

SMART CITY SMART LIGHTING

FONDA TECH



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COMPANY INTRODUCTION

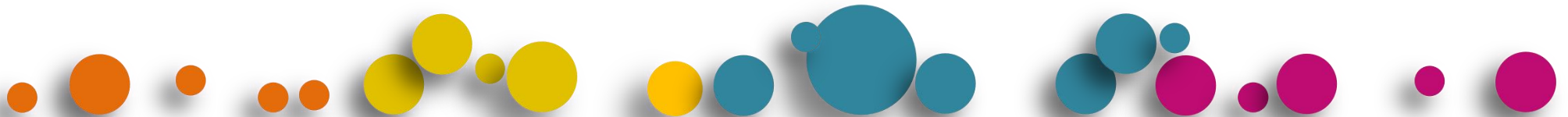
02

SOLUTIONS AND PRODUCTS

03

CASE STUDY

1. COMPANY INTRODUCTION





- Founded in 2011, Hangzhou, Fonda is a national high-tech enterprise committed to the innovative research and development in the field of Internet of Things and smart city.
- 10 years in street lamp controlling, No. 1 smart lighting brand in China.
- Certified by ISO9001, ISO14001 and ISO45001 .
- Holder of 150+ related patents, owner or constitutor of core technology in smart lighting.
- Excellent and comprehensive solution provider for IoT technology such as PLC, Zigbee, RF, LoRa, NB-IoT, GSM/LTE, etc.

FONDA Tech, as the global solution provider of smart lighting control, has more than 50 strategic partners in domestic and oversea.

We have implemented our state-of-the-art solutions and products to more than 80 countries, 200 cities or regions all over the world in the past 10 years.



Dr. Song Hongwei

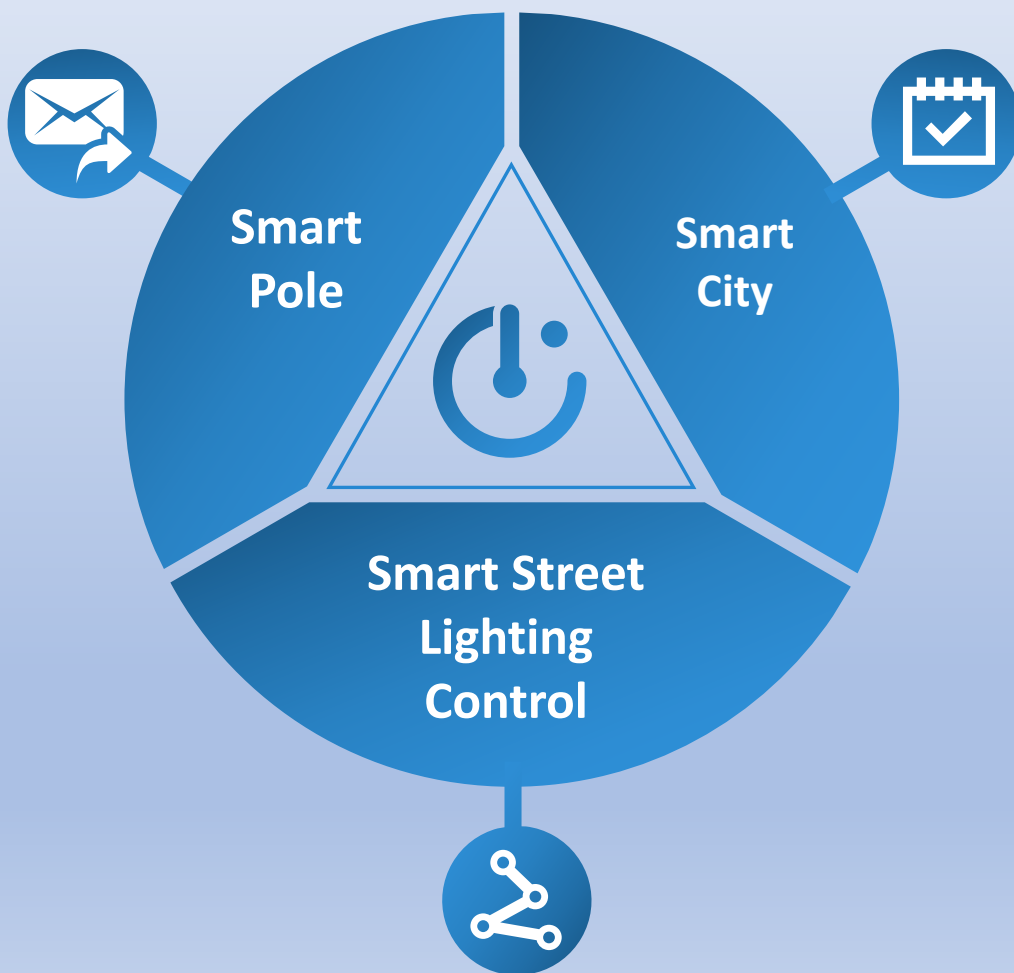
- Phd, Electrical and Computer Engineering, **Carnegie Mellon** University;
- Professor, Dept.of Computer engineering, **Zhejiang University**;
- Senior R&D Manager, **Marvell** Semiconductor, Dec, 2002~Oct, 2007;
- A member of the Sigma Xi Society (with outstanding research achievements);
- Carnegie Mellon University "Inventor of the Year Award (2001)";
- Award of IDEMA (International Disk Drive Equipment And Materials Association);
- A reviewer of World-class academic journal "IEEE";
- Successful led and developed the first batch of LDPC coding technology chip, which has been used globally since 2009.
- First author of 40+ papers on the top academy magazines;
- Owner of dozens of patents globally;
- Founder and CEO of Fonda Technology.

TV INTERVIEW





Fonda is a company that provides professional lighting solutions for smart city construction. We use variety of IoT technology to control street lamps remotely and intelligently. The proudly produced cloud platform SCCS, with over 10 years' continuous upgrading and evolving, is now the most powerful Central Management System that we ever created.



Smart Lighting

The core business of Fonda with 10 years.

The expertised control logic with different kinds of transmission methods such as PLC, Zigbee, LoRa, NB, GSM, LTE etc.

Smart Pole

The newly designed product that carries multiple equipments such as Camera, Screen, Weather Station, Charging station and 5G base station.

5G is the future and a smart pole is the window to it.

Smart City

Fonda's products can not only control street lamps, but also beautify and intelligitize the city.



**NATIONAL HIGH-TECH
R&D CENTER**



ISA 2018 & 2019



**TOP 50 IOT SYSTEM
INTEGRATOR IN CHINA**

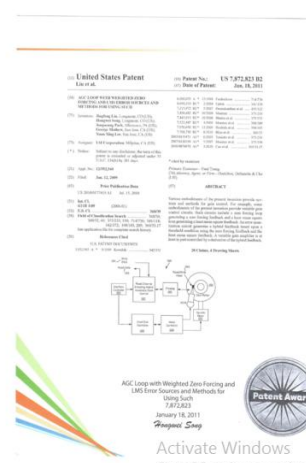
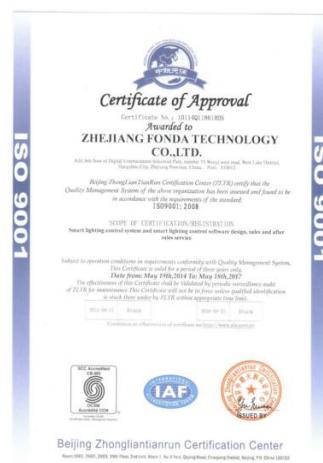


**INVISIBLE
CHAMPION**



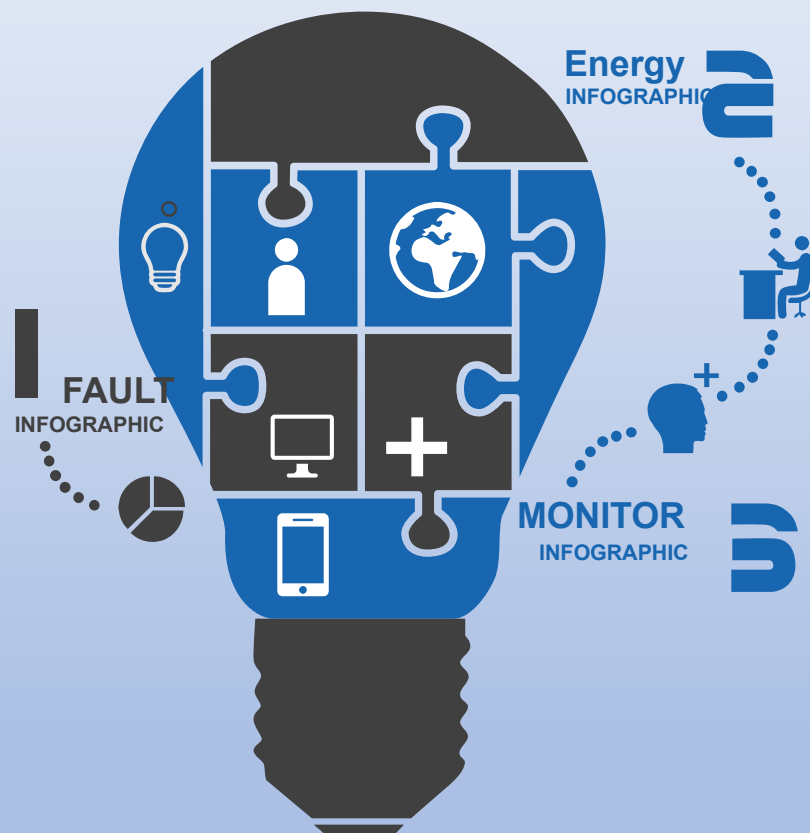


Patents



2. SOLUTIONS & PRODUCTS





Do you have similar situations?

- 01 Your street lights are controlled with timers and/or photocells.
- 02 You cannot remotely control your streetlights or retrieve vital information.
- 03 You rely on citizens or workers to report street light faults visually.
- 04 You have no knowledge of burn hours or the exact amount of kWh spent.
- 05 You are met with energy savings requirements from government.
- 06 You have no ability to minimize energy consumption at off-peak traffic hours.



Replace the traditional HPS with LED lights, and install a lamp controller on each lamp, together with Fonda's energy saving strategy.

76%

Energy Saving Rate

90%

Maintenance Cost Reduction



All devices are controlled and managed by cloud based platform. All failure info will be instantly sent to specific people via SMS, Email and APP notification.

Street Lighting

- PLC (Power Line Communication)
- Zigbee, LoRa Mesh
- LoRaWAN
- Cellular: LTE/NB-IoT

Solar Lighting

- Zigbee
- 2G, LTE

Tunnel Lighting

- PLC
- RS485

Facade Lighting

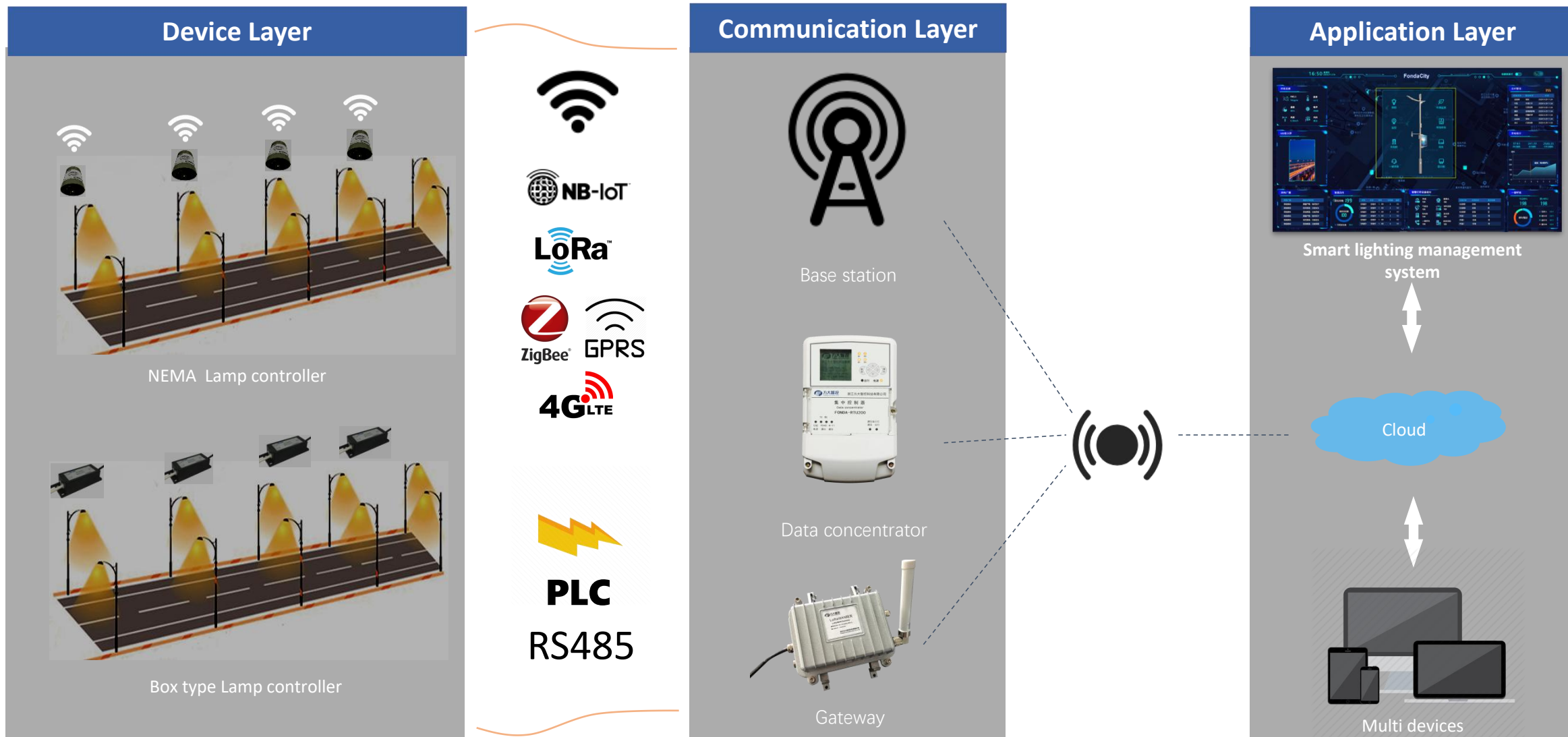
- RS485

Smart Pole

- All in one, multifunctional
- Modules and components customizable

Smart
City



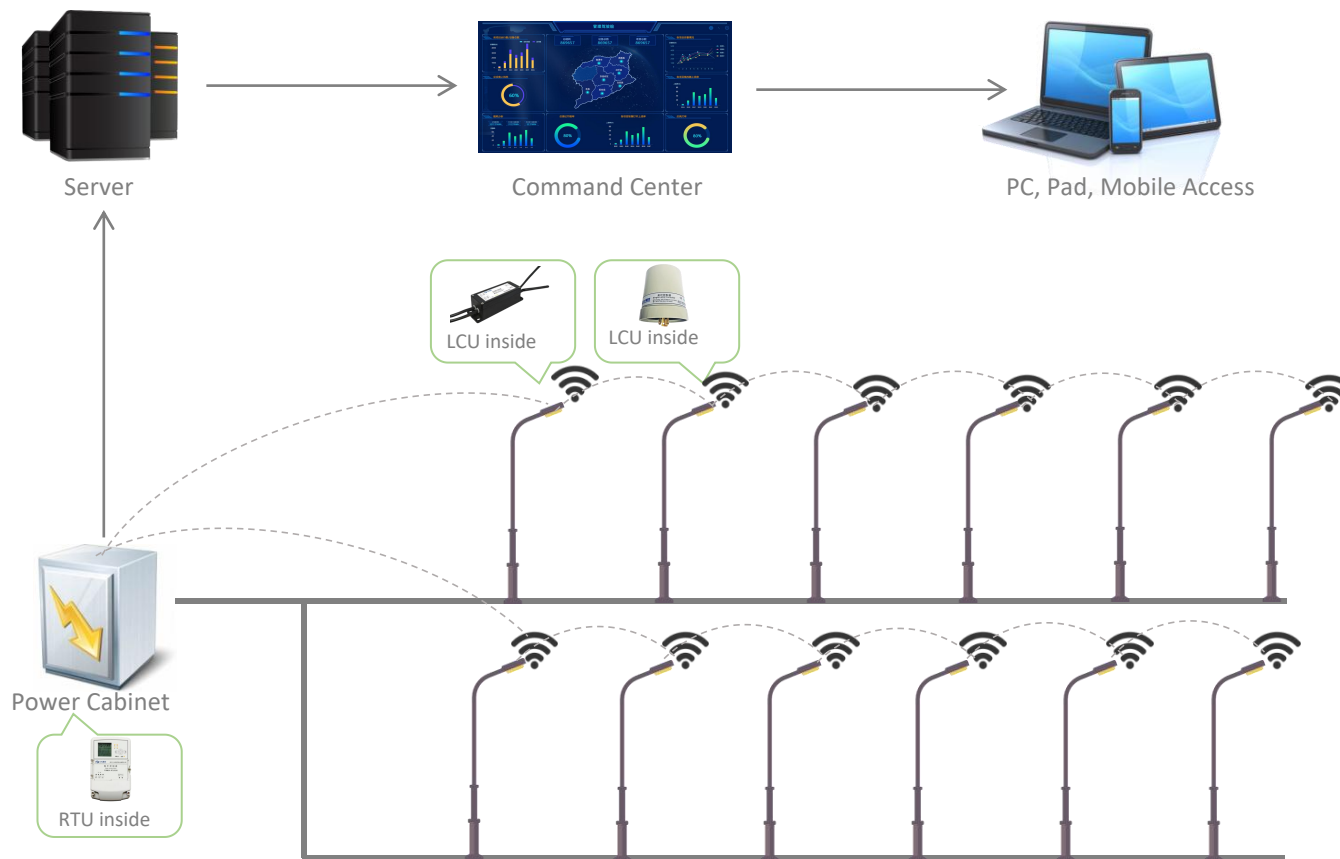




Lamp Controller -EMBEDDED FONDA-LCU15

1. Use power line for communication.
2. Both lamp and circuit control available.
3. One lamp controller per lamp, one concentrator per cabinet.
4. One concentrator connects up to 500 lamp controllers.
5. Node to node distance is 500m, Max distance is up to 2000m.

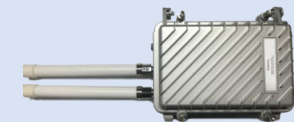
1. Street, tunnel, parking lot, facade lighting with cabinet.
2. The power supply of the lamps is stable, clean and exclusive for street light . (Not recommended for generators)
3. More suitable for new street construction, project with limited budget.



PRODUCTS OF RF SERIES



Concentrator
FONDA-RTU200Z/M



Gateway
FONDA-RTU500Z/M



Lamp Controller-NEMA
FONDA-LCU16Z/M



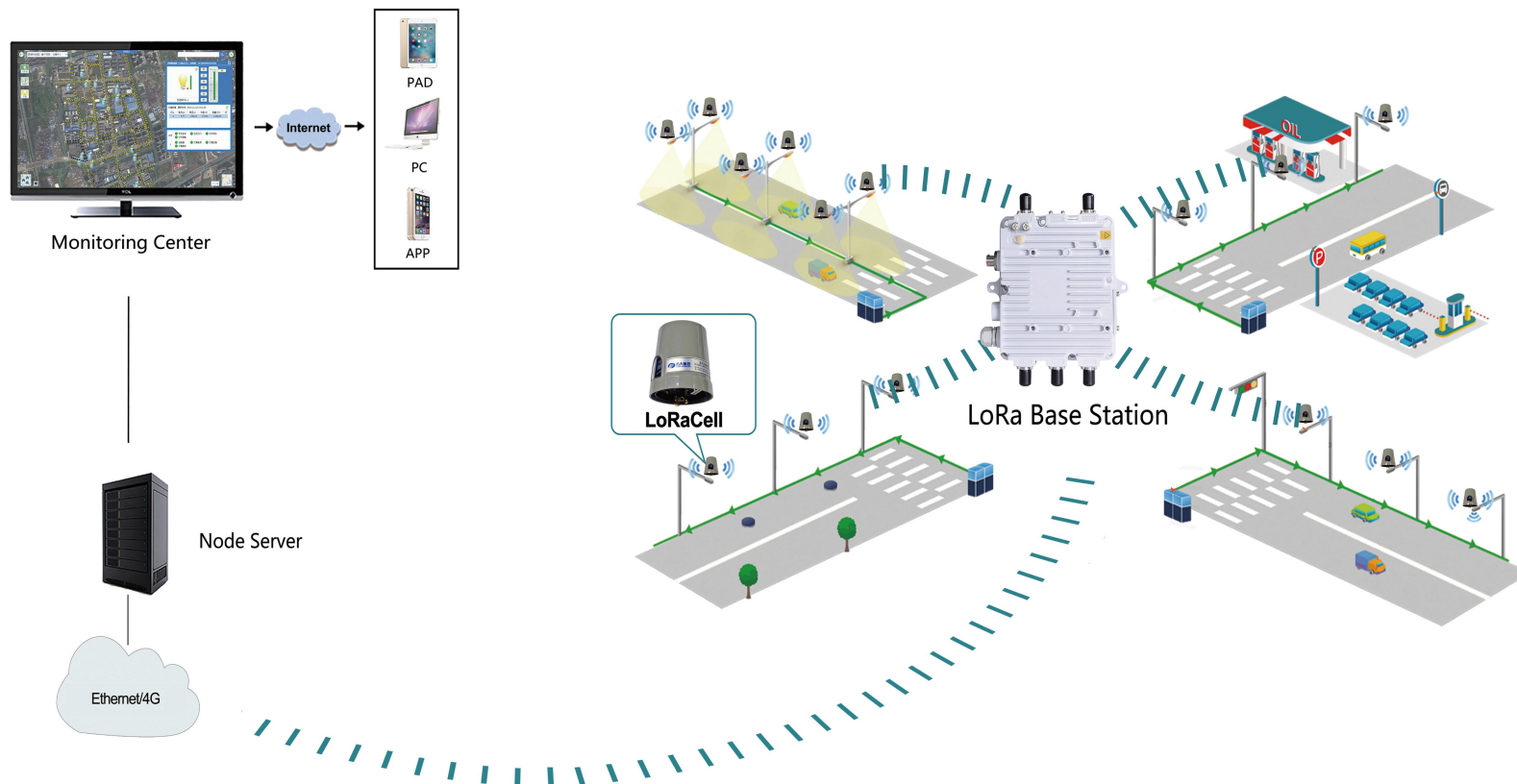
Lamp Controller-EMBEDDED
FONDA-LCU12Z/M

Features

1. RF mesh communication (2.4Ghz/915Mhz) .
2. Both lamp and circuit control available.
3. One lamp controller per lamp, one concentrator per cabinet.
4. One concentrator/gateway connects up to 250 lamp controllers.
5. Node to node distance is 200m, Max distance is up to 3000m.

Application

1. Street, solar, parking lot, factory lighting.
2. Power supply from the cabinet is not exclusive for street light, but needs cabinet control and monitoring.



PRODUCTS OF LoRaWAN SERIES



**Gateway
-LoRaWAN**
FONDA-RTU500LORA



**Lamp Controller
-NEMA**
FONDA-LCU16LORA



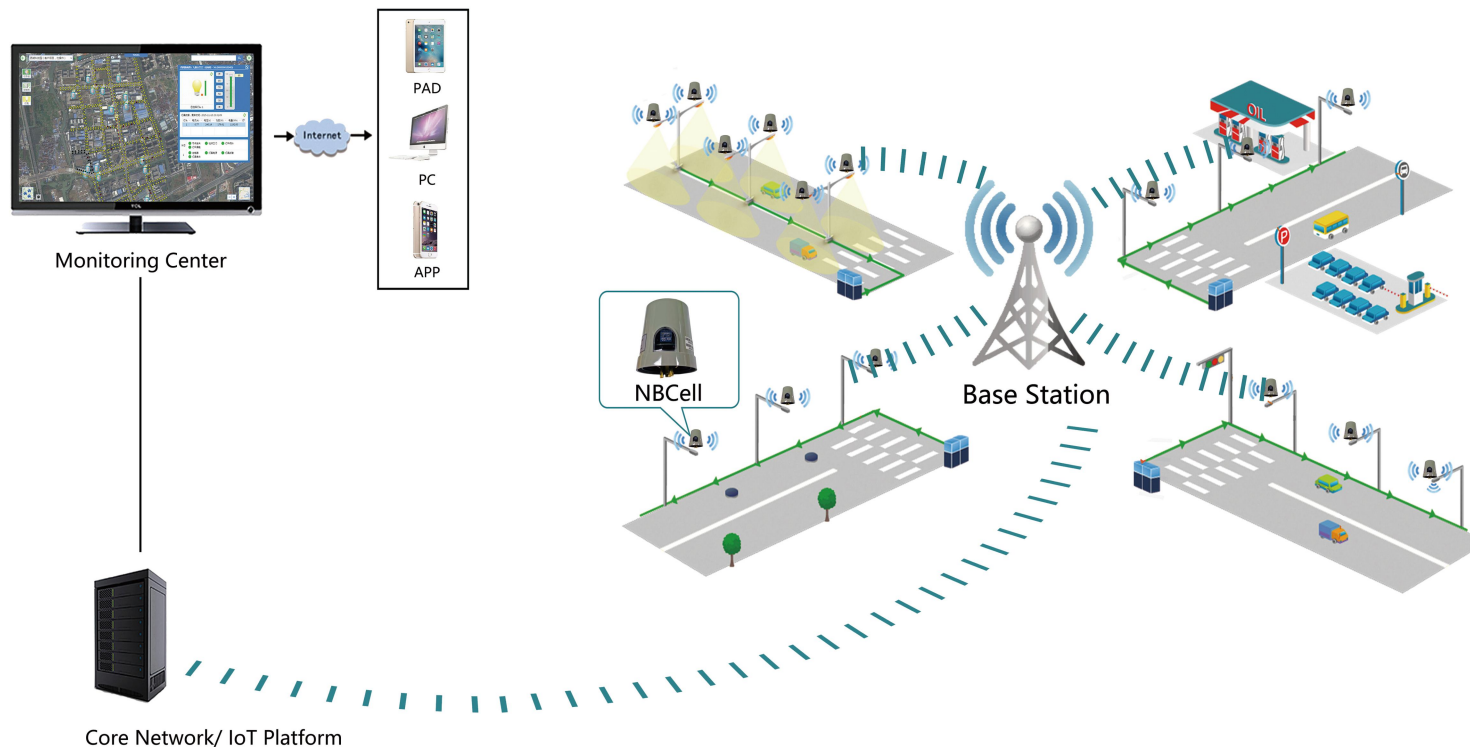
**Lamp Controller
-Zhaga**
FONDA-LCU71LW

Features

1. LoRaWAN Gateway and network server for device management are needed.
2. One lamp controller per lamp, circuit control unavailable.
3. One gateway connects up to 1000 lamp controllers.
4. Max distance is up to 2000~3000m.

Application

1. Street, parking lot, park, island lighting.
2. Where LoRaWAN network is already deployed.
3. Customer already have CMS platform with LoRaWAN.



PRODUCTS OF 2G/LTE/NB-IoT SERIES



**Lamp Controller
-NEMA**
FONDA-LCU16LTE-C1
FONDA-LCU16LTE-C4



**Lamp Controller
-ZHAGA**
FONDA-LCU71LTE



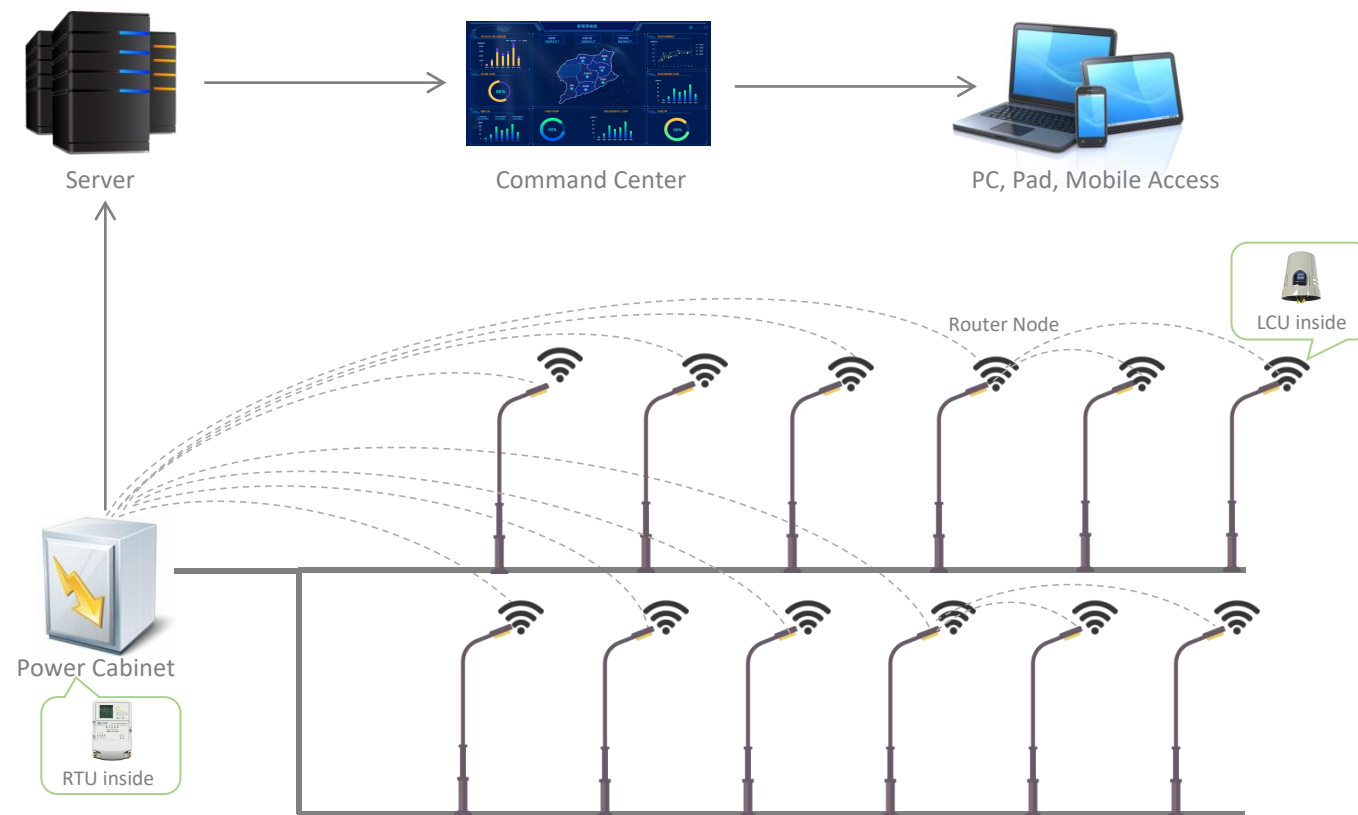
**Lamp Controller
-NEMA**
FONDA-LCU16NG

Features

1. Use LTE or NB-IoT network service from local operator.
2. One lamp controller per lamp with sim card.
3. No broadcasting or circuit control function.
4. Unlimited distance.

Application

1. Any place that can receive LTE/NB signal.
2. The lamps are distributed in large area, such as metropolis and mountain.
3. Project with sufficient budget
4. No need to cabinet control or monitoring
5. Plug and play installation, no maintenance on the gateway or concentrator.



PRODUCTS OF LORA MESH SERIES



Concentrator
FONDA-RTU200LR



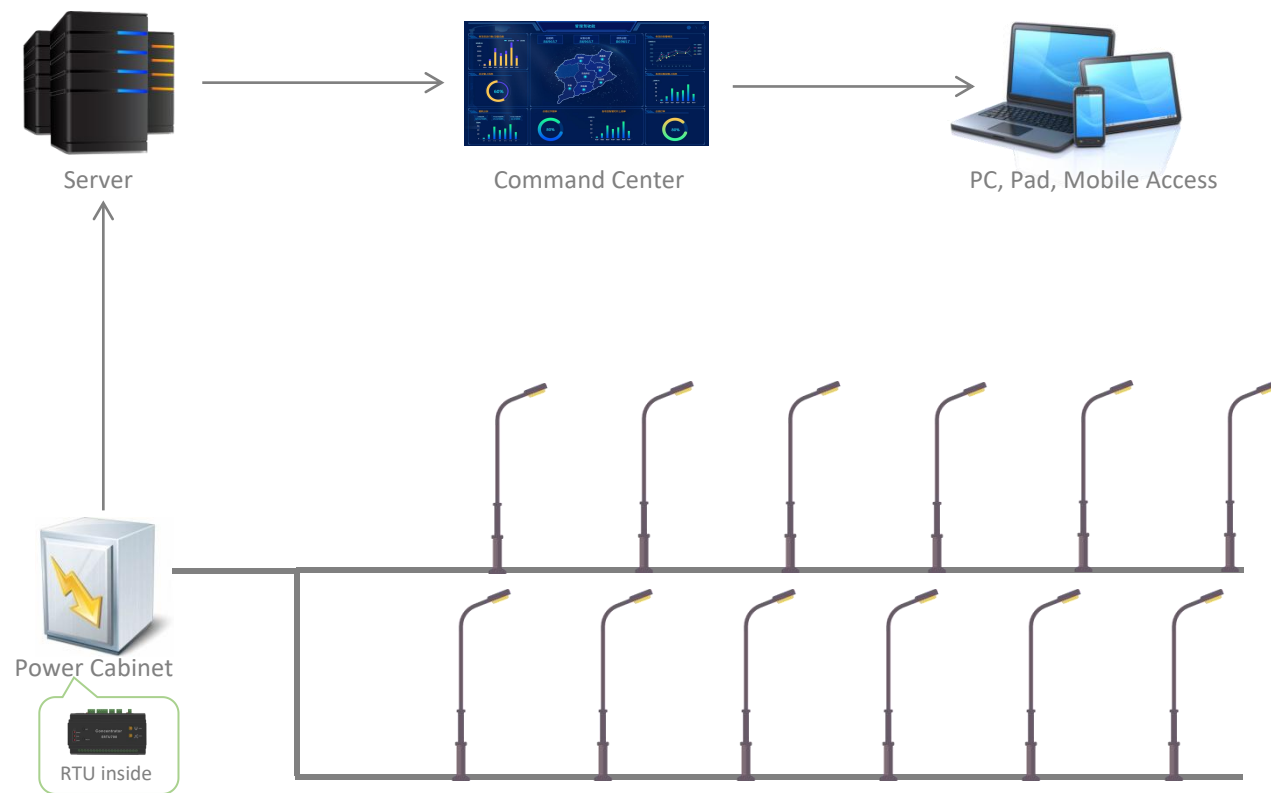
Lamp Controller-NEMA
FONDA-LCU16LR

Features

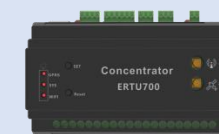
1. LoRa mesh communication with 433Mhz, 868Mhz, 923Mhz.
2. Remote real time control and monitor on the lamps, scheduled lighting by group or individual lamp.
3. One lamp controller per lamp, one concentrator per cabinet.
4. One concentrator connects up to 400 lamp controllers.
5. Max transmission distance is 2000~6000m in urban area after relay by a specified lamp controller..

Application

1. Street, parking lot, Indoor lighting.
2. Environments subject to interference in 2.4Ghz frequency.
3. Project needs cabinet control and monitoring, with longer distance from cabinet.



CIRCUIT CONTROL SERIES








Concentrator
RTU700

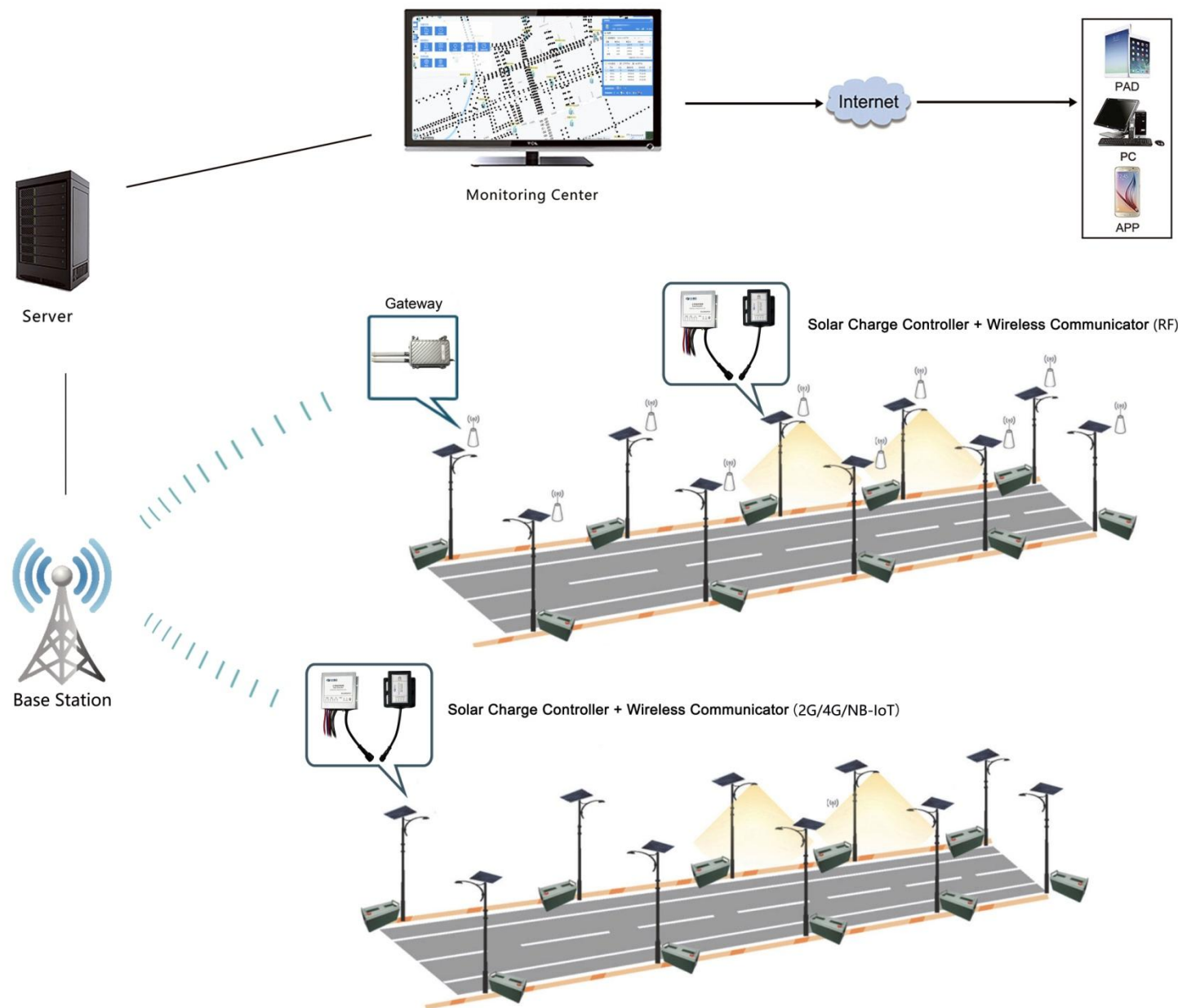
Features

1. Circuit control based on time and sunrise/sunset is available.
2. One cabinet needs one concentrator.

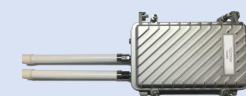
Application

1. Street, tunnel, parking lot with cabinet.
2. Project with limited budget and dimming requirement.
3. Suitable for small size cabinet.

Protocol	PLC 	RF 	2G/LTE/NB-IoT 	LoRaWAN 	LoRa Mesh 
Frequency Band	132Khz	915M/2.4GHz	800/900/1800 MHz	470/868/915/923 MHz	433M/868M/923M
Communication Distance	Node to node:500m Total distance up to 2000m	Node to Node: 200m Total distance up to 3000m	Unlimited	2~3km (urban area) 1~15km (visible distance)	2~6km(urban area) 1~15km (open area)
Communication Speed	5.5-20Kbps	250 Kbps	30-65 Kbps	0.2~37.5 Kbps	8 Kbps
Advantage	-Good security -Stable Data communication -No extra cable needed -Broadcast and multicast operation available	-Good security -Auto-mesh -High communication speed -Broadcast and multicast operation available	-Long range -Good security -Good anti-interference -Low power consumption -Easy to use and maintain	-Long range -Good Security -Good anti-interference -Low power consumption	-Long range -High Sensitivity -Strong penetration -Broadcast and multicast operation available
Disadvantage	-Short communication distance -High cost of maintenance -Weakness of anti-interference	-2.4G easily interfered by other radio -Max connections only 255 nodes -Communication distance is not long enough	-No broadcasting -Data usage needed for each device	-Very slow speed of communication -High cost -No broadcasting -An extra Network Server is needed.	- Slow transmission rate - Spectrum interference



PRODUCTS OF SOLAR SERIES



Gateway
FONDA-RTU500Z/M



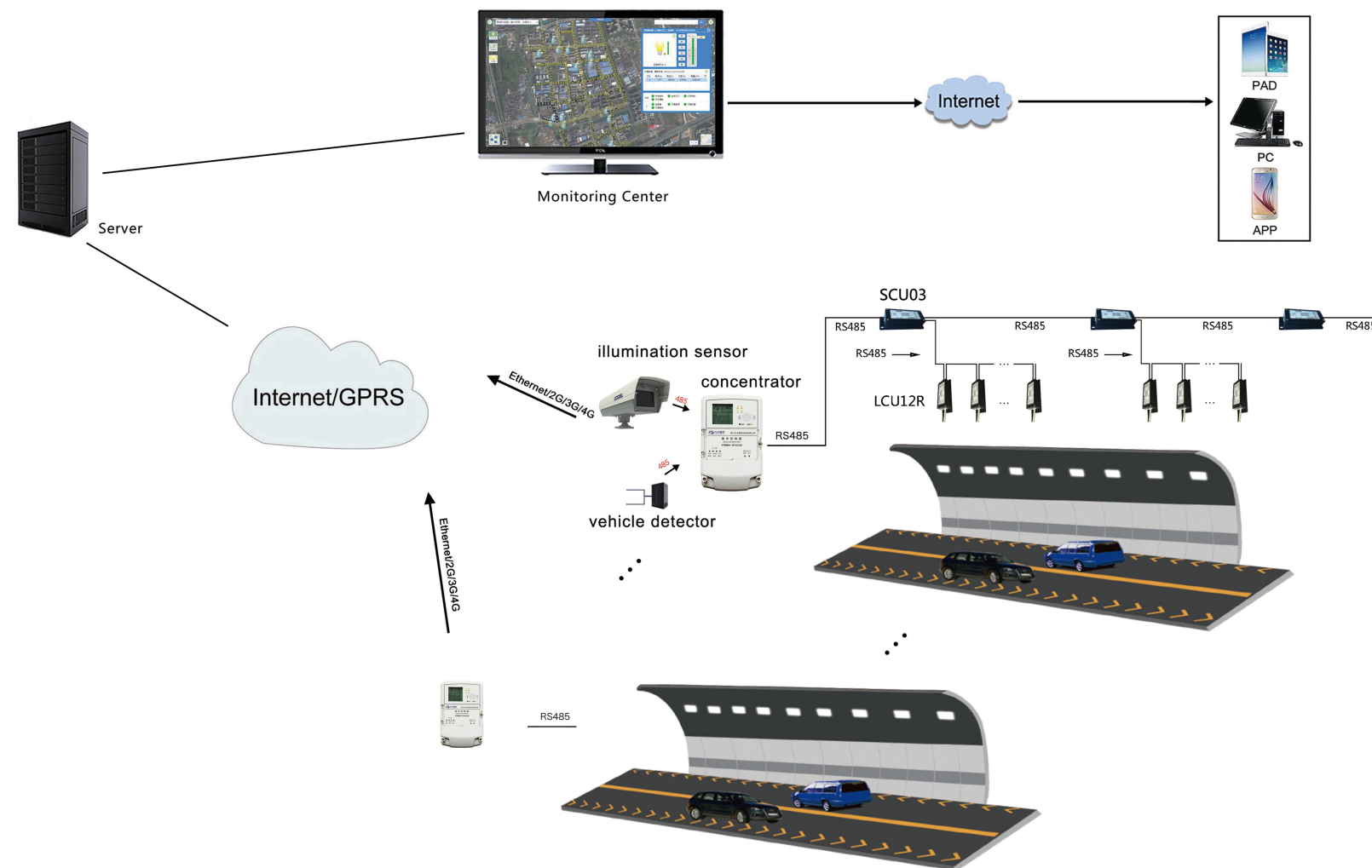
Solar IoT Controller
(RF/2G/LTE)

Features

1. RF/ 2G/LTE Communication.
2. Monitoring on solar panel, solar battery and solar lamp.
3. Automatic alarm on solar system.
4. Lighting task based on time remotely.
5. Solar controllers with designated brands could be applied with IoT controller.

Solutions

1. RF solution includes gateway, solar IoT controller and solar controller.
2. 2G/4G solution includes solar IoT controller, solar controller and 2G/4G sim.



PRODUCTS FOR TUNNEL RS485



Concentrator
FONDA-RTU200T



Signal Controller
FONDA-SCU03



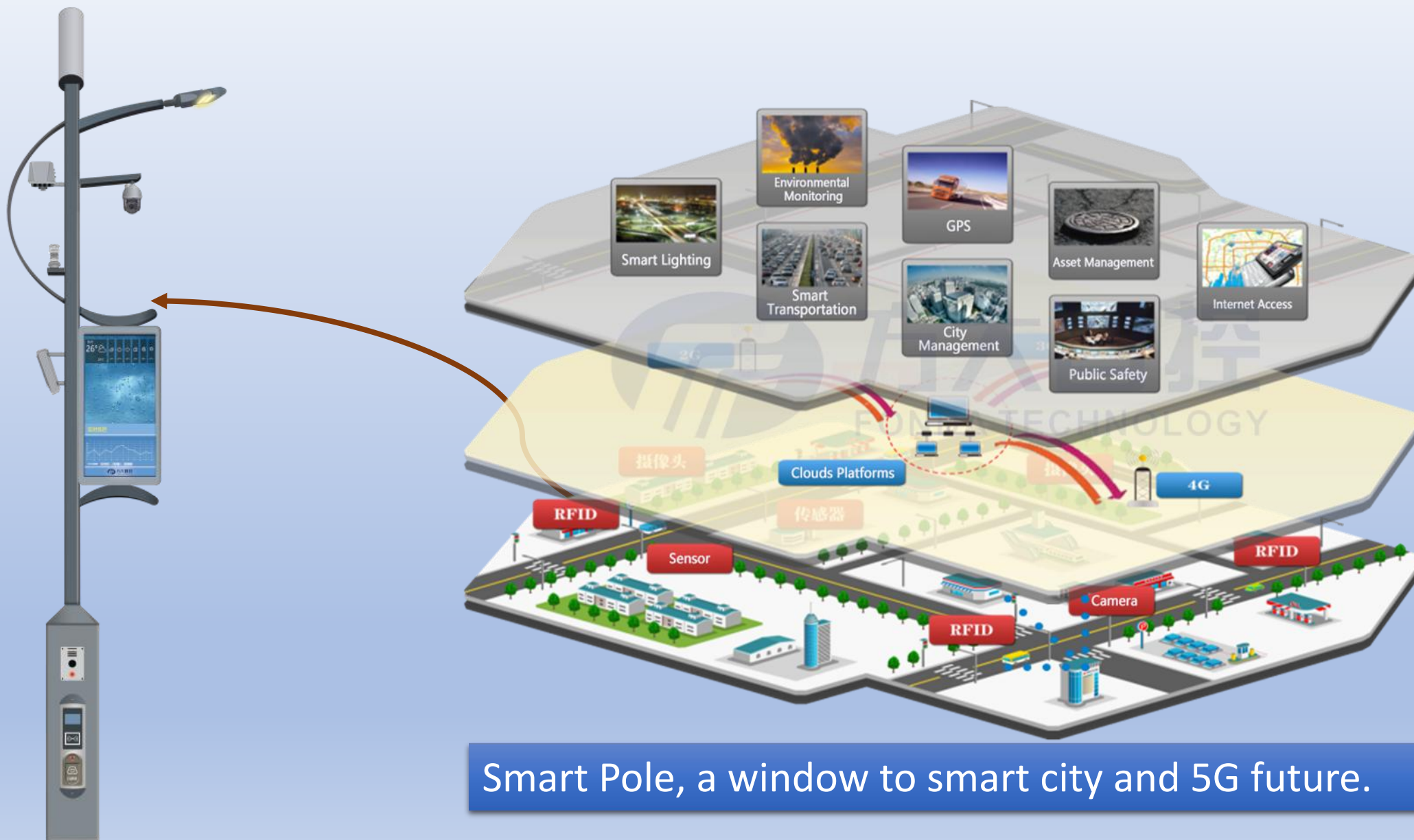
Lamp Controller
-EMMEDDED
FONDA-LCU12R

Features

1. One lamp needs one lamp controller.
2. One signal controller connects 50 lamp controllers.
3. One concentrator controls up to 5000 lamp controllers.
4. Absolute timely and accurate control is available.
5. Lighting task based on time, lux detector and vehicle detector available.

Solutions

1. RS485 Solution is suitable for long tunnel, which includes concentrator, signal controller and lamp controller.
2. PLC Solution is suitable for short tunnel with exclusive power supply for lamps, which includes concentrator and lam controller.



Smart Pole, a window to smart city and 5G future.



The smart devices of smart pole is deployed and integrated into Fonda platform, so that all of the management and operation could be done in a central platform, making the maintenance work easier and more efficient.



Wireless AP

Provide WiFi hotspot for different distances.

Weather Station

Collect and send weather data to monitoring center, such as PM2.5(PM10), noise, wind direction, wind speed, temperature, humidity and air pressure.

Broadcasting Speaker

Broadcast audio file uploaded from control center

Emergency Call

Direct connection to command center for public emergency, the security team can respond quickly with GPS positioning, live stream and online voice call.

Smart Lighting

Remotely control(ON/OFF, dimming, data collecting, alarm etc.) in real time by desktop, mobile phone, Pad. Zigbee, LoRa, No-IoT communication available.

Camera

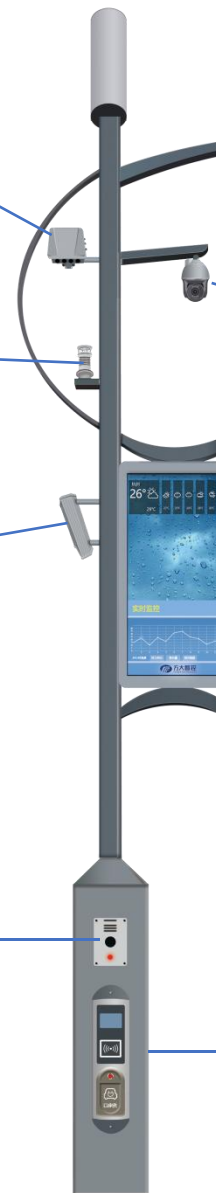
Monitor traffic, public security, city lighting and public infrastructure.

LED Display

Display advertisement, public information in words, pictures, videos in LED screen. Uploading and publishing are done in central platform remotely.

EV Charging Pile

Offer AC charging stations for electrical vehicles.





Lamp Controller



AIOT Camera



WiFi Hotspot



Weather Station



Core Gateway



Network Speaker



LED Display



Help Button



Charging Pile

Smart Devices of Smart Pole



Tilt Sensor



Flood Sensor



Lux Sensor



PIR sensor



Scalable Smart Sensors



-Support multi-languages

-Secured login credential

-Auto account lock down if too many retries

-Full module access control management



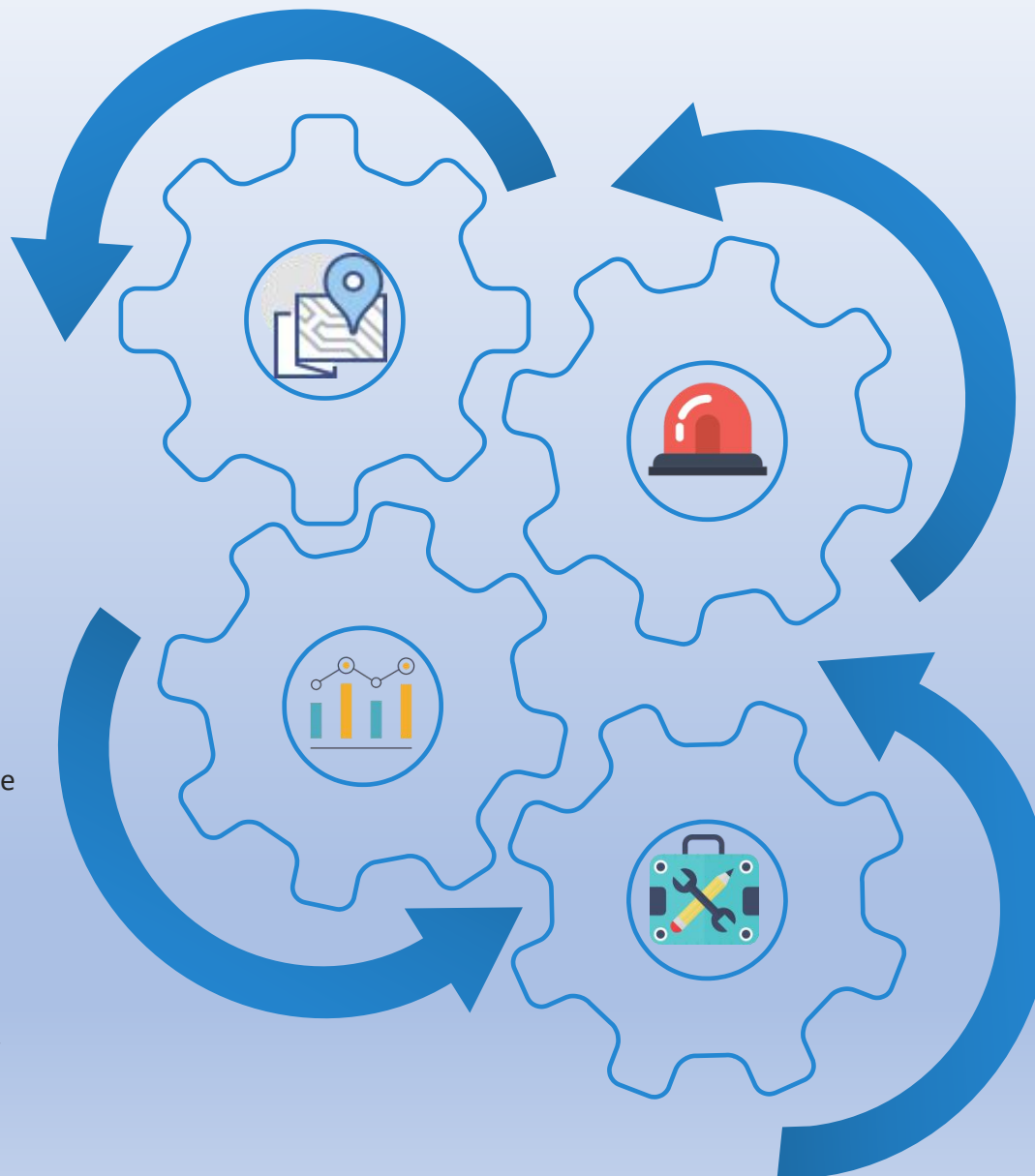
GIS Map

Based on Google Maps, you can see all the devices vividly with actual location and real time status. Also you can manually control and configure all devices directly on GIS.

Energy Report

With proper strategy, the device will report its real time status and parameters to SCCS on a fixed interval.

The system will calculate the total energy consumed and saved on a daily, montly, yearly basis.



Alarm & Event

Useful function of SCCS, which will record all the alarms happened to device and network.

The trigger logic and threshold is customizable.

All alarm info can be sent to specified people via SMS, mail and APP.

Administration

Used to manage all the users, projects and basic variables.

All the settings and configurations are to be done here.



POWERFUL AND FUNCTIONAL

One platform can manage and control all the Fonda products and services, from regular street lighting solutions like PLC, Zigbee, LoRa and NB-IoT to special application like tunnel, landscape and smart pole.

EASY TO USE

The platform has been upgraded for dozens of times from both inner and outside requirement. User-friendly design and reasonable layout make it very easy to use.



EASY TO EXPAND

The structure of SCCS is advanced SEPERATED design, which includes three parts: Web Server, RTU Server and Agent Tray. The Web Server and RTU Server can be deployed on differnet physical and cloud servers and have no quantity limitation. One RTU server can manage up to 100K devices.

EASY TO INTEGRATE

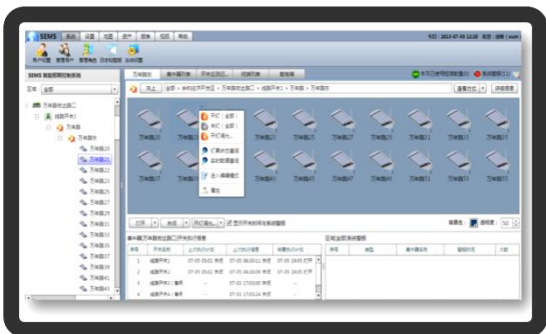
The SCCS reserves many interfaces for third party hardware and software integration. Customer can make their integration via MQTT or SDK. We prepared very detailed tutorial and documents for this.



A DECADE DEVELOPMENT OF SOFTWARE

PLMS

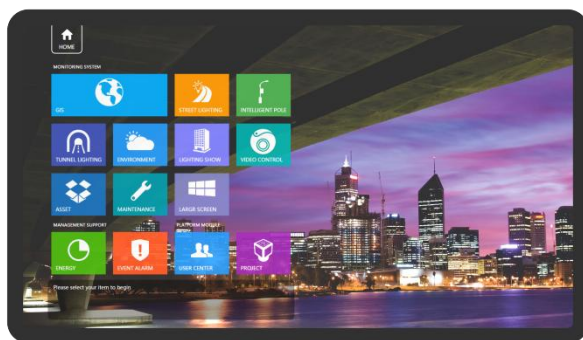
PLMS based on PLC lamp controller to provide remote control and project management



2011

SCCS(Smart Control Cloud-based System)

One platform with multiple smart lighting solutions, multi-language versions, access and data interaction of millions of IoT nodes available



2015

Smart pole control system

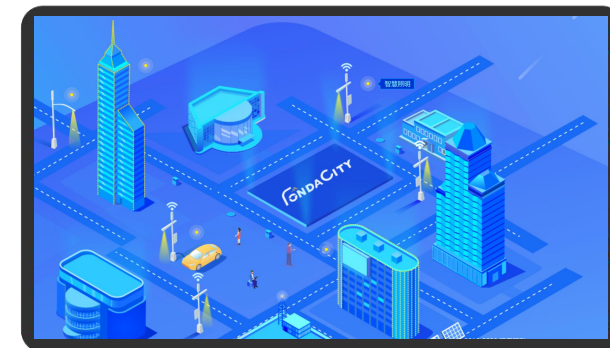
Integrated smart pole IoT sensors in SCCS, to control and manage all the smart devices in one platform.



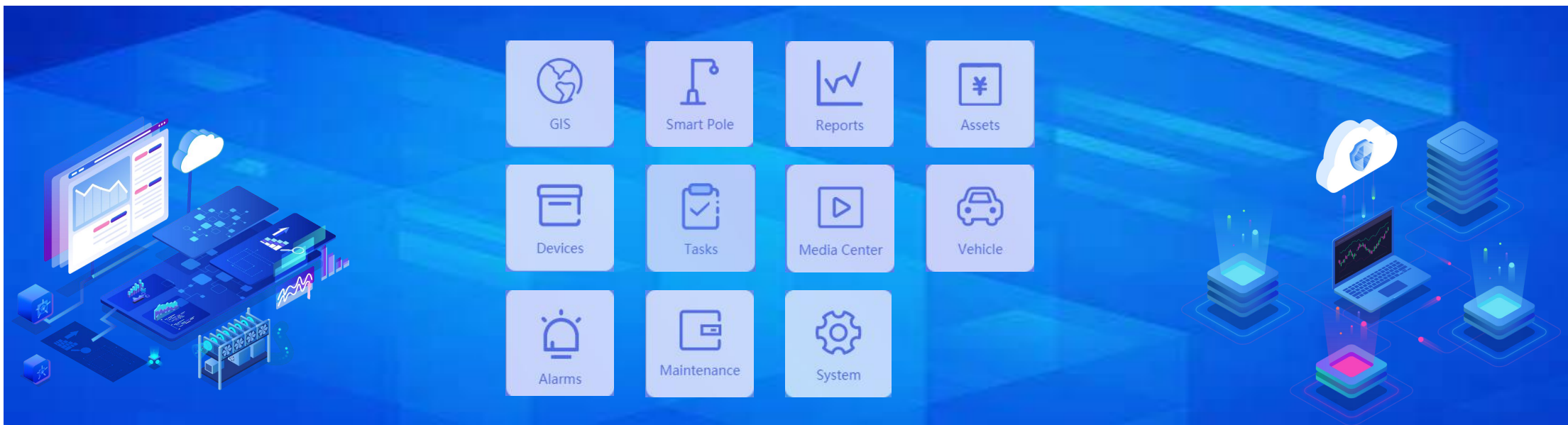
2018

Fonda City

FondaCity platform, smart city ready platform with easy-to-integrate interface to 3rd party or smart city level management platform.



2021



Big Data

The platform provides big data of smart city by connecting traditional infrastructures in the street into Cloud network, while interoperating with urban management systems such as traffic, police, and municipal administration.

All-in-One

As a comprehensive city management platform, FondaCity is applied in the three major fields, "smart lighting, smart poles, façade lighting", with full management tools on the project.

One Stop

One-stop platform for IoT smart lighting, which covers on-site investigation in the early stage, installation and commissioning in the middle stage, and the operation and digital management in the project operation stage.

3. CASES





1M^{illion}

Fonda devices have been deployed globally.

Over 50 countries and 120 cities have deployed Fonda's product. 200+ pilot projects are now ongoing.

Top 1

Jakarta, Indonesia

Scale: 100K

Year: 2017

Top 2

Riyadh, Saudi Arab

Scale: 55K

Year: 2015

Top3

Jeddah, Saudi Arab

Scale: 53K

Year: 2021

Top4

Nigeria

Scale: 50K

Year: 2021

Top5

Jiaxing, China

Scale: 50K

Year: 2015

Yinchuan

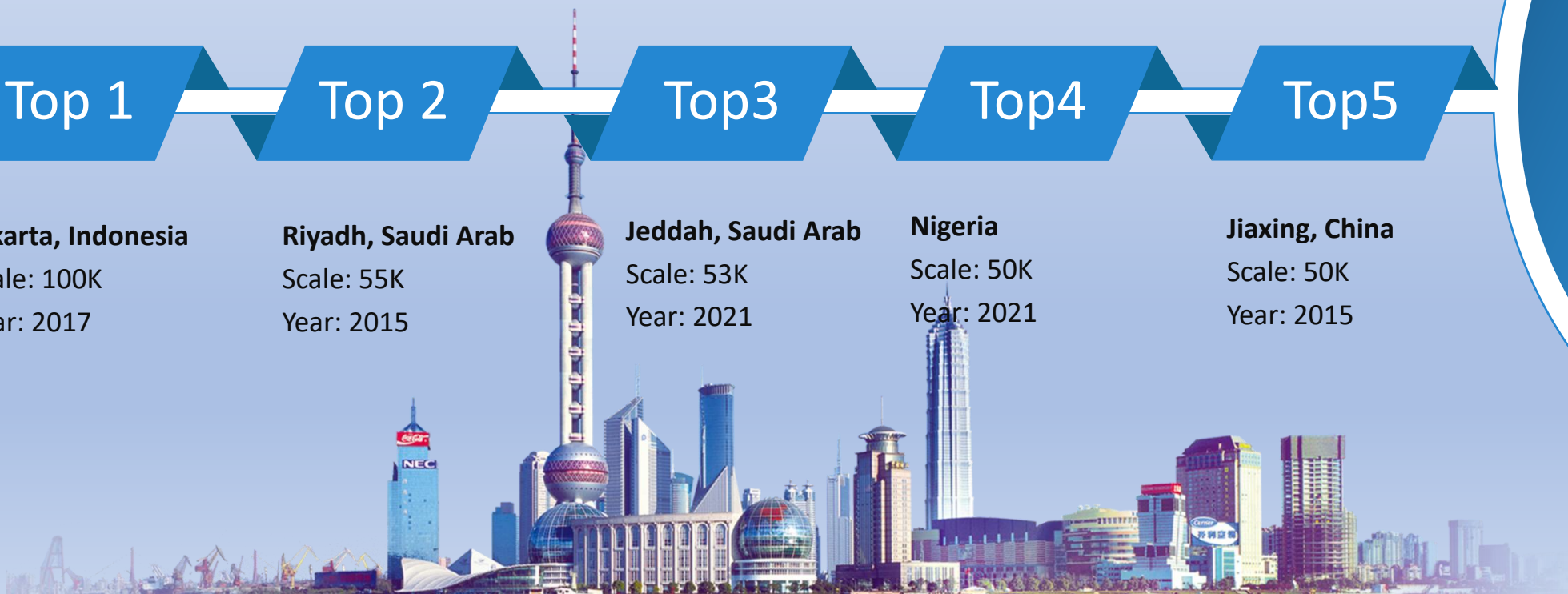
Spain

Portugal

Australia

Ma'anshan

Romania

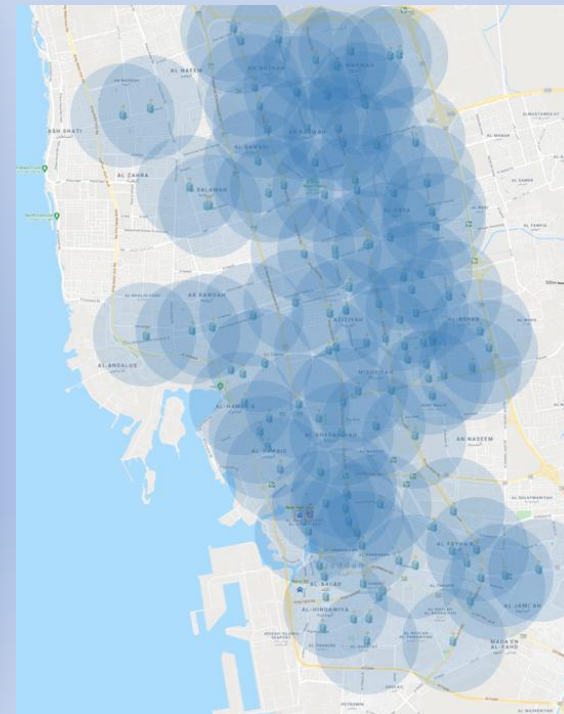
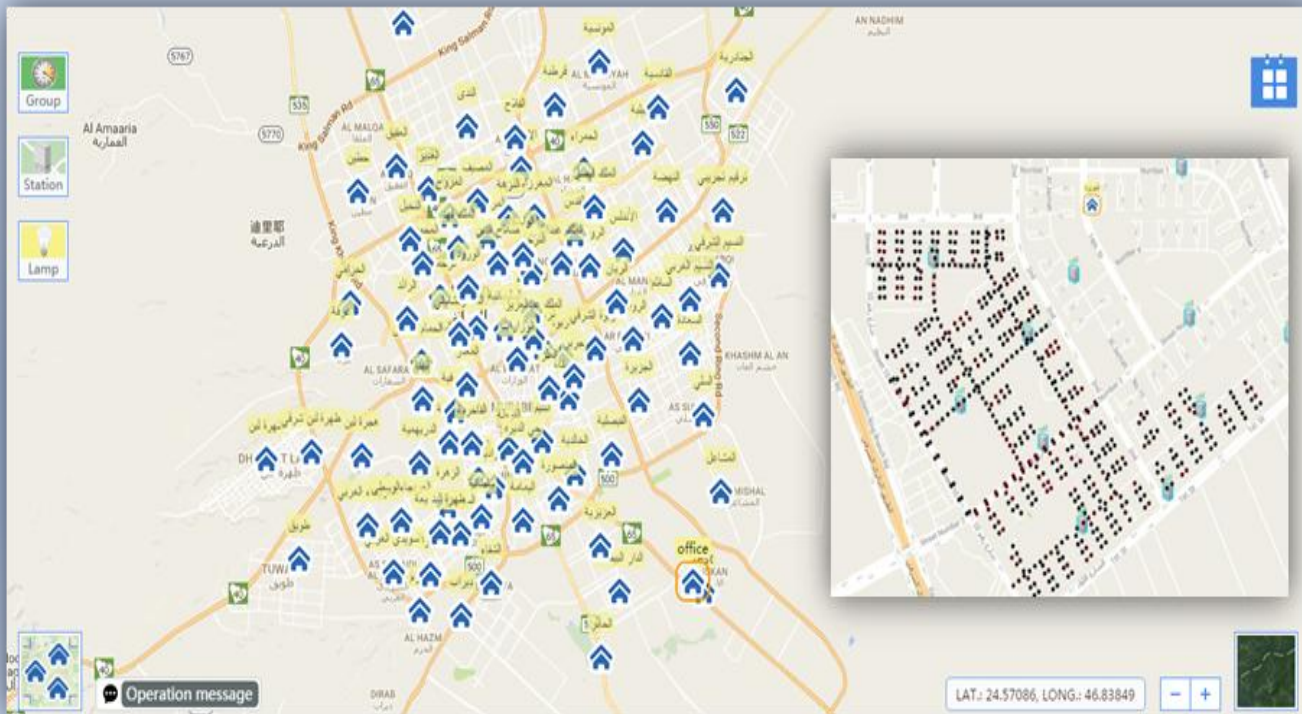


Location	Jakarta, Indonesia
Solution	PLC, LTE
Products	1,700 concentrators and 100,000+ lamp controllers

Panasonic as the main constructor integrated street lighting control system, smart city devices, engineering management and maintenance management. With energy efficiency devices, control the lighting by different time and area according to the needs of pedestrians and vehicles on the road.



Location	Riyadh, Saudi Arabia	Jeddah, Saudi Arabia
Solution	PLC	Lora-mesh
Products	55,000+ lamps	53,000+ lamps

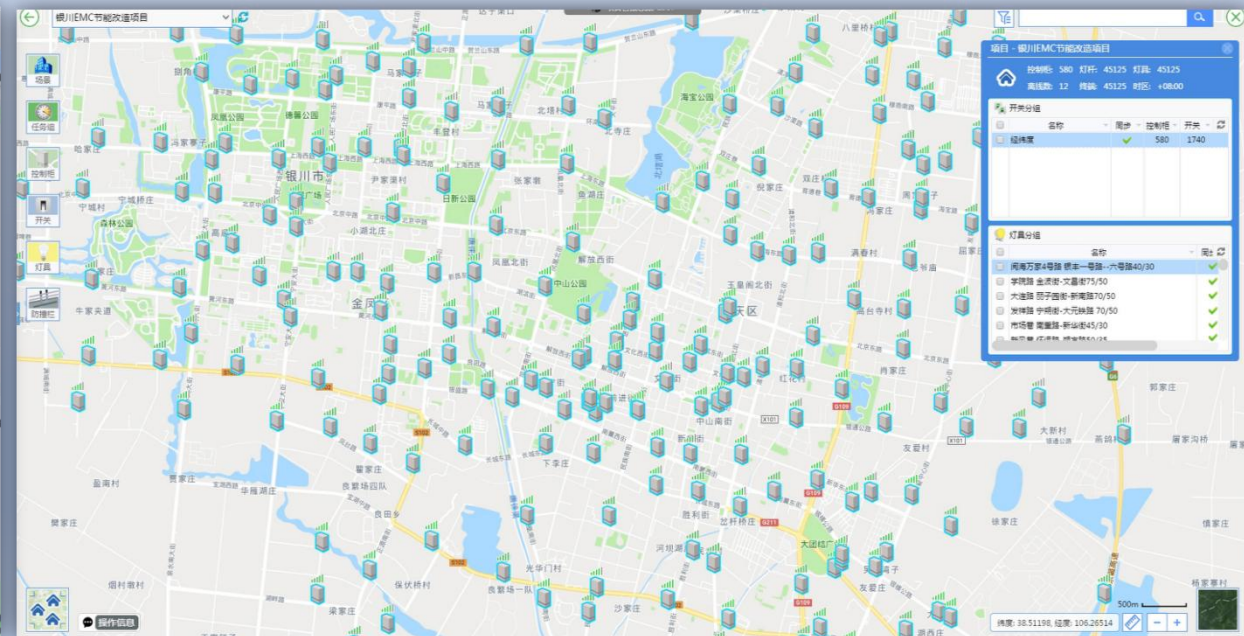
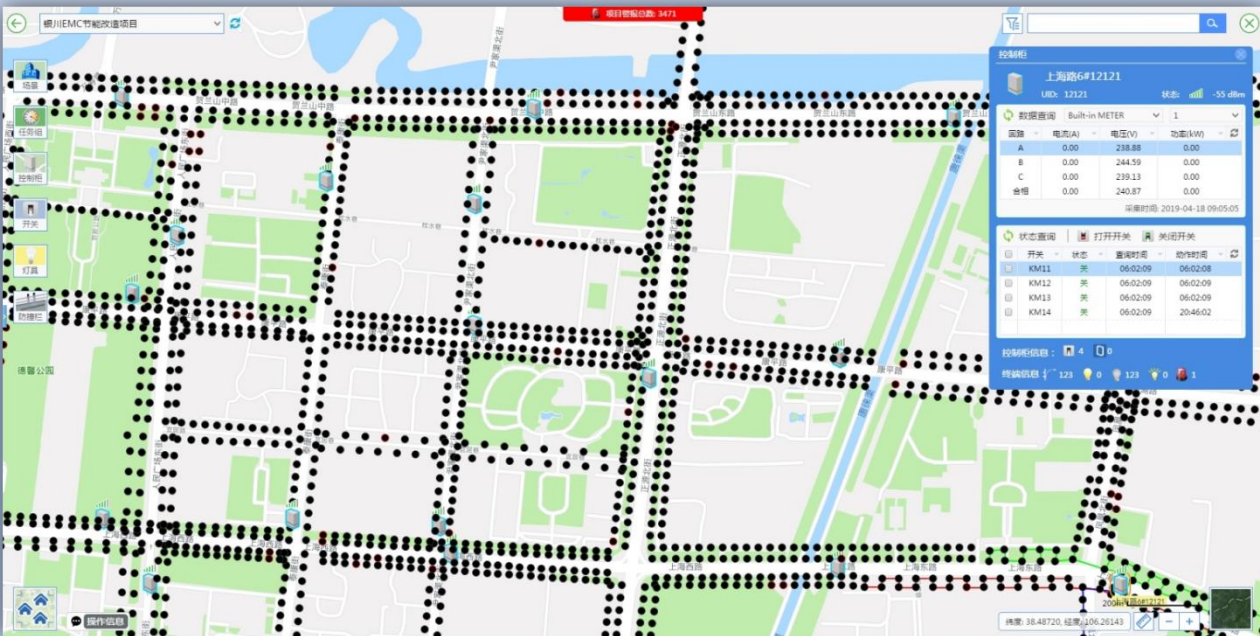


Location Yinchuan, China

Solution PLC Solution

Products 500 Concentrators ,
40,000 Lamp controllers

Launched in 2018 , as one the biggest EMC project in China, every lamp is automatically running very specific task for energy saving as per the flow of car and pedestrian.

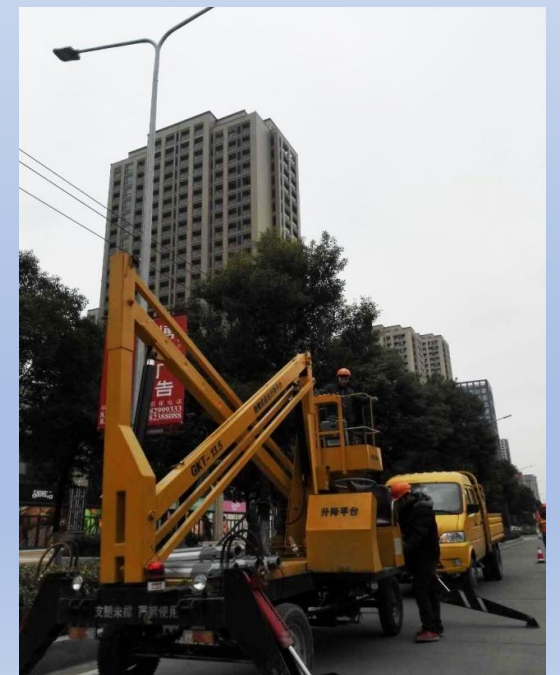
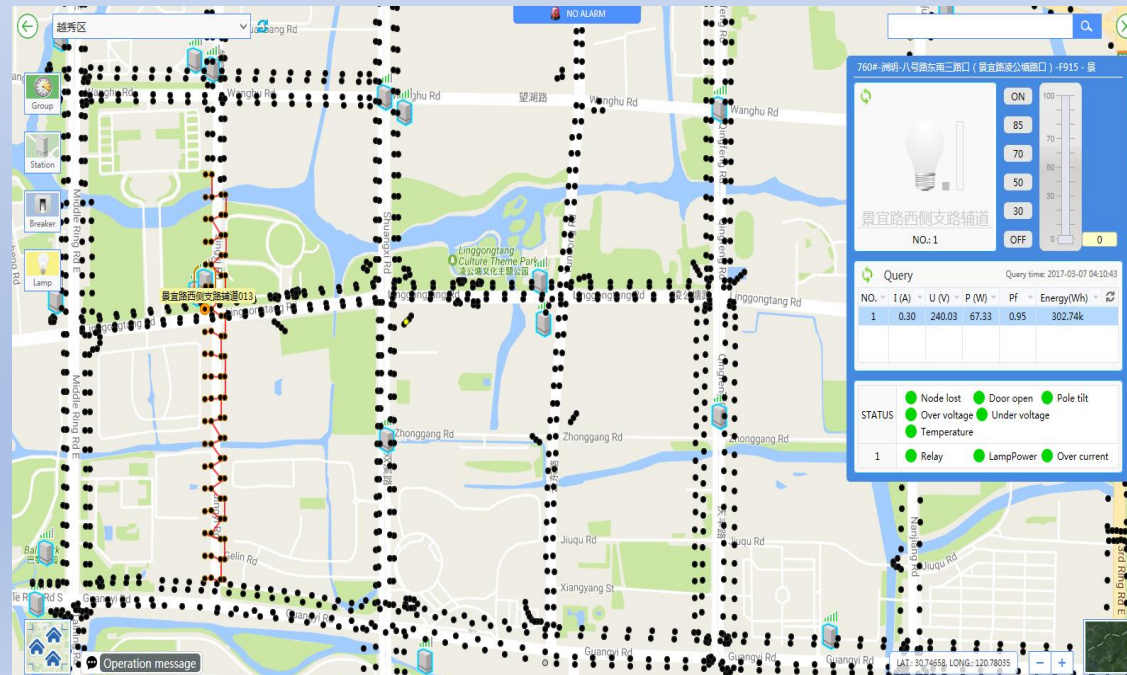


Location Jiaxing, China

Solution PLC

Products 450 Concentrators ,
50,000 Lamp controllers

Launched in 2015 , led by Jiaxing Government, aiming to transform sodium lamps LED lamps with smart lighting control system, it was the largest lamp retrofit project in China. Fonda won the reward of “Global Top 100 Semiconductor Lighting Demonstration Projects” in 2019.





Location **Stuttgart, Germany**

Solution PLC

Products 20 concentrators and
2000 lamp controllers

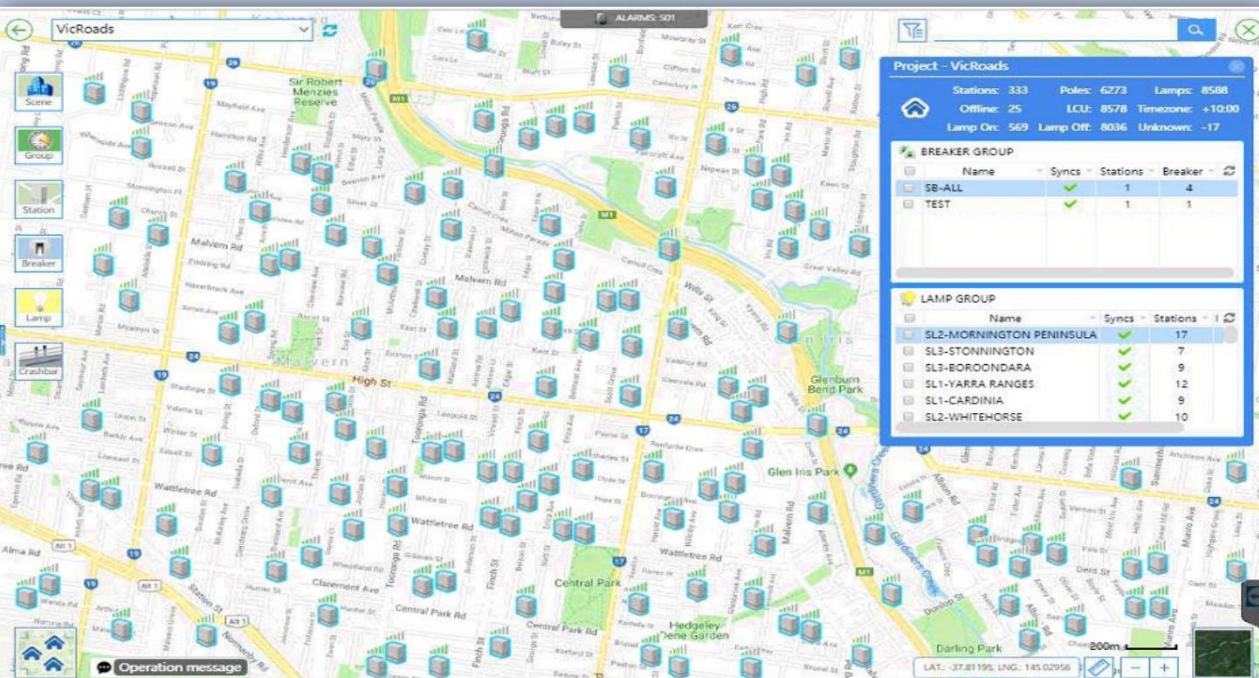
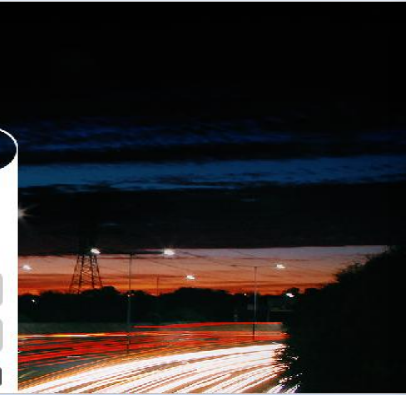
The system set the accurate switching time of every lamp for 365 days a year through a computer. For example, the lights on at 9 pm in summer and 4 pm in winter. The task also can run on local weather conditions, such as heavy rain and heavy fog day, the lights will turn on. In holiday mode, the lighting time could be extended. Through precise control on LED lights, compared with traditional sodium lamps, energy saving can reach to 70%.



Location Melbourne, Australia

Solution Zigbee Solution

Products 450 RTU200Z Concentrators,
19,000 LCU16Z Lamp Controllers

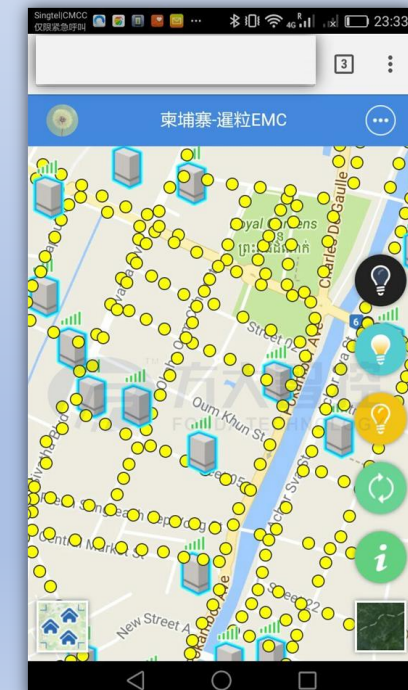
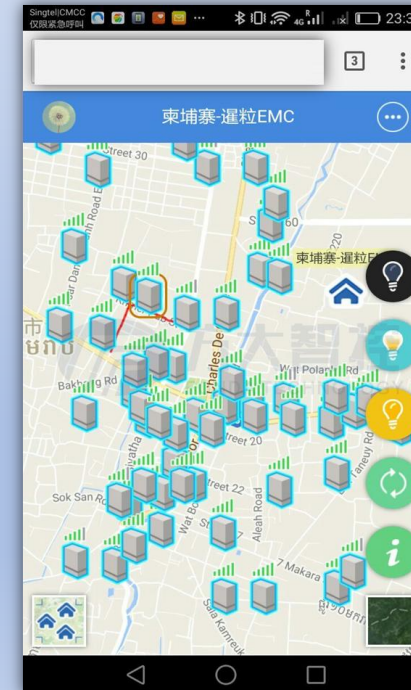


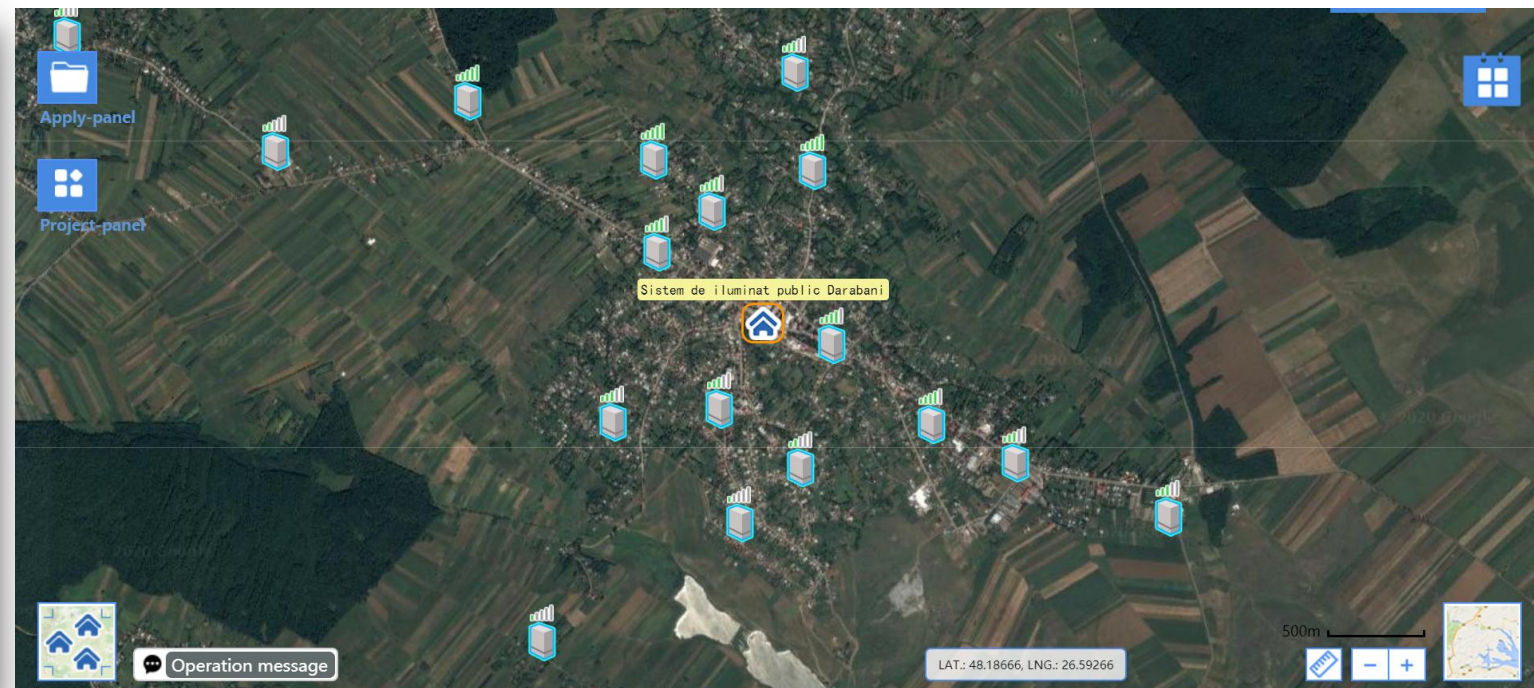
Location Siem Reap, Cambodia

Solution Zigbee Solution

Products 120 Concentrators ,
5,000 Lamp controllers

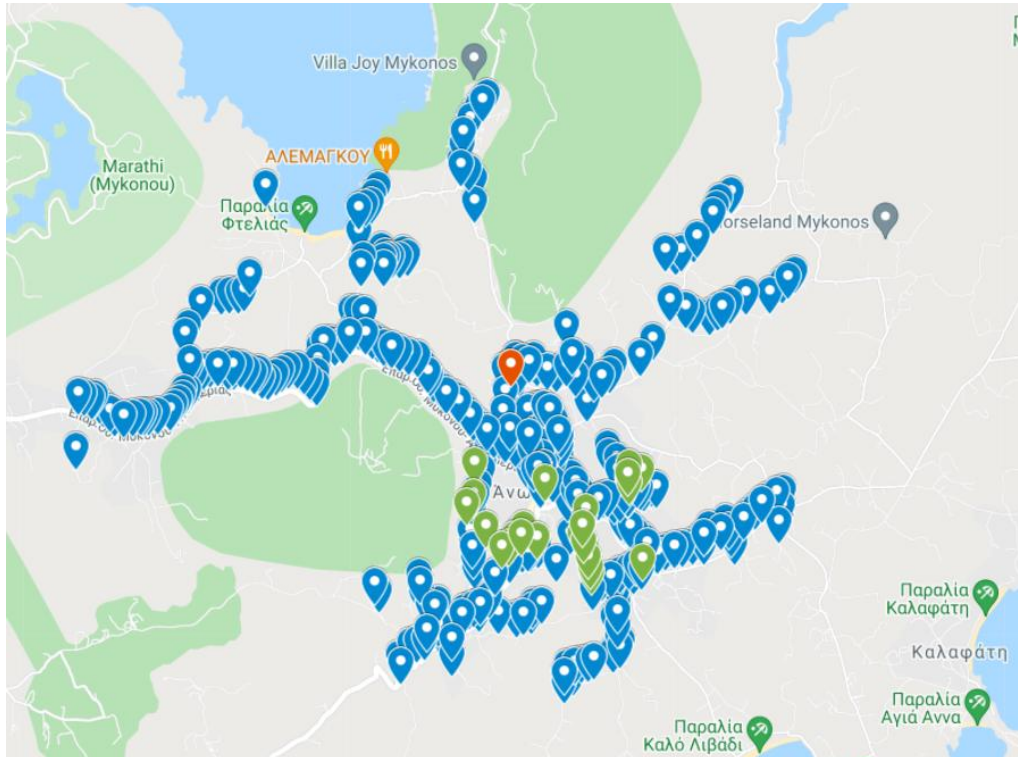
As a national demonstration project of Cambodia, unified intelligent transportation and street light monitoring, for smart urban management.





Location	Mykonos, Greece
Solution	LoraWAN Solution
Products	3,000 Lamp controllers

The street lights of the island in Greece were upgraded with energy saving LED lights and smart lighting system. Fonda LCU16Lora lamp controller was integrated with The things Network, Kerlink Gateway and Customer's existing CMS via standard LoRaWAN Class. C protocol.

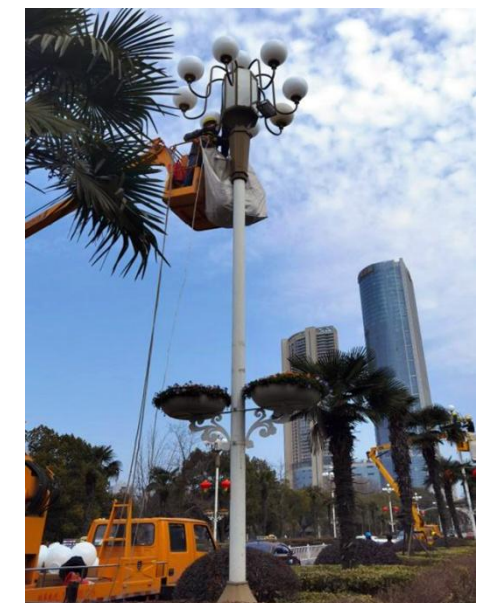
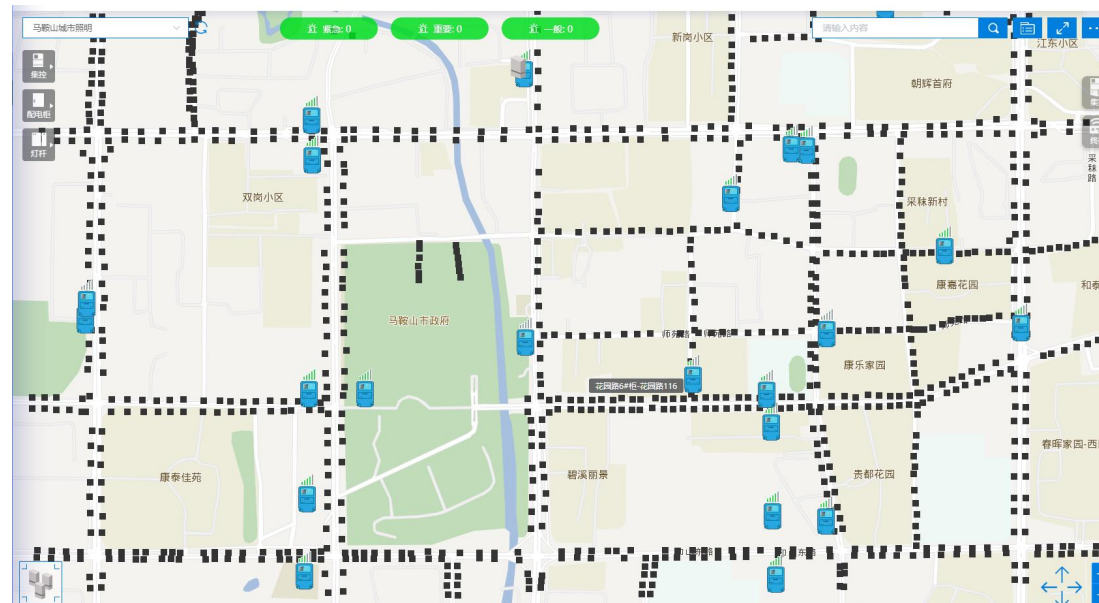


Location Ma 'anshan, Anhui Province, China

Solution NB-IOT

Products 23,000+ lamp controllers

Ma 'anshan city government decided on the city's main street light energy-saving and intelligent control upgrade, the project started in November 2020, completed in March 2021, is currently the largest in anhui province based on NB - IoT IoT street lamp control project, the key point of Ma 'anshan to explore in the field of intelligent city project.



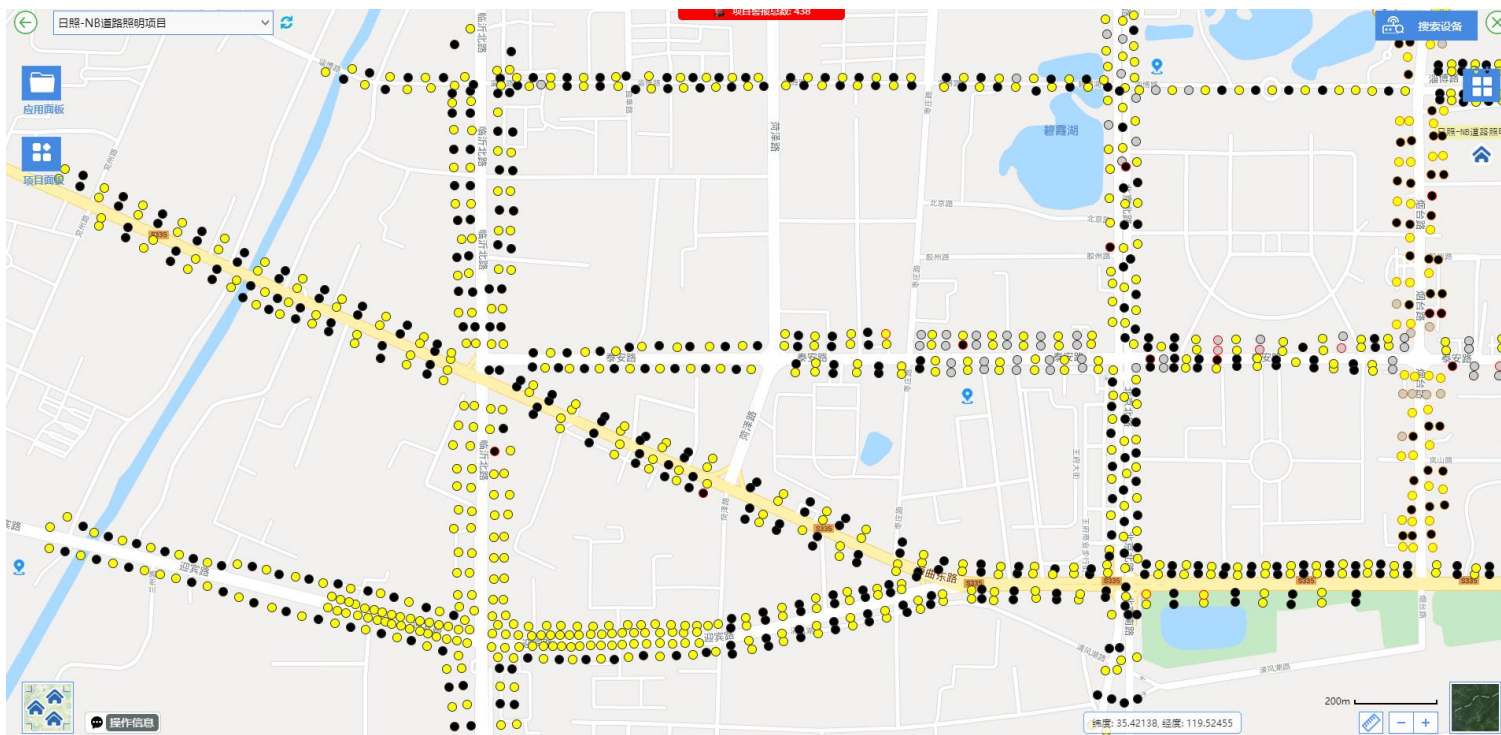


Location Rizhao, Shandong, China

Solution NB-IOT

Products 7478 Lamp Controllers

The intelligent light control system effectively controls energy consumption, greatly saves power resources, helps Rizhao transform the local green development, and also effectively improves the level of public lighting management, reducing maintenance and management costs.



Location	Kunshan, China
Solution	2G/NB-IoT
Products	8,500 lamp controllers

The first phase of the project used 2G solution, and the second phase used NB-IoT solution. The system is running well, stable and reliable.





Location

Saudi Arabia

Solution

Zigbee Solar Solution

Products

12 RTU500Z Gateways ,
600 LCU51ZS Lamp controllers



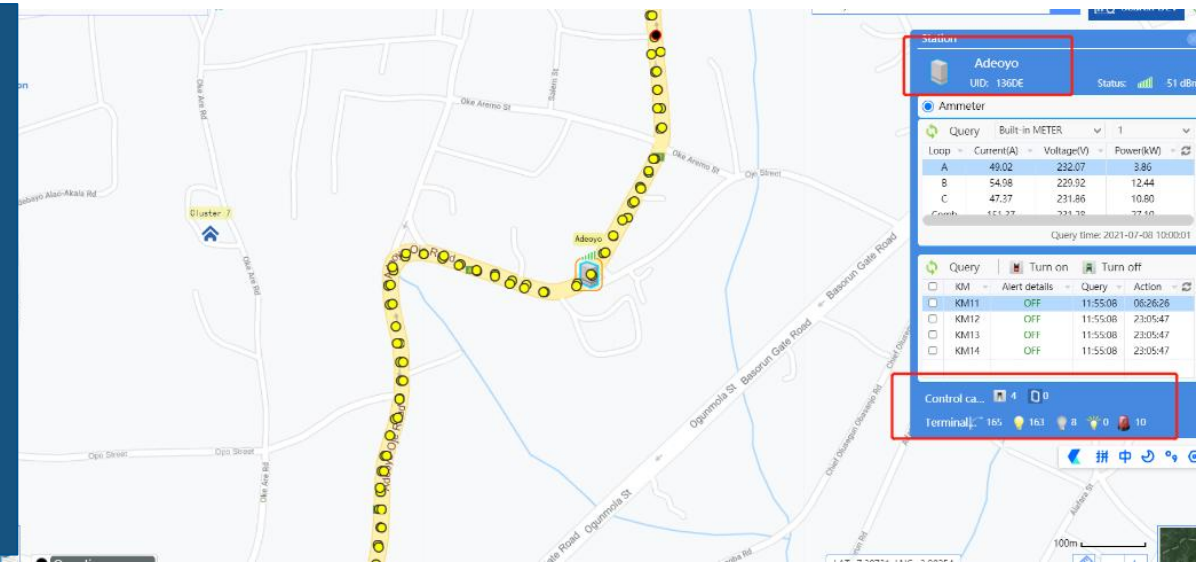


Location Nigeria

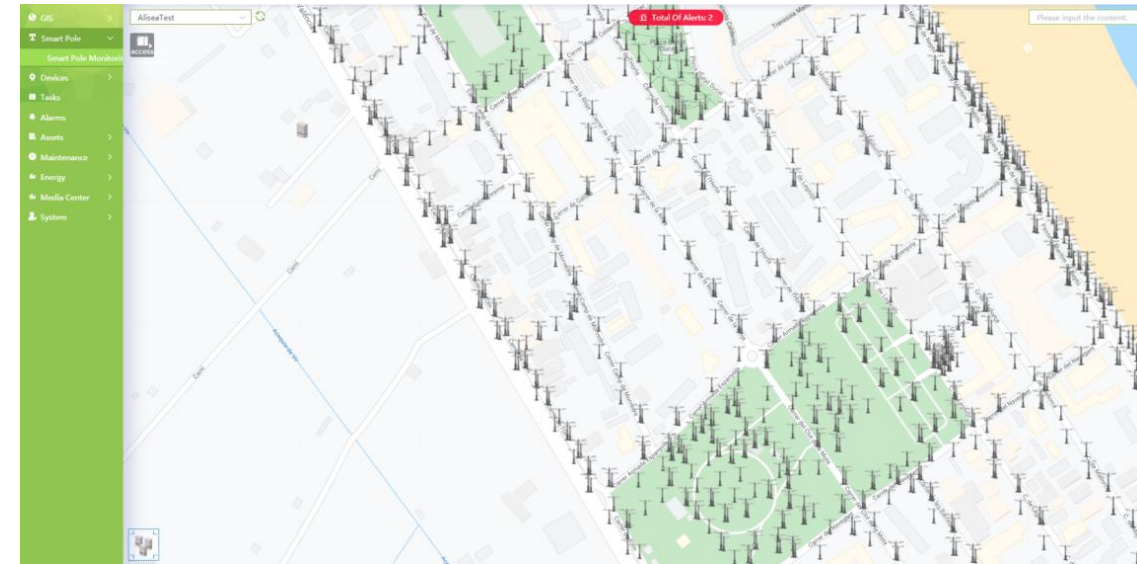
Solution Zigbee Solar Solution

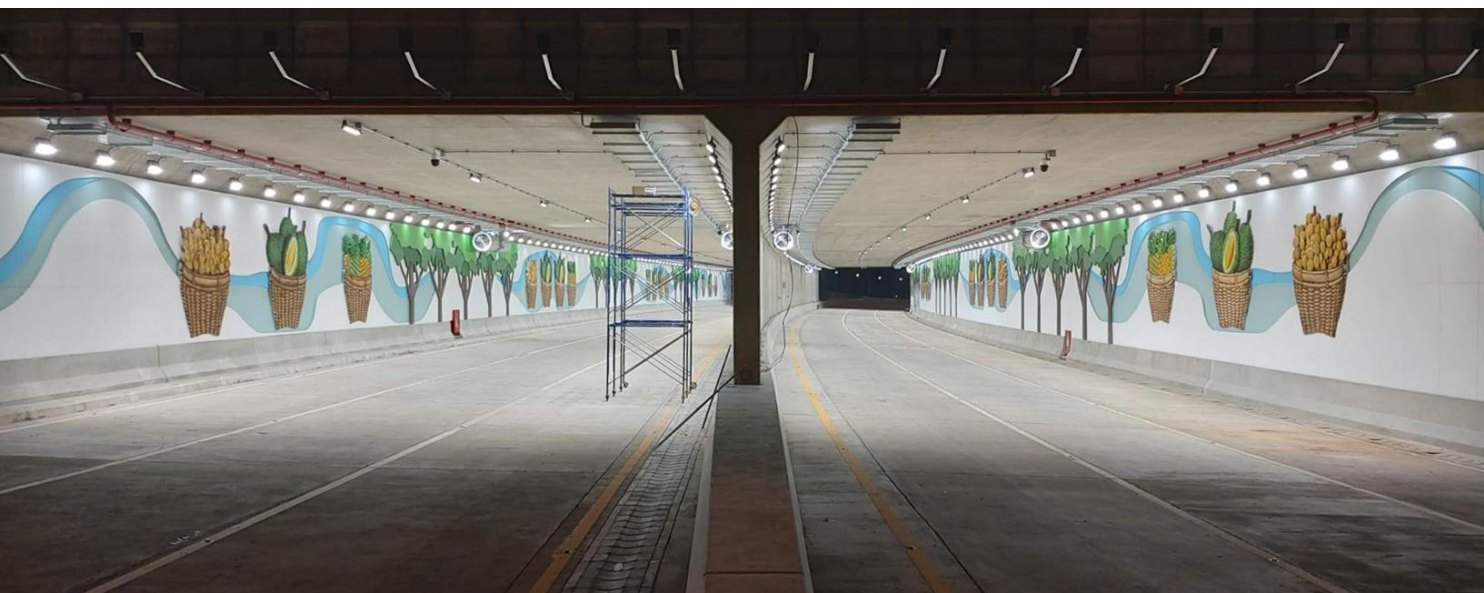
Products 350 RTU200Z Gateways ,
50,000 LCU16Z Lamp controllers

Keyword Generator and public power grid



Location	Spain
Solution	Group control and PLC Solution Smart pole
Products	465 RTU700 concentrator , 17,000 LCU15 Lamp controllers 4 smart pole





Location

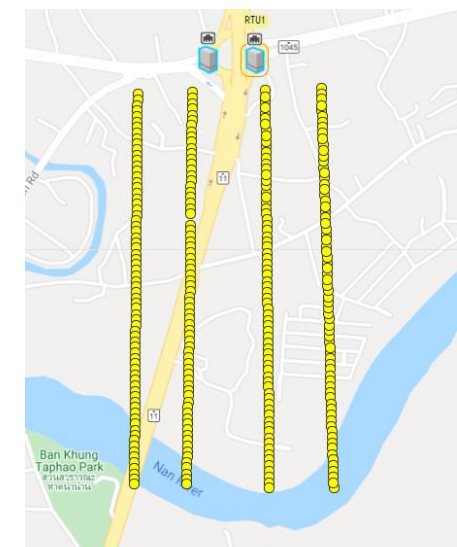
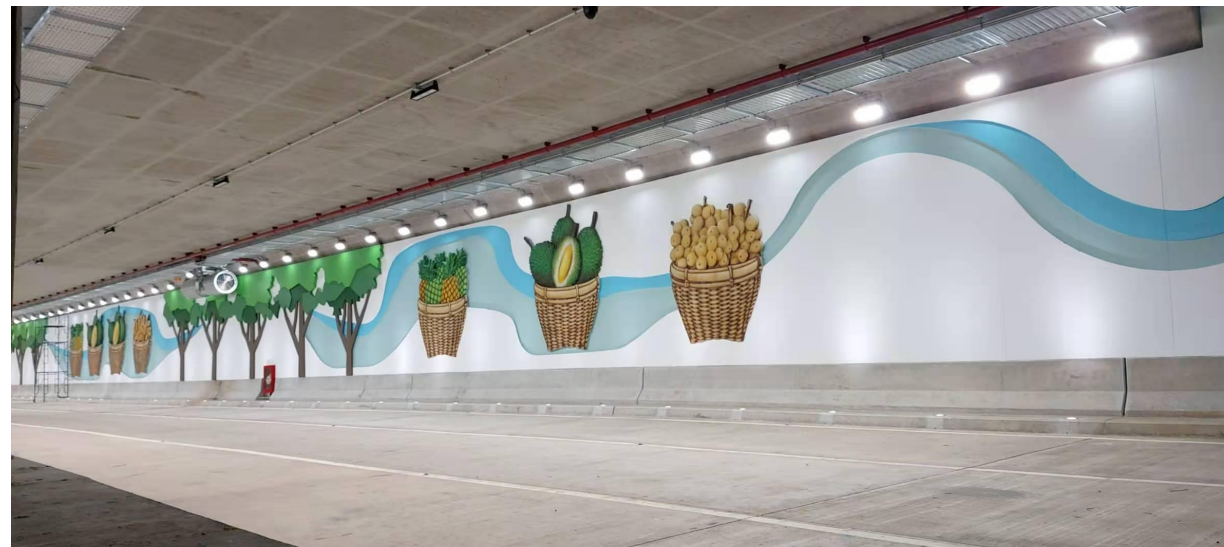
Thailand

Solution

RS485 Tunnel Solution

Products

2 Concentrators , 288 Lamp controllers,
8 Signal Controllers, Lux meter





Huangjia Tunnel



Suichang Tunnel



Changling Tunnel



Nanchong Tunnel

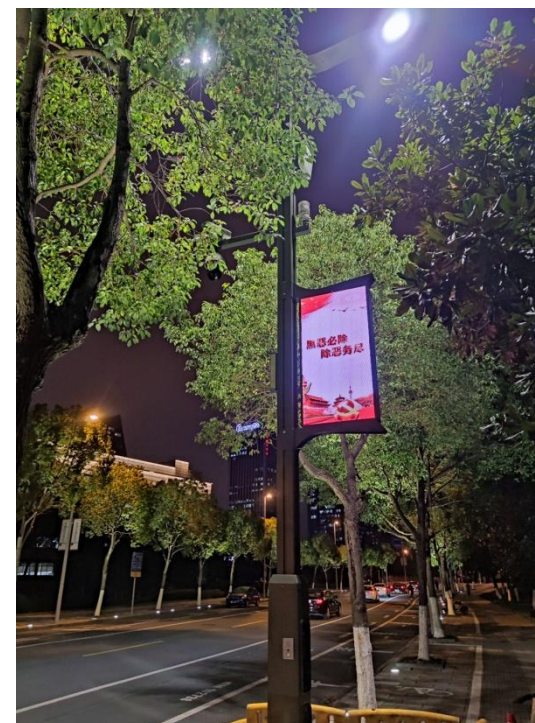
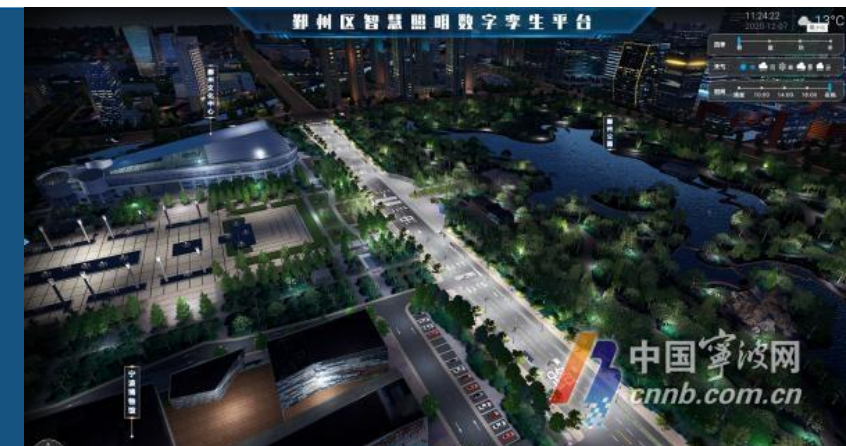


Location Ningbo, China

Solution Smart Pole

Products 34 smart poles

As the first model of the city with full coverage of smart poles, the 700m road with 80 poles upgraded to 34 smart poles of 8 types. With the slot left in the smart pole, various facilities or devices could be directly installed on the existing pole, eliminating the waste of public resources caused by repeated construction.



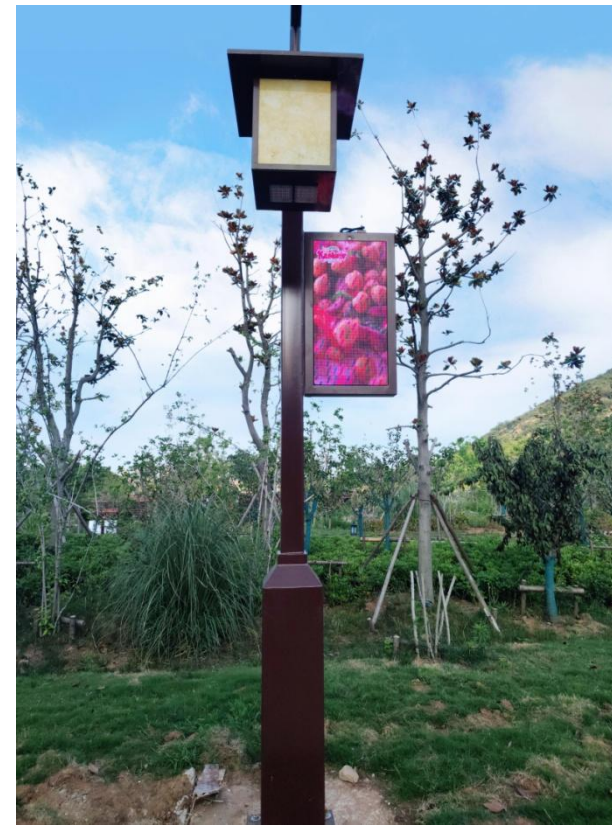


Location Lianyungang, China

Solution Smart Pole

Products 13 smart poles

Customized garden light design for this beautiful park, smart devices such as WiFi, surveillance camera, emergency alarm, weather station, LED display and charging piles were selected by different requirement of the tourist area.



Location Hangzhou, China

Solution Smart Pole

Products 8 smart poles

Smart pole with smart street lighting, WiFi, video surveillance, emergency alarm, environmental monitoring, LED display and charging piles. The data collected by the system can be connected to Smart City system and provide basic data for city management.





Location Hangzhou, China

Solution Smart Pole

Products 4 smart poles

The service and management platform for the community uses smart pole as basic infrastructure, with 5G technology, EV charging pile, LED display, and weather station to improve utilization efficiency of public resources, making it more convenient and efficient.



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