# EcoSystem™ | a revolution in light control

for the individual

the building

and the environment

LUTRON

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## What do you need from light control on your project?

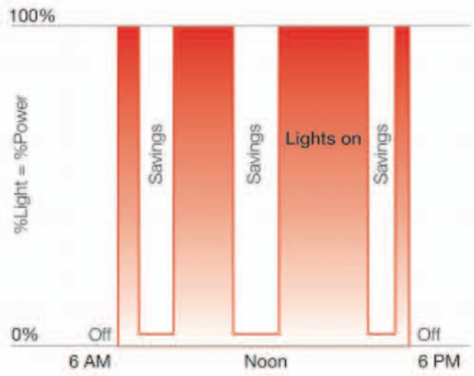
**Typical building**


# Energy Savings

Efficient lighting control offers a significant energy-saving opportunity. Despite the fact that most lighting is energy-efficient fluorescent, the number-one source of energy consumption in any building or school is still lighting.

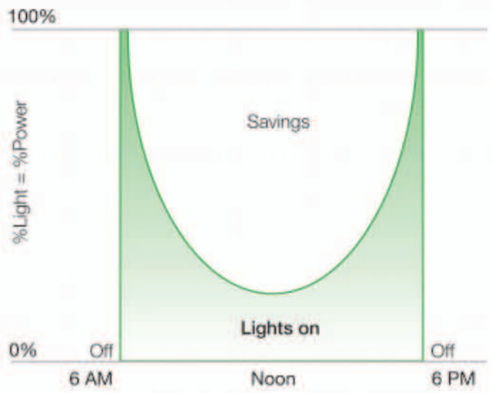
**Automated Occupant Control Saves Energy**
Slowly dim lights to low level or turn lights off when space is unoccupied; turn lights on when someone enters.

Best applied in enclosed areas such as meeting rooms, corridors and offices.



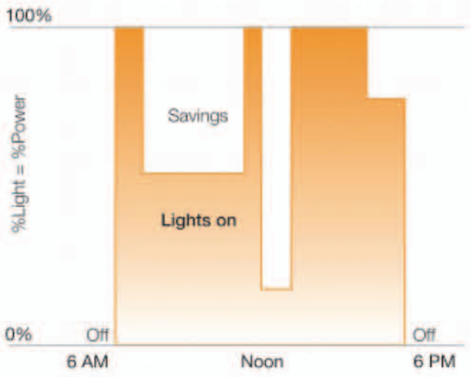

**Daylight Harvesting Saves Energy**
Take advantage of available natural light. Adjust electric lighting smoothly, unobtrusively and continuously.

Best applied in areas with large windows or skylights, such as perimeter offices, malls, classrooms and atria.




**Manual Dimming Control Saves Energy**
Provide personal choice and control of light levels to adapt spaces for different tasks and activities. Permit dimming from multiple locations. Switch lights on and off.

Best applied in areas such as meeting rooms and offices.




# Increased Productivity

**Occupant Comfort**
The cost of an employee (including salary, benefits and overhead) far exceeds the energy costs in any building. That's why ergonomic lighting—lighting that is designed and installed in a way that considers the physical and psychological needs of the people in buildings—pays big dividends for corporations today.

Preliminary studies by the Light Right Consortium show that ergonomic lighting leads to positive effects such as improved productivity, reduced health complaints, and increased occupant satisfaction. As a result, business owners can simultaneously reduce organizational costs and energy consumption.

**Effects of Daylight**
Dozens of studies have confirmed that classrooms are more effective learning environments with greater amounts of daylight. Likewise, office environments and employee productivity can be improved with the proper balancing of daylight and electric light. To maintain proper luminance levels, as the amount of daylight is increased, the amount of electric light must be reduced proportionately.

# Compliance with Building Codes & Guidelines

Energy efficiency is rapidly becoming the design requirement of the new millennium. Many states and cities have already adopted specific energy-saving guidelines. More will soon follow suit.

**ASHRAE**
The ASHRAE/IESNA standard encourages the use of energy efficient lighting controls in design practice for both interior and exterior lighting. Most states have or will adopt energy codes based on the standard.

**Title 24**
California's building efficiency code (along with those for energy-efficient appliances) has saved more than $36 billion in electricity and natural gas costs since 1978. A new even more stringent code will take effect in October 2005.

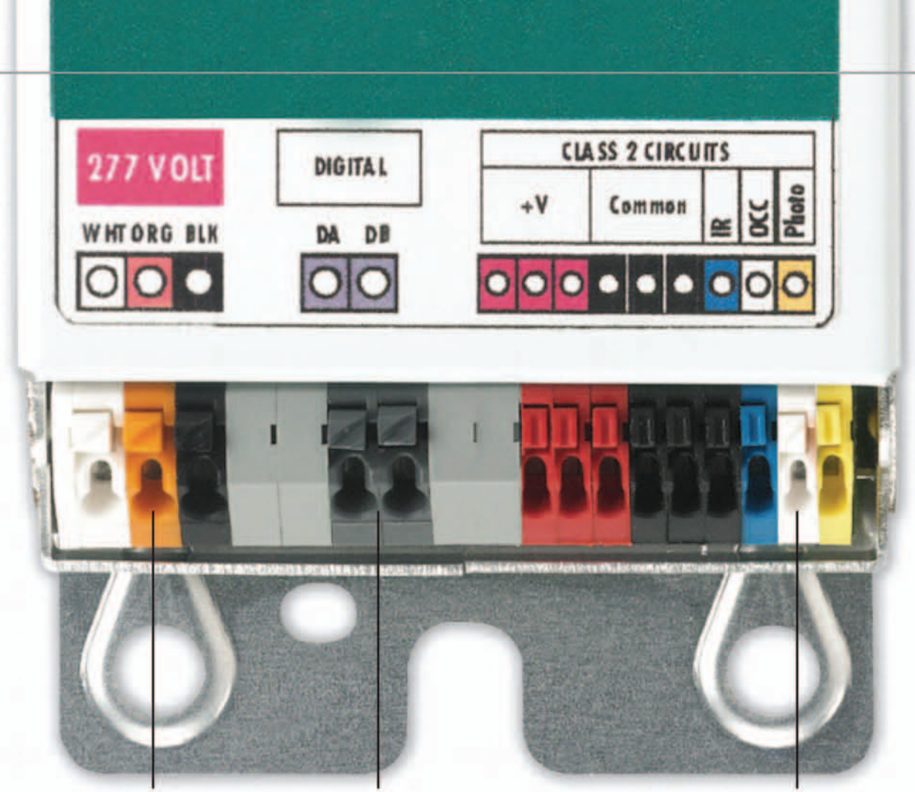
**LEED**
Efficient lighting controls may contribute to obtaining up to 22 points in 5 of 6 LEED credit categories. A minimum of 26 points is required for Leadership in Energy and Environmental Design certification. LEED is a rating system sanctioned by the United States Green Building Council (USGBC) that provides a national standard for what constitutes a green building.

## EcoSystem™

The EcoSystem starts with one simple but essential building block—the EcoSystem ballast—which replaces the non-dim ballast in a fixture.

This single fixture is now the centerpiece of an efficient lighting ecosystem, in which a variety sensors or wallstations can be connected directly to the ballast.

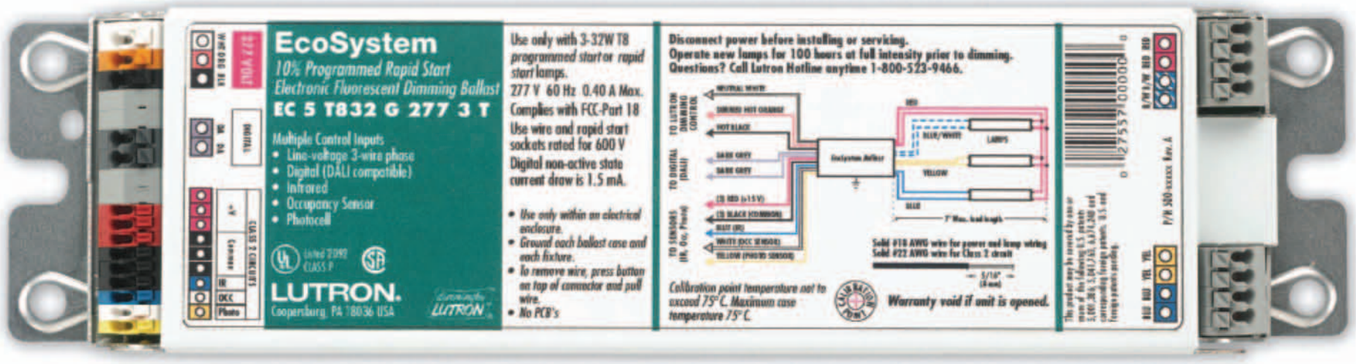
Depending on the type of room or facility, any combination of sensors or wallstations can be utilized to control the fixture.




Use any standard 3-wire control if desired.

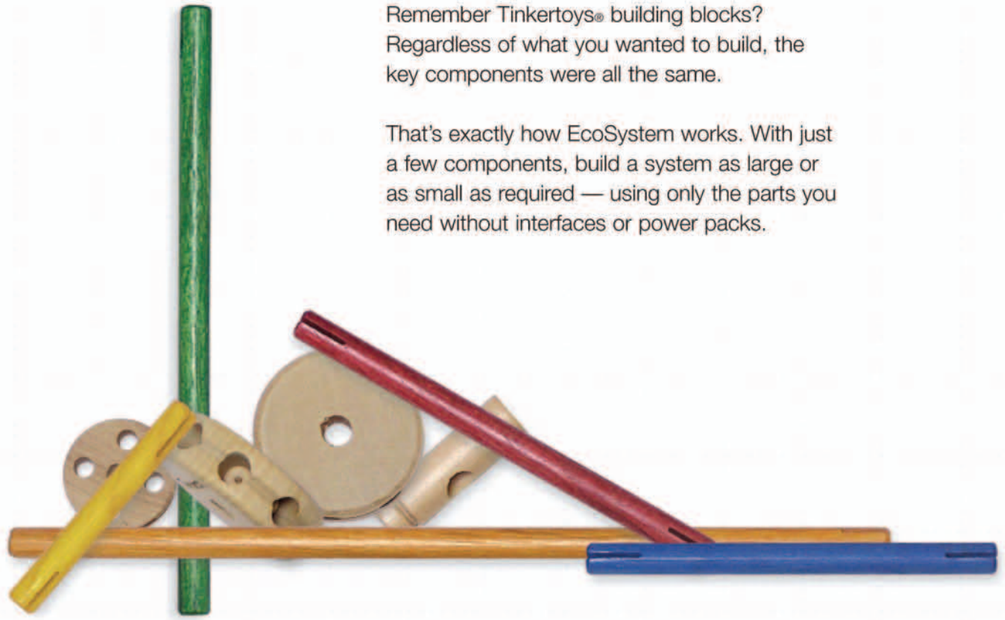
Connect to other EcoSystem ballasts and a power supply to create a system of up to 64 ballasts.

Connect Class 2 sensors or wallstations as needed




EcoSystem ballast
shown actual size
9.5" x 2.38" x 1.0"

## Start with one and build



Remember Tinkertoys® building blocks? Regardless of what you wanted to build, the key components were all the same.

That's exactly how EcoSystem works. With just a few components, build a system as large or as small as required — using only the parts you need without interfaces or power packs.

**Connect EcoSystem components as needed.**

**Scene Control Wallstation**
Allows occupants to save and recall different lighting scenes in multi-purpose rooms

**1B wallstation**
Allows user to manually control any of the fixtures on the loop for simple on/off, raise/lower.

**IR reciever and remote**
For personal control of lighting. (Also possible via PC).

**Photocell**
Senses daylight for harvesting natural light.

**Occupant sensor**
Automatically shuts lights off assigned fixtures in unoccupied spaces.



## From a single fixture, in a single room...

to many rooms...

## to an entire floor...

Any sensor or wallstation connected to an EcoSystem ballast can speak to any or all fixtures on the digital loop to form a sub-system.

Within each sub-system any fixture can accept any type of control device – photosensors, occupant sensors, handheld individual controls, or wall controls – and then be grouped with other fixtures to form control groups.

**Class 1 or Class 2—The choice is yours**

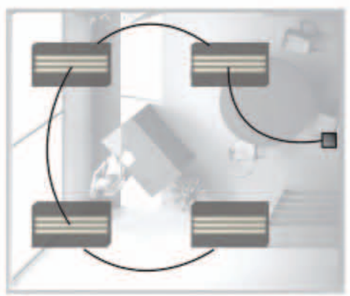
Dozens of studies confirm that installers prefer control wiring that can be run in the conduit with the power wiring (Class 1)—eliminating the need for extra conduit or wiring time. Modular cable (all in one pre-fabricated cable) can be used to quickly connect fixtures and drastically reduce overall wiring time in

If desired, the control wiring can also be wired as Class 2 in cable tray or with other harmless communication wiring. This is ideal for retrofit applications.

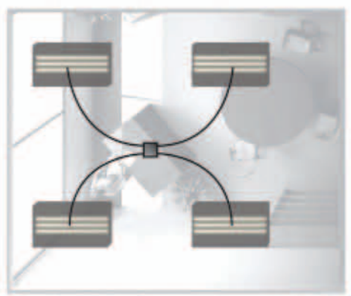
Whether the control wiring is Class 1 or Class 2, the sensors and wallstations that connect to the EcoSystem ballast are always Class 2.

**Topology- and Polarity-free**

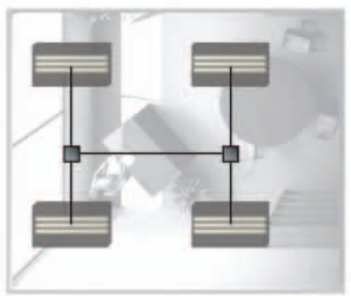
The control wiring is all that is needed to connect the ballasts with each other and a power supply. Unlike standard fluorescent control systems, the control wiring can be connected topology-free – meaning it can be wired in any format the installer desires, such as daisy chain, star method or T-tap. Or, it can be connected polarity-free. Even if the wires are reversed when connected, it will still work.



**Daisy chain**



**Star method**



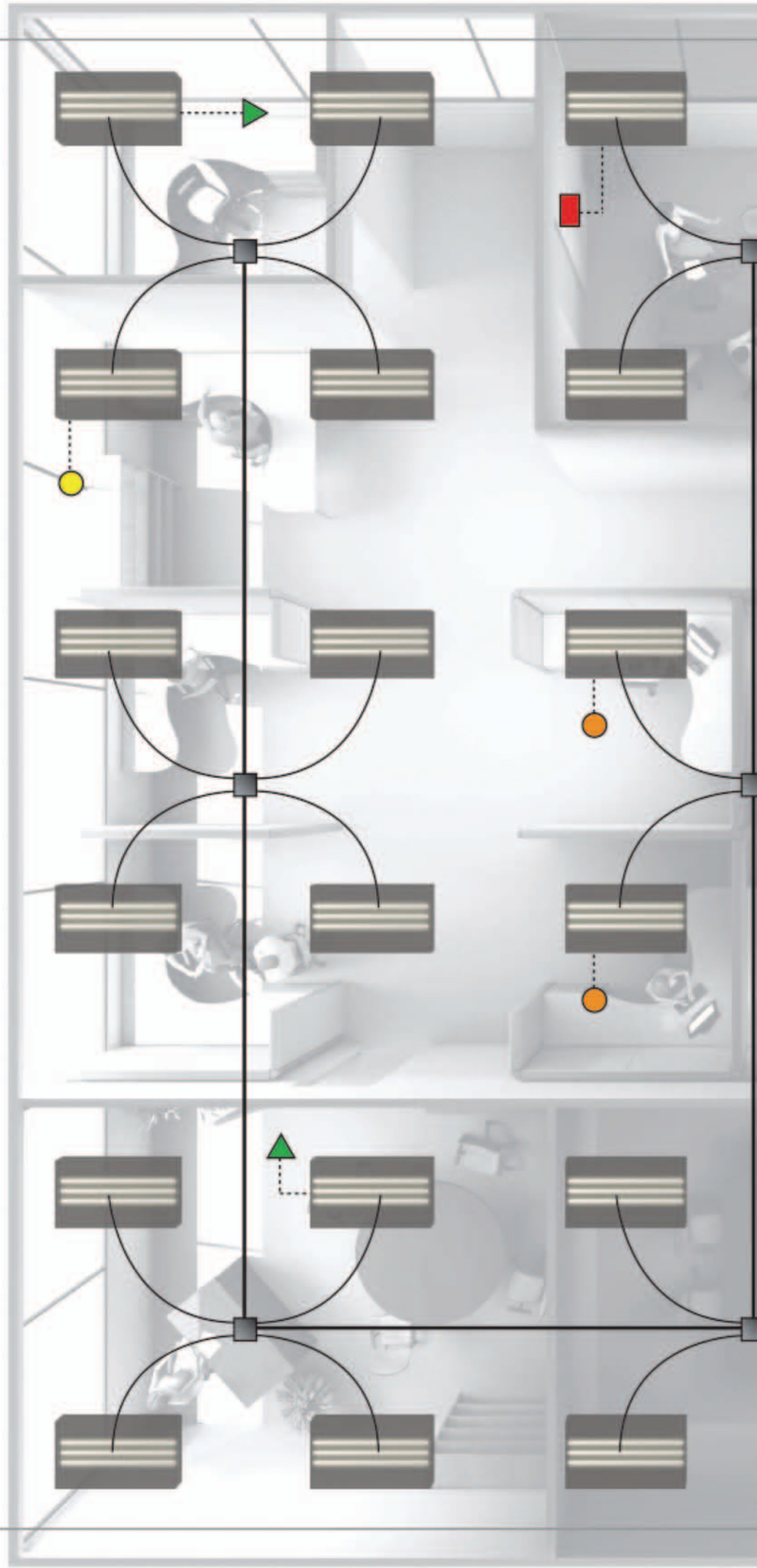
**T-tap**

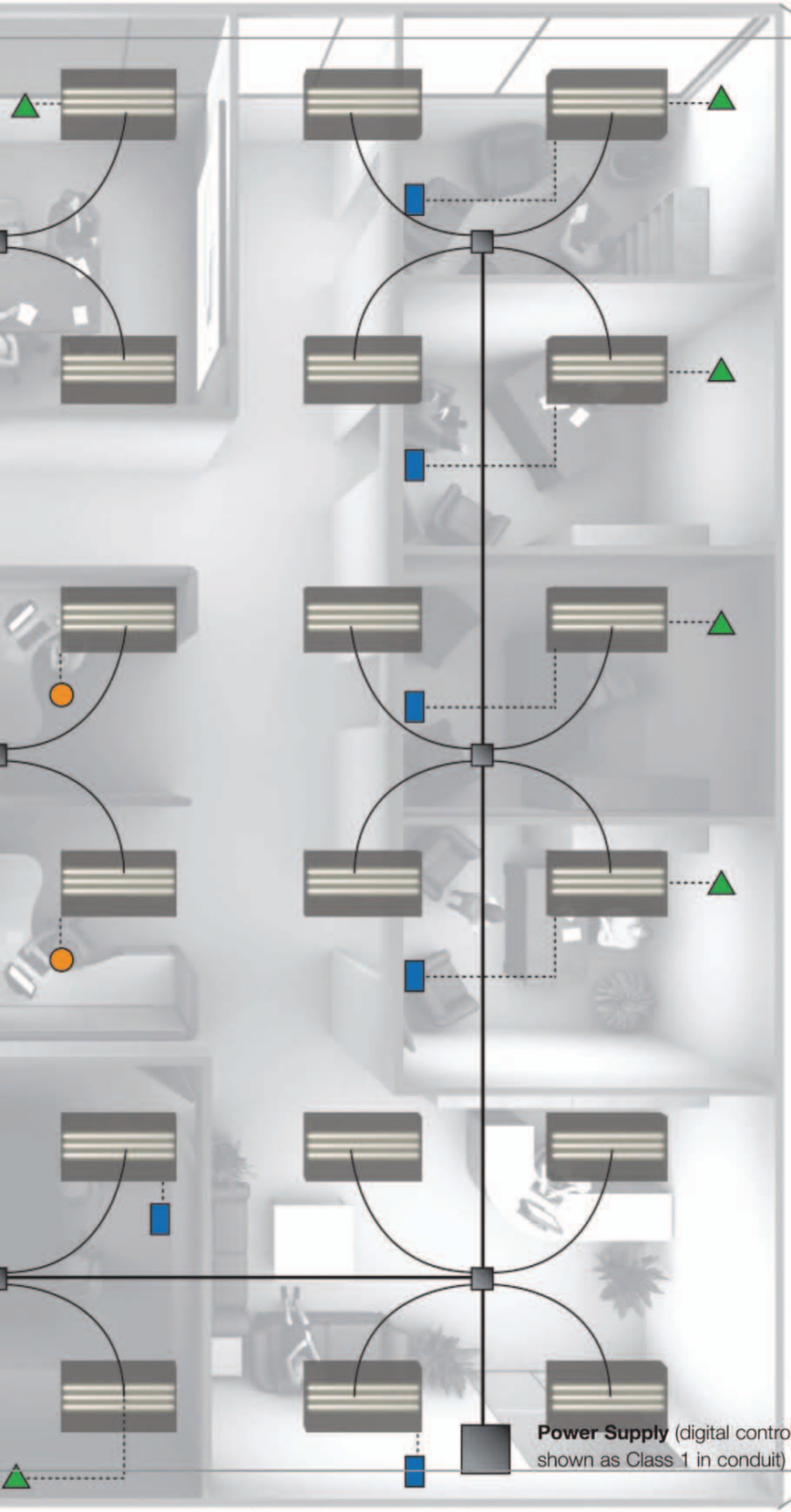
**Scene control wallstation**

**1B wallstation**

**IR receiver and remote for personal control**

**Occupant sensor**

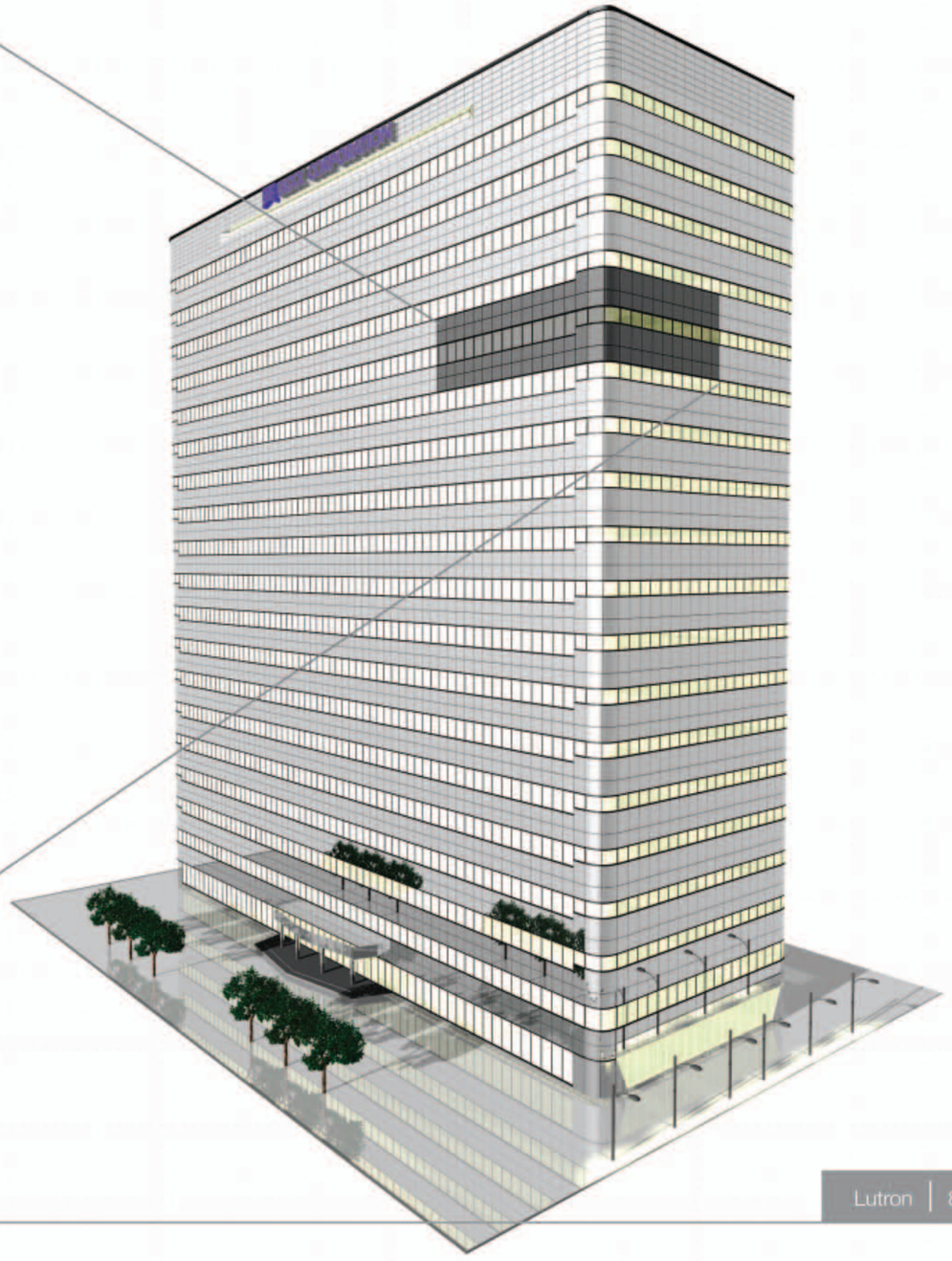




**Power Supply** (digital control loop shown as Class 1 in conduit)

## …to an entire building or campus of buildings

Sub-systems can be linked togther by quadrants, offices, floors, and entire buildings – up to hundreds of thousands of ballasts – all through one simple, smart technology.

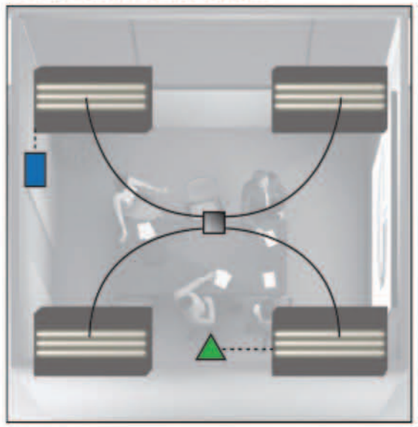


Can a system be this easy to design...*and to maintain?*

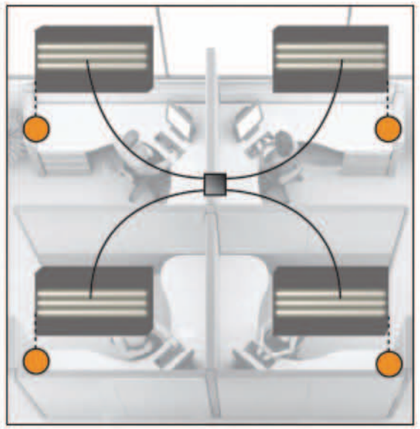
## Yes

Repurposing building space has never been easier. The simplicity with which fixtures, rooms, zones, floors and total buildings can be configured and reconfigured is nothing short of staggering.

**Today's conference room**



Today's conference room can now easily be transformed into tomorrow's open office, at the touch of a button.



**Tomorrow's open office**

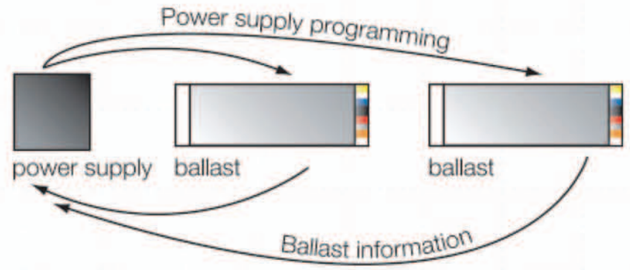
If sensors or wallstations are desired, they can be added or removed easily with simple Class 2 connections at every fixture.

Rooms, floors, even entire buildings can be easily reconfigured without rewiring.



## EcoSystem makes replacements simple.

In the life of a sustainable building, replacements are inevitable. Replacing a ballast or multiple ballasts is as easy as changing a fluorescent lamp. The EcoSystem ballasts and power supplies are intelligent enough that replacement units learn from currently installed devices, and do not need to be readdressed or reprogrammed.




The ballasts back up the power supply programming, and the power supply backs up the ballasts' information. System settings and individual device information is stored redundantly.

When integrated with a Lutron Grafik 7000 system, ballast and lamp information can be requested from the ballasts to reduce maintenance time.

## Is EcoSystem affordable?

# Yes

**EcoSystem ballasts cost less than today's Eco-10 dimming ballasts.**

Lutron's innovative design removed many analog components and allows the microprocessor to run additional portions of the ballast. Reducing the number of parts allowed Lutron to reduce costs. Those savings are passed to the customer.

**EcoSystem solutions have fewer parts and pieces to install.**

EcoSystem's revolutionary system architecture is designed to easily accommodate adding, removing, or reconfiguring parts and pieces over the life of the building. That means you buy only the parts you need when you need them.

Adding daylight sensors, personal control, or occupant sensors can be done easily without costly Class 1 installation of interfaces or power packs.

**EcoSystem solutions do not require commissioning upon installation.**

Sensors work automatically, as soon as they are connected. The system scales up easily with more ballasts, sensors, or wallstations as needed for the project. If more than this "out of box" functionality is desired, changes can be made quickly on a PDA or PC.



**EcoSystem solutions cost less to install.**

EcoSystem ballasts link together on a simple 2-wire control loop that is both topology-free and polarity-free. That helps reduce miswires. The control wire can also be run as Class 1 in conduit, or as Class 2 communication wire – *whichever is best for the project or required by code*.

Since zoning can now be done digitally at the ballast level, Lutron XP relay systems and breakers can be fully loaded to 16A, without using power wiring for zoning. That means that hallways, corridors, stairwells, and multiple classrooms can all live on the same circuit and respond differently. This allows for less hardware in the closet, less conduit in the space, and more efficient use of hardware. Zoning can be changed without rewiring over the life of the building.

**EcoSystem solutions cost less to maintain.**

EcoSystem allows the facility to generate instant reports of lamp and ballast information – that means no more walking the facility at night looking for failed ballasts or lamps.

EcoSystem allows sensors or wallstations to be added or moved, as appropriate for the space, at any time without interfaces or Class 1 rewiring.

For more information contact your Lutron Representative or visit:
**www.lutronecosystem.com**

Lutron XP™ relay panel

LUTRON

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