OPEN PARK

IOT Mobility Solutions

About OpenPark Technologies Kft

- We develop embedded devices, sensors and controllers for smart mobility and smart buildings and infrastructure control
- that brings open IOT enabled solutions to the hands of city operators, real estate developers and facility managers
- and allow them to get free from the monopoly of the legacy providers for closed SCADA systems and traditional ITS solutions

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Ready and Deployable Products and Services Combined with
Product Design Services enabling Smart Cities with open architecture solutions

R&D and Manufacturing capabilities

- Electronics and software R&D team since 2014, and started manufacturing in Hungary in 2019
- Manufacturing of mechanical and electronics elements at manufacturing facilities at Pecs and Budapest facilities in Hungary
- ISO 9001-2015, ISO 14001-2015 Certification
- Comprehensive development & testing process
- Hardware & Embedded software skills (wireless microcontroller, wireless protocol, IoT web development, Android & IOS apps)
- Full in-house design and development from prototypes to certification process
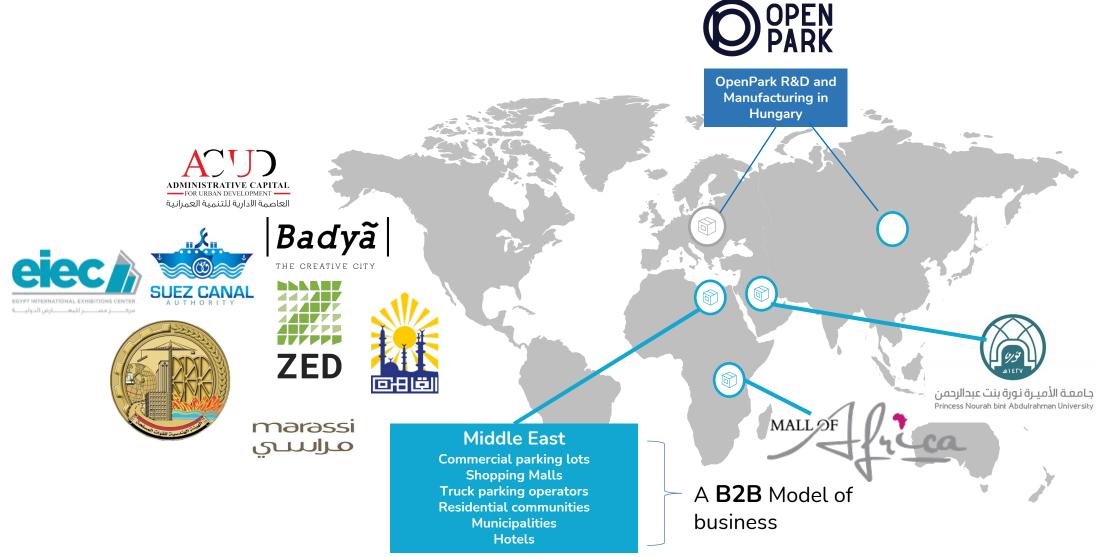- R&D product customization capabilities

Geographical Presence

OpenPark R&D and Manufacturing in Hungary

Middle East
Commercial parking lots
Shopping Malls
Truck parking operators
Residential communities
Municipalities
Hotels

A **B2B** Model of business

OpenPark **references**

- Street parking services at Hevis, Hungary
- Chifeng city, Smart Parking System, China
- Emaar Marassi North Coast Parking – 2022
- ZED towers Sheokh Zayed City– 2022 - 2023
- Mall of Arabia LPR system - 2021
- Badya smart community Access control
- Marakez Aeon Towers, District5 Mall
- ACUD Egypt New Capital central bus station
- Suez Canal Tunnels (Complete ITS and SCADA)
- East Cairo central bus station
- COP-27 Sharm El-sheikh parking control
- Egypt International Exhibition Center parking

Case study **Suez Canal Tunnels**

End User: Suez Canal Authority
Scope of work: Design, Installation, Testing & Commissioning of the integrated tunnel management system

Project components:
- Detailed design and installation for network infrastructure, PLC control solution, ventilation control sensors, emergency telephone system, linear heat detection system, AID and traffic control system
- Servers at East and West control buildings
- License plate recognition system for both Port Said and Ismailia tunnels for statistics and speed limit violation detection.

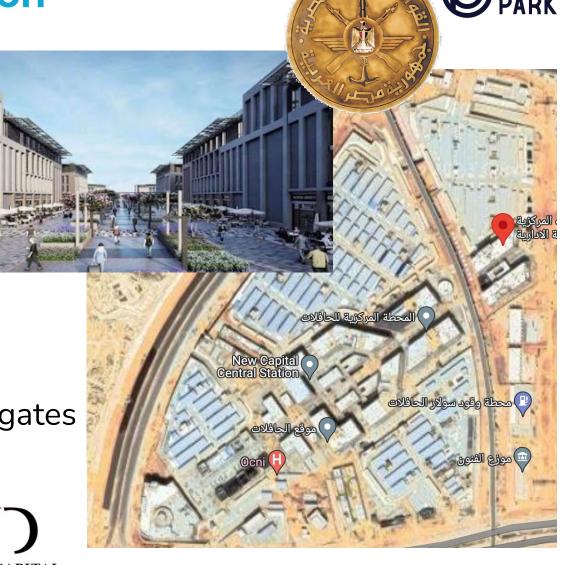# Case study ACUD Central Bus station

End User: Military Engineering Authority

Scope of work: Supply, Installation, Testing & Commissioning of the Parking Management and Guidance system for Central Bus station

Infrastructure sizing in numbers:

- Parking sensors/indicators: 4500 spots+
- Gate barriers : 42 barriers for bus and car gates
- LPR: 35 license plate cameras
- Ticket dispensers/readers : 26
- LED Guidance displays: 100+

OpenPark Offering

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- **Design and Production of IOT enabled devices for:**

  - Parking access control hardware for parking lots

  - Parking meters for street parking

  - RFID, QR code readers / access control for pedestrian or vehicles

  - Smart LED displays

  - Parking sensors (Video and Ultrasonic)

  - License plate recognition controller

  - Ticket Validator for transportation

Integration with any Third party IoT platform with support for major industry standards such as Modbus, OPC UA and MQTT protocols
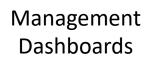
OpenPark Smart city developments

- **More products**
  - Street lighting controllers
  - Indoor presence sensors with integrated lighting control in buildings
  - Indoor thermostat and A/C IR controller in buildings
  - Street traffic counters for highway
  - Traffic signal controllers for street intersections

Integration with any Third party IoT platform with support for major industry standards such as Modbus, OPC UA and MQTT protocols

Architecture for **Smart** infrastructure

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Management Dashboards

City Master
Smart City Management Platform

Video Management and storage System

Communication infrstructure (FO, GPON, LorWAN, NB-IOT…)

MQTT protocol over TCP/IP

MQTT protocol over TCP/IP

MQTT protocol over TCP/IP

ONVIF over TCP/IP

RTU Panels for Electric systems (MVSG, Transformers)

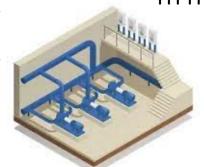RTU Panels for Wet networks(Water, wastewater, irrigation, water tanks..)

OpenPark IOT Gateways

HTTP / OPC / Hardware / Serial

Hardwire or Modbus RTU

Product (1/3) – OpenPark Cloud

Accept Mobile Payment

Sell Reservations

Update Parking Info

Add Parking Locations

Add Pictures of Locations

Reporting & Analytics

- OpenPark hosted Cloud Parking / Ticketing Solution
- Web dashboard and mobile app
- Can monitor space utilization and electronic payments real time

Open IOT integration of other traffic control and infrastructure systems and other Smart city applications

Third party integration

Third party IOT platforms (MQTT – Comulocity – Software AG, RapiMQ)

Video Management Systems and Access control (OPC-UA – Milestone- Tyco)

ERP systems interation (REST API implemented with SAP and Infor)

Payment gateways integration (Google Pay- Apple Pay- Fawry –efinance- Master-VISA)

Products (1/3) – OpenPark Ticketing Features

- Online portal for event registration and ticket sales that can be customised by end user according to event name, ticket prices,

- Includes direct selling and generation of QR code ticket to use at entry gates for parking and turnstiles.

- Ticket confirmation emails and optional SMS integration

- Cashier interface support different payment types including cash, credit card and e-wallets using different accessories.

- Integration with third party systems including ERP, CRM, and Access control systems through industry standard OPC server interface and open web API and MQTT.

- Membership ID cards can be registered on the admin interface and can be based on RFID cards or QR codes

Products (1/3) – OpenPark Parking Features

- Automated vehicle entry of cars with registered license plates or using RFID tag whether short range or long range.
- Automatic gate control with option to manually open gate from the controller web interface.
- Full auditing trail of all vehicles; keeping records of entry and exit times of each vehicle or person, storing all incoming/outgoing event images, plate numbers, tag reads, and time stamps, keeping records of traffic, and each payment made.
- Blacklisted vehicle alarm, warning when an unwanted car appears at the gate.

- User and administrator access rights.
- Unlimited number of gates can be managed from one central server over TCP/IP
- Multi-language Graphical User Interface (GUI) in a customizable layout.
- ANPR engine supports all EU countries and Middle East Arabic plates with on-going support and continuous updates.
- Open integration for any third-party software or management system through REST API, OPC UA and MQTT protocols.

Products (2/3) – OpenPark Hardware

Parking Access Control

Smart Gate terminals

Smart Barriers

License plate recognition cameras

Pedestrian Access Control

Smart Access control / Ticket Validator terminals

Smart Turstiles

Access Control Panels

Parking Guiding Systems

Parking space detection camera-indicator

Inegrated ultrasonic parking space detector-indicator

LED Information displays

Products (3/3)
OpenPark Mobile companion

Register first time with mobile number to receive an OTP SMS then stay logged in.

Main menu includes profile update, last parking location, search for parking space, memberships, invitations & more.

Search for parking space.

Navigate in App on or Google Map.

City operator **challenges**

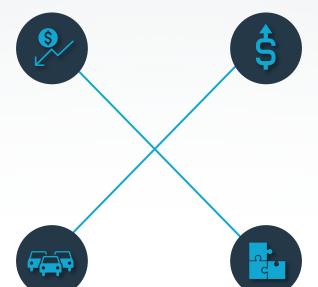**OPEN PARK**

LACK OF TRANSPARENCY

Lack of practicable solutions for monitoring all facilities including street parking and revenue collection.

HIGH BUDGETS

Vendor locking for parking management, traffic management and infrastructure SCADA management

TRAFFIC CONGESTIONS & POLLUTION

Major cities are suffering from extensive traffic congestion due to lack of parking space availability or lack of information about the location of available parking spaces.

LACK OF INTEGRATION

Increasing growth of modern cities with interest to operate from a main City operation center all city facilities including traffic control, parking and smart buildings while facing the fact that each system is separate and use different technology

Traditional parking system manufacturers are not ready for new IOT technologies and do not offer open architecture for smart city integration.

OPENPARK – bridging the gap

REAL TIME INFORMATION SHARING
- Space availability is provided through mobile apps
- Actual utilization & revenue generation is monitored in real time

CASHLESS
- No cash management, and no ticket consumable related costs

MOBILE SOLUTION
- Every car owner can use his smart phone to find a spot and pay for it

SMART CITY SUB-SYSTEMS
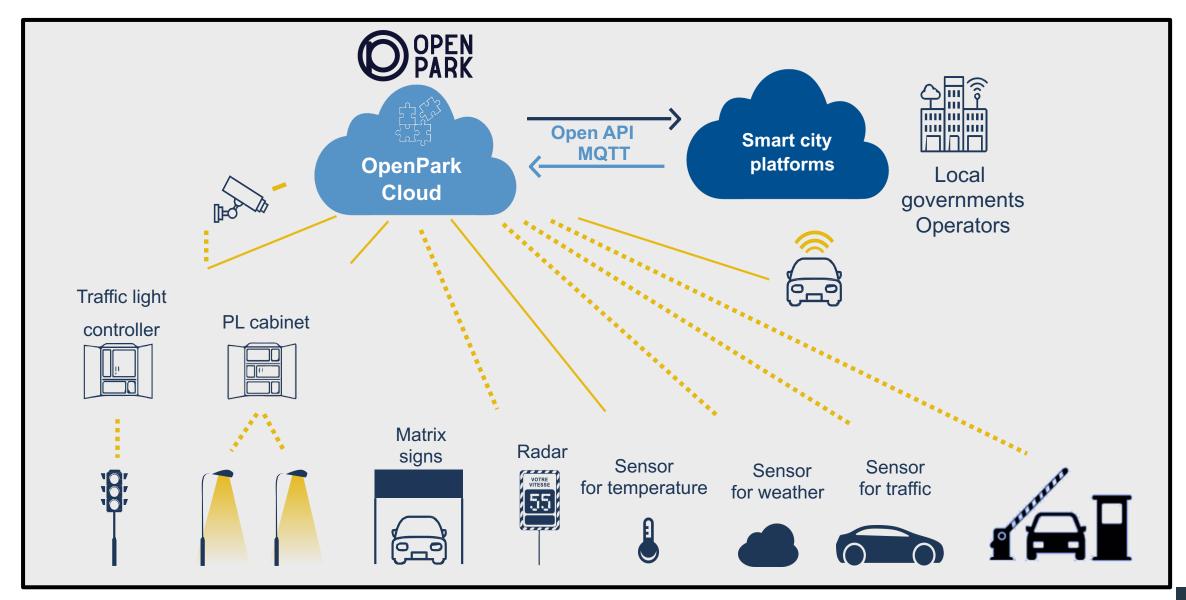- Integration of smart lighting control, bike sharing and other smart city solutions

CLOUD SOLUTION
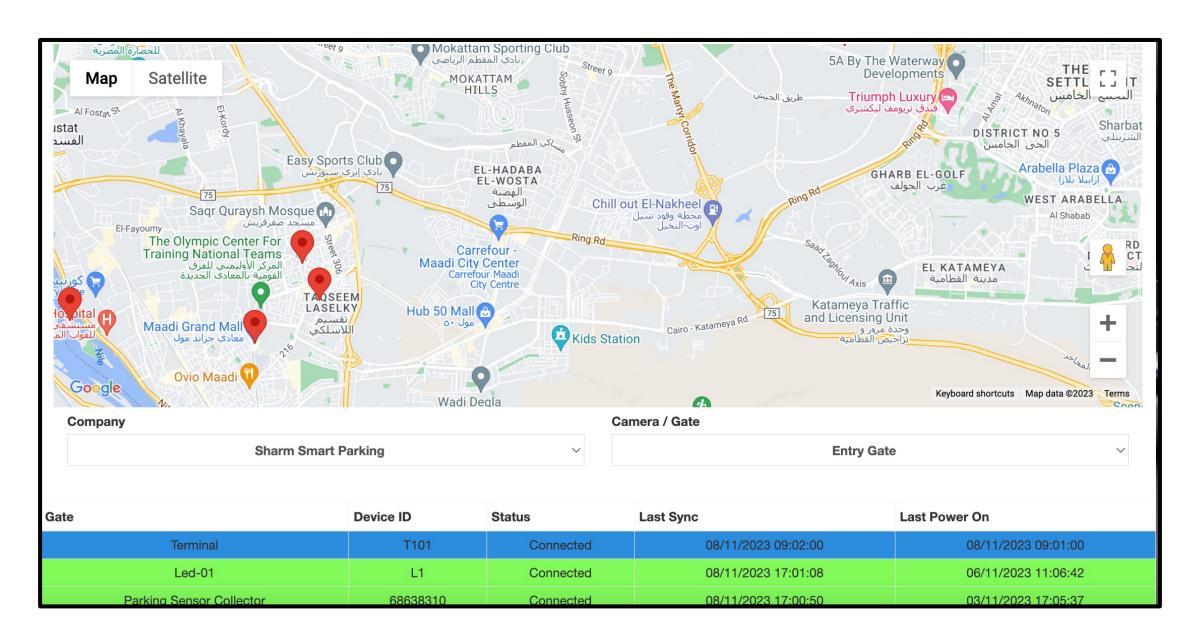- No need for in-parking sophisticated IT infrastructure, no local servers needed.

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Smart city core IOT platform
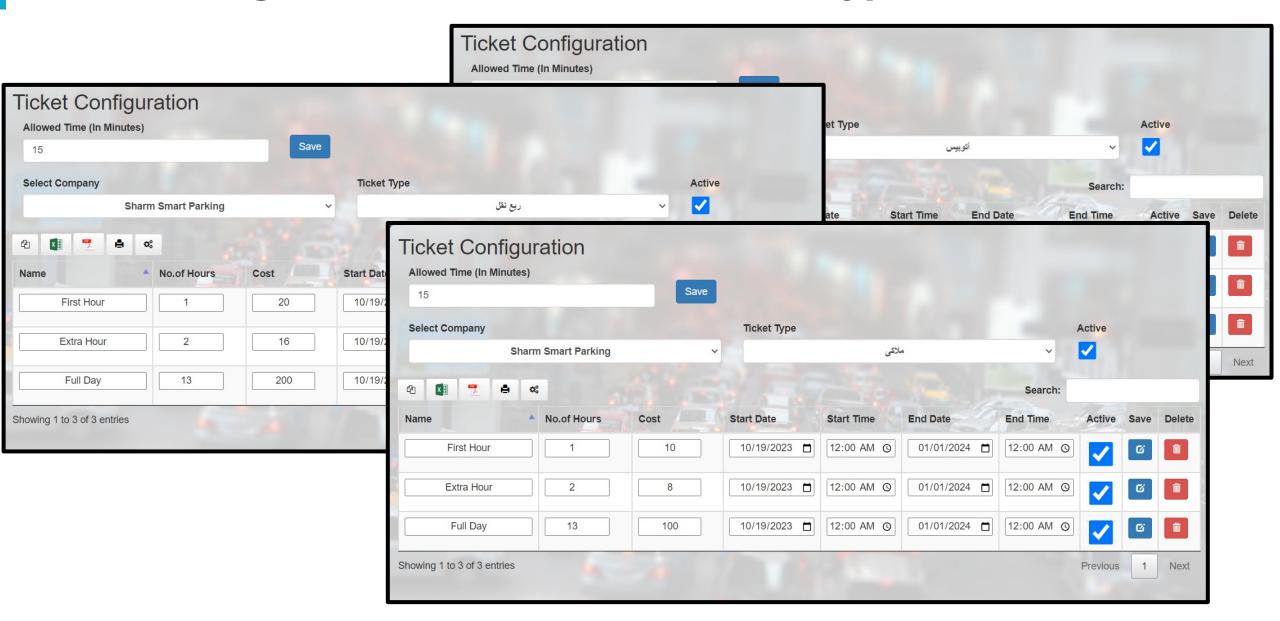
Live monitoring of all OpenPark devices

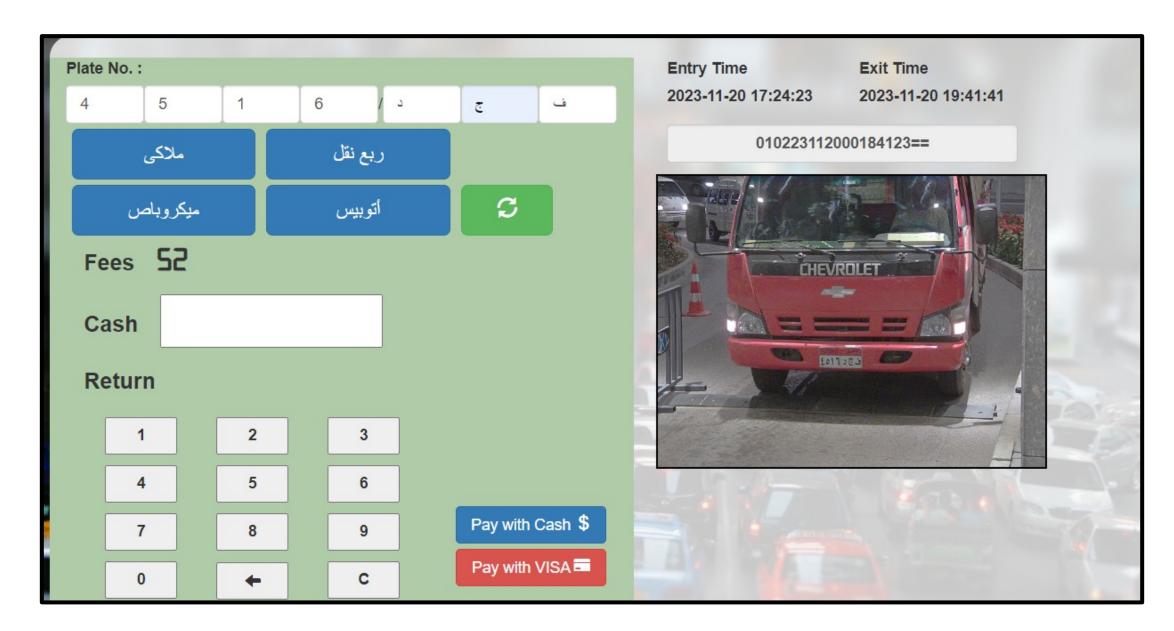| Gate	Device ID	Status	Last Sync	Last Power On
Terminal	T101	Connected	08/11/2023 09:02:00	08/11/2023 09:01:00
Led-01	L1	Connected	08/11/2023 17:01:08	06/11/2023 11:06:42
Parking Sensor Collector	68638310	Connected	08/11/2023 17:00:50	03/11/2023 17:05:37

Ticket configuration for different vehicle types
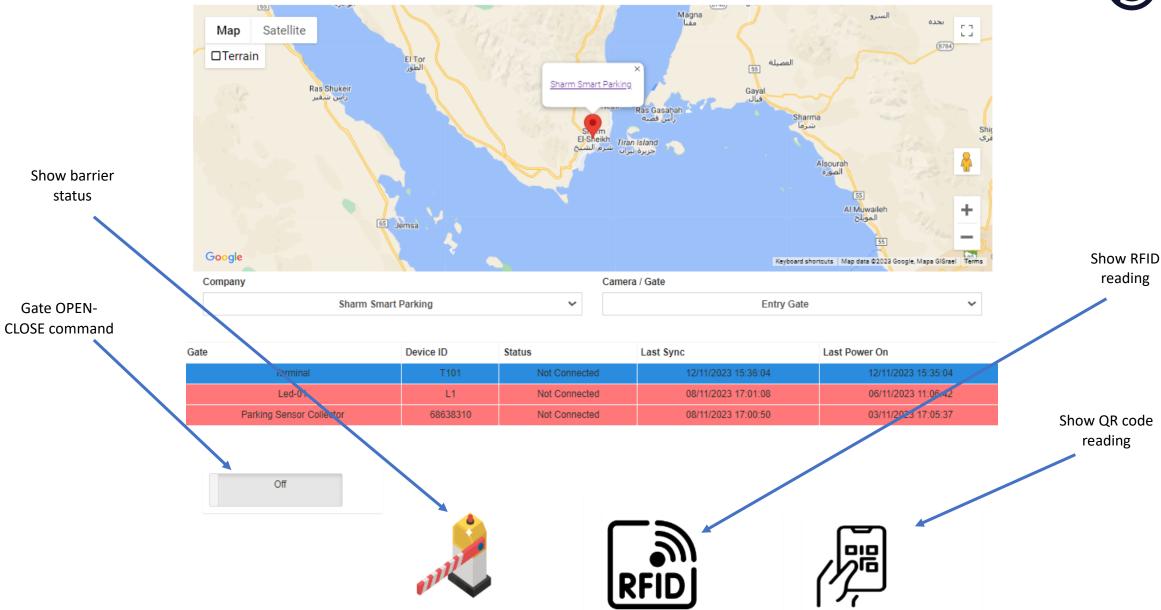
Live monitoring cashier screen

OPEN PARK
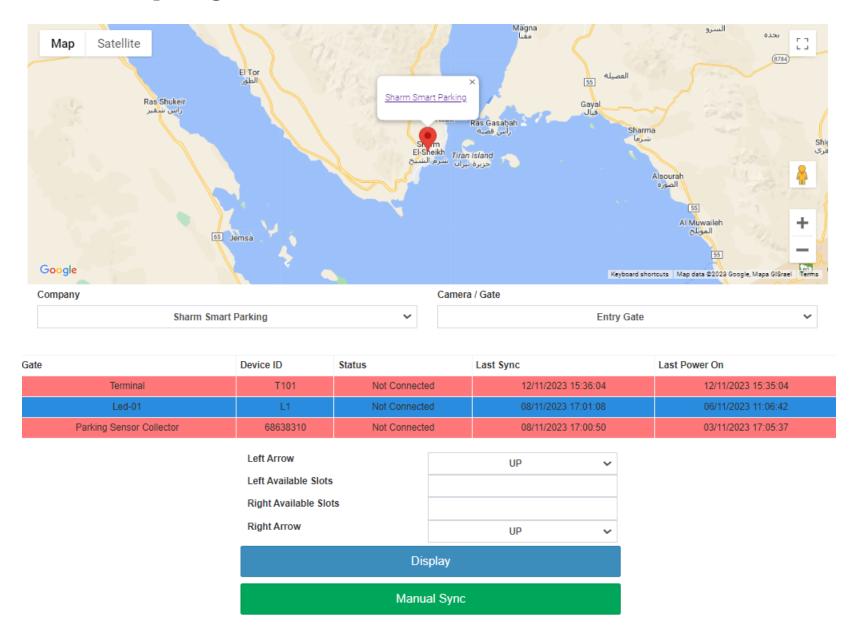
Entry-Exit Terminal monitoring and control

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Show barrier status

Gate OPEN-CLOSE command

Show RFID reading

Show QR code reading

Company	Camera / Gate
Sharm Smart Parking	Entry Gate

Gate	Device ID	Status	Last Sync	Last Power On
Terminal	T101	Not Connected	12/11/2023 15:36:04	12/11/2023 15:35:04
Led-01	L1	Not Connected	08/11/2023 17:01:08	06/11/2023 11:06:42
Parking Sensor Collector	68638310	Not Connected	08/11/2023 17:00:50	03/11/2023 17:05:37

Off

Real time LED display control

OPEN PARK

Gate	Device ID	Status	Last Sync	Last Power On
Terminal	T101	Not Connected	12/11/2023 15:36:04	12/11/2023 15:35:04
Led-01	L1	Not Connected	08/11/2023 17:01:08	06/11/2023 11:06:42
Parking Sensor Collector	68638310	Not Connected	08/11/2023 17:00:50	03/11/2023 17:05:37

Left Arrow — UP

Left Available Slots

Right Available Slots

Right Arrow — UP

Display
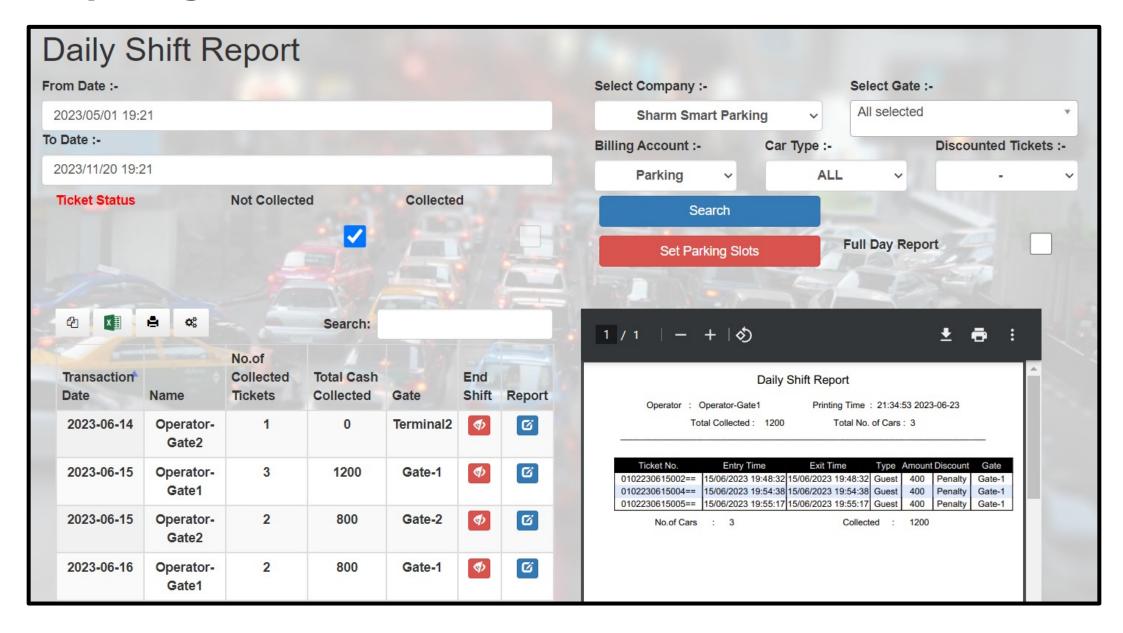
Manual Sync

Statistical reports

Shift report generator

Shift reports

Daily Shift Report

Operator : Operator-Gate1   Printing Time : 21:34:07 2023-06-23

Total Collected : 1650   Total No. of Cars : 7

_____

Ticket No.	Entry Time	Exit Time	Type	Amount	Discount	Gate
4120236141	14/06/2023 12:45:04	14/06/2023 13:20:01	Guest	50		Terminal1
4120236142	14/06/2023 12:51:16	14/06/2023 12:52:20	Guest	0	Free	Terminal1
0102230614003==	14/06/2023 12:57:53	14/06/2023 12:57:53	Guest	400	Penalty	Gate-1
0102230614005==	14/06/2023 12:59:22	14/06/2023 12:59:22	Guest	400	Penalty	Gate-1
0102230614007==	14/06/2023 13:01:27	14/06/2023 13:01:27	Guest	400	Penalty	Gate-1
4120236143	14/06/2023 13:06:42	14/06/2023 13:07:54	Guest	0	Free	Terminal1
0102230614009==	14/06/2023 13:10:47	14/06/2023 13:10:47	Guest	400	Penalty	Gate-1

No.of Cars : 7   Collected : 1650

Shift reports with payment method

Daily Shift Report

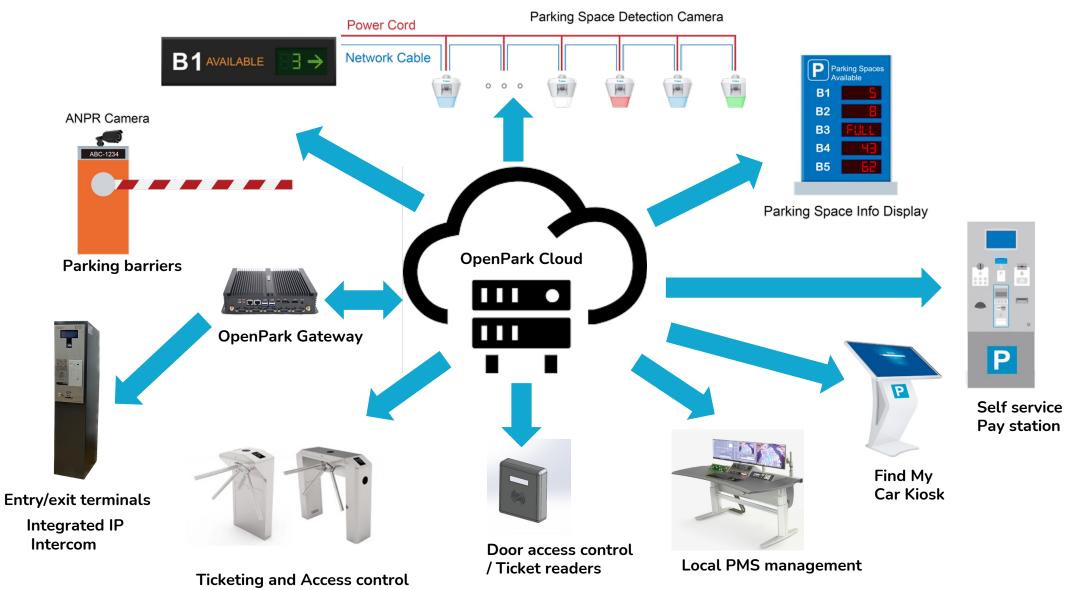Operator : Operator-Gate1   Printing Time : 19:08:31 2023-10-19

Total Collected : 500.66   Total No. of Cars : 2

_____

Plate No.	Entry Time	Exit Time	Type	Amount	Payment Method
ط ج ل 1 2 5 6	19/10/2023 12:13:33	19/10/2023 16:33:44	ربع نقل	500	Cash
ط ج ل 2 1 8 6	19/10/2023 08:24:23	19/10/2023 16:22:20	ميكروباص	0.66	VISA

No.of Cars   :   2   Collected   :   500.66

Connected system architecture

OpenPark smart gate terminals

- **Integrated Access Terminal**
- Support for Mifare RFID (13.5MHz), DESfire 1 and 2
- QR code ticket or mobile screen QR scanning.
- Mobile app control through cloud solution by scanning gate QR code
- Remote open by operator after Intercom call
- Online and offline operation with server synchronization through TCP/IP
- Available communication interfaces: Ethernet port, WiFi, USB, RS-232, 4G
- Integrated loop detector
- Wiegand and serial OSDP interface for external RFID readers
- Battery backup for real-time clock.
- Operating temp -10 deg C to 70 deg C
- IP65 outdoor protected housing
- For ticket dispenser models:
  - Ticket printer support ISO card size thermal tickets
  - Ticket bay for up to 5000 tickets

OpenPark Gateway

- **Up to 8 Gates management system**
- Industrial high-performance CPU
- 8GB RAM, 128GB SSD
- Web appliance running OpenPark Controller engine supporting access control, ticketing, LPR, parking counters and guidance LED display control.
- Smart controller IoT enabled (MQTT)
- Integrated OpenPark REST API and Swaggr API
- Gateway protocol converter
- Dual Ethernet interface 10/100/1000 Base-T
- Multiple IO (USB, RS-232, HDMI)
- Full OpenPark access control functionalities
- -25 °C and +55 °C, %95 non-condensing humidity
- Modular mounting kits for:
    - VESA mounting
    - Wall mounting
    - Electric panel plate mounting
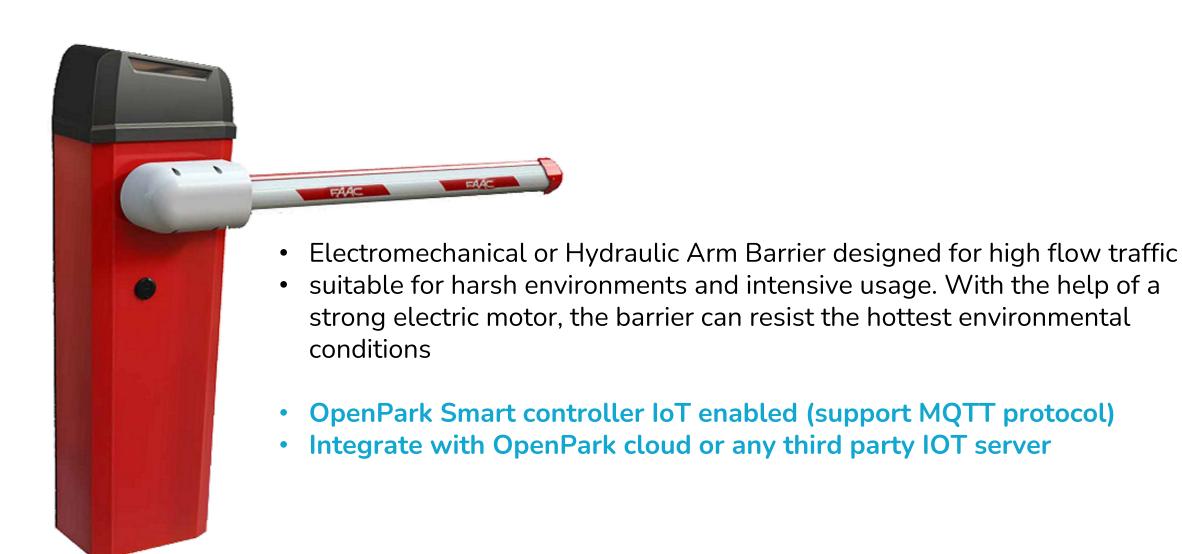
OpenPark Payment terminal

- Excellent printing and scanning experience
- It includes an RFID card reader used as loyalty discount card
- Equipped with an outdoor 2D scanner
- The kiosk includes an 80mm thermal printer.
- Anti-interference touch screen White Luminance 1000cd/m2; Contrast Ratio 1000:1
- The 15.6 " main display has a multitouch screen
- Integrated voice prompt speakers
- Ticket pricing, membership plans are configured through the cloud or local OpenPark management server
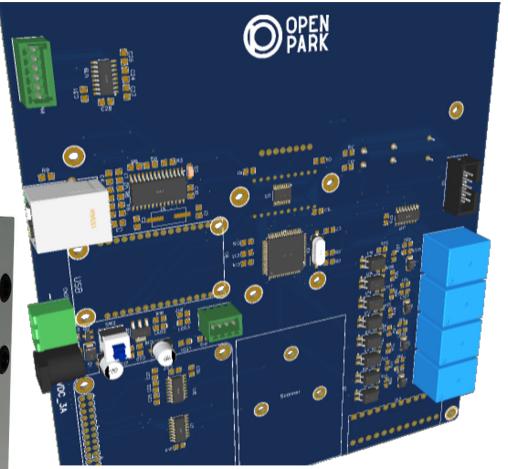- Global currency support including EUR, HUF, EGP and many others.

15 inch touch display

Receipt printer

QR scanner

Cash Recycler

Coin in

Credit card Reader

Coin out

Receipt printer

QR scanner

Coin accept

Bill recycler

Coin chang

OpenPark Smart Barriers

- Electromechanical or Hydraulic Arm Barrier designed for high flow traffic
- suitable for harsh environments and intensive usage. With the help of a strong electric motor, the barrier can resist the hottest environmental conditions

- **OpenPark Smart controller IoT enabled (support MQTT protocol)**
- **Integrate with OpenPark cloud or any third party IOT server**

OpenPark Smart Access control panel

- Smart Access Control Panel IoT enabled (MQTT)
- IP64 external housing protection
- 2 relay outputs for gate control, alarm trigger
- 8 digital inputs could be used for reporting status to IOT server such as door open or closed, push to exit button, fire alarm and more
- Operates in harsh environment -25 °C and +60 °C, %95 non-condensing humidity
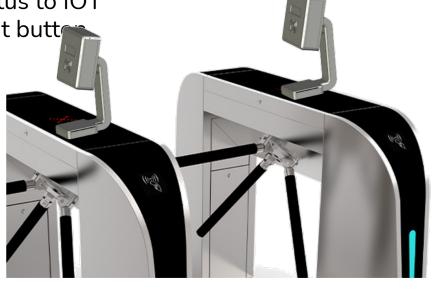
OpenPark Smart Ticket validator / Access Controller

- **Integrated ticket validator / Access controller support**
- Mifare, NFC, 13.5MHz reader
- QR code scanner
- -25 °C and +65 °C, %95 non-condensing humidity
- IP64 external housing protection
- Smart controller IoT enabled (MQTT)
- Welcome message controlled from IOT server
- 2 relay outputs for gate control, alarm trigger
- 4 digital inputs could be used for reporting status to IOT server such as door open or closed, push to exit button, fire alarm and more
- Modular mounting kits for:
  - Wall mounting
  - Turnstile mounting
  - Floor standing
  - Pole mount

OpenPark Smart LED panel

- **Outdoor LED panel with**
- P5 resolution
- -25 °C and +65 °C, %95 non-condensing humidity
- IP64 external housing protection
- Smart controller IoT enabled (MQTT)
- Number and flash direction controlled from IOT server for 1 direction, 2 direction and 3 direction panels
- 2 relay outputs for gate control, alarm trigger
- Integrated optional dual loop detector
- 4 digital inputs used for reporting status to IOT server such as vehicle passage in each direction (from loop)
- Modular mounting kits for:
    - Wall mounting
    - Ceiling mounting
    - Pole mount

Ultrasonic Parking sensors

- OpenPark is a sensor / indicator products that can save a lot regarding the cable and conduits infrastructure.
- This device should be installed at the side of the corridor allowing for the integrated LED to be visible for the drivers while it includes an ultrasonic sensor oriented 45 degrees towards the parking spot.
- With its high-quality sensor an onboard processing it can sense the presence of a car in the parking spot without being installed in the middle of the spot.
- **The sensor sends the information to the OpenPark Gateway for MQTT protocol support and IOT integration through the central controller**

RGB LED can represent different states of a parking
Free, Busy, Reserved, handicap..

Plug and play
Simple and efficient

Video Parking sensors

- The newest model is based on video detection where each unit integrates a 360-degree LED indicator along with one or two smart cameras.
- This sensor should be installed in the middle of the corridor so that its camera can monitor the front side of the car parked in each parking spot.
- The model with one camera can detect the presence of vehicles in one direction (up to 3 spots)
- The model with dual cameras can detect the presence of vehicles in the 2 sides with up to 6 spots.

LoraWAN Parking sensors

Wireless Magnetic Sensor (P/N: OP-WMS-01)

Power Supply	7 years
Operating temperature	-40℃-85℃
Protection level	IP68
Detection range	90 cm
Response time	6-7 seconds
Communication	MQTT via LORA WAN
Dimensions	Ø173mm x H35 mm

Ground LED indicator (P/N: OP-STD-RG-L)

Power Supply	DC9V~36V (Optional: PoE)
Operating temperature	-40℃-85℃
Protection level	IP68 inside cabinet
Communication	MQTT via LORA WAN
Dimensions	100mm x 100mm x29mm

Parking Scenarios of operation

- Vehicle is recognized by License plate camera
- Vehicle is recognized by windshield smart tag
- Driver authenticate with his is ID card (RFID / NFC)
- Driver authenticate by scanning a QR code generated in OpenPark mobile app
- Guest authenticate by scanning a QR code received as a message from an authorized person
- Anonymous guest can push a button to print a ticket
- Anonymous guest can push a button to talk through a video intercom and the operator can open remotely
- Payment can be done by mobile app, manual cashier with credit card or cash or payment terminal with credit card

In the following slides we will explain the products that can make this possible

Bus ticketing Scenarios of operation
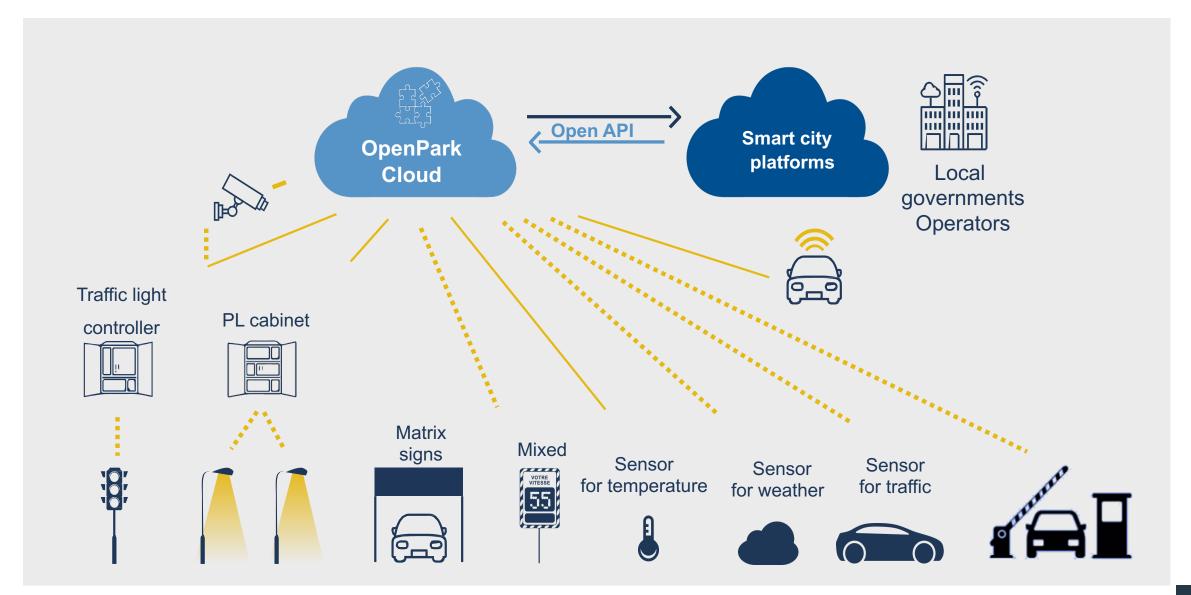
- Passenger will request membership via web portal or mobile app
- Passenger may receive an RFID card if requested after subscription
- Passenger can directly go to the bus stop and buy the ticket from officer using the portable ticket machine
- Passenger can use the generated QR code directly on his phone or on printed paper
- When passenger goes on the bus, he scans the QR code or swipe his RFID card to validate his membership or he can scan his printed ticket purchased at the bus stop

OpenPark ticket validator with integrated GPS/GSM module for real time connection with OpenPark cloud

Smart city core IOT platform

OpenPark Cloud

Open API

Smart city platforms

Local governments Operators

Traffic light controller

PL cabinet

Matrix signs

Mixed

VOTRE VITESSE
55

Sensor for temperature

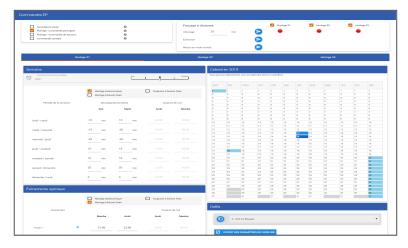Sensor for weather

Sensor for traffic
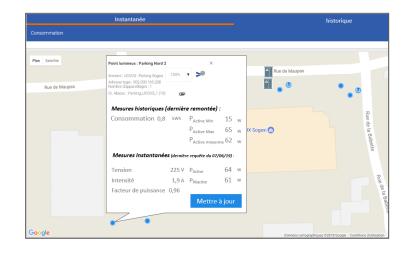
Street Lighting control Advantages

Using a web browser, the web platform allows an access to the control parameters, monitoring, consumption, system analysis from the cabinet to the lighting points and the other services.
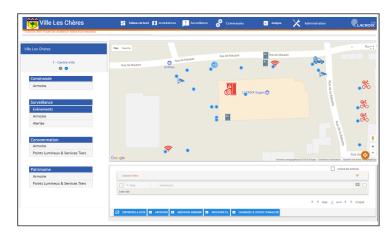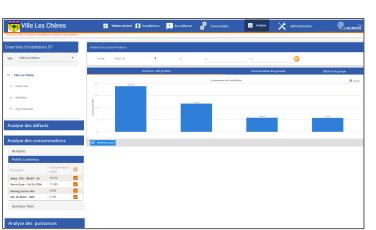
CONTROL

MONITORING
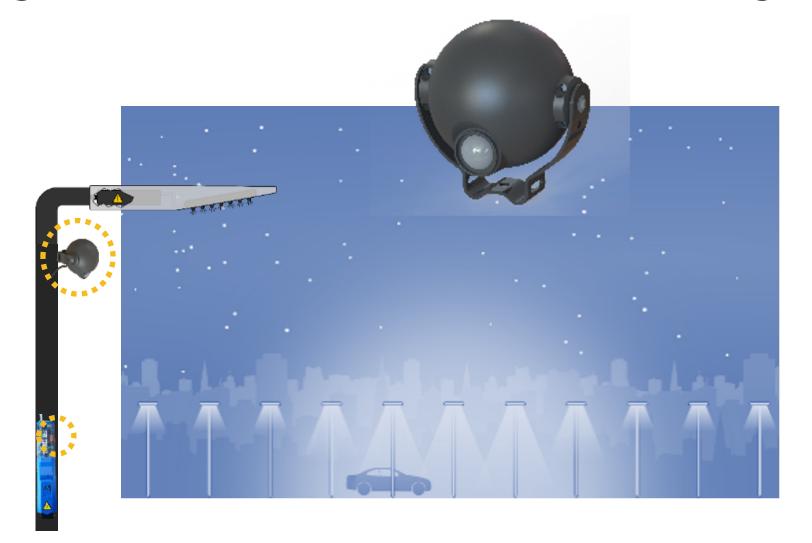
DATA ANALYSIS, CONSUMPTON

CONSUMPTION

STATISTICS

Light where and when needed, at the right level

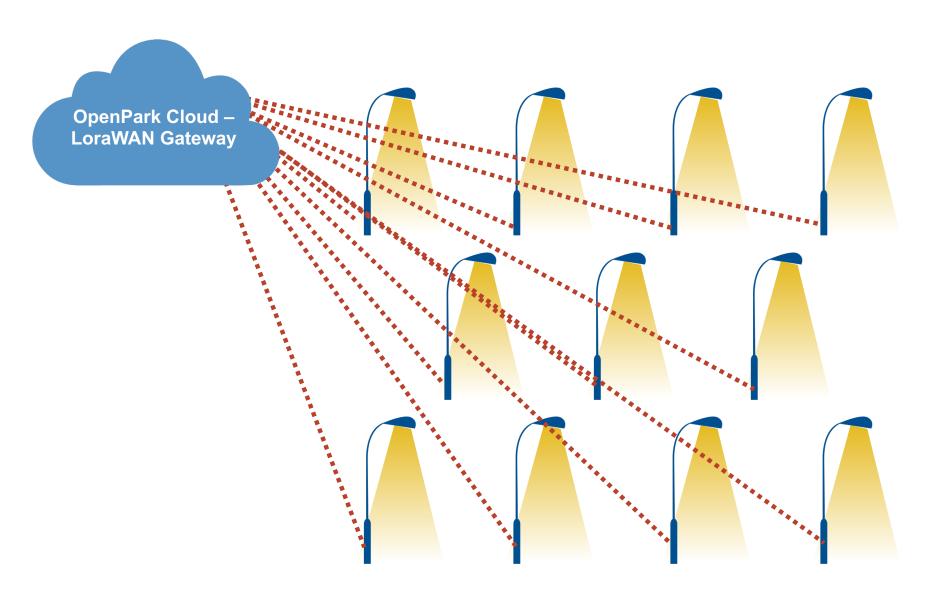
Cost savings up to 80% of electricity & 30% of maintenance

Improved ecological footprint
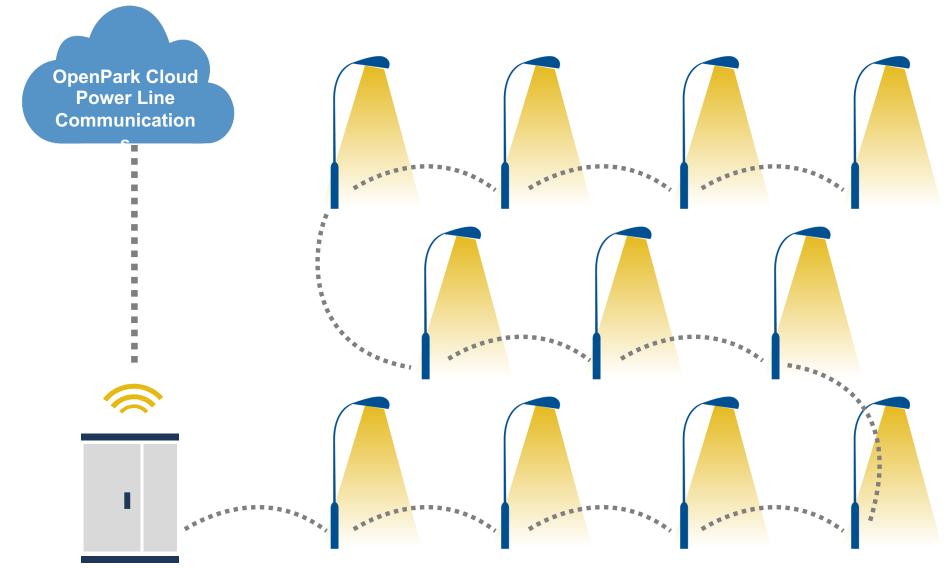
Distributed local intelligence

Street Lighting control architecture (LoraWAN)

OpenPark Cloud – LoraWAN Gateway

Street Lighting control architecture (Power Line Communication

OpenPark Cloud Power Line Communication

Let's Connect!

OPEN PARK

📞 +36702175650

✉ sales@openpark.hu

✉ www.openpark.hu