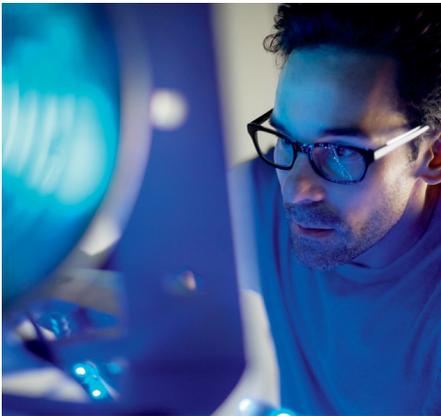


A lightbulb moment: Ersúles makes lighting smart

Intel® Atom™ Processor E3826

Intel® IoT Gateway Development Kit DK300 Series

Internet of Things



Challenges

- **New application.** Internet of Things (IoT) solutions have been used to solve various challenges in facilities management and operations, but not in lighting
- **Boost efficiency.** Offices, factories, and other workplace buildings use a lot of energy, especially for lighting. Ersúles wanted to reduce energy output with smart lighting controls
- **Data waste.** Ersúles wanted to integrate its range of energy-efficiency solutions into an IoT platform so that data from sensors could be gathered, collated, filtered, and analyzed to transform and optimize client operations

Solutions

- **IoT.** Ersúles deployed the Intel® IoT Gateway to seamlessly interconnect its smart controls and ensure a secure, uninterrupted data flow between them
- **Significant capacity.** Intel® Atom™ processors E3826 in the gateway devices provide the computing power and throughput needed to gather all the incoming data, normalize it, and send it to the cloud via the Wind River – Helix Device Cloud* (HDC)*
- **Top security.** The Intel IoT Gateway was developed using the Intel IoT Gateway Development Kit DK300 Series, which has built-in enterprise-grade security, such as McAfee® Embedded Control*, secure boot*, and encrypted storage

Impact

- **Smart lighting.** Ersúles is bringing connected technology to the lighting industry and expects to make a big impact over time, in collaboration with Intel, McAfee and Wind River
- **Cloud connection.** Data from the gateway devices is stored in the cloud for easy review and analysis through a simple Ersúles* dashboard application on the user's PC or mobile device
- **Energy savings.** Thanks to smart lighting, building environment and resources can be automatically monitored, with potential energy savings of up to 90 percent¹. Users can also monitor and optimize on energy and space utilization

Intel® Atom™ processor-powered Ersúles gateways deliver connected, smart lighting

“Opening up the lighting industry to the myriad possibilities the Internet of Things brings has been made possible thanks to Intel’s dedication, expertise, and state-of-the-art technology. Intel® IoT Gateway helps us to connect luminaires to the cloud, integrate with clients’ existing infrastructure, and securely manage the collected data.”

– Elliott Murphy-Kerry,
Chief Operating Officer,
Director, Ersúles

Energy-saving lights

Established in 2002, Patina Lighting is a lighting design and manufacturing company that has developed a range of innovative smart lighting technologies, specializing in innovation, optical design and energy efficient lighting optimization. The company has a hard-working R&D department that focuses on developing solutions that are practical and technically appropriate for industrial and general lighting installations. It has sales and distribution channels across Europe, the Middle East and Africa, and caters to many Intel sites globally.

Moving beyond simple lighting technology, Patina Lighting has a successful intelligent lighting offering with elements of integrated controls in the luminaires that can, for example, switch on and off and dim depending on occupancy and external light sources. A key goal is to reduce energy waste for organizations with large office spaces like factories and warehouses, which can have hundreds of thousands of lamps. For instance, recent projects over the last few years have included lighting supply, installation, and project management for Intel offices in Leixlip and Shannon in Ireland, Swindon in England, Munich in Germany and Amsterdam in The Netherlands. Across these projects alone, Patina Lighting replaced 33,470 lights, saving 23 Gigawatt hours (GWh) in annual energy consumption, almost USD 3 million in annual lighting costs and 1,258 metric tons of annual carbon dioxide emissions. To put the enormity of this energy saving into perspective, if you put together all the power-generating stations around Niagara Falls, they can produce only about 4.4 GWh of power.

Pushing the energy-saving agenda, the team of directors at Patina Lighting realized the potential in luminaires as connected devices that could “talk” to each other. Such smart lights could react even more intelligently to save energy and enable better building management, thereby reducing other resource drains like lighting costs. For instance, with connected, smart lighting, the system can record how long certain areas are occupied and project future usage. This is very helpful for accurately estimating costs and limiting stock intake.

To achieve this next level of truly smart lighting, the company would have to shift to be a heavily IT-focused service provider able to capture and analyze data and manage clients long-term, as well as a smart luminaire manufacturer. So Patina Lighting spun out a sister company called Ersúles. “Thanks to Patina Lighting’s heritage, we have already demonstrated competency in the lighting sector,” said Elliott Murphy-Kerry, chief operating officer, director for Ersúles. “Being able to access Patina’s industry-leading R&D puts us in a strong position to help companies experience the cost savings made possible by investing in smart lighting solutions.”

Making lighting smart

Thanks to the Intel IoT Gateway, Ersúles has created a smart lighting management solution powered by Intel Atom processors. This includes easy-to-install sensor fittings which can track data. Typically, a deployment involves one gateway fitting per room, or per 20 light fittings, since most luminaires are sensor control modules that interface with the gateway luminaire. Such smart light sensors can measure their

environment, from carbon dioxide and oxygen levels to temperature and humidity. This data is captured by the gateway. They can be reactive to natural light as well, automatically and dynamically adjusting light levels depending on the environment. “We are especially excited about our Bluetooth* beaconing offering, whereby our smart luminaires can track an individual’s Bluetooth signal from their smartphone and alter the light levels based on their personal preferences,” said Murphy-Kerry. “If their profile is set up and connected, the system can recognize when a particular person enters a meeting room and lower the lights to their preferred presentation mode.”

With smart lighting, companies also have the ability to integrate their lighting solution within a wider building management system. For instance, using such an IoT solution, a company could monitor when a light source is close to end-of-life and directly reorder through a connected stock management system. From a maintenance perspective, data gathered via the IoT could inform a company which parts were needed for a particular job.

“This technology will drive efficiencies,” said Murphy-Kerry. “By tracking a security guard, for instance, the lights could turn on just for him, limiting lighting usage. From a cost-saving point of view, our smart controls can also monitor wattage and so calculate how much energy each light fitting is using, giving good insight into overall lighting costs. This is very valuable for a building manager, whose annual lighting bill can really add up. We can track power consumption as well, to easily identify and fix or replace any devices that are not delivering energy efficiency, helping us secure sustainability for the future. The value of smart lighting for companies is mainly in either reducing operating costs and streamlining processes or providing information that allows our clients to optimize the use of facilities and resources.”

The benefits of smart lighting are wide-ranging, from improving the employee environment to streamlining operations and boosting energy savings. To achieve these, companies need an ongoing relationship with their smart lighting provider to make use of the data collected by their smart lights. Therefore, Ersúles wants to be able to manage clients long-term. “We see the potential for greater market segment capture with this lighting-as-a-service approach,” said Murphy-Kerry. “Intel is helping us revolutionize our business model and deliver the sort of technical support — including data management and support for remote management of lights — that is necessary given our ongoing client approach. This is a major opportunity for all parties, since smart lighting generates a lot of prospects for innovation.”

Lighting-as-a-service

“To get their smart lighting offering off the ground, Ersúles needed IT expertise. Intel IoT Gateways are the result of Intel’s collaboration with McAfee and Wind River, so Intel was able to provide Ersúles with the base layer of technology. By providing pre-integrated, pre-validated hardware and software building blocks, the gateways connect legacy and new systems and enable seamless and secure data flow between edge devices and the cloud. Ersúles has also developed a dashboard application to let clients access their data. “Users can see the output of all the smart lighting data collection through an app for both iOS* and Android*, enabling them to keep up to date with all their building information using a single dashboard,” said Murphy-Kerry. “Since data is stored securely in the cloud, if one of the gateway devices fails, all the customer needs to do is plug in a new one, and all their old settings and data will be restored. Thus, each gateway delivers an always-on service.”

“The Ersúles Intel IoT Gateway lighting control and smart building solution was

developed using the Intel IoT Gateway Development Kit DK300 Series, but originally the team started using the Intel IoT Gateway Development Kit DK50 Series, which shows how much we have scaled up,” said Murphy-Kerry. Since Ersúles started business, its need for a solid developer team has also grown, in order to offer clients its lighting-as-a-service solution.

The team hired a software architect to work in-house and work closely with a Wind River team to drive software development. This team is helping Ersúles to integrate the HDC into their offering to make sure it can provision its gateways remotely. Utilizing this system, Ersúles is able to dynamically scale up from 100 to 100,000 gateways automatically as demand grows. “Anyone can do an IoT trial with 50 luminaires, but when you are trying to deploy 50,000 you need scalability and a reliable infrastructure. Intel supports us in delivering that,” said Murphy-Kerry. “Working with large, trusted, and scalable suppliers of services and solutions has really helped us to accelerate our business development. The marketplace has confidence in the Intel brand, Intel® technology, and particularly Intel Atom processors. We have felt the benefit of having this association and have drawn strength to delve into the world of the IoT thanks to Intel’s support.

“What also became clear as soon as we sat down with the Intel team was that this was a company with a vision of an IT-enabled future that chimes with our own and has a clear roadmap for getting there,” said Murphy-Kerry. “We chose Intel following a supplier review because it can provide the full package and support us in this new venture. Our end decision was really easy because we had to look at what companies could supply. Intel ticked our boxes. Connectivity, manageability, and security are the three most important elements of our system, since they needed to be part and parcel of our offering. We can trust Intel to deliver,

which means we can also gain the trust of our customers as we move into this new area.”

Securely connecting to the IoT

Intel IoT Gateways enable the connectivity of legacy industrial devices and other systems to the IoT and integrate technologies and protocols for networking, embedded control, and enterprise-grade security, making them invaluable for Ersúles' offering. These luminaire controls connect to the cloud within minutes, meaning they can collate the data coming in from the sensor devices and then send it to the cloud for review and analysis. Security is enforced automatically, since a security key is issued to each device as soon as the gateway connects to the cloud. This means all data sent to and from the gateway device is encrypted for optimum data privacy.

Security is paramount when dealing with this kind of data collection and transfer, so built-in precautions, such as McAfee Embedded Control*, Secure Boot, and Encrypted Storage, are crucial. “Security is vital,” said Murphy-Kerry. “If someone was to know the direction people were going around a facility, there would be major opportunities for that to be misused. A key consideration when you are deploying into large environments in business is that your clients are looking to give you access to their

corporate management system, so security is crucial. They really like the integrated security Intel technology offers. Also, when there are upgrades, deployment is easy and quick because this is a commercial-grade management solution. Our platform is really rigid, with built-in security and encryption at every level.”

Going global

Ersúles has big ambitions for smart lighting and smart buildings using lighting as a base deployment, with significant commercial trials already underway in various regions. “We are very excited to bring the IoT to commercial lighting infrastructures. In a pleasingly circular way, our biggest trials are happening at Intel sites,” said Murphy-Kerry. “We are running smart lighting and building controls trials at multiple Intel locations. These trials are ranging from 10 to 50 pieces per site. We expect results indicating that smart lighting generates even better energy savings than intelligent lighting.

“Our controls offering can deliver energy savings even greater than those currently in reach thanks to intelligent lighting,” Murphy-Kerry said. “However, the option for data to be fed into existing management systems is where the biggest opportunities lie. Smart lighting covering an entire facility will make a huge difference as we can monitor it constantly and optimize

on the status quo. For example, if combined with a marketing system, the data we gather could be useful to determine optimum space utilization and used — for instance, in the retail sector — to highlight the most common route through a store and so help determine positioning for marketing or giveaways. The possibilities are endless, and the value to such data capture is yet unknown. It is all about how the data can be used.”

Lessons learned

While intelligent lighting has been a great step forward and helped organizations save on energy, it is just the tip of the iceberg. With Ersúles smart solutions, it is possible to personalize lighting options, automatically alter atmospheric conditions, and forecast lamp lifetime and inventory requirements, resulting in significant savings on building resources. With Intel's support, it is easy for non-technology companies to bring technical services to market, embrace the IoT, and scale up.

[Find the solution that's right for your organization. View success stories from your peers and check out the IT Center, Intel's resource for the IT Industry.](#)



¹ Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more information go to www.intel.com/performance

Intel does not control or audit the design or implementation of third party benchmark data or Web sites referenced in this document. Intel encourages all of its customers to visit the referenced Web sites or others where similar performance benchmark data are reported and confirm whether the referenced benchmark data are accurate and reflect performance of systems available for purchase.

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. Check with your system manufacturer or retailer or learn more at <http://www.intel.com>

Intel, the Intel logo, and Intel Atom are trademarks of Intel Corporation in the U.S. and other countries. *Other names and brands may be claimed as the property of others.