Automatic Partition Wall Detection with WaveLinx

⚠ ATTENTION

IMPORTANT SAFEGUARDS READ AND FOLLOW ALL SAFETY INSTRUCTIONS: • Class 1 component installation should be performed by a qualified electrician • Installation shall be in accordance with all applicable local and NEC codes • Turn the power off at the circuit breaker before wiring electrical components • Designed for indoor installation and use only • All new wiring must be fully verified before applying power • Servicing of equipment should be performed by qualified service personnel • For proper operation it is important to follow the installation instructions for each product/component.

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 these products.

Overview

Partitioned spaces are common in modern offices, hotels, and other commercial buildings. Partitioning provides a flexible and efficient way to divide larger areas into smaller, more manageable spaces, capitalizing the available square footage.

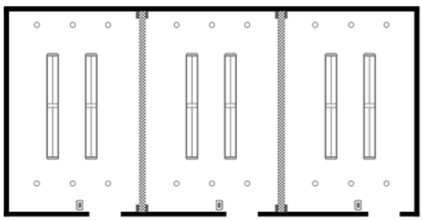
The WaveLinx Connected Lighting System helps businesses easily manage their partitioned spaces. When a partition wall is moved, a signal must be sent to the WaveLinx Area Controller that the partition wall is open or closed. This signal can be generated by:

- **Manually** issuing a command from a wallstation button or other contact closure input. The occupant must have prior knowledge of the need to issue the wall status open and closed command from the provided button/input.
- **Automatically** issuing a command, seamlessly transitioning the space by using an **automatic partition wall detection** sensor. The detection sensor will automatically sense the open or closed wall position and issue the appropriate command to the WaveLinx system, simplifying the occupant's experience.

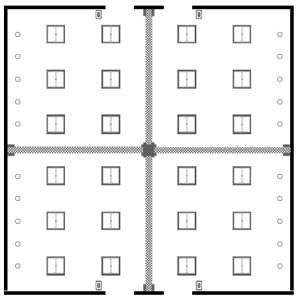
This remainder of this application note will discuss how to implement automatic partition wall detection in a WaveLinx Connected Lighting System.

Implementing Automatic Partition Wall Detection

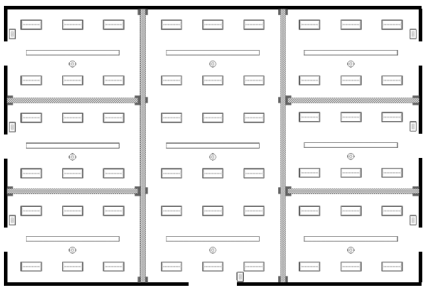
Each WaveLinx Area Controller can control up to two partitioned spaces. One partitioned space can contain up to **10 individual rooms (sub areas)** and/or **10 partition walls**. This allows WaveLinx to achieve very simple to fairly complex partitioning layouts.



Example 1: 3 Sub Areas, 2 Partitions

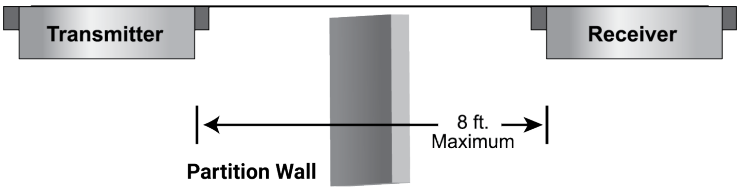


Example 2: 4 Sub Areas, 4 Partitions



Example 3: 7 Sub Areas, 10 Partitions

Automatic partition wall detection requires that one partition wall detection sensor (IRTR) be used for each partition wall in the space. There should be a clear line of sight between the transmitter and receiver when the partition wall is open. The line of sight should be interrupted when the partition wall is closed.



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Required Devices

In the WaveLinx System, automatic partition wall detection requires the use of three devices: the partition wall detection sensor, its power supply, and the contact input device that issues the open and closed wall status command. WaveLinx PRO (wireless) and WaveLinx CAT (wired) both offer contact input devices to meet both WaveLinx PRO and WaveLinx CAT applications.

Partition Wall Detection Sensor

- Cooper Infrared Transmitter and Receiver (IRTR)

IRTR

Power Supply

Power the IRTR from one of the following devices:

- External Power Supply (EXPS-15V)
- Switchpack (SP20-MV)
- Heavy Duty Switchpack (SP20-RD4)

EXPS-15V

SP20-MV

SP20-RD4

Contact Input Device

Connect the IRTR to one of the supported WaveLinx Contact Input Devices:

- WaveLinx PRO Contact Closure Input Module (CCI-P-V)
- WaveLinx PRO Universal Dimming Switchpack with Dry Contact Input (WSP-CA-010)
- WaveLinx CAT Contact Closure Input Module (CCI-C-V)

CCI-P-V

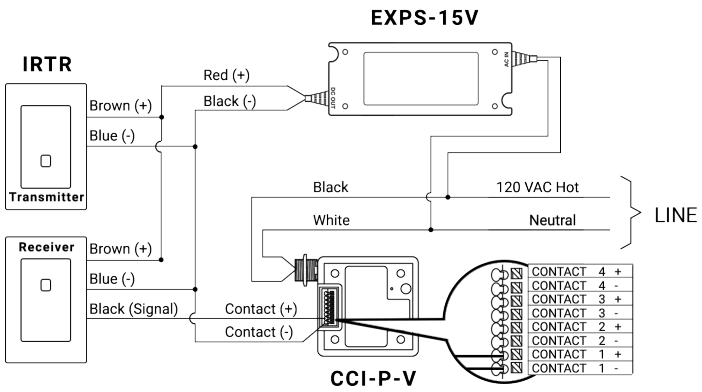
WSP-CA-010

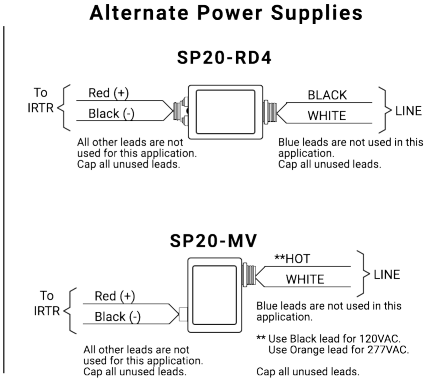
CCI-C-V

Automatic Partition Wall Detection Device Wiring

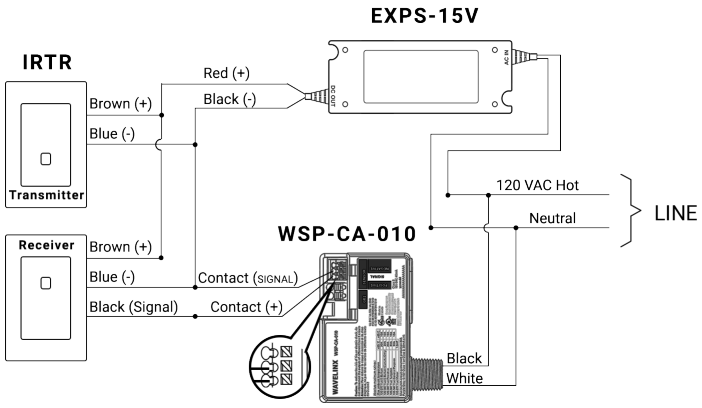
WaveLinx PRO

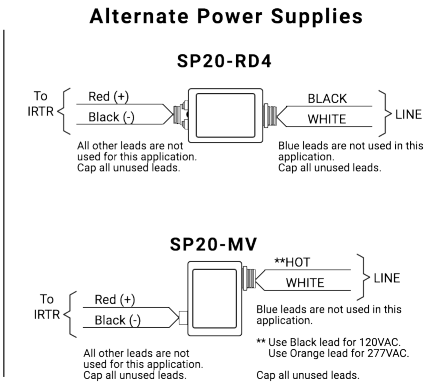
WaveLinx PRO Contact Closure Input Module (CCI-P-V)





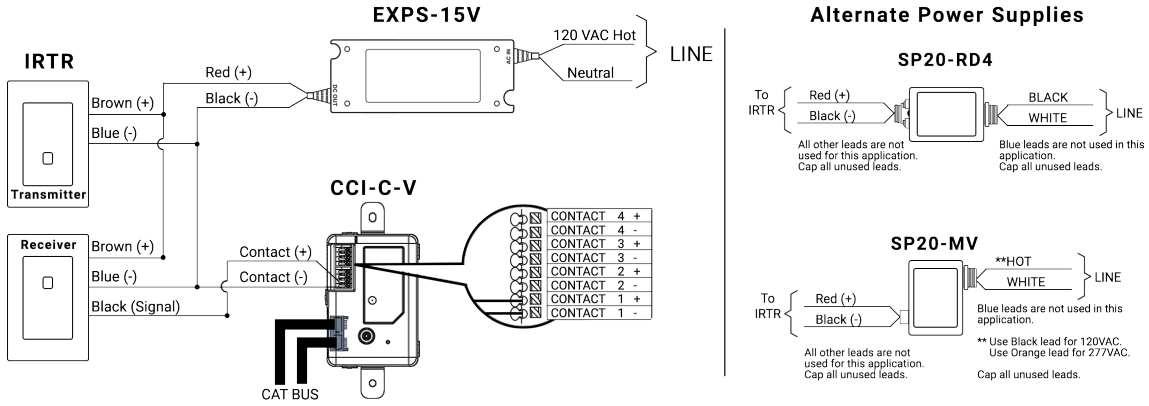
WaveLinx PRO Universal Dimming Switchpack with Dry Contact Input (WSP-CA-010)





WaveLinx CAT

WaveLinx CAT Contact Closure Input Module (CCI-C-V)



Partitioned Area Operation

- When a partition wall is opened or closed, lighting will remain at the last commanded level/state until the next command is issued.
- When sub areas are separated/walls are closed, the wallstations will operate their individual sub area. When the walls are opened, the wallstations in the joined sub areas will issue the programmed command to the original area and any joined sub area(s).
- Occupancy set commands will operate independent sub areas when the walls are closed. When the walls are open, if the assigned occupancy set number is the same in all joined sub areas, the occupancy set will function as one occupancy set over the joined areas.
- If enabled, daylighting will operate the assigned lighting independent of wall position.
- Commands from devices that are not assigned to one of the partitioned sub areas will issue commands to the entire area (no sub area control) regardless of wall position. This includes commands from time schedules and WaveLinx Touchscreen.
- WaveLinx Touchscreens should not be used for partitioned area control.
- A wallstation or other input device that is assigned to a standard WaveLinx area will not be able to control the partitioned area or sub area (multi-area switch operation cannot be applied to partitioned areas).

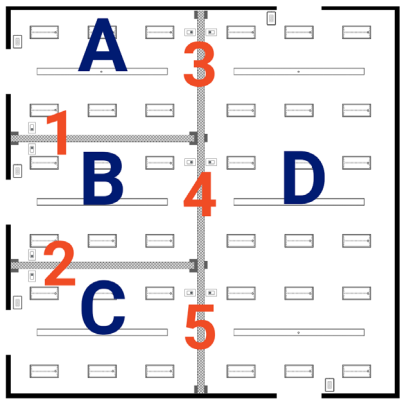
Configuring the Partitioned Area

Once the necessary devices are installed, use the WaveLinx Mobile App or login to the WaveLinx CORE to create and configure the partitioned area. Make sure that all necessary WaveLinx devices have been paired or added to the WaveLinx Area Controller per the instructions on "*Adding WaveLinx Devices to a WaveLinx Area Controller*" found in the WaveLinx User Manual.

Create a Configuration Sketch

For the easiest partition area setup, create a sketch and a table identifying each partition wall, the sub areas that each wall joins, and the device and contact closure input number that is connected to each IRTR.

Sample Sketch: 4 Sub Areas, 5 Partition Walls

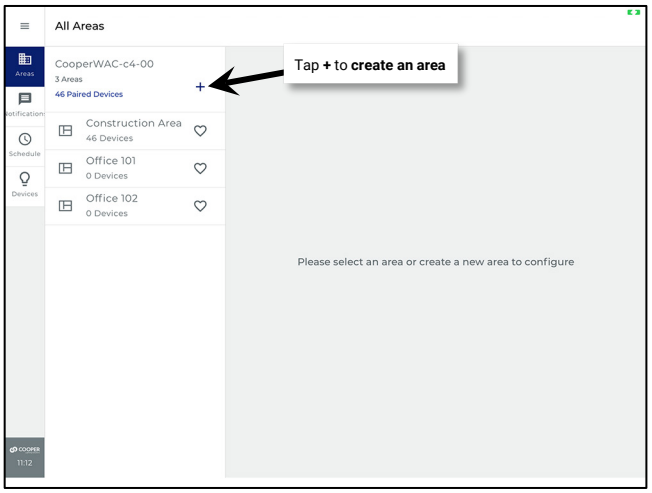


Partition Wall #	IRTR Contact Input	Sub Areas Joined
Wall 1	PRO CCI#1, Input #1	A & B
Wall 2	PRO CCI#1, Input #2	B & C
Wall 3	PRO CCI#1, Input #3	A & D
Wall 4	PRO CCI#1, Input #4	B & D
Wall 5	PRO CCI#2, Input #1	C & D

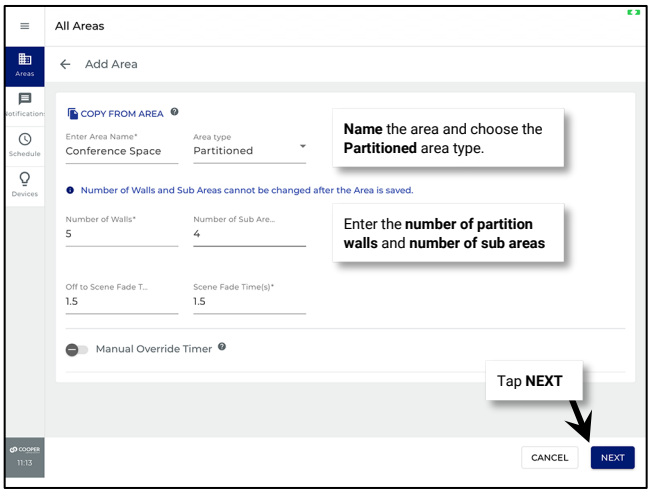
Create a Partitioned Area

Once the area is sketched, create the partitioned area through the WaveLinx Mobile App or through the WaveLinx CORE.

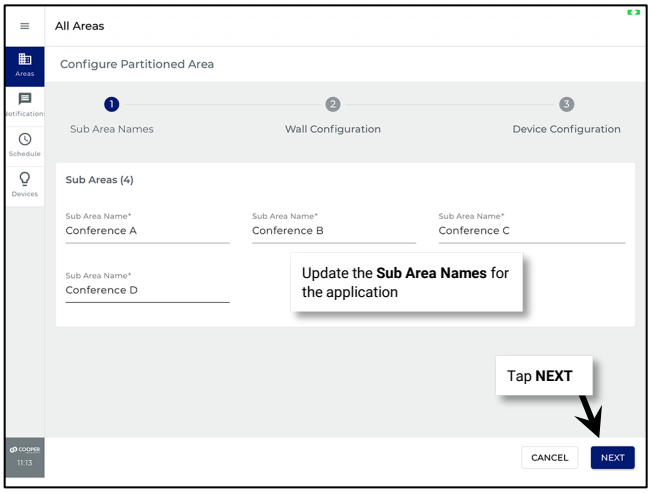
1. Create the Area



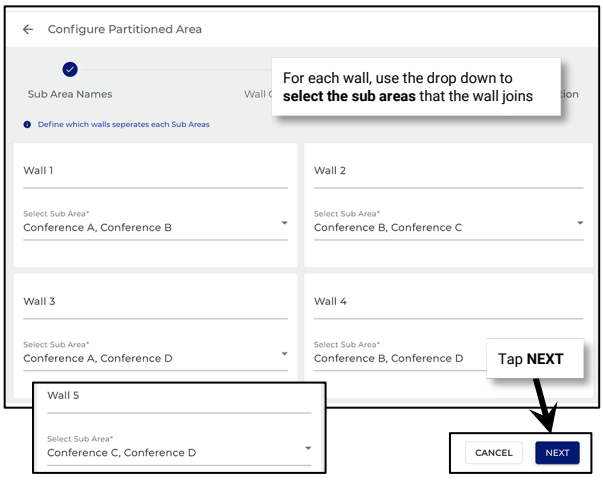
2. Define the Partitioned Area



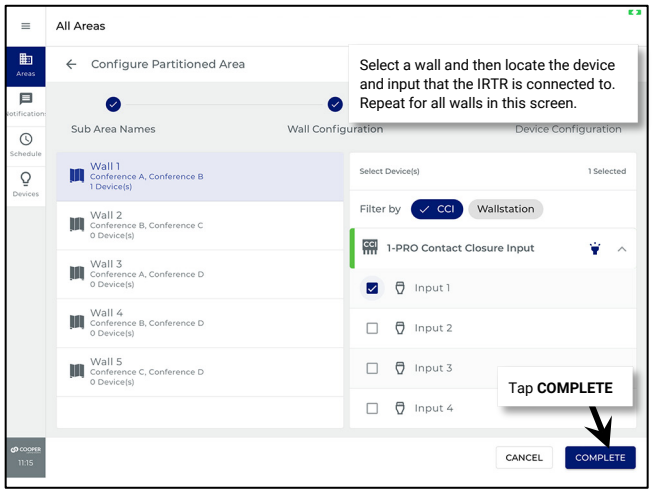
3. Update the Sub Area Names



4. Define Each Wall's Joined Sub Areas



5. Assign the Input for Each Wall



For a complete walk through of creating a partitioned area, refer to the WaveLinx User Guide's "*Part 3: Create Partitioned Areas and Assign Zones*" section.

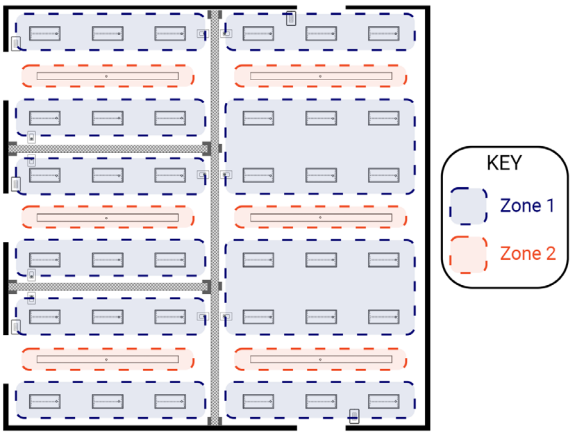
Create Zones

A **zone** is a group of devices that will be controlled together in the exact same way.

In a partitioned area, devices in each sub area that should operate together when partition walls are open should be assigned to the same zone number. This allows for a uniform response when the walls are open.

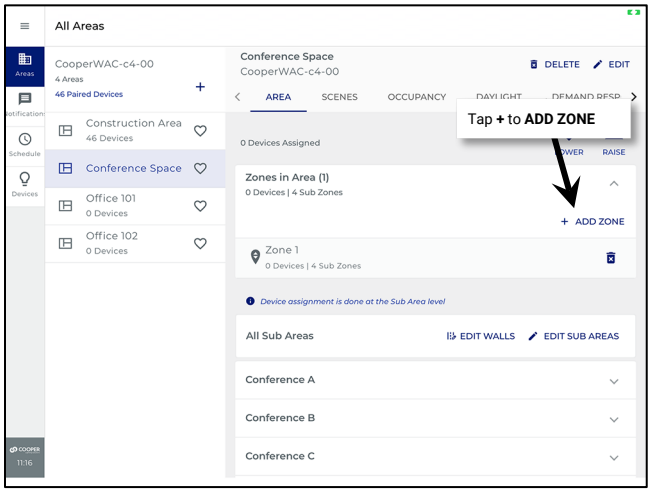
The newly created partitioned area contains one zone (Zone 1) by default that is automatically assigned to all sub areas.

Additional zones may be added to meet the needs of the application.

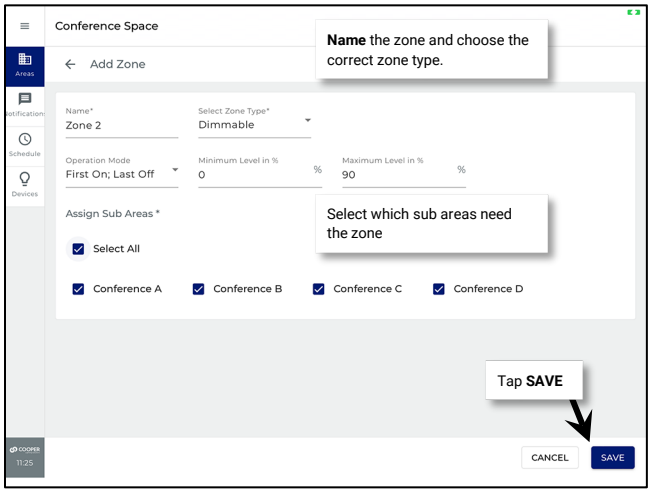


For a complete walk through of creating a partitioned area, refer to the WaveLinx User Guide's "*Part 3: Create Partitioned Areas and Assign Zones*" section.

1. Add a New Zone



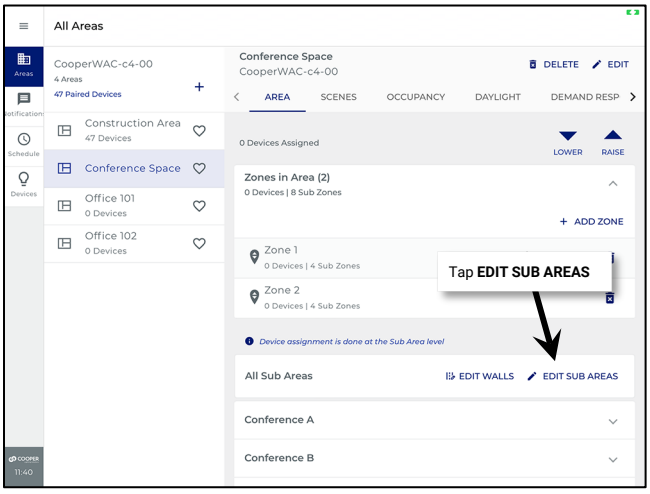
2. Assign the Zone Type and Sub Areas



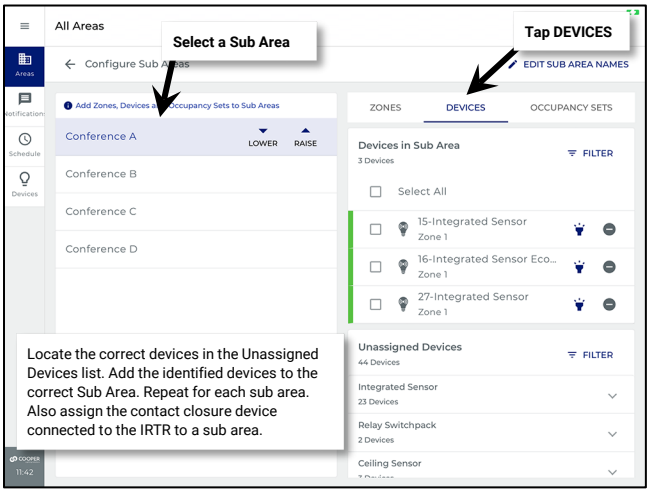
Assign Devices to the Sub Areas and Zones

Once the correct zones are created, WaveLinx devices can be assigned to the partitioned sub areas and zones.

1. Open the Sub Areas



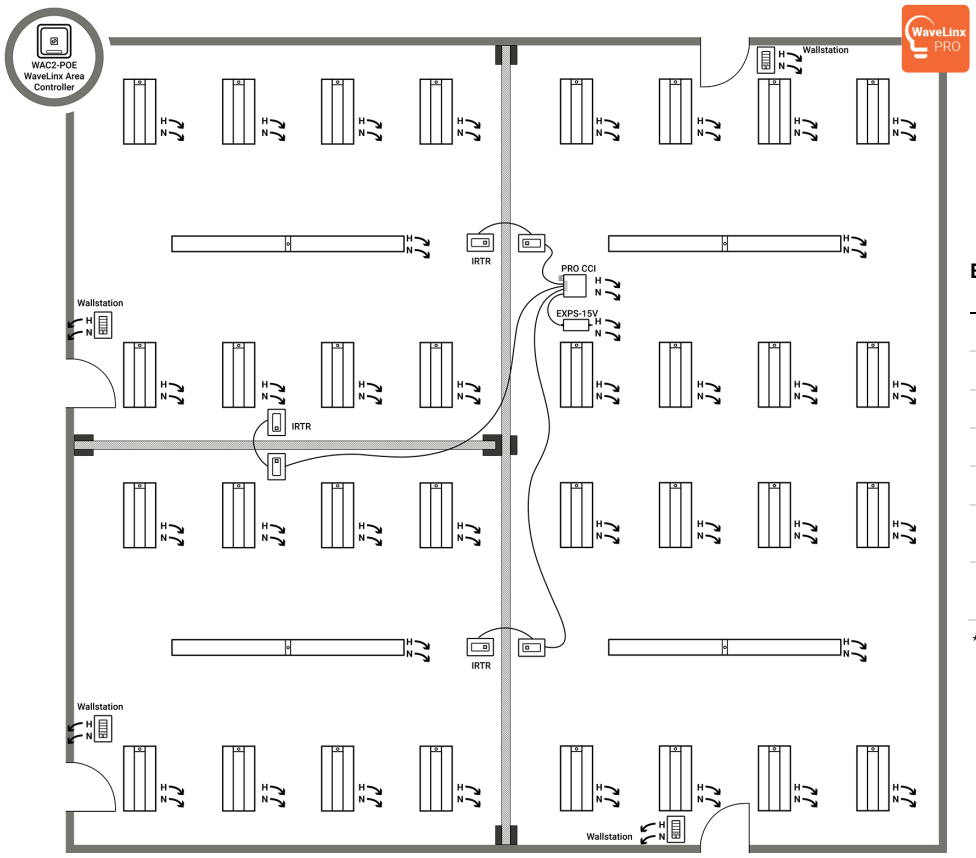
2. Assign Devices to the Sub Areas



For a complete walk through of the device assignment process, refer to the WaveLinx User Guide's "*Organizing WaveLinx Devices into Areas and Zones*" section.

Example: WaveLinx PRO Solution

Partitioned Space: 3 Sub Areas, 3 Partition Walls



Bill of Materials

Qty	Catalog#	Description
1	WAC2-POE	WaveLinx Area Controller G2, PoE Powered
4	WW5-RL-W	WaveLinx PRO Wallstation, 5 Button Raise/Lower White
1*	CCI-P-V	WaveLinx PRO Contact Closure Input Module
1*	EXPS-15V	External Power Supply
3	IRTR	Infrared Transmitter & Receiver
32	24CZ2-40HE-UNV-L835-CD1-WPS-U	Cruze ST 2X4, high efficiency 3500K with WaveLinx PRO Advanced Integrated Sensor
4	I2-WS-3L35-1D-UNV-AC48-T1-12-STD-WAA-W	Iridium i2 Suspended 12ft, WaveStream LED 3500K with WaveLinx PRO Integrated Sensor

* Total quantity of EXPS-15V and CCI-P-V modules is dependent on distance. Distance between IRTR and CCI-P-V should not exceed 32 ft. (10m). If distance exceeds 32 ft. (10m) for any IRTR, provide an additional EXPS-15V and CCI-P-V module for that IRTR location. If one power supply provides power to more than one IRTR, wire positive (+) and negative (–) connections in parallel. Ensure that each IRTR signal lead connects to a different CCI contact on the CCI-P-V. One CCI-P-V supports up to four IRTR connections.

SEQUENCE OF OPERATIONS

LIGHTING

- CONTINUOUS DIMMING

STANDARD CONTROLS

- AUTOMATIC VIA WAVELINX INTEGRATED SENSOR
  - AUTOMATIC ON TO 50%
  - OPTIONAL VACANCY MODE
  - AUTOMATIC OFF OF LIGHTING WITH VACANCY
- CLOSED LOOP DAYLIGHTING (OPTIONAL)

CONTROL DEVICES

- MANUAL VIA WAVELINX WALLSTATION
- AUTOMATIC VIA WAVELINX SCHEDULE (OPTIONAL)

PARTITION CONTROL

- AUTOMATIC VIA IRTR SENSOR COMMAND ISSUED THROUGH WAVELINX PRO CCI
  - LOGIC JOIN CREATED UPON IRTR OPEN COMMAND:
    - WALLSTATIONS AND OCCUPANCY SENSORS IN JOINED AREAS OPERATE TOTAL JOINED SPACE
  - LOGIC SEPARATION CREATED UPON IRTR CLOSED COMMAND:
    - WALLSTATIONS AND OCCUPANCY SENSORS OPERATE SPACES SEPARATELY.

ADDITIONAL FEATURES

- OPTIONAL PLUG LOAD ON WITH OCCUPANCY / OFF WITH VACANCY
- AUTOMATIC DEMAND RESPONSE AVAILABLE FROM WAVELINX AREA CONTROLLER
- UL924 EMERGENCY CONTROL CAPABILITY: WAVELINX PRO EMERGENCY DIMMING SWITCHPACK ESP-P-010-347 (WIRING AND BILL OF MATERIAL WILL DIFFER SLIGHTLY FROM THAT SHOWN)

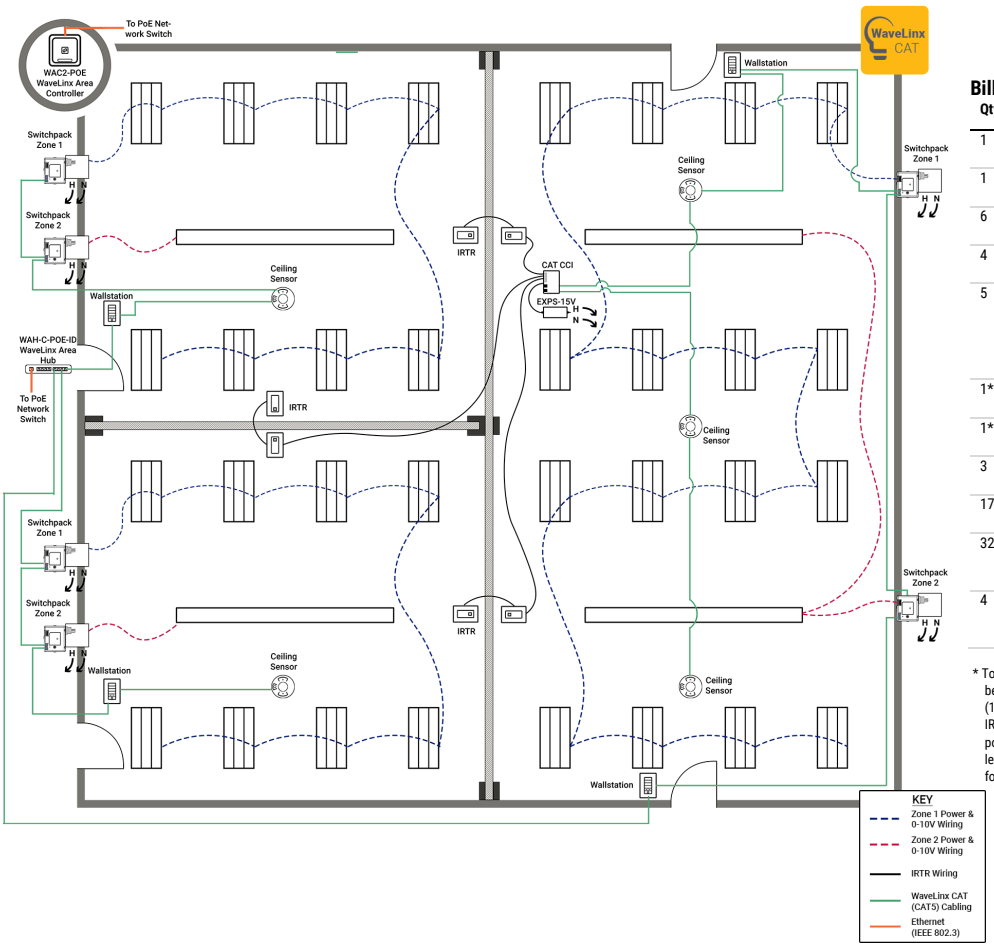
ALTERNATE WAVELINX PRO SOLUTIONS

IF INTEGRATED SENSORS ARE NOT DESIRED THE FOLLOWING DEVICES MAY BE USED (WIRING AND BILL OF MATERIAL WILL DIFFER FROM THE APPLICATION SHOWN):

- WPN (WAVELINX PRO NODE) CAN BE USED IN LIEU OF THE INTEGRATED SENSORS FOR INDIVIDUAL FIXTURE WAVELINX CONTROL
- WAVELINX PRO UNIVERSAL VOLTAGE DIMMING SWITCHPACKS (RSP-P-101-347) CAN BE WIRED TO 0-10V LIGHTING ZONES FOR WAVELINX ZONE CONTROL
- OCCUPANCY SENSING CAPABILITY: SELECT WAVELINX PRO CEILING SENSORS (CWDP-1500)

Example: WaveLinx CAT Solution

Partitioned Space: 3 Sub Areas, 3 Partition Walls



Bill of Materials

Qty	Catalog#	Description
1	WAC2-POE	WaveLinx Area Controller G2, PoE Powered
1	WAH-C-POE-ID	WaveLinx Area Hub
6	RSP-C-010-Z1	WaveLinx CAT RSP-C Relay Switchpack
4	WST-C-5D	WaveLinx CAT Wallstation, 5 Button Raise/Lower
5	OCS-C-P12 **OR** OCS-C-D12	WaveLinx CAT PIR Occupancy Ceiling Sensor, 1200 sq. ft. **OR** WaveLinx CAT DT Occupancy Ceiling Sensor, 1200 sq. ft.
1*	CCI-C-V	WaveLinx CAT Contact Closure Input Module
1*	EXPS-15V	External Power Supply
3	IRTR	Infrared Transmitter & Receiver
17	GGRJ45-25-G	RJ45 cables 25 feet
32	24CZ2-40HE-UNV-L835-CD1-U	Cruze ST 2X4, high efficiency 3500K, 0-10V single circuit driver
4	I2-WS-3L35-1D-UNV-AC48-T1-12-STD-W	Iridium i2 Suspended 12ft, WaveStream LED 3500K, 0-10V single circuit driver

* Total quantity of EXPS-15V and CCI-C-V modules is dependent on distance. Distance between IRTR and CCI-C-V should not exceed 32 ft. (10m). If distance exceeds 32 ft. (10m) for any IRTR, provide an additional EXPS-15V and CCI-C-V module for that IRTR location. If one power supply provides power to more than one IRTR, wire positive (+) and negative (–) connections in parallel. Ensure that each IRTR signal lead connects to a different CCI contact on the CCI-C-V. One CCI-C-V supports up to four IRTR connections.

SEQUENCE OF OPERATIONS

LIGHTING

- CONTINUOUS DIMMING

STANDARD CONTROLS

- AUTOMATIC VIA WAVELINX CAT OCCUPANCY SENSORS
  - AUTOMATIC ON TO 50%
  - OPTIONAL VACANCY MODE
  - AUTOMATIC OFF OF LIGHTING WITH VACANCY
- OPEN LOOP DAYLIGHTING (OPTIONAL)

CONTROL DEVICES

- MANUAL VIA WAVELINX WALLSTATION
- AUTOMATIC VIA WAVELINX SCHEDULE (OPTIONAL)

PARTITION CONTROL

- AUTOMATIC VIA IRTR SENSOR COMMAND ISSUED THROUGH WAVELINX CAT CCI
  - LOGIC JOIN CREATED UPON IRTR OPEN COMMAND:
    - WALLSTATIONS AND OCCUPANCY SENSORS IN JOINED AREAS OPERATE TOTAL JOINED SPACE
  - LOGIC SEPARATION CREATED UPON IRTR CLOSED COMMAND:
    - WALLSTATIONS AND OCCUPANCY SENSORS OPERATE SPACES SEPARATELY.

ADDITIONAL FEATURES

- OPTIONAL PLUG LOAD ON WITH OCCUPANCY / OFF WITH VACANCY
- AUTOMATIC DEMAND RESPONSE AVAILABLE FROM WAVELINX AREA CONTROLLER
- UL924 EMERGENCY CONTROL CAPABILITY: WAVELINX CAT EMERGENCY DIMMING SWITCHPACK ESP-C-010-Z1 (WIRING AND BILL OF MATERIAL WILL DIFFER SLIGHTLY FROM THAT SHOWN)

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