

Case Study: Leadray

Executive Profile

LEADRAY

Officially listed as Cree Solution Provider (CSP) on Sept 2011, Leadray was granted as the best street light strategic supplier to the regions of Taiwan territory and obtained DOEs subsidy, along with the extraordinary achievement of 13,000 pcs street light overseas contract completion during the same period. After the long-term street light installation market test, Leadray proudly extends its superior product quality & gains the regular order quantity from everywhere of the world and becomes the leading manufacturer of the LED Lighting industry.

Summary

Leadray wanted to add competitive edges to its project by supporting an IP camera and other value-added features, such as WiFi and 3G Network for billboard signage. The LED street light supplier trial tested Billion Smart Outdoor Street Light Control and Management System (LCMS) using Broadband Powerline Communication (BPLC) technology on a small site with 14 street lights covering a 1KM road. Billion Smart Outdoor LCMS not only widened the transmission bandwidth and received distance, but also supported real-time video streaming and imaging. Leadray was one of the first pioneers who integrated an IP camera with remote street light control to enable a smarter, safer community.

Location: Taipei, Taiwan

Date: 2015

Challenges

Leadray, a professional manufacturer of LED light head, who has the no.1 market share in the Taiwanese Street Light industry, partnered Billion to participate in a municipality's tender in Miaoli County, the central part of Taiwan, as both system integrator and LED street light supplier. Leadray was searching for an innovative solution that can add competitive edges to its existing projects. Besides recording the amount of energy saving, remotely powering on and off, and sending out maintenance system alarms, Leadray wanted to integrate an IP camera into its lighting control system to 24/7 monitor and document driving conditions. However, with the current ZigBee wireless and NPLC (Narrowband Powerline Communication) technology, they did not have enough bandwidth to support an IP camera by transferring digital images and video surveillance. Leadray also wanted to see how much energy was saved by the replacement of LED street lights.

Our Solutions

Billion deployed its SG7500 Intelligent Powerline Lighting Control Boxes underneath 14 street light fixtures on a 1Km long street side. Linked by three power circuits, Billion Smart Outdoor LCMS use three SG7530 Smart Lighting Wireless Bridges, and one SG7510 Smart Lighting Segment Controller. For this particular project with Leadray, IP-cameras delivered real-time road images and driving videos to SG7530 via Ethernet cables. SG7530 then transferred these pictures and bridged to SG7510 through WiFi with secure point-to-point VPN (Virtual Private Network) encryption. SG7510 was in charge of collecting all these digital pictures and passed the information to the central administrative office via 3G networks. Under normal circumstances, an IP camera can send images and videos via either an SG7530 Smart Lighting Wireless Bridge or an SG7510 Smart Lighting Segment Controller with an Ethernet cable. Digital imaging and video streaming can be transferred across different power circuits through power-line loop. Lighting poles provide the electricity needed for the operation of an IP camera.

What was notable on the project with Leadray is that Billion's BPLC Street Light Control and Management System:

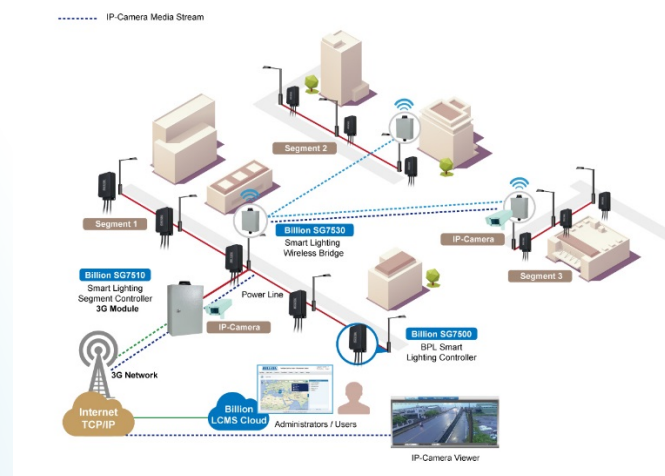
- Provided electricity to an outdoor IP camera with power-line system without complicated technology assimilation
- Served as a communication backbone with broadened transmission bandwidth to transfer digital images and video surveillance collected by an IP camera back to the administrative office

- Built a comprehensive networking architecture with heterogeneous integration by combining broadband power line, WiFi, and 3G network
- Retrofitted the structures of traditional power grid and microgrids to ensure that distributed energy can meet the local energy demands

Benefits

In a total of 62% of energy consumption was saved after switching LED lights. With this energy saving report, Leadray purposed the new value-added street light control and management solution to the municipality and received extremely positive feedbacks. City administrators were able to oversee driving conditions and record traffic accidents in real-time to strengthen the community's safety and security. With the enhanced version of LCMS cloud, both Leadray and administrators were able to present event alarms, as well as login into the cloud-computing system to remotely monitor street light operation and conduct performance analysis at anytime, anywhere.

Billion Smart Outdoor LCMS Street Light Network:



- Broadband power line communication supports standard TCP/IP network, serving as the backbone for the IP-Camera network
- VPN, port mapping, and virtual server are supported by SG7510 Segment Controller with network configuration
- Bridged by SG7530 Wireless Bridge to connect to multiple SG7510 Segment Controllers for backhaul communication

IP Camera Integration:

- Billion's Street Light Control and Management System supported regular IP cameras without much technical assimilation
- Performance depended on the uplink communication of segment controller (SG7510)
- Segment controller supported 3G and Ethernet backhaul communication



Billion's Street Light Control and Management System BPLC provided electricity to the IP camera and supported large Ethernet bandwidth to record high-definition surveillance videos 24/7. By this way, the municipality can largely reduce electricity costs while providing high security and solid safety to the community without any problems.

"It is an inevitable trend that the town is searching broadband technology to be integrated with a variety of sensors, such as luminaries, speed, and humidity, etc. for future LED street light tenders and Smart City projects. Billion's BPLC Street Light Control and Management System is the perfect, mature communication backbone providing the bandwidth required for video surveillance. We are very pleased to have the opportunity to work with Billion as they never failed to offer the most prompt response and assistance."