



LUMEWAVE

By  ECHELON®

Smart Networked Lighting for Cities and Enterprises

Flexible, scalable, complete solutions
for now and the future.

CREATING INTELLIGENT ENVIRONMENTS THROUGH ADVANCED LIGHTING CONTROLS

Intelligent Networked Lighting Control

Echelon's solutions for lighting create a responsive and ubiquitous infrastructure both indoors and out. *Lumewave by Echelon™* solutions help residents, occupants, and enterprises meet their need for adaptive lighting, predictive maintenance, and valuable data analytics that improve comfort, safety, and productivity. Our *Lumewave by Echelon* platform enables customers to satisfy immediate energy-saving and regulatory needs with an architecture that can expand to provide additional operational and strategic value in the future.

Echelon offers an expandable, flexible, open standards-based approach to lighting controls that makes it easy and affordable for lighting owners to increase the efficiency, safety, and versatility of their municipal and commercial lighting systems.

STRATEGIC VALUE

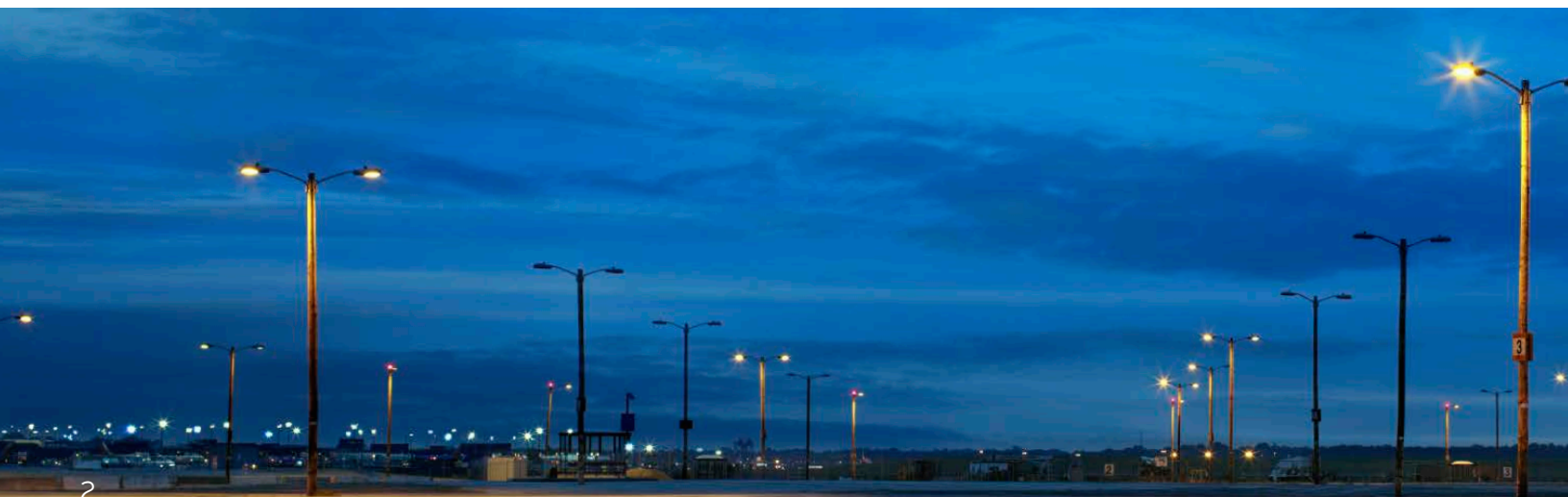
Customers achieve productivity gains, business level benefits, and enable future expansion of technology to further improve city or enterprise needs.

OPERATIONAL ENHANCEMENT

Customers capture additional benefits in operational efficiencies with lower maintenance costs, predictive maintenance practices, and revenue grade energy monitoring.

ENERGY SAVINGS

Customers save energy and comply with regulations by pairing LEDs with intelligent lighting controls that can produce an additional 35% in energy savings on top of savings gained from transitioning to LEDs.



Benefits of Intelligent Lighting Controls

- Boosts energy savings of lighting systems through adaptive lighting control
- Lowers ongoing maintenance and operating costs through remote identification of lamp failures, preventive maintenance, and extending the life of LED lamps
- Provides revenue grade energy metering for precisely quantifying savings
- Improves public safety and satisfaction with better overall lighting quality
- Preserves historical and decorative lights while modernizing their control
- Enhances merchandising of show lots
- Deters theft and vandalism
- Provides future-proof technology platform for smart city and IoT applications

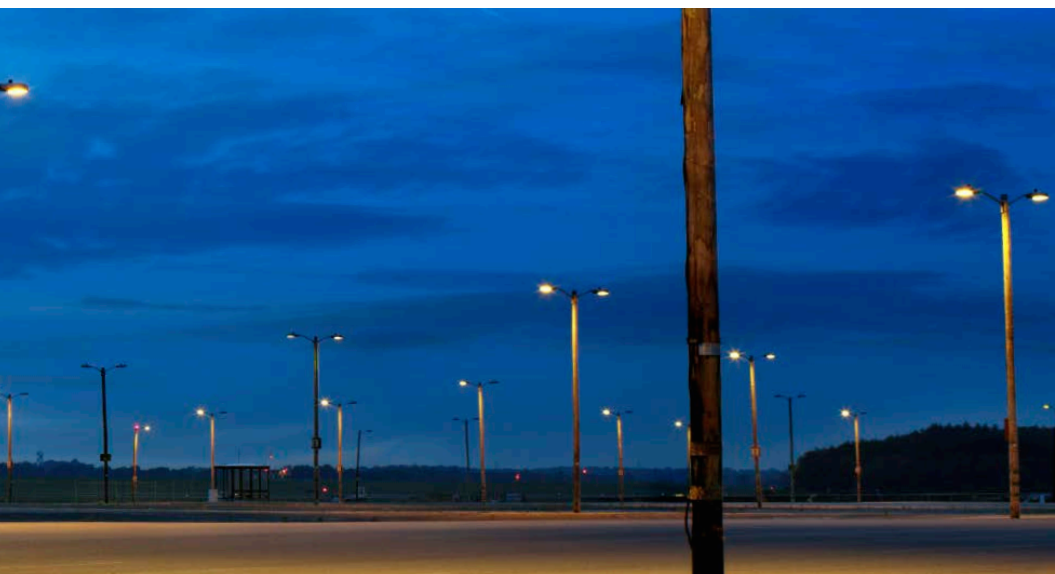


City of Bellingham, Washington

- 3,600 streetlight conversion with Lumewave by Echelon's intelligent hybrid lighting control system
- Annual energy savings of \$240,000
- Included decorative and conventional fixtures using wired and wireless connectivity

"...[Lumewave by] Echelon controls allow us to monitor energy consumption, adaptively dim the lights for increased energy savings, and automatically be alerted of lights that are out of service or are using excess power due to failing components, etc. ...who knows what else might develop in years to come in the industry and Bellingham will be already set up with the infrastructure to implement."

Clark Alan Williams,
Superintendent of Traffic/
Communications/Fleet and
Facilities, City of Bellingham





Kimco Realty Corporation

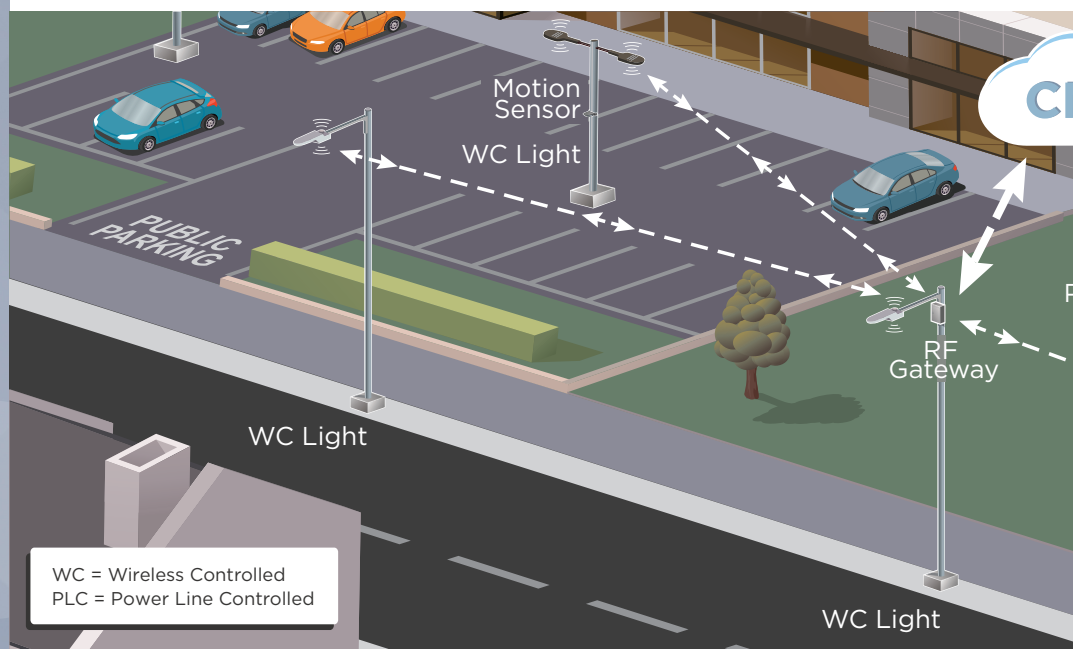
- Wireless control of shopping center parking lots
- Automated fault detection notifications reduce maintenance costs
- Motion-based responsiveness enhances safety and security

"We are very proud to be recognized by the LEEP Campaign [as] an example of how lighting control systems will continue to be stretched beyond traditional uses to increase value and services for property owners, managers and occupants."

Nate Mitten, Senior Manager of Property Standards and Improvements for Kimco Realty

Lumewave by Echelon Solution at a Glance

- Industry exclusive hybrid solution integrating wired and wireless connectivity for connecting just about anything in the city or enterprise
- Compliant with energy code requirements for exterior lighting including ASHRAE 90.1-2010 and CA Title 24-2013
- Scalable architecture for large installations with multi-site support
- Compatible across all commercially available fixture types
- Maximum range and robust data communication between nodes and gateways
- Native support for light and motion sensors for responsive, event-based control strategies
- Easy to navigate central management system (CMS) for single system view and administrative flexibility
- Easy to install, provision, and manage



SOLUTIONS

SYSTEM	FEATURES	APPLICATIONS
Wired (power line)	<ul style="list-style-type: none"> No new wiring Adds modulated control communication signal to existing AC power wiring Highly secure and reliable performance 	<ul style="list-style-type: none"> Challenging environments such as subway tunnels and bridges Underground parking Historic districts, city centers, or other locations with decorative fixtures
Wireless (radio frequency)	<ul style="list-style-type: none"> Easy installation NEMA twist lock Uses secure, bi-directional RF communication between fixture-based controllers and system gateways 	<ul style="list-style-type: none"> Large scale deployments such as parking lots, malls, and universities Street and roadway lighting
Hybrid (wired/wireless)	<ul style="list-style-type: none"> Combines both intelligent technology platforms (power line and RF networks) 	<ul style="list-style-type: none"> City-wide deployments (frequently includes conventional street lighting and decorative lighting)

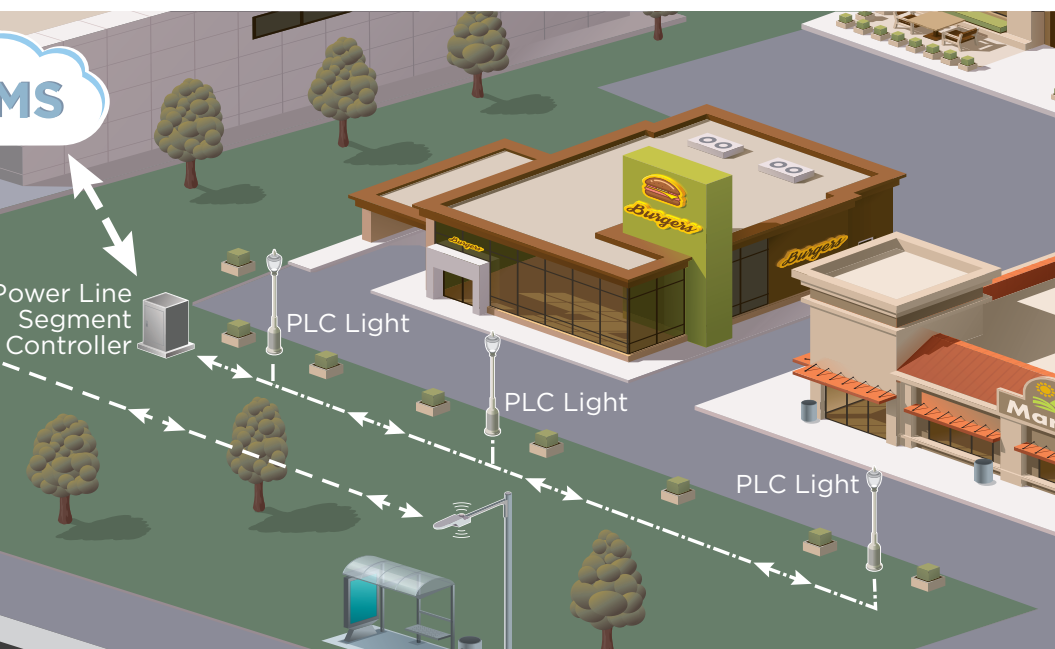


City of Bydgoszcz, Poland

- 7,200 streetlights
- Wired (power line) network control
- 40% energy-related cost savings

“The Bydgoszcz lighting project is a significant city improvement installation for Eastern Europe. It will vividly demonstrate how LED lighting, in conjunction with the right lighting control technology, can create more efficient, safe and eco-friendly street lighting at the citywide level.”

Andrzej Lis, CEO, APANET Green System, member of project team



Lighting Controllers	Description
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TOP900TLX

- Wireless outdoor lighting controller
- Twist lock NEMA ANSI 136.41, 7-pin connectors
- Available with integrated GPS option, 120-277V or 347-480V input, and revenue grade energy metering
- Provides bi-directional communication with gateway, sensor support, and distributed intelligence capability



TOP900TN

- Wireless outdoor lighting controller
- Threaded nipple connection
- Available with integrated GPS option, 120-277V or 347-480V input, and revenue grade energy metering
- Solution for fixtures without NEMA receptacles



EMB900

- Wireless indoor lighting module
- Embedded or external RF antenna options
- Available in horizontal or vertical mounting configurations, or embedded with an external antenna
- Mounts directly to an indoor lighting fixture, providing remote monitoring and control



EMB901

- Fixture integrated wireless control module
- Cost-effective integration to drivers with DC output
- Provides dimming, scheduling, adaptive control, and wireless connectivity features



CPD 3000

- Power line outdoor lighting controller
- Provides ISO/IEC 14908-1 and -3 compliant, two-way communication between lamps and segment controllers
- Provides operational and energy data to segment controller and supports reliable power line meshing

Sensors	Description
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MWX-LVE-180U

- Outdoor bi-directional microwave/radar sensor
- Available in vertical or 90-degree angle mounting configurations
- Can detect approaching vehicles at >400 feet and pedestrians at 100 feet



EW-205-LU

- Outdoor passive infrared (PIR) motion sensor
- Connects to TOP900TLX, TOP900TN, and EMB900 controllers
- Up to 50 feet of coverage at a mounting height of 8 feet



FS-305-LU

- Outdoor and indoor wireless passive infrared (PIR) motion sensor
- Four available lens choices (sold separately) provide flexibility for varying mounting heights
- Connects to TOP900TLX and EMB900 series lighting controllers
- Circular compact design for fixture mounted applications

Gateways	Description
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Lumewave Gateway

- Gateway for wireless lighting controllers
- Ethernet link for LAN connection or cellular link via built-in 3G modem for compatibility with any wireless carrier service
- Works in extended temperature range conditions without service interruptions



Lumewave Base Station

- Base station for the Lumewave Gateway
- Ethernet link for LAN connection or cellular link via built-in 3G modem for compatibility with any wireless carrier service
- Doubles the performance and range of the Lumewave Gateway



Lumewave Power Line RF Gateway

- Gateway for power line and wireless lighting systems
- Available with or without enclosure
- Enables management of power line and wireless networks through a single central management system (LumInsight™ Desktop)

Routers and Controllers	Description
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CRD 3000

- Power line and wireless outdoor control router
- Mounts on existing ANSI standard twist lock photocell sockets of streetlight fixtures
- Connects separate power line segments together via an RF wireless bridge



SmartServer

- Segment controller, router, and smart energy manager for power line lighting controllers
- Provides smart network management, scheduling, alarming, and repeating services
- Manages up to 300 devices as a standalone network manager

Central Management System (CMS) Software	Description
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LumInsight Desktop (formerly LumeStar)

- Central management system for wireless and hybrid lighting systems
- Provides commissioning and enterprise level lighting control functions
- Simple, easy to navigate interface with mapping, asset management, and alarm notification functions



LumInsight Cloud CMS

- Cloud-based central management system for power line lighting networks
- Provides a secure, cloud hosted environment for managing lighting networks without any upfront investment or setup
- Highly scalable platform for multi-site management to track, measure, and control lighting assets



LumInsight Enterprise CMS

- Browser-based on-premise central management system for power line lighting networks
- Provides on-premise installed access to lighting network from desktop, laptop, or mobile device
- Optimized data communication for reliable and encrypted deployment

Echelon Corporation, a pioneer in developing open-standard control networking platforms, delivers elements necessary to design, install, monitor, and control industrial strength communities of devices within the lighting, building automation, Internet of Things (IoT), and related markets worldwide. Echelon sells its lighting products under the *Lumewave by Echelon* brand and its IIoT-related products as part of its IzoT™ platform. With more than 100 million Echelon-powered devices installed worldwide, Echelon helps its customers easily and effectively migrate existing control systems to the most modern platforms, while bringing new devices and applications into an ever-growing global Industrial Internet. Echelon helps its customers innovate, achieve short- and long-term goals, reduce operational costs, enhance satisfaction and safety, grow revenue, and provide better solutions in both established and emerging markets.

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