

# Building a Large-Scale Bluetooth Mesh Network with Demonstration Showcase

Considerations and Collaboration on Designing  
and Deploying a Commercial-Grade Project



Lighting manufacturers work with a wide range of building and design professionals; creating innovative showcase spaces is an ideal way to inform and educate these influencers. Often, design showcase facilities focus on architectural lighting products to the exclusion of other critical lighting technologies. In today's connected world, however, overlooking the importance of including wireless control to enhance and present innovative lighting constitutes a monumental error. Creating an ideal design showcase would integrate the best lighting technologies while simplifying control to the most flexible capability possible. At the same time, the control solution must be capable of delivering the most desired functions, from intelligent light level control to critical emerging functions such as human-centric lighting that benefits occupants' biological, emotional, health, and wellbeing. Finally, the ideal showcase would feature the highest degree of interoperability among fixtures and control devices, providing the design marketplace a demonstration of emerging trends in flexibility in selecting and combining best-in-class devices and components.

In creating Alphabet Lighting's new design showcase in Irvine, California, the project team achieved each of these goals as well as complying with California's ambitious newest energy efficiency building standard, Title 24-2019. This paper will explore this project in detail, examining the project design intent, the criteria for technology selection, the installation and commissioning phase, and lastly, lessons learned.



LEDRAbands Corporate Headquarters, Irvine CA  
Product: ALPHABET Lighting - NUA TW downlight w/ Circadian Mapping  
Controls, McWong Photo/Occ Sensors/Switches - CASAMBI Integrated  
Architect: Ware Malcomb  
Photographer: Jason Luckenbill

**Figure 1.** LEDRAbands new corporate headquarters in Irvine, California houses 115+ employees and a state-of-the-art training and showcase center.



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**Figure 2.** The facility features a proprietary Bluetooth mesh control network throughout the 30,000 ft<sup>2</sup> facility.

In early 2020, Alphabet Lighting moved its corporate headquarters from Tustin, California to a new location in Irvine. The new facility would provide a home for 115 employees as well as establish a state-of-the-art training and showcase center for training and events for important channel partners, such as specifiers and manufacturer representatives. The facility, formerly a biotech manufacturing facility, was a recent move for LEDRABrands to Irvine, CA, also known as the “City of Innovation” which is home to several Fortune 1000 companies from Biotech to electric auto R&D. The new facility is more than double the size of the 3-building campus from where the company relocated. The need to complete the project in spite of COVID restrictions meant the project timeline was extremely compressed, with the goal of opening the new showcase space by October 1, 2020 for Q3-4 events and activities.

A central element of the project was the desire to include wireless Bluetooth® mesh control solutions, as the company remains committed to integrating this technology into its products in recognition of the strong marketplace interest in interoperable, flexible wireless control. Featuring an integrated lighting and controls solution in its design showcase would offer the additional benefit of educating channel partners on the feasibility of integrated smart control in a commercial real estate setting, one of the most common space types.

“**Design showcases that simply showcase beautiful lighting are no longer enough in today’s and more importantly, tomorrow’s marketplace. Building professionals are looking for integrated solutions that deliver a range of functionality today and that can scale with additional functionality in the future.**

— **David Derk, Director of Sales and Marketing, LEDRABrands.**

## Synergies through Collaboration

Three respected companies collaborated on the project:

**Alphabet Lighting** — An American manufacturer founded in 1993, ALPHABET Lighting is a brand of parent LEDRABrands offering commercial, specification grade light fixtures and solutions. Specializing in cutting edge technology for general lighting solutions.

**Casambi** — Casambi – An ecosystem for wireless lighting control.

Established in 2011, Casambi is the industry-leader in full-featured wireless lighting control platforms. Based on Bluetooth Low Energy, we offer an open smart lighting ecosystem of 100% interoperable lighting products from hundreds of major lighting companies. Casambi’s technology can be integrated into anything from individual lighting fixture controls to industrial-scale solutions with cloud-based remote control and monitoring.

**McWong International** — Established in 1984, McWong produces superior lighting controls and related electrical power and protection components. Today, McWong is engineering IoT solutions for the rapidly changing marketplace, leveraging state-of-the-art wireless technologies such as Bluetooth mesh and collaborative relationships with technology partners.

## Creating a Responsive Lighting Showroom

### The Design Phase: Identifying Project Goals

As with any new construction or tenant improvement project, best practices demand the project team complete a lighting design phase during which the team identifies project goals and creates the project plan. Key goals in this project were:

- **Implementing human-centric lighting throughout the facility and particularly the showcase and training spaces**

The project team recognized the increasing importance of human-centric lighting, which considers all aspects of how the lighting system affects people—their productivity but also their wellbeing both physical and emotional. This includes light level adjustment as well as color temperature tuning or accommodating the need for daylight in indoor environments.

For instance, all common areas throughout the building are using Casambi's human-centric automated CCT control for the tunable white luminaires, to allow for automated CCT shifts through the workday. The tuning graph was chosen and uploaded to Casambi based on the facility's geographic location. The design includes wall switch PIR sensors for offices and common areas.

- **Deploying an integrated wireless control network across the facility**

To achieve human-centric lighting goals, a robust wireless control network is necessary to adjust light level or color temperature. Control strategies can range from occupancy-based or scheduled control for specific space types (see below) or according to time of day for daylight-responsive or color tuning strategies.

- **Achieving the most flexible level of control possible**

A key design goal was to push the envelope of control flexibility as far as possible, both in terms of the installation phase (see page 8) and for future operational functionality. For instance, the project team wanted the most intuitive user interface possible, so that virtually any occupant could adjust settings in a personal work area.

In the training room, while the code-compliant control plan is implemented, a robust scenario with heavy scene setting, demo and animation is also planned.

## The Design Phase: Creating a Code-compliant Plan

Equally important to the project team was compliance with California’s newest Title 24 Building Energy Standard. Effective on January 1, 2020, the code includes lighting efficacy and control requirements applicable to numerous space types. The Title 24 compliance plan was carefully executed by the project team. Strict energy guidelines incorporating standards for lumen output versus wattage per square foot were followed, as well as occupancy and daylight harvesting sensors in every space applicable. Wall switches are located in every zone for manual override of scene setting.



**“California Title 24 compliance is foundational for market leaders. Achieving compliance with a Bluetooth mesh solution demonstrates the technology is robust enough for the marketplace.”**

**— Blane Goettle, Vice President, McWong International.**

### *Perimeter Offices*

Title 24 requires readily accessible controls with automatic shut-off and multi-level control for perimeter offices without daylight contribution. For offices with daylight contribution, automatic daylighting control is additionally required.

The project team selected an occupancy-based control strategy to comply with Title 24 requirements as well as an integrated daylight harvesting capability for spaces with windows.

### *Open Offices*

Code provisions mandate readily accessible controls with automatic shut-off, multi-level control, and access to manual override.

The project team selected ceiling mount, passive infrared (PIR) occupancy and daylight harvesting sensors (McWong PSC-BL-I-RT-DCO-BLE-CB, PSC-BL-I-RD-DCO-BLE-CB) and created overlapping control zones for superior coverage and performance. Wall switches provide override capabilities.

### *Conference Rooms*

Code provisions mandate occupancy sensor controls with Partial-ON and automatic shut-off, multi-level control, and access to manual override.

The project team selected PIR occupancy sensors (McWong PSC-BL-I-RT-DCO-BLE-CB) to comply with code requirements. In daylit zones, the team chose daylight harvesting sensors as well (McWong PSC-BL-I-RD-DCO-BLE-CB).

### *Restrooms*

Code provisions mandate occupancy sensors with automatic shut-off. Restrooms larger than 100 ft<sup>2</sup> with more than 0.5 watts/ft<sup>2</sup> must also utilize multi-level controls.

The project team selected ultrasonic occupancy sensors for each of the facility’s eight restrooms (McWong PSC-ND-I-CM-DC-BLE-CB).

### *Lunch/Break Rooms*

Code provisions mandate occupancy sensor controls with Partial-ON and automatic shut-off, multi-level control, and access to manual override.

The project team selected the same ceiling PIR occupancy sensors, wall switches (for manual override), and Casambi-programmed automatic shut-off timers to comply with code requirements.

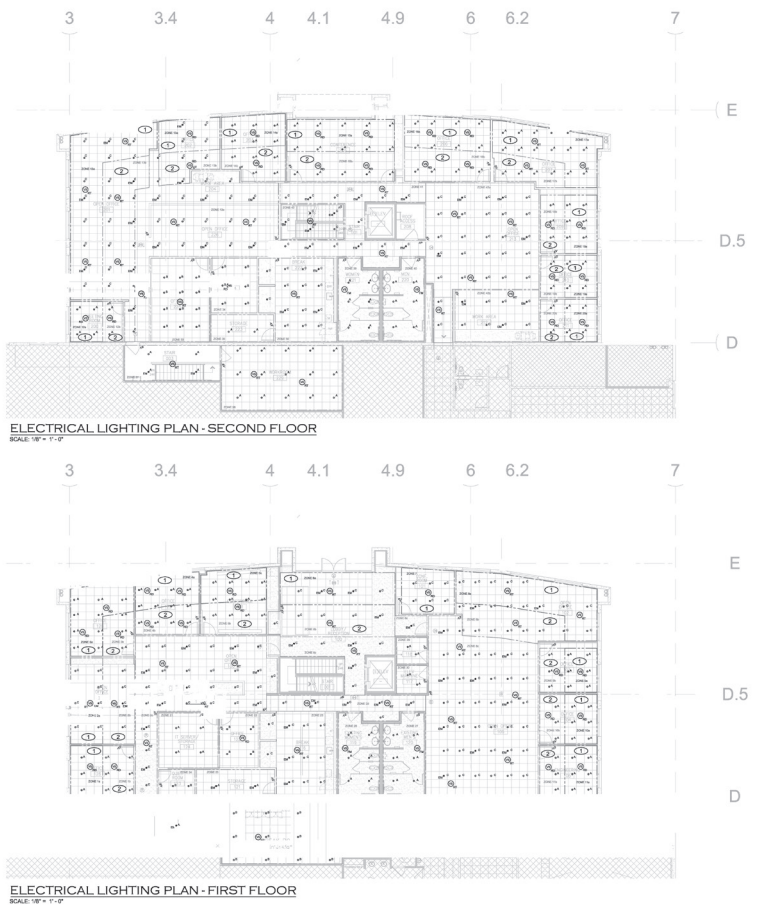
### *Training Rooms*

Code provisions mandate occupancy sensor controls with Partial-ON and automatic shut-off, multi-level control, and access to manual override.

The project team selected occupancy sensors with overlapping coverage zones as well as wall switches for manual override.

**Figure 3.** The facility includes Title 24-2019 compliant control plans for open and private offices, conference rooms, restrooms and training rooms.





LIGHTING ZONES						
ZONE	ROOM NAME	CONTROL TYPE	OCCUPANT OVERRIDE CONTROL	WATTAGE	CIRCUIT	
1a	PRIMARY SIDELIT OFFICE 126	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	48 W	L8Y1	
1b	SECONDARY SIDELIT OFFICE 126	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	MOWING MODEL PSC-DM-HW-BLE	96 W	L8Y1	
2a	PRIMARY SIDELIT OFFICE 127	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	200 W	L8Y1	
2b	SECONDARY SIDELIT OFFICE 127	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	MOWING MODEL PSC-DM-HW-BLE	100 W	L8Y1	
3a	PRIMARY SIDELIT COPY 128 OFFICE 130	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	738 W	L8Y1	
3b	SECONDARY SIDELIT OFFICE 128	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	144 W	L8Y1	
3c	SECONDARY SIDELIT OFFICE 128	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	MOWING MODEL PSC-DM-HW-BLE	48 W	L8Y1	
4a	PRIMARY SIDELIT OFFICE 129	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	96 W	L8Y1	
4b	SECONDARY SIDELIT OFFICE 129	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	MOWING MODEL PSC-DM-HW-BLE	96 W	L8Y1	
5a	PRIMARY SIDELIT OFFICE 131	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	128 W	L8Y1	
5b	SECONDARY SIDELIT OFFICE 131	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	MOWING MODEL PSC-DM-HW-BLE	64 W	L8Y1	
6a	PRIMARY SIDELIT LOBBY/RECEPTION 100	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	70 W	L8B	
6b	SECONDARY SIDELIT LOBBY/RECEPTION 100	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	MOWING MODEL PSC-DM-HW-BLE	70 W	L8B	
6c	SECONDARY SIDELIT LOBBY/RECEPTION 100	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	178 W	L8B	
7	CONFERENCE ROOM 101	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	180 W	L8B	
8a	PRIMARY SIDELIT OPEN OFFICE 102	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	275 W	L8B	
8b	SECONDARY SIDELIT OPEN OFFICE 102	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	MOWING MODEL PSC-DM-HW-BLE	200 W	L8B	
8c	PRIMARY SIDELIT OPEN OFFICE 106	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	900 W	L8B	
8d	SECONDARY SIDELIT OPEN OFFICE 106	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	MOWING MODEL PSC-DM-HW-BLE	90 W	L8B	
9a	PRIMARY SIDELIT OFFICE 103	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	48 W	L8B	
9b	SECONDARY SIDELIT OFFICE 103	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	MOWING MODEL PSC-DM-HW-BLE	96 W	L8B	
10a	PRIMARY SIDELIT OFFICE 104	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	96 W	L8B	
10b	SECONDARY SIDELIT OFFICE 104	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	MOWING MODEL PSC-DM-HW-BLE	48 W	L8B	
11a	PRIMARY SIDELIT ENGINEERING 105	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	90 W	L8B	
11b	SECONDARY SIDELIT ENGINEERING 105	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	MOWING MODEL PSC-DM-HW-BLE	48 W	L8B	
12a	PRIMARY SIDELIT MEETING ROOM 200	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	90 W	L8B	
12b	SECONDARY SIDELIT MEETING ROOM 200	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	MOWING MODEL PSC-DM-HW-BLE	48 W	L8B	
13a	PRIMARY SIDELIT OPEN OFFICE 201	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	408 W	L8B	
13b	SECONDARY SIDELIT OPEN OFFICE 201	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	MOWING MODEL PSC-DM-HW-BLE	375 W	L8B	
13c	WORK AREA 304 OFFICE 228	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	475 W	L8B	
14a	PRIMARY SIDELIT OFFICE 203	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	90 W	L8B	
14b	SECONDARY SIDELIT OFFICE 203	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	MOWING MODEL PSC-DM-HW-BLE	80 W	L8B	
15a	PRIMARY SIDELIT CONFERENCE 205	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	190 W	L8B	
15b	SECONDARY SIDELIT CONFERENCE 205	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	MOWING MODEL PSC-DM-HW-BLE	60 W	L8B	
16a	PRIMARY SIDELIT OFFICE 206	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	128 W	L8B	
16b	SECONDARY SIDELIT OFFICE 206	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	MOWING MODEL PSC-DM-HW-BLE	64 W	L8B	
17a	PRIMARY SIDELIT OFFICE 207	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	208 W	L8B	
17b	SECONDARY SIDELIT OFFICE 207	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	MOWING MODEL PSC-DM-HW-BLE	64 W	L8B	
18a	PRIMARY SIDELIT OFFICE 208	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	96 W	L8B	
18b	SECONDARY SIDELIT OFFICE 208	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	MOWING MODEL PSC-DM-HW-BLE	48 W	L8B	
19a	PRIMARY SIDELIT OFFICE 210	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	64 W	L8B	
19b	SECONDARY SIDELIT OFFICE 210	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	MOWING MODEL PSC-DM-HW-BLE	32 W	L8B	
20a	PRIMARY SIDELIT OFFICE 211	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	64 W	L8B	
20b	SECONDARY SIDELIT OFFICE 211	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	MOWING MODEL PSC-DM-HW-BLE	32 W	L8B	
21	IT SERVER/STORAGE 134	WALL MOUNTED VACANCY SWITCH WITH DIMMING	WALL MOUNTED VACANCY SWITCH WITH DIMMING	64 W	L8Y1	
22	OFFICE 122	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	108 W	L8Y1	
23	BREAK 116	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	275 W	L8Y1	
24	QUIET ROOM 123	WALL MOUNTED VACANCY SWITCH WITH DIMMING	WALL MOUNTED VACANCY SWITCH WITH DIMMING	54 W	L8Y1	
25	STORAGE 121	WALL MOUNTED VACANCY SWITCH WITH DIMMING	WALL MOUNTED VACANCY SWITCH WITH DIMMING	32 W	L8Y1	
26	EXISTING WOMEN'S 119	F34 MOWING MODEL PSC-BL-LF34-D00-BLE (18.4' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	96 W	L8B	
27	EXISTING MEN'S 120	F34 MOWING MODEL PSC-BL-LF34-D00-BLE (18.4' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	96 W	L8B	
28	1ST FLOOR HALLWAY	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	120 W	L8Y1	
29	IT 118	WALL MOUNTED VACANCY SWITCH WITH DIMMING	WALL MOUNTED VACANCY SWITCH WITH DIMMING	32 W	L8B	
30	ELEVATOR MACHINE 119	WALL MOUNTED VACANCY SWITCH WITH DIMMING	WALL MOUNTED VACANCY SWITCH WITH DIMMING	32 W	L8B	
31	STAIR 003	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	128 W	L8Y1	
32	BREAK ROOM	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	334 W	L8Y1	
33	OFFICE 224	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	334 W	L8B	
34	OFFICE 224	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	152 W	L8B	
35	STORAGE 223	WALL MOUNTED VACANCY SWITCH WITH DIMMING	WALL MOUNTED VACANCY SWITCH WITH DIMMING	32 W	L8B	
36	BREAK 222	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	330 W	L8B	
37	STAIR 003	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	64 W	L8B	
38	WORK ROOM 228	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	240 W	L8B	
39	WOMEN 221	F34 MOWING MODEL PSC-BL-LF34-D00-BLE (18.4' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	96 W	L8B	
40	MEN 222	F34 MOWING MODEL PSC-BL-LF34-D00-BLE (18.4' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	96 W	L8B	
41	PASSAGE WAY	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	328 W	L8B	
42a	OPEN OFFICE 213	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	875 W	L8B	
42b	SECONDARY SIDELIT OPEN OFFICE 213	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	200 W	L8B	
43	WORK AREA 212	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	200 W	L8B	
44	STAIR 001	R2P MOWING MODEL PSC-BL-HD-D00-BLE (8' RADIUS COVERAGE)	WALL MOUNTED VACANCY SWITCH WITH DIMMING	128 W	L8B	

**Figure 4.** The Casambi software interface makes it easy to create control groups (also known as zones) and specific control scenarios for each group. Since the grouping is defined by the software not the physical wiring, groups, scenes, schedules and more can easily be changed.

## The Installation Phase: Installing & Commissioning the System

The installation and commissioning process presented the team with a challenge. The timeframe for completion was non-negotiable as the company needed to relocate by June 1st, 2020. However, the statewide shelter-in-place mandate, effective on March 19, 2020, meant that the installation and commissioning team could not access the facility. “This is when the Bluetooth mesh functionality became extremely valuable,” notes David Derk, Director of Sales and Marketing, LEDRAbrands. “The project team was able to remotely program devices via the Casambi app, even from multiple remote locations. Because every team member had access to the project on the app, each person could continue to move forward regardless of whether they were working in their own garage.”

The team pre-labeled each device before installation and ensured each device was pre-commissioned, including scenes, to reduce the amount of time needed for the final on-site commissioning walkthrough.

This proven to be critical in maintaining the project timeline. Similarly, the team could create desired zones in the app without actually being physically present in the new building. They were able to collaborate via web-based video calls as well as the app to make sure every team member knew what had been done and what remained to be done. The design featured eight control zones per floor on each of the building’s two floors.



**Figure 5.** The project team was able to remotely commission the control network to maintain progress during the statewide Covid shutdown.

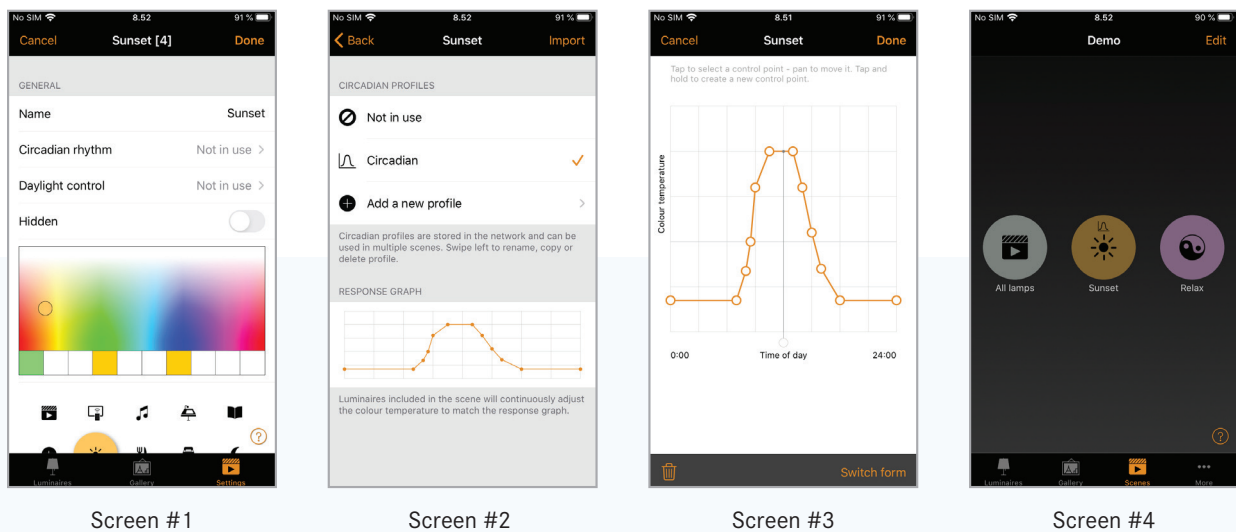


In total, 753 fixtures in the main common areas, and an additional 262 fixtures in the assembly and training area were installed, along with 161 McWong occupancy sensors and 128 Casambi node controllers. Each team member had access to the project via the Casambi software on their iOS or Android smartphone. Once the installation team was able to access the facility in late May, physical installation went swiftly, and the project was completed shortly after move-in. During on-site commissioning, visual confirmation helped ensure the pre-commissioned devices were working as desired.

A range of Alphabet Lighting fixtures were deployed by the project team. Inside offices, static white LED fixtures were chosen along with daylight harvesting controls for perimeter offices. In common areas and open office areas, tunable white fixtures were used, and programmed via the Casambi app to track a graph that directly mimics the sun to correlate with the time of day. This feature is available in the latest CASAMBI upgrades for Human-Centric design. The same units are installed in LEDRAbrands.

**“ The value of human-centric lighting that seamlessly transitions from warmer color temperatures in the early morning to cooler temperatures later in the day is unquestioned. The Casambi interface makes this a completely automated experience, using the geo-coordinates of a facility’s location. Adjustments can be achieved as simply as moving the points on the tuning graph (see Figure 6, screen #2 and #3).**

– Peter Augusta, Vice President, Major Accounts, Casambi



**Figure 6.** The Casambi interface enables easy setup of circadian, human-centric color temperature changes over the course of a day. As illustrated on screen 3, the user can simply slide the points on the graph to create the daily color change sequence.

# lessons learned

Early performance insights reveal that the lighting and controls system is stable and working as programmed. Company management could not be more pleased with the results and the installation cost savings as a result. Future plans include upgrades to the warehouse portion of the facility next. Continuing design and installation of the training room area is ongoing, and LEDRABrands is planning to host a LEDRAfair for late fall. This will be a hybrid open house celebration, coupled with product launch and vendor showcase featuring these integrated technologies as well as training classes for those technologies.

Alphabet Lighting's new corporate headquarters provided the ideal opportunity to design a lighting and controls showcase with the types of future-forward technology that the marketplace is seeking. This includes responsive, human-centric lighting to create comfortable working environments for enhanced productivity, as well as responsive, easy-to-use wireless controls for energy code compliance and optimal energy performance.

The result of collaboration between three industry leaders—Alphabet Lighting, Casambi and McWong International—proves out the value of interoperability offered by Bluetooth mesh, particularly during the Covid epidemic. This created numerous challenges to the project timeline, with the statewide shelter-in-place mandate for two months coming at a critical time during the project. Bluetooth technology and the Casambi software platform proved to be an unexpected benefit, enabling the project team to continue to move forward with project design and commissioning in spite of the lack of access to the facility. Overall, the project ended up being straightforward, with simple commissioning and installation. In particular, scene setting for sun-pattern CCT animation and sensor control integration were simple programming exercises.

Once the installation team was able to access the facility in late May 2020, physical installation went swiftly and the project was completed in July 2020.

## References

Building Energy Efficiency Standards for Residential and Nonresidential Buildings for the 2019 Building Energy Efficiency Standards Title 24, Part 6, and Associated Administrative Regulations in Part 1. California Energy Commission, December 2018.



LEDRABRANDS.COM



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