

Intelligent Wireless-Based Lighting Control System Will Cut Energy Use Enabling Councils to Meet Carbon Reduction Targets

Wireless- mesh networking and automation specialist, IDC, has won a £250,000 grant from the East Midlands Development Corporation to develop a plug-in wireless- controlled system that will make street lighting far more energy efficient, flexible, and interactive - with all lanterns communicating via a GPRS modem connected to a hosted server.

The £250,000 intelligent street lighting scheme is 40% funded by the UK and European Union. It will enable hundreds of street lights to connect together using low cost wireless technology. The major benefit of this to councils is twofold: the considerable energy saving that will result, from the ability to dim street lanterns during quiet times: between 11.30 – 4.30am; and the contribution to Carbon Reduction targets that the intelligent system will deliver.

"Our low cost wireless networking technology is ideal for this project," commented IDC's Managing Director, Kevin Buckley. "The network technology we use is easily scalable for urban, residential or major road lighting; it is simple to retrofit to existing installations and is highly robust and secure. In addition, streetlights are perfect for wireless communication: they have the height, which enables wireless service coverage, and their spacing means that several lights are within wireless range of each other."

IDC's system is based on the licence free and globally available International Standard 802.15.4 2.4 GHz Private Area Networking (PAN). It comprises four main parts: a plug-in Wireless Lamp controller, a Wireless Lamp gateway, a Server/Web- based Central Data Centre, and a Handheld Maintenance and Diagnostic unit.

The plug- in Wireless Lamp Controller fits into the top of the street lamp, replacing the existing controller, which switches the lamp on at dusk and off at dawn, via a light sensor. It integrates a wireless router (transceiver) and smart metering chip.

These provide the ability to switch on/off and control a dimmable electronic ballast; and the facility to monitor the power consumption of the lamp, its operating temperature, provide fault diagnostics, and give early warning of lamp failure.

IDC's system is designed to enable up to 1000 of the plug-in Wireless Lamp Controllers to communicate with one Wireless Gateway. The Wireless Lamp Gateway acts as the network co-ordinator and transfer messages to/from the network of street lamps to an onboard GPRS/GSM module for transfer to the Central Data Centre. The Server/Web-based Central Data Centre itself provides the functionality for monitoring multiple wireless networks with real time viewer and data logging facility. It provides the system user with energy readings, temperature levels and fault diagnostics. In addition, other applications will be provided via web pages, PDA's and mobile phones. Importantly, all of this data is provided using modern IT platforms which everyone can use and understand.

Also included in IDC's proposed system is a handheld maintenance and diagnostic unit, to enable maintenance personnel to switch on and control individual lamps. The handheld proposed is based on IDC's current ZB111 hand- held mobile barcode scanner, with integrated LCD display and keypad. This unit will connect directly to individual lamps in the field, and be fitted with optional barcode and RFID readers to identify individual lamps if required.

"The ability to vary lamp brightness on demand has been calculated to save a medium sized city around £700,000 a year on energy costs, which is a massive fillip against the current backdrop of pressure on council budgets," said Kevin Buckley. "You only have to look from the air, to see how much of the light from street lamps is wasted, so dimming provides an ideal solution - especially at quiet times - and one that does not compromise road safety."

Photo Caption: Image shows prototype of the IDC Wireless Lamp Controller.

