MAKE(S)ENSE PARKING SENSOR TECHNOLOGY

Parking Space Occupancy Sensors

In modern on-street parking systems, individual parking spaces can be equipped with wireless sensors that indicate whether the given lot is occupied or not. Parking sensors communicate with the central parking management system via the on-street parking machines or via dedicated gateways. With the help of sensors, parking management systems can monitor the occupancy of each parking space real-time. Such prompt occupancy data is useful for a number of purposes.

Benefits

Enhanced driver information

Sensors provide real-time data on available parking places, which may be fed to various driver information services and tools (i.e. occupancy boards, mobile apps, navigation systems), which direct drivers towards free parking spaces. This improves driver morale and satisfaction on the one hand, and drastically reduces traffic by eliminating the search to find empty spaces.

Streamlined and improved parking inspection

Sensors help automate and optimise the processes of parking inspection to a great extent, as the system knows the exact parking spaces that are occupied without valid payment, and can deploy inspectors automatically to visit such spaces only.

This has the beneficial effects of reducing inspector workloads, and of ensuring higher sanctioning and enforcements ratios and reducing the possibility of corruption, as non-paying use is known to the central system immediately and without fault.

Accurate parking data aggregate

Sensors collect very precise parking occupancy bulk data, showing which exact spaces are occupied and at precisely what time and for how long. With this, they contribute greatly to parking and general traffic planning and management.

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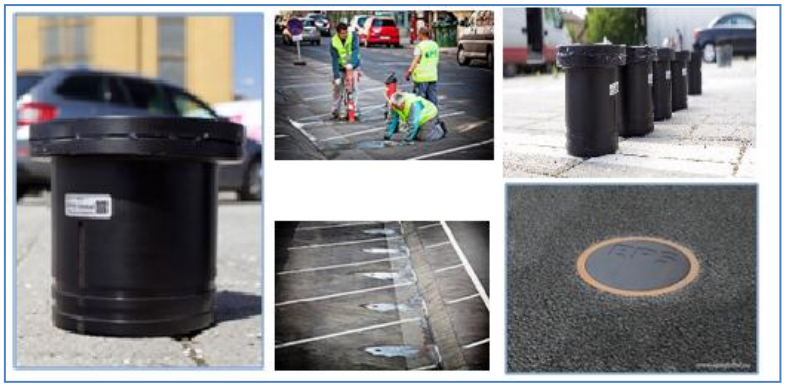

Parking space occupancy sensors developed and manufactured by MAKE(S)ENSE are based on sensing and measuring the earth magnetic field of individual parking spaces.

MAKE(S)ENSE parking sensors are buried underground just below surface level, with no protruding parts. They can be installed in a flexible manner as no connection is required to the public networks neither for power input nor for communication purposes. Installing the sensors involves only a minimal breaching of the pavement – only a shallow hole needs to be drilled to fit the sensor itself.

MAKE(S)ENSE sensors operate on batteries with very low power requirements, having a life span of up to a decade (with battery extension pack). They transmit occupancy data to parking meters or to gateways via RF technology.

The sensor developed by MAKE(S)ENSE detects if the parking place in question is occupied by a vehicle or not. The sensor measures the 3D magnetic field of the Earth. The magnetic field can be distorted by a nearby large metallic object, such as a car. This distortion is detected by the sensor and used to establish occupancy of the parking place in question. The sensor is able to compensate the slow changes of the magnetic field not caused by vehicles. As a consequence of its operating principle, the sensor is unresponsive to non-metallic objects. The sensor is placed into a housing filled up with a polymer, sunken beneath ground level. It is unresponsive to moisture and temperature. The capacity and the quality of the connected battery as well as the sophisticated software ensure a minimum operation time of 5-6 years (with just one battery, so no battery extension pack).

The sensors communicate with the central software system via the Sensor Gateways. The communication uses IQRF's own encryption, eliminating possibilities of abuse. For reasons of energy management, the communication of the sensors is limited to the absolutely necessary operations. Measurement/detection is performed every 1 minutes (it can be changed however, if the need arises). The sensor firmware may be updated wireless, without the need to open the equipment, allowing the sensor to be updated, configured and calibrated remotely.