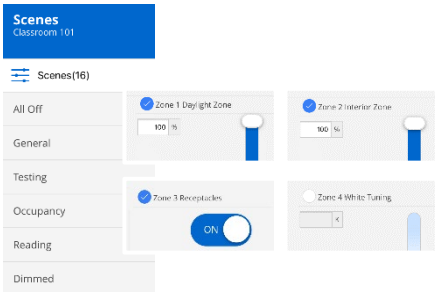


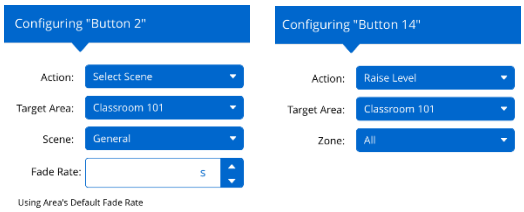
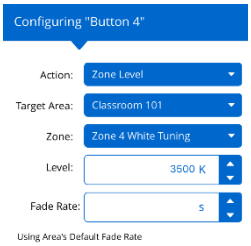
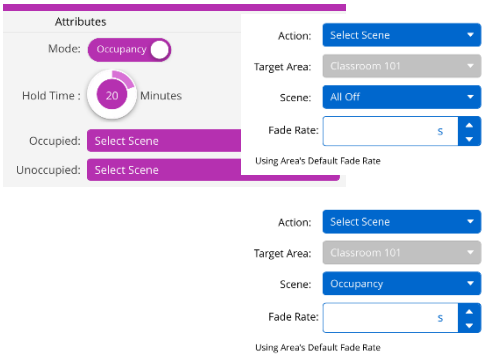
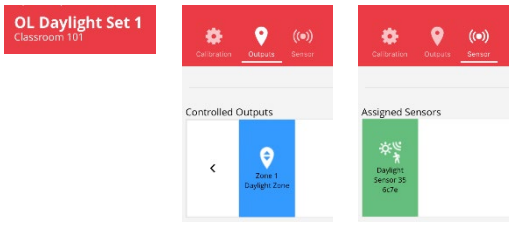
Zones:

- Zone 1: Dimmable: Daylight Zone
- Zone 2: Dimmable: Interior Zone
- Zone 3: Receptacle Zone (Optional)
- Zone 4: White Tuning Zone

Controls:

- Battery Powered Ceiling Sensor for occupancy and daylight control
- Wallstation 1: Scene and raise lower control for intensity
- Wallstation 2: Zone control for white tuning

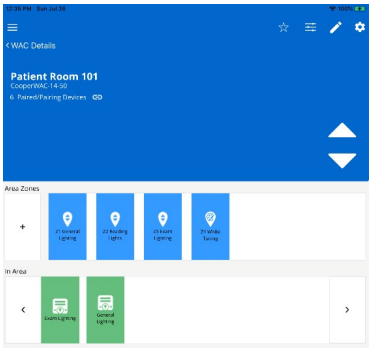
Items	Programming Assigned
Zones 1 -3	• Devices are assigned to these zones according to their location. 
Zone 4 White Tuning Zone	• Set for White Tuning • Set to support the white tuning range of the connected fixtures. For this example, the fixture range is 3000K – 5000K. 
White Tuning Devices	• Set for white tuning device type if using a Dimming Switchpack. • Set to support the white tuning range of the connected fixtures. For this example, the fixture range is 3000K – 5000K. • Assign the device(s) to white tuning zone 4. 
Scene Programming	• Scenes are programmed for each of the intensity levels issued by the scene wallstation and occupancy sensor. • For each scene, white tuning zone 4 is ignored (unchecked). **Note**: Optionally, the occupancy sensor may control the white tuning zone to reset to a specified color temperature when the space is initially occupied. The white tuning zone must be assigned to the occupancy set and a color temperature level defined for zone in the occupied scene. 

Items	Programming Assigned
Wallstation 1: Scene and Raise/Lower Control	• Set each button to issue the desired scene command • Set the raise/lower buttons to control “ALL’ or ‘AFFECTED’ zones of the area. White tuning zones will automatically ignore these commands. 
Wallstation 2: White Tuning Control	• Set each button to issue a zone level command to the white tuning zone and set the desired color temperature (in Kelvin). 
Occupancy Sensor	• The occupancy sensor set is set to issue scene commands for the occupied and unoccupied actions. Optionally, the sensor could be set for vacancy mode to issue only an unoccupied action. **Note**: Optionally, the occupancy sensor may control the white tuning zone. The white tuning zone must be assigned to the occupancy set and a color temperature level defined for zone in the occupied scene. 
Daylight Control	• The ceiling sensor is assigned to an open loop daylight set. The daylight zone is assigned for daylight control and calibrated for the location. **Note**: If using WaveLinx Integrated Sensors, each sensor will report to its own closed loop daylight set. Refer to “Calibrating and Modifying Light Levels for Interior Closed Loop Daylight Sensors” on page 105 for detailed instructions. 

Application 2: White Tuning Controlled by Automatic Timed Events

Another strategy for implementing lighting and white tuning control is to automate color temperature progression while allowing manual control of the lighting intensity. In this application, occupancy sensors, daylight sensors and manual controls could be used to adjust the intensity levels. White tuning is controlled automatically by daily scheduled events that automatically adjust the color temperature. Healthcare facilities may use this approach to promote healing by mimicking daylight color temperature progression while office locations may use the approach to enhance productivity during peak hours.

Here is a sample of how this might be programmed in the WaveLinx system:

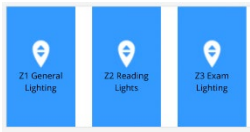
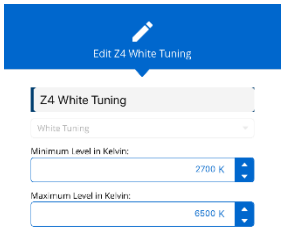
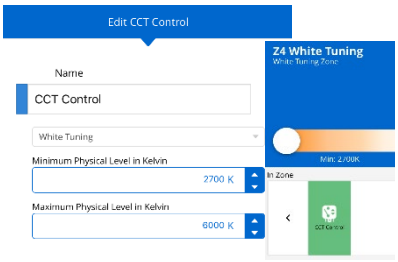


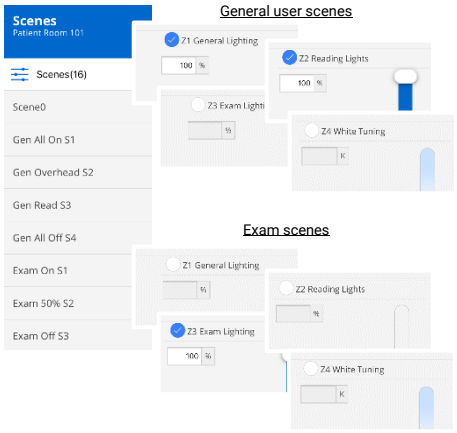
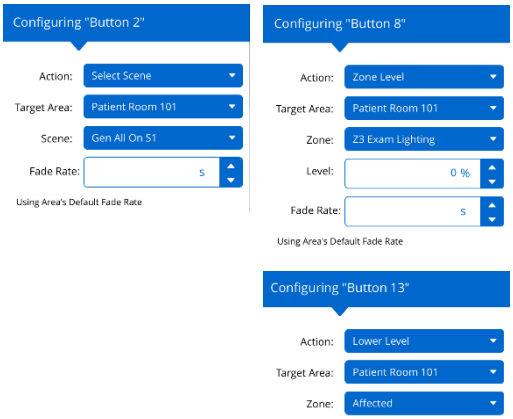
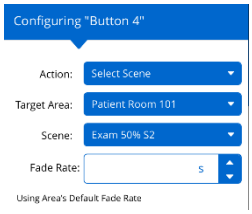
Zones:

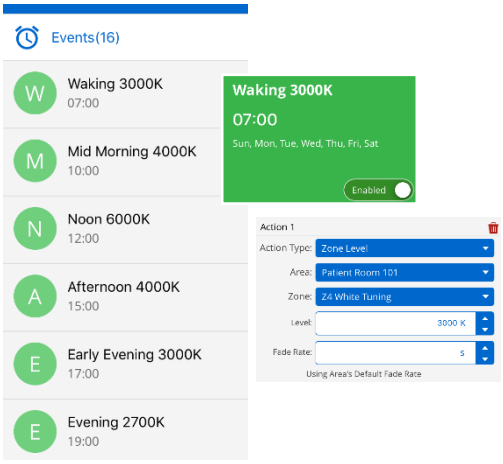
- Zone 1: General Lighting Zone
- Zone 2: Reading Lights
- Zone 3: Exam Lighting
- Zone 4: White Tuning Zone

Controls:

- Wallstation 1: General user control: scene and raise lower control of general and reading lights
- Wallstation 2: Exam lighting control. (Could optionally control general and reading lighting as well as exam lighting)
- Schedule Events: Color temperature control

Items	Programming Assigned
Zones 1 -3	• Devices are assigned to these zones according to their location. 
Zone 4 White Tuning Zone	• Set for White Tuning • Set to support the white tuning range of the connected fixtures. For this example, the fixture range is 2700K- 6500K. 
White Tuning Devices	• Set for White Tuning • Set to support the white tuning range of the connected fixtures. For this example, the fixture range is 2700K – 6500K. • Assign the device(s) to white tuning zone 4. 

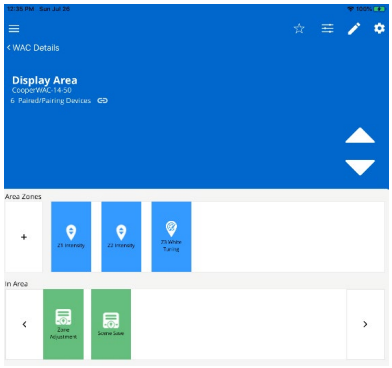
Items	Programming Assigned
Scene Programming	• Scenes are programmed for each of the intensity levels issued by the general user wallstation and the exam lighting wallstation. • For the general user wallstation scenes, ignore zone 3 exam lighting. • For the exam lighting wallstation scenes, ignore the General or Reading zones. • For all scenes, ignore white tuning zone 4. 
Wallstation 1: General User Control	• The wallstation is set to issue the general user scene commands. • One button could be used to issue a zone level 0% command to the exam lighting, allowing the general user to turn OFF the exam lights if they have been left on. • The raise/lower controls are set to control ‘‘AFFECTED’ zones of the area to allow raise and lower of the general and reading lighting. Exam lights have been ignored from the general user scenes and will ignore the raise/ lower controls when these scenes are active. White tuning zones will automatically ignore these commands 
Wallstation 2: Exam Lighting Control Station	• •Set each button to issue the scenes programmed for the exam lighting. 

Time Schedule Events	• Time schedule events are programmed every few hours to issue zone level commands to the white tuning zone.
	• For example, events may progressively shift the color temperature:
	  • 7:00am: Zone Level 3000K
	  • 10:00am: Zone Level 4000K
	  • 12:00pm: Zone Level 6000K
	  • 3:00pm: Zone Level 4000K
	  • 5:00pm: Zone Level 3000K
	  • 7:00pm: Zone Level 2700K
		

Application 3: White Tuning and Intensity Scenes with Flexible Adjustment

To meet the needs of a changing environment, the WaveLinx system allows for quick adjustments to intensity and white tuning levels in strategies where both the intensity and the color temperature are controlled as part of the same scenes. Quickly change the levels of each zone and save them to scenes using either the WaveLinx Mobile Application, or with wallstations zone raise and lower commands and save scene commands. This type of control is ideal in environments such as a retail space where lighting needs to be changed frequently to showcase products in the best possible light.

Here is an example of how this might be programmed in the WaveLinx system:



Zones:

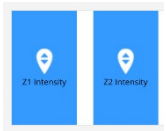
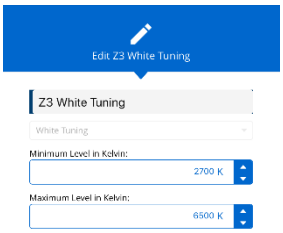
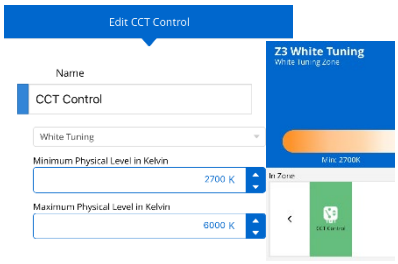
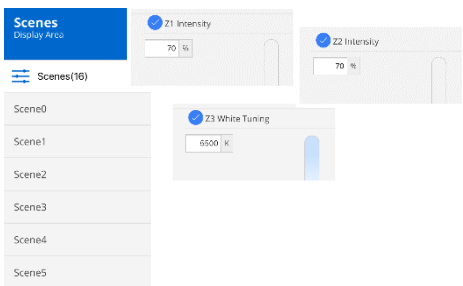
- Zone 1: Intensity Control
- Zone 2: Intensity Control
- Zone 3: White Tuning Zone

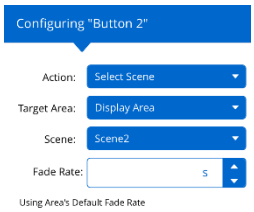
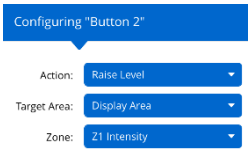
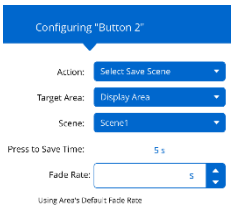
Controls:

There may be any number of controls throughout the space to issue commands to the lighting via scene-based control methods

Adjustment Controls (if not using the WaveLinx Mobile Application)

- Wallstation 1: Zone Adjustment Control
- Wallstation 2: Save Scene Control

Items	Programming Assigned
Zones 1 -2	• Devices are assigned to these zones according to their location. 
Zone 3 White Tuning Zone	• Set for White Tuning • Set to support the white tuning range of the connected fixtures. For this example, the fixture range is 2700K- 6500K. 
White Tuning Devices	• Set for White Tuning • Set to support the white tuning range of the connected fixtures. For this example, the fixture range is 2700K – 6500K. • Assign the device(s) to white tuning zone 3. 
Scene Programming	• Scenes are programmed for each of the desired intensity/color temperature levels to be issued by control devices. • For each scene, Zone 3 White Tuning is included and programmed for the desired color temperature 

Items	Programming Assigned
Control Devices	• Any devices or events that issue commands are programmed to issue the appropriate scene. 
Wallstation 1: Zone Adjustment Control	• Two buttons will be used for every zone. In this example, there are three zones. This requires the use of a 6-button station. • Each pair of buttons is programmed to issue a raise or lower to one of the three zones. 
Wallstation 2: Scene Adjustment Control	• Each scene that requires modification will need one button on the wallstation. In this application, five scenes are being used so a 5-button station would be used. • Program each button to issue the action type 'select save scene', to one of the scenes being used. 
How to use the adjustment wallstations	• First, quickly press and release (less than 5 seconds) the 'select save scene' button for the scene being adjusted. This will issue the scene command. • Next, use the individual zone raise and lower buttons to adjust each zone to the desired lighting intensity and color temperature. Making sure to use the button that is associated with the scene being reprogrammed, press, and hold the 'select save scene' button for at least 5 seconds. This will save the new levels to the scene.

Configuring the WaveLinx Touchscreen

The WaveLinx Touchscreen connects to the WaveLinx Wireless Area Controller (WAC) through the building LAN. Both devices (touchscreen and WAC) must reside within the same network. The touchscreen requires an IP address (either through DHCP or static assignment) and the use of a “tenant” or personal user account.

Once the touchscreen is logged in, the touchscreen will be able to access the areas, scenes/presets and zones that have been programmed in the connected Wireless Area Controller. It is possible to limit the touchscreen to display only specified areas, to load the screen automatically to a favorite area, and to show only certain presets/scenes. It is also possible to adjust the display brightness and auto-dim timing, as well as the default language (Spanish, English, and French). Administrative changes may be made to the touchscreen passcode or the touchscreen can be reset to factory defaults.

Further details regarding the WaveLinx Touchscreen and Cybersecurity may be found in the supplemental appendix article “WaveLinx Touchscreen Cybersecurity Recommendation” on page 202.

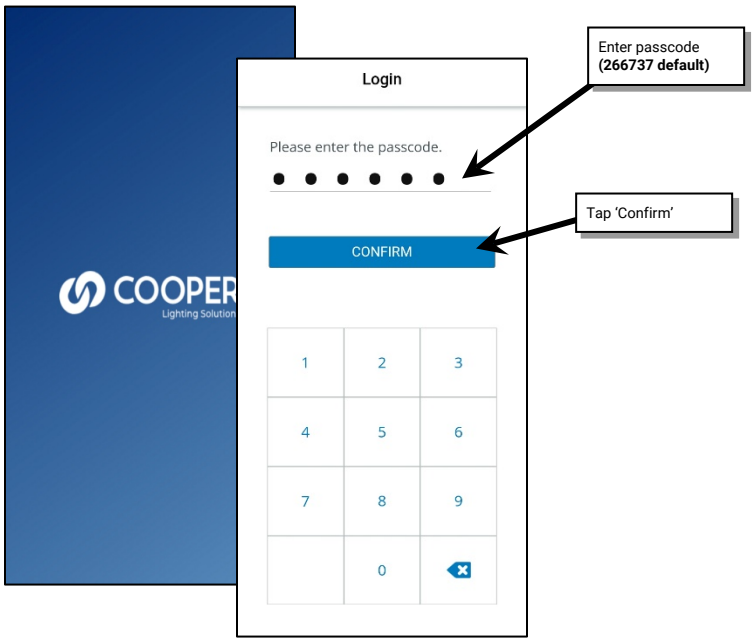
Getting Started: Configuring the Touchscreen for Initial Use

This section walks through the steps necessary to make the initial connection of the touchscreen to the WaveLinx Wireless Area Controller. This section assumes that the touchscreen is still in its default configuration.

1: Before connecting the touchscreen to the network, set up the required “tenant” user account that the touchscreen will use. If there are multiple touchscreens at the facility, each touchscreen will require a unique user account. For step-by-step instructions on creating a new user account, refer to ”Adding a New User Account” on page 164.

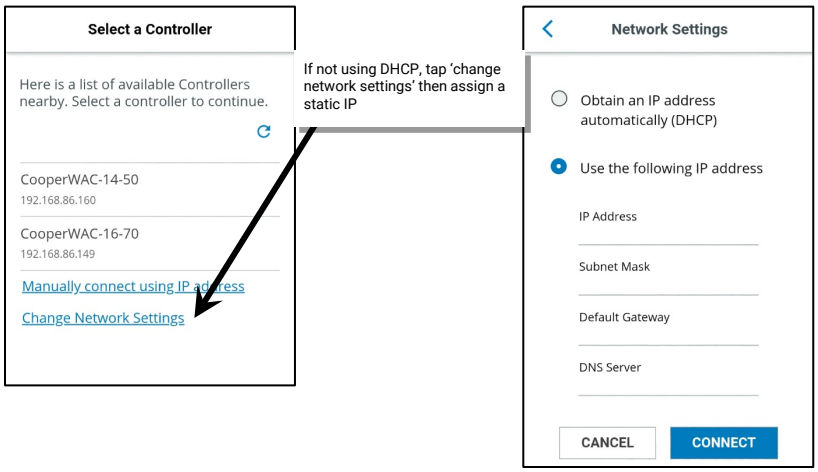
2: Connect the touchscreen to the building LAN. The touchscreen requires a PoE connection for power and communications. The touchscreen must be installed in the same network as the WaveLinx Wireless Area Controller.

3: Once power is applied, the touchscreen will display a blue screen. Once it is ready for input, it will request the administrator login passcode. Enter the default passcode 266737 ‡ and then tap the ‘confirm’ button.

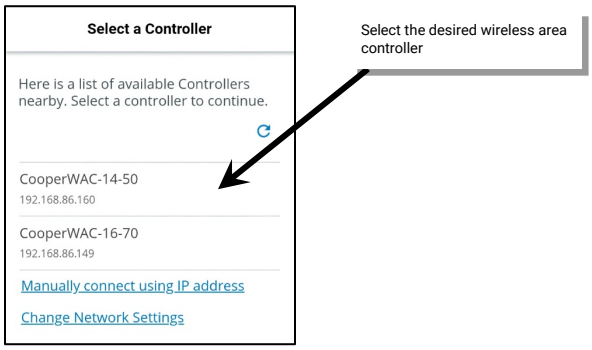


‡ **Note**: For security, it is recommended that default passcode be changed once the initial touchscreen configuration is complete. Refer to “Modifying Existing User Accounts and Passwords” on page 165 for step-by-step instructions. In previous versions of touchscreens, the default passcode was 328661.

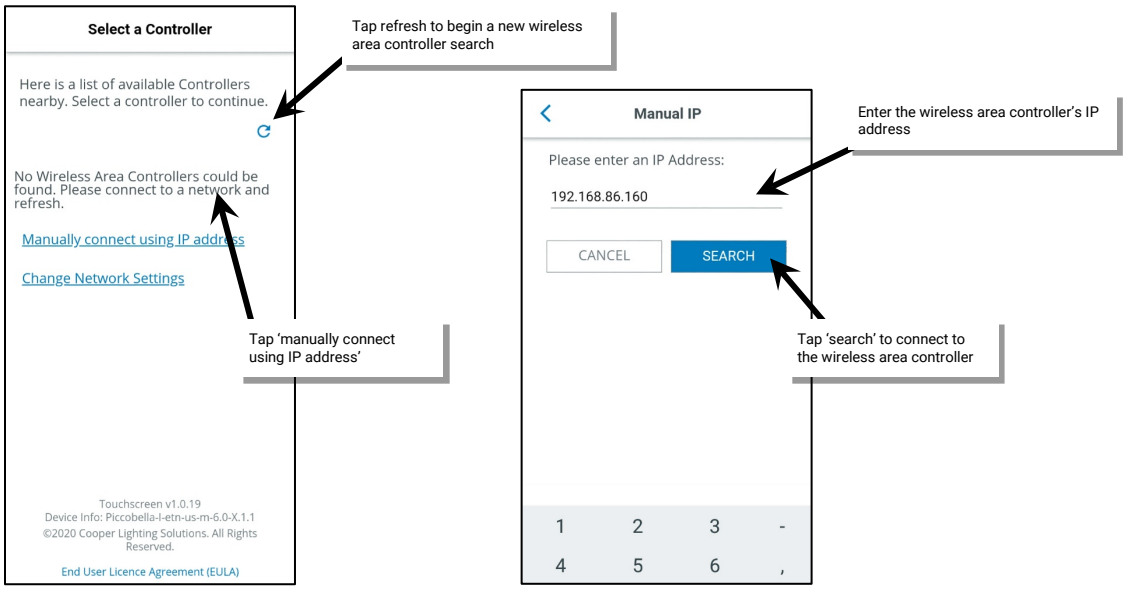
4: The touchscreen defaults to using DHCP to obtain its IP address. If the site is using DHCP, no further IP configuration is necessary. For sites that require a statically assigned IP, select the 'Change Network Settings' option, and then select the option to 'use the following IP address'. Type in the requested information.



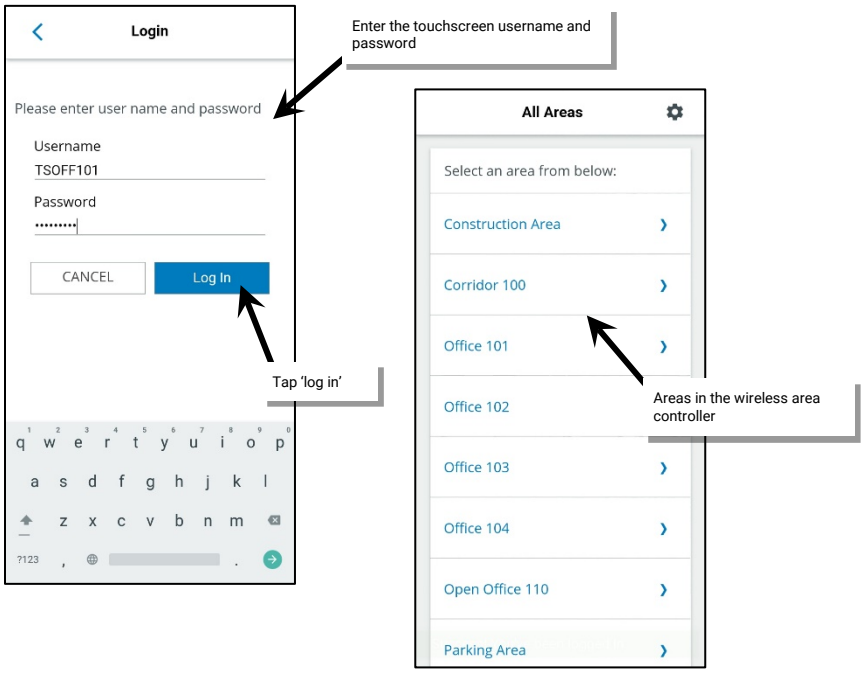
5: Once it has an IP address, the touchscreen will search for and then display any WaveLinx Wireless Area Controllers that it has found on the network. If the site has more than one WaveLinx Wireless Area Controller, multiple controllers may be listed. Select the controller that is programmed for the area(s) that the touchscreen should operate.



If no Wireless Area Controllers are found, touch the refresh button to begin the search again. If the touchscreen still does not find the Wireless Area Controller, select the option to 'manually connect using an IP address', and then type in the controller's IP address. Tap the 'search' button to connect to the controller.



6: In the displayed ‘Login’ screen, enter the username and password created for the touchscreen, and then select the ‘Login’ button. Once connected, the touchscreen will display the areas that have been programmed in the Wireless Area Controller.



WARNING: Do not log in using an “admin” role password. Only one administrator user may be logged into the system at a time.

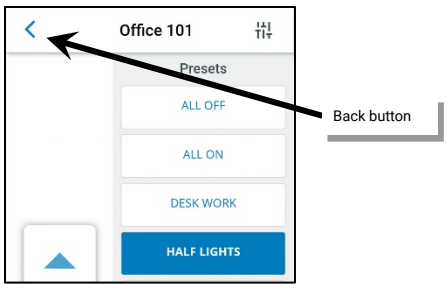
The touchscreen can now be used to control lighting in the defined areas. For information on using the touchscreen, refer to “Using the Touchscreen Controls” on page 147.

Configuring the Area(s) that the Touchscreen Displays

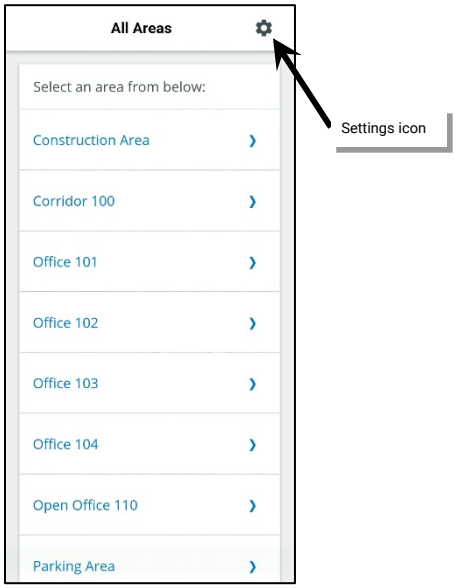
By default, once the connection between the Touchscreen and the WaveLinx Wireless Area Controller is made, the touchscreen will display all areas that are programmed into the connected Wireless Area Controller. It is possible to limit the touchscreen to display a specific area, multiple selected areas, and default to opening a favorite area.

This section assumes that the connection has been successfully made between the Wireless Area Controller and the touchscreen. It also assumes that the touchscreen is still using the default passcode.

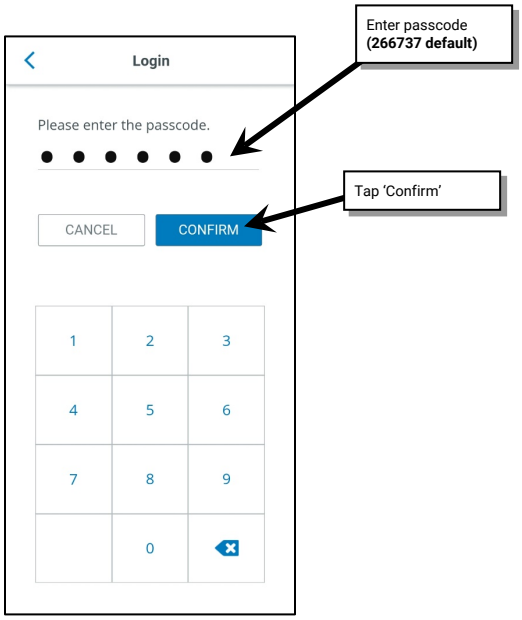
If the touchscreen is displaying an area’s preset page, touch the back button until the ‘all areas’ screen is displayed.



1: From the ‘all areas’ screen, select the settings gear icon

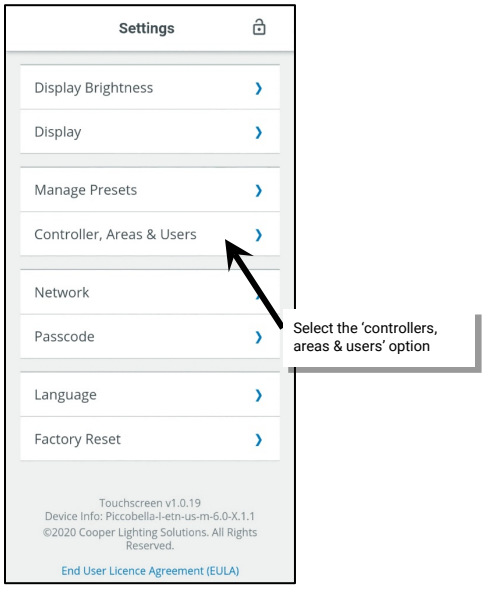


2: Enter the touchscreen passcode, then tap confirm. (The default passcode is 266737 ‡).

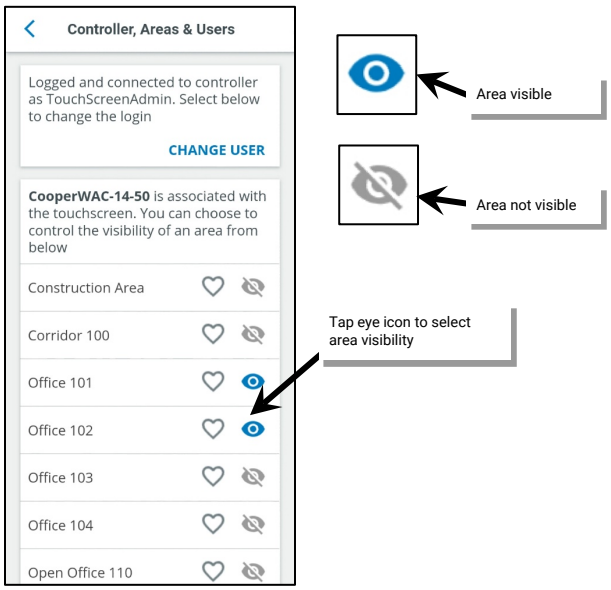


‡**Note**: In previous touchscreen versions the default passcode was 328661.

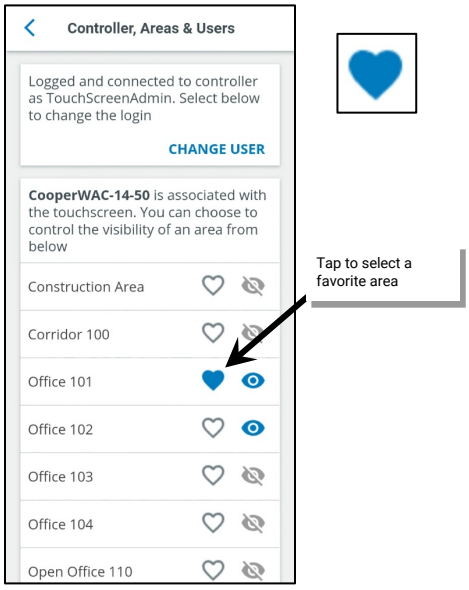
3: In the ‘settings’ screen, tap the ‘controllers, areas & users’ option.



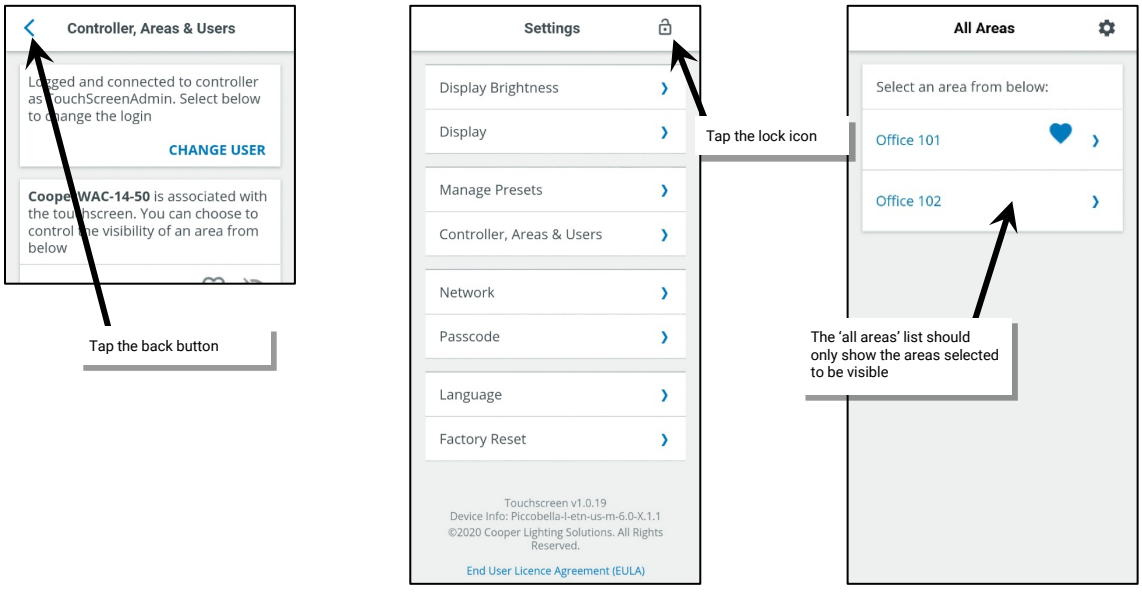
4: Turn on or off the visibility of the areas displayed by tapping on the eye icon next to each area. The area will be visible if the icon is dark blue. Hide the area by tapping on the icon. The icon will turn gray. Touch and drag the display up or down to access areas beyond the current screen view.



5: Select a favorite area by selecting the heart icon next to the desired area. After a power up or restart, the touchscreen will automatically reboot to display the controls of the favorite area.



6: Tap the back button to exit and save the changes, and then tap the lock icon to exit the settings screen. The touchscreen should now show only the visible areas in the 'all areas' display.



The touchscreen can now be used to control lighting in the defined areas. For information on the screen controls, refer to "Using the Touchscreen Controls" on page 147.

Quick Links for Common Questions

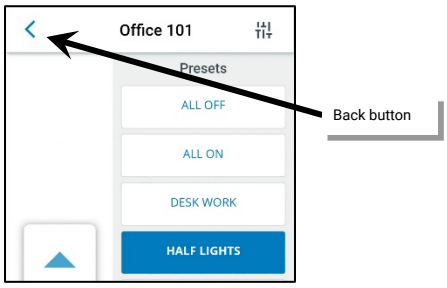
- How do I change the area name(s) that is displayed? The area names are stored in the Wireless Area Controller. For information on changing an area name, see "Modifying Names of Areas, Zones and Devices" on page 60.

Selecting the Presets/Scenes that the Touchscreen Displays

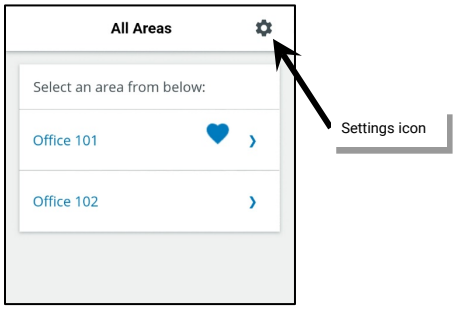
The touchscreen defaults to displaying all presets/scenes except for scenes that have been hidden through the WaveLinx Mobile Application. It is possible to limit the touchscreen further to display only specific presets/scenes.

This section assumes that the connection has been successfully made between the Wireless Area Controller and the touchscreen. It also assumes that the touchscreen is still using the default passcode.

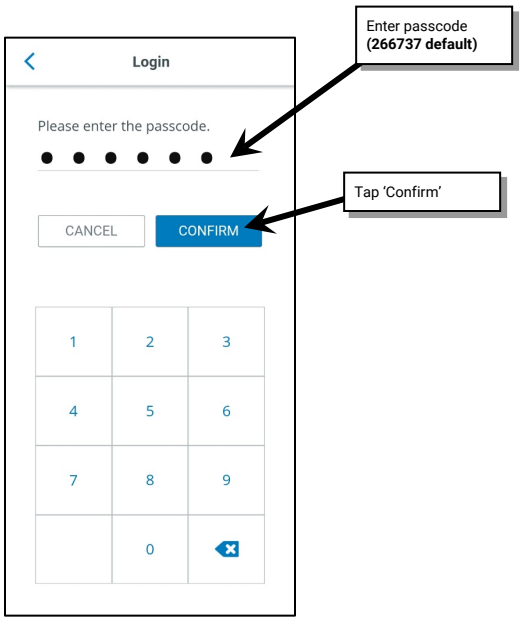
If the touchscreen is displaying an area's preset page, touch the back button until the 'all areas' screen is displayed.



1: From the 'all areas' screen, select the settings gear icon.

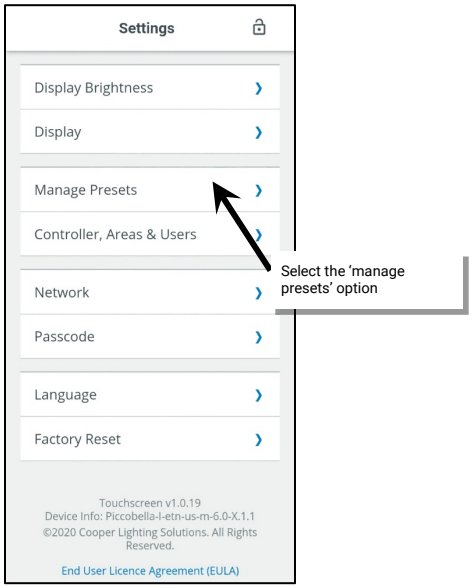


2: Enter the touchscreen passcode, then tap confirm. (The default passcode is 266737 ‡).

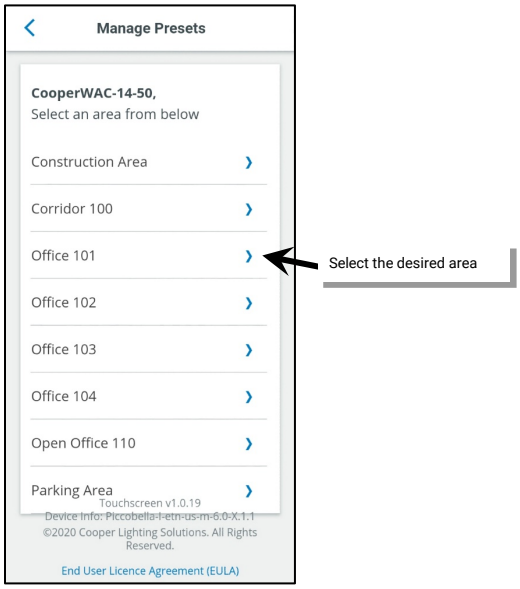


‡ **Note**: In previous touchscreen versions the default passcode was 328661.

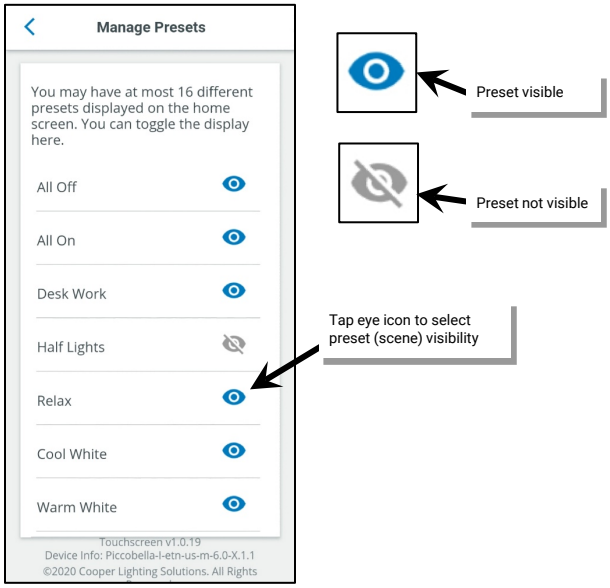
3: In the ‘settings’ screen, tap the ‘manage presets’ option.



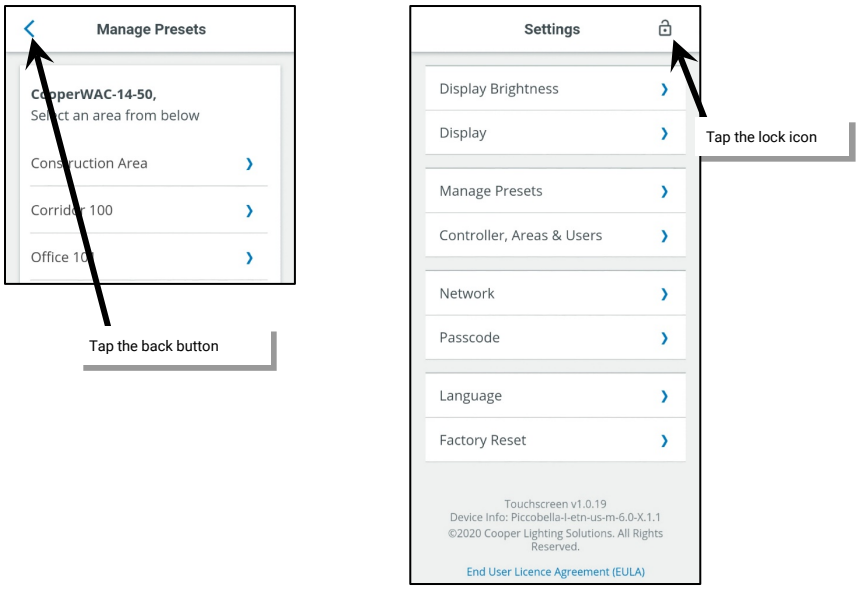
4: Select the desired area.



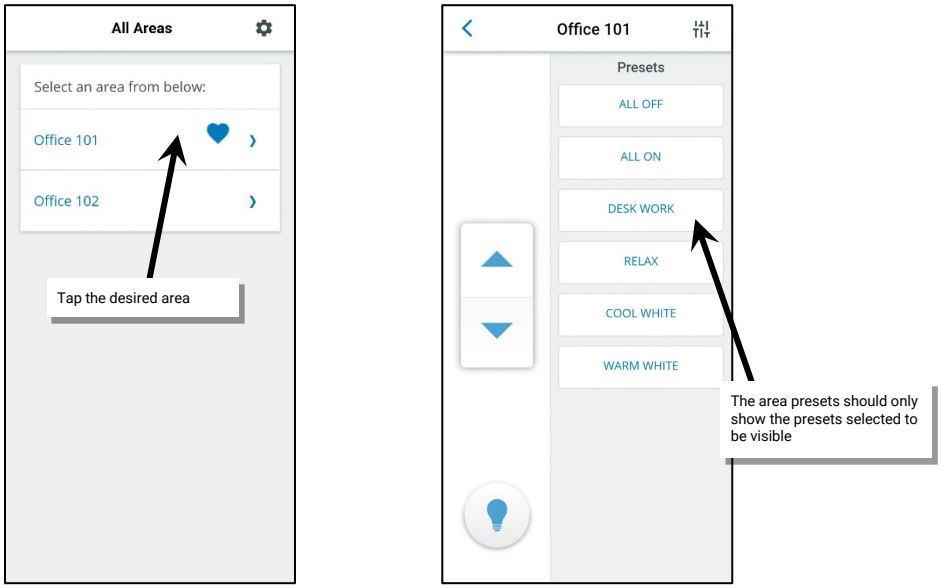
5. Turn on or off the visibility of the presets/scenes by tapping on the eye icon next to the presets. The preset/scene will be visible if the icon is dark blue. Hide a preset/scene by tapping on the icon until it changes to gray. Set visible scenes to the dark blue eye icon. Define a preset as hidden by tapping on the eye icon. The icon will turn gray. Touch and drag the display up or down to access presets/scenes beyond the current screen view.



6: Tap the back button to exit and save the changes, and then tap the lock icon to exit the settings screen.



7: Tap the area from the ‘all areas’ list and view the controls. Only the presets that have been defined as visible will show.



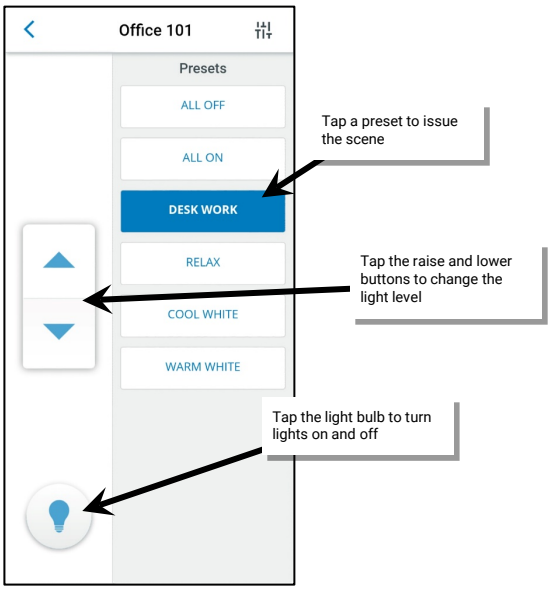
The touchscreen can now be used to control lighting in the defined areas. For information on the screen controls, refer to “Using the Touchscreen Controls” on page 147.

Quick Links for Common Questions

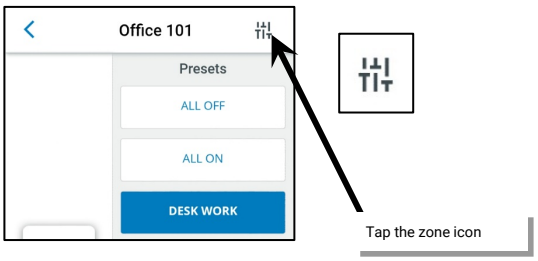
- How do I change the preset name(s) that is displayed? The preset or scene name is defined and stored in the Wireless Area Controller. For information on changing a scene name, see “Modifying Scene Attributes and Response” on page 61.
- Not all of my scenes are appearing on my touchscreen display. I have checked the visibility through the touchscreen and the scenes simply do not show. What could cause this? The scene may be defined as a hidden scene through the programming stored in the Wireless Area Controller. For information on how to hide or unhide scenes, see “Modifying Scene Attributes and Response” on page 61.

Using the Touchscreen Controls

Once the touchscreen is configured for the desired area and presets, use the onboard controls to adjust the lighting to the desired level.



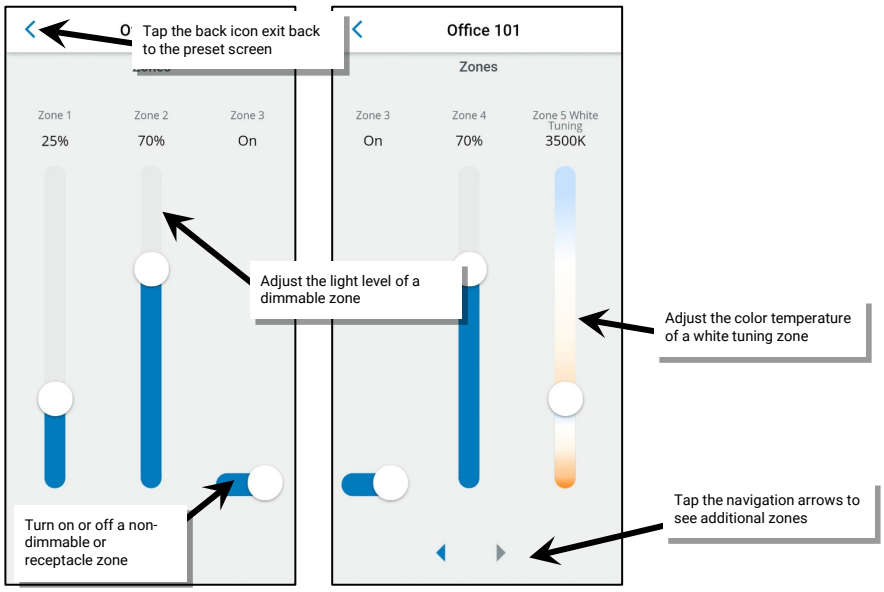
- In the main area control screen, tap one of the presets select a scene.
- Tap the raise or lower button on the sidebar to increment or decrement the light level by 1% increments or press and hold the raise or lower button to change the light level at a more rapid rate.
- Quickly turn ON or turn OFF lighting in the area by tapping the light bulb icon in the sidebar. This will toggle between the ALL OFF scene (scene 0), and scene 1.



It is also possible to adjust individual zone light levels or white tuning color temperature. To access the zone adjustments, tap the zone level icon at the top of the area presets screen.

The zone adjustment screen will allow control of any zone that is part of the area.

- Use the slider control for a dimmable zone to adjust the light level.
- Use the ON/OFF control for non-dimmable and receptacle zones to turn the load ON or OFF.
- Use the slider control for white tunable zones to adjust the color temperature.
- Use the provided navigation arrows at the bottom of the screen to navigate to additional zones.
- Use the back button to return to the area presets display.

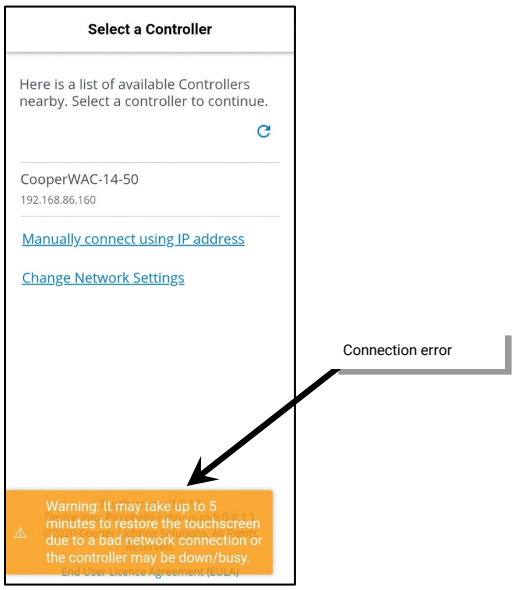


Important Connection Error Resolution and Power Up Details

Under normal conditions, the touchscreen will maintain the connection to the Wireless Area Controller it has been connected to. If the connection to the Wireless Area Controller is lost or the touchscreen goes through a power cycle, the touchscreen should exhibit the following behavior:

Lost Connection to the Wireless Area Controller

Communications from the touchscreen to the Wireless Area Controller can be interrupted if the Wireless Area Controller is powered down or in a reboot process, or if there are issues with the network. In these circumstances, the touchscreen may display the following message and be redirected to the Wireless Area Controller selection screen.



The touchscreen will continue to try to connect to the Wireless Area Controller. If it is a temporary issue caused by the Wireless Area Controller being powered down or rebooting, the touchscreen will automatically reconnect and login once the Wireless Area Controller has completed the reboot process. If the problem is due to a network issue, it may be necessary to troubleshoot the network or review the defined IP addresses to verify that there is no conflict before the problem is resolved.

Touchscreen Power Up Behavior

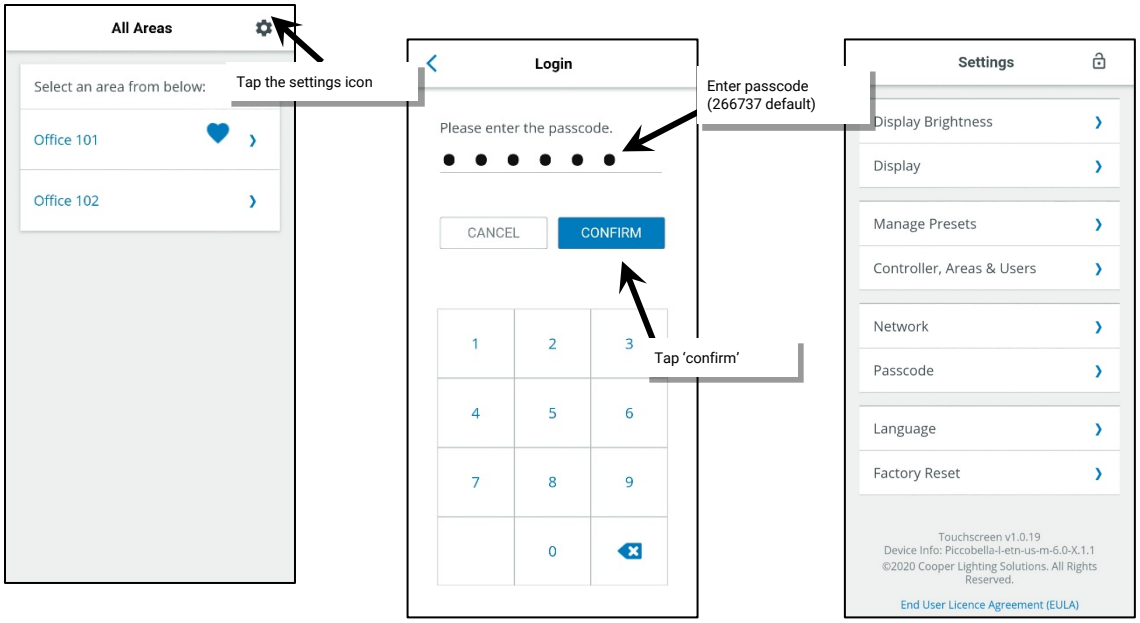
If a touchscreen has been powered down, once power is restored, the touchscreen boot and attempt to reconnect to the previously connected Wireless Area Controller. Once the connection is made, the touchscreen will login with the previously defined user credentials and then will display either the areas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

Performing Other Touchscreen Administrator Functions

The touchscreen also allows for administration of other general settings. This includes:

- Changing the logged in touchscreen user or connected Wireless Area Controller
- Adjusting the display brightness and auto-dim timing settings
- Viewing the touchscreen's IP address
- Changing the administrator passcode
- Changing the display language
- Viewing the End User License Agreement (EULA)
- Performing a factory reset

All of these options are found in the touchscreen 'settings' screen. Navigate to the 'settings' screen by tapping the settings gear icon in the 'all areas screen and then entering the touchscreen passcode. (The default passcode is 266737 ‡).

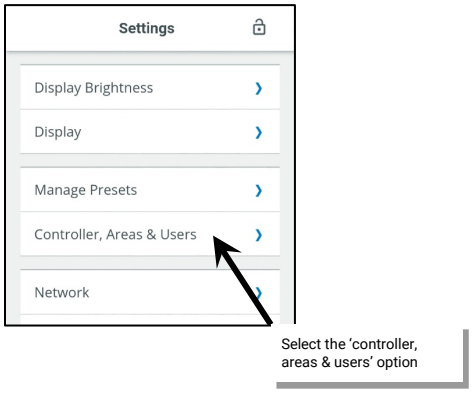


‡ **Note**: In previous touchscreen versions the default passcode was 328661.

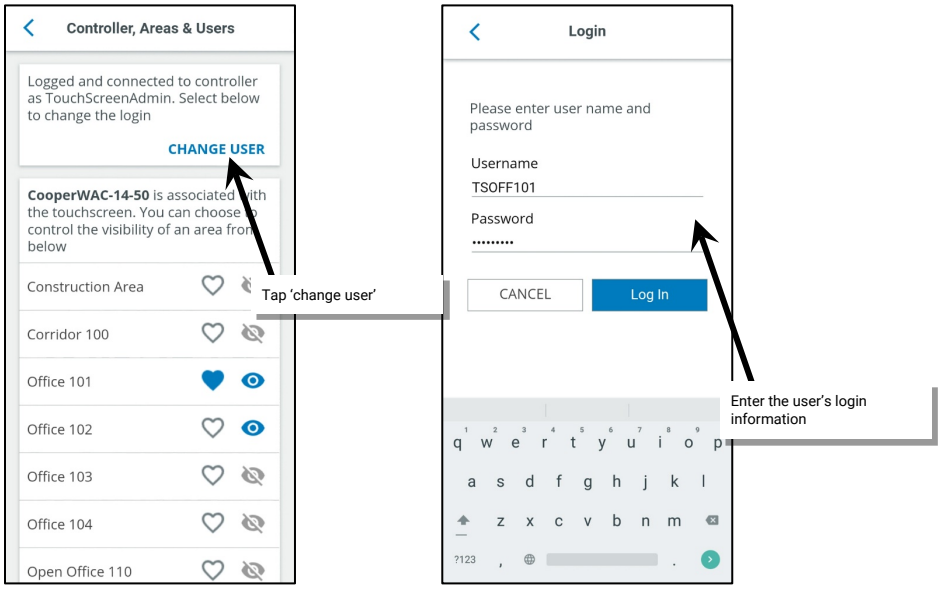
Changing the Touchscreen User or Wireless Area Controller

In the event that the incorrect user account has been used to login to the touchscreen, it is possible to change users. It is also possible to select a different Wireless Area Controller if the incorrect controller has been accessed. To change the user or Wireless Area Controller:

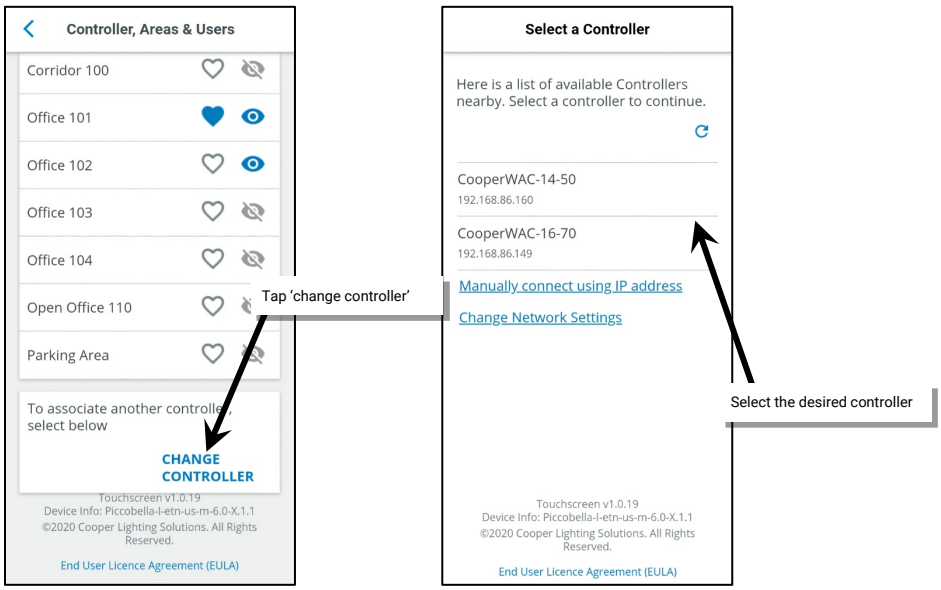
1: From the 'settings' screen, select the 'controllers, areas & users' option.



2: To login as a different user account, at the top of the screen, select the option to ‘change user’ and then login with the desired user’s credentials.



3: To connect to a different Wireless Area Controller, scroll to the bottom of the display and select the option to ‘change controller’. Select the correct Wireless Area Controller from the list.

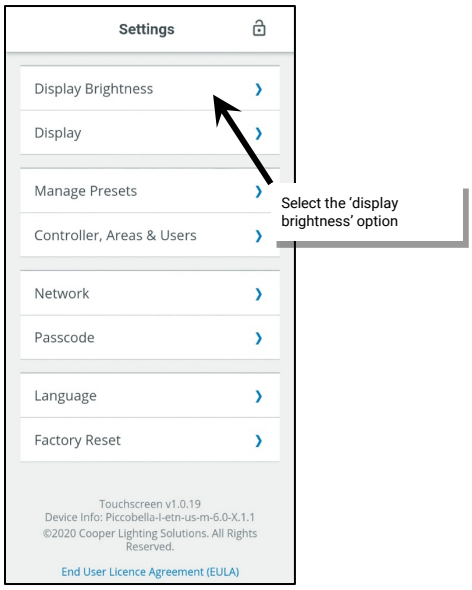


Adjusting the Preferred Display Brightness and Auto-dim Timing

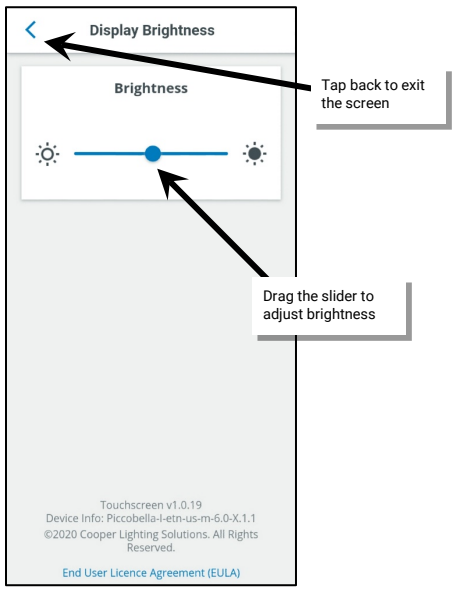
The touchscreen allows selection of a preferred brightness level for when the screen is in use. If no activity occurs during an initial user defined time-out period, the touchscreen will automatically dim to 50% of the preferred brightness level. If there is no activity for 10 minutes, the touchscreen will automatically dim to 20% of the preferred brightness level. At any time, if the touchscreen registers a touch, the touchscreen will immediately return to the preferred brightness level.

To adjust the preferred brightness level and the initial auto-dim time-out period:

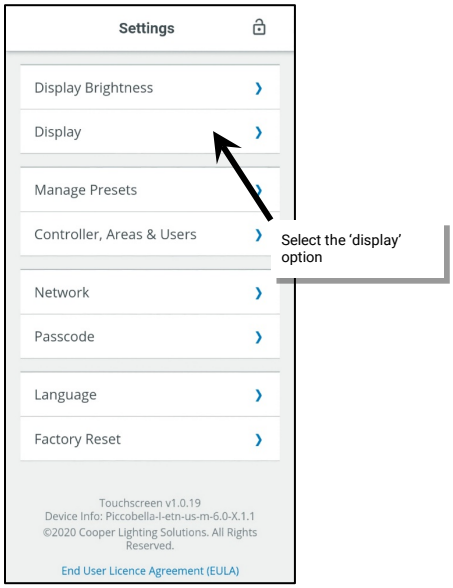
1: From the ‘settings’ screen, select the ‘display brightness’ option.



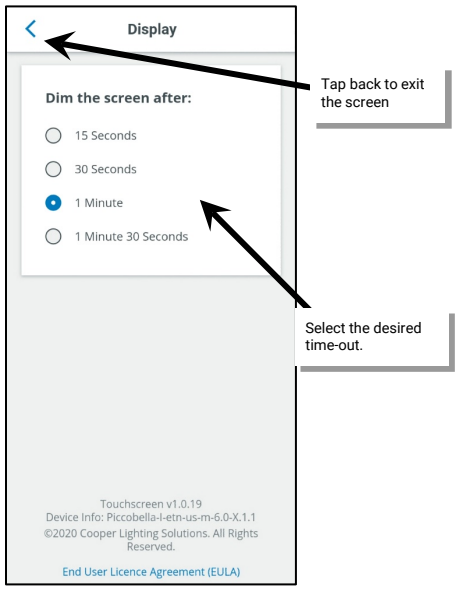
2: Use the slider to adjust the screen to the desired brightness, and then tap the ‘back’ button.



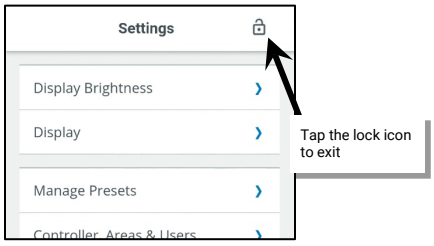
3: Next, select the ‘display’ option.



4: Select the initial time-out period from the provided options, and then tap the ‘back’ button.



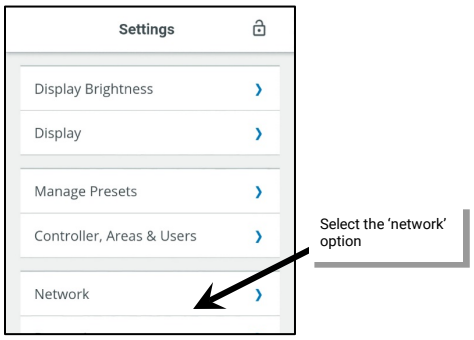
5: Tap the lock icon to exit the settings screen.



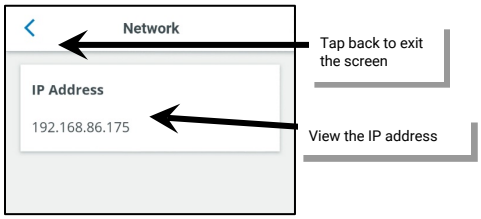
Viewing or Changing the Touchscreen's IP Address

To view the touchscreen's currently assigned IP address:

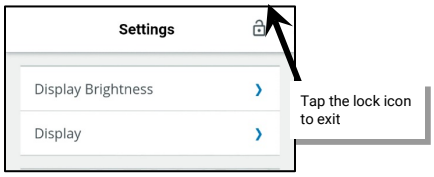
1: From the 'settings' screen, select the 'network' option.



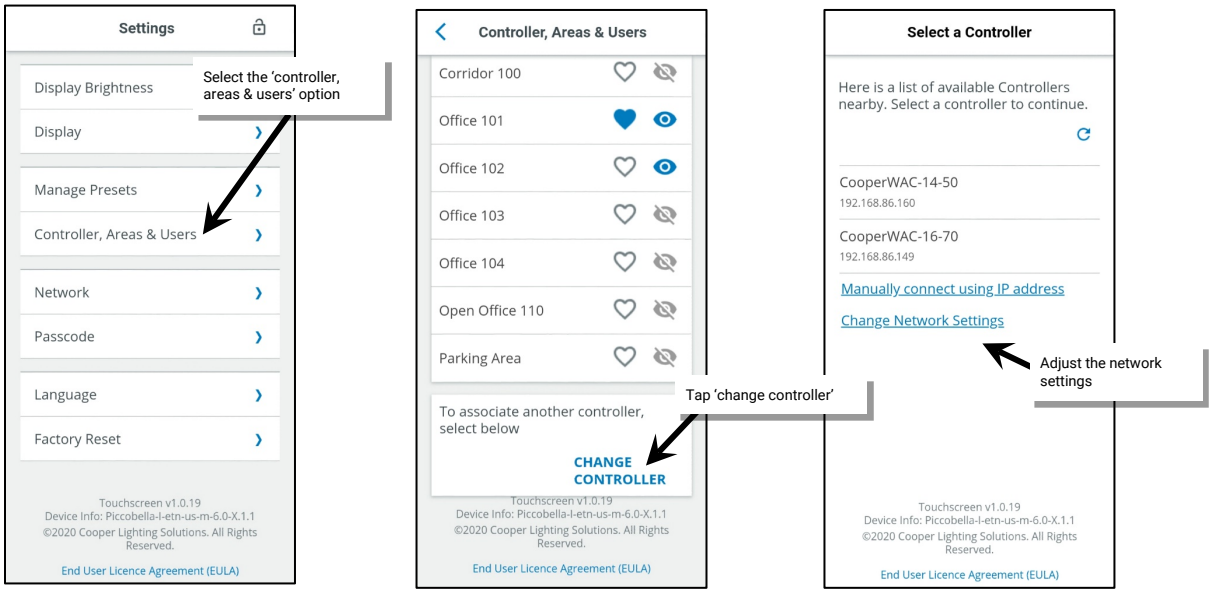
2: Review the IP address. Once finished, tap the 'back' button.



3: Tap the lock icon to exit the settings screen.



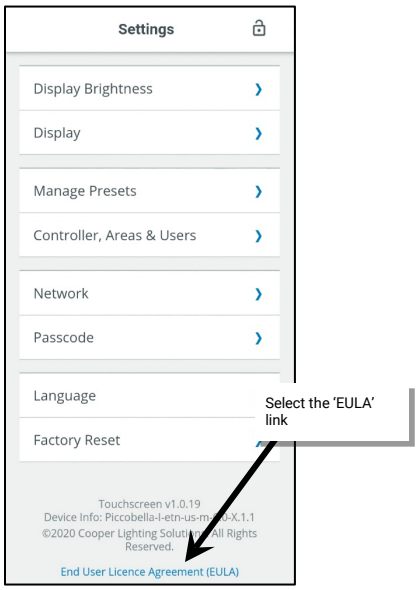
Note: To change the touchscreen's IP address, from the settings menu, select the option for 'controllers, areas & users', and then select 'change controller'. Define the new settings and then tap the correct Wireless Area Controller to reconnect.



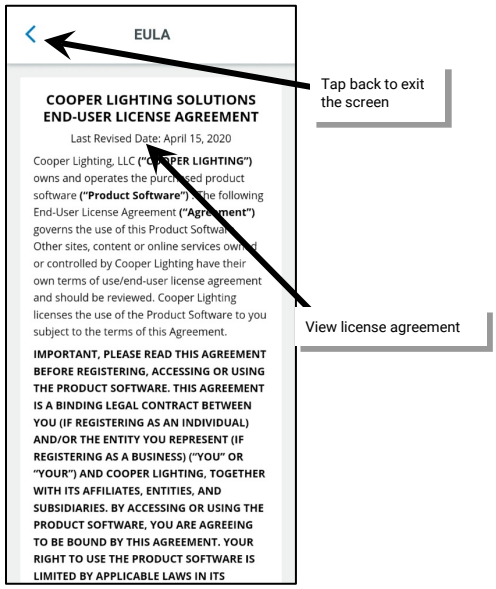
Viewing the End User License Agreement (EULA)

To view the touchscreen End User License Agreement (EULA):

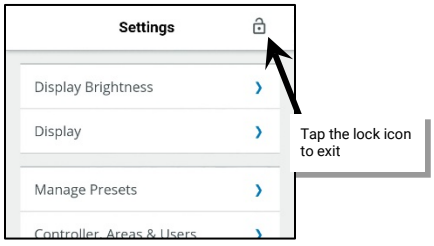
1: From the 'settings' screen, select the 'End User License Agreement (EULA)' link at the bottom of the screen.



2: Once finished reviewing the information, tap the 'back' button.



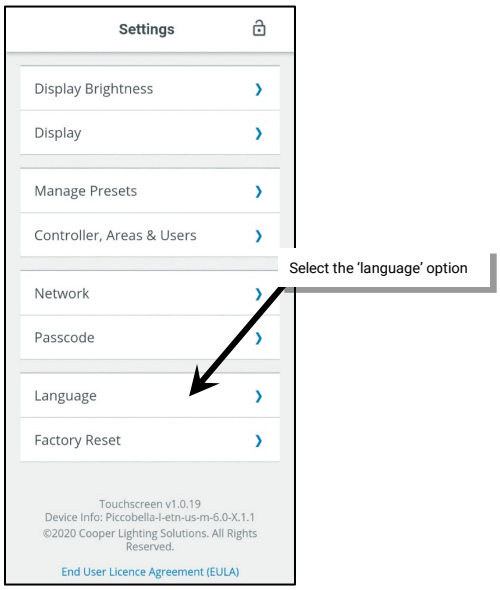
3: Tap the lock icon to exit the settings screen.



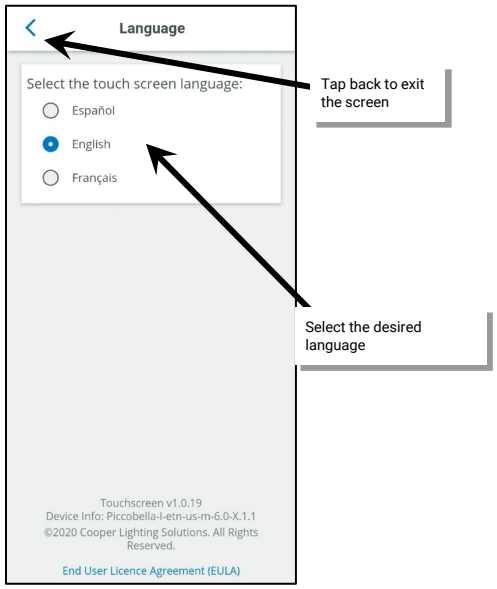
Changing the Display Language

It is possible to switch the display language between English, Spanish and French. To change the display language:

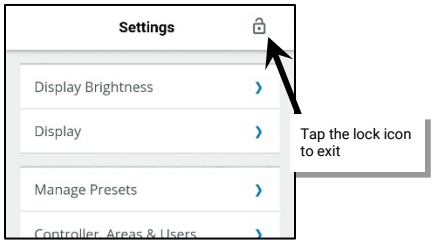
1: From the ‘settings’ screen, select the ‘language’ option.



2: Select the desired language, and then tap the ‘back’ button.



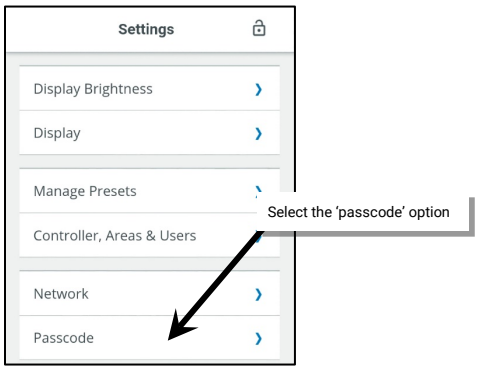
3: Tap the lock icon to exit the settings screen.



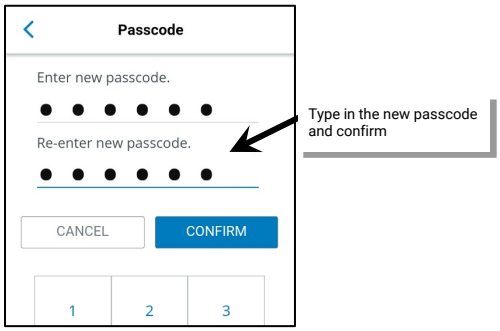
Changing the Administrator Passcode

For security reasons, it is recommended that the default administrator passcode be changed. To change the admin passcode:

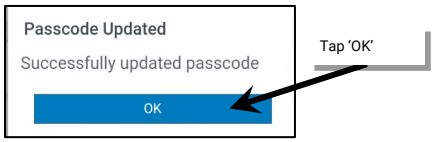
1: From the 'settings' screen, tap the 'passcode' option.



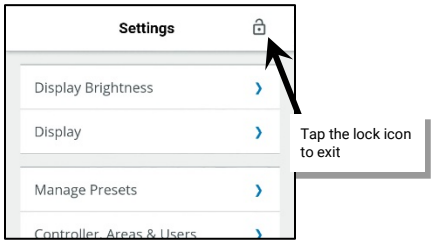
2: Enter the new passcode desired (must be 6 digits), and then enter the same passcode in the second field. Tap confirm.



3: Tap the 'ok' button once the success message box is displayed.



4: Tap the lock icon to exit the settings screen.

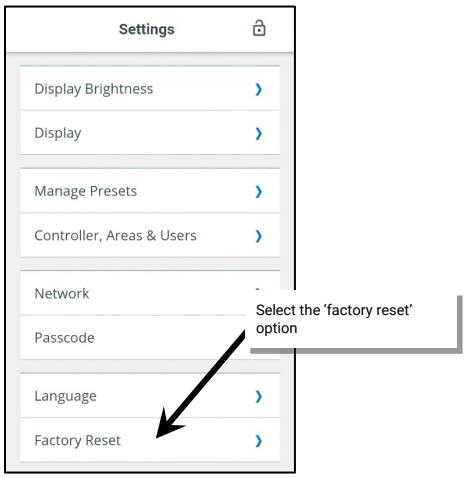


The new passcode must now be used for administrative functions. The default passcode will no longer be valid.

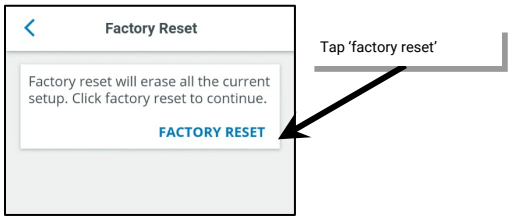
Performing a Factory Reset

A factory reset will erase the current touchscreen setup and return the device to factory defaults. Use with caution!

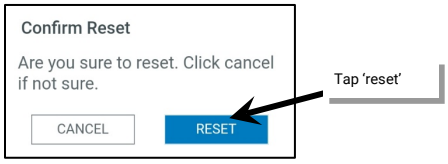
1: From the "settings' screen, tap the 'factory reset' option.



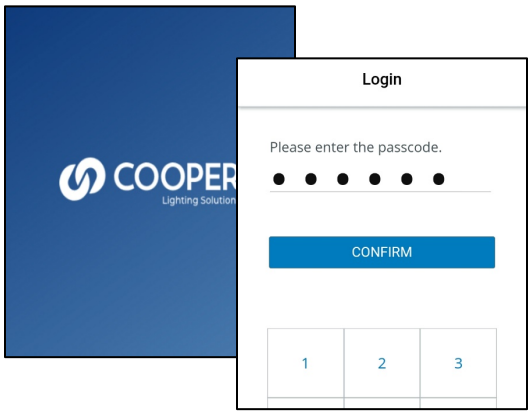
2: Tap the 'factory reset' link.



3: Tap the 'reset' option when prompted to confirm.



The display will show the blue screen, and then request the passcode. Enter the default administrative passcode (266737 ‡) to begin the setup process. Reconfigure the touchscreen using the steps outlined in this chapter.



‡ **Note**: In previous touchscreen versions the default passcode was 328661.

Performing Administrator Tasks

The Wireless Area Controller allows for advanced administrator functionality using built-in internal webpages. This section describes how to log in to the webpage and perform the following functions:

- System administration
- Set the system location, time, date, and time zone
    - Manage user accounts and passwords
    - Rename the Wireless Area Controller
    - Backup and restore databases
    - View disclaimers and license agreements
- Firmware administration
    - View and update firmware/software of the Wireless Area Controller
    - View or update firmware of WaveLinx devices
- Advanced network administration
    - Administer Wi-Fi access point settings
    - Administer other Wi-Fi settings
    - Administer Ethernet setting
    - Change DNS settings

In addition to internal webpage functions, this section also describes how to perform the following administrative and Mobile Application tasks:

- Reboot the Wireless Area Controller
- View application version details
- Update the Mobile Application
- Replace and synch WaveLinx devices
- Use the Wireless Area Controller PAIR button advanced functionality

Logging into the Wireless Area Controller Webpages

Establish a connection from a computer to the Wireless Area Controller to access administrator functions in the internal webpages.

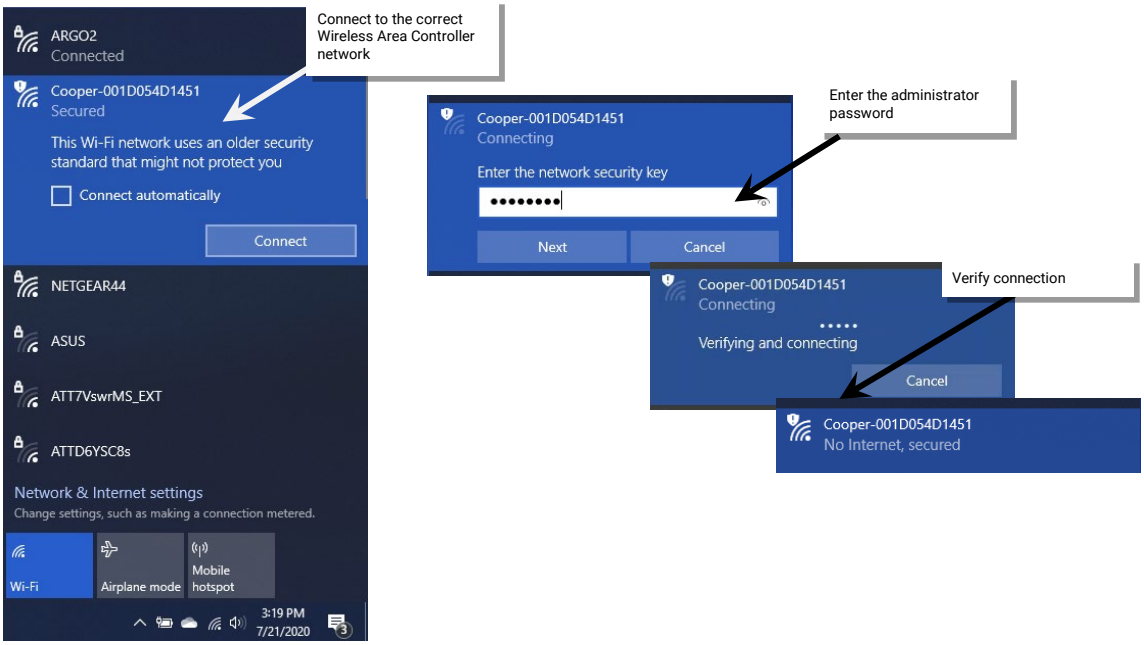
The steps in this section assume that the Wireless Area Controller has not been connected to a building network and is still in its factory default state for wireless name and username/password. If the Wireless Area Controller is connected to the building network, or the wireless name and password has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

Note: There is a WaveLinx Manager Monitoring Webpage which is an additional webpage accessible by Technical Support and Field Engineers for component level analysis.

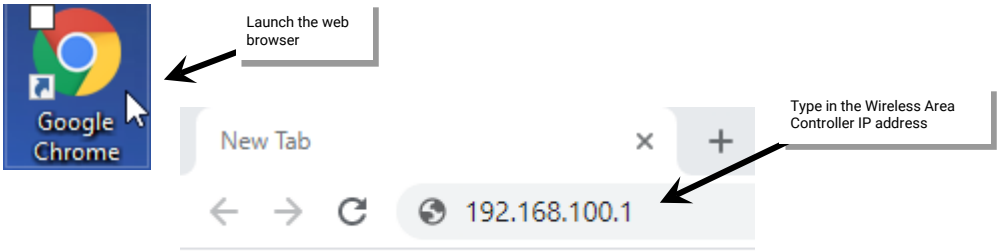
Step 1: Make sure that the computer being used has wireless connectivity and has a compatible web browser installed. The WaveLinx internal webpage configuration is accessed using Google Chrome version 70 or higher, Internet Explorer version 11 or higher, and Mozilla Firefox version 63 or higher.

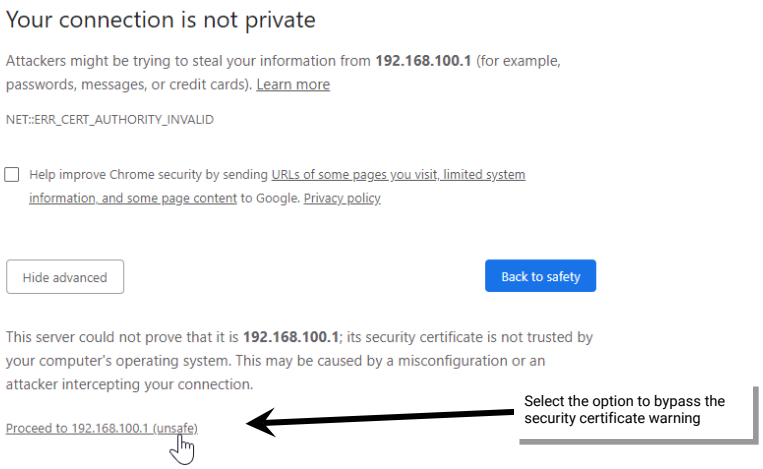
Step 2: Go to the location of the Wireless Area Controller. On the front plate of the Wireless Area Controller below the blue power LED, locate the label with the MAC ID. Make note of the MAC ID shown.

Step 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-XXXXXXXXXXX (where X is a string of letters and numbers). If there is more than one Wireless Area Controller in the facility, more than one wireless ID with this naming criteria may be shown. 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 password wclAdmin when prompted matching the case shown and join the network.



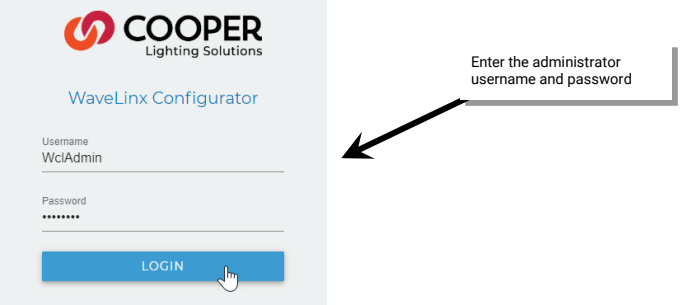
Step 4: Open the web browser. In the web browser address bar, enter the IP address of the Wireless Area Controller. (The default IP address if connecting through the onboard wireless access point is 192.168.100.1.) The first time the Wireless Area Controller is accessed, the browser may display message 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.





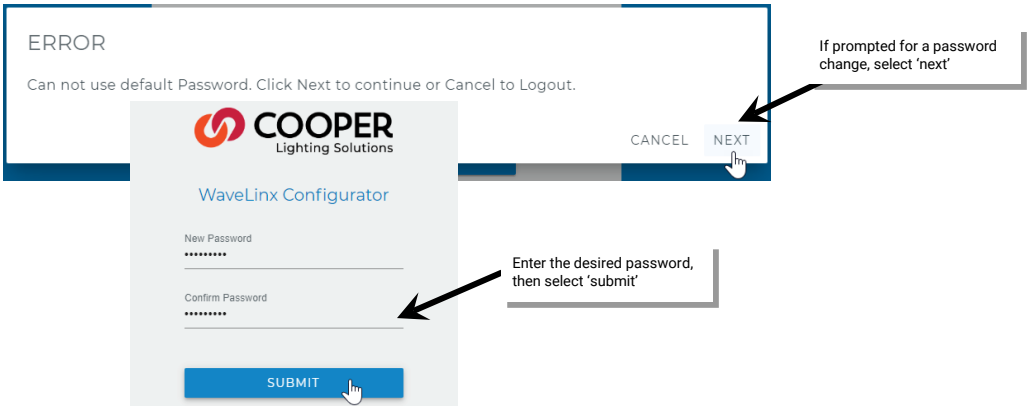
Step 5: In the log in screen, enter the username and password for the administrator user.

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

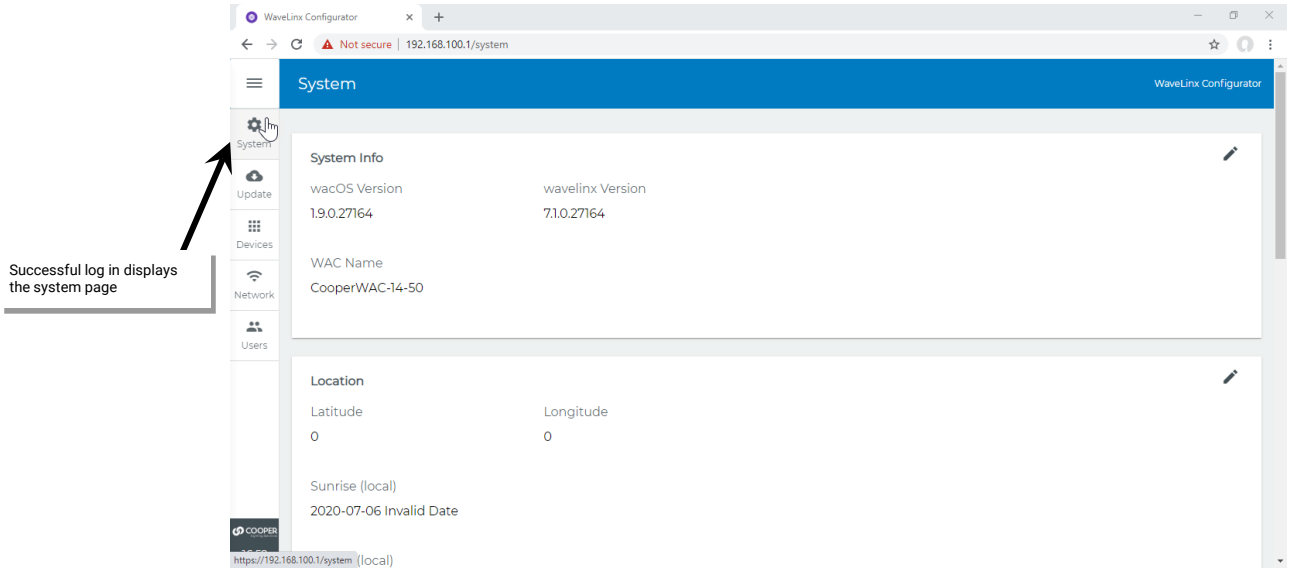


Step 6: If this is the first time the administrator is logged in, the system will force a password change. When prompted, enter a new password for the administrative user. Users should set a complex password when changing passwords, making sure it something that can be easily remembered.

Note: If the administrator password was previously changed through the Mobile Application, this step will be skipped.



The internal webpage will open and display the system page.



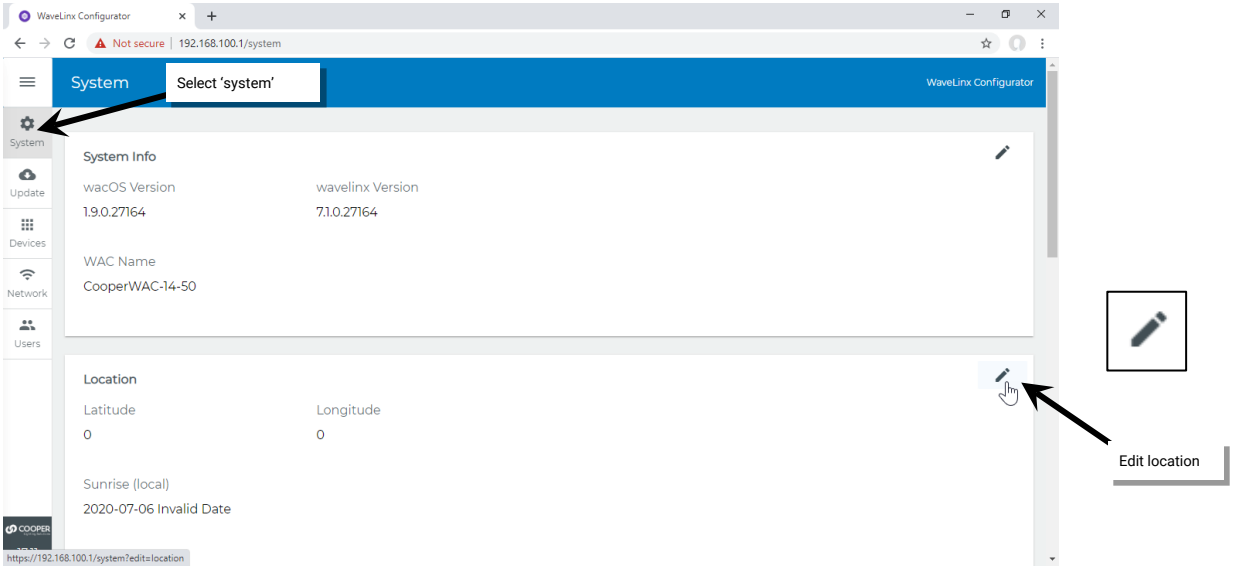
Setting the System Location, Time, Date and Time Zone

To ensure schedule event accuracy, set the location, time, date, and time zone in the controller. The location is used for astronomic clock sunset and sunrise times. 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.

To set the location, time, date, and time zone:

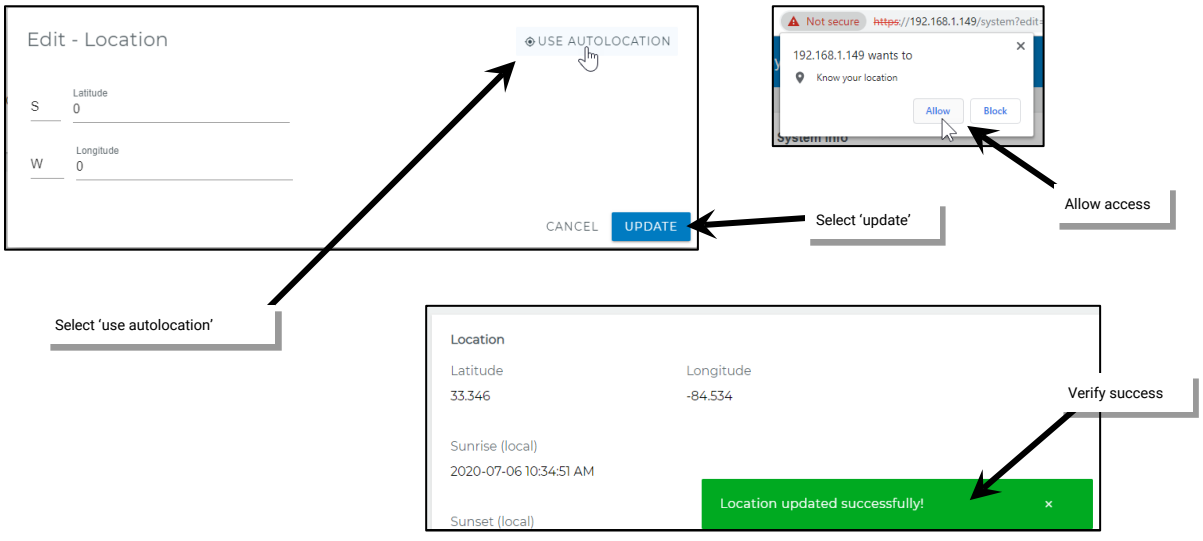
Step 1: Establish a connection from the computer to the Wireless Area Controller as the administrator user.

Step 2: Select the 'system' page and then select the pencil icon in the location section to open it for editing.

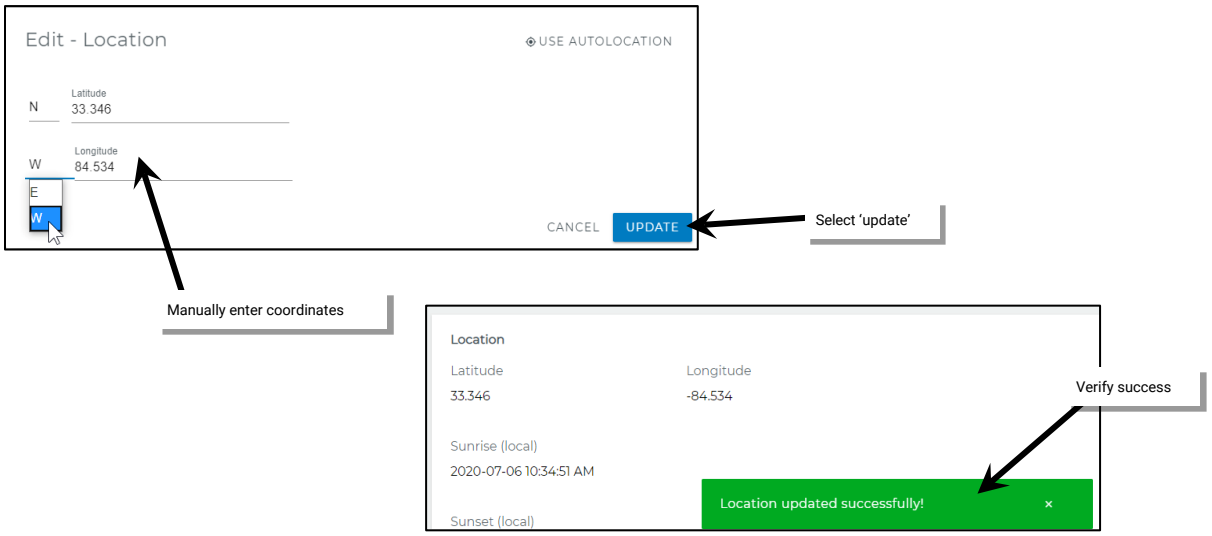


Step 3: Next, set the location. There are two methods of setting the location, either using the auto location feature or by manually entering the coordinates.

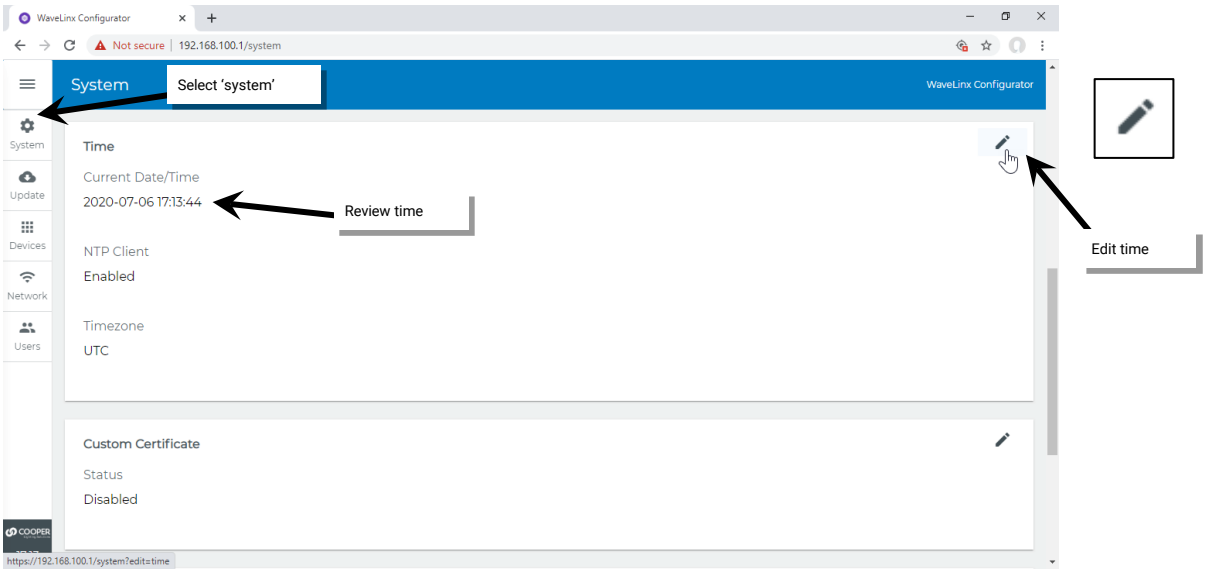
- Method 1: Use the auto-location method if the computer or device being used is connected to a network that allows for GPS location. Select the 'use autolocation' link, and then accept any popup messages to allow location access. The latitude and longitude fields should populate with the current location. Select the update button to save the coordinates to the controller. A success message will be displayed when the controller completes the update.



- Method 2: Manually enter the coordinates if the computer or device being used is not connected to a network or does not support the GPS location feature. Determine the latitude and longitude for the facility using a basic internet search. In the system webpage, use the drop-down arrows and entry boxes to enter the correct settings for the latitude and longitude. Select the update button to save the coordinates to the controller. A success message will be displayed when the controller completes the update.

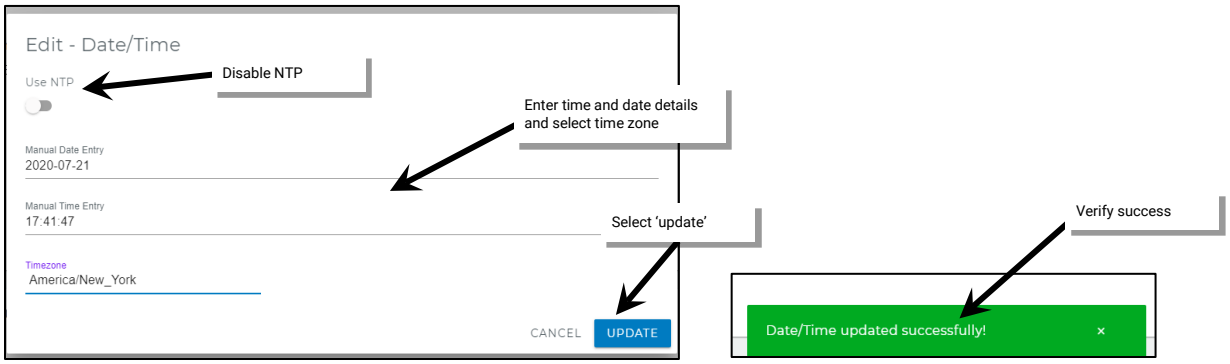


Step 4: Next, in the time section of the system page, review the current time, date, and time zone. If they are not correct, select the pencil icon to open the time window for editing.

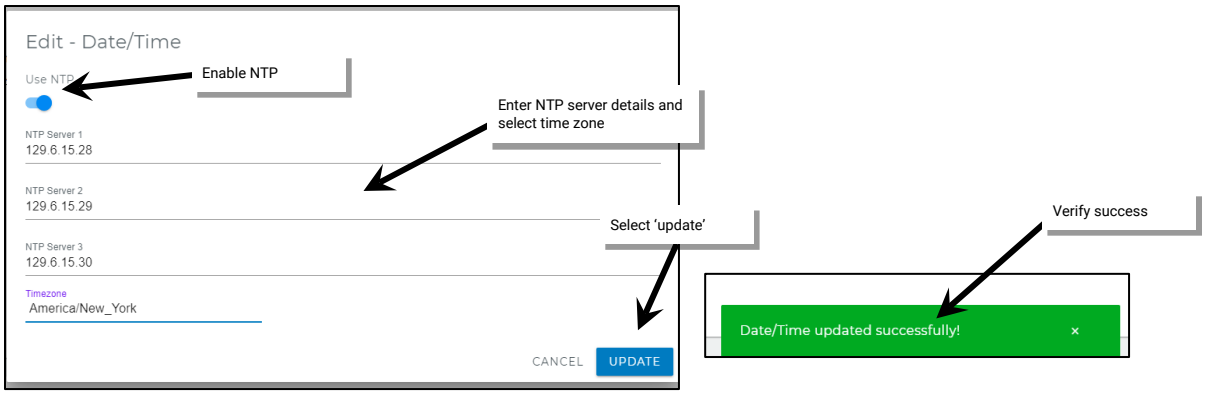


There are two methods of setting the time information, either entering the data manually, or by using an NTP server.

- Method 1: To manually enter the time, date, and time zone details, disable the 'Use NTP' slider. Next, if needed, correct the manual date entry (year-month-day YYYY-MM-DD format) and manual time entry fields (Use 24-hour military clock format to distinguish AM from PM). Use the time zone drop down to select the proper time zone. Select the update button to send the information to the controller. A success message will be displayed when the controller completes the update.



- Method 2: Method 2: 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. Select the update button to send the information to the controller. A success message will be displayed when the controller completes the update.



Managing User Accounts and Passwords

The internal webpages allow for creation of user accounts and administration of user accounts and passwords. By default, the Wireless Area Controller ships with a default system administrator user and a default personal control user account. These user accounts may be changed, or additional user accounts may be defined. The Wireless Area Controller supports up to 99 user accounts. Only one system administrator may be logged into the Wireless Area Controller at a time. Up to 31 tenant users may be logged into the Wireless Area Controller concurrently.

The Wireless Area Controller determines user access and permissions by associating the user accounts with different roles. For the purposes of a stand-alone WaveLinx Wireless Area Controller, only two roles will be used:

- **System Administrator Role**: A user defined as a system administrator will have access to all functions within the WaveLinx Mobile Application as well as the Wireless Area Controller webpages. This includes all programming options, system administration, and user management.
- **Tenant Role**: A user defined as a tenant will have access to the system as a personal control user. The user will be able to view areas in the WaveLinx Mobile Application, issue normal overrides through the Mobile Application, and view schedule events. The personal control tenant user will not be able to change or modify programming, access the Wireless Area Controller webpages, or create user accounts/ administer passwords. The WaveLinx Touchscreen requires the use of a tenant role user account.

Other role types are specific to the implementation of the Wireless Area Controller into larger systems using the Trellix Core and Trellix applications software. The additional user roles and default user accounts will not be discussed in this user guide. Refer to the user guides for these products for further information.

For security, change the default passwords for the administrator and personal control users to be unique for the facility. Users should set a complex password when changing passwords.

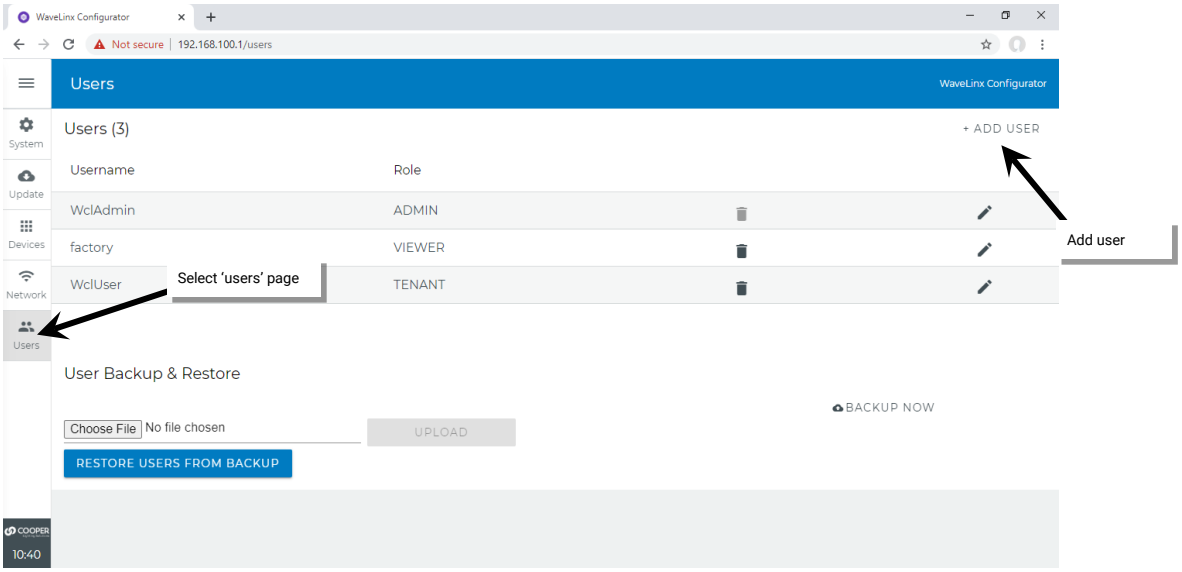
Once all users are created, a backup of the user accounts may be done. This backup can be restored at any time if user accounts and roles need to be re-established after modification at a later time or if user accounts need to be duplicated in other Wireless Area Controllers.

Adding a New User Account

Up to 99 user accounts may exist in the Wireless Area Controller. To create a new user account:

Step 1: Establish a connection from the computer to the Wireless Area Controller as the administrator user.

Step 2: Select the 'users' page, and then select the option to add a user.



Step 3: Type in the desired username, select the role, and create a password for the new account per the details shown below. Then select the create button save the new user account.

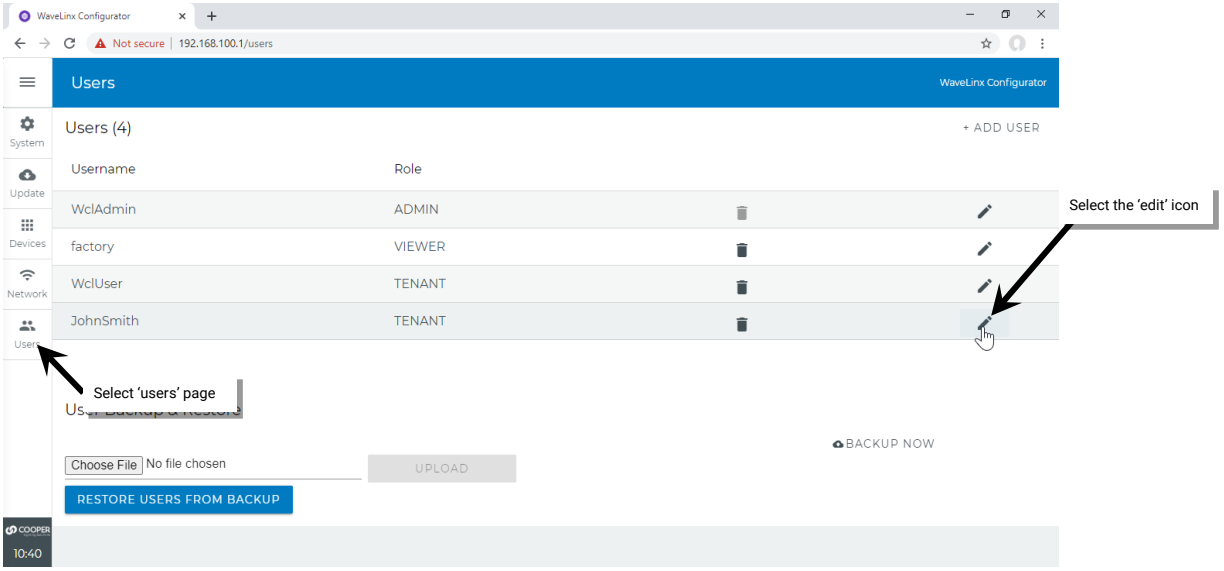
- Username: Usernames can contain up to 32 characters and may include letters, numbers, and a limited set of special characters. Usernames may not contain spaces. Special characters that may be used include - _ ' .
- Role: Select between "Tenant" (personal control user or Touchscreen user account) and "Admin" (system administrator user). Other roles are for use with the Trellix Core and Trellix applications software package and will not be used for standalone Wireless Area Controller administration.
- Password: The password must be between 8 and 16 characters and must contain at least 1 upper case letter, 1 number and 1 special character. The special characters that may be used are "#$'()*,-./:;<=>?@[]^_`{|}~.

Modifying Existing User Accounts and Passwords

To administer changes to the username, role, and passwords of existing user accounts:

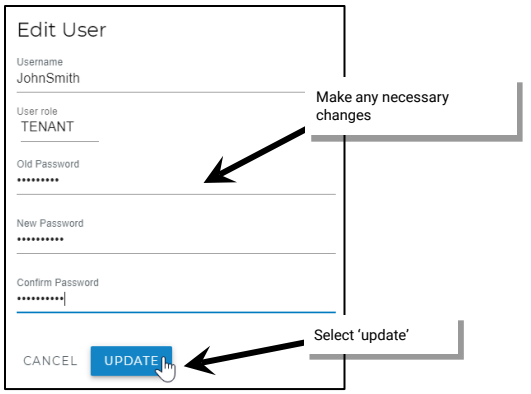
Step 1: Establish a connection from the computer to the Wireless Area Controller as the system administrator user.

Step 2: Select the ‘users’ page, and then locate and select the ‘edit’ button in the desired username row to open the edit form.



Step 3: Make the necessary changes to the role, username, or password. If changing the password, the password must be between 8 and 16 characters and must contain at least 1 upper case letter, 1 number and 1 special character. The special characters that may be used are "#$'()*,-./:;<=>?@[]^_`{|}~. Once the information is correct, select the ‘update’ button to save the changes.

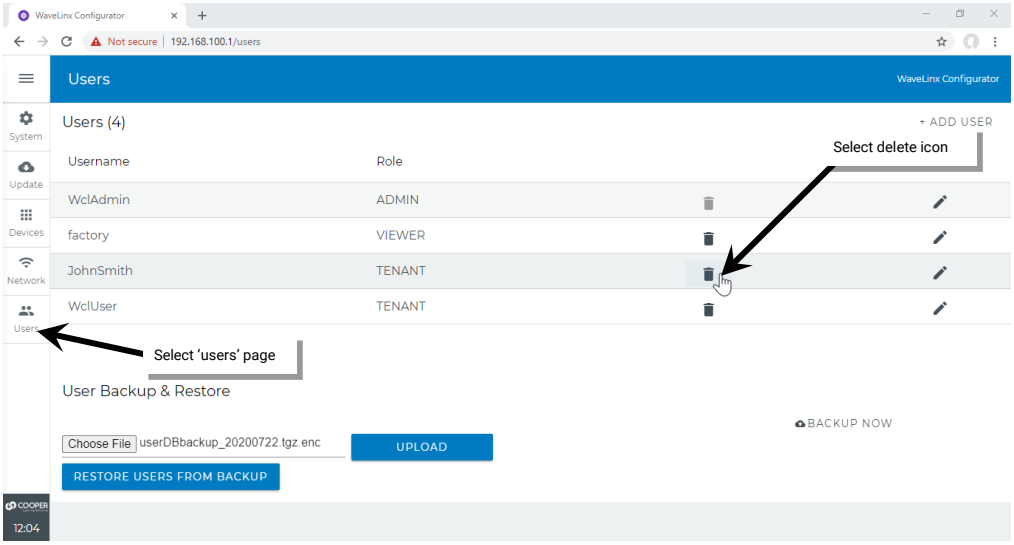
Note: The factory user listed is not used in typical applications.



Deleting a User Account

Step 1: Establish a connection from the computer and the Wireless Area Controller as the system administrator user.

Step 2: Select the "users" page and then select the ‘delete’ button in the desired username row.



Step 3: Confirm the deletion.

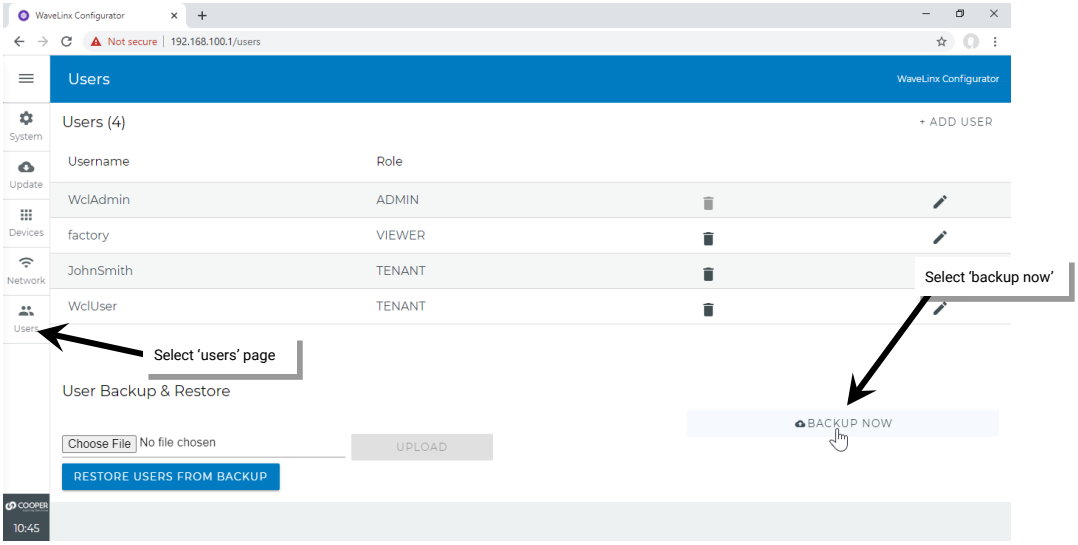
Using the Backup and Restore User Accounts Option

Once user accounts are defined, the accounts may be backed up. This allows accounts to be restored at a later time, or if a site has more than one stand-alone Wireless Area Controller, allows for the accounts to be established on one Wireless Area Controller and then copied to the additional controllers.

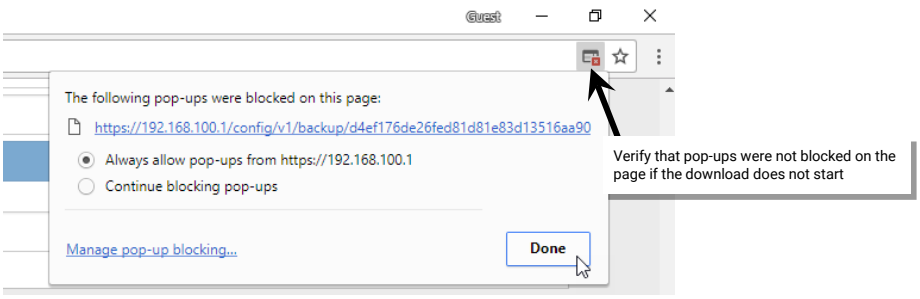
Creating a User Accounts Backup

Step 1: Establish a connection form the computer to the Wireless Area Controller as the system administrator user.

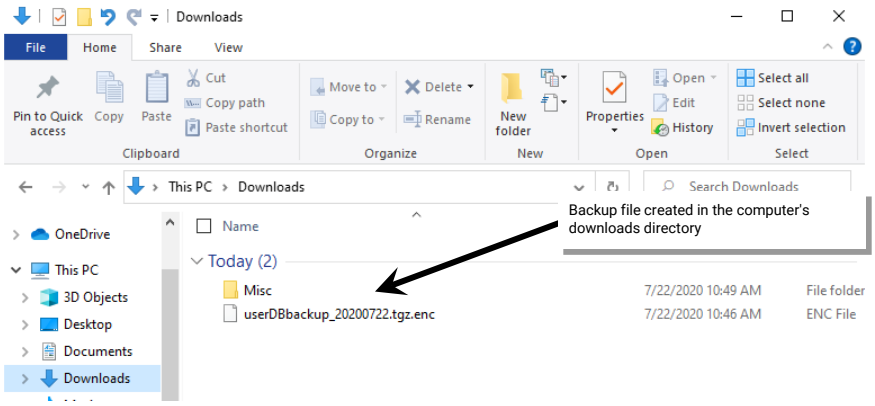
Step 2: Select the ‘users’ page and then scroll to the bottom of the page to select the backup now option.



Step 3: After a few seconds, a file transfer from the Wireless Area Controller to the computer's local downloads directory should start. If the download does not start, verify that popups are not blocked for this site, and then try again.



Step 4: After the file transfer completes, verify that the file is in the computer's downloads directory. The file name will reflect that it is a user database backup and the date that the backup was created. Move the file to a designated directory for WaveLinx user database backups (optional).

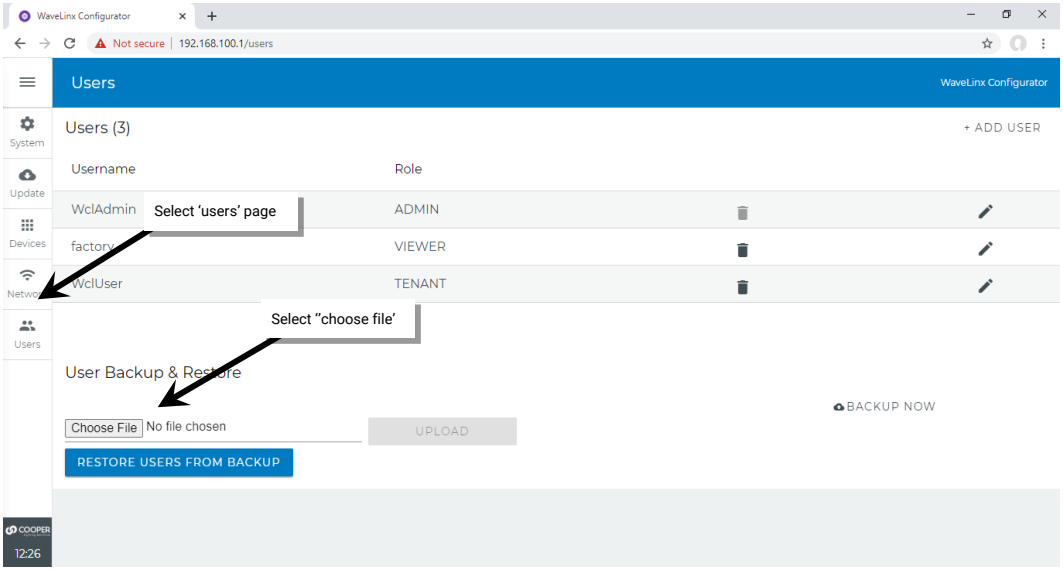


Restoring User Accounts from a Backup

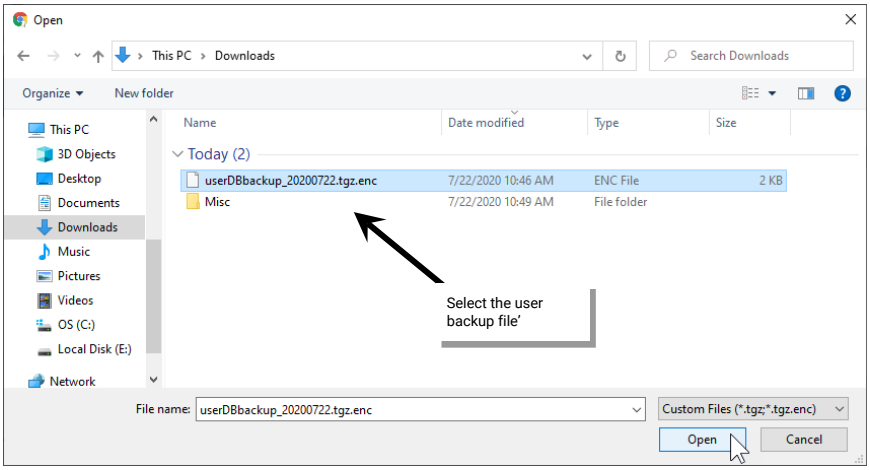
To restore the user accounts from a backup:

Step 1: Establish a connection from the computer to the Wireless Area Controller as the system administrator user.

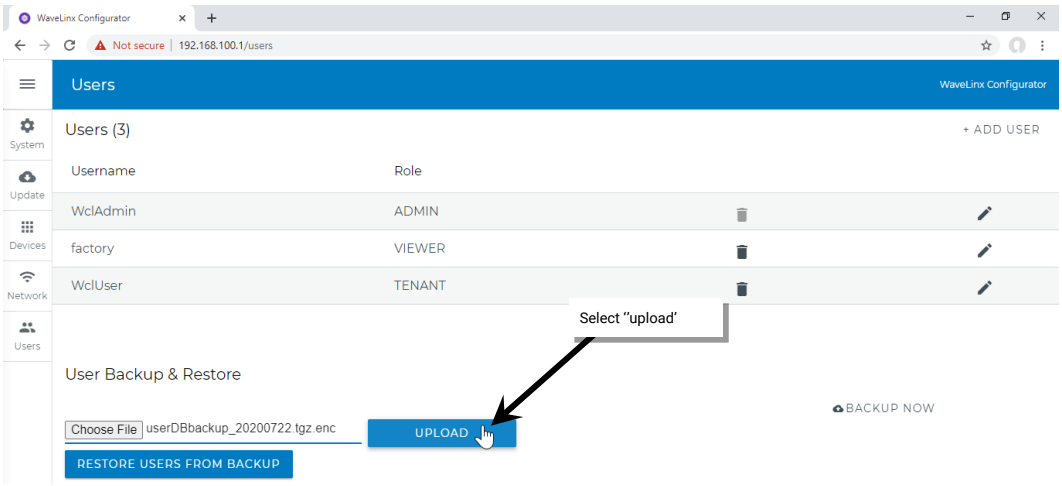
Step 2: Select the 'users' page and then, scroll down the page, to select the choose file option.



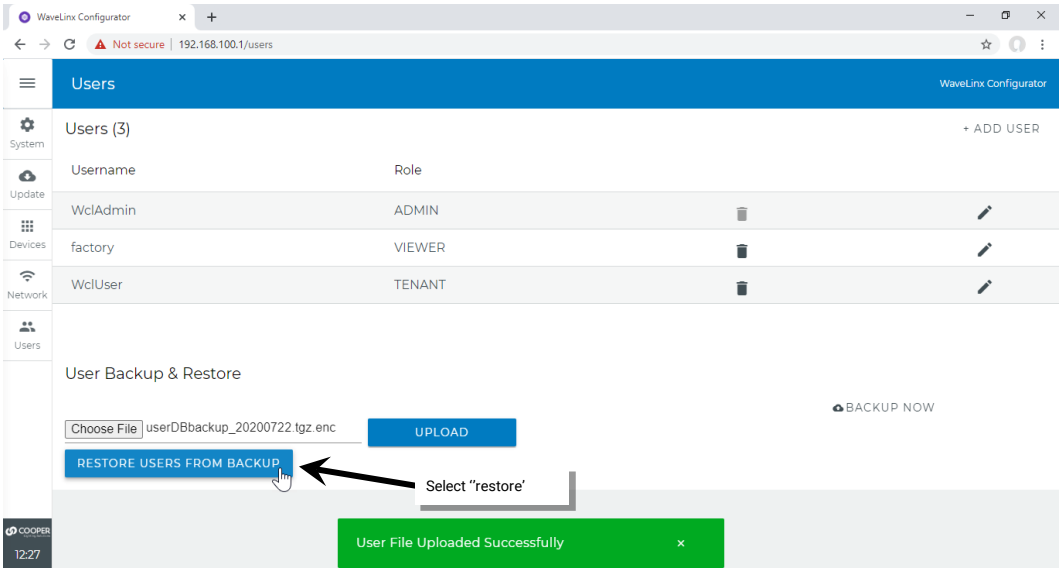
Step 3: Navigate to and then select the user backup file.



Step 4: Next, select the upload option. After a short delay, a successful upload message should be displayed.



Step 5: Next, select the 'restore users from backup' option. Once complete, a successful user database restore message will be displayed.



Note: It may be several minutes before the restored users show in the WAC webpages.

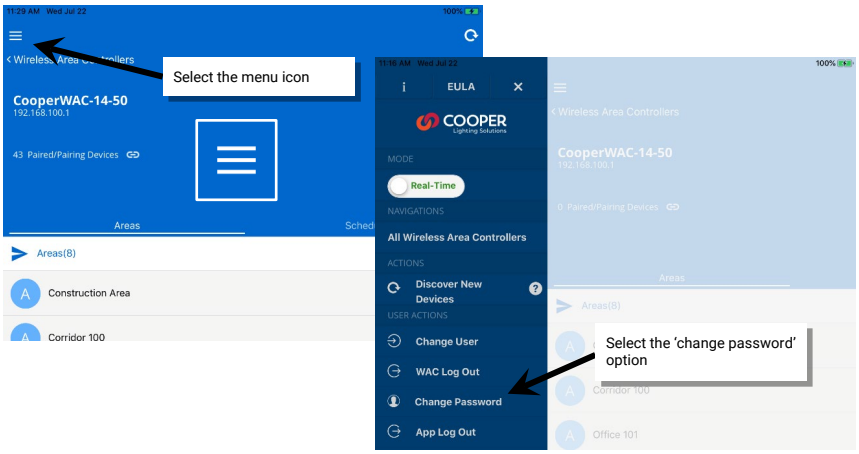
Using the Mobile Application to Change Passwords

Use the WaveLinx Mobile Application as an alternate method of changing user passwords. While any user account password may be changed using this method, only a user logged in as a system administrator may make the changes.

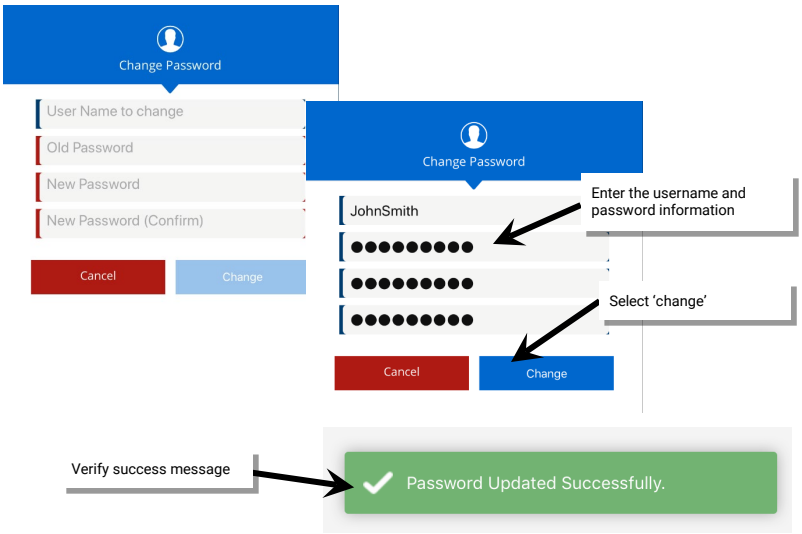
To change user passwords using the Mobile Application:

Step 1: Open the WaveLinx Mobile Application and establish a connection with the Wireless Area Controller as an administrator user.

Step 2: In the area screen, select the menu icon located in the top-left corner, and choose the option to change password.



Step 3: Enter the desired username for the account password you wish to change along with the existing password for the user. Then, type in the new desired password into both the new password and the confirmation fields. Select the change button to save the settings and verify the success message appears at the bottom of the screen.



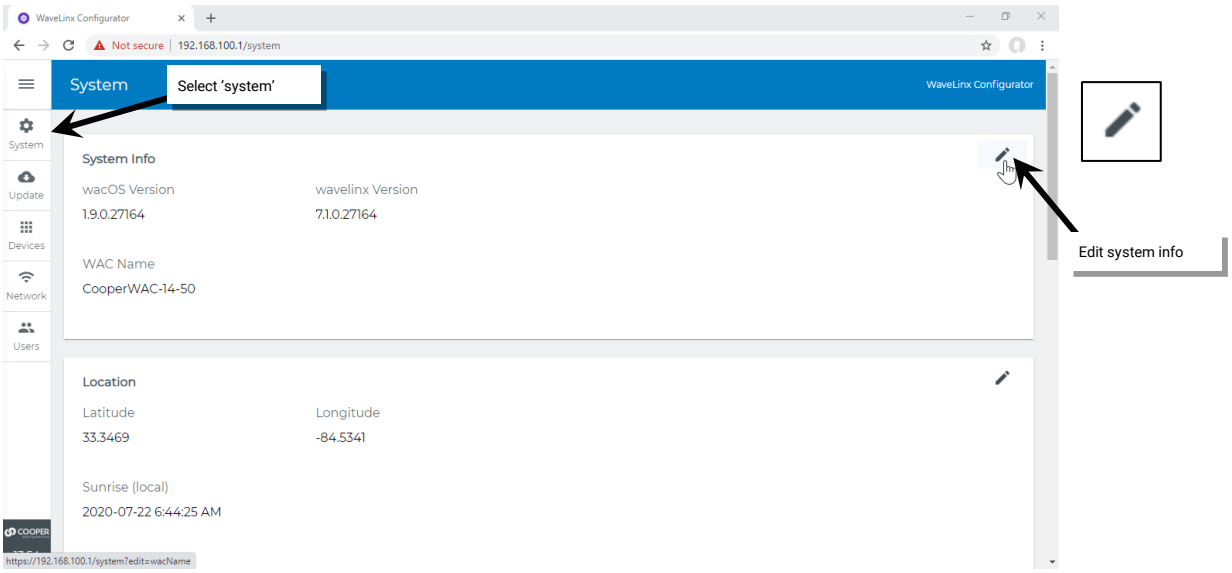
Renaming the Wireless Area Controller

Each Wireless Area Controller has a default name that will appear in the WaveLinx Mobile Application. It is possible to change this name through the internal webpages.

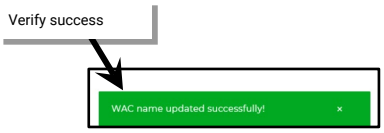
To change the Wireless Area Controller default name:

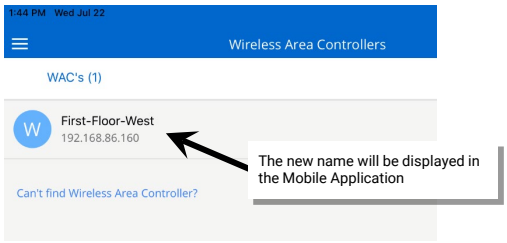
Step 1: Establish a connection from the computer to the Wireless Area Controller as the administrator user.

Step 2: Select the 'system' page, and then in the system info section, select the pencil icon to open the page for editing.



Step 3: Type the desired name in the provided field (letters, numbers, and hyphens only). Select the update button to save the change. A success message will be displayed when the controller completes the update. The new name will display in the WaveLinx Mobile Application.





Performing a System Backup

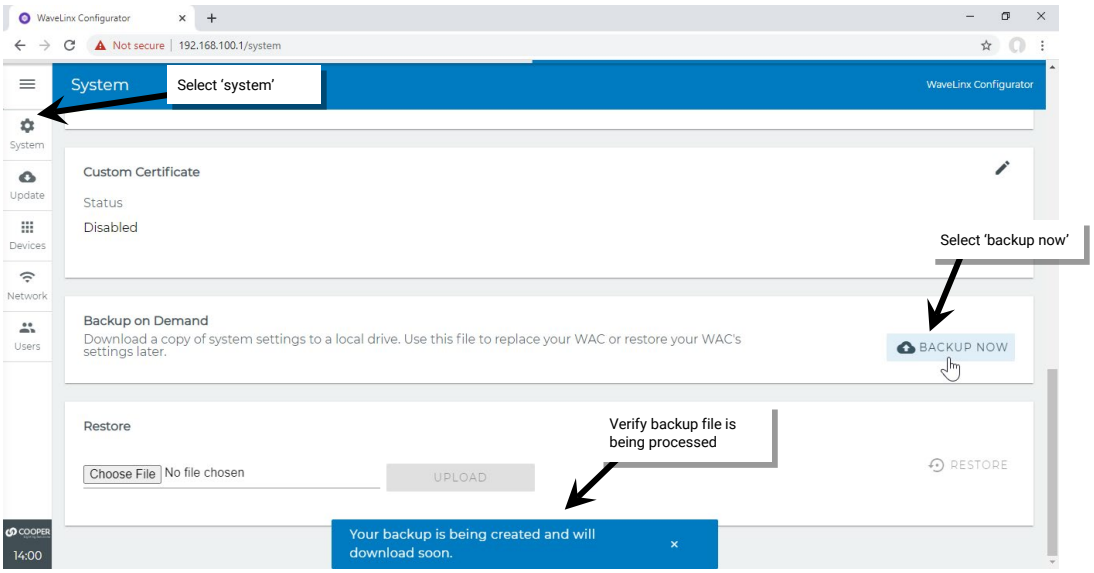
Perform system backups regularly. The system should be backed up:

- Once the system is initially running and operational
- Before making significant changes
- Before updating Wireless Area Controller or device firmware (suggested)
- After updating Wireless Area Controller or device firmware (suggested)

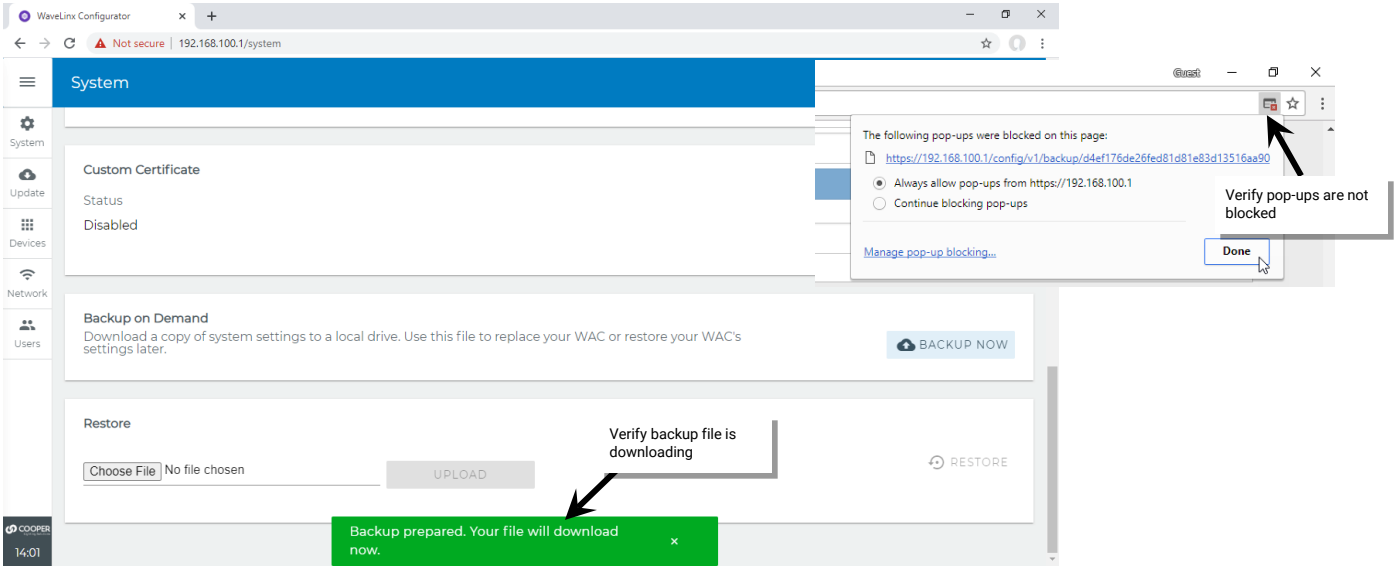
The system may be restored from the backup if programmed changes do not operate as intended or if replacing the Wireless Area Controller in the event of a controller failure.

Step 1: Establish a connection from the computer to the Wireless Area Controller as the administrator user.

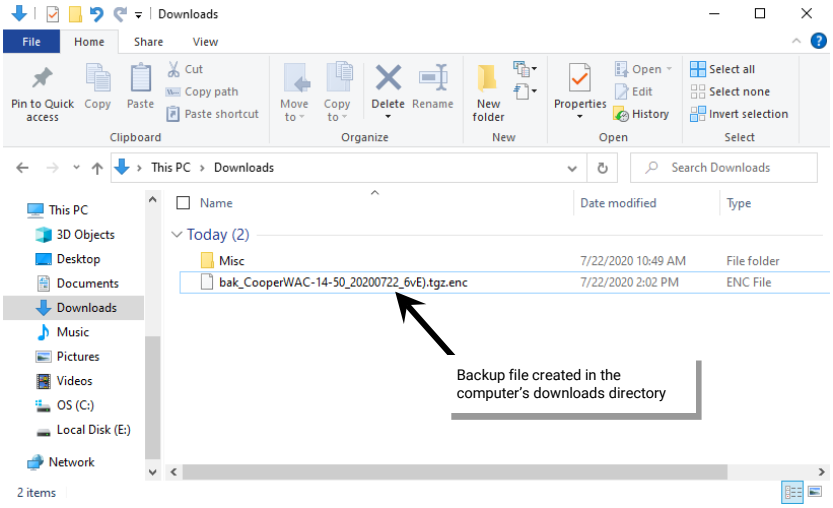
Step 2: Select the 'system' page and then locate the 'backup on demand' section. Select the option to 'backup now'. A message should appear at the bottom of the screen indicating that the backup file is being created for download.



Step 3: After a few minutes of processing time, a second message will appear stating that the backup will download now. The file transfer from the Wireless Area Controller to the computer's local downloads directory should begin. If the download does not start, verify that popups are not blocked for this site, and then try again.



Step 4: After the file transfer completes, verify that the file is in the computer's downloads directory. The file name will reflect the Wireless Area Controller name and the date that the backup was created. Move the file to a designated directory for WaveLinx backups (optional).



Performing a System Restore

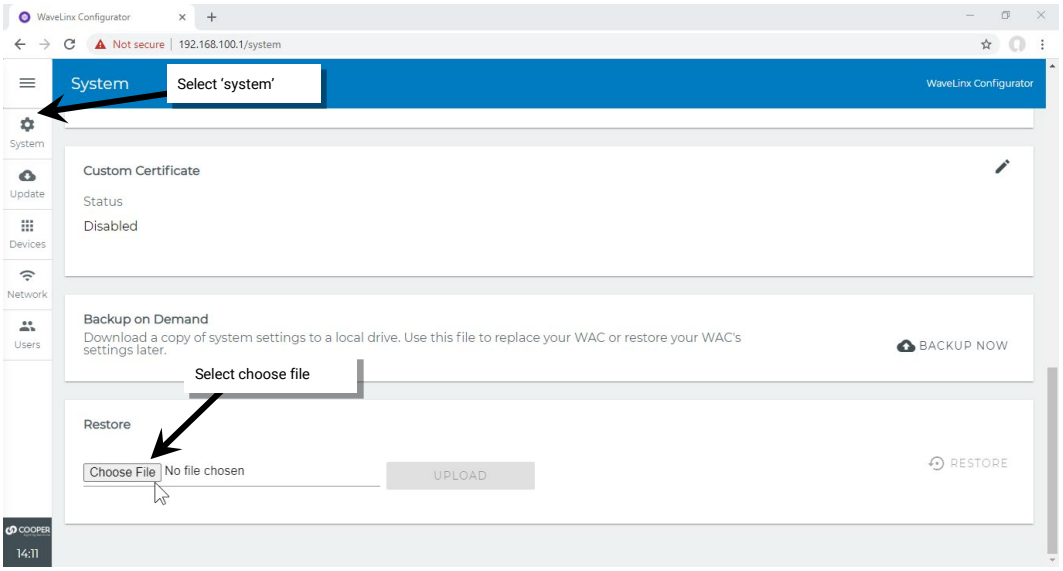
Restore the system at any time from a previously created backup file. A backup may also be restored to a replacement Wireless Area Controller if necessary. During restoration, devices will remain in their current state until the restoration is complete, and they have rejoined the wireless network.

To restore the system:

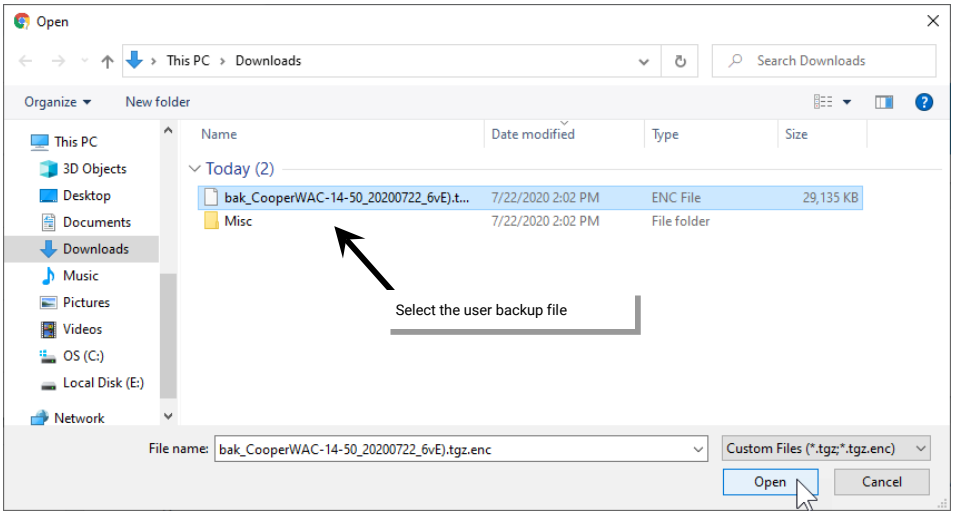
Before beginning the restore process, if replacing a Wireless Area Controller, ensure that only the replacement Wireless Area Controller is powered.

Step 1: Establish a connection from the computer to the Wireless Area Controller as the administrator user.

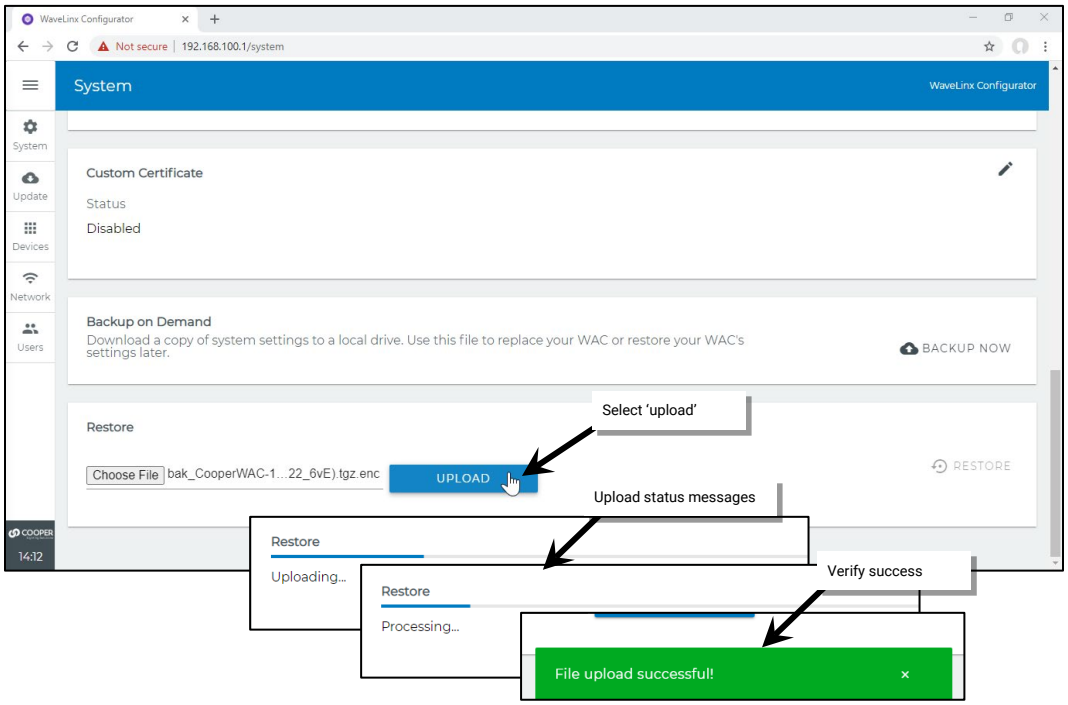
Step 2: Select the 'system' page and then scroll down to the 'restore' section and select the option to 'choose file'.



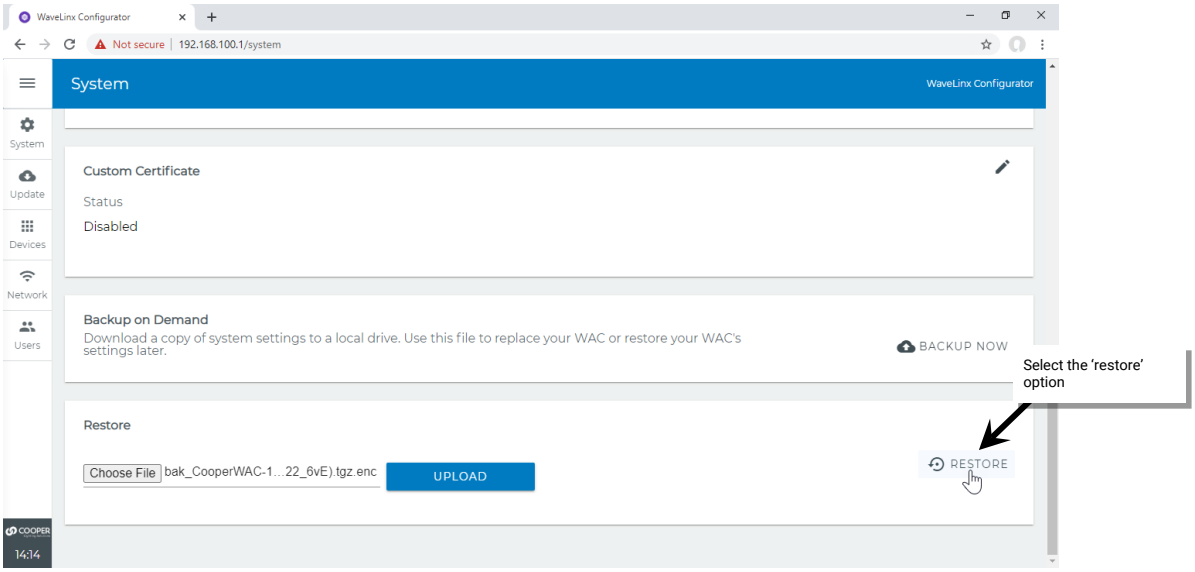
Step 3: Navigate to and then select the backup file to restore.



Step 4: Next, select the upload option. The status indicators will show the unit is uploading and processing the file. After several minutes, a successful upload message should be displayed. Note that this message is indicating that the upload of the file was successful. Continue with the below steps to complete the restore process.



Step 5: Next, select the restore option. Once started, a successful restore message will be displayed. The actual restore process may take several minutes as the WAC restores the database and reboots.



At this point, it is possible to disconnect from the webpage. After a restore, the Wireless Area Controller may take approximately 45 minutes to propagate the information to all connected devices and may take approximately an additional 45 minutes for devices to operate with the restored programming. If firmware updates are necessary after the restoration is done, wait 1½ hours prior to performing the firmware update to ensure that devices have completed the restoration and rejoining process.

Note: If replacing a Wireless Area Controller that has failed, once the restore is completed, the replacement unit will take on the functions and ID of the original controller. The replacement controller may then be backed up and restored to itself as many times as needed but may not be used to replace another controller in the facility with a different ID. It is imperative that only the replacement unit be powered after the restore is complete to avoid communication conflicts.

For example:

- If controller A1 fails, its backup can be restored into replacement controller A2.
- Controller A2 can be backed up and restored to itself if it is necessary to rollback to previous programming.
- If controller A2 also fails it can be replaced by a new controller A3.
- If a controller in another area of the facility fails (B1), and the B controller is deemed more critical than the A controller, controller A2 cannot be moved to replace controller B1 (A2's ID was previously overwritten by A1's ID and cannot be overwritten again with the B1 ID).
- If the replacement controller A2, mistakenly has controller B1's backup restored into it, and then the mistake is realized and then the A1 backup is then restored, the Wireless Area Controller will look like it is correct but the devices will not join the WAC. To recover from this issue, all devices that should be paired with that Wireless Area Controller will need to be placed into out-of-the-box mode through either performing the factory reset on devices, or through the use of the WaveLinx FAST Commissioning Tool. Once reset, pair the devices to the WAC. Once paired, the devices will begin operating per the programming in the restored A1 database.

Quick Links for Common Questions

- I am replacing a failed Wireless Area Controller with a replacement Wireless Area Controller. Do I need to go through the construction grouping process to pair the devices with the new Wireless Area Controller or is this part of the restore function? See the answer on page 200.
- My backup was done prior to a firmware update. Can I restore the older backup if I have updated the firmware in my devices? See the answer on page 200.
- What will my devices do if they lose communication with the Wireless Area Controller? See the answer on page 201.

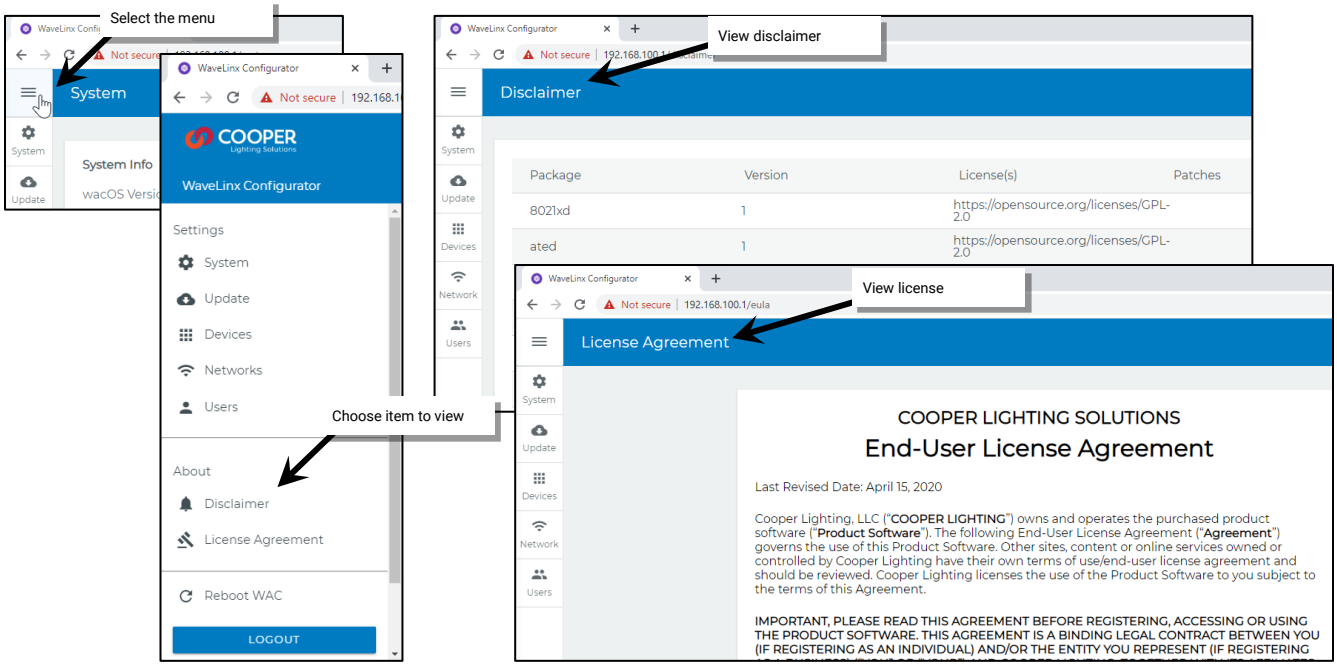
Viewing Disclaimers and End User License Agreements

The Wireless Area Controller internal webpages display required disclaimer and end user license agreement pages which may be viewed as needed.

To access this information:

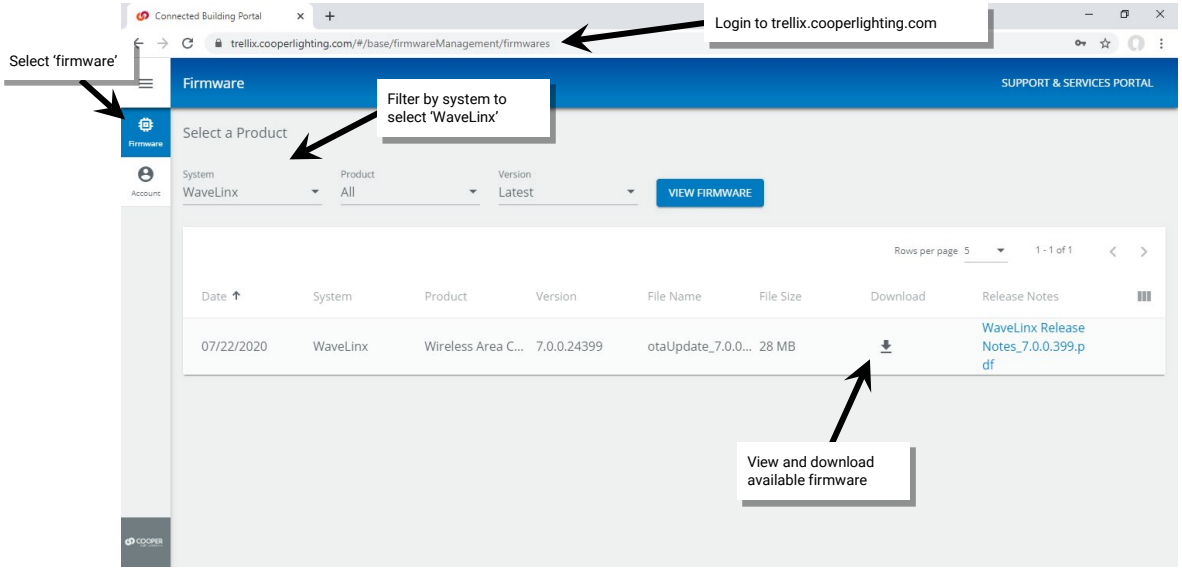
Step 1: Establish a connection from the computer to the Wireless Area Controller as the administrator user.

Step 2: Select the menu icon, then select the ‘disclaimer’ or ‘license agreement’ option to view the desired item.



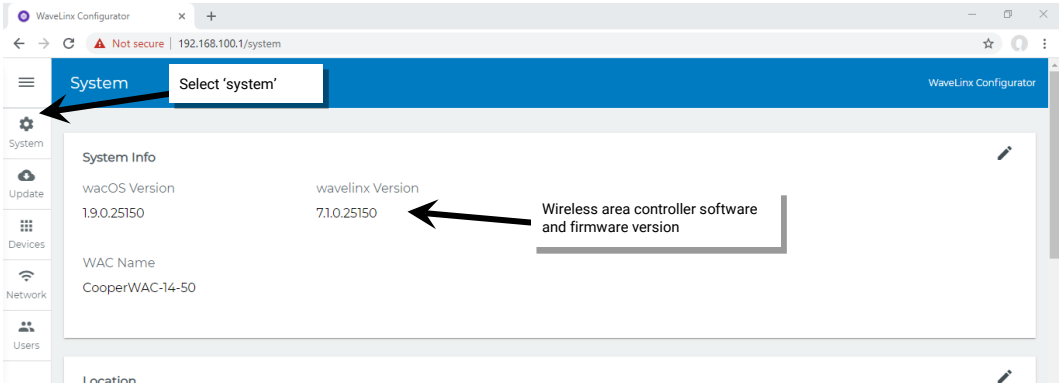
Viewing and Updating Firmware of the Wireless Area Controller and WaveLinx Devices

It is important to keep the Wireless Area Controller and installed WaveLinx devices current with firmware updates to ensure functionality and security. Check for updates by using a web browser to log in to the Cooper Lighting Connected Building Portal at trellix.cooperlighting.com with the email address registered in the WaveLinx App. Once logged in, select ‘Firmware’, then filter for WaveLinx firmware updates. Select download to save any updates to the computer.



Viewing Firmware/Software of the Wireless Area Controller

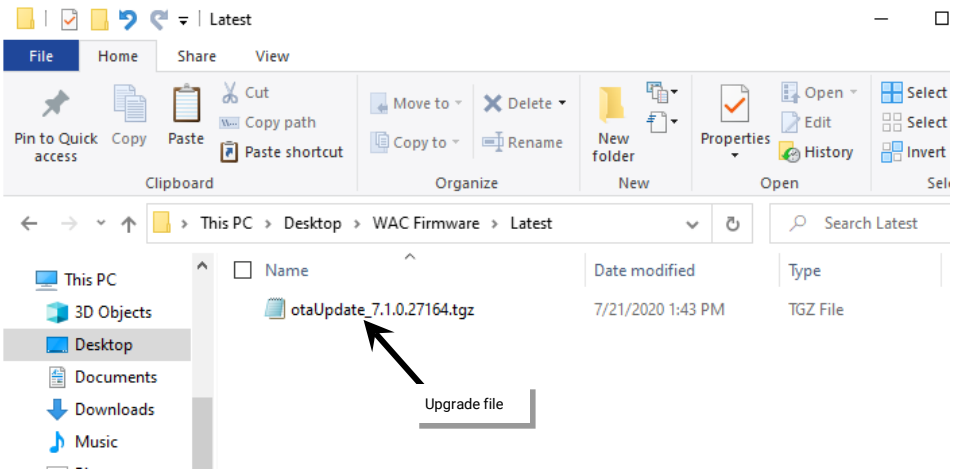
To view the current firmware and software versions for the Wireless Area Controller, access the internal Wireless Area Controller webpages and select the system page. The operating system and firmware version will be displayed in the system info section at the top of the page.



Updating the Firmware/Software of the Wireless Area Controller

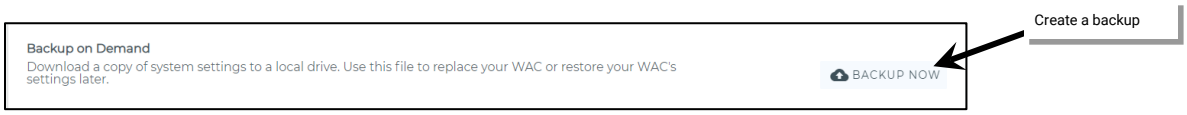
To perform an update to the Wireless Area Controller firmware/software:

Step 1: Download the firmware/software file from the Cooper Lighting Connected Building Portal, trellix.cooperlighting.com and save it to the computer being used to perform the update. If the file is in a .zip format, unzip the files to a known location. The filename should appear as otaUpdate_XXXXXXXX.tgz.

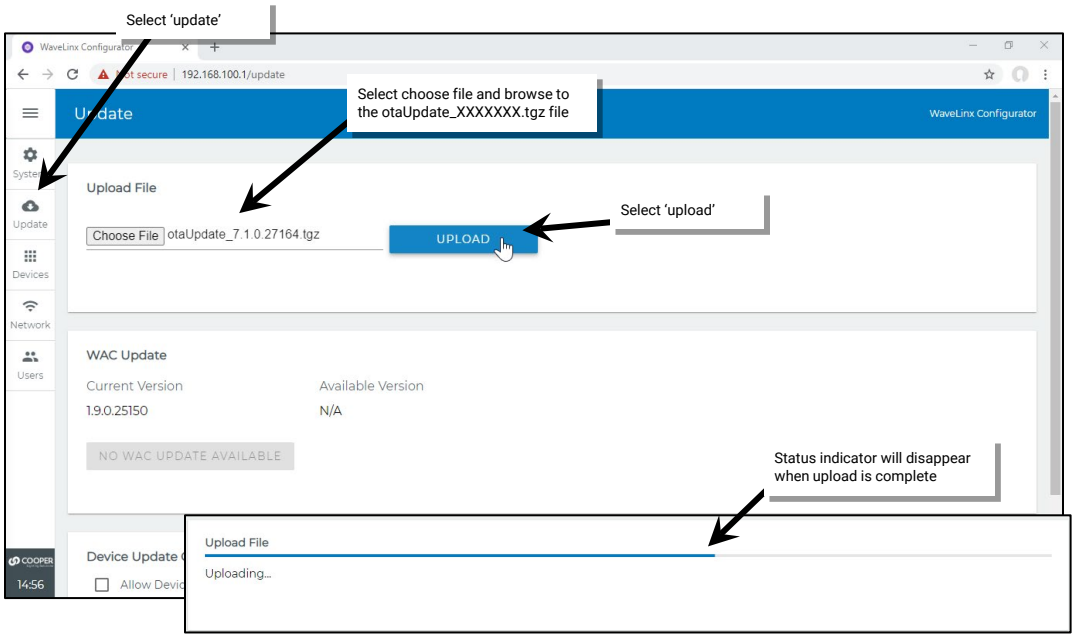


Step 2: Establish a connection from the computer to the Wireless Area Controller as the administrator user.

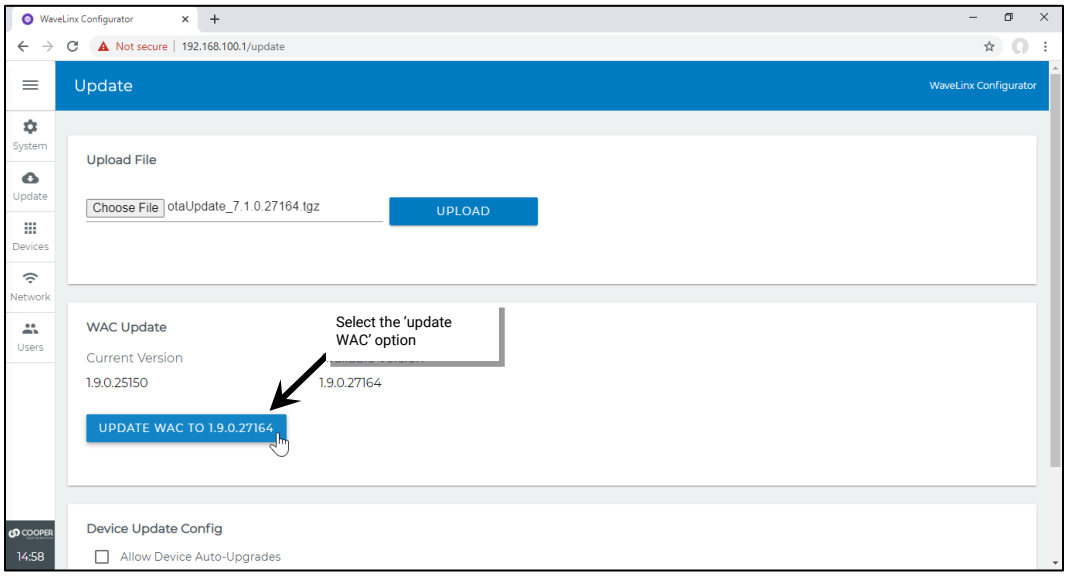
Step 3: If not done previously, turn off the browser popup blocker for this website and then create a backup of the current programming.



Step 4: Select the ‘update’ page, and then select the ‘choose file’ button to navigate to the location of the otaUpdate_XXXXXX.tgz file saved on the computer. Select the ‘upload’ button. The upload status will disappear when the upload completes.

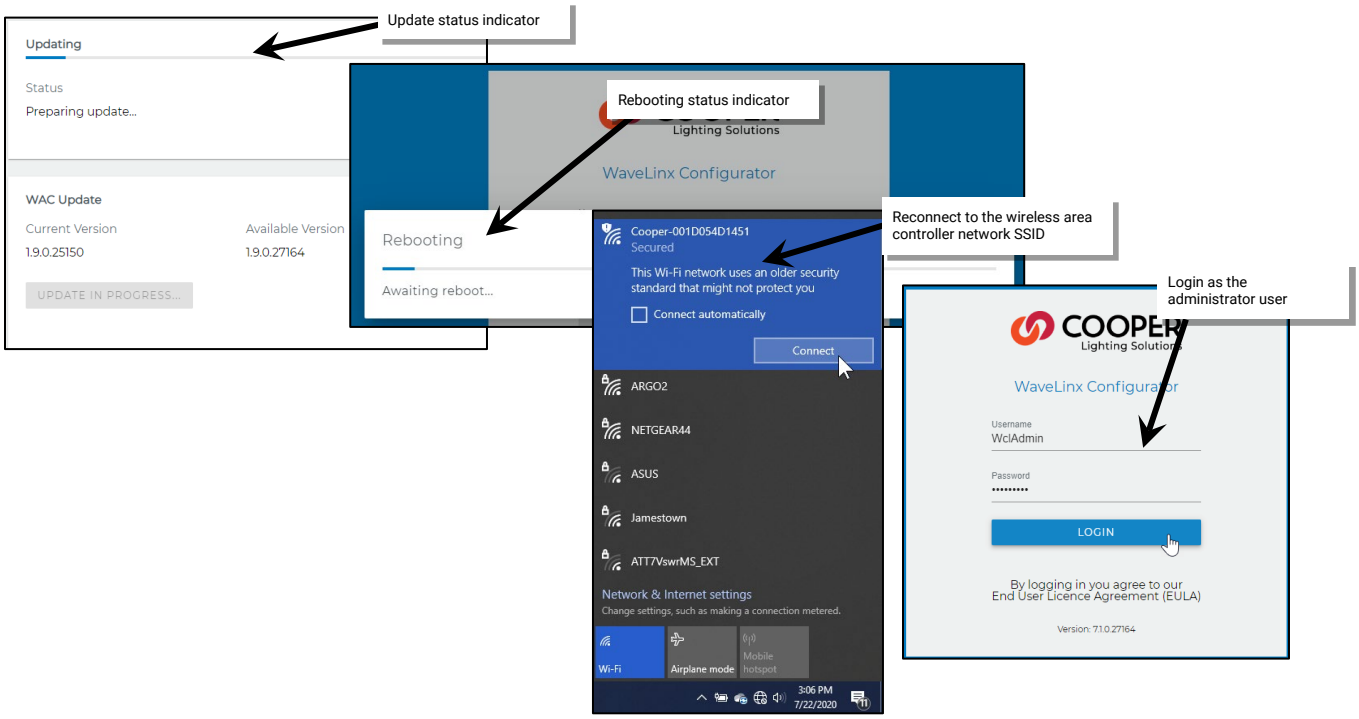


Step 5: Next, scroll down to the ‘WAC Update’ section, to review the available updates for the Wireless Area Controller. If an update is available, select the ‘Update WAC’ button to proceed.



Step 6: The update process takes approximately 5 minutes during which the system may display a status bar and a rebooting status indicator. If the Wireless Area Controller is in a location that is visible, the power LED or other LEDs may flash during the firmware update process. Upon completion, the power LED will turn ON and remain ON and the blue 802.15.4 LED will be ON solid. (Other LEDs may be ON depending on connections). If the computer does not automatically reconnect to the WAC network, re-establish the connection to the Wireless Area Controller's wireless network SSID manually, and then log in as the administrator user.

Note: If the SSID does not appear in the list of available networks, the system has not yet completed the update. If the Wireless Area Controller is visible, the blue power LED and the 802.15.4 LED will illuminate when it is ready. Otherwise, wait for the SSID to appear and then re-establish the connection. The firmware update of the Wireless Area Controller is complete.



Updating the Firmware of WaveLinx Devices

The devices that are paired to the Wireless Area Controller may be updated from the Wireless Area Controller webpages. The updates may be done manually or may be selected to happen automatically using the auto-upgrade feature. Regardless of method chosen, the Wireless Area Controller ensures that devices meet minimum firmware requirements. If a paired device does not meet minimum requirements, the Wireless Area Controller will automatically update the device firmware 1 hour after the Wireless Area Controller reboots or at midnight the day that the discrepancy is detected.

The firmware files for WaveLinx devices are loaded with the Wireless Area Controller firmware/software otaUpdate.tgz file. If necessary, an individual device's firmware file may also be loaded into the Wireless Area Controller.

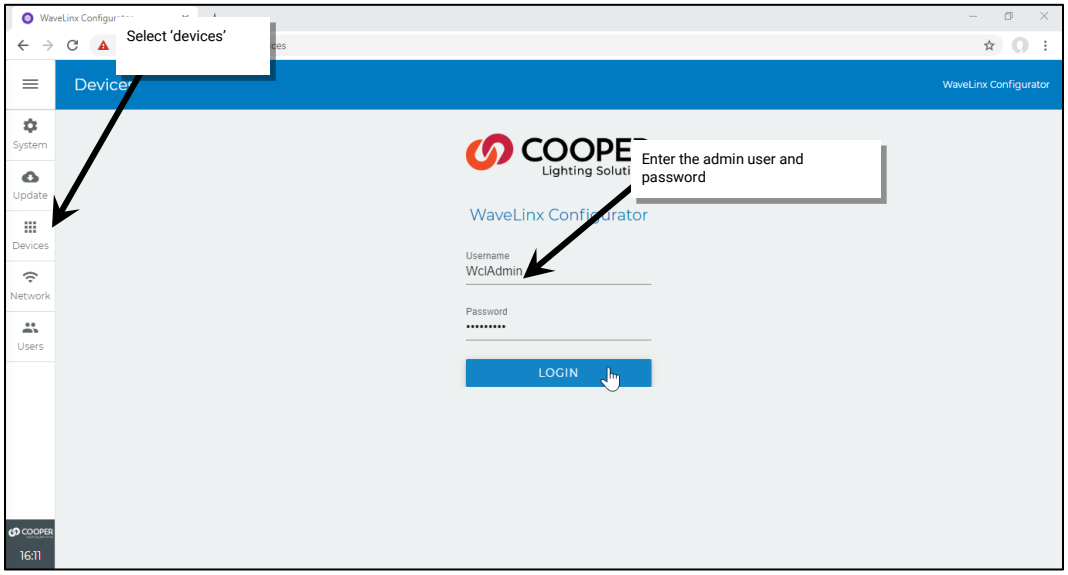
Before updating device firmware, ensure that the Wireless Area Controller firmware has been updated per the instructions on page 176. This should populate the firmware for all WaveLinx devices. If an individual device file has been provided, use this same procedure to upload the provided .ota device file to the Wireless Area Controller.

Manually Updating WaveLinx Device Firmware

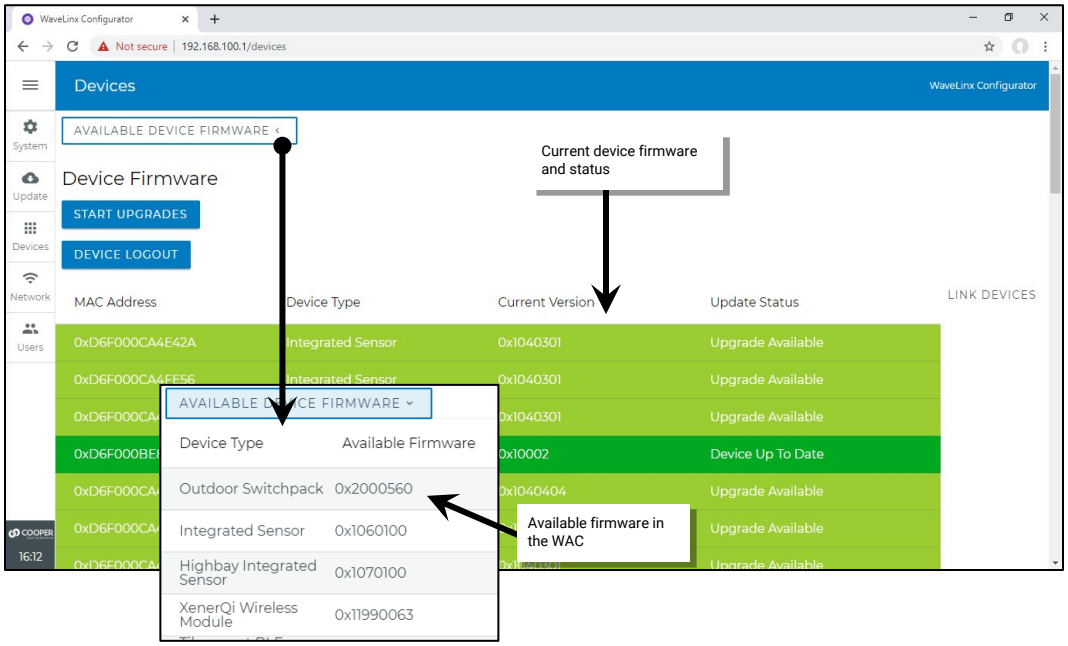
To manually update WaveLinx device firmware:

Step 1: Establish a connection from the computer to the Wireless Area Controller as the administrator user.

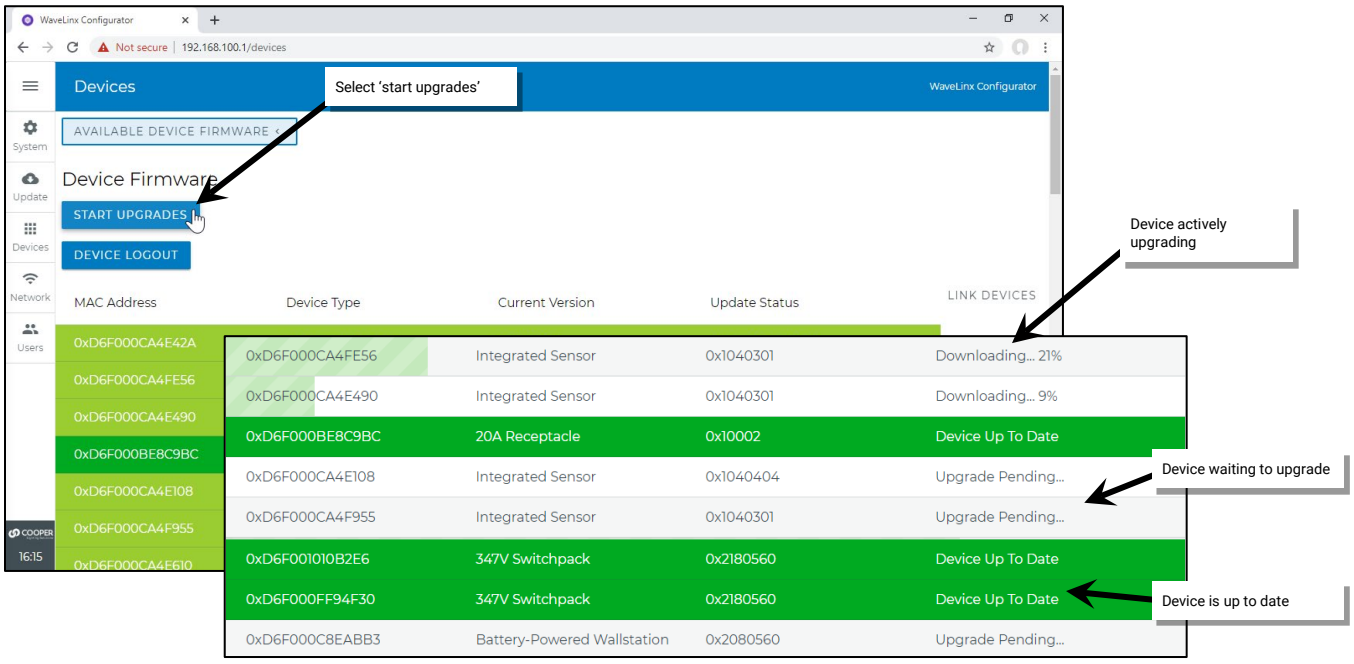
Step 2: Select the ‘devices’ page. When prompted, re-enter the Administrator username and password. (UN: WclAdmin, Pass: wclAdmin).



Step 3: A list of paired devices will show along with the status of the firmware. If desired, review the ‘available device firmware’ list against the actual device firmware.

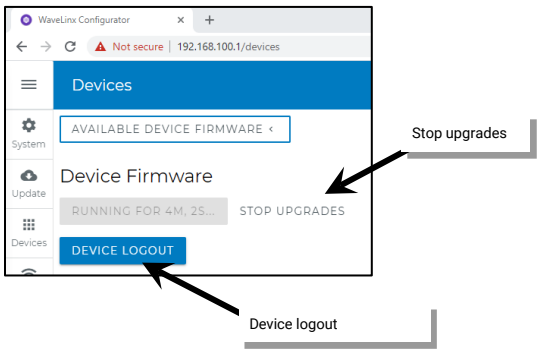


Step 4: Select the start update option to begin the update process. In most cases, the update processes two devices at a time. Devices may take several minutes to process the update (some device types may take significantly longer than others). The page will show a status display indicator for devices that are actively updating and will show any devices that are pending. Once one device finishes, the controller will move on to the next device and will continue until all devices are updated. If the Wireless Area Controller is in a location that is visible, the power LED or other LEDs may flash during the firmware update process. Upon completion, the power LED will turn ON and remain ON and the blue 802.15.4 LED will be illuminated (Other LEDs may also be on dependent on network connections).

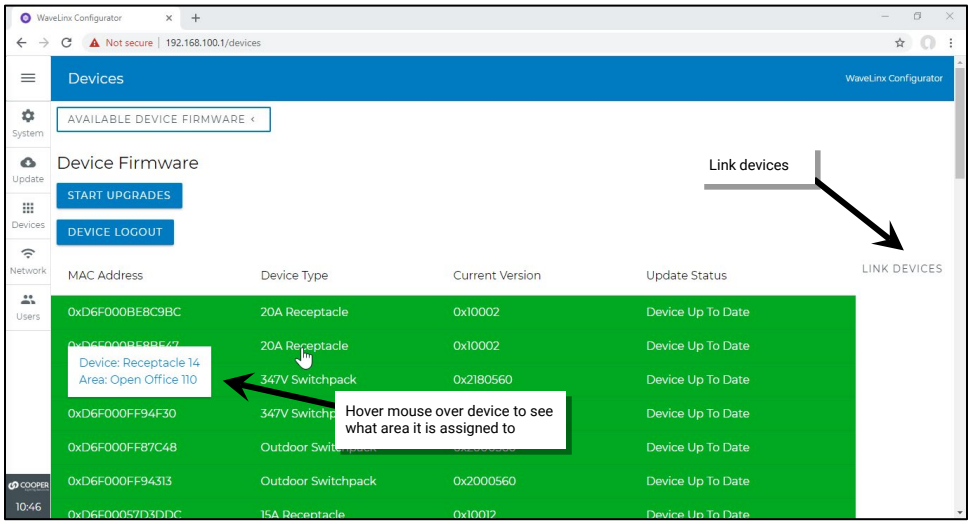


Note: It is not necessary to keep the computer connected to the system once the device update process starts. To disconnect, select 'device logout' option, and then select the 'logout' option from the main menu. To check the status of the update at a later time, log back in and log in to the 'devices' page. If the update is still processing, the status bars will show accordingly. If the update is complete, no updates will be available, and all devices will show a 'device up to date' status.

It is also possible to suspend the update by selecting the 'stop upgrades' option which will suspend the update activity. Restart the upgrade at a later time by selecting 'start upgrades' option.



Useful Tip: It is possible to view the associations of the devices to the areas they are assigned to in the WaveLinx Mobile Application. Select the 'link devices' option. After a moment, the devices will recognize the areas they are in. Simply hover over a device to determine what area a device belongs to.



Quick Links for Common Questions

- What will my devices do during a firmware update? See the answer on page 200.

Using the Auto Upgrade Function

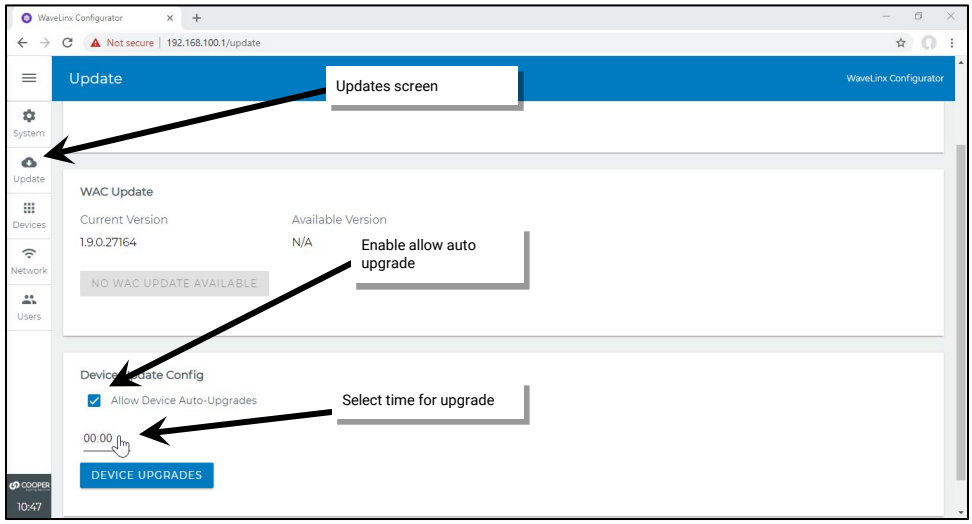
The auto upgrade function is disabled by default and must be specifically enabled. This function ensures that devices that are paired with the Wireless Area Controller automatically update the firmware if needed during the following circumstances:

- If the Wireless Area Controller is updated and the controller firmware for the devices is newer than the installed devices, the update will begin 1 hour after the Wireless Area Controller reboots from the controller update. The delay allows enough time for devices to rejoin the controller after the initial controller update.
- At any other time, if the firmware of a paired device is found to be older than what is in the Wireless Area Controller, the firmware of the device(s) will be update at the user defined time after the discrepancy is detected.

To enable the auto upgrade function:

Step 1: Establish a connection from the computer and the Wireless Area Controller as the administrator user.

Step 2: Select the 'update' page and then scroll down to the 'Device Update Config' section. Enable the option to allow auto upgrades and then click on the time field to select the desired time for the auto upgrade to run.



Quick Links for Common Questions

- What will my devices do during a firmware update? See the answer on page 200.

Advanced Network Administration

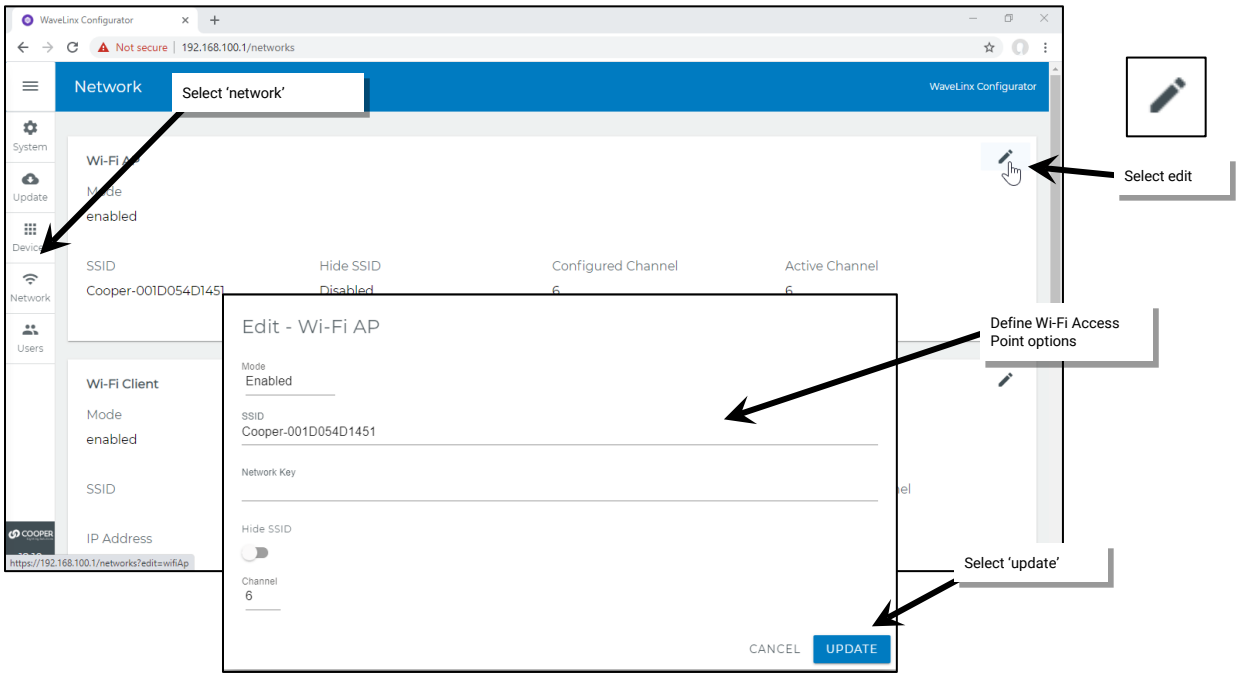
Additional administrator settings are available for advanced network functions. This includes:

- Changing Wi-Fi access point settings
- Changing Wi-Fi client settings
- Changing Ethernet settings
- Changing DNS settings
- Assigning a custom certificate

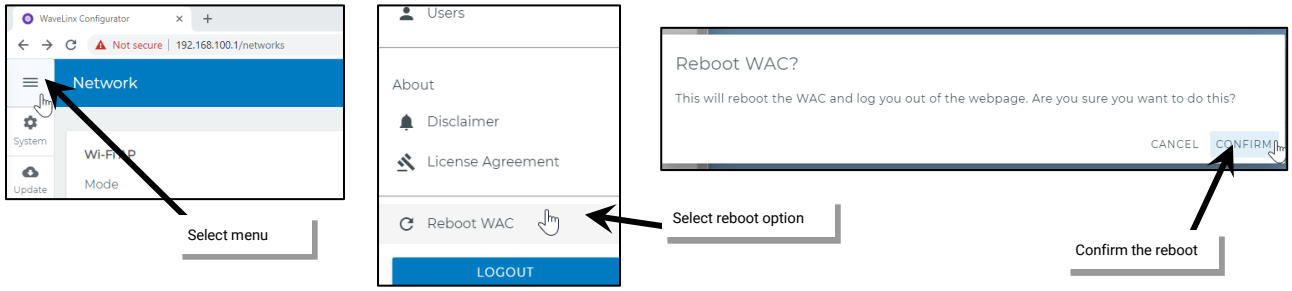
Changing Wi-Fi Access Point Settings

The Wireless Area Controller may be used as an access point for the Mobile Application communications. By default, the wireless access point is enabled and uses the unit's MAC ID plus one for its SSID. To update the Wi-Fi access point settings, select the 'network' page, and then click on the pencil icon in the Wi-Fi AP section. Settings that may be configured include:

- **Enabled/Disabled/On Demand**: If the Wireless Area Controller is placed on the building LAN for administration and access, the internal wireless access point may be disabled. Alternately, the access point may be set for on-demand mode, allowing the access point to be temporarily enabled for 30 minutes upon reboot, or when manually triggered from the activate AP button on the webpage.
- **SSID**: The SSID may be changed from the default by typing in the new desired SSID in the field provided. Network Key: The network key (password) may be updated from the default to be a unique and more complex password to enhance access point security.
- **Hide SSID**: The SSID may be hidden. If the SSID is hidden, it will not be shown in the available list of wireless networks. Users will need to know the SSID to manually connect to the access point. If connecting manually, the wireless access point defaults to using WPA2 security by default.
- **Channel**: The Wi-Fi Access Point will automatically select a Wi-Fi channel. Advanced administrators may change to a specific Wi-Fi channel if encountering interference on the default channel.



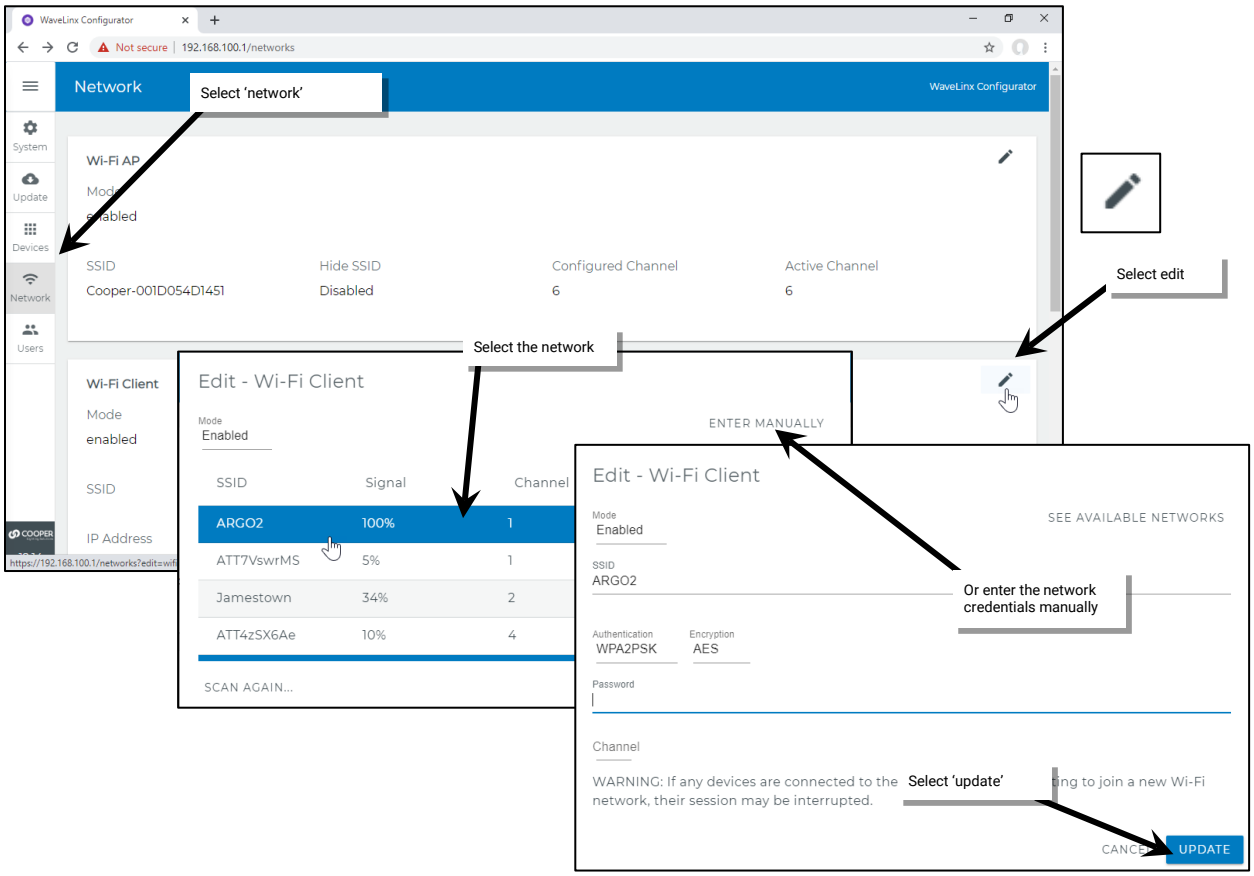
If any setting is changed, it will be necessary to reboot the WAC before the changes take effect. Once all changes are made, from the menu select the 'reboot WAC' option, and then confirm.



Note: Wi-Fi channel modification does not require a reboot.

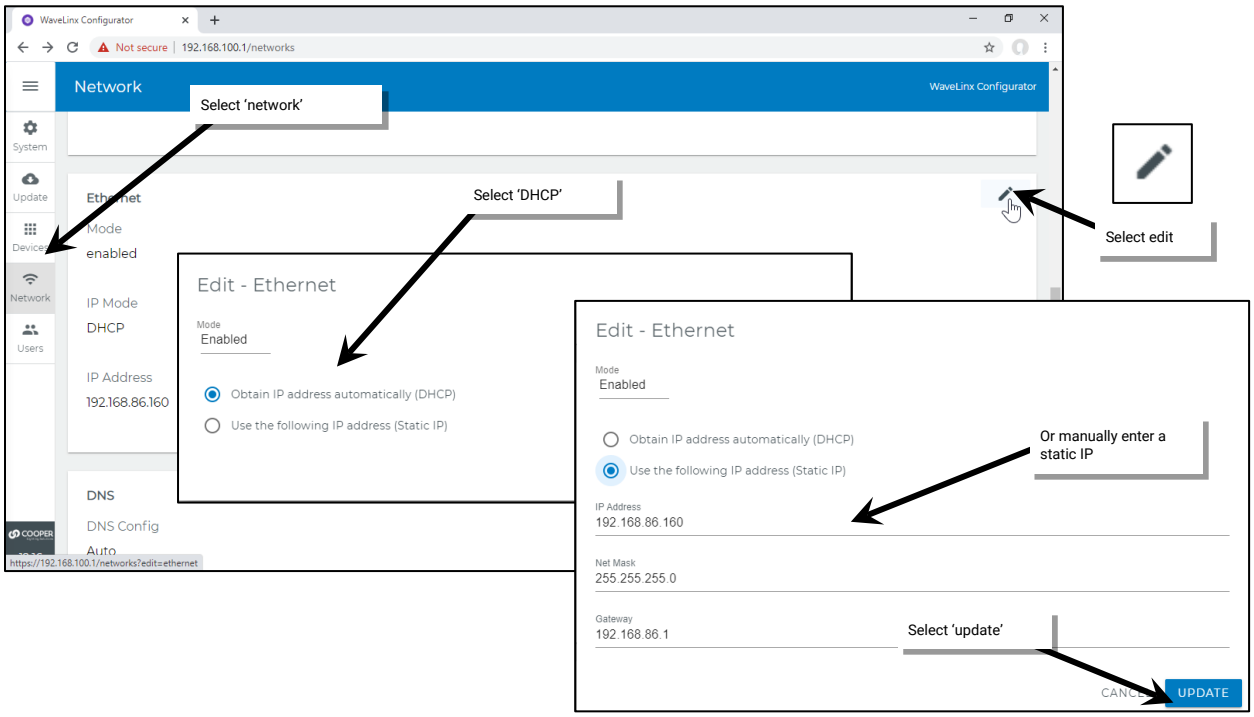
Changing Wi-Fi Client Settings

The Wireless Area Controller may be connected to the facility's building WLAN for wireless communications. To access the Wi-Fi client settings, select the 'network' page, then click on the pencil icon in the 'Wi-Fi client' section. The Wi-Fi client screen will open and will begin a wireless network search. Ensure that the Wi-Fi client mode is enabled, and then select the desired network. Type in the password for the network and select the 'update' button. Advanced administrators only may change to a specific Wi-Fi channel if encountering interference on the default channel. Optionally select the 'enter manually' option to type in the necessary connection credentials by hand.



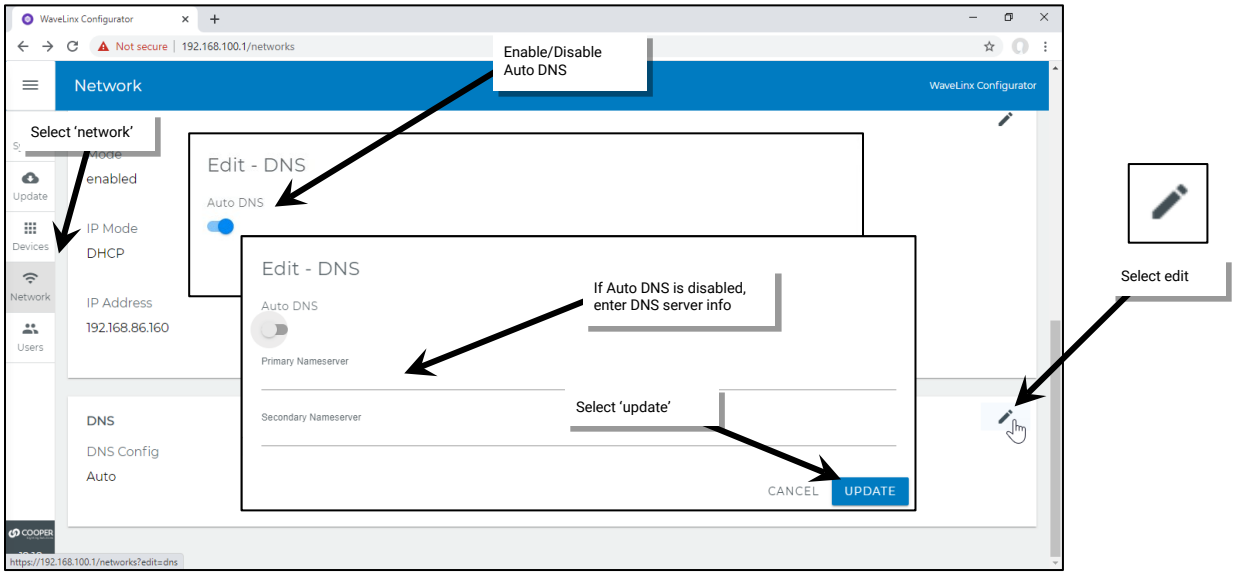
Changing Ethernet Settings

If the Wireless Area Controller is installed into the facility's building LAN, by default, it is set for obtaining an IP address automatically through DHCP. It is possible to assign a static IP by changing the selection to use a defined IP address, and then typing in the desired IP address, subnet mask and default gateway. To access the Ethernet settings, select the 'network' page, and then click on the pencil icon in the Ethernet section. Ensure the Ethernet mode is set to Enabled, if using an Ethernet connection, then select the desired options.



Changing DNS Settings

If not using DHCP, it is possible to hardcode the domain name server settings into the WAC. Select the 'network' page, then click the pencil icon within the 'DNS' screen. To manually enter the DNS, turn off the 'Auto DNS' option and then type the IP addresses of the desired domain name servers. For non-public domain name servers, use a manual name server entry.



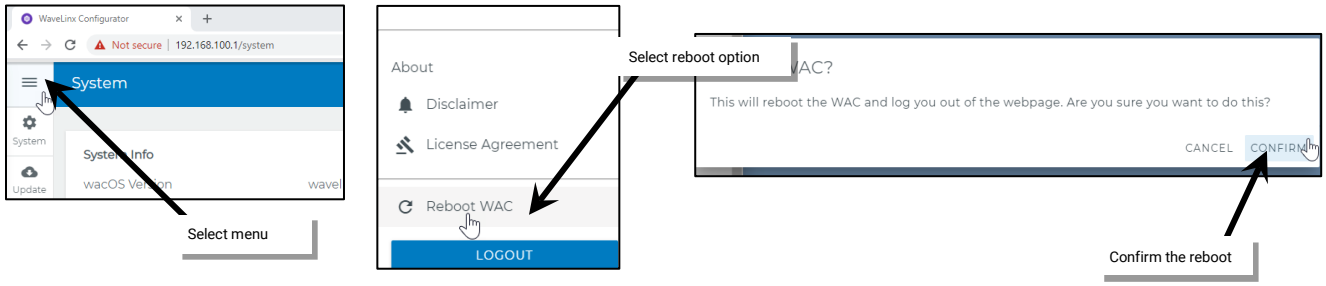
Custom Certificates

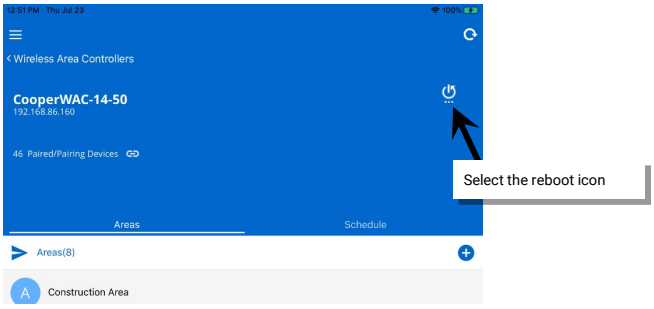
WaveLinx uses Cooper Lighting Solutions provided default SSL certificates that are installed with the system to certify Wireless Area Controller communication to mobile devices and computers. The provision has been made to allow for future support of other custom certificates. This custom certification option feature is not currently operational and should not be used without discussion with Cooper Lighting Solutions technical support team.

Rebooting the Wireless Area Controller

It is possible to reboot the Wireless Area Controller from the internal webpages or from the Mobile Application. During changes to network settings, the system may prompt for a reboot.

To perform the reboot, select the reboot option from the internal webpage menu, or on the Mobile Application's area list screen. Once started, a reboot takes approximately 2 to 4 minutes to complete. Status messages may be displayed on the WAC internal webpage as the WAC reboots.



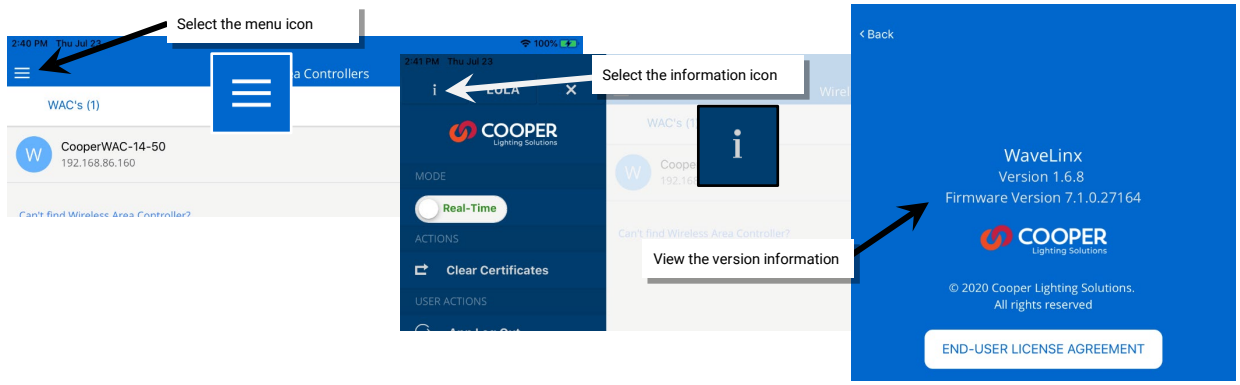


Viewing Mobile Application Version

Use the WaveLinx Mobile Application to view the current application version.

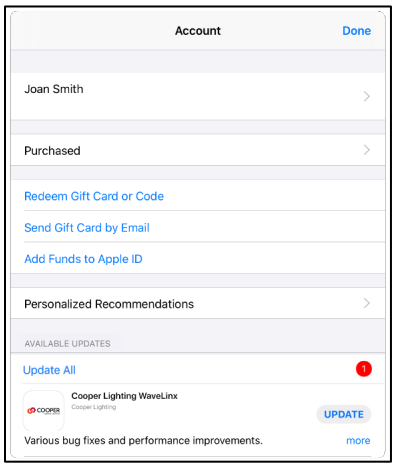
Step 1: On the user's mobile device, open the WaveLinx Mobile Application. The Mobile Application does not need to be connected to the Wireless Area Controller to view the version information.

Step 2: At the top-left corner of the screen, tap the menu icon and then select the information icon. The screen will display the application version. If the Mobile Application is connected to a Wireless Area Controller, the Wireless Area Controller firmware version will also be displayed.



Updating the Mobile Application

From time to time, updates may be available for the WaveLinx Mobile Application. Updates will be performed per the user's preference settings on each mobile device. If not updated automatically, updates may be installed manually from the updates section of the App Store or Google Play Store.



Replacing and Syncing End Devices using the Mobile Application

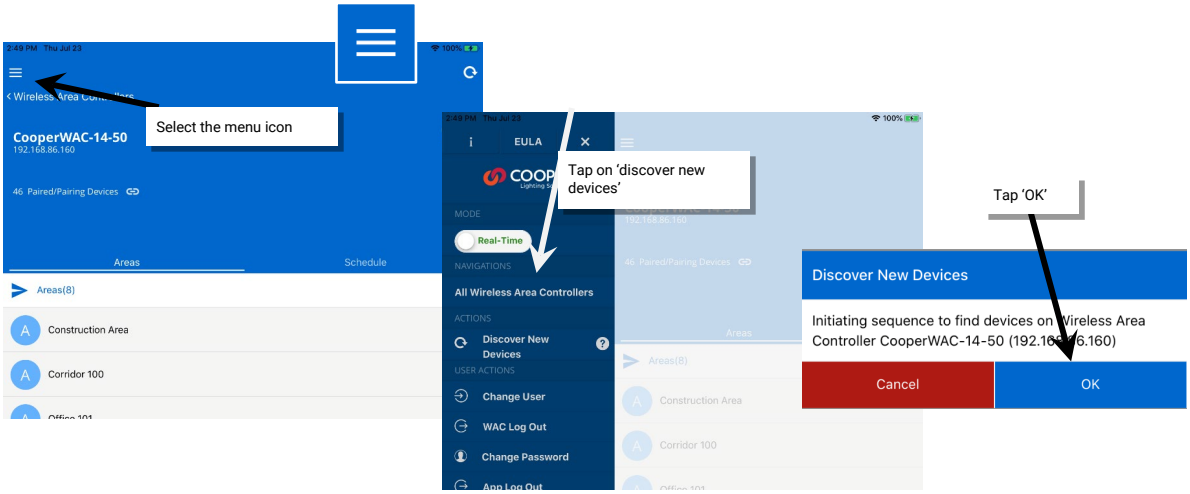
If a WaveLinx device is replaced in the system, the Mobile Application may be used to synch the previous device's settings to the new device.

To perform the device synch:

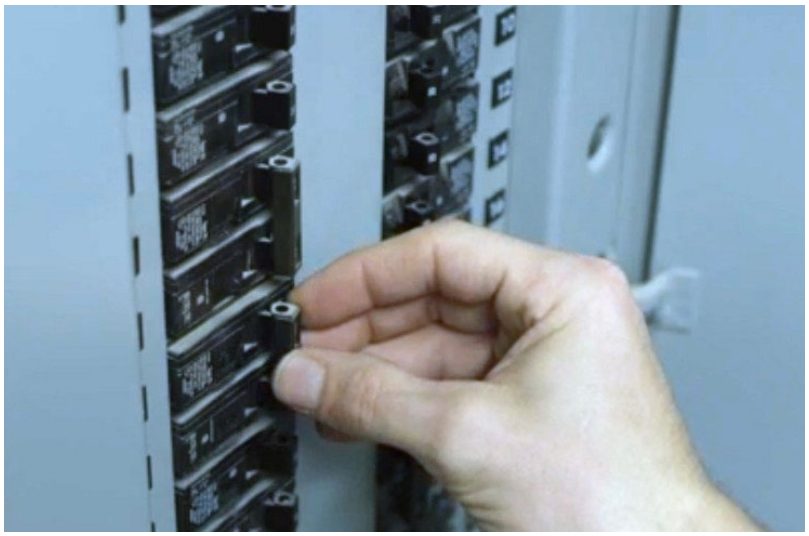
Step 1: Install the replacement device per the device's installation instructions.

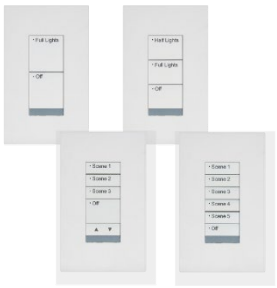
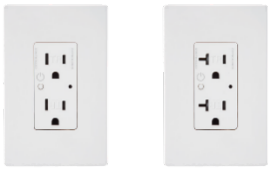
Step 2: Open the WaveLinx Mobile Application and establish a connection with the Wireless Area Controller as the administrator user.

Step 3: From the WaveLinx Mobile Application, select the menu icon. Tap on the option to enable pairing and then tap on the OK button to proceed.



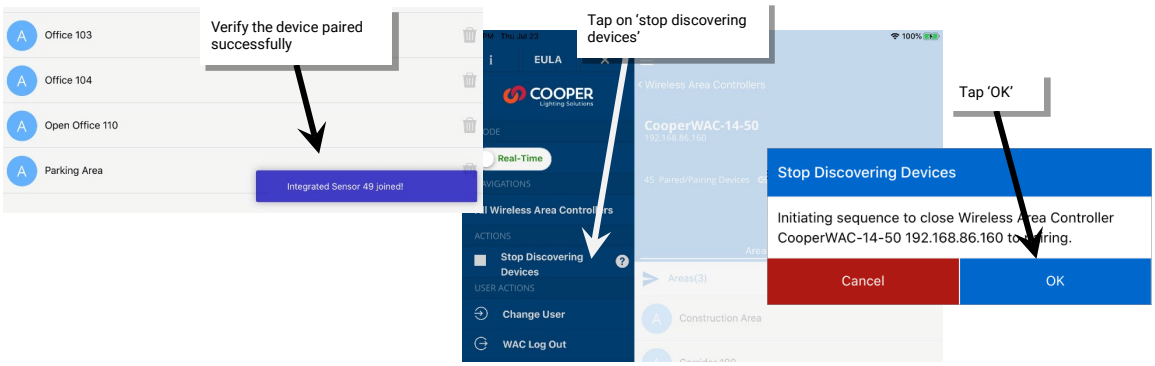
Step 4: Place the replacement device in pairing mode. See the below chart for information on how to place specific devices in pairing mode:

Device Type	How to place in pairing mode
WaveLinx Wireless Dimming Switchpack (WSP-MV-010: 120-277VAC model)  WaveLinx Integrated Sensor  WaveLinx Tilemount Sensor Kit  WaveLinx Industrial Integrated Sensor  WaveLinx Outdoor Integrated Sensor  WaveLinx Wireless Fixture 	Cycle the power (switch OFF and then ON) of each identified circuit using the circuit breakers. This places the devices into pairing mode and starts their search for a Wireless Area Controller. Pairing mode automatically times-out after 60 minutes if a device does not successfully pair with a Wireless Area Controller. Only unpaired devices will enter pairing mode on the power cycle.  **Note**: Standard WaveLinx Wallstations (line voltage powered) will also respond to this pairing technique.

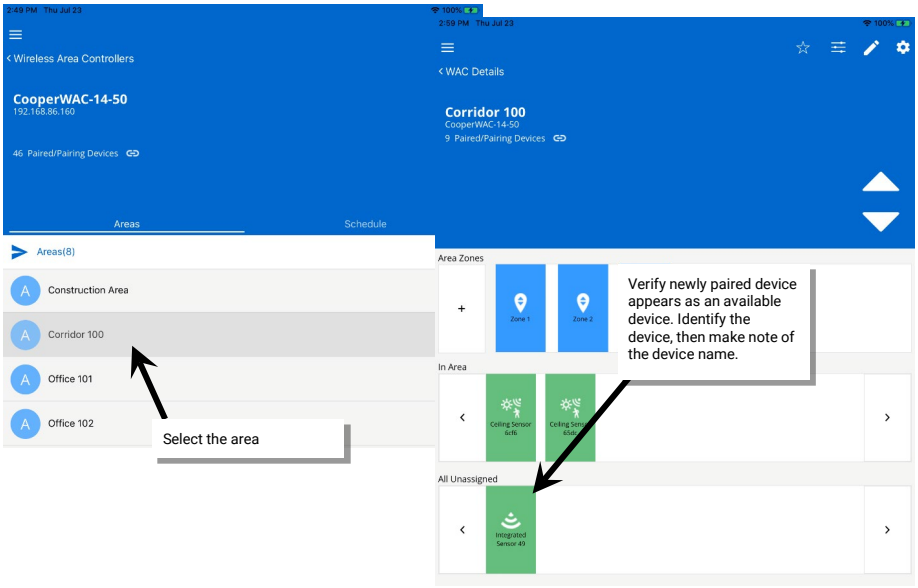
Device Type	How to place in pairing mode
WaveLinx Wallstation  WaveLinx Battery Powered Wallstation 	Press any button on the Wallstation to initiate a PAIR request from any unpaired wallstation. • On the standard WaveLinx Wallstation (line voltage powered), the LED on the button pressed should flash slowly for approximately 10 seconds. • On the WaveLinx Battery Powered Wallstation, the red LED below the buttons may flash briefly when the proximity sensor detects someone near and may flash intermittently during the pairing process. No other feedback from button LEDs will occur.
WaveLinx Wireless Outdoor Lighting Control Module  WaveLinx Wireless Dimming Switchpack (WSP-CA-010: 120-347VAC model) 	If in an unpaired state, these devices will automatically pair when they receive the Wireless Area Controller PAIR mode signal. The search command re-initiates every 20 minutes until a pair forms. A power cycle to these devices will cause the search to start again approximately 20 seconds after the initial power up. If connected to control lighting, connected fixtures will dim briefly when paired then turn ON to a brighter light level and remain ON. It may be difficult to review paired behavior during the initial pairing cycle. Pairing can be verified after PAIR mode exits (see chart that follows this section). If used only for a contact input device, there is no immediate feedback that the pairing was successful. Pairing will be verified through the Mobile Application in a later step.
WaveLinx Ceiling Sensor 	Within the 60-minute pairing period, use one of the following methods to place each of the Occupancy Sensors into PAIR mode. • (Preferred method) Press the wireless PAIR button onboard the sensor to initiate the pair process. • Shine a bright flashlight into the lens of each battery powered ceiling sensor to place the sensor into PAIR mode. • Motion activity may also trigger the sensor into PAIR mode although this method is less reliable. The LED in the sensor window will flash ON and OFF for 10 seconds to indicate it is in pairing mode before going back to its normal blink pattern.
WaveLinx Receptacle 	Within the 60-minute pairing period, at each receptacle location, press and hold down the manual push button for 5 seconds and then release the push button when the LED starts flashing red. **Note**: The LED may flash red or cycle between green and amber during the pairing process.

Step 5: Wait a few minutes to give the system enough time to find the device. The device may display a message briefly on the Mobile Application when it joins the paired construction group. The device will show in the construction group if the message was missed.

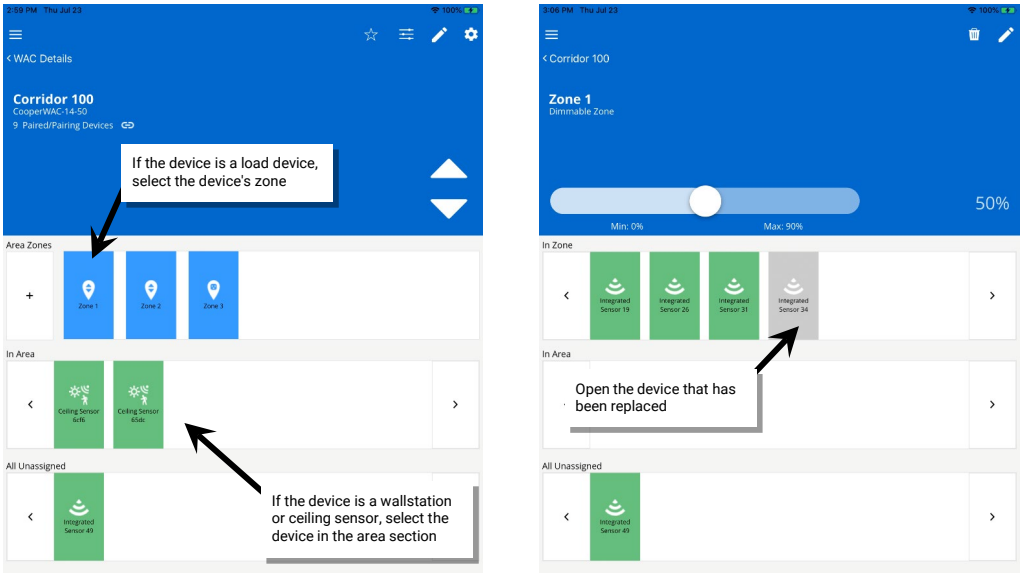
Once the device has joined, select the menu option to stop discovering devices and tap OK to cancel pairing mode.



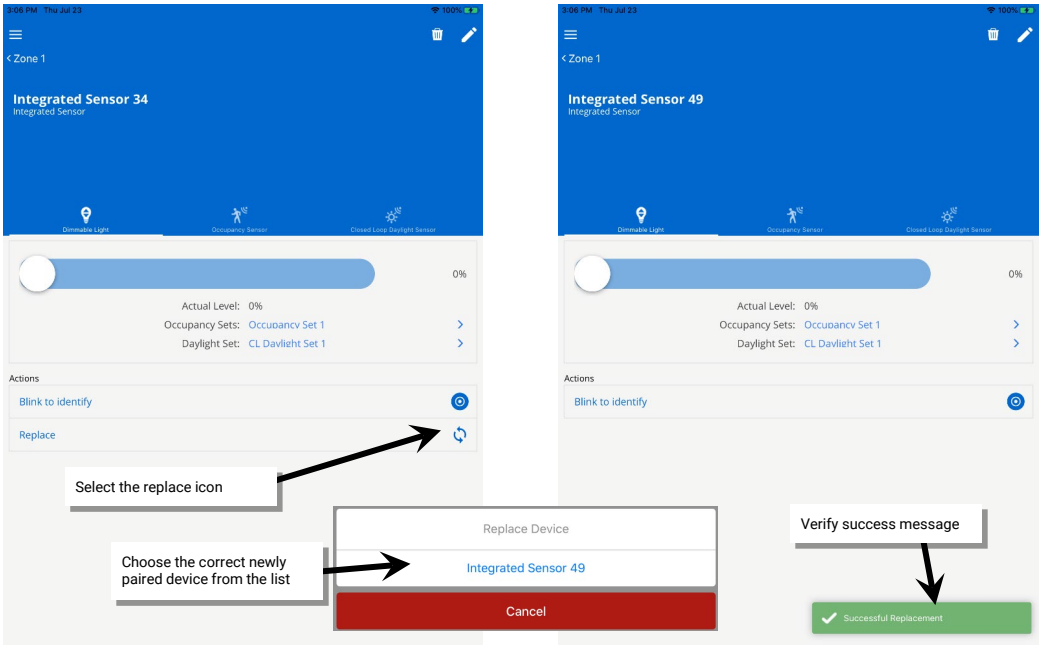
Step 6: In the areas list, select the area that the replacement device belongs in and verify that a device shows in the all unassigned devices section. Double tap the device to place it in blink to identify mode or use the device identification methods beginning on page 38 to ensure that the device showing is the expected device and then make note of the device name.



Step 7: Next, open the originally programmed device. For load devices, open the device's control zone. For wallstations or ceiling sensors, locate the device in the 'in area' section. Note that the icon for the device may be gray or red indicating that the device has lost communication.



Step 8: In the device screen, select the replace icon. When prompted, select the name of the replacement device from the list. Wait for the application to display a success message. After a brief delay, the device will begin operation per the original device settings.



Quick Links for Common Questions

- What will my devices do if they lose communication with the Wireless Area Controller? See the answer on page 201.

Using the Wireless Area Controller PAIR Button Advanced Functionality

The WaveLinx Wireless Area Controller PAIR button is used during the initial construction grouping pairing process. It also allows for some advanced functionality to reset administrator and Wi-Fi usernames and passwords and restore factory defaults. 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 table on page 22.	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 75% level and be operable by 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 LED. After approximately 2 minutes, the power 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	1. Power cycle the Wireless Area Controller and wait approx. 2 to 4 minutes for the reboot to occur. The power LED will be ON, and the 802.15.4 LED illuminated when the reboot is complete (other LEDs may be on depending on connections).
	2. 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[1]
		• 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 LED. After approximately 2 minutes, the power 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).

[1] **Note**: When factory reset is performed, device associations will be removed from the Wireless Area Controller, however, the devices will need to have the pairing manually removed before they will pair with the Wireless Area Controller again. Refer to the procedure on page 195 for steps on manually resetting the device pairing.

Common Questions

This section has some commonly encountered scenarios that may occur when following the procedures in this manual. Refer to this section for solutions to these scenarios.

One or more of my devices does not display the correct out-of-the-box functionality. What should I do?

Refer to the following chart organized by device type for troubleshooting steps. After performing the resolution steps, if the unexpected condition is not resolved, contact technical support using one of the following communications methods:

- Phone: 1-800-553-3879
- Email:

  United States: Controltechsupport@cooperlighting.com

  Canada: CANSupport@cooperlighting.com

Device	Unexpected Condition	Resolution Steps

Wireless Area Controller
 
 	
	• The blue power LED is not illuminated.
	• The green LAN LED is not illuminated.
	• The blue 802.15.4 LED is not illuminated.
	• Other LEDs are illuminated on the unit.
		• Ensure the unit is connected to a PoE switch or injector for power.
		• Try to perform the PAIR function. If the PAIR operation works and the unit appears operational, continue with configuration.
		• Other LEDs may be illuminated dependent on the other connections to the controller.
		  • Blue Wi-Fi LED will be ON if there is a valid Wi-Fi connection and will blink with active communications.
		  • WAN LED will be ON if there is an active connection from a third-party device and will blink with active communications.
		  • LAN LED will be ON if the controller has a defined IP address (DHCP/static) and is on the building network. It will blink with active communications.
		  • Bluetooth LED should always be OFF.
		• If connected properly and the PAIR functionality does not work, make note of the current LED statuses, and contact technical support.

WaveLinx Wireless Dimming Switchpack (WSP-MV-010: 120-277VAC model)	LED and connected load is OFF.	• Press the onboard push button for less than 4 seconds to try to toggle the load ON. • If the load and LED do not respond, verify that the circuit wiring is properly connected and energized. • Disconnect 0-10V wiring from switchpack. Load should go to full bright when these wires are separated. • Contact technical support if the problem persists.
WaveLinx Wireless Dimming Switchpack (WSP-CA-010: 120-347VAC model)	Connected load is OFF.	• Verify that the circuit wiring is properly connected and energized. • Disconnect 0-10V wiring from switchpack. Load should go to full bright when these wires are separated. • Contact technical support if the problem persists.
WaveLinx Integrated Sensor and WaveLinx Tilemount Sensor	No LED in the sensor window and the connected fixture is OFF.	• Verify that the fixture's power source is connected and powered from the circuit breaker. • Ensure that there is motion activity within the sensor's viewing field. • Try to perform the PAIR function. If the PAIR operation works, the LED may be turned off via a software setting. Once the device is paired and accessible in the Mobile Application, select the device to review the occupancy sensor settings and ensure that the LED function is enabled. • If the PAIR function fails to find the fixture/sensor and the fixture/sensor is still not responding, contact technical support.
	No LED in the sensor window and the connected fixture is ON.	• Try to perform the PAIR function. If the PAIR operation works, the LED may be turned off via a software setting. Once the device is paired and accessible in the Mobile Application, select the device to review the occupancy sensor settings and ensure that the LED function is enabled. • If the PAIR function fails to find the fixture/sensor, contact technical support.

Device	Unexpected Condition	Resolution Steps
	LED in the sensor window blinks white instead of green.	• The sensor has been previously paired with a Wireless Area Controller. If there is more than one Wireless Area Controller at the facility, identify which Wireless Area Controller is paired by successively placing the Wireless Area Controllers into PAIR mode to locate which unit prompts a dimming response in the load in question. Then, use the Mobile Application to identify and delete the device manually from the incorrectly paired Wireless Area Controller. The device's LED should then blink green indicating its ready state for pairing.
WaveLinx Wireless Fixture	The connected fixture is OFF.	• Verify that the fixture's power source is connected and powered from the circuit breaker. • Try to perform the PAIR function. • If the PAIR function fails to find the device and the fixture is still not responding, contact technical support.
WaveLinx Industrial Integrated Sensor **Note** In high mount applications, it may be difficult to see the LED.	No LED in the sensor window and the connected fixture is OFF.	• Verify that the fixture's power source is connected and powered from the circuit breaker. • Verify that the sensor is fully seated on the fixture mounting. • Contact technical support for further assistance.
	No LED in the sensor window and the connected fixture is ON.	• Try to perform the PAIR function. If the PAIR operation works, the LED may be turned off via a software setting. Once the device is paired and accessible in the Mobile Application, select the device to review the occupancy sensor settings and ensure that the LED function is enabled. • If the PAIR function fails to find the fixture/sensor, contact technical support.
	LED in the sensor window blinks white instead of green.	• The sensor has been previously paired with a Wireless Area Controller. If there is more than one Wireless Area Controller at the facility, identify which Wireless Area Controller is paired by successively placing the Wireless Area Controllers into PAIR mode to locate which unit prompts a dimming response in the load in question. Then, use the Mobile Application to identify and delete the device manually from the incorrectly paired Wireless Area Controller. The device's LED should then blink green indicating its ready state for pairing.
WaveLinx Outdoor Integrated Sensor **Note** In high mount applications, it may be difficult to see the LED.	No LED in the sensor window and the connected fixture is OFF.	• During daytime hours, the sensor may have lighting turned OFF due to out-of-the-box ON at dusk, OFF at dawn operation. Verify operation after dusk. • Verify that the fixture's power source is connected and powered from the circuit breaker. • Verify that the sensor is fully seated on the fixture mounting. • Contact technical support for further assistance.
	No LED in the sensor window and the connected fixture is ON.	• Try to perform the PAIR function. If the PAIR operation works, the LED may be turned off via a software setting. Once the device is paired and accessible in the Mobile Application, select the device to review the occupancy sensor settings and ensure that the LED function is enabled. • If the PAIR function fails to find the fixture/sensor, contact technical support.
	LED in the sensor window blinks white instead of green.	• The sensor has been previously paired with a Wireless Area Controller. If there is more than one Wireless Area Controller at the facility, identify which Wireless Area Controller is paired by successively placing the Wireless Area Controllers into PAIR mode to locate which unit prompts a dimming response in the load in question. Then, use the Mobile Application to identify and delete the device manually from the incorrectly paired Wireless Area Controller. The device's LED should then blink green indicating its ready state for pairing.
WaveLinx Ceiling Sensor	LED does not flash	• Ensure that the sensor batteries are installed and charged.

Device	Unexpected Condition	Resolution Steps
WaveLinx Wireless Outdoor Lighting Control Module	Connected load is OFF or ON continuously.	• This device will operate the connected fixture via the onboard daylight sensor until the device is paired with a Wireless Area Controller. To verify functionality, power down, then power up the device via the circuit breaker. Immediately after power up, verify that the lighting load turns ON to 100% initially. The daylight sensor will then dictate whether the load remains ON or turns OFF. • If load does not turn on initially upon power up, verify all connections and ensure the module is properly seated in the fixture's onboard mounting receptacle. • Contact technical support if the problem persists.
WaveLinx Wallstation standard line voltage powered	All the button LEDs are flashing quickly.	• The wallstation is still in pairing mode and is indicating a successful connection to a Wireless Area Controller. The wallstation will automatically time-out from this function after 1 hour. • If the Wireless Area Controller has exited PAIR mode already, the press of the wallstation button should also cancel the LED flash behavior.
	When a button is pressed, no LEDs illuminate.	• Verify that the circuit wiring is properly connected and energized. • Contact technical support if the problem persists.
	When a button is pressed the LED flashes slowly for 10 seconds.	• The wallstation has not been paired with a Wireless Area Controller. Press the PAIR button on the wireless area to reinitialize the PAIR process, and then press the button on the wallstation again to reissue the join request (the button LED will flash slowly for 10 seconds again to indicate the join request will be sent. As it joins the network, the LED may flash very rapidly for approximately 5 seconds, and then flash all LEDs to indicate it is paired). • If the problem persists, verify that the distance of the wallstation to the controller is within the expected range and that there are fewer than 150 devices paired before contacting technical support.
	When the button is pressed, the LED stays ON.	• The wallstation has been previously paired and is part of either a construction group or Mobile Application defined area. If paired with the incorrect Wireless Area Controller, locate the controller that is responding to the button presses. Then, use the Mobile Application to identify and delete the device manually from the incorrectly paired Wireless Area Controller to allow pairing to the correct controller.
WaveLinx Battery Powered Wallstations	When a button is pressed, no button LEDs illuminate.	• Out-of-the-box, this is the correct behavior.
	When my hand is in proximity to the wallstation, the red LED under the bottom button does not flash.	• Verify that the batteries are installed properly for the wallstation and that they are fully charged. • Verify that your hand is within approximately 5cm of the wallstation. • Contact technical support if the problem persists.
	When the button is pressed, the LED on the button illuminates then turns OFF. When I have my hand close to the station, the LED on the button turns ON again.	• The wallstation has been previously paired and is part of either a construction group or Mobile Application defined area. If paired with the incorrect Wireless Area Controller, locate the controller that is responding to the button presses. Then, use the Mobile Application to identify and delete the device manually from the incorrectly paired Wireless Area Controller to allow pairing to the correct controller. • The LEDs will turn OFF automatically to the conserve battery life conserving energy until the wallstation is used again.
WaveLinx Receptacle	The outlet LED does not illuminate and there is no power on both outlets.	• Verify that the circuit wiring is properly connected and energized. • Contact technical support if the problem persists.
	The outlet LED does not illuminate and there is no power to the controlled outlet. The constantly powered outlet is operational.	• Press the onboard manual push button to try to toggle the LED and outlet state. • If the problem persists, contact technical support.

Pairing mode timed out before I was done adding my battery powered ceiling sensors or before I confirmed my devices paired properly. What should I do?

Simply press the PAIR button on the Wireless Area Controller again to re-establish pairing mode. All paired devices that are in the construction group will respond with the paired behavior and additional devices may be added. Review the chart on page 22 for more in-depth information on confirming paired behavior.

One or more of my devices did not pair to the controller or does not appear in my Mobile Application. What should I do?

First verify that the device still exhibits the proper out-of-the box behavior described on page 15. If it is not displaying the proper behavior, refer to the troubleshooting chart on page 192 to determine the cause before proceeding.

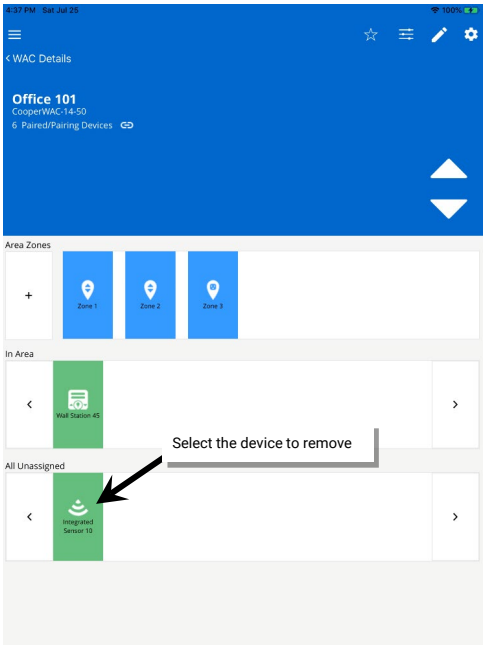
If the device is exhibiting the proper behavior press the PAIR button on the Wireless Area Controller and then place the device into pairing mode per the table on page 20. If the device still does not pair properly, verify that the distance is within the expected range and that there are fewer than 150 devices paired (100 devices is the recommended best practice) to the Wireless Area Controller before contacting technical support.

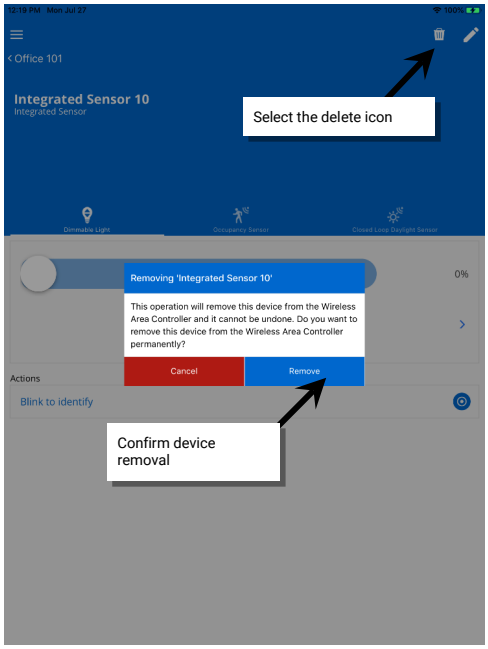
How do I unpair devices that have paired with the wrong Wireless Area Controller?

First ensure that you have performed the steps to connect to the Wireless Area Controller from the Mobile Application. Then organize all the devices that should be paired with this Wireless Area Controller into the correct areas and zones. After the devices are assigned, remaining devices will appear in the all unassigned device section of the Mobile Application and will still be assigned to the default construction area.

To remove a single device

For a single device, select the device to open the device screen, then select the trash can icon and confirm the deletion. Then, pair the device with the correct Wireless Area Controller.





To remove multiple devices

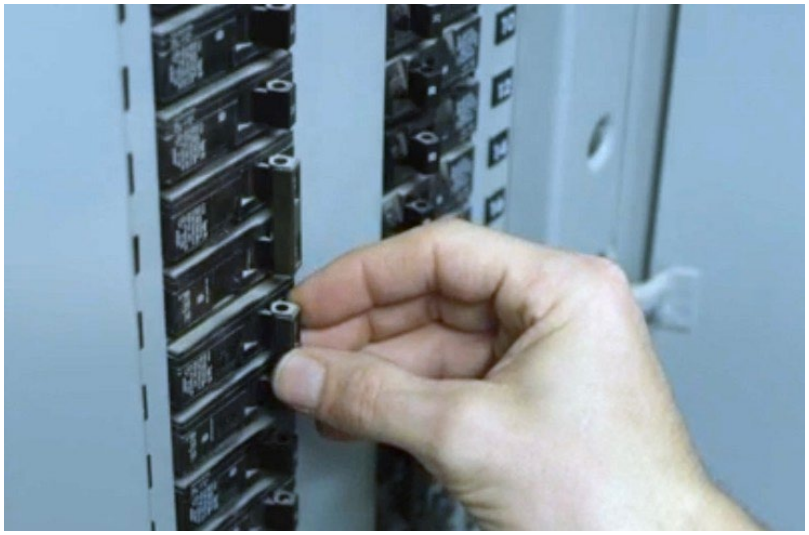
Remove all devices still assigned to the default construction group by pressing and holding the PAIR button on the Wireless Area Controller for 4 seconds. Then, go through the pairing process to pair the devices with the correct Wireless Area Controller.

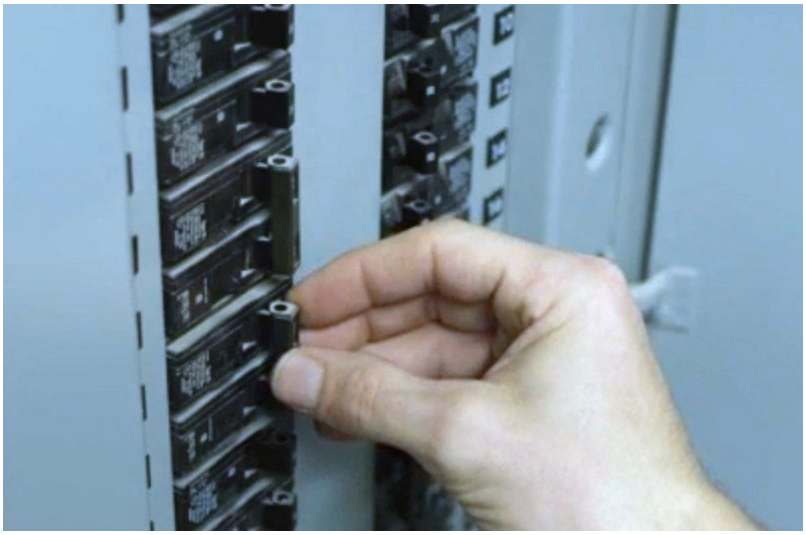
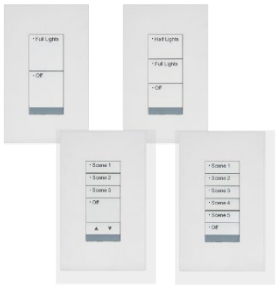
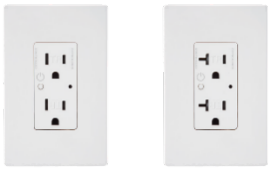
Note: This command will only affect devices that are still in the default construction area.

How do I manually force a device to unpair?

If a device is showing paired behavior but it is not visible in the mobile application, it may have been paired previously with a different controller. It is possible to manually force a device to unpair.

Each device has the ability of being removed from pairing by a specific sequence. The remove pairing sequence should only be used as a last resort. Please be aware for devices requiring power cycle sequences to remove pairing, if there are other like devices on the same circuit, the power cycle sequence will remove pairing for ALL devices that respond to this clear sequence. Use with caution!

Device Type	How to remove pre-existing pairing
WaveLinx Wireless Dimming Switchpack (WSP-MV-010: 120-277VAC model)  WaveLinx Integrated Sensor  WaveLinx Industrial Integrated Sensor  WaveLinx Outdoor Integrated Sensor  WaveLinx Tilemount Sensor Kit  WaveLinx Wireless Fixture WaveLinx Wallstation standard line voltage powered 	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.  **Note**: Some devices may flash their lights to indicate the reset was successful and will return to their out-of- the-box behavior. • WaveLinx ambient, industrial, and outdoor Integrated Sensors and loads connected to Tilemount sensors if previously ON will flash twice then remain ON. If OFF prior to reset, the flash behavior may not be observed, but lighting will turn ON.

Device Type	How to remove pre-existing pairing
WaveLinx Wireless Outdoor Lighting Control Module  WaveLinx Wireless Dimming Switchpack (WSP-CA-010: 120-347VAC model) 	**Preferred method:** Cycle the power to (switch OFF 6 seconds and then ON 6 seconds) the device's circuit six times. This removes pairing for ALL devices of this type on the affected circuit.[1]  [1] **Note**: Wireless Outdoor Lighting Control Modules prior to firmware version 0x2050560 (v2050560) and Wireless Dimming Switchpacks prior to firmware version 0x2180560 (v2180560) will not respond to the 6-power cycle method. Please use the alternate 20-cycle method shown below. **Alternate 20-cycle 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.
WaveLinx Ceiling Sensor 	Remove the battery for exactly 5 seconds then replace. The LED should illuminate on power up and then turn OFF. Immediately after the LED turns OFF, press the radio button ten times at 1 second intervals. To confirm the device has left the network, after the tenth button press wait a few more seconds, then press the radio button again. The LED should remain OFF initially and then flash slowly two times with a brief third flash.
WaveLinx Battery Powered Wallstation 	Remove the battery for exactly 5 seconds then replace. Immediately, press any button ten times at 1 second intervals.
WaveLinx Receptacle 	Press and hold down the manual push button for 5 seconds and then release the push button when the LED starts flashing red or green/amber.

I am done assigning my devices to areas, but I still have devices showing in my all unassigned devices list. What should I do?

If this is the only Wireless Area Controller in the facility, a device may have been added that is not shown on the plans. Connect to the Wireless Area Controller using the Mobile Application. Then, open the device configuration and select the blink to identify option located at the bottom of the screen. If the device is a standard ambient, industrial, or outdoor Integrated Sensor, a Tilemount sensor, a wireless Dimming Switchpack, or wireless outdoor lighting control module the connected load will start turning ON and OFF repeatedly during a 15-second period. If the device is a standard line voltage powered wallstation, the button LEDs will flash for a 15-second period. If the device is a receptacle, the LED on the receptacle will flash between green and amber if the outlet is ON or red and OFF if the outlet is OFF. Walk around the space until the device is identified, continuing to refresh the blink to identify command as needed.

Note: Battery powered ceiling sensors and battery powered wallstations do not have the option to blink to identify.

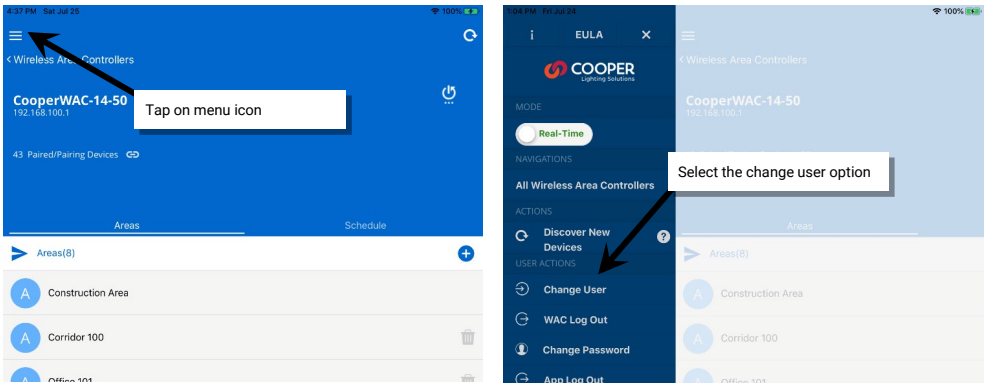
If there are other Wireless Area Controllers in the facility, the device may have paired with the incorrect controller. Follow the steps on page 195 to remove the device and to prepare it for pairing to the correct controller.

I installed a new device after I completed the initial construction pairing or I found a device that was not powered during the pairing process. How do I pair the new device into the existing construction group?

To pair an additional device after the initial construction pairing is complete, press the PAIR button on the Wireless Area Controller to reinitialize pairing and then place the device in pairing mode per the table on page 20. The device should join the existing construction group within the 60-minute pairing process.

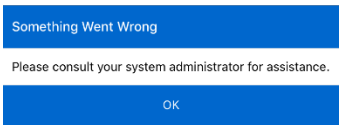
How do I switch users?

It is easy to change users in the Mobile Application. Simply select the menu icon at the top any screen, and then select the option to change user. Log in as the desired user.



When I open the Mobile Application, I get an error message. What should I do?

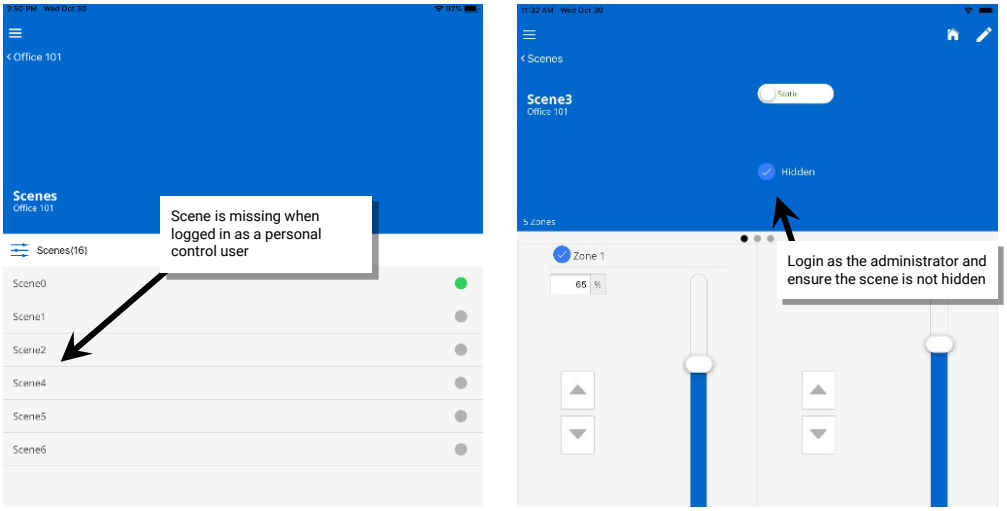
Review the displayed message. If it is a connection error, verify that the mobile device is still connected to the proper wireless network.



If it is not a connection error, shut down the application by double tapping the home button and closing it if using an iOS device, or close it through the recent applications function on android devices. Disconnect and then reconnect to the correct wireless network, and then open the application. Contact technical support if the problem persists.

When I log in as the personal control user, not all of the scenes are showing when I go to the scene screen. Why is this happening?

It is possible that the administrator of the system has hidden the scene during the configuration process. If this was done in error, log in to the system as the administrator user, and then select the area to modify. In the area's scene editor, select the affected scene and ensure that the hidden option is not active for the scene.



In personal control, I selected a scene, but the lighting did not appear to change. Why?

First, try selecting a different scene, or adjusting a zone. If there is still no change in the light level, ensure that the loads respond to basic ON and OFF control commands. If loads do not respond, log in as the administrator user and verify that the devices have not lost communication with the system.

If ON and OFF commands operate but the light level remains dim or if the light level remains OFF, the daylight sensors or an active demand response signal may be lowering the light output level. If demand response is not being used and the light level remains at a low level or OFF, ensure that the daylight sensors are properly calibrated by following the procedures on page 105 or page 110.

The lights are dimmed but the personal control screen or other screen indicators says that they are at 100%. Why?

The system may have any of the following active commands that can cause the lights to be dimmed:

- The maximum level (high end trim) assigned to the device's zone
- Active demand response signals
- Daylight sensor signals

If any of these items is calling for a light reduction, the system response is a reduced light output. Therefore, it is possible to have the light range reduced by the daylight sensor and still see that the light zone is at 100%. This reflects that the electric light is at the full 100% potential of the calibrated daylight level. If the light level does not seem to be correct for the space, ensure that the daylight sensors are properly calibrated by following the procedures on page 105 or page 110.

I work between two different spaces in my facility. Can I control both rooms through the Mobile Application?

It is possible to control any area as a personal control user. During setup, one of the areas may have been assigned as a favorite area, meaning the application will open to that area by default. To navigate to a different area, simply touch the back button at the top-left corner of the screen, and then select the desired area in the list.

If the area is controlled through a different Wireless Area Controller than the original area and the Wireless Area Controllers are not connected to the facility's building LAN, it may be necessary to switch the mobile device connection to a different wireless network to control the additional area.

I am not using demand response. How do I disable it?

There is no need to disable the demand response feature. If a demand response system is not connected, the system will not trigger a demand response command unless placed into test mode through the Mobile Application. The test mode may be cancelled through the Mobile Application or will time-out automatically after 30 minutes if it is triggered in error.

I want to use demand response. How do I make the connection to my demand response system?

For information on integration and connection to the demand response system, refer to the Trellix manual.

My schedule events are running but they are running at the incorrect time. What could be causing this?

The Wireless Area Controller may not be on the correct time and date or may be set for the incorrect time zone. Refer to page 161 to set the time, date, and time zone in the controller. Also, make sure that the schedule event time has been entered in military time format.

How do I define the astronomic clock's latitude and longitude?

The astronomic clock's latitude and longitude as well as the time zone are set through the Wireless Area Controller's internal webpages. Refer to page 161 to set the location and time zone for the controller.

What will my devices do during a firmware update?

During firmware update, devices will remain in their current state until the update is complete, and they have rejoined the wireless network after a reset upon completion. Then they will begin to operate from schedule events or user/device commands.

I am installing a replacement Wireless Area Controller. Do I need to go through the construction grouping process to pair the devices with the new Wireless Area Controller?

During database restoration, the previous Wireless Area Controller's ID and device tables will be populated into the new Wireless Area Controller negating the need to pair the devices with the new Wireless Area Controller. Simply restore the backup to the new Wireless Area Controller and once the backup is completed, the devices will begin to operate. The restoration process may take approximately 1½ hours to propagate to all devices.

My backup was done prior to a firmware update. Can I restore the older backup if I have updated the firmware in my devices?

Yes, you can. The backup contains not only the saved settings, but also a backup of the firmware that was present in the Wireless Area Controller at the time that the backup was created. During the restoration, the Wireless Area Controller firmware will be replaced with the version that was present during the backup. The firmware of other devices will not be downgraded and will continue to run with the most current firmware. Once restoration is complete, wait approximately 1 ½ hours to allow devices to rejoin the network and then ensure that the Wireless Area Controller and devices are updated to the latest firmware. Make sure to create a new backup.

After I calibrated the closed loop sensors, I noticed that the light output is different for each fixture. Why is this occurring?

Each sensor in a closed loop system is maintaining a light level for its directly connected fixture(s). This can result in a different electric light output for each separately controlled fixture making the ceiling light output look uneven. Keep in mind that the goal of closed loop is to keep the light level at the work surface consistent, not the light output at the ceiling.

My lights over my desk appear to adjust to different dimming levels even through the daylight does not appear to change. Why is this happening?

Sensor placement is critical to proper daylight function. With both open and closed loop sensors, what the sensor is "looking" at will affect the reading of the sensor. Darker furnishing may be less reflective, resulting in the electric light being brighter. Lighter furnishing may be more reflective, resulting in electric light being dimmer. Placement of a sensor over a surface that frequently changes will affect the overall performance. This also includes papers on the desk surface, or even what the occupant of the space is wearing if they are within the sensor's view.

After I programmed the open loop daylight sets, the work surface light level is not consistent over the controlled zone. Why is this occurring?

In open loop daylighting, because larger areas are controlled, the uniformity of the work surface light level across the zone may vary due to differences in daylight exposure, furniture placement, as well as surface colors within the space. Ceiling light output is more uniform with open loop daylight approaches, but the work surface level may be less consistent for larger controlled zones. It may be necessary to create additional zones to group lighting in smaller control groups that can be controlled by different open loop daylight sets so that different light levels may be set to accommodate these differences.

My exterior lighting does not all respond ON or OFF at the same time. Why is this occurring?

If outdoor Integrated Sensors are being used, each fixture responds to its own sensor for daylighting commands. While calibration should get fixture response to daylighting close, there is no way of ensuring that all lighting will respond in the same manner at the same time. If fixture response seems very disparate, refer on the process on page 108 to recalibrate the sensors.

If WaveLinx Wireless Outdoor Lighting Control Modules are being used, it is possible to have one sensor control daylighting for the fixture it is mounted on or for a defined group of fixtures. If fixtures are not responding at the same time to daylighting commands, they may be assigned to different daylight sets. In this circumstance, determine which sensor will be the sensor in control of daylighting and ensure that it is assigned to a single daylight set controlling all lighting zones in the area. See page 115 for details on defining the daylight set, assigning the controlled zones, and assigning the sensor.

My wallstation or occupancy sensor does not appear to operate during the day but seems to work at night. Why is this occurring?

Daylighting filters the fixture's response to other control commands. A command from a wallstation button or occupancy sensor to go to 100% will adjust the electric light level output to meet the calibrated daylight level. A command from a wallstation button or occupancy sensor to go to 50% will adjust the electric light level to meet 50% of the calibrated daylight level. The actual electric light level output with these commands will vary based on the available amount of daylight in the space and how much electric light needs to be contributed to maintain the commanded target. If the electric light has daylight dimmed to OFF, lighting will remain OFF if wallstation, schedule events or occupancy commands are received, preventing unnecessary energy waste when adequate daylight is present.

I get the message "An advanced schedule has been installed and is working …" Why is this message appearing?

For sites using Trellix Core and Trellix software, if schedules are administered in the Trellix software application, the WaveLinx Mobile Application will not allow schedule modification and will display a message box in the scheduling screen. If this occurs, continue to administer any necessary schedule changes through the Trellix software.

My schedule event actions do not always appear to run. Why is this occurring?

There are a few items to check if schedule events do not appear to be running. First, check that the schedule event has been correctly configured AND is enabled. Also, verify that the time in the Wireless Area Controller has been set properly. If these settings appear to be correct, there are other factors that may affect schedule event operations.

First, if a time schedule event that issues a scene or zone level command is assigned to an area that has occupancy sensors, at the time of the schedule event, if the area is occupied, the lighting and receptacle loads will go to the commanded levels. If the area is not occupied, the lighting and receptacle loads will remain at the unoccupied commanded levels.

Second, daylighting filters the fixture's response to other control commands and may be reducing the light level due to adequate daylight being present. If daylighting strategies are being used, the actual electric light level output from schedule event commands will vary based on the available amount of daylight in the space and how much electric light needs to be contributed to maintain the commanded target. If the electric light has daylight dimmed to OFF, lighting will remain OFF if wallstation, schedule or occupancy commands are received, preventing unnecessary energy waste when adequate daylight is present.

What will my devices do if they lose communication with the Wireless Area Controller?

A load device will maintain its current command for approximately a 15-minute period (some devices may respond faster). If a device is not able to communicate with the Wireless Area Controller for more than 15 minutes, the device will default back to disconnected mode (which looks like out of the box behavior described on page 15). Once communication with the Wireless Area Controller is re-established, the device will begin to operate per the programmed parameters.

I am using a Wireless Dimming Switchpack's contact closure input. My dimming switchpack does not have the additional icon showing in the 'in area' section of the mobile app or I do not see the option to set the input type. Why is this icon/input type not showing?

If the Wireless Dimming Switchpack does not show the secondary icon for the contact closure in the 'in area' section of the mobile app, verify the following things:

- Make certain that the device has been correctly identified in the WaveLinx Mobile App.
- Make certain that the WaveLinx Mobile App is the latest version.
- Make certain that the switchpack being used is the correct model. Only the Wireless Dimming Switchpack model WSP-CA-010 supports connection to a contact closure device and will display this additional icon and input type selection.
- If the switchpack is connected to a lighting load as well as a contact input, make sure that the device has been assigned to the correct area and zone. If the switchpack has been left in the 'in area' section, it will not display the link icon but will allow still for selection of an input type.
- After verifying that the correct switchpack model is being used, make sure that the switchpack firmware is updated to the latest version. Firmware must be version 0x2180560 or later to support the contact closure functionality. Refer to "Updating the Firmware of WaveLinx Devices" on page 178 for details on updating device firmware. (The model WSP-CA-010 Wireless Dimming Switchpack will display as a '347 Switchpack' device type in the WaveLinx internal webpages).

Appendix

WaveLinx Touchscreen Cybersecurity Recommendation

Product Team Guidelines

The WaveLinx Touchscreen has been designed with cybersecurity as an important consideration. A number of features are offered in the product to address cybersecurity risks. These Cybersecurity Recommendations provide information to help users to deploy and maintain the product in a manner that minimizes the cybersecurity risks. These Cybersecurity Recommendations are not intended to provide a comprehensive guide to cybersecurity, but rather to complement customers' existing cybersecurity programs.

Cooper Lighting Solutions is committed to minimizing the cybersecurity risk in its products and deploying cybersecurity best practices in its products and solutions, making them more secure, reliable, and competitive for customers.

Category	Description
Asset Management	Keeping track of software and hardware assets in your environment is a pre-requisite for effectively managing cybersecurity. Cooper Lighting Solutions recommends that you maintain an asset inventory that uniquely identifies each important component. To facilitate this, the WaveLinx Touchscreen supports the following identifying information: • Touchscreen Device - manufacturer, type, serial number, and location (available on the physical device). • Touchscreen Software - publisher, name, version (available in software app)
Risk Assessment	Cooper Lighting Solutions recommends conducting a risk assessment to identify and assess reasonably foreseeable internal and external risks to the confidentiality, availability and integrity of the system/device and its environment.
Account Management	Logical access to the system/device should be restricted to legitimate users, who should be assigned only the privileges necessary to complete their job roles/functions. Some of the following best practices may need to be implemented by incorporating them into the organization's written policies: • Ensure default credentials are changed upon first login. The WaveLinx Touchscreen should not be deployed in production environments with default credentials, as default credentials are publicly known. • After 10 minutes of inactivity, the system logs the Admin user out. • Users: 1. Normal User: No login required. Physical proximity to touch the device is required. Users are limited to selecting an area and adjusting presets and zones within that area. 2. Admin User: Certain pages require a login pin to access. (See User Guide for default pin.) Admin Users may set various properties on the Touchscreen device to optimize the user experience. Authentication for Admin User is local to each Touchscreen.
Network Security	The WaveLinx Touchscreen supports network communication with other devices in the environment. This capability can present risks if it is not configured securely. Following are Cooper Lighting Solutions recommended best practices to help secure the network. Cooper Lighting Solutions recommends installing this device behind a secure firewall. Communication Protection: The WaveLinx Touchscreen uses SSL to secure network communications with the default WaveLinx certificate. Any changes to the certificate in a WaveLinx system (specifically changing the WAC) may require a software update to this device. This device does not support custom certificates in the system. Cooper Lighting Solutions recommends opening only those ports that are required for operations and protect the network communication using network protection systems like firewalls and intrusion detection systems / intrusion prevention systems. Use the information below to configure your firewall rules to allow access needed for the WaveLinx Touchscreen to operate smoothly: • Ports: 8988 • Services: On Start of the application, background service associated with OTA update will start automatically and opens the SSL socket using TLSv1.2 for communication using port 8988 and touch device IP address which will accept the incoming client connection on successful certificate verification and will replace the application with new version of application file received from client.
Logging and Event Management	Logs of activity by all users are available from WaveLinx Wireless Area Controller.
Malware Defenses	Cooper Lighting Solutions recommends deploying adequate malware defenses to protect the product or the platforms used to run the Cooper Lighting Solutions product.

Category	Description
Secure Maintenance	**Best Practices** Update device firmware prior to putting the device into production. Thereafter, apply firmware updates and software patches regularly. Cooper Lighting Solutions publishes patches and updates for its products to protect them against vulnerabilities that are discovered. Cooper Lighting Solutions encourages customers to maintain a consistent process to promptly monitor for and install new firmware updates. Instructions for updates are available in the WaveLinx Touchscreen User Manual. Please register to Cooper Lighting's trellix.cooperlighting.com to get notifications when new firmware and software updates are made available.
Decommissioning or Zeroisation	It is a best practice to purge data before disposing of any device containing data. Guidelines for decommissioning are provided in NIST SP 800-88. Cooper Lighting Solutions recommends that products containing embedded flash memory be securely destroyed to ensure data is unrecoverable. **Embedded Flash Memory on Boards and Devices** Cooper Lighting Solutions recommends the following methods for disposing of motherboards, peripheral cards such as network adapters, or any other adapter containing non-volatile flash memory. • **Clear**: If supported by the device, reset the state to original factory settings. A Touchscreen device may be reset to factory settings through the Settings menu. (See the User Guide.) • **Destroy**: Shred, disintegrate, pulverize, or Incinerate by burning the device in a licensed incinerator.

References

[R1] Cybersecurity Considerations for Electrical Distribution Systems (WP152002EN):
http://www.eaton.com/ecm/groups/public/@pub/@eaton/@corp/documents/content/pct_1603172.pdf

[R2] Cybersecurity Best Practices Checklist Reminder (WP910003EN):
http://www.cooperindustries.com/content/dam/public/powersystems/resources/library/1100_EAS/WP910003EN.pdf

[R3] NIST SP 800-82 Rev 2, Guide to Industrial Control Systems (ICS) Security, May 2015:
https://ics-cert.us-cert.gov/Standards-and-References

[R4] National Institute of Technology (NIST) Interagency "Guidelines on Firewalls and Firewall Policy, NIST Special Publication 800-41": October 2009:
http://nvlpubs.nist.gov/nistpubs/Legacy/SP/nistspecialpublication800-41r1.pdf

[R5] NIST SP 800-88, Guidelines for Media Sanitization, September 2006:
http://ws680.nist.gov/publication/get_pdf.cfm?pub_id=50819

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/LightingWarrantyTerms** for our terms and conditions.

Garanties et limitation de responsabilité

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

Garantías y Limitación de Responsabilidad

Visite **www.cooperlighting.com/LightingWarrantyTerms** 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

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