

Adura Wireless Lighting Controls Bring Energy Savings Class A Office Tower in Downtown San Francisco

When the owners of 221 Main wanted to sell the building they knew that their ongoing investment in smart lighting controls and the related energy savings would be a great selling point.

221 Main is a multi-tenant seventeen-floor class-A office tower. Each floor covers approximately 23,700 square feet. Adura Technologies' wireless lighting controls have been installed in five suites in the building, covering a total of 43,300 square feet. As the building spec, Adura is proposed in the tenant improvement packages of new leases.

CHALLENGE

The 221 Main management team wanted more granular control of the building's lighting. Previously, the building used wired occupancy sensors and had overly large sweeps. This meant that most of the building was controlled by one circuit so if there was one person in the building after the scheduled sweep, lights in most of the building would go back on.

SOLUTION

Adura system currently controls approximately 400 light fixtures on several floors. Because the Adura system offers flexible groupings of sensors and fixtures, only 84 sensors will be needed to wirelessly control all 400 fixtures. The control strategies used in the office suites at 221 Main are occupancy detection, daylight harvesting, demand response and Task Tuning. The Adura system is currently in use in office suites for Pankow Construction, Zenith Administrators, MG Design, Triage Consulting and Hair Club for Men.

Occupancy Detection: The Adura system responds to the real-time use of the building's office space. When a person walks through the office suite's front door, sensors respond by not only lighting up the occupied area, but the area ahead of the occupant as well. This is called predictive lighting. Adura's networked approach represents a considerable difference when compared to the building's previous method of inefficient occupancy sensors – the minimum requirement under California's Title 24 requirements. Considerable energy savings above the previous occupancy detection strategy are made possible by the intelligent Adura system.

Occupancy zones are defined down to the fixture level and aggregated into flexible groupings, responding with intelligence to real-time movement within office suites.

Occupancy sensor timeouts are remotely programmable and easy to adjust by the facility managers as required.



ABOUT 221 MAIN

LOCATION

- San Francisco, CA

PROJECT SPACE

- 43,300 ft²

ENERGY SAVINGS

- Reduction of 58% average across suites

CONTROL STRATEGIES

- Occupancy Detection
- Daylight Harvesting
- Demand Response
- Task Tuning

COMPLETION DATE

- Fall 2010 and ongoing

MANAGEMENT COMPANY

- Thorhill Properties

Daylight Harvesting: This is significant in some suites based on the interior design principles applied. The building's architect, NicholsBooth Architects, designed the facility to take advantage of outside and reflective lighting, using interior glass walls, low partitions for cubicles and neutral hues for walls and furniture surfaces. Further, the occupancy sensors and photocells work synergistically. If an occupancy sensor signals the space is occupied, but the photocell detects adequate daylight, the light will not turn on. Likewise, if a photocell detects inadequate daylight and signals the light to turn on, but the sensor indicates the space is not occupied, the light will remain off.

Demand Response: The Adura system enables both manual and automatic load shedding in response to utility requests. While the new building management have not yet decided to automate their demand response with local electric utility PG&E, Adura's Automated Demand Response (ADR) capability was one of the factors that made the system a selling point in the building's buyers package.

Should the building engineers choose to participate in PG&E's ADR program, it is an easy matter to enable the system to do so. Once the automated program is enabled and a request is received, the lighting is reduced according to predetermined scenarios. This would allow building management to take advantage of attractive smart grid incentives, further increasing the total system energy and financial savings.

Even without ADR activated, the office suites in 221 Main are realizing energy and monetary savings on the Adura system. The Pankow and Triage offices have already obtained energy efficiency rebates through the San Francisco Department of the Environment's Energy Watch program. These suites have reduced their lighting-related energy use by 71 and 41 percent, respectively.

Top Trimming: Eighty is the new 100. Lights in the suites with the Adura system are now set at 80 percent of maximum. This level can be adjusted over the life of the lamp to ensure proper light output, but it prevents over lighting at the start of the lamp's life, thus increasing occupant comfort.

Continuous Operational Analysis and Improvement: The Adura system collects sensor data and energy use and logs it into a powerful database. The new building management team is able to use the system's analysis and reporting tools to review use patterns in each office suite, and can adjust control strategies for maximum efficiency and effectiveness.

Preventative Maintenance & Enhanced Safety: The Adura solution streamlines lighting maintenance and reduces security risks by notifying the management team in real time of lamp or ballast failure.

RESULTS

The Adura Wireless Lighting Control System has directly led to the Pankow office suite at 221 Main earning three LEED points towards a LEED Gold certification (certification is currently in progress), with occupancy sensors accounting for one point and daylight harvesting earning two points. The system has contributed to other parts of the LEED certification as well. In addition to its LEED contributions and upgrades to office occupant's comfort and safety, the system has led to an average energy savings of approximately 58 percent across the current suites.

	MONTHLY ENERGY USE (KWH)		SAVINGS	
	Before	After	kWh	%
Triage Consulting	1430	847.5	582.5	41
Pankow Construction	1454.8	421.7	1033.1	71
Zenith Administrators	1621.9	856.9	765.0	47
MG Design	505.4	138.9	366.5	73

Table 1. Savings Summary