Title 24:

A Guide to the 2025 Update

California Building Energy Efficiency Standards

LiteTrace Brands

Introduction to Title 24

Title 24, Part 6, is a set of energy efficiency standards established by the California Energy Commission (CEC) to make buildings more energy-efficient. These standards focus on ensuring that lighting systems and controls are installed and operated in ways that minimize energy consumption. They apply to both new construction and major retrofits of nonresidential buildings across California.

The **2025 Title 24** update incorporates several changes aimed at making buildings more energy-efficient, with particular emphasis on lighting controls. Key areas of focus include demand responsive lighting, occupancy sensors, daylighting controls, and multilevel lighting controls. The 2025 code simplifies multilevel control requirements, lowers the daylighting control threshold, codifies demand response protocol standards, and removes the Tailored Method as a compliance path. By implementing these systems, buildings can reduce energy waste, lower operating costs, and help California meet its climate goals.

This guide explains how our lighting control systems are designed to help you meet the Title 24 compliance requirements, focusing on the areas most relevant to lighting and energy efficiency.

Note: This Guide is for informational purposes only. For official and detailed information, please refer to the 2025 Building Energy Standards website: https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2025-building-energy-efficiency.

When is Title 24 Compliance Required?

Title 24 compliance is required for all newly constructed buildings and major retrofits that receive permits. Compliance applies to:

New Construction: All commercial, industrial, and residential buildings that are constructed or undergo a major renovation.

Major Renovations: Projects that involve replacing existing lighting systems or making significant modifications to systems like HVAC, lighting controls, or building insulation.

Title 24 compliance must be addressed during the design and construction phases of a project. Compliance is typically verified through energy modeling and certification during project review.

CONSTRUCTION TYPE	REQUIRED	
New Construction	Yes	Meeting Title 24 is required for all residential and non residential new construction projects.
Additions	Yes	Meeting Title 24 is required for all residential and non residential additions.
Alterations (Classified as "Retrofit")	Conditional	Based upon the resulting lighting power density and percentage of luminaries altered. Refer to Table 141.0-E.
Modification-in-Place (Classified as "Retrofit")	Conditional	Based upon the resulting lighting power density and number of luminaries modified. Refer to Table 141.0-F.
Repairs	No	Generally, no compliance required.

NOTE: As a general rule, when permit is needed Title 24 Compliance is required.

Bluetooth® Lighting Controls

It's easy with Keilton+autani. Quickly integrate lighting with advanced lighting controls that you can commission from a cell phone or tablet. Immediately see the results of your changes.

Intelligent Spaces and HVAC

Measure, report, control, and optimize your energy use in a single building or across multiple facilities. Generate energy savings automatically year after year. Enhance the comfort and productivity of building occupants. That's the power of Autani.

One Platform, Complete Visibility

The Autani platform delivers a unified dashboard for your entire building automation ecosystem. Our solutions readily integrate with your existing infrastructure to provide:

- Granular monitoring and control with standalone sensor solutions
- Local room-based systems for gateway-free control
- Networked building management systems
- Global enterprise-grade analytics across portfolios

This enables consolidated visibility and control for smarter, more efficient operations. Our scalable approach allows you to start small and seamlessly expand capabilities as needs grow.

Whether managing a single site or a global portfolio, the Autani platform empowers you with actionable insights to optimize comfort, occupancy, maintenance, and energy usage across your built environment. It is the foundation for unified, intelligent building and energy management.

Autani Ecosystem Partners

Autani's luminaire manufacturing ecosystem partners integrate sensors directly into luminaires, simplifying Title 24 compliance. These sensors cover occupancy detection and daylight harvesting within each luminaire's footprint, ensuring seamless lighting and control integration.

These ready-to-use fixtures meet California Title 24 requirements for non-residential lighting (Section 130.1). Factory-wired with Autani's sensor system, the luminaires automatically adjust lighting based on occupancy and daylight levels, optimizing energy efficiency and compliance.

Our expanding partner ecosystem is fully compatible with Autani's software, enabling seamless integration and enhancing scalability. Visit autani.com to view the latest list of Autani Ecosystem Partners.

Contents

2025 Key Changes

Here is what you need to know

The California Building Energy Efficiency Standards are updated every three years, with the latest changes taking effect in 2025. Starting January 1, 2026, these standards apply to all new construction projects and retrofits with permits.

Title 24, Part 6 offers two compliance paths: Prescriptive Path (adherence to specific restrictions) and Performance Path (building modeling using software). Both include mandatory lighting provisions.

Key changes from the 2025 update include: Tailored Method removed; multilevel controls simplified to continuous dimming 100%–10%; manual control location expanded to include remote with annunciation; daylighting threshold lowered from 120W to 75W; demand response protocol certification codified (OpenADR 3.0 added); sign lighting restricted to LED/neon.

Key Highlights from the 2025 Title 24 Update:

The 2025 Title 24 update introduces important changes aimed at improving lighting control systems and reducing energy consumption. The following key changes are now in effect:

- **Demand Responsive Lighting Controls**
  Lighting systems with 4,000 watts or greater must have Demand Responsive capabilities. A VEN certified as OpenADR 2.0a, 2.0b, or Baseline Profile OpenADR 3.0 is now required.

- **Occupancy Sensor Ventilation Controls**
  Unchanged requirement for independent lighting and ventilation control. Ventilation must now shut off within five minutes of occupied standby mode being triggered.

- **Multilevel Lighting Control**
  Spaces 100 sq. ft. or larger with >0.5W/sq. ft. must provide continuous dimming from 100% to 10% or lower. Table 130.1-A removed. HID/induction: one step between 30–70%.

- **Automatic Daylighting Controls**
  Required when daylit zone general lighting is 75W or more (reduced from 120W). Linear fixtures >8 ft may be controlled in 8-ft segments.

- **Shut-Off Controls for Lighting**
  Lighting must auto shut off within 20 minutes of vacancy.

- **Partial-Off Controls**
  Lighting must be reduced by at least 50% when unoccupied. Exceptions allowing 40% reduction remain in effect for warehouse aisleways where installed power is ≤80% of the area category allowance, and for hotel/motel stairwells and corridors under the same power condition.

Title 24 Code Requirements for Typical Building Spaces

		Shut-Off Control				Light Level Control		Additional Controls		Outdoor Lighting Controls		
Control Requirement		**Area Control 2**	**Timeclock**	**Automatic Full-Off via Occupancy 3**	**Automatic Partial-Off via Occupancy 3**	**Multi-Level Lighting Controls**	**Automatic Multi-Level Daylight Controls**	**Demand Response**	**Receptacle (i.e., Plug Load) Control4Motion**	**Daylight Availability**	**Automatic Scheduling Controls Control**	**Motion Sensing Controls**
Code Provision		130.1 (a)	130.1 (c) 1	130.1 (c) 5	130.1 (c) 6 & 7	130.1(b)	130.1(d)	110.12 (c), (e) 130.1 (e)	130.5(d)	1130.2(c) 1	130.2(c) 2	130.2(c) 3
Code Summary		All luminaires shall be functionally controlled with manual on/ off lighting controls.	All areas not shut off by occupancy sensing must be shut off by a time switch control when the space is typically unoccupied.	Occupant-sensing controls must be used in specific areas to shut off lighting.	Partial-off occupancy sensing may be used in combination with another form of full automatic shutoff (exception: parking garage areas may use just partial-off sensing).	Any enclosed area ≥ 100 ft2 with a lighting power density > 0.5 W/ ft2, shall provide continuous dimming from 100% to 10% or lower.	Areas in designated daylight zones with total power ≥ 75 watts use automatic multi-level daylight controls.	Buildings having a total installed lighting power of ≥ 4,000W shall be capable of automatically reducing lighting power, including controlled receptacles in response to demand response signals.	Both controlled and uncontrolled 120-volt receptacles shall be provided in office areas, lobbies, conference rooms, kitchen areas in office spaces, and copy rooms.	Lighting shall be controlled by a photo control, astronomical time-switch control or other control to automatically shut off when daylight is available.	Controls shall be capable of reducing the lighting power by 50-90%, and capable of turning the lighting off, during scheduled unoccupied periods. Scheduling a minimum of two nighttime periods with independent lighting levels is required.	Controls shall be capable of reducing the lighting power by 50-90%, and capable of turning the lighting off, during unoccupied periods. Motion sensing controls shall be capable of reducing the lighting to its dim or off state no longer than 15 minutes after the area has been vacated.
Space Type	**Office < 250 sq. ft.**	✓		✓		✓	✓	✓	✓			
	Open Office > 250 sq. ft.	✓	✓ (or)	✓		✓	✓	✓	✓			
	Conference, Meeting Room	✓		✓		✓	✓	✓	✓			
	Classroom, Lecture Hall, Training Room	✓		✓		✓	✓	✓				
	Lobby	✓	✓ (or)	✓		✓	✓	✓	✓			
	Corridor	✓	✓ (or)	✓	✓		✓	✓				
	Restroom	✓	✓ (or)	✓			✓	✓				
	Stairwell	✓	✓ (or)	✓	✓		✓	✓				
	Gymnasium	✓		✓		✓	✓	✓				
	Warehouse	✓			✓	✓	✓	✓				
	Parking Garage	✓			✓	✓	✓	✓				
	Site Lighting / Facade / Parking Garage Roof									✓	✓	✓

NOTE: The chart above is an overview of the code requirements for typical building spaces. Please use this information as a guide. For specific code requirements, please refer to the California Code of Regulations, Title 24, Part 6.

Sequence of Operation: Office Building Applications

Occupancy / Vacancy Sensor Applications

Per 2021 IECC C405.2.1

1. When lights are on, all non-emergency lights automatically turn off when occupancy is not detected by the occupancy sensor within [30 minutes]. If the sensor has turned lights off and occupancy is detected within [60 seconds], then lights return to the last lighting level.
2. When lights are off, lights set to [manual on] or [automatic on set to [50%] power]. Per code, areas where manual-on operation would endanger the safety or security of the room or building occupants shall be full automatic-on.
3. Operating hours logged and reported in the EnergyCenter software for system learning and alerts. If lights are on for [60 minutes] during afterhours operation [9 PM], an alert shall be sent.

Daylight Sensor Applications

Per 2021 IECC C405.2.3 and C406.4

1. When the space is occupied, the daylight sensor automatically reduces power and dims the light fixtures to maintain a consistent [30] foot candle setting. The maximum [8] fixtures associated within the daylighting zone programmed to not exceed the maximum light level established by the daylight sensor.
2. Set dimming range from a maximum dimming level [100%] of the high-end trim setpoint to a minimum dimming level [10%] to avoid confusion among occupants. Note: Lights can be turned off if occupants are aware of the operations and energy savings benefits.

Open Area Sensor Applications

Per 2025 Title 24 Section 130.1

1. In open areas, lighting control zones must be set up in separate zones less than [600] sqft.
2. When the entire open area is unoccupied for [20 minutes], the lights in the entire area must transition to off.
3. When only some control zones are occupied, the unoccupied zones must drop down at least [80%] of full power within [20 minutes].

Wireless Switch / Dimmer Lighting Control

Per 2021 IECC C405.2.2.2

1. Allow local dimming from [80%] high-end trim to [0%] in the room.
2. Support on/off switching.

Lighting and Thermostat Timeclock Control & Scheduling

Per 2021 IECC C405.2.3 and C406.4

1. Set high-end trim/institutional tuning maximum light level to [80%].
2. EnergyCenter software timeclock turns interior lights on to [50%] light level during scheduled normal hours of operation.
3. During scheduled unoccupied hours, all nonemergency interior lighting systems are [swept off] or [dimmed to [30%]. If occupancy is detected, the lights in the occupied rooms remain on and the occupancy will be logged.
4. Local manual overrides set to allow lights to remain on for [2 hours] maximum.
5. Exterior lights turned on/off via an astronomical timeclock. Lights turn on to [80%] [15 minutes] before sunset, and turn off [15 minutes] after sunrise.
6. Exterior lights grouped to enable automatic dimming from [100%] maximum to a minimum of [50%] between the hours of [12 AM] and [6 AM] with a manual override to full on. See IECC C405.2.6.3
7. Timeclock schedule to automatically setback room thermostats [5 degrees F] during unoccupied hours. Timeclock to reset thermostats to occupied mode [1 hour] prior to normal occupied operations.

Electrical Receptacle / Smart Outlet Plug Load Control

Per ASHRAE 90.1-2019, Section 8.4

1. Controlled electrical receptacles in a space to be automatically turned off within [20 minutes] when occupancy is not detected by the associated occupancy sensor.
2. During scheduled occupied hours, electrical receptacles to be automatic on within [30 seconds] when occupancy is detected.
3. During scheduled unoccupied hours, all controlled electrical receptacles are [swept off]. If occupancy is detected, the controlled receptacles in the occupied rooms remain on.
4. During scheduled unoccupied hours, electrical receptacles to be automatic on with a [5 minute delay] when occupancy is detected.
5. If electrical load exceeds [10 amps] at any receptacle, an alert shall be sent with location of the excessive load and time of occurrence.

Note: These sequences of operation are for general information purposes only, and are provided without any warranty as to accuracy, completeness, or otherwise. The user should read the applicable code requirements for their specific project requirements, and should consult with a professional engineer or other competent advisor to comply with local code requirements.

Sequence of Operation: Demand Response

Having the ability to manage your electricity consumption can allow a building owner/operator to reduce electrical usage during periods of real-time pricing, critical-peak pricing, or time-of-use tariffs that may be charged by the local electric utility. Moreover, some utilities may offer incentive-based demand response programs to pay the building owner/operator if the building's electrical consumption can be reduced during certain periods of time throughout the year.

Participation in a demand response program may generate monthly incentive payments. Having an ability to reduce electrical consumption and potentially shift some of the electrical load, such as precooling the building, can positively impact the bottom line.

Even if your utility does not currently charge for real-time or critical-peak pricing, almost all have a ratchet charge that you pay on a 12-month basis just so the utility can "reserve" power for you. Autani's EnergyCenter helps reduce your risk and exposure to these higher utility charges.

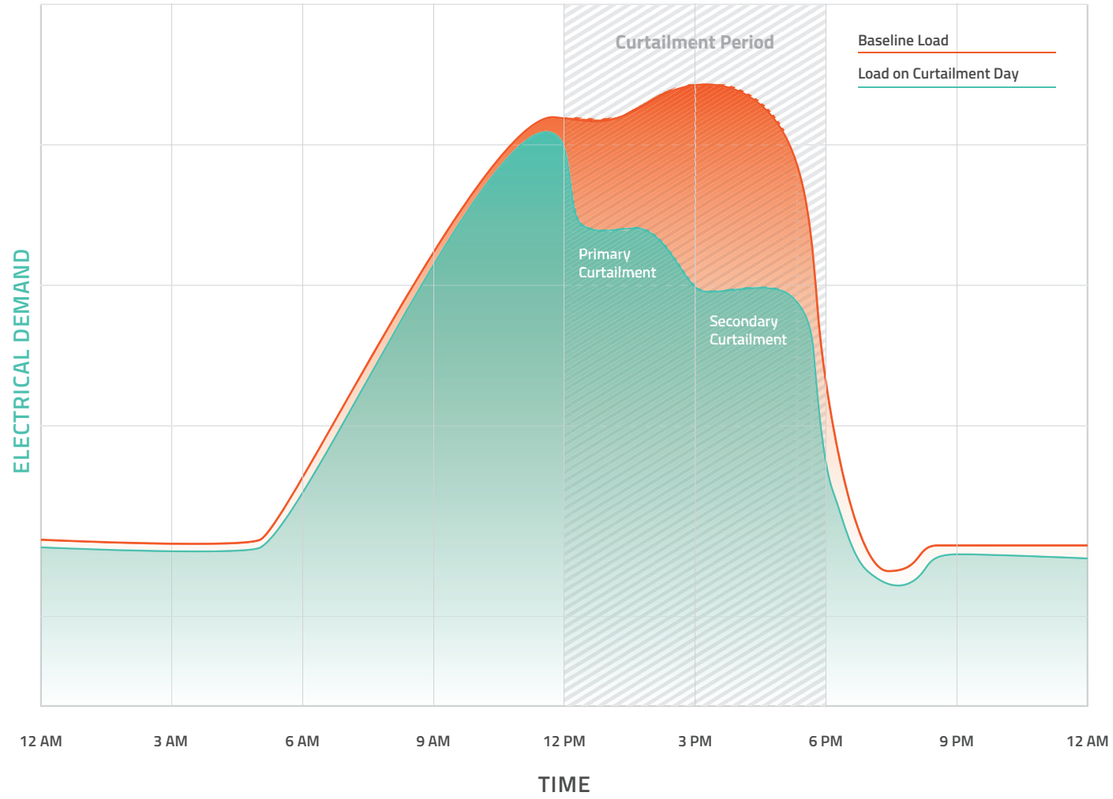
Demand response programs can be initiated automatically through EnergyCenter and reward customers who voluntarily reduce their energy use during peak demand events.

Demand Response / Electrical Load Shedding

Per 2021 IECC C406.4

Upon notification of a demand response signal, the building [automatically] or [manually] implements the following during the entire duration of the event via the EnergyCenter software:

1. Maximum light level set to [50%] in all essential spaces.
2. Non-essential space lighting is turned off.
3. Non-essential controlled electrical receptacles are turned off.
4. Essential controlled electrical receptacles are monitored with alerts set at [10 amps] to notify facilities management of excessive loads and their location.
5. Electrical meters connected through BACnet will report electrical load consumption and provide status alerts every [15 minutes] via the EnergyCenter software during the event.



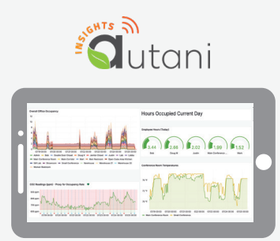
Tiers 1-4: Four Levels of Building Controls

Scalable, Proven Building Controls

With options to scale up from standalone wired systems to fully networked buildings and analytics platforms, we provide the right controls solution. Our spectrum of localized, networked, centralized, and AI-driven enterprise systems meets needs today and evolves tomorrow.

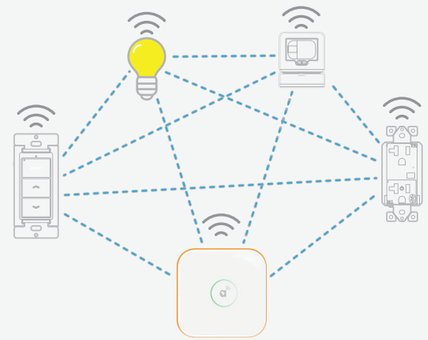
TIER 4
INSIGHT

autani



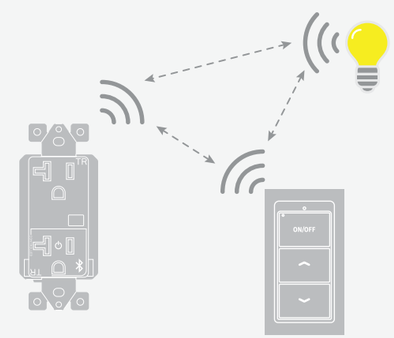
TIER 3
NETWORKED

autani



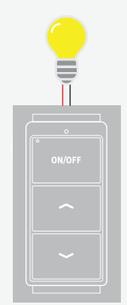
TIER 2
LOCAL ROOM-BASED

Keilton +autani



TIER 1
BASIC, STANDALONE

Keilton Basic32



Building Network Overview - Networked

WIRELESS SMART BUILDING BACKBONE VIA INTEGRATED LIGHTING SYSTEMS

Autani's EnergyCenter building management platform upgrades the entire facility, from indoor and outdoor lighting systems to standalone thermostats, with an energy efficient network of user-friendly controls that can be accessed anytime, from anywhere. Autani's wireless mesh network is primarily built from these components. The Autani Manager collects and aggregates data throughout the building, while the CR05s act as wireless gateways. When combined with an RTR, multiple CR05s extend wireless coverage throughout the entire facility.

Product Recommendations

Manager with EnergyCenter Software
Serves as central control hub to distribute programming to all fixtures. Controlled on-site or remotely via EnergyCenter software. If your facility already utilizes a Manager to control indoor lighting, the same Manager can be used to control outdoor lighting.

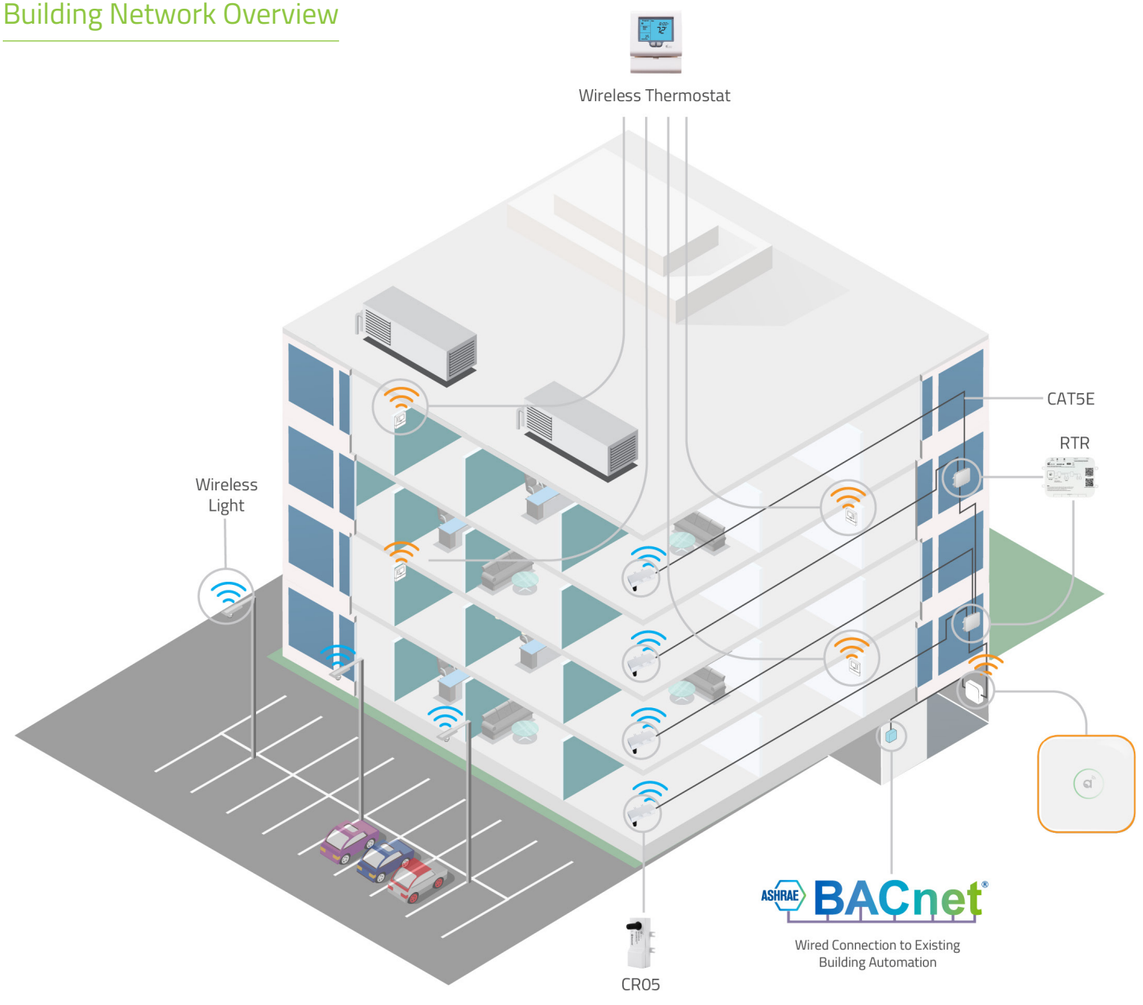
CR05 + RTR
CR05 and RTR devices work in conjunction with the Manager to bring Bluetooth® lighting controls into your network. Additionally, they extend the range of the wireless communications, which is especially useful when bridging between multiple floors or outdoor lights.

Use the RTR and CR05 to position antennas for energy monitoring, offsite schedule changes, and remote monitoring.

T32P Thermostat
T32P Wireless Thermostat is capable of integration with Autani's EnergyCenter Platform. The T32P Thermostat is a direct replacement for many existing thermostats.

EnergyCenter Software and Remote Access

Building Network Overview



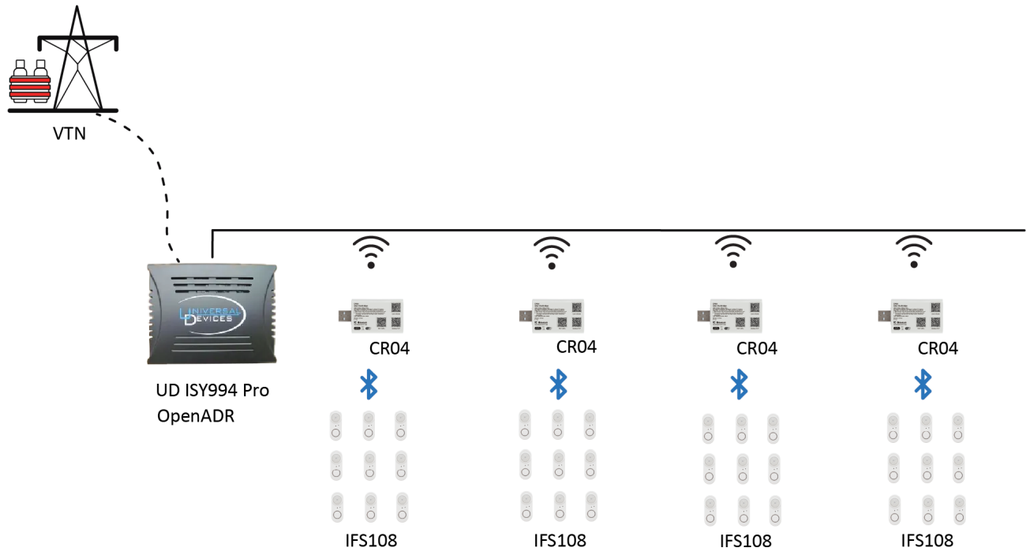
Light Controllers

Building Network Overview - Local Room-Based

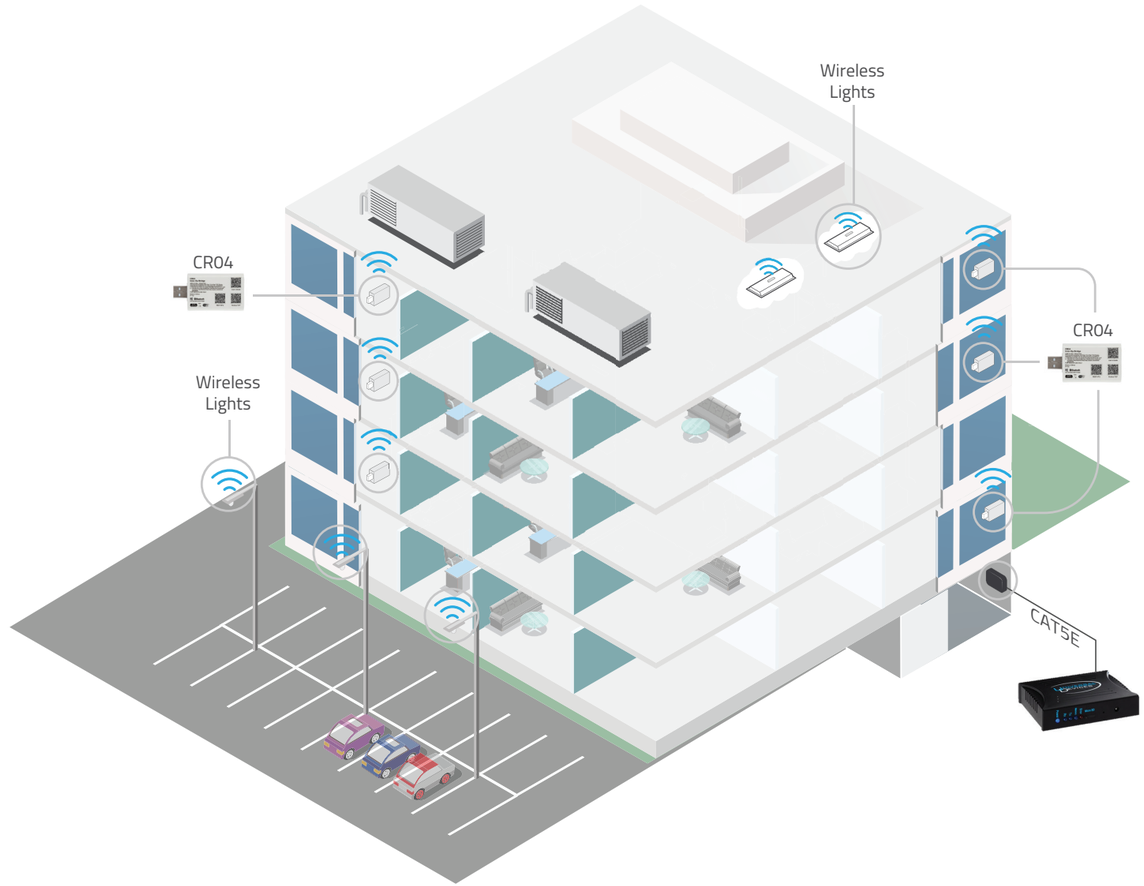
WIRELESS STANDALONE SMART BUILDING

Our Keilton+autani lighting control system uses Universal Devices OpenADR™ gateway in conjunction with our CR04 Inter-Op Bridge to provide Demand Response functions in a stand-alone environment. This complies with OpenADR 2.0b and can easily connect to VTN to create flexible demand response strategies.

Universal Devices: KLT994-OADR is an OEM of the ISY994Z series from Universal Devices, as-is and without any modification



Building Network Overview



Product Recommendations

Universal Devices: KLT994-OADR is

- OpenADR profile: 2.0b (compatible with OpenADR 3.0 systems)
- Type: VEN
- Client type: Cloud Based Control, Controller, Gateway,
- Lighting
- Transport protocol: Simple HTTP
- Pull and Push mode: Pull and Push
- Product provided by others, please visit Universal Devices for more information: https://www.universal-devices.com

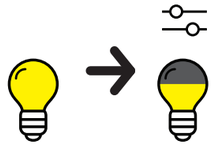
CR04

- CR04 is a WIFI dongle which has BLE and Wi-Fi hardware connections
- BLE connects to Keilton devices, Wi-Fi connects to third-party systems
- Provides Modbus TCP and REST APIs simultaneously over Wi-Fi connections
- Supports mainstream Wi-Fi encryption, such as WPA2-PSK
- Supports both DHCP and static IP assignment
- Automatic sync datetime/daylight saving time settings from mobile phone
- Modbus TCP API
- REST API communications, which is especially useful when bridging between multiple floors or outdoor lights.

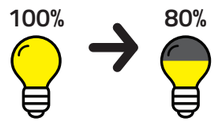
Building Types and Applications

Title 24 of the California Code of Regulations outlines specific lighting control requirements tailored to room types and functions. These standards aim to enhance energy efficiency across different spaces.

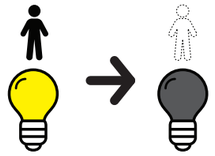
Quick Lighting Control Requirements by Room Type:



Manual Controls
Required in most spaces to allow occupants to turn lights on/off.

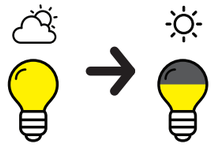


Multi-Level Lighting Controls
Required in spaces 100 sq. ft. or larger. Continuous dimming 100%–10% or lower required.

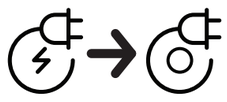


Occupancy Sensors
Required in private offices, classrooms, conference rooms, restrooms, and storage areas.

Automatic Shutoff
Required in most spaces through time clocks, occupancy sensors, or other methods.



Daylight Harvesting (Photo Controls)
Required in areas with significant daylight contribution.



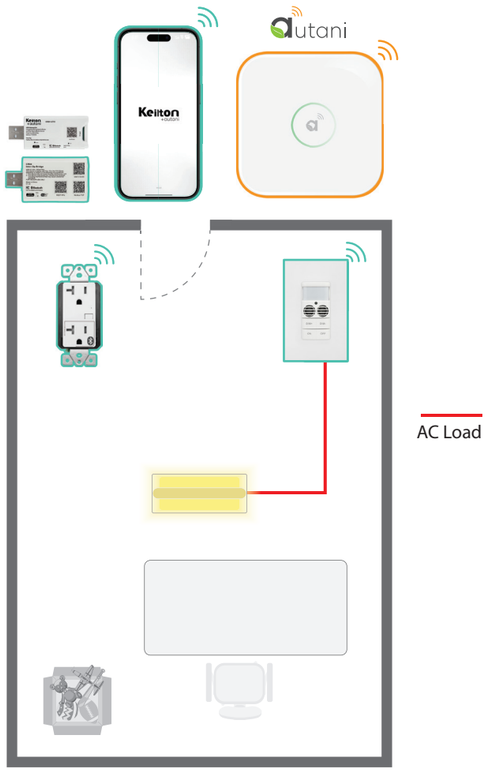
Plug Load Controls
Required for controlled receptacles in office and workstation areas.

Storage / Utility / Electrical / Mechanical < 250 sq. ft, Zone Control

FAST AND ECONOMICAL LOAD CONTROL

Quickly outfit small utility spaces for lighting control using an integrated wall switch with occupancy sensor to control multiple fixtures throughout the space. The occupancy sensor provides automatic occupancy sensing, turning off all lights when the space is vacant, while the wall switch enables manual on/off control, ensuring energy efficiency in areas that may be infrequently accessed. Motion detection is optimized for small storage areas where activity may be brief but lighting needs to respond quickly for safety.

Energy use within the space can be monitored and controlled via phone or tablet using the Keilton+autani app, or elevate to a Tier 3 solution offering analytics capabilities with the Autani Manager.



PRODUCT RECOMMENDATIONS

LOCAL ROOM-BASED

DWS102 Line Voltage Occ/Vacancy Sensor Bluetooth® Wall Switch

- 120-277VAC
- Ideal retrofit of existing wall controls (neutral is required)
- Occupancy and vacancy control of Keilton+autani devices via Bluetooth®
- Integrated relay, Ultrasonic sensor, and photo sensor with Hold-Off functionality

CR04

- CR04 is a WIFI dongle which has BLE and Wi-Fi hardware connections
- BLE connects to Keilton devices, Wi-Fi connects to third-party systems
- Provides Modbus TCP and REST APIs simultaneously over Wi-Fi connections
- 1 per zone

CR01

- Powered by USB-A
- Integrated BT module
- Internal battery with Real Time Clock for syncing all devices in the zone, maintaining schedules during power outage
- Integrated TF/MicroSD card maintains log of energy consumption data
- 1 per zone

WF20R 20A Plug Load Bluetooth® Controller

- 120VAC
- 20A plug load Bluetooth® controller
- Controllable via the Keilton+autani app

NETWORKED

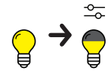
Autani Manager

The Autani Manager is the control processor at the heart of the innovative integrated energy management systems powered by EnergyCenter software. The Manager securely coordinates all energy management functions and provides actionable insights.

CR05 + RTR

- CR05 and RTR devices work in conjunction with the Manager to bring Bluetooth® lighting controls into your network.
- Bluetooth® network per CR05 may not exceed a radius of 100ft
- Bluetooth® network per CR05 may not exceed 4 hops wireless mesh

TITLE 24 REQUIREMENTS



Manual Controls

A readily accessible device to control lighting within or in view of the space.

Occupancy Sensors

Must automatically shut off lighting within 20 minutes of vacancy.

Multi-Level Lighting Controls

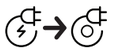
Required if the space is 100 sq. ft. or larger. Continuous dimming 100%–10% required.

Automatic Daylighting Controls

Required when general lighting in any daylit zone is 75W or more. Must adjust lighting based on daylight.

ADR

OpenADR 2.0a, 2.0b, or OpenADR 3.0 certified. ADR automates reducing or shifting electricity consumption during peak demand periods when the utility grid is most strained. This is also capable of internally driven ADR (oftentimes referred to as just Demand Response). This automation minimizes manual interventions and accelerates response times.



Plug Load Controls

Required for controlled receptacles in office and workstation areas.

Alternative Product Recommendations

PPA104S Line Voltage 20A Bluetooth® Zone Control

- 120-277VAC input
- Integrated 20A relay
- Output power up to 2400W (120VAC), 5540W (277VAC)
- UL Plenum Rated
- 1 HP motor load rated

NOTE: This is an alternative solution for 'receptacle / plug load controls'.

WP1013 (3 Button) / WP1025 (5 Button) Battery-Powered Bluetooth® Wall Switch

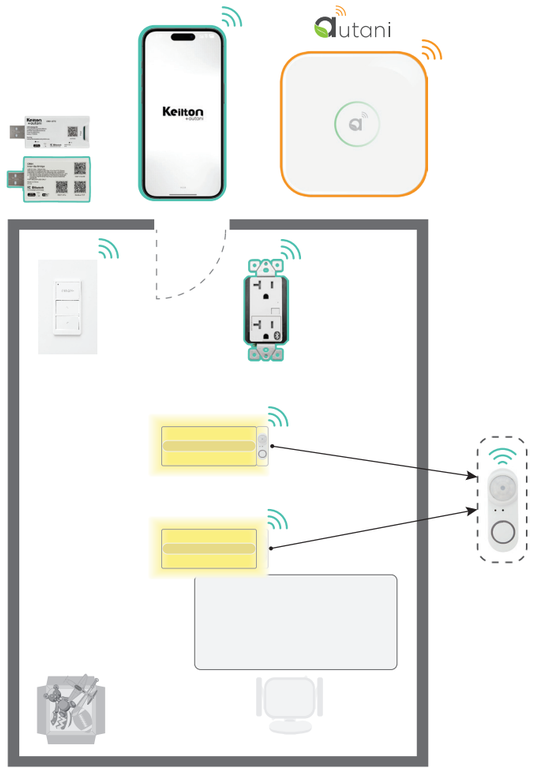
- Quick push-button control of Keilton+autani devices via Bluetooth®
- Powered by a single CR2032 battery
- 10-year typical battery life
- Can be wall-mounted or used as portable remote controller. Can be linked to a light or light group via the Keilton+autani app

Storage / Utility / Electrical / Mechanical < 250 sq. ft LLLC

FAST AND ECONOMICAL LOAD CONTROL

Luminaire Level Lighting Controls save on labor because components can be installed on fixtures prior to installation in the ceiling. Individual fixture control provides targeted lighting for the storage areas, equipment access, or maintenance tasks, with wireless wall switches enabling convenient grouped control. Lights can be virtually grouped to operate together while each fixture remains individually addressable for maximum flexibility. The system responds quickly to motion for safety while automatically turning off when areas are vacant.

Energy use within the space can be monitored and controlled via phone or tablet using the Keilton+autani app, or elevate to a Tier 3 solution offering analytics capabilities with the Autani Manager.



PRODUCT RECOMMENDATIONS

LOCAL ROOM-BASED

IFS108 Integrated Oval 12V Panel Sensor

- Clip-mount allows sensor to attach to luminaire housing
- 12V sensor with oval shape is ideal form factor for panels
- Bluetooth® PIR analog sensor with Algo² algorithm to maximize detection without false trigger
- Allows existing panel and downlight luminaires to upgrade to luminaire level lighting control (LLLC)
- Daylight Harvesting

WP1013

- Quick push-button control of Keilton+autani devices via Bluetooth®
- Single CR2032 battery power
- 10-year typical battery life
- Can be wall-mounted or used as portable remote controller
- App allows link to a light or a group

CR04

- CR04 is a WIFI dongle which has BLE and Wi-Fi hardware connections
- BLE connects to Keilton devices, Wi-Fi connects to third-party systems
- Provides Modbus TCP and REST APIs simultaneously over Wi-Fi connections
- 1 per zone

CR01

- Powered by USB-A
- Integrated BT module
- Internal battery with Real Time Clock for syncing all devices in the zone, maintaining schedules during power outage
- Integrated TF / MicroSD card maintains log of energy consumption data
- 1 per zone

WF20R 20A Plug Load Bluetooth® Controller

- 120VAC
- 20A plug load Bluetooth® controller
- Controllable via the Keilton+autani app

NETWORKED

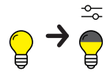
Autani Manager

The Autani Manager is the control processor at the heart of the innovative integrated energy management systems powered by EnergyCenter software. The Manager securely coordinates all energy management functions and provides actionable insights.

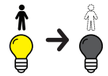
CR05 + RTR

- CR05 and RTR devices work in conjunction with the Manager to bring Bluetooth® lighting controls into your network.
- Bluetooth® network per CR05 may not exceed a radius of 100ft
- Bluetooth® network per CR05 may not exceed 4 hops wireless mesh

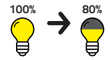
TITLE 24 REQUIREMENTS



Manual Controls
A readily accessible device to control lighting within or in view of the space.



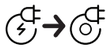
Occupancy Sensors
Must automatically shut off lighting within 20 minutes of vacancy.



Multi-Level Lighting Controls
Required if the space is 100 sq. ft. or larger. Continuous dimming 100%–10% required.

Automatic Daylighting Controls
Required when general lighting in any daylit zone is 75W or more. Must adjust lighting based on daylight.

ADR
OpenADR 2.0a, 2.0b, or OpenADR 3.0 certified. ADR automates reducing or shifting electricity consumption during peak demand periods when the utility grid is most strained. This is also capable of internally driven ADR (oftentimes referred to as just Demand Response). This automation minimizes manual interventions and accelerates response times.



Plug Load Controls
Required for controlled receptacles in office and workstation areas.

Alternative Product Recommendations

PPA104S Line Voltage 20A Bluetooth® Zone Control

- 120-277VAC input
- Integrated 20A relay
- Output power up to 2400W (120VAC), 5540W (277VAC)
- UL Plenum Rated
- 1 HP motor load rated

NOTE: This is an alternative solution for 'receptacle / plug load controls.'

IFS105SE Integrated Round 12V Sensor

- 12VDC input
- Integrated wiring terminal block
- PIR Sensor
- Daylight Harvesting
- Easy installation
- Digital sensor technology designed for low bay applications

NOTE: This is an alternative solution for Luminaire Level Lighting Control

WP1013 (3 Button) / WP1025 (5 Button) Battery-Powered Bluetooth® Wall Switch

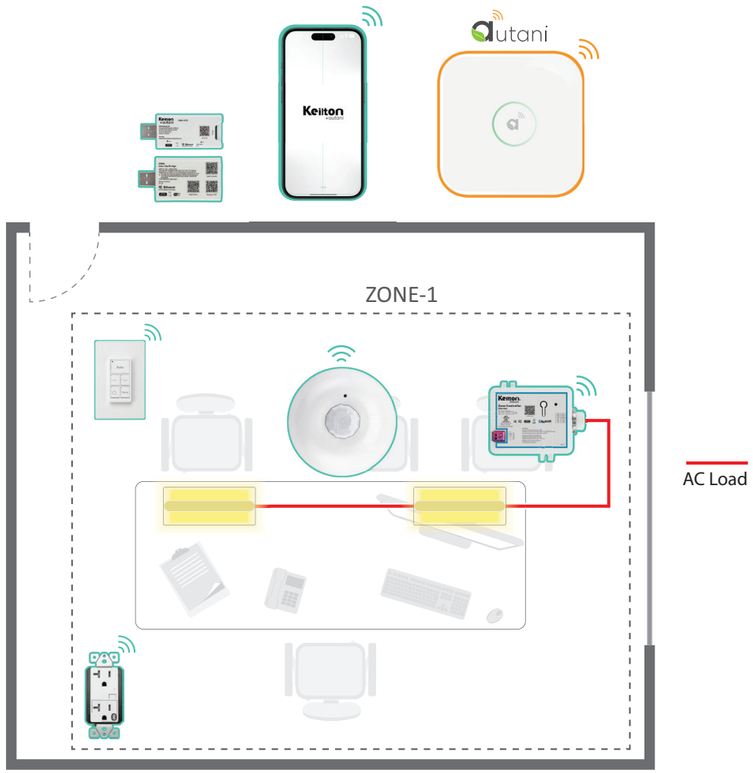
- Quick push-button control of Keilton+autani devices via Bluetooth®
- Powered by a single CR2032 battery
- 10-year typical battery life
- Can be wall-mounted or used as portable remote controller. Can be linked to a light or light group via the Keilton+autani app

Small Office < 250 sq. ft - Zone Control

FAST AND ECONOMICAL LOAD CONTROL

Quickly outfit small office spaces for lighting control using an integrated wall switch with occupancy sensor to control multiple fixtures throughout the personal office. The occupancy sensor provides automatic occupancy sensing, turning off all lights when the office is vacant, while the wall switch enables manual on/off control. Daylight harvesting reduces energy consumption and glare on computer screens. Adding plug load control supports Title 24 usage scenarios and enables energy-draining components such as monitors and printers to be powered down during off hours.

Energy use within the space can be monitored and controlled via phone or tablet using the Keilton+autani app, or elevate to a Tier 3 solution offering analytics capabilities with the Autani Manager.



PRODUCT RECOMMENDATIONS

LOCAL ROOM-BASED

BCS107 Battery Powered Occupancy Sensor
- PIR + Daylight Harvesting
- 600 sq ft room coverage
- Occupancy / vacancy enabled
- Powered by a single CR123A 3V battery
- 10-year typical battery life
- Easy installation with multiple mounting options

PPA104S Line Voltage 20A Bluetooth® Zone Control
- 120-277VAC input
- Integrated 20A relay
- Output power up to 2400W (120VAC), 5540W (277VAC)
- UL Plenum Rated
- 1 HP motor load rated

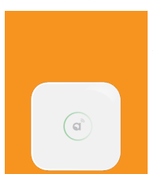
CR04
- CR04 is a WIFI dongle which has BLE and Wi-Fi hardware connections
- BLE connects to Keilton devices, Wi-Fi connects to third-party systems
- Provides Modbus TCP and REST APIs simultaneously over Wi-Fi connections
- 1 per zone

CR01
- Powered by USB-A
- Integrated BT module
- Internal battery with Real Time Clock for syncing all devices in the zone, maintaining schedules during power outage
- Integrated TF / MicroSD card maintains log of energy consumption data
- 1 per zone

WP1013 (3 Button) / WP1025 (5 Button)Battery-Powered Bluetooth® Wall Switch
- Quick push-button control of Keilton+autani devices via Bluetooth®
- Powered by a single CR2032 battery
- 10-year typical battery life
- Can be wall-mounted or used as portable remote controller. Can be linked to a light or light group via the Keilton+autani app

WF20R 20A Plug Load Bluetooth® Controller
- 120VAC
- 20A plug load Bluetooth® controller
- Controllable via the Keilton+autani app

NETWORKED



Autani Manager

The Autani Manager is the control processor at the heart of the innovative integrated energy management systems powered by EnergyCenter software. The Manager securely coordinates all energy management functions and provides actionable insights.

CR05 + RTR
- CR05 and RTR devices work in conjunction with the Manager to bring Bluetooth® lighting controls into your network.
- Bluetooth® network per CR05 may not exceed a radius of 100ft
- Bluetooth® network per CR05 may not exceed 4 hops wireless mesh

TITLE 24 REQUIREMENTS

Manual Controls
Must provide a device to control lighting within or in view of the space.

Occupancy Sensors
Automatically turn off lighting within 20 minutes of vacancy.

Automatic Shutoff
Lighting must automatically shut off after 20 minutes of vacancy.

Daylight Harvesting (if applicable):
Required when general lighting in any daylit zone is 75W or more. Must adjust artificial lighting based on daylight.

Lighting Power Density
Must comply with prescribed wattage limits (typically 0.8 watts/sq. ft.).

ADR
OpenADR 2.0a, 2.0b, or OpenADR 3.0 certified. ADR automates reducing or shifting electricity consumption during peak demand periods when the utility grid is most strained. This is also capable of internally driven ADR (oftentimes referred to as just Demand Response). This automation minimizes manual interventions and accelerates response time.

Plug Load Controls
Required for controlled receptacles in office and workstation areas.

Alternative Product Recommendations

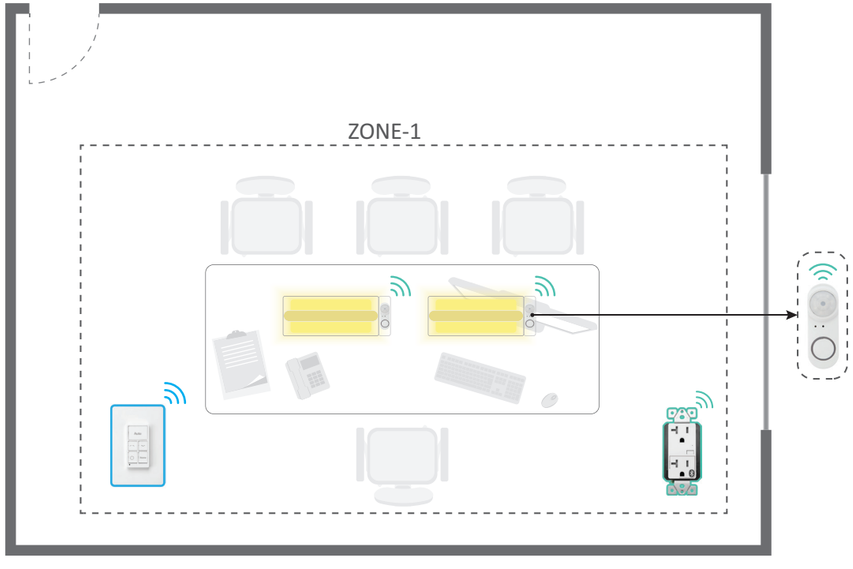
WP1013 (3 Button) / WP1025 (5 Button) Battery-Powered Bluetooth® Wall Switch
- Quick push-button control of Keilton+autani devices via Bluetooth®
- Powered by a single CR2032 battery
- 10-year typical battery life
- Can be wall-mounted or used as portable remote controller. Can be linked to a light or light group via the Keilton+autani app

Small Office < 250 sq. ft - LLLC

FLEXIBLE AND COMFORTABLE WORK SPACE

Luminaire Level Lighting Controls save on labor because components can be installed on fixtures prior to installation in the ceiling. Lights can be virtually grouped to dim and switch on/off together using wireless wall switches, while each fixture is also individually addressable, allowing for the most flexibility and the most savings. Adding plug load control supports Title 24 usage scenarios and enables energy-draining components such as monitors and printers to be powered down during off hours.

Energy use within the space can be monitored and controlled via phone or tablet using the Keilton+autani app, or elevate to a Tier 3 solution offering analytics capabilities with the Autani Manager.



PRODUCT RECOMMENDATIONS

Keilton +autani

LOCAL ROOM-BASED

IFS108 Integrated Oval 12V Panel Sensor

- Clip-mount allows sensor to attach to luminaire housing
- 12V sensor with oval shape is ideal form factor for panels
- Bluetooth® PIR analog sensor with Algo² algorithm to maximize detection without false trigger
- Allows existing panel and downlight luminaires to upgrade to luminaire level lighting control (LLLC)
- Daylight Harvesting

CR04

- CR04 is a WIFI dongle which has BLE and Wi-Fi hardware connections
- BLE connects to Keilton devices, Wi-Fi connects to third-party systems
- Provides Modbus TCP and REST APIs simultaneously over Wi-Fi connections
- 1 per zone

CR01

- Powered by USB-A
- Integrated BT module
- Internal battery with Real Time Clock for syncing all devices in the zone, maintaining schedules during power outage
- Integrated TF/MicroSD card maintains log of energy consumption data
- 1 per zone

WP1013 (3 Button) / WP1025 (5 Button)Battery-Powered Bluetooth® Wall Switch

- Quick push-button control of Keilton+autani devices via Bluetooth®
- Powered by a single CR2032 battery
- 10-year typical battery life
- Can be wall-mounted or used as portable remote controller. Can be linked to a light or light group via the Keilton+autani app

WF20R 20A Plug Load Bluetooth® Controller

- 120VAC
- 20A plug load Bluetooth® controller
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autani

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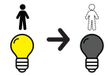
- Bluetooth® network per CR05 may not exceed a radius of 100ft
- Bluetooth® network per CR05 may not exceed 4 hops wireless mesh

TITLE 24 REQUIREMENTS

Luminaire Level Lighting Control (LLLC)

Each luminaire must have individual control, allowing for independent dimming or on/off control for energy efficiency

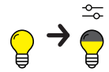


Occupancy Sensors

Required to automatically turn off lighting within 20 minutes of vacancy.

Daylight Harvesting (if applicable)

Required when general lighting in any daylit zone is 75W or more. Must adjust artificial lighting based on daylight.



Manual Override

A readily accessible device to manually control individual luminaires as needed.

Lighting Power Density:

Must comply with prescribed wattage limits(typically 0.8 watts/sq. ft.) as per Title 24.

ADR

OpenADR 2.0a, 2.0b, or OpenADR 3.0 certified. ADR automates reducing or shifting electricity consumption during peak demand periods when the utility grid is most strained. This is also capable of internally driven ADR (oftentimes referred to as just Demand Response). This automation minimizes manual interventions and accelerates response times.

Plug Load Controls

Required for controlled receptacles in office and workstation areas.

Alternative Product Recommendations

PPA104S Line Voltage 20A Bluetooth® Zone Control

- 120-277VAC input
- Integrated 20A relay
- Output power up to 2400W (120VAC), 5540W (277VAC)
- UL Plenum Rated
- 1 HP motor load rated

NOTE: This is an alternative solution for 'receptacle / plug load controls.'

IFS105SE Integrated Round 12V Sensor

- 12VDC input
- Integrated wiring terminal block
- PIR Sensor
- Daylight Harvesting
- Easy installation
- Digital sensor technology designed for low bay applications

NOTE: This is an alternative solution for Luminaire Level Lighting Control

WP1013 (3 Button) / WP1025 (5 Button) Battery-Powered Bluetooth® Wall Switch

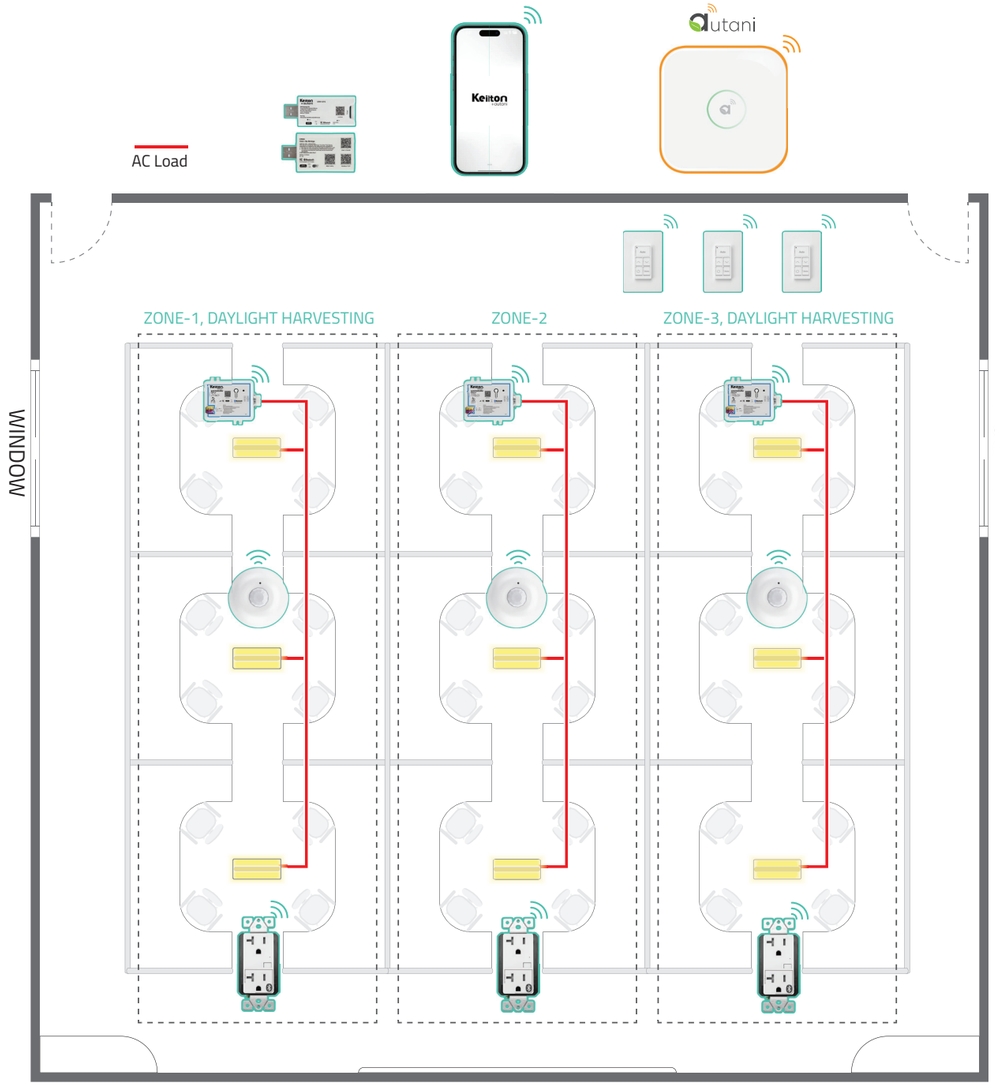
- Quick push-button control of Keilton+autani devices via Bluetooth®
- Powered by a single CR2032 battery
- 10-year typical battery life
- Can be wall-mounted or used as portable remote controller. Can be linked to a light or light group via the Keilton+autani app

Open Office > 250 sq. ft - Zone Control

FLEXIBLE AND COMFORTABLE WORK SPACE

Efficiently control lighting across large open offices using zone-based controls that divide the space into manageable sections of 600 sq ft or less. Each zone has a single occupancy sensor that drives multiple fixtures within that zone, with all fixtures in each zone operating together while wireless wall switches enable occupants to adjust lighting for work activities. The system automatically turns off lights in unoccupied zones while maintaining lighting in active areas, and daylight harvesting reduces energy consumption near windows. Adding plug load control eliminates phantom power from monitors and printers and supports Title 24 usage scenarios by powering down equipment during off hours.

Energy use within the space can be monitored and controlled via phone or tablet using the Keilton+autani app, or elevate to a Tier 3 solution offering analytics capabilities with the Autani Manager.



PRODUCT RECOMMENDATIONS

Keilton + autani LOCAL ROOM-BASED

PPA104S Line Voltage 20A Bluetooth® Zone Control
- 120-277VAC input
- Integrated 20A relay
- Output power up to 2400W (120VAC), 5540W (277VAC)
- UL Plenum Rated
- 1 HP motor load rated

BCS107 Battery Powered Occupancy Sensor
- PIR + Daylight Harvesting
- 600 sq ft room coverage
- Occupancy / vacancy enabled
- Powered by a single CR123A 3V battery
- 10-year typical battery life
- Easy installation with multiple mounting options

CR04
- CR04 is a WIFI dongle which has BLE and Wi-Fi hardware connections
- BLE connects to Keilton devices, Wi-Fi connects to third-party systems
- Provides Modbus TCP and REST APIs simultaneously over Wi-Fi connections
- 1 per zone

CR01
- Powered by USB-A
- Integrated BT module
- Internal battery with Real Time Clock for syncing all devices in the zone, maintaining schedules during power outage
- Integrated TF/MicroSD card maintains log of energy consumption data
- 1 per zone

WP1013 (3 Button) / WP1025 (5 Button)Battery-Powered Bluetooth® Wall Switch
- Quick push-button control of Keilton+autani devices via Bluetooth®
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- Can be wall-mounted or used as portable remote controller. Can be linked to a light or light group via the Keilton+autani app

WF20R 20A Plug Load Bluetooth® Controller
- 120VAC
- 20A plug load Bluetooth® controller
- Controllable via the Keilton+autani app

autani NETWORKED

Autani Manager

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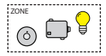
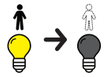
CR05 + RTR
- CR05 and RTR devices work in conjunction with the Manager to bring Bluetooth® lighting controls into your network.
- Bluetooth® network per CR05 may not exceed a radius of 100ft
- Bluetooth® network per CR05 may not exceed 4 hops wireless mesh

TITLE 24 REQUIREMENTS



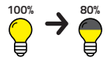
Zone Controls

Lighting must be divided into control zones of no more than 600 sq. ft. per zone for independent lighting control.



Occupancy Sensors

Must automatically turn off lighting within 20 minutes of the space being unoccupied.



Multi-Level Lighting Controls

Required for spaces 100 sq. ft. or larger. Continuous dimming 100%–10% required.

Automatic Shutoff

Lighting must automatically shut off after20 minutes of vacancy.

Daylight Harvesting (if applicable)

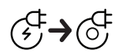
Required when general lighting in any daylit zone is 75W or more. Must adjust artificial lighting based on daylight.

Lighting Power Density

Must comply with prescribed wattage limits (typically 0.8 watts/sq. ft.) for efficient energy use.

ADR

OpenADR 2.0a, 2.0b, or OpenADR 3.0 certified. ADR automates reducing or shifting electricity consumption during peak demand periods when the utility grid is most strained. This is also capable of internally driven ADR (oftentimes referred to as just Demand Response). This automation minimizes manual interventions and accelerates response times.



Plug Load Controls

Required for controlled receptacles in office and workstation areas.

Alternative Product Recommendations

PPA104S Line Voltage 20A Bluetooth® Zone Control
- 120-277VAC input
- Integrated 20A relay
- Output power up to 2400W (120VAC), 5540W (277VAC)
- UL Plenum Rated
- 1 HP motor load rated

NOTE: This is an alternative solution for 'receptacle / plug load controls'.

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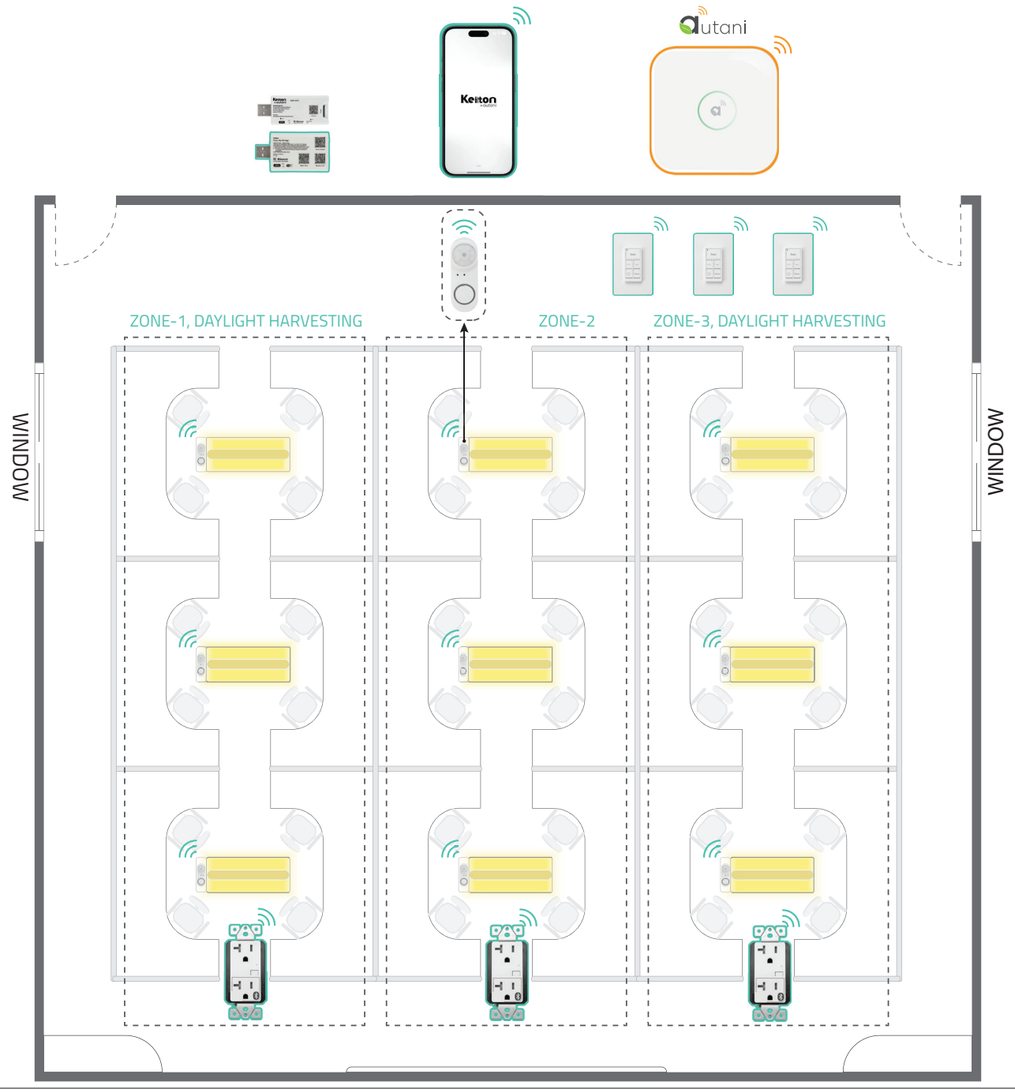
Open Office > 250 sq. ft - LLLC

FLEXIBLE AND COMFORTABLE WORK SPACE

Efficiently control lighting across large open offices with maximum flexibility using Luminaire Level Lighting Controls. Components save on labor because they can be installed on fixtures prior to installation in the ceiling. Individual fixture control enables precise lighting management for varied workstation needs, with wireless wall switches providing grouped control while each fixture remains individually addressable for maximum flexibility**.

Energy use within the space can be monitored and controlled via phone or tablet using the Keilton+autani app, or elevate to a Tier 3 solution offering analytics capabilities with the Autani Manager.

** Daylight harvesting automatically adjusts perimeter fixtures while interior fixtures maintain consistent lighting, and plug load control eliminates phantom power from monitors and printers during off hours.



PRODUCT RECOMMENDATIONS

LOCAL ROOM-BASED

IFS108 Integrated Oval 12V Panel Sensor
- Clip-mount allows sensor to attach to luminaire housing
- 12V sensor with oval shape is ideal form factor for panels
- Bluetooth® PIR analog sensor with Algo² algorithm to maximize detection without false trigger
- Allows existing panel and downlight luminaires to upgrade to luminaire level lighting control (LLLC)
- Daylight Harvesting

CR04
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- Provides Modbus TCP and REST APIs simultaneously over Wi-Fi connections
- 1 per zone

CR01
- Powered by USB-A
- Integrated BT module
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WF20R 20A Plug Load Bluetooth® Controller
- 120VAC
- 20A plug load Bluetooth® controller
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CR05 + RTR
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- Bluetooth® network per CR05 may not exceed a radius of 100ft
- Bluetooth® network per CR05 may not exceed 4 hops wireless mesh

TITLE 24 REQUIREMENTS

Luminaire Level Lighting Control (LLLC)

Each luminaire must have individual control, allowing independent dimming or on/off adjustments for energy efficiency.

Occupancy Sensors

Must automatically shut off lighting within 20 minutes of vacancy.

Daylight Harvesting (if applicable)

Required when general lighting in any daylit zone is 75W or more. Must adjust artificial lighting based on daylight.

Manual Override

Must have manual control available for individual luminaires when needed.

Lighting Power Density

Must comply with prescribed wattage limits (typically 0.8 watts/sq. ft.) for optimal energy use.

ADR

OpenADR 2.0a, 2.0b, or OpenADR 3.0 certified. ADR automates reducing or shifting electricity consumption during peak demand periods when the utility grid is most strained. This is also capable of internally driven ADR (oftentimes referred to as just Demand Response). This automation minimizes manual interventions and accelerates response times.

Plug Load Controls

Required for controlled receptacles in office and workstation areas.

Alternative Product Recommendations

PPA104S Line Voltage 20A Bluetooth® Zone Control
- 120-277VAC input
- Integrated 20A relay
- Output power up to 2400W (120VAC), 5540W (277VAC)
- UL Plenum Rated
- 1 HP motor load rated

NOTE: This is an alternative solution for 'receptacle / plug load controls'.

IFS105SE Integrated Round 12V Sensor
- 12VDC input
- Integrated wiring terminal block
- PIR Sensor
- Daylight Harvesting
- Easy installation
- Digital sensor technology designed for low bay applications

NOTE: This is an alternative solution for Luminaire Level Lighting Control

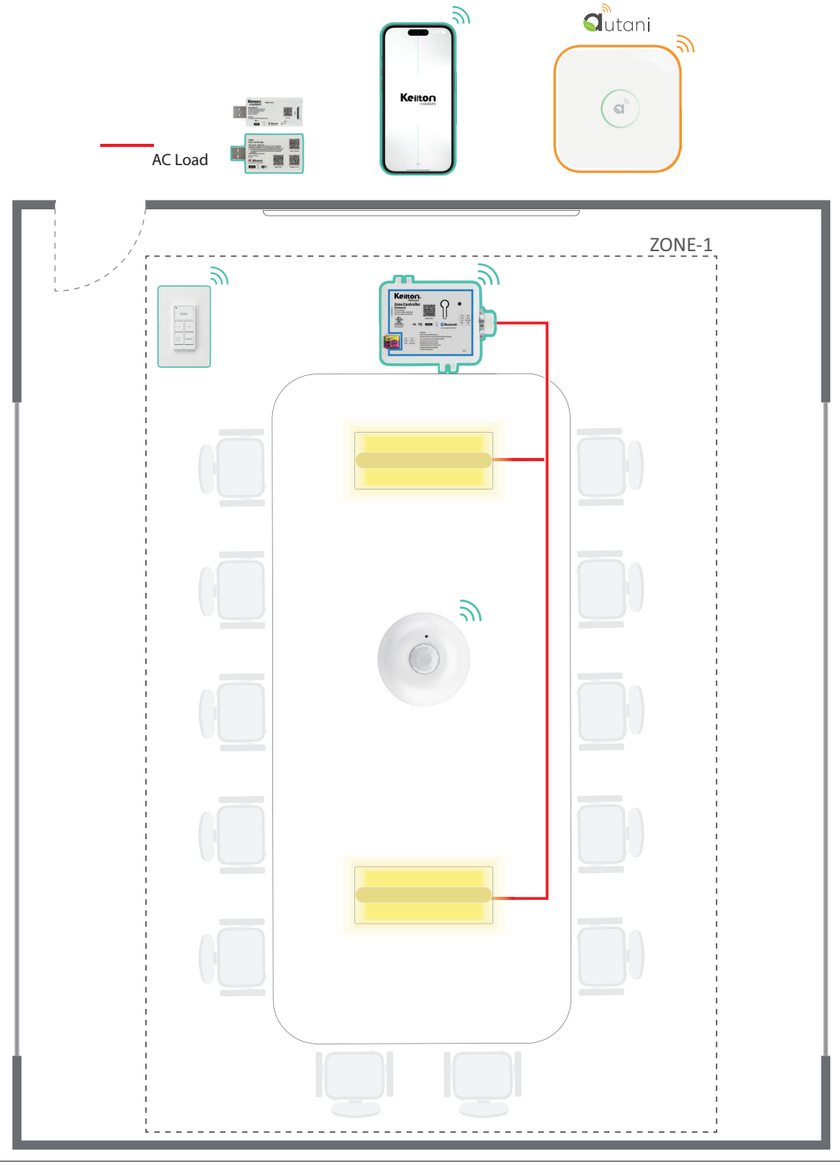
WP1013 (3 Button) / WP1025 (5 Button) Battery-Powered Bluetooth® Wall Switch
- Quick push-button control of Keilton+autani devices via Bluetooth®
- Powered by a single CR2032 battery
- 10-year typical battery life
- Can be wall-mounted or used as portable remote controller. Can be linked to a light or light group via the Keilton+autani app

Conference Room - Zone Control

FLEXIBLE AND COMFORTABLE WORK SPACE

Efficiently control lighting in conference rooms using zone-based controls for flexible meeting scenarios. A single occupancy sensor drives multiple fixtures throughout the space, while wireless wall switches enable presenters to adjust lighting for A/V presentations or full brightness as needed. The system automatically turns off lights when vacant, while daylight harvesting reduces energy consumption near windows.

Energy use within the space can be monitored and controlled via phone or tablet using the Keilton+autani app, or elevate to a Tier 3 solution offering analytics capabilities with the Autani Manager.



PRODUCT RECOMMENDATIONS

LOCAL ROOM-BASED

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- Integrated 20A relay
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- UL Plenum Rated
- 1 HP motor load rated

BCS107 Battery Powered Occupancy Sensor

- PIR + Daylight Harvesting
- 600 sq ft room coverage
- Occupancy / vacancy enabled
- Powered by a single CR123A 3V battery
- 10-year typical battery life
- Easy installation with multiple mounting options

CR04

- CR04 is a WIFI dongle which has BLE and Wi-Fi hardware connections
- BLE connects to Keilton devices, Wi-Fi connects to third-party systems
- Provides Modbus TCP and REST APIs simultaneously over Wi-Fi connections
- 1 per zone

CR01

- Powered by USB-A
- Integrated BT module
- Internal battery with Real Time Clock for syncing all devices in the zone, maintaining schedules during power outage
- Integrated TF/MicroSD card maintains log of energy consumption data
- 1 per zone

WP1013 (3 Button) / WP1025 (5 Button)Battery-Powered Bluetooth® Wall Switch

- Quick push-button control of Keilton+autani devices via Bluetooth®
- Powered by a single CR2032 battery
- 10-year typical battery life
- Can be wall-mounted or used as portable remote controller. Can be linked to a light or light group via the Keilton+autani app

NETWORKED

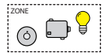
Autani Manager

The Autani Manager is the control processor at the heart of the innovative integrated energy management systems powered by EnergyCenter software. The Manager securely coordinates all energy management functions and provides actionable insights.

CR05 + RTR

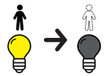
- CR05 and RTR devices work in conjunction with the Manager to bring Bluetooth® lighting controls into your network.
- Bluetooth® network per CR05 may not exceed a radius of 100ft
- Bluetooth® network per CR05 may not exceed 4 hops wireless mesh

TITLE 24 REQUIREMENTS



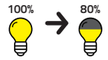
Zone Controls

Lighting must be divided into control zones of no more than 600 sq. ft. per zone for independent lighting control.



Occupancy Sensors

Must automatically turn off lighting within 20 minutes of vacancy.



Multi-Level Lighting Controls

Required for spaces 100 sq. ft. or larger. Continuous dimming 100%–10% required.

Automatic Shutoff

Lighting must automatically shut off after 20 minutes of vacancy.

Daylight Harvesting (if applicable)

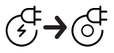
Required when general lighting in any daylit zone is 75W or more. Must adjust artificial lighting based on daylight.

Lighting Power Density

Must comply with prescribed wattage limits (typically 0.8 watts/sq. ft.) for energy-efficient operation.

ADR

OpenADR 2.0a, 2.0b, or OpenADR 3.0 certified. ADR automates reducing or shifting electricity consumption during peak demand periods when the utility grid is most strained. This is also capable of internally driven ADR (oftentimes referred to as just Demand Response). This automation minimizes manual interventions and accelerates response times.



Plug Load Controls

Required for controlled receptacles in office and workstation areas.

Alternative Product Recommendations

PPA104S Line Voltage 20A Bluetooth® Zone Control

- 120-277VAC input
- Integrated 20A relay
- Output power up to 2400W (120VAC), 5540W (277VAC)
- UL Plenum Rated
- 1 HP motor load rated

NOTE: This is an alternative solution for 'receptacle / plug load controls'.

WP1013 (3 Button) / WP1025 (5 Button) Battery-Powered Bluetooth® Wall Switch

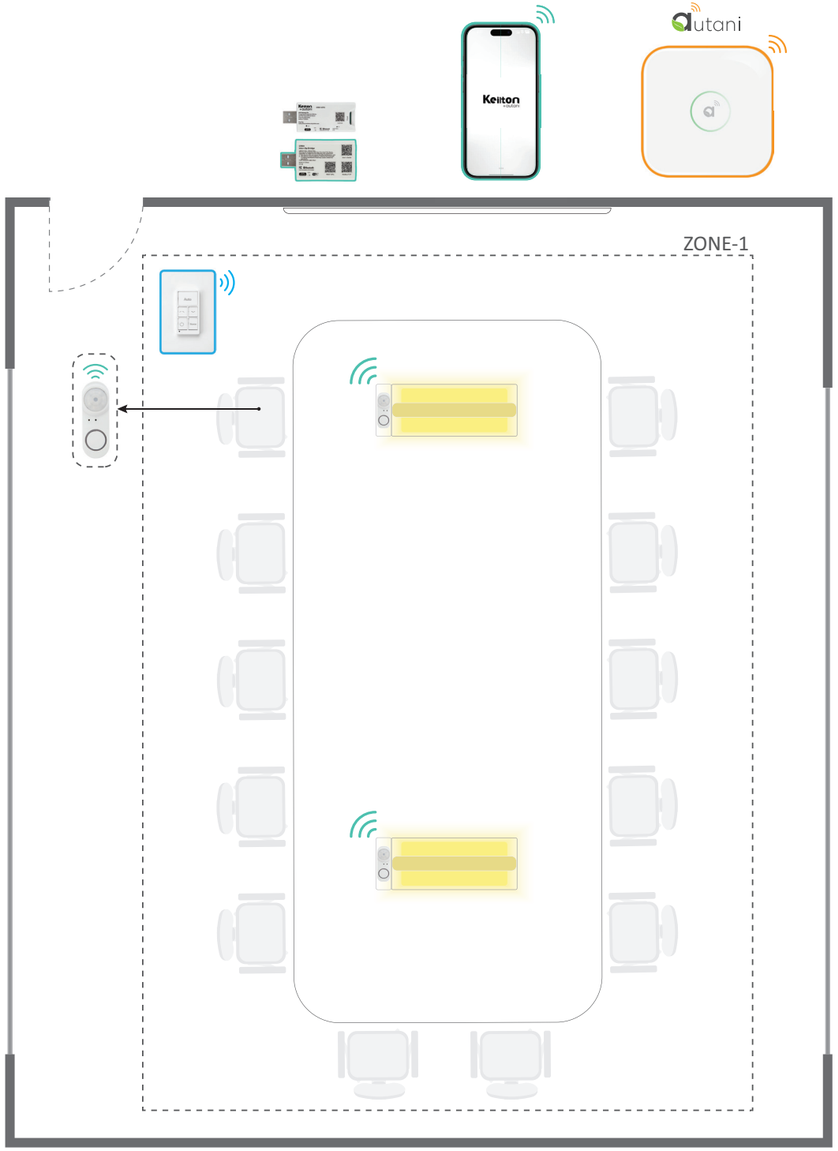
- Quick push-button control of Keilton+autani devices via Bluetooth®
- Powered by a single CR2032 battery
- 10-year typical battery life
- Can be wall-mounted or used as portable remote controller. Can be linked to a light or light group via the Keilton+autani app

Conference Room- LLLC

FLEXIBLE AND COMFORTABLE WORK SPACE

Luminaire Level Lighting Controls save on labor because components can be installed on fixtures prior to installation in the ceiling. Individual fixture control enables precise lighting management, with wireless wall switches providing grouped control while lights remain virtually grouped and individually addressable for maximum flexibility. The system supports meeting scenarios from full brightness to dimmed A/V presentations, with automatic shutoff when vacant.

Energy use within the space can be monitored and controlled via phone or tablet using the Keilton+autani app, or elevate to a Tier 3 solution offering analytics capabilities with the Autani Manager.



PRODUCT RECOMMENDATIONS

LOCAL ROOM-BASED

IFS108 Integrated Oval 12V Panel Sensor

- Clip-mount allows sensor to attach to luminaire housing
- 12V sensor with oval shape is ideal form factor for panels
- Bluetooth® PIR analog sensor with Algo² algorithm to maximize detection without false trigger
- Allows existing panel and downlight luminaires to upgrade to luminaire level lighting control (LLLC)
- Daylight Harvesting

CR04

- CR04 is a WIFI dongle which has BLE and Wi-Fi hardware connections
- BLE connects to Keilton devices, Wi-Fi connects to third-party systems
- Provides Modbus TCP and REST APIs simultaneously over Wi-Fi connections
- 1 per zone

CR01

- Powered by USB-A
- Integrated BT module
- Internal battery with Real Time Clock for syncing all devices in the zone, maintaining schedules during power outage
- Integrated TF/MicroSD card maintains log of energy consumption data
- 1 per zone

WP1013 (3 Button) / WP1025 (5 Button)Battery-Powered Bluetooth® Wall Switch

- Quick push-button control of Keilton+autani devices via Bluetooth®
- Powered by a single CR2032 battery
- 10-year typical battery life
- Can be wall-mounted or used as portable remote controller. Can be linked to a light or light group via the Keilton+autani app

NETWORKED

Autani Manager

The Autani Manager is the control processor at the heart of the innovative integrated energy management systems powered by EnergyCenter software. The Manager securely coordinates all energy management functions and provides actionable insights.

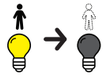
CR05 + RTR

- CR05 and RTR devices work in conjunction with the Manager to bring Bluetooth® lighting controls into your network.
- Bluetooth® network per CR05 may not exceed a radius of 100ft
- Bluetooth® network per CR05 may not exceed 4 hops wireless mesh

TITLE 24 REQUIREMENTS

Luminaire Level Lighting Control (LLLC)

Each luminaire must have individual control, allowing for independent dimming or on/off adjustments to optimize energy efficiency.

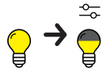


Occupancy Sensors

Must automatically shut off lighting within 20 minutes of vacancy.

Daylight Harvesting (if applicable)

Required when general lighting in any daylit zone is 75W or more. Must adjust artificial lighting based on daylight.



Manual Override

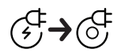
A manual control must be available for each luminaire for user adjustments

Lighting Power Density

Must comply with prescribed wattage limits (typically 0.8 watts/sq. ft.) for energy-efficient lighting.

ADR

OpenADR 2.0a, 2.0b, or OpenADR 3.0 certified. ADR automates reducing or shifting electricity consumption during peak demand periods when the utility grid is most strained. This is also capable of internally driven ADR (oftentimes referred to as just Demand Response). This automation minimizes manual interventions and accelerates response times.



Plug Load Controls

Required for controlled receptacles in office and workstation areas.

Alternative Product Recommendations

PPA104S Line Voltage 20A Bluetooth® Zone Control

- 120-277VAC input
- Integrated 20A relay
- Output power up to 2400W (120VAC), 5540W (277VAC)
- UL Plenum Rated
- 1 HP motor load rated

NOTE: This is an alternative solution for 'receptacle / plug load controls'.

IFS105SE Integrated Round 12V Sensor

- 12VDC input
- Integrated wiring terminal block
- PIR Sensor
- Daylight Harvesting
- Easy installation
- Digital sensor technology designed for low bay applications

NOTE: This is an alternative solution for Luminaire Level Lighting Control

WP1013 (3 Button) / WP1025 (5 Button) Battery-Powered Bluetooth® Wall Switch

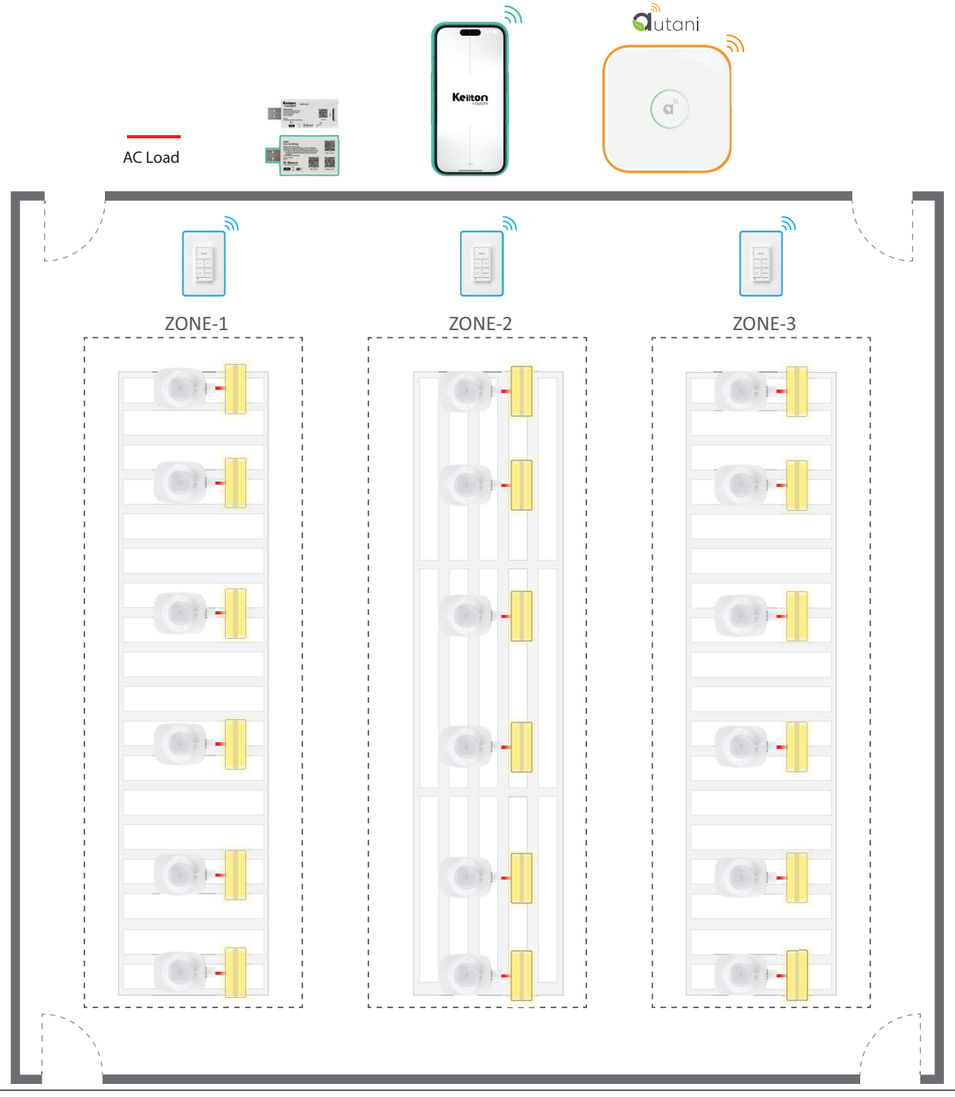
- Quick push-button control of Keilton+autani devices via Bluetooth®
- Powered by a single CR2032 battery
- 10-year typical battery life
- Can be wall-mounted or used as portable remote controller. Can be linked to a light or light group via the Keilton+autani app

Warehouse / Highbay - LLLC

SAFE AND SECURE OPERATING ENVIRONMENT

Nearly 66% of the utility spend in a warehouse can be attributed to lighting. By adding highbay sensors, you can be sure that all areas of your warehouse or manufacturing facility are always lit to the most appropriate levels, balancing both safety and savings. Lights can be virtually grouped to dim and switch on / off together. Each fixture is also individually addressable, allowing for the most flexibility and the most savings. Whether you own or lease your warehouse space, managing your facilities with Our solutions can reduce energy and maintenance costs, creating a more comfortable and secure operating environment for your customers and your employees.

Energy use within the space can be monitored and controlled via phone or tablet using the Keilton+autani app, or elevate to a Tier 3 solution offering analytics capabilities with the Autani Manager.



PRODUCT RECOMMENDATIONS

LOCAL ROOM-BASED

WP1013 (3 Button) / WP1025 (5 Button)Battery-Powered Bluetooth® Wall Switch

- Quick push-button control of Keilton+autani devices via Bluetooth®
- Powered by a single CR2032 battery
- 10-year typical battery life
- Can be wall-mounted or used as portable remote controller, Can be linked to a light or light group via the Keilton+autani app

CR04

- CR04 is a WIFI dongle which has BLE and Wi-Fi hardware connections
- BLE connects to Keilton devices, Wi-Fi connects to third-party systems
- Provides Modbus TCP and REST APIs simultaneously over Wi-Fi connections
- 1 per zone

CR01

- Powered by USB-A
- Integrated BT module
- Internal battery with Real Time Clock for syncing all devices in the zone, maintaining schedules during power outage
- Integrated TF/MicroSD card maintains log of energy consumption data
- 1 per zone

EFS104 External Line Voltage High Bay Sensor

- 120-277VAC input
- Connects with 1/2" standard knockout
- Daylight Harvesting
- Bluetooth® PIR analog sensor with Algo2 algorithm to maximize detection without false trigger
- Replaceable lens options

NOTE: Lens sold separately

NETWORKED

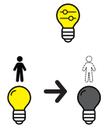
Autani Manager

The Autani Manager is the control processor at the heart of the innovative integrated energy management systems powered by EnergyCenter software. The Manager securely coordinates all energy management functions and provides actionable insights.

CR05 + RTR

- CR05 and RTR devices work in conjunction with the Manager to bring Bluetooth® lighting controls into your network.
- Bluetooth® network per CR05 may not exceed a radius of 100ft
- Bluetooth® network per CR05 may not exceed 4 hops wireless mesh

TITLE 24 REQUIREMENTS

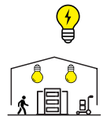


Luminaire Level Lighting Control (LLLC)
Each luminaire must have individual control for dimming or on/off adjustments to optimize energy use.

Occupancy Sensors
Lighting must automatically turn off within 20 minutes of vacancy.

Daylight Harvesting (if applicable)
Required if the space has natural daylight, adjusting lighting to match daylight levels.

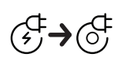
Manual Override
Manual control must be provided for each luminaire.



Lighting Power Density (LPD)
Must comply with 0.8 watts/sq. ft. or use energy-efficient controls for higher wattage.

Highbay Lighting
Dimming required if the lighting load exceeds 1,000 watts. Occupancy sensors ensure lighting is on only when needed.

ADR
OpenADR 2.0a, 2.0b, or OpenADR 3.0 certified. ADR automates reducing or shifting electricity consumption during peak demand periods when the utility grid is most strained. This is also capable of internally driven ADR (oftentimes referred to as just Demand Response). This automation minimizes manual interventions and accelerates response times.



Plug Load Controls
Required for controlled receptacles in office and workstation areas.

Alternative Product Recommendations

PPA104S Line Voltage 20A Bluetooth® Zone Control

- 120-277VAC input
- Integrated 20A relay
- Output power up to 2400W (120VAC), 5540W (277VAC)
- UL Plenum Rated
- 1 HP motor load rated

NOTE: This is an alternative solution for 'receptacle / plug load controls'.

EFS106-AUX Plug and Play High Bay Long-Range Sensor

- 3.5mm audio jack connector
- Enhanced long-range antenna with up to 328 ft Bluetooth® transmission range
- Plug and Play 12V sensor with integrated connector
- Bluetooth® PIR analog sensor with Algo² algorithm to maximize detection without false trigger
- Replaceable lens options

NOTE: Lens sold separately

HBL3-2-W High Bay Lens

- Designed for 20 to 50 ft mounting heights
- IP40
- Powerful high bay lens with 360 degree coverage
- Optimized for open area and aisleway coverage in high bay applications
- Multi-cell, multi-tier Fresnel lens with high density coverage patterns

WP1018A 8-Key Battery-Powered Bluetooth® Wall Switch

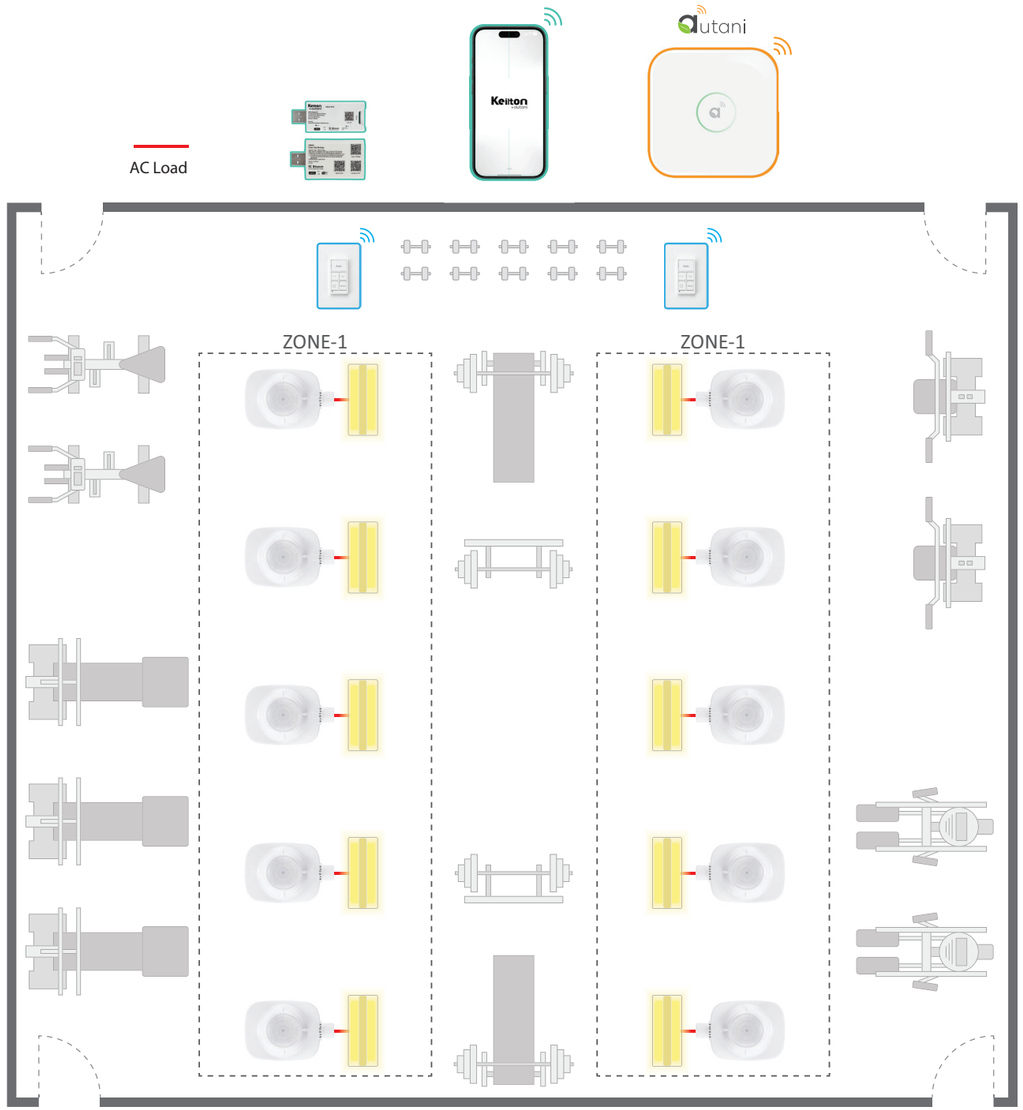
- Quick push-button control of Keilton+autani devices via Bluetooth®
- Powered by two AAA batteries
- 10-year typical battery life
- Can be wall-mounted or used as portable remote controller. Can be linked to a light or light group via the Keilton+autani app

Gymnasium - LLLC

SAFE AND VERSATILE ATHLETIC SPACE

By adding highbay sensors to a gymnasium, you can ensure all gymnasium areas are lit to appropriate levels for fitness activities and weight training. Individual fixture control enables precise lighting management for different workout areas, weight sections, and cardio zones, with wireless wall switches providing grouped control. Lights can be virtually grouped to operate together while each fixture remains individually addressable for maximum flexibility, while maintaining safety and reducing energy costs during vacant periods.

Energy use within the space can be monitored and controlled via phone or tablet using the Keilton+autani app, or elevate to a Tier 3 solution offering analytics capabilities with the Autani Manager.



PRODUCT RECOMMENDATIONS

LOCAL ROOM-BASED

WP1013 (3 Button) / WP1025 (5 Button)Battery-Powered Bluetooth® Wall Switch

- Quick push-button control of Keilton+autani devices via Bluetooth®
- Powered by a single CR2032 battery
- 10-year typical battery life
- Can be wall-mounted or used as portable remote controller. Can be linked to a light or light group via the Keilton+autani app

CR04

- CR04 is a WIFI dongle which has BLE and Wi-Fi hardware connections
- BLE connects to Keilton devices, Wi-Fi connects to third-party systems
- Provides Modbus TCP and REST APIs simultaneously over Wi-Fi connections
- 1 per zone

CR01

- Powered by USB-A
- Integrated BT module
- Internal battery with Real Time Clock for syncing all devices in the zone, maintaining schedules during power outage
- Integrated TF/MicroSD card maintains log of energy consumption data
- 1 per zone

EFS104 External Line Voltage High Bay Sensor

- 120-277VAC input
- Connects with 1/2" standard knockout
- Daylight Harvesting
- Bluetooth® PIR analog sensor with Algo2 algorithm to maximize detection without false trigger
- Replaceable lens options

NOTE: Lens sold separately

NETWORKED

Autani Manager

The Autani Manager is the control processor at the heart of the innovative integrated energy management systems powered by EnergyCenter software. The Manager securely coordinates all energy management functions and provides actionable insights.

CR05 + RTR

- CR05 and RTR devices work in conjunction with the Manager to bring Bluetooth® lighting controls into your network.
- Bluetooth® network per CR05 may not exceed a radius of 100ft
- Bluetooth® network per CR05 may not exceed 4 hops wireless mesh

TITLE 24 REQUIREMENTS

Luminaire Level Lighting Control (LLLC)
Each individual luminaire must have independent control for dimming or on/off adjustments.

Occupancy Sensors
Lighting must automatically turn off within 20 minutes of vacancy.

Daylight Harvesting (if applicable)
Required if the space has significant natural daylight, adjusting lighting to match daylight levels.

Manual Override
Manual control must be available for each luminaire.

Lighting Power Density (LPD)
Must comply with prescribed wattage limits (typically 0.8 watts/sq. ft.).

Highbay Lighting
Highbay luminaires must comply with dimming controls if the lighting load exceeds 1,000 watts and must include occupancy sensors.

ADR
OpenADR 2.0a, 2.0b, or OpenADR 3.0 certified. ADR automates reducing or shifting electricity consumption during peak demand periods when the utility grid is most strained. This is also capable of internally driven ADR (oftentimes referred to as just Demand Response). This automation minimizes manual interventions and accelerates response times.

Plug Load Controls
Required for controlled receptacles in office and workstation areas.

Alternative Product Recommendations

PPA104S Line Voltage 20A Bluetooth® Zone Control

- 120-277VAC input
- Integrated 20A relay
- Output power up to 2400W (120VAC), 5540W (277VAC)
- UL Plenum Rated
- 1 HP motor load rated

NOTE: This is an alternative solution for 'receptacle / plug load controls'.

EFS106-AUX Plug and Play High Bay Long-Range Sensor

- 3.5mm audio jack connector
- Enhanced long-range antenna with up to 328 ft Bluetooth® transmission range
- Plug and Play 12V sensor with integrated connector
- Bluetooth® PIR analog sensor with Algo^2 algorithm to maximize detection without false trigger
- Replaceable lens options

NOTE: Lens sold separately

HBL3-2-W High Bay Lens

- Designed for 20 to 50 ft mounting heights
- IP40
- Powerful high bay lens with 360 degree coverage
- Optimized for open area and aisleway coverage in high bay applications
- Multi-cell, multi-tier Fresnel lens with high density coverage patterns

WP1018A 8-Key Battery-Powered Bluetooth® Wall Switch

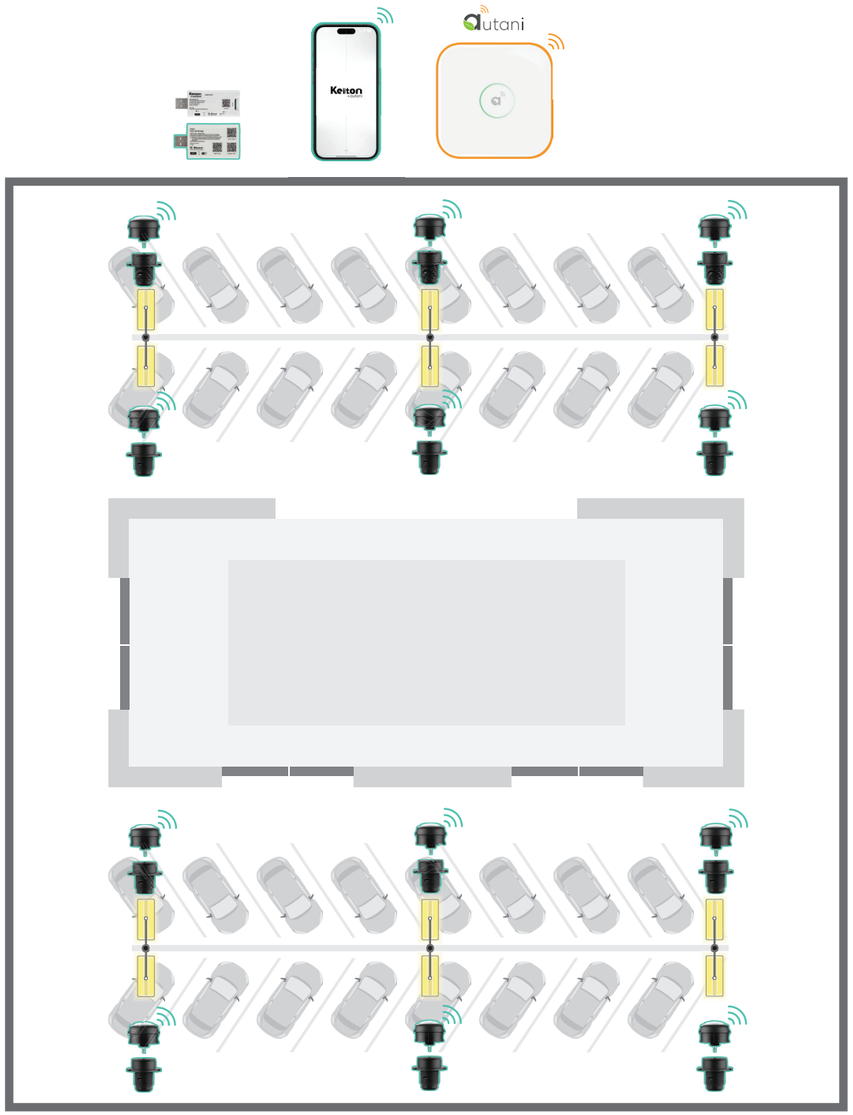
- Quick push-button control of Keilton+autani devices via Bluetooth®
- Powered by two AAA batteries
- 10-year typical battery life
- Can be wall-mounted or used as portable remote controller. Can be linked to a light or light group via the Keilton+autani app

Site Lighting - LLLC

SAFE AND EFFICIENT OUTDOOR SPACES

Wireless outdoor lighting management ensures that your grounds are properly illuminated at the right place, at the right time. Individual fixture control helps balance energy savings, safety, and appropriate light levels. Lights can be virtually grouped while remaining individually addressable for maximum flexibility, with dimming control allowing adjustment of lighting levels during non-business hours.

Energy use within the space can be monitored and controlled via phone or tablet using the Keilton+autani app, or elevate to a Tier 3 solution offering analytics capabilities with the Autani Manager.



PRODUCT RECOMMENDATIONS

LOCAL ROOM-BASED

EFS106-AUX-W Plug and Play High Bay Long-Range Sensor

- 3.5mm audio jack connector
- Enhanced long-range antenna with up to 328 ft Bluetooth® transmission range
- Plug and Play 12V sensor with integrated connector
- Bluetooth® PIR analog sensor with Algo2 algorithm to maximize detection without false trigger
- Replaceable lens options

NOTE: Lens sold separately

CR04

- CR04 is a WIFI dongle which has BLE and Wi-Fi hardware connections
- BLE connects to Keilton devices, Wi-Fi connects to third-party systems
- Provides Modbus TCP and REST APIs simultaneously over Wi-Fi connections
- 1 per zone

CR01

- Powered by USB-A
- Integrated BT module
- Internal battery with Real Time Clock for syncing all devices in the zone, maintaining schedules during power outage
- Integrated TF/MicroSD card maintains log of energy consumption data
- 1 per zone

WHBL1-2-B Wet Location High Bay Lens

- Designed for 20 to 40 ft mounting heights
- IP66
- Powerful high bay lens with 360 degree coverage
- Optimized for open area and aisle way coverage in high bay applications
- Multi-cell, multi-tier Fresnel lens with high density coverage patterns

WSC01

- Outdoor rated
- 3.5mm audio jack receptacle
- Allows additional fixture types to be used in plug and play luminaire level lighting control (LLLC)
- Low-profile design with minimal depth into housing and minimal height above luminaire
- Waterproof version offers UV-resistant high-impact rated covers to fully seal and protect the receptacles

NETWORKED

Autani Manager

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CR05 + RTR

- CR05 and RTR devices work in conjunction with the Manager to bring Bluetooth® lighting controls into your network.
- Bluetooth® network per CR05 may not exceed a radius of 100ft
- Bluetooth® network per CR05 may not exceed 4 hops wireless mesh

TITLE 24 REQUIREMENTS

Luminaire Shielding (BUG Requirements)

Outdoor luminaires with 6,200 lumens or more must comply with Backlight, Uplight, and Glare (BUG) shielding requirements.

Control for Outdoor Lighting

Outdoor lighting must have independent control from other loads, including automatic scheduling and motion sensing controls.

Automatic Scheduling

Outdoor luminaires must have automatic scheduling controls to reduce energy during off-peak hours.

Motion Sensing Controls

Outdoor luminaires must include motion sensing to activate lights based on occupancy.

Manual Override

A manual override must be available for each luminaire, allowing for user adjustment.

Lighting Power Density (LPD)

Must comply with prescribed wattage limits (typically 0.8 watts/sq. ft.) for energy-efficient operation.

High-Wattage Outdoor Luminaires

High-wattage luminaires must comply with energy standards and include LLLC or dimming controls.

ADR

OpenADR 2.0a, 2.0b, or OpenADR 3.0 certified. ADR automates reducing or shifting electricity consumption during peak demand periods when the utility grid is most strained. This is also capable of internally driven ADR (oftentimes referred to as just Demand Response). This automation minimizes manual interventions and accelerates response times.

Plug Load Controls

Required for controlled receptacles in office and workstation areas.

Alternative Product Recommendations

PPA104S Line Voltage 20A Bluetooth® Zone Control

- 120-277VAC input
- Integrated 20A relay
- Output power up to 2400W (120VAC), 5540W (277VAC)
- UL Plenum Rated
- 1 HP motor load rated

NOTE: This is an alternative solution for 'receptacle / plug load controls'.

WP1013 (3 Button) / WP1025 (5 Button) Battery-Powered Bluetooth® Wall Switch

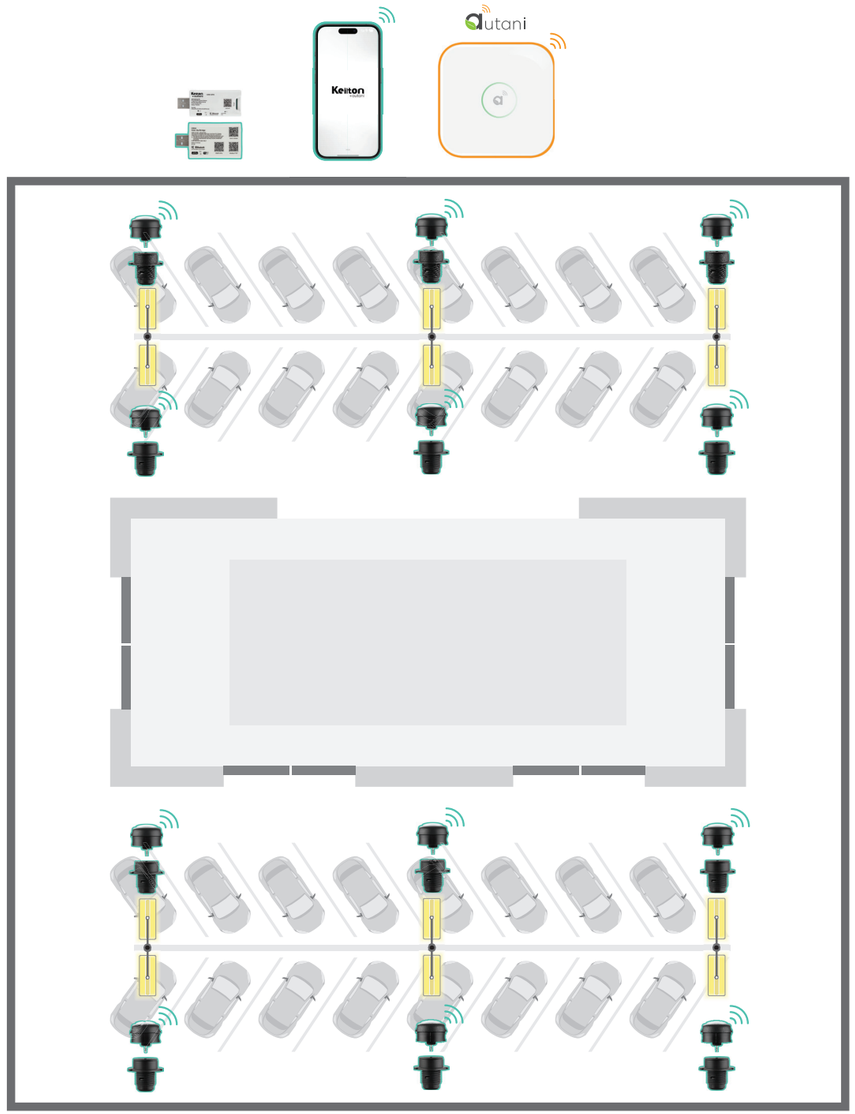
- Quick push-button control of Keilton+autani devices via Bluetooth®
- Powered by a single CR2032 battery
- 10-year typical battery life
- Can be wall-mounted or used as portable remote controller. Can be linked to a light or light group via the Keilton+autani app

Parking Deck - LLLC

SAFE AND EFFICIENT OUTDOOR SPACES

Wireless outdoor lighting management ensures parking areas are safely illuminated for vehicles and pedestrians. Individual fixture control allows lights to be virtually grouped to operate together while each fixture remains individually addressable for maximum flexibility. Motion sensing provides full lighting when areas are occupied while automatically reducing power in vacant areas, optimizing energy consumption while maintaining essential security illumination throughout the parking structure.

Energy use within the space can be monitored and controlled via phone or tablet using the Keilton+autani app, or elevate to a Tier 3 solution offering analytics capabilities with the Autani Manager.



PRODUCT RECOMMENDATIONS

LOCAL ROOM-BASED

EFS106-AUX-W Plug and Play High Bay Long-Range Sensor

- 3.5mm audio jack connector
- Enhanced long-range antenna with up to 328 ft Bluetooth® transmission range
- Plug and Play 12V sensor with integrated connector
- Bluetooth® PIR analog sensor with Algo2 algorithm to maximize detection without false trigger
- Replaceable lens options

NOTE: Lens sold separately

CR04

- CR04 is a WIFI dongle which has BLE and Wi-Fi hardware connections
- BLE connects to Keilton devices, Wi-Fi connects to third-party systems
- Provides Modbus TCP and REST APIs simultaneously over Wi-Fi connections
- 1 per zone

CR01

- Powered by USB-A
- Integrated BT module
- Internal battery with Real Time Clock for syncing all devices in the zone, maintaining schedules during power outage
- Integrated TF/MicroSD card maintains log of energy consumption data
- 1 per zone

WHBL1-2-B Wet Location High Bay Lens

- Designed for 20 to 40 ft mounting heights
- IP66
- Powerful high bay lens with 360 degree coverage
- Optimized for open area and aisle way coverage in high bay applications
- Multi-cell, multi-tier Fresnel lens with high density coverage patterns

WSC01

- Outdoor rated
- 3.5mm audio jack receptacle
- Allows additional fixture types to be used in plug and play luminaire level lighting control (LLLC)
- Low-profile design with minimal depth into housing and minimal height above luminaire
- Waterproof version offers UV-resistant high-impact rated covers to fully seal and protect the receptacles

NETWORKED

Autani Manager

The Autani Manager is the control processor at the heart of the innovative integrated energy management systems powered by EnergyCenter software. The Manager securely coordinates all energy management functions and provides actionable insights.

CR05 + RTR

- CR05 and RTR devices work in conjunction with the Manager to bring Bluetooth® lighting controls into your network.
- Bluetooth® network per CR05 may not exceed a radius of 100ft
- Bluetooth® network per CR05 may not exceed 4 hops wireless mesh

TITLE 24 REQUIREMENTS

Luminaire Shielding (BUG Requirements)

Outdoor luminaires with 6,200 lumens or more must comply with Backlight, Uplight, and Glare (BUG) shielding requirements.

Control for Outdoor Lighting

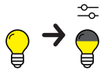
Outdoor lighting must have independent control from other loads, including automatic scheduling and motion sensing controls.

Automatic Scheduling

Outdoor luminaires must have automatic scheduling controls to reduce energy during off-peak hours.

Motion Sensing Controls

Outdoor luminaires must include motion sensing to activate lights based on occupancy.



Manual Override

A manual override must be available for each luminaire, allowing for user adjustment.

Lighting Power Density (LPD)

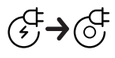
Must comply with prescribed wattage limits (typically 0.8 watts/sq. ft.) for energy-efficient operation.

High-Wattage Outdoor Luminaires

High-wattage luminaires must comply with energy standards and include LLLC or dimming controls.

ADR

OpenADR 2.0a, 2.0b, or OpenADR 3.0 certified. ADR automates reducing or shifting electricity consumption during peak demand periods when the utility grid is most strained. This is also capable of internally driven ADR (oftentimes referred to as just Demand Response). This automation minimizes manual interventions and accelerates response times.



Plug Load Controls

Required for controlled receptacles in office and workstation areas.

Alternative Product Recommendations

PPA104S Line Voltage 20A Bluetooth® Zone Control

- 120-277VAC input
- Integrated 20A relay
- Output power up to 2400W (120VAC), 5540W (277VAC)
- UL Plenum Rated
- 1 HP motor load rated

NOTE: This is an alternative solution for 'receptacle / plug load controls.'

WP1013 (3 Button) / WP1025 (5 Button) Battery-Powered Bluetooth® Wall Switch

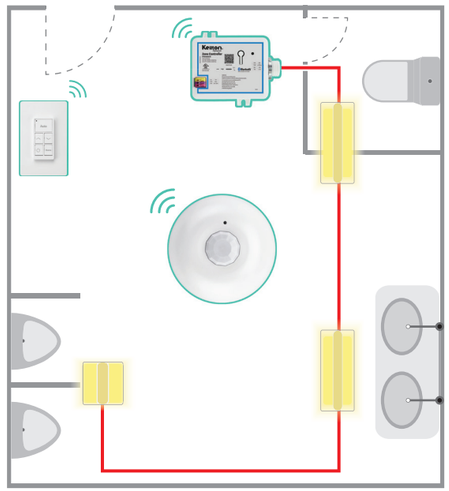
- Quick push-button control of Keilton+autani devices via Bluetooth®
- Powered by a single CR2032 battery
- 10-year typical battery life
- Can be wall-mounted or used as portable remote controller. Can be linked to a light or light group via the Keilton+autani app

Restroom - Single Stall

COMFORTABLE AND SAFE SPACE

Efficiently control lighting in single-stall restrooms using integrated occupancy sensors for optimal privacy and energy management. The system automatically turns lights on when the restroom is occupied and off when vacant, while providing manual override capability for maintenance when needed. Motion detection is optimized for enclosed restroom spaces, meeting Title 24 requirements while providing reliable, responsive lighting for user comfort and safety.

Energy use within the space can be monitored and controlled via phone or tablet using the Keilton+autani app, or elevate to a Tier 3 solution offering analytics capabilities with the Autani Manager.



PRODUCT RECOMMENDATIONS

LOCAL ROOM-BASED

PPA104S Line Voltage 20A Bluetooth® Zone Control

- 120-277VAC input
- Integrated 20A relay
- Output power up to 2400W (120VAC), 5540W (277VAC)
- UL Plenum Rated
- 1 HP motor load rated

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- Quick push-button control of Keilton+autani devices via Bluetooth®
- Powered by a single CR2032 battery
- 10-year typical battery life
- Can be wall-mounted or used as portable remote controller. Can be linked to a light or light group via the Keilton+autani app

BCS107 Battery Powered Occupancy Sensor

- PIR + Daylight Harvesting
- 600 sq ft room coverage
- Occupancy / vacancy enabled
- Powered by a single CR123A 3V battery
- 10-year typical battery life
- Easy installation with multiple mounting options

CR04

- CR04 is a WIFI dongle which has BLE and Wi-Fi hardware connections
- BLE connects to Keilton devices, Wi-Fi connects to third-party systems
- Provides Modbus TCP and REST APIs simultaneously over Wi-Fi connections
- 1 per zone

CR01

- Powered by USB-A
- Integrated BT module
- Internal battery with Real Time Clock for syncing all devices in the zone, maintaining schedules during power outage
- Integrated TF/MicroSD card maintains log of energy consumption data
- 1 per zone

NETWORKED

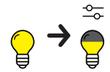
Autani Manager

The Autani Manager is the control processor at the heart of the innovative integrated energy management systems powered by EnergyCenter software. The Manager securely coordinates all energy management functions and provides actionable insights.

CR05 + RTR

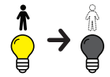
- CR05 and RTR devices work in conjunction with the Manager to bring Bluetooth® lighting controls into your network.
- Bluetooth® network per CR05 may not exceed a radius of 100ft
- Bluetooth® network per CR05 may not exceed 4 hops wireless mesh

TITLE 24 REQUIREMENTS



Manual Controls

Accessible to occupants, within or in view of the space.



Occupancy Sensors

Must turn off lighting within 20 minutes of vacancy.

Multi-Level Lighting Controls

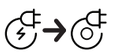
Required for restrooms 100 sq. ft. or larger. Continuous dimming 100%–10% required.

Automatic Daylighting Controls

Required when general lighting in any daylit zone is 75W or more. Must adjust lighting accordingly.

ADR

OpenADR 2.0a, 2.0b, or OpenADR 3.0 certified. ADR automates reducing or shifting electricity consumption during peak demand periods when the utility grid is most strained. This is also capable of internally driven ADR (oftentimes referred to as just Demand Response). This automation minimizes manual interventions and accelerates response times.



Plug Load Controls

Required for controlled receptacles in office and workstation areas.

Alternative Product Recommendations

PPA104S Line Voltage 20A Bluetooth® Zone Control

- 120-277VAC input
- Integrated 20A relay
- Output power up to 2400W (120VAC), 5540W (277VAC)
- UL Plenum Rated
- 1 HP motor load rated

NOTE: This is an alternative solution for 'receptacle / plug load controls'.

DWS102 Line Voltage Occ/Vacancy Sensor Bluetooth® Wall Switch

- 120-277VAC
- Ideal retrofit of existing wall controls (neutral is required)
- Occupancy and vacancy control of Keilton+autani devices via Bluetooth®
- Integrated relay, Ultrasonic sensor, and photo sensor with Hold-Off functionality

WP1018A 8-Key Battery-Powered Bluetooth® Wall Switch

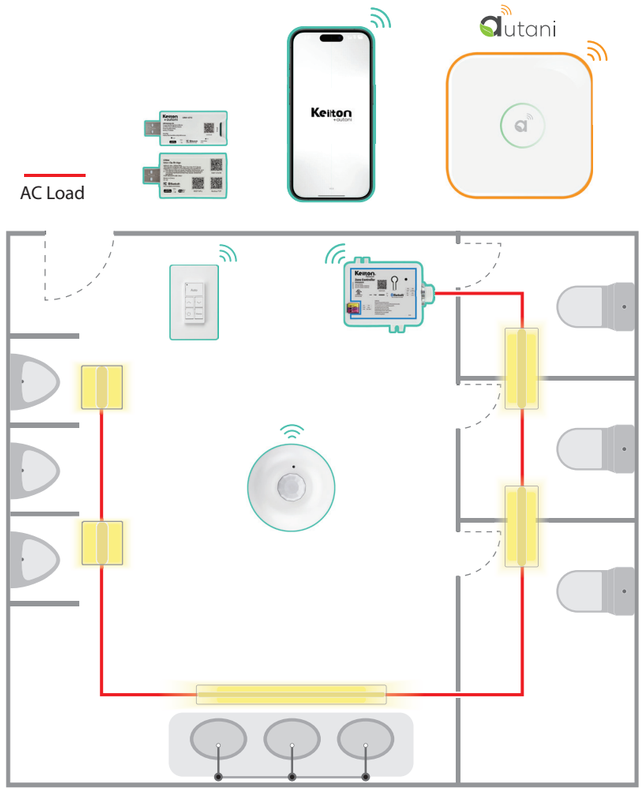
- Quick push-button control of Keilton+autani devices via Bluetooth®
- Powered by two AAA batteries
- 10-year typical battery life
- Can be wall-mounted or used as portable remote controller. Can be linked to a light or light group via the Keilton+autani app

Restroom - Multi Stall

COMFORTABLE AND SAFE SPACE

Efficiently control lighting in multi-stall restrooms using occupancy sensors that manage larger restroom facilities. The system automatically turns lights on when any occupancy is detected and off when the entire restroom is vacant, while providing manual override capability for facility staff when needed. Motion detection responds to movement throughout the multi-stall space, meeting Title 24 requirements while ensuring reliable lighting for user comfort and safety across the entire facility.

Energy use within the space can be monitored and controlled via phone or tablet using the Keilton+autani app, or elevate to a Tier 3 solution offering analytics capabilities with the Autani Manager.



PRODUCT RECOMMENDATIONS

LOCAL ROOM-BASED

PPA104S Line Voltage 20A Bluetooth® Zone Control
- 120-277VAC input
- Integrated 20A relay
- Output power up to 2400W (120VAC), 5540W (277VAC)
- UL Plenum Rated
- 1 HP motor load rated

WP1013 (3 Button) / WP1025 (5 Button) Battery-Powered Bluetooth® Wall Switch
- Quick push-button control of Keilton+autani devices via Bluetooth®
- Powered by a single CR2032 battery
- 10-year typical battery life
- Can be wall-mounted or used as portable remote controller. Can be linked to a light or light group via the Keilton+autani app

BCS107 Battery Powered Occupancy Sensor
- PIR + Daylight Harvesting
- 600 sq ft room coverage
- Occupancy / vacancy enabled
- Powered by a single CR123A 3V battery
- 10-year typical battery life
- Easy installation with multiple mounting options

CR04
- CR04 is a WIFI dongle which has BLE and Wi-Fi hardware connections
- BLE connects to Keilton devices, Wi-Fi connects to third-party systems
- Provides Modbus TCP and REST APIs simultaneously over Wi-Fi connections
- 1 per zone

CR01
- Powered by USB-A
- Integrated BT module
- Internal battery with Real Time Clock for syncing all devices in the zone, maintaining schedules during power outage
- Integrated TF/MicroSD card maintains log of energy consumption data
- 1 per zone

NETWORKED

Autani Manager

The Autani Manager is the control processor at the heart of the innovative integrated energy management systems powered by EnergyCenter software. The Manager securely coordinates all energy management functions and provides actionable insights.

CR05 + RTR
- CR05 and RTR devices work in conjunction with the Manager to bring Bluetooth® lighting controls into your network.
- Bluetooth® network per CR05 may not exceed a radius of 100ft
- Bluetooth® network per CR05 may not exceed 4 hops wireless mesh

TITLE 24 REQUIREMENTS

Manual Controls
Accessible to occupants, within or in view of the space.

Occupancy Sensors
Must turn off lighting within 20 minutes of vacancy.

Multi-Level Lighting Controls
Required for restrooms 100 sq. ft. or larger. Continuous dimming 100%–10% required.

Automatic Daylighting Controls
Required when general lighting in any daylit zone is 75W or more. Must adjust lighting accordingly.

ADR
OpenADR 2.0a, 2.0b, or OpenADR 3.0 certified. ADR automates reducing or shifting electricity consumption during peak demand periods when the utility grid is most strained. This is also capable of internally driven ADR (oftentimes referred to as just Demand Response). This automation minimizes manual interventions and accelerates response times.

Plug Load Controls
Required for controlled receptacles in office and workstation areas.

Alternative Product Recommendations

PPA104S Line Voltage 20A Bluetooth® Zone Control
- 120-277VAC input
- Integrated 20A relay
- Output power up to 2400W (120VAC), 5540W (277VAC)
- UL Plenum Rated
- 1 HP motor load rated

NOTE: This is an alternative solution 'receptacle / plug load controls'.

DWS102 Line Voltage Occ/Vacancy Sensor Bluetooth® Wall Switch
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- Ideal retrofit of existing wall controls (neutral is required)
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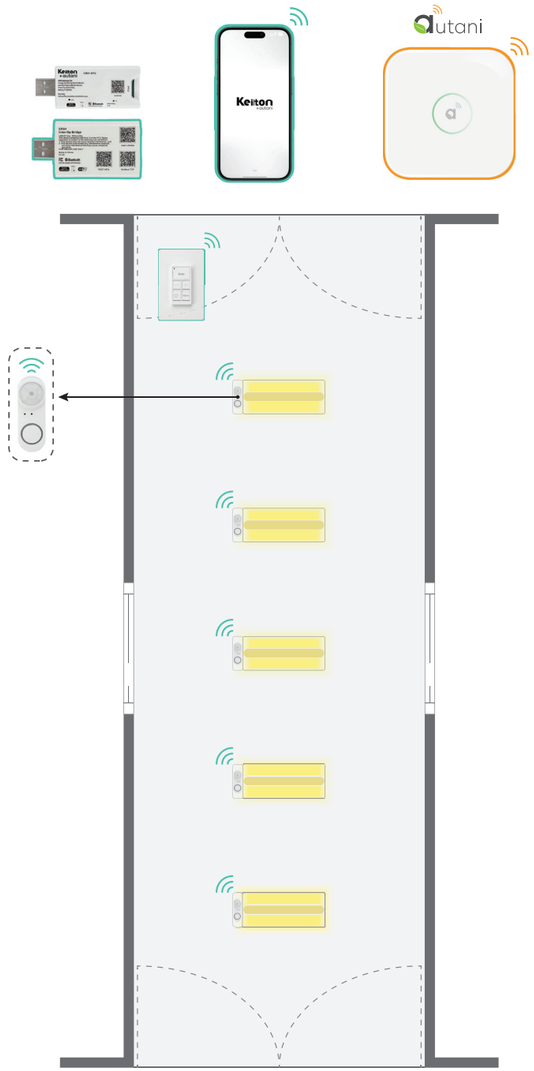
WP1018A 8-Key Battery-Powered Bluetooth® Wall Switch
- Quick push-button control of Keilton+autani devices via Bluetooth®
- Powered by two AAA batteries
- 10-year typical battery life
- Can be wall-mounted or used as portable remote controller. Can be linked to a light or light group via the Keilton+autani app

Hallway / Stairwell / Corridors - LLLC

SAFETY FOCUSED PASSAGEWAYS

Keilton+autani controls create safe passageways where security and energy efficiency work together. Luminaire Level Lighting Controls save on labor because components can be installed on fixtures prior to installation in the ceiling. Individual fixture control automatically reduces lighting to 50% when unoccupied while maintaining essential safety illumination for navigation. Lights can be virtually grouped to operate together while each fixture remains individually addressable for maximum flexibility. Wireless wall switches enable facility staff to override controls for maintenance or emergencies. The system meets Title 24 partial-off requirements while supporting emergency egress and security needs.

Energy use within the space can be monitored and controlled via phone or tablet using the Keilton+autani app, or elevate to a Tier 3 solution offering analytics capabilities with the Autani Manager.



PRODUCT RECOMMENDATIONS

LOCAL ROOM-BASED

IFS108 Integrated Oval 12V Panel Sensor

- Clip-mount allows sensor to attach to luminaire housing
- 12V sensor with oval shape is ideal form factor for panels
- Bluetooth® PIR analog sensor with Algo² algorithm to maximize detection without false trigger
- Allows existing panel and downlight luminaires to upgrade to luminaire level lighting control (LLLC)
- Daylight Harvesting

CR04

- CR04 is a WIFI dongle which has BLE and Wi-Fi hardware connections
- BLE connects to Keilton devices, Wi-Fi connects to third-party systems
- Provides Modbus TCP and REST APIs simultaneously over Wi-Fi connections
- 1 per zone

CR01

- Powered by USB-A
- Integrated BT module
- Internal battery with Real Time Clock for syncing all devices in the zone, maintaining schedules during power outage
- Integrated TF/MicroSD card maintains log of energy consumption data
- 1 per zone

WP1013 (3 Button) / WP1025 (5 Button) Battery-Powered Bluetooth® Wall Switch

- Quick push-button control of Keilton+autani devices via Bluetooth®
- Powered by a single CR2032 battery
- 10-year typical battery life
- Can be wall-mounted or used as portable remote controller. Can be linked to a light or light group via the Keilton+autani app

NETWORKED

Autani Manager

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CR05 + RTR

- CR05 and RTR devices work in conjunction with the Manager to bring Bluetooth® lighting controls into your network.
- Bluetooth® network per CR05 may not exceed a radius of 100ft
- Bluetooth® network per CR05 may not exceed 4 hops wireless mesh

TITLE 24 REQUIREMENTS

Manual Controls
Accessible only to authorized personnel, within or in view of the space.

Occupancy Sensors
Lighting must reduce by at least 50% within 20 minutes of vacancy.

Multi-Level Lighting Controls
Required for areas 100 sq. ft. or larger. Continuous dimming 100%–10% required.

Automatic Daylighting Controls
Applicable if daylit zone lighting is 75W or more.

ADR
OpenADR 2.0a, 2.0b, or OpenADR 3.0 certified. ADR automates reducing or shifting electricity consumption during peak demand periods when the utility grid is most strained. This is also capable of internally driven ADR (oftentimes referred to as just Demand Response). This automation minimizes manual interventions and accelerates response times.

Plug Load Controls
Required for controlled receptacles in office and workstation areas.

Alternative Product Recommendations

PPA104S Line Voltage 20A Bluetooth® Zone Control

- 120-277VAC input
- Integrated 20A relay
- Output power up to 2400W (120VAC), 5540W (277VAC)
- UL Plenum Rated
- 1 HP motor load rated

NOTE: This is an alternative solution for 'receptacle / plug load controls.'

IFS105SE Integrated Round 12V Sensor

- 12VDC input
- Integrated wiring terminal block
- PIR Sensor
- Daylight Harvesting
- Easy installation
- Digital sensor technology designed for low bay applications

NOTE: This is an alternative solution for Luminaire Level Lighting Control

WP1013 (3 Button) / WP1025 (5 Button) Battery-Powered Bluetooth® Wall Switch

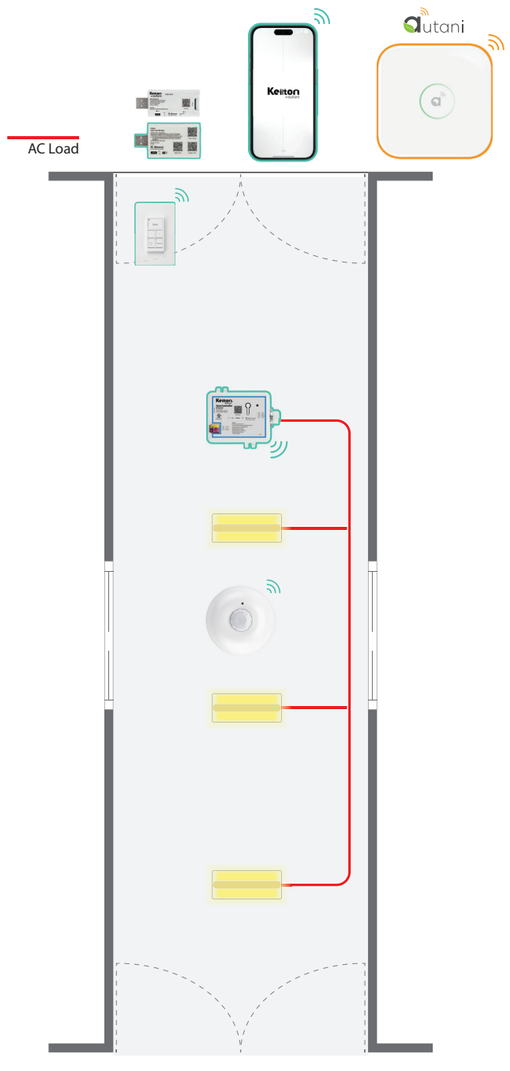
- Quick push-button control of Keilton+autani devices via Bluetooth®
- Powered by a single CR2032 battery
- 10-year typical battery life
- Can be wall-mounted or used as portable remote controller. Can be linked to a light or light group via the Keilton+autani app

Hallway / Stairwell / Corridors - Zone Control

SAFETY FOCUSED PASSAGEWAYS

Keilton+autani controls create safe passageways where reliable lighting and energy efficiency are balanced. Zone-based control manages corridor sections, with an occupancy sensor driving multiple fixtures within each zone, while wireless wall switches provide manual override for facility staff during maintenance or emergencies. The system automatically reduces lighting by 50% when zones are unoccupied while maintaining necessary illumination for safety and wayfinding. The sensor responds quickly to movement, ensuring full lighting when corridors are in use.

Energy use within the space can be monitored and controlled via phone or tablet using the Keilton+autani app, or elevate to a Tier 3 solution offering analytics capabilities with the Autani Manager.



PRODUCT RECOMMENDATIONS

LOCAL ROOM-BASED

PPA104S Line Voltage 20A Bluetooth® Zone Control

- 120-277VAC input
- Integrated 20A relay
- Output power up to 2400W (120VAC), 5540W (277VAC)
- UL Plenum Rated
- 1 HP motor load rated

WP1013 (3 Button) / WP1025 (5 Button) Battery-Powered Bluetooth® Wall Switch

- Quick push-button control of Keilton+autani devices via Bluetooth®
- Powered by a single CR2032 battery
- 10-year typical battery life
- Can be wall-mounted or used as portable remote controller. Can be linked to a light or light group via the Keilton+autani app

BCS107 Battery Powered Occupancy Sensor

- PIR + Daylight Harvesting
- 600 sq ft room coverage
- Occupancy / vacancy enabled
- Powered by a single CR123A 3V battery
- 10-year typical battery life
- Easy installation with multiple mounting options

CR04

- CR04 is a WIFI dongle which has BLE and Wi-Fi hardware connections
- BLE connects to Keilton devices, Wi-Fi connects to third-party systems
- Provides Modbus TCP and REST APIs simultaneously over Wi-Fi connections
- 1 per zone

CR01

- Powered by USB-A
- Integrated BT module
- Internal battery with Real Time Clock for syncing all devices in the zone, maintaining schedules during power outage
- Integrated TF/MicroSD card maintains log of energy consumption data
- 1 per zone

NETWORKED

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CR05 + RTR

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- Bluetooth® network per CR05 may not exceed a radius of 100ft
- Bluetooth® network per CR05 may not exceed 4 hops wireless mesh

TITLE 24 REQUIREMENTS

Manual Controls
Accessible only to authorized personnel, within or in view of the space.

Occupancy Sensors
Lighting must reduce by at least 50% within 20 minutes of vacancy.

Multi-Level Lighting Controls
Required for areas 100 sq. ft. or larger. Continuous dimming 100%–10% required.

Automatic Daylighting Controls
Applicable if daylit zone lighting is 75W or more.

ADR
OpenADR 2.0a, 2.0b, or OpenADR 3.0 certified. ADR automates reducing or shifting electricity consumption during peak demand periods when the utility grid is most strained. This is also capable of internally driven ADR (oftentimes referred to as just Demand Response). This automation minimizes manual interventions and accelerates response times.

Plug Load Controls
Required for controlled receptacles in office and workstation areas.

Alternative Product Recommendations

PPA104S Line Voltage 20A Bluetooth® Zone Control

- 120-277VAC input
- Integrated 20A relay
- Output power up to 2400W (120VAC), 5540W (277VAC)
- UL Plenum Rated
- 1 HP motor load rated

NOTE: This is an alternative solution for 'receptacle / plug load controls'.

WP1018A 8-Key Battery-Powered Bluetooth® Wall Switch

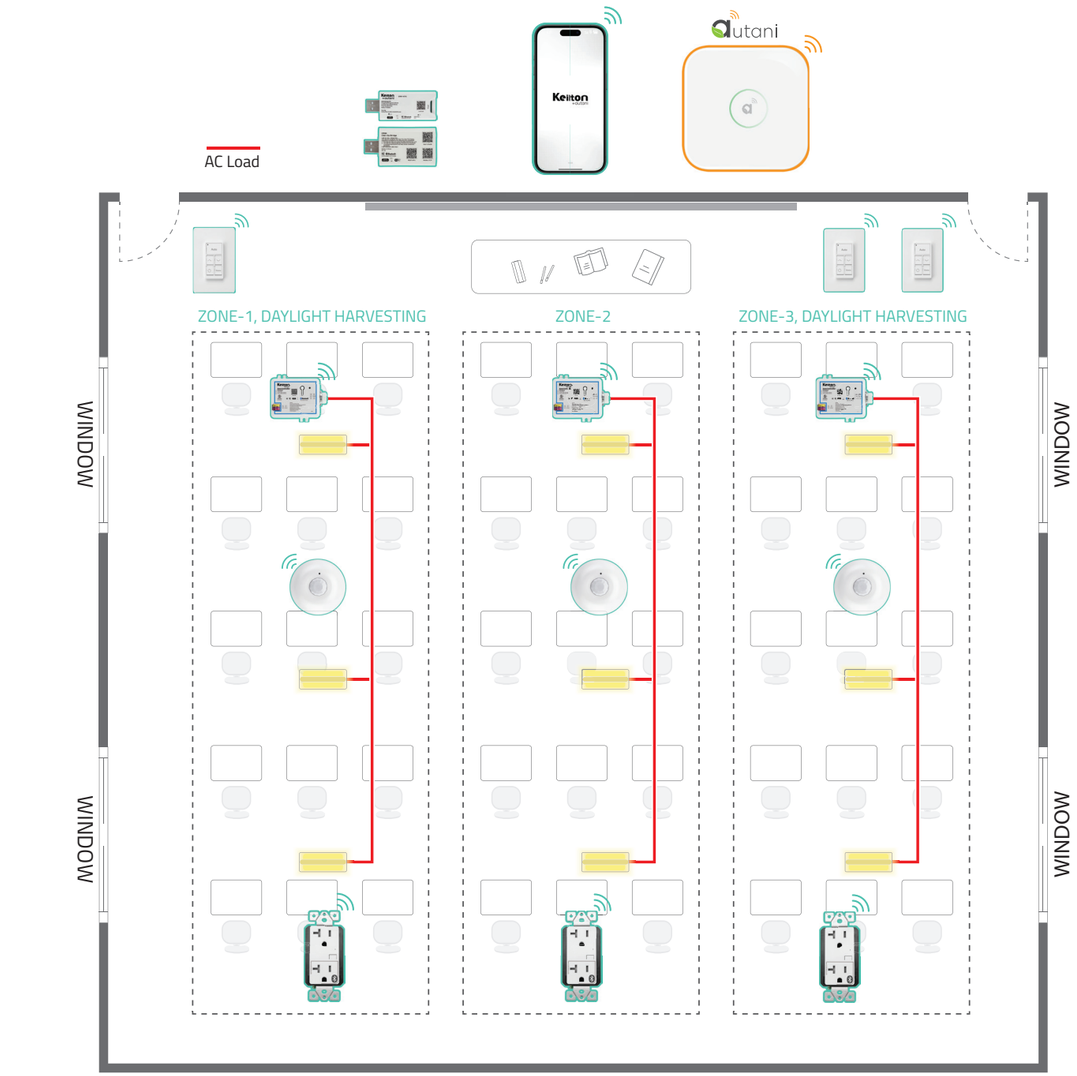
- Quick push-button control of Keilton+autani devices via Bluetooth®
- Powered by two AAA batteries
- 10-year typical battery life
- Can be wall-mounted or used as portable remote controller. Can be linked to a light or light group via the Keilton+autani app

Classroom - Zone Control

FLEXIBLE AND COMFORTABLE LEARNING SPACE

Keilton+autani controls create flexible learning environments where educational activities and energy efficiency work together. Zone-based lighting control allows teachers to adjust different classroom zones using wireless wall switches - dimming the front zone for presentations while maintaining adequate lighting in other zones for student note-taking. Daylight harvesting reduces artificial lighting near windows, eliminating glare on whiteboards and screens. The system supports teaching methods with occupancy sensors ensuring lights turn off when classrooms are vacant between classes.

Energy use within the space can be monitored and controlled via phone or tablet using the Keilton+autani app, or elevate to a Tier 3 solution offering analytics capabilities with the Autani Manager.



PRODUCT RECOMMENDATIONS

LOCAL ROOM-BASED

PPA104S Line Voltage 20A Bluetooth® Zone Control

- 120-277VAC input
- Integrated 20A relay
- Output power up to 2,400W (120VAC), 5,540W (277VAC)
- UL Plenum Rated
- 1 HP motor load rated

BCS107 Battery Powered Occupancy Sensor

- PIR + Daylight Harvesting
- 600 sq ft room coverage
- Occupancy / vacancy enabled
- Powered by a single CR123A 3V battery
- 10-year typical battery life
- Easy installation with multiple mounting options

CR04

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- BLE connects to Keilton devices, Wi-Fi connects to third-party systems
- Provides Modbus TCP and REST APIs simultaneously over Wi-Fi connections
- 1 per zone

CR01

- Powered by USB-A
- Integrated BT module
- Internal battery with Real Time Clock for syncing all devices in the zone, maintaining schedules during power outage
- Integrated TF/MicroSD card maintains log of energy consumption data
- 1 per zone

WP1013 (3 Button) / WP1025 (5 Button) Battery-Powered Bluetooth® Wall Switch

- Quick push-button control of Keilton+autani devices via Bluetooth®
- Powered by a single CR2032 battery
- 10-year typical battery life
- Can be wall-mounted or used as portable remote controller. Can be linked to a light or light group via the Keilton+autani app

WF20R 20A Plug Load Bluetooth® Controller

- 120VAC
- 20A plug load Bluetooth® controller
- Controllable via the Keilton+autani app

NETWORKED

Autani Manager

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CR05 + RTR

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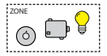
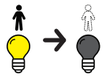
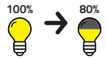
TITLE 24 REQUIREMENTS



Zone Control:
Lighting must be divided into control zones of no more than 600 sq. ft. per zone for independent lighting control.



Occupancy Sensors
Must automatically turn off lighting within 20 minutes of vacancy.



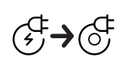
Multi-Level Lighting Controls
Required for spaces 100 sq. ft. or larger. Continuous dimming 100%–10% required.

Daylight Harvesting (if applicable):
Required when general lighting in any daylit zone is 75W or more. Must adjust artificial lighting based on daylight.

Lighting Power Density (LPD)
Must comply with prescribed wattage limits (typically 0.8 watts/sq. ft.) for energy-efficient operation.

Automatic Shutoff
Lighting must automatically shut off after 20 minutes of vacancy.

ADR
OpenADR 2.0a, 2.0b, or OpenADR 3.0 certified. ADR automates reducing or shifting electricity consumption during peak demand periods when the utility grid is most strained. This is also capable of internally driven ADR (oftentimes referred to as just Demand Response). This automation minimizes manual interventions and accelerates response times.



Plug Load Controls
Required for controlled receptacles in office and workstation areas.

Alternative Product Recommendations

PPA104S Line Voltage 20A Bluetooth® Zone Control

- 120-277VAC input
- Integrated 20A relay
- Output power up to 2400W (120VAC), 5540W (277VAC)
- UL Plenum Rated
- 1 HP motor load rated

NOTE: This is an alternative solution for 'receptacle / plug load controls'.

WP1018A 8-Key Battery-Powered Bluetooth® Wall Switch

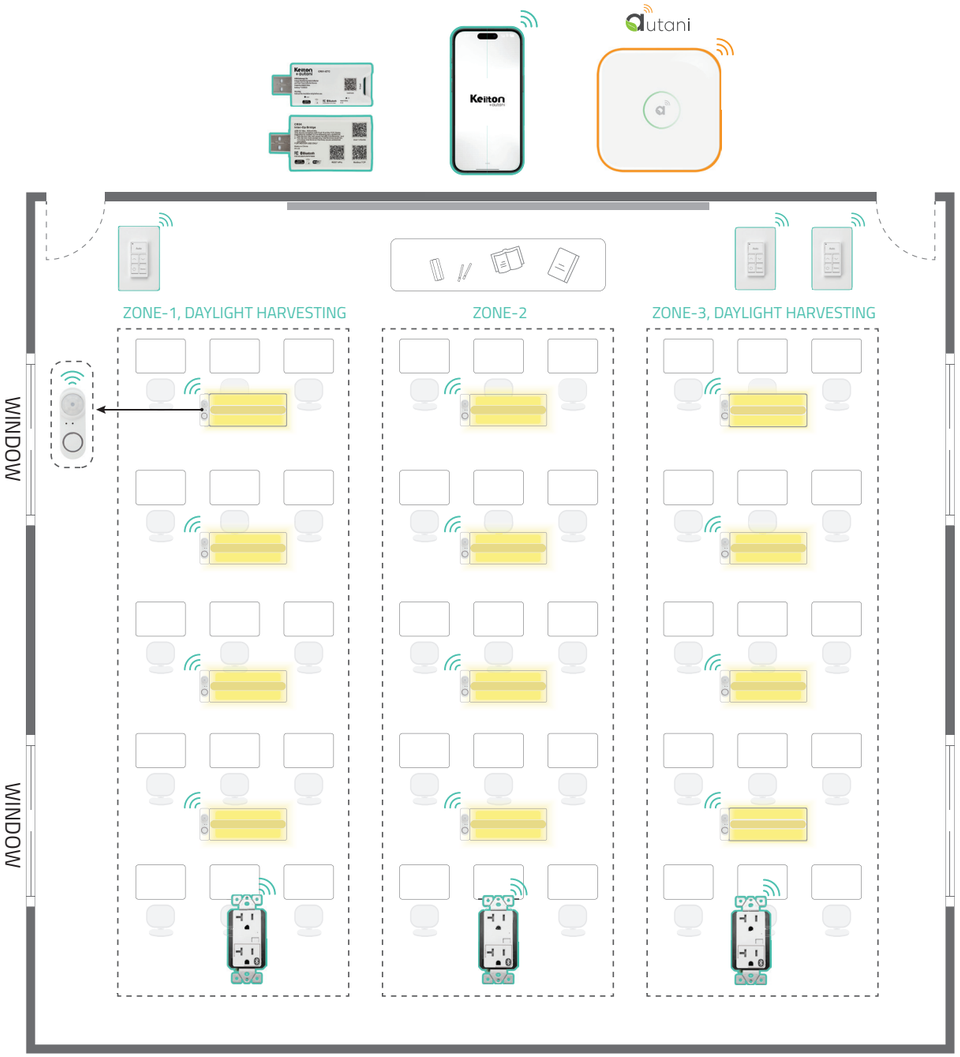
- Quick push-button control of Keilton+autani devices via Bluetooth®
- Powered by two AAA batteries
- 10-year typical battery life
- Can be wall-mounted or used as portable remote controller. Can be linked to a light or light group via the Keilton+autani app

Classroom - LLLC

FLEXIBLE AND COMFORTABLE LEARNING SPACE

Luminaire Level Lighting Controls save on labor because components can be installed on fixtures prior to installation in the ceiling. Individual fixture control creates optimal conditions for different learning activities - brightening reading areas while dimming multimedia zones for presentations. Lights can be virtually grouped using wireless wall switches while each fixture remains individually addressable for maximum flexibility. The system enables precise light management around interactive whiteboards and projection screens while maintaining Title 24 compliance, and plug load control manages power to classroom technology during off hours.

Energy use within the space can be monitored and controlled via phone or tablet using the Keilton+autani app, or elevate to a Tier 3 solution offering analytics capabilities with the Autani Manager.



PRODUCT RECOMMENDATIONS

Keilton +autani

LOCAL ROOM-BASED

PPA104S Line Voltage 20A Bluetooth® Zone Control

- 120-277VAC input
- Integrated 20A relay
- Output power up to 2,400W (120VAC), 5,540W (277VAC)
- UL Plenum Rated
- 1 HP motor load rated

IFS108 Integrated Oval 12V Panel Sensor

- Clip-mount allows sensor to attach to luminaire housing
- 12V sensor with oval shape is ideal form factor for panels
- Bluetooth® PIR analog sensor with Algo^2 algorithm to maximize detection without false trigger
- Allows existing panel and downlight luminaires to upgrade to luminaire level lighting control (LLLC)
- Daylight Harvesting

CR04

- CR04 is a WIFI dongle which has BLE and Wi-Fi hardware connections
- BLE connects to Keilton devices, Wi-Fi connects to third-party systems
- Provides Modbus TCP and REST APIs simultaneously over Wi-Fi connections
- 1 per zone

CR01

- Powered by USB-A
- Integrated BT module
- Internal battery with Real Time Clock for syncing all devices in the zone, maintaining schedules during power outage
- Integrated TF/MicroSD card maintains log of energy consumption data
- 1 per zone

WP1013 (3 Button) / WP1025 (5 Button) Battery-Powered Bluetooth® Wall Switch

- Quick push-button control of Keilton+autani devices via Bluetooth®
- Powered by a single CR2032 battery
- 10-year typical battery life
- Can be wall-mounted or used as portable remote controller. Can be linked to a light or light group via the Keilton+autani app

WF20R 20A Plug Load Bluetooth® Controller

- 120VAC
- 20A plug load Bluetooth® controller
- Controllable via the Keilton+autani app

autani

NETWORKED

Autani Manager

The Autani Manager is the control processor at the heart of the innovative integrated energy management systems powered by EnergyCenter software. The Manager securely coordinates all energy management functions and provides actionable insights.

CR05 + RTR

- CR05 and RTR devices work in conjunction with the Manager to bring Bluetooth® lighting controls into your network.
- Bluetooth® network per CR05 may not exceed a radius of 100ft
- Bluetooth® network per CR05 may not exceed 4 hops wireless mesh

TITLE 24 REQUIREMENTS

Luminaire Level Lighting Control (LLLC):
Each individual luminaire must have independent control for dimming or on/off adjustments to optimize energy efficiency.

Occupancy Sensors
Must automatically turn off lighting within 20 minutes of vacancy.

Manual Override:
A manual override must be available for each luminaire, allowing for occupant adjustments when needed.

Daylight Harvesting (if applicable):
Required when general lighting in any daylit zone is 75W or more. Must adjust lighting accordingly.

Lighting Power Density (LPD)
Must comply with prescribed wattage limits (typically 0.8 watts/sq. ft.) to ensure energy-efficient operation.

ADR
OpenADR 2.0a, 2.0b, or OpenADR 3.0 certified. ADR automates reducing or shifting electricity consumption during peak demand periods when the utility grid is most strained. This is also capable of internally driven ADR (oftentimes referred to as just Demand Response). This automation minimizes manual interventions and accelerates response times.

Plug Load Controls
Required for controlled receptacles in office and workstation areas.

Alternative Product Recommendations

PPA104S Line Voltage 20A Bluetooth® Zone Control

- 120-277VAC input
- Integrated 20A relay
- Output power up to 2400W (120VAC), 5540W (277VAC)
- UL Plenum Rated
- 1 HP motor load rated

NOTE: This is an alternative solution for 'receptacle / plug load controls.'

IFS105SE Integrated Round 12V Sensor

- 12VDC input
- Integrated wiring terminal block
- PIR Sensor
- Daylight Harvesting
- Easy installation
- Digital sensor technology designed for low bay applications

NOTE: This is an alternative solution for Luminaire Level Lighting Control

WP1013 (3 Button) / WP1025 (5 Button) Battery-Powered Bluetooth® Wall Switch

- Quick push-button control of Keilton+autani devices via Bluetooth®
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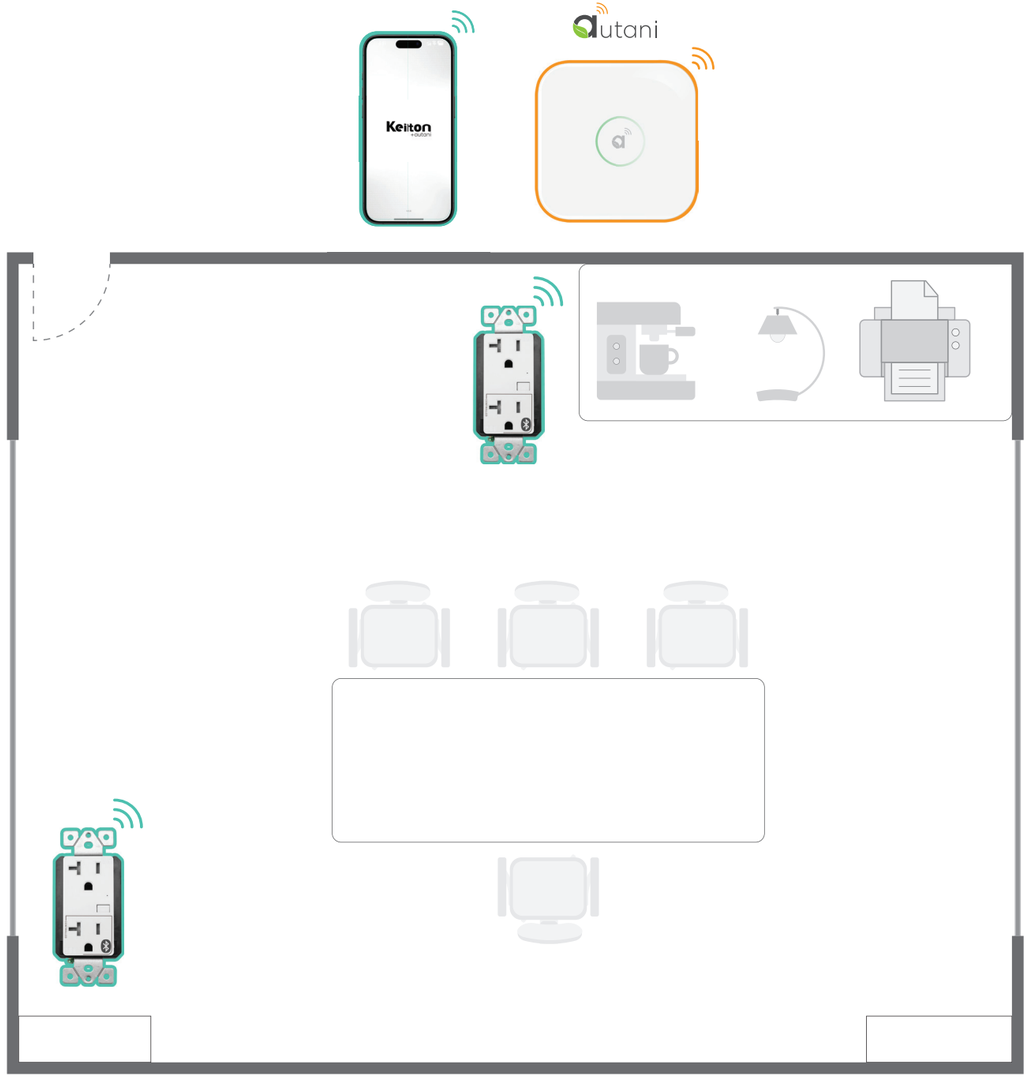
Plug Load

PRODUCTIVE AND EFFICIENT WORK SPACE

Plug loads, such as task lighting, computer monitors, and printers, account for more than 5% of commercial electricity usage. Many energy codes now require control of receptacles for Title 24 compliance. Based on schedule, the relay module switches power to receptacles on or off during non-business hours, eliminating phantom power consumption and reducing energy waste. Manual override capabilities ensure equipment access when needed outside normal operating hours.

Energy use within the space can be monitored and controlled via phone or tablet using the Keilton+autani app, or elevate to a Tier 3 solution offering analytics capabilities with the Autani Manager.



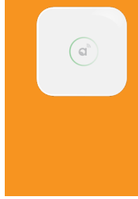
PRODUCT RECOMMENDATIONS

LOCAL ROOM-BASED

WF20R 20A Plug Load Bluetooth® Controller

- 120VAC
- 20A plug load Bluetooth® controller
- Controllable via the Keilton+autani app

NETWORKED



Autani Manager

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CR05 + RTR

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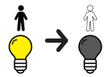
- Bluetooth® network per CR05 may not exceed 4 hops wireless mesh

TITLE 24 REQUIREMENTS



Occupancy / Vacancy Sensing

Turn lights on when occupants are in a space and off when they vacate the space. Alternate Functionality: Partial-on and manual-on modes are supported for additional savings and for more stringent local codes.

High-End Trim | Institutional Tuning

Set the maximum light level based on customer requirements in each space to prevent overlighting.

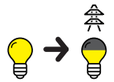
Daylight Harvesting

Dim lighting when daylight is available. Multiple zones are supported where required by code.

Automatic Scheduling & Timeclock*

Automatically dim or shut off lighting based on centrally managed schedules.

* Requires Autani Manager or CR02-W.



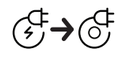
Demand Response*

Manage lighting and electrical loads per utility requirements during periods of high demand.

* Requires Autani Manager.

ADR

OpenADR 2.0a, 2.0b, or OpenADR 3.0 certified. ADR automates reducing or shifting electricity consumption during peak demand periods when the utility grid is most strained. This is also capable of internally driven ADR (oftentimes referred to as just Demand Response). This automation minimizes manual interventions and accelerates response times.



Plug Load Controls

Required for controlled receptacles in office and workstation areas.

Alternative Product Recommendations

PPA104S Line Voltage 20A Bluetooth® Zone Control

- 120-277VAC input
- Integrated 20A relay
- Output power up to 2400W (120VAC), 5540W (277VAC)
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A Deep Dive into Title 24 Requirements

This section provides a comprehensive overview of the 2025 Title 24, Part 6 updates, focusing on the lighting and control requirements for nonresidential buildings. The following details outline the mandatory compliance paths and highlight the exceptions for different types of lighting systems.

Prescriptive Requirements for Indoor Lighting

SECTION 140.6

Requirement:

Lighting systems in nonresidential buildings must comply with the Prescriptive Requirements for Indoor Lighting under Title 24, Part 6. Specifically, multilevel lighting controls are required in spaces of 100 square feet or larger, with a lighting load greater than 0.5 watts per square foot. These controls must allow the lighting to be adjusted up and down as needed to meet varying lighting needs throughout the day. These controls must provide continuous dimming from 100% to 10% or lower of full-rated lighting power. In addition, Power Adjustment Factors (PAF) can be applied to lighting systems equipped with automatic controls, including daylighting, occupant sensors, and demand-responsive controls, to reduce power consumption and achieve compliance with Title 24. The Tailored Method has been removed as a compliance path; its wattage flexibility is now available through Additional Power Allowances under the Area Category Method.

Specific Testing Requirements:

- Automatic Daylighting Controls must be tested in accordance with Reference Nonresidential Appendix NA7.6.1.
- Lighting Shut-Off Controls must be tested in accordance with Reference Nonresidential Appendix NA7.6.2.
- Demand Responsive Lighting Controls must comply with Section 130.1(e) and be tested in accordance with Reference Nonresidential Appendix NA7.6.3.
- Outdoor Lighting Controls must be tested in accordance with Reference Nonresidential Appendix NA7.8.
- Lighting Systems Receiving the Institutional Tuning Power Adjustment Factor (PAF) must be tested in accordance with Reference Nonresidential Appendix NA7.6.4.
- Demand Responsive Controls for Controlled Receptacles must be tested in accordance with Reference Nonresidential Appendix NA7.6.5.

What This Means:

The Prescriptive Requirements for Indoor Lighting ensure that lighting systems in nonresidential buildings are energy efficient. By automatically adjusting lighting based on daylight, occupancy, and demand signals, energy is conserved, lowering costs while maintaining appropriate light levels. The use of Power Adjustment Factors (PAF) helps to further reduce energy consumption by adjusting the lighting power in response to factors like occupancy and daylight. These requirements apply to all spaces with lighting loads above 0.5 watts per square foot, including large office spaces, warehouses, and public areas like parking garages. Exceptions are provided for specific types of lighting, such as task lighting and furniture-mounted luminaires, offering flexibility for different building types.

EXCEPTIONS:

- Exception 1 (Section 130.1(c)6): Task lighting or under-shelf lighting controlled by a local switch or occupancy sensor is exempt from the multilevel lighting control requirement as long as it complies with other applicable lighting control provisions.
- Exception 2 (Section 130.1(c)6): In office spaces where general lighting is provided by embedded sensors capable of reducing lighting power independently from other luminaires, each luminaire can be treated as its own control zone. This exception allows greater flexibility for lighting systems that automatically adjust based on occupancy or available daylight.
- Exception 3 (Section 140.6(b)2): Furniture-mounted luminaires that comply with Section140.6(b)2C qualify as permanently installed general lighting systems, provided that 0.2 watts per square foot of the area illuminated by furniture-mounted luminaires is subtracted from the installed wattage before applying the Power Adjustment Factor (PAF). This exception allows furniture-mounted systems to meet PAF criteria while still being compliant with Title 24.
- Exception 4 (Section 130.1(d) and 130.4): Daylight controls in daylit zones (such as skylit daylit zones, primary sidelit zones, and secondary sidelit zones) must meet the continuous dimming plus OFF control requirement. The system will only apply the PAF for primary and secondary sidelit daylit zones and skylit zones, where the illuminance from daylight exceeds 150% of the required illuminance for artificial lighting. In this case, the system will reduce artificial lighting power by at least 65-90% or 100% in certain zones, helping to optimize energy efficiency. If primary daylit zone is not required and secondary daylit zone is less than 85 watts, daylighting controls for secondary zone are not required. Linear fixtures >8 ft may be controlled in 8-ft segments.
- Exception 5 (Section 130.1(d) and 130.4): Lighting systems installed in parking garages are exempt from the daylighting control requirements if the combined installed general lighting power in the daylit zones (including skylit and sidelit zones) is less than 75 watts. Additionally, secondary sidelit zones in parking garages with combined lighting power less than 60 watts are also exempt from the daylighting control requirement.
- Exception 6 (Section 130.1(e)): Lighting systems with less than 4,000 watts of general lighting power are exempt from the Demand Responsive requirement but still must meet the other lighting control provisions outlined in the code.

Example:

In a large office space with more than 250 sq. ft. and embedded sensors in the lighting fixtures, the system will automatically reduce lighting to 20% when the space is unoccupied. Additionally, daylight dimming controls will reduce lighting when natural light is sufficient, ensuring energy efficiency. In a warehouse with lighting installed over aisleways and stacked book shelves, the lighting will be reduced to 20% when unoccupied, contributing to significant energy savings while still maintaining necessary light levels for safety.

Demand Responsive Lighting Controls

SECTION 130.1(e)

Requirement:

Lighting systems with general lighting power of 4,000 watts or greater, in spaces required to have multilevel lighting per Section 130.1(b), must include Demand Responsive capabilities.

- **Automatic Adjustments:** These systems must be capable of automatically adjusting in response to demand response signals from utilities or grid operators. The demand response signal may use a wired or wireless protocol as long as it is bi-directional. In response to the signal, the lighting controls must demonstrate a lighting power reduction of at least 15% below installed full lighting power.
- **Protocol Requirement:** A Virtual End Node (VEN) certified as OpenADR 2.0a, 2.0b, or Baseline Profile OpenADR 3.0 must be included, certified by the manufacturer to automatically implement the required control function. Alternately, the lighting control manufacturer must certify that their system responds to a demand response signal from another system's certified VEN.

What This Means:

For buildings or spaces with high lighting loads (like large office buildings, retail spaces, or warehouses), the lighting system must have the ability to automatically adjust in response to demand response events. This helps reduce energy consumption during peak demand periods and ensures the building is contributing to energy efficiency and grid stability.

Exceptions:

- Exception 1: Lighting systems in spaces with less than 4,000 watts of general lighting power are exempt from this requirement.

Example Spaces:

In a large office building with a lighting load greater than 4,000 watts, the lighting system must automatically reduce lighting levels by at least 15% during peak grid demand periods, in response to signals sent by the utility.

Occupancy Sensor Ventilation Controls

SECTION 120.1.5

Requirement:

In spaces where ventilation can be reduced to zero when unoccupied (e.g., during occupied standby mode), occupant sensors are required for both lighting and ventilation control. The control of lighting and ventilation must be independent, meaning that the ventilation signal should not be influenced by factors like daylighting, manual lighting overrides, or manual control of lighting.

- Lighting Control: Occupancy sensors must automatically turn off the lighting when the room is unoccupied.
- Ventilation Control: Ventilation systems must continue to operate according to the sensor's input to ensure air quality, regardless of the lighting control state. After occupied standby mode is triggered, mechanical ventilation must shut off within five minutes until the space becomes occupied again.

What This Means:

Both lighting and ventilation in spaces such as offices or classrooms must be controlled by occupant sensors. However, the two systems must operate independently of each other. The lighting may be turned off when the space is unoccupied, but the ventilation system must continue to operate based on the sensor's input to maintain air quality. The ventilation should not be influenced by the daylighting or manual overrides in the lighting system.

Exceptions:

- Exception 1 (Section 120.1.5): Occupancy sensing controls are not required for spaces where the ventilation air is reduced to zero when in occupied-standby mode, as per Table 120.1-A, if the ventilation system is designed to handle this reduction automatically when the space is unoccupied.

Example:

In an office that uses both lighting and ventilation controls, when the room is unoccupied, the lighting will automatically turn off. The ventilation system will shut off within five minutes of the occupied standby mode being triggered, then resume when occupancy is detected.

Multi-level Lighting Controls

SECTION 130.1(b)

Requirement:

General lighting greater than 0.5 watts per square foot in spaces 100 square feet or larger must provide multilevel lighting controls capable of continuous dimming from 100% to 10% or lower of full-rated lighting power.

What This Means:

Lighting systems must now provide smooth, continuous dimming across the full range, rather than meeting specific stepped control levels. The system must dim from full power down to 10% or lower, ensuring occupants can fine-tune lighting to their needs.

Exceptions:

- Restrooms, healthcare facilities, and spaces served by a single luminaire are exempt from continuous dimming.
- HID or induction light sources: Continuous dimming is not required. Instead, one control step between 30% and 70% of full-rated power is required.
- For library stack aisles, warehouse aisleways, parking garages, loading/unloading areas, stairwells, corridors: at least one control step between 20% and 60% of full-rated power.
- Classrooms with a connected general lighting load of 0.6 watts per square foot or less are required to provide only one control step between 30% and 70% of full-rated power, regardless of luminaire type.

Example:

A conference room of 120 square feet with a lighting load of 0.6 watts per square foot requires continuous dimming from 100% down to 10% or lower.

Automatic Daylighting Controls

SECTION 130.1(d)

Requirement:

In any enclosed space where there is 75 watts or more of general lighting in any primary sidelit, secondary sidelit, or skylit daylit zone, automatic daylighting controls must be provided for the qualifying zones. This threshold has been reduced from 120 watts in the 2022 code.

Daylight Zones:

- Skylit Daylit Zones: Areas directly under skylights.
- Primary Sidelit Daylit Zones: Areas with windows on one side providing daylight.
- Secondary Sidelit Daylit Zones: Areas with windows providing indirect daylight.

The lighting system must adjust artificial lighting by either dimming or turning it off depending on the amount of natural daylight entering the space. Linear lighting >8 ft may be controlled in 8-ft segments. Where daylight exceeds 150% of the general lighting design level, lighting power must be reduced by at least 90%.

What This Means:

Spaces with natural daylight need automatic controls that adjust artificial lighting as daylight changes. The lower 75W threshold means more spaces will require daylighting controls compared to 2022.

Exceptions:

- If the primary daylit zone is not required and the secondary daylit zone has less than 85 watts, daylighting controls for the secondary zone are not required. (New in 2025)
- Skylights with structures blocking direct sunlight for 1,500 daytime hours per year. For parking garages, luminaires in the daylight adaptation zone are exempt. Luminaires in sidelit daylit zones in retail merchandise sales and wholesale showroom areas.

Example:

A conference room with large windows and 80W of general lighting in the primary sidelit zone now requires automatic daylighting controls (previously exempt at the 120W threshold).

Shut-Off Controls for Lighting

SECTION 130.1(c)

Requirement:

Lighting in offices, multipurpose rooms, classrooms, conference rooms, and restrooms must be controlled with occupant sensing controls that automatically shut off all lighting when the room is unoccupied.

For offices up to 250 square feet, multipurpose rooms up to 1,000 square feet, classrooms, conference rooms, and restrooms, lighting must be automatically turned off when the room is unoccupied.

What This Means:

Lighting must automatically turn off in specified spaces once the space is unoccupied for a period of time, within 20 minutes. This helps to ensure energy efficiency by preventing lights from being left on when they are not needed.

Exceptions:

- Exception 1 (Section 130.1(c)5): Task lighting or under-shelf lighting controlled by a local switch or occupancy sensor is exempt from the shut-off control requirements.
- Exception 2 (Section 130.1(c)): Lighting in non-occupied storage rooms or utility spaces maybe exempt from the occupancy sensing control requirements if the lights are controlled by manual overrides or timers.

Example:

A conference room with occupancy sensors will automatically turn off the lighting when the room is unoccupied. If someone leaves the room, the lights will turn off after a 20-minute period of inactivity to save energy.

Partial-Off Controls

SECTION 130.1(c)7

Requirement:

For areas such as aisleways, warehouse areas, library aisles, corridors, and stairwells, lighting must be reduced by at least 50% when unoccupied.

What This Means:

The lighting system should automatically reduce lighting by at least 50% when unoccupied. This helps reduce energy consumption while maintaining safety and visibility. Exceptions apply for certain warehouse installations and hotel/motel stairwells and corridors — see below.

Exceptions:

- Exception 1 (Section 130.1(c)6A): In warehouse aisleways and open areas where installed lighting power is 80% or less of the Area Category Method allowance, occupant sensing controls may reduce lighting power by at least 40%.
- Exception 2 (Section 130.1(c)6A): Where metal halide or high pressure sodium lighting is installed in warehouses, occupant sensing controls may reduce lighting power by at least 40%.
- Exception 3 (Section 130.1(c)7A): In hotel/motel stairwells and common area corridors where installed lighting power is 80% or less of the area category allowance, occupant sensing controls may reduce power by at least 40%. This exception remains in effect.

Example:

A warehouse aisle with occupancy sensors will automatically reduce lighting to at least 50% when no one is present. Where installed power is 80% or less of the area category allowance, a 40% reduction is acceptable.

Partial-Off Occupant Sensing Controls

SECTION 130.1(c)6

Requirement:

Partial-Off occupant sensing controls are required for spaces like aisleways, open areas in warehouses, library book stack aisles, corridors, stairwells, and specified offices. Lighting installed in these areas must meet the following requirements in addition to complying with Section 130.1(c)1.

- In office spaces greater than 250 square feet, general lighting must be controlled by occupant sensing controls that meet the following criteria:
- The occupant sensing controls must be configured so that lighting is controlled separately in control zones no greater than 600 square feet. For luminaires with embedded sensors capable of reducing power independently from other luminaires, each luminaire may be considered its own control zone.
- Within 20 minutes of the control zone being unoccupied, the occupant sensing controls must uniformly reduce lighting power in the control zone to no more than 20% of full power.
- In spaces required to have multilevel lighting controls under Section 130.1(b) where occupant sensing controls provide an automatic-on function, the controls must function as either: a partial-on occupant sensor capable of automatically activating between 50% and 70% of controlled lighting power, or a vacancy sensor where all lighting responds to a manual on input only.
- Within 20 minutes of the entire office space being unoccupied, the occupant sensing controls must automatically turn off lighting in all control zones within the space.
- Lighting in each control zone must automatically return to full power when occupancy is detected in that zone. When occupancy is detected in any control zone in the space, the lighting in other unoccupied control zones must operate at no more than 20% of full power.

What This Means:

Partial-Off controls ensure that in spaces like offices or warehouses, lighting will be automatically reduced to 20% of full power when unoccupied. This ensures energy savings while still maintaining necessary light levels for safety and convenience. It also ensures that lighting turns off completely within 20 minutes after the room is unoccupied.

Control Zones: The lighting system must be divided into control zones to manage lighting in different areas independently. This ensures that lighting is adjusted optimally based on occupancy within the space, improving energy efficiency.

Exceptions:

- Exception 1 (Section 130.1(c)6): Under-shelf or furniture-mounted task lighting, controlled by a local switch and either a time clock or occupancy sensor, is exempt from these requirements.
- Exception 2 (Section 130.1(c)6): In office spaces where general lighting is provided by embedded sensors capable of reducing lighting power independently from other luminaires, each luminaire may be treated as its own control zone. This provides more flexibility and energy savings for larger spaces, allowing individual fixtures to be controlled separately.

Example:

In an office space greater than 250 sq. ft., if part of the space is unoccupied, the occupant sensor will reduce lighting in that area to 20% of full power. If the entire office is unoccupied, the lights will automatically turn off after 20 minutes of inactivity. Task lighting like desk lamps controlled by a local switch may remain on as needed.

Control Interactions

SECTION 130.1(f)

Requirement:

Each lighting control installed to comply with Sections 130.1(a) through (e) must be designed to allow for integration and interaction with other required lighting controls.

- For lighting controlled by both automatic daylighting controls and occupant sensing controls, the combined power consumption cannot exceed the lower power limit set by either control system.
- For HVAC systems serving spaces required to have occupant sensing controls, and where Table 120.1-A allows ventilation air to be reduced to zero during occupied-standby mode, the space conditioning system must also be controlled by occupancy sensing controls. After occupied standby mode is triggered, ventilation must shut off within five minutes. The HVAC signal must be independent of lighting control signals.

What This Means:

Control interactions ensure that all lighting controls and building systems work together efficiently. For spaces with occupancy sensors and HVAC, both lighting and ventilation adjust based on occupancy, saving energy when unoccupied.

Exceptions:

No specific exceptions. Building owners must properly configure and test each control system to work within energy efficiency limits.

Example:

In a conference room with daylighting controls and occupancy sensors, lighting will automatically dim or turn off based on natural light or occupancy. The HVAC system will shut off ventilation within five minutes of the room being vacated.

Outdoor Lighting Controls and Equipment

SECTION 130.2

Outdoor lighting must be independently controlled from other electrical loads. The controls for outdoor lighting must meet the following functional requirements:

LUMINAIRE SHIELDING (SECTION 130.2(B))

Requirement:

Outdoor luminaires must be controlled by an astronomical time-switch control or other automatic control capable of turning off outdoor lighting during daylight hours and during scheduled unoccupied nighttime periods. Controls capable of reducing lighting power by 50–90% during off-peak nighttime hours are required for qualifying luminaires.

What This Means:

Outdoor luminaires with high lumens need to be shielded to minimize glare, backlight, and uplight. This ensures that lighting is directed properly, reducing light pollution and improving visibility without impacting surrounding areas like roads or residences.

Exceptions:

- Exception 1 (Section 130.2(b)): Signs are exempt from the luminaire shielding requirements.
- Exception 2 (Section 130.2(b)): Lighting for building facades, public monuments, public art, statues, and vertical surfaces of bridges.
- Exception 3 (Section 130.2(b)): Lighting not permitted by a health or life safety statute, ordinance, or regulation to be a cutoff luminaire.
- Exception 4 (Section 130.2(b)): Temporary outdoor lighting.
- Exception 5 (Section 130.2(b)): Replacement of existing pole-mounted luminaires in hardscape areas if certain conditions are met (spacing, no added poles, no increased wattage).
- Exception 6 (Section 130.2(b)): Luminaires that illuminate the public right-of-way, including publicly-maintained roadways, sidewalks, and bikeways, are exempt from the shielding requirements.
- Exception 7 (Section 130.2(b)): Outdoor lighting attached to hotels/motels, controlled separately from the guest room, is exempt from the shielding requirements.

Example:

In a commercial parking lot, luminaires with 6,200 lumens or more must be shielded to prevent light from spilling over into adjacent areas. However, streetlights illuminating public roadways are exempt from the shielding requirements since they are classified under public right-of-way lighting.

AUTOMATIC SCHEDULING CONTROLS (SECTION 130.2(C)(2))

Requirement:

All outdoor luminaires with an initial luminaire lumen output of 6,200 lumens or greater must comply with the Backlight, Uplight, and Glare (BUG) requirements as specified in ANSI/IES TM-15-20, Annex A.

What This Means:

Outdoor lighting must be automatically scheduled to turn on and off at specific times. For example, lights can be set to turn off at midnight and turn back on at dusk. Scheduling controls can be combined with other controls, such as motion sensors, to ensure that lights are only on when needed, conserving energy.

Exceptions:

- Exception 1 (Section 130.2(c)(2)): Public roadways and sidewalks are exempt from the automatic scheduling control requirement.

Example:

Parking lot lights are equipped with automatic scheduling controls to turn off at midnight and turn on at dusk, ensuring energy efficiency by preventing lights from staying on during the day. Public street lighting is exempt from this requirement, as it is designed specifically to illuminate public roadways and sidewalks, and follows separate regulations under public roadway lighting.

MOTION SENSING CONTROLS (SECTION 130.2(C)(3))

Requirement:

Motion sensing controls must be installed for the following outdoor luminaires:

- Luminaires other than Building Facade, Ornamental Hardscape, Outdoor Dining, or Outdoor Sales Frontage lighting, where the bottom of the luminaire is mounted 24 feet or lower above grade.
- Wall-mounted luminaires installed for Building Facade, Ornamental Hardscape, or Outdoor Dining lighting, with a bilaterally symmetric distribution as defined in the IES Lighting Library™ and mounted 24 feet or lower above grade.

What This Means:

Motion sensors are required for certain outdoor luminaires to ensure that lighting is only activated when necessary. For example, lights in parking lots or outdoor walkways will automatically turn on when motion is detected. This helps to conserve energy by keeping lights off when no one is around.

Exceptions:

- Exception 3 (Section 130.2(c)): Lighting in parking structures is exempt from the motion sensing and automatic scheduling controls if the total lighting power does not exceed the specified threshold for luminaires in these areas.
- Exception 4 (Section 130.2(c)): Lighting systems installed above 24 feet are exempt from motion-sensing and automatic scheduling controls in specific applications, such as building façade lighting and ornamental hardscape lighting.

Example:

- In a parking garage, motion-sensing controls ensure that the lights are only activated when a vehicle enters the space. Similarly, motion sensors in an outdoor walkway turn on the lights when pedestrians are detected. Luminaires installed above 24 feet (such as for building façade lighting) are exempt from the motion-sensing requirement due to their height, which reduces the likelihood of unnecessary activation.

SIGN LIGHTING SOURCE RESTRICTION (2025)

Sign lighting sources are now limited to LED or neon only. High-pressure sodium, metal halide, fluorescent, and CFL are no longer permitted.

Lighting Control Acceptance and Installation Certificate Requirements

SECTION 130.4

Requirement:

Before an occupancy permit is granted, indoor and outdoor lighting and receptacle controls installed to comply with Sections 110.12, 130.1, 130.2, 130.5, or 140.6 must be certified as meeting the Acceptance Requirements for Code Compliance. These requirements are specified in the Reference Nonresidential Appendix NA7.6 and NA7.8.

A Certificate of Acceptance must be submitted to the enforcement agency under Section 10-103(a) of Part 1, confirming that the systems and equipment meet all the acceptance requirements.

What This Means:

Lighting systems must undergo testing and certification to ensure compliance with Title 24standards before the occupancy permit is issued. The Acceptance Requirements confirm that the systems are correctly installed and functioning as intended. This includes verifying that required controls—such as automatic daylighting, demand response, and motion sensing—are properly installed and working. Compliance is verified through the Certificate of Acceptance submitted to the enforcement agency.

The 2025 code now requires testing of controllable receptacles. Both a Certificate of Installation and a Certificate of Acceptance are required from a certified Acceptance Test Technician.

Specific Testing Requirements:

- Automatic Daylighting Controls: Must be tested in accordance with Reference Nonresidential Appendix NA7.6.1.
- Lighting Shut-Off Controls: Must be tested in accordance with Reference Nonresidential Appendix NA7.6.2.
- Demand Responsive Lighting Controls: Must comply with Section 130.1(e) and be tested in accordance with Reference Nonresidential Appendix NA7.6.3.
- Outdoor Lighting Controls: Must be tested in accordance with Reference Nonresidential Appendix NA7.8.
- Lighting Systems Receiving the Institutional Tuning Power Adjustment Factor: Must be tested in accordance with Reference Nonresidential Appendix NA7.6.4.
- Demand Responsive Controls for Controlled Receptacles: Must be tested in accordance with Reference Nonresidential Appendix NA7.6.5.

Example:

After installing demand responsive controls in a commercial office building, the lighting control system must undergo testing to ensure it can respond to utility signals by reducing lighting power during peak demand periods. Once the system successfully passes the test, the Certificate of Acceptance is submitted, allowing the building to be approved for occupancy.

Title 24 Application Guide

This Title 24 Application Guide aims to streamline the implementation of lighting control solutions, ensuring compliance with standards using our systems. While there are numerous approaches to designing spaces that meet building energy codes, use this guide as a concise reference to expedite your project's compliance journey. Our Design Services Team is ready to assist engineers and contractors with comprehensive support in design, submittal, and installation. For further details, please reach out to your Autani sales representative.

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