GridLight™ LoRaWAN

Intelligent streetlight management for group control

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Intelligent Streetlight - Now!!

GridLight™ for LoRaWAN: Future Smart City Management

A typical city spend approximately 40% of its energy budget on streetlight. That is a lot of energy, a lot of money and a lot of carbon emissions.

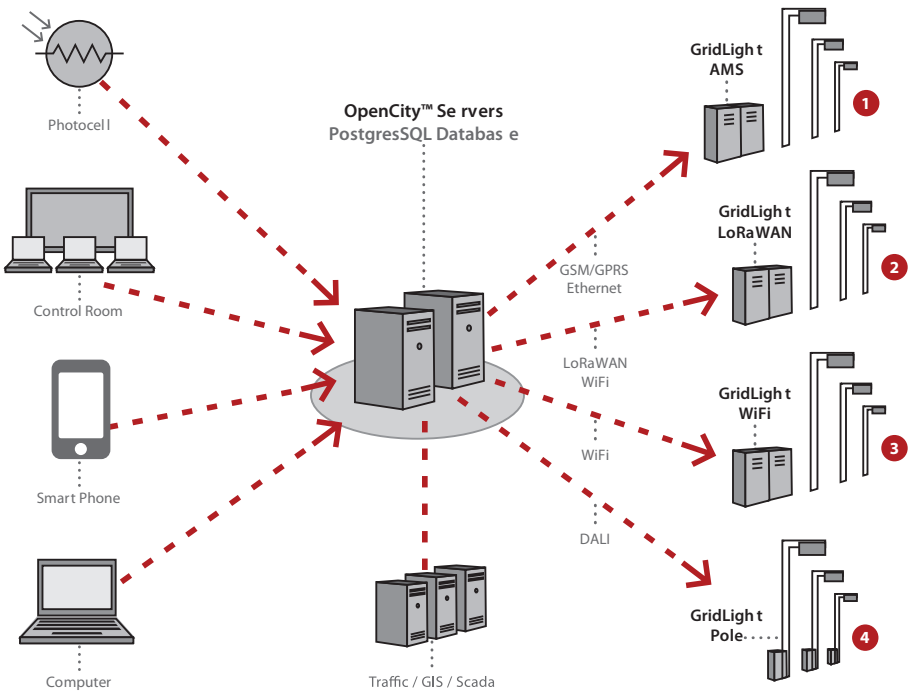
Unfortunately a lot of the energy is wasted, as the light is either turned on too early in the evening or turned off too late in the morning - or simply because areas are over-illuminated, when the lighting is not needed.

This i often the case as many cities still use outdated systems, where hundreds of photocells and timers are chronically out of sync.

Amplex GridLight™ LoRaWAN is the intelligent, automatic streetlight management system, which instantly provides savings in both energy, CO_2-emissions and maintenance costs.

The idea is simple: Install intelligent management in all streetlight cabinets using Amplex gridCPUs and connect them via smart city infrastructure LoRaWAN, which is already standard in many cities. In case the infrastructure is not already installed, Amplex can also provide this long-range communication technology. Thereby enabling you to get started right away. As the range for LoRaWAN is up to 15 km, it does not require many base stations to cover a municipality. In Aarhus for instance only 18 base stations are needed.

Today LoRaWAN is used to drive smart city applications globally and is a widely recognized open standard within the IoT-area. Thereby there is a wide supply of sensors, trackers and gateways on the global market, making a LoRaWAN-solution feasible to establish. GridLight LoRaWAN is compliant with the established networks such as Loriot, The Things Network, Actility and Amplex' own open source LoRaWAN cloud solution.



GridLight™ is managing more streetlights than any other product on the market. Amplex manage more than 50% of the streetlight in Denmark and is used in large cities such as Aarhus, Odense and Horsens. The Amplex-solution is also solely used by the Danish national road authorities. The worlds biggest installation managing 275.000 poles in Abu Dhabi is also supplied by Amplex.

GridLight™ has been operating since 2001 and has the best uptime in the market.

GridLight™ LoRaWAN is the 5th generation of streetlight management from Amplex. The system has been developed in Aarhus and contains more than 250 man-years of development. GridLight™ started as AmpLight, but has changed its name as the system has become both more Smart City- and Smart Grid-ready.

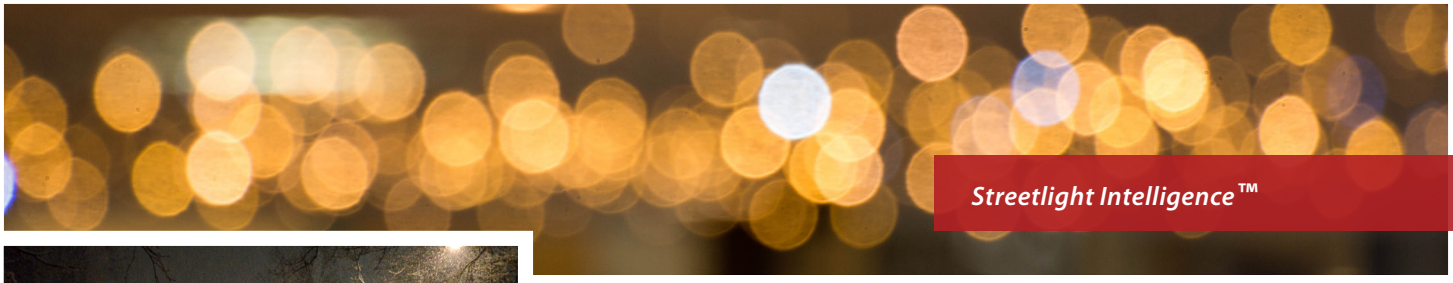
Amplex's LoRaWAN based cabinet solution gridCPU is based on the newest communication technology, with LoRaWAN as the long-range communication technology, but also with the ability to communicate via Wifi - The latter aiming at cities with a Wifi-based Smart City infrastructure.

The gridCPU-module contains two relais for managing the light. These can either be used to manage two separate installations i.e. streetlights on one and park lights on the other or they can be grouped whereby one manage the streetlight in general and the other manage night-mode whereby every second lamp is turned off.

To ease installation and service the gridCPU also has Bluetooth build in. Bluetooth is also useful when installing larger firmware. Whereas smaller software updates can be made directly from the server via LoRaWAN.

GridLight™ LoRaWAN use Multicast to secure that inputs from for instance a photocell can be send simultaneously to all relevant cabinets and thereby not being limited by the generally narrow bandwith of LoRaWAN.

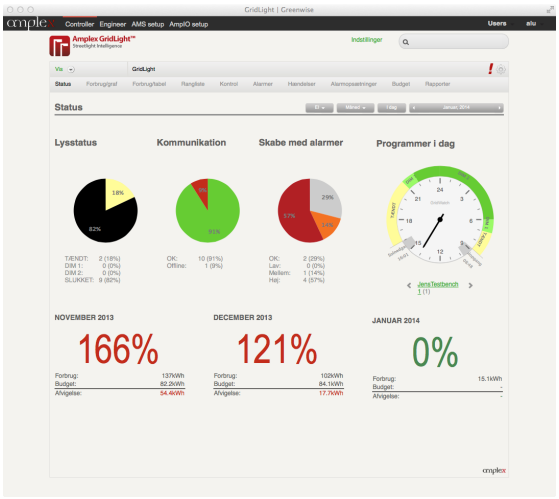
As the gridCPU is based on the open source standard LoRaWAN, it can also be usable in other systems than GridLight™. By using gridCPU API Keys the module can be opened for use on other managementsystems. Thereby the customer is not automatically tight-up to GridLight™ or Amplex simply because the gridCPU is chosen.



Streetlight Intelligence™

The best streetlight management system in the world

Amplex is consistently improving GridLight™ and add-ons and updates are made each month. The improvements are made in a close dialogue with both national and foreign customers, focusing on meeting any new standards or requirements. The user-surface is easy to access and provides a fast overview of the current status. GridLight™ includes maps and the cabinets can both be managed via a hieraki and via tags..



Central management with light sensor

Based on experiences from both Denmark and Sweden an energy reduction of 10-15% is achieved only by replacing the old light sensors and timers with Amplex GridLight™. Furthermore maintenance of light sensors and timers is radically reduced, while a high degree of flexibility managing burn hours is also achieved.

Flexible backwards compatible solution

Amplex has been doing streetlight management for almost 20 years. One of GridLight's advantages is that the user-surface supports all generations of hardware. Whereby all hardware solutions can be combined within the overall city-solution. Meaning that old customers with first generation hardware is not left behind. Actually they have the opportunity to combine the old hardware with the latest technology and thereby gradually update their solution. If smart city functionality is requested such as advanced monitoring of power-consumption, traffic and air-quality, this is also a natural part of GridLight™.

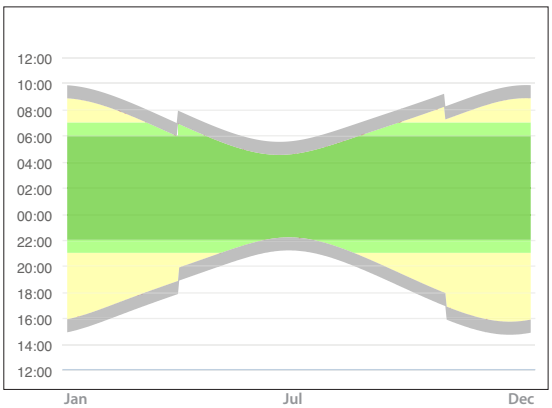
Remote-control in the field using Apps

When the streetlight is to be maintained or inspected GridLight™ is easy to use remote via the smartphone app (iPhone and Android). The app has a build-in map-facility, with access to all the data accumulated in each module. Probably the most user-friendly installation- and service app in the market.

Flexible and simple programming of the streetlight

The demands for managing streetlight, light in parks, lightment of monuments, buildings etc is increasing. GridLight™ offers intuitive, visual programming, whereby even advanced lighting strategies can be programmed and shown using GridWatch™. Thereby any doubt regarding whether the programming or timing is right will be eliminated. The system automatically calculates burn hours - including full-on, dimming and night-off.

Special programming on anniversaries, Open by Night, Earth Hour, Christmas Lighting etc is made fast, easily and well in advance.



Alarms, events ad reports

GridLight™ logs all events in the system - Both what the user has done and what is done automatically by the system. Meaning if it needs to be determined why the light was on at a certain point in time, this can be easily found in the log. GridLight™ also monitor all parts of the system - Both the Amplex hardware and the streetlight itself. When incidents occur these will be logged in GridLight™ and the user will be informed - via the webpage, mail and text.

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Technical Specifications

gridCPU

Dimension	DIN-rail, 6 modules: 105x86x57mm
Temperature	-25 - +65 °C
Communication	LoRaWAN with Multicast Wifi (IEEE802.11b, 802.11g, 802.11n)
Clock	Crystal controlled real-time clock with a battery back-up. Absolute maximum deviation of ± 7 seconds per 24 hours in the whole temperature range even without time synchronisation with the network. Time fluctuations are under normal circumstances adjusted automatically with the network. Providing a maximum deviation of ± 1 second.

Input/output

Relays	2 relays, one of which with NO/NC.
Light sensor input	Analog and digital light sensor, which can be shared with modules in other cabinets.
Expansion slot	With Open eXpansion Interface (OXI) extra functionality can be added via an extra PCB, which can be plugged into the module and connected to external equipment via the 3 OXI connectors. This can be used for meter readings, surveillance and other project specific expansions.

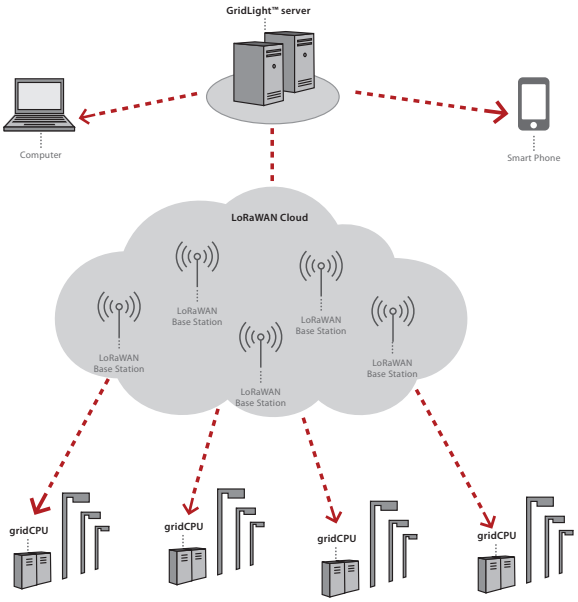
Light schedule management

Twilight	Calculated automatically according to map position.
Dimming levels	Two levels - dim 1 and dim 2 + intelligent dimming, which is regulated according to voltage level - including individual poles
Light sensor	One or more light sensors are used to manage a program. The program can manage any number of units. Activation period can be configured whereby light is not turned on in the middle of the day. The signal from the light sensor is transmitted via multi-cast to all units whereby simultaneous activation is ensured.
Repeat function	A program can be daily, weekly (ie. every Saturday) or monthly (ie. every last Saturday each month). Programs can be for the full year or for any given period.
Mode switch	Any given number of switches can be made during the day. These switches can be on fixed times or influenced by twilight.

LoRaWAN

IoT communications cloud

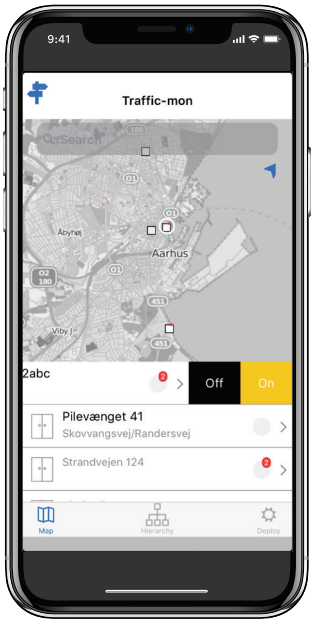
LoRaWAN is a long-range communication technology, which is based on a number of base stations communicating directly with the individual street cabinets. You can either rent access to a LoRaWAN cloud or build your own. Amplex GridLight™ offers its own open source cloud solution and also supports the leading LoRaWan-suppliers in the market.



Field Tool

GridLight™ Field App

Equipment can easily be located and serviced using the GridLight™ Field App which runs on both iPhone and Android. The App makes it easy to find the equipment, read the state of the equipment and deploy/replace Amplex modules. The App can control the streetlight - either a single cabinet or a group of cabinets.



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