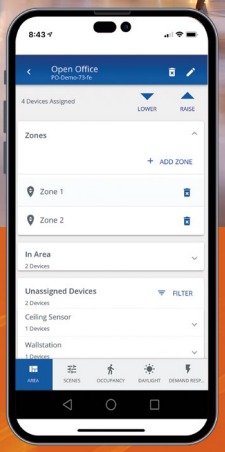
design and application guide
volume 8



WaveLinx Pro

Wireless Connected Lighting System for Indoor | Outdoor | Industrial

Flexible. Connected. Secure.

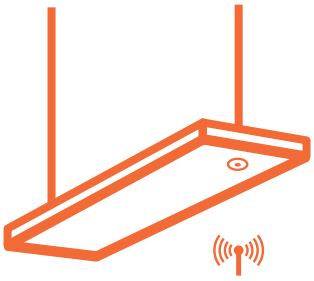
COOPER Lighting Solutions

cooperlighting.com

WAVELINX PRO

Flexible. Connected. Secure.

Integrated sensors provide immediate out-of-the-box performance,
code compliance and can be configured as a system from a secure mobile application.



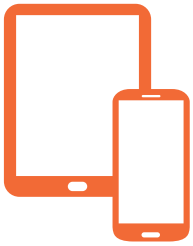
CONNECTED LIGHTING & CONTROLS

Advanced lighting fixtures and digital control devices

Sensing and communications technology

CONNECTIVITY

Gateway with edge data process power



APPS / SOFTWARE

Data accumulation & analysis

Software applications

Industry-leading technology, in a simple package

WaveLinx Pro provides immediate out-of-the-box functionality while the intuitive mobile application simplifies even the most complex installation. Contractors love the simplified installation saving them time on site.

WaveLinx Pro is the designers choice for offices, schools, healthcare facilities, distribution centers and more.

Table of Contents

Connected Lighting

Wireless the way you want it

The value of the WaveLinx Pro connected lighting system is to better manage and fully optimize your lighting system with your existing people, energy and property.

Save time on system installation and setup

Eliminates the cost and complexity of typical wireless control system commissioning while providing a flexible and reconfigurable wireless topology for on the fly space adjustments.

Achieve peace of mind

WaveLinx Pro was designed with security and luminaire compatibility in mind from day one, to meet your applications.

Grow your cost savings

Designed to save energy, WaveLinx Pro provides superior code compliance and energy saving sequences while reducing installation and increasing flexibility.

Features & benefits

Contractor Benefits

- Reduce installation time/cost with the WaveLinx Pro wireless system that includes luminaires and controls that just work.
- Peace of mind with fully integrated luminaires and a wireless control system from WaveLinx Pro that are compatible and secure.
- Save time with WaveLinx Pro out-of-the-box functionality, construction grouping and automatic code commissioning that allow the installer to verify functionality at least 40% faster than traditional addressable systems.

Facility Manager/Owner Benefits

- Save on operating costs with a system that was designed to provide consistent energy savings and drive energy efficiency throughout the building.
- Manage flexibility with quickly re-assignable fixtures to create new control zones and areas via WaveLinx Pro Mobile.
- Save on capital with utility and DLC rebates. WaveLinx Pro meets the utility requirements for networked addressable luminaires with energy calculations.

Specifier Benefits

- Worry free design with WaveLinx Pro that was developed to meet the latest energy codes and utility rebate requirements.
- Design flexibility provided with WaveLinx Pro allows spaces to be easily reconfigured and zoned based on occupant work flow.
- Easily integrate with BMS and 3rd party systems.

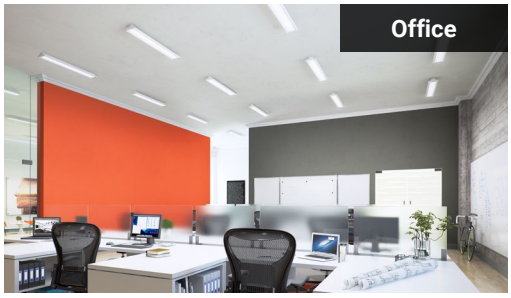
End User Benefits

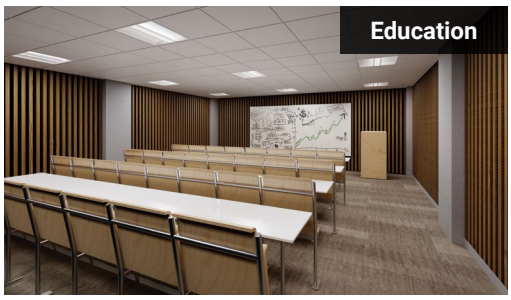
- Control flexibility with simple to use WaveLinx Pro Mobile App to configure area and zone daylight, occupancy and scene controls.
- Reduce training time and simplify control using the intuitive WaveLinx Pro Mobile App.
- Enhance occupant experiences with IoT capabilities to share data via a Public API (REST).

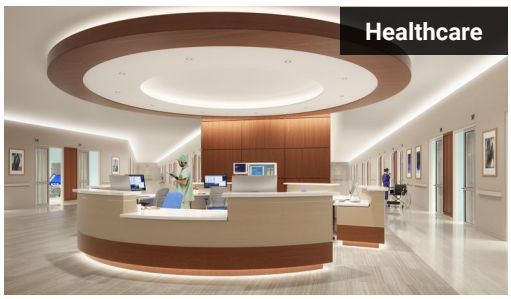
Connected solutions overview

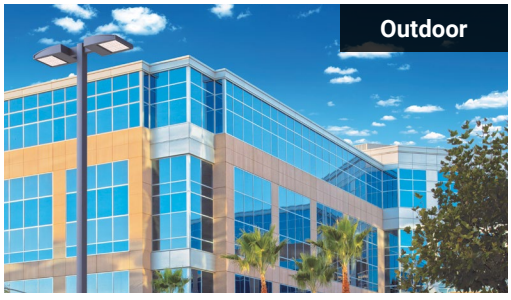
A number of product solutions to meet your code and application requirements. This guide provides information on how WaveLinx Pro can be used to meet or exceed your code and application requirements.

		Trellix* (optional)	
		WaveLinx Pro wireless	**WaveLinx** wired
EQUIPMENT	Wired Switches	●	●
	Battery Switches	●	
	Wired Sensors	●	●
	Battery Sensors	●	
	Wireless fixtures	●	
	Sensor integrated fixtures	●	
	Switchpacks	●	●
	Receptacle Control	●	●
	Low-Voltage Power Module	●	
INSTALLATION	Traditional wiring	●	●
	Modular Wiring System	●	●
	Wireless communications	●	
	Two wire communications		●
	Low-Voltage Power Module	●	
SOFTWARE	AV integration*	●	●
	BACnet*	●	●
	OpenADR*	●	
	Mobile App	●	
	Floorplan*	●	○
	Alarms & Events*	●	○
	Energy Dashboard*	●	○
	API Integration*	●	○
APPLICATIONS	Office/ Private/ Open	●	●
	Education/ Classroom	●	●
	Industrial/ Warehouse	●	●
	Outdoor Parking Lot	●	●
	Outdoor Area Site	●	●
	Outdoor Parking Garage		●
CODE	ASHRAE 90.1	●	●
	IECC	●	●
	T24	●	●



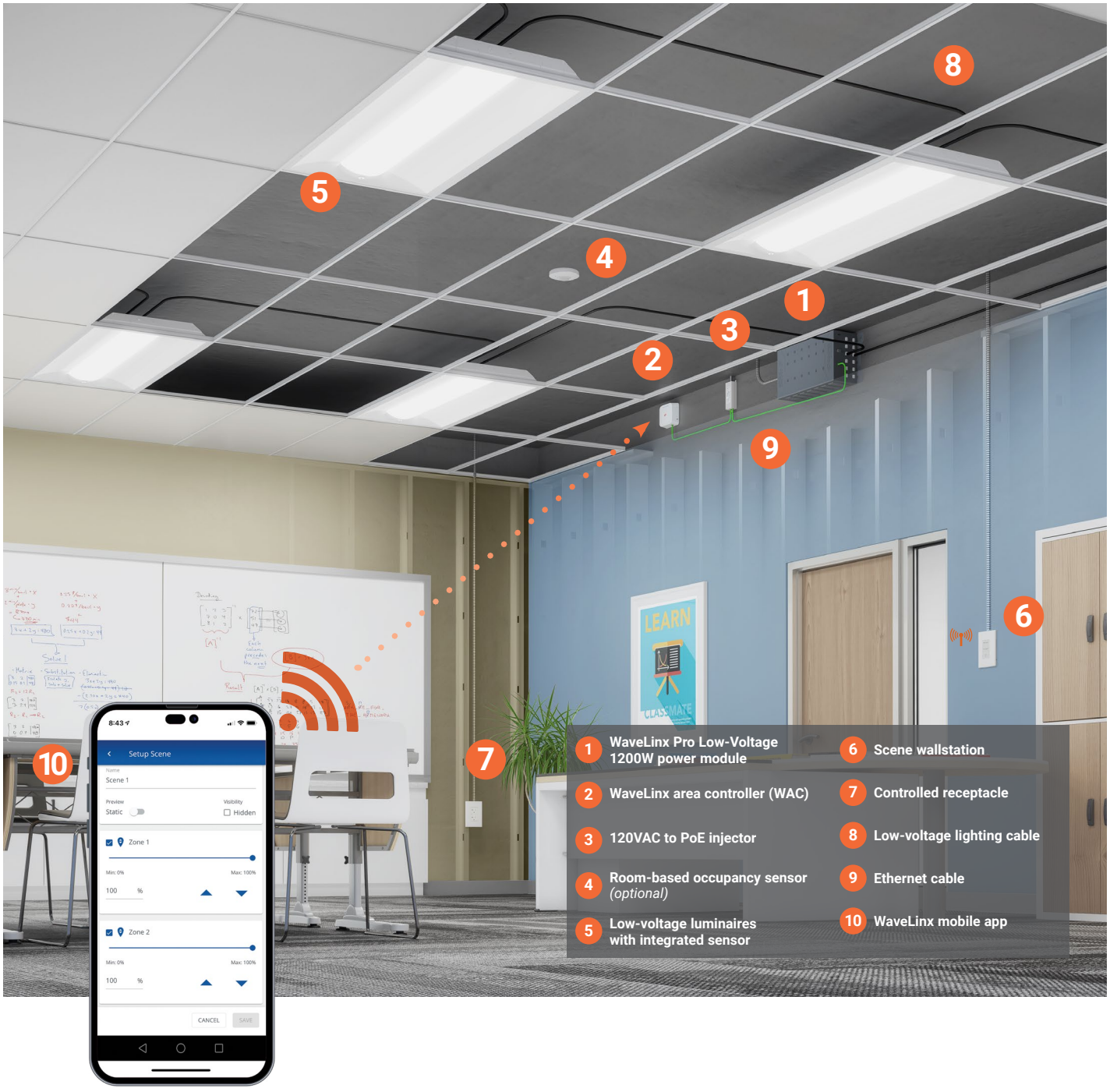






WaveLinx Pro becomes a more comprehensive lighting system on the market with the inclusion of low-voltage wiring capabilities via the WaveLinx Pro Low-Voltage Power Module

A system that is so simple that it can be setup without lighting controls knowledge is extremely rare. WaveLinx Pro is setup using an intuitive mobile application that only requires you to create an area and identify which device is in the area. WaveLinx Pro, wireless and low-voltage operating seamlessly, does the rest using our patent pending automatic code commissioning.



Features

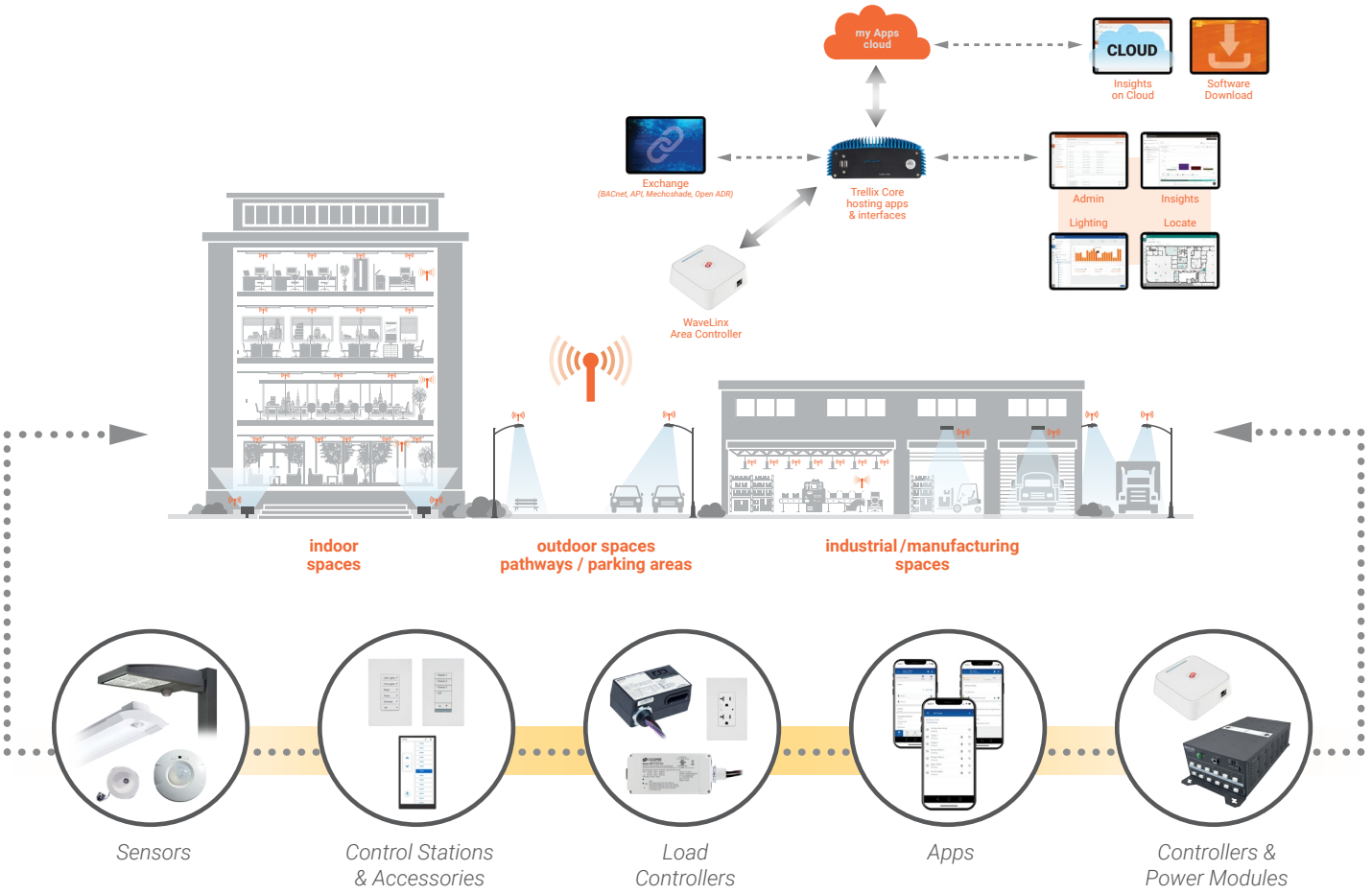
- Wireless controls and luminaires for indoor and outdoor
- Wireless integrated or external multi-sensors
- Comply with latest energy code and incentive requirements
- No new wires, control system installed with fixture
- Integrated low-voltage wiring topology option
- Simplified personal control
- Simplified installation and setup for contractor
- Out-of-the-box functionality
- Future-ready design
- Energy calculations (available through Trellix) (BACnet and API)
- IoT ready and POE capable
- Enterprise networkable
- BACnet and API integration

System Architecture

- Each luminaire, sensor, relay, receptacle and wallstation wirelessly communicate to the WaveLinx Area Controller (WAC2-POE)
- All components are individually addressable and networked back to the WaveLinx Area Controller
- Setup and personal control are completed using the WaveLinx Pro Mobile app
- The WaveLinx Area Controllers communicate to Trellix using a LAN or VLAN connection
- Standardized IEEE 802.15.4 wireless communications

Connected does not have to mean complex.

One streamlined, easy-to-install system to rule them all.



WaveLinx Pro mobile app

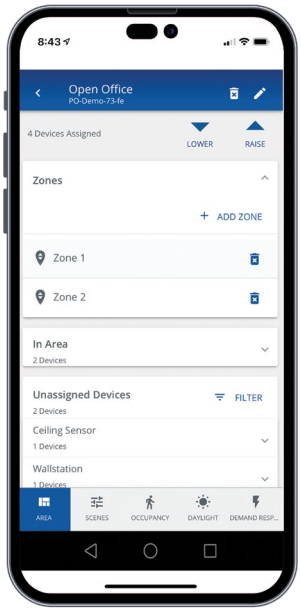
The WaveLinx Pro Mobile App enables users to perform setup, configuration and maintenance of the WaveLinx Pro system from a wireless smartphone or tablet.

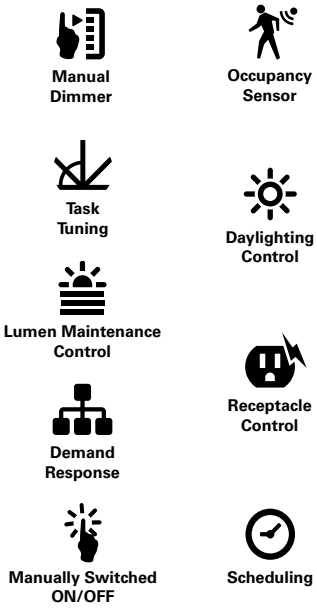
Automatic Code Commissioning

- Create Areas
- Drag devices into Areas/Zones

Automatic Sequence of Operations

- Automatic ON to 50%
- Automatic OFF of lights & plug load
- Wallstation scene control
  - Dominant button is 50% light level
  - Other buttons are scenes
- Demand Response ready





WaveLinx Pro security

Stay secure with ultimate peace of mind with information security threats and fears on the rise, WaveLinx Pro is designed to keep your data on lockdown with seven tiers of security.

Physical barriers to entry

The WaveLinx Area Controller sits in the ceiling, and hidden from view

Customer security

NIST Cybersecurity Framework and industry best practices

Device security

Features AES 128-bit encryption device-to-device communication

Network segmentation

Isolated targets mean reduced for large scale breaches

Network security

Secure HTTPS protocols and WPA2 technology

Over-the-air updates

Wireless technology allows your system to securely stay up-to-date

WaveLinx Pro security assurance

Continuous monitoring and reporting of internet threats and vulnerabilities. Notifications are sent to user when cybersecurity threats have been identified.

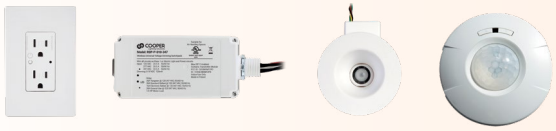
IEC 62443-4-1 and 62443-4-2 CERTIFICATION

WaveLinx Pro devices are IEC 62443-4-1 and IEC 62443-4-2 certified.

Independent certifications have been performed by Dekra, an IEC accredited cybersecurity lab.

Data communication and management

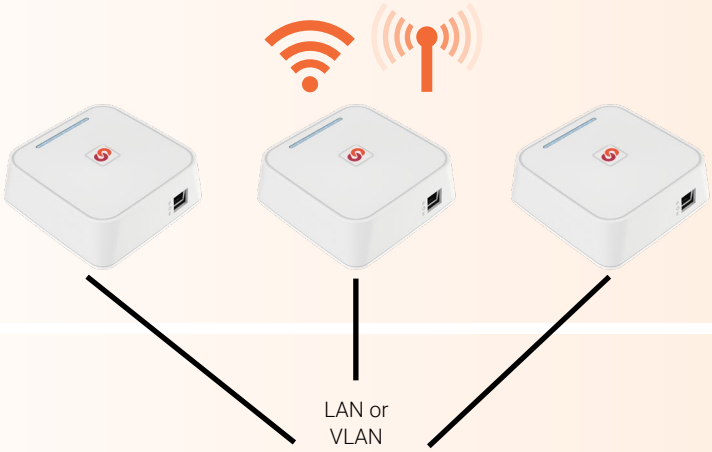
WaveLinx Pro controlled and integrated sensor fixtures - wireless and low-voltage options



Wireless 0-10V fixture and plug load control

data collected

Wireless wallstations and connected touchscreens



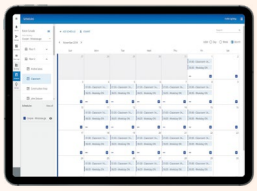
Trellix Core Pro and Trellix Core Enterprise

data connected

at the edge

data exchanged

and shared



Trellix Applications

Admin | Lighting | Exchange

data insight

KEY Wi-Fi Signal | IEEE 802.15.4 | Low-Voltage

Trellix

Smart Spaces Platform

Trellix transforms the WaveLinx Pro connected lighting System into an IoT infrastructure with limitless potential to keep up with the growing service demands of people, property and resources.

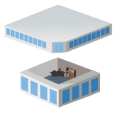
Trellix is a distributed network of smart sensing and beacon technology that captures real-time data; making your facility smarter so you can make smarter decisions.



Gateways	1 Wireless Area Controller	up to 20 Wireless Area Controllers	up to 300 Wireless Area Controllers
Devices	200	3,000	32,500
Software	Mobile App	Trellix Core Pro	Trellix Core Enterprise

SCALABILITY

WaveLinx expands from 1 to 32,500 devices with Trellix



Control up to 200 devices for a single **ROOM / FLOOR**

Add Trellix Core Pro and control over 3,000 devices for a **BUILDING**

Use a Trellix server (on premises or virtual) and control over 32,500 devices for a **CAMPUS**

Unlock the Value of the Data being gathered by Trellix

Connectivity service

Manages data exchange with WaveLinx Area Controllers and 3rd party gateways using API.

Message Routing service

Manages the routing of the received data to the other Trellix Core microservices.

Data Management service

Manages the real-time data received from the various sources as well as aggregated data for analytics.

Device and Spatial Object Management service

Manages (add, edit, remove) devices connecting the platform as well as spatial objects (clients, buildings, floors, etc) defined within the platform.

Event Management service

Manages the events generated by the devices and spatial objects.

Location service

Computes the location of the assets based on received BLE data.

Security service

Manages the devices authentication as well as data exchange between the various components.

Authentication and Authorization service

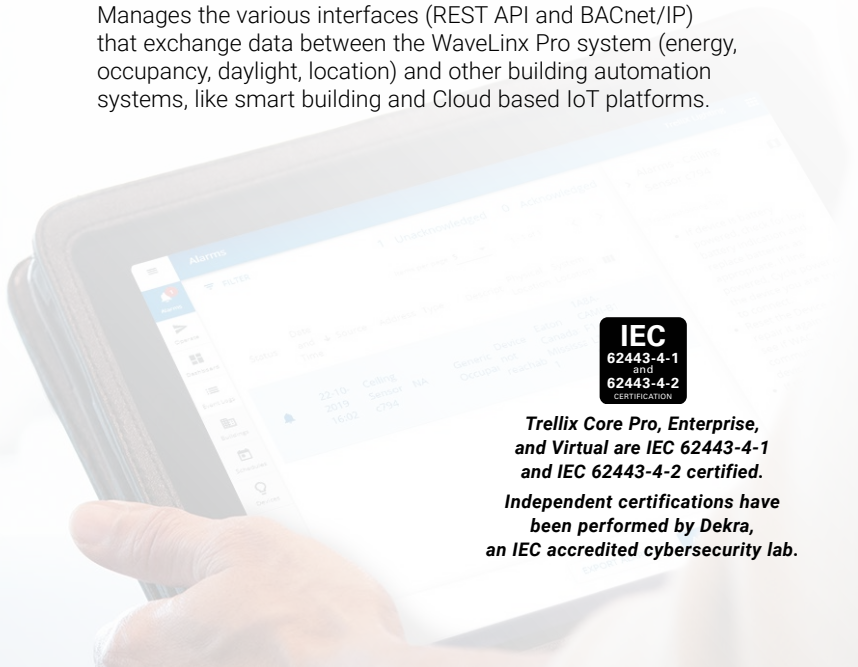
Manages the users that can safely connect to the Trellix platform and applications as well as roles and permissions for each user.

OS & Applications Management service

Manages the operating system and applications hosted on the Trellix platform.

Interfaces service

Manages the various interfaces (REST API and BACnet/IP) that exchange data between the WaveLinx Pro system (energy, occupancy, daylight, location) and other building automation systems, like smart building and Cloud based IoT platforms.



IEC 62443-4-1 and 62443-4-2 CERTIFICATION

Trellix Core Pro, Enterprise, and Virtual are IEC 62443-4-1 and IEC 62443-4-2 certified.

Independent certifications have been performed by Dekra, an IEC accredited cybersecurity lab.

Trellix key features

Trellix Smart Spaces Platform

Trellix is an on-premises, open integration Smart Spaces Platform that moves real-time monitoring and processing to the edge which allows you to gain faster insights of building's operations, drive efficiencies and make effective decisions.

Alarms and Events with Smart Tips

Get alerted to outages and other system health issues, so you can address issues with minimal disruption. You can receive detailed alerts via the app and/or email, eliminating the need for routine checks. Smart Tips also provides time saving suggestions to resolve issues.

Energy Dashboard

Analyze historical usage data across multiple areas, floors, buildings, and sites, to visualize where you're using the most energy and identify areas for improvement.

Schedules

Use the Trellix intuitive scheduling interface to manage lighting and controlled receptacle schedules for one or more buildings – all from a central location.

Operate

From one fixture to the entire building, lighting control is at your fingertips.
Monitor devices, update dimming schedules, send light control commands, and much more – across buildings, floors and areas.

Trellix Locate

Real-Time Location System

Leverage the WaveLinx Wireless integrated sensor along with the Trellix Locate application to monitor and manage critical assets equiped with BLE tags.

Asset Tracking

Have total visibility to where your assets are by quickly locating them on map or tabular view. Reduce by more than 90% your search time for critical equipment.

Geofencing

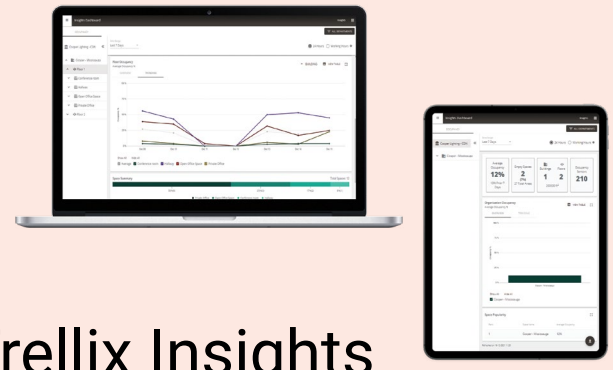
Get real-time notifications when a location-based condition associated with a geo-fence is met. Easily create and manage geo-fence.

Alarms

Get instant notifications when something needs your attention—like an asset exiting or a fridge exceeding the upper-temperature limit—based on business rules you create. You can quickly see where the situation is located within your floorplan and respond immediately.

Asset Tags

Trellix Locate offers a range of tag options, from personal and assets tags to using your mobile device as a virtual tag, all configurable by mobile app.



Trellix Insights

Occupancy Dashboard

Analyze the data gathered from occupancy sensors to optimize the building space utilization with pre-configured dashboards.

Out-of-the-box dashboard and reports

Ready-to-use scalable multi-site dashboards available on-premises and on cloud. The dashboard and reports provide aggregated and detailed occupancy metrics at enterprise, site, building, area, and room level.

Floorplan visualization

Along with enterprise hierarchy, charts, and other representation to quickly view average area occupancy, compare occupancy trends and real-time occupancy at site, building and floor level.

Quickly navigate

From Enterprise level to site, area, and room level to monitor key performance indicator for real-time occupancy utilization and occupancy trends. Desktop, mobile and kiosk compatible and intuitive chart views – bar/line.

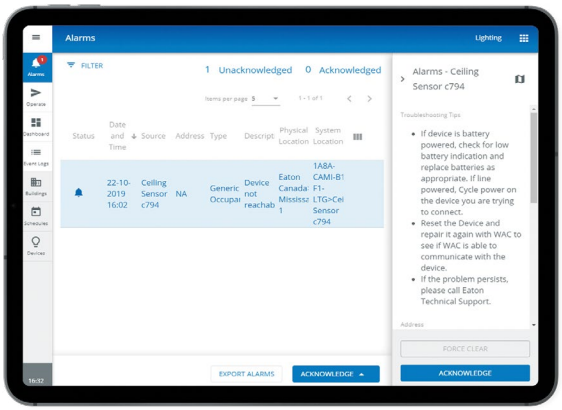
Identify your most and least used spaces

View area occupancy across your real-estate portfolio from most used (>70%) to least used (< 30%) by department, space type, building and floor.

Unlock the value of the data being gathered by the Trellix Core

A suite of microservices required for a fully functional IoT solution; Trellix facilitates device communication, device management, data upload, aggregation and storage, app/solution creation as well as robust user and device security, authentication and authorization.

For more information, see:
cooperlighting.com



Trellix Lighting Central Configuration and Management

Enterprise | IoT | BACnet | API Integration

The Trellix Lighting application helps facility/property managers take full advantage of IoT by connecting WaveLinx Pro with other building systems using BACnet and Public API (REST). Trellix solutions include alarms with smart tips, system events, demand response, platform flexibility and future readiness.

catalog number:

TRX-LGT250 - Additional Trellix Basic licenses (250 devices) (BACnet and API sold seperately)

TRX-BACNET - Trellix BACnet Integration license for unlimited devices

TRX-API - Trellix API Integration license for unlimited devices

TRX-OPNADR - Trellix OpenADR software license for unlimited devices.

TRX-CONFIG - Commissioning service for Trellix Energy and Graphical Floorplan setup (per 250 devices)

See product spec sheet for ordering information.

Trellix Core Pro

Enterprise | BACnet | API Integration

The Trellix Core Pro is an on-premises hardware platform hosting Trellix software applications. It networks up to twenty (20) WaveLinx Area Controllers collecting data that can be shared with third party systems via BACnet and Public API (REST).

catalog number:

TRX-TCPR02 - Trellix Core Pro (supports 20 WACs) Includes license for 250 devices

Trellix Core Enterprise
Virtual Trellix Core Enterprise

Enterprise | BACnet | API Integration

The Trellix Core Enterprise is an on-premises hardware platform hosting Trellix software applications. They network up to three-hundred (300) WaveLinx Area Controllers collecting data that can be shared with third party systems via BACnet and Public API (REST).

catalog number:

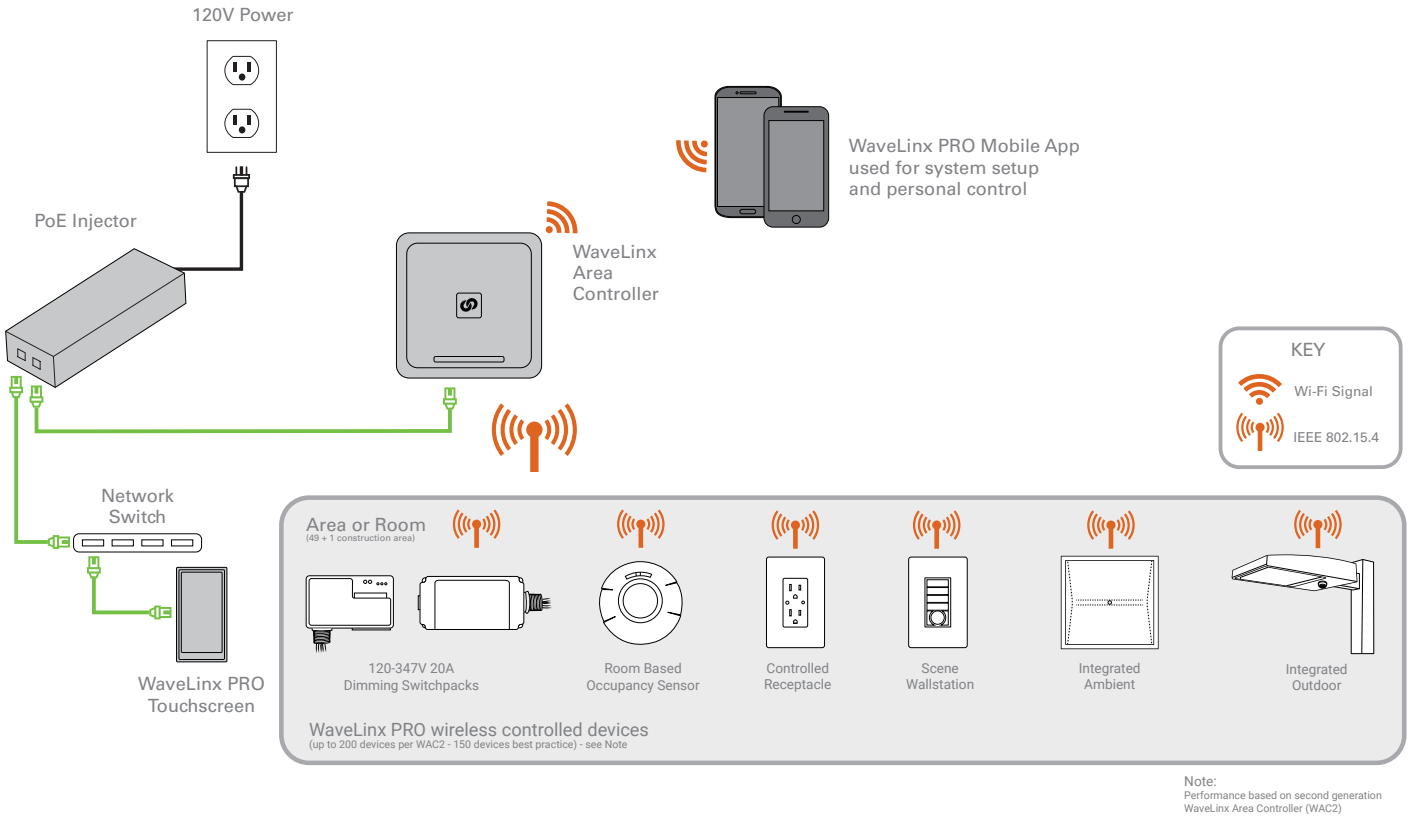
TRX-TCENT2 - Trellix Core Enterprise (supports 300 WACs) Includes: 250 devices (Lighting base license)

TRX-TCVRT2 - Trellix Core Virtual Enterprise (supports 300 WACs) Includes: 250 devices (Lighting base license)

System architecture

WaveLinx Pro dedicated installation

Stand-alone space | IT setup not required | Scalable to join Network

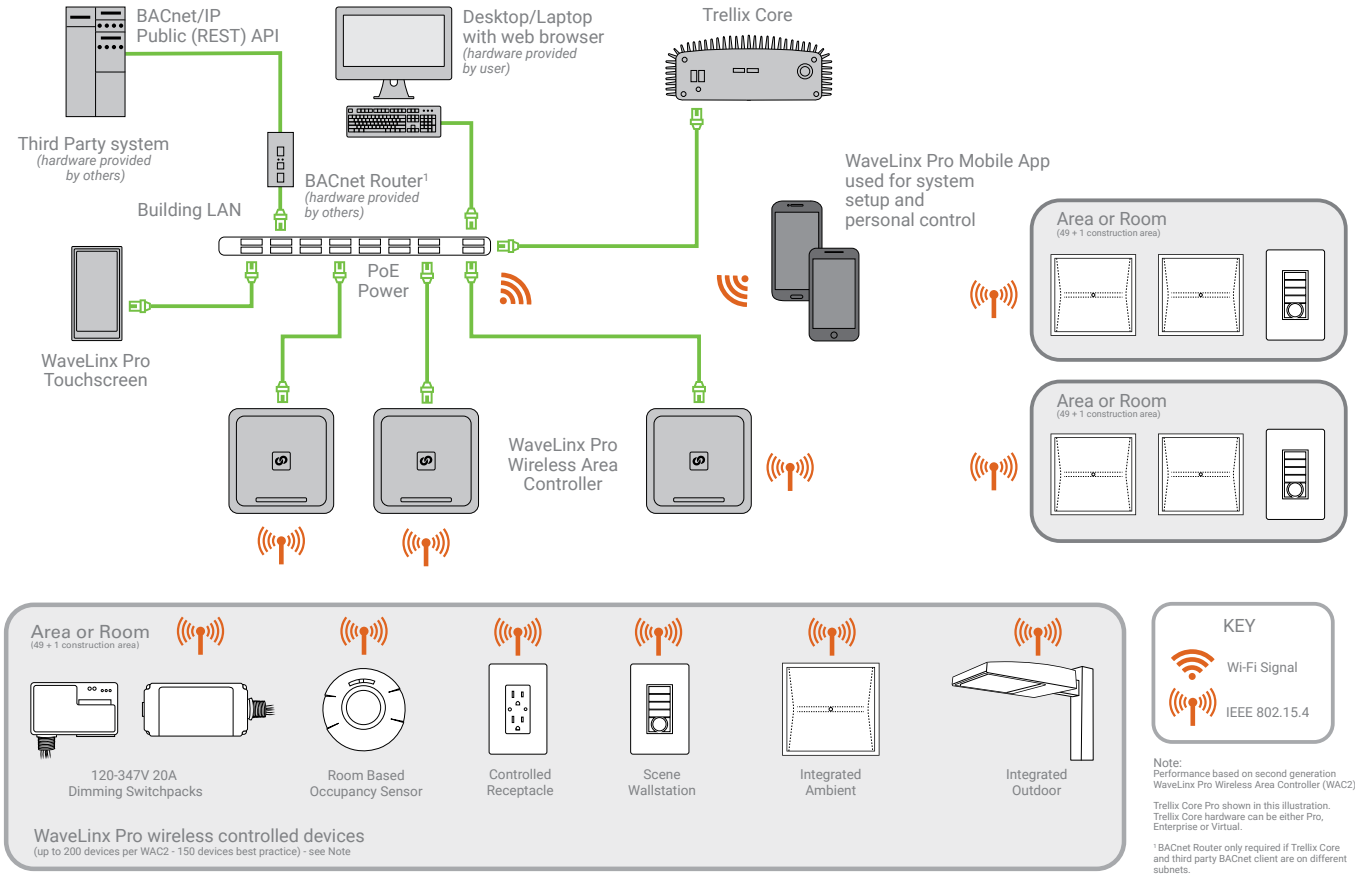


Features

- Creates Wireless Access point for Direct Mobile Connection
- No connection to Building LAN required
- Powered via PoE injector
- Controls up to 200 WaveLinx Pro devices (light fixtures, relay switchpacks, wallstations, sensors, etc.)
- Supports up to 50 Areas (49 user defined) with multiple lighting zones, occupancy sets, and daylight sets per area
- Drag and drop programming of lighting zones and areas via WaveLinx Pro Mobile App

WaveLinx Pro network installation

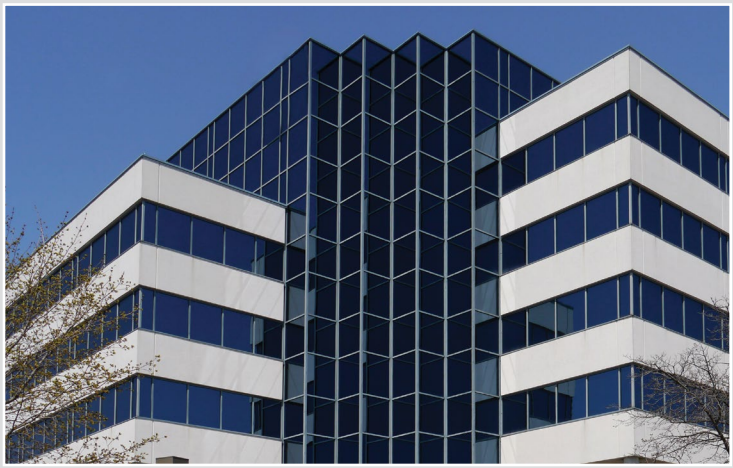
Entire building solution | Smart building ready | Simple, secure network addition



Note:
Performance based on second generation WaveLinx Pro Wireless Area Controller (WAC2)

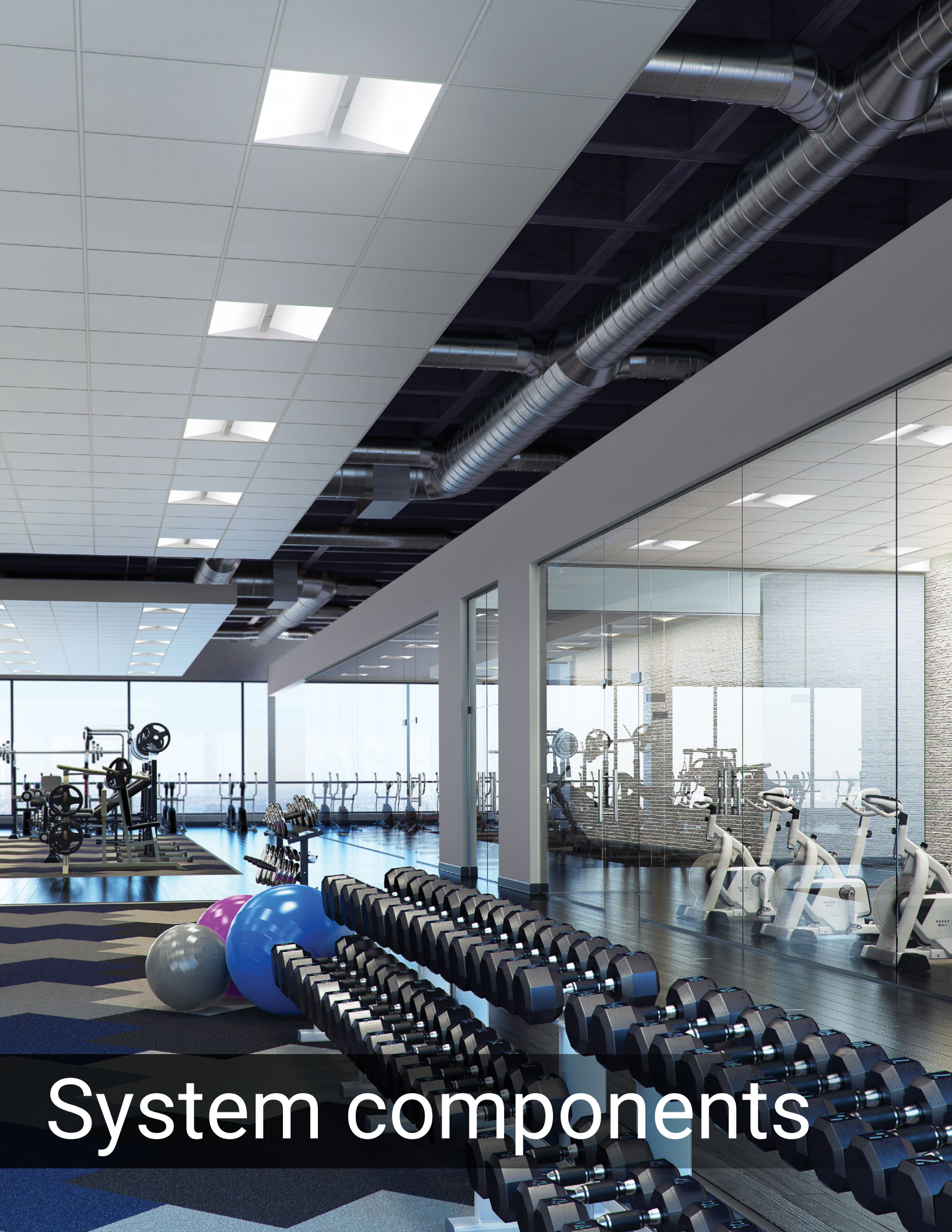
Trellix Core Pro shown in this illustration. Trellix Core hardware can be either Pro, Enterprise or Virtual.

[1] BACnet Router only required if Trellix Core and third party BACnet client are on different subnets.



Features

- Ensures peace of mind with WaveLinx Pro seven layer security assurance
- WaveLinx Pro uses building LAN or VLAN to create enterprise network with Trellix
- Web-based enterprise platform for integration, alarms, events and reporting provided by Trellix
- Enterprise level control of WaveLinx Pro devices (lights, relays, sensors, wallstations, receptacles, etc)
- Trellix Core includes Lighting base license for 250 devices. BACnet and API licensed separately



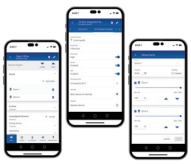
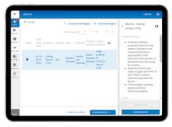
System components

System components

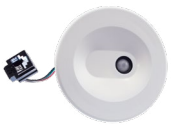
Wireless Connected Lighting

WaveLinx Pro is the most comprehensive and cost effective wireless lighting system on the market. It provides out-of-the-box functionality that facilitates basic occupancy code compliance while also providing an energy saving high end trim. A wireless system that is so simple that it can be setup without lighting controls knowledge is extremely rare. WaveLinx Pro is setup using a mobile application that only requires you identify which device is in each room, WaveLinx Pro does the rest using our patent pending automatic code commissioning.

WIRELESS CONNECTED LIGHTING COMPONENTS

DESCRIPTION		T24 2019	ASHRAE 90.1-2019	IECC 2021	CAT NUMBER
WaveLinx Area Controller Stand-alone | Network Mobile Access		130.1 (e) 130.4 130.1 (c) 6c	9.4.3 9.4.1.1.g	C405.2.2 C405.2.6 C406.1 C406.4 C408.3	WAC2-POE WAC2-120 WPOE2-120
WaveLinx Area Controller with IP-66 Rated Outdoor Enclosure Stand-alone | Network Mobile Access *Not for installation in direct sunlight*		130.1 (e) 130.4 130.1 (c) 6c	9.4.3 9.4.1.1.g	C405.2.2 C405.2.6 C406.1 C406.4 C408.3	WAC2-POE-OUT-EN
WaveLinx Pro Mobile app Stand-alone | Network Mobile Access		130.1(a) 130.1(b) 130.1(c)1 130.5(a)	9.4.1.1a 9.4.1.1.b 9.4.1.1.c 9.4.1.1.d 8.4.3.1	C405.2.2 C405.2.6 C406.1 C406.4 C408.3	W-APP
Trellix Core Pro Enterprise | BACnet API Integration				C406.4 C408.3	TRX-TCPRO2
Trellix Core Enterprise & Virtual Trellix Core Enterprise Enterprise | BACnet API Integration				C406.4 C408.3	TRX-TCENT2 TRX-TCVRT2
Trellix Enterprise | IoT BACnet | API Integration				C406.4 C408.3	TRX-LGT250 TRX-API TRX-BACNET TRX-OPNADR

WIRELESS CONNECTED LIGHTING COMPONENTS

	DESCRIPTION	T24 2019	ASHRAE 90.1-2019	IECC 2021	CAT NUMBER
Wireless Integrated Sensor Sensing | Daylight Wireless		130.1 (c) 130.5 (d) 130.1 (d) 140.6 (d)	9.4.1.1.e 9.4.1.1.f 9.4.1.1.h 9.4.1.1.i 9.4.1.1.g	C405.2.1 C405.2.1.1.2 C405.2.1.2 C405.2.1.3 C405.2.3 C405.2.4 C405.2.5	WAA
Wireless Tilemount Sensor Kit Sensing | Daylight Downlights | Wireless		130.1 (c) 130.5 (d) 130.1 (d) 140.6 (d)	9.4.1.1.e 9.4.1.1.f 9.4.1.1.h 9.4.1.1.i 9.4.1.1.g	C405.2.1 C405.2.1.1.2 C405.2.1.2 C405.2.1.3 C405.2.3 C405.2.4	WTA
Wireless Ceiling Sensor Sensing | Daylight Wireless | Battery		130.1(c) 130.5(d)	9.4.1.1.h 9.4.1.1.i 9.4.1.1.g	C405.2.1 C405.2.1.1.2 C405.2.1.2 C405.2.1.3 C405.2.3 C405.2.4	CWPD-1500
Wireless Outdoor Lighting Control Module Scheduling | Dimming Astronomic | Wireless Zones				C405.2.6	WOLC-7P-10A
Outdoor Fixture Mount Sensor Sensing | Daylighting Individual | Grouping Motion | Astronomic		130.1(a) 130.1(b)	9.4.1.1a 9.4.1.1.b 9.4.1.1.c 9.4.1.1.d	C405.2.1.1.2 C405.2.2 C405.2.2.2 C405.2.5	SWPD4 SWPD5
Industrial High Bay Sensor Sensing | Daylighting Individual | Grouping Motion		130.1(a) 130.1(b)	9.4.1.1a 9.4.1.1.b 9.4.1.1.c 9.4.1.1.d	C405.2.1.1.2 C405.2.2 C405.2.2.2 C405.2.5	SWPD3
IR Remote Wireless | Reduce Commissioning Time					ACC-P-RT

WIRELESS CONNECTED LIGHTING COMPONENTS

	DESCRIPTION	T24 2019	ASHRAE 90.1-2019	IECC 2021	CAT NUMBER
Wireless Dimming Switchpack 0-10V | 120-277V Plug Load | Wireless					RSP-P-010-347
Universal Dimming Switchpack with Dry Contact Input 0-10V | 120-347V Wireless					WSP-CA-010
Wired Wallstation Manual | Scenes Zones | Wireless		130.1(a) 130.1(b)	9.4.1.1a 9.4.1.1.b 9.4.1.1.c 9.4.1.1.d	C405.2.1.1.2 C405.2.2 C405.2.2.2 C405.2.5	W1L -* W1L - RL -* W2L -* W2L -RL -* W3L -* W2S -* W2S - RL -* W4S -* W4S - RL -* W5S -* W6S -*
Wired Wallstation Manual | Scenes Zones | Wireless		130.1(a) 130.1(b)	9.4.1.1a 9.4.1.1.b 9.4.1.1.c 9.4.1.1.d	C405.2.1.1.2 C405.2.2 C405.2.2.2 C405.2.5	WW1-W WW3-W WW3-RL-W WW5-RL-W
Battery powered on-wall wallstation Battery | Manual Scenes | Zones Wireless		130.1(a) 130.1(b)	9.4.1.1a 9.4.1.1.b 9.4.1.1.c 9.4.1.1.d	C405.2.1.1.2 C405.2.2 C405.2.2.2 C405.2.5	WB2L-S1 -* WB2L-S2 -* WB2L-* WB3L-S2 -* WB3L-D -* WB3L-* WB5-S3 -* WB6S-S3 -* WB6S-S3D -* WB6S-S5 -*
Battery powered in-wall Wallstation Battery | Manual Scenes | Zones Wireless		130.1(a) 130.1(b)	9.4.1.1a 9.4.1.1.b 9.4.1.1.c 9.4.1.1.d	C405.2.1.1.2 C405.2.2 C405.2.2.2 C405.2.5	WWB1-W WWB3-W WWB3-RL-W WWB5-RL-W
Touchscreen PoE Powered Light Control Architectural Design		130.1(a) 130.1(b)	9.4.1.1a 9.4.1.1.b 9.4.1.1.c 9.4.1.1.d	C405.2.1.1.2 C405.2.2 C405.2.2.2 C405.2.5	TSE57-WLX-B
Wireless Receptacle Plug Load | Wireless		130.5 (d)	8.4.2	C405.2.4	WR-20

WaveLinx:

Convergence of wireless and low-voltage

Blends the benefits of low-voltage wiring with wireless control for speed and flexibility

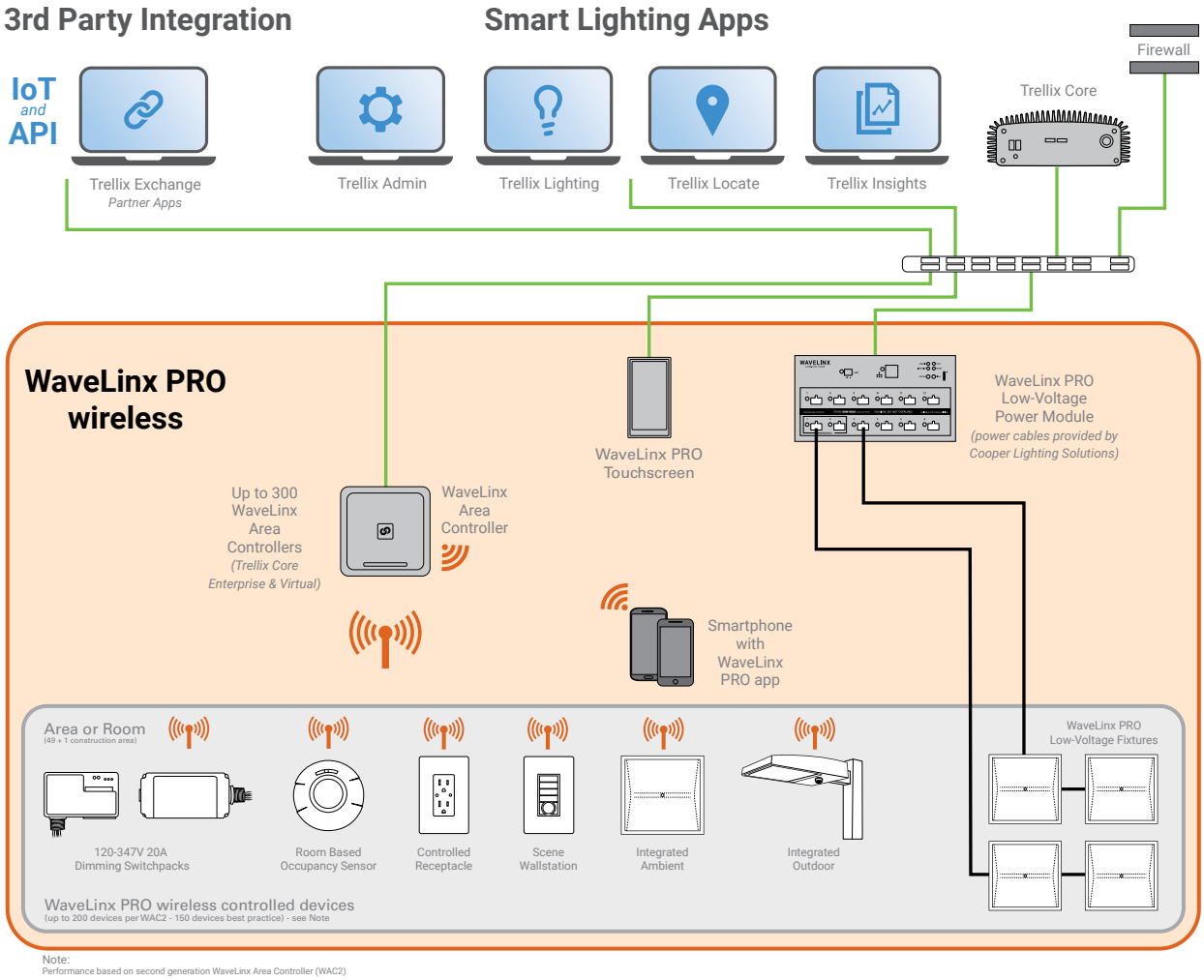
Optional 1200W Low-Voltage Power Module unlocks material cost and labor efficiencies, effectively creating a hybrid system that combines the installation benefits of class 2 low-voltage wiring with flexibility of wireless control.

Low-Voltage 1200W Power Module

The WaveLinx 1200W Low-Voltage Power Module is a central feature of the WaveLinx Pro Low-Voltage offering. The WaveLinx Pro Low-Voltage Power Module supports the full functionality of the WaveLinx Pro connected lighting System via an Ethernet connection to a WaveLinx Area Controller (WAC) allowing low-voltage wired and wireless devices to operate harmoniously as part of a single control system.

Note: Low-voltage light fixtures not compatible with Trellix Locate.

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



Note:
Performance based on second generation WaveLinx Area Controller (WAC2)

simply
plug-and-play

WaveLinx Pro low-voltage fixtures

See pages 27-28 for
available Low-Voltage options = ○

or

For a complete list of compatible products, see:
www.cooperlighting.com

Reduce Labor

WaveLinx Pro Low-Voltage not only reduces the reliance on the in demand Class 1 contractor, but also reduces the overall project time by up to 40%.

Pre-terminated low-voltage cables and fixtures mean that after the initial power module and line voltage cable are installed, the rest of the process can be completed using less specialized labor.

Save on Materials

Still wrestling with conduit and Class 1 materials? There's no need.

WaveLinx Pro Low-Voltage matches your lighting system's power needs with the power provided, so you're able to power each fixture with low-voltage Class 2 cables.

Be Electrically Efficient

The WaveLinx Pro Low-Voltage hybrid model utilizes Class 1 for building power distribution and Class 2 for plug and play connectivity creating an electrically efficient system of discrete micro-grids.

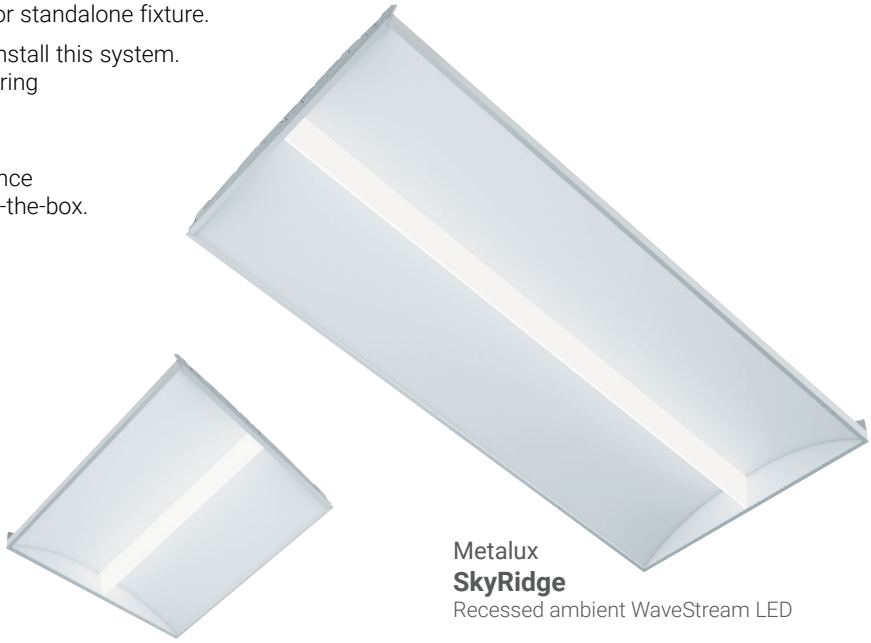
WaveLinx Pro wireless fixtures

The WaveLinx Pro wireless fixture gives you all the features you need now, with the ability to scale and evolve on your own timeline. Available with select Metalux fixtures, it's a cost-efficient way to lay the foundation for an intelligent building infrastructure.

- **Out-of-the-box wireless control.** Get streamlined code compliance and energy savings, whether you're installing a whole system or standalone fixture.
- **Ready to "plug & play."** Any electrician can easily install this system. There's no 0-10V wiring required, and no control wiring between fixtures.
- **Easier commissioning.** No more waiting weeks for commissioning teams, or dealing with compliance headaches. Each fixture is code compliance out-of-the-box.

Perfect for simple applications

this system covers all the basics while keeping installation time and costs to a minimum



Metalux
SkyRidge
Recessed ambient WaveStream LED

Metalux
Cruze ST
LED recessed ambient

Metalux
Cruze SB
LED recessed ambient

Metalux
Encounter
Recessed ambient WaveStream LED

Metalux
RLN
LED recessed ambient

Metalux
Flat Panel
Ultra-thin LED troffer

Metalux
GRLED
LED recessed troffer

WaveLinx Pro wireless switchpacks

Wireless Dimming Switchpack

Plug Load | 0-10V | Wireless

The WaveLinx PRO Switchpack (RSP-P) is a lighting control device designed to control (on/off/dim) commercial and industrial lights as well as receptacles. The PRO Switchpack consists of a 120-347VAC 20A relay and a continuous 0-10V dimming control.

catalog number:
RSP-P-010-347 - Pro switchpack

Universal Dimming Switchpack with Dry Contact Input

0-10V | 120-347VAC | Wireless

The dimming switchpack (WSP-CA-010) offers 120-347VAC 20amp relay control and continuous 0-10V dimming control of LED and non LED loads. May also be used to integrate Greengate low-voltage occupancy (PIR or Dual Tech) sensors or contact closure input for a control area

catalog number:
WSP-CA-010 - Universal Dimming Switchpack with Dry Contact Input

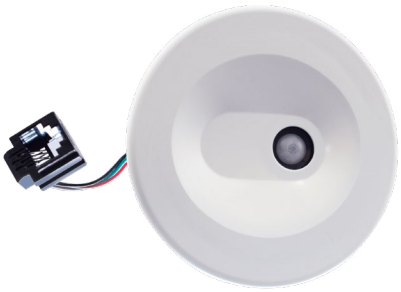
WaveLinx Pro wireless sensors

Wireless Ceiling Sensor

Sensing | Daylight | Wireless | Battery

The room based wireless sensor offers PIR occupancy and daylight sensing of up to 1500 square feet. The room based sensor is battery powered and is one of the smallest ceiling mounted room based wireless occupancy and daylight sensors on the market. The sensor in combination with the WaveLinx mobile application allows you to gain considerable energy savings from occupancy sensing-based control of lighting and plug loads.

catalog number:
CWPD-1500 - Ceiling sensor



Octagonal junction box installation

Wireless Tilemount Sensor Kit

Sensing | Daylight | Downlights | Wireless

The Tilemount Sensor Kit provides PIR occupancy and daylight dimming and control for connected downlight luminaires or other luminaires that do not support the WaveLinx Integrated Sensor. The Tilemount Sensor Kit provides 0-10V dimming control of LED and non LED loads for up to 3amps 120-277V luminaires.

catalog number:
WTA - Tilemount Sensor Kit
(also includes hardware for installation to standard 4" octagonal junction box)

WaveLinx Pro integrated sensor

The luminaire-integrated sensor control system reduces the design time and complexity of meeting energy codes for both lighting and controls. The sensor system was designed to ensure occupancy and daylight harvesting coverage from within the footprint of the luminaire, so the lighting design is the control design. And, the system achieves the lowest installed cost in small spaces compared to traditional control products.

No New Wires

An in-place fixture retrofit is all that's needed to meet most energy codes in commercial spaces. The sensor system is factory wired to the luminaire, switching on or off based on occupancy, and dimming the light when enough daylight is available.

Lighting Controls Without Commissioning

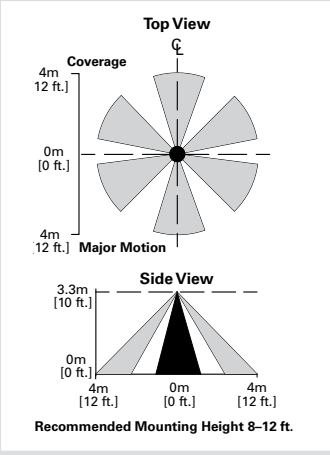
The luminaire-integrated sensor system offers out-of-the-box operation using thoughtful default settings.

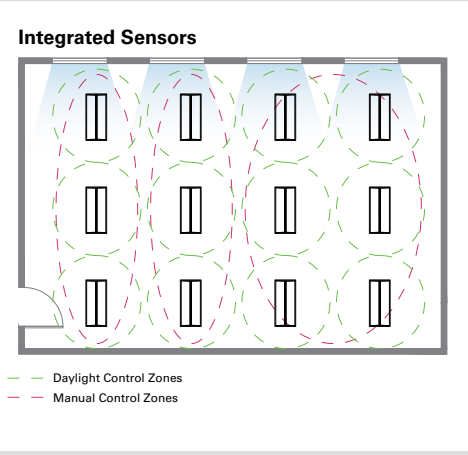
Flexibility and Individual Control

When the application demands more, the sensor system has the option to make changes using the mobile app. The mobile app allows changes from the default settings for occupancy, target light level, preset lighting levels, and more.

Low Installed Cost

With a single product to mount, and a single electrical connection to make, a luminaire with an integrated sensor system saves money on the total installed cost when occupancy and daylighting harvesting controls are needed.





Worry-free Controls Planning

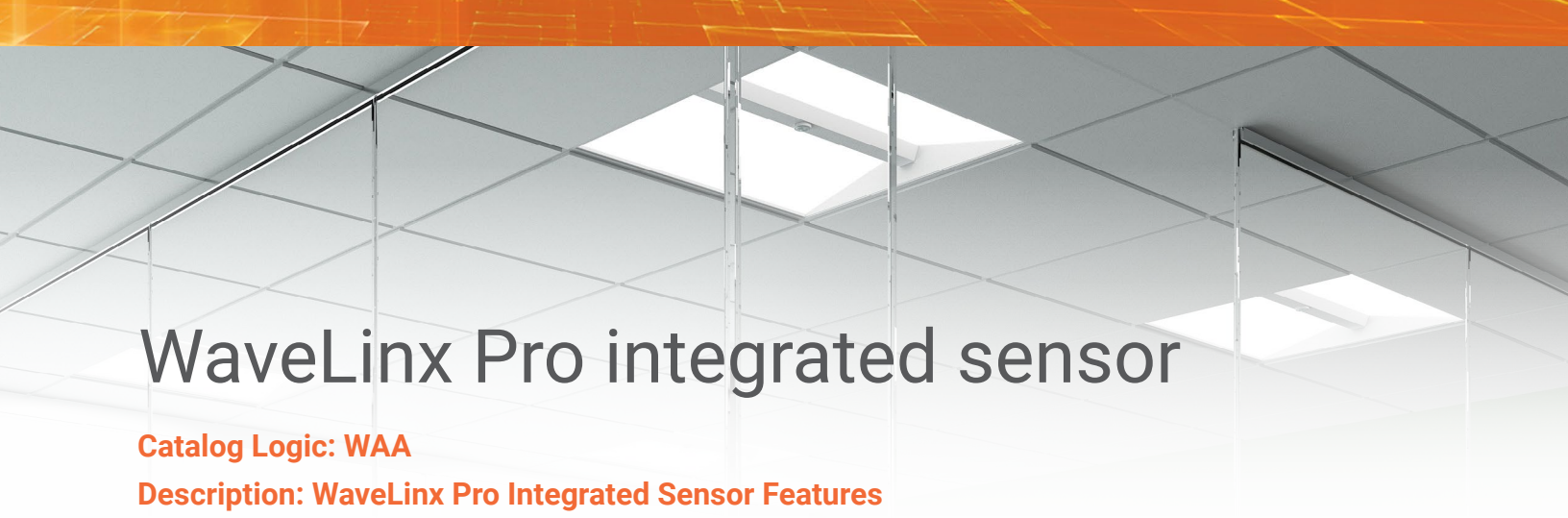
Ensure seamless coverage and performance with a sensor system built into every luminaire. The multi-technology sensor's occupancy and light sensing coverage overlaps the area each fixture illuminates.

Integrated Design

The sensor system adds to the contemporary aesthetic of WaveStream luminaires. The system is factory wired and ready to meet code out of the box.

Daylight Dimming Independence

Integrated sensors for daylighting, manual control zones are completely independent of daylighting control sets.

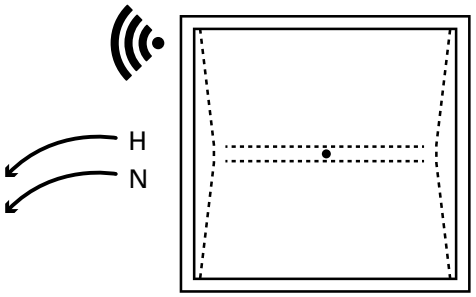


WaveLinx Pro integrated sensor

Catalog Logic: WAA

Description: WaveLinx Pro Integrated Sensor Features

- Factory installed and integrated into luminaires
- Wireless bi-directional communications
- Occupancy/Vacancy
- Closed loop daylighting
- Multicolored LED for status and diagnostics
- Energy calculations (available through Trellix)
- Bluetooth beacon for RTLS capabilities (Trellix Locate and BLE tags required)

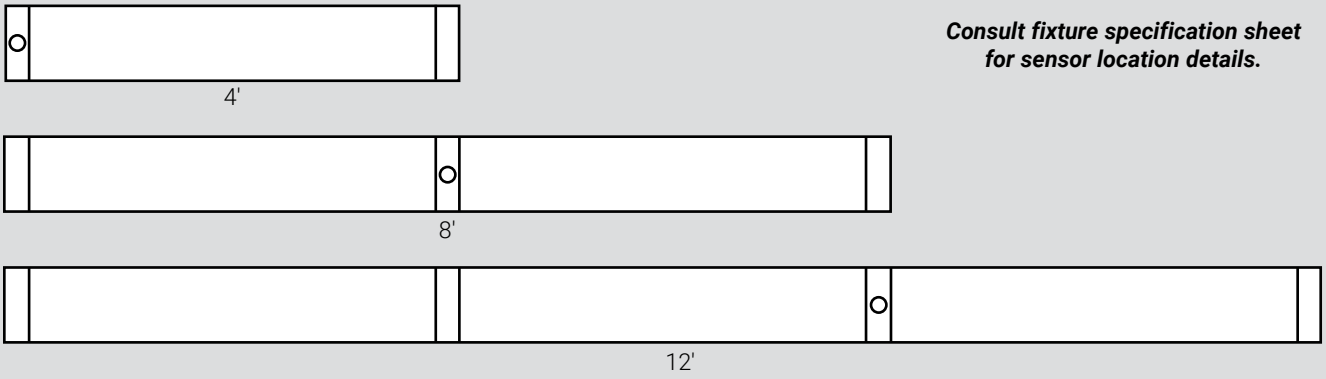


*Include **WAA** with the specified luminaire catalog logic*

22EN-LD2-34-UNV-L835-HCD-WAA-U

Encounter 2x2 with WaveLinx Pro Integrated Sensor

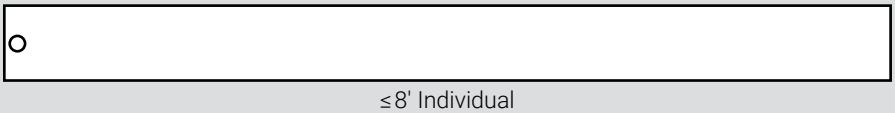
WaveLinx Pro sensor locations in Metalux and Corelite linear products



Consult fixture specification sheet for sensor location details.

Sensors will be approximately located as shown on individual luminaires. When configured in linear runs, the same locations will apply based on the size of sections that comprise the run. Each 4', 8', or 12' section will be individually controllable with the WaveLinx Pro system. Consult fixture specification sheet for details.

WaveLinx Pro sensor locations in Neo-Ray linear products



Consult fixture specification sheet for sensor location details.

Luminaires longer than 8ft have sensors placed every 8-12ft along the length of the luminaire.

Lighting products with integrated sensors

The WaveLinx Pro technology offers an intelligent, simple, easily control of various luminaires to meet application requirements:

- Supports integrated or tile mount connected sensors for occupancy and daylighting
- Designed and tested to provide guaranteed compatibility
- Eliminate the worry of controls and luminaire integration

Ambient lighting

Integrated sensors
Sensing | Daylighting | Individual | Grouping

Click on products to **learn more**

Low-Voltage option available = ○

Integrated Sensor

Sensing | Daylight | Wireless

The integrated sensor combines control within the light fixtures to reduce installation and design time; while meeting energy codes. With the integrated sensor the lighting design is the control design capable of IoT features without hardware replacement.

catalog number:
WAA - Integrated sensor
See luminaire spec sheets for ordering information

WLA - Low-voltage integrated sensor
(WLA sensors are not compatible with Trellix Locate)
See luminaire spec sheets for ordering information

For a complete list of compatible products, see:
www.cooperlighting.com

Metalux
Perceive (PD) ○
LED recessed ambient

Metalux
Cruze ST & SB ○
LED recessed ambient

Metalux
Encounter ○
Recessed ambient
WaveStream LED

Metalux
Cruze Retrofit Kit
LED recessed ambient

Metalux
WSL ○
Linear surface / suspended
series WaveStream LED

Metalux
SkyRidge ○
Recessed ambient
WaveStream LED

Metalux
Accord ○
LED recessed ambient

Metalux
RBG ○
Architectural
linear slot

Metalux
SRL
Linear LED
striplight

Metalux
Flat Panel (FPX)
○
Ultra-thin LED panel

Metalux
RLN ○
LED recessed ambient

Metalux
GR ○
General recessed
LED troffer

Metalux
SWLED
Linear LED striplight

Architectural lighting

Integrated sensors
Sensing | Daylighting | Individual | Grouping

Low-Voltage option available = ○

Click on products to **learn more**

Corelite
Bridge ○
Architectural recessed
WaveStream LED

Corelite
Iridium i3
Linear suspended
WaveStream LED

Neo-Ray
Define Gen 2
Linear recessed &
Linear Suspended LED

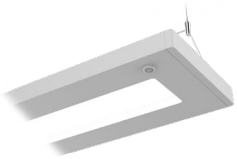
Corelite
Discreet
Linear suspended
& surface direct LED

Corelite
Continua &
Continua SQ4
Linear suspended LED

Corelite
RX / ZX ○
Architectural recessed
LED

Corelite
D3X ○
Architectural recessed
LED

Corelite
Divide
Suspended
WaveStream LED



Corelite
Jaylum
Suspended LED

RSA
MRZ
Architectural recessed
integral LED

For a complete list of compatible products, see:
www.cooperlighting.com

Recessed lighting

Tile Mount Sensing when installed with
WTA Tilemount Sensor Kit

Low-Voltage option available = ○

Click on products to **learn more**

HALO Commercial
PR Series ○
4", 6" and 8"
SeleCCTable Downlights

HALO Commercial
HC Series ○
4", 6" and 8"
Downlights

Portfolio
LDA Series ○
2", 3", 4" and 6"
Adjustable Downlights

Portfolio
LD Series ○
2", 4", 6" and 8"
Downlights

Portfolio
LE / LS Series
- Cylinders ○
2", 4" and 6" Round & Square
8" Round
2", 4" and 6" Round & Square
Shallow

Portfolio
LAM and LDM Series
- Multiples
1" (1 cell to 15 cells)
Downlight or Adjustable
4" (1 head to 4 heads)

Industrial lighting

Integrated sensors

Sensing | Daylighting | Individual | Grouping | Motion

Click on products to **learn more**

Industrial High Bay Sensor

The WaveLinx Pro industrial high bay sensors offer passive infrared (PIR) occupancy with a photocell for closed loop daylight sensing. The sensors are IP66 rated for warehouse, manufacturing and industrial spaces with installation heights up to 40 feet and coverage up to 5000 square feet. Easy tool-less fixture connection (Zhaga Book 18 socket) with out-of-the-box controls functionality. Factory or field install this sensor with 4 pin connector standard.

catalog number:
SWPD3 - Fixture Mount High Bay Sensor, 15 - 40ft (4.5 - 12.2m)

Metalux
Steeler
High Bay LED

Metalux
Benchmark
High Bay LED

Metalux
LHB
LED High Bay

Metalux
VHB
High Bay LED

Metalux
VT2
LED Vaportite

Metalux
SNLED
LED Striplight

Metalux
HBLED
High Bay LED

Metalux
VT3
LED Vaportite

Metalux
SkyBar Single
LED Low Bay

Metalux
ILED
LED Linear Bay

Metalux
VT4
LED Vaportite

Metalux
Optimized HB
High Bay LED

Outdoor lighting with **Fixture Mount Sensors**

Sensing | Daylighting | Individual | Grouping | Motion | Astronomic

LEDs can be fitted with smart and connected controls, allowing lighting infrastructure to be easily configured to operate based on astronomic or time schedules, for all or zones of outdoor luminaires.

Click on products to **learn more**

Outdoor Fixture Mount Sensor

The WaveLinx Pro outdoor sensors (high and low mounted) offer passive infrared (PIR) occupancy with a photocell for closed loop daylight sensing. The sensors are IP66 rated for outdoor site and indoor environments with installation heights up to 40 feet and coverage up to 5000 square feet. Easy tool-less fixture connection (Zhaga Book 18 socket) with out of the box controls functionality. Available color options: white, black and bronze. Factory or field install this sensor with 4 pin connector standard.

catalog number:
SWPD4 - Outdoor Fixture Mount - Low Bay Sensor, 7 - 15ft (2.1 - 4.5m)

SWPD5 - Outdoor Fixture Mount - High Bay Sensor, 15 - 40ft (4.5 - 12.2m)

Galleon LED
Area and site, Wall, PC and Flood

Arbor LED
Area and site

Impact Elite Cylinder LED
Wall

Prevail/Prevail XL
Area and site

Luxescape LED
Area and site

Outdoor lighting with **Wireless Outdoor Lighting Control Module**

Scheduling | Dimming | Astronomic | Wireless | Zones

Luxescape LED
Area and site

Prevail/Prevail XL
Area and site

Wireless Outdoor Lighting Control Module

The WaveLinx Pro 7-pin outdoor lighting control module enables schedules to provide ON, OFF and dimming controls based on astronomic or time schedules based on a 7 day week. Allows to create multiple control zones.

catalog number:
WOLC-7P-10A - Outdoor lighting control module

Night Falcon
Floodlight

Talon
Area and site

Caretaker
Area and site

Verdeon
Area and site

Galleon LED
Area and site,
Wall, PC
and Flood

Navion
Area and site

Ventus
Area and site

Impact Elite Cylinder LED
Wall

Arbor LED
Area and site

Why Contractors should use WaveLinx Pro?

Rising conduit and wire costs

Conduit and copper has seen continued cost increase, as much as 100% over the past 12 months.

- Eliminate up to 60% of the wire runs
- Less wire - Less pipe

Training

How do you keep up with the latest technology? WaveLinx Pro provides local and classroom certification programs

- Learn how the system works in as little as 2 hours
- Simply mobile

Shortage of qualified labor

80% of electrical contracting firms are reporting difficulty filling hourly craft worker positions and higher salaries.

- Save up to 45 minutes per control zone
- Less time - Less people

Instructional videos

What if I need a tutorial on site? WaveLinx Pro has fifteen, 5-minute videos that walk you through it.

- Free mobile app
- Free training videos

Installation times

Get off the job at least 40% faster simple install and simple setup.

- More jobs with the same people means more money for you
- Faster install

Utility incentives

Many states provide rebate incentives for LED fixtures with integrated sensors.

- Less material to install, and the rebate pays for it
- Incentives up to $75 per fixture

Energy savings

How do you make sure you meet local code and provide energy savings to your customer?

- Network Lighting Controls (NLCs) provide 47-70% savings with integrated luminaire lighting controls
- Up to 70% energy savings

Cybersecurity

Are you concerned with cybersecurity? You should be, but rest assured as WaveLinx Pro has the IECC 62443 listing for Network Cybersecurity.

- Help customers stay secure
- Peace of mind that the product is backed by independently certified IECC cybersecurity standards

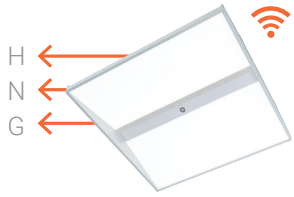
Wireless, code-compliant and cost-effective for today's **Electrician**

WaveLinx Pro How to Videos

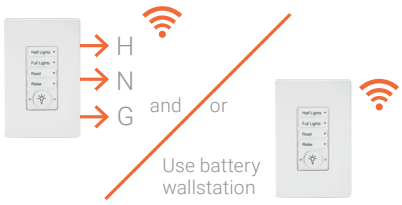
Use what you already know

Complete projects faster while reducing costs with the WaveLinx Pro system for LED lighting and controls.

Wire integrated luminaire or retrofit kit

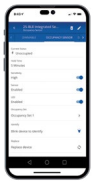


Wire for power not load switching

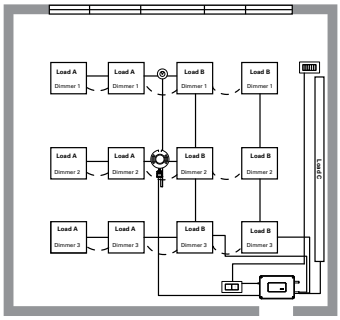


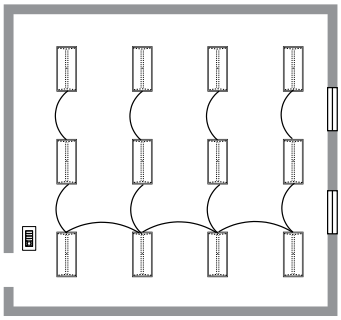
Easy programing with mobile application

(WaveLinx Area Controller required)



Go from this...





To this!

Now simple standard wiring provides so much more. Here's what you get:

Lighting
- Continuous dimming
- Individual control

Occupancy
- Auto On to 50% or Vacancy
- Auto Off of lighting and plug loads

Daylighting
- Continuous dimming to OFF
- Open or closed loop

Scheduling

Security
- IEC 62443-4-1 and IEC 62443-4-2 certified

DLC NLC V5 qualified

Assuming 12 fixtures in a typical classroom, MWS will save more than 1 day per electrician per room.

Pipe and Wire

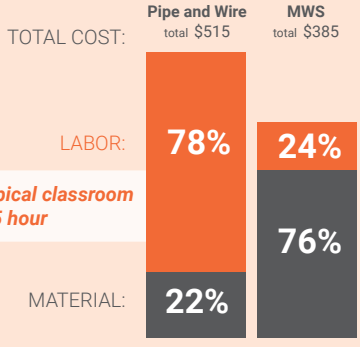
QTY.	MATERIAL
60 ft	1/2" EMT
252 ft	#12 THHN
2	1/2" Couplings
10	1/2" Couplings
5	J-box covers
12	Fixture whips

Simplified BOM

MWS

QTY.	MATERIAL
12	12FC12 / 2G09
2	12ST12 / 2G
3	12EC12 / 2G11

12 Fixtures in typical classroom and Labor @ $75 hour



up to 30% LOWER TOTAL COST
75% LESS LABOR

Design layout steps

Choose the right products

1. Select and layout **Fixtures**

- Use integrated luminaires to make the most of your lighting aesthetics and controls requirements.
- Add the WaveLinx Pro Outdoor Load Control module to area, site and flood lighting for complete building site control.

2. Place **Wallstations**

- Wallstations are the users primary method of control, make sure the placement and engraving delight the customer.
- Wallstations are fully programmable to control any zone or scene in the area.

3. Place **Receptacle**

(Where required by energy code)

- Receptacle control is required to meet California Title 24 and current ASHRAE 90.1 code.
- These wireless receptacles make it easy to meet code for any new construction or retrofit.

4. Place **Relays, Ceiling Sensors and Tilemount**

- The WaveLinx Pro dimming switchpack with 0-10V makes it easy to control large zones of lighting or any 3rd party luminaire.
- The ceiling sensor adds extra occupancy coverage to the areas that either do not have integrated sensor or need extra coverage.
- Tilemount daylight sensors enable 0-10V dimmable downlights to support daylight dimming and add them to the control zones.

5. Place **Wireless Area Controllers**

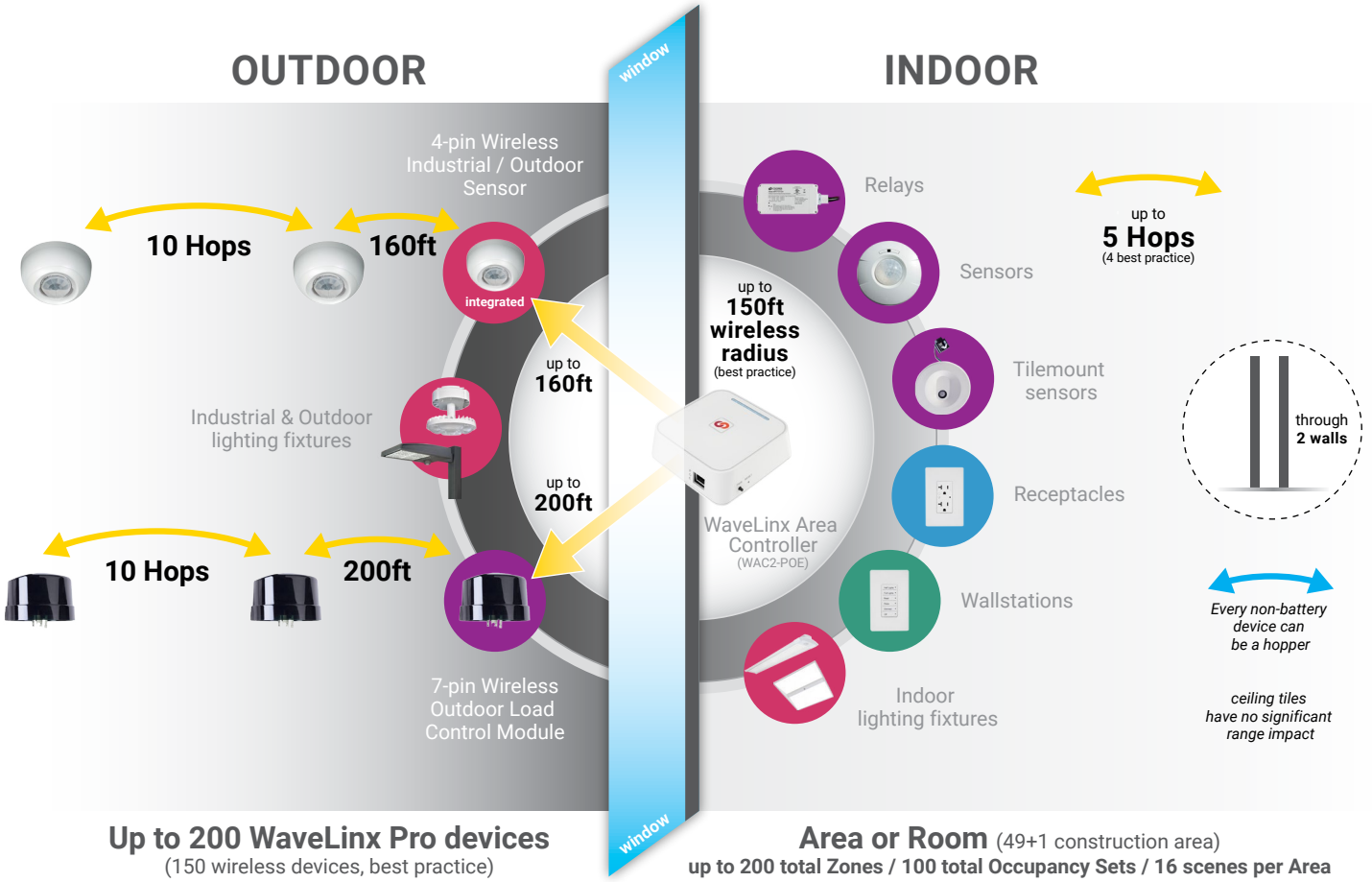
- Every application needs at least one WaveLinx Area Controller (WAC).
- Mounted above the ceiling tile the WAC controls up to 200 devices over 50 (49 user defined) areas.

6. Connected to **Enterprise LAN Network**

(optional)

- For enterprise solutions ensure all WACs and Trellix are on the same network.
- Trellix Core Pro can communicate with up to 20 WACs.

WaveLinx Pro installation rules



Up to 200 WaveLinx Pro devices
(150 wireless devices, best practice)

Area or Room (49+1 construction area)
up to 200 total Zones / 100 total Occupancy Sets / 16 scenes per Area

WAVELINX PRO OUTDOOR GUIDANCE

DEVICE	LOS Line of Sight	SWPD2-5 4-pin integrated	WOLC-7P-10A 7-pin integrated
WaveLinx Area Controller *(indoor mounted)* WAC2-POE	LOS through window[3] Through 7" concrete	160ft (49m) 40ft (12m)	200ft (60m) 60ft (18m)
Wireless Outdoor Lighting Control Module WOLC-7P-10A *(7-pin)*	LOS node to node	160ft (49m)	200ft (60m)
Outdoor Fixture Mount Sensor SWPD4-5 *(4-pin integrated)*	LOS node to node	160ft (49m)	200ft (60m)
Hops	Outside WAC connect range	10	10

1 - This guidance does NOT include Parking Structures (Site and Area ONLY)
2 - MAX is based on 90% probability of establishing a WaveLinx connection
3 - Tinting / metallic shades reduce range by 20ft (6m)

Basic steps to design a WaveLinx Pro system

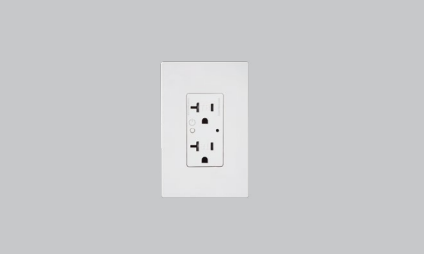
1. Select and layout **Fixtures**

- Fixture layout can be sensor layout
- Numerous recessed and suspended options

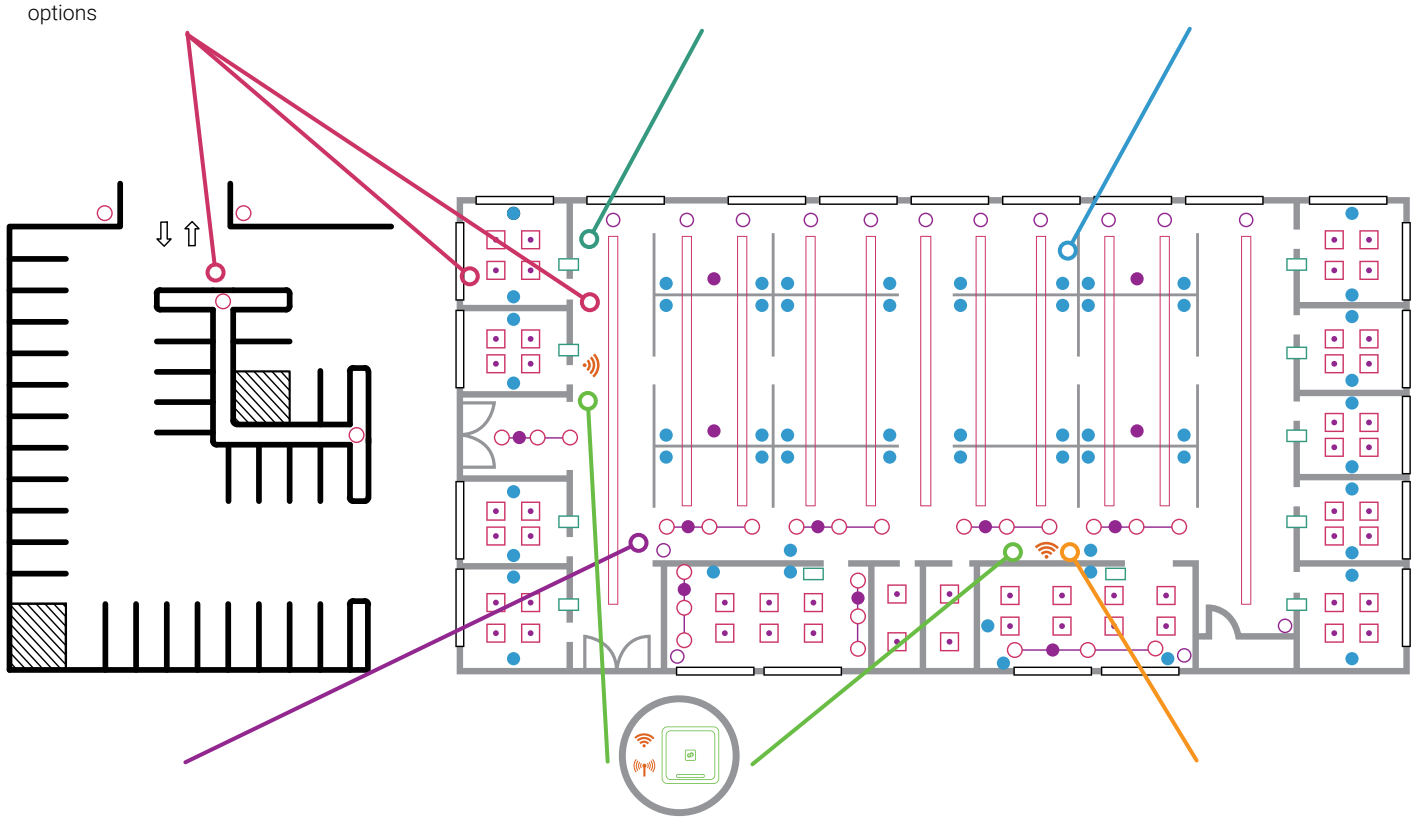
2. Place **Wallstations**

- Multiple programmable configurations
- Mains and battery powered options

3. Place **Receptacle**



- Required for modern energy codes
- Power measurement to Trellix



4. Place **Relays and Sensors**

- Dimming relay for 3rd party luminaires
- Tilemount sensor option
- Ceiling mounted sensor options

5. Place **WaveLinx Area Controllers**

- 150-ft communications radius
- Up to 200 devices (150 best practice)
- Up to 200 total zones

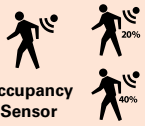
6. Connect to **Enterprise LAN**

- Network WAC's
- IoT connectivity to LAN or VLAN
- Integrates with BACnet, Demand Response and API

Energy codes

Built-in energy saving lighting control strategies

WaveLinx Pro provides these energy saving strategies with a simple configuration app.

STRATEGY	DESCRIPTION	ESTIMATED SAVINGS
 **Manual Dimmer**	Manual/personal dimming control – is one of five alternative methods to meet the multi-level lighting control requirements.	**10-20%**
 **Occupancy Sensor**	Occupancy/vacancy sensing – provides Manual On/Automatic Off or Automatic On/ Automatic Off and Partial Off capabilities.	**20-60%**
 **Daylighting Control**	Daylight dimming – provides multiple daylight dimming zones that automatically adjust the lighting based on daylight available in the space, or fixture integrated sensors for completely granular daylighting control.	**20-45%**
 **Receptacle Control**	Plug load control – automatically turns On receptacles upon occupancy regardless of light status. Ensures receptacles are turned Off when the space is vacant.	**15-50% Controlled loads**
 **Task Tuning**	High-end/Task Tuning – lowers the maximum light level for automatic energy savings.	**10-30%**
 **Demand Response**	Demand Response – automatically reduces light level based on signal from 3rd party system.	**10-40%**
 **Remote Signal Control**	BACnet- Coordinate control through BMS Remote Signal Control – Communicates to 3rd party systems via API.	**20%**
 **Outdoor Control**	Outdoor Control - automatically adjust area, site, flood lighting via scheduling or astronomic clock.	**25%**

Energy Codes application notes

ANSI / ASHRAE / IES Standard 90.1-2019

Energy Standard for Buildings Except Low-Rise Residential Buildings (Standard 90.1-2019) adopted as of May 2018. This code significantly fine-tunes the design requirements for code-compliant lighting controls systems, mechanical systems, and the building envelope. This application note summarizes the new mandatory lighting control requirements and highlights where they can be used in various spaces. Please note: this document is intended to provide a general reference and design professionals should consult Standard 90.1-2013 and the authority having jurisdiction for project-specific requirements and interpretation.

ASHRAE 90.1 was recognized by the U.S. Department of Energy (DOE) as the national energy reference standard.

Below summarizes changes from 90.1-2016 to 90.1-2019:

- Reduced LPD by ~5%
- Includes DC Low-voltage lighting systems with flexible cabling for plug-in connection
- Step dimming requirements removed in favor of continuous dimming
- Partial off is subject to daylighting

International Energy Conservation Code (IECC) 2021

IECC 2021 establishes minimum energy efficiency requirements for new and renovated buildings. This latest iteration contains dramatic changes to the prescriptive and performance-based criteria that previously defined IECC-compliant lighting and lighting control systems. ASHRAE 90.1 is recognized by the DOE as the national reference standard, however IECC is adopted by many states. Please note: this document is intended to provide a general reference and design professionals should consult IECC 2021 and the authority having jurisdiction for project-specific requirements and interpretation.

Below summarizes changes from 2018 to 2021:

- Occupancy sensor use clarified and expanded
- Daylighting enhancements
- Time switch use in spaces scheduled to be unoccupied
- Expanded plug-load guidance

California Title 24

California's Building Energy Efficiency Standards are updated on an approximately three-year cycle. The 2019 Standards will continue to improve upon the 2016 Standards for new construction of, and additions and alterations to, residential and nonresidential buildings. The effective date of the 2019 Standards is June 1, 2020.

Below summarizes changes from 2016 to 2019:

- Indoor lighting power allowances reduced by 37 percent (complete building method), and 29 percent (area category method)
- Mandatory automatic daylighting control language clarified

Quick Reference Guide Commercial Requirements

IECC (2018), ASHRAE 90.1 (2019), Title 24 (2019), NECB (2017)

	IECC 2021	ASHRAE 90.1 2019	T24 2019	WaveLinx Pro
Automatic Controls				
Occupancy Sensors	C405.2.1	9.4.1.1(h)	130.1(c)	●
Partial Off	C405.2.1.2 (warehouse) C405.2.1.3 (open office)	9.4.1.1(g)	130.1(c)	●
Full Off	C405.2.1.1.1 (20min)			●
Scheduled Off	C405.2.2	9.4.1.1(h)	130.1(c) - (warehouse, corridor, stairwell, library stacks)	●
Plug Load Off	N/A	8.4.2	130.1(d)	●
Manual On/Partial On	C405.2.1.1.2	9.4.1.1(b) - (manual ON) 9.4.1.1(c) - (partial ON)	130.1(c) - (office <250ft^2, classrooms, conference rm)	●
Manual Controls				
Manual On/Partial On	C405.2.1.1.2	9.4.1.1(b) - (manual ON) 9.4.1.1(c) - (partial ON)	130.1(c) - (office <250ft^2, classrooms, conference rm)	●
Manual Light Reduction	C405.2.2.2			●
Area/Local Controls	C405.2.5	9.4.1.1(a)	130.1(b)-(multi-level controls)	●
Daylighting				
Daylight Responsive Control	C405.2.3	9.4.1.1(e) - (>150W sidelighting) 9.4.1.1(e) - (>150W toplighting)	130.1(d) - (>120W with < .5W/ft^2 dimming optional) 130.1(d) - (>120W with > .5W/ft^2 dimming required)	●
Exterior Controls				
Parking Garage Lighting		9.4.1.2		●
Exterior Lighting	C405.2.5	9.4.1.4		●
Special Items				
Specific Application Controls	C405.2.4			●
Additional Efficiency Packages	C406.1			●
Guest Room or Sleeping Units	C405.2.4.3	9.4.1.3(b)		●
Functional Testing	C408.3	9.4.3	130.4	●
Metering			130.5(a)	●
Demand Responsive Controls			130.1(e) - (>10K ft^2 reduce by 15%)	●

Application code compliant sequence best practices

	ASHRAE 90.1 2019	IECC 2021	T24 2019	Atrium	Banking	Classroom / Training / Lecture	Conference / Meeting room
Local Control	9.4.1(a)	C405.2.5	130.1(a), (b)	●	●	●	●
Manual ON	9.4.1(b)	C405.2.5	130.1(a), (b)	○	○	○	○
Partial Automatic ON	9.4.1(c)	C405.2.1.1.2	130.1(b)	○	○	○	○
Bi-level Lighting	9.4.1(d)					●	●
Daylighting Side lighting	9.4.1(e)	C405.2.3.2	130.1(d)	●	●	●	●
Daylighting Top lighting	9.4.1(f)	C405.2.3.3	130.1(d)	●	●	●	●
Automatic Partial OFF	9.4.1(g)	C405.2.1.3	130.1(c).6				
Automatic Full OFF	9.4.1(h)	C405.2.1.1.1	130.1(c).5	○	○	○	○
Scheduled Shutoff	9.4.1(i)	C405.2.2	130.1(c)	○	○	○	○
Receptacle Control	8.4.2	C405.2.4	130.5(d)		●	●	●
Energy Monitoring	8.4.3.2		130.5(b)	○	○	○	○
Parking Garage Lighting Control	9.4.2	C405.2.6	130.1(a), (b)				
Functional Testing	9.4.3	C408.3	130.1(a), (b)	●	●	●	●
Demand Response			130.1(a), (b)	○	○	○	○
Enhanced Digital Lighting Controls		C406.4		○	○	○	○

● Required ○ Choose one ○ Choose one ○ Choose one

Copy / Print room	Corridor	Courtroom	Dining area	Food preparation	Library	Office	Restroom	Sales area	Stairwell
●	●	●	●	●	●	●	●	●	●
○		○	○	○	○	○	○	○	○
○		○	○	○	○	○	○	○	○
●	●	●	●	●	●	●		●	●
●	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●
									●
○	○	○	○	○	○	●	○	○	○
○	○	○	○	○	○		○	○	○
●			●		●	●	●	●	
○	○	○	○	○	○	○	○	○	○
●	●	●	●	●	●	●	●	●	●
○	○	○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○	○	○

● Required ○ Choose one ○ Choose one ○ Choose one

Best practices / FAQs

What components do I need to have a complete WaveLinx Pro system?

- WaveLinx Area Controller (Gateway)
- Trellix Core Pro (Enterprise Gateway)
- Trellix Core Enterprise (Enterprise Gateway)
- Trellix (web based application)
- WaveLinx Pro Mobile App (Commissioning and user personal control)
- WaveLinx Pro Wallstation (Manual lighting and scene control)
- Wireless Integrated Sensor (Fixture integrated occupancy sensor, ambient light sensor and control)
- WaveLinx Pro Dimming Switchpack with 0-10V
- WaveLinx Pro Receptacle (Wall mounted power outlet)
- WaveLinx Pro Ceiling Sensor (Ceiling mounted PIR occupancy sensor)
- WaveLinx Pro Outdoor Load Control Module (ON/OFF/DIM via astronomic clock)
- WaveLinx Pro direct driver luminaires (ON/OFF/DIM of wireless drivers)

What are the wireless design best practices?

DESIGN CONSIDERATION	BEST PRACTICE	MAXIMUM
WCL devices per WAC2	150	200
User-defined areas per WAC2	49	49
Construction areas per WAC2	1	1
Total Zones per WAC2	200	200
Scenes per Area	16	16
WAC range (indoor WCL devices)	150ft (45m) LOS[1]	300ft (91m) LOS[2]
WAC range (outdoor WCL devices)	See sensor spec sheets	
Device hops beyond WAC (indoor / outdoor)	4 / 10	5 / 10

Notes

[1] Considering two (2) interior walls of standard construction

[2] Considering no LOS obstructions (walls, columns, etc.)

Can WaveLinx Pro communicate through interior walls?

Yes, WaveLinx Pro will communicate through two to three interior walls of standard sheetrock construction with wood or aluminum framing.

Can sensors be disabled?

Yes, Integrated or external sensors can be disabled or have the sensitivity adjusted.

Does the WaveLinx Area Controller (WAC) need to be installed in the space or can it be installed in the Plenum?

The WAC can installed in the plenum above the drop ceiling and will communicate to the devices in the space. It should not be installed on or next to a metal or concrete wall.

Should I install the WAC next to a concrete or metal wall?

No, Concrete or metal walls severely impact the strength of the wireless signal and will reduce the overall coverage and performance of the WaveLinx Pro system. The WAC should be installed in the center of the overall space that it will be controlling.

Should I install the WAC in an Electrical Closet or IT room?

No, these types of rooms are typically surrounded by concrete walls. Concrete walls severely impact the strength of the wireless signal and will reduce the overall coverage and performance of the WaveLinx Pro system. The WAC should be installed in the center of the overall space that it will be controlling.

How does WaveLinx Pro communicate through or around concrete spaces, like stairwells and electrical closets?

The WaveLinx Area Controller emits an wireless signal using the IEEE 802.15.4 wireless protocol in the 2.4Mhz frequency range. This signal pulses out from the WAC in a wireless bubble. Concrete or metal structures will break this bubble. Ensure to place the WAC at least 15 feet away from these structures to allow the wireless signal to have the best angle around these structures. In addition most WaveLinx Pro devices act as a signal repeater which can allow the wireless signal to communicate around difficult spaces.

What is the maximum distance the WaveLinx Pro system can communicate?

The WaveLinx Area Controller can control up to 200 WaveLinx Pro devices (150 devices recommended best practice) within 150 ft line of sight (LOS). If you have not reached the device limit within 150ft LOS, wireless hopping will allow you to reach additional devices up to the device limit. Each line-voltage powered wireless device can act as a signal repeater or (hopper) and provides up to an additional 75 feet (consult device spec sheet for specific range as range varies by device) of wireless coverage as long as the device is within range of a device that is within range of the WAC. WaveLinx Pro supports a maximum of 5 hops (4 hops recommended best practice) each adding communications beyond the WAC 150ft LOS range. For example, 150ft + (75x5) = 525ft MAX indoor radius. Remember successful wireless coverage includes not only distance but also wall construction, wall thickness and number and density of devices. If you are unsure of application communication coverage consult WaveLinx Pro support.

Can WaveLinx Pro be installed in the same area as the building Wi-Fi?

Yes, although 802.15.4 communications use a similar frequency as standard Wi-Fi it uses different channels, modulation and communications structure. This reduces the risk of conflicts between wireless systems.

Can multiple 802.15.4 wireless networks exist in the same area of a building?

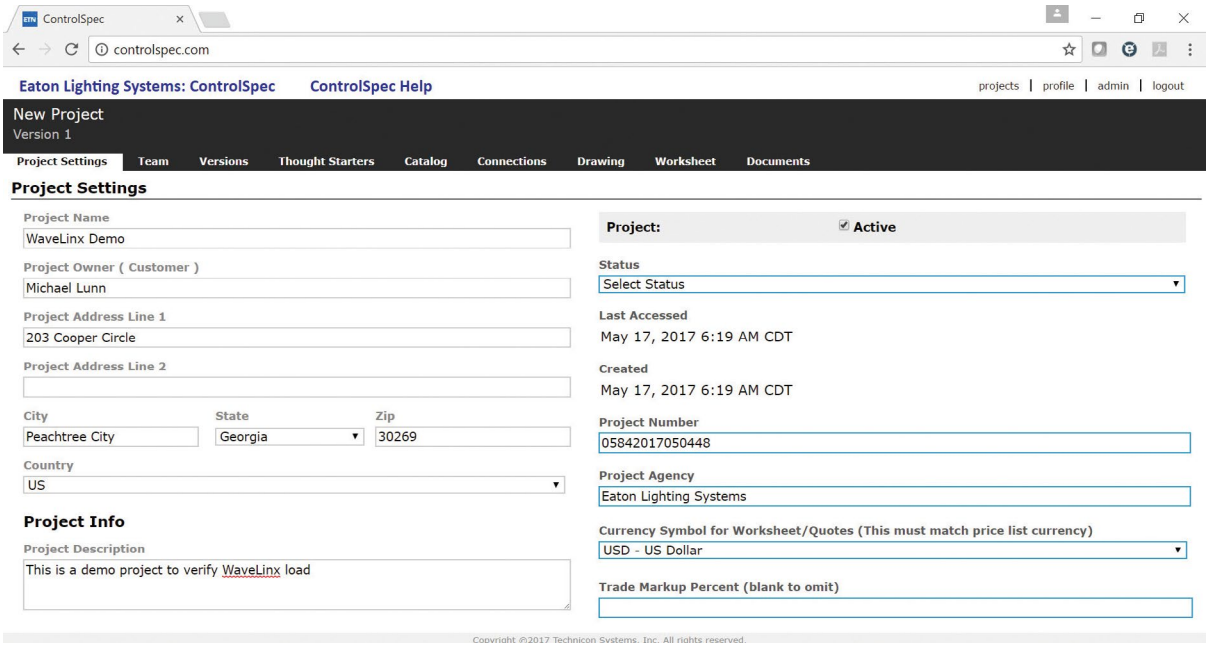
Yes, 802.15.4 is self-healing, auto channel selecting mesh network. This means that these networks can coexist if set up correctly. In addition WaveLinx Pro devices will only communicate with the assigned WaveLinx Area Controller. Other 802.15.4 wireless networks may not include all the security and performance qualities of WaveLinx Pro and may not perform as well.

ControlSpec design tool

ControlSpec is your design and quote tool of choice, enabling you to layout, quote and submit on a project from within one tool. For the WaveLinx Pro product line all control devices and a large selection of WaveLinx Pro integrated fixtures are at your fingertips. Create your project, perform a takeoff, create one-line drawings and price your project. Product pricing is inside ControlSpec reducing your quote time.

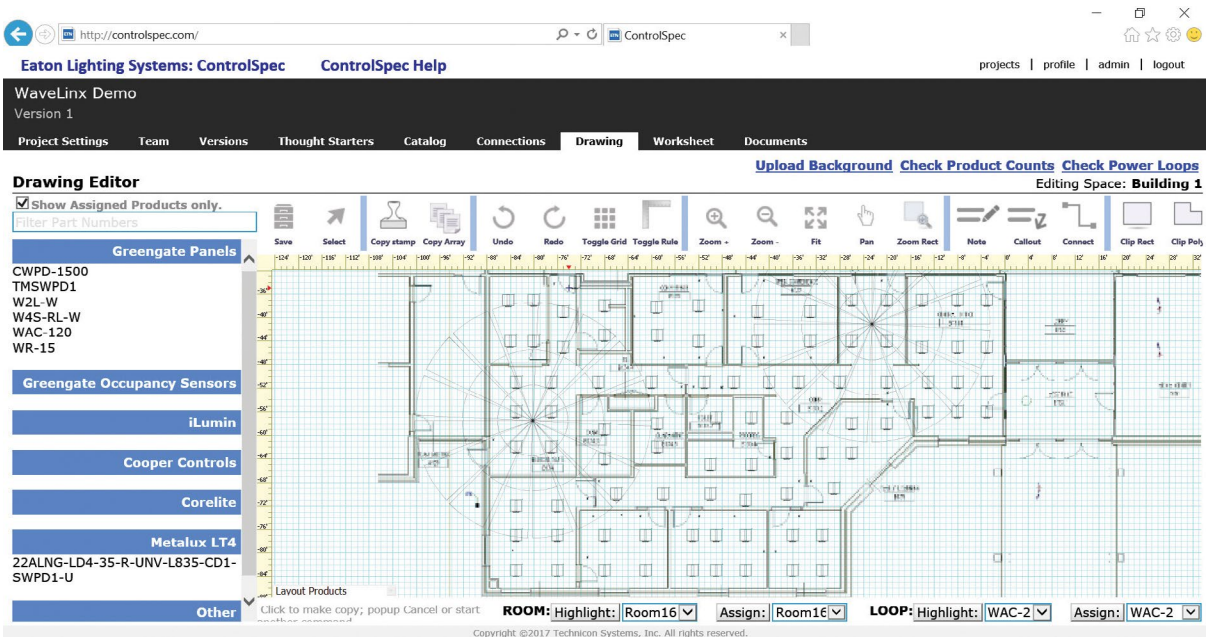
ControlSpec value to you:

- Create a project
- Perform layout take-off
- Review and adjust pricing
- Create customized one line drawings
- Print quote and submittal documentation
- Product filtering for faster access and selection

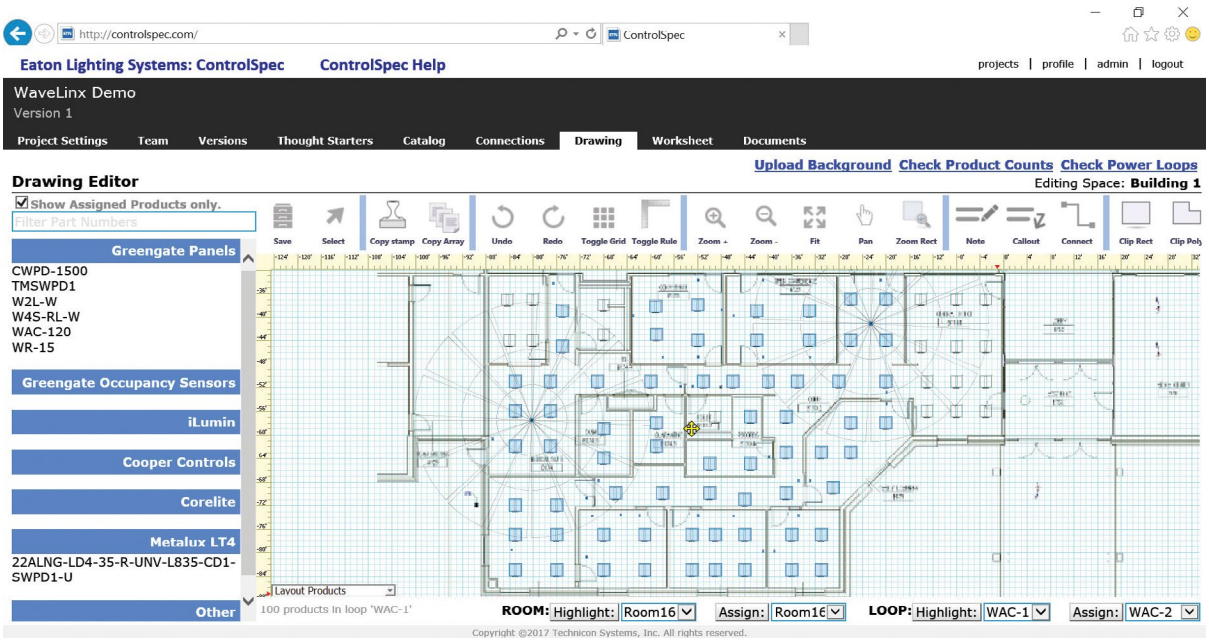


- Quick product addition on every screen

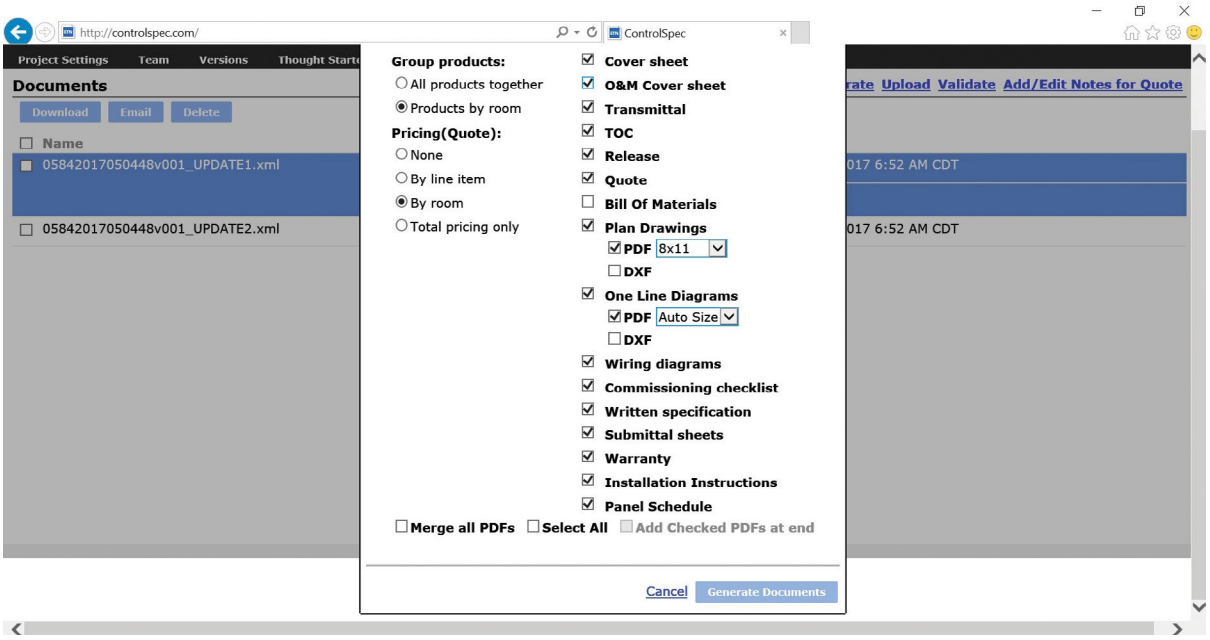
Create a project with customer information and share with other members of the design team.



Use the floorplan tool to layout your project, add luminaires, wallstations, receptacles, tilemount sensors, ceiling sensors, relays and WaveLinx Area Controllers.



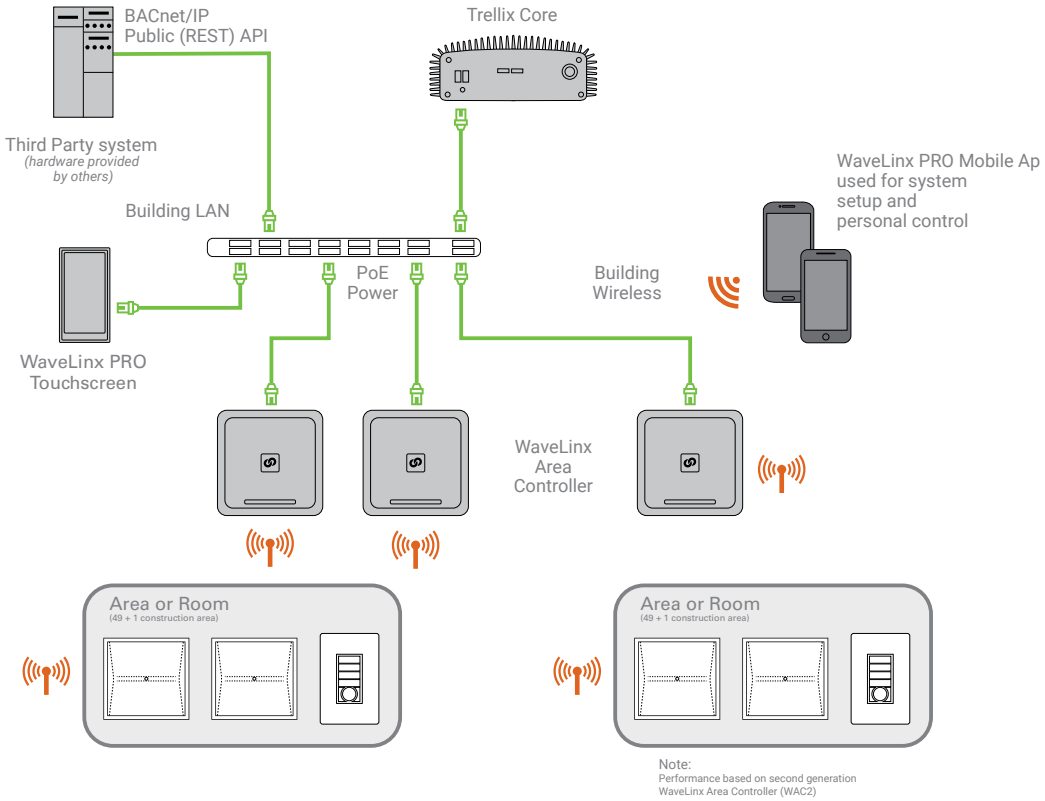
Define rooms, and assign WaveLinx Pro devices to each WaveLinx Area Controller. Highlight areas to confirm your design.



Generate a full submittal package, quotation, one lines and floor plan drawings.

Typical applications wiring diagrams

WaveLinx Pro network integration



Third party systems connect to the same LAN or VLAN as the Trellix and WaveLinx Area Controllers.

Trellix exposes BACnet points to the BMS system which include:

Network
- Write Demand Response Active/Inactive

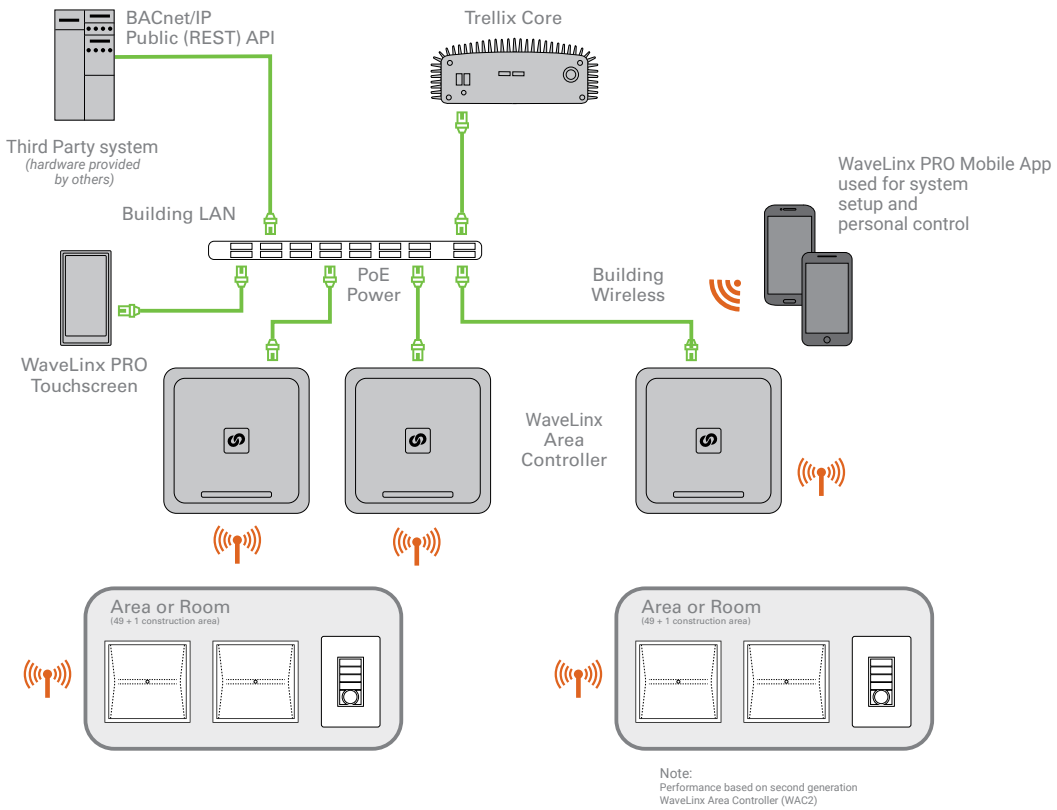
Area
- Read Name & Scene
- Write Scene
- Read energy calculations

Zone
- Read/Write Zone light level

Endpoint (Device)
- Read/Write endpoint light level

Third parties can also communicate to Trellix via Public API (REST). A subset of the HTTP methods are supported by the REST API. The supported methods are GET and POST (note: PUT and DELETE actions not currently supported).
Please refer to the Trellix Manual for more details.

WaveLinx Pro demand response integration



WaveLinx Pro integrates with Demand Response systems via the BMS BACnet system. The BMS system will support Automatic Demand Response standard protocols and can send a Demand Response signal to the WaveLinx Pro system via BACnet.

Each WaveLinx Pro area can have a different Demand Response value assigned to it to reduce the light level when the demand response mode is active. This can be programmed and tested using the WaveLinx Pro Mobile Application.

How demand response works.

When demand response is active:

- The WaveLinx Area Controller will receive the message from the BMS BACnet via Trellix
- The WaveLinx Pro mobile app will display a "DR" icon at the top of any Area where Demand Response is active
- Lighting in the area will be reduced by the demand response value in the area
- Light levels will equal: lighting target (scene value) minus daylighting minus demand response

When demand response is inactive:

- The Demand Response mode will be removed and the indicator icon in the mobile app will be clear
- Light level will not change until the next target level change via daylight, occupancy, wallstation pushbutton

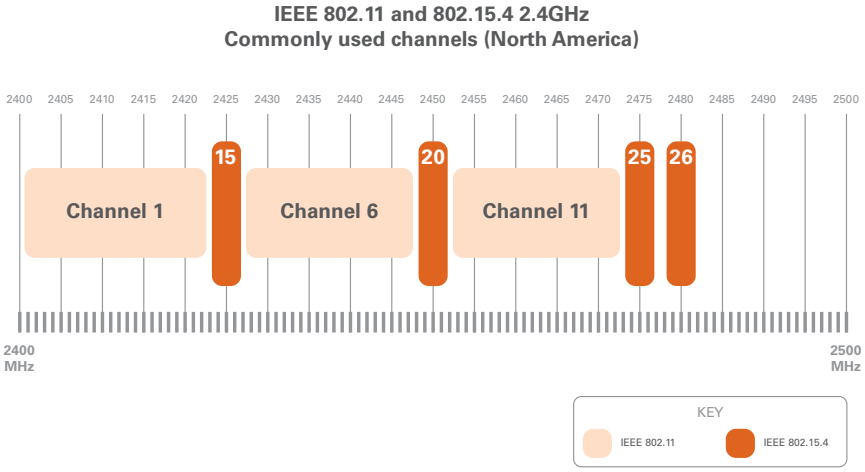
This provided you a more accurate demand reduction than just applying a scene value when demand response is active (caution: some systems simply trigger a scene value when demand response is active, which may actually increase the light level).

Wireless coexisting communication information

Coexisting with Wi-Fi

The WaveLinx Pro connected lighting system employs three techniques to either eliminate or drastically impact on Wi-Fi networks in the building: reduce its impact on Wi-Fi networks in the building.

- **Channel selection:**
  This technique involves identifying WaveLinx Pro IEEE 802.15.4 communication channels that do not overlap with the current Wi-Fi deployment (shown)
- **Low airtime consumption:**
  WaveLinx Pro is designed to reduce wireless communications during steady state operation, greatly reducing the probability of collision with Wi-Fi traffic



Channel Selection

WaveLinx Pro uses IEEE 802.15.4 channels, which are within the same 2.4 GHz frequency band that IEEE 802.11 Wi-Fi operates within. Since devices communicating on the same channel can cause interference, the devices need to be set on channels that do not overlap.

If we overlay the most frequently used channels used by IEEE 802.15.4 (WaveLinx Pro) and IEEE 802.11 (Wi-Fi) on the chart below, you can see there is no overlap.

Wi-Fi uses channels 1, 6 and 11 by default, and IEEE 802.15.4 devices should be set to use channels 14,15,19,20,24,25, and 26 by default which fall within the gaps of the Wi-Fi channels. For IEEE 802.15.4 channels 15 and 20 are typical and allow us to prevent overlap that can lead to potential signal interference. Channels 25 and 26 are typically not used in North America because they are too close to a restricted RF band.

Ultimately this means that IEEE 802.11 Wi-Fi and IEEE 802.15.4 wireless devices can co-exist in the same space without interference if they are properly set with the correct channels.

Low Airtime Consumption

WaveLinx Pro recognizes that it is not always possible to select non-overlapping channels. Many Wi-Fi access points aggressively use all available spectrum to maximize performance. To coexist with such solutions, WaveLinx Pro is designed to send two messages every five minutes per sensor. The following example shows the airtime consumption for a 50,000 square foot installation.

- Airtime Consumption = # sensors*msgs_per_sensor*airtime_per_msg/5mins*100%
- 50,000 square feet = 500 sensors
- 1.5 ms of airtime per message
- Airtime Consumption = 500 * 2 * 1.5ms/5mins * 100%
- Typical Airtime Consumption = 0.5%

With such low airtime consumption, the WaveLinx Pro system will easily coexist with Wi-Fi networks whether or not non- overlapping channels are used.

Interference Tolerance

In addition to ensuring that there is no impact on Wi-Fi installations, the WaveLinx Pro connected lighting system must be tolerant of interference by other Wi-Fi and IEEE 802.15.4 networks. The selection of non-overlapping channels serves to avoid the potential problem.

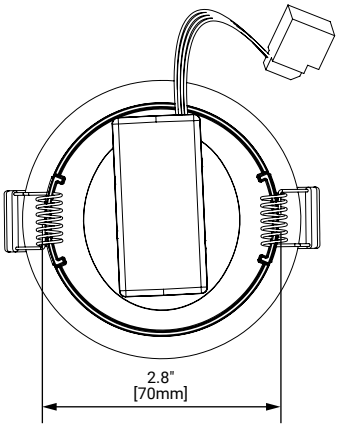
In addition, WaveLinx Pro is designed to be loss tolerant. The WaveLinx Pro communications increase transmission reliability through the use of acknowledgments and packet retransmission. As a result, when a packet is lost, the loss is detected and corrected through retransmission. Additionally, WaveLinx Pro is designed to perform lighting control without requiring network communication at all. Lighting control will continue to operate in the event of a complete wireless failure.

Wireless Tilemount Sensor Kit - WTA

Provides daylight dimming and control for connected luminaires that do not support the WaveLinx Pro integrated sensor.

Tilemount Installation

Sensor for Tilemount installation

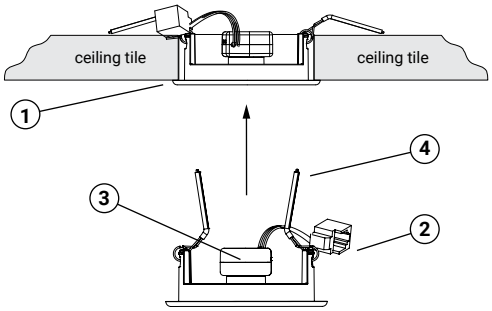


Step 1:
Cut 2-7/8" (73mm) to 3" (76mm) diameter hole in ceiling tile.

Step 2:
Connect plenum cable connectors.

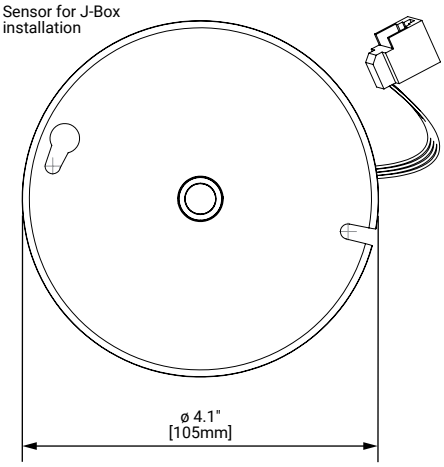
Step 3:
Snap sensor body into ceiling trim.

Step 4:
Squeeze trim springs and insert through hole.



J-Box Installation

Sensor for J-Box installation

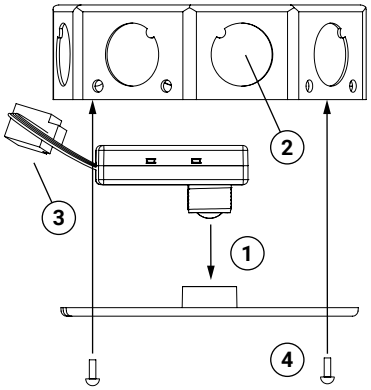


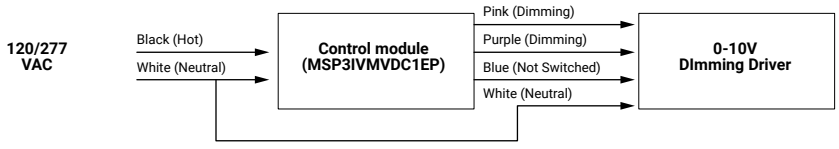
Step 1:
Snap sensor body into cover plate.

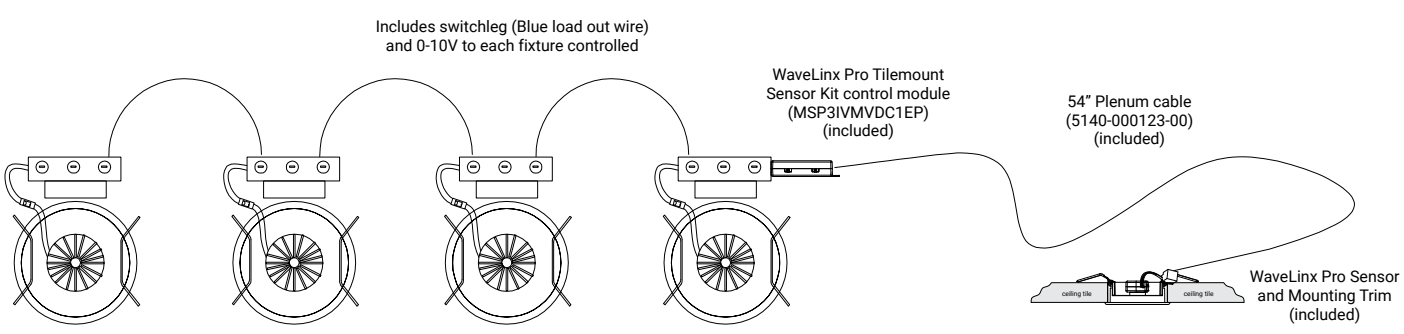
Step 2:
Pull plenum sensor cable through junction box knockout.

Step 3:
Connect plenum cable connectors.

Step 4:
Secure sensor kit to junction box.





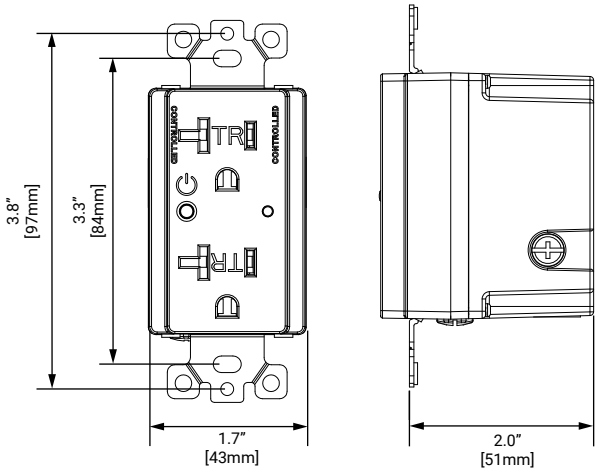


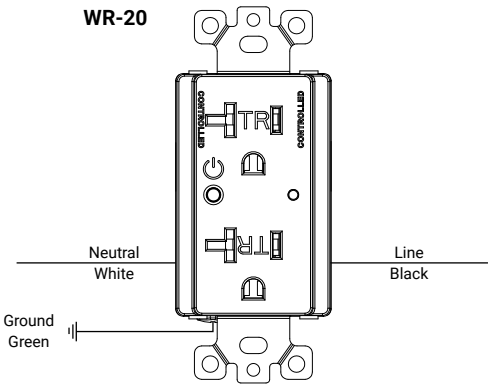
120/277 VAC 3A downlights with 0-10V control

Receptacle - WR-20

Wireless receptacle enables energy savings by turning OFF the top outlet when the area is unoccupied.

WR-20





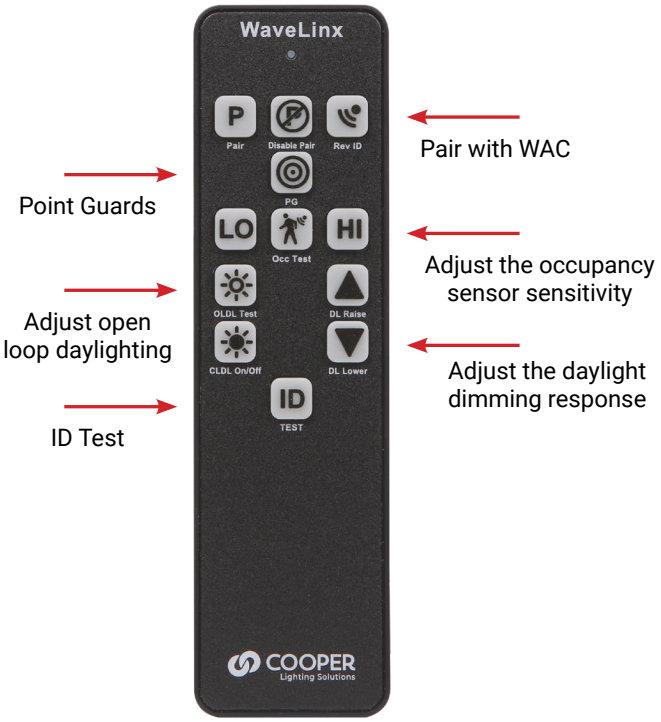
IR Remote

ACC-P-RT

The WaveLinx Pro IR Remote is not a substitute for using the WaveLinx Pro Mobile App to perform the initial site setup. It is a tool to be used in addition to the mobile app to assist with a useful subset of testing/programming functions.

The WaveLinx Pro IR Remote streamlines the processes that installers or set-up technicians use to test device functionality, test daylight or occupancy sensor function, enable or disable pairing mode, reverse identify devices to find them in the mobile app, enable or disable closed loop daylighting, adjust daylight light levels and occupancy sensor sensitivity, factory reset specific devices, and perform the advanced functionality of assigning point guards for larger zone applications.

The WaveLinx Pro IR Remote can be used on supported WaveLinx Pro devices.

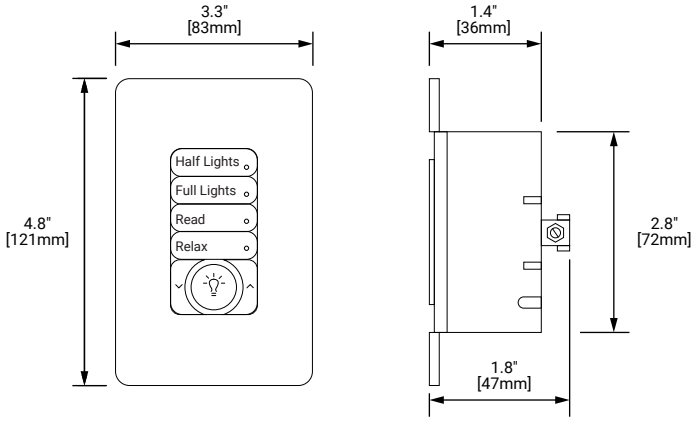


Disclaimer:

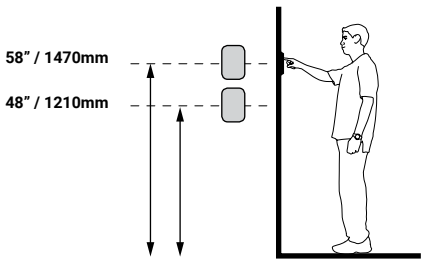
The information contained in this document is provided for general purposes only. Conditions in the field may vary from the assumptions on which the diagrams and information contained herein were based and we make no warranties or representations about the accuracy, completeness or suitability of the information herein for any specific site. The installation of the lighting, wiring, control, and other products contained in this document should only be performed by a qualified professional.

Wallstation - line voltage

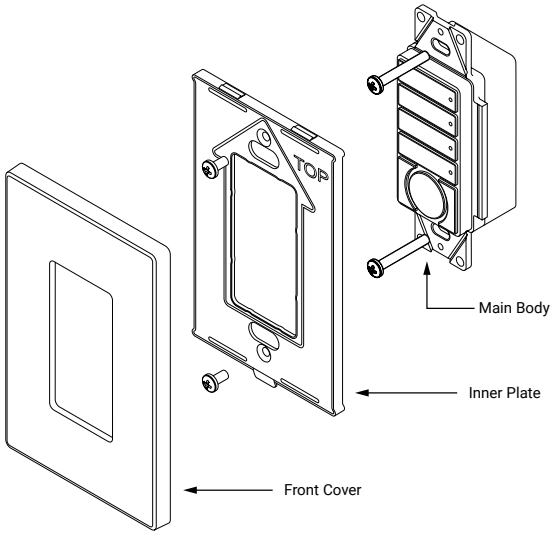
120-277VAC (neutral required) multi-scene, single area dimming wallstation which provides customized light level for each area.



Mounting Height

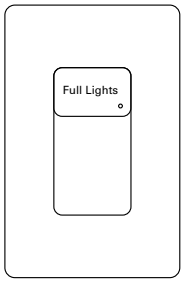


Installation

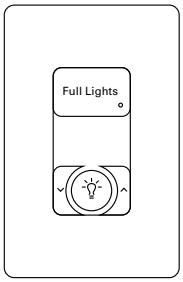


Note: Use of ammonia based or VOC cleaners on this device must be avoided. Prolonged use may cause loss of integrity and expose electrified components. If this occurs, turn OFF power to the unit and replace.

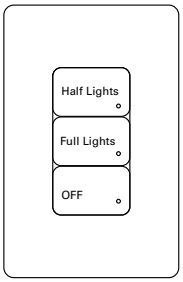
Pre-Programmed Buttons



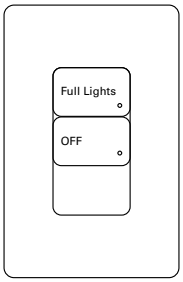
W1L-*
(* = W,V,G,B)



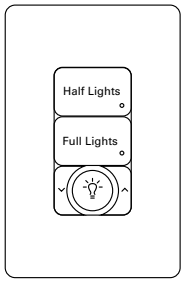
W1L-RL-*
(* = W,V,G,B)



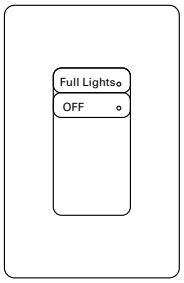
W3L-*
(* = W,V,G,B)



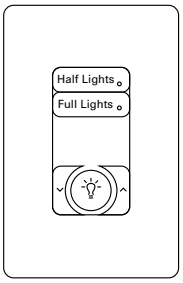
W2L-*
(* = W,V,G,B)



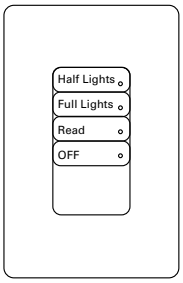
W2L-RL-*
(* = W,V,G,B)



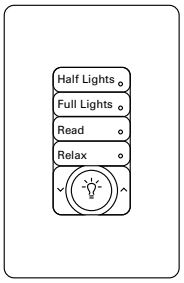
W2S-*
(* = W,V,G,B)



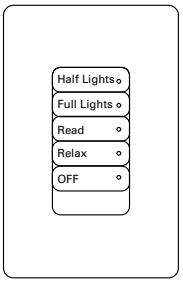
W2S-RL-*
(* = W,V,G,B)



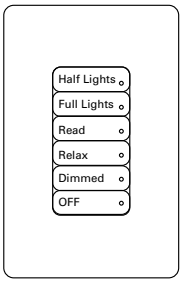
W4S-*
(* = W,V,G,B)



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



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



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

Default engraving & light levels

Half Lights	Scene 3 = 50%
Full Lights	Scene 1 = 100%
Read	Scene 2 = 70%
Relax	Scene 4 = 30%
Dimmed	Scene 5 = 10%
Night	Scene 6 = 1%
Off	Scene 0 = Off

ON/OFF Raise/Lower buttons

Lowers Area light level

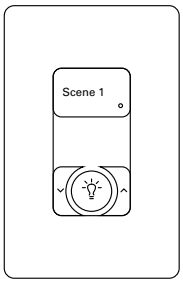
Raise Area light level

Toggles
Scene 1 &
Scene 0

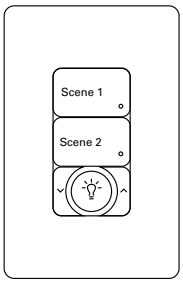
Button programming options via WaveLinx Mobile Application

Scene Selection
Scene Toggle
Zone Toggle
Zone Level
Raise
Lower
HR Release
No Action

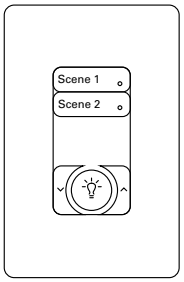
Field Programmable Buttons



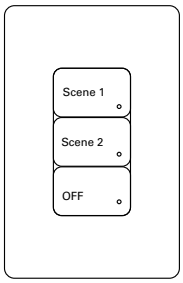
W1L-RL-S-1*
(* = W,V,G,B)



W2L-RL-S2-*
(* = W,V,G,B)



W2S-RL-S2-*
(* = W,V,G,B)



W3L-S2-*
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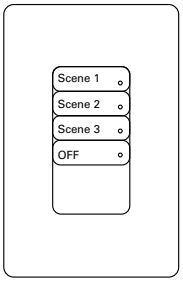
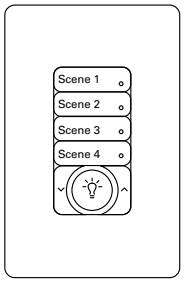
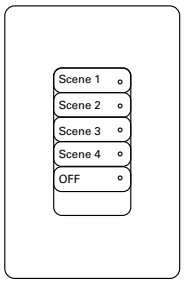


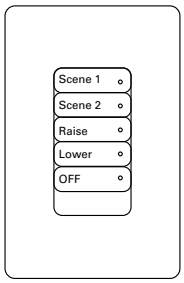
W4S-S3-*
(* = W,V,G,B)



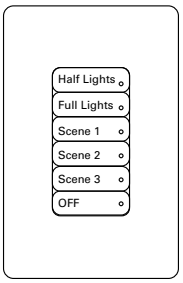
W4S-RL-S4-*
(* = W,V,G,B)



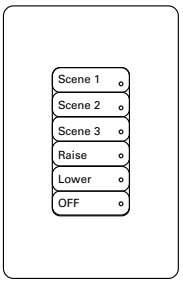
W5S-S4-*
(* = W,V,G,B)



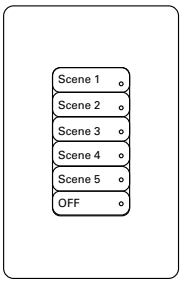
W5S-S2D-*
(* = W,V,G,B)



W6S-S3-*
(* = W,V,G,B)



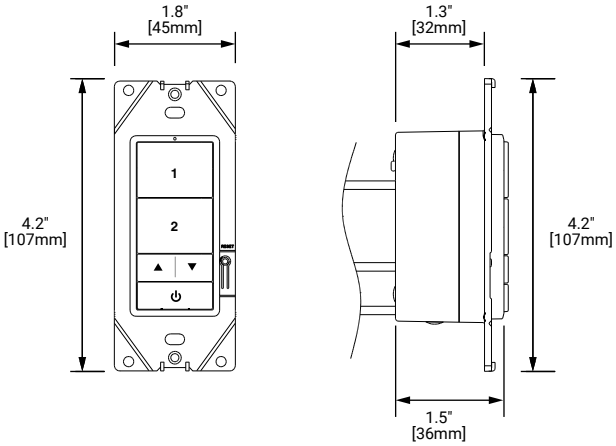
W6S-S3D-*
(* = W,V,G,B)



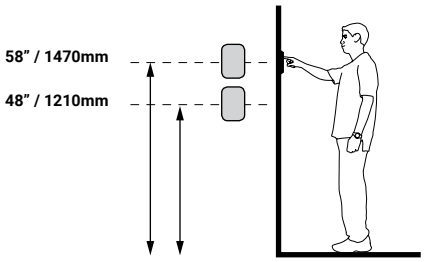
W6S-S5-*
(* = W,V,G,B)

Wallstation - line voltage

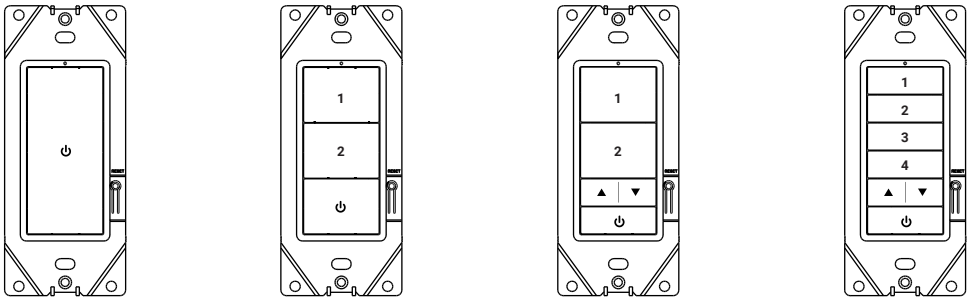
120-277VAC (neutral required) multi-scene, single area dimming wallstation which provides customized light level for each area.



Mounting Height



Standard models



WW1-W | WW3-W | WW3-RL-W | WW5-RL-W

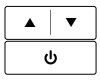
Standard button engraving for each wallstation

Default engraving & light levels

Button 1	Scene 3 = 50%
Button 2	Scene 1 = 100%
Button 3	Scene 2 = 70%
Button 4	Scene 4 = 30%
Raise press*	Increase 1% (per press)
hold*	Increase 15% (per sec)
Lower press*	Decrease 1% (per press)
hold*	Decrease 15% (per sec)
Power*	Toggle Scene 3 (50%) & Scene 0 (Off)
	* - affects all zones in area

Raise / Lower / OFF buttons

Raise Area light level



Lowers Area light level

Turns all lights in area ON / OFF

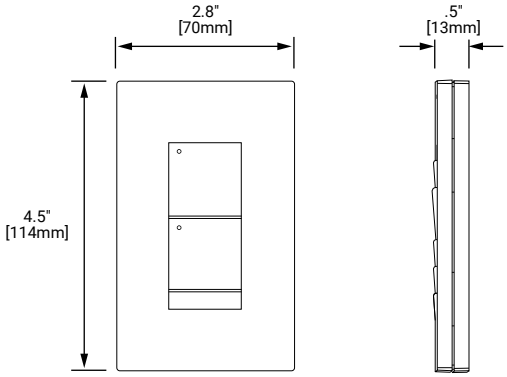
Button programming options via WaveLinx Pro Mobile Application

Scene Selection
Zone Level
Raise Level
Lower Level
Toggle Scene or Zone Level
No Action

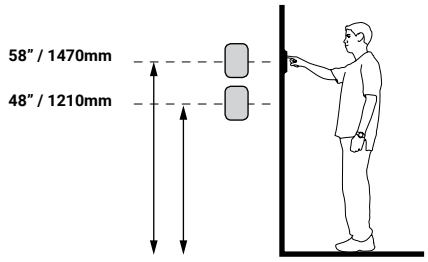
Note: Use of ammonia based or VOC cleaners on this device must be avoided. Prolonged use may cause loss of integrity and expose electrified components. If this occurs, turn OFF power to the unit and replace.

Wallstation - battery

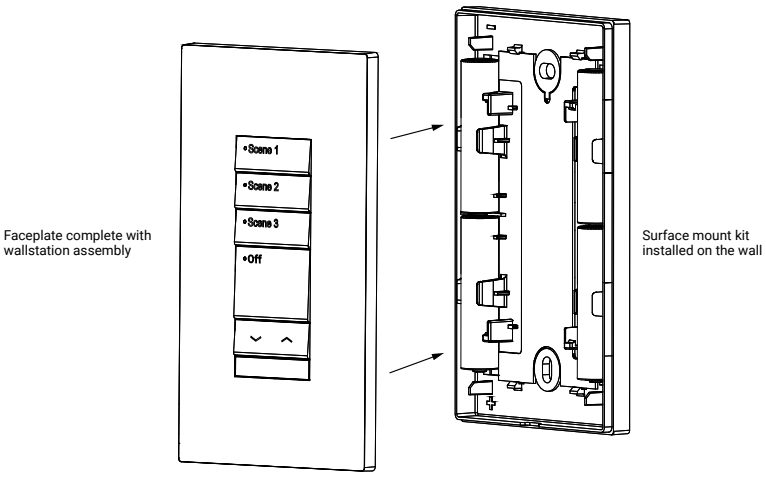
Battery powered surface mounted multi-scene, single area dimming wallstation.



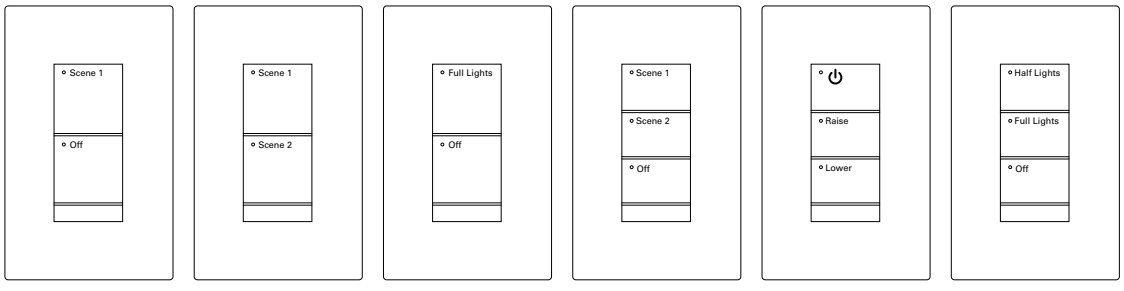
Mounting Height



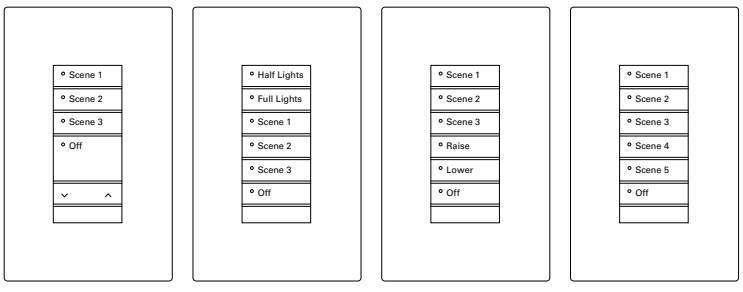
Installation



Field Programmable Buttons



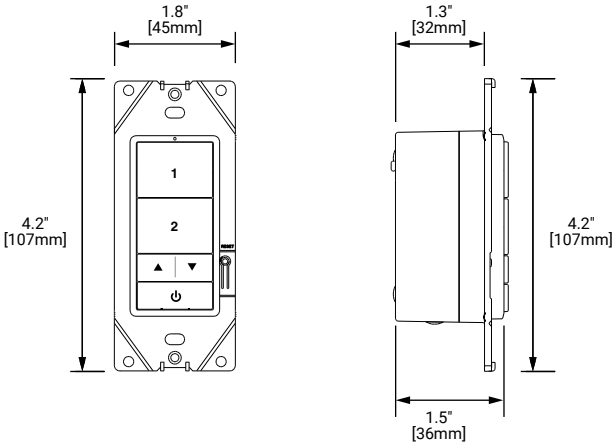
WB2L-S1-W | WB2L-S2-W | WB2L-W | WB3L-S2-W | WB3L-D-W | WB3L-W



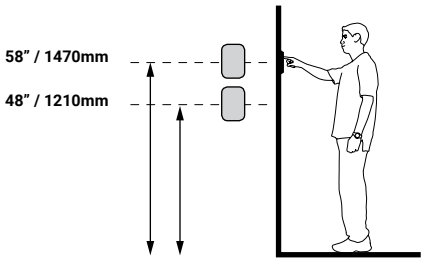
WB5-S3-W | WB6S-S3-W | WB6S-S3D-W | WB6S-S5-W

Wallstation - battery

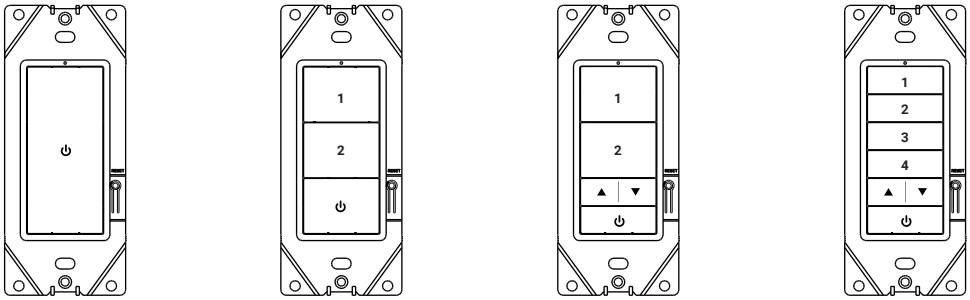
Battery powered wall box mounted multi-scene, single area dimming wallstation.



Mounting Height



Standard models



WWB1-W | WWB3-W | WWB3-RL-W | WWB5-RL-W

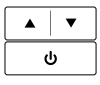
Standard button engraving for each wallstation

Default engraving & light levels

Button 1	Scene 3 = 50%
Button 2	Scene 1 = 100%
Button 3	Scene 2 = 70%
Button 4	Scene 4 = 30%
Raise press*	Increase 1% (per press)
hold*	Increase 15% (per sec)
Lower press*	Decrease 1% (per press)
hold*	Decrease 15% (per sec)
Power*	Toggle Scene 3 (50%) & Scene 0 (Off)
	* - affects all zones in area

Raise / Lower / OFF buttons

Raise Area light level



Lowers Area light level

Turns all lights in area ON / OFF

Button programming options via WaveLinx Pro Mobile Application

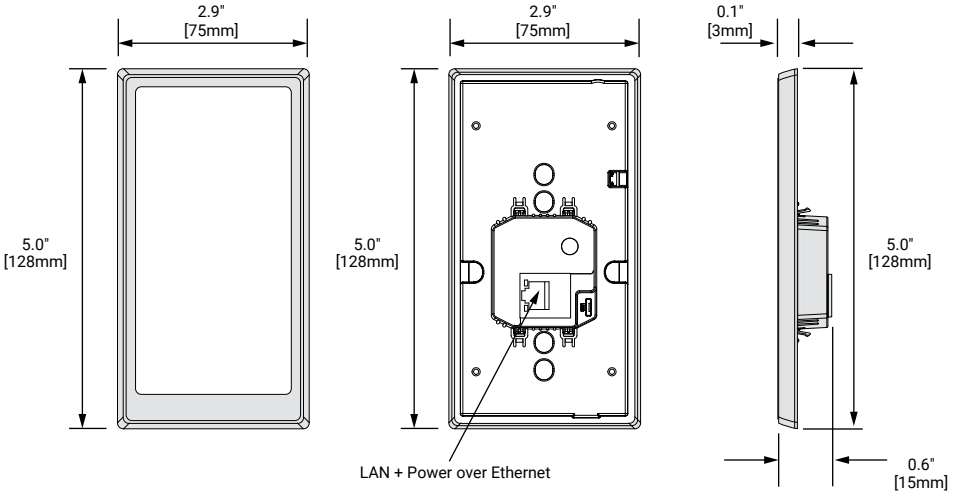
Scene Selection
Zone Level
Raise Level
Lower Level
Toggle Scene or Zone Level
No Action

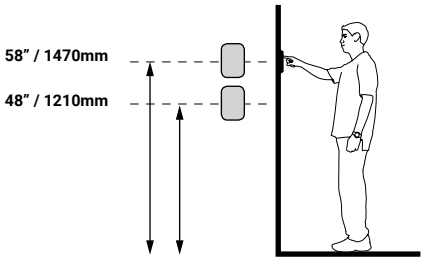
Note: Use of ammonia based or VOC cleaners on this device must be avoided. Prolonged use may cause loss of integrity and expose electrified components. If this occurs, turn OFF power to the unit and replace.

Touchscreen

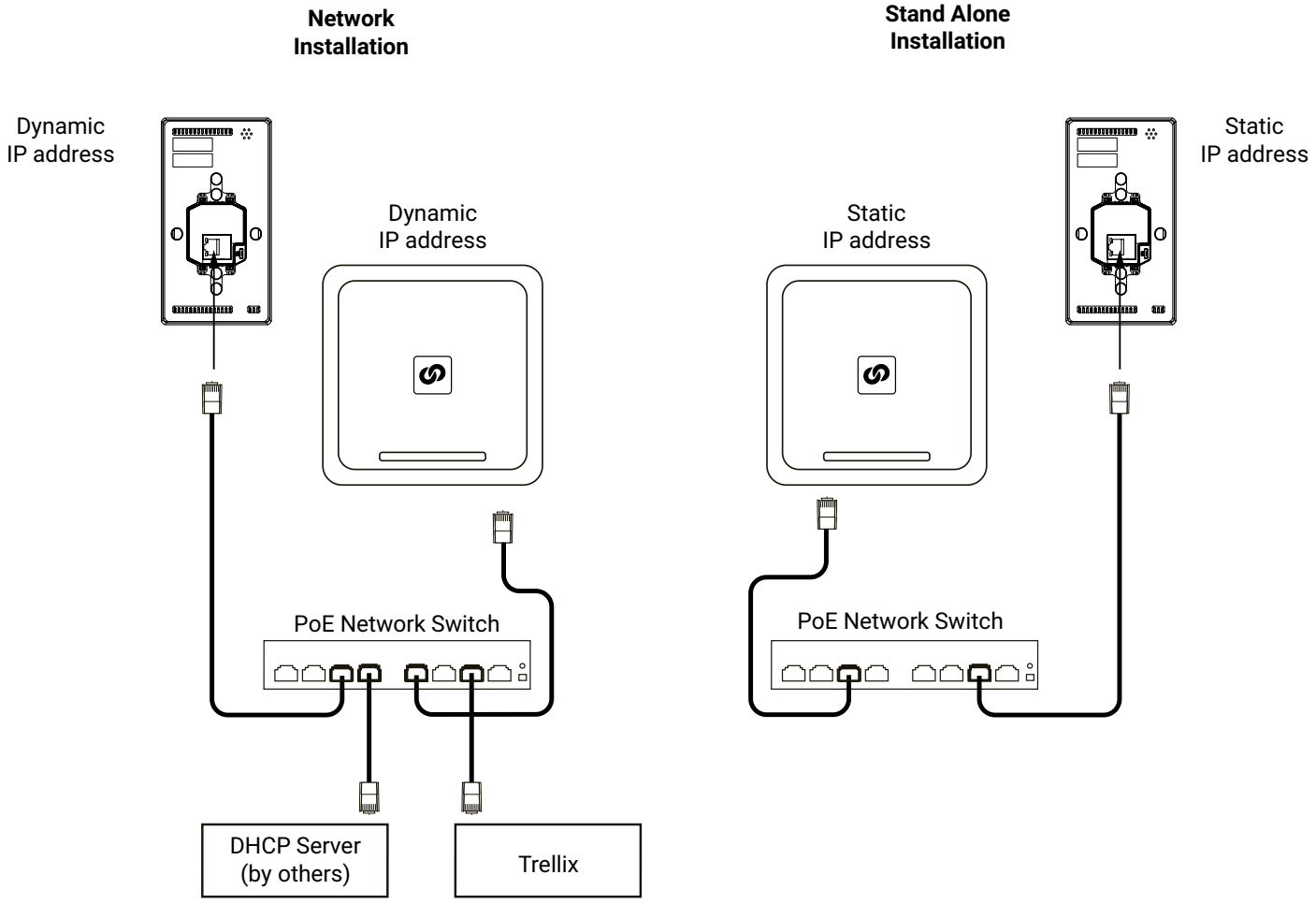
Provides an elegant and discreet light control for any WaveLinx Pro controlled area.

Mounting Height



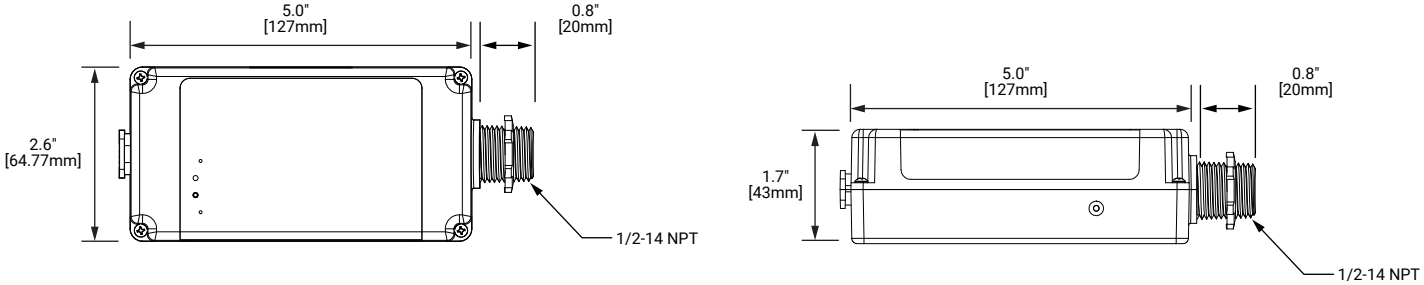


Installation

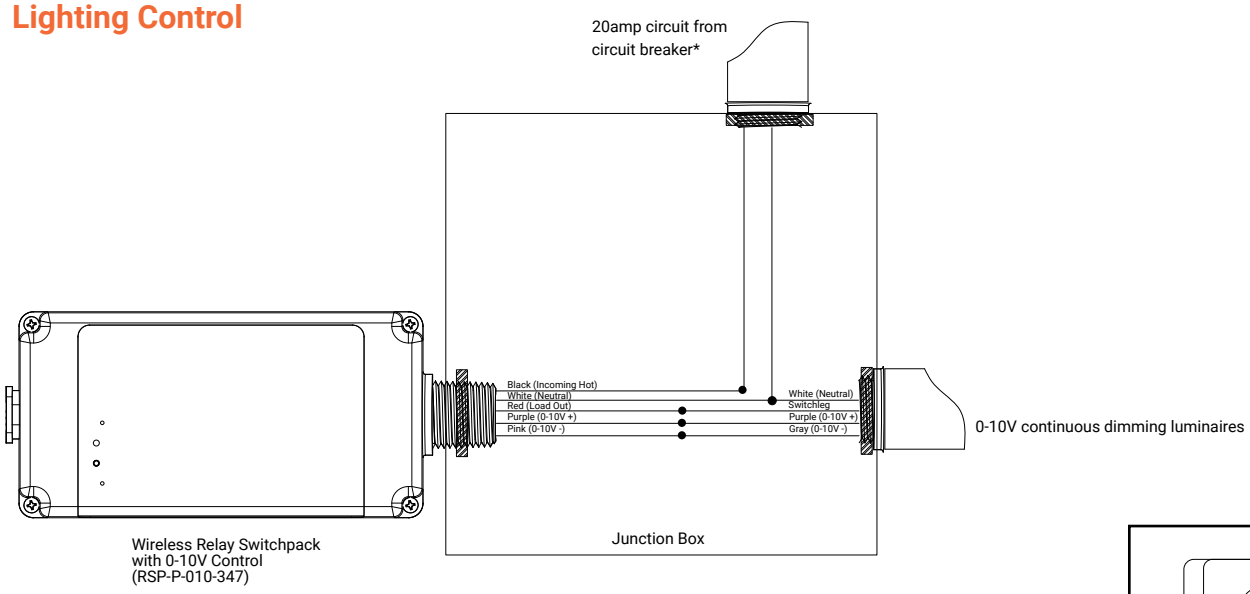


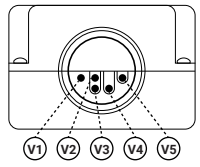
Relay switchpack for lighting control

Relay switchpack with 0-10V control.



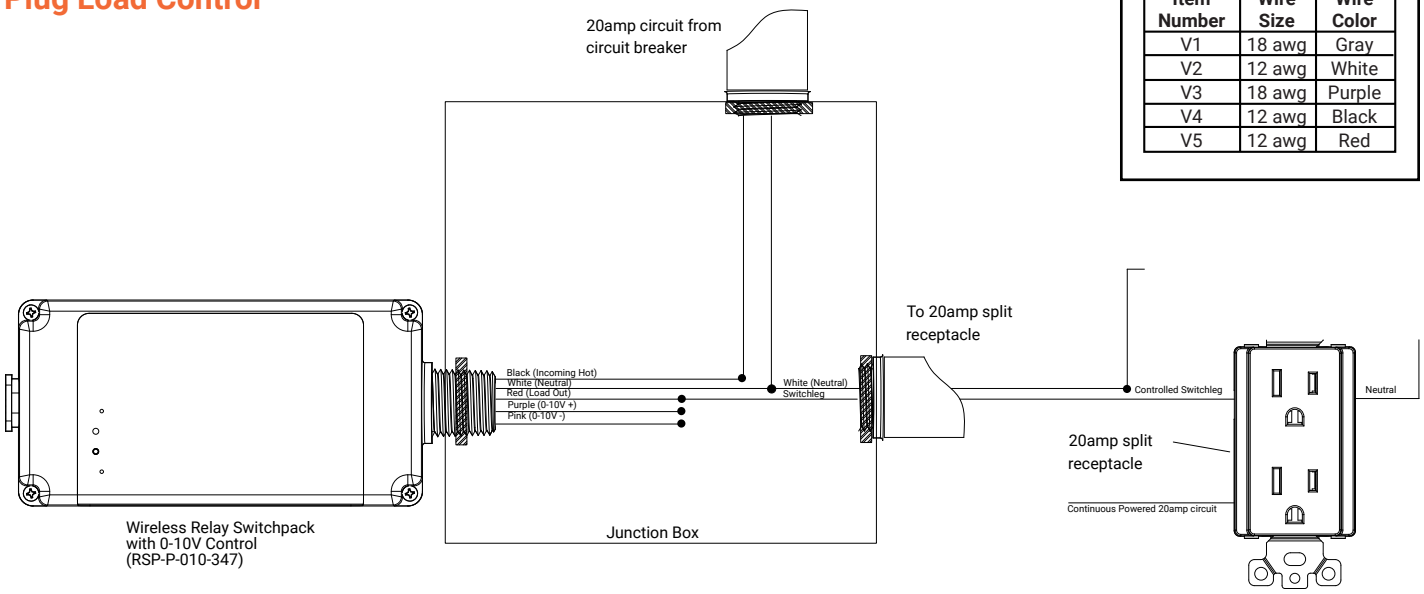
Lighting Control





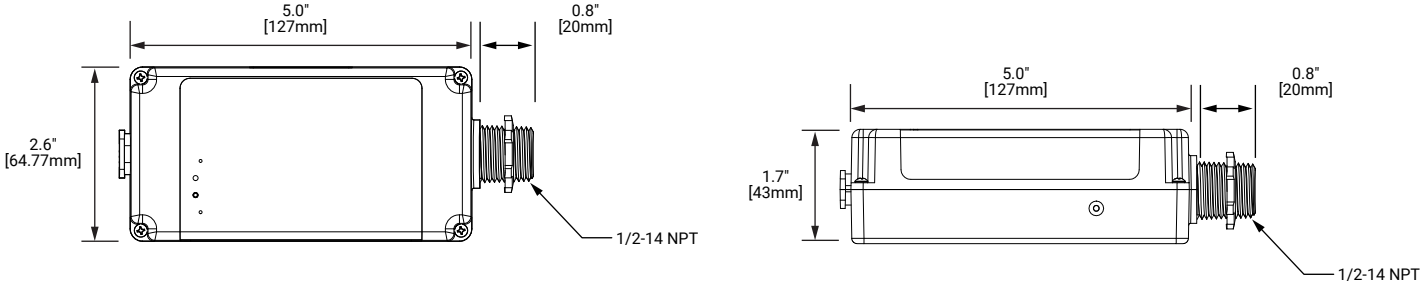
Item Number	Wire Size	Wire Color
V1	18 awg	Gray
V2	12 awg	White
V3	18 awg	Purple
V4	12 awg	Black
V5	12 awg	Red

Plug Load Control

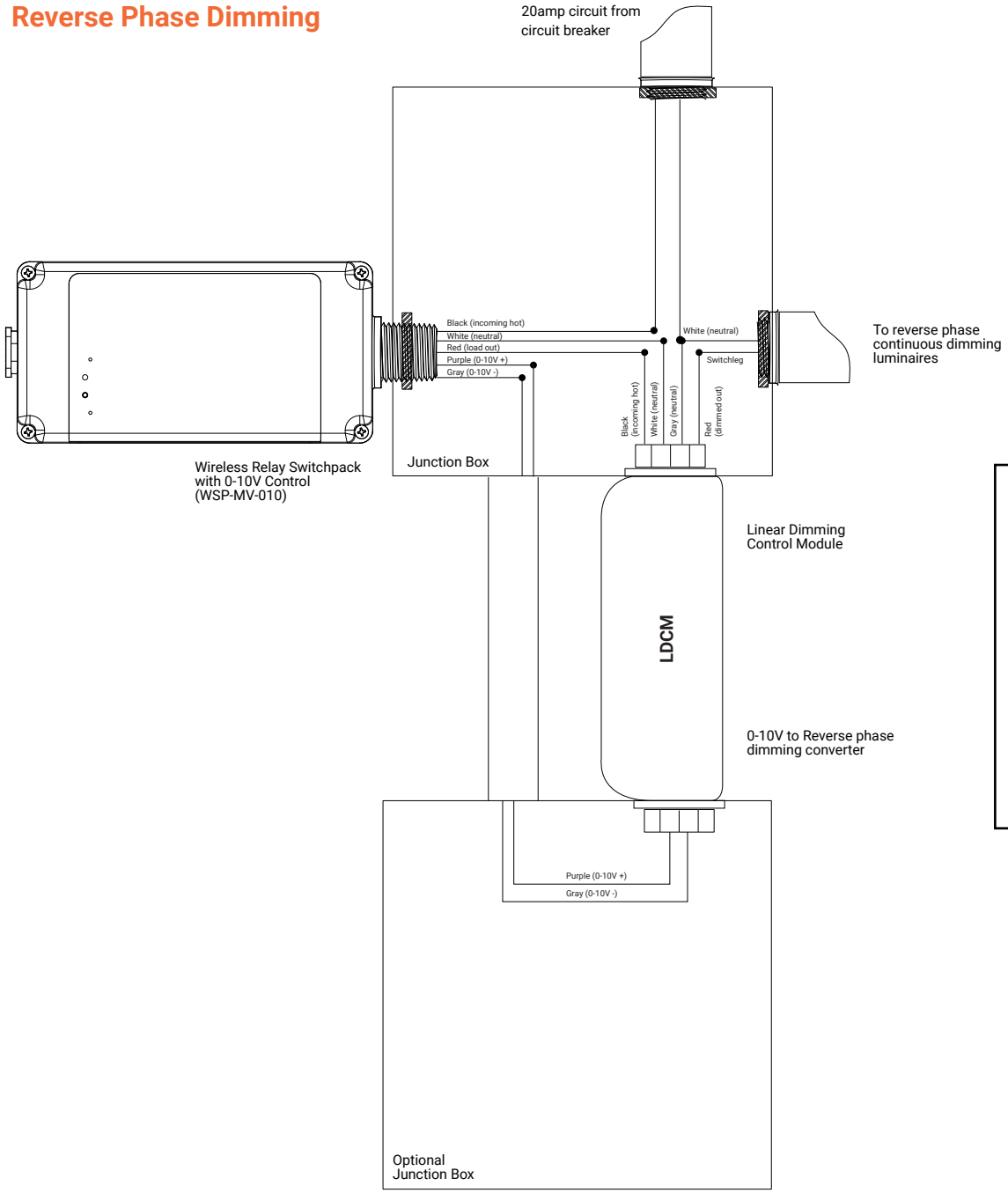


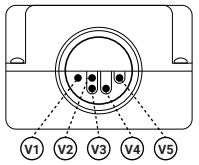
Relay switchpack with LDCM

0-10V to Reverse phase dimming.



Reverse Phase Dimming



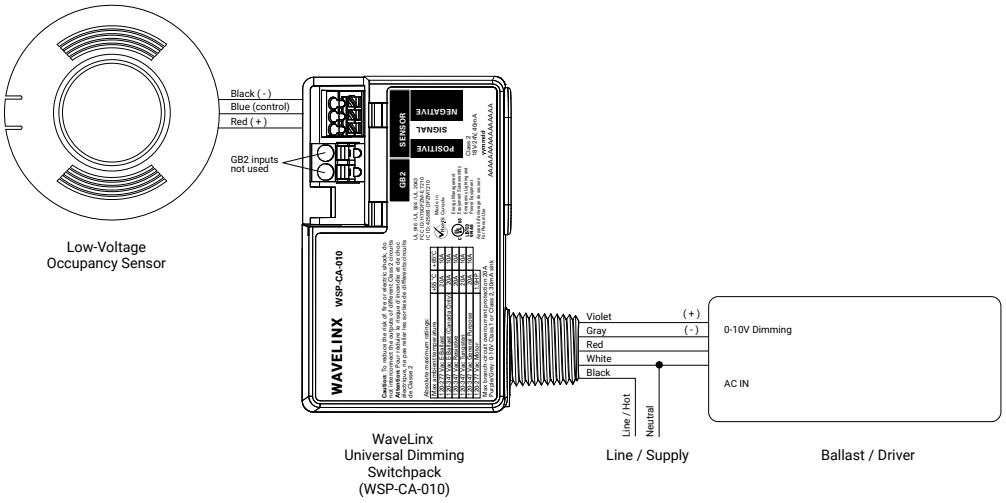


Item Number	Wire Size	Wire Color
V1	18 awg	Gray
V2	12 awg	White
V3	18 awg	Purple
V4	12 awg	Black
V5	12 awg	Red

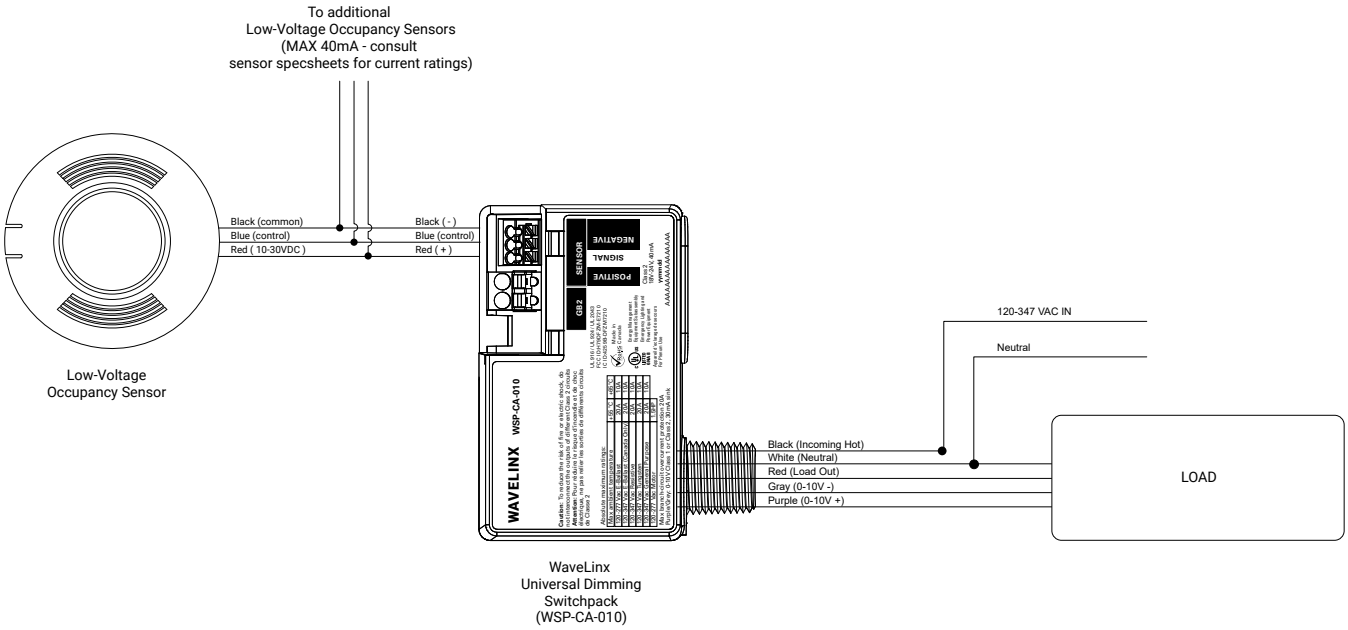
Universal switchpack for lighting control

Wireless 0-10V dimming switchpack for 120-347V lighting applications

Contact Closure - Single Sensor



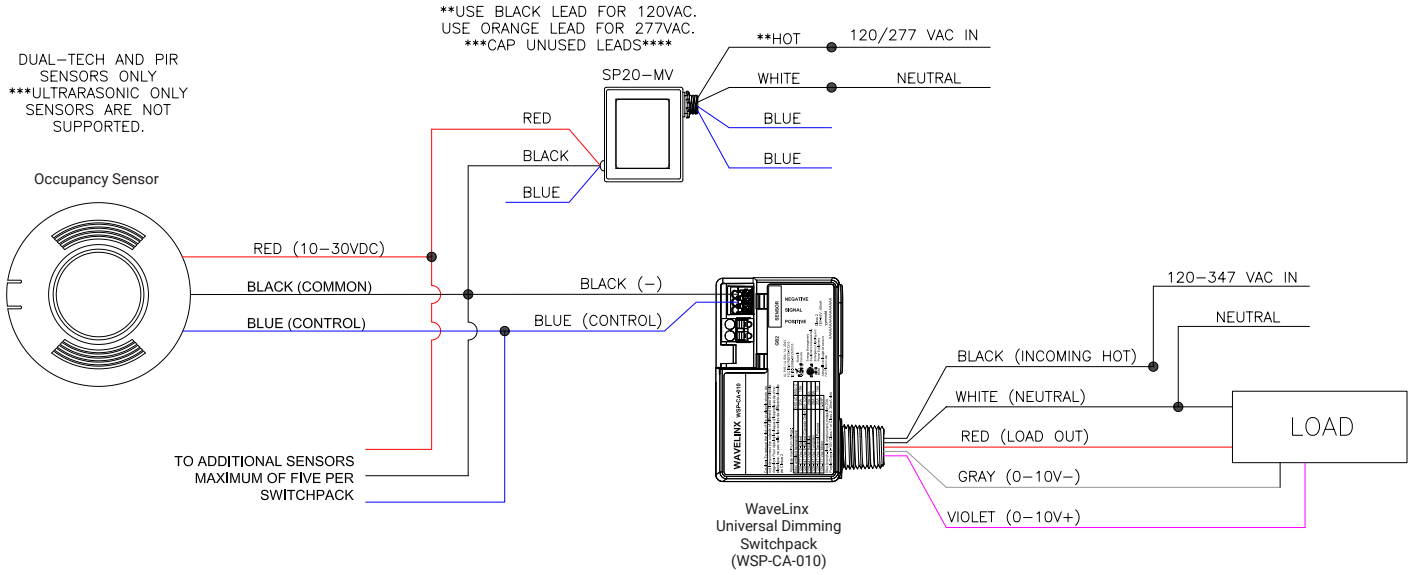
Contact Closure - Multiple Sensors



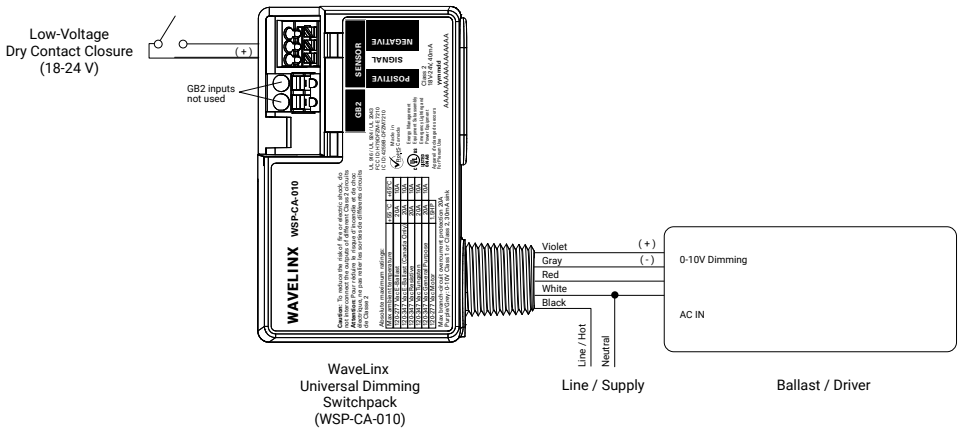
Universal switchpack for lighting control

Wireless 0-10V dimming switchpack for 120-347V lighting applications

Contact Closure - Sensors Externally Powered

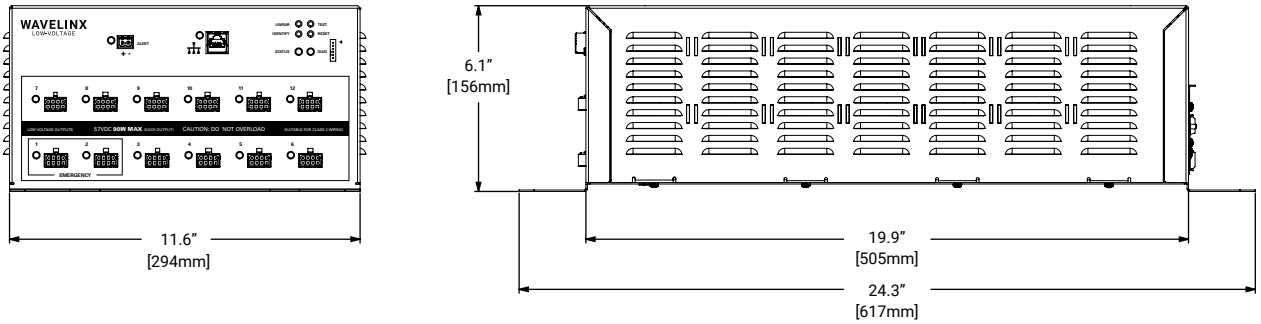


Low-Voltage Dry Contact Closure



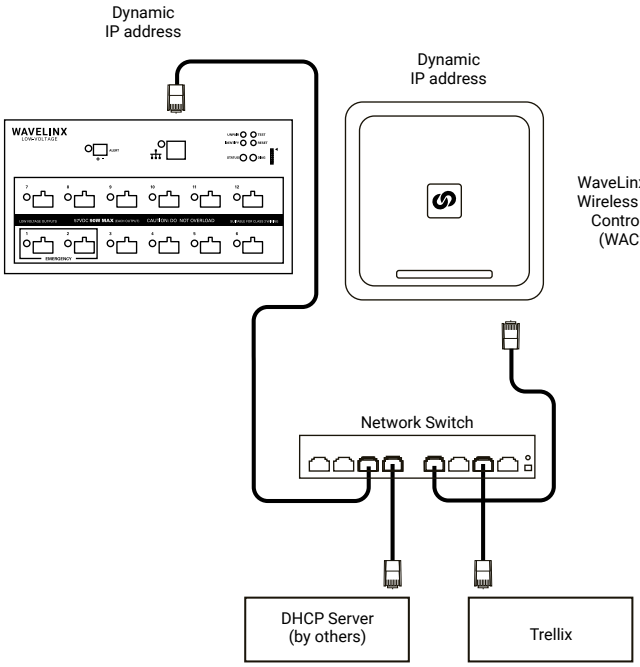
WaveLinx Pro Low-Voltage power module

1200W Power Module Blends the benefits of low-voltage wiring with wireless control for speed and flexibility.

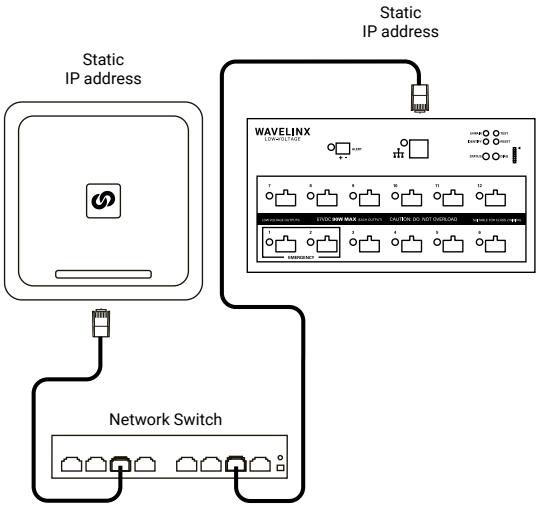


Installation

Network Installation



Stand Alone Installation

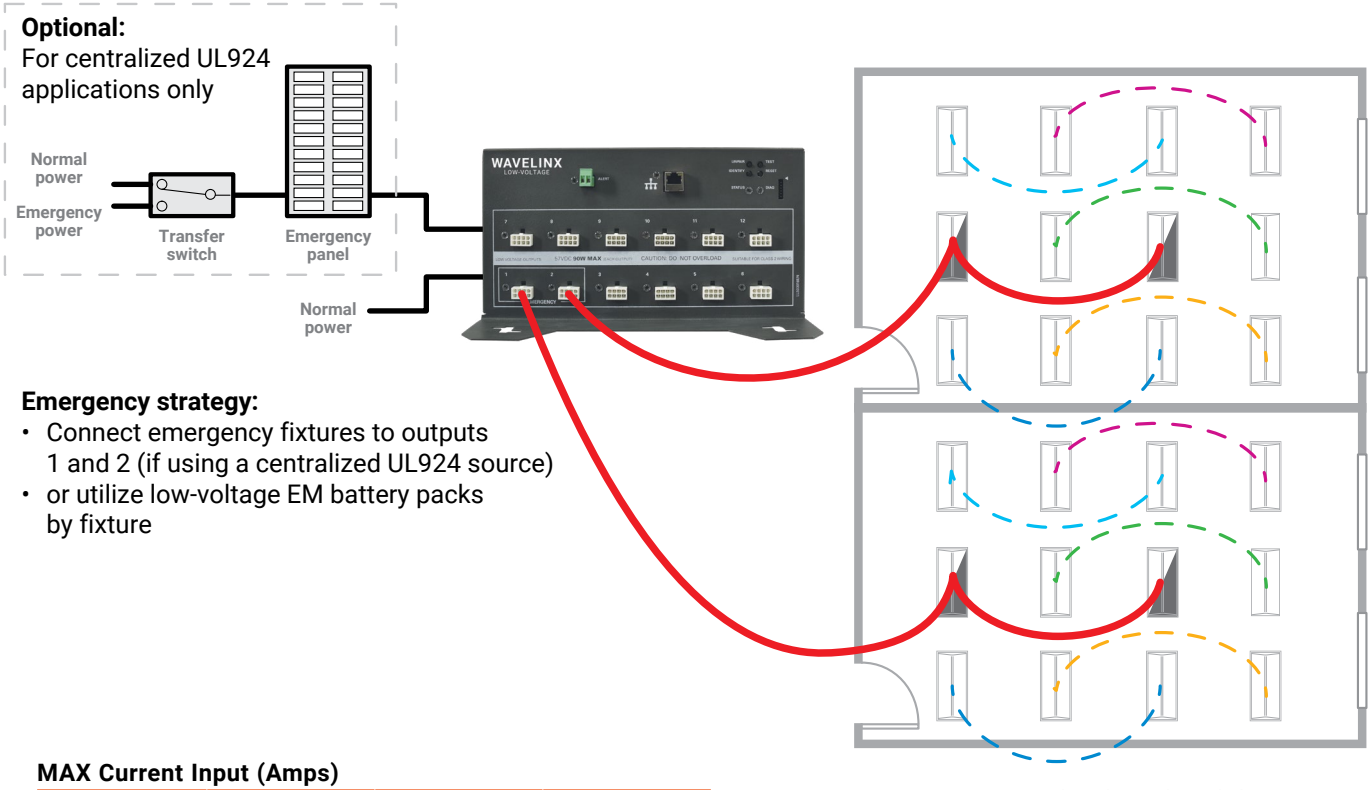


Combination of low-voltage and wireless devices per WaveLinx Area Controller (WAC2)

- *MAX = 200*
- *Best Practice = 150*

WaveLinx Pro low-voltage power module

Installation



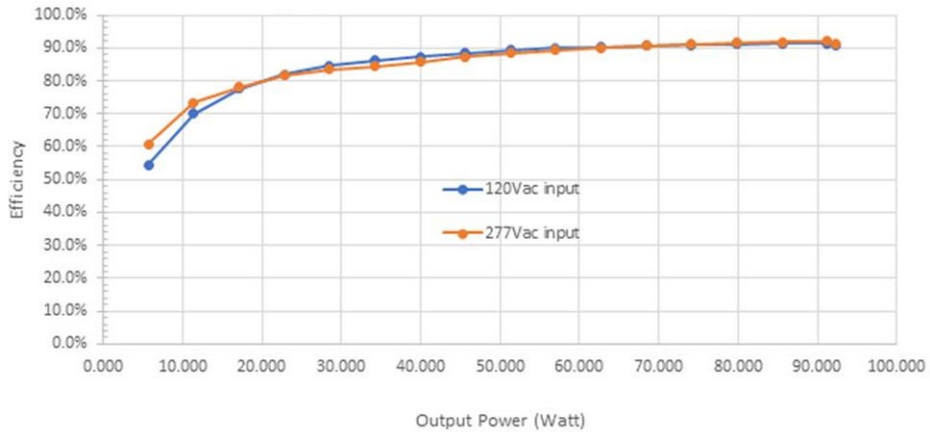
MAX Current Input (Amps)

	Normal Power Input		EM Power Input		Single Panel Input Only	
Model	120VAC	277VAC	120VAC	277VAC	120VAC	277VAC
LVPM-12-100-64-2E	9.0	4.0	1.8	0.8	10.8	4.8

Note: Daisy-chain low-voltage lighting loads up to 90W per output

Note: When normal power is de-energized and emergency panel is energized, lighting on low-voltage output circuit #1 and #2 go to 100% while other low-voltage output circuits are OFF / de-energized.

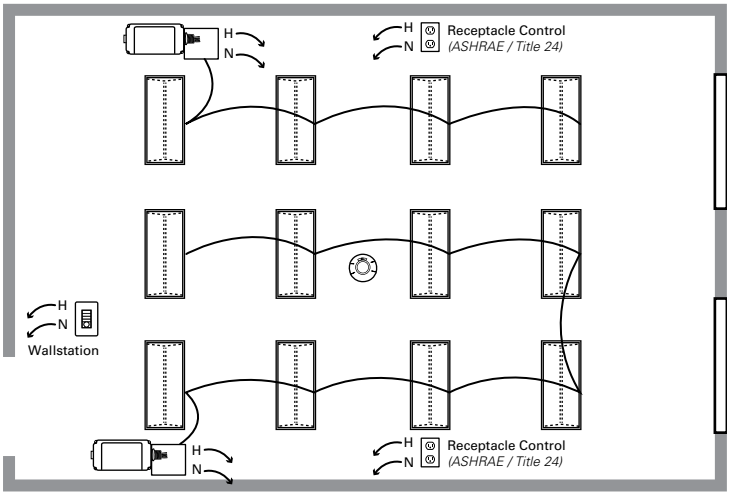
Low-Voltage Circuit Efficiency



Classroom

example 1

	Manually Switched ON / OFF	Manual Dimmer	Manual ON / Auto OFF	Occupancy Sensor	Daylighting Control	Lumen Maintenance Control	Tuning Control	Receptacle Control	Demand Response
IECC 2021	•	•	•	•	•	•	•		
ASHRAE 90.1 - 2019	•	•	•	•	•	•	•	•	•
T24 2019	•	•	•	•	•	•	•	•	•
NECB 2017	•	•	•	•	•	•	•		



Sequence of Operations

Lighting

- 0-10V lighting loads
- Up to 3 dimmable zones
- Daylight dimming zones of no more than eight luminaires *(IECC only)*
- Out of the box 75% high end trim

Occupancy

- Automatic auto on to 50%
- Optional vacancy mode
- Optional auto on to scene
- Plug load turns on with occupancy
- Automatic off of lighting and plug load on vacancy

Daylighting

- Continuous dimming to off
- Daylighting not required for indoor spaces without windows
- Not required in spaces without windows or that are less than 150W *(120W for ASHRAE / Title 24)*

Manual Controls

- Programmable scenes
- Dominant button is 50% light level
- Scene raise / Scene lower
- All off

Additional Features

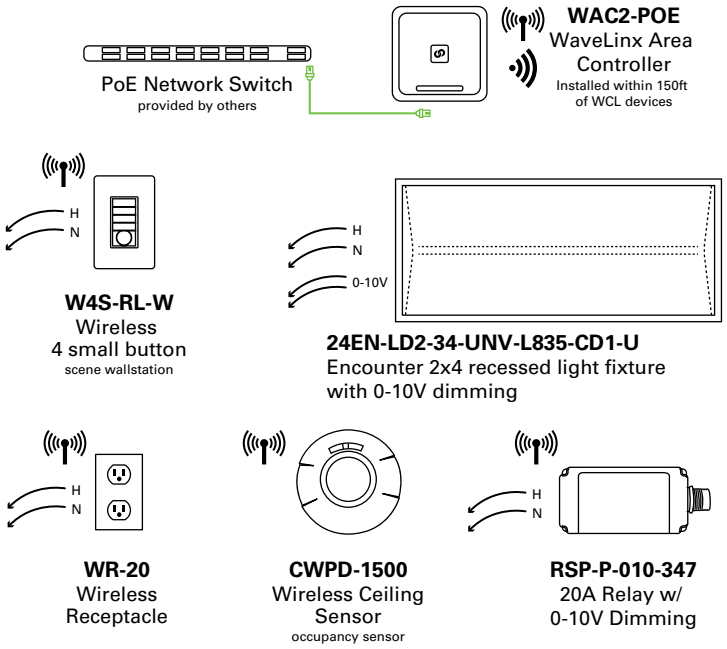
- Energy calculations (available through Trellix)
- Automatic demand response through WaveLinx Area Controller
- Scheduling of partial off light levels from WaveLinx Area Controller
- UL924 emergency control capabilities via luminaire battery backup or CEPC-2-D for entire switchpack circuit when emergency panels are deployed

Bill of Material

Quantity	Catalog #	Description
1	WAC2-POE	WaveLinx Area Controller
2	RSP-P-010-347	Universal Voltage Dimming Switchpack
1	CWPD-1500	WaveLinx ceiling sensor
1	W4S-RL-W	WaveLinx Wallstation
1	WR-20	WaveLinx Receptacle *(ASHRAE / Title 24)*
12	24EN-LD2-34-UNV-L835-CD1-U	Encounter 2x4

Design Consideration	Best Practice	Maximum
Gateway / WaveLinx Area Controller range	150ft LOS	300 ft LOS
Number of interior walls	2 walls	3 walls
Distance from WaveLinx Area Controller to 1st WaveLinx device	150 ft	200 ft
Distance between WaveLinx devices	75 ft	150 ft
Number of hops from WaveLinx Area Controller	4 hops	5 hops
Number of areas per WaveLinx Area Controller	49 + 1 construction area	
Number of zones per WaveLinx Area Controller	200	200
Number of scenes per area	16	16

Typical Wiring Detail

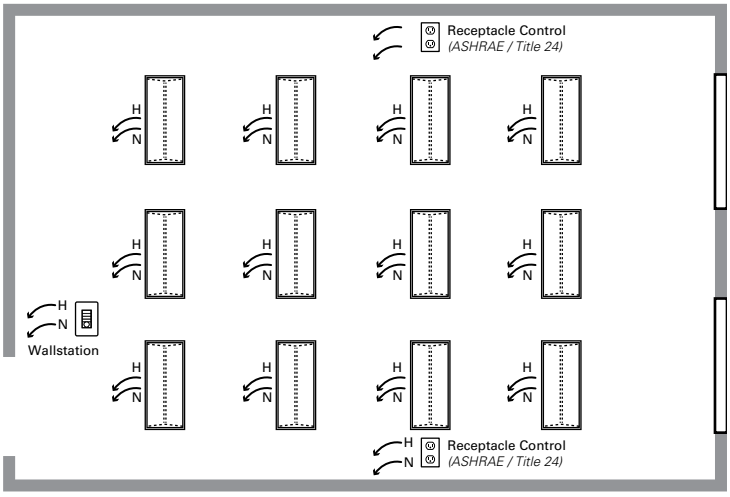


	Local Control	Manual ON	Partial ON	Bilevel Lighting	Daylight Side	Daylight Top	Partial OFF	Automatic OFF	Scheduled OFF	Receptacle Control	Energy Monitoring	Parking Garage	Functional Testing	Demand Response	Enhanced Digital
IECC 2018	C405.2.5	C405.2.5	C405.2.2.1.2		C405.2.3.2	C405.2.3.3	C405.2.1.3	C405.2.1.1.1	C405.2.2	C405.2.4		C405.2.6	C408.3		C406. 4
ASHRAE 90.1-2019	9.4.1 (a)	9.4.1.1 (b)	9.4.1.1 (c)	9.4.1.1 (d)	9.4.1.1 (e)	9.4.1.1 (f)	9.4.1.1 (g)	9.4.1.1 (h)	9.4.1.1 (i)	8.4.2	8.4.3.2	9.4.1.2	9.4.3		C406. 4
T24 2019	130.1 (a)(b)	130.1 (a)(b)	130.1 (b)		130.1 (d)	130.1 (d)	130.1 (c).6	130.1 (c).5	130.1 (c)	130.5 (d)	130.5 (b)	130.1 (d)	130.4	130.1 (e) 130.1 (e)	
NECB 2017	4.2.2.1.(3)	4.2.2.1.(3), 4.2.2.1.(6)	4.2.2.1 (8)	4.2.2.1.(9)	4.2.2.1.(10)	4.2.2.1.(13)	4.2.4.1. (16-17)	4.2.2.1. (18-19)	4.2.2.1. (20-23)			4.2.2.2 4.2.2.4			

Classroom

example 2

	Manually Switched ON / OFF	Manual Dimmer	Manual ON / Auto OFF	Occupancy Sensor	Daylighting Control	Lumen Maintenance Control	Tuning Control	Receptacle Control	Demand Response
IECC 2021	•	•	•	•	•	•	•		
ASHRAE 90.1 - 2019	•	•	•	•	•	•	•	•	•
T24 2019	•	•	•	•	•	•	•	•	•
NECB 2017	•	•	•	•	•	•	•		



Sequence of Operations

Lighting

- 0-10V lighting loads
- Up to 3 dimmable zones
- Out of the box 75% high end trim

Occupancy

- Automatic auto on to 50%
- Optional vacancy mode
- Optional auto on to scene
- Plug load turns on with occupancy *(optional for IECC)*
- Automatic off of lighting and plug load on vacancy

Daylighting

- Continuous dimming to off
- Individual luminaire daylight dimming to approximately 500 lux
- Daylighting not required for indoor spaces without windows
- Not required in spaces without windows or that are less than 150W *(120W for ASHRAE / Title 24)*

Manual Controls

- Programmable scenes
- Dominant button is 50% light level
- Scene raise / Scene lower
- All off

Additional Features

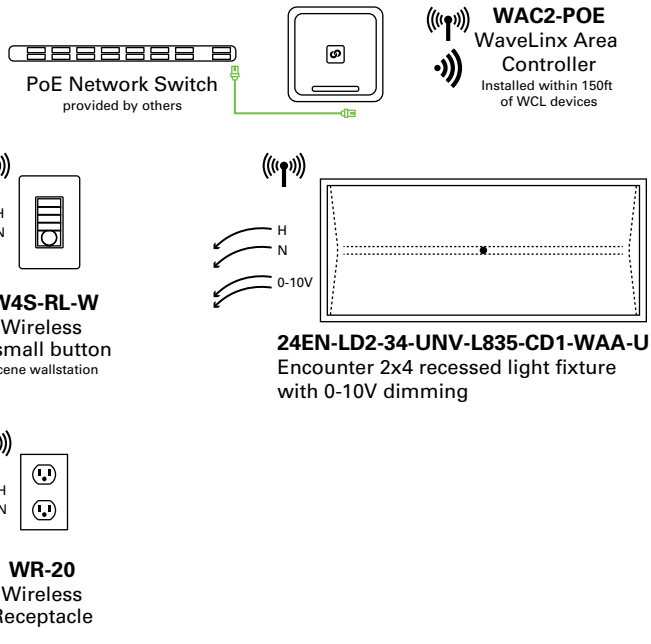
- Energy calculations (available through Trellix)
- Automatic demand response through WaveLinx Area Controller
- Scheduling of partial off light levels from WaveLinx Area Controller
- UL924 emergency control capabilities via luminaire battery backup or fixture integrated transfer device (consult fixture spec sheet)
- Complies with Enhanced Digital Lighting Control section C406 *(IECC)*

Bill of Material

Quantity	Catalog #	Description
1	WAC2-POE	WaveLinx Area Controller
1	W4S-RL-W	WaveLinx Wallstation
1	WR-20	WaveLinx Receptacle *(ASHRAE / Title 24)*
12	24EN-LD2-34-UNV-L835-CD1-WAA-U	Encounter 2x4 with WaveLinx Sensor

Design Consideration	Best Practice	Maximum
Gateway / WaveLinx Area Controller range	150 ft LOS	300 ft LOS
Number of interior walls	2 walls	3 walls
Distance from WaveLinx Area Controller to 1st WaveLinx device	150 ft	200 ft
Distance between WaveLinx devices	75 ft	150 ft
Number of hops from WaveLinx Area Controller	4 hops	5 hops
Number of areas per WaveLinx Area Controller	49 + 1 construction area	
Number of zones per WaveLinx Area Controller	200	200
Number of scenes per area	16	16

Typical Wiring Detail

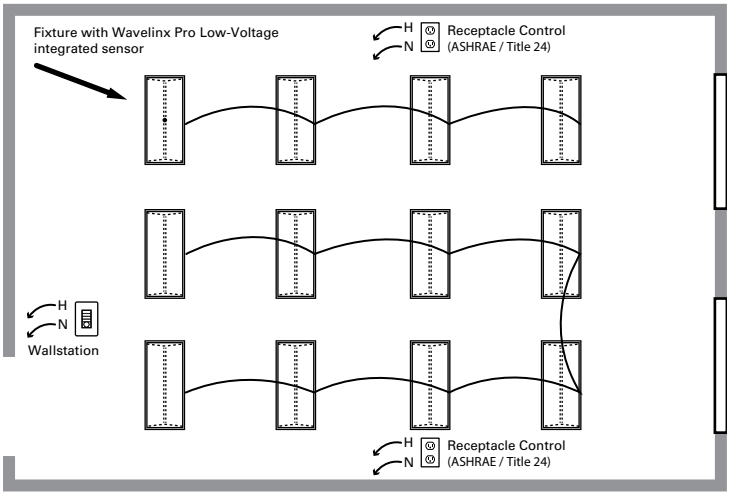


	Local Control	Manual ON	Partial ON	Bilevel Lighting	Daylight Side	Daylight Top	Partial OFF	Automatic OFF	Scheduled OFF	Receptacle Control	Energy Monitoring	Parking Garage	Functional Testing	Demand Response	Enhanced Digital
IECC 2018	C405.2.5	C405.2.5	C405.2.2.1.2		C405.2.3.2	C405.2.3.3	C405.2.1.3	C405.2.1.1.1	C405.2.2	C405.2.4		C405.2.6	C408.3		C406. 4
ASHRAE 90.1-2019	9.4.1 (a)	9.4.1.1 (b)	9.4.1.1 (c)	9.4.1.1 (d)	9.4.1.1 (e)	9.4.1.1 (f)	9.4.1.1 (g)	9.4.1.1 (h)	9.4.1.1 (i)	8.4.2	8.4.3.2	9.4.1.2	9.4.3		C406. 4
T24 2019	130.1 (a)(b)	130.1 (a)(b)	130.1 (b)		130.1 (d)	130.1 (d)	130.1 (c).6	130.1 (c).5	130.1 (c)	130.5 (d)	130.5 (b)	130.1 (d)	130.4	130.1 (e) 130.1 (e)	
NECB 2017	4.2.2.1.(3)	4.2.2.1.(3), 4.2.2.1.(6)	4.2.2.1 (8)	4.2.2.1.(9)	4.2.2.1.(10)	4.2.2.1.(13)	4.2.4.1. (16-17)	4.2.2.1. (18-19)	4.2.2.1. (20-23)			4.2.2.2 4.2.2.4			

Classroom

example 3

	Manually Switched ON / OFF	Manual Dimmer	Manual ON / Auto OFF	Occupancy Sensor	Daylighting Control	Lumen Maintenance Control	Tuning Control	Receptacle Control	Demand Response
IECC 2021	•	•	•	•	•	•	•		
ASHRAE 90.1 - 2019	•	•	•	•	•	•	•	•	•
T24 2019	•	•	•	•	•	•	•	•	•
NECB 2017	•	•	•	•	•	•	•		



Sequence of Operations

Lighting

- 0-10V lighting loads
- Up to 3 dimmable zones
- Out of the box 75% high end trim

Occupancy

- Automatic auto on to 50%
- Optional vacancy mode
- Optional auto on to scene
- Optional Plug load turns on with occupancy
- Automatic off of lighting and plug load on vacancy

Daylighting

- Continuous dimming to off
- Individual luminaire daylight dimming to approximately 500 lux
- Daylighting not required for indoor spaces
- Not required in spaces without windows or that are less than 150W

Manual Controls

- Programmable scenes
- Dominant button is 50% light level
- Scene raise / Scene lower
- All off

Additional Features

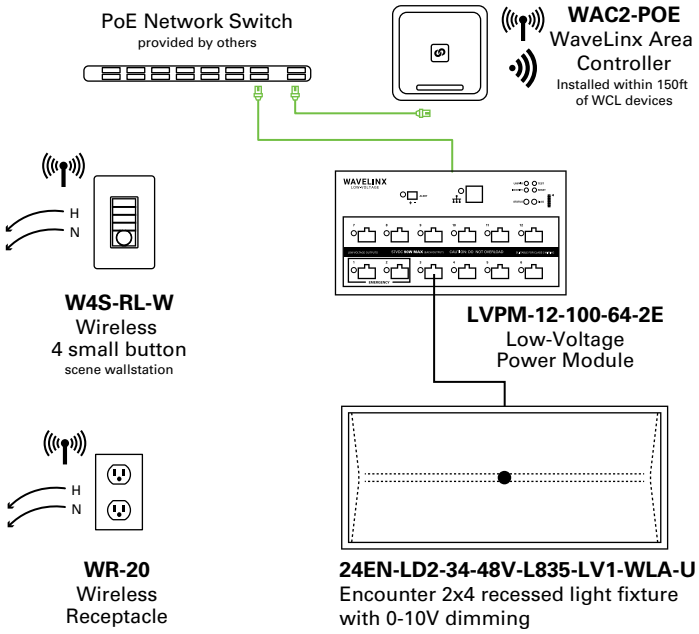
- Energy calculations (available through Trellix)
- Automatic demand response through WaveLinx Area Controller
- Scheduling of partial off light levels from WaveLinx Area Controller
- UL924 emergency control capabilities via luminaire battery backup or EM panel integration with LVPM
- Complies with Enhanced Digital Lighting Control section C406

Bill of Material

Quantity	Catalog #	Description
1	WAC2-POE	WaveLinx Area Controller
1	W4S-RL-W	WaveLinx Wallstation
2	WR-20	WaveLinx Receptacle *(ASHRAE / Title 24)*
12	24EN-LD2-34-48V-L835-LV1-WLA-U	Low-Voltage Encounter 2x4 with WaveLinx Sensor
1	LVPM-12-100-64-2E	WaveLinx 1200W Low-Voltage Power Module
12	LVC-xxP	Low-Voltage Lighting Cable, xxft

Design Consideration	Best Practice	Maximum
Gateway / WaveLinx Area Controller range	150 ft LOS	300 ft
Number of interior walls	2 walls	3 walls
Distance from WaveLinx Area Controller to 1st WaveLinx device	150 ft	200 ft
Distance between WaveLinx devices	75 ft	150 ft
Number of hops from WaveLinx Area Controller	4 hops	5 hops
Number of areas per WaveLinx Area Controller	49 + 1 construction area	
Number of zones per WaveLinx Area Controller	200	200
Number of scenes per area	16	16

Typical Wiring Detail

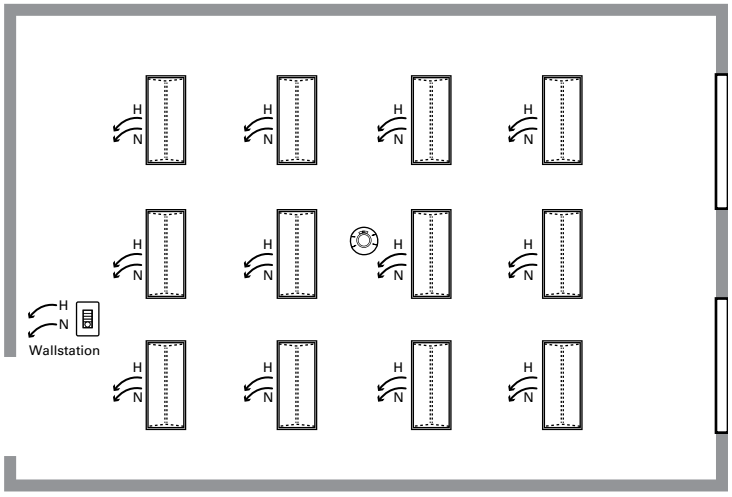


	Local Control	Manual ON	Partial ON	Bilevel Lighting	Daylight Side	Daylight Top	Partial OFF	Automatic OFF	Scheduled OFF	Receptacle Control	Energy Monitoring	Parking Garage	Functional Testing	Demand Response	Enhanced Digital
IECC 2018	C405.2.5	C405.2.5	C405.2.2.1.2		C405.2.3.2	C405.2.3.3	C405.2.1.3	C405.2.1.1.1	C405.2.2	C405.2.4		C405.2.6	C408.3		C406. 4
ASHRAE 90.1-2019	9.4.1 (a)	9.4.1.1 (b)	9.4.1.1 (c)	9.4.1.1 (d)	9.4.1.1 (e)	9.4.1.1 (f)	9.4.1.1 (g)	9.4.1.1 (h)	9.4.1.1 (i)	8.4.2	8.4.3.2	9.4.1.2	9.4.3		C406. 4
T24 2019	130.1 (a)(b)	130.1 (a)(b)	130.1 (b)		130.1 (d)	130.1 (d)	130.1 (c).6	130.1 (c).5	130.1 (c)	130.5 (d)	130.5 (b)	130.1 (d)	130.4	130.1 (e) 130.1 (e)	
NECB 2017	4.2.2.1.(3)	4.2.2.1.(3), 4.2.2.1.(6)	4.2.2.1 (8)	4.2.2.1.(9)	4.2.2.1.(10)	4.2.2.1.(13)	4.2.4.1. (16-17)	4.2.2.1. (18-19)	4.2.2.1. (20-23)			4.2.2.2 4.2.2.4			

Classroom

example 4

	Manually Switched ON / OFF	Manual Dimmer	Manual ON / Auto OFF	Occupancy Sensor	Daylighting Control	Lumen Maintenance Control	Tuning Control	Receptacle Control	Demand Response
IECC 2021	•	•	•	•	•	•	•		
ASHRAE 90.1 - 2019	•	•	•	•	•	•	•	•	•
T24 2019	•	•	•	•	•	•	•	•	•
NECB 2017	•	•	•	•	•	•	•		



Sequence of Operations

Lighting

- 0-10V lighting loads
- Up to 3 dimmable zones
- Out of the box 75% high end trim

Occupancy

- Automatic auto on to 50%
- Optional vacancy mode
- Optional auto on to scene
- Optional Plug load turns on with occupancy
- Automatic off of lighting and plug load on vacancy

Daylighting

- Continuous dimming to off
- Individual luminaire daylight dimming to approximately 500 lux
- Daylighting not required for indoor spaces
- Not required in spaces without windows or that are less than 150W

Manual Controls

- Programmable scenes
- Dominant button is 50% light level
- Scene raise / Scene lower
- All off

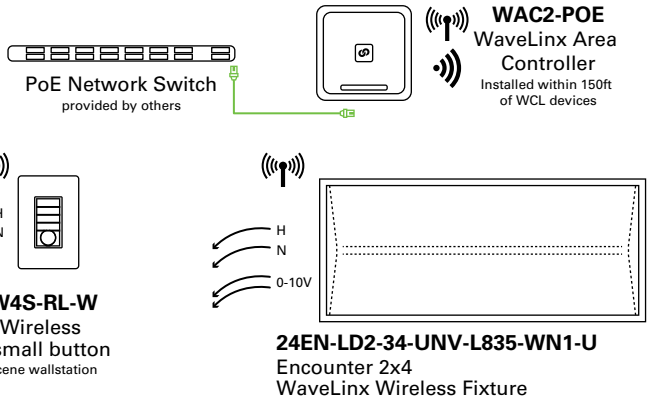
Additional Features

- Energy calculations (available through Trellix)
- Automatic demand response through WaveLinx Area Controller
- Scheduling of partial off light levels from WaveLinx Area Controller
- UL924 emergency control capabilities via luminaire battery backup
- Complies with Enhanced Digital Lighting Control section C406

Bill of Material

Quantity	Catalog #	Description
1	WAC2-POE	WaveLinx Area Controller
1	CWPD-1500	WaveLinx ceiling sensor
1	W4S-RL-W	WaveLinx Wallstation
12	24EN-LD2-34-UNV-L835-WN1-U	Encounter 2x4 WaveLinx Wireless Fixture

Typical Wiring Detail



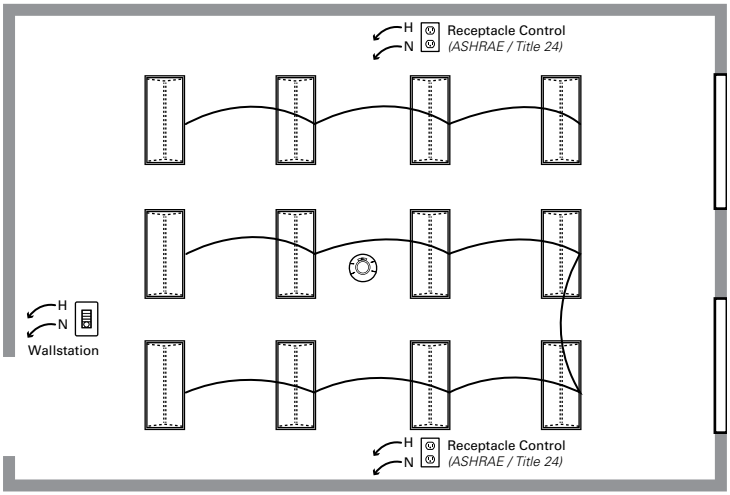
Design Consideration	Best Practice	Maximum
Gateway / WaveLinx Area Controller range	150 ft LOS	300 ft LOS
Number of interior walls	2 walls	3 walls
Distance from WaveLinx Area Controller to 1st WaveLinx device	150 ft	200 ft
Distance between WaveLinx devices	75 ft	150 ft
Number of hops from WaveLinx Area Controller	4 hops	5 hops
Number of areas per WaveLinx Area Controller	49 + 1 construction area	
Number of zones per WaveLinx Area Controller	200	200
Number of scenes per area	16	16

	Local Control	Manual ON	Partial ON	Bilevel Lighting	Daylight Side	Daylight Top	Partial OFF	Automatic OFF	Scheduled OFF	Receptacle Control	Energy Monitoring	Parking Garage	Functional Testing	Demand Response	Enhanced Digital
IECC 2018	C405.2.5	C405.2.5	C405.2.2.1.2		C405.2.3.2	C405.2.3.3	C405.2.1.3	C405.2.1.1.1	C405.2.2	C405.2.4		C405.2.6	C408.3		C406. 4
ASHRAE 90.1-2019	9.4.1 (a)	9.4.1.1 (b)	9.4.1.1 (c)	9.4.1.1 (d)	9.4.1.1 (e)	9.4.1.1 (f)	9.4.1.1 (g)	9.4.1.1 (h)	9.4.1.1 (i)	8.4.2	8.4.3.2	9.4.1.2	9.4.3		C406. 4
T24 2019	130.1 (a)(b)	130.1 (a)(b)	130.1 (b)		130.1 (d)	130.1 (d)	130.1 (c).6	130.1 (c).5	130.1 (c)	130.5 (d)	130.5 (b)	130.1 (d)	130.4	130.1 (e) 130.1 (e)	
NECB 2017	4.2.2.1.(3)	4.2.2.1.(3), 4.2.2.1.(6)	4.2.2.1 (8)	4.2.2.1.(9)	4.2.2.1.(10)	4.2.2.1.(13)	4.2.4.1. (16-17)	4.2.2.1. (18-19)	4.2.2.1. (20-23)			4.2.2.2 4.2.2.4			

Classroom

example 5

	Manually Switched ON / OFF	Manual Dimmer	Manual ON / Auto OFF	Occupancy Sensor	Daylighting Control	Lumen Maintenance Control	Tuning Control	Receptacle Control	Demand Response
IECC 2021	•	•	•	•	•	•	•		
ASHRAE 90.1 - 2019	•	•	•	•	•	•	•	•	•
T24 2019	•	•	•	•	•	•	•	•	•
NECB 2017	•	•	•	•	•	•	•		



Sequence of Operations

Lighting

- 0-10V lighting loads
- Up to 3 dimmable zones
- Out of the box 75% high end trim

Occupancy

- Automatic auto on to 50%
- Optional vacancy mode
- Optional auto on to scene
- Optional Plug load turns on with occupancy
- Automatic off of lighting and plug load on vacancy

Daylighting

- Continuous dimming to off
- Individual luminaire daylight dimming to approximately 500 lux
- Daylighting not required for indoor spaces
- Not required in spaces without windows or that are less than 150W

Manual Controls

- Programmable scenes
- Dominant button is 50% light level
- Scene raise / Scene lower
- All off

Additional Features

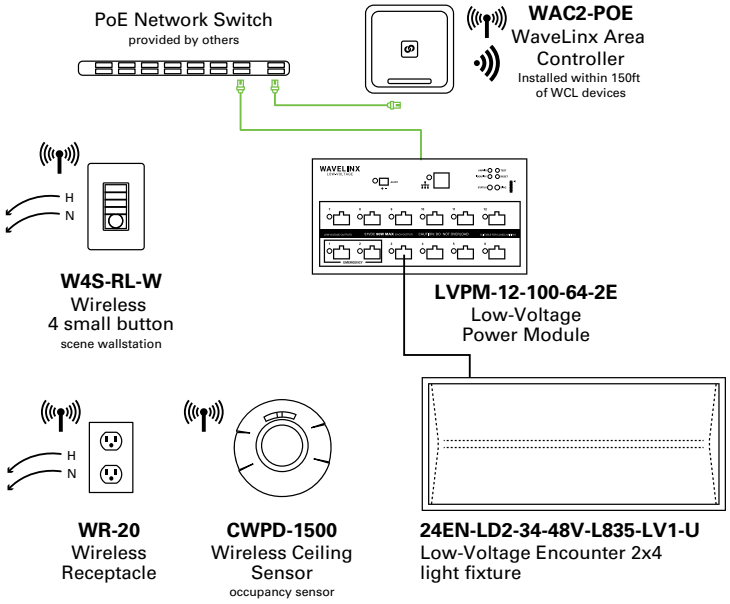
- Energy calculations (available through Trellix)
- Automatic demand response through WaveLinx Area Controller
- Scheduling of partial off light levels from WaveLinx Area Controller
- UL924 emergency control capabilities via luminaire battery backup or EM panel integration with LVPM
- Complies with Enhanced Digital Lighting Control section C406

Bill of Material

Quantity	Catalog #	Description
1	WAC2-POE	WaveLinx Area Controller
1	CWPD-1500	WaveLinx ceiling sensor
1	W4S-RL-W	WaveLinx Wallstation
2	WR-20	WaveLinx Receptacle *(ASHRAE / Title 24)*
12	24EN-LD2-34-48V-L835-LV1-U	Low-Voltage Encounter 2x4
1	LVPM-12-100-64-2E	WaveLinx 1200W Low-Voltage Power Module
12	LVC-xxP	Low-Voltage Lighting Cable, xxft

Design Consideration	Best Practice	Maximum
Gateway / WaveLinx Area Controller range	150 ft LOS	300 ft
Number of interior walls	2 walls	3 walls
Distance from WaveLinx Area Controller to 1st WaveLinx device	150 ft	200 ft
Distance between WaveLinx devices	75 ft	150 ft
Number of hops from WaveLinx Area Controller	4 hops	5 hops
Number of areas per WaveLinx Area Controller	49 + 1 construction area	
Number of zones per WaveLinx Area Controller	200	200
Number of scenes per area	16	16

Typical Wiring Detail

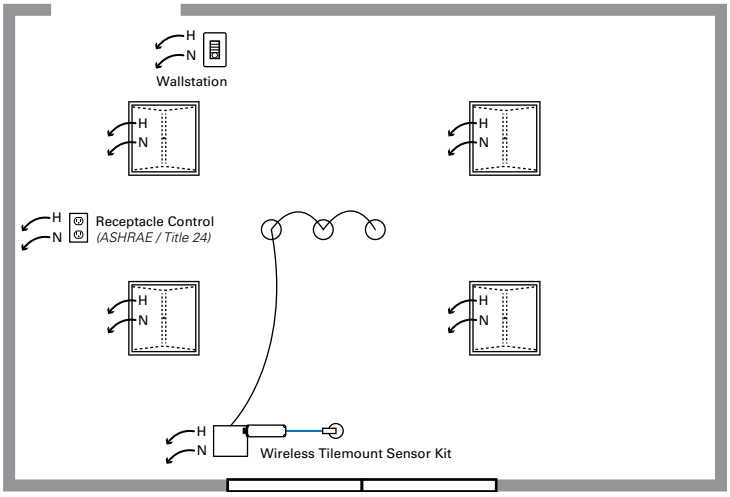


	Local Control	Manual ON	Partial ON	Bilevel Lighting	Daylight Side	Daylight Top	Partial OFF	Automatic OFF	Scheduled OFF	Receptacle Control	Energy Monitoring	Parking Garage	Functional Testing	Demand Response	Enhanced Digital
IECC 2018	C405.2.5	C405.2.5	C405.2.2.1.2		C405.2.3.2	C405.2.3.3	C405.2.1.3	C405.2.1.1.1	C405.2.2	C405.2.4		C405.2.6	C408.3		C406. 4
ASHRAE 90.1-2019	9.4.1 (a)	9.4.1.1 (b)	9.4.1.1 (c)	9.4.1.1 (d)	9.4.1.1 (e)	9.4.1.1 (f)	9.4.1.1 (g)	9.4.1.1 (h)	9.4.1.1 (i)	8.4.2	8.4.3.2	9.4.1.2	9.4.3		C406. 4
T24 2019	130.1 (a)(b)	130.1 (a)(b)	130.1 (b)		130.1 (d)	130.1 (d)	130.1 (c).6	130.1 (c).5	130.1 (c)	130.5 (d)	130.5 (b)	130.1 (d)	130.4	130.1 (e) 130.1 (e)	
NECB 2017	4.2.2.1.(3)	4.2.2.1.(3), 4.2.2.1.(6)	4.2.2.1 (8)	4.2.2.1.(9)	4.2.2.1.(10)	4.2.2.1.(13)	4.2.4.1. (16-17)	4.2.2.1. (18-19)	4.2.2.1. (20-23)			4.2.2.2 4.2.2.4			

Conference Room

example 1

	Manually Switched ON / OFF	Manual Dimmer	Manual ON / Auto OFF	Occupancy Sensor	Daylighting Control	Lumen Maintenance Control	Tuning Control	Receptacle Control	Demand Response
IECC 2021	•	•	•	•	•	•	•		
ASHRAE 90.1 - 2019	•	•	•	•	•	•	•	•	•
T24 2019	•	•	•	•	•	•	•	•	•
NECB 2017	•	•	•	•	•	•	•		



Sequence of Operations

Lighting

- 0-10V lighting loads
- Up to 3 dimmable zones
- Out of the box 75% high end trim

Occupancy

- Automatic auto on to 50%
- Optional vacancy mode
- Optional auto on to scene
- Plug load turns on with occupancy
- Automatic off of lighting and plug load on vacancy

Daylighting

- Continuous dimming to off
- Individual luminaire daylight dimming to approximately 500 lux
- Daylighting not required for indoor spaces without windows
- Not required in spaces without windows or that are less than 150W *(120W for ASHRAE / Title 24)*

Manual Controls

- Top or dominant button half lights (sets lights to 50% or less)
- Remaining buttons trigger scenes
- Scene raise / Scene lower
- All off

Additional Features

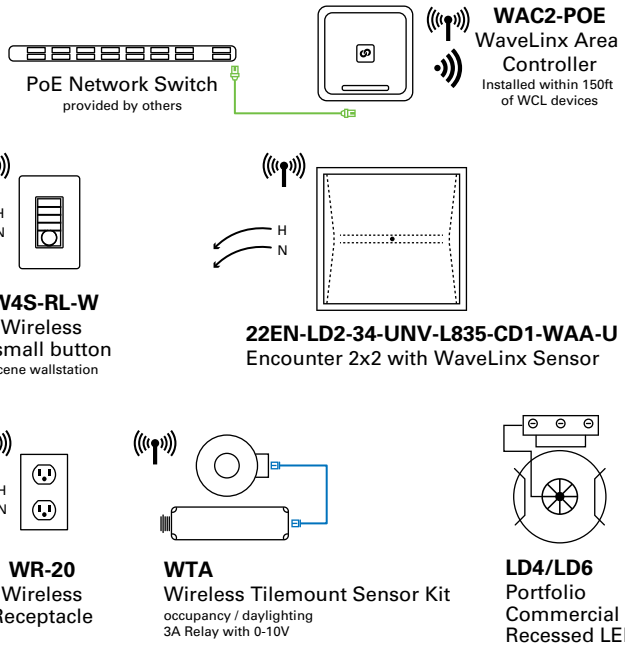
- Energy calculations (available through Trellix)
- Automatic demand response through WaveLinx Area Controller
- Scheduling of partial off light levels from WaveLinx Area Controller
- UL924 emergency control capabilities via luminaire battery backup or fixture integrated transfer device (consult fixture spec sheet)
- Complies with Enhanced Digital Lighting Control section C406 *(IECC)*

Bill of Material

Quantity	Catalog #	Description
1	WAC2-POE	WaveLinx Area Controller
1	W4S-RL-W	WaveLinx Wallstation
1	WR-20	WaveLinx Receptacle *(ASHRAE / Title 24)*
1	WTA	WaveLinx Tilemount Sensor Kit
3	LD4 or LD6	Portfolio Commercial Recessed LED
4	22EN-LD2-34-UNV-L835-CD1-WAA-U	Encounter 2x2 with WaveLinx Sensor

Design Consideration	Best Practice	Maximum
Gateway / WaveLinx Area Controller range	150 ft LOS	300 ft LOS
Number of interior walls	2 walls	3 walls
Distance from WaveLinx Area Controller to 1st WaveLinx device	150 ft	200 ft
Distance between WaveLinx devices	75 ft	150 ft
Number of hops from WaveLinx Area Controller	4 hops	5 hops
Number of areas per WaveLinx Area Controller	49 + 1 construction area	
Number of zones per WaveLinx Area Controller	200	200
Number of scenes per area	16	16

Typical Wiring Detail

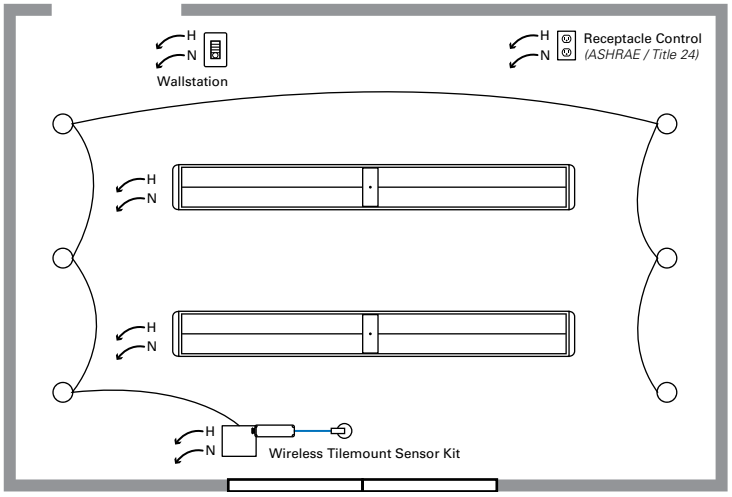


	Local Control	Manual ON	Partial ON	Bilevel Lighting	Daylight Side	Daylight Top	Partial OFF	Automatic OFF	Scheduled OFF	Receptacle Control	Energy Monitoring	Parking Garage	Functional Testing	Demand Response	Enhanced Digital
IECC 2018	C405.2.5	C405.2.5	C405.2.2.1.2		C405.2.3.2	C405.2.3.3	C405.2.1.3	C405.2.1.1.1	C405.2.2	C405.2.4		C405.2.6	C408.3		C406. 4
ASHRAE 90.1-2019	9.4.1 (a)	9.4.1.1 (b)	9.4.1.1 (c)	9.4.1.1 (d)	9.4.1.1 (e)	9.4.1.1 (f)	9.4.1.1 (g)	9.4.1.1 (h)	9.4.1.1 (i)	8.4.2	8.4.3.2	9.4.1.2	9.4.3		C406. 4
T24 2019	130.1 (a)(b)	130.1 (a)(b)	130.1 (b)		130.1 (d)	130.1 (d)	130.1 (c).6	130.1 (c).5	130.1 (c)	130.5 (d)	130.5 (b)	130.1 (d)	130.4	130.1 (e) 130.1 (e)	
NECB 2017	4.2.2.1.(3)	4.2.2.1.(3), 4.2.2.1.(6)	4.2.2.1 (8)	4.2.2.1.(9)	4.2.2.1.(10)	4.2.2.1.(13)	4.2.4.1. (16-17)	4.2.2.1. (18-19)	4.2.2.1. (20-23)			4.2.2.2 4.2.2.4			

Conference Room

example 2

	Manually Switched ON / OFF	Manual Dimmer	Manual ON / Auto OFF	Occupancy Sensor	Daylighting Control	Lumen Maintenance Control	Tuning Control	Receptacle Control	Demand Response
IECC 2021	•	•	•	•	•	•	•		
ASHRAE 90.1 - 2019	•	•	•	•	•	•	•	•	•
T24 2019	•	•	•	•	•	•	•	•	•
NECB 2017	•	•	•	•	•	•	•		



Sequence of Operations

Lighting

- 0-10V lighting loads
- Up to 3 dimmable zones
- Out of the box 75% high end trim
- Individually addressable luminaires *(IECC)*

Occupancy

- Automatic auto on to 50%
- Optional vacancy mode
- Optional auto on to scene
- Plug load turns on with occupancy
- Automatic off of lighting and plug load on vacancy

Daylighting

- Continuous dimming to off
- Individual luminaire daylight dimming to approximately 500 lux
- Daylighting not required for indoor spaces without windows
- Not required in spaces without windows or that are less than 150W *(120W for ASHRAE / Title 24)*

Manual Controls

- Programmable Scenes
- Remaining buttons trigger scenes
- Scene raise / Scene lower
- All off

Additional Features

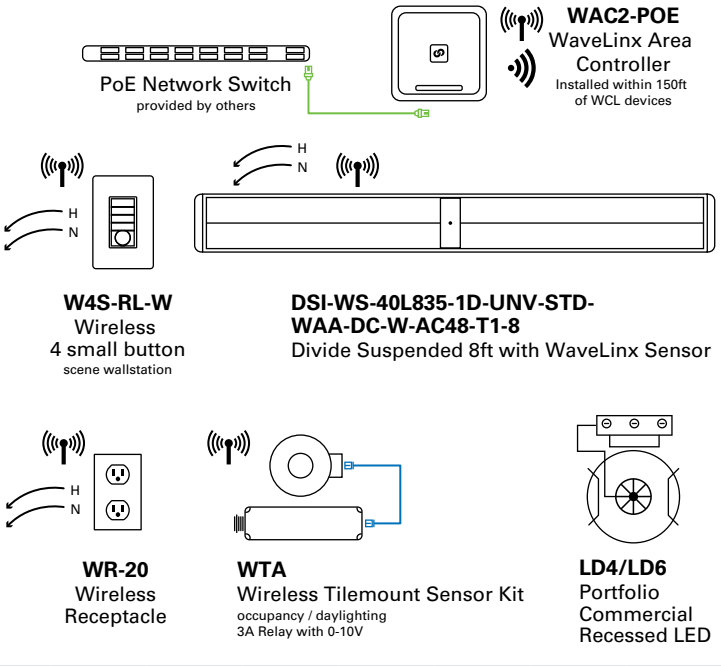
- Energy calculations (available through Trellix)
- Automatic demand response through WaveLinx Area Controller
- Scheduling of partial off light levels from WaveLinx Area Controller
- UL924 emergency control capabilities via luminaire battery backup or fixture integrated transfer device (consult fixture spec sheet)
- Complies with Enhanced Digital Lighting Control section C406 *(IECC)*

Bill of Material

Quantity	Catalog #	Description
1	WAC2-POE	WaveLinx Area Controller
1	W4S-RL-W	WaveLinx Wallstation
1	WR-20	WaveLinx Receptacle *(ASHRAE / Title 24)*
1	WTA	WaveLinx Tilemount Sensor Kit
6	LD4 or LD6	Portfolio Commercial Recessed LED
2	DSI-WS-40L835-1D-UNV-STD-WAA-DC-W-AC48-T1-8	Divide Suspended with WaveLinx Sensor

Design Consideration	Best Practice	Maximum
Gateway / WaveLinx Area Controller range	150 ft LOS	300 ft LOS
Number of interior walls	2 walls	3 walls
Distance from WaveLinx Area Controller to 1st WaveLinx device	150 ft	200 ft
Distance between WaveLinx devices	75 ft	150 ft
Number of hops from WaveLinx Area Controller	4 hops	5 hops
Number of areas per WaveLinx Area Controller	49 + 1 construction area	
Number of zones per WaveLinx Area Controller	200	200
Number of scenes per area	16	16

Typical Wiring Detail

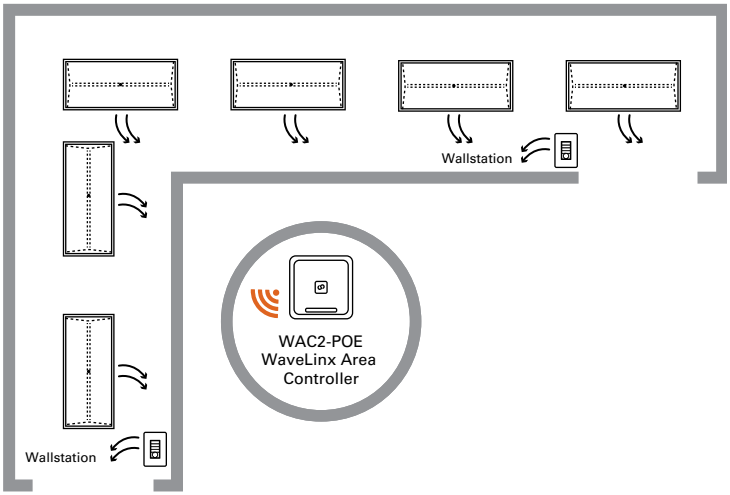


	Local Control	Manual ON	Partial ON	Bilevel Lighting	Daylight Side	Daylight Top	Partial OFF	Automatic OFF	Scheduled OFF	Receptacle Control	Energy Monitoring	Parking Garage	Functional Testing	Demand Response	Enhanced Digital
IECC 2018	C405.2.5	C405.2.5	C405.2.2.1.2		C405.2.3.2	C405.2.3.3	C405.2.1.3	C405.2.1.1.1	C405.2.2	C405.2.4		C405.2.6	C408.3		C406. 4
ASHRAE 90.1-2019	9.4.1 (a)	9.4.1.1 (b)	9.4.1.1 (c)	9.4.1.1 (d)	9.4.1.1 (e)	9.4.1.1 (f)	9.4.1.1 (g)	9.4.1.1 (h)	9.4.1.1 (i)	8.4.2	8.4.3.2	9.4.1.2	9.4.3		C406. 4
T24 2019	130.1 (a)(b)	130.1 (a)(b)	130.1 (b)		130.1 (d)	130.1 (d)	130.1 (c).6	130.1 (c).5	130.1 (c)	130.5 (d)	130.5 (b)	130.1 (d)	130.4	130.1 (e) 130.1 (e)	
NECB 2017	4.2.2.1.(3)	4.2.2.1.(3), 4.2.2.1.(6)	4.2.2.1 (8)	4.2.2.1.(9)	4.2.2.1.(10)	4.2.2.1.(13)	4.2.4.1. (16-17)	4.2.2.1. (18-19)	4.2.2.1. (20-23)			4.2.2.2 4.2.2.4			

Office Corridor

example

	Manually Switched ON / OFF	Manual Dimmer	Manual ON / Auto OFF	Occupancy Sensor	Daylighting Control	Lumen Maintenance Control	Tuning Control	Receptacle Control	Demand Response
IECC 2021	•	•	•	•	•	•	•		
ASHRAE 90.1 - 2019	•	•	•	•	•	•	•	•	•
T24 2019	•	•	•	•	•	•	•	•	•
NECB 2017	•	•	•	•	•	•	•		



Sequence of Operations

Lighting

- 0-10V lighting loads
- Up to 3 dimmable zones
- Individually addressable luminaires *(IECC only)*
- Out of the box 75% high end trim

Occupancy

- Automatic auto on to 50%
- Optional vacancy mode
- Optional auto on to scene
- Plug load turns on with occupancy
- Automatic off of lighting and plug load on vacancy

Daylighting

- Continuous dimming to off
- Individual luminaire daylight dimming to approximately 500 lux
- Daylighting not required for indoor spaces without windows
- Not required in spaces without windows or that are less than 150W *(120W for ASHRAE / Title 24)*

Manual Controls

- Programmable scenes
- Dominant button is 50% light level
- Manual on/off
- Scene raise / Scene lower
- All off

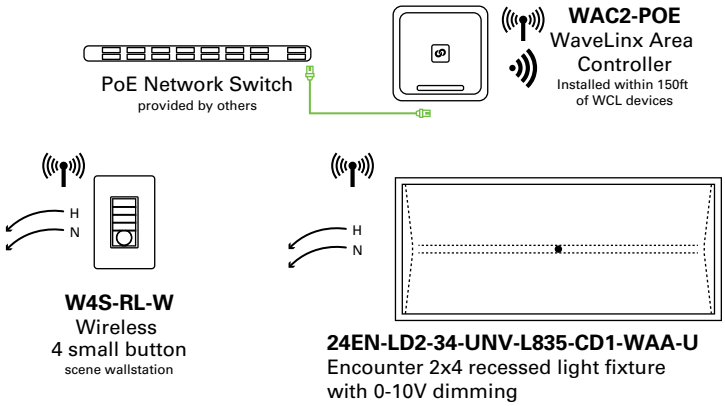
Additional Features

- Energy calculations (available through Trellix)
- Automatic demand response through WaveLinx Area Controller
- Scheduling of partial off light levels from WaveLinx Area Controller
- UL924 emergency control capabilities via luminaire battery backup or fixture integrated transfer device (consult fixture spec sheet)

Bill of Material

Quantity	Catalog #	Description
1	WAC2-POE	WaveLinx Area Controller
2	W4S-RL-W	WaveLinx Wallstation
6	24EN-LD2-34-UNV-L835-CD1-WAA-U	Encounter 2x4 with WaveLinx Sensor

Typical Wiring Detail



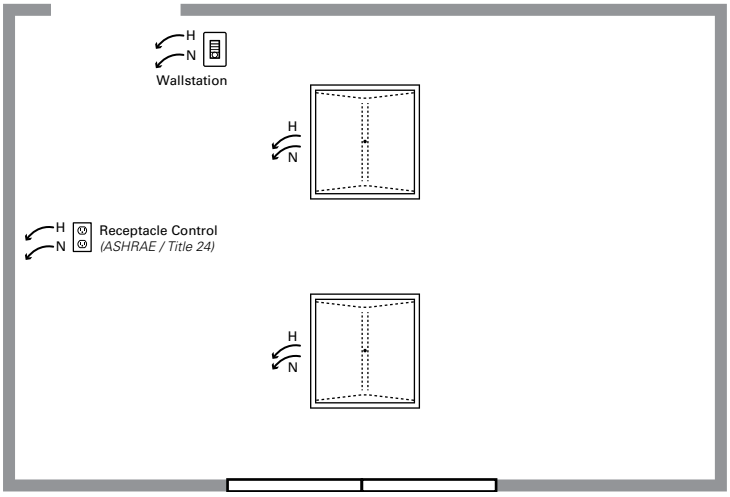
Design Consideration	Best Practice	Maximum
Gateway / WaveLinx Area Controller range	150 ft LOS	300 ft LOS
Number of interior walls	2 walls	3 walls
Distance from WaveLinx Area Controller to 1st WaveLinx device	150 ft	200 ft
Distance between WaveLinx devices	75 ft	150 ft
Number of hops from WaveLinx Area Controller	4 hops	5 hops
Number of areas per WaveLinx Area Controller	49 + 1 construction area	
Number of zones per WaveLinx Area Controller	200	200
Number of scenes per area	16	16

	Local Control	Manual ON	Partial ON	Bilevel Lighting	Daylight Side	Daylight Top	Partial OFF	Automatic OFF	Scheduled OFF	Receptacle Control	Energy Monitoring	Parking Garage	Functional Testing	Demand Response	Enhanced Digital
IECC 2018	C405.2.5	C405.2.5	C405.2.2.1.2		C405.2.3.2	C405.2.3.3	C405.2.1.3	C405.2.1.1.1	C405.2.2	C405.2.4		C405.2.6	C408.3		C406. 4
ASHRAE 90.1-2019	9.4.1 (a)	9.4.1.1 (b)	9.4.1.1 (c)	9.4.1.1 (d)	9.4.1.1 (e)	9.4.1.1 (f)	9.4.1.1 (g)	9.4.1.1 (h)	9.4.1.1 (i)	8.4.2	8.4.3.2	9.4.1.2	9.4.3		
T24 2019	130.1 (a)(b)	130.1 (a)(b)	130.1 (b)		130.1 (d)	130.1 (d)	130.1 (c).6	130.1 (c).5	130.1 (c)	130.5 (d)	130.5 (b)	130.1 (d)	130.4	130.1 (e) 130.1 (e)	
NECB 2017	4.2.2.1.(3)	4.2.2.1.(3), 4.2.2.1.(6)	4.2.2.1 (8)	4.2.2.1.(9)	4.2.2.1.(10)	4.2.2.1.(13)	4.2.4.1. (16-17)	4.2.2.1. (18-19)	4.2.2.1. (20-23)			4.2.2.2 4.2.2.4			

Private Office

example

	Manually Switched ON / OFF	Manual Dimmer	Manual ON / Auto OFF	Occupancy Sensor	Daylighting Control	Lumen Maintenance Control	Tuning Control	Receptacle Control	Demand Response
IECC 2021	•	•	•	•	•	•	•		
ASHRAE 90.1 - 2019	•	•	•	•	•	•	•	•	•
T24 2019	•	•	•	•	•	•	•	•	•
NECB 2017	•	•	•	•	•	•	•		



Sequence of Operations

Lighting

- 0-10V lighting loads
- Up to 3 dimmable zones
- Out of the box 75% high end trim

Occupancy

- Automatic auto on to 50%
- Optional vacancy mode
- Optional auto on to scene
- Plug load turns on with occupancy
- Automatic off of lighting and plug load on vacancy

Daylighting

- Continuous dimming to off
- Individual luminaire daylight dimming to approximately 500 lux
- Daylighting not required for indoor offices without windows
- Not required in spaces without windows or that are less than 150W *(120W for ASHRAE / Title 24)*

Manual Controls

- Top or dominant button half lights (sets lights to 50% or less)
- Remaining buttons trigger scenes
- Scene raise / Scene lower
- All off

Additional Features

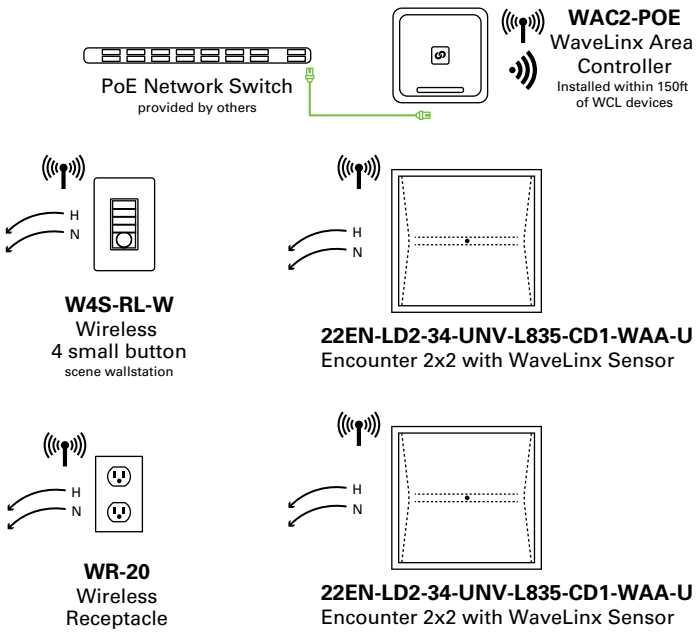
- Energy calculations (available through Trellix)
- Automatic demand response through WaveLinx Area Controller
- Scheduling of partial off light levels from WaveLinx Area Controller
- UL924 emergency control capabilities via luminaire battery backup or fixture integrated transfer device (consult fixture spec sheet)
- Complies with Enhanced Digital Lighting Control section C406 *(IECC)*

Bill of Material

Quantity	Catalog #	Description
1	WAC2-POE	WaveLinx Area Controller
1	W4S-RL-W	WaveLinx Wallstation
1	WR-20	WaveLinx Receptacle *(ASHRAE / Title 24)*
2	22EN-LD2-34-UNV-L835-CD1-WAA-U	Encounter 2x2 with WaveLinx Sensor

Design Consideration	Best Practice	Maximum
Gateway / WaveLinx Area Controller range	150 ft LOS	300 ft LOS
Number of interior walls	2 walls	3 walls
Distance from WaveLinx Area Controller to 1st WaveLinx device	150 ft	200 ft
Distance between WaveLinx devices	75 ft	150 ft
Number of hops from WaveLinx Area Controller	4 hops	5 hops
Number of areas per WaveLinx Area Controller	49 + 1 construction area	
Number of zones per WaveLinx Area Controller	200	200
Number of scenes per area	16	16

Typical Wiring Detail

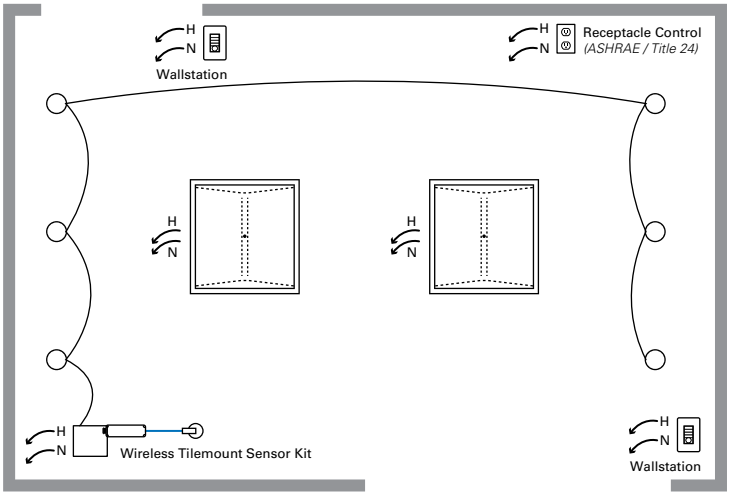


	Local Control	Manual ON	Partial ON	Bilevel Lighting	Daylight Side	Daylight Top	Partial OFF	Automatic OFF	Scheduled OFF	Receptacle Control	Energy Monitoring	Parking Garage	Functional Testing	Demand Response	Enhanced Digital
IECC 2018	C405.2.5	C405.2.5	C405.2.2.1.2		C405.2.3.2	C405.2.3.3	C405.2.1.3	C405.2.1.1.1	C405.2.2	C405.2.4		C405.2.6	C408.3		C406. 4
ASHRAE 90.1-2019	9.4.1 (a)	9.4.1.1 (b)	9.4.1.1 (c)	9.4.1.1 (d)	9.4.1.1 (e)	9.4.1.1 (f)	9.4.1.1 (g)	9.4.1.1 (h)	9.4.1.1 (i)	8.4.2	8.4.3.2	9.4.1.2	9.4.3		
T24 2019	130.1 (a)(b)	130.1 (a)(b)	130.1 (b)		130.1 (d)	130.1 (d)	130.1 (c).6	130.1 (c).5	130.1 (c)	130.5 (d)	130.5 (b)	130.1 (d)	130.4	130.1 (e) 130.1 (e)	
NECB 2017	4.2.2.1.(3)	4.2.2.1.(3), 4.2.2.1.(6)	4.2.2.1 (8)	4.2.2.1.(9)	4.2.2.1.(10)	4.2.2.1.(13)	4.2.4.1. (16-17)	4.2.2.1. (18-19)	4.2.2.1. (20-23)			4.2.2.2 4.2.2.4			

Lobby

example

	Manually Switched ON / OFF	Manual Dimmer	Manual ON / Auto OFF	Occupancy Sensor	Daylighting Control	Lumen Maintenance Control	Tuning Control	Receptacle Control	Demand Response
IECC 2021	•	•	•	•	•	•	•		
ASHRAE 90.1 - 2019	•	•	•	•	•	•	•	•	•
T24 2019	•	•	•	•	•	•	•	•	•
NECB 2017	•	•	•	•	•	•	•		



Sequence of Operations

Lighting

- 0-10V lighting loads
- Up to 3 dimmable zones
- Out of the box 75% high end trim

Occupancy

- Automatic auto on to 50%
- Optional vacancy mode
- Optional auto on to scene
- Plug load turns on with occupancy
- Automatic off of lighting and plug load on vacancy

Daylighting

- Continuous dimming to off
- Individual luminaire daylight dimming to approximately 500 lux
- Daylighting not required for indoor space without windows
- Not required in spaces without windows or that are less than 150W *(120W for ASHRAE / Title 24)*

Manual Controls

- Dominant button half lights (sets lights to 50% or less)
- Programmable scenes
- Scene raise / Scene lower
- All off

Additional Features

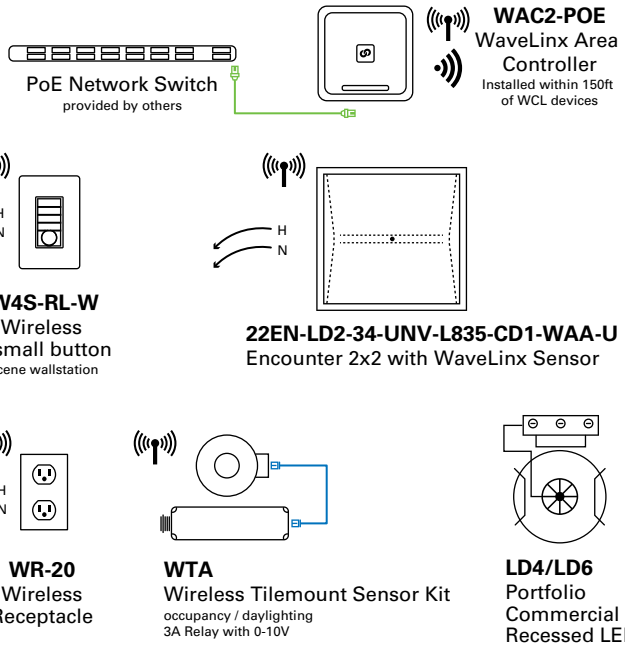
- Energy calculations (available through Trellix)
- Automatic demand response through WaveLinx Area Controller
- Scheduling of partial off light levels from WaveLinx Area Controller
- UL924 emergency control capabilities via luminaire battery backup or fixture integrated transfer device (consult fixture spec sheet)
- Complies with Enhanced Digital Lighting Control section C406 *(IECC)*

Bill of Material

Quantity	Catalog #	Description
1	WAC2-POE	WaveLinx Area Controller
2	W4S-RL-W	WaveLinx Wallstation
1	WR-20	WaveLinx Receptacle *(ASHRAE / Title 24)*
1	WTA	WaveLinx Tilemount Daylight Sensor
6	LD4 OR LD6	Portfolio Commercial Recessed LED
2	22EN-LD2-34-UNV-L835-CD1-WAA-U	Encounter 2x2 with WaveLinx Sensor

Design Consideration	Best Practice	Maximum
Gateway / WaveLinx Area Controller range	150 ft LOS	300 ft LOS
Number of interior walls	2 walls	3 walls
Distance from WaveLinx Area Controller to 1st WaveLinx device	150 ft	200 ft
Distance between WaveLinx devices	75 ft	150 ft
Number of hops from WaveLinx Area Controller	4 hops	5 hops
Number of areas per WaveLinx Area Controller	49 + 1 construction area	
Number of zones per WaveLinx Area Controller	200	200
Number of scenes per area	16	16

Typical Wiring Detail

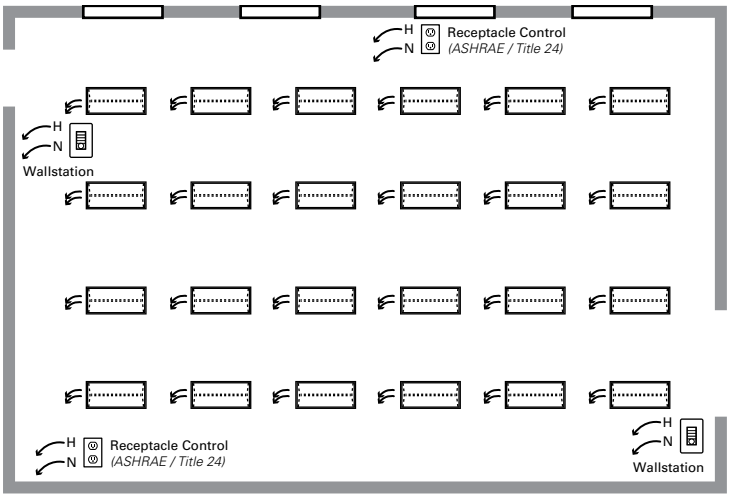


	Local Control	Manual ON	Partial ON	Bilevel Lighting	Daylight Side	Daylight Top	Partial OFF	Automatic OFF	Scheduled OFF	Receptacle Control	Energy Monitoring	Parking Garage	Functional Testing	Demand Response	Enhanced Digital
IECC 2018	C405.2.5	C405.2.5	C405.2.2.1.2		C405.2.3.2	C405.2.3.3	C405.2.1.3	C405.2.1.1.1	C405.2.2	C405.2.4		C405.2.6	C408.3		C406. 4
ASHRAE 90.1-2019	9.4.1 (a)	9.4.1.1 (b)	9.4.1.1 (c)	9.4.1.1 (d)	9.4.1.1 (e)	9.4.1.1 (f)	9.4.1.1 (g)	9.4.1.1 (h)	9.4.1.1 (i)	8.4.2	8.4.3.2	9.4.1.2	9.4.3		
T24 2019	130.1 (a)(b)	130.1 (a)(b)	130.1 (b)		130.1 (d)	130.1 (d)	130.1 (c).6	130.1 (c).5	130.1 (c)	130.5 (d)	130.5 (b)	130.1 (d)	130.4	130.1 (e) 130.1 (e)	
NECB 2017	4.2.2.1.(3)	4.2.2.1.(3), 4.2.2.1.(6)	4.2.2.1 (8)	4.2.2.1.(9)	4.2.2.1.(10)	4.2.2.1.(13)	4.2.4.1. (16-17)	4.2.2.1. (18-19)	4.2.2.1. (20-23)			4.2.2.2 4.2.2.4			

Open Office

example 1

	Manually Switched ON / OFF	Manual Dimmer	Manual ON / Auto OFF	Occupancy Sensor	Daylighting Control	Lumen Maintenance Control	Tuning Control	Receptacle Control	Demand Response
IECC 2021	•	•	•	•	•	•	•		
ASHRAE 90.1 - 2019	•	•	•	•	•	•	•	•	•
T24 2019	•	•	•	•	•	•	•	•	•
NECB 2017	•	•	•	•	•	•	•		



Sequence of Operations

Lighting

- 0-10V lighting loads
- Up to 3 dimmable zones
- Out of the box 75% high end trim

Occupancy

- Automatic auto on to 50%
- Optional vacancy mode
- Optional auto on to scene
- Plug load turns on with occupancy
- Automatic off of lighting and plug load on vacancy

Daylighting

- Continuous dimming to off
- Individual luminaire daylight dimming to approximately 500 lux
- Daylighting not required for indoor spaces without windows
- Not required in spaces without windows or that are less than 150W *(120W for ASHRAE / Title 24)*

Manual Controls

- Top or dominant button half lights (sets lights to 50% or less)
- Remaining buttons trigger scenes
- Scene raise / Scene lower
- All off

Additional Features

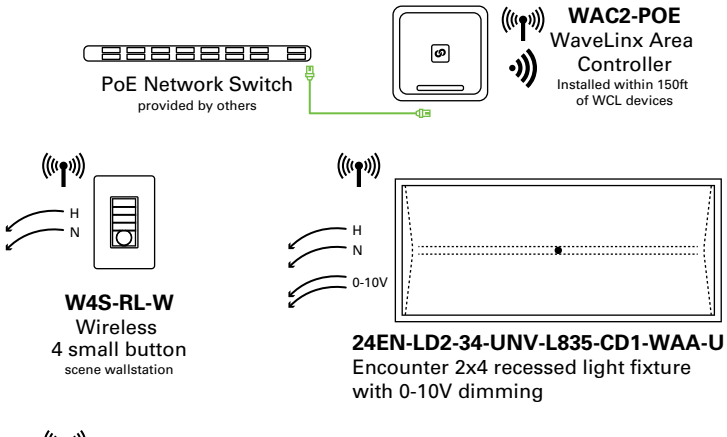
- Energy calculations (available through Trellix)
- Automatic demand response through WaveLinx Area Controller
- Scheduling of partial off light levels from WaveLinx Area Controller
- UL924 emergency control capabilities via luminaire battery backup or fixture integrated transfer device (consult fixture spec sheet)
- Complies with Enhanced Digital Lighting Control section C406 *(IECC)*

Bill of Material

Quantity	Catalog #	Description
1	WAC2-POE	WaveLinx Area Controller
2	W4S-RL-W	WaveLinx Wallstation
2	WR-20	WaveLinx Receptacle *(ASHRAE / Title 24)*
24	24EN-LD2-34-UNV-L835-CD1-WAA-U	Encounter 2x4 with WaveLinx Sensor

Design Consideration	Best Practice	Maximum
Gateway / WaveLinx Area Controller range	150 ft LOS	300 ft LOS
Number of interior walls	2 walls	3 walls
Distance from WaveLinx Area Controller to 1st WaveLinx device	150 ft	200 ft
Distance between WaveLinx devices	75 ft	150 ft
Number of hops from WaveLinx Area Controller	4 hops	5 hops
Number of areas per WaveLinx Area Controller	49 + 1 construction area	
Number of zones per WaveLinx Area Controller	200	200
Number of scenes per area	16	16

Typical Wiring Detail

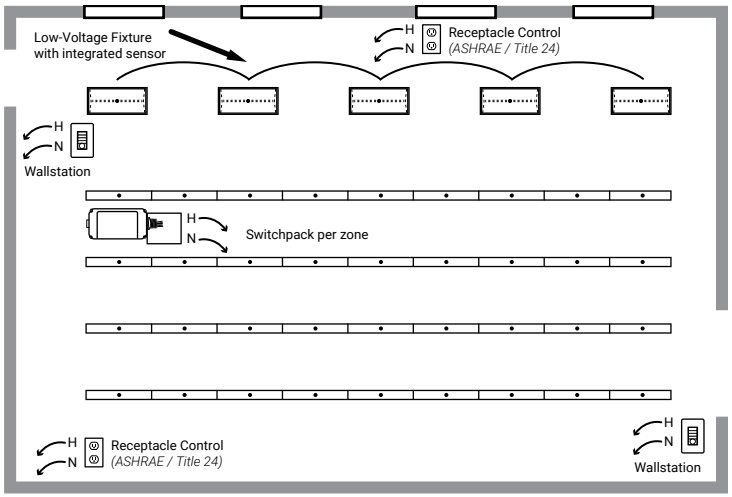


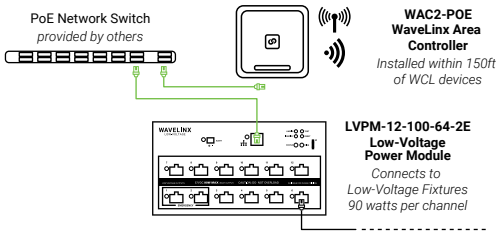
	Local Control	Manual ON	Partial ON	Bilevel Lighting	Daylight Side	Daylight Top	Partial OFF	Automatic OFF	Scheduled OFF	Receptacle Control	Energy Monitoring	Parking Garage	Functional Testing	Demand Response	Enhanced Digital
IECC 2018	C405.2.5	C405.2.5	C405.2.2.1.2		C405.2.3.2	C405.2.3.3	C405.2.1.3	C405.2.1.1.1	C405.2.2	C405.2.4		C405.2.6	C408.3		C406. 4
ASHRAE 90.1-2019	9.4.1 (a)	9.4.1.1 (b)	9.4.1.1 (c)	9.4.1.1 (d)	9.4.1.1 (e)	9.4.1.1 (f)	9.4.1.1 (g)	9.4.1.1 (h)	9.4.1.1 (i)	8.4.2	8.4.3.2	9.4.1.2	9.4.3		
T24 2019	130.1 (a)(b)	130.1 (a)(b)	130.1 (b)		130.1 (d)	130.1 (d)	130.1 (c).6	130.1 (c).5	130.1 (c)	130.5 (d)	130.5 (b)	130.1 (d)	130.4	130.1 (e) 130.1 (e)	
NECB 2017	4.2.2.1.(3)	4.2.2.1.(3), 4.2.2.1.(6)	4.2.2.1 (8)	4.2.2.1.(9)	4.2.2.1.(10)	4.2.2.1.(13)	4.2.4.1. (16-17)	4.2.2.1. (18-19)	4.2.2.1. (20-23)			4.2.2.2 4.2.2.4			

Open Office

example 2

	Manually Switched ON / OFF	Manual Dimmer	Manual ON / Auto OFF	Occupancy Sensor	Daylighting Control	Lumen Maintenance Control	Tuning Control	Receptacle Control	Demand Response
IECC 2021	•	•	•	•	•	•	•		
ASHRAE 90.1 - 2019	•	•	•	•	•	•	•	•	•
T24 2019	•	•	•	•	•	•	•	•	•
NECB 2017	•	•	•	•	•	•	•		





Sequence of Operations

Lighting

- 0-10V lighting loads
- Up to 3 dimmable zones
- Out of the box 75% high end trim

Occupancy

- Automatic auto on to 50%
- Optional vacancy mode
- Optional auto on to scene
- Plug load turns on with occupancy
- Automatic off of lighting and plug load on vacancy

Daylighting

- Continuous dimming to off
- Individual luminaire daylight dimming to approximately 500 lux
- Daylighting not required for indoor spaces without windows
- Not required in spaces without windows or that are less than 150W *(120W for ASHRAE / Title 24)*

Manual Controls

- Top or dominant button half lights (sets lights to 50% or less)
- Remaining buttons trigger scenes
- Scene raise / Scene lower
- All off

Additional Features

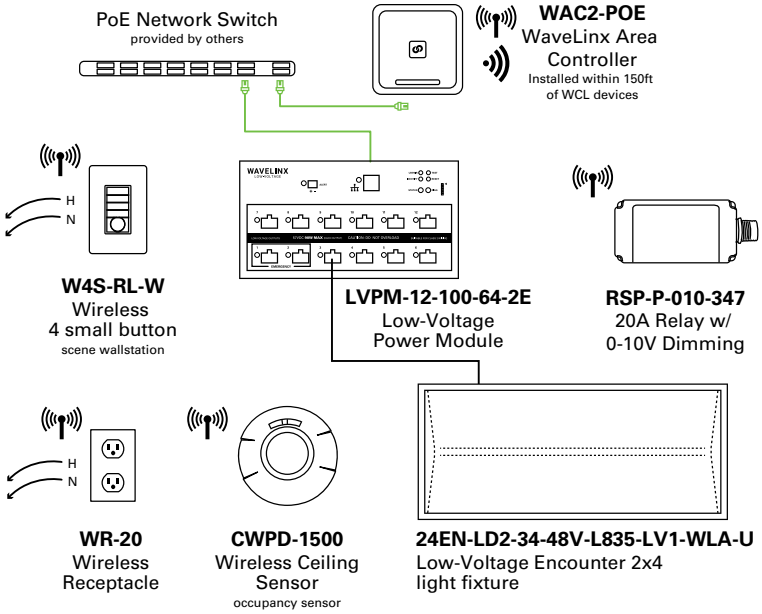
- Energy calculations (available through Trellix)
- Automatic demand response through WaveLinx Area Controller
- Scheduling of partial off light levels from WaveLinx Area Controller
- UL924 emergency control capabilities via luminaire battery backup or EM panel integration with LVPM
- Complies with Enhanced Digital Lighting Control section C406 *(IECC)*

Bill of Material

Quantity	Catalog #	Description
1	WAC2-POE	WaveLinx Area Controller
2	W4S-RL-W	WaveLinx Wallstation
2	WR-20	WaveLinx Receptacle *(ASHRAE / Title 24)*
5	24EN-LD2-34-48V-L835-LV1-WLA-U	Low-Voltage Encounter 2x4 with WaveLinx Sensor
4	RSP-P-010-347	Universal Voltage Dimming Switchpack
1	LVPM-12-100-64-2E	WaveLinx 1200W Low-Voltage Power Module

Design Consideration	Best Practice	Maximum
Gateway / WaveLinx Area Controller range	150ft LOS	300 ft
Number of interior walls	2 walls	3 walls
Distance from WaveLinx Area Controller to 1st WaveLinx device	150 ft	200 ft
Distance between WaveLinx devices	75 ft	150 ft
Number of hops from WaveLinx Area Controller	4 hops	5 hops
Number of areas per WaveLinx Area Controller	49 + 1 construction area	
Number of zones per WaveLinx Area Controller	200	200
Number of scenes per area	16	16

Typical Wiring Detail

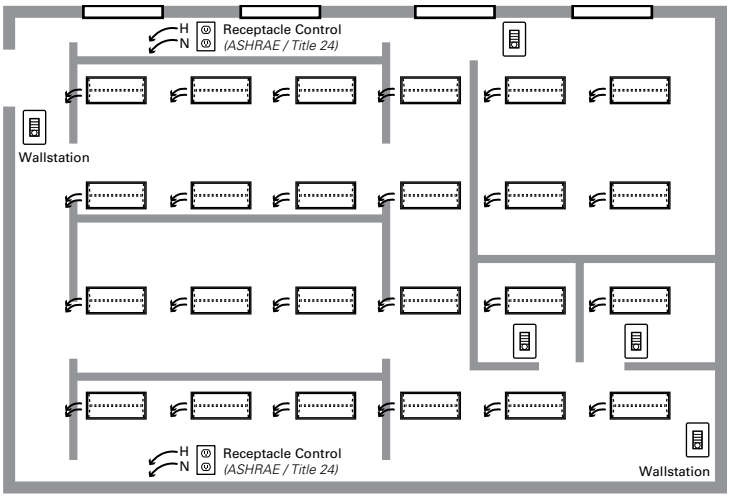


	Local Control	Manual ON	Partial ON	Bilevel Lighting	Daylight Side	Daylight Top	Partial OFF	Automatic OFF	Scheduled OFF	Receptacle Control	Energy Monitoring	Parking Garage	Functional Testing	Demand Response	Enhanced Digital
IECC 2018	C405.2.5	C405.2.5	C405.2.2.1.2		C405.2.3.2	C405.2.3.3	C405.2.1.3	C405.2.1.1.1	C405.2.2	C405.2.4		C405.2.6	C408.3		C406. 4
ASHRAE 90.1-2019	9.4.1 (a)	9.4.1.1 (b)	9.4.1.1 (c)	9.4.1.1 (d)	9.4.1.1 (e)	9.4.1.1 (f)	9.4.1.1 (g)	9.4.1.1 (h)	9.4.1.1 (i)	8.4.2	8.4.3.2	9.4.1.2	9.4.3		
T24 2019	130.1 (a)(b)	130.1 (a)(b)	130.1 (b)		130.1 (d)	130.1 (d)	130.1 (c).6	130.1 (c).5	130.1 (c)	130.5 (d)	130.5 (b)	130.1 (d)	130.4	130.1 (e) 130.1 (e)	
NECB 2017	4.2.2.1.(3)	4.2.2.1.(3), 4.2.2.1.(6)	4.2.2.1 (8)	4.2.2.1.(9)	4.2.2.1.(10)	4.2.2.1.(13)	4.2.4.1. (16-17)	4.2.2.1. (18-19)	4.2.2.1. (20-23)			4.2.2.2 4.2.2.4			

Restaurant

example

	Manually Switched ON / OFF	Manual Dimmer	Manual ON / Auto OFF	Occupancy Sensor	Daylighting Control	Lumen Maintenance Control	Tuning Control	Receptacle Control	Demand Response
IECC 2021	•	•	•	•	•	•	•		
ASHRAE 90.1 - 2019	•	•	•	•	•	•	•	•	•
T24 2019	•	•	•	•	•	•	•	•	•
NECB 2017	•	•	•	•	•	•	•		



Sequence of Operations

Lighting

- 0-10V lighting loads
- Up to 3 dimmable zones
- Individually addressable luminaires *(IECC only)*
- Out of the box 75% high end trim

Occupancy

- Automatic on to 50%
- Optional vacancy mode
- Optional auto on to scene
- Plug load turns on with occupancy *(optional IECC)*
- Automatic off of lighting and plug load on vacancy

Daylighting

- Continuous dimming to off
- Individual luminaire daylight dimming to approximately 500 lux
- Daylighting not required for indoor spaces without windows
- Not required in spaces without windows or that are less than 150W *(120W for ASHRAE / Title 24)*

Manual Controls

- Top or dominant button half lights (sets lights to 50% or less)
- Remaining buttons trigger scenes
- Scene raise / Scene lower
- All off

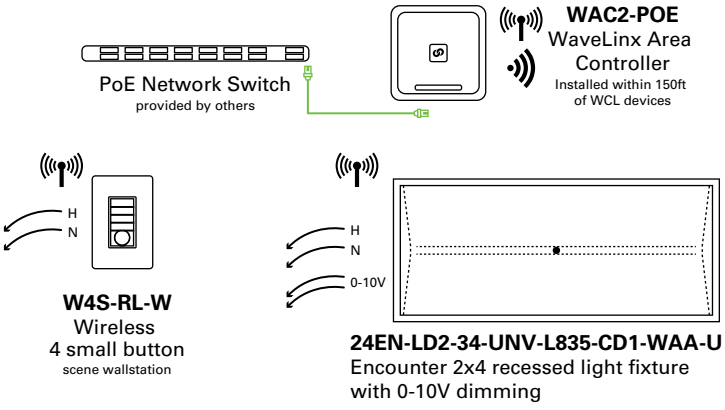
Additional Features

- Energy calculations (available through Trellix)
- Automatic demand response through WaveLinx Area Controller
- Scheduling of partial off light levels from WaveLinx Area Controller
- UL924 emergency control capabilities via luminaire battery backup or fixture integrated transfer device (consult fixture spec sheet)
- Complies with Enhanced Digital Lighting Control section C406 *(IECC)*

Bill of Material

Quantity	Catalog #	Description
1	WAC2-POE	WaveLinx Area Controller
5	W4S-RL-W	WaveLinx Wallstation
2	WR-20	WaveLinx Receptacles *(ASHRAE / Title 24)*
24	24EN-LD2-34-UNV-L835-CD1-WAA-U	Encounter 2x4 with WaveLinx Sensor

Typical Wiring Detail



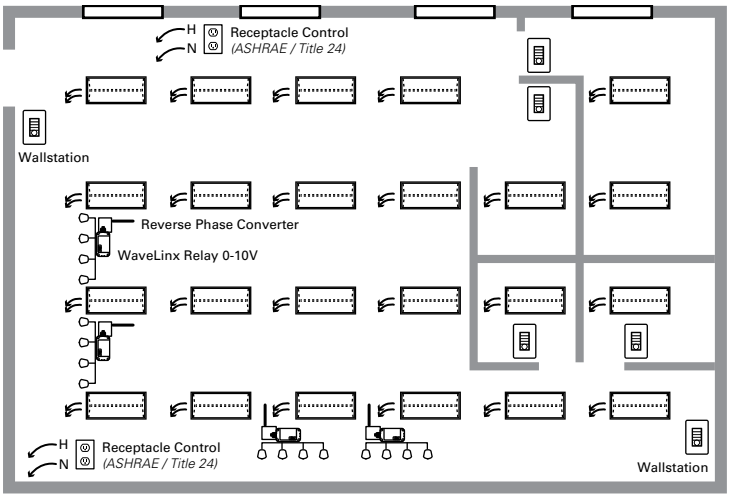
Design Consideration	Best Practice	Maximum
Gateway / WaveLinx Area Controller range	150 ft LOS	300 ft LOS
Number of interior walls	2 walls	3 walls
Distance from WaveLinx Area Controller to 1st WaveLinx device	150 ft	200 ft
Distance between WaveLinx devices	75 ft	150 ft
Number of hops from WaveLinx Area Controller	4 hops	5 hops
Number of areas per WaveLinx Area Controller	49 + 1 construction area	
Number of zones per WaveLinx Area Controller	200	200
Number of scenes per area	16	16

	Local Control	Manual ON	Partial ON	Bilevel Lighting	Daylight Side	Daylight Top	Partial OFF	Automatic OFF	Scheduled OFF	Receptacle Control	Energy Monitoring	Parking Garage	Functional Testing	Demand Response	Enhanced Digital
IECC 2018	C405.2.5	C405.2.5	C405.2.2.1.2		C405.2.3.2	C405.2.3.3	C405.2.1.3	C405.2.1.1.1	C405.2.2	C405.2.4		C405.2.6	C408.3		C406. 4
ASHRAE 90.1-2019	9.4.1 (a)	9.4.1.1 (b)	9.4.1.1 (c)	9.4.1.1 (d)	9.4.1.1 (e)	9.4.1.1 (f)	9.4.1.1 (g)	9.4.1.1 (h)	9.4.1.1 (i)	8.4.2	8.4.3.2	9.4.1.2	9.4.3		
T24 2019	130.1 (a)(b)	130.1 (a)(b)	130.1 (b)		130.1 (d)	130.1 (d)	130.1 (c).6	130.1 (c).5	130.1 (c)	130.5 (d)	130.5 (b)	130.1 (d)	130.4	130.1 (e) 130.1 (e)	
NECB 2017	4.2.2.1.(3)	4.2.2.1.(3), 4.2.2.1.(6)	4.2.2.1 (8)	4.2.2.1.(9)	4.2.2.1.(10)	4.2.2.1.(13)	4.2.4.1. (16-17)	4.2.2.1. (18-19)	4.2.2.1. (20-23)			4.2.2.2 4.2.2.4			

Retail

example

	Manually Switched ON / OFF	Manual Dimmer	Manual ON / Auto OFF	Occupancy Sensor	Daylighting Control	Lumen Maintenance Control	Tuning Control	Receptacle Control	Demand Response
IECC 2021	•	•	•	•	•	•	•		
ASHRAE 90.1 - 2019	•	•	•	•	•	•	•	•	•
T24 2019	•	•	•	•	•	•	•	•	•
NECB 2017	•	•	•	•	•	•	•		



Sequence of Operations

Lighting

- 0-10V lighting loads
- Up to 3 dimmable zones
- Out of the box 75% high end trim

Occupancy

- Automatic on to 50%
- Optional vacancy mode
- Optional auto on to scene
- Plug load turns on with occupancy *(optional IECC)*
- Automatic off of lighting and plug load on vacancy

Daylighting

- Continuous dimming to off
- Individual luminaire daylight dimming to approximately 500 lux
- Daylighting not required for indoor spaces without windows
- Not required in spaces without windows or that are less than 150W *(120W for ASHRAE / Title 24)*

Manual Controls

- Top or dominant button half lights (sets lights to 50% or less)
- Remaining buttons trigger scenes
- Scene raise / Scene lower
- All off

Additional Features

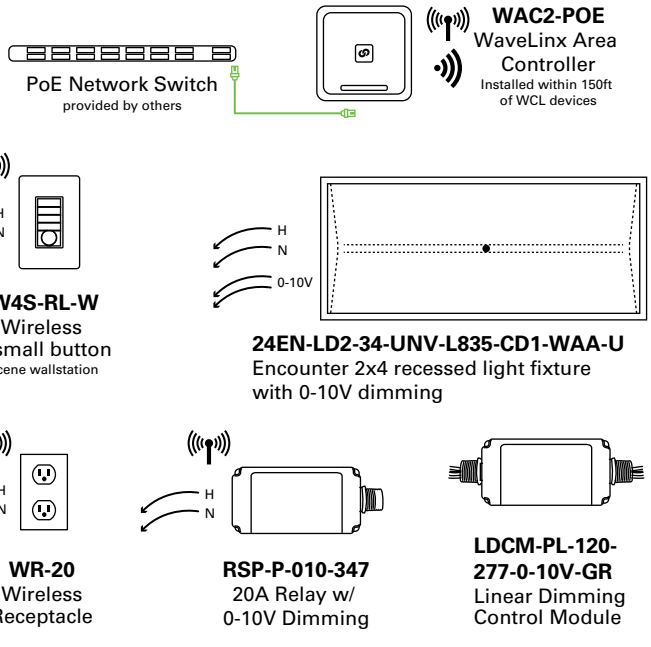
- Energy calculations (available through Trellix)
- Automatic demand response through WaveLinx Area Controller
- Scheduling of partial off light levels from WaveLinx Area Controller
- UL924 emergency control capabilities via luminaire battery backup or fixture integrated transfer device (consult fixture spec sheet)
- Complies with Enhanced Digital Lighting Control section C406 *(IECC)*

Bill of Material

Quantity	Catalog #	Description
1	WAC2-POE	WaveLinx Area Controller
6	W4S-RL-W	WaveLinx Wallstation
4	RSP-P-010-347	WaveLinx Relay Switchpack with 0-10V dimming
2	WR-20	WaveLinx Receptacles *(ASHRAE / Title 24)*
4	LDCM-PL-120-277-010V-GR	Linear Dimming Control Modules
12	24EN-LD2-34-UNV-L835-CD1-WAA-U	Encounter 2x4 with WaveLinx Sensor

Design Consideration	Best Practice	Maximum
Gateway / WaveLinx Area Controller range	150 ft LOS	300 ft LOS
Number of interior walls	2 walls	3 walls
Distance from WaveLinx Area Controller to 1st WaveLinx device	150 ft	200 ft
Distance between WaveLinx devices	75 ft	150 ft
Number of hops from WaveLinx Area Controller	4 hops	5 hops
Number of areas per WaveLinx Area Controller	49 + 1 construction area	
Number of zones per WaveLinx Area Controller	200	200
Number of scenes per area	16	16

Typical Wiring Detail

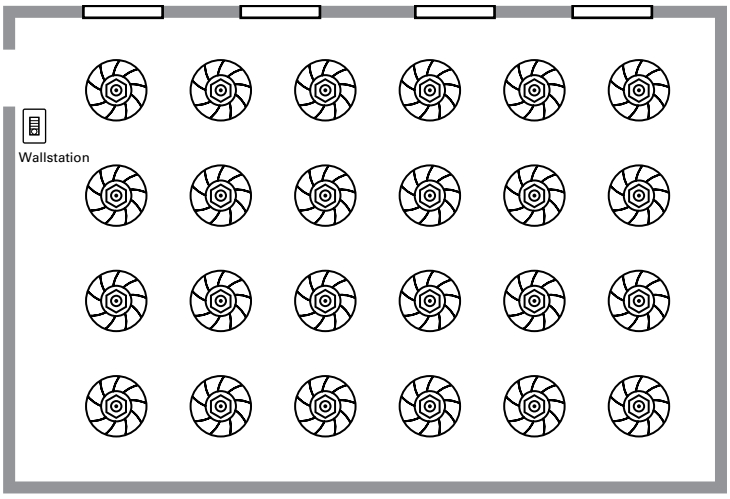


	Local Control	Manual ON	Partial ON	Bilevel Lighting	Daylight Side	Daylight Top	Partial OFF	Automatic OFF	Scheduled OFF	Receptacle Control	Energy Monitoring	Parking Garage	Functional Testing	Demand Response	Enhanced Digital
IECC 2018	C405.2.5	C405.2.5	C405.2.2.1.2		C405.2.3.2	C405.2.3.3	C405.2.1.3	C405.2.1.1.1	C405.2.2	C405.2.4		C405.2.6	C408.3		C406. 4
ASHRAE 90.1-2019	9.4.1 (a)	9.4.1.1 (b)	9.4.1.1 (c)	9.4.1.1 (d)	9.4.1.1 (e)	9.4.1.1 (f)	9.4.1.1 (g)	9.4.1.1 (h)	9.4.1.1 (i)	8.4.2	8.4.3.2	9.4.1.2	9.4.3		C406. 4
T24 2019	130.1 (a)(b)	130.1 (a)(b)	130.1 (b)		130.1 (d)	130.1 (d)	130.1 (c).6	130.1 (c).5	130.1 (c)	130.5 (d)	130.5 (b)	130.1 (d)	130.4	130.1 (e) 130.1 (e)	
NECB 2017	4.2.2.1.(3)	4.2.2.1.(3), 4.2.2.1.(6)	4.2.2.1 (8)	4.2.2.1.(9)	4.2.2.1.(10)	4.2.2.1.(13)	4.2.4.1. (16-17)	4.2.2.1. (18-19)	4.2.2.1. (20-23)			4.2.2.2 4.2.2.4			

Warehouse

example

	Manually Switched ON / OFF	Manual Dimmer	Manual ON / Auto OFF	Occupancy Sensor	Daylighting Control	Lumen Maintenance Control	Tuning Control	Receptacle Control	Demand Response
IECC 2021	•	•	•	•	•	•	•		
ASHRAE 90.1 - 2019	•	•	•	•	•	•	•	•	•
T24 2019	•	•	•	•	•	•	•		
NECB 2017	•	•	•	•	•	•	•		



Sequence of Operations

Lighting

- 0-10V lighting loads
- Each luminaire includes dimmable integrated sensor
- Control zones of no more than 4 luminaires *(IECC only)*
- Each luminaire supports occupied/unoccupied programmable light levels

Occupancy

- Automatic on to programmable level
- Programmable unoccupied light level

Daylighting

- Continuous dimming
- Individual luminaire daylight dimming
- Daylighting not required for indoor space

Manual Controls

- Programmable Zone/Scene control
- Optional Scene/Raise/Lower Control
- All Off

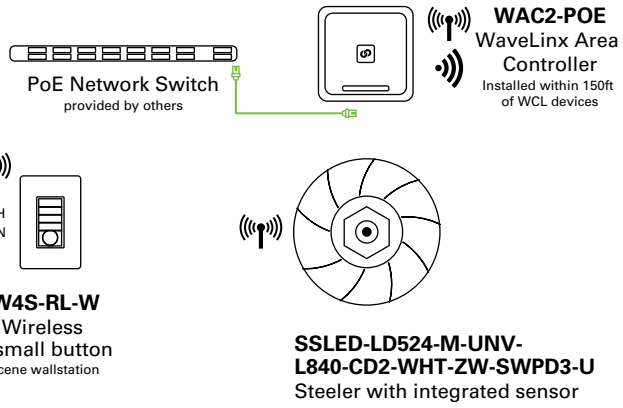
Additional Features

- Energy calculations (available through Trellix)
- Automatic demand response available from wireless area controller
- Scheduling of partial off light levels and times from WaveLinx Area Controller
- UL924 emergency control capabilities available via luminaire battery backup or fixture integrated transfer device (see fixture spec sheet)

Bill of Material

Quantity	Catalog #	Description
1	WAC2-POE	WaveLinx Area Controller
6	W4S-RL-W	WaveLinx Wallstation
24	SSLED-LD524-M-UNV-L840-CD2-WHT-SWPD3-U	Steeler with integrated sensor

Typical Wiring Detail

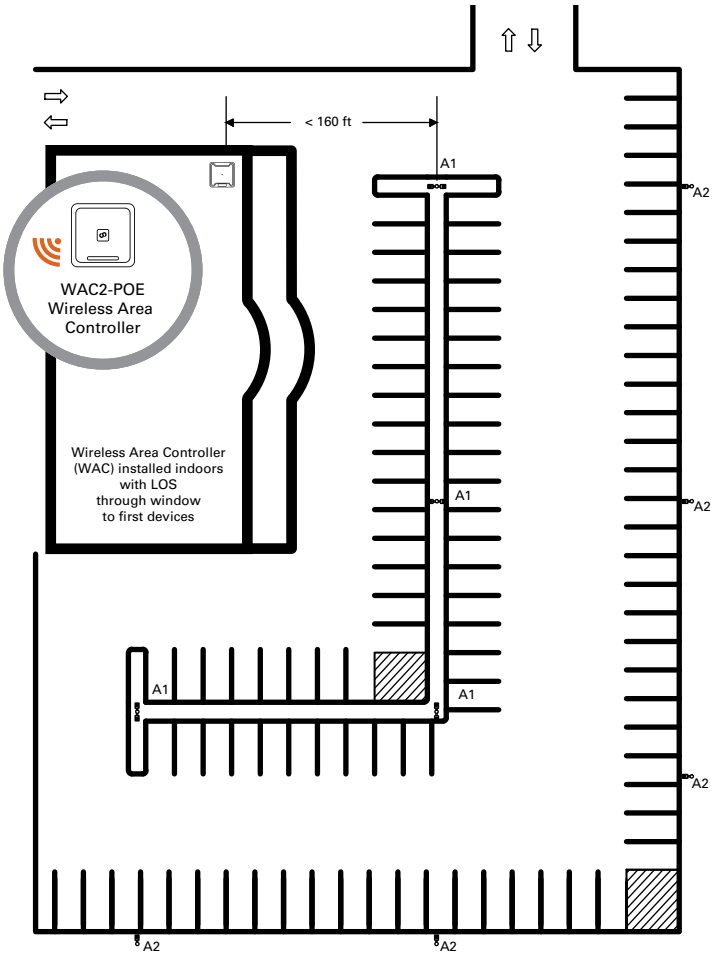


Design Consideration	Best Practice	Maximum
Gateway / WaveLinx Area Controller range	150 ft LOS	300 ft LOS
Number of interior walls	2 walls	3 walls
Distance from WaveLinx Area Controller to 1st WaveLinx device	150 ft	200 ft
Distance between WaveLinx devices	75 ft	150 ft
Number of hops from WaveLinx Area Controller	4 hops	5 hops
Number of areas per WaveLinx Area Controller	49 + 1 construction area	
Number of zones per WaveLinx Area Controller	200	200
Number of scenes per area	16	16

	Local Control	Manual ON	Partial ON	Bilevel Lighting	Daylight Side	Daylight Top	Partial OFF	Automatic OFF	Scheduled OFF	Receptacle Control	Energy Monitoring	Parking Garage	Functional Testing	Demand Response	Enhanced Digital
IECC 2018	C405.2.5	C405.2.5	C405.2.1.1		C405.2.3.2	C405.2.3.1	C405.2.1.2	C405.2.1.1	C405.2.2.1	C405.2.4		C405.2.5	C408.2.3		C406. 4
ASHRAE 90.1-2019	9.4.1 (a)	9.4.1.1 (b)	9.4.1.1 (c)	9.4.1.1 (d)	9.4.1.1 (e)	9.4.1.1 (f)	9.4.1.1 (g)	9.4.1.1 (h)	9.4.1.1 (i)	8.4.2	8.4.3.2	9.4.1.2	9.4.3		
T24 2019	130.1 (a)(b)	130.1 (a)(b)	130.1 (b)		130.1 (d)	130.1 (d)	130.1 (c).6	130.1 (c).5	130.1 (c)	130.5 (d)	130.5 (b)	130.1 (d)	130.4	130.1 (e) 130.1 (e)	
NECB 2017	4.2.2.1.(3)	4.2.2.1.(3), 4.2.2.1.(6)	4.2.2.1 (8)	4.2.2.1.(9)	4.2.2.1.(10)	4.2.2.1.(13)	4.2.4.1. (16-17)	4.2.2.1. (18-19)	4.2.2.1. (20-23)			4.2.2.2 4.2.2.4			

Exterior Lighting

example



	Occupancy Sensor	Daylighting Control	UL924 (Energy Back-Up Circuit)
IECC 2021		•	
ASHRAE 90.1 - 2019		•	
T24 2019	•	•	•
NECB 2017		•	•

Sequence of Operations

Lighting

- 0-10V lighting loads
- Each luminaire includes dimmable integrated sensor
- Each luminaire supports occupied/unoccupied programmable light levels

Occupancy

- Automatic auto on to 50%
- Automatic on to programmable level
- Programmable unoccupied light level

Daylighting

- Continuous dimming
- Individual luminaire daylight dimming
- Daylighting not required for indoor space

Manual Controls

- Programmable Zone/Scene control
- Optional Scene/Raise/Lower Control
- All Off

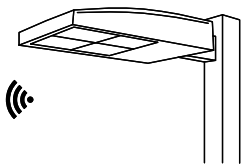
Additional Features

- Energy calculations (available through Trellix)
- Automatic demand response available from WaveLinx Area Controller
- Scheduling of partial off light levels and times from WaveLinx Area Controller
- UL924 emergency control capabilities available via luminaire battery backup

Bill of Material

Quantity	Catalog #	Description
1	WAC2-POE	WaveLinx Area Controller
8	GLEON-AF-04-LED-E1-5MQ-BZ -SWPD5BZ	Galleon LED Area/Site Luminaire
5	GLEON-AF-04-LED-E1-T4W-BZ -SWPD5BZ	Galleon LED Area/Site Luminaire

Typical Wiring Detail



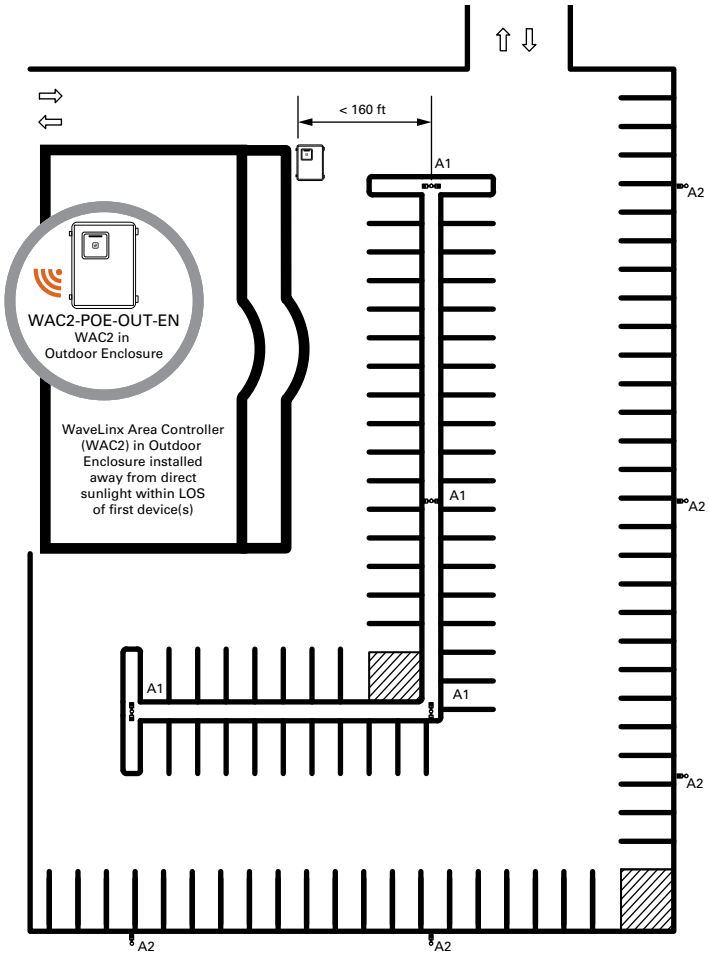
GLEON-AF-04-LED-E1-5MQ-BZ-ZW-SWPD5BZ
Galleon LED Area/Site Luminaire

Design Consideration	Best Practice	Maximum
Gateway / WaveLinx Area Controller range	150 ft LOS	300 ft LOS
Number of interior walls	LOS through a window to first nodes	
Distance from WaveLinx Area Controller to 1st WaveLinx device	160 ft	160 ft
Distance between WaveLinx devices	160 ft	160 ft
Number of hops from WaveLinx Area Controller	10 hops	10 hops
Number of areas per WaveLinx Area Controller	49 + 1 construction area	
Number of zones per WaveLinx Area Controller	200	200
Number of scenes per area	16	16

	Dimming	Automatic OFF	Scheduled OFF	Bilevel Lighting	Manual	Functional Testing
IECC 2018	C405.2.6	C405.2.6	C405.2.6	C405.2.6		
ASHRAE 90.1-2019	9.4.1.1 (e) (f)	9.4.1.1 (g) (h)	9.4.1.1 (i)	9.4.1.1 (d)	9.4.1.1 (a)	9.4.3
T24 2019	130.2 (c)	130.2 (c)	130.2 (c)	130.2 (c)		
NECB 2017	4.2.2.1.(3)(6)	4.2.2.1.(18-19)	4.2.2.1.(20-23)	4.2.2.1.(9)	4.2.2.1.(3)(6)	

Exterior Lighting - Alternate

example



Design Consideration	Best Practice	Maximum
Gateway / WaveLinx Area Controller range	150 ft LOS	300 ft LOS
Number of interior walls	LOS through a window to first nodes	
Distance from WaveLinx Area Controller to 1st WaveLinx device	160 ft	160 ft
Distance between WaveLinx devices	160 ft	160 ft
Number of hops from WaveLinx Area Controller	10 hops	10 hops
Number of areas per WaveLinx Area Controller	49 + 1 construction area	
Number of zones per WaveLinx Area Controller	200	200
Number of scenes per area	16	16

	Dimming	Automatic OFF	Scheduled OFF	Bilevel Lighting	Manual	Functional Testing
IECC 2018	C405.2.6	C405.2.6	C405.2.6	C405.2.6		
ASHRAE 90.1-2019	9.4.1.1 (e) (f)	9.4.1.1 (g) (h)	9.4.1.1 (i)	9.4.1.1 (d)	9.4.1.1 (a)	9.4.3
T24 2019	130.2 (c)	130.2 (c)	130.2 (c)	130.2 (c)		
NECB 2017	4.2.2.1.(3)(6)	4.2.2.1.(18-19)	4.2.2.1.(20-23)	4.2.2.1.(9)	4.2.2.1.(3)(6)	

	Occupancy Sensor	Daylighting Control	UL924 (Energy Back-Up Circuit)
IECC 2021		•	
ASHRAE 90.1 - 2019		•	
T24 2019	•	•	•
NECB 2017		•	•

Sequence of Operations

Lighting
- 0-10V lighting loads
- Each luminaire includes dimmable integrated sensor
- Each luminaire supports occupied/unoccupied programmable light levels

Occupancy
- Automatic auto on to 50%
- Automatic on to programmable level
- Programmable unoccupied light level

Daylighting
- Continuous dimming
- Individual luminaire daylight dimming
- Daylighting not required for indoor space

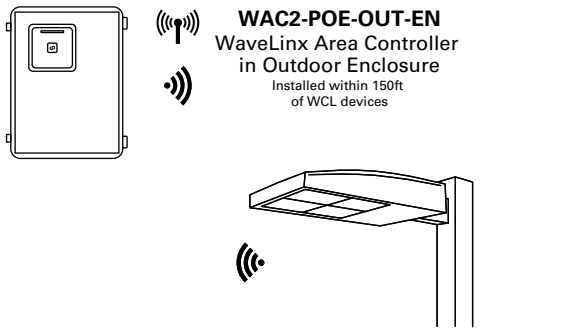
Manual Controls
- Programmable Zone/Scene control
- Optional Scene/Raise/Lower Control
- All Off

Additional Features
- Energy calculations (available through Trellix)
- Automatic demand response available from WaveLinx Area Controller
- Scheduling of partial off light levels and times from WaveLinx Area Controller
- UL924 emergency control capabilities available via luminaire battery backup

Bill of Material

Quantity	Catalog #	Description
1	WAC2-POE-OUT-EN	WaveLinx Area Controller in Outdoor Enclosure
8	GLEON-AF-04-LED-E1-5MQ-BZ -SWPD5BZ	Galleon LED Area/Site Luminaire
5	GLEON-AF-04-LED-E1-T4W-BZ -SWPD5BZ	Galleon LED Area/Site Luminaire

Typical Wiring Detail



WAC2-POE-OUT-EN
WaveLinx Area Controller in Outdoor Enclosure
Installed within 150ft of WCL devices

GLEON-AF-04-LED-E1-5MQ-BZ-ZW-SWPD5BZ
Galleon LED Area/Site Luminaire

WaveLinx Pro

WaveLinx Pro

Designers, electrical contractors and building owners/operators use the WaveLinx Pro connected lighting system to comply with latest energy codes, maximize energy savings and improve occupant experience.

Lighting Brands
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AtLite
Corelite
Ephesus
Fail-Safe
HALO
HALO Commercial
Invue
iO
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Lumark
Lumière
McGraw-Edison
Metalux
MWS
Neo-Ray
Portfolio
RSA
Shaper
Shaper PrentaLux - 3D Printed Lighting
Streetworks
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Telensa

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