

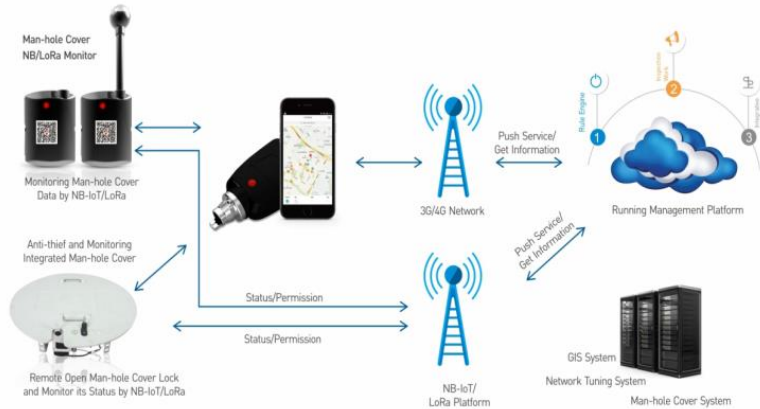
IoT lock in Man-Hole Service

—for Power Grid and Telecom Applications

Adopting advanced i-cloud platform technology, Rayonics R&D developed the new man-hole cover which uses a monitoring sensor and smart locks to be combined with big data technology, unified schedule the inspection maintenance, field operation and alarming processing, which can improve the work efficiency via the management of working flow, personnel, equipment. The modular design system can configure different sites according to the requirements, which ensures that man-hole cover always in operates monitoring status.

A Solution

Rayonics offers 2 solutions for man-hole cover monitoring management system making sure every man-hole cover works like an intelligent brain to complete the data processing and event audit.



Project	Man-hole Cover Controller (Bottom Installation/Wall Installation)	Anti-theft and Monitoring Integrated Man-hole Cover
Working Power	Fully Self-contained Battery	Fully Self-contained Battery
Power Consumption	Low Power Consumption	Low Power Consumption
Network	NB-LoT/LoRa	NB-LoT/LoRa
Door Lock Status	/	Remote Control/BLT Open/Smart Key Open
Composite Cost	Low	Medium
Adaptability	Extremely High	Extremely High
System Expandability	High	Extremely High

B Platform Profile

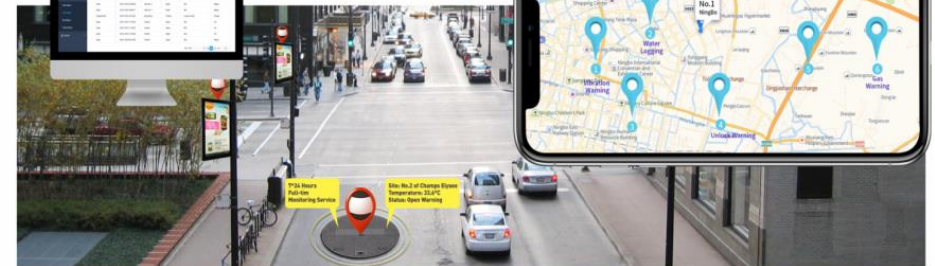
After analysing the requirement of the man-hole cover industry, the Rayonics solution can track the man-hole cover resources data in real time to ensure the maintenance in time, at same time it keep the record in i-cloud server which is easy for inquiry.



PC Server Layout



App Layout



- System maximum capacity around 60,000 man-hole cover
- Support the 4 levels management according to different organization and personnel
- Support to different role user with different permissions.the user maximum to 60,000.
- Support 10,000 tickets application and processing at same time;
- Man-hole cover equipment status, jumper will be shown, and the terminal port information can be altered
- Support different manufacturer and type devices, data collection and data access.
- Type-in location, site picture, controller SN and other information by APP on installation site
- Show information of user operation, location, status and warning

The monitor adopts the NB-IoT/4G/LoRa network, which is applied for monitoring the man-hole cover status. Its industry design standard with IP68 grade, strong ability to resist electromagnetic interference and high temperature adaptability which can used in severe environment to acquire the sensor status, temperature status, battery status, equipment number, signal strength and other informations.



Extensibility



- Water Level Monitoring
- Gas Detection
- PI Bottom Dynamic Environmental Monitoring
- Lock Control



Anti-Theft Man-hole Cover Monitor



Anti-theft & Monitoring Integrated Man-hole Cover
With unique identification number, all of the status information of the man-hole cover can be centralized monitored, combined with IoT smart lock, the city dumb man-hole cover resource information will be visible. Its design adopts industry level which can be applied in severe environment.

Technical Parameters

- IP Grade: IP68;
- Working Temperature: -20°C~+60°C;
- Low-consumption Design: The resting current $\leq 8\mu A$ monitoring man-hole cover status working current $\leq 30mA$;
- Low False Alarm Rate: the man-hole cover will not alarm when the traffic car on it, the false alarm rate less than 0.5%;
- Long Battery Life: one battery can work more than 1200 times, the working life more than 3 years;
- Industry Design Standard: seal housing, anti-corrosion, Proof;
- Pressure and anti-knock;
- Strong ability to transmit information: One area with 50,000 man hole cover at same time without problem for data transfer.

Performance Parameters

- Low False Alarm Rate: the man-hole cover will not send an alarm during normal car traffic, the false alarm rate less than 0.5%;
- Long Battery Life: one battery can work more than 1200 times. The result of working life more than 3 years;
- Industry Design Standard: seal housing, anti-corrosion, Proof Pressure and anti-knock;
- IP Grade: IP68;
- Working Temperature: -30°C~+85°C;
- Strong ability to transmit information: One area with 50,000 man hole cover at same time without problem for data transfer;
- 580mm/630mm/670mm dimensions available.

