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Tinkertoy® is a registered trademark of Hasbro, Inc.

EcoSystem™ | a revolution in light control

for the individual
the building
and the environment





What do you need from light control on your project?

Annual electricity use in office buildings¹



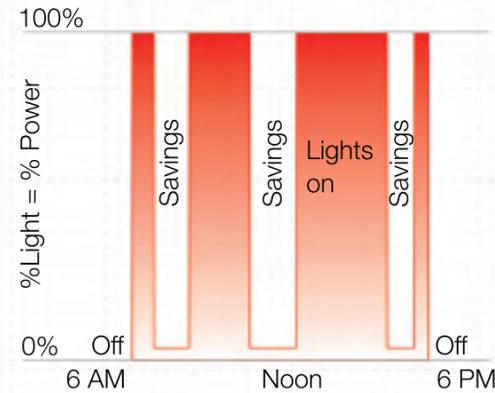
Energy Savings

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.

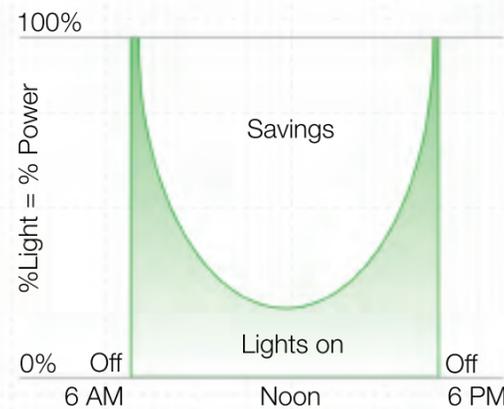
Best applied in enclosed areas such as meeting rooms, corridors and offices.



Daylight Harvesting Saves Energy

Take advantage of available natural light. Adjust electric lighting smoothly, unobtrusively and continuously.

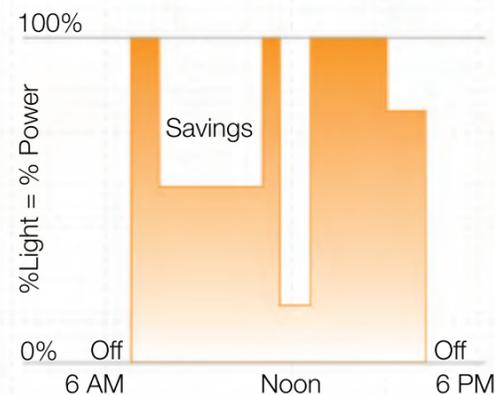
Best applied in areas with large windows or skylights, such as perimeter offices, malls, classrooms and atria.



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. Turn 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 took effect in October 2005.

LEED (Leadership in Energy and Environmental Design)

Efficient lighting controls may contribute to obtaining up to 20 points in LEED for New Construction and Major Renovations (LEED-NC) credit categories, and up to 12.5 points in LEED for Commercial Interiors (LEED-CI) credit categories. To be certified for LEED, a minimum of 26 points is required for NC, and a minimum of 21 points is required for CI. 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.

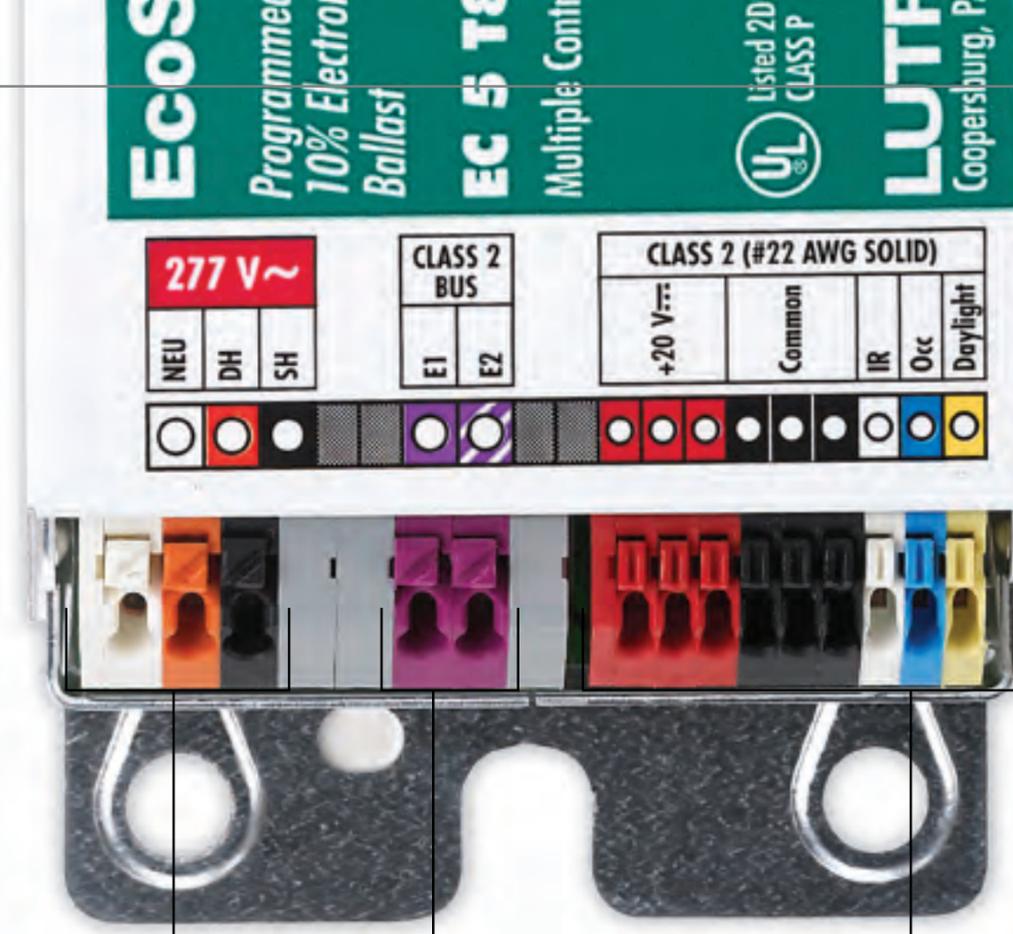
1. Source: Energy information Administration Office. Energy statistics from the U.S. Government Commercial Buildings Energy Consumption survey.

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 of sensors or wallstations can be connected directly to the ballast.

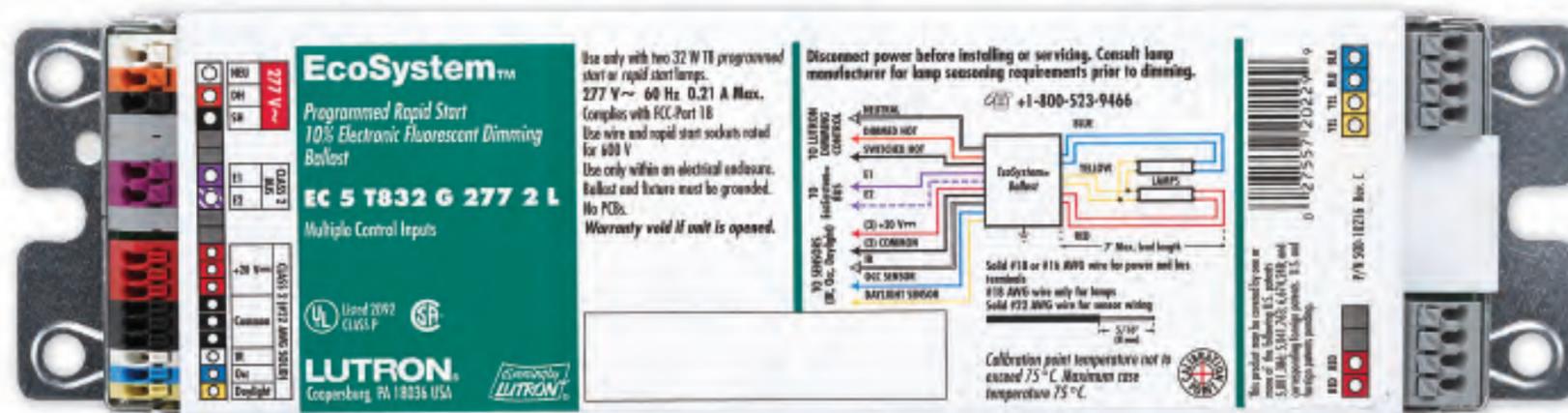
Depending on the type of room or facility, any combination of sensors or wallstations can be utilized to control the fixture.



Use any standard 3-wire control if desired.

Connect to other EcoSystem™ ballasts and a bus supply.

Connect Class 2 sensors or wallstations as needed.

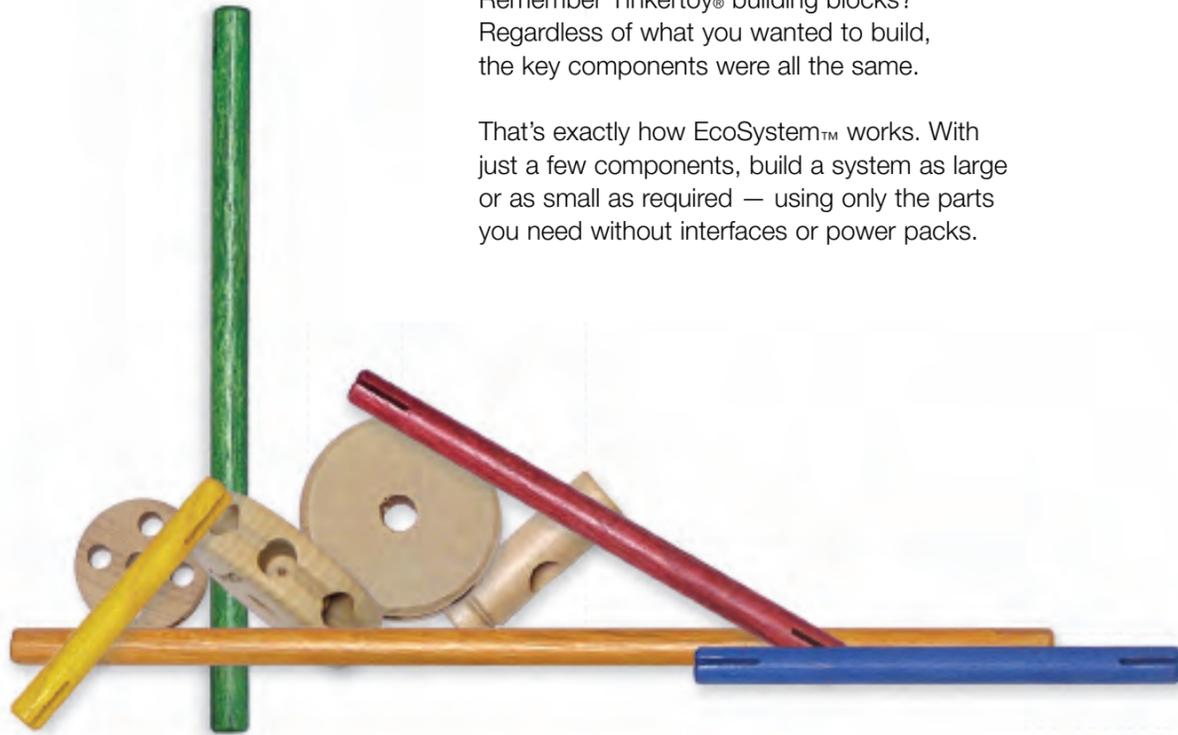


EcoSystem ballast shown actual size 9.5" x 2.38" x 1.0"

Start with one and build

Remember Tinkertoy® 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.



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



Connect EcoSystem components as needed.



4B 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 bus
for simple on/off,
raise/lower.



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

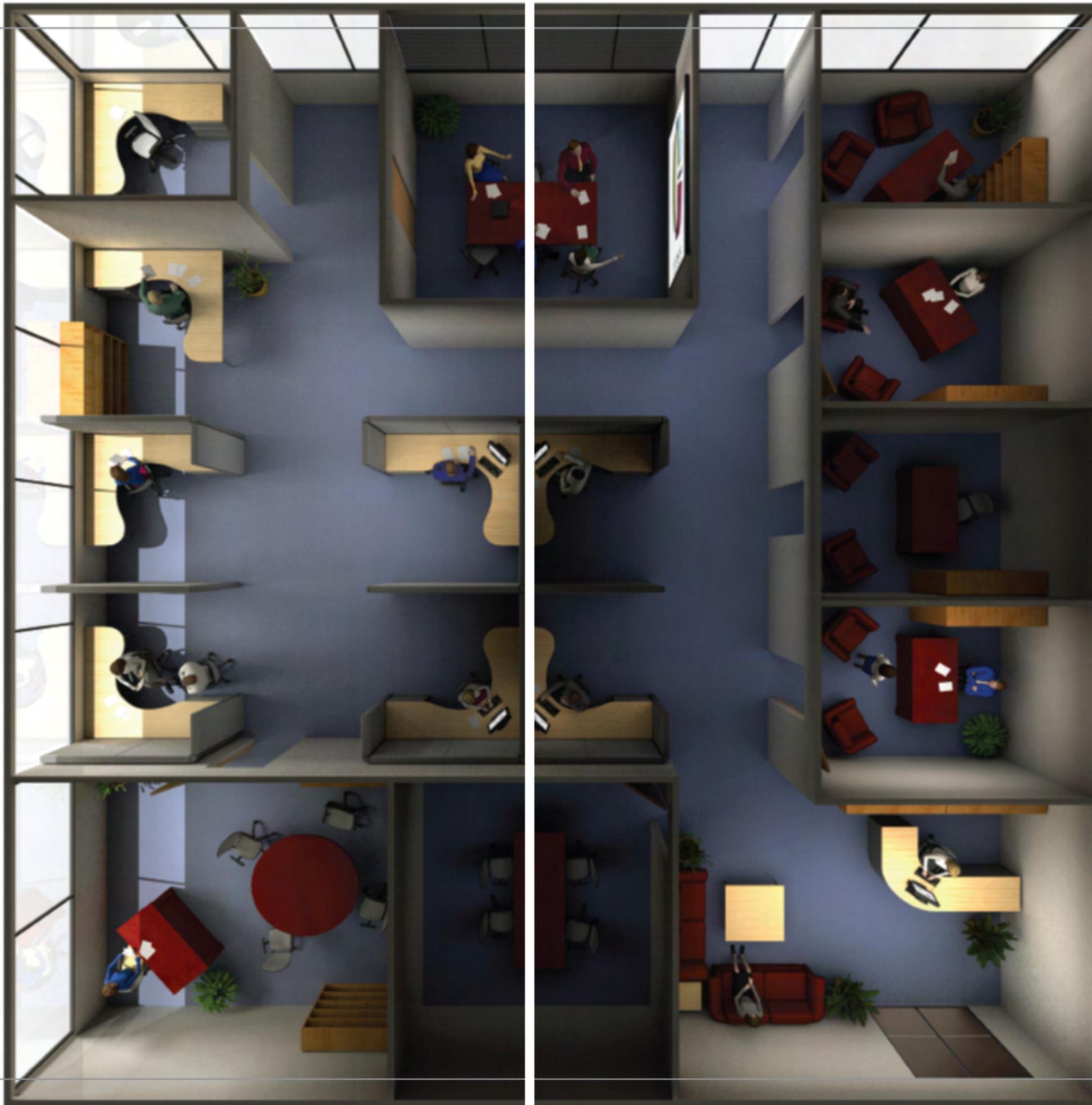


Daylight sensor
Senses daylight
for harvesting
natural light.



Occupancy sensor
Automatically shuts off
assigned fixtures in
unoccupied spaces.

to many rooms...



to an entire floor...

Connect up to 64 EcoSystem™ ballasts and a control bus supply to create a sub-system. Within a sub-system, any individual fixture can accept one or more EcoSystem control devices such as daylight sensors, occupancy sensors, handheld individual controls, and wallstations. Any sensor or wallstation connected to a fixture can control all fixtures or any sub-group of fixtures.

Wiring a system is easy

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 new construction. 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.

Topology-free and Polarity-free
 The control wiring is all that is needed to connect the ballasts with each other and a bus 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. And, it can be connected polarity-free. Even if the wires are reversed when connected, it will still work.

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



4B wallstation



1B wallstation



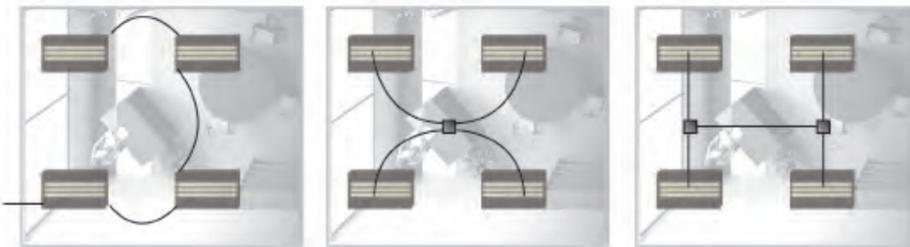
IR receiver and remote for personal control



Occupancy sensor



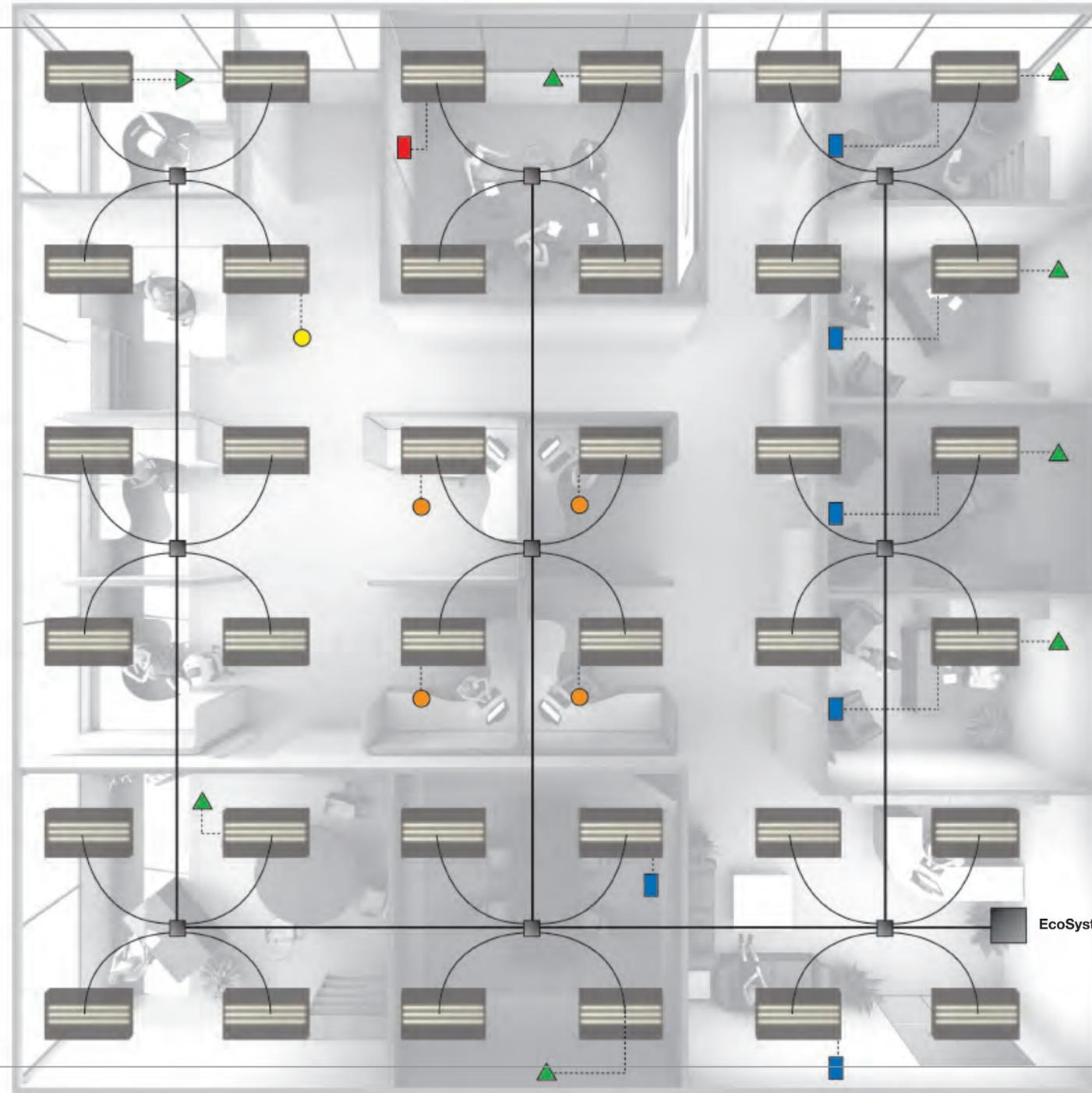
Daylight sensor



Daisy chain

Star method

T-tap



EcoSystem™ bus supply

...to an entire building or campus of buildings

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



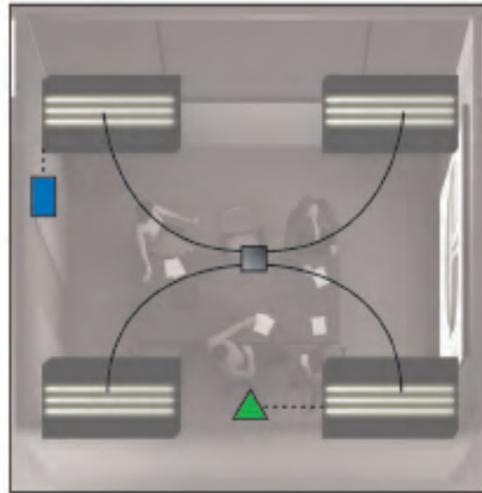


Can a system be this easy to design...*and to maintain?*

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.

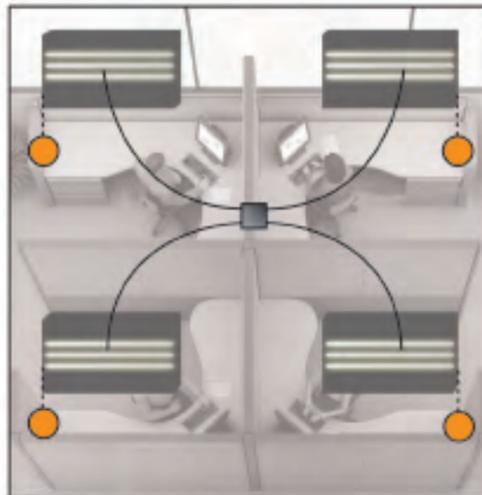
Today's conference room



Today's conference room can now easily be transformed into tomorrow's open office.

Sensors and wallstations can be added or removed easily with simple Class 2 connections at any fixture.

Rooms, floors, even entire buildings can be easily reconfigured without changes to power wiring.

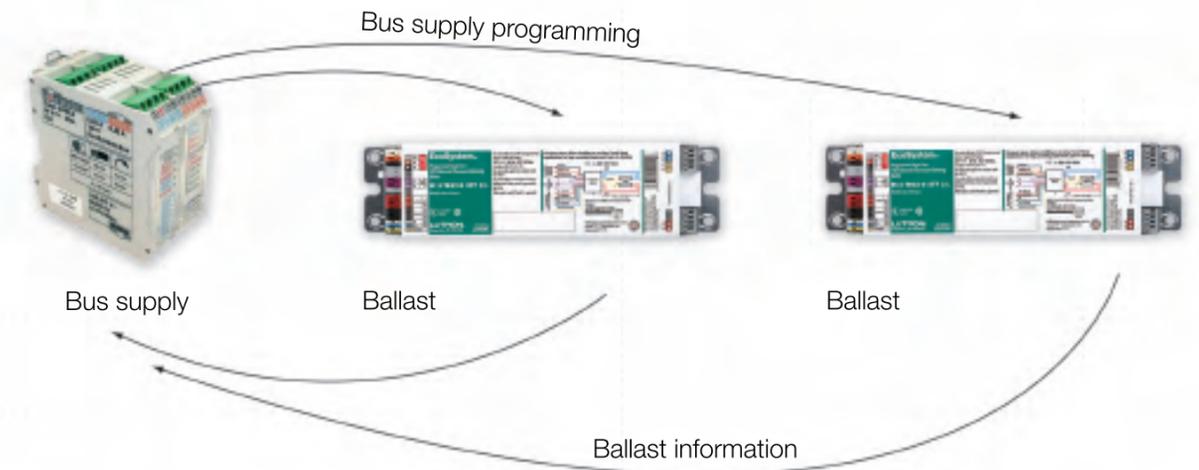


Tomorrow's open office

-  wallstation
-  occupancy sensor
-  IR receiver and remote for personal control

EcoSystem™ makes replacements simple.

In the life of a sustainable building, replacements are inevitable. EcoSystem ballasts and bus supplies are so intelligent that replacement units learn the programming from currently installed devices. Since every ballast is uniquely identified by a serial number, replacing devices is as simple as entering two numbers into a handheld programmer – the number of the unit being replaced and the number of the new unit. Once the numbers are entered, the new unit is fully functioning in the system. Or, you can configure the system to allow ballast replacement to occur automatically by replacing ballasts one at a time. Either approach eliminates the need for readdressing and reprogramming.



The ballasts back up the bus supply programming and the bus supply backs up the ballasts' information.



Is EcoSystem™ affordable?

Yes

EcoSystem™ solutions cost less than other solutions available today.

Lutron's innovative microprocessor-controlled ballasts are more cost effective than today's analog ballasts. The controls cost less, and the total solution costs less to install, passing savings on 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 occupancy sensors can be done easily without costly Class 1 installation of interfaces or power packs.

EcoSystem components work directly out of the box as soon as they are wired together.

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 wireless handheld programmer.

EcoSystem solutions cost less to install.

EcoSystem ballasts link together on a simple 2-wire control bus 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 switching panels 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 or a demonstration contact your Lutron Representative or visit:
www.lutron.com/ecosystem



Softswitch128™ relay panel