LeafNut

WIRELESS LIGHTING CONTROLS FOR THE SMART CITY ECOSPHERE

Wireless lighting controls for the Smart City Ecosphere

Smart Cities are advancing rapidly around the globe, with enhancements in connectivity and technological developments meaning they are set to grow at an astounding rate.

Smart lighting can become the hub of the Smart City Ecosphere through the next generation in wireless lighting control technology.

The latest advancements in wireless controls mean systems can be implemented city-wide to allow users complete control of their lighting infrastructure, from street lighting to indoor lighting and beyond.

With wireless lighting controls, every lighting point within the Smart City – both indoor and outdoor – can be wirelessly-enabled to offer local authorities enhanced control, increased connectivity and revolutionized communication across their cities.

Smart Cities wireless lighting control solution are more than just a CMS, they are an ecosystem that provide a platform through which data can be transferred from street level and buildings to end users via mobile apps and machine-to-machine connectivity.

With enhanced wireless connectivity, waste management, traffic control, parking and much more are all within the remit of the 'smartest' wireless solution.

LeafNut

A World of wireless connections

In 2017, we will launch LeafNut Smart City to provide further choice to local authorities seeking to reap the benefits of lighting CMS, together with the possibilities of a future-proofed, open protocol wide area network.

LeafNut Smart City represents the latest evolution of our CMS – adding new innovative features to a solution that has already been proven in 100s of installations and over 400,000 light points around the World.

The evolution of LeafNut

CMS

- Dimming
- Switching
- Scheduling
- Reporting
- Maintenance
- Energy Monitoring

SMART CMS

- AMS integrations
- BMS Bridges
- Sensor inputs
- Traffic flow integrations
- Energy monitoring
- Dimming
- Switching
- Scheduling
- Reporting
- Maintenance
- Energy Monitoring

SMART CITY

- Enhanced Data Flow
- Easy Auto-Comminssioning
- Dual Radio Networks
- Lora Wide Area Low Power Capability
- Zigbee Mesh, Aws Hosting
- AMS integrations
- BMS Bridges
- Sensor inputs
- Traffic flow integrations
- Energy monitoring
- Dimming
- Switching
- Scheduling
- Reporting
- Maintenance
- Energy Monitoring

LeafNut

CMS

- Dimming
- Switching
- Scheduling
- Reporting
- Maintenance
- Energy Monitoring

LeafNut is a wireless control and monitoring system for street and outdoor lighting, which provides users with the ability to make savings by reducing carbon emissions and lowering energy usage.

The system uses WiMAC protocol Central Management System (CMS) technology to remotely manage and control the output of individual lighting points, using a combination of GPRS and radio frequency.

Each lighting point can be dimmed using automatic profiles to match the specific requirements of the surrounding area throughout the night. At the users command, such as in the event of an emergency, lighting points can be brought back up to full brightness at the touch of a button, from either a computer, laptop, tablet or smartphone.

Every lighting point within the inventory is remotely monitored, with any faults being reported to the specified user(s) via scheduled email. Reports detailing the energy usage of each light, or a particular group of lights, are also available.

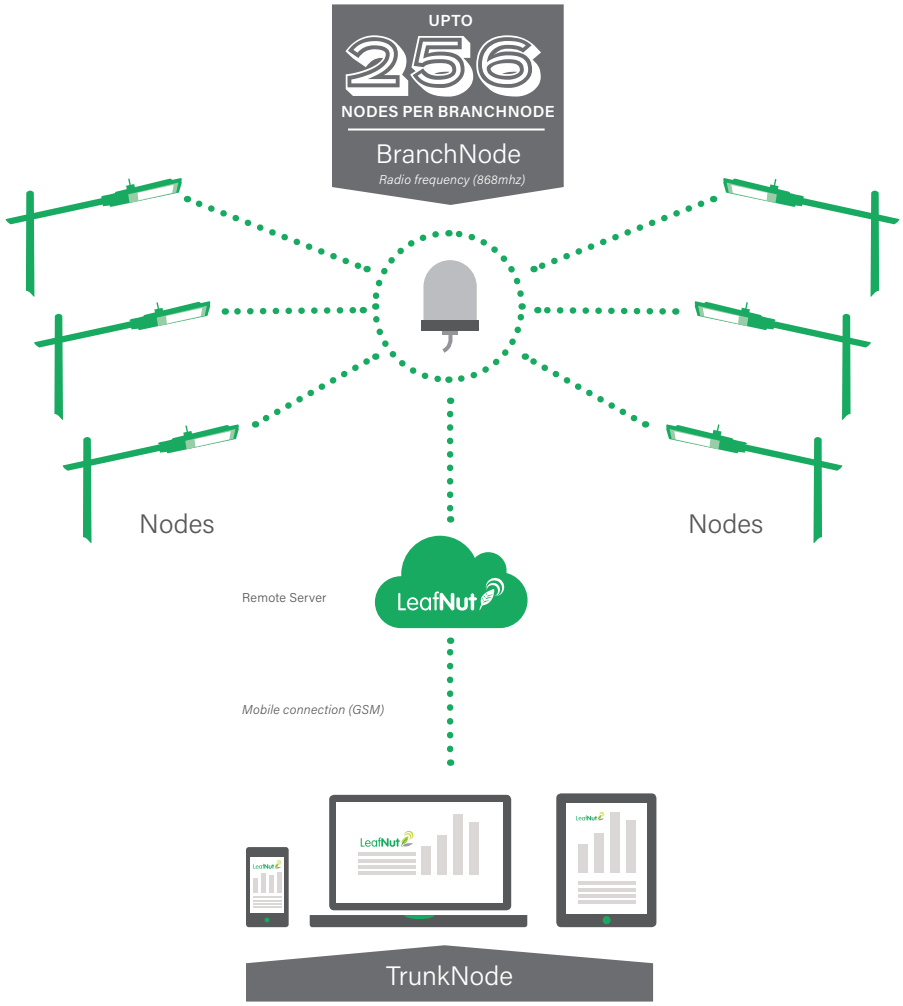
So far, LeafNut has been successfully installed by over 100 organisations monitoring over 400,000 light points across the world and is used to realise significant cost savings and reductions in carbon emissions.

BranchNode

Nodes

Drivers

HOW IT WORKS



LeafNut

SMART CMS

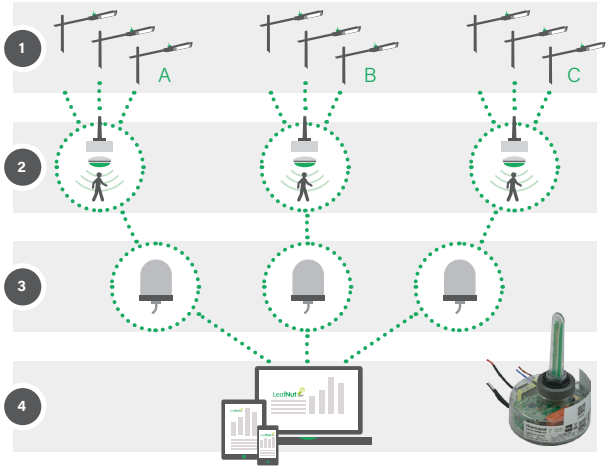
- AMS integrations
- BMS Bridges
- Sensor inputs
- Traffic flow integrations
- Energy monitoring
- Dimming
- Switching
- Scheduling
- Reporting
- Maintenance
- Energy Monitoring

LeafNut Smart CMS

LeafNut Smart CMS represents the latest advancements in Smart City technology. The solution is already widely used, with many applications integrated with Asset Management Systems (AMS)and as bridging solutions into Building Management Systems (BMS).

SensorNode

The SensorNode enables presence detection in the LeafNut Smart CMS System through a remote sensor. Ideal for a range of Smart City applications such as footpath and cycle paths, the SensorNode automatically overrides the current dimming level and brings the lights up to full light output for a specified period of time.



1. Luminaire Groups with Uninodes > 256 UniNodes per BranchNode
2. SensorNodes and PIRs > 5 PIRs per SensorNode
3. BranchNodes > 5 SensorNodes per BranchNode
4. TrunkNode Smart Luminaire Control, CLO Plus Dimming Profiles, PIR Group Override

MoRLiCs

MoRLiCs is the latest development and allows server level integration with the UK Highways Agency Traffic Flow system. Working in tandem with LeafNut Smart CMS, the MoRLiCs system assists in adapting lighting profiles to suit changing traffic conditions and requirements.

1. The MoRLiCs system works by both continuously collecting real time vehicle traffic data whilst also storing historical data from the roadside. The system combines the real time and historical data in order to determine what light level to apply.
2. MoRLiCs then sends updated lighting profile instructions to the LeafNut CMS in the cloud via a secure connection over the Internet.
3. The LeafNut CMS firstly verifies and validates the instructions, only once LeafNut is satisfied that the data is correct, the CMS identifies light points are to be updated.
4. New level information is sent to the units at street level and subsequently the light output profile changes as determined by MoRLiCs instructions.

LeafNut

SMART CITY

- Enhanced Data Flow
- Easy Auto-Comminssioning
- Dual Radio Networks
- Lora Wide Area Low Power Capability
- Zigbee Mesh, Aws Hosting
- AMS integrations
- BMS Bridges
- Sensor inputs
- Traffic flow integrations
- Energy monitoring
- Dimming
- Switching
- Scheduling
- Reporting
- Maintenance
- Energy Monitoring

LeafNut Smart City

LeafNut Smart City is the next generation technology and will enable LeafNut to act as the network backbone to your Smart City infrastructure in 2017.

The system represents the latest advancement in the evolution of LeafNut Central Management System (CMS). LeafNut Smart City continues to offer a full core suite of remote lighting management, energy saving and maintenance reduction benefits of LeafNut CMS.

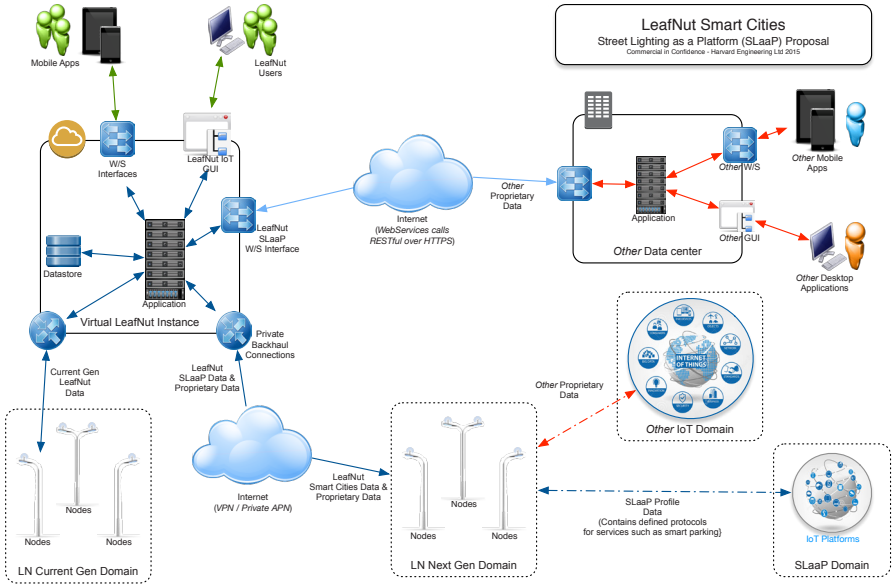
New dynamic adaptive lighting tools also offer an enhanced network and data rate capacity, whilst the system is able to integrate with a wide range of Smart City Infrastructure devices and systems.

UniNode NG

BranchNode NG

Utilising the best radio technologies available, LeafNut Smart City is able to provide a highly robust and extendable implementation to meet the requirements of Smart Cities. Over-the-Air (OTA) update capabilities, allow the system to migrate from the WiMAC protocol to LoRa, or utilise ZigBee.

Designed from the outset with the future in mind, LeafNut Smart City provides all the flexibility of the existing LeafNut CMS, with enhanced capabilities. The next generation in Smart City hardware such as the BranchNode NG and UniNode NG further enhance the solution.



BranchNode NG

The main controller for the LeafNut SmartCity network is the BranchNode NG, comprising a Linux computer connected to dual radio modules that will integrate seamlessly into the existing CMS and will be accessible through the standard Graphic User Interface (GUI).

The processing power is significantly enhanced versus earlier generation models, allowing for in-field processing of data and easy OTA upgrades, future proofing demands for processing and communication with third party smart devices and solutions.

UniNode NG

At the hardware level, the UniNode NG will form an integral part of the new LeafNut Smart City architecture, incorporating GPS on board, each Node will enable the LeafNut Trunk to auto-assimilate Node location in the CMS immediately on being powered up.

The new UniNode NG will also enable actual measured energy consumption to be monitored using the GUI, alongside the calculated consumption offered on earlier variants through a +/-2% accurate on board monitoring chip.

eyeNUT

INGENIOUS CONTROL

EyeNut - Our indoor solution

EyeNut is an innovative cloud-based, IoT enabled, remote access, wireless control solution for indoor lighting. It gives users the freedom to commission, configure and completely control their own lighting to maximise energy saving and reduce carbon emissions.

Early generation lighting controls provided energy savings but were difficult and expensive to fit retrospectively, requiring specialist engineers. Once installed, they were difficult to alter and not well suited to respond to changing occupancy patterns in buildings. EyeNut eliminates these problems.

Installation and initial configuration is simple and controls can be altered at the touch of a button to meet a building's changing needs. Comparisons with existing technology are impressive; it is capable of controlling 500 EyeNut-enabled devices from one wireless gateway compared to DALI's 64.

EyeNut will also allow connection to Building Management Systems and enable a variety of control strategies to be employed, for example daylight harvesting, occupancy sensing, time scheduling, and scene setting.

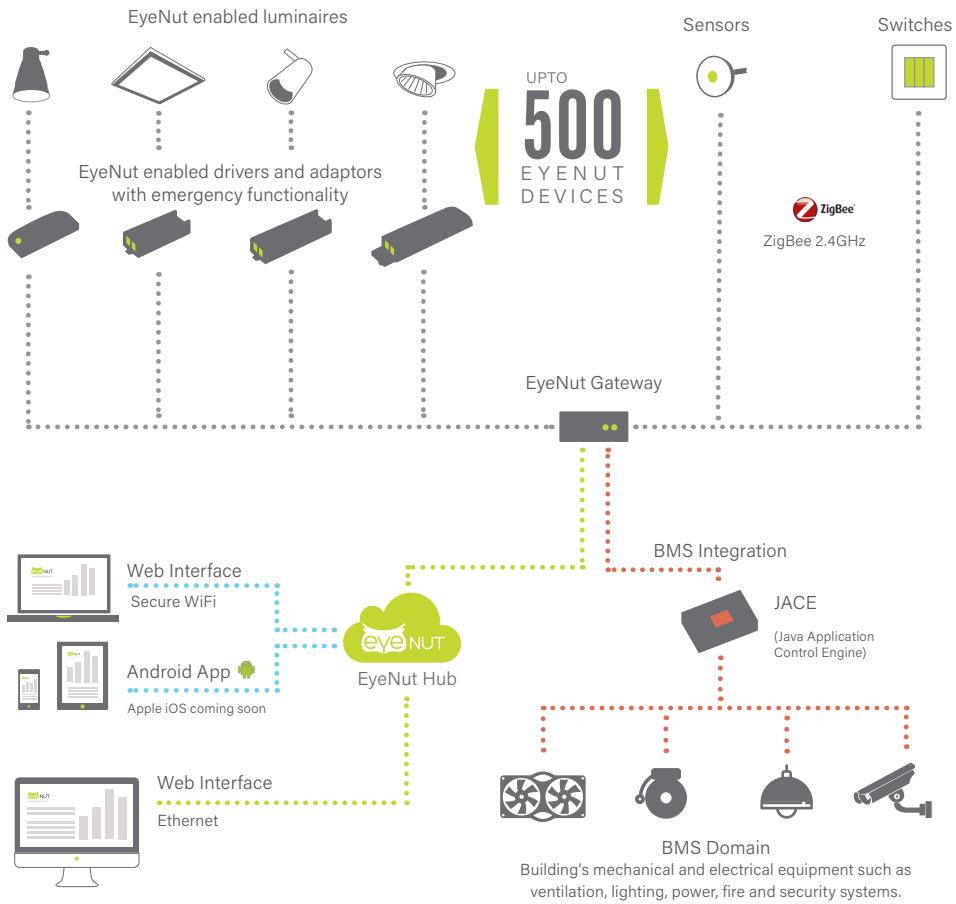
The system's emergency functionality provides additional benefits, eradicating the requirement for monthly emergency on-site tests. Users are able to set up automatic scheduling of functional and duration tests and export results to external systems for audit tracking. Emergency luminaires are enabled for auto-testing using the new EyeNut Emergency Interface Adaptor.

EyeNut continues to be at the forefront of the industry with the latest updates including emergency testing functionality and BMS integration. Future developments include EyeNut Air; allowing for combined indoor and outdoor control on the same system.

EyeNut has already delivered substantial monetary and energy savings for several blue chip clients including, Oxford Brookes University, Skanska, EON and The White Company. Research has shown that at Oxford Brookes University, the installation of EyeNut resulted in a 48% energy saving, leading to forecasted savings equating to £13,000 per annum.

HOW IT WORKS

The future of indoor lighting control...



LeafNut Westminster case study

"Harvard's LeafNut system is enabling Westminster to transform the public lighting service. The City Council now has a dynamic, interactive lighting solution suitable for the requirements of one of the world's most demanding city's.

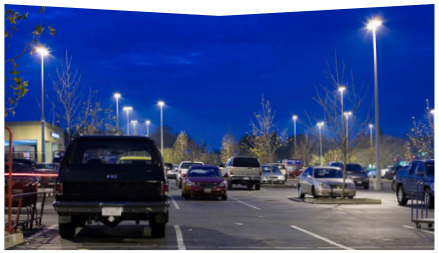
A system that not only meets our current demands, but will be able to adapt to future challenges. The 'end to end' solution provided by LeafNut promotes a two way dialogue ensuring that our needs are met and any concerns are addressed directly, with their ongoing support that is seen as a significant benefit."

Dave Franks,
chief lighting engineer at Westminster City Council

- Rolled out across Westminster's 15,000 street lights, with over 100 BranchNodes currently installed controlling the whole borough.
- The potential to reduce light output by 25% during off peak times where there is little activity.
- The ability to monitor and control Lighting from CCTV control centre or the Police reports. If levels are too low managers will be immediately alerted.
- Harvard's engineers are constantly working alongside Westminster's street lighting engineers to ensure smooth running of the system.
- The installation of LeafNut is expected to save Westminster City Council an estimated £20 million over an anticipated 20 year product life cycle.

LeafNut is perfect for...

CAR PARKS



LOCAL AUTHORITIES

LeafNut

MADE IN BRITAIN

THE QUEEN'S AWARDS FOR ENTERPRISE: INTERNATIONAL TRADE 2014

HLEDs

CELEBRATING 20 YEARS of EXCELLENCE
SINCE 1993

Harvard Technology

wireless · connected · lighting

Harvard Technology Ltd. Tyler Close, Normanton, Wakefield, WF6 1RL, UK
Tel: +44 (0)113 383 1000 Fax: +44 (0)113 383 1010

www.HarvardTechnology.com