

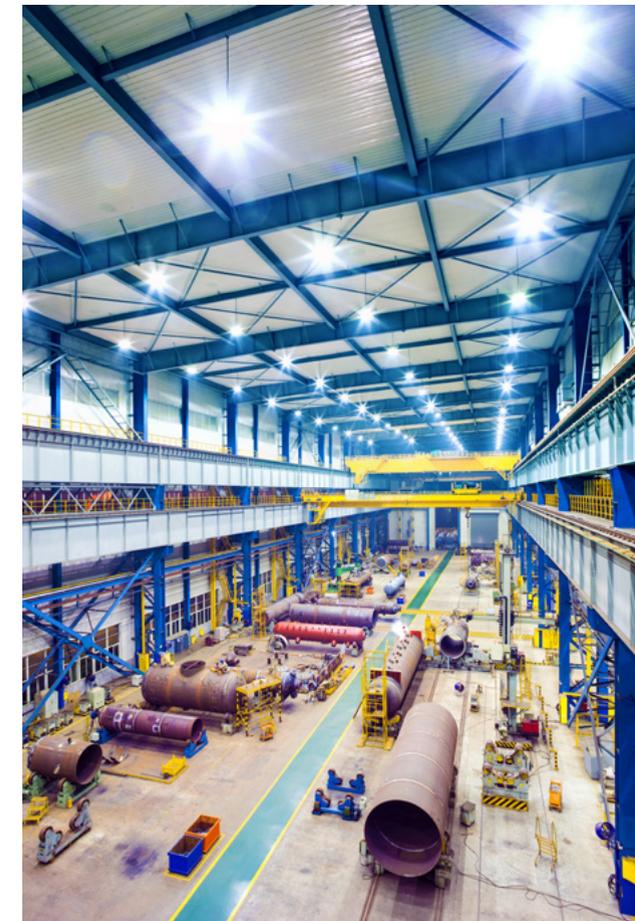
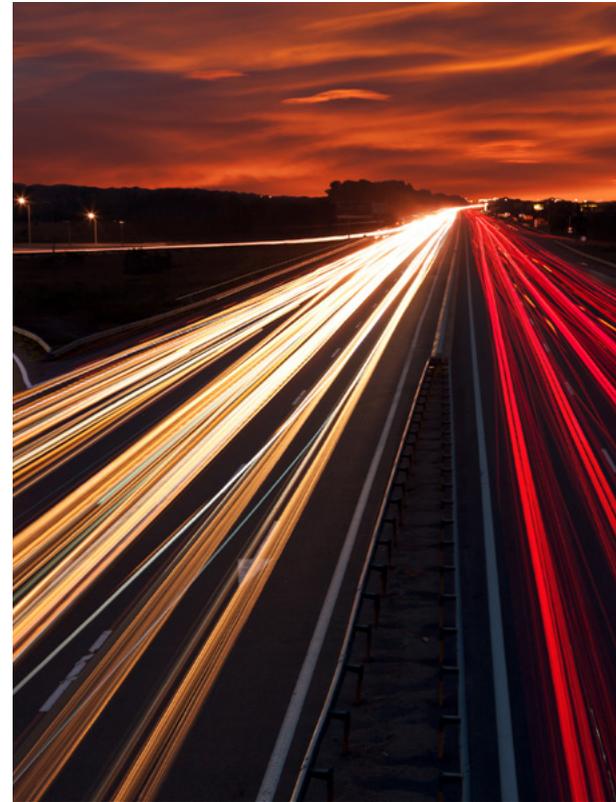
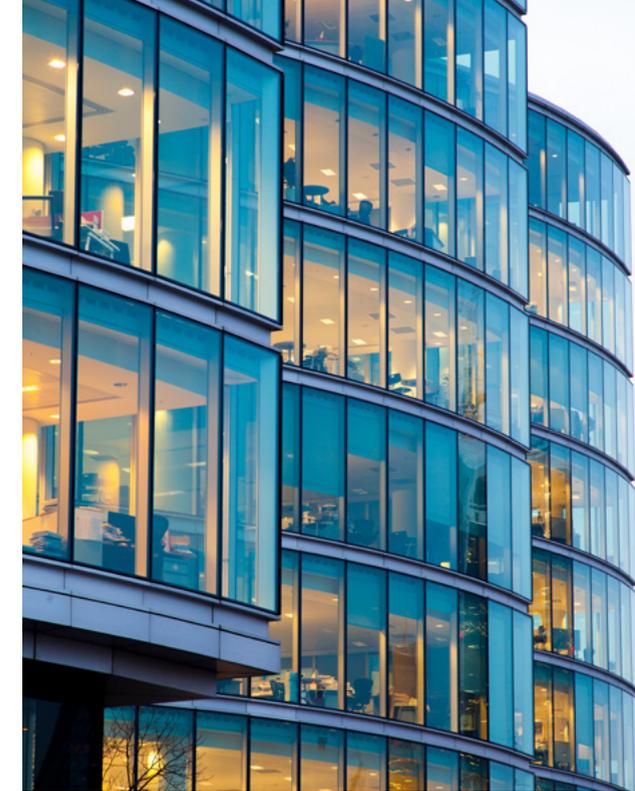
INTELLIGENT LIGHTING FOR BRIGHTER TOMORROWS

How smart lighting injects
intelligence into factories

IN ASSOCIATION WITH:



GE Digital



INTRODUCTION

Lighting may not seem like cutting-edge technology. But when humble light fixtures are outfitted with sensors and connected to the cloud, they can unleash truly brilliant ideas.

Intelligent lighting makes cities less congested, more efficient and safer. It makes factories more productive and commercial buildings more efficient.

And that's just the beginning. As more systems sync up and developers use open platforms to create new applications, people in all walks of life—from scientists to factory managers to ordinary citizens—will have new ways to improve their environment.

This connected world may sound far-fetched, but businesses and municipalities around the globe are already using sophisticated lighting to pave the way to a brighter future. This e-book will explore how companies like Current, a smart energy startup within GE, are creating the next generation of lighting. We'll show how Current is combining GE's data analytics with Intel's computing and security solutions to help factories run more efficiently.



Factory managers are always on the lookout for ways to increase revenue and save money. Intelligent lighting with integrated sensors can help them do both. These lights can monitor factory conditions to boost throughput, improve quality control and decrease operational costs.



WHAT INTELLIGENT LIGHTING CAN DO FOR FACTORIES

Current, a smart energy startup within GE, is combining GE's data analytics prowess with Intel's cutting-edge computing and security expertise, and has created intelligent lighting systems that provide new solutions to age-old problems.

Consider how GE is using lighting to reduce downtime. At a plant run by GE Power, GE and Intel are installing LED lights with embedded sensors. These lights will measure the temperature near a turbine assembly stand, where it's critical for parts to be heated and cooled at a uniform rate. By tracking temperature

with intelligent lighting, the factory expects to identify potential defects that could avoid rework—and avoiding weeks of possible downtime.

Temperature information will be sent to Predix, GE's cloud-based platform designed specifically for industrial-grade internet of things (IoT) applications, which will use Intel technology to deliver readings in real time along various points of the turbine as parts are heated and cool down. Data will be visualized allowing the workers to know if there is a potential defect.



MANY PATHS TO ROI

Other factories could find their own ways of using intelligent lights. For example, intelligent lighting could help managers better understand utility costs, leading to more energy-efficient decisions.

24%

GE itself used intelligent lighting to reduce energy consumption in its manufacturing facilities by 24%.¹

Intelligent lighting could detect malfunctions or parts that are wearing down, benefiting both product quality and equipment maintenance. Or it could optimize air quality, enabling manufacturers to maintain safe conditions without running ventilation systems excessively.

No matter what factories do with their intelligent lights, they will save energy just by installing them. Considering that the industry accounts for

33% of the world's energy consumption,

switching to LEDs could have a considerable impact.²



HOW INTELLIGENT LIGHTING WORKS IN FACTORIES

Factories are full of equipment, some new, some old and all of it made by different manufacturers. As a result, factory information is often fragmented or compartmentalized. To be effective, intelligent lighting needs to work with many kinds of equipment and technologies. It needs to scale easily and deliver results to workers in the field as well as those in the executive suite. And, of course, state-of-the-art security is a must.

Current's open architecture works with sensors, bulbs and other hardware made by a wide range of manufacturers. This allows factory managers to choose the best products for their needs rather than forcing them to buy compatible brands.

Public cloud infrastructure doesn't support the multi-terabyte data generated by factory systems, and it doesn't provide adequate security. The Predix cloud is expressly designed for industrial workloads—it can process terabytes of data a day. Running on Intel processors with built-in security features, the Predix cloud handles vast amounts of information securely. Every layer of the Predix system is monitored and scanned for vulnerabilities.

The open architecture allows third parties to build apps and services. Sensors can be connected to new or old machinery made by any manufacturer. And they can be easily scaled to meet growing or diminishing production needs.

Because Predix uses Intel processors everywhere, applications can move freely to where they are needed. Manufacturers don't have to worry whether they should deploy intelligence in the cloud or in the factory—both options are always open.

Predix data can be safely shared with field workers and plant managers to improve operations in real time. In the C-suite, this information can help executives and data scientists make big-picture decisions.

Factory machines spit out tons of information, but it often isn't coordinated in a way that helps managers solve problems. Intelligent lighting can zero in on manufacturing processes and collect pertinent information to streamline the work.



LIGHT YOUR PATH FOWARD

Factory operators can save money and improve efficiency with intelligent lighting. Tapping an open architecture enabled by Predix cloud and the universality of Intel processors, these managers can beam intelligence broadly across operations or focus it like a laser to solve specific problems. With GE's expertise in big data analytics and Intel's cutting-edge processing and security, no problem is too big or too small to solve.





PARTNERING FOR IOT SUCCESS



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Intel's partnerships with IoT leaders like GE is bringing transformational change to organizations worldwide. With best-of-breed solutions for smart cities, smart grids, smart buildings, and smart factories, these partners are proving the value of collaboration.

To see how you can benefit from this partnership, visit <http://bit.ly/2IkVdLB>

REFERENCES

¹ <https://www.ge.com/digital/blog/hannover-message-make-industrial-internet-work-you>

² <http://www.gereports.com/smart-leds-are-starting-to-revolutionize-manufacturing/>