Introduction

GE Current, a Daintree company, enables intelligent environments with a powerful combination of LED lighting solutions, digital controls and energy management. The purpose of this guide is to provide recommendations for deploying the Daintree® wireless lighting controls in compliance with the California Title 24 Energy Code.

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California Title 24-2019

Title 24 establishes minimum requirements for energy-efficient buildings using prescriptive- and performance-related provisions.

For more information, visit energy.ca.gov.

The recommendations in this document are based on our understanding and interpretation of the code. In order to ensure full compliance, please reference the official published code.
Daintree Wireless Controls

The Daintree wireless solution suite includes wireless lighting controls, edge hardware devices and an intuitive web-based software platform. Our three levels of Daintree wireless controls are upgradeable, cost-effective and, most importantly, code-compliant. For those interested in a wired solution, LightSweep® offers a reliable and scalable solution.

Daintree wireless controls are available integrated and preinstalled in many Current lighting fixtures. For a complete list of integrated sensors, look for the Daintree Wireless Controls icon on the product pages on gecurrent.com.

<table>
<thead>
<tr>
<th>WIRELESS</th>
<th>WIRED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single-Fixture Control</td>
<td>✓</td>
</tr>
<tr>
<td>Daylight Harvesting</td>
<td>✓</td>
</tr>
<tr>
<td>Occupancy Sensing</td>
<td>✓</td>
</tr>
<tr>
<td>Embedded Luminaire Sensors</td>
<td>✓</td>
</tr>
<tr>
<td>Multiple-Fixture Control</td>
<td>✓</td>
</tr>
<tr>
<td>Commissioning App</td>
<td>✓</td>
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<tr>
<td>Energy Harvesting Wireless Switch</td>
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<td>HVAC Controls</td>
<td>✓</td>
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<tr>
<td>Environmental Monitoring and Alarms</td>
<td>✓</td>
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<tr>
<td>Automated Demand Response</td>
<td>✓</td>
</tr>
<tr>
<td>Plug Load Control</td>
<td>✓</td>
</tr>
<tr>
<td>Centralized Managed Controls</td>
<td>✓</td>
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<tr>
<td>Third-Party Sensor Compatibility</td>
<td>✓</td>
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<tr>
<td>Third-Party Software Compatibility</td>
<td>✓</td>
</tr>
<tr>
<td>Cloud Deployment</td>
<td>✓</td>
</tr>
<tr>
<td>DLC Certification</td>
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</tbody>
</table>

*Via BACNet
### LIGHTING CONTROL STRATEGIES

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>CONTROL STRATEGY</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="symbol.png" alt="Occupancy" /></td>
<td>Occupancy</td>
<td>Detects and alerts the system when the presence of people in a given area.</td>
</tr>
<tr>
<td><img src="symbol.png" alt="Vacancy" /></td>
<td>Vacancy</td>
<td>Detects and alerts the system when people are no longer in a given area.</td>
</tr>
<tr>
<td><img src="symbol.png" alt="Full Auto-On" /></td>
<td>Full Auto-On</td>
<td>Automatic control involves an occupancy sensor that turns the lights to full brightness when occupancy is detected. Light levels can be overridden with a dimmer switch.</td>
</tr>
<tr>
<td><img src="symbol.png" alt="Full Auto-Off" /></td>
<td>Full Auto-Off</td>
<td>Also referred as Vacancy detection, turns the lights off after a set time. California Title 24 requires Full Auto-Off after 20 minute vacancy of most common spaces.</td>
</tr>
<tr>
<td><img src="symbol.png" alt="Partial Auto-On" /></td>
<td>Partial Auto-On</td>
<td>Lights will automatically turn on to a set light level when a room has occupancy. Light levels can be adjusted by the user with a manual control.</td>
</tr>
<tr>
<td><img src="symbol.png" alt="Auto-Partial Off" /></td>
<td>Auto-Partial Off</td>
<td>In certain environments (such as open offices or egress stairwells), it is allowed and desirable to dim lights rather than turn them off when the area is vacant. The off-delay time is a maximum of 20 minutes.</td>
</tr>
<tr>
<td><img src="symbol.png" alt="Multi-level Control" /></td>
<td>Multi-level Control</td>
<td>Reduce lighting levels by dimming or multi-steps, usually with a scene switch. All general area lighting in rooms &gt; 100 sq. ft. and &lt; 0.5W/sq. ft. shall meet control step requirements of Table 130.1-A Multi-Level Lighting Controls &amp; Uniformity.</td>
</tr>
<tr>
<td><img src="symbol.png" alt="Demand Response" /></td>
<td>Demand Response</td>
<td>The control system has the capability of automatically reducing lighting power when a participating utility sends a peak demand signal. Daintree can also adjust integrated HVAC systems to reduce energy during peak demand times.</td>
</tr>
<tr>
<td><img src="symbol.png" alt="Emergency Fixture" /></td>
<td>Emergency Fixture</td>
<td>Emergency fixtures are required by building codes and may be powered by a fixture-integrated battery backup or unswitched power circuit. To fully control an emergency fixture/zone without impeding its function during a power loss event, an automatic load control relay must be used to disable the control signal and switch the fixture/zone to emergency power.</td>
</tr>
<tr>
<td><img src="symbol.png" alt="Daylight Harvesting" /></td>
<td>Daylight Harvesting</td>
<td>Title 24 requires lights near windows and skylights to dim automatically and take advantage of sunlight entering the building. Photosensors in each zone are required to keep light levels consistent. The areas where this is necessary are daylighting zones, which have specific dimensions based on window size and ceiling height. For an in-depth explanation of these zones, see page 10 of this guide.</td>
</tr>
</tbody>
</table>

### LIGHTING CONTROL STRATEGIES

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<tr>
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<th>CONTROL STRATEGY</th>
<th>DESCRIPTION</th>
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</thead>
<tbody>
<tr>
<td><img src="symbol.png" alt="Scheduling" /></td>
<td>Scheduling</td>
<td>Title 24 allows or requires adjustment of lighting behavior based on normally occupied days/times. This is often in lieu of occupancy controls in areas (e.g., atriums) that may not be conducive to occupancy sensors. The controls system must be able to account for days of the week and holiday overrides.</td>
</tr>
<tr>
<td><img src="symbol.png" alt="Top Trimming" /></td>
<td>Top Trimming</td>
<td>LED lights are extremely efficient and may project more light than expected, even when considering their lumen rating. Top trimming limits the maximum power of the luminaire to save additional energy and extend the life of the chips and driver. As time goes on, trimming can be removed or reduced to increase light levels as a fixture ages.</td>
</tr>
<tr>
<td><img src="symbol.png" alt="Scene Control" /></td>
<td>Scene Control</td>
<td>Scene control is a helpful and efficient way to create custom dimming levels for different areas of the room. Although not explicitly required by any energy codes, this strategy meets bilevel dimming requirements and is popular in conference rooms for presentations.</td>
</tr>
<tr>
<td><img src="symbol.png" alt="Plug Load Control" /></td>
<td>Plug Load Control</td>
<td>Plug Load control turns off receptacle devices to curb phantom or vampire loads of devices like printers, coffee pots, monitors, and other non-critical electronic devices.</td>
</tr>
</tbody>
</table>

### SCHEMES

<table>
<thead>
<tr>
<th>SCHEMES</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="symbol.png" alt="Zonal" /></td>
<td>A zonal design wires multiple lights together as a single control group. Zonal designs require less equipment and can offer a higher ROI. Zonal control groups are fixed in place and must be rewired if changes are necessary. <em>In a zonal scheme, the Daintree wireless lighting control adapter (WAPM) can govern 10 or more fixtures. Note that a single WAPM cannot be used to control fixtures on two different circuits.</em></td>
</tr>
<tr>
<td><img src="symbol.png" alt="Granular" /></td>
<td>A granular lighting design provides independent control of fixtures and requires the least amount of effort to deploy. Granular control allows the highest level of flexibility as lighting zones can be redefined and reprogrammed at any time. This scheme requires more equipment than a zonal design. In all cases, it is best to consult with a lighting estimator who can help optimize product and installation strategy.</td>
</tr>
</tbody>
</table>

The following control strategies are the way GE Current, a Daintree company, interprets the energy code and the products and sequence of operation that support the code. Always check with local ordinances and the code to ensure compliance with all state and local codes.
## Daintree System Symbol Guide

<table>
<thead>
<tr>
<th>Room</th>
<th>The application space z</th>
<th>Independently controlled zone dx</th>
<th>Device labeling</th>
</tr>
</thead>
</table>

### WALL DEVICES

- **Wireless wall dimmer (WWD2-2xx)**
- **EZ Connect wireless dimmer switch (ZB1-ST1AWH)**

### OCCUPANCY SENSORS

- **Wireless PIR occupancy sensor (WOS2-RM-E)**
- **Wireless PIR occupancy sensor (WOS2-CM-E)**
- **Wireless PIR occupancy sensor (WOS2-WM-W)**
- **Integrated fixture control with daylight and occupancy (WIZ100)** (Model number is specified with fixture)
- **EZ Connect multisensor adapter (WIT100)**

### PHOTOCELL

- **Wireless photocell (WPS1)**

### WIRELESS NETWORKED AREA CONTROLLER

- **Wireless area controller (WAC60)**

### ADAPTERS

- **Wireless lighting control adapter (WA100-PM)**
- **Wireless fixture adapter (WFA100-SN)**
- **Wireless highbay adapter (WHS100)**
- **Wireless general adapter (WGA100)**
- **Wireless sensor adapter (WSA100)**
- **Wireless thermostat (WTS10)**
- **NON-Zigbee-enabled luminaire with room, zone, device labeling**
- **Aux relay (BZ200/250)**

### OTHER EDGE DEVICES

- **Zigbee-enabled luminaire with room, zone, device labeling**
- **Automatic load control relay (0-10V) (BRU-X-UVW)**
- **Phase to 0-10v converter (LDCM-PL-120-277-010V-GR)**

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### Daintree Lighting Control General Notes

1. Installer is responsible for the final location of all sensors, switches and controllers, and for conforming with the manufacturer’s recommendations and meeting the functional requirements of the system.

2. Daintree Networked leverages a wireless area controller (WAC60) to network components or nodes. A node is any Daintree wireless device that connects and communicates to the Daintree Networked platform. Multiple rooms or zones can connect to a WAC60, and each WAC60 can support up to 175 nodes.

3. Daintree Control Software utilizes distributed control for on/off and dim state on the Daintree Networked platform. Existing relay panels and line-side switches must be overridden or removed. All wireless adapters must be provided with uninterrupted/unswitched power.

4. During installation, the last four digits of the IEEE address for each wireless component must be recorded on the shop drawing set corresponding to the location of the component.

5. During wireless adapter installation, follow these steps as defined in the device installation guide in the following order:
   - Confirm wireless adapter DIP switches are set correctly.
   - Reset adapter (all adapters).
   - Perform proper test suite.

### Daintree Mechanical Control General Notes

1. All wireless adapters must be provided with uninterrupted/unswitched power. WSA10 wireless sensor adapters require 24V power.

2. During installation, the last four digits of the IEEE address for each wireless component must be recorded on the shop drawing set corresponding to the location of the component.

3. For any sensors attached to a wireless adapter, the last four digits of the IEEE address must be recorded.

4. During wireless adapter installation, follow these steps as defined in the device installation guide in the following order:
   - Confirm wireless adapter DIP switches are set correctly.
   - Reset adapter (all adapters).
   - Perform proper test suite.

5. Installer must become familiar with the published installation guides for the products in the project scope. Daintree installation guides can be found at geconnect.com.

### Daintree Power/Receptacle Control General Notes

1. Installer is responsible for the final location of all sensors, switches and controllers, and for conforming with the manufacturer’s recommendations and meeting the functional requirements of the system.

2. Daintree Control Software utilizes distributed control for on/off and dim state. Existing relay panels and line voltage switches must be overridden or removed. All wireless adapters must be provided with uninterrupted/unswitched power.

3. During installation, the last four digits of the IEEE address for each wireless component must be recorded on the shop drawing set corresponding to the location of the component.

4. During wireless adapter installation, follow these steps as defined in the device installation guide in the following order:
   - Confirm wireless adapter DIP switches are set correctly.
   - Reset adapter (all adapters).
   - Perform proper test suite.

5. Installer must become familiar with the published installation guides for the products in the project scope. Daintree installation guides can be found at geconnect.com.

6. Electrical contractor is responsible for procurement and install of Daintree and related components pertaining to IT/data, lighting, power and HVAC.
Daylight Zone Requirements

Daylight Zone Requirements

Daylight Zone Requirements

Daylight Zone Requirements

Daylight Zone Requirements

Daylight Zone Requirements

Daylight Zone Exceptions

- Total lighting power is 150W or less.
- Total glazing area is 24 sq. ft. or less.
- Space types include healthcare patient areas, sleeping units and special application lighting.
- There may be additional exceptions based on space type, window area, neighboring obstructions and glass transmittance.

Please refer to the energy code.

Demand Response

Demand Response

Demand Response

Demand Response

Demand Response

Demand Response

What is Demand Response?

Demand response is a change in the power consumption of an electric utility customer to better match the demand for power with the supply. Until recently electric energy could not be easily stored, so utilities have traditionally matched demand and supply by throttling the production rate of their power plants, taking generating units on or off line, or importing power from other utilities. There are limits to what can be achieved on the supply side, because some generating units can take a long time to come up to full power, some units may be very expensive to operate, and demand can at times be greater than the capacity of all the available power plants put together. Demand response seeks to adjust the demand for power instead of adjusting the supply.

Why is Automated Demand Response Important?

Automated Demand Response (ADR) can be used to reduce energy usage during peak power consumption to reduce strain on the power grid.

California Title 24 Demand Response Requirements

Provision 110.12(c) – Demand Responsive Lighting Controls. Lighting controls in nonresidential buildings larger than 10,000 square feet shall be capable of automatically reducing lighting power in response to a Demand Response Signal. General lighting shall be reduced in a manner consistent with the uniform level of illumination requirements in Table 130.1-A.

Provision 110.12(c)(1) – For compliance testing, the lighting controls shall demonstrate a lighting power reduction in controlled spaces of a minimum of 15 percent below the total installed lighting power. The controls may provide additional demand responsive functions or abilities.

Exception 1 to 110.12(c): Spaces with a lighting power density of 0.5 watts per square foot or less are not required to install demand responsive controls and do not count toward the 10,000 square foot threshold.
Daintree Solution Stack

Daintree® provides a controls & IoT infrastructure that can scale from basic to highly advanced, today and tomorrow.

Simple, Scalable, Flexible

Daintree Networked Architecture

Multifaceted, cost-effective platform for entire portfolio, single platform.

IoT & Advanced Data Integrations leverage data with 3rd party applications to increase productivity.

How to Use This Guide

Room type

Configuration

List of control strategies being deployed in this scenario

Description of the lighting behavior for the space

Important notes related to the proposed solution

Wiring diagram showing the light fixtures, placement of control devices and line voltages

Bill of materials for the solution being described

Conference Room

Configuration

Daintree®

List of control strategies being deployed in this scenario

Important notes related to the proposed solution

Wiring diagram showing the light fixtures, placement of control devices and line voltages

Bill of materials for the solution being described
**Atrium Daintree Networked**

- 4–WA100-PM-Wireless lighting control adapter
- 3–WW2D-2xx-Wireless wall dimmer
- 2–WOS2-CM-E-Wireless PIR occupancy sensor
- 2–WPS1-Wireless photocell
- 1–BZ200-20 Amp Auxiliary Relay

**Control Strategies**

**Scheduling**

- 130.1(c)

**Daylight Harvesting**

- < 130.1(d)

**Top Trimming**

**Scene Control**

**Manual-On**

- 130.1(a)

**Multi-Level Control**

- 130.1(b)

**Plug Load Control**

**Lighting Behavior**

- Scene control is optional.
- All installed indoor lighting shall be equipped with controls able to automatically reduce lighting power when the space is typically unoccupied.
- Plug load control will operate based on occupancy and scheduling of the room.

**Exception to 130.1(c):**

- An exception allows up to 0.2 watts per foot² for a “path of egress” to not be controlled by manual area control.

**Exception to Section 140.3(c):**

- For skylight located in an atrium, the skylit daylit zone shall apply to the floor area directly under the atrium and the top floor area directly adjacent to the atrium.

**Note:**

- Many-current indoor fixtures can be ordered with TQ or TS controls catalog logice support Daintree Networked zonal control.

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**SOLUTION COMPONENTS**

<table>
<thead>
<tr>
<th>Picture</th>
<th>Symbol</th>
<th>Model Number</th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="WAPM" /></td>
<td><img src="image" alt="WAPM" /></td>
<td>WA100-PM</td>
<td>Wireless lighting control adapter</td>
<td>4</td>
</tr>
<tr>
<td><img src="image" alt="WWD2-2xx" /></td>
<td><img src="image" alt="WWD2-2xx" /></td>
<td>WWD2-2xx</td>
<td>Wireless wall dimmer</td>
<td>3</td>
</tr>
<tr>
<td><img src="image" alt="WOS2-CM-E" /></td>
<td><img src="image" alt="WOS2-CM-E" /></td>
<td>WOS2-CM-E</td>
<td>Wireless PIR occupancy sensor</td>
<td>2</td>
</tr>
<tr>
<td><img src="image" alt="WPS1" /></td>
<td><img src="image" alt="WPS1" /></td>
<td>WPS1</td>
<td>Wireless photocell</td>
<td>2</td>
</tr>
<tr>
<td><img src="image" alt="WWD2-4xx" /></td>
<td><img src="image" alt="WWD2-4xx" /></td>
<td>WWD2-4xx</td>
<td>Wireless Scene Switch</td>
<td>1**</td>
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<tr>
<td><img src="image" alt="NETWAC60" /></td>
<td><img src="image" alt="NETWAC60" /></td>
<td>WAC60**</td>
<td>Wireless area controller</td>
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<tr>
<td><img src="image" alt="BZ200-20A" /></td>
<td><img src="image" alt="BZ200-20A" /></td>
<td>BZ200</td>
<td>Power pack</td>
<td>1</td>
</tr>
</tbody>
</table>

* Top trimming maximum light output is not required by code, but is a recommended practice for energy savings.

** Optional; can be used for scene control or control of more than one WA100-PM instead of or in addition to a WWD2-2xx.

*** Daintree Networked leverages a wireless area controller (WAC60) and can support 175 nodes per WAC60. Multiple rooms can connect to the Daintree Networked platform using a WAC60.
Break Room Daintree Networked

1–WA100-PM–Wireless lighting control adapter
1–WOS2-CM-E–Wireless PIR occupancy sensor
1–WWD2-2xx–Wireless wall dimmer
1–BZ200-20 Amp Auxiliary Relay

- Each WA100-PM is capable of supporting 5mA sink or source on its 0–10V dimming circuit and can provide on/off via its line-voltage relay. Ensure zones are designed with respect to maximum sinking current supported by WA100-PM.
- BZ200 is capable of supporting 20 amp plug load receptacles.
- All general area lighting in rooms >100 sq. ft. and < 0.5W/sq. ft. shall meet control step requirements of Table 130.1-A Multi-Level Lighting Controls & Uniformity.

CONTROL STRATEGIES

OCCUPANCY/VACANCY CONTROL 130.1(c)1A

TOP TRIMMING

MULTI-LEVEL CONTROL 130.1(b)

PLUG LOAD CONTROL

EMERGENCY LIGHTING

LIGHTING BEHAVIOR

- Lights turn on when an occupant enters the space. Max light level trimmed to 80%.
- Occupants may use wall dimmers to set desired light levels.
- All lights automatically turn off after all occupants exit.
- Plug load control will operate based on occupancy and scheduling of the room.

SOLUTION COMPONENTS

<table>
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<tbody>
<tr>
<td><img src="image1" alt="WAPM" /></td>
<td>WAPM</td>
<td>WA100-PM</td>
<td>Wireless lighting control adapter</td>
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</tr>
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<td><img src="image2" alt="WWD2-2xx" /></td>
<td>WWD2-2xx</td>
<td>Wireless wall dimmer</td>
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</tr>
<tr>
<td><img src="image3" alt="WOS2-CM-E" /></td>
<td>WOS2-CM-E</td>
<td>Wireless PIR occupancy sensor</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><img src="image4" alt="WAC60**" /></td>
<td>WAC60**</td>
<td>Wireless access controller</td>
<td>1</td>
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</tr>
<tr>
<td><img src="image5" alt="BZ200 AUX" /></td>
<td>BZ200</td>
<td>Power pack</td>
<td>1</td>
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</tr>
</tbody>
</table>

* Top trimming maximum light output is not required by code but is a recommended practice for energy savings.

** Daintree Networked leverages a wireless access controller (WAC60) and can support 175 nodes per WAC60. Multiple rooms can connect to the Daintree Networked platform using a WAC60.

Note: Many current indoor fixtures can be ordered with TQ or TS controls catalog logic. These controls catalog logic support Daintree Networked zonal control.
**CONTROL STRATEGIES**

**OCCUPANCY/VACANCY CONTROL**

130.1(c)1A

**TOP TRIMMING**

**PLUG LOAD CONTROL**

**MULTI-LEVEL CONTROL**

130.1(b)

**LIGHTING BEHAVIOR**

- Max light level trimmed to 80%.
- Occupants may use wall dimmers to set desired light levels.
- All lights automatically turn off after all occupants exit.
- Plug load control will operate based on occupancy and scheduling of the room.

**SOLUTION COMPONENTS**

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<tr>
<td><img src="WAPM" alt="Wireless Lighting Control Adapter" /></td>
<td>WAPM</td>
<td>WA100-PM</td>
<td>Wireless lighting control adapter</td>
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</tr>
<tr>
<td><img src="WIZ100" alt="Integrated Fixture Control" /></td>
<td>WIZ100</td>
<td>Integrated fixture control with daylight and occupancy</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td><img src="WWD2-2xx" alt="Wireless Wall Dimmer" /></td>
<td>WWD2-2xx</td>
<td>Wireless wall dimmer</td>
<td>1</td>
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<tr>
<td><img src="WAC60" alt="Wireless Access Controller" /></td>
<td>WAC60</td>
<td>Wireless access controller</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><img src="BZ200" alt="Power Pack" /></td>
<td>BZ200</td>
<td>Power pack</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

* Top trimming maximum light output is not required by code but is a recommended practice for energy savings.

** Optional; can be used for scene control or in addition to a WWD2-2xx.

*** Order Lumination® LED luminaires come preinstalled with WIZ100 sensors and can be ordered with Daintree Networked “TZ” Controls Catalog logic. For a complete list of Daintree Integrated Fixtures, visit [gecurrent.com](http://gecurrent.com).

**** BZ200 is capable of supporting 20 amp plug load receptacles.

[20A] BZ200 Power pack 1
Conference Room Daintree Networked

- 2–WA100-PM-Wireless lighting control adapter
- 1–WWD2-2xx-Wireless wall dimmer
- 1–WOS2-CM-E-Wireless PIR occupancy sensor
- 2–WPS1-Wireless photocell
- 1–BZ200-20 Amp Auxiliary Relay

- Each WA100-PM is capable of supporting 5mA sink or source on its 0–10V dimming circuit and can provide on/off via its line-voltage relay. Ensure zones are designed with respect to maximum sinking current supported by WA100-PM.
- BZ200 is capable of supporting 20 amp plug load receptacles.

LIGHTING BEHAVIOR
- Lights turn on automatically to 50% when an occupant enters the space. Max light level trimmed to 80%.
- Lights adjust brightness based on daylight availability while the room is occupied. There is one perimeter daylighting zone.
- Occupants may use wall dimmers to set desired light levels.
- All lights automatically turn off within 20 minutes after all occupants exit.
- Plug load control will operate based on occupancy and scheduling of the room.

SOLUTION COMPONENTS

<table>
<thead>
<tr>
<th>Picture</th>
<th>Symbol</th>
<th>Model Number</th>
<th>Description</th>
<th>Quantity</th>
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<tr>
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<td>WOS2-CM-E</td>
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<td>WAC60***</td>
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<td>AUX</td>
<td>20A</td>
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<td>Power pack</td>
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</tbody>
</table>

* Top trimming maximum light output is not required by code but is a recommended practice for energy savings.
** Optional; can be used for scene control or control of more than one WA100-PM instead of or in addition to a WWD2-2xx.
Conference Room
Sensor Integrated Fixture Option

Control Strategies

**OCCUPANCY/VACANCY CONTROL**
130.1(c)1A, 130.1(c)5, 130.1(c)5A or 130.1(c)5B

**DAYLIGHT HARVESTING**
130.1(d)

**TOP TRIMMING**

**SCENE CONTROL**

**MANUAL-ON**
130.1(a)

**MULTI-LEVEL CONTROL**
130.1(a)

**PLUG LOAD CONTROL**

**EMERGENCY LIGHTING**

Lighting Behavior
- Lights turn on automatically to 50% when an occupant enters the space. Max light level trimmed to 80%.
- Lights adjust brightness based on daylight availability while the room is occupied. There is one perimeter daylighting zone.
- Occupants may use wall dimmers to set desired light levels.
- All lights automatically turn off within 20 minutes after all occupants exit.
- Plug load control will operate based on occupancy and scheduling of the room.

SOLUTION COMPONENTS

<table>
<thead>
<tr>
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<td>Power pack</td>
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</table>

* Top trimming maximum light output is not required by code but is a recommended practice for energy savings.
** Optional; can be used for scene control or control of more than one WA100-PM instead of or in addition to a WWD2-2xx.
*** Order Lumination fixtures with “TZ” catalog logic for sensors preinstalled in fixtures.
**CONTROL STRATEGIES**

### OCCUPANCY/VACANCY CONTROL

- 130.1(c)1A, 130.1(c)5, 130.1(c)5A or 130.1(c)5B, 130.1(c)6c

### EMERGENCY LIGHTING

- 130.1(d)

### DAYLIGHT HARVESTING

- 130.1(a)

### MANUAL-ON

- 130.1(a)

### LIGHTING BEHAVIOR

- **Lights turn on automatically to 100% when an occupant enters.**
- **Lights connected to emergency circuits default to 100% output during a power loss.**

### SOLUTION COMPONENTS

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<thead>
<tr>
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<th>Symbol</th>
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**Top trimming maximum light output is not required by code but is a recommended practice for energy savings.

** Daintree Networked leverages a wireless access controller (WAC60) and can support 175 nodes per WAC60. Multiple rooms can connect to the Daintree Networked platform using a WAC60.

Notes:

- A node is any Daintree wireless device that connects and communicates to the system.
- When the RRU-X sense loss of regular power, the RRU-X disconnects the 0–10V output from the WA100-PM and the emergency light fixture operates at maximum output from the emergency power circuit. If the RRU-X is not installed, the emergency fixture will dim to minimum because the WA100-PM 0–10V output shorts when the adapter loses power.
- Ceiling sensors can be used in place of wall-mounted sensors.
- Many Current indoor fixtures can be ordered with TQ or TS controls catalog logic. These controls catalog logic support Daintree Networked zonal control.

---

**Egress Corridor**

**Zonal Control Option**

**Option 1**—Single Fixture Emergency Generator Circuit

- 2–WA100-PM - Wireless lighting control adapter
- 2–WWD2-2 - Wireless wall dimmer
- 1–WOS2-WM-L - Wireless PIR occupancy sensor
- 1–RRU-X-UNV - Automatic load control relay (0–10v)

**Option 2**—Multiple Fixture Emergency Generator Circuit

- 2–WA100-PM - Wireless lighting control adapter
- 2–WWD2-2 - Wireless wall dimmer
- 1–WOS2-WM-L - Wireless PIR occupancy sensor
- 1–RRU-X-UNV - Automatic load control relay (0–10v)

**Egress Corridor Daintree Networked**

- 2–WA100-PM - Wireless lighting control adapter
- 2–WWD2-2 - Wireless wall dimmer
- 1–WOS2-WM-L - Wireless PIR occupancy sensor
- 1–RRU-X-UNV - Automatic load control relay (0–10v)

- **Each WA100-PM is capable of supporting 5mA sink or source on its 0–10V dimming circuit and can provide on/off via its line-voltage relay. Ensure zones are designed with respect to maximum sinking current supported by WA100-PM.**
- **Add a daylight sensor for corridors with daylight zones.**
- **Emergency fixtures may require an automatic load control relay (per WA100), which would bypass normal controls and cause the light level to change to 100% after a loss of normal power.**
- **Emergency fixture will dim but not turn off.**
- **If full-off is desired, a separate wireless adapter may be used at the emergency fixture. Locating the WA100 for the zone at the emergency fixture will also allow for this. An automatic load control relay will be required.**
- **Wire Emergency Battery Packs per code.**
**Lighting Behavior**

- Lights turn on automatically to 100% when an occupant enters.
- Lights connected to emergency circuits default to 100% output during a power loss.

**Control Strategies**

**Occupancy/Vacancy Control**

130.1(c)1A, 130.1(c)5, 130.1(c)5A or 130.1(c)5B, 130.1(c)6c

**Emergency Lighting**

130.1(d)

**Daylight Harvesting**

130.1(a)

**Manual-On**

130.1(e)

**Solution Components**

<table>
<thead>
<tr>
<th>Picture</th>
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<th>Description</th>
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</table>

* Top trimming maximum light output is not required by code but is a recommended practice for energy savings.

** Daintree Networked leverages a wireless access controller (WAC60) and can support 175 nodes per WAC60. Multiple rooms can connect to the Daintree Networked platform using a WAC60.

Notes: A node is any Daintree wireless device that connects and communicates to the system. Ceiling sensors can be used in place of wall-mount sensors. Many Current indoor fixtures can be ordered with TQ or TS controls catalog logic. These controls catalog logic support Daintree Networked zonal control.
Egress Corridor
Standalone Fixture Control Option

Emergency Generator Circuit

- Line-Voltage Wiring
- Emergency (EM) on a separate circuit

Egress Corridor Daintree One
5–WIZ100—Integrated fixture control with daylight and occupancy
2–WWD2—Wireless wall dimmer

CONTROL STRATEGIES

OCCUPANCY/VACANCY CONTROL
130.1(c)1A, 130.1(c)5, 130.1(c)5A or 130.1(c)5B, 130.1(c)6c

EMERGENCY LIGHTING

DAYLIGHT HARVESTING
130.1(d)

MANUAL-ON
130.1(a)

LIGHTING BEHAVIOR

- Lights turn on automatically to 100% when an occupant enters.
- Lights connected to emergency circuits default to 100% output during a power loss.
- Lights on nonemergency and emergency circuits dim to 50% when the area is vacant.

SOLUTION COMPONENTS

<table>
<thead>
<tr>
<th>Picture</th>
<th>Symbol</th>
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<th>Description</th>
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</table>

* Top trimming maximum light output is not required by code but is a recommended practice for energy savings.
CONTROL STRATEGIES

OCCUPANCY/VACANCY CONTROL
130.1(c)1A, 130.1(c)1B, 130.1(c)5, and exception

MULTI-LEVEL CONTROL
130.1(b)

LIGHTING BEHAVIOR
• Lights turn on automatically to 100% when an occupant enters.
• Lights connected to emergency circuits default to 100% output during a power loss.
• Lights dim to 50% when the area is vacant.

SOLUTION COMPONENTS

<table>
<thead>
<tr>
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<th>Symbol</th>
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<tr>
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<td>RRU-X-UNV</td>
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</tr>
</tbody>
</table>

* Top trimming maximum light output is not required by code but is a recommended practice for energy savings.
** Daintree Networked leverages a wireless access controller (WAC60) and can support 175 nodes per WAC60. Multiple rooms can connect to the Daintree Networked platform using a WAC60.

Notes:
- A node is any Daintree wireless device that connects and communicates to the system.
- When the RRU-X senses loss of regular power, the RRU-X disconnects the 0–10V output from the WA100-PM and the emergency light fixture operates at maximum output from the emergency power circuit. If the RRU-X is not installed, the emergency fixture will dim to minimum because the WA100-PM 0–10V output shorts when the adapter loses power.
- Ceiling sensors can be used in place of wall-mount sensors.
- Many Current indoor fixtures can be ordered with TQ or TS controls catalog logic. These controls catalog logic support Daintree Networked zonal control.

Egress Stairwell Daintree Networked
1–WOS2-WM-W-Wireless PIR occupancy sensor
2–RRU-X-UNV-Automatic load control relay (0–10v)
2–WFA100-SN-Wireless fixture adapter

• Lighting providing means of egress illumination, as the term is used in the California Building Code, shall be configured to provide no less than the amount of light required by California Building Code Section 1008 while in the partial-off mode.
• Wire Emergency Battery Packs per code.
**LIGHTING BEHAVIOR**

- Lights turn on automatically to maximum when an occupant enters.
- Lights connected to emergency circuits default to 100% output during a power loss.
- Lights dim to 10% when the area is vacant for at most 20 minutes.

**SOLUTION COMPONENTS**

<table>
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<th>Description</th>
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</tbody>
</table>

*Top trimming maximum light output is not required by code but is a recommended practice for energy savings.

**Notes:**

- A node is any Daintree wireless device that connects and communicates to the system.
- When the RRU-X senses loss of regular power, the RRU-X disconnects the 0–10V output from the WA100-PM and the emergency light fixture operates at maximum output from the emergency power circuit. If the RRU-X is not installed, the emergency fixture will dim to minimum because the WA100-PM 0–10V output shorts when the adapter loses power.
- Ceiling sensors can be used in place of wall mount sensors.
- Many current indoor fixtures can be ordered with TQ or TS controls catalog logic. These controls catalog logic support Daintree Networked zonal control.
LIGHTING BEHAVIOR

- Lights turn on automatically to 100% when an occupant enters.
- Lights connected to emergency circuits default to 100% output during a power loss.
- Lights dim to 50% when the area is vacant.

SOLUTION COMPONENTS

<table>
<thead>
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<th>Picture</th>
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<th>Description</th>
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* Top trimming maximum light output is not required by code but is a recommended practice for energy savings.
LIGHTING BEHAVIOR

• Lights turn on automatically to 100% when an occupant enters.
• Lights connected to emergency circuits default to 100% output during a power loss.

• Lights dim to 50% when the area is vacant.

SOLUTION COMPONENTS

<table>
<thead>
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</table>

* Order Lumination fixtures with “TT” catalog logic for sensors preinstalled in fixtures.
**Multistall Restroom Zonal Control Option**

- Each WA100-PM is capable of supporting 5mA sink or source on its 0–10V dimming circuit and can provide on/off via its line-voltage relay. Ensure zones are designed with respect to the lighting drivers used.
- Emergency fixtures may require an automatic load control relay (per WA100-PM), which would bypass normal controls and cause the light level to change to 100% after a loss of normal power.

---

**CONTROL STRATEGIES**

**EMERGENCY LIGHTING**

- Lights turn on automatically to 100% when an occupant enters the space.
- All lights automatically turn off after all occupants exit.

- Lights connected to emergency circuits default to 100% output during a power loss.

---

**LIGHTING BEHAVIOR**

- Lights turn on automatically to 100% when an occupant enters the space.
- All lights automatically turn off after all occupants exit.

---

**SOLUTION COMPONENTS**

<table>
<thead>
<tr>
<th>Picture</th>
<th>Symbol</th>
<th>Model Number</th>
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* Top trimming maximum light output is not required by code but is a recommended practice for energy savings.

**Notes:**
- A node is any Daintree wireless device that connects and communicates to the system.
- Many current indoor fixtures can be ordered with TQ or TS controls catalog logic. These controls catalog logic support Daintree Networked zonal control.

---

**SOLUTION COMPONENTS**

- 1–WA100-PM - Wireless lighting control adapter
- 1–WWD2 - Wireless wall dimmer
- 1–WOS2-CM-E - Wireless PIR occupancy sensor

---

**OCCUPANCY/VACANCY CONTROL**

- 130.1(c)1A, 130.1(c)5A, 130.1(c)5B

---

**MULTI-LEVEL CONTROL**

- 130.1(b) and exception
Zonal Control Option

- Each WA100-PM is capable of supporting 5mA sink or source on its 0–10V dimming circuit and can provide on/off via its line-voltage relay. Ensure zones are designed with respect to maximum sinking current supported by WA100-PM.
- Each control zone must be no larger than 5,000 sq. ft.
- All control zones in the open office area must be turned off if no activity is detected.
- Emergency fixtures may require an automatic load control relay (per WA100-PM), which would bypass normal controls and cause the light level to change to 100% after a loss of normal power.
- BZ200 is capable of supporting 20 amp plug load receptacles.
- All general area lighting in rooms >100 sq. ft. and < 0.5W/sq. ft. shall meet control step requirements of Table 130.1-A Multi-Level Lighting Controls & Uniformity.
- Lights turn on automatically when an occupant enters the zone.
- Lights adjust brightness based on daylight availability while the room is occupied. At the perimeter is a primary zone, as well as a secondary daylighting zone.
- Occupants may use wall dimmers to set desired light levels.
- Lights turn off when a zone is vacant for at most 20 minutes.
- Lights connected to emergency circuits default to 100% output during a power loss.
- Plug load control will operate based on occupancy and scheduling of the room.

SOLUTION COMPONENTS

**Manual-On**

- WA100-PM Wireless lighting control adapter
- WWD2 Wireless wall dimmer
- WOS2-CM-E Wireless PIR occupancy sensor
- WPS1 Wireless photocell
- BZ200 20A Auxillary Relay

**Daylight Harvesting**

130.1(d)

**Emergency Lighting**

**Multi-Level Control**

130.1(b)

**Plug Load Control**

**Top Trimming**

130.1(a) and exception

**Lighting Behavior**

- Lights turn on automatically when an occupant enters the zone.
- Lights adjust brightness based on daylight availability while the room is occupied. At the perimeter is a primary zone, as well as a secondary daylighting zone.
- Occupants may use wall dimmers to set desired light levels.
- Lights turn off when a zone is vacant for at most 20 minutes.
- Lights connected to emergency circuits default to 100% output during a power loss.
- Plug load control will operate based on occupancy and scheduling of the room.

**Notes:**

- A node is any Daintree wireless device that connects and communicates to the system.
- Adapters can be wired to additional fixtures on the same circuit. Ensure fixtures wattage and mA loads stay below adapter electrical ratings.
- Many current indoor fixtures can be ordered with TQ or TS controls catalog logic. These controls catalog logics support Daintree Networked zonal control.

**Tabular Form:**

<table>
<thead>
<tr>
<th>Picture</th>
<th>Symbol</th>
<th>Model Number</th>
<th>Description</th>
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</tbody>
</table>

* Top trimming maximum light output is not required by code but is a recommended practice for energy savings.
** Daintree Networked leverage a wireless access controller (WAC60) and can support 175 nodes per WAC60. Multiple rooms can connect to the Daintree Networked platform using a WAC60.
*** WWD2-4xx can be used in place of wireless wall dimmer to preset 4 light levels, or can be used as a 2 zone dimmer.

Notes: A node is any Daintree wireless device that connects and communicates to the system. Adapters can be wired to additional fixtures on the same circuit. Ensure fixtures wattage and mA loads stay below adapter electrical ratings. Many current indoor fixtures can be ordered with TQ or TS controls catalog logic. These controls catalog logics support Daintree Networked zonal control.
• Each control zone must be no larger than 600 sq. ft.
• All control zones in the open office area must be turned off if no activity is detected in any zone for 20 minutes.
• Many Lumination® LED luminaires come preinstalled with WIZ100 sensors and can be ordered with Daintree Networked “TZ” Controls Catalog logic. For a complete list of Daintree Integrated Fixtures, visit gecurrent.com.

Lighting Behavior

• Lights turn on automatically when an occupant enters the zone.
• Lights adjust brightness based on daylight availability while the room is occupied. At the perimeter is a primary zone, as well as a secondary daylighting zone.
• Occupants may use wall dimmers to set desired light levels.

Control Strategies

Occupancy/Vacancy Control

130.1(c)(1)A, 130.1(c)(1)B, 130.1(c)(1)C and exception

Top Trimming®

Manual-On

130.1(a) and exception

Daylight Harvesting

Emergency Lighting

Multi-Level Control

Plug Load Control

Solution Components

<table>
<thead>
<tr>
<th>Picture</th>
<th>Symbol</th>
<th>Model Number</th>
<th>Description</th>
<th>Quantity</th>
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<tbody>
<tr>
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<td>WA100-PM</td>
<td>Wireless lighting control adapter</td>
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<td>BZ200</td>
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</tbody>
</table>

* Top trimming maximum light output is not required by code but is a recommended practice for energy savings.
** Order Lumination fixtures with “TZ” catalog logic for sensors preinstalled in fixtures.
*** WWD2-4xx can be used in place of wireless wall dimmer to preset 4 light levels, or can be used as a 2 zone dimmer.
Private Office Daintree Networked

- 2–WA100-PM—Wireless lighting control adapter
- 1–WWD2—Wireless wall dimmer
- 1–WOS2-CM-E—Wireless PIR occupancy sensor
- 2–WPS1—Wireless photocell
- 1–BZ200—20 Amp Auxiliary Relay

- Each WA100-PM is capable of supporting 5mA sink or source on its 0–10V dimming circuit and can provide on/off via its line-voltage relay. Ensure zones are designed with respect to maximum sinking current supported by WA100-PM.
- Due to the size of the room, daylighting controls need to be installed individually. This can be done by field installing an adapter or ordering an integrated granular fixture.
- BZ200 is capable of supporting 20 amp plug load receptacles.
- All general area lighting in rooms >100 sq. ft. and < 0.5W/sq. ft. shall meet control step requirements of Table 130.1-A Multi-Level Lighting Controls & Uniformity.

** Note:** Daintree Networked leverages a wireless access controller (WAC60) and can support 175 nodes per WAC60. Multiple rooms can connect to the Daintree Networked platform using a WAC60.

** Notes:**
- A node is any Daintree wireless device that connects and communicates to the system.
- Many Current indoor fixtures can be ordered with TQ or TS controls catalog logic. These controls catalog logic support Daintree Networked zonal control.
Private Office Granular—Daintree Networked

Primary Daylight Zone
Secondary Daylight Zone

Office a, d1
Office a, d2

2–WIZ100—Integrated fixture control with daylight and occupancy
1–WA100-PM—Wireless lighting control adapter
1–WWD2—Wireless wall dimmer
1–BZ200—20 Amp Auxiliary Relay

• Many Lumination® LED luminaires come preinstalled with WIZ100 sensors and can be ordered with Daintree Networked “TZ” Controls Catalog logic. For a complete list of Daintree Integrated Fixtures, visit gecurrent.com.
• BZ200 is capable of supporting 20 amp plug load receptacles.
• All general area lighting in rooms >100 sq. ft. and < 0.5W/sq. ft. shall meet control step requirements of Table 130.1-A Multi-Level Lighting Controls & Uniformity.

CONTROL STRATEGIES

OCCUPANCY/VACANCY CONTROL
130.1(c)1A, 130.1(c)1C, 130.1(c)5, 130.1(c)5A or 130.1(c)5B

TOP TRIMMING* 

DAYLIGHT HARVESTING

PLUG LOAD CONTROL

MULTI-LEVEL CONTROL 130.1(b)

LIGHTING BEHAVIOR

• Lights turn on automatically to 50% when an occupant enters the space or full brightness with manual-on.
• Lights adjust brightness based on daylight availability while the room is occupied. There is one perimeter daylighting zone.
• Occupants may use wall dimmers to set desired light levels.
• All lights automatically turn off within 20 minutes after all occupants exit.
• Plug load control will operate based on occupancy and scheduling of the room.

SOLUTION COMPONENTS

<table>
<thead>
<tr>
<th>Picture</th>
<th>Symbol</th>
<th>Model Number</th>
<th>Description</th>
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</table>

* Top trimming maximum light output is not required by code but is a recommended practice for energy savings.
** Order Lumination fixtures with “TZ” catalog logic for sensors preinstalled in fixtures.
Warehouse Daintree One
12–WH520-High bay fixture control with daylight and occupancy

- Unser Albeo® High Bay Fixtures with “FB” catalog logic for sensors preinstalled in fixtures.
- All general area lighting in rooms >100 sq. ft. and < 0.5W/sq. ft. shall meet control step requirements of Table 130.1-A Multi-Level Lighting Controls & Uniformity.

CONTROL STRATEGIES

OCCUPANCY/VACANCY CONTROL

- Automatically reduce lighting ≥50% when unoccupied.
- Each aisle can be independently controlled.

DAILIGHT HARVESTING

- Lights adjust brightness based on daylight availability while the room is occupied.

TOP TRIMMING*

- Top trimming maximum light output is not required by code but is a recommended practice for energy savings.

SOLUTION COMPONENTS

<table>
<thead>
<tr>
<th>Picture</th>
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<th>Description</th>
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</table>

* Top trimming maximum light output is not required by code but is a recommended practice for energy savings.
** Order Albeo fixtures with “FB” catalog logic for sensors preinstalled in fixtures.

Note: Daintree WH520 can be custom programmed with the WHR1 remote.

Line-Voltage Wiring
CONTROL STRATEGIES

**OCCUPANCY/VACANCY CONTROL**

- Automatically reduce lighting ≥50% when unoccupied.
- Each aisle can be independently controlled.

**DAYLIGHT HARVESTING**

- Lights adjust brightness based on daylight availability while the room is occupied.
- Lights must turn off after aisle is vacated after 20 minutes.

**TOP TRIMMING**

* Top trimming maximum light output is not required by code but is a recommended practice for energy savings.

** Order Albeo® fixtures with “DF” catalog logic for sensors preinstalled in fixtures.

*Note:* Daintree WHS20 can be custom programmed with the Daintree EZ Connect App available on the Apple® App Store.

**SOLUTION COMPONENTS**

<table>
<thead>
<tr>
<th>Picture</th>
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<tbody>
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</table>

* Order Albeo fixtures with “DF” catalog logic for sensors preinstalled in fixtures.

** Note:** Daintree WHS20 can be custom programmed with the Daintree EZ Connect App available on the Apple® App Store.

** Warehouse Daintree EZ Connect**

12–WHS20—High bay fixture control with daylight and occupancy

- Under Albeo® High Bay Fixtures with “DF” catalog logic for sensors preinstalled in fixtures.
- All general area lighting in rooms >100 sq. ft. and < 0.5W/sq. ft. shall meet control step requirements of Table 130.1-A Multi-Level Lighting Controls & Uniformity.
Warehouse Daintree One
12–WHS20—High bay fixture control with daylight and occupancy

• Under Albeo® High Bay Fixtures with “NA” catalog logic for sensors preinstalled in fixtures.
• All general area lighting in rooms >100 sq. ft. and < 0.5W/sq. ft. shall meet control step requirements of Table 130.1-A Multi-Level Lighting Controls & Uniformity.

**CONTROL STRATEGIES**

**OCCUPANCY/VACANCY CONTROL**

- Lights adjust brightness based on daylight availability while the room is occupied.
- Lights must turn off after aisle is vacated after 20 minutes.

**DAYLIGHT HARVESTING**

**TOP TRIMMING**

- Automatically reduce lighting ≥50% when unoccupied.
- Each aisle can be independently controlled.

**LIGHTING BEHAVIOR**

**SOLUTION COMPONENTS**

<table>
<thead>
<tr>
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<th>Symbol</th>
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<th>Description</th>
<th>Quantity</th>
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</table>

* Top trimming maximum light output is not required by code but is a recommended practice for energy savings.
** Order Albeo fixtures with “NA” catalog logic for sensors preinstalled in fixtures.
*** WWD2-4xx can be used in place of wireless wall dimmer to preset 4 light levels, or can be used as a 2 zone dimmer.

Note: Daintree WHS20 can be custom programmed with Daintree Controls Software web application in Daintree Networked.