

Tartu: LED Lights with smart controllers

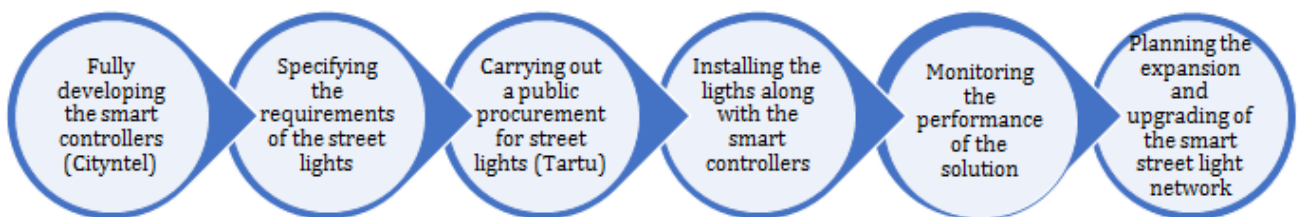
Overview

The smart street light control system developed by Cityntel OU is based on a wireless mesh technology. Smart controllers, capable of network and device-related decision-making, are installed in each of the new 312 LED street lights in Tartu and rely on wireless communication for exchanging information between the controllers and sensors. The aim is to bring intelligence and data processing to the device level. Sensors and luminaire controllers for weather and traffic conditions adjusting street lights without any central server data processing. The street light network of the demo area are supplied with the following sensors and detectors:

- PIR movement detector – detecting people and vehicles computing human presence and traffic flow level;
- Movement detector with cameras – detects people and vehicles using picture analytics and differentiating between vehicle types (passenger cars, buses, trucks etc.);
- Light reflection sensor – analyzing road conditions (dry, wet, snowy etc.);
- Noise sensor – detecting noise level and source (human speech, traffic etc.);
- Environmental sensor – measures pollution (CO₂, NO_x), air temperature, humidity etc.

All in all, the smart controller system is expected to result in up to 80% energy savings when combined with LED luminaires, up to 70% savings from maintenance costs, significantly lower carbon emissions, much less light pollution and longer luminaire lifetime.

Process



Benefis

- Easy adoption by both luminaire manufacturers and end users
- No need for engineering personnel for deployment and maintenance
- Dynamic control of luminaires based on real-time local information
- High reliability and accurate power consumption measurements
- Future proof (i.e. easy to add other devices providing smart city services to the same network)
- Increased resource and energy efficiency
- Smaller carbon footprint and light pollution
- More efficient delivery of city services
- Increased comfort and better living environment
- Better (evidence-based) planning (e.g. traffic)

Citizen Engagement

The smart street light system is connected with the City Information Open Platform (CIOP). The data from luminaires (energy consumption) and sensors feed into the CIOP for monitoring and analysis purposes. Weather and traffic information that the smart street lights have collected will then be demonstrated in the pilot apartments through the smart home system. The citizens are also involved through the CIOP in form of a poll that explores the outdoor lighting comfort level. Based on the feedback received from the residents, the brightness level of the street lights can be adjusted.

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Stakeholders

Owner(s)	City of Tartu
Service/Technology Provider	Cityntel, LED lamps tbs.
Users	Citizens
Investors	H2020, City of Tartu, Cityntel

Investment/Finance: ca. 400,000 Euro

Outcome/Successful implementation

The new gas buses started operation in Tartu city bus lines on 1st of July of 2019. In total 64 new buses, manufactured in the Scania factory, started travelling along the routes, equipped with air conditioning, low bottoms and running on an environmentally friendly source of fuel - biomethane. There are two types of buses: normal buses (12 m in length, 27 seats, and standing room for 52) and articulated buses (18 m in length, 41 seats and standing room for 96). As of 1 July 2019, the City of Tartu switched over to a new bus route network, which differs significantly from the recent network in terms of itineraries, the number of lines, as well as the frequency of departures. New bus line network consists 13 regular bus lines (formerly 26 lines) along with two night lines. The total mileage of city buses during first 8 months was about 3,300,000 kilometers in Tartu and about 8,500,000 journeys were made.

Replication Potential

The smart street light solution implemented in Tartu is simple and can be deployed quickly even on a large scale. The solution enables municipalities to start saving right from the moment of introducing the solution without having to worry about the payback period. Furthermore, as savings are instant, it will also reduce the payback period of the LED luminaire. The successful installment of the solution can also enable other smart city innovations based on the same technology and principles, such as smart parking, smart traffic management and smart waste management.

Contact

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More Details:

<https://smartency.eu/about/solutions/led-lights-with-smart-controllers-tartu/>

