Smart City Road Lighting Product Collection

A comprehensive energy management service provider for road lighting contracts

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Product Introduction

2 Part

Product Overview

Detailed fu

详细功能

Single lamp controller

Functions: Remote on/off control of individual street lamps, dimming control, data collection...

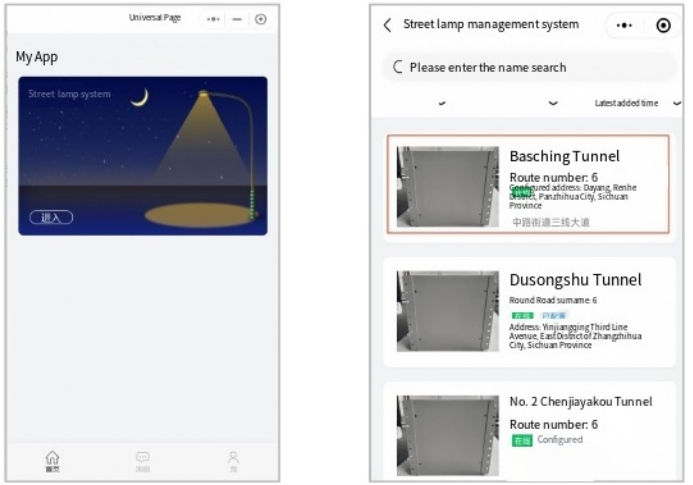
Illumination Management Platform

Function: Digital operation and management of urban road lighting

Intelligent monitoring terminal

Functions: Electrical energy collection for main and branch circuits of distribution cabinets, leakage monitoring, over-limit protection, etc.

Illumination Management Mini Program



Function: Urban Road Lighting Operation and Management Too

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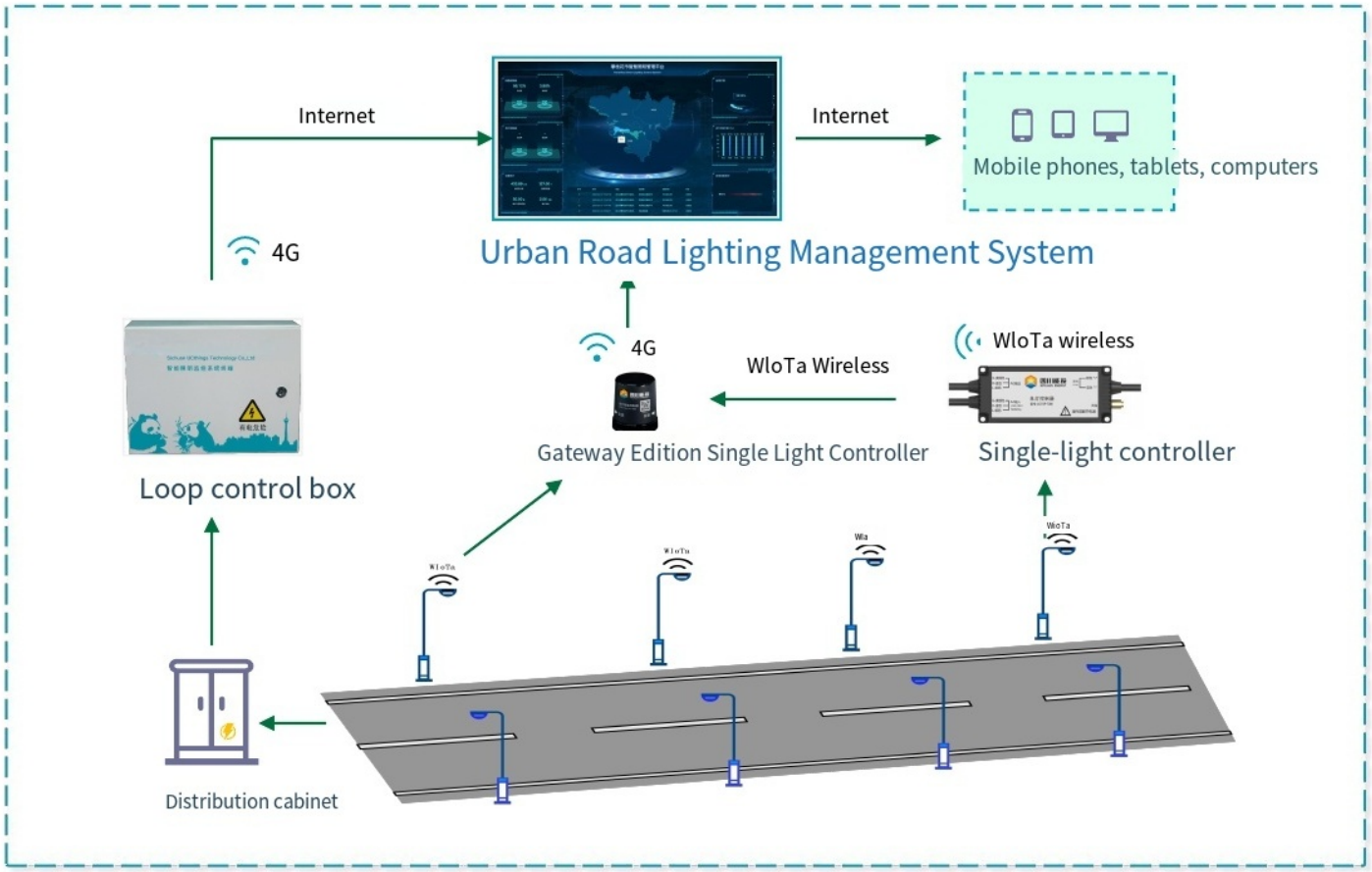
Business View

Digital Infrastructure for Fine-Grained Management of Road Lighting in Smart Cities



Business value

An Internet of Things application platform based on cloud computing and edge computing

Real-time equipment data reporting and remote system upgrade are available.

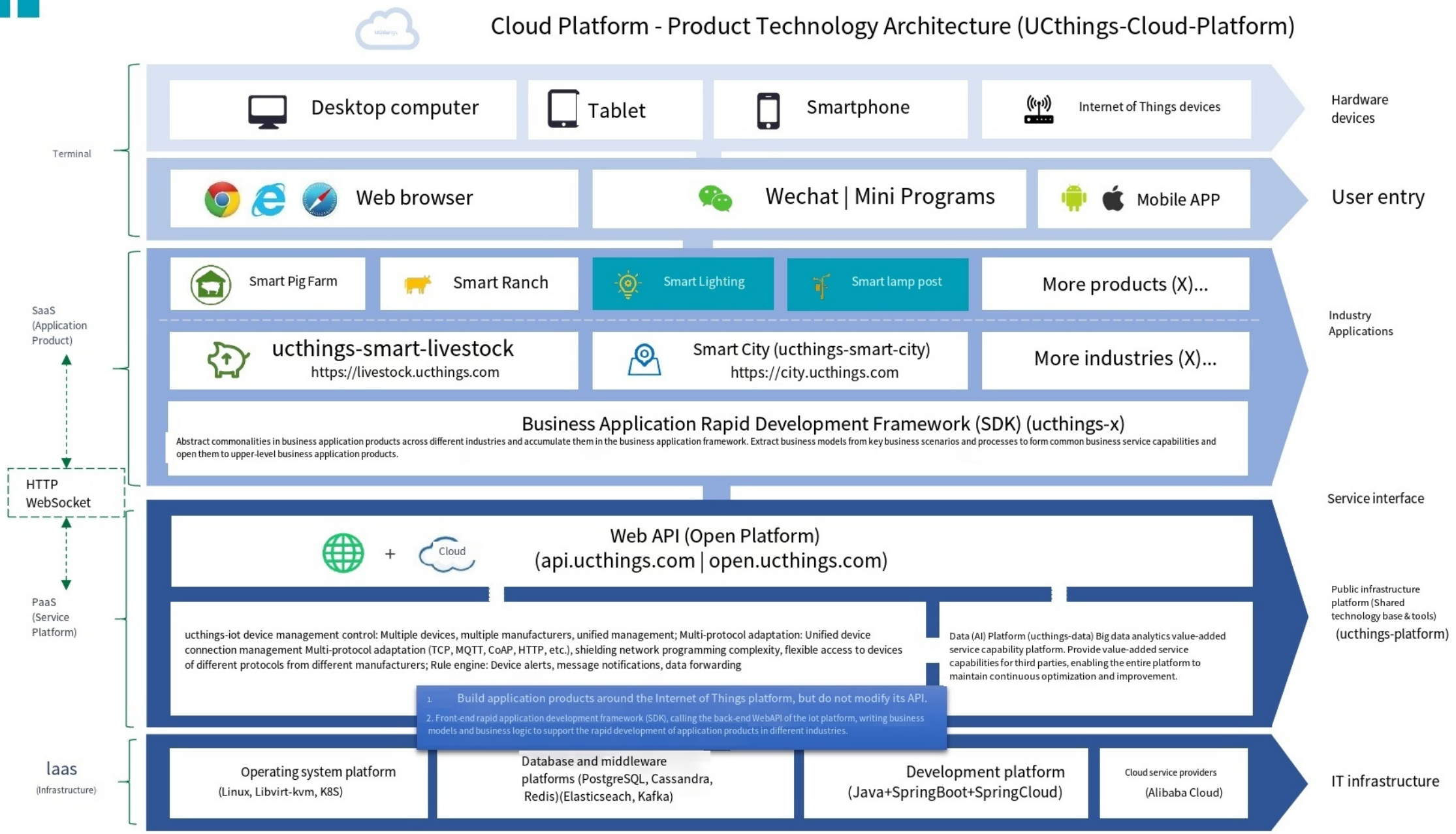
· Self-owned intellectual property WIoTa wireless communication protocol, extended communication distance, anti-interference, strong penetration.

Industrial-grade intelligent terminals, specially designed for harsh outdoor environments.

Precise control over the on/off and dimming of each street lamp, with multiple preset dimming strategies, flexible grouping, and one-click command issuance.

2 Part

Technical architecture



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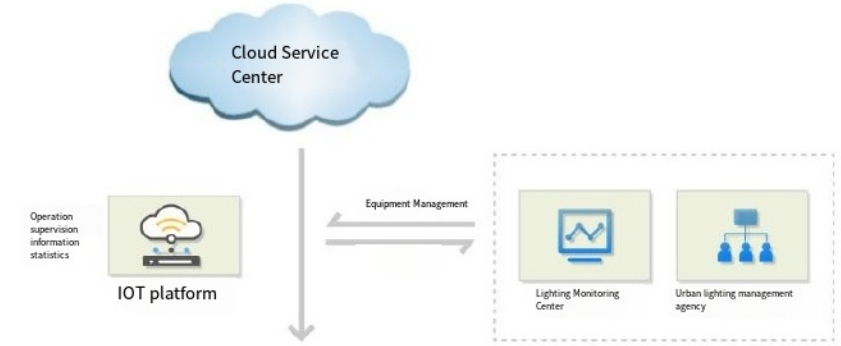
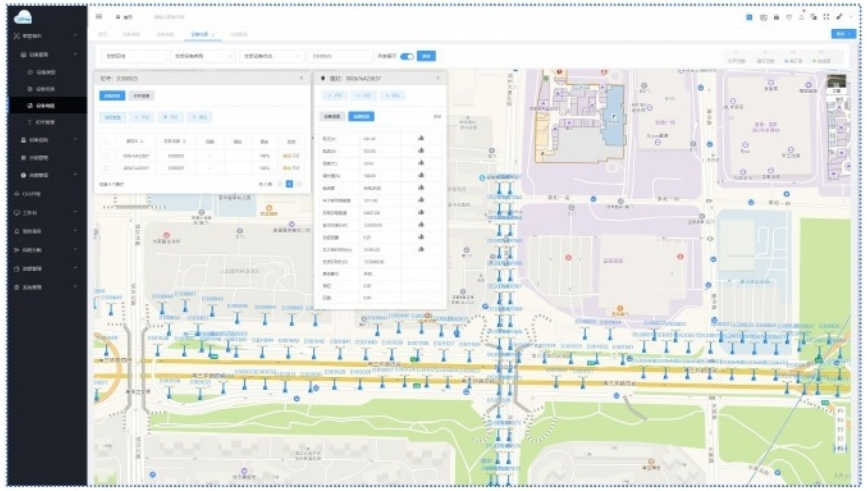
Smart lighting management platform





Flexible control for effective energy saving + One-click writing for worry-free operation and maintenance

Supports visual remote control.

· Equipped with systems such as IoT single-lamp management, operation and maintenance management, big data asset management, project management, and auxiliary decision-making for lighting energy consumption.

Supports functions such as data collection, GIS map monitoring, remote control, alarm/log, control strategy and asset management.

Rich interaction, supporting system expansion interfaces such as APPs and WeChat mini-programs.

· It can be redeveloped and extended for other sensor applications.

Support multi-platform interconnection and interoperability of different manufacturers.

Highly available multi-functional

Unified management of multiple devices from various manufacturers; multi-protocol adaptation; rule engine;

Business data modeling and integration

Modular SDK + Rich Interface API

All systems and sub-systems of each module share data resources and can call on each other, effectively realizing the integration of all systems.

Business interaction between systems

Microservice scalable architecture

The microservice architecture is relatively independent and highly autonomous. It can be integrated into a service aggregation platform "upward" and standardized logic can be added "downward" based on modularization.

Block functionality, enabling agile customized development

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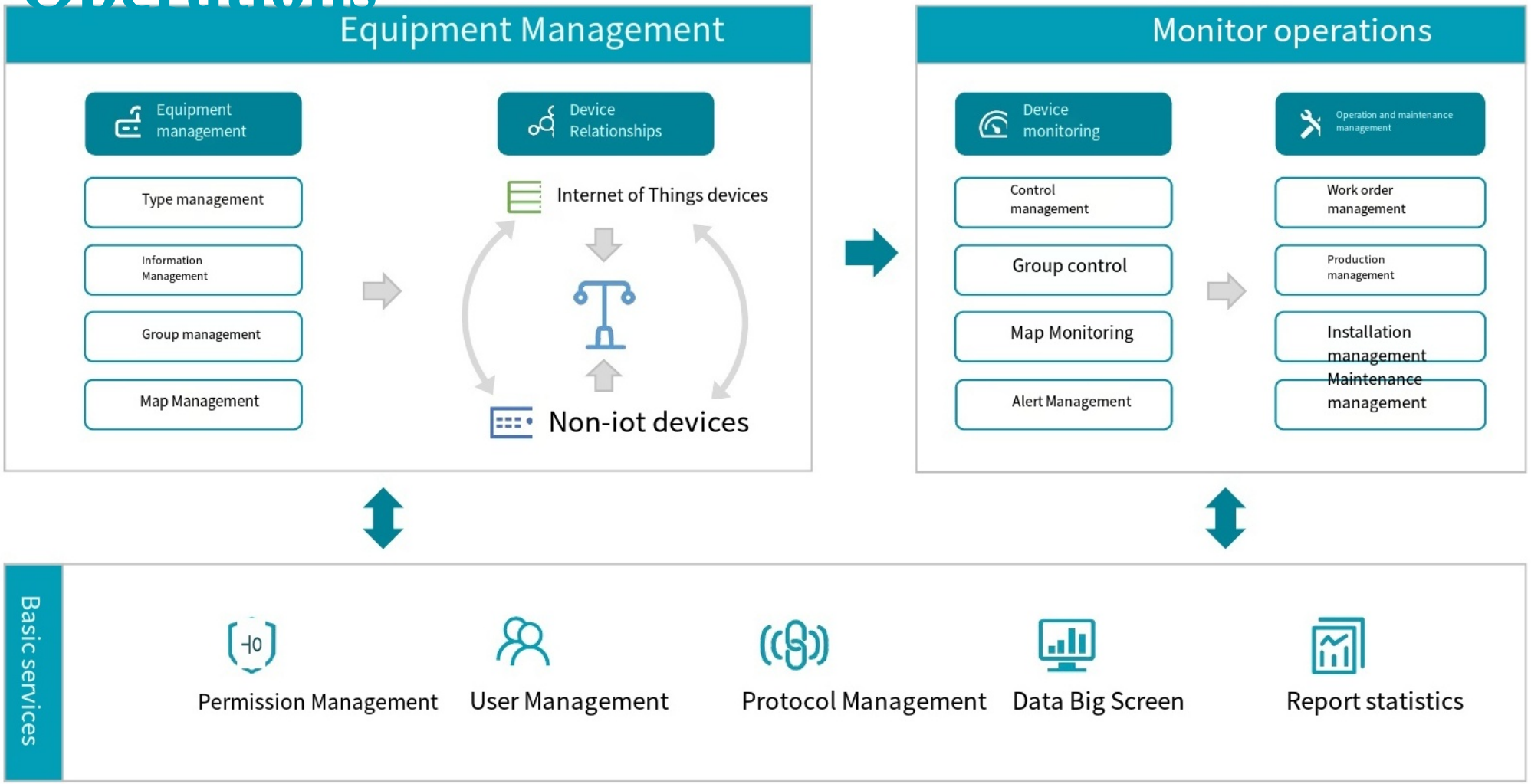
Smart Lighting Management Platform - Business Operations



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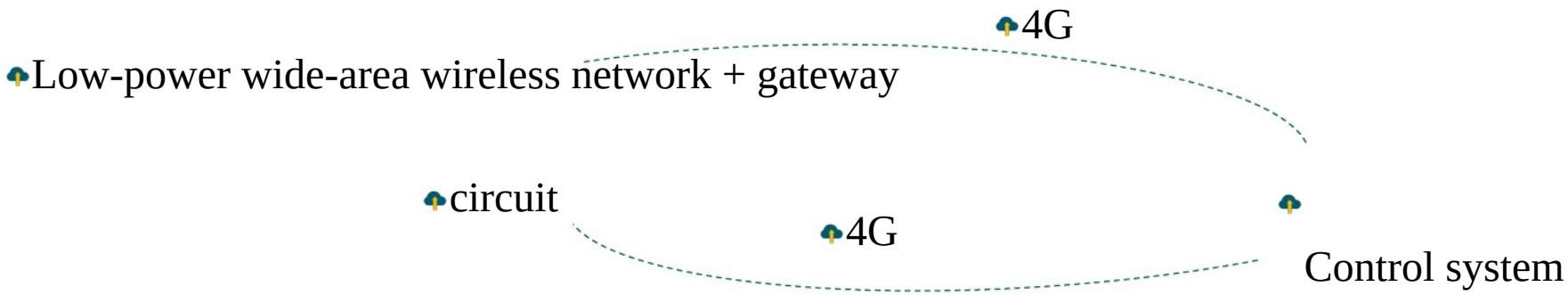
Patented networking mode, sensitive instructions, and cost-effective network usage.



PLC

No additional wiring required.

Not affected by communication signals;

There is too much signal noise;

Resource-intensive;

The number of loads carried is small.

NB-IOT

It will incur data charges;

It requires operators to set up base stations.

ZigBee

More practical short-distance scenarios;

Weak wall-penetrating ability;

WIoTA

Low power consumption; Long transmission distance; Strong anti-interference; Unique detection method; Advanced data scheduling algorithm;

Carry more loads.

Lora

The transmission power of non-domestically produced technology is restricted.

Low power consump

Long transmission dista

Can be networked;

The load-carrying capacity is large.

2 Part

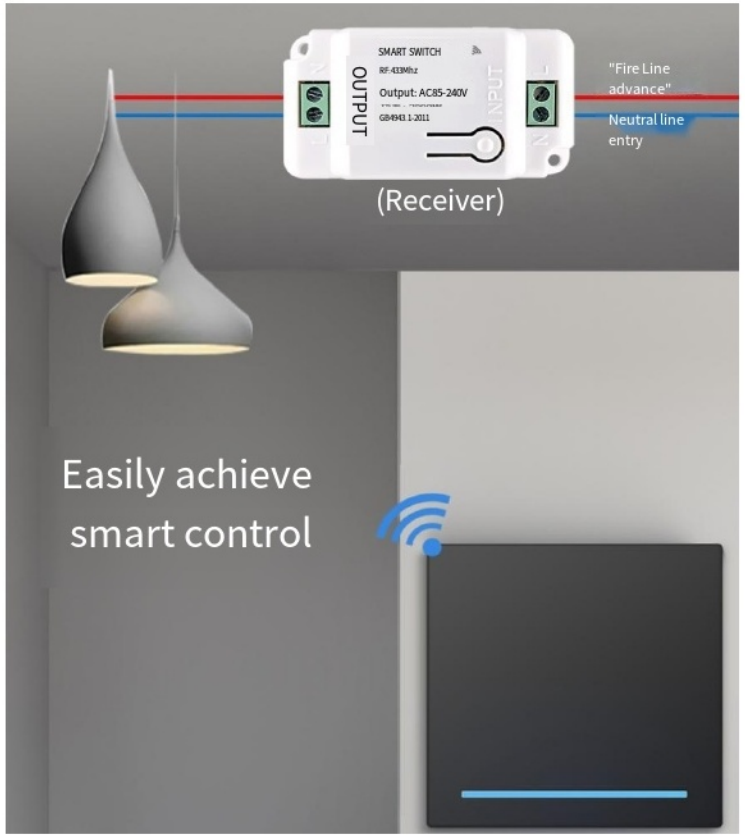
Intelligent street lamp product life cycle management

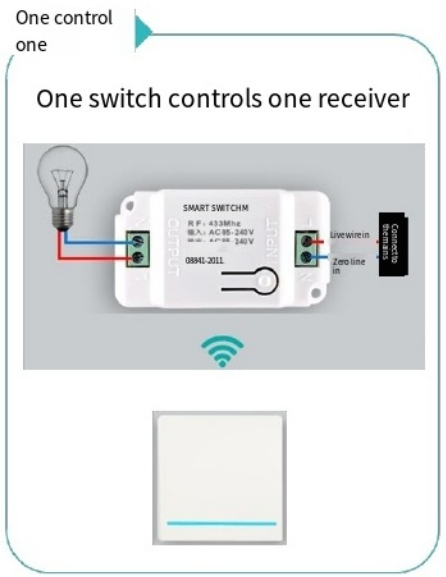
2
Part

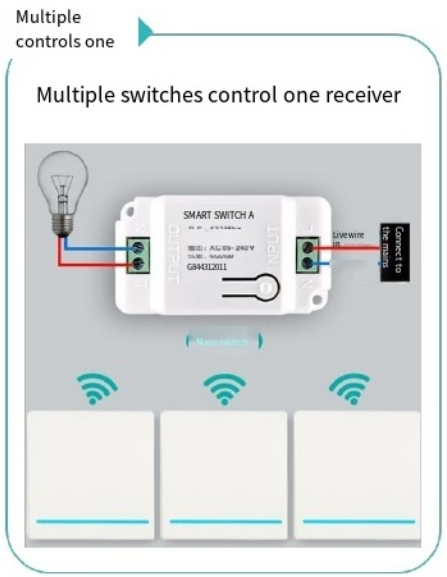
New application scenario - Wireless switch control for lighting

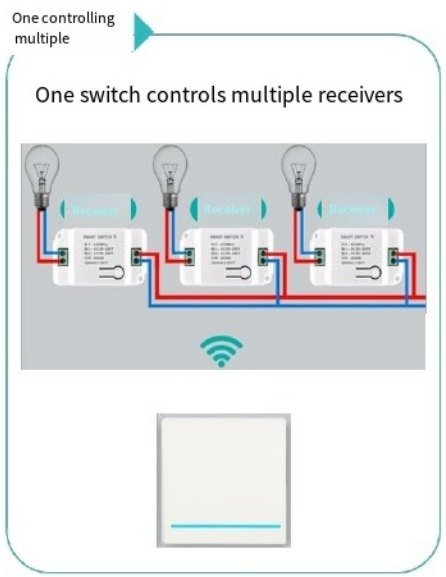
WIoTa Wireless Switch Controller

The WIoTa wireless switch controller is a fast, flexible and low-cost solution designed for indoor lighting scenarios. Its core features include **no wiring**, **wide coverage**, **low power consumption**, **low cost** and **multiple modes.** It is **easy** to **install** and can meet the lighting system requirements of **various** scenarios such as homes, schools, supermarkets, exhibitions, companies, temporary venues and lighting renovations. It solves many problems of traditional lighting systems, **such** as wall drilling and rewiring, **long** deployment cycle, **difficult later** maintenance and **renovation**, **inflexibility** in **use** and **high cost.**









2 Product Applications and Value

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Challenges Faced by Traditional Road Lighting

Huge consumption of electric power

The energy consumption of traditional street lamps is huge.

Poor management leads to waste of electric energy, which is easily affected by seasonal, weather and natural conditions as well as human factors. Lights are often left on when they should be off and turned off when they should be on, resulting in energy waste and financial burden.

High maintenance cost

The fault is difficult to locate.

High maintenance labor costs

There is a lack of initiative, timeliness and reliability, and it is impossible to monitor the operating status of all street lamps in the city in real time, accurately and comprehensively.

Safety risks

Poor weather conditions prevent the lights from being turned on in a timely and proactive manner, posing safety risks and leading to complaints from citizens.

It is impossible to carry out timely and effective maintenance and management.

3
Part

Current operation status and user pain points

Manual, light-controlled, clock-controlled

They are often affected by seasonal, weather, natural environmental and human factors, and fail to turn on or off at the right time, resulting in energy waste and financial burden.

The switch time cannot be remotely controlled.

It is impossible to adjust the time and modify the switch time in a timely manner according to the actual situation (such as sudden weather changes, major events, and festivals), nor can the LED lights be dimmed, thus failing to achieve secondary energy conservation.

Lacking the function of monitoring the status of street lamps

The lack of initiative, timeliness and reliability makes it impossible to monitor the operational status of all the street lamps in the city in real time, accurately and comprehensively.

Ordinary manual inspection

The management department lacks the ability to make unified dispatching, and can only adjust each distribution cabinet as a unit. This not only takes a lot of time and effort but also increases the possibility of human error.

Safety hazards

Relying on manual inspections and citizen complaints for monitoring physical changes in street lamps cannot be timely, which may lead to potential safety hazards and cause secondary injuries.

Failure to carry out timely repairs

Without a powerful repair force and effective repair means, it is impossible to carry out timely and effective maintenance and management.

First-level energy conservation

	of LED lights	150 watts per day (12-hour working day)	cost at 1.8 degrees (At 0.8 per degree)
 High-pressure sodium lamp	400 watts	4.8 degrees	About 1,400 yuan
 Typical power consumption	Power consumption:	Annual electricity	About 525 yuan

The second step of energy conservation: An overall solution for smart lighting

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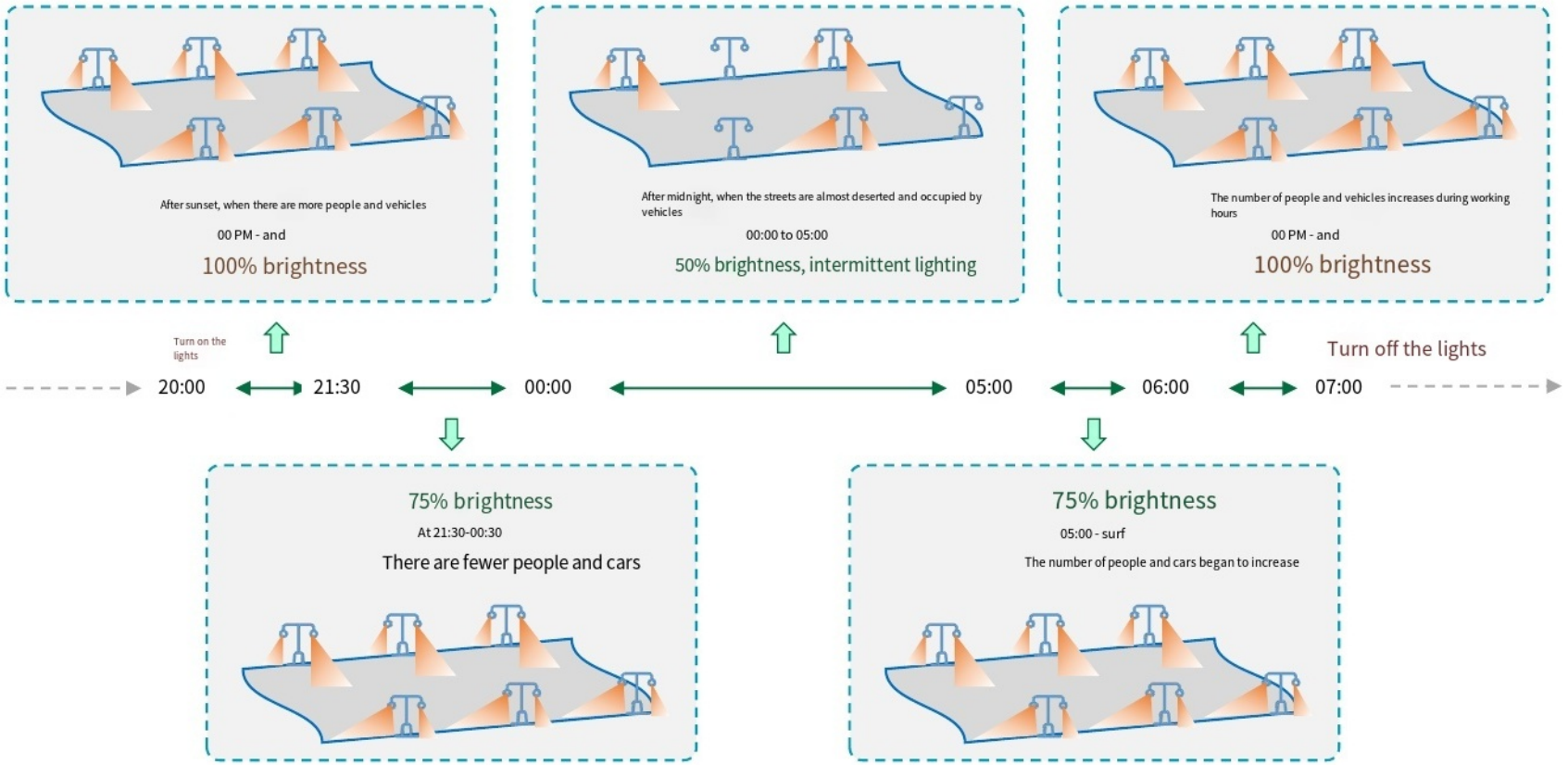
Application Scenario 1: Energy-saving dimming at different times of the day



Solution

Automatically adjust the on/off status and brightness of the lights according to the preset lighting control plan.

The gateway automatically calculates the sunrise and sunset times based on the input latitude and longitude, which are in line with the local actual conditions.

If a single-lamp controller is used in combination, it can also achieve real-time on-demand lighting, maximizing energy savings.

Start	as of; by; up to	Power output
Turn on the lights at sunset	21:30	100%
21:30	0:00	75%
0:00	5:00	50%
5:00	6:00	75%
6:00	Turn off the lights at sunrise	100%

3
Part

Application Scenario 2: Special Festival/Location Care Settings

Scene description

Special lighting control strategies can be set up to implement differentiated lighting plans during holidays or in areas with high pedestrian traffic.

Interact with other systems to enhance the illumination brightness at the accident site.

Real-time specification of the illumination brightness for certain areas.

3
Part

Application Scenario 3: Automatically turn on or adjust the brightness in bad weather.

Traditional control methods cannot achieve automatic control based on the environment.

Scene description

Traditional street lamps are controlled by manual operation or timers according to a fixed schedule.

When encountering severe weather such as heavy rain, it is unable to provide flexible and timely lighting, posing a risk to road safety.

Solution

The controller integrates a brightness sensor or connects to a city-wide brightness sensor and automatically turns on the street lamps when the brightness drops below the set threshold.

It has enhanced road safety in bad weather and raised citizens' satisfaction.

3
Part

Scene 4: Automatic Operation and Maintenance for Faulty Street Lights

A malfunction of the street lamp has been detected.

Automatically send alarm messages

Arrange the maintenance plan and notify the maintenance personnel.

On-site maintenance and repair

Street lamp restoration work

3
Part

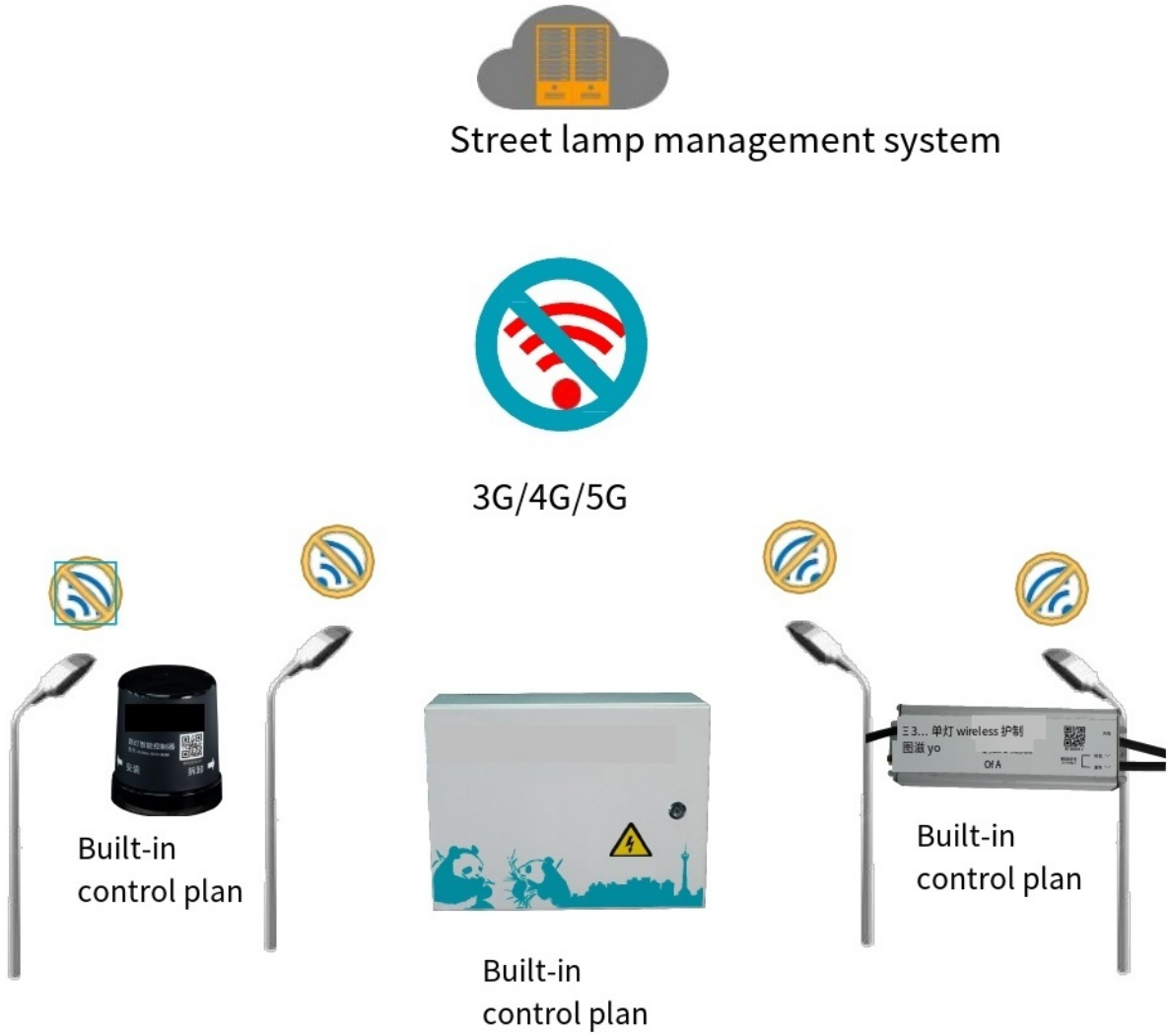
Scene 5: System Self-Operation in Case of Network Connection Failure

Scene description

When the device loses network connection, it can work in offline mode. The control plan is written into the device and is not affected by the network disconnection.

Both the gateway and the street lamp control support writing control plans, providing double protection.

It greatly reduces the reliance on communication networks and enhances the reliability of the system.



3 Part

Product application advantages: Flexible configuration

Advantages of domestic chip components:

All the chips used in the product hardware are independently developed and designed by our company with our own intellectual property rights. The technical standards can be compared with the first-tier in both domestic and international markets. They are particularly suitable for Internet of Things application scenarios, and can achieve highly customized flexible deployment solutions, while also featuring higher performance and lower power consumption.

Flexible networking mode:

The product communication mode can adopt the configuration of both WIoTA wireless private domain deployment and 4G cellular communication public network deployment simultaneously. The WIoTA wireless communication protocol of Yuzhiwei is an IoT communication protocol with completely independent intellectual property rights of Chinese people. It has technical advantages such as low power consumption, long transmission distance, strong anti-interference ability, and large number of loadable devices. It is not restricted by foreign technologies and can also ensure national communication security. Under this flexible networking mode, the communication mode of the system can prioritize free communication without data traffic, and cellular communication can be called in extreme scenarios in a timely manner. This can not only ensure the efficient operation of the system but also reduce operating costs, while also taking into account national security and the protection policy of domestic technologies.

Structural advantages:

The board card modular design allows for flexible addition and removal. The interface has high expandability and can be externally connected to temperature and humidity sensors, rain sensors, etc. It is equipped with rich AI/DI/DO, making it suitable for complex power distribution scenarios. The LCD display and key operation system enable local direct configuration.

Performance advantages:

 Cortex-M4 architecture ARM microprocessor (higher than the average level of M3 in the market), high-performance 32-bit CPU with full independent intellectual property rights based on RISC-V architecture (domestic high-performance CPU)

Advantages of iterative upgrading:

The device can be conveniently upgraded via USB interface, SD card or wireless communication.

3
Part

Product application advantages: Business security and reliability

A meticulous ability to interpret business operations:

Based on the accumulation of experience in the smart city industry, we can accurately interpret the pain points of business needs.

High flexibility and scalability:

The platform has established a unified device model for devices, which is highly modular and componentized. Even for complex internal infrastructure, if there is a need for resource expansion or reduction, the platform can provide the required flexibility and scalability.

Professional platform R&D capabilities:

Apply the design and architecture of the operator-level communication equipment management platform to the smart city-related industries, to achieve basic capabilities such as unified access management, data management, parsing, and data empowerment for terminal devices, and provide top-notch technical services to the existing industries.

A reliable data security system:

Apply the professional data operation and maintenance management system of the platform to the smart city industry to enhance the reliability, stability and security of the platform system and user data.

Rapid service response mechanism:

Professional platform operation and maintenance engineers provide rapid and effective assistance to clients in data maintenance and analysis, and solve various platform issues. They effectively display basic equipment information, operational status, alarm status, log status, etc., and perform available operations on the equipment based on GIS and 3D technology.

03

合作模式

4
Part

Cooperation mode

Product sales

Direct purchase of chips, customized chips, networking equipment and terminal devices, providing data interfaces, chip and module solutions.

Overall solution provision

A complete solution that includes networking equipment, terminal devices, operation and management software, Internet of Things (IoT) and artificial intelligence (AI) platforms.

Internet of Things (IoT) service provision

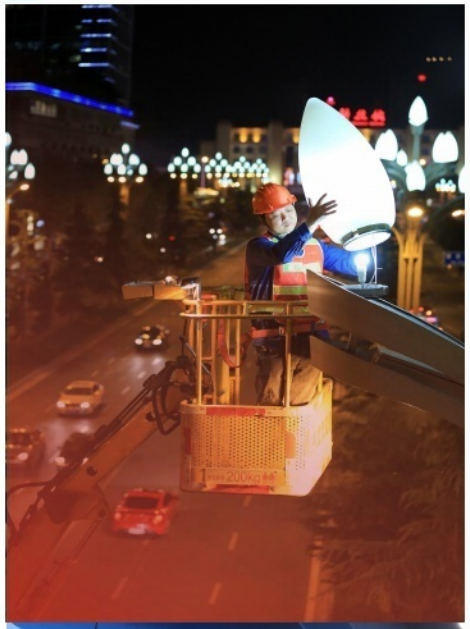
Provide comprehensive Internet of Things (IoT) services to enterprises, industries, and government institutions and entities, assisting them in enhancing production efficiency, improving industry standards, and perfecting regulatory measures.

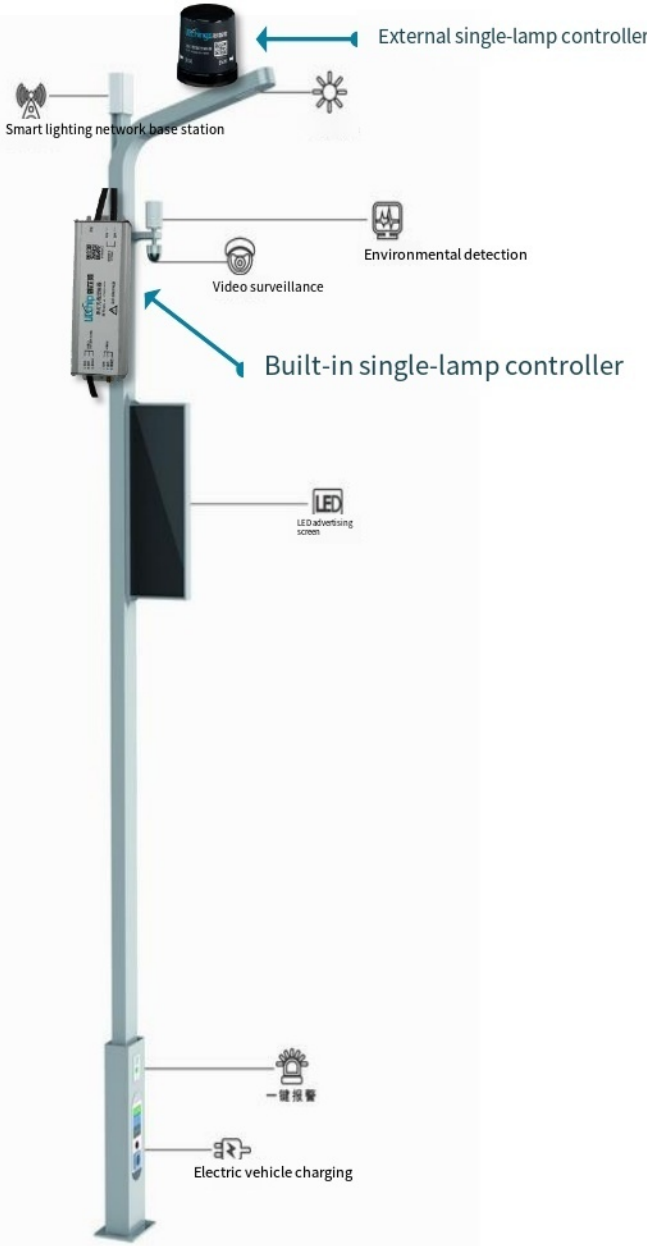
Joint research and development, operation

Jointly develop and operate Internet of Things (IoT) products with enterprises, industries, and government institutions and entities. Complement each other's strengths, make progress together, enhance the competitiveness of partner enterprises, and rapidly expand the IoT application market.

04 客户案例

Case 1 - Large-scale Deployment of Equipment upon Market Launch

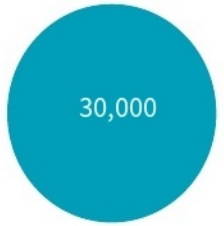




Chengdu City Investment Smart City Company

Chengdu Urban Lighting Precision Management Project

Cover the streets



Street lamp management

Based on our company's "completely independently designed chip and smart street lamp controller integration solution", Chengdu City Investment Smart City Company has completed the renovation of multiple street lamps within the Third Ring Road in the urban area of Chengdu. The project has been successfully connected to the City Investment Smart City Internet of Things platform, achieving an expansion and improvement from smart street lamps to smart city applications.

Case 2 - Precise Control of Landscape Lighting

Chongqing Liangjiang Smart City Investment and Development Co., Ltd.

The Landscape Lighting Project of Cun Tan International New City in Liangjiang New Area, Chongqing

Dynamic adjustment

Multi-dimensional switching of seasons, latitude and longitude, light effects and materials

Remote control

Device information is visible on one screen

Remote processing is one-click access

Chongqing Liangjiang City Investment has adopted a smart street lighting solution, endowing the landscape lighting system with intelligent control capabilities. Based on the demands for unified services and precise management and control, it has achieved rapid integration of single lamps, equipment groups, systems, and its own platform as well as existing applications in multiple aspects. With precise and intelligent control capabilities and stunning visual effects, it helps Liangjiang New Area attract more people and build an international fashion consumption experience zone.

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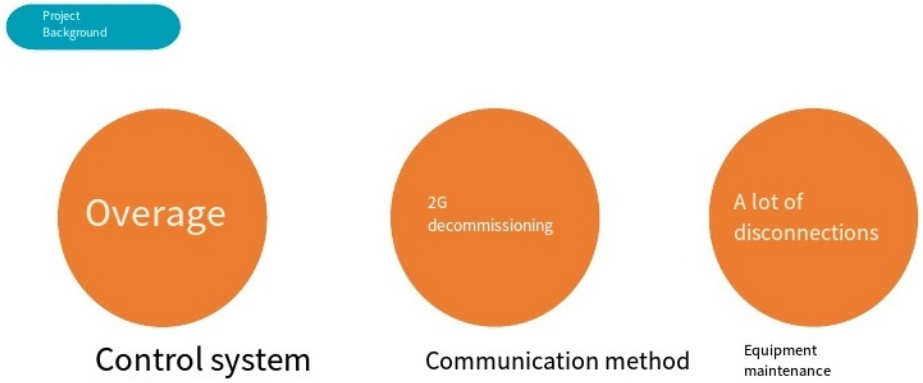
Case 3 - Overall Construction of Street Lamp Operation System

Panzhihua City Street Lamp Management Office

Panzhihua Street Lamp Monitoring System Upgrade and Transformation Project



The construction plan: It is an integrated control system with a central control room as the core, communication equipment and networks as the link, and advanced computer technology as the guarantee. It is characterized by high intelligence, few manual intervention links, good real-time performance and security, simple and convenient operation, and complete historical data records.

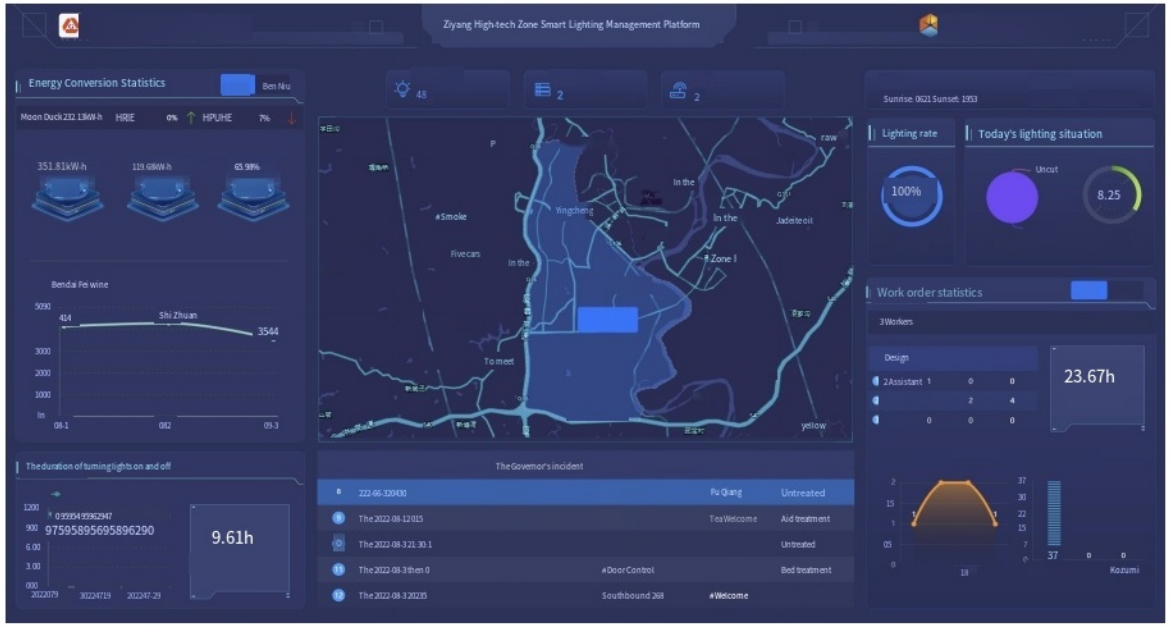
The system's functions cover all aspects including measurement, control, data collection, transmission, safety monitoring, communication, equipment management, real-time dynamic street lamp information, and intelligent management. It collects and monitors data such as the on-off status, alarm status, lighting rate, current and voltage of the lighting system, and enables real-time remote control. Thus, it can keep track of the operation status of the lighting system in real time. Any faults in street lamps can be detected promptly and trigger active alarms, ensuring the reliable operation of the lighting system and improving the quality of street lamp operation.

Case 4 - Overall Solution Services for Energy Performance Contracting

Sichuan Energy Investment Smart City Company

Smart lighting for urban street lamps in the High-tech Zone of Ziyang City

Energy-saving renovation project based on energy performance contracting with shared energy-saving benefits



The project adopts the "energy-saving benefit-sharing type of energy performance contracting" cooperation model, with a cooperation operation period of ten years. By comprehensively applying Internet of Things, cloud computing, GIS and other technologies, it will carry out LED energy-saving renovations for urban street lamps within the scope of Ziyang High-tech Zone and deploy a smart lighting energy-saving management system, equipping the street lamps with a "smart brain".

5
Part

A partial list of projects

Chengdu City Investment Tunnel Smart Lighting Installation Project	Installation Project of Fenghuangshan Sports Park	Integrated Improvement Project of Wenshu Fang Area	Chengdu City Investment Street Lamp Renovation Project
The First Phase of Chengdu City Investment Street Lamp (Energy-Saving Renovation)	Chongqing Liangjiang EMC Project	Chongqing Li Ming Road Project in Liangjiang Area	The "Multi-Pole Integration" Project on the Welcome Avenue of Chongqing Smart China Expo
Lighting up Chongqing Jin Haiwan Park	Longxing Landscape Film City Bridge Lighting Control Project	Longxing Landscape Building Landscape Lighting Control Project	Lighting Project of Chongqing Jinyu Outlets
Lighting Upgrade Project for Tunnels such as Baihuating	Lighting Project of Jinshan Tunnel in Liangjiang, Chongqing	Lighting Project of Chongqing Liangjiang Lanfeng Tunnel	Chongqing High Mast Lamp Project

2
Part

Attachment 1: Overview of Product Functions - Single Lamp Controller

Return

Basic functions

Remote control of lights on and off

Pre-set flexible dimming strategies, in conjunction with the information registration and reporting of loop control terminals, when the line

It can remember the last configuration.

Fault Monitoring

Automatic anomaly alerting

Automatic assignment

Lightning surge protection

Automatic time synchronization

Equipment upgrade

Featured Functions

Loop affiliation

It can also be checked when the route changes.

Dual-mode positioning with GPS and Beidou

GIS-based visualization management of equipment, rapid location for operation and maintenance, and maximum saving of personnel work.

Peripheral expansion

It can be connected with external temperature and humidity sensors, rain sensors, etc.

☒ Lamp post tilt monitoring

☒ Lamp post collision monitoring

Product form

Product highlights

·Optional multiple functions

The equipment supports self-checking.

When a single lamp is offline, the fixture automatically remains on and does not go dark.

·Memory dimming configuration

· Dual-lamp control/series-lamp control models are available for selection.

·Supports remote upgrade

·High protection grade

2
Part

Attachment 2: Overview of Product Functions - Smart Monitoring Terminal

返回

Basic Functions Special Features

Remote control

Self-control

Automatic alarm

Manual selection and measurement, patrol measurement

Automatic and manual remote meter reading

Automatic time synchronization

Locally controllable

Event Record

Equipment upgrade

Flood control mode

When the water level is abnormal during the flood season, the terminal of the circuit will automatically stop the control to avoid the risk of electric shock.

Smart Bluetooth lock

Through a unified lock management platform, unlocking permissions are allocated to each maintenance personnel, and the unlocking history can be queried while the status of the locks is monitored.

Peripheral expansion

It can be externally connected with temperature and humidity sensors, rain sensors, etc.

Dual-mode positioning with GPS and Beidou

Relay communication mode

Product form

Product highlights

Rich AI/DI/DO functions, suitable for complex power distribution scenarios;

·ARM Cortex-M4 grade microprocessor;

A high-performance 32-bit CPU with full independent intellectual property rights based on the RISC-V architecture;

The device can be upgraded via USB interface, SD card or wireless communication.

· Board card modular design, high scalability