

Building a Bluetooth mesh Demonstration/ Lighting Showcase

Considerations and Collaboration



LEDRIK® is a registered trademark of LEDRIK, Inc. CA
Product: ALPHABET Lighting - N4 TV above right w/ Circular Mapping
Controls: HoWang PhotoCoo; Sensors: Sefirae; CASANO Integrated
Architect: Wain McBurnie
Photographer: Jason Luskowski

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.



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

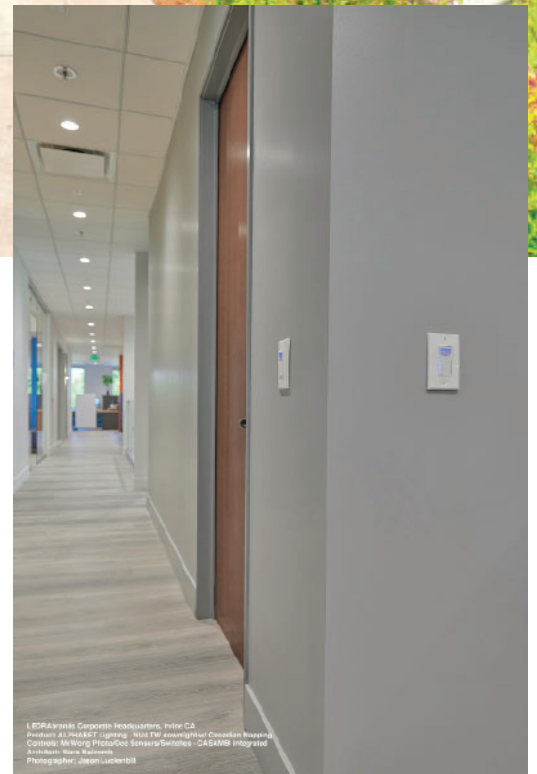


Figure 2. The facility features a proprietary Bluetooth mesh control network throughout the 30,000 ft² facility.

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 with 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.

mwConnect™ (formerly McWong International) — Established in 1984, mwConnect produces superior lighting controls and related electrical power and protection components. Today, mwConnect 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, mwConnect.

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 (mwConnect PSC-BL-I-RT-DC0-BLE-CB, PSC-BL-I-RD-DC0-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 (mwConnect PSC-BL-I-RT-DC0-BLE-CB) to comply with code requirements. In daylight zones, the team chose daylight harvesting sensors as well (mwConnect PSC-BL-I-RD-DC0-BLE-CB).

Restrooms

Code provisions mandate occupancy sensors with automatic shut-off. Restrooms larger than 100 ft² with more than 0.5 watts/ft² must also utilize multi-level controls.

The project team selected ultrasonic occupancy sensors for each of the facility's eight restrooms (mwConnect 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.



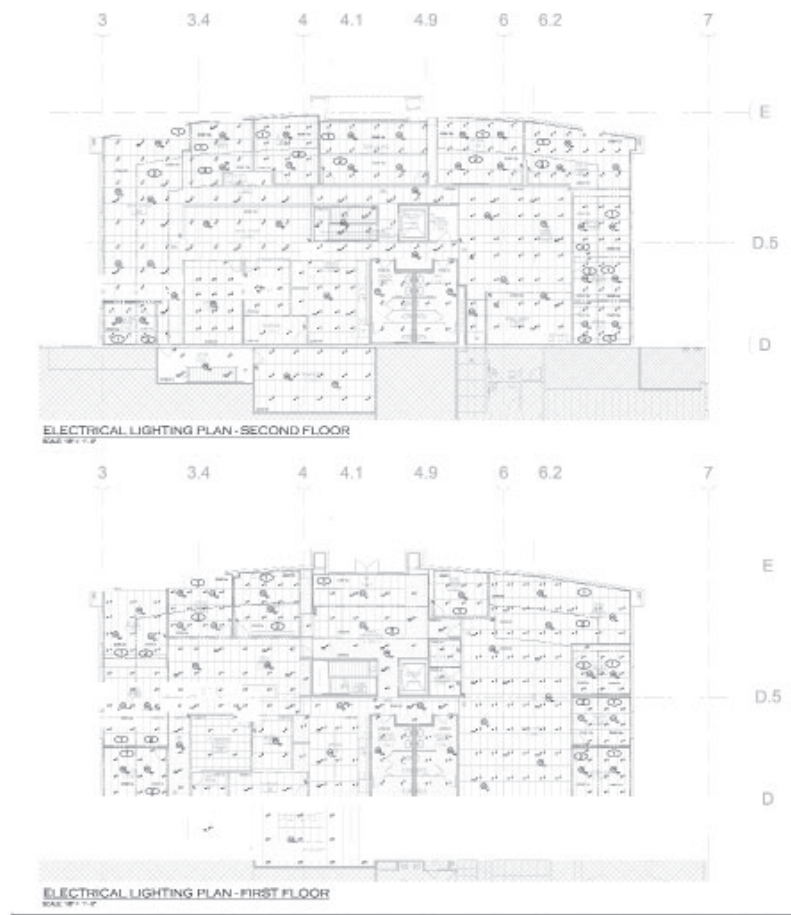


Figure 4. The Casambi software interface makes it easy to create control groups (also known as zones) and specific control scenarios for each group. Since the grouping is defined by the software not the physical wiring, groups, scenes, schedules and more can easily be changed.

LIGHTING ZONES						
ZONE	ROOM NAME	CONTROL TYPE	OCCUPANT OVERRIDE CONTROL	WATTAGE	CIRCUIT	
18	PRIMARY SIDEIT	OFFICE 126	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	45 W	LB17	
19	SECONDARY SIDEIT	OFFICE 126	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	54 W	LB17	
20	PRIMARY SIDEIT	OFFICE 127	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	100 W	LB17	
21	SECONDARY SIDEIT	OFFICE 127	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	100 W	LB17	
22	PRIMARY SIDEIT	OFFICE 128	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	144 W	LB17	
23	SECONDARY SIDEIT	OFFICE 128	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	45 W	LB17	
24	PRIMARY SIDEIT	OFFICE 129	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	98 W	LB17	
25	SECONDARY SIDEIT	OFFICE 129	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	54 W	LB17	
26	PRIMARY SIDEIT	OFFICE 181	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	128 W	LB17	
27	SECONDARY SIDEIT	OFFICE 181	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	64 W	LB17	
28	PRIMARY SIDEIT	LOBBY/RECEPTION 100	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	78 W	LB19	
29	SECONDARY SIDEIT	LOBBY/RECEPTION 100	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	78 W	LB19	
30	PRIMARY SIDEIT	LOBBY/RECEPTION 100	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	173 W	LB19	
31	SECONDARY SIDEIT	LOBBY/RECEPTION 100	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	173 W	LB19	
32	PRIMARY SIDEIT	CONFERENCE ROOM 101	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	190 W	LB19	
33	SECONDARY SIDEIT	CONFERENCE ROOM 101	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	190 W	LB19	
34	PRIMARY SIDEIT	OPEN OFFICE 132	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	275 W	LB19	
35	SECONDARY SIDEIT	OPEN OFFICE 132	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	200 W	LB19	
36	PRIMARY SIDEIT	OPEN OFFICE 108	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	80 W	LB19	
37	SECONDARY SIDEIT	OPEN OFFICE 108	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	61 W	LB19	
38	PRIMARY SIDEIT	OFFICE 109	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	96 W	LB19	
39	SECONDARY SIDEIT	OFFICE 109	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	45 W	LB19	
40	PRIMARY SIDEIT	OFFICE 104	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	96 W	LB19	
41	SECONDARY SIDEIT	OFFICE 104	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	45 W	LB19	
42	PRIMARY SIDEIT	ENGINEERING 105	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	68 W	LB19	
43	SECONDARY SIDEIT	ENGINEERING 105	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	45 W	LB19	
44	PRIMARY SIDEIT	MEETING ROOM 200	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	90 W	LB19	
45	SECONDARY SIDEIT	MEETING ROOM 200	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	45 W	LB19	
46	PRIMARY SIDEIT	OPEN OFFICE 201	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	400 W	LB19	
47	SECONDARY SIDEIT	OPEN OFFICE 201	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	375 W	LB19	
48	PRIMARY SIDEIT	WORK AREA 304	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	475 W	LB19	
49	SECONDARY SIDEIT	WORK AREA 304	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	30 W	LB19	
50	PRIMARY SIDEIT	OFFICE 202	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	90 W	LB19	
51	SECONDARY SIDEIT	OFFICE 202	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	30 W	LB19	
52	PRIMARY SIDEIT	CONFERENCE 205	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	190 W	LB19	
53	SECONDARY SIDEIT	CONFERENCE 205	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	60 W	LB19	
54	PRIMARY SIDEIT	OFFICE 208	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	128 W	LB19	
55	SECONDARY SIDEIT	OFFICE 208	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	64 W	LB19	
56	PRIMARY SIDEIT	OFFICE 207	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	208 W	LB19	
57	SECONDARY SIDEIT	OFFICE 207	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	64 W	LB19	
58	PRIMARY SIDEIT	OFFICE 206	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	96 W	LB19	
59	SECONDARY SIDEIT	OFFICE 206	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	45 W	LB19	
60	PRIMARY SIDEIT	OFFICE 210	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	64 W	LB19	
61	SECONDARY SIDEIT	OFFICE 210	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	32 W	LB19	
62	PRIMARY SIDEIT	OFFICE 211	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	64 W	LB19	
63	SECONDARY SIDEIT	OFFICE 211	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	32 W	LB19	
64	PRIMARY SIDEIT	IT SERVER ROOM 124	WALL MOUNTED VACUANCY SWITCH WITH DIMMING	64 W	LB17	
65	SECONDARY SIDEIT	IT SERVER ROOM 124	WALL MOUNTED VACUANCY SWITCH WITH DIMMING	64 W	LB17	
66	PRIMARY SIDEIT	OFFICE 122	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	100 W	LB17	
67	SECONDARY SIDEIT	OFFICE 122	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	100 W	LB17	
68	PRIMARY SIDEIT	BREAK 110	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	275 W	LB17	
69	SECONDARY SIDEIT	BREAK 110	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	275 W	LB17	
70	PRIMARY SIDEIT	QUITTE ROOM 123	WALL MOUNTED VACUANCY SWITCH WITH DIMMING	54 W	LB17	
71	SECONDARY SIDEIT	QUITTE ROOM 123	WALL MOUNTED VACUANCY SWITCH WITH DIMMING	54 W	LB17	
72	PRIMARY SIDEIT	STORAGE 121	WALL MOUNTED VACUANCY SWITCH WITH DIMMING	32 W	LB17	
73	SECONDARY SIDEIT	STORAGE 121	WALL MOUNTED VACUANCY SWITCH WITH DIMMING	32 W	LB17	
74	PRIMARY SIDEIT	EXISTING WOMEN'S 119	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	96 W	LB19	
75	SECONDARY SIDEIT	EXISTING WOMEN'S 119	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	96 W	LB19	
76	PRIMARY SIDEIT	EXISTING MEN'S 120	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	96 W	LB19	
77	SECONDARY SIDEIT	EXISTING MEN'S 120	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	96 W	LB19	
78	PRIMARY SIDEIT	13F FLOOR HALLWAY	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	100 W	LB17	
79	SECONDARY SIDEIT	13F FLOOR HALLWAY	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	100 W	LB17	
80	PRIMARY SIDEIT	IT 118	WALL MOUNTED VACUANCY SWITCH WITH DIMMING	32 W	LB17	
81	SECONDARY SIDEIT	IT 118	WALL MOUNTED VACUANCY SWITCH WITH DIMMING	32 W	LB17	
82	PRIMARY SIDEIT	ELEVATOR MACHINE 118	WALL MOUNTED VACUANCY SWITCH WITH DIMMING	32 W	LB17	
83	SECONDARY SIDEIT	ELEVATOR MACHINE 118	WALL MOUNTED VACUANCY SWITCH WITH DIMMING	32 W	LB17	
84	PRIMARY SIDEIT	STAR 028	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	128 W	LB17	
85	SECONDARY SIDEIT	STAR 028	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	128 W	LB17	
86	PRIMARY SIDEIT	BREAK ROOM	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	334 W	LB17	
87	SECONDARY SIDEIT	BREAK ROOM	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	334 W	LB17	
88	PRIMARY SIDEIT	OFFICE 208	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	334 W	LB17	
89	SECONDARY SIDEIT	OFFICE 208	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	334 W	LB17	
90	PRIMARY SIDEIT	OFFICE 224	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	162 W	LB17	
91	SECONDARY SIDEIT	OFFICE 224	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	162 W	LB17	
92	PRIMARY SIDEIT	STORAGE 222	WALL MOUNTED VACUANCY SWITCH WITH DIMMING	32 W	LB17	
93	SECONDARY SIDEIT	STORAGE 222	WALL MOUNTED VACUANCY SWITCH WITH DIMMING	32 W	LB17	
94	PRIMARY SIDEIT	BREAK 222	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	350 W	LB17	
95	SECONDARY SIDEIT	BREAK 222	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	350 W	LB17	
96	PRIMARY SIDEIT	STAR 028	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	64 W	LB17	
97	SECONDARY SIDEIT	STAR 028	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	64 W	LB17	
98	PRIMARY SIDEIT	WORK ROOM 228	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	240 W	LB17	
99	SECONDARY SIDEIT	WORK ROOM 228	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	240 W	LB17	
100	PRIMARY SIDEIT	WOMEN 221	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	96 W	LB19	
101	SECONDARY SIDEIT	WOMEN 221	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	96 W	LB19	
102	PRIMARY SIDEIT	MEN 222	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	96 W	LB19	
103	SECONDARY SIDEIT	MEN 222	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	96 W	LB19	
104	PRIMARY SIDEIT	PASSAGE WAY	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	328 W	LB17	
105	SECONDARY SIDEIT	PASSAGE WAY	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	328 W	LB17	
106	PRIMARY SIDEIT	OPEN OFFICE 213	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	875 W	LB19	
107	SECONDARY SIDEIT	OPEN OFFICE 213	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	875 W	LB19	
108	PRIMARY SIDEIT	WORK AREA 212	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	200 W	LB19	
109	SECONDARY SIDEIT	WORK AREA 212	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	200 W	LB19	
110	PRIMARY SIDEIT	STAR 001	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	128 W	LB19	
111	SECONDARY SIDEIT	STAR 001	RFT MOWING MODEL PSC-BL-4HD-DOS-BLE (8' RADIUS COVERAGE)	128 W	LB19	

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.

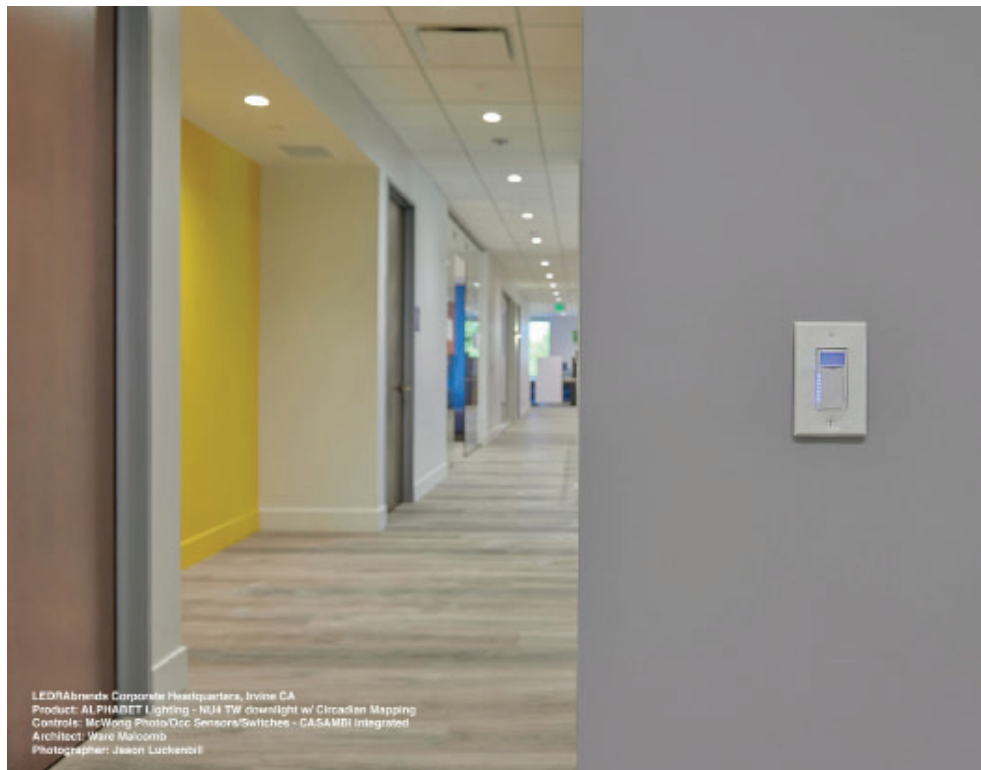


Figure 5. The project team was able to remotely commission the control network to maintain progress during the statewide Covid shutdown.

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 mwConnect 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

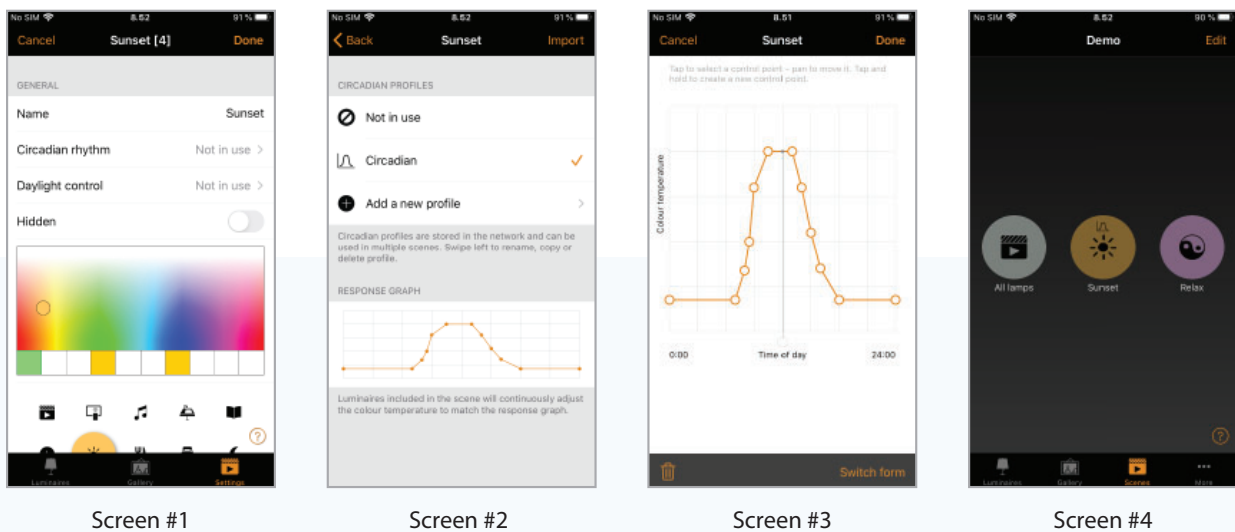


Figure 6. The Casambi interface enables easy setup of circadian, human-centric color temperature changes over the course of a day. As illustrated on screen 3, the user can simply slide the points on the graph to create the daily color change sequence.

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 mwConnect—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.



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