Building a Bluetooth mesh Demonstration/ Lighting Showcase

Considerations and Collaboration



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. Into day's connected world, however, overlooking the importance of including wirelesscontroltoenhanceandpresentinnovativelightingconstitutes 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 suchashuman-centriclightingthatbenefitsoccupants'biological, emotional, health, and wellbeing. Finally, the ideal show case would feature the highest degree of interoperability among fixtures and controldevices, providing the design market place a demonstration of emerging trends inflexibility inselecting and combining best-inclass 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.

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n 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 intewrated 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 industryleader 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 stateof-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-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 (mwConnect PSC-BL-I-RT-DC0-BLE-CB) to comply with code requirements. In daylit 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 Casambiprogrammed 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.



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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.

ZONE	ROOM NAME	CONTROL TYPE	OCCUPANT OVERRIDE CONTROL	WATTAGE	CIRCUI
16 PRIMARY BIDELIT	OFFICE (26	"RD" NEWONG NODEL PSC-BL-HRD-DOG-BLE (6" RADIUS DOVERAGE)	WALL NOUNTED VACANCY SMITCH	4EW	LINH
10 SECONDARY SIDELIT	OFFICE 128	'RD' MOWONG MODEL PSC-8L-HRO-DOG-BLE (C'RADIUS DOVERAGE)	WITH DINNING NOVEL PSC-DH-WB-BLE	W H2	184
Za PRIMARY SIDELIT	OPFICE 127	RT MOWONG MODEL PSC-BLI-RT-DOD(-BLE) (10' RADIUS COVERAGE)	WALL NOUNTED VACANCY SWITCH	2K0 W	LIBM
25 SECONDARY SIDELIT	OFFICE 127	RT MOWONG MODEL PSC-BL-HT-DOD(-BLE) (1/7 RADUS COVERAGE)	WITH DIMNING MOWONG MODEL PSC-DNI-WE-BLE	100 W	LIBT
25	COPY 125 OFFICE 136	(10 INDEXES CONTRACTOR (10 INDEXES) (10 INDEXES CONTRACTOR (10 INDEXES)	WALL NOUNTED VACANCY SWITCH WITH DIMNING MCWONG MCOEL PSC-DH-WB-BLE	726 W	LIB/H
âa -	OFTIDE 128	'RD' NOWOVA MODEL PAC-BLI-RD-DOS-BLE		141 W	LIB/1
FRIMARY SIDELIT	OFFICE 128	(F RADIUS COVERAGE) - CTY, (2) RD* MCWONG MDDEL PSC-BL+RD-DCG-BLE (F RADIUS COVERAGE)	WALL NOUNTED VACANCY SWITCH WITH DIMNING MCWORG MODEL PSC-041-W3-BLE	46 W	101
	OFFICE 128	(F RADUE COVERAGE) 'RO' NOWONG MODEL PSC-BLERD-DOD-BLE (F RADUE COVERAGE) - OTY. (2)		3110	LB/1
	OFFICE (28	(© RADIUS COVERAGE) - GTY. (2) "RD" INDWONG INDDEL PSC-8L-I-RD-DO3-8LE (© RADIUS COVERAGE)	WALL NOUNTED VACANCY SWITCH WITH DIMNING NOWONG MODEL PSC-044-493-BLE	30 W	LEVI
SECONDARY SIDELT					
PRIMARY SIDELIT	DFFICE 181	RDT NEWONG NODEL PSC-BLHED-DOHBLE (5" RADIUS COVERAGE)	WALL NOUNTED VACANCY SWITCH WITH DINNING MCWONG MCOEL PSC-ONI-YS-BLE	128 W	LIBI1
50 SECONDARY SIDELT	DFFICE 181	"RD" NOWONG NODEL PSC-8L-1-RD-DOX-BLE (8' RADILIE COMBRACIE)	NEWLING NEORE PSE-ONH-ROHER	64 W	UB/1
RA PRIMARY SIDELIT	LOBBY/RECEPTION 100	RT MOWONG MODEL PSC-BL-I-RT-OCO(BLE) (10" RADIUS COVERAGE)	WALL NOUNTED VACANCY SWITCH WITH DIMMING NOWORG MODEL PSC-DWI-WB-ELE	78 W	LNS
SECONDARY SIDELT	LOBBY/RECEPTION 100	RT MOWONG MODEL PSC-EL-HT-DOR(ELE) (10" RADIUS COVERAGE)	WALL NOUNTED VACANCY SWITCH	78 W	189
60	LOBBY/RECEPTION 100	'RT' MOWONG MODEL PSC-BL-LAT-DOQ(-BLE) (10' RADIUS COVERAGE)	WALL NOURTED WACKNOT SWITCH WITH DIMMINO NOWONG MODEL PSC-ONL-WS-BLE WALL NOURTED VACANCY SWITCH	175 W	LBS
7	CONFERENCE ROOM 101	'RD' MOWONG MODEL INCHLARD-DOTHLE (E'RADILIS COMPRAGE)	WALL NOUNTED VACANCY SWITCH WITH DIWNING MCWONG MODEL PSC-ON-1-W8-BLE	180 197	LBIS
an. PRIMARY SIDELIT	OPEN OFFICE 102	TRT MOMONO MODEL PEC-BL-I-RT-DOD(BLE) (10' RADIUS COVERAGE)		275 W	LBS
No SECONDARY SIDELIT	OPEN OFFICE 102	RT MEWONG MODEL PSC-BL-I-RT-DOB(BLE) (1/7 NADUG COVERAGE)	WALL NOUVTED VACANCY SWITCH WITH DIMMING NOWONG NODEL PSC-DHI-WS-BLE	200 W	185
ð.	OPEN OFFICE 105	TET MEMORIE MODEL PSC-BLI-RT-DOR(HELE) (10' RADIUS COVERNEE)	WALL NOUNTED VACANCY SWITCH WITH DIMNING NOWONG MODEL PSC-041-983-0LE	ano w	LBS
PS. PRIMARY SIDELIT	OFFICE 158	(R) NOVOVS NODEL PSC-8U4 ND-DO2-BLE (R) RADUS COMBRAGE)		SH W	Las
96 SECONDARY SIDELIT	OFFICE 108	(* HADLIS COVENAUE) *RD* MCWONG MODEL PSC-BL4-RD-DOS-BLE (# RADUS DOVERAUE)	WALL NOUNTED VACANCY SWITCH WITH DINNING NOWONG MODEL PSC-ONI-W8-BLE	45.W	LBIS
106 PRIMARY SIDELIT	DEFICE IM	(C RADIUS COVERAGE) RD: NOWONS NODEL INC-BLHRD-DCHBLE (B RADIUS COVERAGE)			Las
PRIMARY SIDELIT 10b SECONDARY SIDELIT	OFFICE 104	(# PADIUS COMERADE) "RD" INCWONG INDDEL PSC-BLI IRD-DOS-BLE (# PADIUS COMERAGE)	WALL NOUNTED VACANCY SWITCH WITH DINNING NOWONG MODEL PSC-ON-1-WB-BLE	43.W	LBR
114	ENGINEERING 108	(6' RADIUS COMPRAGE) 'PD' NOWONS MODEL PSC-BLI-RD-DOJ-BLE (6' RADIUS COMPRAGE)		 et w	Las
PRIMARY SIDELIT	ENGINEEPUNG 105		WALL NOUNTED VACANCY SWITCH WITH DINNING NOWONG MODEL PSC-ONI-INS-RUE		
11b SECONDARY BIDELIT		"RD" NOWONG NDDEL PSC-8L-HRD-DCG-8LE (* RADIUS COMERAGE) "RD" NOWONG NDDEL PSC-8L-HRD-DCG-8LE		48 W	190
128 PRIMARY SIDELIT	MEETING ROOM 200	RD' NOWONG NODEL PSC-BLI RENDOS BLE (6' RADIUS CONFRAGE)	WALL NOUNTED VACANCY SWITCH WITH DIMNING NOWONG MODEL PSC-DMI-WS-RLE	SH W	LB/2
SECONDARY SIDELT	MEETING ROOM 200	PD" NCWONG MDDEL PSC-BLI-RD-DCG-BLE (# RADIUS COVERAGE) PRT MCWONG MODEL PSC-BLI-RT-DCD(BLE)	NGWORG MODEL PSCHOMMARSELE	45 W	182
15m PRIMARY SIDELIT	OPEN OFFICE 201	(10 RADIUS CONFRAGE) - QTY. (3) (10 RADIUS CONFRAGE) - QTY. (3) (10 RADIUS CONFRAGE) (6 RADIUS CONFRAGE)		400 W	LB/2
		(8" RADIUS COMPRAGE) "RT MOWONG MODEL PSC-BL4-RT-DOB(-BLE)	WALL NOUNTED VACANCY SWITCH WITH DINNING NOWONG MODEL PSC-DM-PND-DLE		
13b GECONDARY SIDELT	OPEN OFFICE 202	"RT MGWONG MODEL P3C-BL4-RT-DGWELE) (10 RADUUS COVERAGE)- GTV. (2) "RD" NGWDNG MDDEL PSC-BL4 RD-DGSBLE (8" RADUUS COVERAGE)		W 616	LB/2
150	WORK AREA 204 OPEN OFFICE 228	PT MOWING MODEL PSC-8L-L-RT-DOM-BLES	WALL NOUNTED VACANCY SWITCH WITH DIMNING	415 W	182
14g PRIMARY SIDELIT	OPEN OFFICE 228	(10" IAADUS COVERABE) - CITT: (2) "RD" INCVIONG INDDEL PSC-BULFID-DOGALE (6" RADUS COVERAD]	MOWONG MODEL PSC-DHI-WE-BLE	58 W	1.82
	OFFICE 208	(6' RADUS COVERAGE) "RD" NOWONS MODEL PSC-8L1-RD-DOS-8LE (6' RADUS COVERAGE)	WALL NOUNTED VACANCY BATTER WITH DINNING NGWONG MODEL PSG-DHI-WG-BLE	80 W	195
146 SECONDARY SIDELT	CONFERENCE 205	(* RADIUS CONFRAGE) "RD" MCWDNG MDDEL PSC-BLI-RD-DCG-BLE (* RADIUS COVERAGE) - GTY, (2)		190 W	LBN
PRIMARY SIDELIT			WALL NOUNTED VACANCY SWITCH WITH DINNING NOWONG MCOEL PSC-DHI-INS-BLE		
1db aECONDARY SIDELT	GONFERENCE 205	"BD" NOWONG MODEL PSC-BL-RID-DOS-BLE (6" RADIUS COVERAGE) - OTY. (2) "DD" MONONO MODEL PSC-N LED-DOVER F	Inclusion model Postan - Notel	en w	LBN
15a PRIMARY SIDELIT	OFFIDE 2%	RD' NOWONS MODEL PSC-BL-RD-DCS-BLE (F RACIUS COVERAGE) - CTY, (2)	WALL NOUNTED VACANCY SWITCH WITH DIMNING NOWONG MODEL PSC-DNI-WS-BLE	128 W	LB4
16L SECONDARY SIDELT	OFFICE 208	RD* NOWONG MODEL PSC-BL-PD-DOSALE (8" RADIUS COVERAGE) - CTY, (2)	NEWONG MODEL PSE-D41-WEBLE	64 10	LBN
17# PRIMARY SIDELIT	OFTIDE 297	RT MONONO MODEL PSC-BL-I-BT-DOO(BLE) (10 RADIUS COVERAGE) - GTV. (2)	WALL NOUNTED VACANCY SWITCH WITH DIMNING NOWONG MODEL PSC-041-W3-BLE	208 19	LB:4
175 SECONDARY SIDELIT	OFFICE 207	RT MCWONG MODEL PSC-BL-4-RT-DC3(-BLE) (1/7 RADIUS COVERAGE)	NOWING MODEL PSC-041-W3-BLE	61 W	LINA
180 FRIMARY SIDELIT	OFFICE 208	RD" NGWONG NODEL PSC-BLH-RD-DOHBLE (F RADIUS COVERAGE)	WALL NOUNTED VACANCY SWITCH WITH DINNING NOWONG MODEL PSC-ONT-WS-BLE	98 W	1.84
16b SECONDARY SIDELT	OFFICE 200	RD' NOWONG MODEL PSC-8L1-RD-DOG-BLE (I' RADIUE DOVERAGE)	NOWONG MODEL PSC-ON- WS-BLE	48 W	LB/4
168 PRIMARY SIDELIT	OFFICE HIS	RD' NOWONG MODEL PSC-BLI-RD-DOG-BLE (6' RADIUS DOVERAGE)	WALL NOUNTED VACANCY SMITCH	01W	LDH
19b SECONDARY SIDELIT	OFFICE 210	'RD' NOWONG NODEL PSC-BLI-PD-DOS-BLE (6' RADIUS COVERAGE)	WALL NOUNTED VACANCY SMITCH WITH DINNING NOWONG NOOEL PSC-ONI-WB-BLE	32 W	1.84
254. PRIMARY BIDELIT	OFFICE 211	RD' MOWONG MODEL PSC-8L1 RD-DOG-MLE (* RADIUS EDVERAGE)	WALL NOUNTED VACANCY SWITCH	54 97	LBH
206 SECONDARY SIDELIT	OFFICE 211	PD' NOWONS MODEL PSC-BLI-RD-DOS-BLE Nº RADUS COVERAGE	WALL NOUNTED VACANCY SWITCH WITH DIMNING NOWONG MODEL PSD-DHH-WG-BLE	32 W	L84
21	IT SERVER/STORAGE 124	IN MUCHS CONSIGNED WALL INCLUSED VACANCY SWITCH WITH DIMINING MCWONG MODEL PSC-DM+WS-8LE	WALL NOUNTED VACANCY SWITCH WITH DIMMING	61 W	LIB/1
22	OFFICE 122	NCWONG MODEL PSC-BM+WS-8LE 'RD' NCWONG NDDEL PSC-BL4-RD-DCG-8LE (6' RADIUS COMERADE)	MCWONG MODEL PSG-ONH-WOHR F	108 197	
23	BREAK 110	(# RADILE COVERADE) RT MONONG MODEL PSC-BLI-RT-DOB(BLE) [19 RADILE COVERADE)	WITH DINNING NOWONG MODEL PSG-ONH-Y68-BLE WALL NOUNTED VACANCY BWITCH	210 1/	108/1
			WALL NOUNTED VACANCY BATCH WITH DINNING NOWONG MODEL PSCOMLARCALE WALL NOUNTED VACANCY SATCH WITH DINNING NOWONG MODEL PSCOMLANSHIE WALL NOUNTED VACANCY SATCH		
24	QUITE ROOM 123	WALL NOUNTED VACANCY SIMITCH WITH DIMINING NOWONG MODEL PSC-DM-HVIS-BLE WALL NOUNTED VACANCY SIMITCH WITH DIMINING		91W	LIBH
25	STDRAGE 121	MCWONG MODEL PSC-DM+WS-BLE	WITH DIMNING MCWORG MODEL [SC-ON-1-Y8-BLE WALL NOLIVIED VACANCY SMITCH	32 W	LBU1
20	EXISTING WOMEN'S 119	FM NOWONG MODEL PSC-BL-U-FM-OCO(-BLE) (16.4" RADIUS COVERAGE)	WITH DINNING MCWONG MODEL INCOME YARALE WALL NOUNTED VACANCY BATTCH	99 14	180
27	EXISTING MEM'S 120	TM NOWONG NODEL PSC-BL-U-TM-DOX(-BLE) [16.4" RADIUS COVERADE]	WALL NOUNTED WACKCY BWITCH WITH DINNING NOWONG MODEL PSD-DHI-WERLE WALL NOUNTED VACANCY SWITCH	99 1 4	LBP
28	15T FLOOR HALLWAY	'RT' MOWONG MODEL PSC-BLI-RT-DOB(-BLE) (10' RADIUS COVERAGE) - QTY, (2)	WITH DIMMING	1 <i>5</i> 0 W	LIS1
29	IT 118	WALL NOUNTED VACANCY SMITCH WITH DIMNING NOWTING MODEL PSC-DM+WS-BLE	NOWONG MODEL PSCOM-WSGLE WALL NOUNTED VACANCY SWITCH WITH DIMNING NOWONG MODEL PSCOM-USGREE	22 W	183
50	ELEVATOR MACHINE 118	WALL NOUNTED VIGANOV SWITCH WITH DIMNING MCWONG MODEL PSC-DM-WS-RLE	MOWORE MODEL PSC ONLY AS BLE WALL NOUNTED VACANCY SMITCH WITH DINNING	32 W	LBO
31	STAIR (03	RT MOWONG MODEL PSC-BL-HT-OCO(-BLE) (10' RADIUS COVERAGE) - QTY. (5)	WITH DINNING NOWONG MODEL PSCAME WALL WALL NOUNTED VACANCY DWITCH WITH DINNING	128 W	LISH
2	BREAK ROOM	(10" IDADIUS COVERABE) - Q1Y. (3) "RT MCWONG MODEL PSG-BLI-RT-DC0(BLE) (10" RADIUS COVERAGE) - Q1Y. (2)	WALL NO WORD VACANCY SWITCH	324 W	U81
	OFFICE 228	(19' RADIUS COVERNGE) - GITY, (2) "RT MONORIS MODEL (190-BLH-RT-DOR(BLE) (19' RADIUS COVERNGE)	WITH DIMMING NEWONG MODEL PSC-041-WS-REE WALL NOUNTED VACANCY SWITCH WITH DIMMING	324 W	Laz
81	OFFICE 220	(19' RADILIS COVERAGE) RD' NOVIONS INDDEL PSC-BLHRD-DOS-BLE (8' RADILIS COVERAGE)	MOWONG MODEL PSC-ON-LY/8-BLE WALL NOUNTED VACANCY SWITCH	-	
83			WITH DINNING NEWONG MODEL PSE-DHI-14/6-RLE WALL NOUNTED VACANCY DWITCH	162 W	195
84	077106 224		WALL NOUNTED VACANCY DWITCH		L8/2
	6TORAGE 223	WALL MOUNTED VACANCY SWITCH WITH DIMNING MCWDING MODEL PSC-DM-WS-BLE	WITH DIMMING NOWONG MODEL PSG-DMI-WG-BLE WALL NO INTED VACANCY SMITCH	32 W	
84		WALL MOUNTED VACANCY SWITCH WITH DIMINING MCWDING MODEL PSC-BAN-WSHLE RT MCWONG MODEL PSC-BL-RT-DCG(ELE) (10" RADLIS COVERNGE)	WITH DIMMING NOWONG MODEL PSG-DMI-WG-BLE WALL NO INTED VACANCY SMITCH	350 W	L812
94 25	6TORAGE 223	WALL INCOMPTED VACANCY SWITCH WITH DIMINING INCOMPS MODEL: PRCEMIANSHLE RT MONORO MODEL PRCEMIATOCORELS) (10 RADIL/S COVERNES) (10 RADIL/S COVERNES) (10 RADIL/S COVERNES)	WITH DUNING MCDC/NB ADOLE POCOMIANS-BLE WALL NOLINTED VACANCY SMITCH WITH DUNING MCWCNED VACANCY SMITCH WALL NOLINTED VACANCY SMITCH WITH DUNING		L82 L82
54 55 59	STURAGE 223 BREAK 222	WALL MOUNTED VACANCY SWITCH WITH DIMINING MOWING MODEL RECEMANISALE REVENSION MODEL RECEMANISALE REV MOWCH MODEL PROFILATIOD(REE) (10 MAULE COVERNOE) REV MOWCHG MODEL REVENATIOD(REE) (10 MAULE COVERNOE) REV MOWCHG MODEL REVENATION(REE) (10 MAULE COVERNOE)	WITH DIMINING INCOMENT BOOTER PSCIDMLINGS BE WALL MOUNTED VACANCY SMITCH WITH DIMINING NOWONG MOORE PSCIDMLINGS BE WALL MOUNTED VACANCY SMITCH WITH DIMINING NOWONG MOORE PSCIDMLINGS BE WALL MOUNTED VACANCY SMITCH WALL MOUNTED VACANCY SMITCH WALL MOUNTED VACANCY SMITCH	350 W	
54 55 59 87	GTURAGE 223 BREAK 222 STAIR 008	WALL MOUNTED VACANCY SWITCH WITH DIMINING MOWING MODEL RECEMANISALE REVENSION MODEL RECEMANISALE REV MOWCH MODEL PROFILATIOD(REE) (10 MAULE COVERNOE) REV MOWCHG MODEL REVENATIOD(REE) (10 MAULE COVERNOE) REV MOWCHG MODEL REVENATION(REE) (10 MAULE COVERNOE)	WITH DIMMING MICHAEL AND MARKET RECOMMENSE WALL MOLIFIED VARANCE SMITCH MICHAEL MOLIFIED VARANCE SMITCH WALL NO WITCH DIMMING MICHAEL ROOM INCOMENT MICHAEL MOLITE VARANCE SMITCH WALL NOUTIED VARANCE SMITCH WITH DIMMING MICHAEL MOLIER VARANCE SMITCH	350 W 64 W	L82
84 85 59 87 53	GTURAGE 223 BREAK 222 STAIR (CB WORK ROOM 228	WAL INCOME DOCUMENT SHAFTSH WITH DOMAINS DOTATION AND CALL RECEMENTSH INTERPORTER WOODS (POILS AND CALL RECE (IN MARCINE CONSTRAINED) (IN MARCINE CONSTRAINED)	WITH BUILING WITH BUILING WITH BUILING AND	350 W 64 W 240 W	L82
54 55 59 87 53 53 53 59	GTURAGE 223 BREAK 222 STAIR CG8 WORK ROOM 228 WORK ROOM 228		VITTI DUANISO VITTI DUANISO VITI DUANISO VIT	350 W 64 W 240 W 38 W	L82 L82 L84
54 55 59 57 53 59 40 41	6TDRAGE 223 BREAK 222 STAIR 608 WORK ROOM 228 WORK N21 MEN 222 PASSAGE WAY		ATTER DAMAGES ATTER	350 W 84 W 246 W 98 W 98 W	L82 L82 L84 L84 L84
53 53 53 53 53 53 53 54	BTDRAGE 223 BREAK 222 STAIR GGB WORK ROOM 228 WOREN 221 MEN 222		VITTI DUANISO VITTI DUANISO VITI DUANISO VIT	350 W 84 W 240 W 98 W	L812 L812 L814 L814

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.

n 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 geocoordinates 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, easyto-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

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