iLCS®

Intelligent Light Control System

iLCS SMART CITY PLATFORM

Index

Who We Are:
Global Synergy in Smart Urban Solutions

Join the revolution in energy-efficient street lighting. Illuminate the future with us!

iLCS: A Global Fusion of Italian Innovation and Malaysian Mastery

iLCS stands as a evidence to international collaboration, born from the synergy between an advanced Italian Engineering Center, renowned for its expertize in wireless technologies and IoT systems and a Malaysian powerhouse dominating the public lighting market with expansive production and distribution capacities on a global scale.

Strength in Unity: Our Global Partnerships Drive Excellence

Our partnerships further amplify our capabilities. With a dedicated Italian firm at the helm of our production and distribution throughout Europe, a German entity deeply rooted in smart city service provisions and a strategic partner in Dubai orchestrating our reach within the UAE market, our network is vast and proficient.

iLCS: Pioneering the Future of Smart Urban Connectivity

Renowned for its 'smart' urban services, iLCS is at the forefront of IoT data management through its cutting-edge real-time platform. Seamlessly integrating various wireless infrastructures - from IEEE802.15.4, LoRaWAN, Mioty, 5G, NBIoT and beyond – our platform serves as a versatile middleware and multiservice collector. With its myriad of connectors, it captures and channels data for third-party application use, enabling cross-data processing and alerts. Such capabilities not only enrich the individual data points but also deliver unparalleled value to our customers seeking our advanced services. Dive into the future with iLCS and reshape the way cities breathe and function.

Development of Smart City Projects:
iLCS Approach

Thanks to numerous technological partnerships, iLCS innovatively optimizes the management of information from every major urban communication site, offering complete flexibility and modularity, all while reducing costs by using its smoothly integrated approach.

The Building Blocks for Intelligent Urban Areas: Communication Infrastructure

Our habits have been radically altered by digital transformation, both in the private sector and in the time we spend in urban centres.

The goal is to continually improve the quality of life of the inhabitants with connected and integrated technological solutions, increasing innovation, sustainability and efficiency in cities.

It is a continuous succession of devices that require data connections of various types and with different needs; in public transport and mobility in general, in the management and distribution of energy, public lighting, urban safety, environmental management and monitoring such as waste management, maintenance and optimization of public buildings (such as schools, hospitals and museums).

It is for this reason that the main enabling technology, allowing the operation of our established centres,

is the information and communications infrastructures, they are the real highways for the data exchange necessary for the operation of each service.

iLCS offers a modular approach, integrating with multi-level architecture, thus allowing you to make the most of each layer, with an integrated approach for data management and processing.

The architecture integrates a number of sensors and third-party triggers for optimal process automation in public spaces and industrial areas.

That is why we present iLCS Platform, a distributed platform with excellent performance for real-time monitoring and control of the environment (encompassing both urban and industrial), maximizing the added value of the IoT.

The variety of sensors and industrial partners, using different wireless technologies for the acquisition of data from the environment and for its control, allows for wider accessibility, flexibility and modularity in addition to being more cost effective thanks to the integrative approach.

iLCS uses innovative communication technologies in a layered approach, as shown in the diagram. This can be considered as a necessary first step for the improvement, advancement and optimization of information management in the city.

For more information, contact us: www.ilcs.it

iLCS Platform and Its Application Modules

The iLCS platform features a variety of application modules, each meticulously crafted to intuitively capture, process and display real-time data from the field.

Features

- Management of real-time data flows
- Integrates data sources from existing and future systems
- Open communication protocols
- Generation of complete data streams from the connection of existing systems to the system using the data or to the final application
- Ability to integrate IoT devices for the collection and analysis of municipal data
- Provision of services to interested parties and analysis to support the integration of existing systems

Functionality

- Real-time data collection by pre-existing systems and IoT devices
- Provision of raw or in-depth data integrated between them (data fusion) for users and processing systems
- Smooth visualization in framework, maps and dashboards
- Data security and protection from cyber attacks
- Analysis of raw data and harmonization
- Calculation of real-time forecasts based on incoming data
- Event data ("raw data"): Analysis
- Calculation models based on historical data - Big Data Analysis

Extensions

- Provision the development of data processing and actions based on events
- Complex artificial intelligence models based on available data
- Deep Learning and Computer Vision frameworks for extracting data in real-time from video streams
- Customizable and verticalized dashboards for the user and / or for the service

Smart Lighting

The advanced technologies adopted in the intelligent lighting service are able to dynamically adapt the light intensity according to actual needs, generating significant additional energy savings compared to just replacing the LED.

The iLCS platform is the most advanced light management platform that combines the advantages of a modern remote control system with the exceptional possibilities deriving from the use of the real-time wireless communication network and an advanced IoT cloud platform.

The most interesting function for a massive energy saving is the possibility to adjust the light intensity according to the actual needs, for example by lowering the light when low volumes of traffic are detected in combination with good visibility conditions, in compliance with the national or regional regulations.

For example, using the FAI (Full Adaptive Installation) algorithm, it is possible to generate significant savings thanks to dynamic dimming, linked to road traffic conditions and weather conditions.

Each street is generally assigned to a specific lighting category that depends on the expected traffic flow.

However, according to the UNI 11248 standard, the lighting category can be dynamically modified on the basis of real-time measurements of real traffic and weather conditions.

In this way, significant savings are achieved which justify intelligent lighting systems as additional sources of savings in the transition to LED.
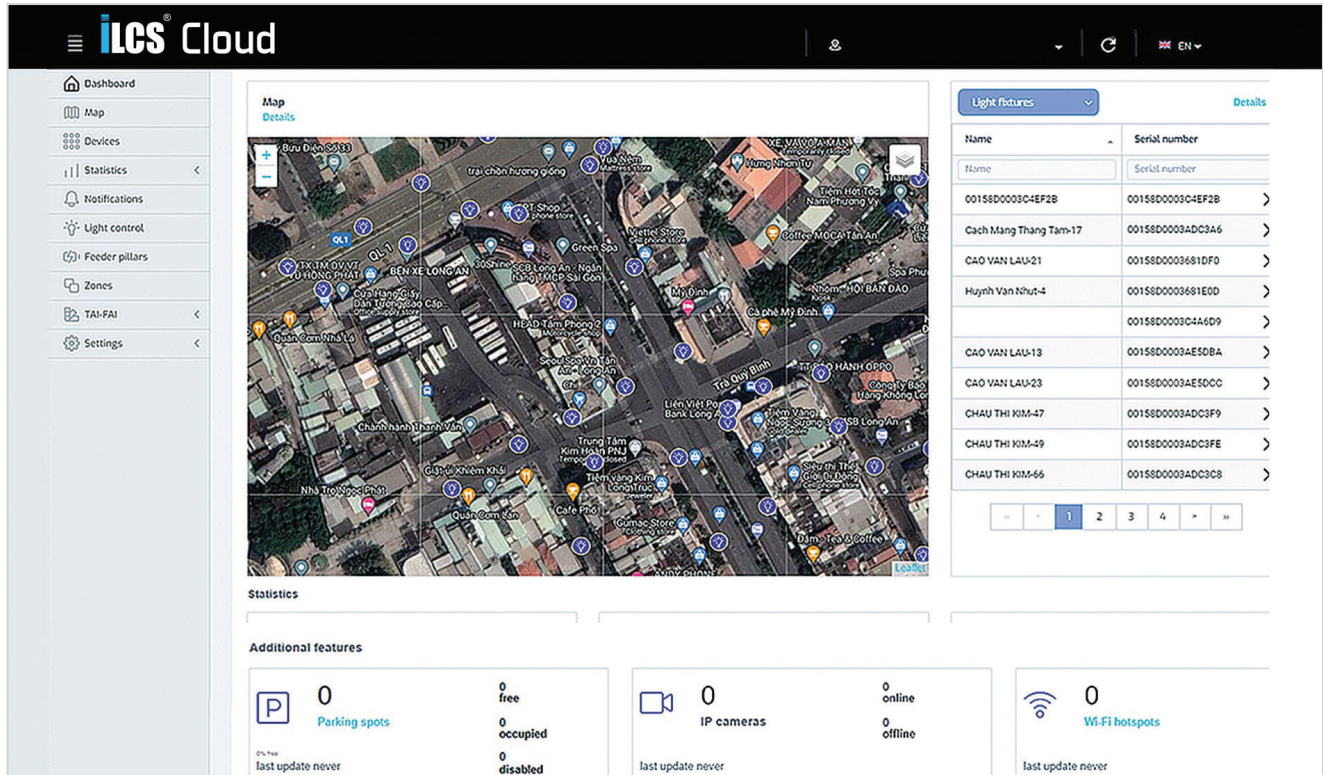
AI Traffic and Mobility

The Computer Vision module allows the extraction of data in real-time from the video streams present in the city, using AI modules on the edge.

The increase of cameras installed in cities has made it possible to help very often to solve safety problems or congestion in the streets.

However, video streams are underused due to the amount of information that can be extracted, processed in real-time and made available as aggregated data, for easy processing.

The AI Traffic and Mobility module was designed to increase and improve the use of IP cameras in the municipal area, allowing them to evolve from simple recording tools to advanced

sensors for analyzing the surrounding environment, providing previously inaccessible information and opening up to new potential services.

The system can be configured to manage the count of people entering and exiting places of interest such as squares or historic centers. The system can also be used to study the statistical trends of pedestrian flows.

Accurate information can be obtained in the counting of pedestrians or cyclists, being able to analyze in detail the trend of historic centers

during periods of closure to traffic, optimizing the people flow to vehicles and studying the trend in the use of neighbouring parking lots.

The applications for its use are several and they are totally configurable.

For example, traffic can be classified into 7 categories (cars, buses, trucks, trucks with trailers, motorcycles, bicycles, pedestrians) by defining one or more gates in the area framed by the camera.

Faced with a complex road situation therefore useful for a more detailed analysis, such as an intersection, more areas can be defined and each analysis area can provide independent and useful information for a better profiling of traffic as a whole.

The AI module adds sense to surveillance by automatically analyzing and extracting meaningful information from huge amounts of digital streaming data.

Based on a rich and constantly updated set of Computer Vision-based

video analytics engines, the module has already been used successfully in several security and surveillance applications, including traffic, crowd, parking, building management such as the count of people entering / exiting.

The introduction of a Deep Learning (DL) framework also allow to enable many new applications.

The AI Traffic and Mobility module has been specially designed to replace the tedious manual processes used to track, regulate and analyze the movement of vehicles on the roads

and to enforce traffic rules. It acts as a true decision support system for traffic planners and law enforcement.

The system is highly scalable as it allows video processing to be performed even on the edge, distributing the processing load and allowing the architecture to scale easily without resource limits.

Environmental Analysis

The platform offers an excellent tool for a detailed analysis of the air and the real points of interest.

The quality of the urban environment directly affects people's health and it is important to understand the real-time status of urban air quality.

The monitoring of air quality, the analysis of data on the concentration of atmospheric pollutants and the space-time visualization are the strengths of the platform.

Using real-time monitoring data, with detection points down to the granularity of the minute,

the iLCS platform enables interactive queries and makes it easier for users to assess the trend of pollutants.

Air pollution with PM2.5 (particulate matter less than 2.5 micrometers in diameter) is a serious health risk in many cities around the world, but because measuring instruments are traditionally expensive, monitoring sites are rare and generally they show only background concentrations.

With the advent of low-cost, radio connected sensors, air quality measurements are increasingly being made in places where many people spend their time and pollution is worst: on streets near traffic.

Their ease of installation and low cost make it possible to have data which, although less precise, are an important source for understanding the space-time trends of pollutants.

Parking Management

The platform offers a real-time view of events, provides all statistical data to acquire information on behaviours and trends. It also allows to know the type of vehicle parked in each spot.

Designed to monitor and manage large public and private car parks, the platform allows to easily integrate third-party hardware products, thus benefiting from the strengths of each technology.

For this reason it is possible to use a multitude of technologies available for parking detection:
- Sensors to be installed on the ground
- Optical detection sensors
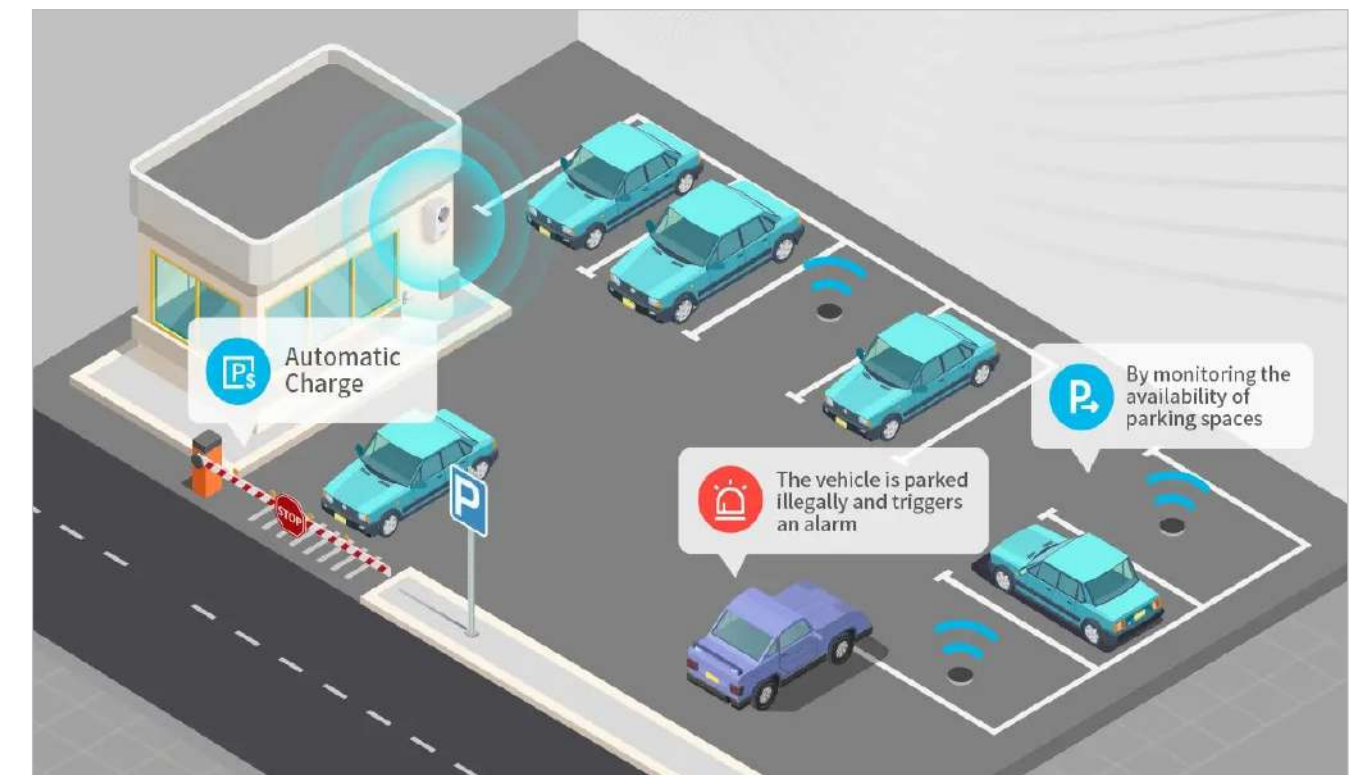- IP cameras
- Magnetic and / or radar sensors

Each technology has its own strengths and their joint use allows you to customize the project in the best way, depending on the individual areas to be monitored.

An advanced function that the Parking Management module provides concerns the possibility of receiving information also relating to the type of vehicle parked.

The advanced functions allow for example to more effectively monitor the use of electric vehicle charging stations.

iLCS Cloud allows you to view all installations associated with the user in one place. Moving between them takes just one click.

The car parks are georeferenced and displayed on the main dashboard, allowing for easy location and are intuitively coloured according to their actual occupancy status.

Source: https://www.geospatialworld.net/prime/business-and-industry-trends/north-america-to-use-iot-technology-for-parking-management/

Urban IoT Automation

It allows to connect, manage, process and analyze data from thousands of IoT devices and sensors from heterogeneous networks, activating triggers and outputs in real-time, in geographically distributed environments.

One of the most distinctive features of a smart city is its ability to assimilate new technologies. But what do we mean by smart city technology? No, it is not a list of devices "that facilitate urban life".

Self-driving cars, Big Data, robots, remote public services... reveal the level of urban intelligence on the surface. However, their integration is based on a more complex equation.

To solve this problem, it is important to note that these smart city solutions are closely related and generate effects on many levels.
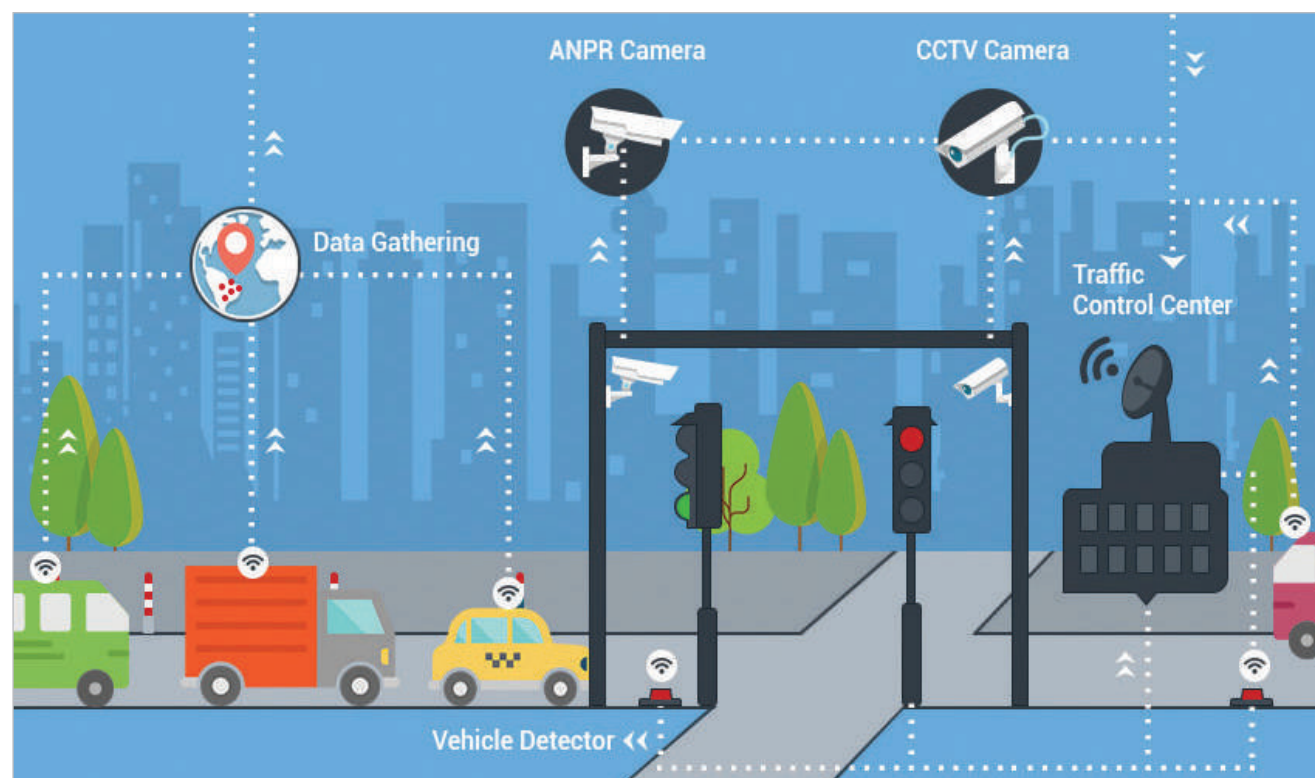
Interoperability and data integration are two of the most challenging problems facing cities today.

Very often it is not possible to effectively exploit this information due to the huge amount of data generated, the heterogeneity of the data and the lack of a common platform for their integrated analysis.

The Urban IoT automation module realizes a complete data fusion, allowing you to connect, manage, process and analyze the data of thousands of IoT devices and sensors of heterogeneous networks.

It also allows you to:
- Collect data from thousands of IoT devices
- Normalize the integration of IoT devices
- Big data analysis in real-time on flows and events
- Run custom machine learning algorithms
- Free real-time triggers and outputs, obtained from the implemented algorithms

Source: https://www.finoit.com/blog/role-of-internet-of-things-for-smart-cities-challenges-of-iot/

Metering

Monitoring and management of multi-utility infrastructures (electricity, water, gas and others), connecting, managing and processing data from smart meters, in geographically distributed environments.

The Metering module is our integral solution dedicated to measuring, analyzing and optimizing consumption of electricity, water or gas, among others.

Oriented to provide services to companies that need the infrastructure to manage the acquisition and processing of data, as well as the management of the assets involved centralized in a single platform.

The tools provided allow to analyze and optimize the efficiency of the monitored infrastructure. The Metering module can be implemented in residential, industrial or commercial environments to also carry out sub-accounting activities, which make it possible to reduce costs by optimizing consumption.

Some of its strengths:
- Device integration: multi-protocol and multi-utility
- Data collection and processing to build a unified data model
- Personalized reports
- Customizable tools and dashboards for data visualization
- M2M and API integration to be integrated also with external systems

- Advanced data processing tools for the implementation of new ad hoc algorithms, aggregations, analyze, etc
- Positioning management (geolocation)
- Automated rules and customizable alarms
- Operational status monitoring

Smart Meters and other collection devices communicate with the Metering module in a safe, efficient and economical way, using modern communication technologies. Our system is independent of communication technology, so wireless communications of any kind are available while monitoring and management tools enrich the information collected.

The Metering module is part of the iLCS IoT platform and therefore leverage the complete set of tools to remotely monitor, manage and operate with resources and devices. It allows you to integrate many types of smart meters and allows to have real-time information on consumption, through two-way communication for accurate analysis.

For example, smart meters can be placed into Outdoor Feeder Pillars (Electrical Distribution Boxes) making them smart, that allows you to track energy consumptions, points of loss and inefficient or unauthorized tampering use of electricity. It offers the ability to have shorter downtime, as well as long-term benefits such as trade loss tracking and improved operational efficiency.

Furthermore, smart meters can optimize the use of any network that leads to its stability and expansion at reduced costs. One can know more precisely how much energy is being used and how it could be used more efficiently through detailed feedback.

By analyzing large-scale data, we can move to a model in which granular, real-time demand data, rather than historical data, determines supply generation. This will support the shift from large-scale planning to more local and efficient planning.

IoT Connect

Wireless transport infrastructures for IoT devices, in the various protocols available on the market, such as: LoRaWAN, IEEE802.15.4, NBIoT, 802.11, 5G. Your devices can be connected to the Cloud without developing or using an intermediate network server.

The iLCS team can support you with a full range of network infrastructure solutions that solve critical problems in the design, construction, installation, commissioning and operation of wireless networks.
The offered design is based on:

- Simplicity: ease of implementation and maintenance
- Efficiency: operate reliably and scalable to reduce costs
- Capacity: increase capacity quickly and inexpensively as needs grow
- Performance: offer an optimal user experience to increase customer satisfaction and consequently revenues

We build strong partnerships, our customers know they can count on us to modernize their network infrastructure.

iLCS supports by offering you a complete end-to-end RF solution, everything you need to build complete, high-performance networks.
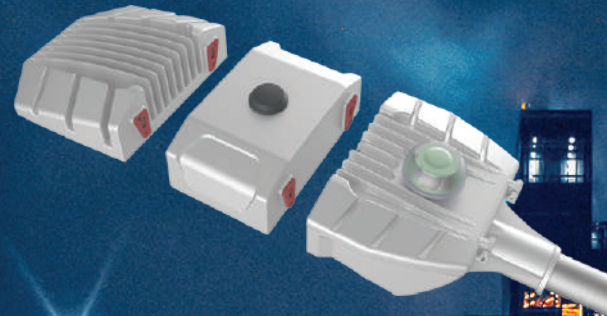
2018
Best innovative product – Middle East
lighting design summit 2018 (Dubai)

2018
Best innovative product –
Australian smart lighting summit

2019
Top 5 in category "smart city"
at Handelsblatt energy awards
19/20 (Germany)

2020
European product design award

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