

Use Case: Off Street Parking Monitoring

Company: OneSitu / WizziLab

Industry: Civil Construction

More than 5
years battery
life

More than
2500 sensors
per site

DASH7

The DASH7 Alliance Protocol (D7A) is an Open Standard for bi-directional, sub-GHz medium range wireless communication tailored for ultra-low sensor-actuator applications using private networks. D7A stems from ISO 18000-7 for Active RFID and operates in the sub-GHz ISM bands. The protocol specification is free to use without any patent or license requirements.

Sensors will securely report events and actuators can receive commands with a typical latency of 1 second while consuming only 30 uA on average. It's local synchronization and smart addressing features allow to upgrade thousands of sensors simultaneously, drastically reducing the upgrade time.

D7A fills the gap between the Short and the Large Area Networks. D7A excels in urban and industrial network installations connecting actuators and messaging applications (sensors, alarms, states) with ranges up to 500m.

Intro

Everybody has already been frustrated by circling around a parking lot trying to find a free parking spot. For tenants of mall, it is very important to help customers park easily and prevent traffic jams to make the shopping experience as pleasant as possible.

OneSitu offers autonomous and connected intelligent parking solutions to successfully transform urban mobility. They design and manufacture in France a whole range of wireless Smart Parking sensors and information screens, that lead the client in the right area. The system allows the mall tenants to retrieve statistics about their parking (number of unique visitors, time of stay, favorite area to stay).



Challenges

- A shopping mall parking lot is used almost every day, the installation of the guidance system must have as little impact as possible on the daily activity
- The sensors are strongly attached to the ground, on each parking spot and are sealed to avoid water intrusion. Physically accessing the sensor for maintenance become extremely costly. Battery life must be over 5 years and maintenance must be performed remotely over the air
- Sensors are placed directly on the ground and surrounded by mostly metallic cars. Wireless communication conditions are therefore extremely challenging
- A single parking lot can have more than 2000 spots, requiring the system to be highly scalable

Solutions

- DASH7 medium range allows to cover a parking lot with only several access points, keeping the infrastructure cost to a minimum
- DASH7 provides bidirectional communication with a very low power budget allowing sensors to last 5 to 10 years on a 3xAA battery pack
- DASH7 messages between sensors and access points can be acknowledged, guaranteeing the quality of service
- DASH7 uplink capacity allows real time updates of the parking state on the supervision server. Low latency downlink capabilities allows to update solar powered information displays
- DASH7 allows to upgrade sensor firmware over the air in broadcast. A single transmission of the firmware allows to upgrade thousands of sensors at once.

Highlights

- More than 30 000 parking spots connected in real time
- 300 000 vehicles guided every day
- 2 500 000 data analyzed and processed per day
- Decrease the time spent searching for a place by about 60%.