

Broadband PLC Lighting Control System

There is currently a trend towards improving the quality of life of those who live in cities and bringing about major savings in energy costs and to achieve environmental sustainability goals without compromising on safety. Street and parking structure lighting are two of the main sources of energy consumption in a city accounting for between 40% and 70% of energy costs. In addition to the high energy cost, it also involves extremely expensive infrastructure that is nowadays very much underutilized. Our Broadband Power Line Communication (B-PLC) technology allows the system to be installed without the need for additional infrastructure while providing better reliability and network security over wireless communication systems.



Smart Lighting

The main aim of this remote street and parking structure light management system is to enable users to manage their lighting infrastructure and dim lights in accordance with specific needs. By using the system efficiently, the municipalities and private parking structure owners can save up to 80% in energy costs and 20% in maintenance costs while cutting CO2 emissions.

Sustainability

The goal of Smart Cities and private real estate owners is to become more sustainable. The Smart Cities platform offers the possibility of adding features ranging from environmental monitoring sensors (noise, temperature, pollution, etc.) to electric vehicle recharging and payments systems. All this is done using the existing lighting infrastructure.

Safety

The Smart Cities system uses broadband communications, and makes transmission of large data volumes in real time possible, enabling implementation of CCTV cameras, PA systems, traffic sensors, and surveillance networks to improve safety, planning and administration.

Public Information and Communication Technology (ICT) Services

Humanity is facing the challenge of providing quality-of-life to our cities' new inhabitants. In this context, the system is the ideal solution for offering local residents and tourists services such as Wi-Fi networks and real time information panels.

Smart Cities modernizes traditional lighting systems, turning them into information highways capable of offering the most advanced Smart City services to the public. The only limit to the technology is your own imagination.

The Benefits of LED Light and Power's Smart Lighting System

- Providing the public with ICT services.
- More interconnected cities that are better prepared for growing populations.
- Considerably improved energy efficiency.
- Maintenance cost savings.
- Improved public safety.
- Existing infrastructure is used.
- Adaptive Real Time solution.
- Lower greenhouse gas emissions.
- Flexibility in adapting trail-blazing solutions.
- Rapid return on investment.

Technology

Our Smart Cities solution allows a municipalities' streetlight infrastructure, or a facility's, to be controlled remotely by means of a Central Management System (CMS) which integrates the following parts:

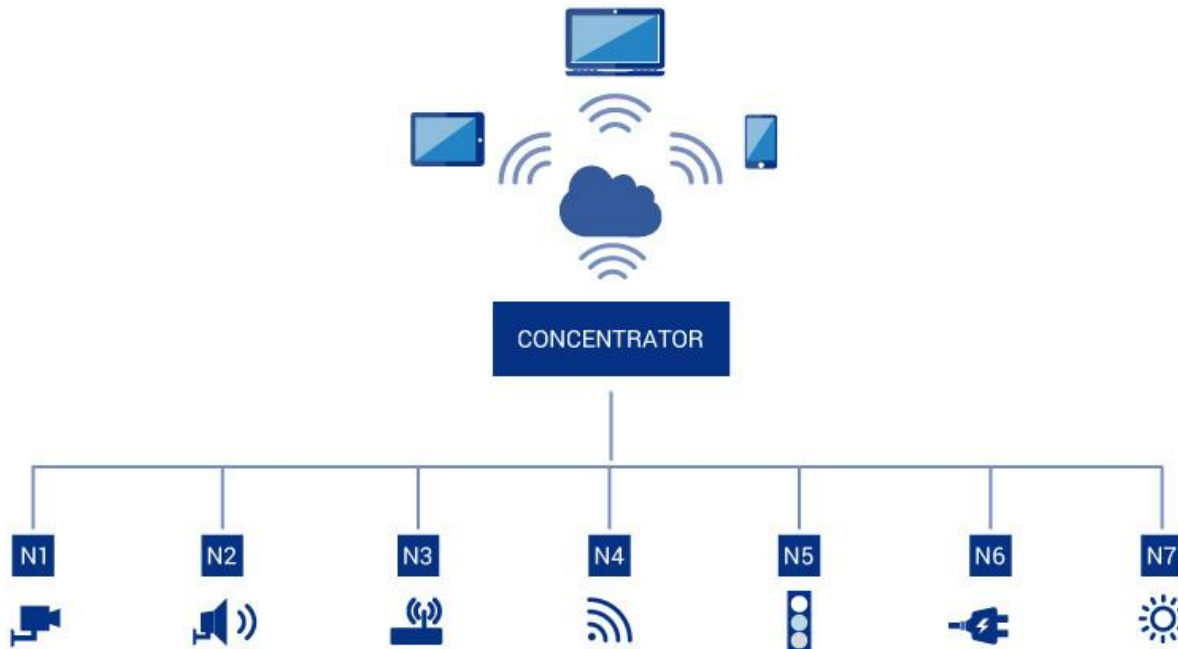
Concentrator

This device is installed in the electrical cabinet of a streetlight network or in the electrical cabinet of a facility. It serves as a gateway to the cloud, so the whole network can be managed from a control center or from any authorized mobile device. One Concentrator controls up to 300 Nodes.

Nodes

This is a device fitted into each light fixture which can be used both, to manage the fixture itself and to control other devices linked to the Nodes (e.g. sensors, cameras, etc.)

The Nodes exchange data with the concentrator (gateway) at the end of the segment through the power line. The concentrator communicates by Wi-Fi, PLC, GPRS, 3G, etc. with the control center (server) where the user can configure and supervise the entire system.



The System's Advantages

- The system allows for Broadband PLC by using the existing power lines which provides a high speed and robust communication channel and link to the internet
- The system is very straightforward to install, as it has built-in automatic network management features, making it a real Plug and Play (PnP) solution.

A Scalable Solution

- A complete end-to-end remote management solution with total and individual control of each Node. It is possible to incorporate innovative Smart City solutions into each Node.
- The system provides advanced management features and data reporting in real time, as well as efficiency criteria to optimize each network point.
- Adaptive lighting comes built into the standard product line.

- The system integrates the latest State of the Art features such as Geographic Information System (GIS) maps, instant messaging of alarm and warning signals, energy efficiency measurement, configuration of automatic operating conditions, and manual override.
- CCTV
- Information panels
- Wi-Fi networks control sensors
- Electric vehicle charging and payment system

Software



The CMS can be accessed through the cloud or installed on customers' proprietary servers, enabling energy service companies and municipalities to intelligently manage the whole infrastructure in real-time from any location.

CMS Functionality

- Configure the entire system, group Nodes, and characterize them individually
- Active/inactive hours in accordance with a configured timetable
- Continuous control in real time
- Real-time programming for ad hoc events such as local festivals
- Using sensors to adapt to real conditions in the street, such as weather or light levels
- Provides real-time alert management and alert history with SMS and e-mail alert
- Real-time system information

- Measuring power and energy consumption.
- Graphic reports and the option of exporting data in XML and CVS formats.
- Asset management.
- GIS geolocation with maps.
- Instant messaging (fault detection, cabinet open, power consumption out of range, etc.)

Real-Time Communication

We have developed a unique communication platform based on B-PLC, which makes it possible to transmit data at high speed through the electricity grid to receive information in real time.

Why B-PLC?

- Because it does not require any additional wiring for installation. It uses existing electrical grids.
- Because it reaches data transmission speeds of up to 50 Mb/s.
- Because it makes it possible to create innovative solutions for smart cities/structures.
- Because it coexists with other technologies: fiber optics, radio, etc.

The concept of data transmission through power lines is as old as the electricity grid itself. In the early days, signals were sent down the power lines for status reports, to detect faults in the grid, telemetry, and to share information between substations. The constant research and development effort into modulation techniques, encryption, signal injection, and processing have now made it possible to achieve excellent levels of speed and reliability.

Larger packets were first carried on frequencies between 20 kHz and 200 kHz, today known as the IEC61334 standard, using the CENELEC-A-B-C bands. Such transmission, considered narrowband PLC, is capable of transmitting data at a speed of up to 200 Kbits/s.

In 2003, work began on Distribution Line Carrier (DLC) System Technology. This is considered medium-speed narrowband, transmitting at frequencies between 9 kHz and 500 kHz and provides speeds of up to 576 Kbits/s. This technology was used as the basis for the Powerline Intelligent Metering Evolution (PRIME) alliance, made up of several companies in the industry in 2009. It is mainly used for remote management of smart meters.

Meanwhile, efforts have been made to develop and evolve Broadband Power Line Communication (B-PLC). Now, thanks to more advanced technology in digital systems integration, data transfer speeds of up to 50 Mb/s have been achieved. With integration of digital and analogue circuits, new modulation techniques such as Orthogonal Frequency Division Multiplexing (OFDM), digital signal processing and other techniques used for this technology, PLC has reached levels which can compete against other communication services in terms of performance and price.

Past experience

MALAYSIA

Remote end-to-end street lighting management system in Johor Bahru, Malaysia. The solution includes CCTV to improve safety in the area and GPS on each of the outdoor lamps. Energy savings of around 68% is expected.

SPAIN

Remote end-to-end street lighting management system with presence sensors. Presence sensors make it possible to change how bright the lights are based on pedestrian and vehicle traffic. As there is little traffic in this particular area, electricity consumption could be cut by as much as 80%.

USA

Lighting control system for aircraft hangars/ warehouses with occupancy detection and daylight harvesting, commercial aquariums and basketball gymnasiums. Our LCS allows for individual control of all light fixtures in the facility. This solution enables the operator to change the brightness of each fixture as needed manually or automatically with the use of photo sensors (daylight harvesting), which considerably reduces consumption and improves total efficiency. The most recent example is a facility in Las Vegas, NV. Energy consumption has been reduced by 80%.