Energy Code Solution Guide

IECC 2018

Current

Introduction

Current 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 2018 International Energy Conservation Code (IECC).

TABLE OF CONTENTS

IECC 2018

The IECC establishes minimum requirements for energy-efficient buildings using prescriptive- and performance-related provisions.

For more information, visit *codes.iccsafe.org.*

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.

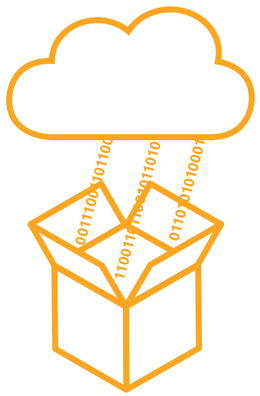
Daintree Wireless Controls

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 ixtures. For a complete list of integrated sensors, look for the Daintree Wireless Controls icon on the product pages on **LED.com.**

WIRELESS

SIMPLE COMMISSIONING



OPEN ARCHITECTURE

CODE-COMPLIANT

	Daintree ONE	Daintree EZ CONNECT	Daintree NETWORKED	LightSweep®
	WIRELESS			WIRED
Single-Fixture Control	✓	✓	✓	✓
Daylight Harvesting	✓	✓	✓	✓
Occupancy Sensing	✓	✓	✓	✓
Embedded Luminaire Sensors	✓	✓	✓	
Multiple-Fixture Control		✓	✓	✓
Commissioning App		✓		
Energy Harvesting Wireless Switch		✓		
HVAC Controls			✓	✓
Environmental Monitoring and Alarms			✓	✓
Automated Demand Response			✓	✓
Plug Load Control			✓	✓
Centralized Managed Controls			✓	✓
Third-Party Sensor Compatibility			✓	✓
Third-Party Software Compatibility			✓	✓*
Cloud Deployment			✓	
DLC Certification			✓	

Via BACNet

LIGHTING CONTROL STRATEGIES

SYMBOL	CONTROL STRATEGY		DESCRIPTION
	**Occupancy/Vacancy**		IECC 2018 requires the use of sensors to detect the presence of people in a given area. Sensors may be used in the following ways:
	SETTINGS	**Manual-On**	Manual control involves a switch and/or dimmer that overrides automatic and scheduled lighting behavior. Manual control is necessary in most areas but not all. Any override initiated via manual control may, by code, last up to two hours, after which the lighting will revert to its programmed behavior.
		Auto-On	Lights in the area automatically illuminate upon entry. Set auto-on light levels below 100% for increased energy savings. If additional light is necessary, brightness can be manually increased if manual controls are present.
		Auto-Off	IECC 2018 requires a maximum auto-off delay of 20 minutes for applicable areas. Decrease this time to maximize energy savings.
		Auto-Partial Off	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.
	**Demand Response**		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.
	**Emergency Fixture**		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.
	**Daylight Harvesting**		IECC 2018 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.

LIGHTING CONTROL STRATEGIES

SYMBOL	CONTROL STRATEGY		DESCRIPTION
	**Scheduling**		IECC 2018 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.
	**Top Trimming**		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.
	**Scene Control**		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.
	SCHEMES	**Zonal**	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. **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.*
		Granular	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.

Daintree System Symbol Guide

Room: The application space z: Independently controlled zone dx: Device labeling

WALL DEVICES			
Wireless wall dimmer (WWD1)	$ Room z, s#	Wireless 3-button switch (WWS3)	$ 3
EZ Connect wireless dimmer switch (ZBT-S1AWH)	EZ $ Room z, s#		
OCCUPANCY SENSORS			
Wireless PIR occupancy sensor (WOS2-RM-E)	OS Room z, ox	Wireless PIR occupancy sensor (WOS2-CM-E)	z OS Room
Wireless PIR occupancy sensor (WOS2-WM-L)	z OS Room	Wireless PIR occupancy sensor (WOS2-WM-W)	z OS Room
Integrated fixture control with daylight and occupancy (WIZ100) *(Model number is specified with fixture)*	WIZ100	High bay sensor (WHS20)	WHS20
EZ Connect multisensor adapter (WIT100)	WIT100		
PHOTOCELL		**WIRELESS NETWORKED AREA CONTROLLER**	
Wireless photocell (WPS1)	PS Room z, px	Wireless area controller (WAC60)	NET WAC
ADAPTERS			
Wireless lighting control adapter (WA100-PM)	Room z, dx WAPM	Wireless general adapter (WGA100) *Receptacle control*	z WGA
Wireless fixture adapter (WFA100-SN)	z WFA Room	Wireless sensor adapter (WSA10)	z WSA Room
Wireless highbay adapter (WHS100)	Room z, dx WHS OS a, o1	WHS100 (occupancy sensor not used)	Room z, dx WHS
OTHER EDGE DEVICES			
Wireless thermostat (WTS10)	x T STAT x	Zigbee-enabled luminaire with room, zone, device labeling	Room z, dx
NON-Zigbee-enabled luminaire with room, zone, device labeling	Room z, dx	Automatic load control relay (0–10V) (RRU-X-UNV)	EM X
Aux relay (BZ200/250) *Receptacle control or 2-pole lighting*	x AUX	Phase to 0–10v converter (LDCM-PL-120-277-010V-GR)	LDCM

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.
6. Installer must become familiar with the published installation guides for the products in the project scope. Daintree installation guides can be found at **LED.com.**
7. Daintree EZ Connect sensors can be configured by the Daintree EZ Connect app. This is a free download available on the Apple® App Store.

Download on the App Store

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-side 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 **LED.com.**

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 for the respective adapter 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 **LED.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

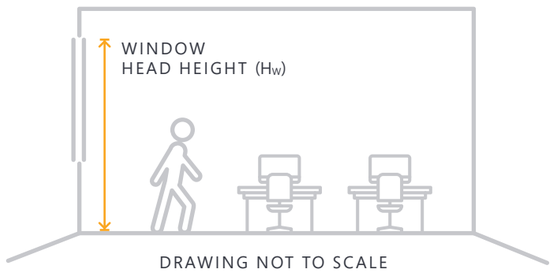
- Sidelight daylight zones should be controlled separately from toplighted zones.
- The north, south, east and west zones should be controlled separately.
- Rooms such as classrooms, office spaces, labs and libraries must continuously dim to ≤ 15%.

DAYLIGHT ZONE EXCEPTIONS

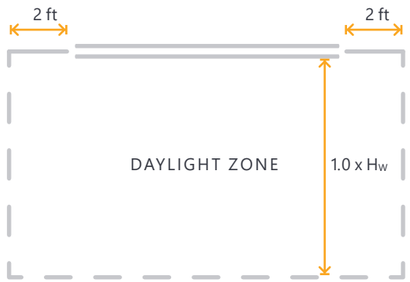
- Total lighting power is 150W or less.
- Total glazing area is 24 sq. ft. or less.
- Space types include healthcare patient areas, sleeping units and special application lighting.
- There may be additional exceptions based on space type, window area, neighboring obstructions and glass transmittance.

Please refer to the energy code.

SIDELIGHTING (WINDOW)



DRAWING NOT TO SCALE



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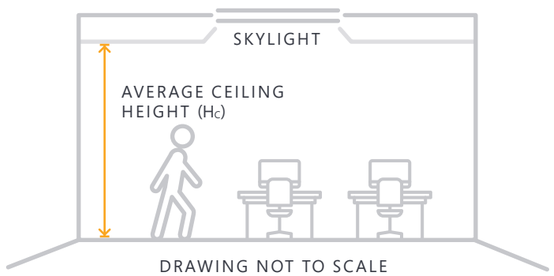
TOPLIGHTING (SKYLIGHT)



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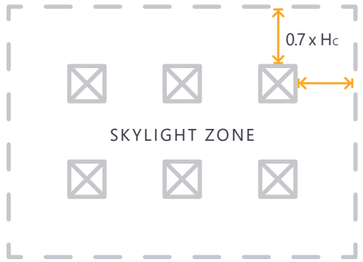
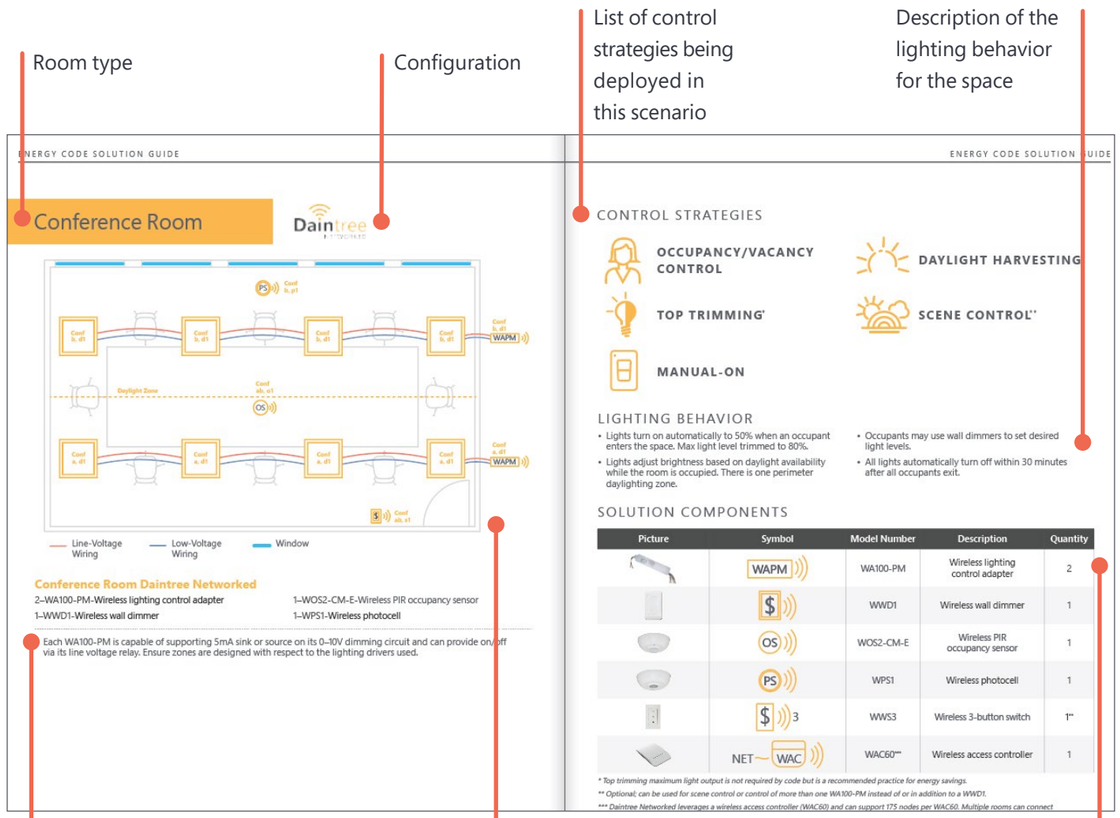


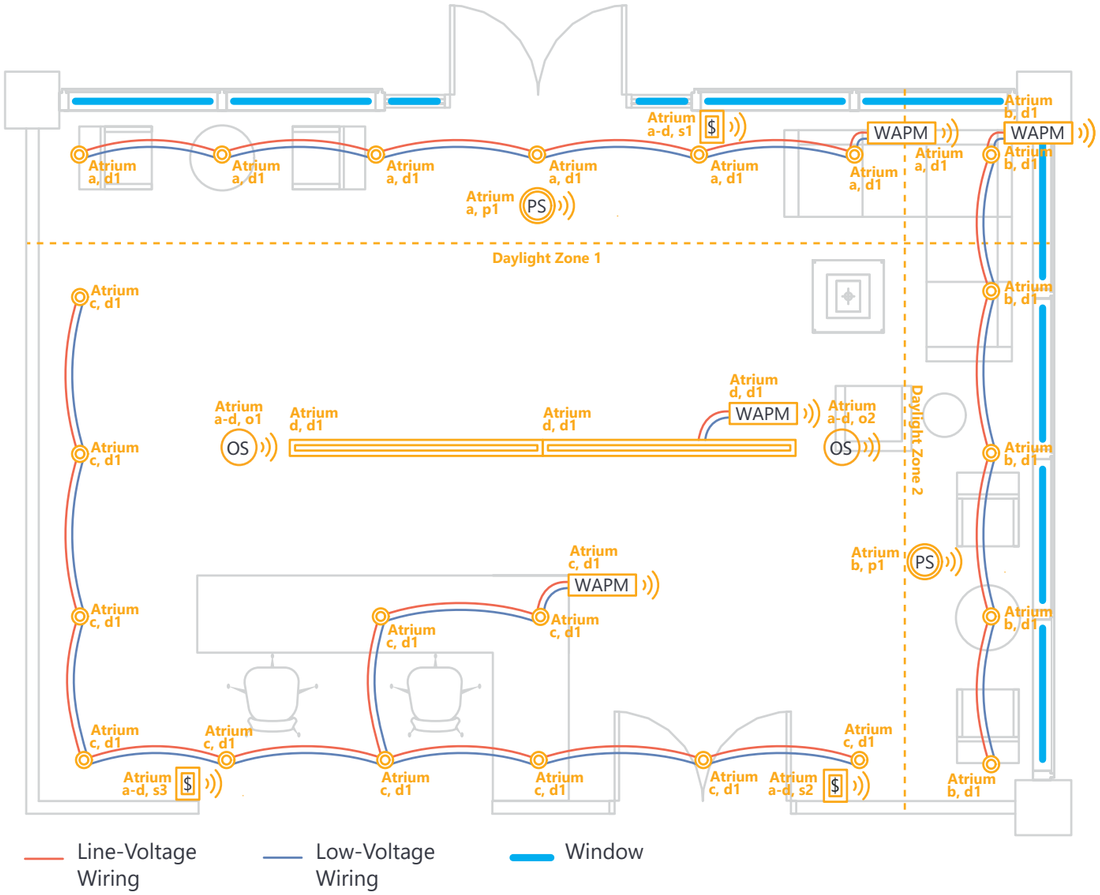
DRAWING NOT TO SCALE

How to Use This Guide



Atrium

Daintree NETWORKED



Atrium Daintree Networked

4–WA100-PM-Wireless lighting control adapter
3–WWD1-Wireless wall dimmer
2–WOS2-CM-E-Wireless PIR occupancy sensor
2–WPS1-Wireless photocell

- 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 zones should be fitted with 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

- **SCHEDULING**
- **TOP TRIMMING***
- **MANUAL-ON**
- **DAYLIGHT HARVESTING**
- **SCENE CONTROL****
- **EMERGENCY LIGHTING**

LIGHTING BEHAVIOR

- Lights turn on and off based on time clock scheduling for normal occupied hours. Max light level trimmed to 80%.
- Lights automatically adjust brightness based on daylight availability.
- Occupants may use wall dimmers to set desired light levels.
- Scene control is optional.
- Lights on nonemergency circuits turn off when the area is vacant for at most 20 minutes.

SOLUTION COMPONENTS

Picture	Symbol	Model Number	Description	Quantity
	WAPM	WA100-PM	Wireless lighting control adapter	4
	$	WWD1	Wireless wall dimmer	3
	OS	WOS2-CM-E	Wireless PIR occupancy sensor	2
	PS	WPS1	Wireless photocell	2
	$ 3	WWS3	Wireless 3-button switch	1**
	NET WAC	WAC60***	Wireless area controller	1

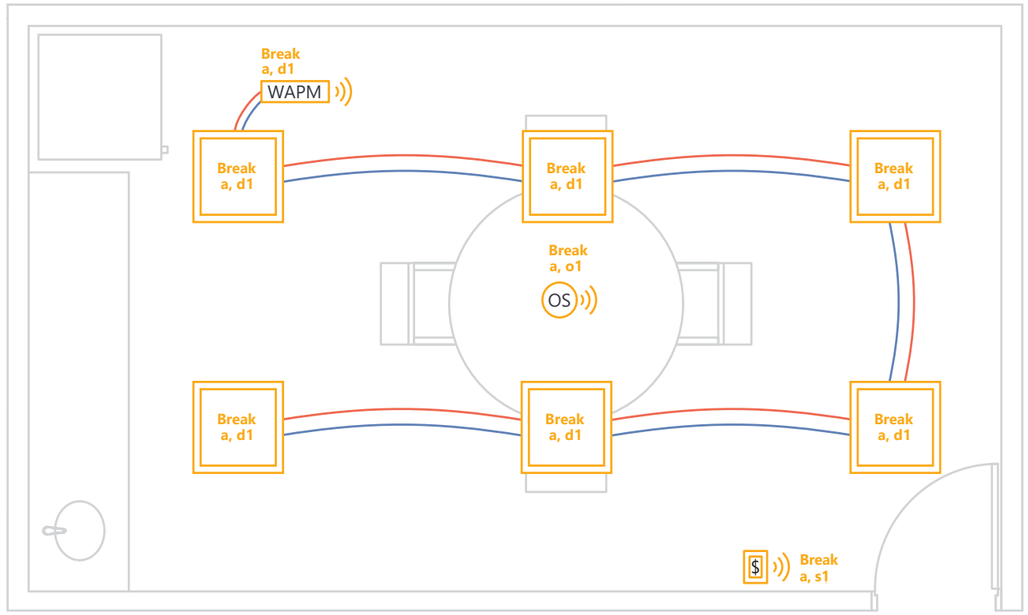
** Top trimming maximum light output is not required by code, but is a recommended practice for energy savings.*

*** Optional; can be used for scene control or control of more than one WA100-PM instead of or in addition to a WWD1.*

**** 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.*

***Note:** A node is any Daintree wireless device that connects and communicates to the system.*

Break Room



Break Room Daintree Networked

1–WA100-PM-Wireless lighting control adapter

1–WWD1-Wireless wall dimmer

1–WOS2-CM-E-Wireless PIR occupancy sensor

- 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.

CONTROL STRATEGIES

OCCUPANCY/VACANCY CONTROL

MANUAL-ON

TOP TRIMMING*

LIGHTING BEHAVIOR

- Lights turn on automatically to 50% 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 within 20 minutes after all occupants exit.

SOLUTION COMPONENTS

Picture	Symbol	Model Number	Description	Quantity
	WAPM	WA100-PM	Wireless lighting control adapter	1
	$	WWD1	Wireless wall dimmer	1
	OS	WOS2-CM-E	Wireless PIR occupancy sensor	1
	NET WAC	WAC60**	Wireless access controller	1

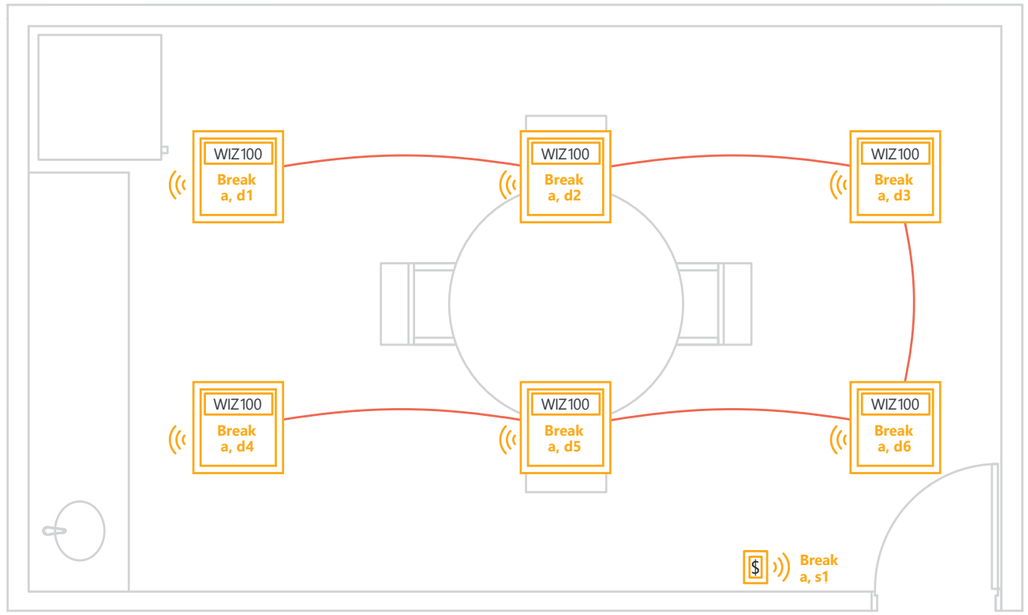
** Top trimming maximum light output is not required by code but is a recommended practice for energy savings.*

*** 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:** A node is any Daintree wireless device that connects and communicates to the system.*

Break Room
Integral Option

Daintree NETWORKED



Line-Voltage Wiring

Break Room Daintree Networked

6–WIZ100-Integrated fixture control with daylight and occupancy

1–WWD1-Wireless wall dimmer

- 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 **LED.com.**

CONTROL STRATEGIES

OCCUPANCY/VACANCY CONTROL

MANUAL-ON

TOP TRIMMING*

SCENE CONTROL**

LIGHTING BEHAVIOR

- Lights turn on automatically to 50% 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 within 20 minutes after all occupants exit.

SOLUTION COMPONENTS

Picture	Symbol	Model Number	Description	Quantity
	WIZ100	WIZ100	Integrated fixture control with daylight and occupancy***	6
	$	WWD1	Wireless wall dimmer	1
	NET WAC	WAC60****	Wireless access controller	1

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

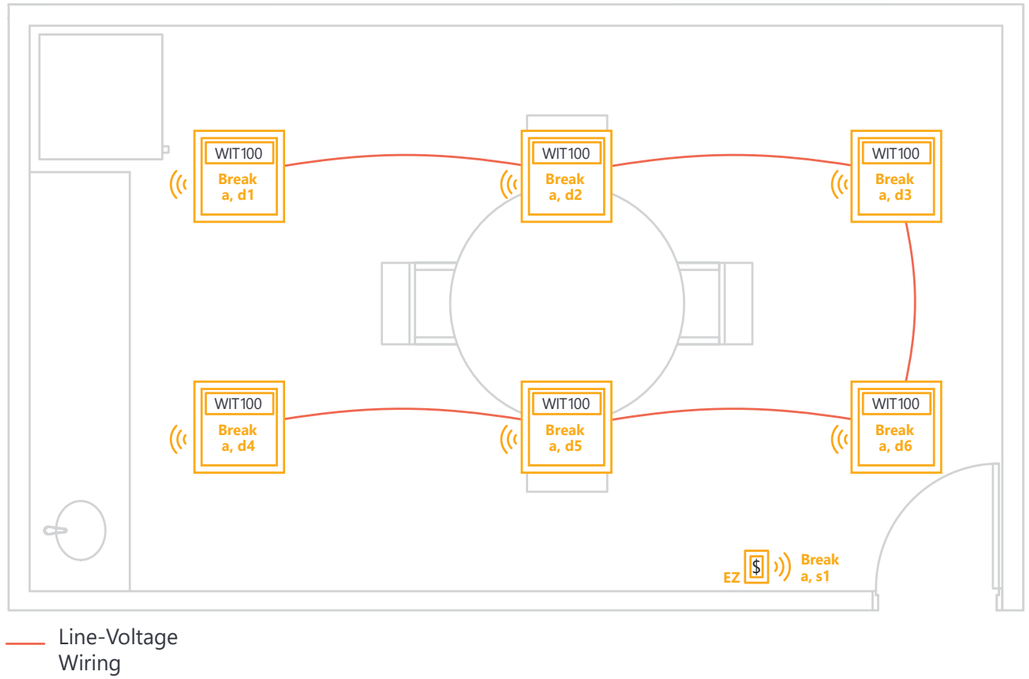
*** Optional; can be used for scene control or control of more than one WA100-PM instead of or in addition to a WWD1.*

**** Order Lumination fixtures with "TZ" catalog logic for sensors preinstalled in fixtures.*

***** 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.*

Break Room

Daintree EZ CONNECT



Break Room Daintree EZ Connect

6–WIT100-Integrated fixture control with daylight and occupancy

1–ZBT-S1AWH-Wireless dimmer switch

- Many Lumination® LED luminaires come preinstalled with WIT100 sensors and can be ordered with Daintree EZ Connect "TT" Controls Catalog logic. For a complete list of Daintree Integrated Fixtures, visit **LED.com.**

CONTROL STRATEGIES

OCCUPANCY/VACANCY CONTROL

MANUAL-ON

TOP TRIMMING*

LIGHTING BEHAVIOR

- Lights turn on automatically to 50% 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 within 20 minutes after all occupants exit.

SOLUTION COMPONENTS

Picture	Symbol	Model Number	Description	Quantity
	WIT100	WIT100	Integrated fixture control with daylight and occupancy**	6
	EZ $ Room z, s#	ZBT-S1AWH	Wireless dimmer switch	1

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

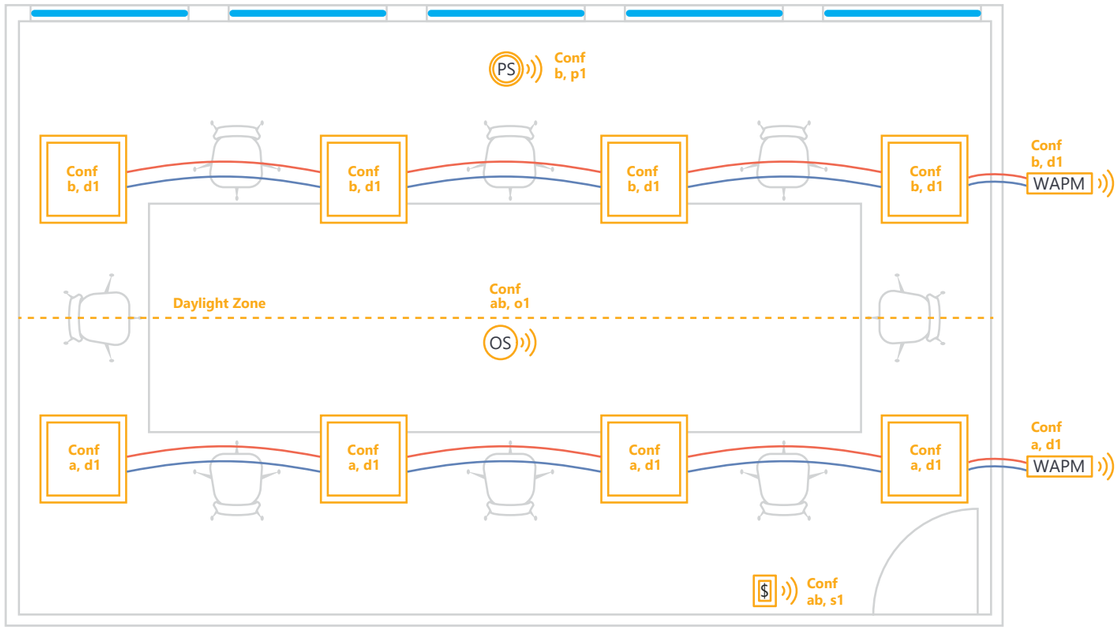
*** Order Lumination fixtures with "TT" catalog logic for sensors preinstalled in fixtures.*

***Note:** Daintree EZ Connect devices can be custom programmed using the Daintree EZ Connect App and is available on the Apple® App Store.*

Download on the App Store

Conference Room

Daintree NETWORKED



Conference Room Daintree Networked

2–WA100-PM-Wireless lighting control adapter
1–WWD1-Wireless wall dimmer
1–WOS2-CM-E-Wireless PIR occupancy sensor
1–WPS1-Wireless photocell

- 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.

CONTROL STRATEGIES

- **OCCUPANCY/VACANCY CONTROL**
- **DAYLIGHT HARVESTING**
- **TOP TRIMMING***
- **SCENE CONTROL****
- **MANUAL-ON**

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.

SOLUTION COMPONENTS

Picture	Symbol	Model Number	Description	Quantity
	WAPM	WA100-PM	Wireless lighting control adapter	2
	$	WWD1	Wireless wall dimmer	1
	OS	WOS2-CM-E	Wireless PIR occupancy sensor	1
	PS	WPS1	Wireless photocell	1
	$ 3	WWS3	Wireless 3-button switch	1**
	NET WAC	WAC60***	Wireless access controller	1

** 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 WWD1.*

**** 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:** A node is any Daintree wireless device that connects and communicates to the system.*

Conference Room

Daintree NETWORKED

Conference Room Daintree Networked

8–WIZ100-Integrated fixture control with daylight and occupancy

1–WWD1-Wireless wall dimmer

- 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 **LED.com.**

CONTROL STRATEGIES

OCCUPANCY/VACANCY CONTROL

DAYLIGHT HARVESTING

TOP TRIMMING*

SCENE CONTROL**

MANUAL-ON

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.

SOLUTION COMPONENTS

Picture	Symbol	Model Number	Description	Quantity
	WIZ100	WIZ100	Integrated fixture control with daylight and occupancy***	8
	$	WWD1	Wireless wall dimmer	1
	$ 3	WWS3	Wireless 3-button switch	1**

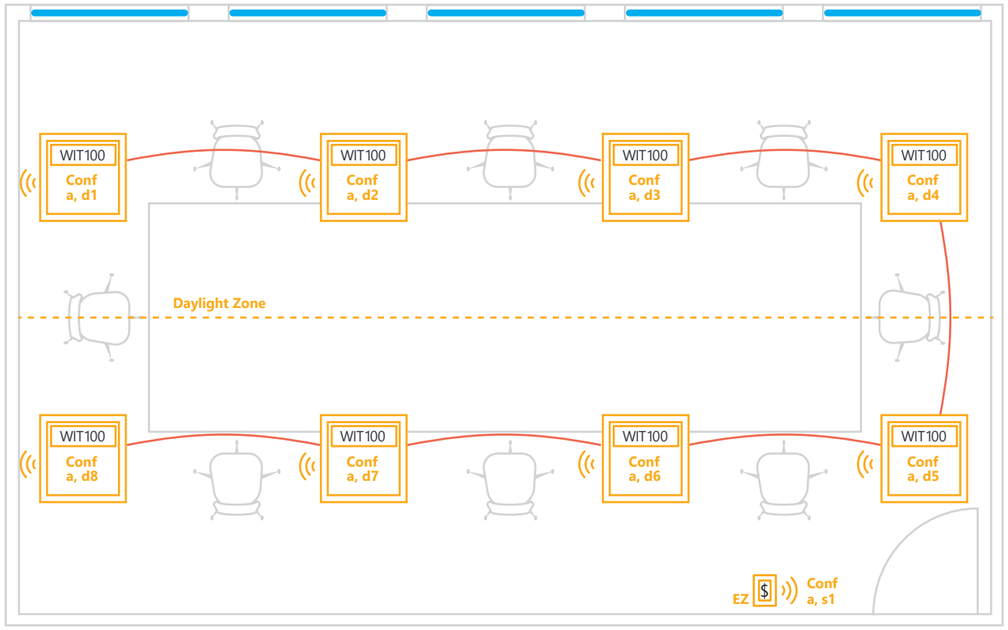
** Top trimming maximum light output is not required by code but is a recommended practice for energy savings.*

*** Optional; can be used for scene control or control of more than one WA100-PM instead of or in addition to a WWD1.*

**** Order Lumination fixtures with "TZ" catalog logic for sensors preinstalled in fixtures.*

Conference Room

Daintree EZ CONNECT



Conference Room Daintree EZ Connect

8–WIT100-Integrated fixture control with daylight and occupancy

1–ZBT-S1AWH-Wireless dimmer switch

- Many Lumination® LED luminaires come preinstalled with WIT100 sensors and can be ordered with Daintree EZ Connect "TT" Controls Catalog logic. For a complete list of Daintree Integrated Fixtures, visit **LED.com.**

CONTROL STRATEGIES

OCCUPANCY/VACANCY CONTROL

DAYLIGHT HARVESTING

TOP TRIMMING*

MANUAL-ON

LIGHTING BEHAVIOR

- Lights turn on automatically to 50% when an occupant enters the space. Max light level trimmed to 80%.
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SOLUTION COMPONENTS

Picture	Symbol	Model Number	Description	Quantity
	WIT100	WIT100	Integrated fixture control with daylight and occupancy**	8
	EZ $ Room z, s#	ZBT-S1AWH	Wireless dimmer switch	1

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

*** Order Lumination fixtures with "TT" catalog logic for sensors preinstalled in fixtures.*

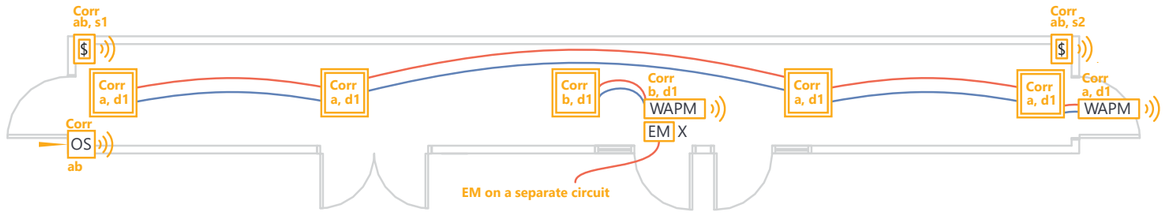
***Note:** Daintree EZ Connect devices can be custom programmed using the Daintree EZ Connect App and is available on the Apple® App Store.*

Download on the App Store

Egress Corridor

Daintree NETWORKED

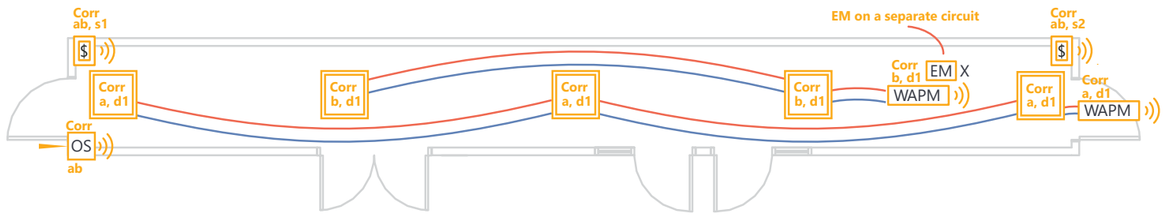
Option 1—Single Fixture Emergency Generator Circuit



Egress Corridor Daintree Networked

2–WA100PM-Wireless lighting control adapter
2–WWD1-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



Line-Voltage Wiring
Low-Voltage Wiring

Egress Corridor Daintree Networked

2–WA100-PM-Wireless lighting control adapter
2–WWD1-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 the lighting drivers used.
- 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.

CONTROL STRATEGIES

OCCUPANCY/VACANCY CONTROL

EMERGENCY LIGHTING

TOP TRIMMING*

LIGHTING BEHAVIOR

- Lights turn on automatically to maximum when an occupant enters.
- Occupants may use wall dimmers to set desired light levels.
- Lights connected to emergency circuits default to 100% output during a power loss.
- Lights on nonemergency circuits turn off when the area is vacant for at most 20 minutes.

SOLUTION COMPONENTS

Picture	Symbol	Model Number	Description	Quantity
	WAPM	WA100-PM	Wireless lighting control adapter	1
	$	WWD1	Wireless wall dimmer	2
	OS	WOS2-WM-L	Wireless PIR occupancy sensor	1
	EM X	RRU-X-UNV	Automatic load control relay (0–10v) - Double pole double throw (DPDT)	1
	NET WAC	WAC60	Wireless access controller	1**

** 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.*

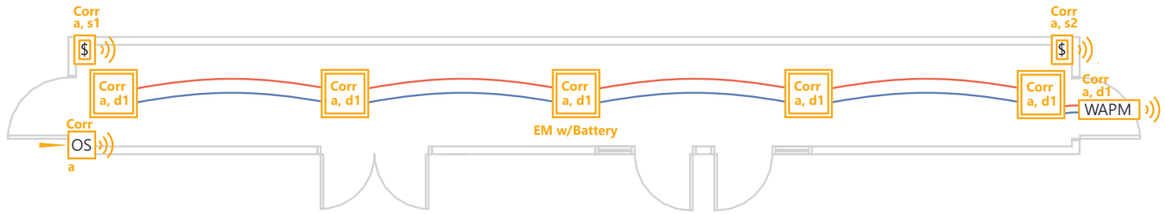
When the RRU-X senses loss of regular power, the RRU-X disconnects the 0–10V output from the WA100-PM and the emergency light fixture operates at maximum output from the emergency power circuit. If the RRU-X is not installed, the emergency fixture will dim to minimum because the WA100-PM 0–10V output shorts when the adapter loses power.

Ceiling sensors can be used in place of wall-mount sensors.

Egress Corridor

Daintree NETWORKED

Emergency Battery Pack Wired to Normal Circuit



Line-Voltage Wiring

Low-Voltage Wiring

Egress Corridor Daintree Networked

1–WA100-PM-Wireless lighting control adapter

2–WWD1-Wireless wall dimmer

1–WOS2-WM-L-Wireless PIR occupancy sensor

- 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.
- 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.

CONTROL STRATEGIES

OCCUPANCY/VACANCY CONTROL

EMERGENCY LIGHTING

TOP TRIMMING*

LIGHTING BEHAVIOR

- Lights turn on automatically to maximum when an occupant enters.
- Occupants may use wall dimmers to set desired light levels.
- Lights connected to emergency circuits default to 100% output during a power loss.
- Lights on nonemergency circuits turn off when the area is vacant for at most 20 minutes.

SOLUTION COMPONENTS

Picture	Symbol	Model Number	Description	Quantity
	WAPM	WA100-PM	Wireless lighting control adapter	1
	$	WWD1	Wireless wall dimmer	2
	OS	WOS2-WM-L	Wireless PIR occupancy sensor	1
	NET WAC	WAC60	Wireless access controller	1**

** 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.*

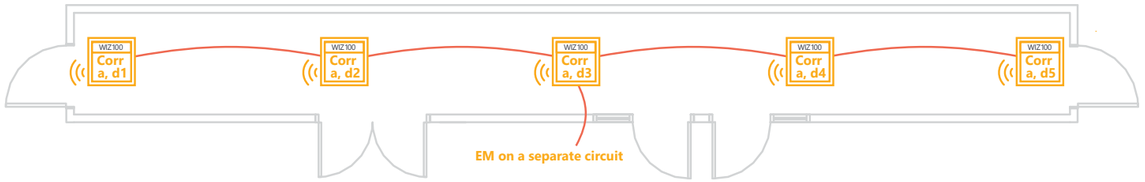
***Notes:** A node is any Daintree wireless device that connects and communicates to the system.*

Ceiling sensors can be used in place of wall-mount sensors.

Egress Corridor

Daintree ONE

Emergency Generator Circuit



Line-Voltage Wiring

Egress Corridor Daintree One

5–WIZ100-Integrated fixture control with daylight and occupancy

CONTROL STRATEGIES

OCCUPANCY/VACANCY CONTROL

EMERGENCY LIGHTING

TOP TRIMMING*

LIGHTING BEHAVIOR

- Lights turn on automatically to maximum when an occupant enters.
- Occupants may use wall dimmers to set desired light levels.
- Lights connected to emergency circuits default to 100% output during a power loss.
- Lights on nonemergency circuits turn off when the area is vacant for at most 20 minutes.

SOLUTION COMPONENTS

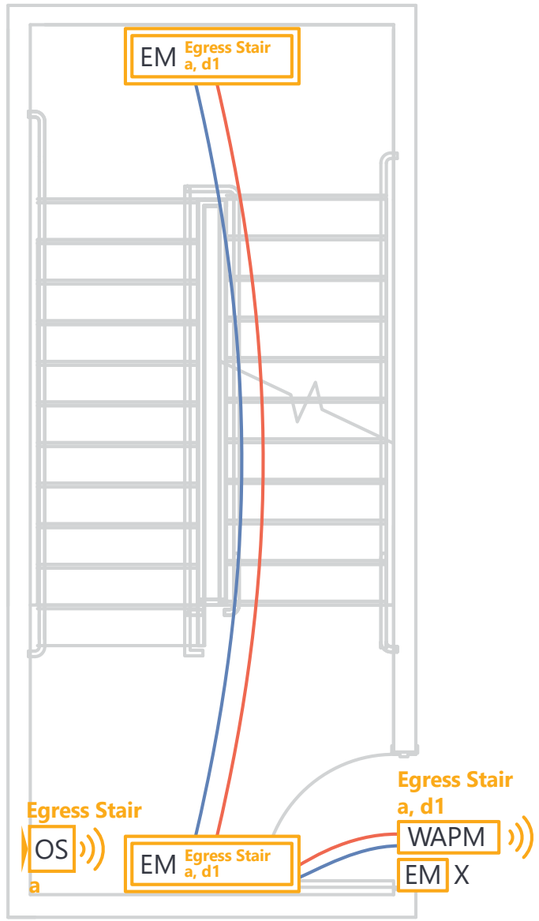
Picture	Symbol	Model Number	Description	Quantity
	WIZ100	WIZ100	Integrated fixture control with daylight and occupancy	5

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

Egress Stairwell

Daintree NETWORKED

On Dedicated Emergency Circuit



Egress Stairwell Daintree Networked

1–WA100-PM-Wireless lighting control adapter

1–WOS2-WM-W-Wireless PIR occupancy sensor

1–RRU-X-UNV-Automatic load control relay (0–10v)

CONTROL STRATEGIES

OCCUPANCY/VACANCY CONTROL

EMERGENCY LIGHTING

TOP TRIMMING*

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

Picture	Symbol	Model Number	Description	Quantity
	WAPM	WA100-PM	Wireless lighting control adapter	1
	OS	WOS2-WM-W	Wireless PIR occupancy sensor	1
	EM X	RRU-X-UNV	Automatic load control relay (0–10v)	1
	NET WAC	WAC60	Wireless access controller	1**

** 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.

Egress Stairwell

On Dedicated Emergency Circuit

Egress Stairwell Daintree Networked

2–WA100-PM-Wireless lighting control adapter

1–WOS2-WM-W-Wireless PIR occupancy sensor

2–RRU-X-UNV-Automatic load control relay (0–10v)

CONTROL STRATEGIES

OCCUPANCY/VACANCY CONTROL

EMERGENCY LIGHTING

TOP TRIMMING*

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

Picture	Symbol	Model Number	Description	Quantity
	WAPM	WA100-PM	Wireless lighting control adapter	2
	OS	WOS2-WM-W	Wireless PIR occupancy sensor	1
	EM X	RRU-X-UNV	Automatic load control relay (0–10v)	2
	NET WAC	WAC60	Wireless access controller	1**

** 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.*

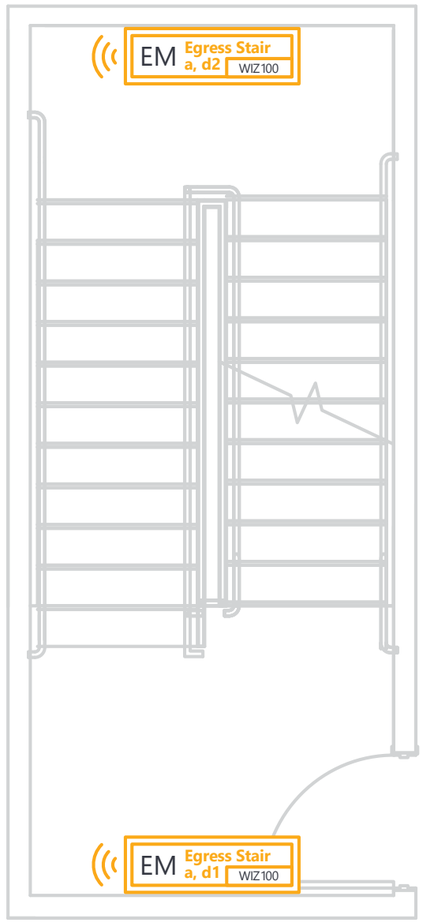
When the RRU-X senses loss of regular power, the RRU-X disconnects the 0–10V output from the WA100-PM and the emergency light fixture operates at maximum output from the emergency power circuit. If the RRU-X is not installed, the emergency fixture will dim to minimum because the WA100-PM 0–10V output shorts when the adapter loses power.

Ceiling sensors can be used in place of wall mount sensors.

Egress Stairwell

Daintree ONE

On Dedicated Emergency Circuit(s)



Egress Stairwell Daintree One

5–WIZ100-Integrated fixture control with daylight and occupancy

CONTROL STRATEGIES

OCCUPANCY/VACANCY CONTROL

EMERGENCY LIGHTING

TOP TRIMMING*

LIGHTING BEHAVIOR

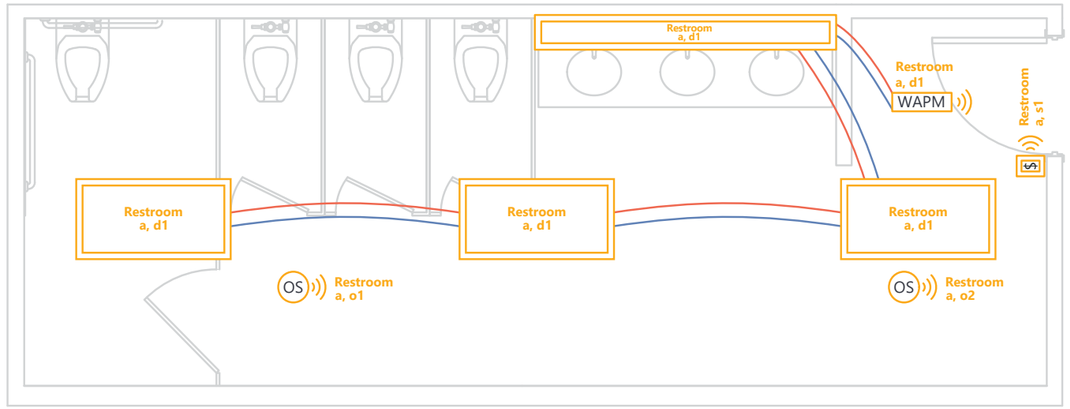
- Lights turn on automatically to maximum when an occupant enters.
- Lights connected to emergency circuits default to 100% output during a power loss.
- Lights dim to 10% when the area is vacant for at most 20 minutes.

SOLUTION COMPONENTS

Picture	Symbol	Model Number	Description	Quantity
	WIZ100	WIZ100	Integrated fixture control with daylight and occupancy	2

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

Multistall Restroom



Line-Voltage Wiring

Low-Voltage Wiring

Multistall Restroom Daintree Networked

1–WA100-PM-Wireless lighting control adapter

1–WWD1-Wireless wall dimmer

1–WOS2-CM-E-Wireless PIR occupancy sensor

- 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

OCCUPANCY/VACANCY CONTROL

TOP TRIMMING*

EMERGENCY LIGHTING

LIGHTING BEHAVIOR

- Lights turn on automatically to maximum when an occupant enters.
- Occupants may use wall dimmers to set desired light levels.
- All lights automatically turn off within 20 minutes after all occupants exit.
- Lights connected to emergency circuits default to 100% output during a power loss.

SOLUTION COMPONENTS

Picture	Symbol	Model Number	Description	Quantity
	WAPM	WA100-PM	Wireless lighting control adapter	1
	$	WWD1	Wireless wall dimmer	1
	OS	WOS2-CM-E	Wireless PIR occupancy sensor	2
	NET WAC	WAC60	Wireless access controller	1**

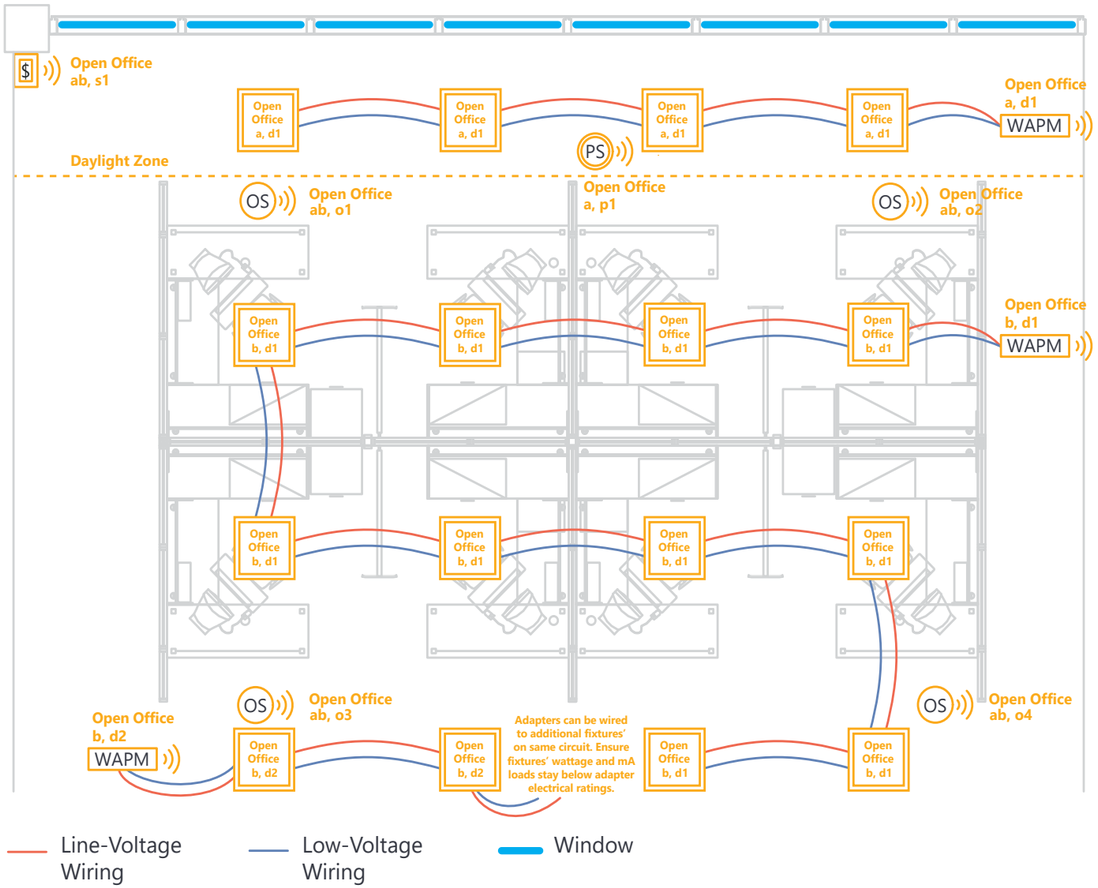
** Top trimming maximum light output is not required by code but is a recommended practice for energy savings.*

*** 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:** A node is any Daintree wireless device that connects and communicates to the system.*

Open Office

Daintree NETWORKED



Open Office Daintree Networked

2–WA100-PM-Wireless lighting control adapter

1–WWD1-Wireless wall dimmer

4–WOS2-CM-E-Wireless PIR occupancy sensor

1–WPS1-Wireless photocell

- 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.
- 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.
- 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

OCCUPANCY/VACANCY CONTROL

DAYLIGHT HARVESTING

TOP TRIMMING*

EMERGENCY LIGHTING

MANUAL-ON

LIGHTING BEHAVIOR

- Lights turn on automatically when an occupant enters the zone.
- 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.
- 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.

SOLUTION COMPONENTS

Picture	Symbol	Model Number	Description	Quantity
	WAPM	WA100-PM	Wireless lighting control adapter	3
	$	WWD1	Wireless wall dimmer	1
	OS	WOS2-CM-E	Wireless PIR occupancy sensor	4
	PS	WPS1	Wireless photocell	1
	NET WAC	WAC60	Wireless access controller	1**

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

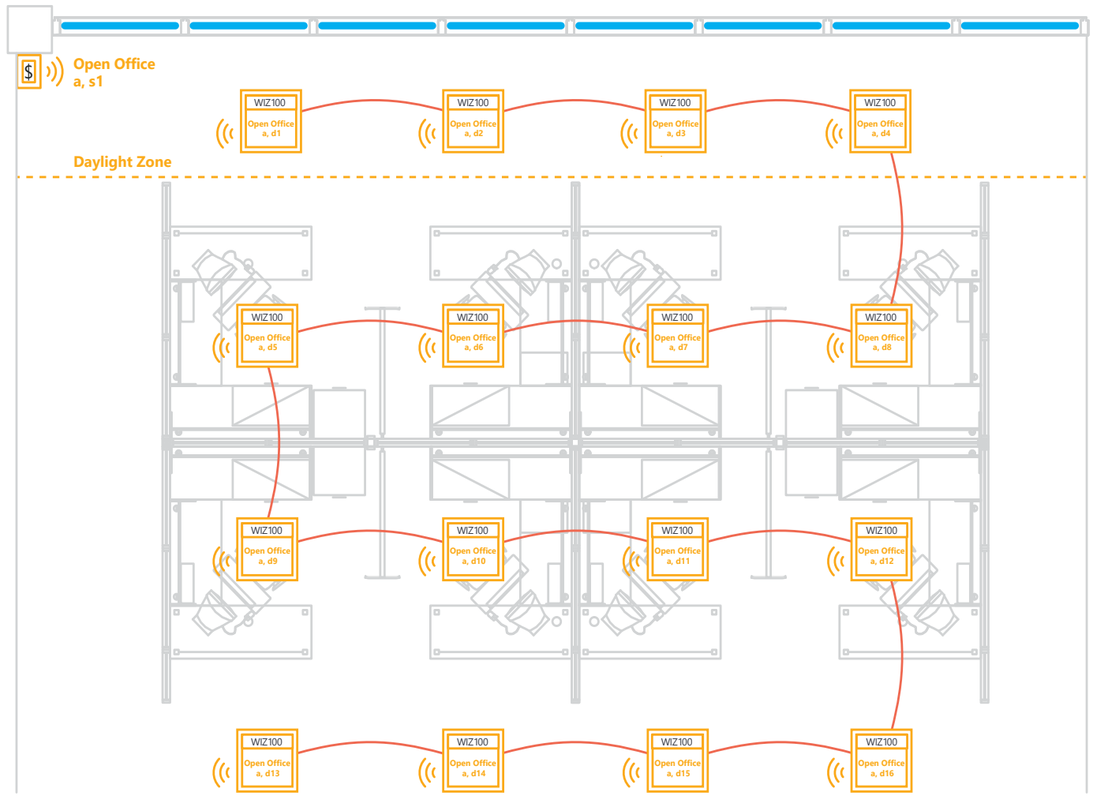
*** Daintree Networked leverages a wireless access controller (WAC60) and can support 175 nodes per WAC60. Multiple rooms can connect to the Daintree Networked platform using a WAC60.*

***Notes:** A node is any Daintree wireless device that connects and communicates to the system.*

Adapters can be wired to additional fixtures on same circuit. Ensure fixtures wattage and mA loads stay below adapter electrical ratings.

Open Office

Daintree NETWORKED



Open Office Daintree Networked

16–WIZ100-Integrated fixture control with daylight and occupancy

1–WWD1-Wireless wall dimmer

- 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 **LED.com.**

CONTROL STRATEGIES

OCCUPANCY/VACANCY CONTROL

DAYLIGHT HARVESTING

TOP TRIMMING*

EMERGENCY LIGHTING

MANUAL-ON

LIGHTING BEHAVIOR

- Lights turn on automatically when an occupant enters the zone.
- 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.
- 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.

SOLUTION COMPONENTS

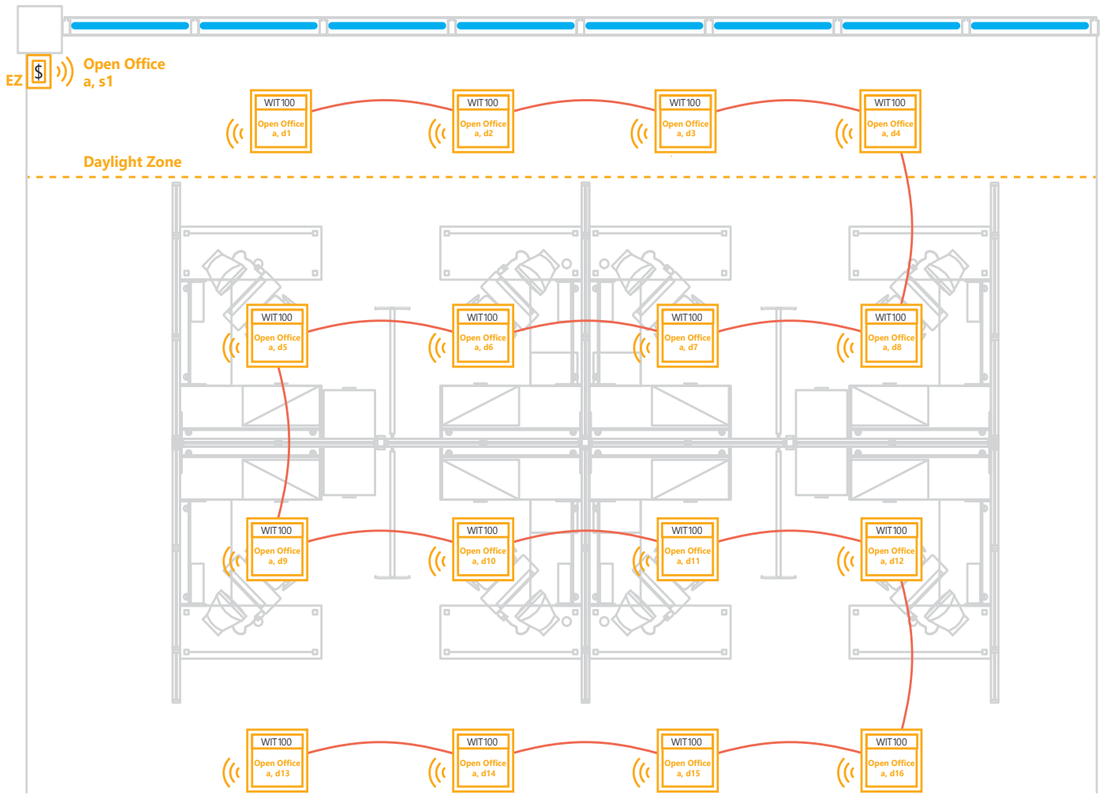
Picture	Symbol	Model Number	Description	Quantity
	WIZ100	WIZ100	Integrated fixture control with daylight and occupancy**	16
	$	WWD1	Wireless wall dimmer	1

** 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.*

Open Office

Daintree EZ CONNECT



Open Office Daintree EZ Connect

16–WIT100-Integrated fixture control with daylight and occupancy

1–ZBT-S1AWH-Wireless dimmer switch

- 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 WIT100 sensors and can be ordered with Daintree EZ Connect "TT" Controls Catalog logic. For a complete list of Daintree Integrated Fixtures, visit **LED.com.**

CONTROL STRATEGIES

- **OCCUPANCY/VACANCY CONTROL**
- **DAYLIGHT HARVESTING**
- **TOP TRIMMING***
- **EMERGENCY LIGHTING**
- **MANUAL-ON**

LIGHTING BEHAVIOR

- Lights turn on automatically when an occupant enters the zone.
- 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.
- 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.

SOLUTION COMPONENTS

Picture	Symbol	Model Number	Description	Quantity
	WIT100	WIT100	Integrated fixture control with daylight and occupancy**	16
	EZ $ Room z, s#	ZBT-S1AWH	Wireless dimmer switch	1

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

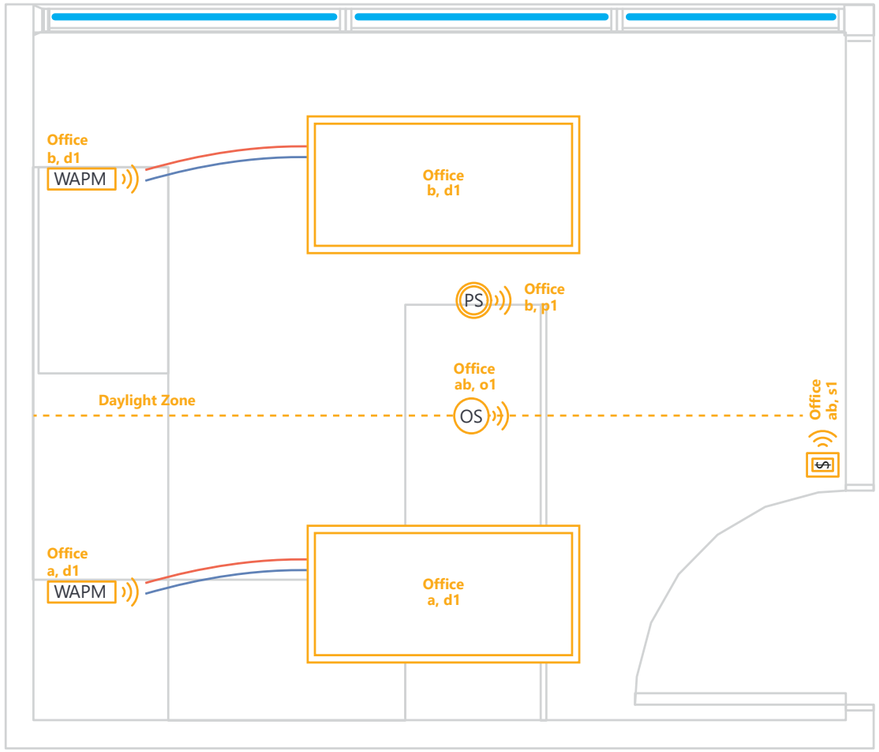
*** Order Lumination fixtures with "TT" catalog logic for sensors preinstalled in fixtures.*

***Note:** Daintree EZ Connect devices can be custom programmed using the Daintree EZ Connect App and is available on the Apple® App Store.*

Download on the App Store

Private Office

Daintree NETWORKED



Window

Private Office Daintree Networked

2–WA100-PM-Wireless lighting control adapter
1–WWD1-Wireless wall dimmer
1–WOS2-CM-E-Wireless PIR occupancy sensor
1–WPS1-Wireless photocell

- 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.
- 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.

CONTROL STRATEGIES

OCCUPANCY/VACANCY CONTROL

MANUAL-ON

TOP TRIMMING*

DAYLIGHT HARVESTING

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.

SOLUTION COMPONENTS

Picture	Symbol	Model Number	Description	Quantity
	WAPM	WA100-PM	Wireless lighting control adapter	2
	$	WWD1	Wireless wall dimmer	1
	OS	WOS2-CM-E	Wireless PIR occupancy sensor	1
	PS	WPS1	Wireless photocell	1
	NET WAC	WAC60	Wireless access controller	1**

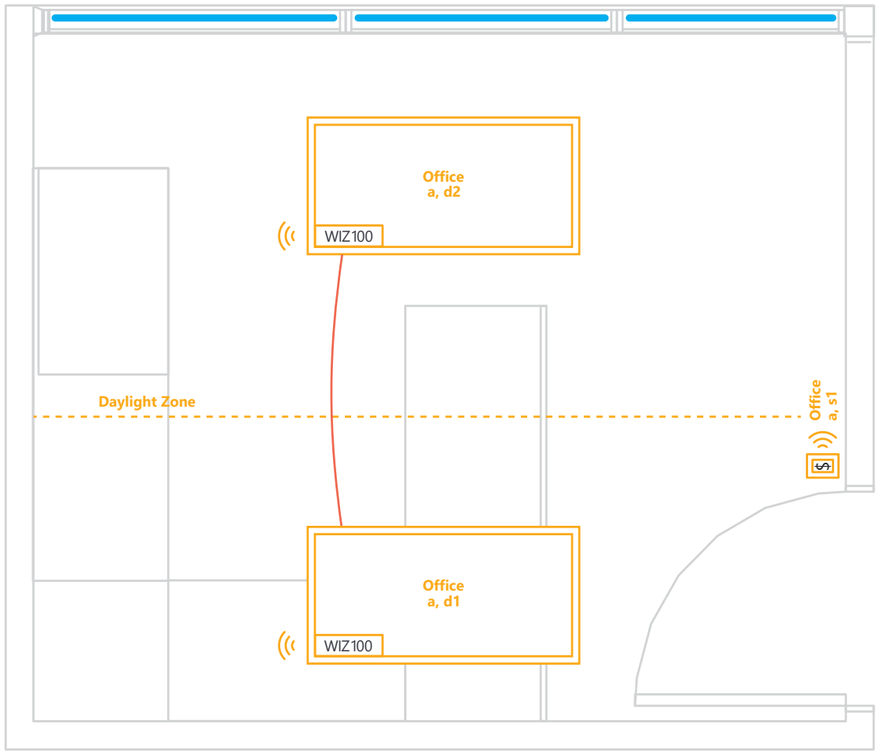
** Top trimming maximum light output is not required by code but is a recommended practice for energy savings.*

*** 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:** A node is any Daintree wireless device that connects and communicates to the system.*

Private Office

Daintree NETWORKED



Line-Voltage Wiring

Window

Private Office Daintree Networked

2–WIZ100-Integrated fixture control with daylight and occupancy

1–WWD1-Wireless wall dimmer

- 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 **LED.com.**

CONTROL STRATEGIES

OCCUPANCY/VACANCY CONTROL

MANUAL-ON

TOP TRIMMING*

DAYLIGHT HARVESTING

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.

SOLUTION COMPONENTS

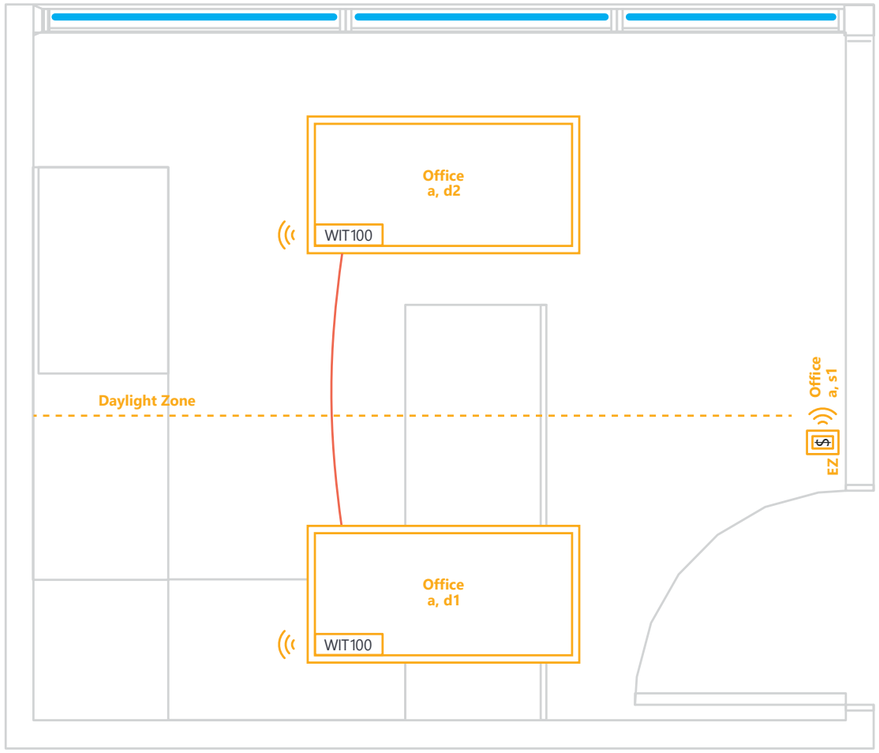
Picture	Symbol	Model Number	Description	Quantity
	WIZ100	WIZ100	Integrated fixture control with daylight and occupancy**	2
	$	WWD1	Wireless wall dimmer	1

** 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.*

Private Office

Daintree EZ CONNECT



Line-Voltage Wiring

Window

Private Office Daintree EZ Connect

2–WIT100-Integrated fixture control with daylight and occupancy

1–ZBT-S1AWH-Wireless dimmer switch

- Many Lumination® LED luminaires come preinstalled with WIT100 sensors and can be ordered with Daintree EZ Connect "TT" Controls Catalog logic. For a complete list of Daintree Integrated Fixtures, visit **LED.com.**

CONTROL STRATEGIES

OCCUPANCY/VACANCY CONTROL

MANUAL-ON

TOP TRIMMING*

DAYLIGHT HARVESTING

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.

SOLUTION COMPONENTS

Picture	Symbol	Model Number	Description	Quantity
	WIT100	WIT100	Integrated fixture control with daylight and occupancy**	2
	EZ $ Room z, s#	ZBT-S1AWH	Wireless dimmer switch	1

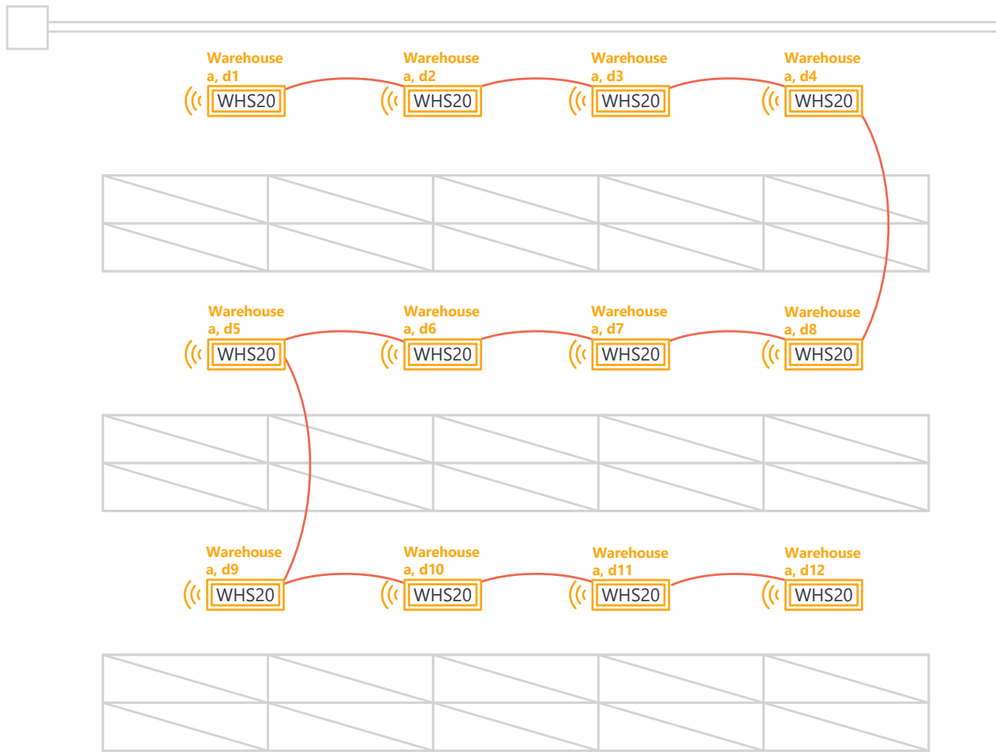
** Top trimming maximum light output is not required by code but is a recommended practice for energy savings.*

*** Order Lumination fixtures with "TT" catalog logic for sensors preinstalled in fixtures.*

***Note:** Daintree EZ Connect devices can be custom programmed using the Daintree EZ Connect App and is available on the Apple® App Store.*

Download on the App Store

Warehouse



Line-Voltage Wiring

Warehouse Daintree One

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

- Order Albeo® High Bay Fixtures with "FB" catalog logic for sensors preinstalled in fixtures.

CONTROL STRATEGIES

OCCUPANCY/VACANCY CONTROL

DAYLIGHT HARVESTING

TOP TRIMMING*

LIGHTING BEHAVIOR

- Automatically reduce lighting >50% when unoccupied.
- Each aisle can be independently controlled.
- Lights adjust brightness based on daylight availability while the room is occupied.

SOLUTION COMPONENTS

Picture	Symbol	Model Number	Description	Quantity
	WHS20	WHS20	High bay fixture control with daylight and occupancy	12
		WHR1	Daintree One remote for WHS20 sensors	1

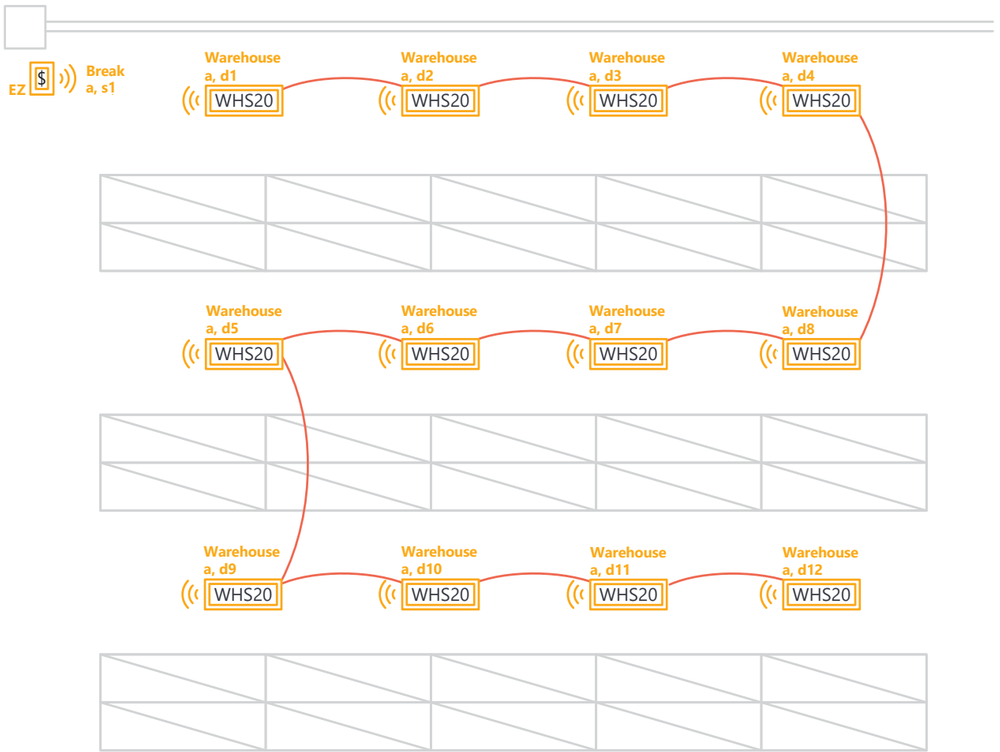
** Top trimming maximum light output is not required by code but is a recommended practice for energy savings.*

*** Order Albeo fixtures with "FB" catalog logic for sensors preinstalled in fixtures.*

***Note:** Daintree WHS20 can be custom-programmed with the WHR1 remote.*

Warehouse

Daintree EZ CONNECT



Line-Voltage Wiring

Warehouse Daintree EZ Connect

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

- Order Albeo® High Bay Fixtures with “DF” catalog logic for sensors preinstalled in fixtures.

CONTROL STRATEGIES

OCCUPANCY/VACANCY CONTROL

DAYLIGHT HARVESTING

TOP TRIMMING*

LIGHTING BEHAVIOR

- Automatically reduce lighting >50% when unoccupied.
- Each aisle can be independently controlled.
- Lights adjust brightness based on daylight availability while the room is occupied.
- Lights must turn off after aisle is vacated after 20 minutes.

SOLUTION COMPONENTS

Picture	Symbol	Model Number	Description	Quantity
	WHS20	WHS20	High bay fixture control with daylight and occupancy	12
		WHR1	Daintree EZ Connect App	1
	EZ $ Room z, s#	ZBT-S1AWH	Wireless dimmer switch	1

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

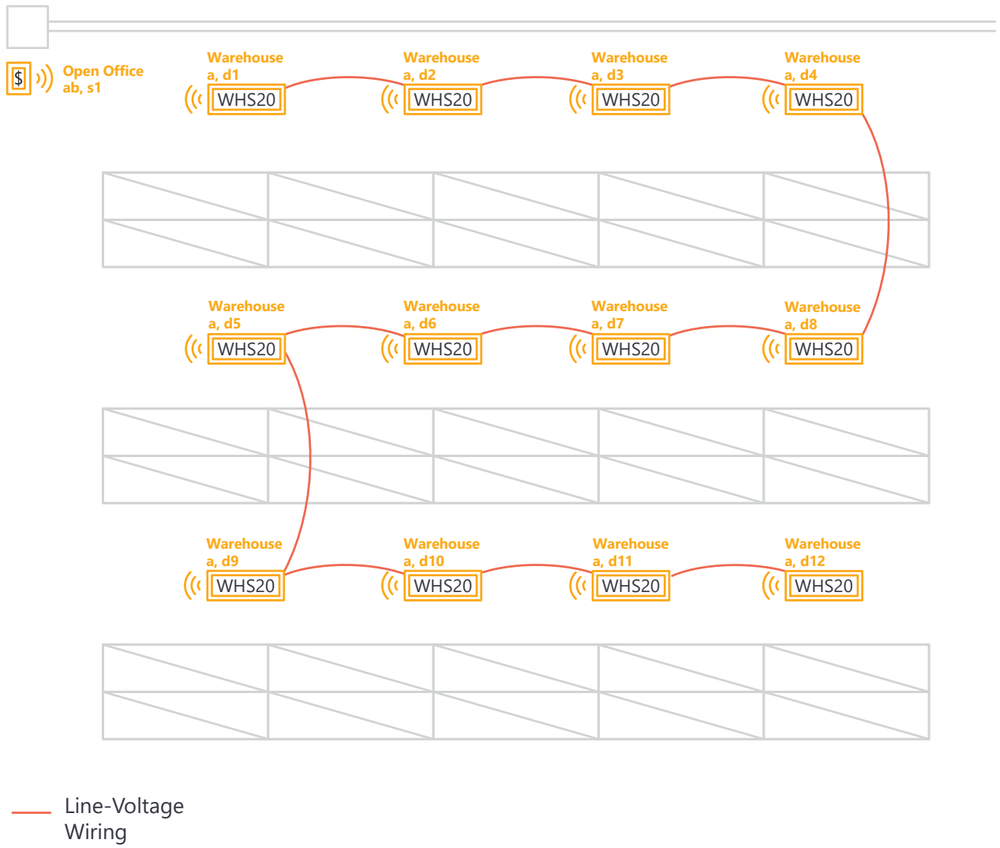
*** Order Albeo fixtures with “DF” catalog logic for sensors preinstalled in fixtures.*

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

Download on the App Store

Warehouse

Daintree NETWORKED



Warehouse Daintree One

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

- Order Albeo® High Bay Fixtures with “NA” catalog logic for sensors preinstalled in fixtures.

CONTROL STRATEGIES

OCCUPANCY/VACANCY CONTROL

DAYLIGHT HARVESTING

TOP TRIMMING*

LIGHTING BEHAVIOR

- Automatically reduce lighting >50% when unoccupied.
- Each aisle can be independently controlled.
- Lights adjust brightness based on daylight availability while the room is occupied.
- Lights must turn off after aisle is vacated after 20 minutes.

SOLUTION COMPONENTS

Picture	Symbol	Model Number	Description	Quantity
	WHS20	WHS20	High bay fixture control with daylight and occupancy	12
	$	WWD1	Wireless wall dimmer	1
	NET WAC	WAC60	Wireless access controller	1**

** 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.*

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

Current

Current - GLI Brands

25825 Science Park
Beachwood, OH 44122

LED.com

(Rev 07/20/23)

DT121-Current-IECC-2018-Energy-Guide-Solution-Guide