Breakthrough Lighting
For Today's Changing Classrooms

ICLS

Integrated Classroom Lighting System

Proven to Meet the Needs of Today's Changing Classrooms

Better Learning
With Effective Lighting Modes

Today's classroom is a visual environment that uses technology like video projectors, computers, and interactive whiteboards to improve student engagement. The Integrated Classroom Lighting System (ICLS) delivers simple and effective lighting modes to maximize the impact of this technology and drastically reduce energy consumption.

Audiovisual Mode

The Audiovisual Mode improves the contrast of images projected on audiovisual screens or interactive whiteboards, and provides recommended light levels for note taking and maintaining proper eye contact between teacher and student.

General Mode

The General Mode delivers quality lighting for lectures, discussions, and general study work. Using indirect/direct luminaires, this mode eliminates glare that leads to eyestrain and headaches while integrating well with daylighting designs.

Focus Mode

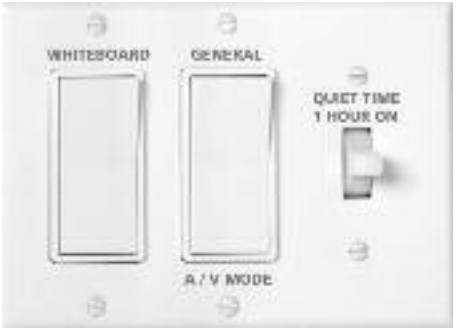
Combining the lower ambient illumination of the Audiovisual Mode with the task lighting from the whiteboard luminaire, the Focus Mode creates a calming environment that draws attention to board work.

Save Energy

With Simple Modes & Teacher Controls

Teacher Controls at the Front of the Classroom are Paramount

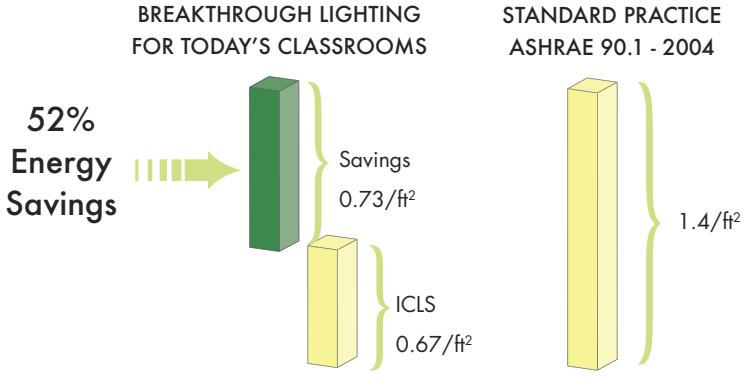
Research* shows that simple lighting modes, when coupled with easy-to-use switches placed at the front of the classroom, accommodate changing curriculum needs. Meeting these needs results in increased teacher satisfaction.



* *Detailed information on the NYSERDA Classroom Demonstration Project, including classroom templates, can be found on www.finelite.com.*

ICLS Saves Energy

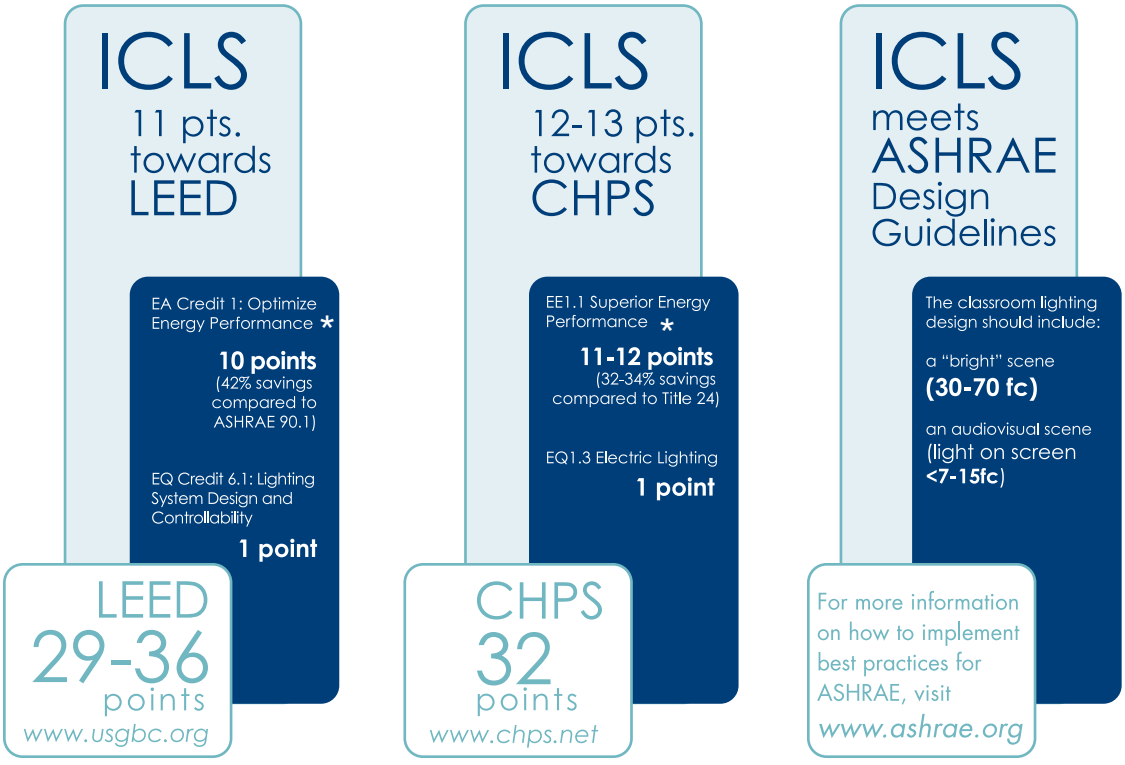
Simple, effective lighting modes result in dramatic energy savings. The more teachers that use Audiovisual Mode, the more energy will be saved.



*The NYSERDA classroom demonstration project showed ICLS resulted in **52% energy savings** compared to national best practices.*

Meet Best Practices

LEED, CHPS, & ASHRAE



* *Energy performance points are based on whole-school performance. ICLS delivers dramatic savings specifically for the classroom.*

Best practice guidelines from LEED, CHPS, and ASHRAE seek to improve the learning environment, making it a safe, healthy, and energy-efficient place for teachers to teach and students to learn. Get Finelite involved and understand how you can earn maximum points with ICLS.

- Use ICLS and achieve the classroom lighting requirements.
- Use ICLS and classrooms will achieve maximum energy performance points.
- Use ICLS to easily integrate daylight harvesting strategies.

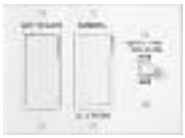
ICLS Is Easy to Implement

Implementing high-performance classroom lighting requires just five components. This simple template can be adjusted to accommodate a variety of project designs, including those employing daylight designs.

1 **Indirect/Direct Luminaires**
Two rows of two-scene indirect/direct luminaires are mounted perpendicular to the main teaching wall. Commonly used luminaires: Series X1, 16, 15, 14, 12ID, and Series 10.

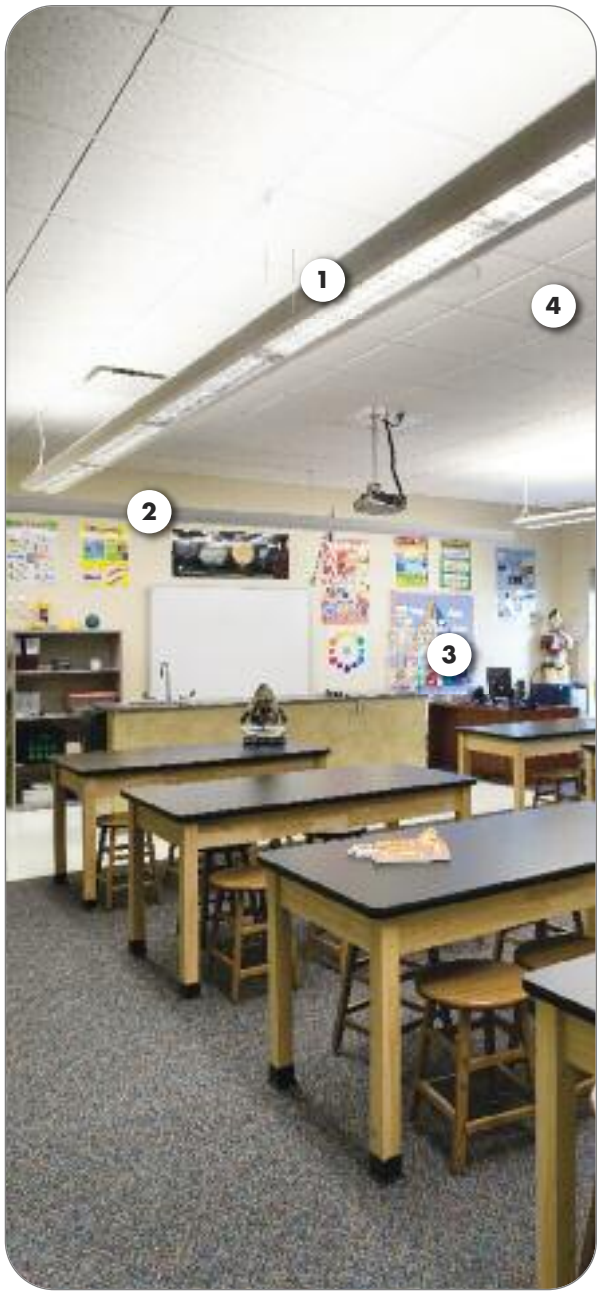
2 **Whiteboard Luminaire**
A dedicated luminaire illuminates the whiteboard on the main teaching wall: Series X2.

3 **Teacher Control Center (TCC)**
The TCC is placed at the front of the classroom within 6 inches of the whiteboard for easy teacher access.



4 **Sensors**
Sensors are placed in the center of the classroom and always include occupancy. Daylight harvesting is added where appropriate.

5 **Master On/Off Switch**
A master on/off switch is by every door to the classroom. (Not Shown)



Audiovisual Mode

For Today's Classroom

Finelite led the PIER 4.5 research sponsored by the California Energy Commission. This demonstration resulted in changes to the best practices for classroom lighting and demonstrates the importance of simple, effective, and affordable lighting for audiovisual modes.

Visual Learning Environment

Today's classroom is a visual environment where teachers use technology to enhance student engagement. Projectors and interactive whiteboards provide that central site in the classroom for sharing and discussing materials. Teachers use this video display medium to bring on-line lessons into the classroom as well as to bridge the gap between public and private learning by projecting and discussing student-created materials. These video displays need the appropriate lighting to maximize their benefit.

Audiovisual Mode

- Improves contrast of images projected on the screen.
- Delivers enough light to maintain eye contact between teacher and student.
- Provides enough light for note taking.
- Provides enough light to keep students awake.
- Delivers 10 to 20 fc (< 7 fc on the audiovisual screen).

Investment in Technology

Interactive whiteboards are excellent tools for the learning environment, and these devices need an Audiovisual Mode to enhance the learning environment. Simple, effective audiovisual lighting can:

- Improve contrast of projected images.
- Ensure that every student can see the materials presented.

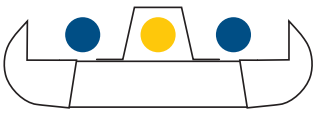
Achieving Audiovisual Mode

Two unique ICLS switching methods bring effective audiovisual lighting into your classroom, ensuring that students can see projected images while maintaining eye contact with the teacher. Choose the one that best meets your specific needs.

Uniform Audiovisual Switching Luminaire Specifics

The Uniform Audiovisual Switching luminaire uses a highly reflective optical element to separate the center lamp. The ICLS control system uses a simple and robust relay system to switch between General and Audiovisual Modes. To avoid costly energy waste, the unique ICLS system restricts the user to either General or Audiovisual Mode, never both.

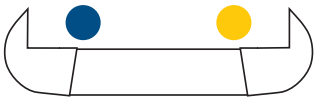
- Can be in General or Audiovisual Mode – never both.
- Features a 96% reflective optical element.
- Produces uniform audiovisual illumination.
- Results in dramatic energy savings.

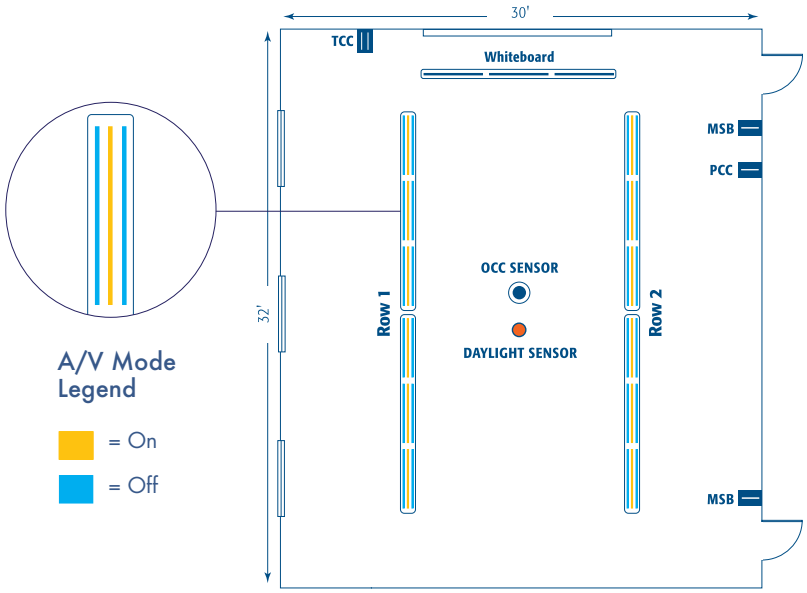


Front of Room Switching Luminaire Specifics

Custom wiring capabilities makes this Audiovisual Mode possible. This method uses a 2T8 cross-section luminaire, which minimizes the number of lamps and ballasts required.

- Extremely sustainable system.
- Excellent audiovisual illumination.
- Improved facial modeling.
- Dramatic energy savings.





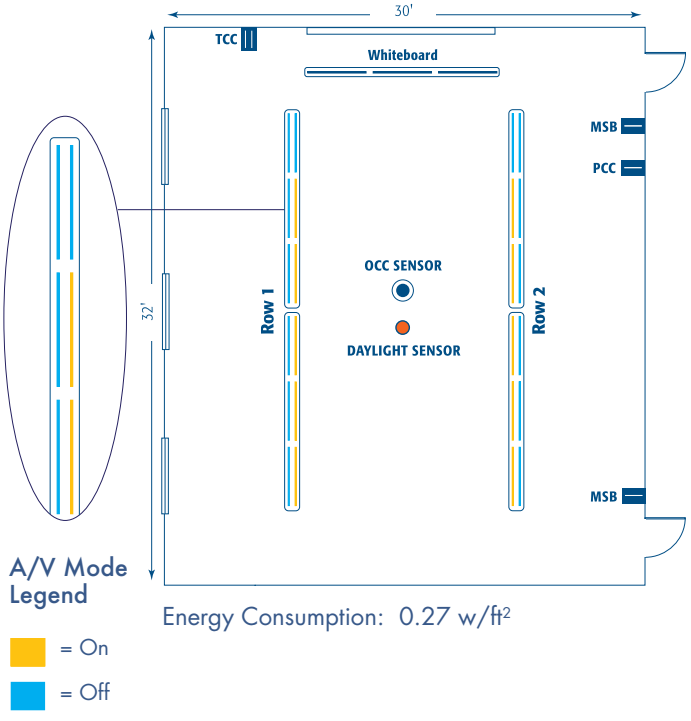
Energy Consumption: 0.35 w/ft²

Uniform Audiovisual Switching

Uniform Audiovisual Switching uses a 2-lamp/1-lamp cross-section luminaire with a highly reflective optical system over the center lamp. In Audiovisual Mode, the center lamp is turned on and the outer lamps are turned off, yielding excellent screen contrast and energy savings.

Front of Room Switching

The Front of Room Switching method uses a simple 2-lamp cross-section luminaire and switches off the lamps closest to the projection screen as well as one entire row of lamps in each row yielding excellent screen contrast, improves energy savings, and reduces the number of lamps and ballasts.

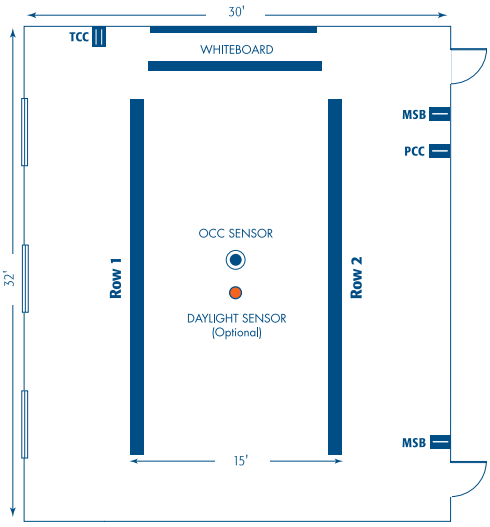


Energy Consumption: 0.27 w/ft²

The ICLS Template Is Effective

ICLS is easy to implement. See page 42 to see the system components. Follow these simple templates to implement best practices or contact Finelite with your specific plans. We will ensure that your project meets best practices.

Uniform Audiovisual Switching



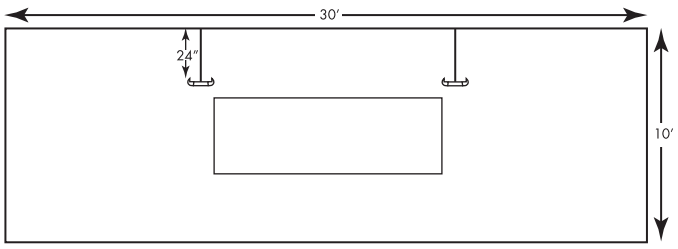
LEGEND

TCC = Teacher Conrol Center

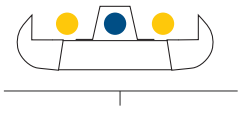
MSB = Main Switch Bank

PCC = Power Control Center (Above Ceiling)

Elevation View



General Mode

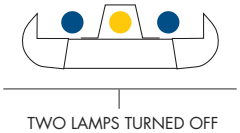


TWO LAMPS TURNED ON

ONE LAMP TURNED ON

Avg. Horizontal FC	Avg. Vertical FC Whiteboard	Power Density
49.5 FC	56.2 FC	0.85 w/ft²

Audiovisual Mode



TWO LAMPS TURNED OFF

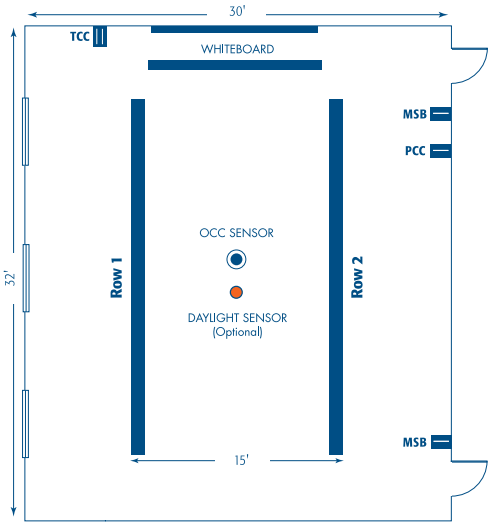
ONE LAMP TURNED OFF

Avg. Horizontal FC	Avg. Vertical FC Whiteboard	Power Density
23.2 FC	4.5 FC	0.35 w/ft²

Application Support

Our application team has extensive knowledge in laying out classroom lighting designs. Contact Finelite and have us complete your next classroom lighting layout.

Front of Room Switching



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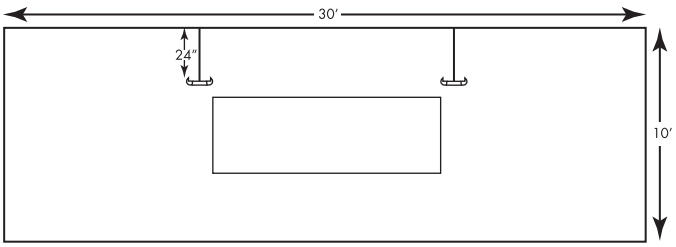
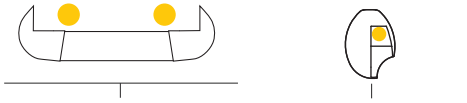
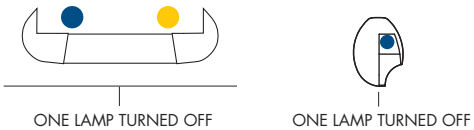


General Mode



Avg. Horizontal FC	Avg. Vertical FC Whiteboard	Power Density
45.6 FC	55.3 FC	0.85 w/ft²

Audiovisual Mode



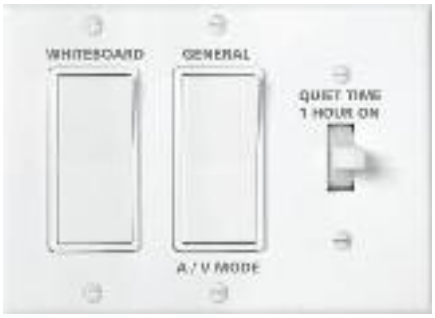
Avg. Horizontal FC	Avg. Vertical FC Whiteboard	Power Density
19.3 FC	6 FC	0.29 w/ft²

Simple, Effective Lighting Modes Yield Energy Savings

Simple and effective lighting modes coupled with easy-to-use teacher controls placed at the front of the classroom yield energy savings of 52 percent over national standards. The more teachers that use the lighting to improve the learning environment, the more energy savings will be realized.

Teacher Controls Are Key to Savings

Research shows that controls placed at the front of the classroom result in energy savings of up to 52 percent.



Save **42%** in General Mode

The General Mode provides enough light for lectures, discussions, and general study work and can be designed to consume just 0.8 w/ft^2. This energy level is 42 percent below ASHRAE 90.1 – 2004 yielding savings when all the lights are on.

Save **75%** in Audiovisual Mode

The Audiovisual Mode provides recommended light levels for audiovisual presentations and is generally designed to consume just 0.35 w/ft^2. This energy level is 75 percent below ASHRAE 90.1 – 2004. Teachers will reduce energy consumption as they use this mode to enhance the effectiveness of audiovisual presentations and interactive whiteboards.

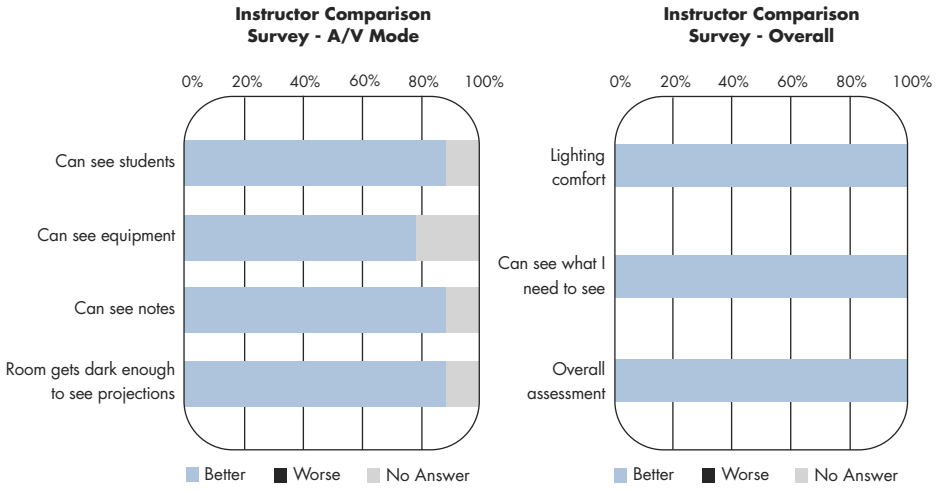
Save **69%** in Focus Mode

The Focus Mode adds another tool for the teacher to draw attention and calm students. This mode combines the whiteboard luminaire with the Audiovisual Mode and consumes 0.44 w/ft^2.

ICLS Is Affordable and Preferred by Teachers

Teacher Preference

Improved quality; simple, effective lighting modes; task-specific whiteboard illumination; and simple-to-use teacher controls make ICLS the preferred choice among teachers. Research conducted for NYSERDA shows that teachers prefer ICLS over the previous lighting used in the classroom.



* *Source: Classroom Lighting System Demonstration Research Study / Final Report, Pg.33.*

Affordablity

ICLS is affordable for every high-performance school project. Research shows that this system yields unanimous teacher acceptance.

Project size (three-floor high school)	58,000 ft^2
National median construction costs	\$171.43 / ft^2
Project cost	\$9,943,000
30 high-performance classrooms lighting systems	\$135,000
Percent of total project costs	1.3%

ICLS Is Easy to Install and Maintain

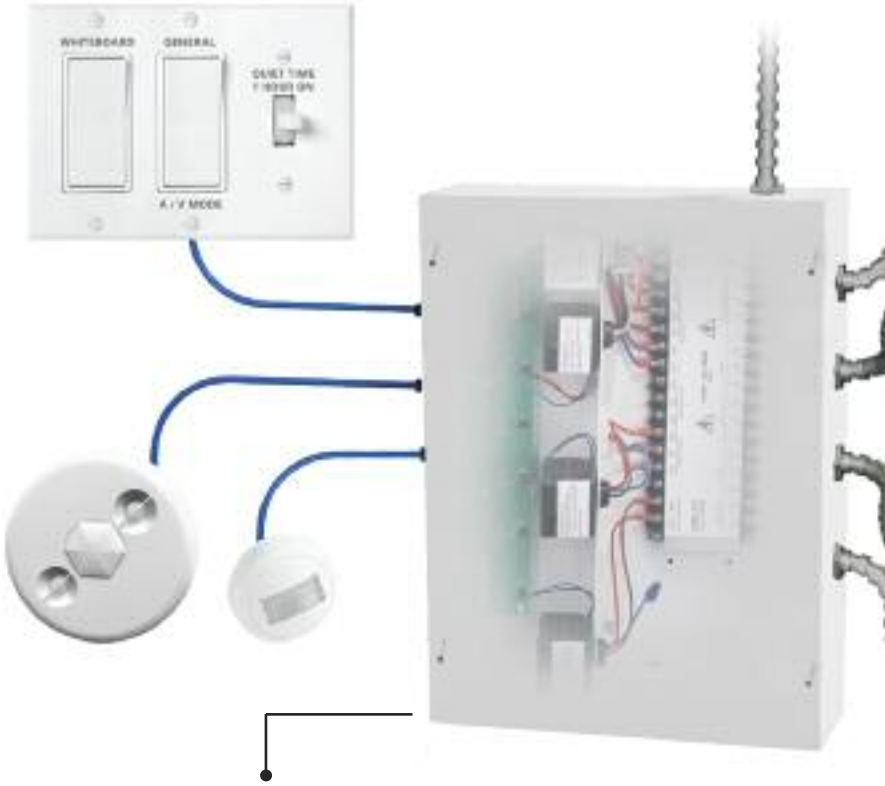
The Power Control Center (PCC) takes line voltage from building power and then carries power to and communicates with ICLS components. The base system requires no commissioning or software interface and drastically reduces the labor and materials required to install ICLS. This robust system is built to last the life of the school.

Teacher Control Center (TCC)

The TCC places easy-to-use lighting control at the front of the classroom. The TCC arrives on site prewired and is connected to the system using plug-and-play wiring, minimizing labor as well as wiring issues.

Occupancy & Daylight Sensors

Occupancy sensors and optional daylight dimming sensors are connected to the system using plenum-rated, plug-and-play wiring, minimizing labor as well as wiring issues. An additional occupancy sensor can easily be daisy-chained to the first sensor.



The PCC:

- Requires no commissioning
- Requires no software interface
- Reduces installation labor & materials

PCC Features

Terminal Blocks

Building and luminaire wiring is connected to the system using terminal blocks for easy and secure wiring connections.

Plug-and-Play

Connections to teacher controls and sensors are made by plenum rated plug-and-play connections.

Single-Source Warranty

ICLS is easy for contractors to install and for school districts to maintain. The system is covered by a five-year, single-source warranty on all electronic and interconnection components and two years on lamps.

Luminaires

ICLS luminaires arrive on site fully assembled and prewired. They incorporate many labor-saving elements, including On-Grid™ mounting, plug-together wiring, and our exclusive Gridbox™.

Whiteboard Luminaire

The whiteboard luminaire is generally positioned 30 inches back from the main teaching wall. The luminaire can be installed on-grid and features adjustable mounting points for easy installation.

Main Switch Bank

The main switch bank is positioned by each classroom entrance. Simple line voltage connections are made to the PCC.

Wiring Labels

Detailed wiring diagrams show each wiring connection.

Prewired Relays

Prewired relays are installed at the factory and undergo 100% quality control testing.

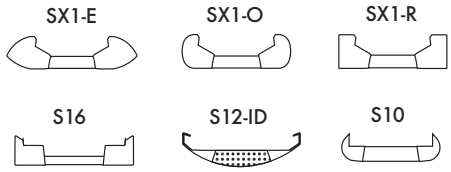
ICLS Ordering Guide

Specifying ICLS is Easy as 1, 2, 3

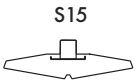
ICLS delivers the right lighting for today's learning environment and specifiying the system is easy. Use the following to select the right system for your project. Contact Finelite for additional information or assistance with your layout.

1. Select Luminaires

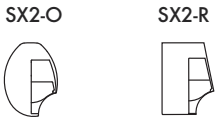
A wide variety of luminaires can be used with ICLS controls. Commonly used luminaires are listed here. See the specific luminaire specification sheet for ordering information.



Low Ceiling Luminaire
For portables or low ceiling applications, consider using Series 15.



Whiteboard Luminaire
Research proves that proper whiteboard illumination is vital for proper classroom communication.



2. Select the Audiovisual Style

Specify audiovisual style when ordering luminaires.
See page 44 for more information.

Uniform Audiovisual Switching
Developed during research conducted for the California Energy Commission, this system results in a very uniform illumination during audiovisual presentations with an intense focus on the audiovisual screen.

Front of Room Switching
This audiovisual style turns off lamps near the audiovisual screen to improve contrast. In addition, an entire row of lamps is turned off in each 2 T8 cross-section luminaire to reduce overall ambient illumination as well as energy consumption.

3. Select Controls & Sensors

1. Room Number

Include the actual classroom number so Finelite can include this type on each controls box.

2. Number of Rows

Identify the number of luminaire rows in the classroom. Do not include the whiteboard luminaire. Contact factory for more than 4 rows.

a. 1R = 1 Row.
b. 2R = 2 Rows.
c. 3R = 3 Rows.
d. 4R = 4 Rows.

3. Voltage

a. Identify site voltage: 120V or 277V.

4. Dimming

a. Identify dimming requirements. Select ALD dimming option when using Daylight Dimming (DD) controls.

i. 00 = No Dimming.
ii. CLD = Center Lamp Dimming (Uniform A/V Switching).
iii. ALD= All Lamp Dimming.

5. Occupancy Sensors

Identify the number of occupancy sensors required in the space and mounting type. Ceiling mounted is standard.

a. OS1 = One Occupancy Sensor.
b. OS2 = Two Occupancy Sensors (plus one additional plug-and-play cable).

6. Daylight Harvesting

Identify daylight harvesting requirements. Select ALD dimming option when using Daylight Dimming (DD). Specify which lamps are to connect to the sensor.

a. NDD = No Daylight Harvesting.
b. DS = Daylight Switching.
c. DD = Daylight Dimming.

7. Whiteboard Luminaire Controls

Identify requirements for whiteboard luminaire control. The necessary electrical equipment and Teacher Control Center switches will be included.

a. NWL = No whiteboard luminaire control.
b. WLLV= Add whiteboard luminaire control to the low voltage Teacher Control Center.
c. WLHV= Add a separate line voltage control switch for the whiteboard luminaire.

8. Row Control (Main Switch Bank)

Identify Main Switch Bank controls for providing on/off control at primary room entrance.

a. 00 = No Finelite supplied switchbank controls.
b. MSB1 = Independent control for two luminaire rows.
c. MSB2 = Independent control for three luminaire rows.
d. MSB3 = Independent control for two luminaire rows and a whiteboard luminaire.
e. MSB4 = Independent control for three luminaire rows and a whiteboard luminaire.
f. MSB5 = One single master control for all luminaires. Add X to any of the above to double controls for a 3-way wiring installation. *Example = MSB1X will result in two sets of two independent row controls.*

9. Laser Engraving for Main Switch Bank

Laser engrave the main switch bank faceplate for easy function identification. The Teacher Control Center is always engraved. The standard is to label rows from left to right with Row 1 on the left. Contact factory for custom labeling.

a. NLE = No laser engraving.
b. LE = Laser engraving for Main Switch Bank.

Ordering Example

Room #1 — 2R — 120V — CLD — OS1 — NDD — WLLV — MSB3 — LE

1. 2. 3. 4. 5. 6. 7. 8. 9.