



## Lighting Control & Design Case Study

### High-Tech High L.A.

#### Profile:

High Tech High L.A.  
Van Nuys, California

Completed in 2005, High Tech High L.A. is a unique learning facility designed to optimize student performance. Classrooms are open to a central "great room" area, where students can work on group projects, socialize, or stake out a quiet corner for individual work. Windows and skylights allow for an abundance of daylight which prompted the Los Angeles Unified School District to opt for a lighting control system that included Daylight Harvesting.

#### Challenges:

A Daylight Harvesting system flexible enough to meet the changing needs of the classroom environment, and which returned control to the teachers.

#### Solutions:

- User-friendly and intuitive interface
- Distributed controls to meet room-to-room demands
- Energy conservation
- 24/7/365 customer support



#### Harvesting Human Potential: Smart Design + Smart Kids = High performance

When designing lighting controls for the High Tech High L.A. project (HTH-LA), the LAUSD was looking for a lighting control system that would be durable, adaptable and allowed for flexibility in configuration. The LAUSD also wanted to make a substantial, long-term investment in Daylight Harvesting Technology but were mindful of the pitfalls that plagued earlier systems, such as false "ons" and "offs" and the issue of manual control. The LAUSD was also looking to utilize a local Los Angeles-based manufacturer, minimize installation and maintenance costs and recognized that it required extensive technical support.

Daylight Harvesting and lighting control have been linked to higher classroom grade performance and lower classroom energy bills. Most schools spend more money on energy than on books and supplies. In fact, the cost of energy is second only to salaries. It is well documented that

effective Daylight Harvesting can significantly lower the energy consumption in school buildings. According to the National Center for Educational Statistics, 72% of the cost of energy in educational buildings goes towards electricity, with 56% going toward electric lighting.

By utilizing effective Daylight Harvesting strategies, schools can reduce or eliminate the need for heat-producing electric lights during the school day. According to the U.S., Department of Education, school energy costs average \$176 per student per year. Daylight Harvesting and high-efficiency lighting control strategies can save up to \$85 per student per year.

The concept of Daylight Harvesting is simple. Digital photosensors detect daylight levels and automatically adjust the output level of electric lighting to create a balance. Dimming ballasts and photoreceptors can

reduce electric lighting loads proportional to the amount of daylight that enters the space. The result is energy savings.

Nationally recognized for the research, design and development of Daylight Harvesting products, LC&D was selected by the LAUSD to provide HTH-LA with a 100% scalable system utilizing Daylight Harvesting principles along with a list of customized features including digital connectivity for easier installation, interface between lighting and temperature systems, and free lifetime programming with 24/7 dial-up customer service. LC&D's GR2400 System is a 100% digital solution to lighting control. Panels and switches daisy chain together linking up to 128 devices using Cat. 5 patch cable with RJ45 connectors in any sequence. This particular application included digital switches, photosensors and relay panels that allowed for a distributed layout.

LC&D's MicroPanel lighting control panels helped HTH-LA achieve the proper balance between natural daylight and electrical lighting. Dis-



Top-lit applications present a straightforward daylight harvesting control strategy

tributed controls move the relay panels into each room, addressing the issue of manual override of automatic controls while simplifying wiring. This greatly lowered installation costs and increased flexibility.

Photosensor placement was simple because the MicroPanel features a long list of locally and remotely adjustable settings which simplify photosensor placement in any architectural setting. Photosensor adjustments can be done both locally and remotely. Indoor photosensors with multiple trigger points provide control of multiple dimming or switching zones. Manual switches are available in a number of configurations from simple SPST wall switches to digital, such as the Chelsea DigitalSwitch.

Daylight Harvesting is just one strategy to shed total load during peak consumption hours. The GR2400 system is a complete lighting control system that minimizes energy wasted with the ability to satisfy a multitude of lighting control scenarios. While the primary goal is energy efficiency, studies reveal that students working with the most daylight showed a 21% increase in learning rates over students in classrooms with the least daylight.

Daylight harvesting is the buzz word in the lighting controls industry because studies indicate that electric lighting energy use can be reduced as much as 84% when supplemented with free, natural daylight. It has become increasingly accepted as research also continues to reveal the health and performance benefits associated with properly commissioned systems - such as better grades in school.

## Lighting Control Technology

*for Successful Daylight Harvesting*

The GR2400 System is LC&D's 100% digital lighting control system that uses state-of-the art technology to provide innovative lighting control solutions. All systems are delivered pre-programmed, and are guaranteed with a three year warranty and free lifetime remote programming.



### MicroPanel iDH™

This distributed panel is part of the GR2400 lighting control system and features daylight harvesting capabilities simply not found anywhere else.



### Universal Indoor Photosensor

Designed to fit both ceiling and luminaire mounted applications.



### Chelsea DigitalSwitch™

Digital switches connect directly to the GR2400 system via Cat. 5 cable, and can be set to override photocell triggers.

## Daylight Harvesting Gets High Marks at High Tech High “Learning Day”

On June 20, 2005, HTH-LA held a “Learning Day” on Daylight Harvesting, today’s most advanced technology on energy control. Experts from the fields of lighting control and design presented a hands-on seminar with students as part of a series of seminars on the arts and emerging technologies.

David Wilson, founder of Lighting Control & Design is a nationally recognized leader in the research, design and development of daylight harvesting products. He provided a lecture along with some assignments for the students to gain hands-on experience with the same lighting controls installed at their own school. LC&D staff assisting the students were struck by how quick the students were able to assemble and program the equipment – an attestation to the success of project-based learning.

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### Students Participating in the Lighting Controls Activity Learned:

- How to connect a Chelsea DigitalSwitch to a MicroPanel-iDH relay panel
- How to connect an indoor photosensor to the same panel using contact-closure inputs
- How to program both the switch and the photosensor by navigating with the Digital Time Clock

# Classroom Digital Controls

*Controls for every classroom or lab*

The Classroom Digital Control package from LC&D represents years of testing and fine-tuning in classrooms throughout the country and now offers the very best in energy savings and flexibility - flexibility for the teacher and for the energy manager.

Occupants (teachers, students) are presented with an intuitive wall-mounted switch for manual control at room entry. Teachers are also provided with a teacher's control station to override automatic control levels.

Behind the scenes, automatic functions such as daylight harvesting, time-based shut-off, can be quickly adjusted to meet changing requirements in seconds. The software is so simple to use that LC&D offers free lifetime programming.

- ① Entry Station
- ② Digital Photosensor
- ③ *Micro*Panel
- ④ Digital Occupant Sensor
- ⑤ Digital Control Station



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## Lighting Control & Design

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