

## Network Powered Lighting for Educational Facilities



*The smartengine deployment at the accadis International School in Bad Homburg, Germany has an incredibly low consumption of 6 kWh at peak for lighting 45,000 sqft. of their facilities.*

“

Together with wtec, we are showing our students a very special version of green energy. while at the same time our energy savings for lighting are over 80%.

”

- Prof. Dr. Kexel, Managing Partner  
@ accadis International School

Designing schools and educational facilities requires planning that focusses on the comfort, productivity, and safety of the occupants along with future-proofing and sustainability. The smartengine platform provides an infrastructure for smart lighting and a fine mesh sensor network that can not only help achieve the aforementioned topics along with collecting data about the space in real-time helping solve many of the challenges we are faced with today. In addition to collecting data, an easy-to-use interface allows building operators the ability to manage their building on day two along with making informed data driven decisions based on the activities of the students, visitors and staff.

smartengine’s infrastructure is the backbone to both power and control light fixtures along with a fine-mesh sensory network using standard low voltage Cat5 or Cat6 cabling eliminating the need to install expensive conduit and wiring; methods that are traditionally used in buildings today. This allows an advanced building control network to be designed without increasing the costs of the project. Many times, the savings from unneeded infrastructure alone can reduce overall capital expenditures associated with creating smart buildings.

### REDUCED OPERATING EXPENSES

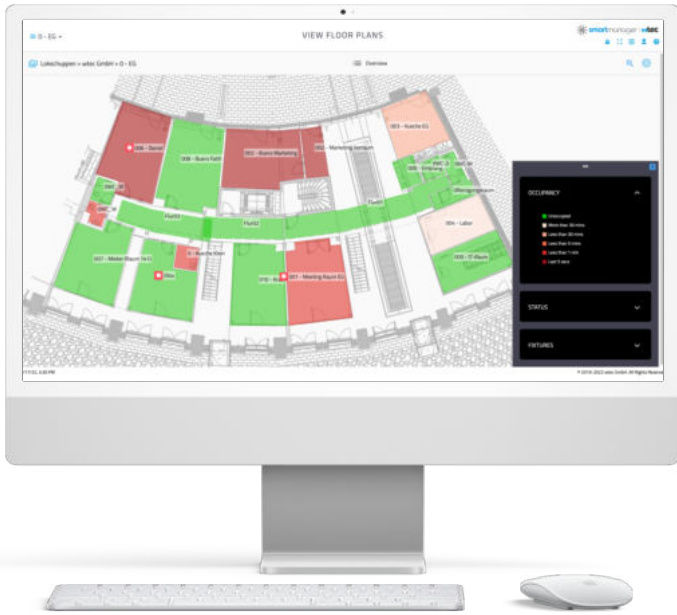
smartengine helps reduce a buildings total operating expenses for lighting, cooling and heating by up to 34%, this is achieved by delivering real-time data to the BMS system to optimize HVAC operations and best in class lighting efficiency with LPD averages of 0.1 to 0.3 Watt/ft. Maintenance costs can also be greatly reduced because the light fixtures do not require a localized driver or emergency battery. If issues with the lighting were to arise, the smartengine software reports these in real-time alerting facility operators allowing for easy troubleshooting or repairs.

### FINE MESH SENSOR GRID ENABLE SMART BUILDING USE CASES

smartsensors are physically located at each light fixture, which allows for very granular data to be collected in real-time. smartsensors collect the following data points: power usage, motion, illuminance, temperature and can generate and detect Bluetooth beacons in the iBeacon format. The data collected can be shared with the building management system and other 3rd party systems using RESTful, Unified, BACnet/IP and MQTT API’s.

KEY BENEFITS	
Sustainability	<ul style="list-style-type: none"> <li>Reduce energy for lighting by up to 80%</li> <li>Average LPD of 0.1 to 0.3 Watt/ft<sup>2</sup></li> <li>Earn up to 29 points for LEED Credits</li> </ul>
Well-being	<ul style="list-style-type: none"> <li>Human Centric Lighting through precision dimming and tunable white LED fixtures</li> <li>Daylight Harvesting at a per fixture level</li> </ul>
Smart Education	<ul style="list-style-type: none"> <li>User-friendly web interface for easy lighting management</li> <li>Space Analytics for valuable building utilization insights</li> <li>Floor Plan Manager for real time location information at a glance</li> <li>Open APIs for integration with third party systems</li> </ul>

## FEATURING OUT-OF-THE-BOX SMART APPLICATIONS



### REAL-TIME FLOOR PLAN MANAGER

Floor Plan Manager provides real-time insights into your building's health and utilization on a floorplan basis.



### SMARTMANAGER

Via the smartmanager, a browser based UI on the smartdirector, reports and graphs for space analytics as well as a floor plan tool are available to the building operator to allow for easy adjustments to the system from a single pane of glass. Scenes and lighting schedules can also be set in the smartmanager or local adjustments can be made using scene control wall switches.

### SPACE ANALYTICS TOOL



Data provided from smartsensors can help decision makers better understand how their spaces are being utilized and allow for informed decision making about how to most effectively use classrooms, public spaces, multi-purpose rooms and other spaces in their buildings.

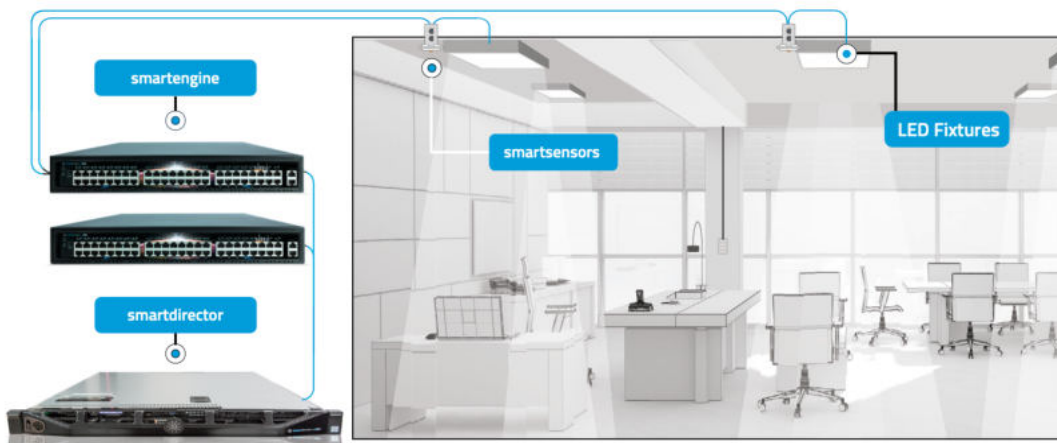
### HUMAN CENTRIC LIGHTING



Human Centric Lighting (HCL) is easily accomplished using smartengine. Light fixtures that have color-tuning capabilities allow for dynamic control of the color temperature from warm to cold, back to warm, similar to the sun's movements from sunrise to sunset. Research has proven that people perform better when the lighting matches our natural circadian rhythms.



## SMARTENGINE INFRASTRUCTURE



The **smartdirector** provides a browser based user interface for all of the smartengine devices, stores smartsensor data and provides web services and BACnet/IP APIs.

The **smartengine** provides power, control and communication for LED fixtures and smartsensors.

The **smartsensors** capture real-time data on motion, temperature, brightness and power consumption.