EnOcean
Self-powered IoT

CASE STUDY

Delmatic uses EnOcean's SmartServer™ IoT to Connect Lighting Controls to BMS for Award Winning Solution at 2022 World Cup Football Stadium

SmartServer IoT Seamlessly Networks DALI to LON and BACnet BMS

Exec summary

Delmatic, an international supplier of advanced lighting management solutions, was appointed to provide a sustainable lighting control solution for Ahmad Bin Ali Stadium, one of the major sporting venues hosting the FIFA World Cup Qatar 2022™. The company's innovative lighting control system combines DALI lighting, LON controllers, and BACnet/IP communications to connected services and applications. The seamlessly integrated solution enables the stadium Building Management System (BMS) to effectively control the lighting system, contributing to the tournament's sustainability goals. Delmatic chose EnOcean's SmartServer IoT to network the DALI lighting management system and ensure open and seamless communication and data optimization with the stadium BMS.

The challenge

Delmatic are leading international suppliers of advanced lighting management solutions specializing in open, connected systems using protocols including DALI-2, LON, BACnet, and IP. Delmatic were appointed to provide a lighting control solution for the 92,000 sq. meter Ahmad Bin Ali Stadium, one of the major sporting venues hosting the FIFA World Cup Qatar 2022™. Delmatic was tasked with delivering the highest levels of sustainability toward the overarching goal of achieving the first-ever carbon neutral tournament.

Delmatic's innovative lighting control solutions for the event provide addressable scene-setting of normal, emergency and decorative lighting across the stadium canopies and façades. The solutions are based on DALI/DALI-2 (Digital Addressable Lighting Interface), a dedicated protocol for digital lighting control that enables the easy installation of robust, scalable and flexible lighting management networks. For Ahmad Bin Ali Stadium, Delmatic's DALI lighting control modules use LON FT, a robust fieldbus that allows for cable runs of up to 1000 meters.

Delmatic needed a solution that would easily route the FT signals from the LON-based lighting control modules onto Ethernet so they could take advantage of the speed and flexibility of an IP based backbone network. They also needed the solution to act as a BACnet gateway to enable the LON based DALI lighting control modules to connect with the Building Management System (BMS).

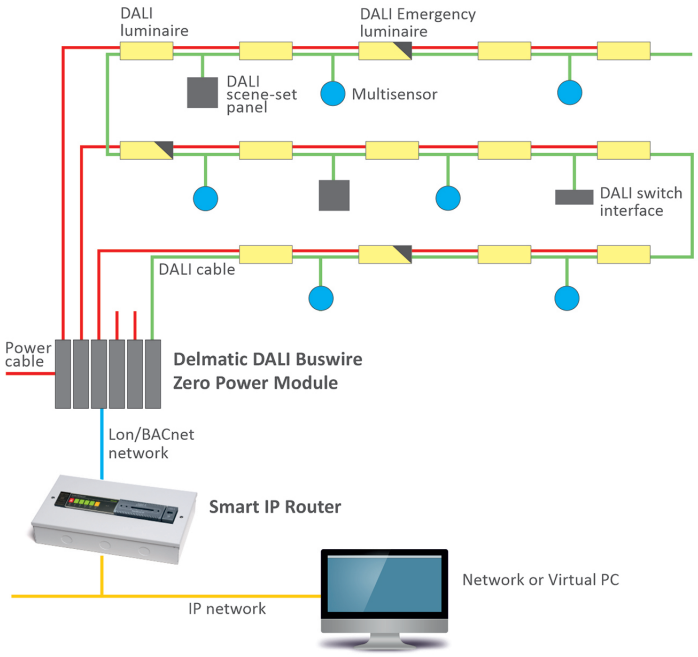
The solution

Delmatic chose the SmartServer IoT from EnOcean to act both as a LON router for the lighting control modules as well as a BACnet gateway to enable the lighting control system to communicate with the BMS. SmartServer IoT is an open, easy to use, freely customizable, BTL-ready edge server that enabled Delmatic to seamlessly and securely connect their DALI controllers to the LON based lighting control network via Ethernet (IP) and integrate the control modules to the BMS via BACnet. Delmatic had used the SmartServer IoT for previous projects and knew they could get it up and running quickly and easily.

SmartServer IoT plays a critical role in the stadium-wide lighting management system architecture, as part of Delmatic's Smart IP Routers that ensure open and seamless communication across the horizontal and vertical networks and optimize transmission of data. Within the Ahmad Bin Ali Stadium lighting control system, sixteen IP/LON routers control 584 LON nodes.

Delmatic's Smart IP Router with SmartServer IoT

Data from all sixteen routers is converged into one SmartServer IoT, which effectively routes the LON messages through its standards-based data fabric called the IoT Access Protocol (IAP), which provides a common information model and standard services that are harmonized with BACnet object models. Using an MQTT based message bus, IAP enables autonomous cross communication across disparate protocols and services, handling all translations and data normalization. It creates digital twins of the LON control modules and feeds them into the BMS, which sees each LON module datapoint as native BACnet datapoint.



Schematic of the Delmatic lighting management system at Ahmad Bin Ali Stadium

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To maximize operational efficiency and sustainability, the Delmatic lighting management system is capable of tracking the Ahmad Bin Ali Stadium's energy usage, and sharing key sensor data with connected services and the BMS via BACnet/IP. A key feature of the Delmatic lighting control modules is the ultra-efficient DALI Zero Power technology. The feature optimizes energy savings by smartly turning off the mains power to areas where lights are digitally off, thereby eliminating wasteful standby parasitic power consumption. The SmartServer IoT in conjunction with Delmatic's DALI Zero Power technology, optimizes the transmission and sharing of module data with the BMS.

The result

For its lighting control systems at the World Cup Stadiums, Delmatic received the High Commendation in the Entertainment & Architectural category at the 2021 DALI Lighting Control Awards. The systems were recognized for their impressive array of DALI technical features including sharing sensor data to maximize efficiency and sustainability of lighting and connected services as well as tracking the stadiums' energy usage.

Unveiled on Qatar National Day in December 2020, the new Ahmad Bin Ali Stadium became the fourth Qatar 2022™ stadium to be completed. Delmatic's smart lighting system using EnOcean's SmartServer IoT contributes to the stadium's four-star Global Sustainability Assessment System (GSAS).

Learn more

Learn more about the Delmatic's **outstanding achievement at 2021 DALI Awards**

Learn more about the **SmartServer IoT and the IoT Access Protocol**

View a webinar on **The Case for an Open IoT 'Data Fabric' for Smart Buildings Integration**

Contact us for a demo

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