Watran

Light from the heart

智慧城市 智慧照明

SMART CITY SMART LIGHTING

版本号/VERSION NUMBER : SCT23-01

Watran

公司介绍
Company Profile

- 创建：1986年
- 注册资金人民币：5000万元
- 占地面积约130亩,
- 厂房面积：3万平方米
- CNAS认可实验室
- UL授权实验室
- NEMKO授权ENEC实验室
- 广东省级企业技术中心
- 中国国家船级社照明授权实验室
- 高新技术企业

- Establish: 1986
- Registered fund: CNY 50 million
- Land area: about 130Acres
- Factory area:30,000㎡
- CNAS Authorized Laboratory
- UL Authorized Laboratory
- NEMKO Authorized ENEC Laboratory
- Guangdong provincial enterprise technology center
- China National classification society lighting authorization Laboratory
- Hi-tech enterprise

公司优势 Company Advantage

资历/技术优势
Qualification/technical advantage

行业经验
Industry Experience

36年的照明行业从业经验，中国国家照明标准起草企业之一, 参与了60多项国家照明标准制定。

36 years working experience in lighting industry, China One of the drafting companies of lighting standards, Participated in more than 60 national lighting standards.

技术优势
Technological Advantage

拥有100多项国家产品专利,
20项国家发明专利，已经获取了国家受理。

Has more than 100 national product patents, 20 national invention patents have been accepted by the state.

Watran

先进的生产设备和测试仪器
Advanced production equipment and test instrument

拥有世界先进的制造设备，实现自动化，智能化工厂。
Watran has the world's advanced manufacturing equipment, automation, intelligent plants.

主营产品
Main products

HID电感镇流器
HID Magnetic Ballast

LED驱动电源
LED Driver

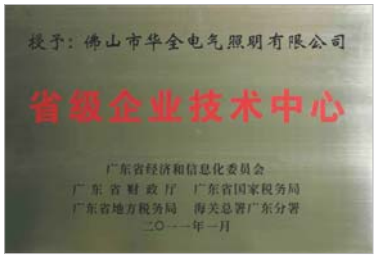
LED灯具
LED Luminaires

智慧城市解决方案
Smart City Solution

Watran

证书Certificate

高新技术企业证书
Hi-tech enterprise confirmation certificate



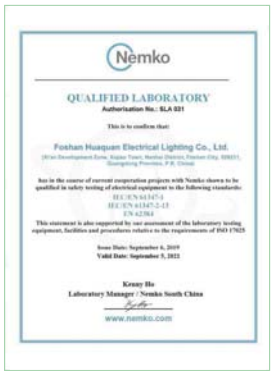
省级企业技术中心
Province Level Technology Center

中国质量认证中心A类企业
CQC Class A Enterprise

信用等级证书
Certificate of Credit Rating

十大智慧路灯品牌
Top Ten Smart Street Light Brand

UL授权实验室
UL accredited laboratory



ENEC授权实验室
ENEC certification and Accreditation Laboratory authorized by NEMKO

ISO 9001证书
ISO 9001 Certificate

ISO 14001证书
ISO 14001 Certificate

ISO/TS 22163
轨道交通体系认证
ISO TS 22163 rail transit system certification.

国家标准起草单位证书
National Drafting Committee of China's Illumination Standard

智能照明管理平台
Intelligent Lighting Manageerment Platform

智慧多功能杆管理平台
Smart Multi-function Pole Manageerment Platform

“防雷击驱动控制电路的发明专利”
Core PatentA Perfect Solution for Anti-Lightening LED Street Light.

智慧城市解决方案·服务

Provide - Smart City Solution & Services

硬件/ Hardware

提供专业的硬件解决方案

Provide protessional hardware solution

- 智慧杆挂载设备：
  例如环境监测、5G基站、
  视频监控、充电桩等。

  Smart Pole mounting equipment:
  Such as environmental monitoring, 5G base stations, Video monitoring, charging pile, etc

- 智慧城市通信硬件：
  高达1Gbits/s 的宽带电力载
  波方案、边缘管理服务器、
  智能路灯管理系统相关硬件。

  Smart city communication hardware:
  Broadband power line communication up to 1Gbits/s, Edge management server , Intelligent street light management system related hardware.

软件/ Software

提供综合的软件平台方案

Provide synthetical software platform solution

- 智慧杆管理平台
  (智慧城市相关的多种
  设备一站式管理)

  Smart Pole management platform
  (one-stop management of various devices related to smart city)

- 智能路灯管理控制平台
  (精准、灵活的路灯控制
  与监控)

  Intelligent street light management control platform (precise and flexible street light control and monitoring)

服务/ Service

为城市解决问题

Solve problems for the city

- 解决安全问题；
  Solve security problem ;
- 解决便民问题；
  Solve the problem of convenience ;
- 解决通信问题；
  Solve communication problems ;
- 解决交通问题 。
  Solve traffic problems.

Watran 佛山市华全电气照明有限公司 FOSHAN HUAQUAN ELECTRICAL LIGHTING CO.,LTD
佛山市华全科技有限公司 FOSHAN HUAQUAN TECHNOLOGY CO.,LTD.

Watran 华全电气

战略合作

STRATEGIC COOPERATION

/ 华南理工大学

华全与华南理工大学建立智慧城市分布技术联合实验室，致力于:

- ✓ 系统信息安全管理
- ✓ 智慧城市管理平台
- ✓ AI视频处理与图像分析

Watran and SCUT(South China University of Technology) together established the smart city distribution technologyunited laboratory, focus on:

- √ The safety management for system information.
- √ Smart city management platform.
- √ AI video processing and image analysis.

/ Teamly Digital通信公司

华全投资法国 Teamly Digital通信公司，合作开发智慧城市通信解决方案:

- ✓ 宽带电力载波(BPL)通信方案

Watran invested a France communication company TD (Teamly Digital), and together develop the smart city communication solution:

- √ BPL(Broadband Power Line) communication solution.

/ 中交智慧城市

华全与中交四航院的中交智慧城市生态发展有限公司形成战略合作伙伴,致力于:

✓ 智慧城市的整体方案设计与实施。

Watran and CCCC Smart City Ecological Development Co.,Ltd. have formed a strategic partner committed to:

√ The overall scheme design and implementation of smart city.

中国中铁 / 中铁武汉电气化局

华全与中铁武汉电气化局集团有限公司形成战略合作伙伴,致力于:

✓ 新基建建设战略合作。

Watran and China Railway Wuhan Electrification Bureau Group Co., Ltd.. have formed a strategic partner committed to:

√ Strategic Cooperation in new infrastructure construction.

目录
CONTENTS

01 智慧多功能杆系统 Smart Multi-function Pole System P02~P27

1.1 系统框架 System Framework P02

1.2 管理平台 Management Platform P03~P06

1.3 配套硬件 System Supporting Hardware P07~P09

1.4 智慧多功能杆款式 Smart Multi-function Pole Types P10~P27

02 宽带电力载波传输方案 Broadband Power line Transmission P28~P31

2.1 200M BPL 宽带电力载波传输 200M BPL Broadband Power Line Transmission P28~P29

2.2 1G BPL 宽带电力载波传输 1G BPL Broadband Power Line Transmission P30~P31

03 智能路灯管理系统 Intelligent street light management system P32~P35

3.1 系统框架 System Framework P32

3.2 控制平台 Software Platform P33

3.3 硬件信息 Hardware Information P34

3.4 技术优势 Technical Advantages P35

04 智能隧道照明系统 Intelligent tunnel lighting system P36~P39

4.1 系统框架 System Framework P36

4.2 主要功能 Main Functions P36

4.3 管理平台 Management Platform P37

4.4 核心硬件 The core hardware P38

4.5 灯具控制方式 Lamp control mode P39

智慧多功能杆系统

Smart Multi-function Pole System

智慧城市实施方案

Smart City Solution

城市路灯是重要的公共基础设施，遍布城市每个角落，实现对城市地理位置的全面覆盖，又自接电力资源，是作为布局城市物联网的最佳载体，也是服务市民的一个绝佳平台。

华全电气研发的智慧多功能杆集成照明、无线城市（Wifi+5G+物联网）、视频监控、环境监测、应急求助、信息交互、智能广播、新能源充电桩等多功能为一体，实现智慧照明、智慧环保、智慧生活、无线城市、智慧市政、智慧交通等诸多应用，是实现智慧城市重要载体。

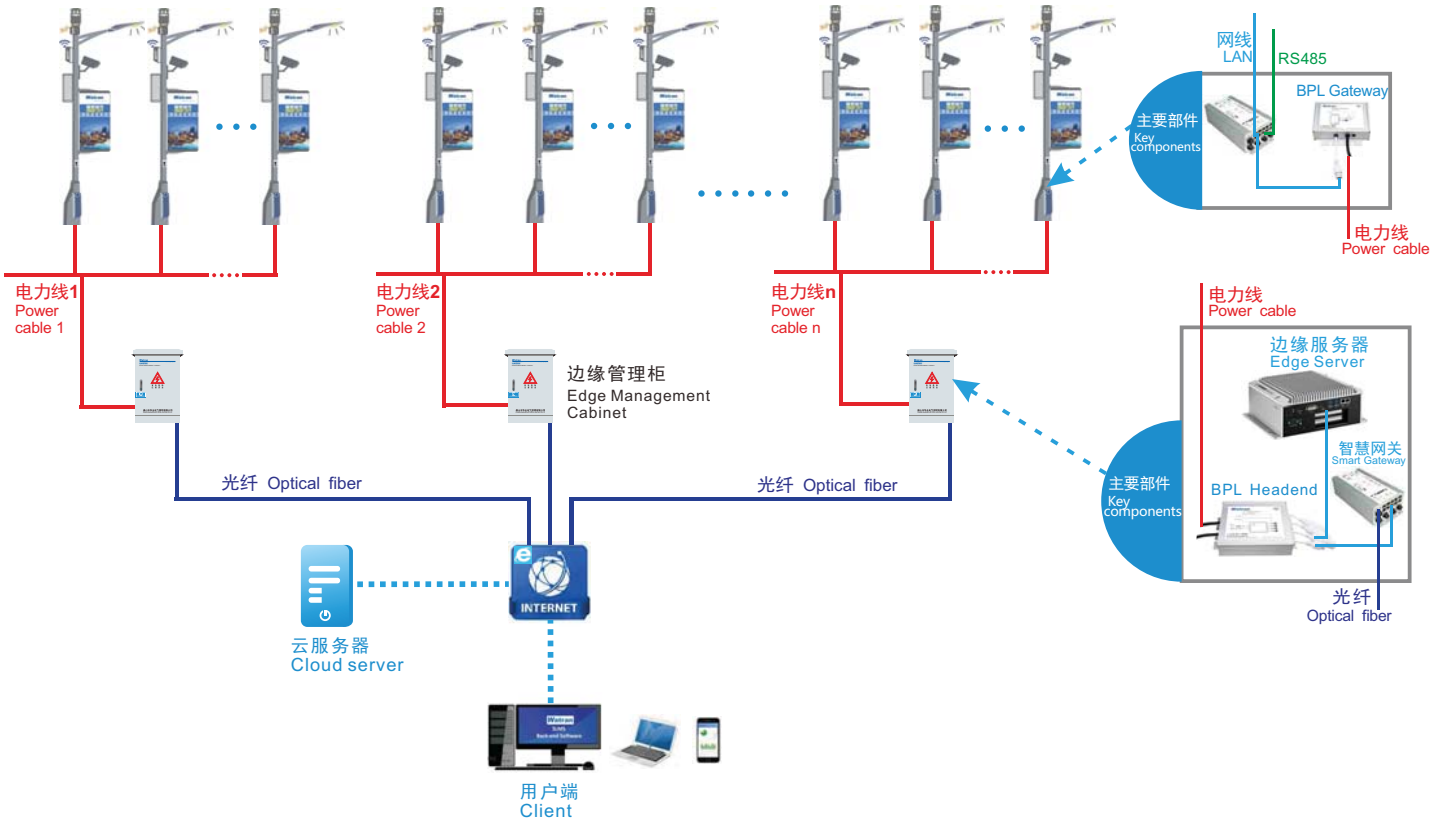
The street light are important public infrastructures which are located in every corner of the city. They provide comprehensive coverage of the city's geographical location and self-connected power resources. They are the best carrier for the layout of the interconnectivity city's Internet of Things and an excellent platform for serving inhabitant.

The Smart Multi-function Pole developed by Watran includes these functions together: streetlight, wireless city (Wifi + 5G + IoT), video surveillance, environmental monitoring, SOS, information interaction, intelligent broadcasting and E-charger. It can realize the various applications like smart lighting, smart environment, smart living, wireless city, smart municipal and smart transportation. It is the important carrier to realize smart city.

1.1系统框架 SYSTEM STRUCTURE

华全的智慧多功能杆系统框架采取边缘服务器与云服务器相结合的管理方式，即确保了管理的便利性，也确保了系统运行的可靠性与实时性。系统部署时，每15~50个智慧多功能杆作为一个分组，分配一个边缘服务器，进行本地运行和存储。每个分组再通过边缘服务器分析计算，同步关键数据到云服务器，这样可以降低云服务器的流量与存储负荷，也更容易地对智慧多功能杆系统进行扩展。

The structure of Watran Smart Multi-function Pole system adopts the management mode of combining edge server and cloud server, which ensures the convenience of management , as well as the reliability and timeliness of system operation. When the system is deployed, 15 to 50 Smart Multi-function Pole are assigned as a group, one edge server is allocated for local operation and storage. Each group synchronize the key data to the cloud server through edge server analysis and calculation, which can reduce the data flow and storage load of the cloud server, and make it easier to extend the Smart Multi-function Pole system.



边缘服务器与智慧多功能杆之间主要有三种通信方式：一是通过华全拥有的世界领先的宽带电力载波传输方案，二是通过传统的光纤连接，三是通过无线WiFi传输。利用宽带电力载波传输方案，是利用原有的电力线来传输大数据，可以有效地节约铺设光纤的人工费用和后续光纤的管理费和流量费。光纤的通信速度很高，但是施工比较麻烦，而且费用很高。无线WiFi在天气不好的时候通信稳定性较差，一般不被采用。

综合来说，宽带电力载波是旧城区改造的首选方案，以上框架图用的就是该方案。对于成本控制要求不高的新区建设，可以使用光纤方案。

There are three main modes of communication between the edge server and the Smart Multi-function Pole : first, through the world-leading broadband power line communication solution owned by Watran ; second, through the traditional optical fiber connection; third, through the wireless WiFi transmission. Broadband power line communication solution is to use the original power lines to transmit big data, which can effectively save the labor cost of laying fiber and the management cost and flow cost of subsequent fiber. The communication speed of optical fiber is very high, but the construction is troublesome, and the cost is very high. Wireless WiFi has poor communication stability in bad weather and is generally not adopted.

Generally speaking, BPL is the first choice for old urban reform, as shown in the above frame structure.For the construction of new areas which not required low cost control requirements, optical fiber can be used.

	通信稳定性 Communication stability	通信速度 Communication Speed	通信距离 Communication distance	施工便利性 Construction convenience	施工成本 Construction cost	维护成本 Maintenance costs
宽带电力载波（BPL） Broadband Power line Transmission(BPL)	★★★★	★★★★	★★★	★★★★★	低 Low	低 Low
光纤 Fiber	★★★★★	★★★★★	★★★★★	★★★	高 High	高 High

1.2 管理平台与主要功能 SYSTEM PLATFORM AND MAIN FUNCTIONS

华全自主开发的智慧多功能杆管理平台可以在一个系统里面同时控制多个智慧多功能杆和杆上的不同设备，其兼容性好、操控人性化、功能强大。控制平台连接到互联网与云服务器，客户何时何地都可以通过手机、电脑等多设备端都可进行控制与管理。

The Smart Multi-function Pole management platform independently developed by Watran can simultaneously control multiple Smart Multi-function Poles and different devices on the Poles in a system, with good compatibility, humanized control and powerful functions. The control platform is connected to the Internet and cloud server, and customers can control and manage it by computer or other multi-device terminal whenever and wherever they want.

系统特点：

1.一个城市一张图，城市状态一目了然。
2.环境/视频/拥堵/能耗信息、设备状态等综合图示化显示。
3.工单自动追踪和统计分析，发现问题与处理问题。
4.安全事件自动识别与弹出播放，及时预警危险。
5.人脸/车牌识别与轨迹追踪，解决人员丢失与治安问题。
6.标准化的API数据接口，开放性的数据接入。
7.数据挖掘、前沿计算、边缘计算和云计算的技术融合。
8.多杆联动，多设备联动，智能安全管理。

System features:

A.One map for each city makes the state of the city clear.
B.Comprehensive graphical display of environment/video/congestion/energy consumption information and equipment status.
C.Automatic tracking and statistical analysis of work order, find and solve problems.
D.Automatic security event recognition and pop-up play, timely warning of danger.
E.Face/license plate recognition and track tracking to solve the loss of personnel and security issues.
F.Standardized API data interface, open data access.
G.Technology convergence of data mining, frontier computing, edge computing and cloud computing.
H.Multi-rod linkage, multi-device linkage, intelligent safety management.

功能模块灵活扩展接入
Flexible Extention and Access for Function Modules

智慧照明
Intelligent lighting

手动控制和自动控制模式切换；按时间/亮度/车流量等自动开关与调光；能耗计算，并图表显示；实时运行状态与参数监控。

Switch between manual control and automatic control modes ; Automatic switching and dimming according to time/brightness/vehicle flow ; Energy consumption calculation and chart display ; Real-time running state and parameter monitoring.

视频监控
Video surveillance

实时视频与回放播放；越界监测;车牌识别与人脸识别；人员密集监测。

Live video and playback ;
Crossing the line monitoring ;
License plate recognition and face recognition ;
Intensive monitoring.

公共Wifi
Public Wifi

同时在线人数监控；接入设备的人员分布地图显示；单个用户的网速和流量控制；总网速和流程控制。

At the same time online number monitoring ;
Access device personnel distribution map display ; Network speed and flow control for single user ; Total network speed and flow control.

公共广播
Public broadcasting

播放设定时间单次或循环播放；多个节目拼接播放；手动音量调节；按时间自动音量调节。

Set time for single or looping playback ;
Multiple programs are played together ;
Manual volume adjustment ;
Automatic volume adjustment by time.

视频信息发布
Video information display

播放设定时间单次或循环播放；多个节目拼接播放；手动亮度调节；按时间或环境亮度自动亮度调节。

Set time for single or looping playback ;
Multiple programs are played together ;
Manual brightness adjustment ;
Adjust the brightness automatically on time or in the environment.

一键求助
One touch call

实时视频/语音播放；视频/语音存储与调用；一键报警时弹出提醒界面。

Live video/voice playback ;
Video/voice storage and invocation ;
The warning interface pops up when the alarm is pressed.

环境监测
Environmental monitoring

显示实时环境信息；自动存储环境信息；环境指标超标告警；环境参数历史数据曲线显示。

Display real-time environment information ;
Automatic storage of environment information ;
Warning of excessive environmental indicators ;
Historical data curves of environmental parameters are displayed.

充电桩
Charging pile

实时输出电压电流监控；用电量与缴费信息记录与查看。

Real-time output voltage and current monitoring ; Record and view electricity consumption and payment information .

智慧市政
Smart municipal

井盖异常监控；垃圾桶异常监控；水位异常监控。

Manhole cover anomaly monitoring ;
Garbage can anomaly monitoring ;
Water level anomaly monitoring.

5G基站
5G Base stations

工作状态监控；用电量监控；数据传输速度监控。

Working condition monitoring ;
Electricity consumption monitoring ;
Data transmission speed monitoring.

智慧交通
Smart traffic

实时车流量/人流量监控与历史数据查看；基于车流量/人流量自动设置红绿灯时间。

Real-time traffic/people flow monitoring and historical data review ; Set traffic light time automatically based on traffic/people flow..

工单维护
Order maintenance

新建工单；审批工单；工单清单查看与管理。

Create work order ; check and approve work order ; work order list review and management.

多杆联动
Multi-pole linkage

越界联动；一键报警联动；沙井盖异常联动；其它特定事件联动。

Cross linkage ; One key alarm linkage ;
Abnormal manhole cover linkage ;
Other specific event linkage.

设备管理
Equipment management

查看设备清单与基本信息；设置特定故障发邮件或短信提醒；灯杆倾斜检测；电缆防盗检测；灯杆分组。

View equipment list and basic information ;
Set email or SMS alerts for specific failures ;
Lamp pole tilt detection ; Cable anti-theft detection ; Light poles are grouped.

账号管理
Account management

用户分组；用户权限设定；用户基本信息设置。

Tenant Service ; User permission setting ;
User basic information Settings.

边缘计算与存储
Edge management

网络断线本地运行；数据安全和备份；人脸/车牌等标签数据库的建立；基于标签的视频搜索与定位；本地数据与云服务器同步数据。

Network disconnection runs locally ; Data security and backup ; Face/license plate and other tag database ; Tabbed video search and location ; Local data synchronization with the cloud server.

1.2 管理平台与主要功能 SYSTEM PLATFORM AND MAIN FUNCTIONS

高内聚、低耦合的平台开发接入
High cohesion, low coupling platform development access

(其他平台API)

(数据库API接口)

▲独立数据库开发，API数据库接口；
Independent database development, API database interface;

▲数据库可接入政府数据平台；
The database can be connected to the government data platform;

▲HQSMS平台可接入第三方平台；
The HQSMS platform can be connected to third party platforms;

▲智能网关全开发，不捆绑平台。
Smart gateway fully developed, not bundled platform.

城市管理平台

公安平台

其他平台

HQSMS 分布式数据库

(边缘服务器)

(边缘服务器)

(边缘服务器)

(智能网关)

(智能网关)

(智能网关)

1.2 管理平台与主要功能 SYSTEM PLATFORM AND MAIN FUNCTIONS

能耗管理
Energy Managerment

▲动态能耗管理，确保5G基站供电充足
Dynamic energy consumption management ensures sufficient power supply for 5G base stations

▲系统按用电优先级，自动智能调整
The system is automatically and intelligently adjusted power on/off according to the priority

优先级：5G基站 > LED照明 > 广播 > 显示屏 > 充电桩
5G Stations > LED Lighting > Broadcast > LED Screen > E-Charge

人脸/车牌AI处理与轨迹追踪
Face/Car Numbers AI processing and track tracking

▲终端、边缘、云齐协调AI视频事件触发管理，把人和车作为重要信息分布式数据库管理
Terminal, edge and cloud coordinate the trigger management of AI video events, and manage people and vehicles as the distributed database of important information

▲利用分布式数据库可以快速查找事件的发生轨迹，通过记录路径调取对应视频查看
Using the distributed database can quickly find the occurrence track of the event, through the record path to retrieve the corresponding video to view

事件分级管理
Event Classification Managerment

视频监控系统具备下面特点：
系统自动识别事件安全等级，分颜色循环播放。发生安全事件时及时预警，并上传云端永久存储，同时自动派出工单处理。

The video surveillance system has the following characteristics:
The system automatically identifies the security level of the event and plays the event by color. Timely warning of security incidents, and upload cloud permanent storage, at the same time automatically send work order processing.

1.3 配套硬件 SUPPORTING HARDWARE

边缘管理柜 EDGE MANAGEMENT CABINET

型号 Model：HQSDPBM-01

边缘管理柜是用于存放边缘服务器和相关通信设备，例如电力载波设备等。它是一组智慧多功能杆的电力入口和数据入口。其防水防潮防腐蚀，具备智能电子锁，体积小，容易部署。

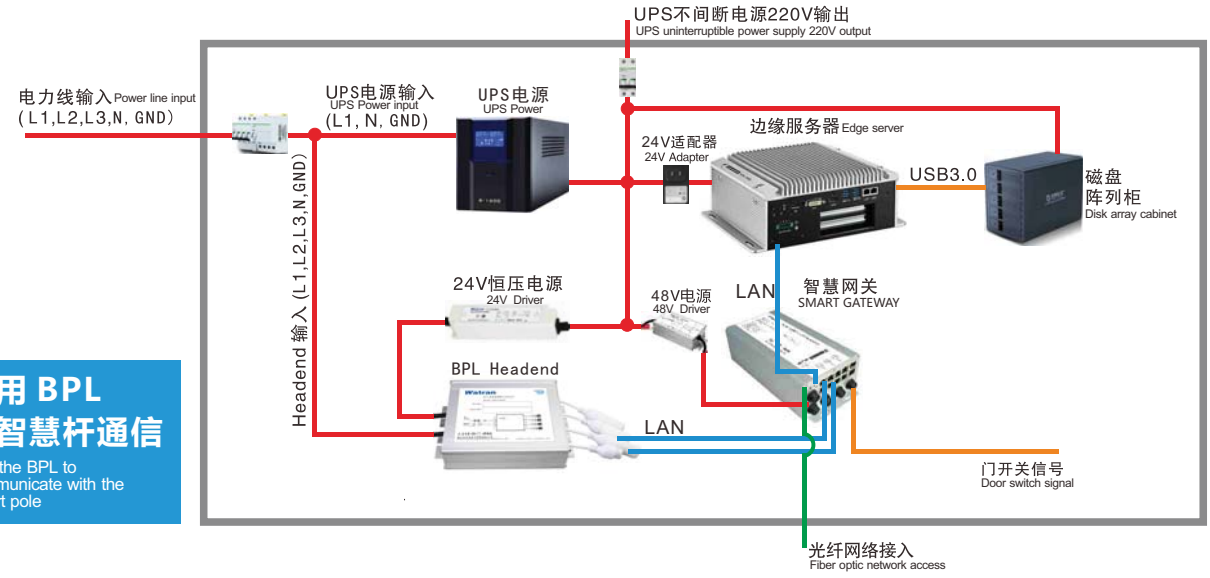
Edge Management cabinet is used to store edge servers and related communication equipment, such as power line communication equipment. It is the entrance of power supply and data transmission for Smart Multi-function Pole Its water-proof, moisture -proof, corrosion-proof ,with intelligent electronic lock, small size, easy to deploy.

边缘管理柜的主要功能：
1. 一组智慧多功能杆数据的边缘计算；
2. 输入网络断线时可以离线运行；
3. 自动存储历史数据并与云服务器同步关键数据。

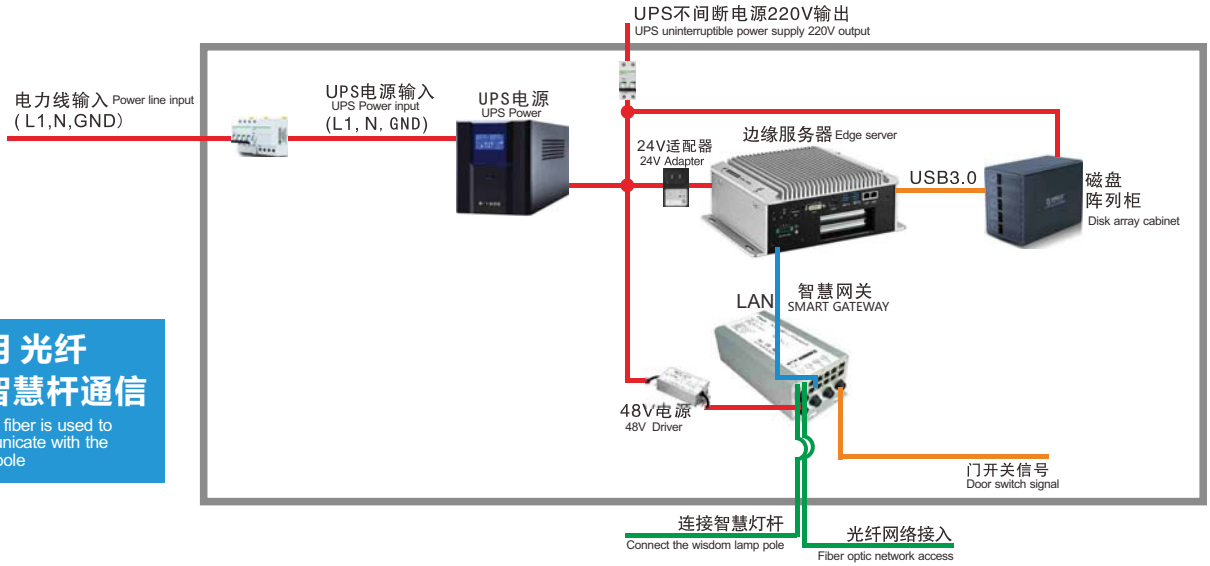
Main functions of edge management cabinet:
1. Edge calculation of a set of Smart Multi-function Pole data ;
2. It can run offline when The network connection is drop ;
3. Automatically store historical data and synchronize key data with the cloud server.

内部接线图 INTERNAL WIRING DIAGRAM

利用 BPL 与智慧杆通信
Use the BPL to communicate with the smart pole



利用 光纤 与智慧杆通信
Optical fiber is used to communicate with the smart pole



1.3 配套硬件 SUPPORTING HARDWARE

智慧网关 SMART GATEWAY

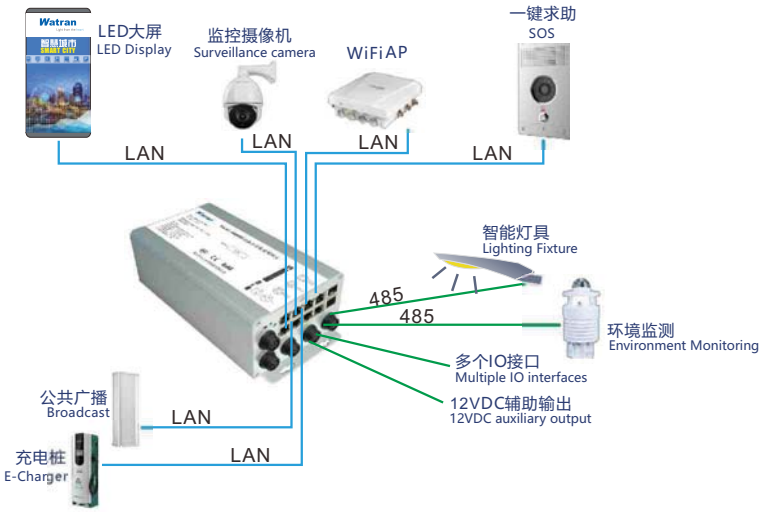
型号 Model：HQSSG-G20

尺寸 Size：265x126x75mm

1. 多功能的智慧网关，适用于多设备的同时接入与控制;
2. 适用于智慧多功能杆等应用，工业级设计，可靠性高;
3. 千兆光纤接口，适用环网、级联、星型等组网方式;
4. 金属外壳，防水端子，防潮防腐;
5. 具有MQTT、Modbus、VPN、IP/Http/UDP等标准协议;
6. 路由/桥接模式灵活切换，标配多种接口。

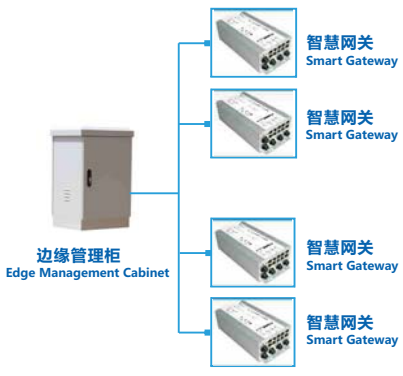
1. Multi-functional intelligent gateway, suitable for multi-device access and control at the same time;
2. Suitable for intelligent multi-function bar and other applications, industrial grade design, high reliability;
3. Gigabit optical fiber interface, suitable for ring network, cascade, star network and other networking methods;
4. Metal Housing, waterproof connector, moisture proof and anticorrosion;
5. With MQTT, Modbus, VPN, IP/ HTTP /UDP and other standard protocols;
6. Routing/bridge mode flexible switching, standard with a variety of interfaces.

多个接口 MULTIPLE INTERFACES

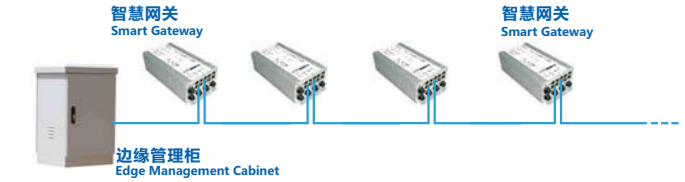


多种网络接线方式

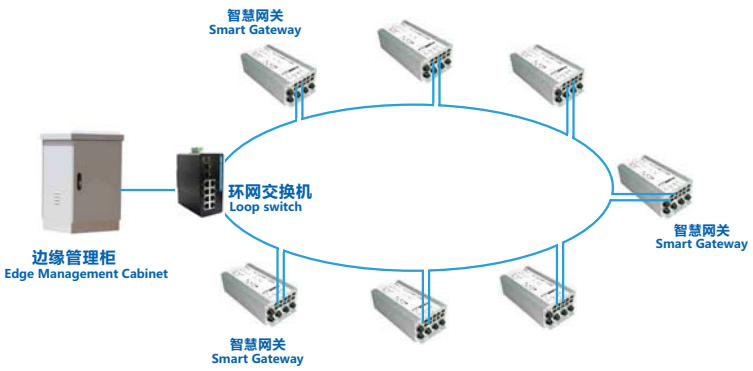
VARIOUS NETWORK CONNECTION MODES



星型组网方式 Star networking



级联组网方式 Cascaded group network mode



环网组网方式 Ring network networking mode

1.3 配套硬件 SUPPORTING HARDWARE

1.3.3 智慧多功能杆挂载设备 | SMART MULTI-FUNCTION POLE MOUNTING EQUIPMENT

智慧多功能杆采用分层设计，一般按照下图规则挂载相关设备：
Smart Multi-function Pole adopts layered design, and generally mounts related equipment according to the following rules:

8米以上
above 8m


5G基站
5G Base Station


LoRa网关
LoRa Gateway


气象环境监测
Environment Monitoring


照明灯具
Lighting Fixture

5.5~8米
5.5~8m


交通信号灯
Traffic Light


交通监控摄像头
Traffic surveillance camera

交通标志牌
Traffic sign


WiFi AP
WiFi AP

2.5~5.5米
2.5~5.5m

LED大屏
LED Display


监控摄像机
Surveillance camera


公共广播
Broadcast


行人信号灯
Pedestrian Signal Light

小型标志牌
Small Sign

0~2.5米
0~2.5m


充电桩
E-Charger


信息交互屏
Information screen


一键求助
SOS


智慧通信盒
Intelligent communication box

注：挂载设备可以根据客户需求选配 Note: mounting equipment can be optional according to customer demand.

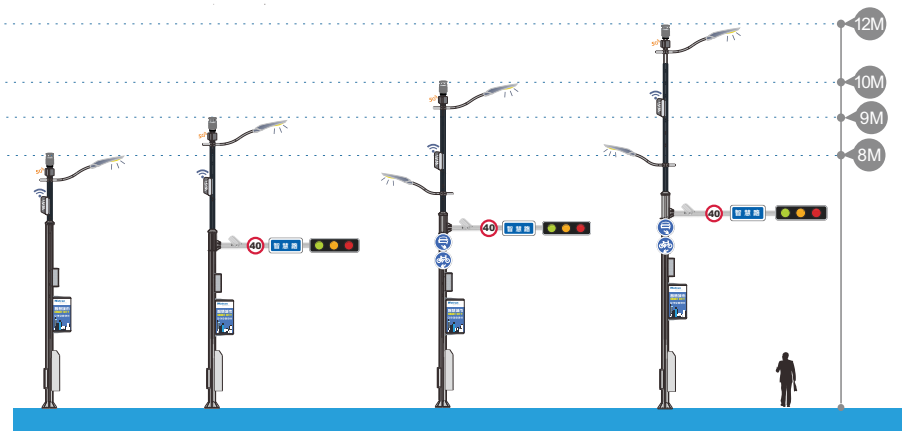
1.4 智慧多功能杆款式 | SMART MULTI-FUNCTION POLE STYLE

城市之星系列

（标准款）
Standard type

（单横杆款）
Single rail type

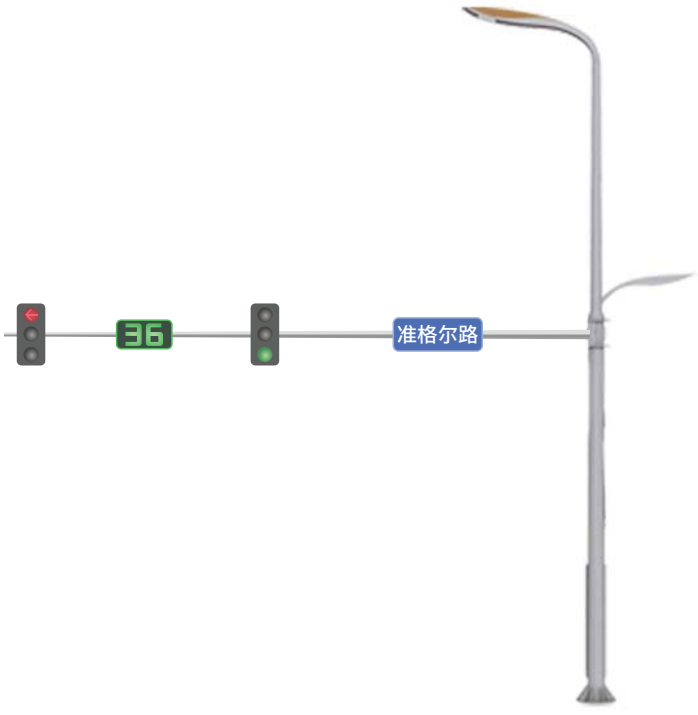
灵活的高度配置
Flexible height configuration



1.4 智慧多功能杆款式 | SMART MULTI-FUNCTION POLE STYLE

极光系列

(标准款)
Standard type

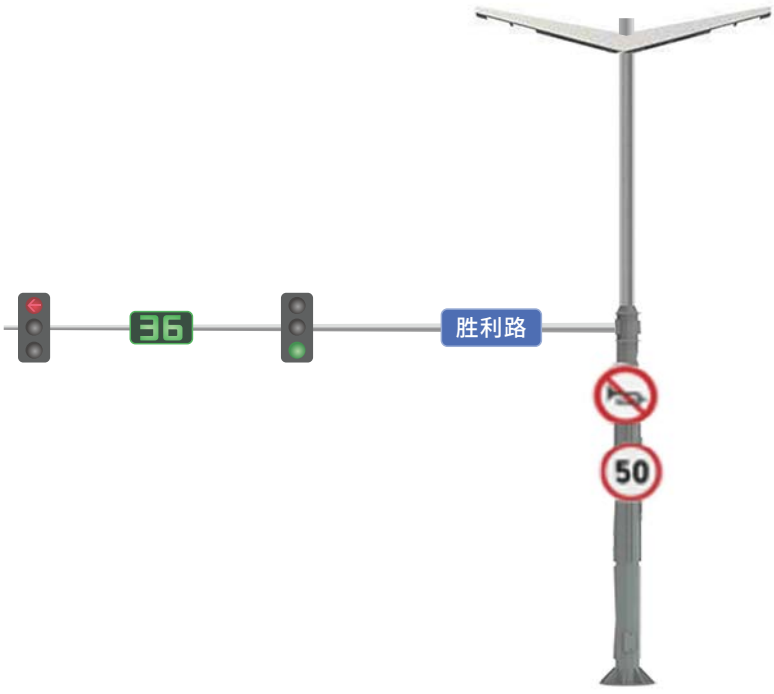


(单横杆款)
Single rail type

1.4 智慧多功能杆款式 | SMART MULTI-FUNCTION POLE STYLE

金刚系列

(标准款)
Standard type



(单横杆款)
Single rail type

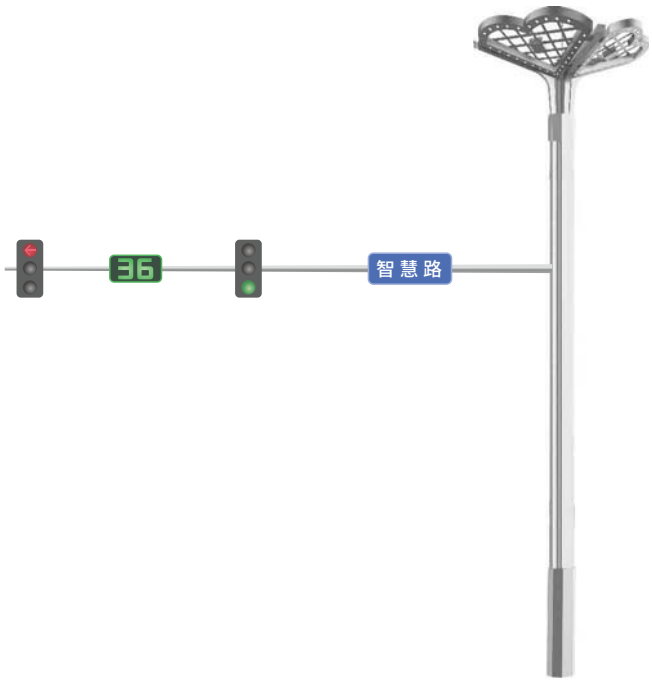
1.4 智慧多功能杆款式 | SMART MULTI-FUNCTION POLE STYLE

蟠龙系列

1.4 智慧多功能杆款式 | SMART MULTI-FUNCTION POLE STYLE

鼎盛系列

(标准款)
Standard type

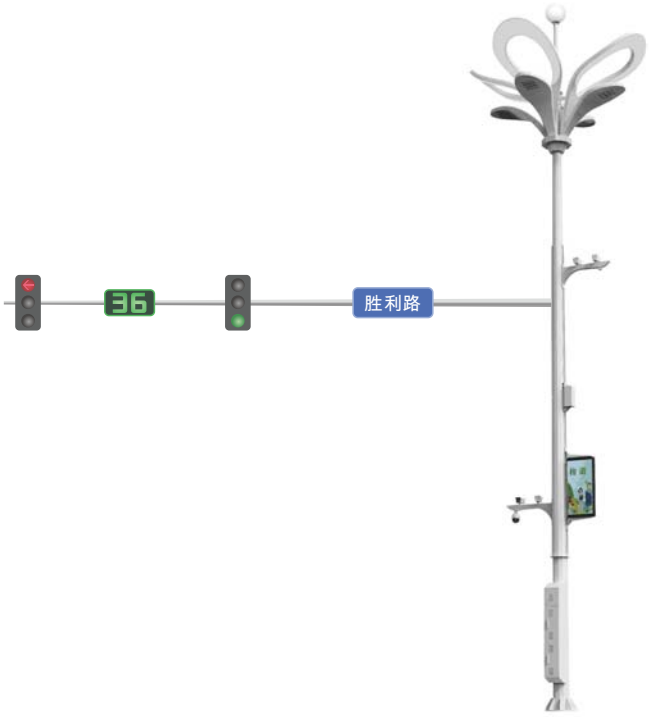


(单横杆款)
Single rail type

1.4 智慧多功能杆款式 | SMART MULTI-FUNCTION POLE STYLE

宝莲系列

(标准款)
Standard type



(单横杆款)
Single rail type

1.4 智慧多功能杆款式 | SMART MULTI-FUNCTION POLE STYLE

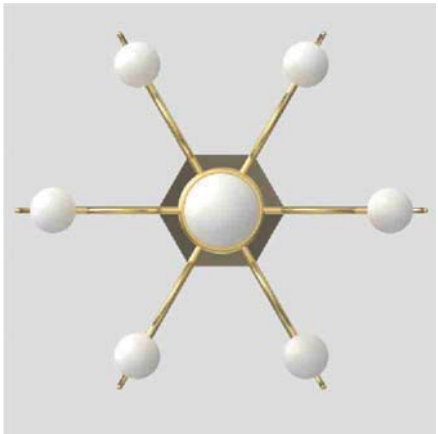
盛世系列

(标准款)
Standard type

(单横杆款)
Single rail type

1.4 智慧多功能杆款式 | SMART MULTI-FUNCTION POLE STYLE

明珠系列



1.4 智慧多功能杆款式 | SMART MULTI-FUNCTION POLE STYLE

星光系列

1.4 智慧多功能杆款式 | SMART MULTI-FUNCTION POLE STYLE

银河系列

1.4 智慧多功能杆款式 | SMART MULTI-FUNCTION POLE STYLE

盛放系列

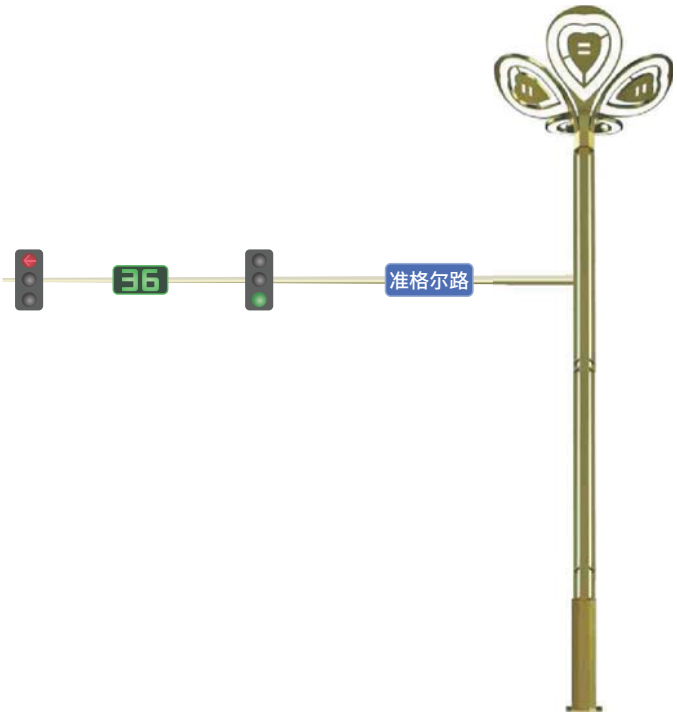
1.4 智慧多功能杆款式 | SMART MULTI-FUNCTION POLE STYLE

云天系列

1.4 智慧多功能杆款式 SMART MULTI-FUNCTION POLE STYLE

心叶系列

(标准款)
Standard type



(单横杆款)
Single rail type

1.4 智慧多功能杆款式 | SMART MULTI-FUNCTION POLE STYLE

百合系列

1.4 智慧多功能杆款式 | SMART MULTI-FUNCTION POLE STYLE

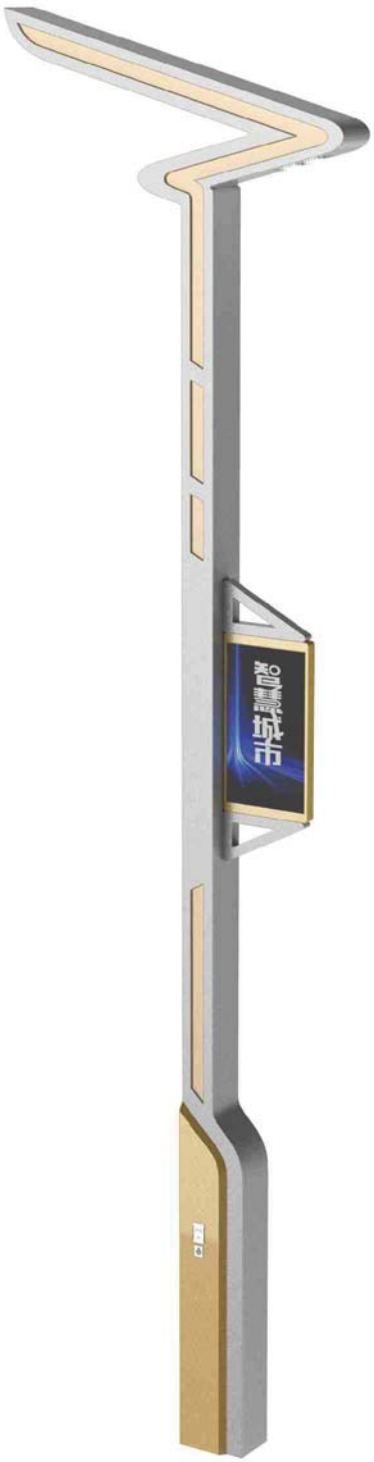
天际系列

(单臂款)
Single arm type

(双臂款)
Double arms type

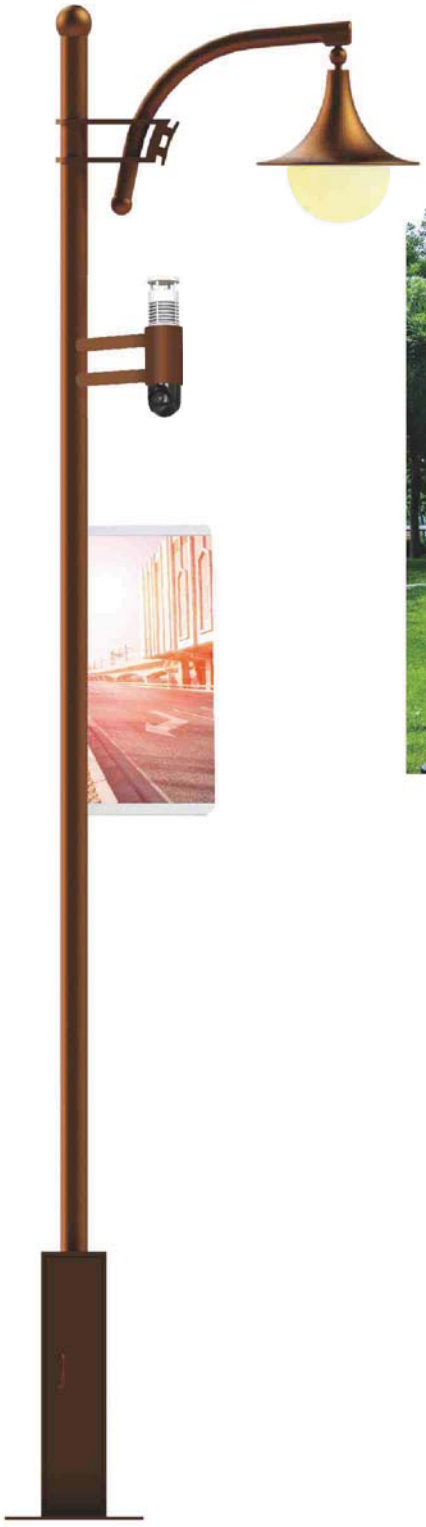
1.4 智慧多功能杆款式 | SMART MULTI-FUNCTION POLE STYLE

电光系列



1.4 智慧多功能杆款式 | SMART MULTI-FUNCTION POLE STYLE

大唐系列

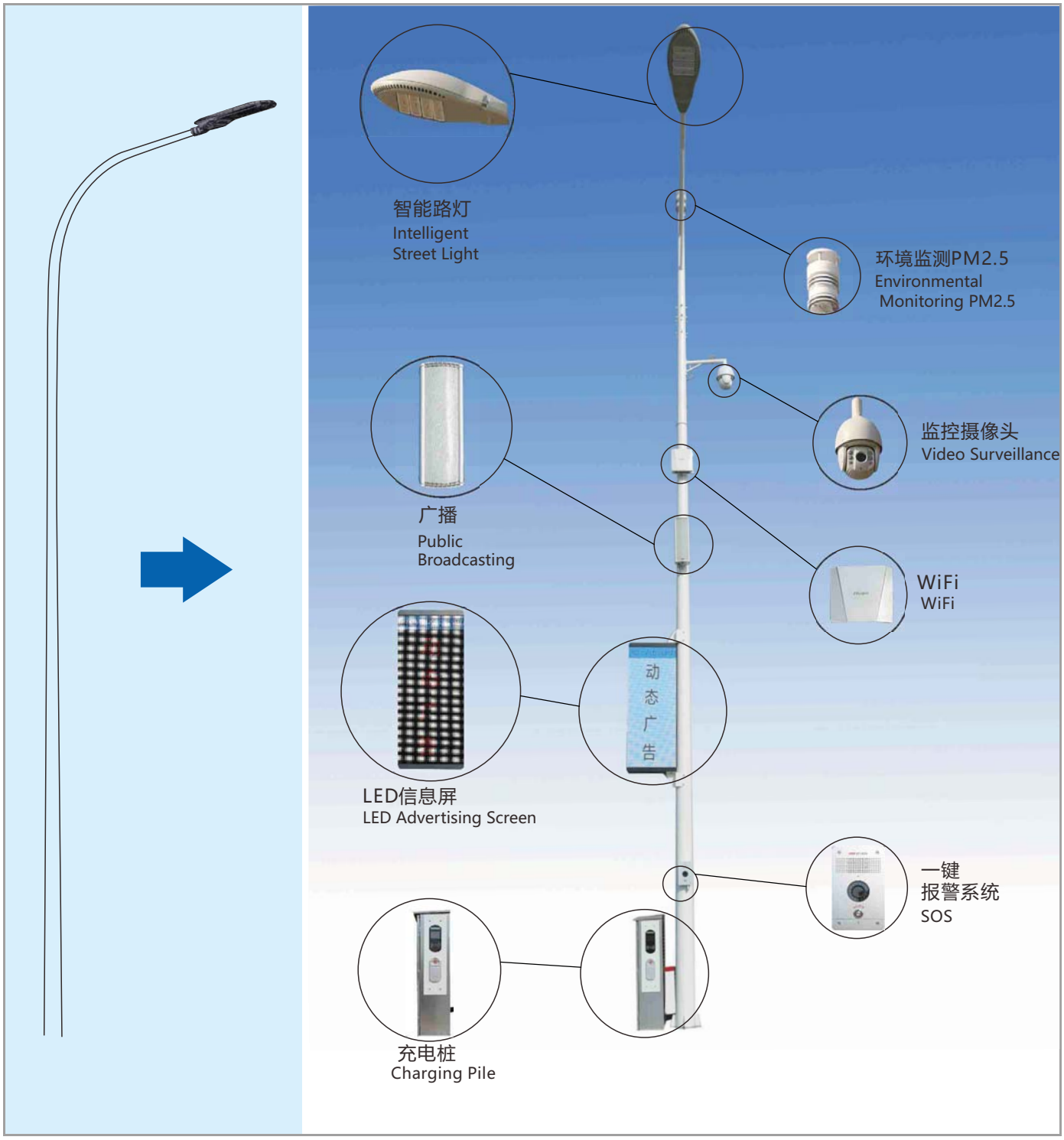


(单头款)
Single head type

(双头款)
Double head type

1.4 智慧多功能杆款式 | SMART MULTI-FUNCTION POLE STYLE

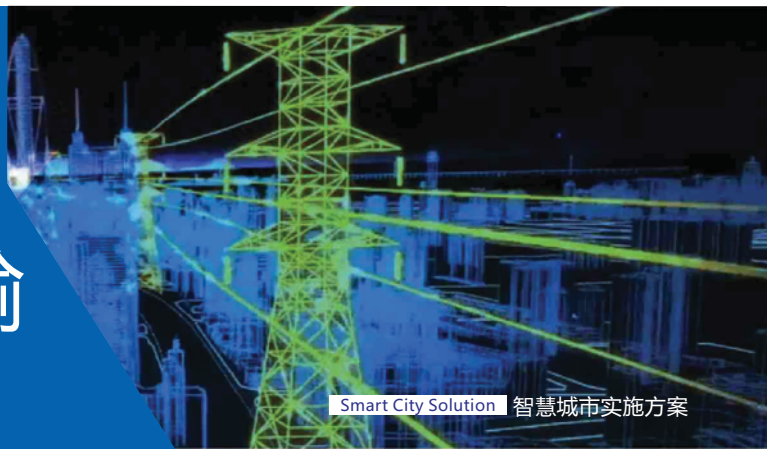
升级杆系列



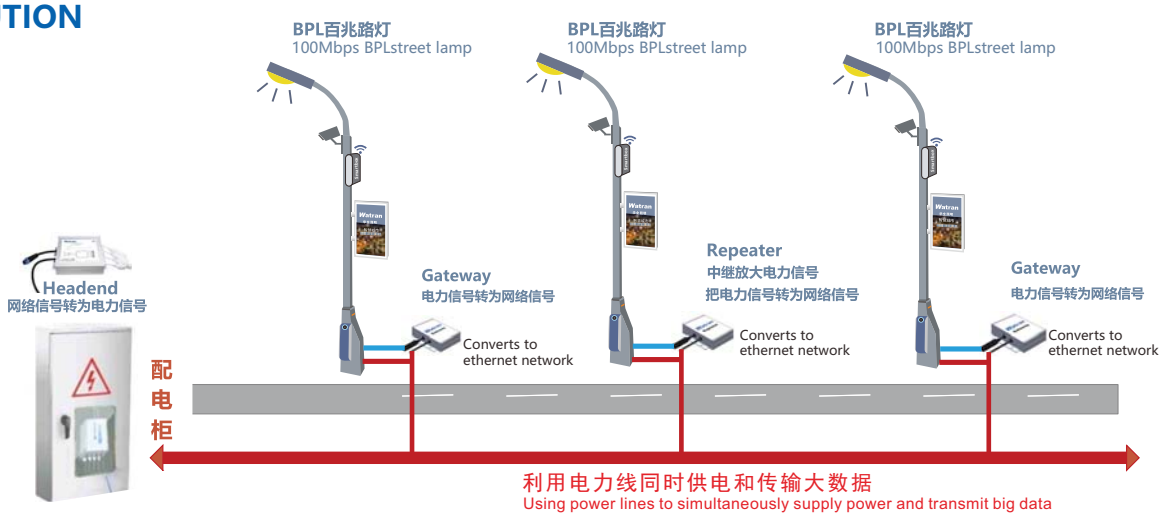
宽带电力载波传输方案

200M BPL
宽带电力载波传输

200M BPL Broadband Power Line Transmission



方案组成 SOLUTION



BPL技术可以提供高速安全网络，确保和优化带宽。BPL技术的三个主要设备是通过现有电力线电网连接和传输宽带信号，并提供完全集成的软件用于端到端附加服务。

1. 网络管理器（Headend）是一种通过连接的电力线来发送和接收调制宽带信号的装置。
2. 为进一步分配信号，可以部署一个信号中继放大器 (Repeater) ,中继器与前端、中继器和终点通信。
3. 网络高级调制解调器(Gateway) 是用于收集和分配数字信息的终端设备。

BPL technology can provide a high-speed secure network, ensuring and optimizing bandwidth. The three main devices of BPL technology are connecting and transmitting broadband signals over existing power line grids and providing fully integrated software for end-to-end add -on services.

1. Network Manager (Headend) is a device that sends and receives modulated broaddband signals from a connected power network.
2. To further distribute the signal, a repeater can be deployed. The repeater communicates with the front end, repeater, and terminal point.
3. Network Advanced Modem (Gateway) is a terminal device that collects and distributes digital information.

方案特点 CHARACTERISTICS

- 百兆网络引入，满足安防监控，广告发布，天气监控等网络要求；
- 无需重新布置光纤线路，特别适合不方便施工或者施工成本高的场合；
- 简单易用，即插即用，有电的地方就能有网络；
- 核心技术来自于法国，自动跳频技术抗干扰能力极强，核心芯片自带中继技术，传输距离长。

- Introducing Megabit network to satisfy security monitoring, advertisement publishing, weather monitoring and other demand on network ;
- No fiber redeployment is required, especially suitable for the applications with inconvenient and high cost construction ;
- Easy to use, plug in and apply, can access to network anywhere with power line ;
- Core technology come from France, auto Frequency-Hopping, strong anti-jamming capability, core chip with repeating technology and long distance delivery.

适用领域 APPLICATION

- 适用于智慧多功能杆，高清摄像监控，高清网络发布等只需要百兆网络，该方案更适用于大规模智慧城市搭建，大大降低网络建设成本，使得智慧城市大范围推广成为可能。
- Suitable for Smart Multi-function Pole , HD video surveillance and publishing, etc. and only require Megabit network. This solution is more suitable for large-scale Smart City construction as it greatly reduces network construction cost and make it possible for extensive implementation.

硬件信息 HARDWARE

Headend

型号Model:
HQEH10SWT
HQEH10SWT-3

芯片CHIP: DSS9503/DSS7800-DSS2718

Headend（BPL网络管理器）
BPL Network Manager

- 输入供电12-48VDC ,输入功率15W;
- 接入电力线100-400VAC用于电力载波通讯，具备单相接入和3相接入两款;
- 调制方式OFDM，子载波数量1536个，载波频率为 2-32MHz;
- 最高PLC物理速度为200Mbits/秒，以太网速度为100Mbits/秒;
- 支持网络协议为TCP / IP-DHCP-TFTP-SNMP;
- 最大MAC地址管理数量为1024个，最大BPL直接节点为15个;
- 单相的Headend可以通过耦合器接入三相电力线，将信号传输覆盖到三相
- 电力线，或直接使用三相Headend;
  默认Eth1和Eth2是管理和配置接入口， Eth3和Eth4 为数据交换口。
- 产品尺寸：155×212×42.2mm

- Input voltage: 12-48VDC, input power: 15W ;
- Access power line: 100-400VAC for PLC communication. It include two types with 1 phase or 3 phase ;
- 1536 OFDM carriers spread over a configurable frequency range between 2-32MHz ;
- Maximum PLC physical data rate up to 200Mbps, the speed of Ethernet up to 100Mbps ;
- Support Network protocol TCP/IP-DHCP-TFTP-SNMP ;
- Maximum number of MAC address management is 1024 and up to 15 number of BPL nodes for direct connection ;
- One-phase Headend can connect and cover the signal transmission to 3-phase power line through
- coupler or directly use 3-phase Headend ;
  Eth1 and Eth2 ports are dedicated to management and configuration; Eth3 and Eth4 ports are
- dedicated to network communication.
- Product size: 155×212×42.2mm

Repeater

型号Model:
HQER10

芯片CHIP: DSS9503/DSS7800-DSS2718

Repeater（BPL信号中继放大器）
BPL Network Repeater

- 接入100-400VAC，通讯和供电同时,工作电流100mA，每个Headend 管理的BPL线路最多使用8个Repeater;
- 调制方式OFDM,子载波数量1536个，载波频率为2-32MHz;
- 最高PLC物理速度为200Mbits/秒 ,以太网速度为100Mbits/秒;
- 支持网络协议为TCP / IP-DHCP-TFTP-SNMP;
- 最大MAC地址管理数量为1024个,最大BPL节点为15个;
- 当路灯节点离Headend超过300米时可用Repeater对信号进行中继放大，保证通讯速度。
- 产品尺寸：155×140×42.2mm

- Access 100-400VAC power line, operating current is100mA while power on and communicating ; Each headend can connect to 8pcs repeater directly ;
- 1536 OFDM carriers spread over a configurable frequency range between 2-32MHz ;
- Maximum PLC physical data rate up to 200Mbps, the speed of Ethernet up to 100Mbps ;
- Support network protocol TCP/IP-DHCP-TFTP-SNMP ;
- Maximum number of MAC address management is 1024 and up to 15 number of BPL nodes for direct connection ;
- Repeaters can amplify signals when the streetlight nodes more than 300m away from Headend to ensure communication speed.
- Product size: 155×140×42.2mm

Gateway

型号Model:
HQEM10AG

芯片CHIP : DSS9501/DSS7800-DSS2718

Gateway（BPL网络高级调制解调器）
BPL Network Advanced Modem

- 接入100-400VAC，通讯和供电同时,工作电流100mA，视节点的带宽要求连接节点数量,每个Gateway最多管理64个MAC地址;
- 调制方式OFDM,子载波数量1536个，载波频率为2-34MHz;
- 最高PLC物理速度为200Mbits/秒 ,以太网速度为100Mbits/秒;
- 支持网络协议为TCP / IP-DHCP-TFTP-SNMP;
- 产品尺寸：155×140×42.2mm

- Access 100-400VAC power line; operating current is100mA while power on and communicating. Each gateway can manage maximum 64 MAC address according to bandwidth requirement ;
- 1536 OFDM carriers spread over a configurable frequency range between 2-32MHz ;
- Maximum PLC physical data rate up to 200Mbps, the speed of Ethernet up to 100Mbps ;
- Support Network protocol TCP/IP-DHCP-TFTP-SNMP ;
- Meet the standards EEE802.3u, 802.1p, 802.1q ;
- Product size: 155×140×42.2mm

宽带电力载波传输方案

1G BPL
宽带电力载波传输

1G BPL Broadband Power Line Transmission

Smart City Solution 智慧城市实施方案

2.2.1 1G BPL集中器 | 1G BPL CONCENTRATOR

1G BPL系统与前面的提到200M BPL系统都属于宽带电力载波通信方案。1G BPL系统使用了先进的G.Hn通信协议，它是200M BPL系统的升级版本，其具备更高的速度和更好的抗干扰能力。主要的升级有：

（1）通过电力线传输的物理速度高达1Gbits/s；

（2）同一个硬件设备同时具有网络接入、中继和终端应用的功能。

1G BPL system and the 200M BPL system mentioned as previous are both belong to broadband power line communication solution. 1G BPL system use the advanced G.Hn communication protocol, it is the upgrade version of 200M BPL system with higher speed and better anti-noise ability. It mainly has below upgrade:

(1) The physical speed through power line is up to 1Gbits/s ;

(2) One hardware device merge three functions as network input, repeater and terminal application.

型号 Model:
HQNBP/123/GN

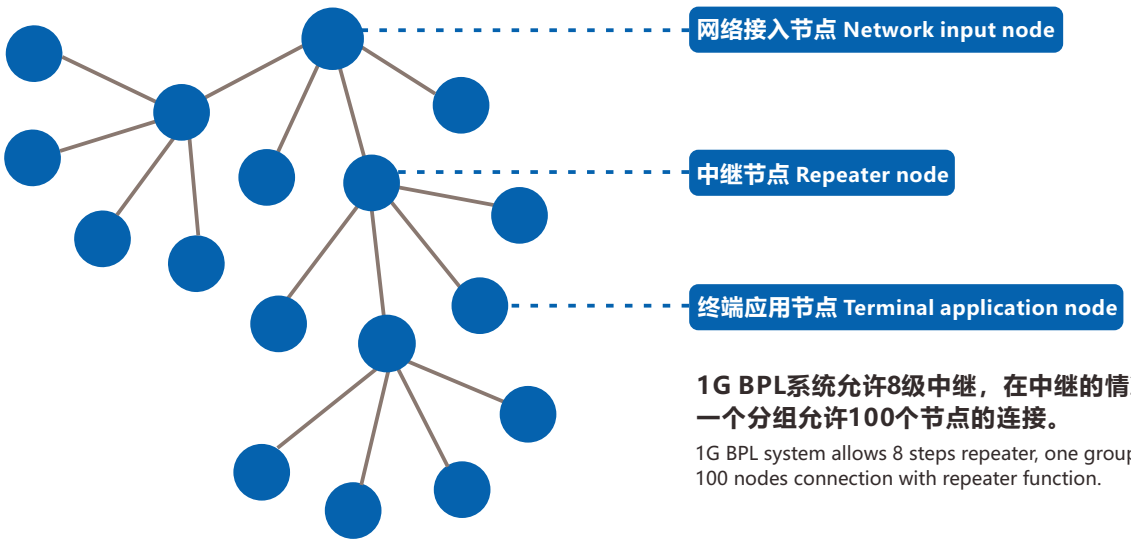
1G BPL 集中器参数：

- 输入电压：100-277VAC，50/60Hz；
- 电力载波通信速度高达1Gbits/s；
- 电力载波通信频率高达100MHz；
- 符合ITU-T G.Hn 标准: G.9960/9961/9962/9963/9964；
- 支持中继功能，最多8级中继；
- 支持IPv4和IPv6网络协议；
- 同时支持MINO和SISO传输模式；
- 外壳防护等级：IP65。
- 产品尺寸：155×140×42.2mm

Parameters:

- Input voltage: 100-277VAC, 50/60Hz ;
- Power line communication speeds up to 1Gbits/s ;
- Power line communicate frequency up to100MHz ;
- Comply with ITU-T G.Hn： G.9960/9961/9962/9963/9964 ;
- Support for relay, up to 8 levels of relay ;
- Support for IPv4 and IPv6 network protocols ;
- Support both MINO and SISO data transmission mode ;
- Enclosure protection class: IP65.
- Product size: 155×140×42.2mm

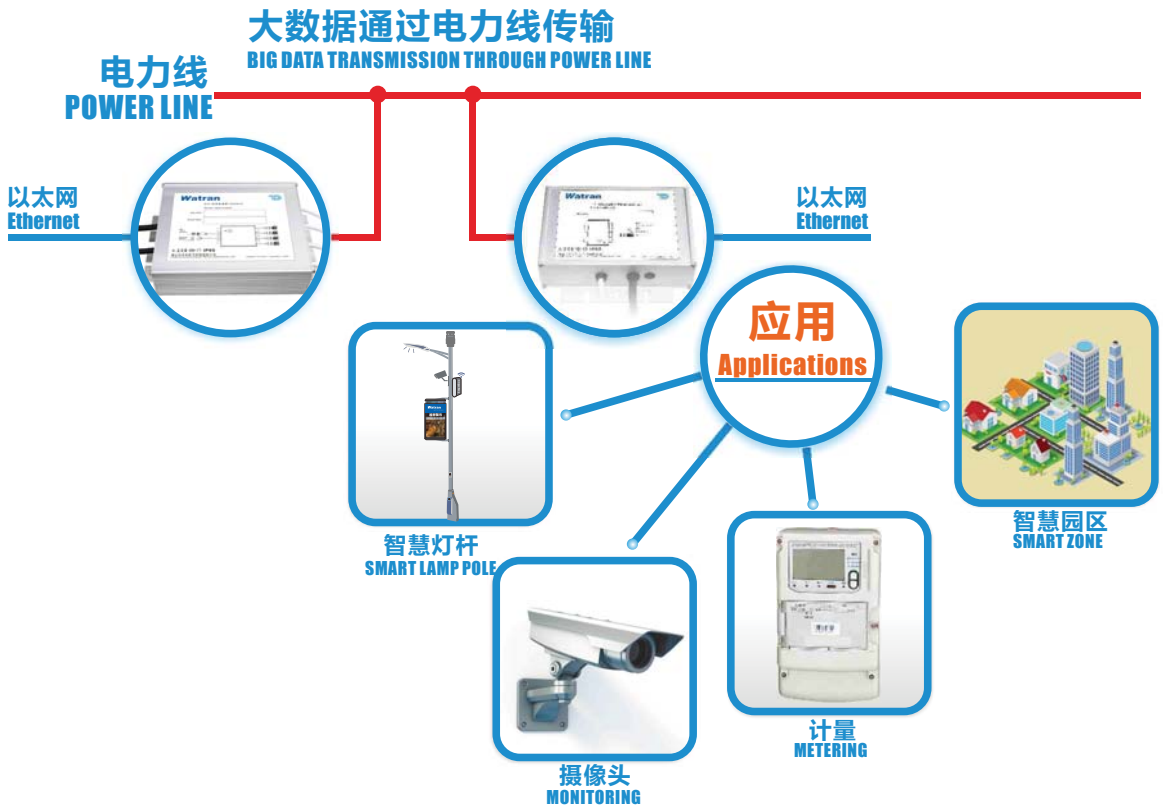
拓扑结构图 | TOPOLOGICAL CHART



1G BPL系统允许8级中继，在中继的情况下一个分组允许100个节点的连接。

1G BPL system allows 8 steps repeater, one group allows 100 nodes connection with repeater function.

应用 APPLICATION

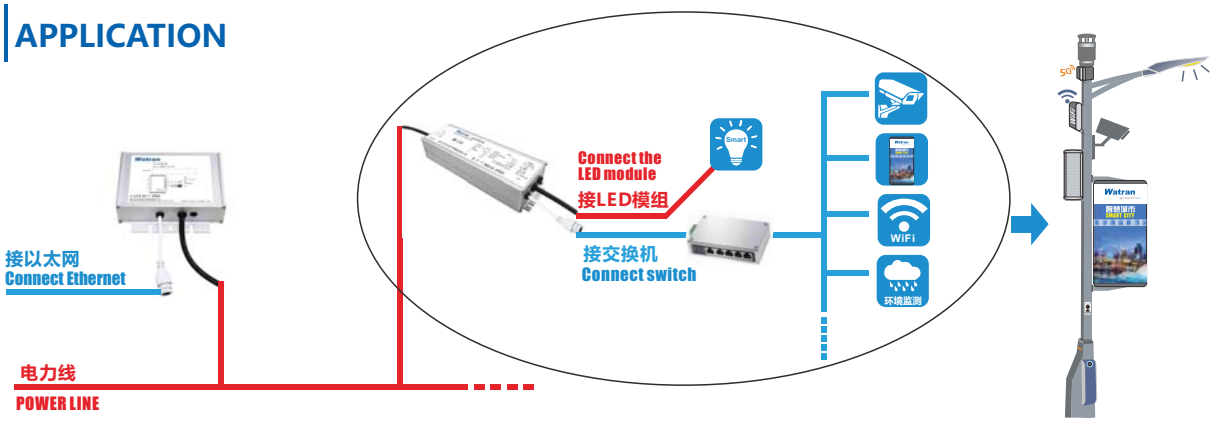


2.2.2 1G BPL集成LED驱动电源 | 1G BPL INTEGRATED LED DRIVES

1G BPL集成LED驱动电源是把可调光的LED驱动电源和1G BPL电力载波的功能集成在一起，同时可以给LED照明提供稳定的供电和调光控制，和给智慧杆上的其它设备传输大数据。

The 1G BPL Integrated LED Driver integrates the dimmable LED drive function and 1G BPL function together, it can provide the stable power supply and dimming control for LED lighting, and also can transmit the big data for the other devices on Smart Pole at the same time.

应用 APPLICATION



智能
路灯管理系统

Intelligent Street Light Management System

华全照明智慧照明解决方案，通过新加坡多通道 PLC电力载波通讯 + LoRa 远距离无线通讯技术建立可靠的通讯网络使普通照明变得更加聪明，使用这个网络来连接照明和物联网传感器来创建可靠及可持续的智慧照明网络，协助人们构建高效的动态、资源高效的平台，实现灯光的远程管理，智能控制，提升照明系统的安全性、便利性、舒适性，并实现环保节能的环境。

Watran provides a complete smart lighting solution that creates a network over a city's power line. Watran uses 18 redundant channels with an additional wireless channel. Even if there is noise on some channels, redundancy with the other channels enables error free data transmission. This PLC+RF solution lays the foundation for a network to be implemented via the streetlight and power line infrastructure. This sustainable intelligent lighting network helps people build an efficient and dynamic, resource-efficient platform, realize remote management of lighting, intelligent control, improve the safety, convenience and comfort of lighting systems, and achieve an environment-friendly and energy-saving environment.

方案组成 SOLUTION

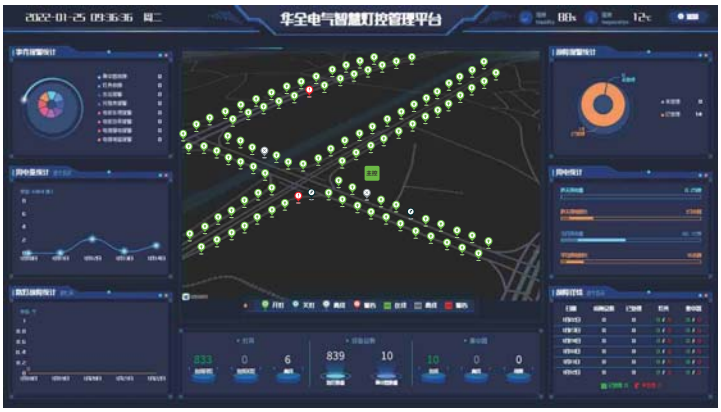
方案特点 CHARACTERISTICS

- 投资回报周期短：将高压钠灯更换为LED路灯，将节约40%的能源消耗，植入智能路灯控制方案，将再节约40%的能源消耗，大大降低路灯维护成本，节省的大量电费将会大力推动市政改造的落地意愿。
- 适合场合广泛：本系统除了进行路灯管理外，还适用于一切静态调光场合，如足球场，演示厅，电影院等。
- 部署简单，降低成本：系统不需要重新架设网络，只要电线，就能进行数据传递，传输速率高，是智能物联网控制的最佳方案之一。
- Short ROI period: it saves 40% energy by using LED to replace HID lamps. And adding the smart street light solution, it will save another 40% energy. It can attract the municipal reformation because it can save much street light maintenance cost and energy.
- Wide applications: This system is not only suitable for street light management, but also suitable for the static dimming occasions such as football courts, presentation rooms and cinemas.
- Easy deploy, low cost: This system only requires power lines instead of network reconstruction to transmit data in high speed. It is one of the best solution of smart IoT network control.

系统预览 SOFTWARE PLATFORM

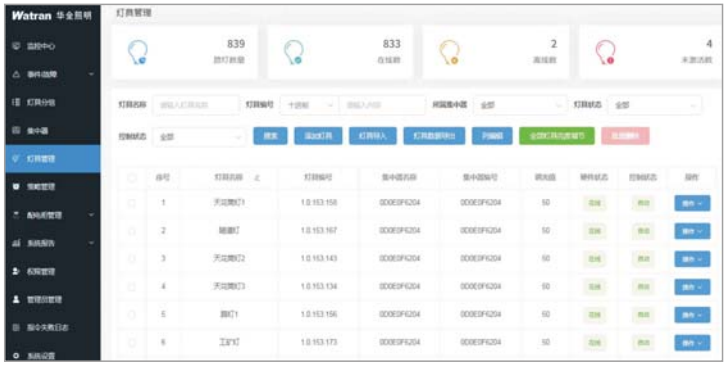
建立路灯地理信息系统，实现资源管理精细化：安装时候通过手机APP对单灯控制器二维码扫码采集定位，形成直观可视 、图表结合、条理清晰、条块合理的城市照明空间数据档案，以地理信息系统(GIS)为基础，实现精细化、可视化、动态化管理，实现灯杆定位，助力城市维稳，提升路灯价值。

Establish street light geographic information system and implement the precise resource management: Through mobile phone APP to collect location from the QR code on single light controller when installing. This can form a straightforward, graphically visualized and clear city lighting spatial data archive. Base on the foundation of Geographic Information System (GIS), it achieves a visual and dynamic management and provides light pole locating services. It also helps to maintain cities' stability and enhance the value of street light.



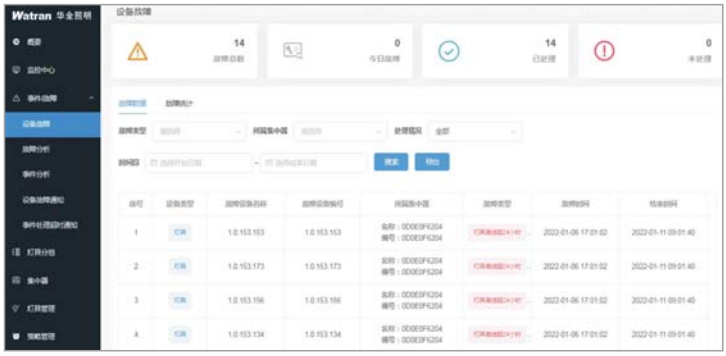
构建单灯控制物联网，实现节能管控精准化: 采用单灯控制技术，构建路灯物联网，精准控制每一盏路灯开关/调光，在保证照明需求的前提下，根据季节、路段、天气、特殊场合等条件设定路灯运行方案，真正实现“按需照明”，深化节能减排，配合电力报告，可以一目了然的掌握每天的路灯能耗情况。

Build IoT network for single light control, implement precise energy saving management: By applying single light control technology to conduct IoT for street light and control switching or dimming for each street light. According to season, roads, weather, special events and etc. to set up an operation plan for street light while keeping the lighting demand. This can implement light on demand, further achieve energy saving and emission reduction. With the power report, it also can clearly and easily understand the lighting consumption on each day.



实现运维服务主动化，降本增效、解放人力：通过系统的“多种类自动邮件报警功能”，及时发现路灯故障并在地图上进行精准定位，转变“人工巡检、热线报修”的传统运维方式，实现定向运维、主动服务，减轻劳动强度，提高路灯运维效率，降低运维成本。

Implementation of proactive operation and maintenance services, lower cost, higher efficiency and labour free: through the 'multi-type auto email alarm function' in the system, street light faults can be detected and accurately located on the map. It turns the traditionally manual operation method to a directional and high efficient operation and maintenance. This implementation also can reduce labour intensity and provide proactive services and cost efficient.



硬件信息 HARDWARE

MLC（主控制器）
MLC（Main Controller）

型号Model：HQ1338-LR
尺寸 Size：137×133×65mm

- 输入电源电压100-240VAC，输入频率50/60Hz，运行功率<8W；
- 支持RS485,Modbus通讯，支持PLC电力载波单相和三相，LORA，4G通讯，以太网通讯；
- 18独立载波频率，自适应跳频，5-500KHz载波频率，抗干扰能力强；
- 单个MLC可连接200个SLC节点（因现场环境不同，建议100个）；
- MLC和SLC的直接通信距离可达1km,利用SLC的自带中继功能可延伸到10km；
- 支持8回路的独立开关控制；
- 其它接口：4路数字量输入，3路模拟量输入，2路模拟量输出，1路12V恒压输出等。

- Input power supply voltage 100-240VAC, input frequency 50/60Hz, operating power <8W;
- Support RS485,Modbus communication, support PLC power carrier single-phase and three-phase, LORA, 4G communication, Ethernet communication;
- 18 Independent carrier frequency, adaptive frequency hopping, 5-500khz carrier frequency, strong anti-interference ability;
- A single MLC can be connected to 200 SLC nodes (100 is recommended due to different site environments);
- The direct communication distance between MLC and SLC can reach 1km, and it can be extended to 10km by using the built-in relay function of SLC;
- Support 8 loop independent switching control;
- Other interface: 4 digital input, 3 analog input, 2 analog output, 1 12V constant voltage output, etc.

SLC（单灯控制器）
SLC（Single Light Controller）

型号Model：HQ-SLC-500-P
HQ-SLC-500-PD
尺寸 Size：135×63×38mm

- 宽输入电源电压110-240VAC，输入频率50 / 60Hz，待机功率<2W，IP65;
- 支持0-10V、PWM 调光输出（DALI可选）；
- 支持2%精度的电压，电流，电量，功率因素，控制器温度，已运行时间等数据读取;
- 支持过电压、电流、功率报警，温度报警等数据读取;
- 单个SLC可带载500W，也可以定制放宽。

- Wide input power voltage 110-240VAC, Input frequency 50/60Hz, Standby power<2W, IP65 ;
- Dimming output signal: 0-10V and PWM (optional for Dali) ;
- Real-time data read-back with 2% accuracy of voltage, current, power consumption, power factor, controller temperature, running time etc ;
- Feedback of over voltage, over current, over power and over temperature ;
- Each SLC can connect to 500W load, or customization to higher.

NEMA SLC（NEMA接口单灯控制器）
NEMA SLC (NEMA Interface Single Light Controller)

型号Model：HQ-SLC-500-HN
尺寸 Size：Φ84×98mm

- 宽输入电源电压110-240VAC，输入频率50 / 60Hz，待机功率<2W，IP65;
- 支持0-10V调光输出（可选PWM、Dali）；
- 支持2%精度的电压，电流，电量，功率因素，控制器温度，已运行时间等数据读取;
- 支持过电压、电流、功率报警，温度报警等数据读取;
- 单个NEMA可带载500W，也可以定制放宽;
- 支持PLC电力载波及LoRa无线双重保险通讯。

- Wide input power voltage 110-240VAC, Input frequency 50/60Hz, Standby power<2W, IP65 ;
- Light control output signal: 0-10Vm analog dimming, (optional PWM, Dali) ;
- Real-time data read-back with 2% accuracy of voltage, current, power consumption, power factor, controller temperature, running time etc ;
- Feedback of over voltage, over current, over power and over temperature ;
- Each MEMA can connect to 500W load, or customization to higher ;
- Support PLC and wireless LoRa double-secure communication.

电力线通信 (PLC) 数字电源
Power Line Communication (PLC) Digital Power Supply

- 宽输入电源电压100-277VAC，输入频率50 / 60Hz，IP65;
- 恒定电流输出，输出电流可调;
- 支持2%精度的电压，电流，电量，功率因素，驱动温度，已运行时间等数据读取;
- 支持过电压、电流、功率报警，温度报警等数据读取;
- 提供40W,60W,80W,110W,160W,240W功率可选，亦可定制。

- Wide input power voltage 100-277VAC, Input frequency 50/60Hz, Standby power<2W, IP65 ;
- Constant current output, output current can be adjusted ;
- Real-time data read-back with 2% accuracy of voltage, current, power consumption, power factor, controller temperature, running time etc ;
- Feedback of over voltage, over current, over power and over temperature ;
- Available at 40W, 60W, 80W, 110W, 160W & 240W , Or customization to other power.

技术优势 TECHNICAL ADVANTAGES

混合网络电力线载波通信是成本最低、可靠性最好的路灯控制的通信解决方案。一般的电力线传输方案，却在复杂的电力环境中频繁失效。华全照明的解决方案采用18个可变频率信道，再加上1个无线信号，混合使用将大大提高通信的可靠性。纯无线方案如3G，LoRa WAN, Sigfox 等等往往存在以下的问题： 1. 这些无线方案都需要每个月支付运营商费用，大大增加了运营成本。 2. 这些无线方案也需另架设基站，前期投入很大。而ZigBee，WiFi在户外使用都存在通信不可靠的问题。

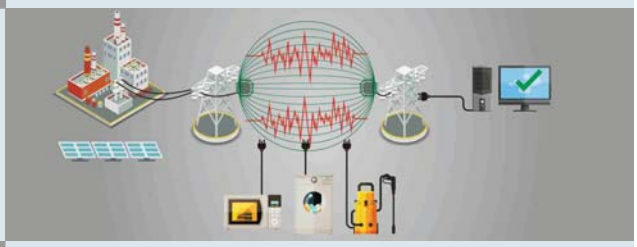
Power line communications enables the most economic cost and most secure street light control approach. Normal power line solutions fail easily in noisy power line environments. Watran's solutions uses 18 auto frequency-hopping PLC channel and one wireless RoLa channel together to highly increase the communication reliability. Pure wireless solutions such as 3G, LoRa WAN and Sigfox have the following problems normally. 1. These wireless solutions need monthly charges, it increase the operation cost a lot. 2. These wireless solution need to build the base station infrastructure, initial one time cost is high. ZigBee and WiFi have problems of unreliable communication in outdoor application.

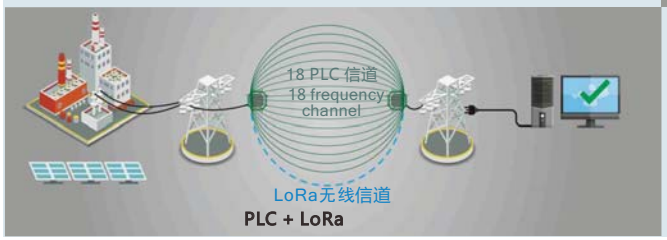
目前市面上一般的PLC通信技术最多只有两个固定频率的信道，华全照明方案采用18频率通道，自动跳频技术，从容面对电力干扰。

At present, the general PLC communication technology on the market only has two fixed frequency channels. Watran lighting solution uses 18 different frequency channels, and with the automatic frequency hopping technology, can solve the power interference issues easily.

针对以上通信存在的问题，华全照明开发了一套特有的多信道PLC通信技术，该技术采用18个数据重复的信道，即使在某些信道上存在噪声干扰，其他冗余信道照样可以进行毫无误差的数据通信传输。

In response to above problems of communication, Watran has developed the special multi-channel PLC communication technology, which uses 18 data redundant channels, even if there is noise interference on some channels, other redundant channels can still carry out error-free data communication transmission.





同时，为了能跨越不同电力线网络和变压器，华全照明在18个PLC信道的基础上添加了第19个无线频道作为自动切换和跨域通信，使其上天能飞，入地能通提供了极为可靠又稳定的通信网络。

At the same time, in order to be able to communicate different power grid and transformers, the 19th wireless channel is added base on the 18 PLC channels which can be auto switching. Then the communication can be on the air or through the wire, the reliable and stable communication network can be achieved.

扩展功能 EXTEND THE FUNCTIONALITY

光感开关控制
Light sensing switch control

电柜功率监测
Electric cabinet power monitoring

漏电监测
Leakage monitoring

电缆防盗监测
Cable theft monitoring

水浸监测
Flood monitoring

灯杆倾斜监测
Light pole tilt monitoring

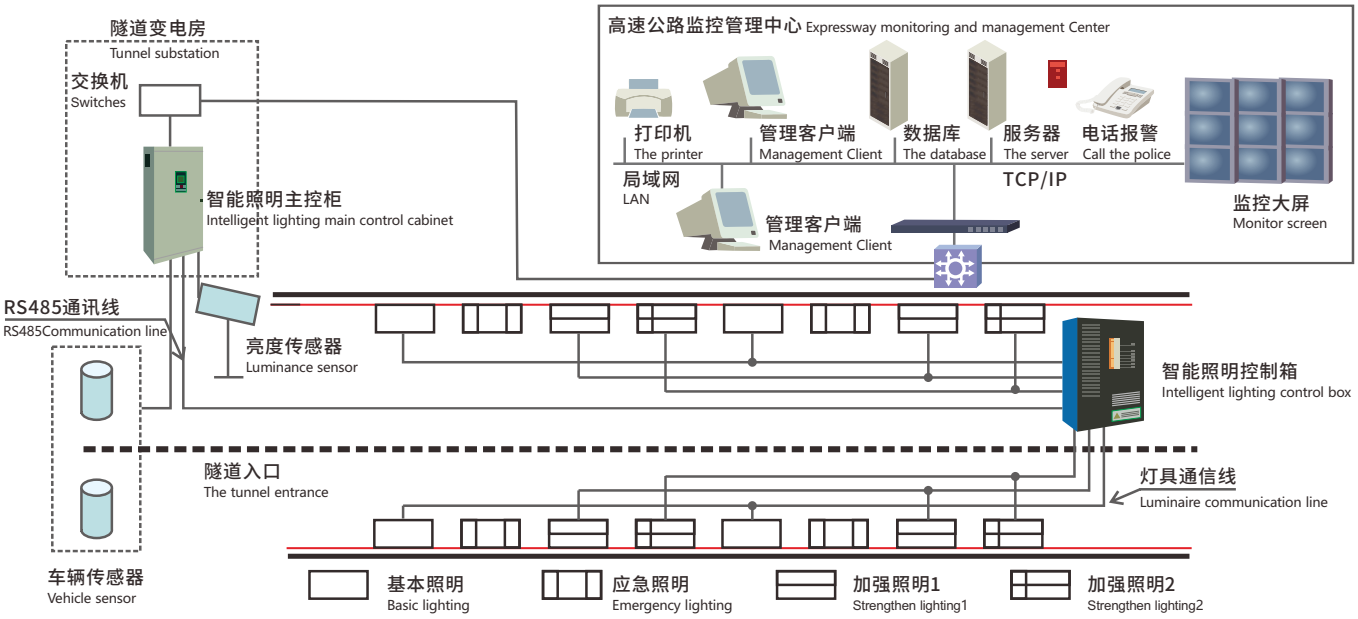
智能
隧道照明系统

Intelligent tunnel lighting system

系统框架 SYSTEM FRAMEWORK

华全的智能隧道照明系统可通过实时采集洞外光强和车流量等数据，利用专业控制算法完成仿生隧道照明控制，避免高速驾驶员出现人眼生理黑洞效应，提高行驶安全性。整个系统由主控柜、智能照明控制箱、亮度传感器、车辆传感器、上位机控制软件等组成。控制框架如下图所示：

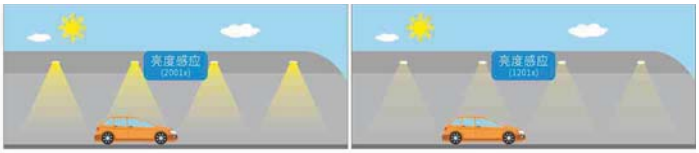
Watran's intelligent tunnel lighting system can realize bionic tunnel lighting control through real-time collection of light intensity and traffic flow data, and use professional control algorithm to avoid the human eye physiological black hole effect of high-speed drivers and improve driving safety. The whole system is composed of main control cabinet, intelligent lighting control box, brightness sensor, vehicle sensor, upper computer control software, etc. The control framework is shown in the figure below:



主要功能 MAIN FUNCTIONS

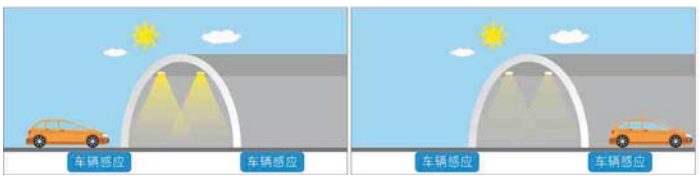
功能1：利用亮度感应实现入口端的灯具亮度接近洞外亮度，防止驾驶员出现人眼黑洞效应，提高行车安全性。

Function 1: Luminance sensor is used to realize that the luminance of the lamps at the entrance is close to the luminance outside the hole, so as to prevent the black hole effect of drivers' eyes and improve driving safety.



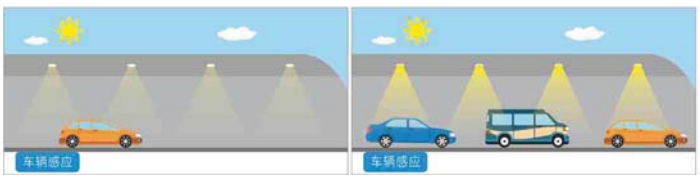
功能2：利用亮度感应器实时监测洞内亮度，自动调节洞内灯具功率，使得洞内亮度达到相关标准，并可以根据用户需求调整。

Function 2: The luminance sensor is used to monitor the luminance in the cave in real time, and automatically adjust the power of lamps in the cave, so that the luminance in the cave can meet the relevant standards, and can be adjusted according to the needs of users.



功能3：车辆准备到达隧道前，入口段亮度自动提高，车辆离开后，亮度自动降下来，达到节能的效果。

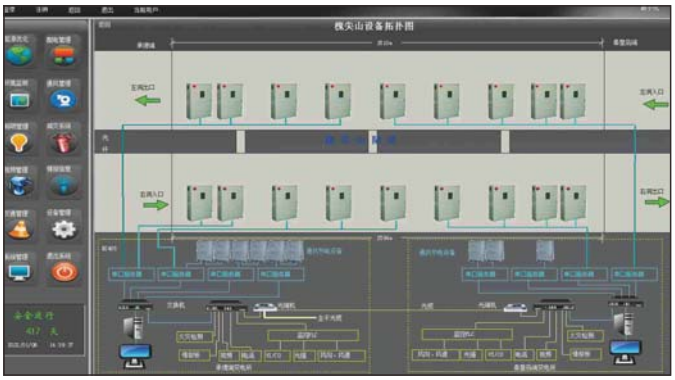
Function 3: Before the vehicle is ready to arrive at the tunnel, the brightness of the entrance section will increase automatically, and after the vehicle leaves, the brightness will decrease automatically to achieve the effect of energy saving.



功能4：利用车辆感应器可以实时监测每小时的车流量，自动调整洞内灯具的整体亮度，达到根据车流量调整亮度的效果。

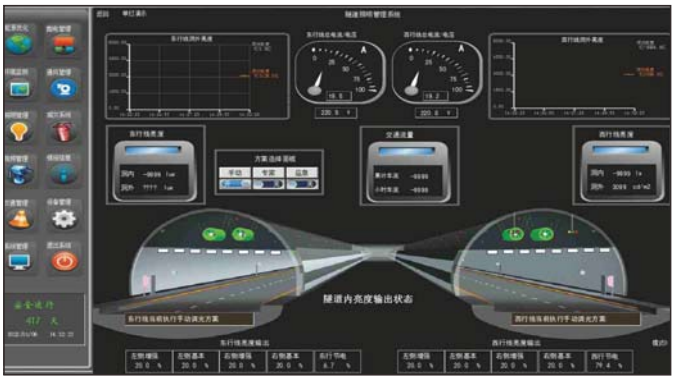
Function 4: The vehicle sensor can monitor the hourly traffic flow in real time, automatically adjust the overall brightness of lamps in the cave, and achieve the effect of adjusting brightness according to the traffic flow.

管理平台 Management platform



▲ 实时查看控制设备的运行状态
View the running status of the controller device in real time

▲ 设备故障记录查看
View device fault records



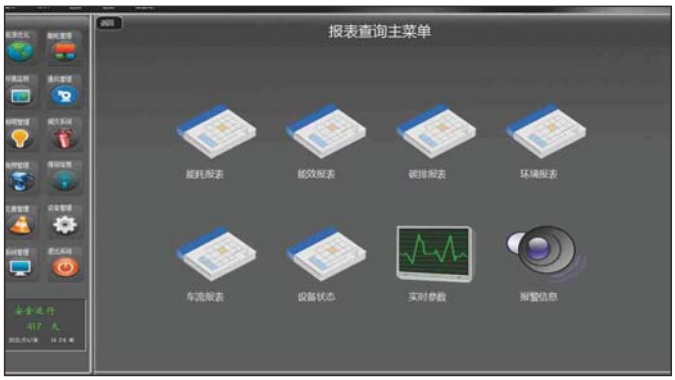
▲ 车流量、亮度实时监控与灯具亮度联动控制
Real-time monitoring of traffic flow and luminance and linkage control of luminance

▲ 在特定情况可手动控制灯具的亮度
The luminance of the lamp can be manually controlled under certain circumstances

▲ 火警联动控制
Combined fire control

▲ 风机控制管理
Fan control management

▲ 实时查看交通状况
Check traffic in real time



▲ 自动生成各种报表，方便管理
Automatic generation of various reports, convenient management

除照明控制外，可扩展其它功能接入，例如通风管理、环境监测、视频管理、减灾系统等。
In addition to lighting control, it can expand access to other functions, such as ventilation management, environmental monitoring, video management, disaster reduction system, etc.

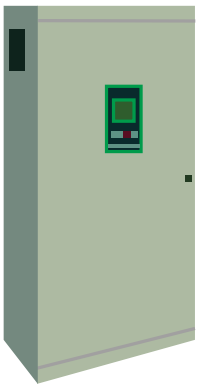
主控柜 THE CONTROL CABINET

主控柜安装于隧道变电所，承上启下的作用，同时可以实现本地控制。

- 主要功能：系统分别输出加强照明、基本照明调光信号到洞内各照明控制箱。
- 集成多种控制方式：可设置为远程控制、手动控制、自动控制和应急预案控制。
- 本地主动控制：当与上位机通讯断开后，能够自动启动预置程序安全运行。
- 采集信号功能：系统能采集光强、车辆及其他系统等信号。

The main control cabinet is installed in the tunnel substation, connecting the preceding and the following functions and realizing local control at the same time.

- Main function: the system outputs enhanced lighting and basic lighting dimming signals to each lighting control box in the cave.
- Integrated control mode: can be set to remote control, manual control, automatic control and emergency plan control.
- Local active control: when the communication is disconnected from the host computer, it can automatically start the preset program for safe operation.
- Signal acquisition function: the system can collect light intensity, vehicle and other system signals.



（主控柜）
The control cabinet

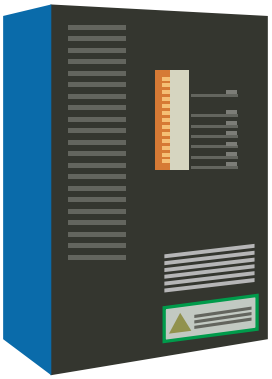
智能照明控制箱 INTELLIGENT LIGHTING CONTROL BOX

智能照明控制箱集成了隧道照明配电的基本功能和远程智能管理控制调光功能。

- 接收主控器的控制信号，分组控制灯具，同步控制灯具。
- 自适应调光：适应人眼感光生理现象，不出现跳跃，解决普通无级调光节能存在的视觉疲劳问题。
- 保护功能：过压、过流、短路保护等功能。

The intelligent lighting control box integrates the basic functions of tunnel lighting distribution and remote intelligent management control dimming function.

- Receive the control signal of the master controller, grouping control lamps and lanterns, synchronous control lamps and lanterns.
- Adaptive dimming: adapt to the physiological phenomena of human eyes, no jump, solve the problem of visual fatigue existing in ordinary stepless dimming energy saving.
- Protection function: over voltage, over current, short circuit protection, etc.



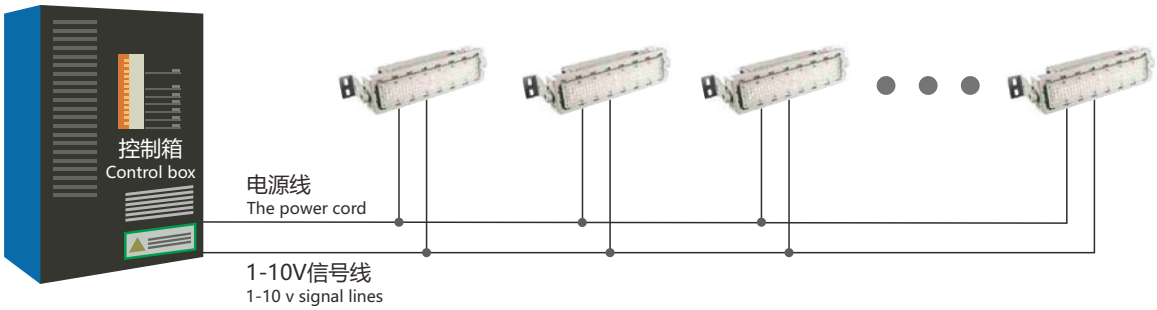
（控制箱）
Control box

灯具控制方式 Lamp control mode

(1) 1-10V控制 (1-10 v control)

智能照明控制箱配套1-10V调光灯具使用，可以起到回路控制的功能。（如下接线图）

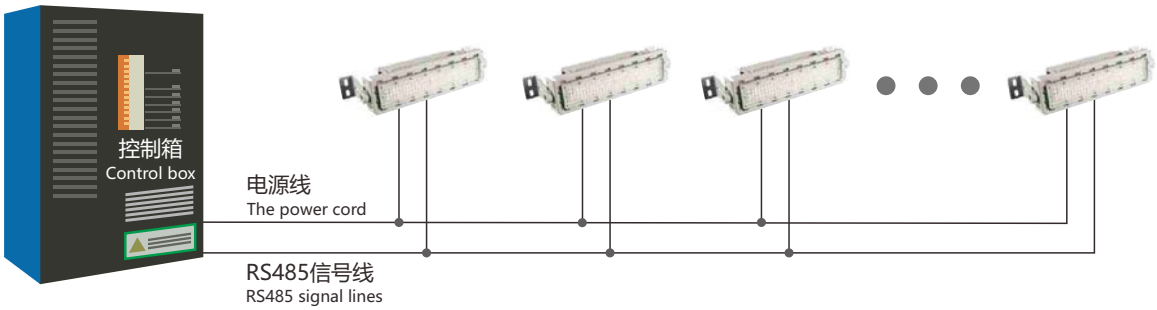
Intelligent lighting control box supporting 1-10V dimming lamps, can play a loop control function. (Wiring diagram below)



(2) 485信号控制 (485 signal control)

智能照明控制箱配套485调光灯具使用，可以起到单灯控制和状态反馈的功能。（如下接线图）

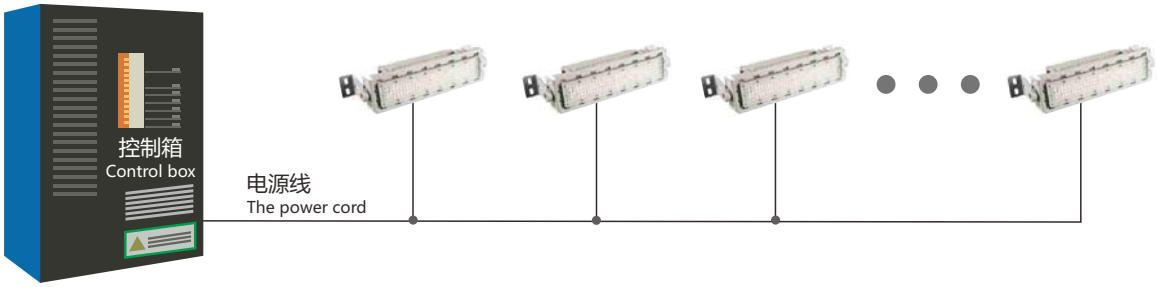
Intelligent lighting control box with 485 dimming lamps, can play a single lamp control and state feedback function. (Wiring diagram below)



(3) 电力载波控制 (Power carrier control)

智能照明控制箱配套电力载波灯具使用，利用电源线传输控制信号，可以起到单灯控制和状态反馈的功能。（如下接线图）

Intelligent lighting control box supporting power carrier lamps and lanterns, the use of power cable transmission control signal, can play a single lamp control and state feedback function. (Wiring diagram below)



项目案例
Project cases

案例目录

智能灯控系统

2016
① 印尼雅加达等多个城市部署智能路灯系统
Intelligent street lighting systems have been deployed in Jakarta and other cities in Indonesia

2017
② 马来西亚吉隆坡部署智能灯控系统
Intelligent light control system deployed in Kuala Lumpur, Malaysia

2019
③ 台湾多个地区部署智能灯控系统
Intelligent light control systems are deployed in many areas of Taiwan

2020
④ 湖北省宜昌市五峰部署智能灯控系统
Intelligent light control system was deployed in Wufeng, Yichang city, Hubei Province

2020
⑤ 山东省青岛市高铁维修站部署智能灯控系统
An intelligent light control system is deployed at a high-speed railway maintenance station in Qingdao, Shandong Province

2020
⑥ 广东省佛山市南海区西樵山部署智能灯控系统
Intelligent light control system is deployed in Xiqiao Mountain, Nanhai District, Foshan City, Guangdong Province

智慧城市系统

2019
① 南海区政府部门部署BPL宽带电力载波安防监控
Nanhai district government departments deployed BPL broadband power carrier security monitoring

2020
② 佛山中车部署智慧杆与轨道安全监控系统
CRRC Foshan deployed smart rod and track safety monitoring system

2021
③ 新疆克拉玛依地区智慧灯杆建设
Construction of intelligent light poles in Karamay, Xinjiang

INTELLIGENT LIGHT CONTROL SYSTEM CASE
智能灯控系统案例

印尼雅加达及其他多个城市
Jakarta, Indonesia, and many other cities



2016年开始，华全公司陆续生产了20000个SLC和 600个MLC，用于雅加达等多个城市的智能路灯建设。

Since 2016, Watran has successively produced 20,000 SLCs and 600 MLCs for the construction of intelligent street lamps in several cities including Jakarta.

马来西亚吉隆坡
Kuala Lumpur, Malaysia



2017年开始，华全公司陆续生产了8000多个SLC和100多个MLC，用于马来西亚吉隆坡的智能路灯建设。

Since 2017, Watran has produced more than 8,000 SLCs and more than 100 MLCs for the construction of intelligent street lamps in Kuala Lumpur, Malaysia.

台湾地区
Taiwan district




2019年开始，华全公司陆续生产了2300多个SLC和33个MLC，用于台湾机场和各地区的智能路灯建设。

Since 2019, Watran has successively produced more than 2,300 SLCs and 33 MLCs for the construction of intelligent street lamps in Taiwan's airports and various regions.

INTELLIGENT LIGHT CONTROL SYSTEM CASE
智能灯控系统案例

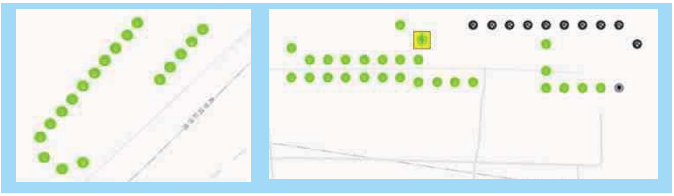
湖北省宜昌市五峰
Wufeng, Yichang City, Hubei Province




2020年开始，华全公司陆续生产了3200多个SLC和38个MLC，用于宜昌五峰县整个县城的智能路灯建设。

Since 2020, Watran has successively produced more than 3,200 SLCs and 38 MLCs for the construction of intelligent street lamps in the entire county seat of Wufeng County in Yichang.

山东省青岛市高铁维修站
High-speed Railway Maintenance Station In Qingdao, Shandong Province




2020年开始，华全公司陆续生产了100多个SLC和2个MLC，用于青岛莱西和平度的2个高铁维修站进行智能路灯建设。

Since 2020, Watran has successively produced more than 100 SLCs and 2 MLCs for the construction of intelligent street lamps at 2 high-speed railway maintenance stations in Laixi and Pingdu, Qingdao.

广东省佛山市南海区西樵山风景区
Xiqiaoshan Scenic Spot, Nanhai District, Foshan City, Guangdong Province




2020年开始，华全公司陆续生产了800多个SLC和10多个MLC，用于西樵山整个景区的周边道路进行智能路灯建设。

Since 2020, Watran has successively produced more than 800 SLCs and more than 10 MLCs for the construction of intelligent street lamps on the surrounding roads of the entire scenic area of Xiqiaoshan.

佛山市南海区政府部门部署BPL宽带电力载波安防监控

Foshan Nanhai District Government Departments Deployed Bpl Broadband Power Carrier Security Monitoring

2019年开始，华全公司陆续与南海区维稳治安办合作，在已经建设好的社区道路、在不重新挖路的情况下部署了多个 BPL宽带电力载波通信安防监控。

Since 2019, Watran has been cooperating with the Nanhai District Security and Security Office to deploy multiple BPL broadband power carrier communication security monitors in the community roads that have been built without the need to re-build the roads.

佛山中车部署智慧杆与轨道安全监控系统

Foshan CRRC deploys a smart pole and track safety monitoring system

2020年，在佛山中车四方轨道车辆有限公司内安装多根智慧杆与其他安防AI设备，结合智能设备和AI摄像头，可以对动调线围栏内进行安全监控与报警，大大提高了厂区动调线安全性。

In 2020, a number of smart rods and other security AI equipment will be installed in Foshan CRRC Sifang Railway Vehicle Co., Ltd., which, combined with intelligent equipment and AI cameras, can carry out security monitoring and alarm in the fence of dynamic line adjustment, greatly improving the safety of dynamic line adjustment in the factory.

新疆克拉玛依地区智慧灯杆建设

Construction of intelligent light poles in Karamay, Xinjiang

2021年，在新疆克拉玛依完成1. 27亿智慧灯杆及智能亮化项目，对5条路1447杆智慧杆进行新建改造，对康桥、友谊大桥、俄罗斯小镇、康城网格屏等7个区域进行亮化升级改造。

In 2021, Karamay, Xinjiang will complete 127 million smart light poles and smart lighting projects, build and renovate 1,447 smart poles on 5 roads, and upgrade 7 areas including Cambridge Bridge, Friendship Bridge, Russian Town and Kangcheng Grid Screen.

智慧城市.智慧照明，让生活更美好

Smart city .smart lighting,makes life better

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