Powerlink
Lighting Control Solutions

Make the most of your energy℠

Schneider Electric

Exceed energy reduction goals. Monitor and verify energy savings.

Unrivaled energy savings, measurement and verification, convenience, and control all from a single compact solution.

Reduce energy cost and consumption

Lighting is one of the largest culprits of energy waste in buildings. And it takes more than just energy efficient lighting to significantly reduce your energy costs. Powerlink™ lighting control systems reduce energy costs as much as 30 percent by automatically turning off lighting during unoccupied periods. Retrofit is also easy with Powerlink lighting control systems, with payback periods often less than two years. Compared with other energy savings technologies, a Powerlink control system can provide both a lower initial capital outlay and greater energy savings.

Powerlink lighting control systems can also deliver savings by serving as a key component of a building's demand response system, which saves money by reducing lighting levels during peak demand periods.

No additional installation cost

Powerlink lighting control systems are housed in a standard lighting panelboard. There are no extra boxes to mount, relays to wire, or complex panel schedules to decipher. Each Powerlink panel comes from the factory fully-assembled and tested. Installing a Powerlink lighting panel takes no more time than mounting a standard lighting panelboard.

Design operation and maintenance simplicity

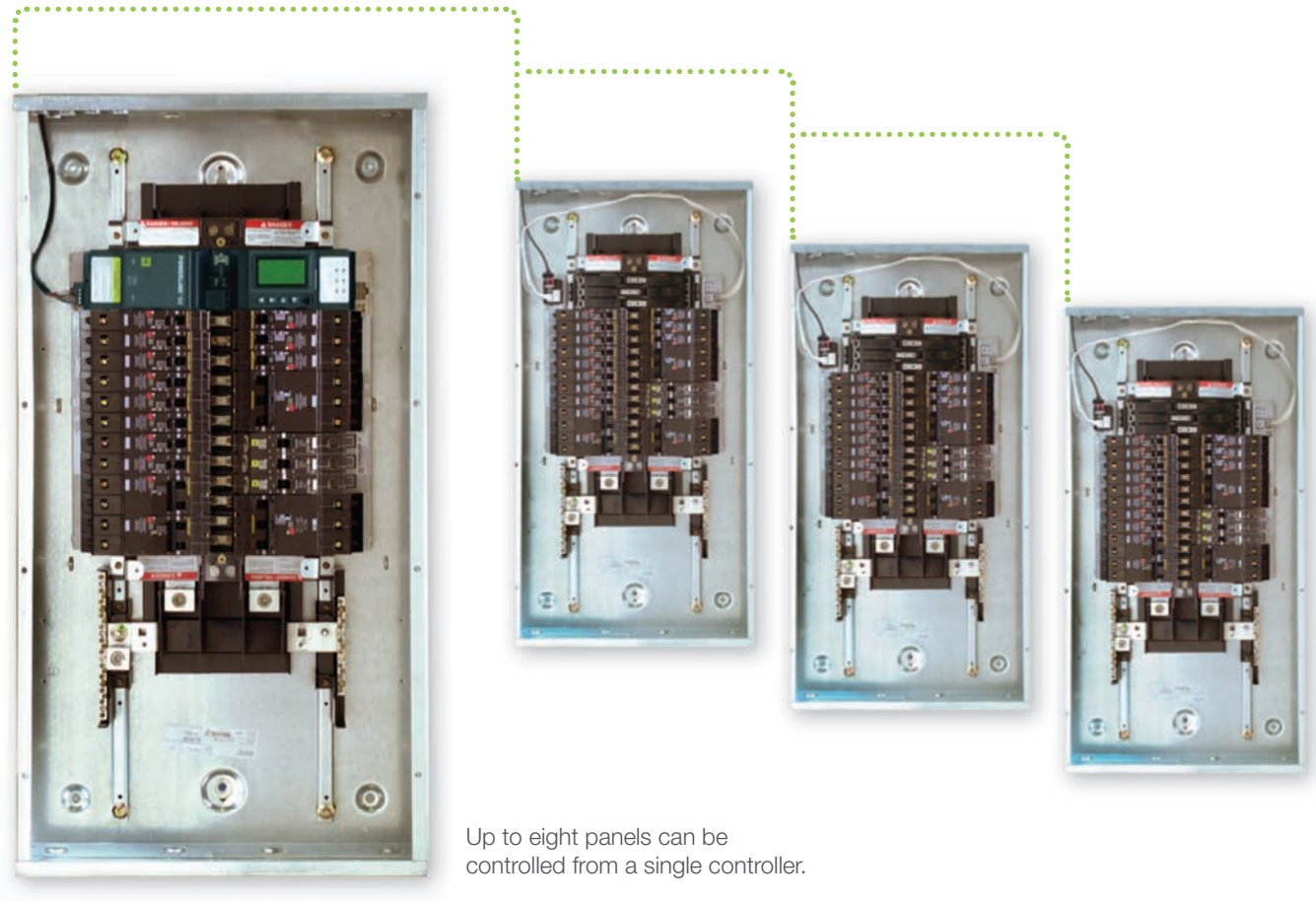
Powerlink lighting control systems simplify a designer's life by eliminating the need to create special lighting schedules or to negotiate with the architect over limited space constraints. Powerlink lighting control systems also reduce installation time over other technologies by eliminating extra cabinets and wiring. Facility and maintenance personnel will also enjoy the ability to quickly change schedules and operation from a central workstation.

Design compliance

Powerlink lighting systems are fully compliant to meet today's building and energy code standards.

- NEMA® Compliance: Applicable portions of NEMA standards pertaining to types of electrical equipment and enclosures.
- NEC Compliance: Applicable portions of the NEC; including Articles 110–10.
- UL™ Compliance: Applicable UL standards for panelboards, circuit breakers, and energy management equipment.
- FCC Emissions: Compliance with FCC emissions standards specified in Part 15, Subpart J for Class A applications.
- ESD Immunity: IEC 1000, Level 4.
- RF Susceptibility: IEC 1000, Level 3.
- Electrical Fast Transient Susceptibility: IEC 1000, Level 3.
- Electrical Surge Susceptibility: Power line, IEC 1000, Level 4.
- Electrical Surge Susceptibility: Interconnection lines, IEC 1000, Level 3.
- California Title 24: Certified by the California Energy Commission.
- Seismic compliance: NFPA 5000, ASCE7, ICC ES AC156.

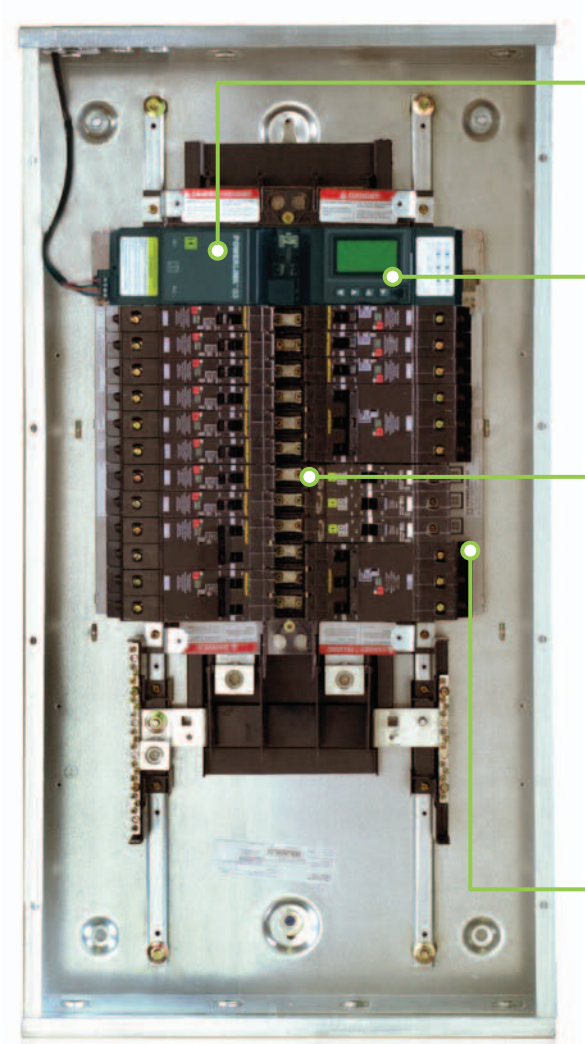
Powerlink intelligent lighting control systems



Up to eight panels can be controlled from a single controller.

Refer to diagram on pages 12–13 to view total system connectivity

- Eliminate unnecessary energy consumption by switching lights off during unoccupied periods
- Reduce demand by shedding lights during peak demand periods
- Improve productivity by controlling and monitoring panels from remote locations
- Reduce potential lost time and liability by receiving instant alerts to important occurrences with remote email alarming
- Gain important insights into lighting system performance with integral metering provided by the MVP panel (page 8)
- Offer reliable over-current protection
- Have so many benefits, all in the footprint of a standard lighting panelboard enclosure



A self-contained power supply furnishes power for remote circuit breaker switching and the system's electronics.

The intelligence of the Powerlink lighting control system comes from its micro-processor-based controller. It processes signals that originate externally from control devices, such as switches or sensors, or from its powerful internal time scheduler that switches breakers according to predefined daily schedules.

Innovative Square D™ brand remotely-operated circuit breakers combine the protective features of conventional circuit breakers with the switching functions of a contactor. This eliminates the need for separate relays or contactors and the associated enclosures and wiring. With series connected ratings up to 200,000 RMS A, Powerlink circuit breakers are designed to handle today's and tomorrow's high short circuit current requirements. They're proven to perform for 200,000 On/Off/On load operations, which far surpasses industry requirements. The circuit breakers are rated for HACR, HID, and SWD loads. Single-, two-, and three-pole versions are available in ratings up to 30 A.

Plug-in control bus strips serve as the bridge between the circuit breakers and the electronic control components of a Powerlink lighting control system. There's no complicated, bulky control wiring or connectors to worry about. The bus strips easily attach to the panelboard interior without any special fasteners or modifications.

A control system to meet every need

500 Level System

Basic control for low-voltage switching applications

Ideal for use in facilities where time-of-day control is being managed from a time clock or centralized building management system.

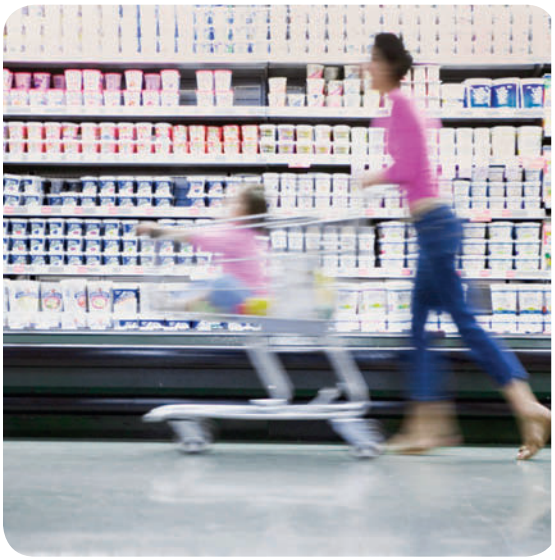
- Soft mapping for grouping branch circuits into zones that can be operated as a common group
- Up to 64 independent zones can be configured for a single controller with software
- Eight input terminations for connecting local control devices like space controls, occupancy sensors, security systems, and other devices
- Timed overrides for automatic shutoff
- Blink notification to alert occupants of an impending “lights out” command
- Configurable with LCS basic and advanced software
- Serial communications using industry recognized Modbus® protocol

1000 Level System

Time-of-day control for meeting today’s energy code requirements

Stand-alone solution for small commercial buildings.

- Seven-day repeating electronic clock, temperature compensated to minimize clock drift. Includes automatic daylight savings setbacks, leap year correction, 32 special holiday periods, and automatic computation of sunrise/sunset times
- 16 independently configurable time schedules, each having 24 separate On/Off periods
- 16 input terminations for connecting local control devices to operate individual lighting zones
- On-board event log
- Breaker run-time counters for tracking burn-time on lighting fixtures
- Configurable with LCS basic and advanced software
- Supports serial communications using Modbus ASCII/RTU, DMX512, and JCI-N2 protocols



2000 Level System

Fast Ethernet-based control for managing a large lighting system

Recommended for larger commercial and industrial buildings with multiple spaces that share schedules and operational needs.

- 10BaseT port for peer-to-peer Ethernet communications using Modbus TCP™ protocol
- Global inputs for sharing external control status, schedule status, and zone status with other controllers
- Full boolean logic capability for creating virtually any control need
- Network time synchronization service to eliminate clock drift
- Custom alarms generator notifies operators of non-operational condition
- Supports native BACnet™ (IP), BACnet (MS/TP)
- Configurable with LCS basic and advanced software
- Supports serial communications using Modbus ASCII/RTU and DMX512

3000 Level System

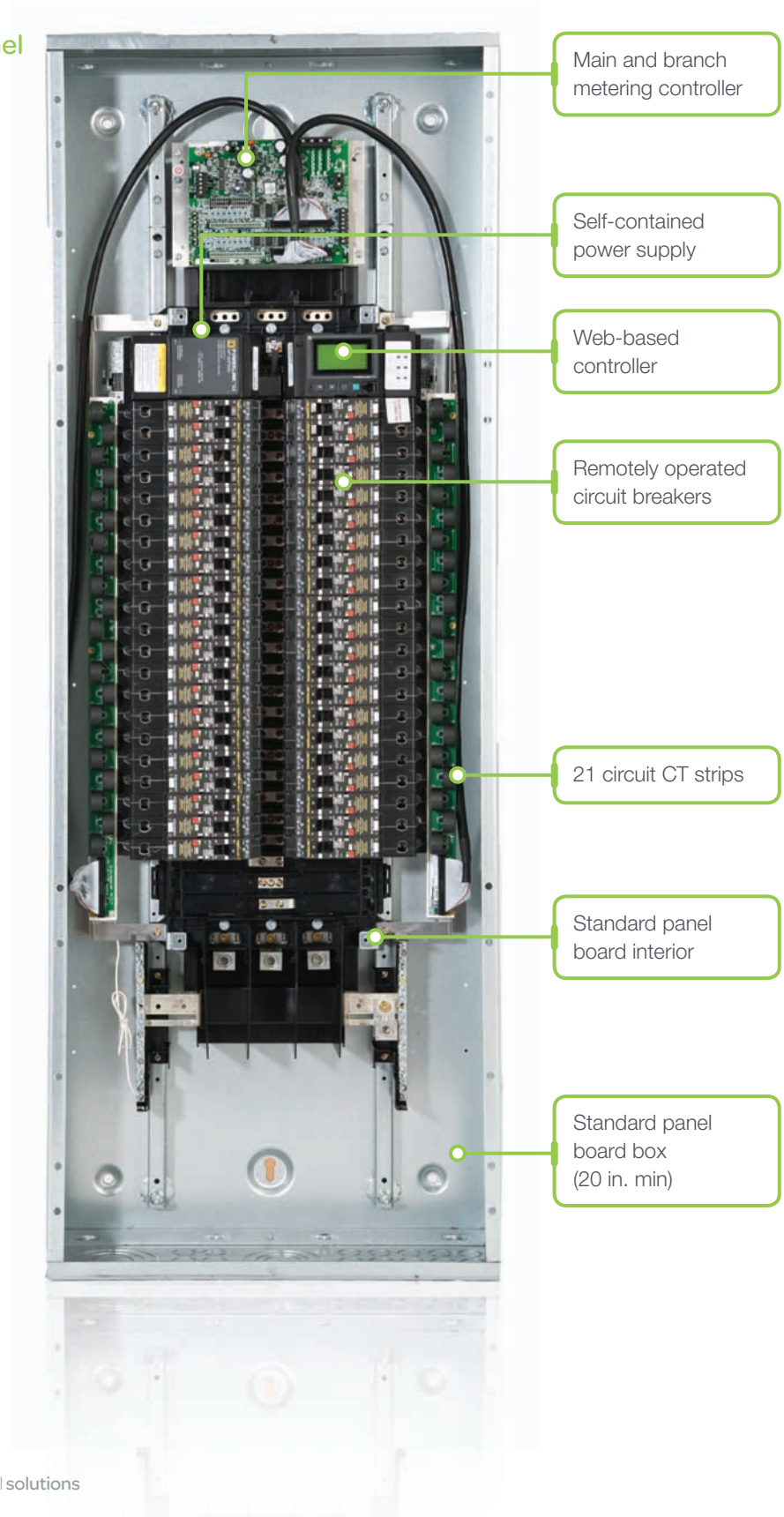
Web-enabled control for controlling and managing the cost of the lighting system

The 3000 level system forms the foundation for a completely web-enabled lighting control system. From the convenience of a standard web browser, users can easily access information about the lighting control system, initiate overrides, or make a schedule change.

- Integral web server provides ready access to panel status and configuration screens via a standard web browser
- Email alarm notification service to notify assigned users of an alarm condition via email or smart phone
- Extends functionality of Powerlink lighting control systems to communicate with C-Bus™ devices
- Supports native BACnet (IP), BACnet (MS/TP)
- Configurable with LCS basic and advanced software
- Supports serial communications using Modbus ASCII/RTU and DMX512

Powerlink MVP (Measurement and Verification) Lighting Control Panel

Powerlink MVP Panel



Monitor and verify your energy performance

You expect an energy management system to perform. With Powerlink MVP, that performance goes to a totally new level. These panels not only provide savings by controlling lights, but also provide a total infrastructure for measuring and verifying the performance of all your lighting and plug load energy conservation measures.

The Powerlink MVP lighting control system incorporates the same great features found in the Powerlink G3 3000 level system, in addition to integral branch circuit and main metering. Integral metering is accomplished using the PowerLogic™ branch circuit power meter (BCPM), which is a highly accurate, full-featured, multi-branch circuit power meter that provides unrivalled low-current monitoring.

- **Monitor** by circuit, zone, space, or complete lighting system
- **Review** data through existing building management software, or specialized MVP software to isolate areas of energy waste and improve efficiency
- **Implement** energy saving methods to reduce energy costs
- **Achieve** greater savings month-over-month and year-over-year, while accomplishing your energy management goals

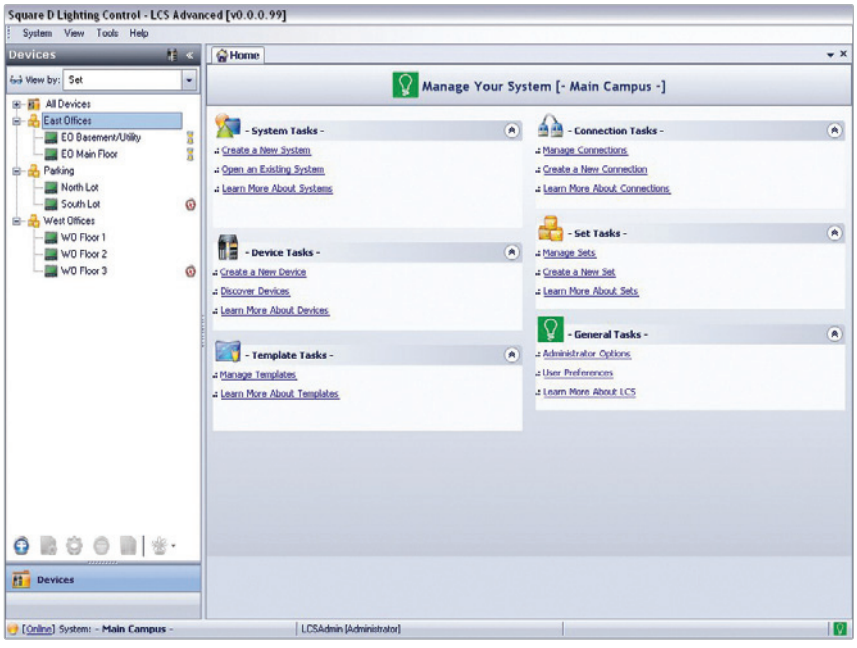
Remote monitoring and control at your fingertips

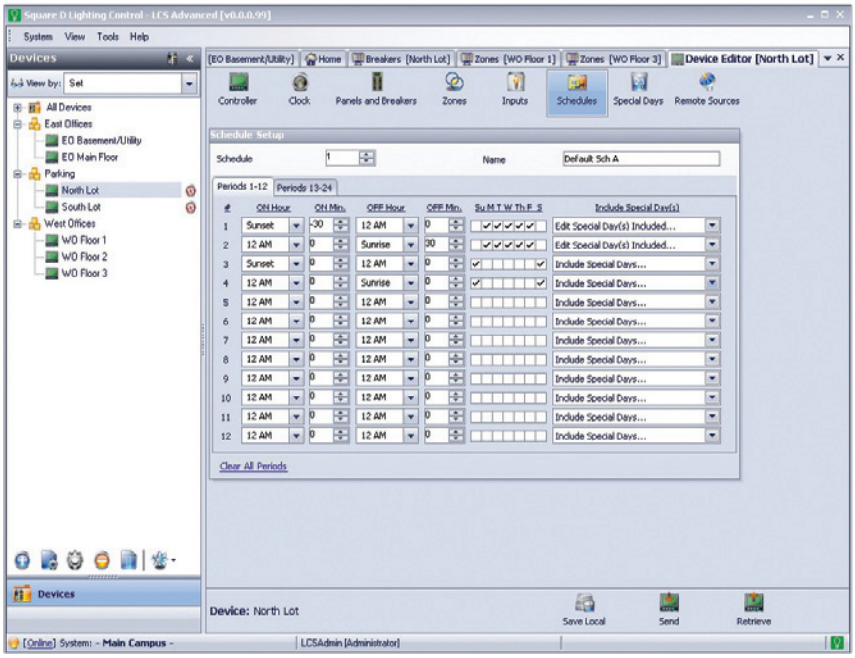
Connectivity is the key to managing a lighting system. With Powerlink, critical information about your lighting system is always available at your fingertips. With the click of a mouse, users can quickly observe breaker status, system operation, or make configuration changes.

Unlock the potential of the Powerlink lighting control system with LCS basic and advanced software from Schneider Electric™. Schedule events, override lighting, and check the status of a breaker with the click of a button. Easy-to-navigate software gives a whole new meaning to lighting control.

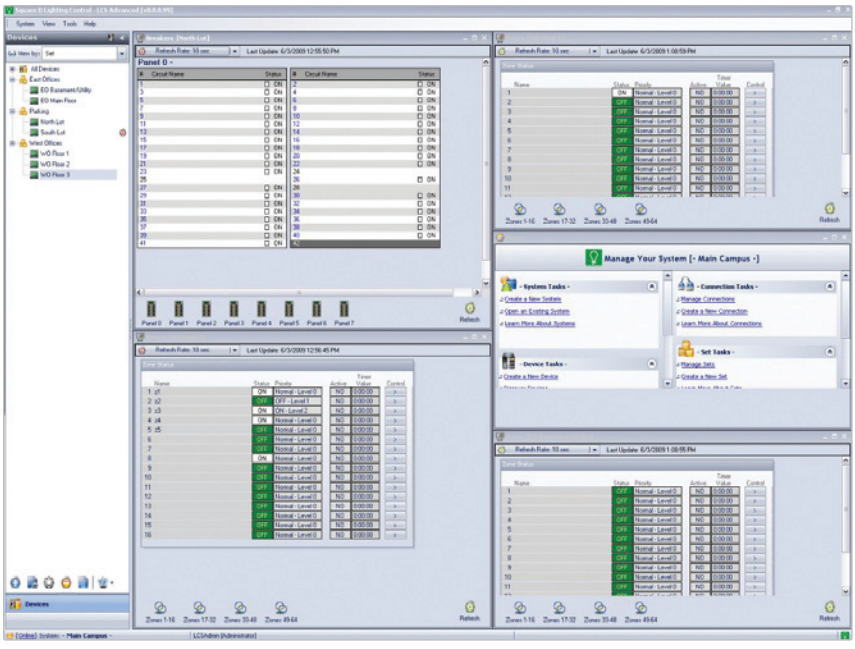
- Create schedules that easily apply to all controllers within a system rather than programming each controller individually
- Quickly view branch circuit status (on, off, tripped, or non-responding)
- Examine system event logs, make configuration modifications, create or modify schedules, initiate overrides, and upgrade firmware

LCS software offers users a convenient and easy-to-use interface for the Powerlink lighting control system.





The LCS schedule configurator feature makes daily schedules and commands fast, simple, and intuitive.



See multiple controllers' live status on the same screen.

Total system connectivity

C-Bus network lighting control, Powerlink intelligent panelboards, and occupancy sensors from Schneider Electric create one of the most comprehensive energy-saving offers in the industry. They combine automated and web-enabled control with advanced space controls, such as touchscreens, motion-based controls, daylighting, energy management dimming, and smart grid connectivity.

Device router

Wiser™ IP controller

Typical cat-5 cable

PC Web browser

Ethernet

Input units

C-Bus remote controls

Neo™ keypads

Saturn™ keypads

DLT™ keypads

Output units

Multi-Channel relays

Network units

Power supply

PC interface

Powerlink lighting control panelboard

Schneider Electric occupancy sensors

Occupancy sensors from Schneider Electric are the perfect solution for applications needing simple occupancy-based controls. Low-voltage ceiling- and wall-mounted occupancy sensors can be tied into the C-Bus network using simple dry contact inputs.


Wall switch


Ceiling mount


Wall mount


Fixture mount

C-Bus network


Touch screens


Sensor
(PIR/IR/Light levels)

Bus coupler
(dry contact connections)


Auxiliary input unit


General input unit


Phase angle dimmer


Professional
series dimmer


0-10 V
dimming unit


Changeover relay unit


Network bridge


Ethernet gateway


DALI gateway


DMX gateway


Pascal automation
controller


Telephone
interface unit

Quality products backed by over 100 years of experience

Schneider Electric delivers results.

Case studies

Cabela's® : Streamline the design and build process and assure sustainable energy savings

Cabela's, the Sidney, Nebraska-based purveyor of outdoor clothing and gear for hunting, camping, and fishing, had been using a variety of lighting control technologies from multiple suppliers prior to 2006. Cabela's recongized an opportunity to accrue greater energy and cost savings through uniform equipment and building product standards, including lighting control for all new locations. Cabela's did have extensive building automation systems and equipment in place, including lighting control. However, there was little system and brand consistency for new store construction. In 2006, the standard for all new Cabela's stores became the Powerlink 2000 Level intelligent lighting control system, commercial grade occupancy sensors, and PowerLogic power meters, all from Schneider Electric.

Application

To streamline the design and construction processes and improve both energy management and energy efficiency, a plan was put in place to develop uniform standards for temperature and lighting control, and electrical and mechanical equipment.

Objectives

- Streamline design and construction processes across all stores
- Accrue greater energy efficiency and cost savings
- Balance need for adequate lighting with energy efficiency
- Reasonable return on investment
- Easy functionality for employees
- Specialized lighting scenes for designated areas within the building
- Monitor energy usage to begin load-shed programming

Solution

- Powerlink 2000 level intelligent lighting control panelboards
- Commercial-grade occupancy sensors
- PowerLogic power meters

Benefits

- New stores found to be 21% more energy efficient than existing stores
- Major contributor to $1 million savings in energy costs
- Metering installed to provide constant flow of information to prompt more astute energy-related decision making
- Convenience of interconnecting with building automation system eliminates need for multiple systems

Case studies (cont.)

Energy savings: Albany International

With manufacturing plants in 14 countries, Albany International manufactures paper machine clothing, a key component used in the production of paper products. Its Menasha, Wisconsin facility, for example, makes forming fabrics for the paper industry. Menasha facility management implemented an entire lighting retrofit project and called on Schneider Electric to provide a solution to manage lighting requirements in its unique production environment. That solution was Schneider Electric Powerlink lighting control systems, which provided the appropriate type of lighting control based on the different work areas in the facility, including specific areas on the manufacturing floor, along with the office area.

Application

By implementing the Powerlink 3000 level lighting system as part of a lighting retrofit, the company is able to manage the lighting schedules required in each work zone on the manufacturing floor. Extensive lighting controls were retrofitted throughout the facility including manufacturing areas, office, and parking lots.

Objectives

- Implement a lighting control system that maximizes cost savings
- Make the new lighting strategy easily transferable to other company facilities

Solution

Implemented a lighting controls retrofit programing using both Powerlink and C-Bus lighting control systems combined. Lighting circuits were isolated from other electrical loads to provide utmost flexibility in scheduling and control.

Benefits

- Enhanced cost savings by up to 33%
- Improved operating margins resulting from reduction in energy use and lamp maintenance
- Increased worker productivity resulting from accessible and easy-to-use operator interfaces
- Energy cost reductions of $65,000 in the first year

Remote monitoring: Thomas & Mack Center – UNLV

The Thomas & Mack Center is a state-of-the-art sports and entertainment facility located on the campus of the University of Nevada Las Vegas (UNLV). Home to the UNLV Runnin' Rebels, the Thomas & Mack Center also hosts numerous other events, such as championship boxing matches, professional wrestling, music concerts, and a busy schedule of conferences and exhibitions. With the help of a Schneider Electric Powerlink G3 3000 Level whole-building, schedule-based lighting control system, this venue has significantly reduced energy costs and gained complete control over all its lighting, while maintaining its impressive status as a world-class venue.

Application

Lighting control wasn't initially a concern of electrical supervisors at the Thomas & Mack Center until the facility went dark after a power outage during a nationally televised basketball game.

The incident was enough to spur the installation of a more reliable, whole-building lighting control system. Space constraints and operational needs necessitated a fresh approach to how the facility's lighting system would be controlled. After extensive review, a Schneider Electric Powerlink 3000-Level lighting control system was chosen.

Objectives

- Minimize likelihood of future control problems
- Quickly and remotely locate power outages and issues
- Control and reduce energy-related costs
- Increase power control and monitoring capabilities

Solution

Schneider Electric Powerlink 3000-Level lighting control system

Benefits

- Power conservation through scheduled off-peak events
- Web-enabled monitoring and control to facilitate remote access
- Quick identification of power outages and issues
- First-year cost savings of $200,000
- Monitor current energy bills for accuracy of energy usage and rates

Case studies (cont.)

Flexible and simple: Civic Center of Greater Des Moines

The Civic Center of Greater Des Moines, Iowa, is recognized as the cornerstone of a 1979 downtown revitalization effort that transformed the city's business district, an area which continues to evolve today. In 2007, the theater portion underwent the first phase of its own revitalization — an upgrade that included the addition of automated lighting control throughout its lobbies, ticket offices, and other common areas. Prior to the upgrade, lights throughout the Civic Center were activated prior to performances by manually operating a sequence of circuit breakers. This was not only time consuming for staff and fraught with opportunities for mistakes, but, as Civic Center management also learned, potentially dangerous. Additionally, due to the age of the original panelboards, finding replacement parts in the event of an equipment malfunction created major reliability concerns.

Application

The legacy lighting panelboards were replaced with a Schneider Electric Powerlink lighting control system and C-Bus keypad controllers.

While the interior lights are controlled through programmed keypads, the exterior lights operate based on an automated schedule. The astronomical clock built into the Schneider Electric Powerlink system ensures that the on and off times are adjusted to accommodate changing sunrise and sunset times, along with daylight-savings time, maximizing energy efficiency throughout the year.

Objectives

- Reduce energy costs associated with lighting loads
- Facilitate easy-to-use and virtually transparent lighting control for employees
- Develop specialized lighting scenes for designated areas within the building

Solution

- Schneider Electric Powerlink lighting control system
- Schneider Electric C-Bus keypad controllers equipped with Dynamic Labeling Technology™

Benefits

- Ease of use for entire staff
- Lighting scenes contoured to time of day and type of event or work task

Total life-cycle support

Reliable Powerlink lighting control systems deserve reliable support to match. With Schneider Electric lighting controls, you can always count on our Schneider Electric field sales engineers and factory-trained experts for help when you need it — before, during, or after installation. Whether that means local support, troubleshooting, or on-site commissioning.

- Energy audits and design assistance
- Start-up and commissioning
- Technical support
- Training

Choose Schneider Electric expertise

Whether in buildings, factories, or mission-critical infrastructures, Schneider Electric commits to reducing energy costs and CO_2 emissions for its customers. Schneider Electric offers products, solutions, and services that integrate with all levels of the energy value chain.

Solutions adapted to all needs

Through flexible solutions for commercial and industrial buildings, Schneider Electric commits to help customers gradually move towards an active approach to their energy efficiency. It helps get more return from investments and future design solutions.

To learn more, visit **www.schneider-electric.com**
or call **1-888-778-2733.**

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February 2012

Measurement and Verification: Monitoring Lighting Systems for Optimal Performance

February 2012/1200DB1101R01/12
by Scott Jordan, Product Marketing Manager,
LifeSpace Division of Schneider Electric

Make the most of your energy℠

Schneider Electric™

Summary

Introduction

Measurement and Verification is an increasingly common term being used within the energy efficiency and environmental communities. Simply stated, Measurement and Verification (sometimes referred to as M&V) is the process used to track the performance of a piece of equipment, a system, or an entire facility. The M&V plan compares the performance of a particular piece of equipment, system, or building to:
a) the performance of the same equipment, system, or building at an earlier time,
b) the performance predicted by a simulation,
c) or the performance of another piece of equipment, building or system.

M&V plans have become an essential component of many LEED® projects as well as many federal, state, and local public energy projects. M&V is used to assure that projected savings occur, to identify opportunities that might impact greater efficiency, and as a means for quantifying and reporting emission reductions.

Since a commercial building's lighting system can account for up to 35 percent of a building's total energy load, lighting and lighting controls are key considerations when developing an M&V plan. This paper addresses the various types of M&V plans typically used for evaluating lighting systems, the benefits provided from these plans, along with the implementation of an M&V system.

M&V Overview

M&V beginnings can be tracked back to the oil embargo of 1973 when high energy prices spawned the Energy Service industry. New companies termed ESCO's (Energy Service Companies) emerged to offer various services for designing, implementing, and financing energy-related improvements for existing buildings. ESCO's would typically guarantee the building owner specific results; usually these results were lower utility costs. Various forms of performance verification resulted from these needs to assure contractual requirements were being met. Today's M&V plans were born from the work done during these early years of verifying energy performance.

The green community has also embraced M&V as a means for reporting both energy savings and other environmental aspects. In LEED certified and other high-performance buildings, an M&V plan is used to document the reduction in emissions, to ensure enhanced environmental quality is being maintained. For example, the *US Green Building Council's (USGBC)* standard requires, as a prerequisite, that an operations maintenance plan be established to ensure that a facility's energy efficiency targets are being met.

New high-performance building standards such as the *International Green Construction Code (IGCC)* requires that commissioning be performed on specific energy conservation measures (ECMs) and documented such that measures are meeting the design criteria. Draft versions of the ASHRAE Standard 189.1-2009, *Standard for the Design of High-Performance, Green Buildings Except Low-Rise Residential Buildings*, also outline requirements for metering and M&V verification.

The industry standard for M&V, both in the United States and internationally, is the International Performance Measurement and Verification Protocol (IPMVP). The American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE), the United States Department of Energy (DOE), Federal Energy Management Program (FEMP), and the United States Green Building Council (USGBC) Leadership Environment and Engineering Design (LEED) rating system use the IPMVP standard as the basic guideline for energy performance verification.

M&V Basics

The IPMVP guidelines group M&V methodologies into four general categories: Options A, B, C, and D. These are generic approaches with each option having its own advantages and disadvantages based on specific site criteria and the needs of the building owner.

The two most prevalent options for lighting and lighting control energy conservation measures are Options A and B. (see Figure: 1) Option A is a popular approach for straightforward lighting retrofit projects that do not include any controls. In these projects, the parameters affecting savings include fixture power, hours of operation, and level of coincident operation (the percentage of operation when the building peak demand is established). Fixture power can be estimated based on manufacturer's specifications and spot-checked for compliance. Hours of operation are generally documented through a site survey. These operating periods are then used to determine both energy and demand savings during the performance period. This option is easy to implement compared with other approaches and provides a high level of confidence, especially if the operating hours remain unchanged.

Option B is typically used in both new construction and retrofit projects that include the addition of lighting controls. Savings are determined by field measurement of all key performance parameters including fixture power, hours of operation, and level of coincident operation. Option B verification involves the same items as Option A, but requires more end-use metering. Results are generally more precise using Option B since actual metering values are made.

Option C pertains to whole facility utility analysis. This approach is generally used with complex equipment and controls projects where predicated savings can be substantial (i.e. > 20 percent of the building's total energy usage). Savings are determined by comparing a baseline analysis with the energy use reports provided for the entire building. Sub-metering may be used to provide data for overall energy profiles.

Option D utilizes computer software to model energy performance of the entire facility. Accuracy of modeling is ensured by using metered site data to describe both baseline and performance period conditions. Generally, Option D is used on very complex projects where the interactive effects between various ECMs are too complex for other methods. Option D is also useful for new construction or major building modifications where a baseline does not exist.

M&V Option	Description
A	Parameters are estimated based on historical data, manufacturer's specifications, or engineering judgment. Site spot checks are conducted for energy savings verification. Documentation of the source is required.
B	Savings are determined by field measurement of all key performance parameters which define the energy use of the ECM affected system.
C	Savings are determined by measuring energy use at the whole facility or sub-facility level.
D	Savings are determined through simulation of the energy use of the whole facility or a sub-facility. Simulation routines are demonstrated to adequately model energy performance measured in the facility.

Figure: 1

M&V Process

Implementation of an M&V plan for lighting and lighting controls generally can be broken down into the following steps:

1. Define a baseline and estimate energy performance for the individual systems.
2. Define the energy conservation measures (ECM's) and estimate initial savings. This is a comparison of the building's baseline energy performance to the building's energy profile once the ECMs are implemented.
3. Define the M&V approach (see above for options A, B, C, and D).
4. Verify proper installation and commissioning of ECMs.
5. Determine actual savings resulting from the implementation of the ECMs using the agreed M&V approach.
6. Re-evaluate at scheduled intervals to ensure savings are being maintained while also looking at data for new energy savings opportunities.

The M&V Systems for Lighting Systems

Option A is often selected for simple lighting retrofits where the confidence level of the ECM (fixture) is high in terms of its power consumption, and operating hours can be accurately predicted based on a sample of spaces conducted during a site survey. An M&V plan for this type of project assumes:

- Operating hours will be measured prior to the retrofit. The hours the fixtures operate will be the same before and after the fixtures are replaced for the purposes of energy calculations.
- Fixture power before and after the retrofit will be measured.
- Interactive effects of the fixture retrofit on the heating, ventilation, and cooling system is not considered.
- Lighting levels remain constant.

Determining actual hours of operation is often performed using portable data loggers that time stamp the change-of-state that occurs between ON and OFF. Data collected from these loggers are also analyzed to determine if the surveyed area is ON during expected peak demand periods. Portable power meters are typically used for measuring power levels.

With the advent of green buildings and high performance building standards, Option B is quickly becoming the prevalent approach. Virtually every building energy code now requires lighting controls for any new construction or major alternation of a lighting system. As such, the need to measure power usage and time of operation becomes necessary. At a minimum, lighting controls affect the operational time a lighting system operates. Lighting controls, however, are also used to lower power consumption by dimming lights in response to available ambient daylight or in response to load shed commands. An M&V system for these types of installations must be able to track energy profiles, both kWH and kW by time of day. This means that adequate metering must be installed along with the ECM's.

Many green building standards' committees recognize this need and have included sections within the relevant standards to require metering at both main and sub-metering levels. Metering is required for each major system within the building as well as at sub-components of a system.

In the case of lighting systems, metering is generally employed for different areas and types of lighting used throughout a building. For instance as in the case of Harvard University's Green Building Standard*, lighting for parking garages are to be metered separately from a buildings commercial space.

Several types of metering options are currently available. Individual enclosed electronic meters are often used when there are a minimal number of metering points. More often, however the number of required metering points may be numerous and the practicality of mounting separately unenclosed meters is not practical. In these cases, enclosures containing several meters are preferred.

One particularly unique approach to metering lighting systems is to embed the metering functions within the lighting control. These hybrid solutions provide a complete energy monitoring and control package that reduces the total footprint required for the equipment. This complete package allows a single network to communicate data back to the central building management system while also independently monitoring and controlling individual branch circuits.

The Schneider Electric™ Powerlink™ MVP (Measurement and Verification Panel) lighting control panel is one example of such a system. This panelboard provides four key functions critical to a lighting energy efficiency and M&V system: branch overcurrent protection, load scheduling whereby individual branch circuits can be independently scheduled for ON or OFF operation, override of scheduled events in the event of a load shed requirement, and data acquisition of individual branch circuit parameters including power consumption, peak kW load and cumulative power consumption kWH.

Having the ability to independently control and monitor individual branch circuit loads opens a wide range of options for an energy manager to better understand the dynamics of a building's performance. Through data acquisition software programs such as the Schneider Electric PowerLogic™ ION Enterprise™, an energy manager can quickly determine system performance by load type, building area, or ECM.

Schneider Electric Powerlink MVP Panel

Summary

It's an old adage: "if you can't measure it, you can't control it". Any energy conservation measure must be accompanied with a proper M&V plan if success is to be measured. A properly designed M&V plan and system will:

- Provide the energy manager the ability to measure actual energy consumption objectively and accurately,
- Account for energy usage on a time-of-day basis,
- Compare energy consumption and demand to an established baseline,
- Verify energy and dollar savings resulting from the energy conservation project,
- Monitor the performance of various systems to determine if they are operating as intended,
- Provide data for planning and subsequent further energy savings opportunities,
- Provide an objective means for prioritizing future energy management opportunities.

* 2009 Harvard University Green Building Standard, green.harvard.edu/theresource/.../green-building-standards-2010.pdf

About Schneider Electric

Schneider Electric is a $22 billion global leader in energy management with core competencies in buildings, energy and infrastructure, data centers and networks, industry, and residential. We help people and companies make the most of their energy, helping them make it safe, reliable, efficient, productive, and green. Our expertise in energy management and our involvement in all end-user energy consumption, uniquely positions us to help address one of our world's largest dilemmas – energy. Schneider Electric is leading the "Intelligent Energy" movement, calling for businesses and consumers to be smarter about the way they use energy.

To further demonstrate its commitment in the energy efficiency space, Schneider Electric recently announced the Powerlink Measurement and Verification Panelboards (MVP) lighting control panelboards. Powerlink MVP lighting control panelboards provide a simple, cost effective, and energy code compliant way to meter and control branch circuits from a standard panelboard.

Powerlink MVP lighting control panelboards feature powerful microprocessor based controllers to provide lighting control and power metering. The Powerlink MVP lighting control panelboards integrate the features of the Square D™ PowerLogic Branch Circuit Power Meter with the Powerlink™ G3 system in one solution.

Scott Jordan joined Square D/Schneider Electric in 1978 and has worked in the company's lighting control business since 1992. Scott served as Product Marketing Manager of the company's Installation Systems & Control business. He has a bachelor of science degree in electrical engineering from the University of Kentucky.

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