# VividTune with Integrated WaveLinx

## Overview

Cooper Lighting Solutions offers a wide range of luminaires equipped with VividTune color tuning and WaveLinx Integrated Sensors.

The WaveLinx Wireless Connected Lighting System is based on today's most stringent energy codes, providing a complete control solution for commercial applications. The WaveLinx system allows for simple setup of different control strategies including occupancy sensing, daylight sensing, time-of-day scheduling, demand response, and manual and personal control.

The VividTune color tuning solution adds additional value. Using VividTune, WaveLinx devices can adjust the lighting's correlated color temperature (CCT), giving the facility the ability to alter the atmosphere or mood of the controlled space to best meet the task at hand.

WaveLinx gives flexibility when approaching CCT (white tuning) control. While control of both lighting intensity and white tuning can be done with easy to issue scenes, intensity control zones can be separated from white tuning zones to allow for differences in control strategies or more complex applications.

This application note will outline how to achieve basic white tuning applications when luminaires with VividTune and WaveLinx Integrated Sensors are used. This features:

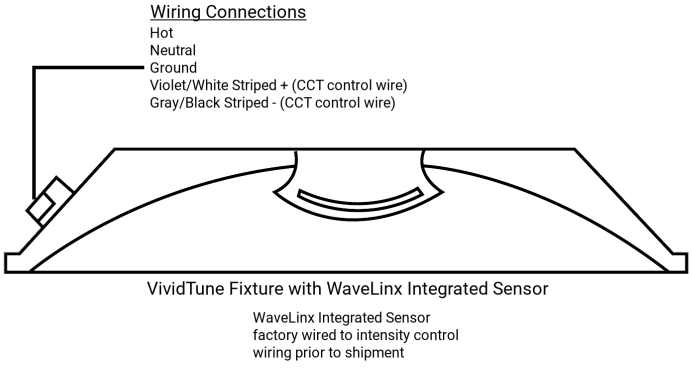
- Full control of lighting intensity
- Full control of white tuning (CCT) with 3000K-5000K or 2700K-6500K ranges
- Operation from standard WaveLinx accessories, wallstations, sensors, schedules, etc.

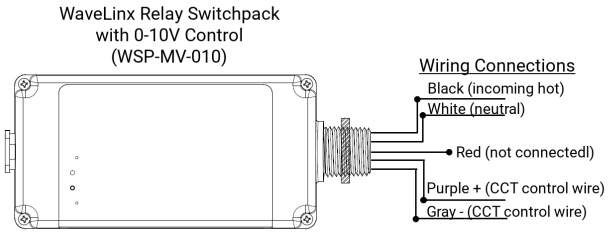
## How does a luminaire with VividTune and WaveLinx Integrated Sensor connect?

The luminaire is initially ordered with VividTune capability and a WaveLinx Integrated Sensor. The WaveLinx Integrated Sensor is prewired to the luminaire's intensity control wiring at the factory.

A WaveLinx Relay Switchpack (WSP-MV-010) is needed to provide the white tuning (CCT) control. Typically one WaveLinx Relay Switchpack will control white tuning for an entire room.*

- Connect incoming power (Hot/Neutral/Ground) at each fixture.
- Connect incoming power to the WaveLinx Relay Switchpack (Hot/Neutral). The WaveLinx Relay Switchpack load control wire (red) will not be connected.
- Connect the WaveLinx Relay Switchpack purple and gray control wires to the fixture's VividTune (CCT) control wires (striped purple, striped gray). The CCT control wiring continues on to connect to additional VividTune fixtures in the same room.*




***Note**: Additional WaveLinx Relay Switchpacks may be used to split the CCT control connection within the same room to allow for wire run simplification, or accommodating more complex CCT applications.

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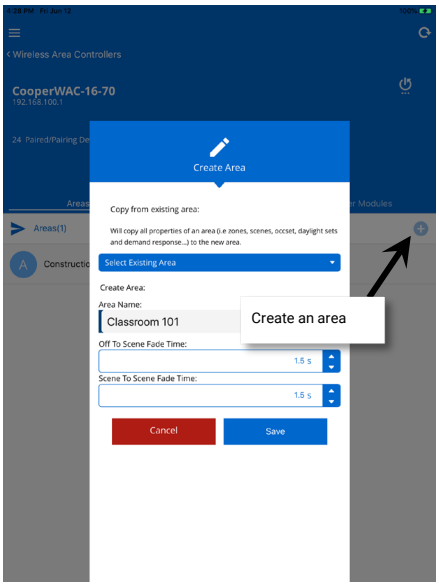
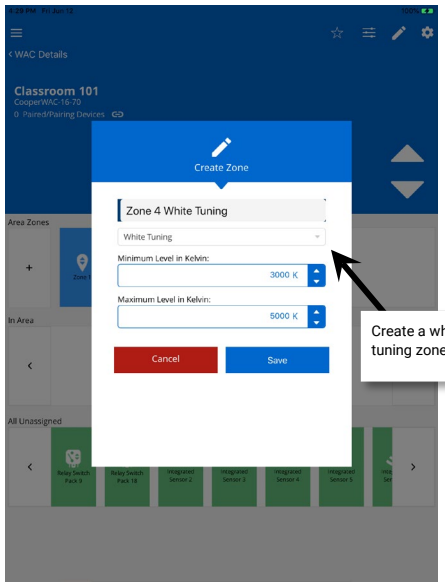
# WaveLinx Mobile Application Setup for White Tuning

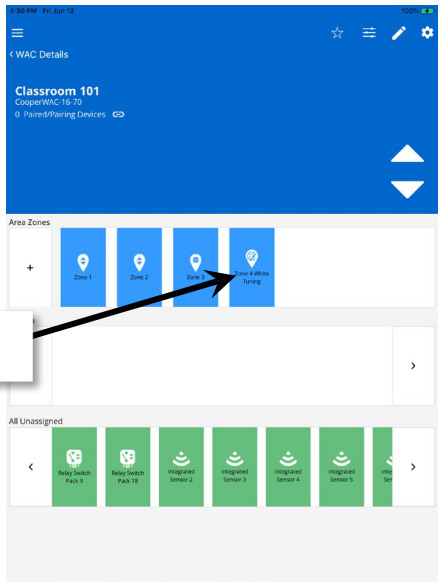
This section describes the basic setup for a typical WaveLinx application with White Tuning control. For further information or a step-by-step walkthrough, see the WaveLinx User Manual or videos.

## Initial Setup

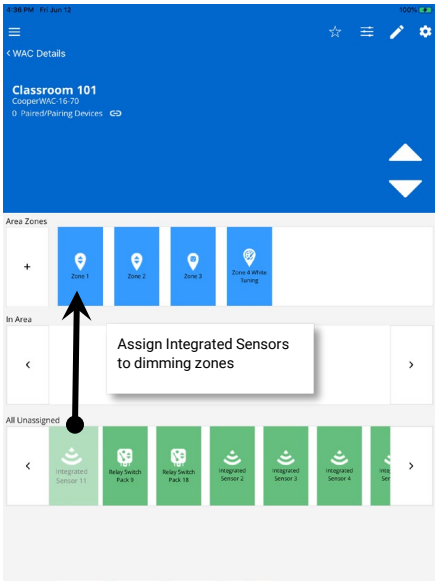
- Pair the WaveLinx Integrated Sensors, WaveLinx Relay Switchpacks, and other WaveLinx devices to the WaveLinx System.
- Create an area for the room.
- In the new area, leave the default zones and add a new zone for the white tuning (CCT) control. Give the new zone a descriptive name, and select the 'White Tuning' zone type.



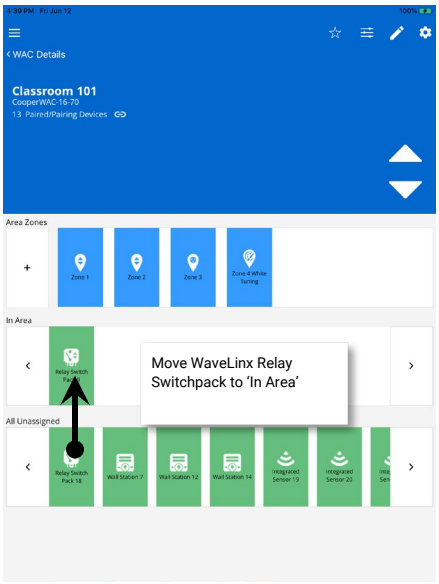



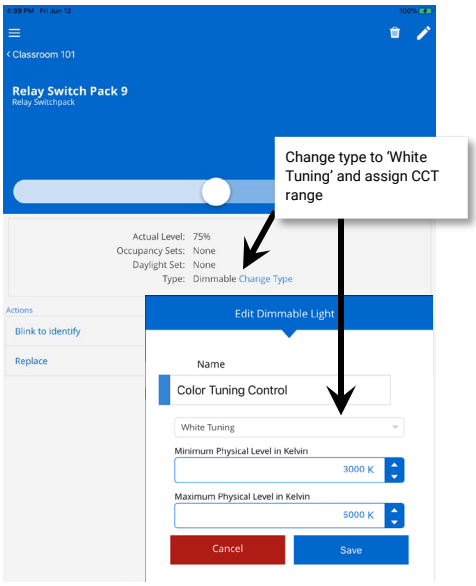



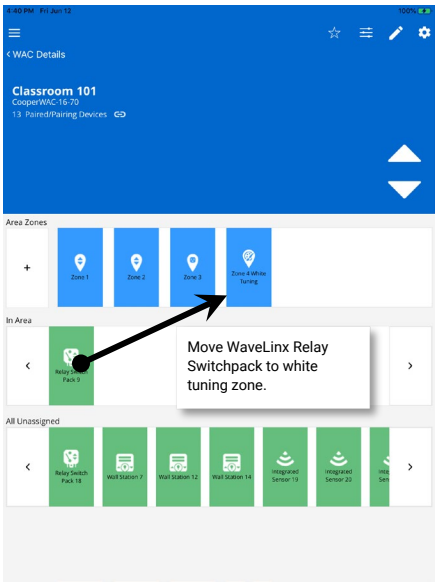

- Drag the WaveLinx Integrated Sensors into the correct dimming zones for control.



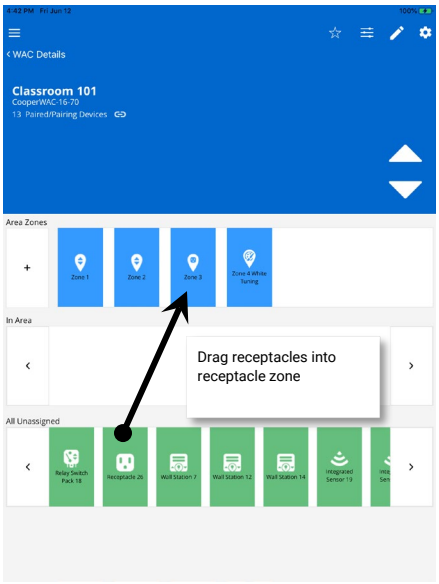
- Drag the VividTune connected WaveLinx Relay Switchpack into the 'In Area' section, and then change the type to 'White Tuning' entering the correct expected color temperature range.
- Drag the WaveLinx Relay Switchpack into the previously created white tuning zone.

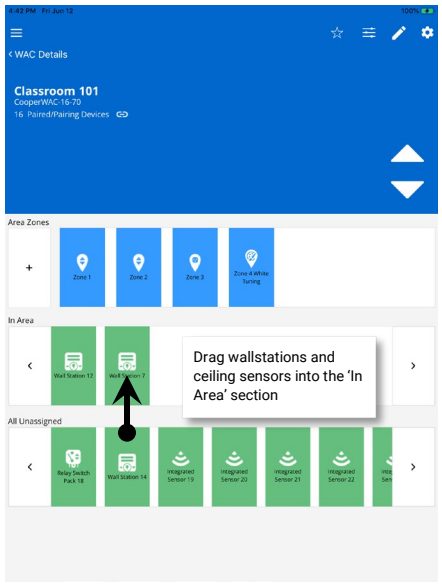



- Drag any WaveLinx Receptacles into the correct receptacle zone for control.
- Drag any WaveLinx Wallstations or Ceiling Sensors into the 'In Area' section of the screen.



## Programming for CCT Control

Once the white tuning and other WaveLinx devices are added to the area and assigned to their zones, the space will begin to operate with the default WaveLinx programming. In the default programming:

- White tuning zones are automatically excluded from being controlled by daylighting and demand response.
- White tuning zones are programmed to 3500K in scenes 0-6. Wallstations and occupancy sensor commands will drive CCT to 3500K when these scenes are activated.
- White tuning zones ignore wallstation raise and lower commands that are programmed to command 'ALL' zones, preventing unintentional color temperature shifts when lighting intensity is adjusted.

With the exception of daylighting and demand response, the white tuning zone's default behavior can be changed to allow for customized response.

### Determining the Control Strategy

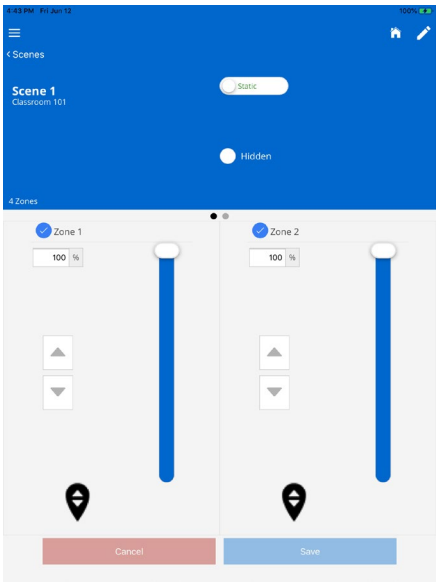
The most common control commands issued in the WaveLinx system are scene commands and zone commands.

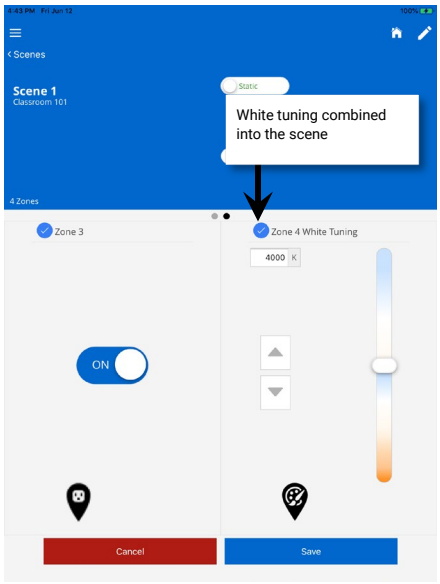
A **scene** command is used to recall a pre-defined set of light levels in the space. Scenes typically include light levels for multiple zones in the area.

**Zone** commands are used to control a specific zone within an area. Zone commands can be sent to issue a specific level or to raise and lower the light level.

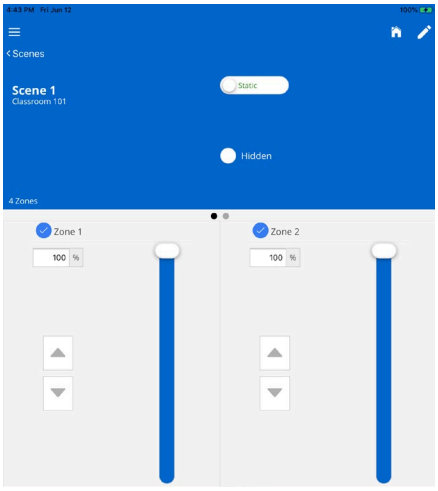
There may be circumstances that require the use of one command type over the other when dealing with CCT control. Both scene commands and zone commands can be issued by wallstations, occupancy sensors and time schedules making it easy to apply the correct strategy.

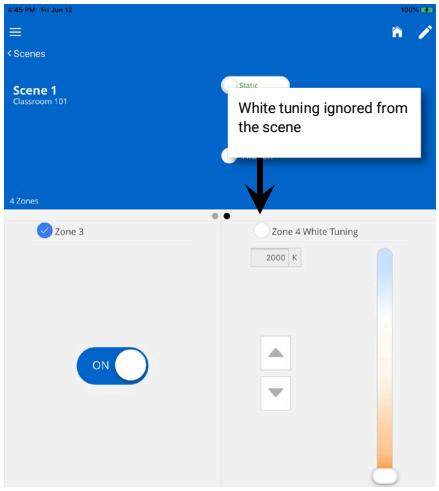
For simple control strategies, lighting intensity and white tuning can be combined into scenes for easy recall from controls.



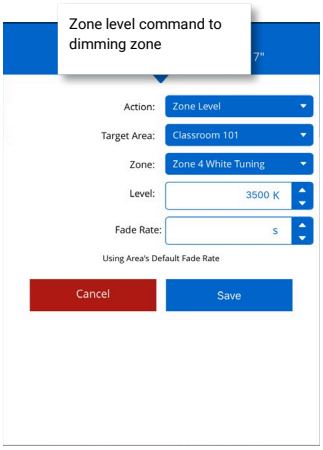



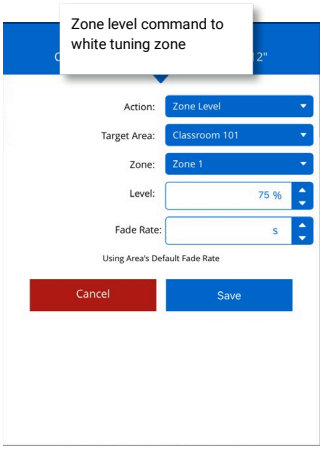
For strategies requiring separate control of lighting intensity from white tuning, simply ignore the white tuning zone from the scenes. While the lighting intensity is being controlled from standard scenes, the white tuning zone can be separately controlled from zone based commands.



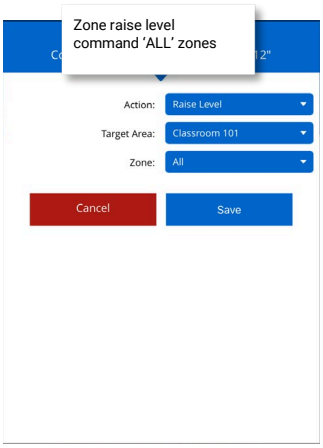




When setting up controls to issue zone commands, a specific zone will need to be selected. While a zone level command to a dimming zone requests an intensity level, a zone level command to a white tuning zone requests the desired color temperature.



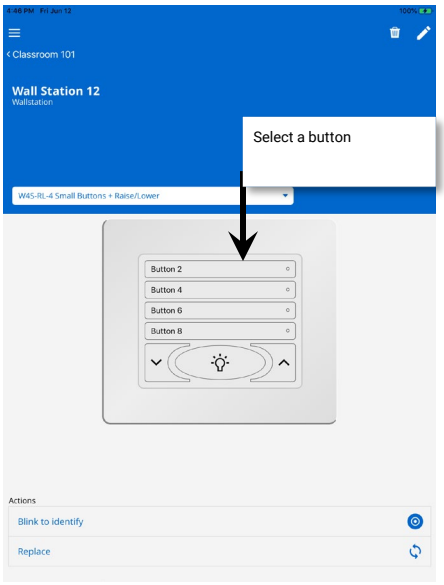

Additional zone command options include sending commands to 'ALL' zones or 'AFFECTED' zones. White tuning zones will automatically ignore commands issued to 'ALL' or 'AFFECTED' zones in the area, preventing unintentional color shifts when intensity control zones are being adjusted.

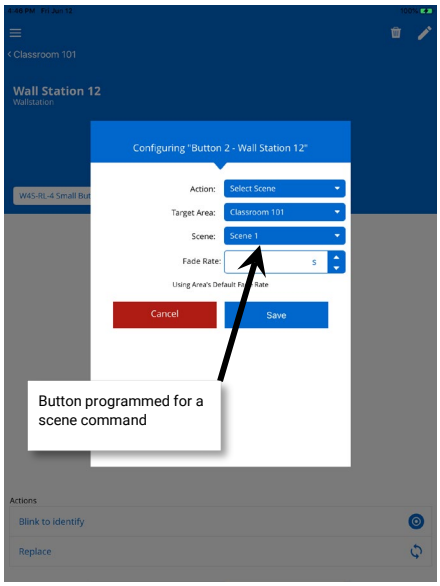


### Adding Scene or Zone Commands to Wallstation Buttons

Wallstation buttons can be programmed to issue commands to scenes or zones along with other specialized functions.

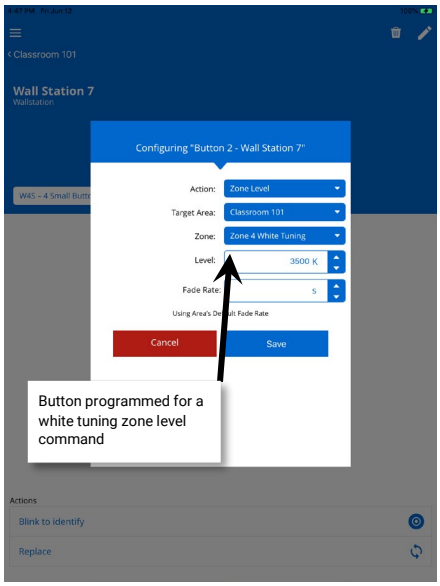
If using scene based strategies to control both the light intensity and the white tuning, simply program the wallstation button to issue the appropriate scene command.



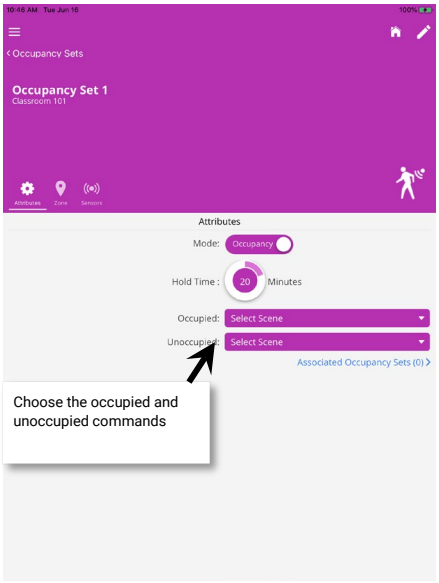

Often separate wallstations are provided for lighting intensity control and white tuning control. In this scenario, the wallstation for the lighting intensity uses scene based strategies, with the white tuning zone ignored from the scenes.

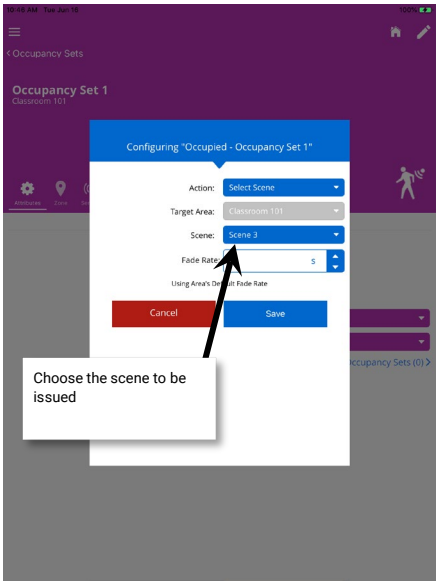
The white tuning control station is then programmed using a zone based strategy. Each button is programmed to issue a zone level command to the white tuning zone, selecting the desired Kelvin level for each button. Each button will adjust the color temperature to the specified warmer or cooler white temperature.

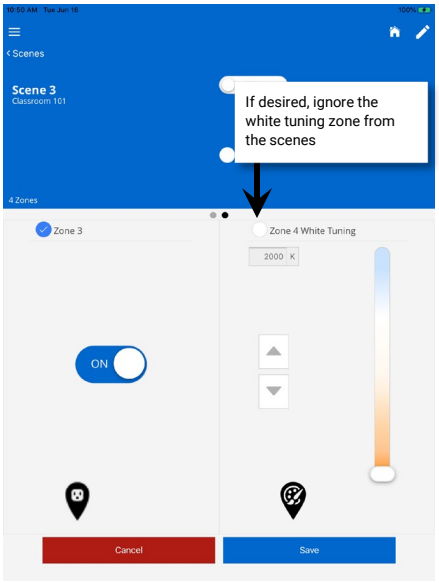



## Adding or Removing Occupancy Control of White Tuning

Occupancy sensors typically issue scene based commands. To have the occupancy event affect the white tuning level, program the white tuning level to be included in the occupancy set scenes. To remove occupancy control from white tuning, ensure that the occupancy set scenes ignore the white tuning zone.



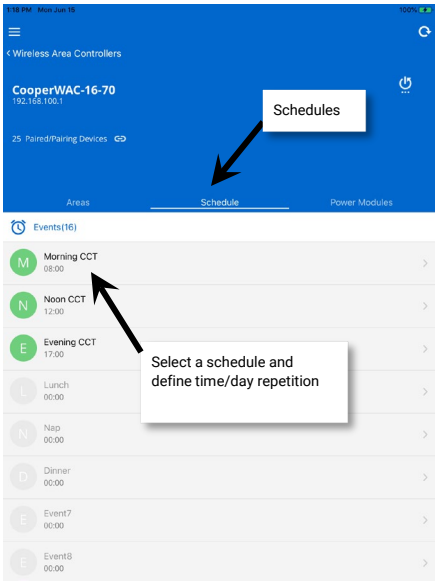



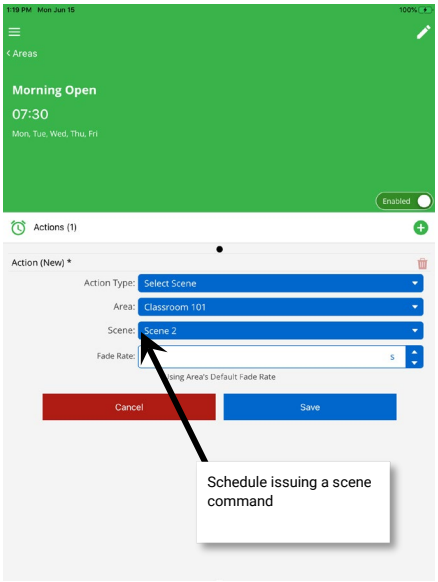



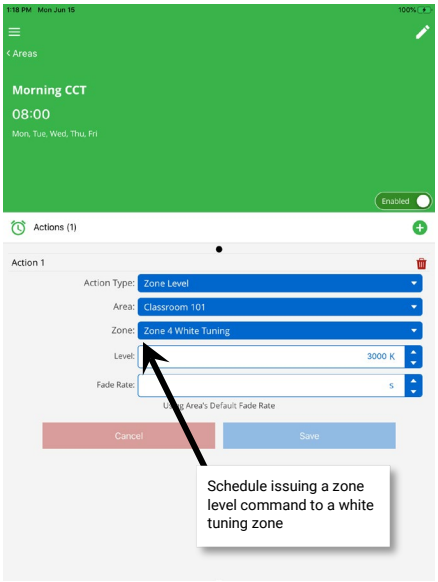

## Adding Schedule Events for White Tuning Control

Schedule events can be added to meet applications that require the color temperature shift to happen automatically based on time-of-day. The schedule event can issue:

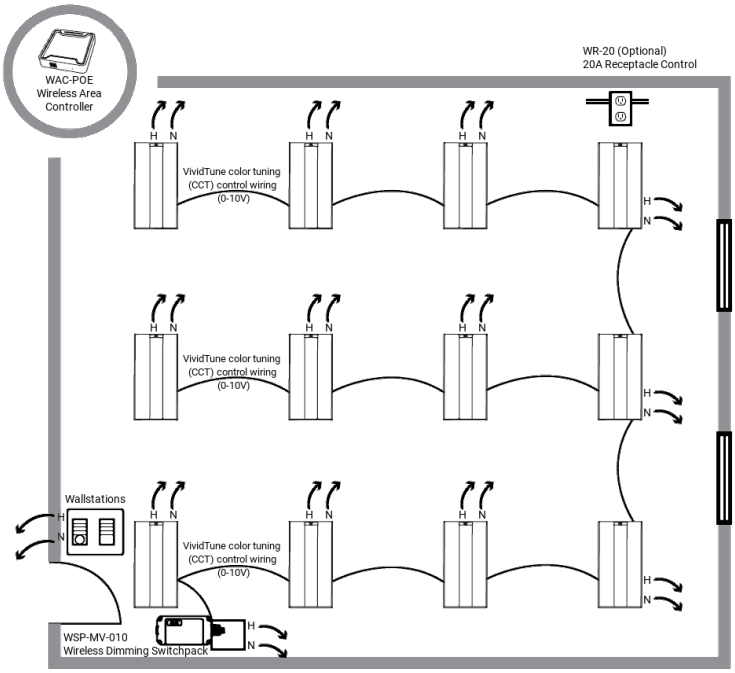
- a scene command to the area to adjust both the lighting intensity and white tuning
- a zone level command to affect only the white tuning zone



# Classroom Example




**Bill of Materials**

| Qty | Catalog# | Description |
|---|---|---|
| 1 | WAC-POE | Wireless Area Controller |
| 1 | W4S-RL-W | 4 Small button scene wallstations w/raise-lower |
| 1 | W4S-W | 4 Small button wallstation |
| 1 | CUST-ENGRV-4BTNS-W | Custom engraving for 4 small button CCT wallstation |
| 1 | WSP-MV-010 | WaveLinx Wireless Dimming Switchpack with 0-10V |
| 1 | WR-20 | Wireless Receptacle |
| 12 | 24CZ2-45-UNV-L83050-W2A1-WAA-U | Cruze 2X4 with VividTune and WaveLinx Integrated Sensor |

**SEQUENCE OF OPERATIONS**

**LIGHTING**
- CONTINUOUS DIMMING
- CCT WHITE TUNABLE
  PRODUCTIVITY RANGE (3000K – 5000K)
  RHYTHM RANGE (2700K-6500K)

**STANDARD CONTROLS**
- AUTOMATIC ON TO 50%
- OPTIONAL VACANCY MODE
- PLUG LOAD TURNS ON WITH OCCUPANCY
- AUTOMATIC OFF OF LIGHTING AND PLUG LOAD ON VACANCY
- CLOSED LOOP DAYLIGHTING (OPTIONAL)

**VIVIDTUNE CONTROLS**
- LIGHT INTENSITY CONTROL
  MANUAL VIA WAVELINX WALLSTATION
- COLOR TEMPERATURE CONTROL
  MANUAL VIA WAVELINX WALLSTATION
  AUTOMATIC VIA WAVELINX SCHEDULE (OPTIONAL)

**ADDITIONAL FEATURES**
- AUTOMATIC DEMAND RESPONSE AVAILABLE FROM WIRELESS AREA CONTROLLER
- SCHEDULING OF PARTIAL OFF LIGHT LEVELS AND TIMES FROM WIRELESS AREA CONTROLLER
- UL924 EMERGENCY CONTROL CAPABILITIES AVAILABLE VIA LUMINAIRE BATTERY BACKUP OR LUMINAIRE INTEGRATED UL924 TRANSFER SWITCH IF USING CENTRALIZED EMERGENCY SOURCE (WIRING MAY DIFFER SLIGHTLY FROM THAT SHOWN)

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