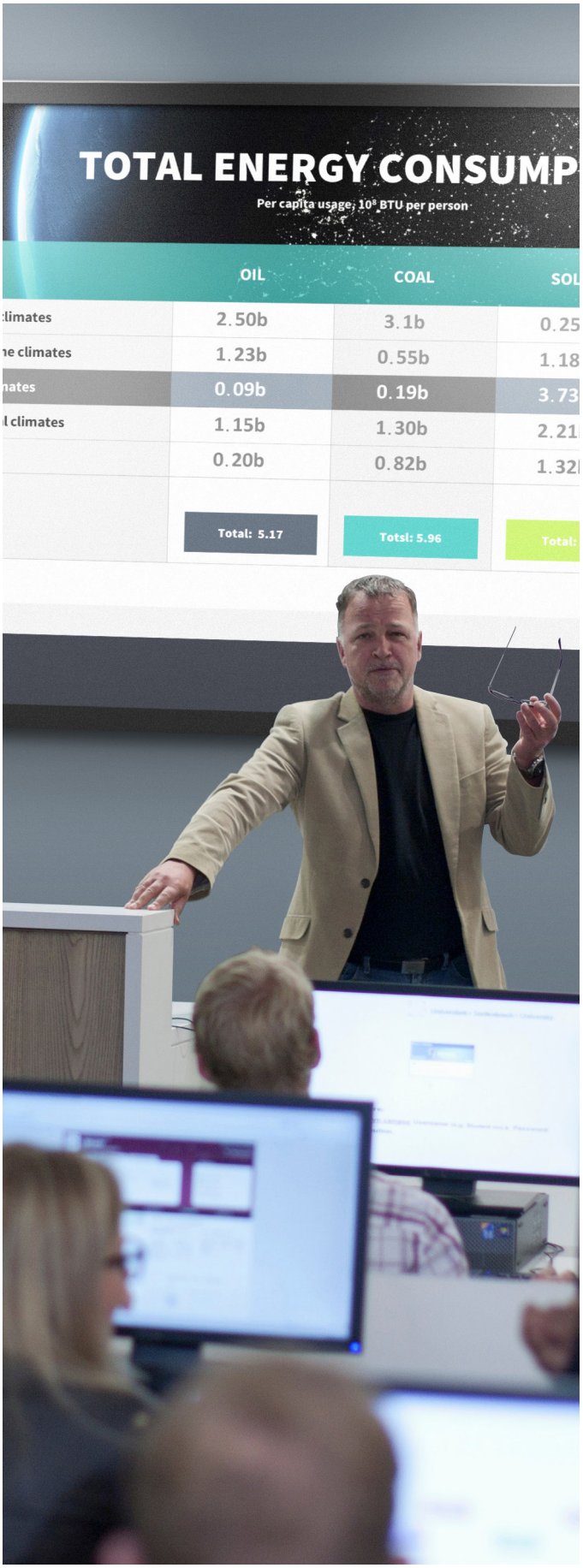
Education
IECC 2015 Solutions

Design Guide

Crestron Electronics, Inc.

Contents



About IECC 2015

The International Energy Conservation Code (IECC) 2015 is a residential and commercial building energy code that has been adopted by many states and municipalities. The goal of this code is to reduce energy consumption by providing design and construction requirements for lighting controls.

Lighting controls such as occupancy status sensors, multi-level controls, and demand response provisions allow you to synchronize indoor light levels with daylight levels in accordance with IECC 2015.

Design Guide Information

Crestron® offers this Design Guide for Education - IECC 2015 solutions to use as a reference for typical layouts. Use it as guidance to make code compliance quicker and easier than ever. The Crestron team is also available to support with detailed design, submittal, and installation requirements. For additional information, please contact your Crestron representative at CLCDesign@crestron.com or (888) 330-1502.

IECC 2015 Code Requirements

Summary

IECC 2015 Code Requirements			
	Code Provision	**Minimum Control Requirement**	**Code Description**
ON/OFF CONTROLS	C405.2.1.1.3	Manual Controls	There must be one or more readily accessible manual lighting control(s) in each space
	C405.2.1.1.2	Manual ON / partial auto ON (Vacancy Sensing Mode)	The general lighting must either be manually turned ON, or automatically turned ON to no more than 50%.
	C405.2.1.1.2	Automatic Full ON (Occupancy Sensing Mode)	Lighting is permitted to automatically turn to full ON.
	C405.2.1.2	Automatic Partial Off	Lighting loads must be automatically reduced by at least 50% within 30 minutes of vacancy
	C405.2.1.1.1	Automatic Full Off	All lighting must be shut OFF within 30 minutes of vacancy.
	C405.2.2	Time-switch controls (i.e. programmable timeclock)	All lighting must be programmed to shut OFF automatically when a space is vacant by using a programmable timeclock or signal from another control device (i.e. security system).
LIGHT LEVEL CONTROL	C405.2.3.1.4	Bi-level control (i.e. 0-10v dimming)	Lighting must have at least one intermediate step power that is at least 15% of full power, in addition to full on and full off.
	C405.2.3	Daylight-responsive controls (i.e. photocontrols)	In side daylighting zones with greater than 150W (or greater than 300W within the primary and secondary daylighting zones), daylight must be harvested using photocontrols. In top daylighting zones with greater than 150W, daylight must be harvested using photocontrols.
			PRIMARY SOLUTIONS
			Zūm™ Wireless
			GLPP
			GLPAC
			Steinel

	SPACE TYPE					
	Classrooms Lecture, Training Rooms	**Conference** Meeting, Multi-purpose Rooms	**Private Offices** Lounge/Break Rooms, Copy/ Print Rooms	**Open Plan Office** Large Private Offices (>250 ft²)	**Public Spaces** Corridors, Lobbies	**Restrooms** Private, Public
	X	X	X	X	X	X
	X	X	X	X		
					X	X
	X	X	X	X	X	X
	-OR-	-OR-	-OR-	-OR-	-OR-	
	X	X	X	X	X	
	X		X			
	X	X	X	X	X	X
	X	X	X	X	X	X
	X		X		X	X
		X		X	X	
			X			X

Differences between IECC 2012 Standards & 2015 Standards

Classroom, Lecture Room, Training Room

	IECC 2012	IECC 2015
Motion Sensing	Vacancy Sensor	Vacancy Sensor
Daylight Harvesting	Required (for spaces with 24+ sq. ft. of windows)	Required (for spaces with 24+ sq. ft. of windows)
Timeclock	Not Required	Not Required
Manual Control	Dimmer/Scene Recall	Dimmer/Scene Recall

Public Corridor, Stairwell, Entrance and Exit

	IECC 2012	IECC 2015
Motion Sensing	Sensor Optional	Sensor Optional
Daylight Harvesting	Required (for spaces with 24+ sq. ft. of windows)	Required (for spaces with 24+ sq. ft. of windows)
Timeclock	Required (if no occupancy sensor)	Required (if no occupancy sensor)
Manual Control	Required Device (if no occupancy sensor)	Required Device

Cafetorium

	IECC 2012	IECC 2015
Motion Sensing	Not Required	Not Required
Daylight Harvesting	Required (for spaces with 24+ sq. ft. of windows)	Required (for spaces with 24+ sq. ft. of windows)
Timeclock	Required	Required
Manual Control	Dimmer/Scene Recall	Dimmer/Scene Recall

Public Restroom, Private Bathroom

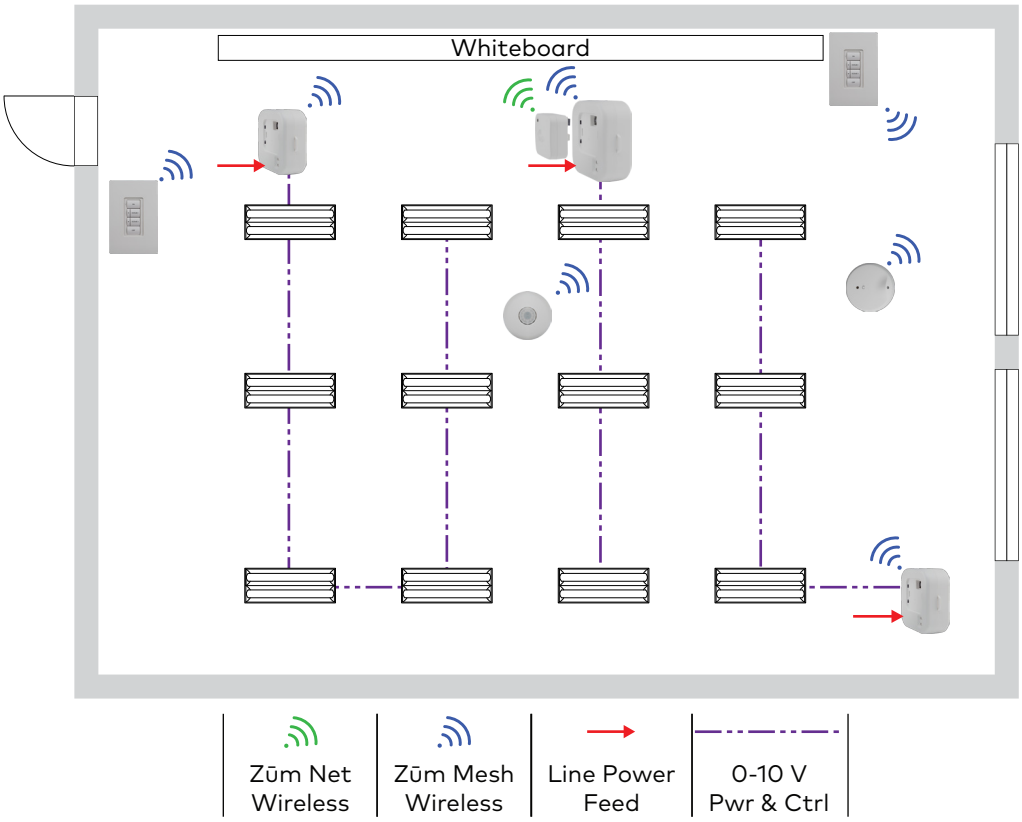
	IECC 2012	IECC 2015
Motion Sensing	Sensor Optional	Sensor Optional
Daylight Harvesting	Required (for spaces with 24+ sq. ft. of windows)	Required (for spaces with 24+ sq. ft. of windows)
Timeclock	Required (if no occupancy sensor)	Required (if no occupancy sensor)
Manual Control	Required Device (if no occupancy Sensor)	Required Device

Parking Lot Lighting

	IECC 2012	IECC 2015
Motion Sensing	Sensor Optional	Sensor Optional
Daylight Harvesting	Required	Required
Timeclock	Required	Required
Manual Control	Device Optional	Device Optional

Classroom

Zūm™ Wireless



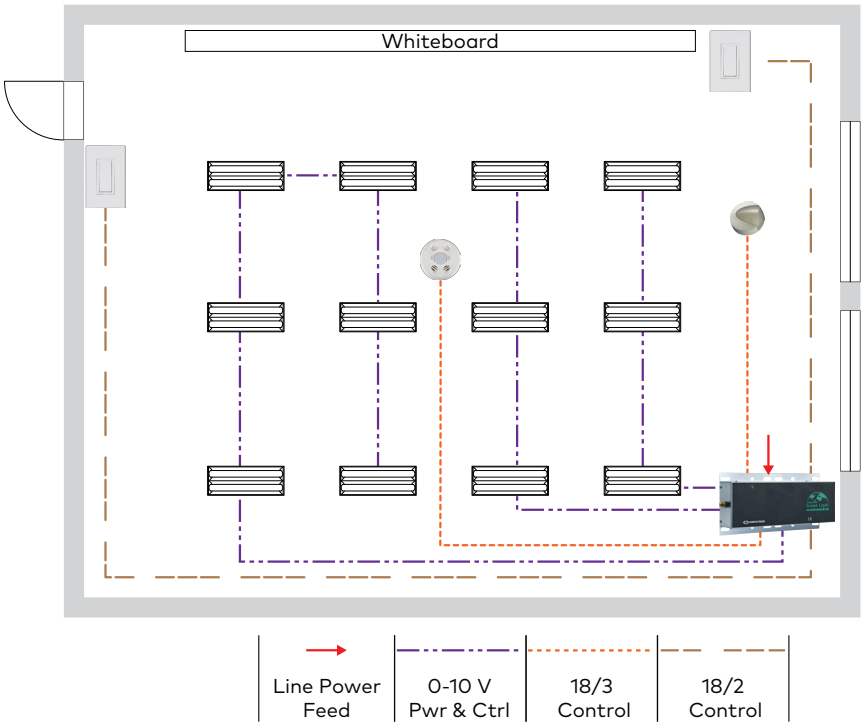
IECC 2015 Code Compliance:

- Manual Controls (C405.2.1.1.3)
- Automatic Full Off (C405.2.1.1.1)
- Bi-level Control (0-10V Dimming) (C405.2.3.1.4)
- Daylight-responsive Controls (Photocontrols) (C405.2.3)

Symbol	Product	Qty.	Description
	ZUMMESH-PIR-VACANCY-BATT	1	PIR Vacancy Sensor (AUTO-OFF)
	ZUMESH-OL-PHOTOCELL-BATT	1	Open-Loop Daylight Sensor
	ZUMMESH-JBOX-5A-LV	3	Junction Box Zone Controller, 0-10V Dimming, 5A
	ZUMMESH-KP10CBATT	2	6-Button Battery-Powered Keypad
	ZUMMESH-NETBRIDGE	1	Zūm™ Network Bridge

Classroom

GLPP



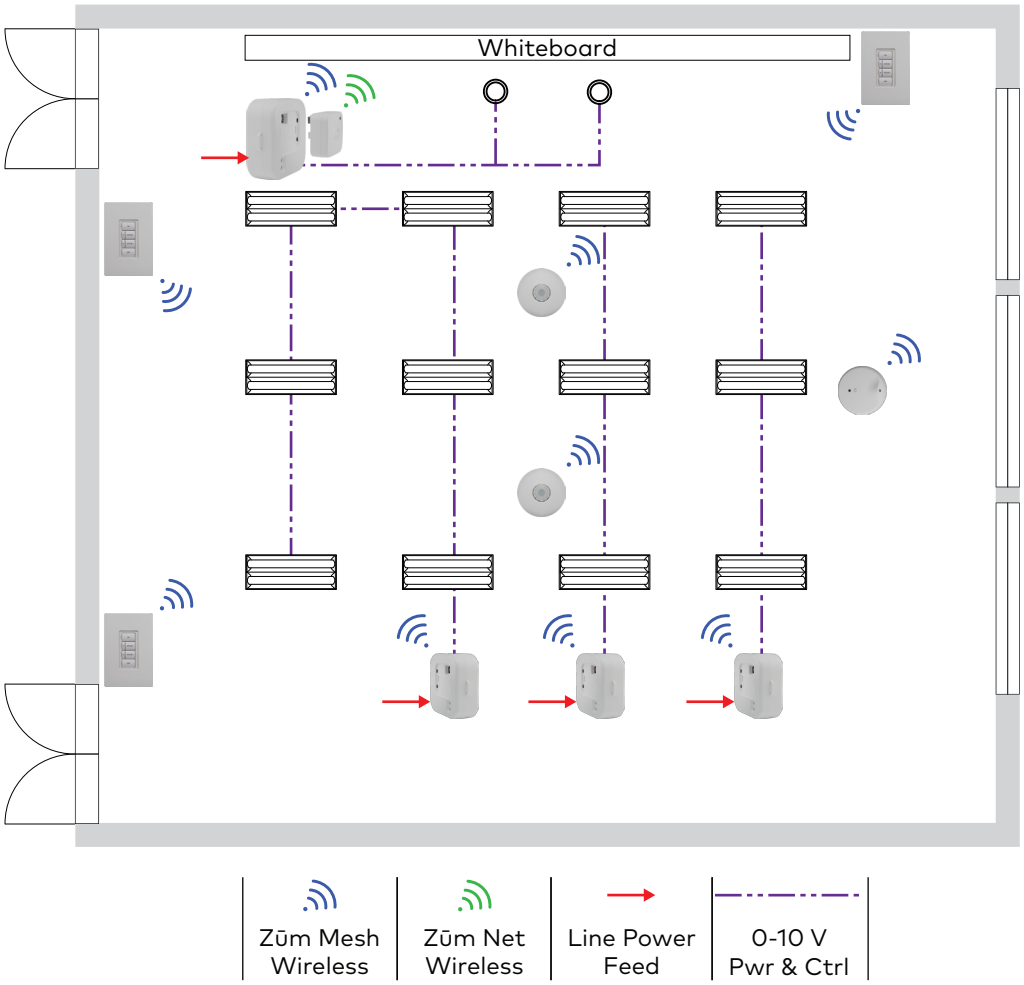
IECC 2015 Code Compliance:

- Manual Controls (C405.2.1.1.3)
- Manual On/Partial On (Vacancy Sensing Mode) (C405.2.1.1.2)
- Automatic Full Off (C405.2.1.1.1)
- Bi-level Control (0-10V Dimming) (C405.2.3.1.4)
- Daylight-responsive Controls (Photocontrols) (C405.2.3)

Product	Product	Qty.	Description
	GLPP-1DIMFLV3-CN-PM	1	3-Ch 0-10V Dimmer with Cresnet®
	GLS-ODT-C-NS	1	Dual-Technology Ceiling Mount Occupancy Sensor
	GLPPA-KP	2	In-Wall Keypad for GLPP
	GLS-LOL	1	Crestron Green Light® Photosensor, Open-Loop

Higher Education Classroom

Zūm™ Wireless



IECC 2015 Code Compliance:

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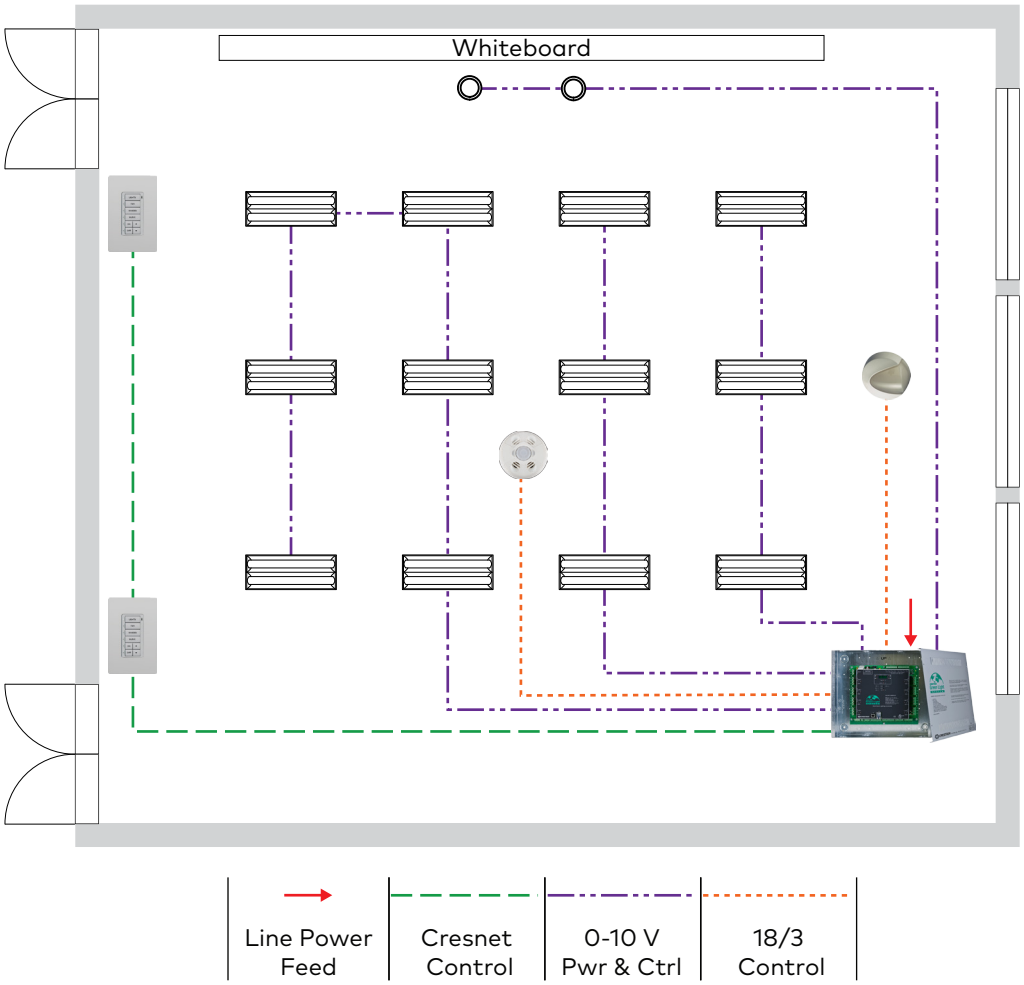
- Automatic Full Off (C405.2.1.1.1)
- Bi-level Control (0-10V Dimming) (C405.2.3.1.4)
- Daylight-responsive Controls (Photocontrols) (C405.2.3)

Symbol	Product	Qty.	Description
	ZUMMESH-OL-PHOTOCELL	1	Open Loop Daylight Sensor
	ZUMMESH-PIR-VACANCY-BATT	2	PIR Vacancy Sensor (AUTO-OFF)
	ZUMMESH-JBOX-5A-LV	4	Junction box Zone Controller, 0-10V Dimming, 5A
	ZUMMESH-KP10CBATT	3	6-Button Battery-Powered Keypad
	ZUMMESH-NETBRIDGE	1	Zūm™ Network Bridge

Higher Education Classroom

GLPAC



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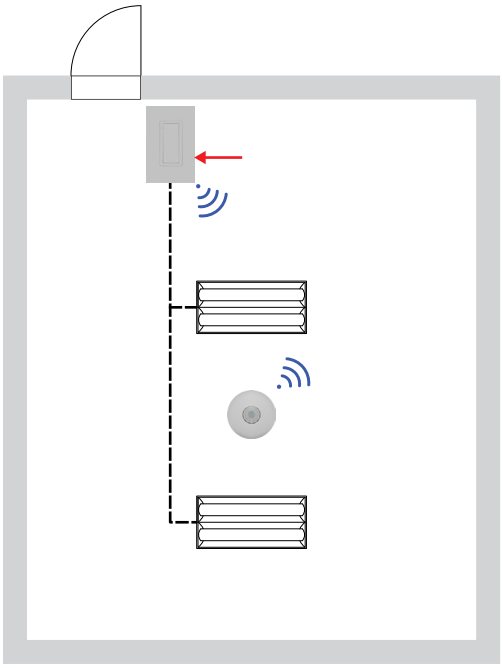
- Automatic Full Off (C405.2.1.1.1)
- Bi-level Control (0-10V Dimming) (C405.2.3.1.4)
- Daylight-responsive Controls (Photocontrols) (C405.2.3)

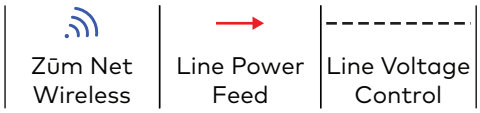
NOTE: UL924 emergency lighting devices are available for life safety.

Symbol	Product	Qty.	Description
	GLPAC-DIMFLV4	1	Green Light Integrated Lighting System, 4-Channel
	GLS-ODT-C-NS	1	Dual-Technology Ceiling Mount Occupancy Sensor
	C2N-CBD-P	2	Cameo® Keypad, Standard Mount
	GLS-LOL	1	Crestron Green Light® Photosensor, Open-Loop

Private Office

Zūm™ Wireless





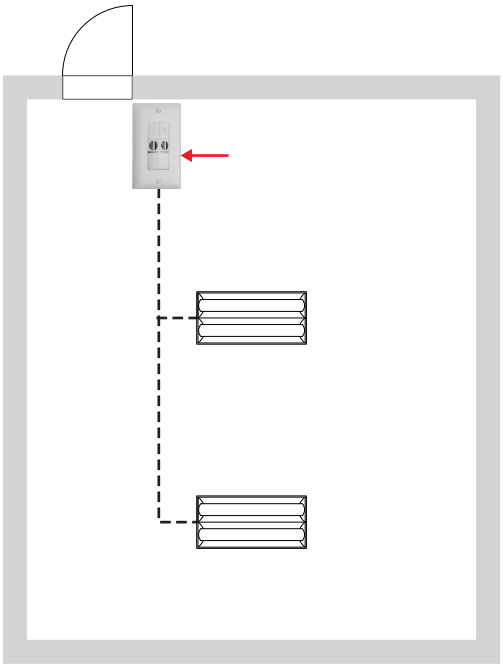
IECC 2015 Code Compliance:

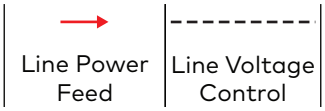
- Manual Controls (C405.2.1.1.3)
- Automatic Full Off (C405.2.1.1.1)
- Bi-level Control (0-10V Dimming) (C405.2.3.1.4)

Symbol	Product	Qty.	Description
	ZUMMESH-PIR-VACANCY-BATT	1	PIR Vacancy Sensor (AUTO-OFF)
	ZUMMESH-5A-SW	1	Wall-Box Switch, 5A

Office

Steinel





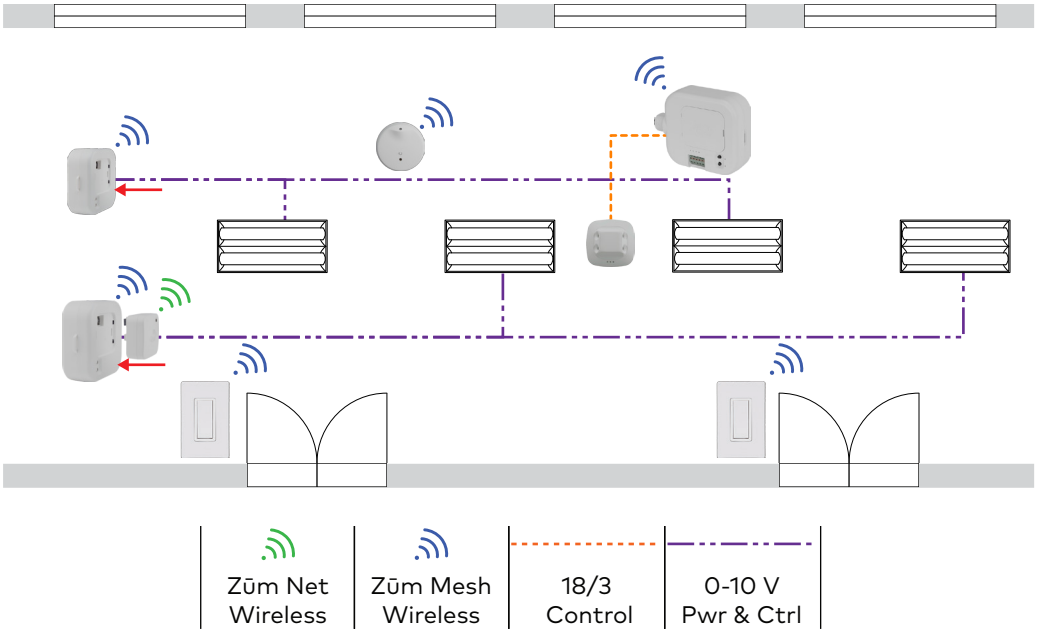
IECC 2015 Code Compliance:

- Manual Controls (C405.2.1.1.3)
- Manual On/Partial On (Vacancy Sensing Mode) (C405.2.1.1.2)
- Automatic Full Off (C405.2.1.1.1)

Symbol	Product	Qty.	Description
	GLA-DT-WLS-1	1	Dualtech PIR & 40 kHz Ultrasonic Wall Switch Occupancy Sensor, 1 Button, 180* Coverage, 120/230/277 VAC, 50/60 Hz

Corridors

Zūm™ Wireless



IECC 2015 Code Compliance:

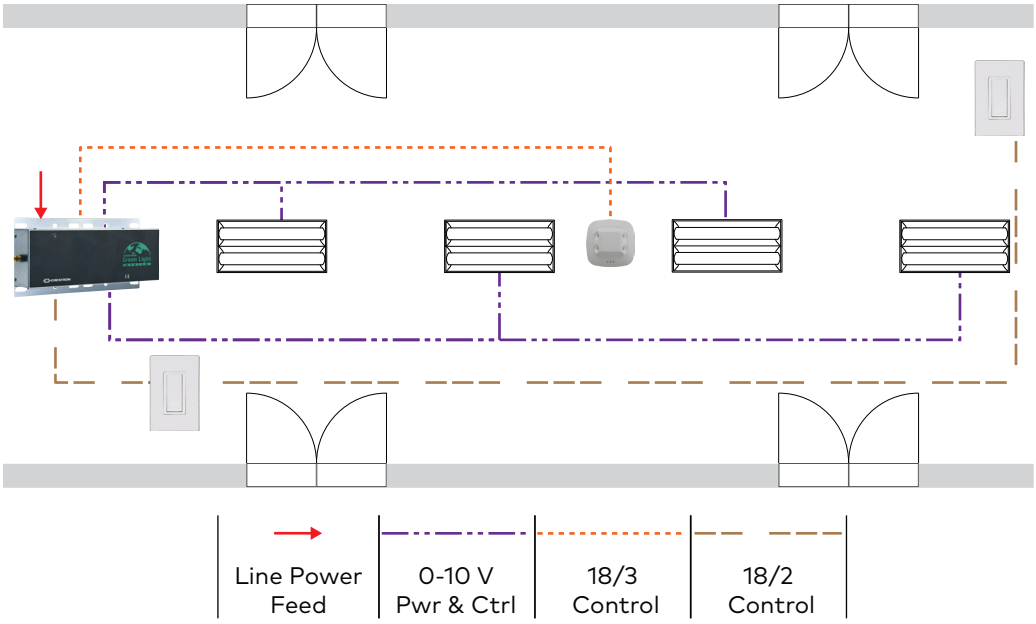
- Manual Controls (C405.2.1.1.3)
- Automatic Full On (Occupancy Sensing Mode) (C405.2.1.1.2)
- Automatic Full Off (C405.2.1.1.1)
- Bi-level Control (0-10V Dimming) (C405.2.3.1.4)
- Daylight-responsive Controls (Photocontrols) (C405.2.3)

NOTE: UL924 emergency lighting devices are available for life safety.

Symbol	Product	Qty.	Description
	ZUMMESH-JBOX-SIM	1	Zūm™ Junction Box Sensor Integration Module
	GLA-US-HALLWAY-COM1-24	1	40 kHz Ultrasonic Presence Detector, Ceiling Mount, Hallway Coverage, 18-24 VAC/VDC
	ZUMMESH-JBOX-5A-LV	2	Junction Box Zone Controller, 0-10V Dimming, 5A
	ZUMMESH-NETBRIDGE	1	Zūm™ Network Bridge
	ZUMMESH-KP10ABATT	2	Rocker-Button Battery Powered Keypad
	ZUMMESH-OL-PHOTOCELL	1	Open Loop Daylight Sensor

Corridors

GLPP



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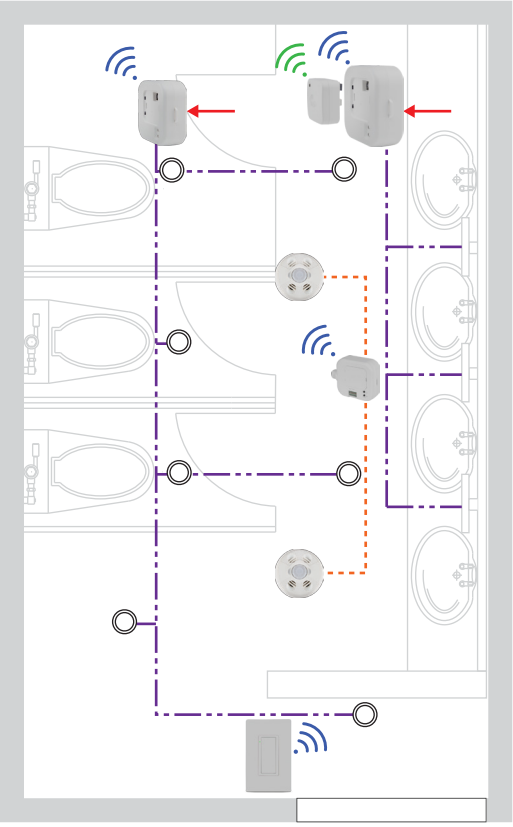
- Bi-level Control (0-10V Dimming) (C405.2.3.1.4)

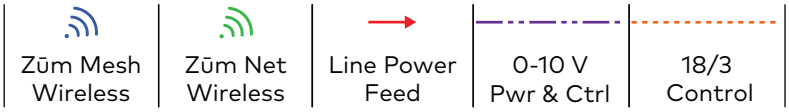
NOTE: UL924 emergency lighting devices are available for life safety.

Product	Product	Qty.	Description
	GLPP-1DIMFLV2CN-PM	1	2-Ch 0-10V Dimmer with Cresnet®
	GLA-US-HALLWAY-COM1-24	1	40 kHz Ultrasonic Presence Detector, Ceiling Mount, Hallway Coverage, 18-24 VAC/VDC
	GLPPA-KP	2	In-Wall Keypad for GLPP

Restroom

Zūm™ Wireless





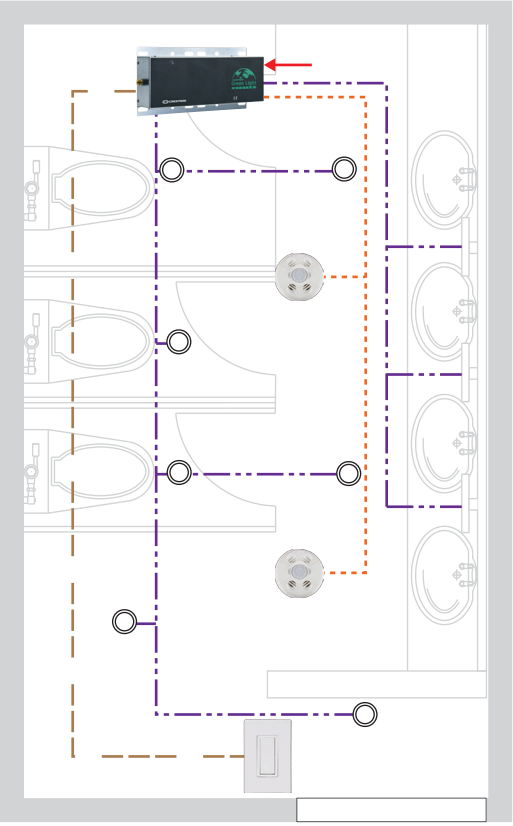
IECC 2015 Code Compliance:

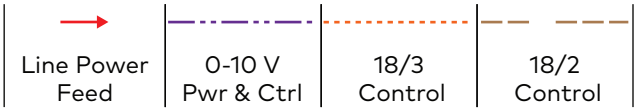
- Manual Controls (C405.2.1.1.3)
- Automatic Full On (Occupancy Sensing Mode) (C405.2.1.1.2)
- Automatic Full Off (C405.2.1.1.1)
- Bi-level Control (0-10V Dimming) (C405.2.3.1.4)

Symbol	Product	Qty.	Description
	GLS-ODT-C-NS	2	Dual-Technology Ceiling Mount Occupancy Sensor
	ZUMMESH-JBOX-5A-LV	2	Junction Box Zone Controller, 0-10V Dimming, 5A
	ZUMMESH-NETBRIDGE	1	Zūm™ Network Bridge
	ZUMMESH-KP10ABATT	1	Rocker-Switch Battery Powered Keypad
	ZUMMESH-JBOX-SIM	1	Zūm™ Junction Box Sensor Integration Module

Restroom

GLPP





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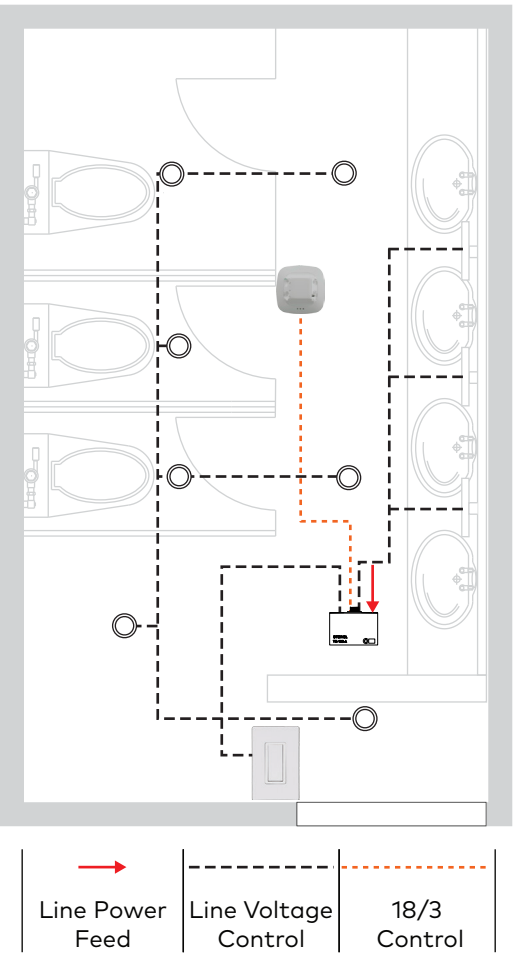
- Automatic Full On (Occupancy Sensing Mode) (C405.2.1.1.2)
- Automatic Full Off (C405.2.1.1.1)
- Bi-level Control (0-10V Dimming) (C405.2.3.1.4)

Product	Product	Qty.	Description
	GLPP-1DIMFLV2CN-PM	1	2-Ch 0-10V Dimmer with Cresnet®
	GLS-ODT-C-NS	2	Dual-Technology Ceiling Mount Occupancy Sensor
	GLPPA-KP	1	In-Wall Keypad for GLPP

Restroom

Steinel



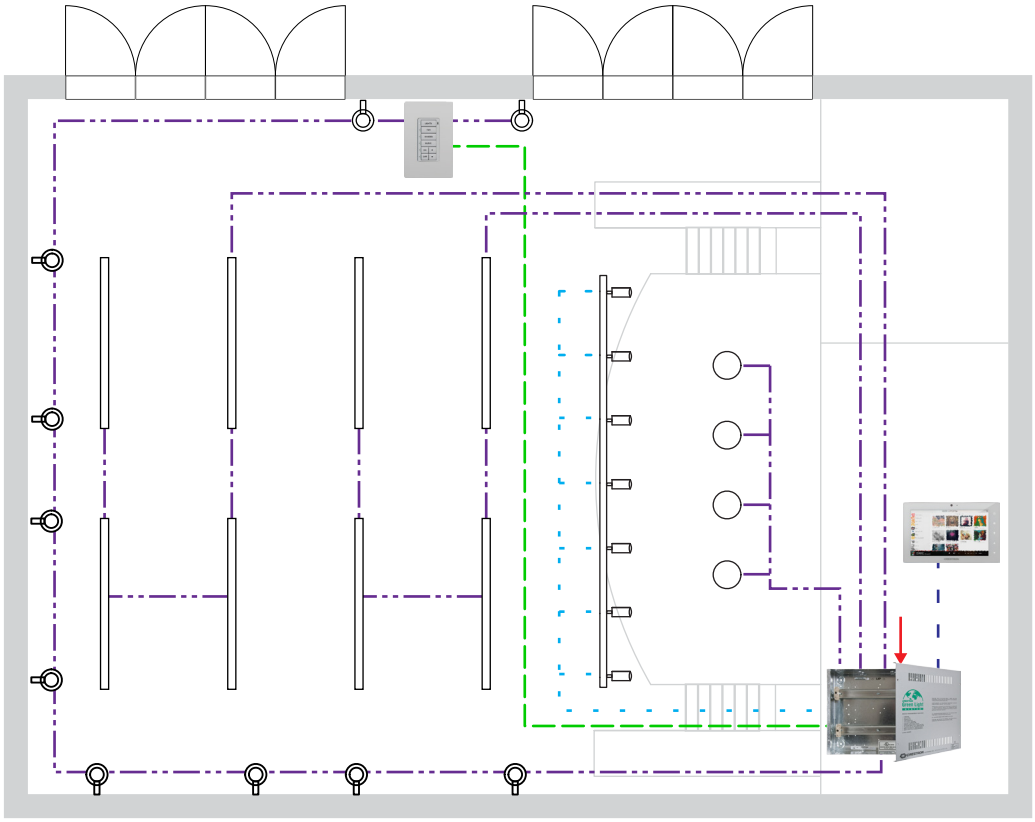
IECC 2015 Code Compliance:

- Manual Controls (C405.2.1.1.3)
- Automatic Full On (Occupancy Sensing Mode) (C405.2.1.1.2)
- Automatic Full Off (C405.2.1.1.1)

Symbol	Product	Qty.	Description
	GLA-DT-QUATTRO-COM1-24	1	Dual Technology Presence Detector, Ceiling Mount, Square & Scalable 360° Coverage, 18-24 VAC/VDC
	GLA-TR-100	1	Power Pack 120/230/277 VAC, 50/60Hz, 24 VDC, 250mA, 20 Amp. Relay, Manual/auto (on) switching
	Single-Pole Switch	1	Single-Pole Switch

Cafetorium

GLPAC + DMX



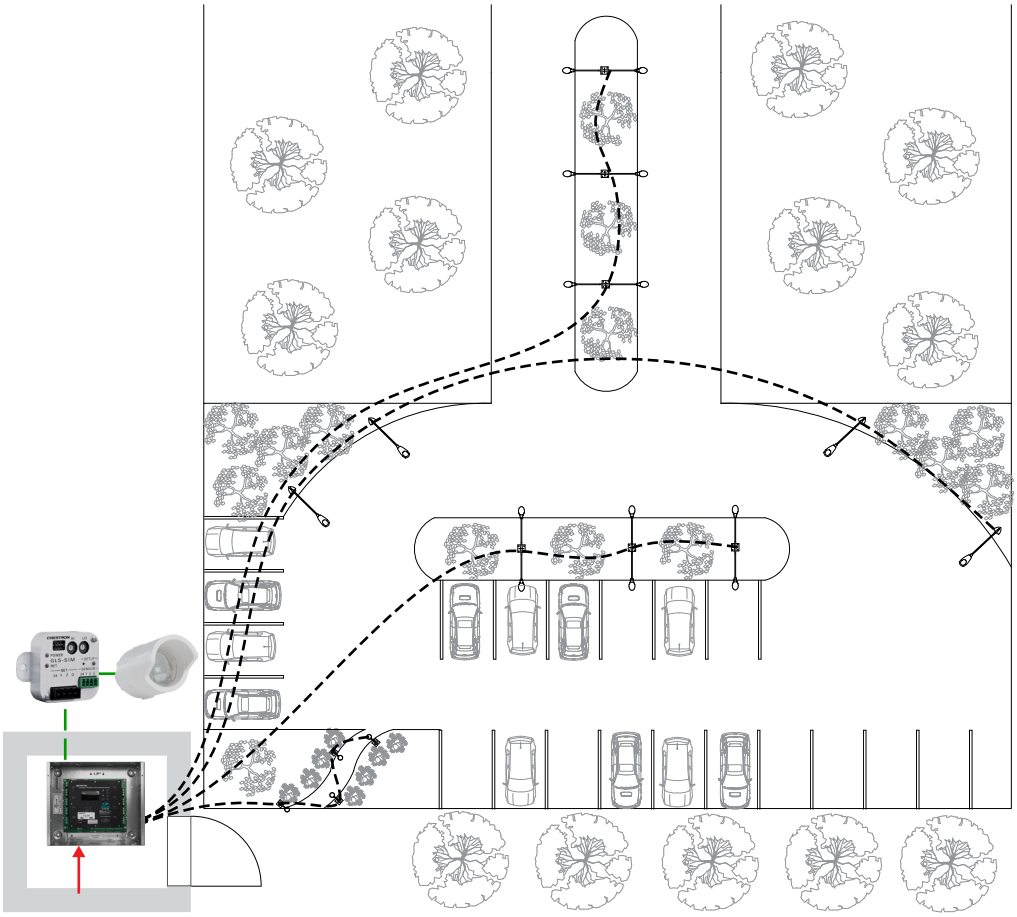
IECC 2015 Code Compliance:

- Manual Controls (C405.2.1.1.3)
- Time-switch Controls (Programmable timeclock) (C405.2.2)
- Bi-level Control (0-10V Dimming) (C405.2.3.1.4)

Symbol	Product	Qty.	Description
	C2N-CBD-P	1	Cameo® Keypad, Standard Mount
	TSW-760	1	7" Touch Screen
SpaceBuilder System Components:			
	GLPAC-DIMFLV8	1	Green Light® Integrated Lighting System, 8-Channel
	DIN-EN-2x18	1	Enclosure for DIN Rail Devices, 2 DIN Rails, 18 Units Wide
	DIN-AP3	1	DIN Rail 3-Series® Automation Processor
	DIN-DMZ-1UNIVERSE	1	DIN, CONTROLLER, DMX, 1 Universe
	CEN-SW-POE-5	1	5-Port PoE Switch

Site Lighting

GLIPAC (Non-dimming)



IECC 2015 Code Compliance:

- Time-switch Controls (Programmable timeclock) (C405.2.2)
- Daylight-responsive Controls (Photocontrols) (C405.2.3)

Symbol	Product	Qty.	Description
	GL-IPAC-SW8	1	Crestron Green Light® Integrated Switching System
	GLS-SIM	1	Crestron Green Light® Sensor Integration Module
	GLS-LEXT	1	Crestron Green Light® Photosensor, Outdoor

Notes

Notes

Notes

This document was written by the Technical Publications department at Crestron Electronics, Inc.

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