SBPWSIx

Outodoor, in-ground wireless sensor

Benefits

- **Long life lithium battery.** Up to 10 years.
- **Wide temperature range.** -40°C to +85°C.
- **Long range communication.** Up to 2 Km in urban environment, 250 m in typical applications.
- **Available in different version.** Long Range wireless, LoRaWAN® or NB-IoT.
- **Easy and invisible installation.** Flush mount under the road surface.
- **Strong resistance.** To mechanical influences and heavy traffic.
- **Reduced operating costs.** Once installed, no maintenance is required.

Description

The wireless sensor is part of the Carpark system, which contains other variants of sensors, controllers and displays.

SBPWSIx is designed to be buried under the parking bay and it will be completly invisible.

It detects the occupied/free status of the parking bays by using the earth's magnetic field.

The sensor is available in two versions according to the communication protocol: Long Range wireless/LoRaWAN® or NB-IoT.

The SBPWSI1 sensor can be configured to transmits the parking bay status to the central gateway SBPCWSI1 using Long Range wireless communication or directly to the LoRaWAN® networks, while the SBPWSI2 sensor communicate directly to the NB-IoT bridges and then to the cloud.
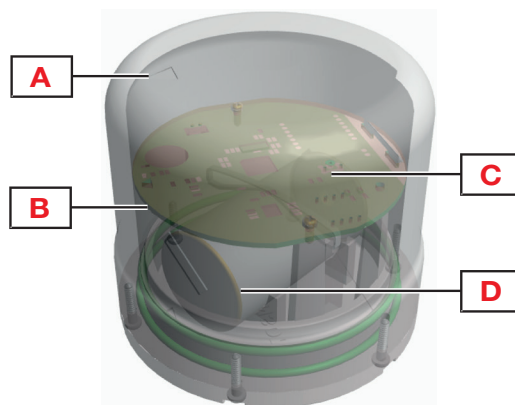
Applications

Parking Guidance Systems

Main functions

- Presence detections of cars in outdoor parking bays.

▶ Structure

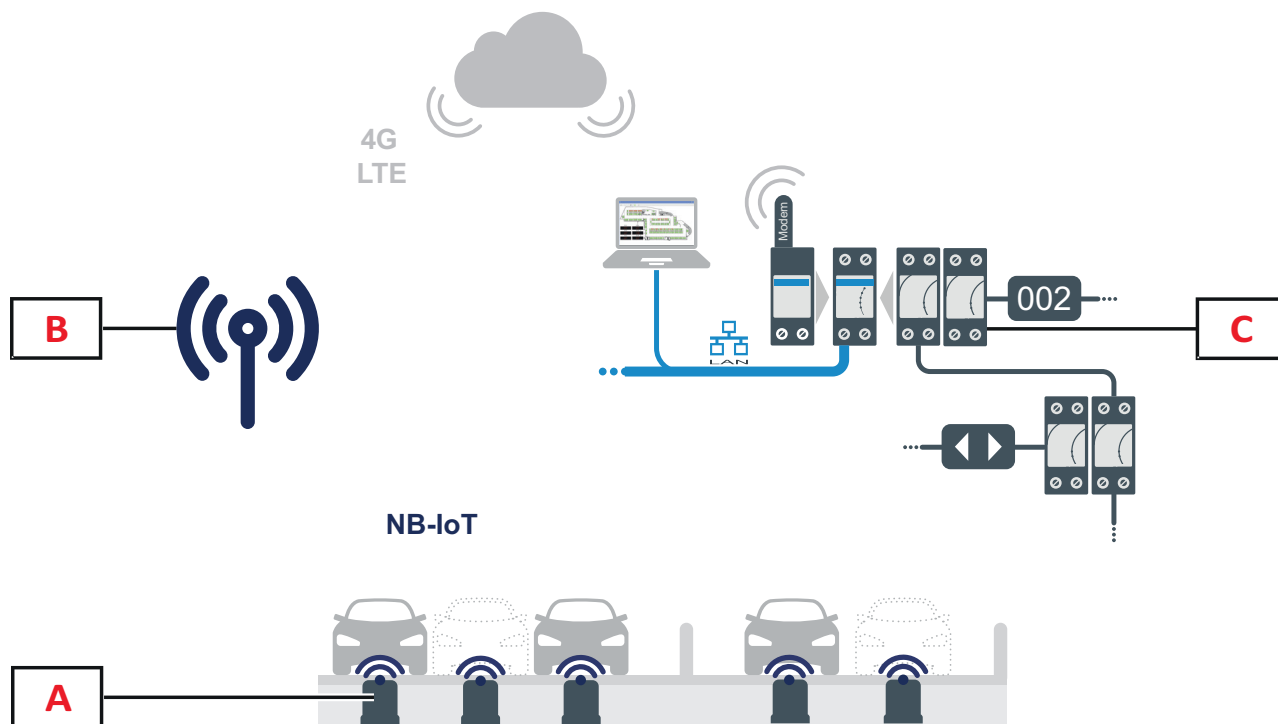| Element	Component	Function
A	Arrow indicator	Indicates the orientation of the sensor to the direction of SBPCWSI1 central gateway or LoRaWAN® and NB-IoT bridges
B	Reed switch	Wakes the sensor up from "deep sleep" mode by using a magnet
C	Electronic board	Contains: three-axis magnetic field sensor, wireless chip and antenna
D	Lithium battery	Powers the sensor up

Architecture (private Long Range Wireless)
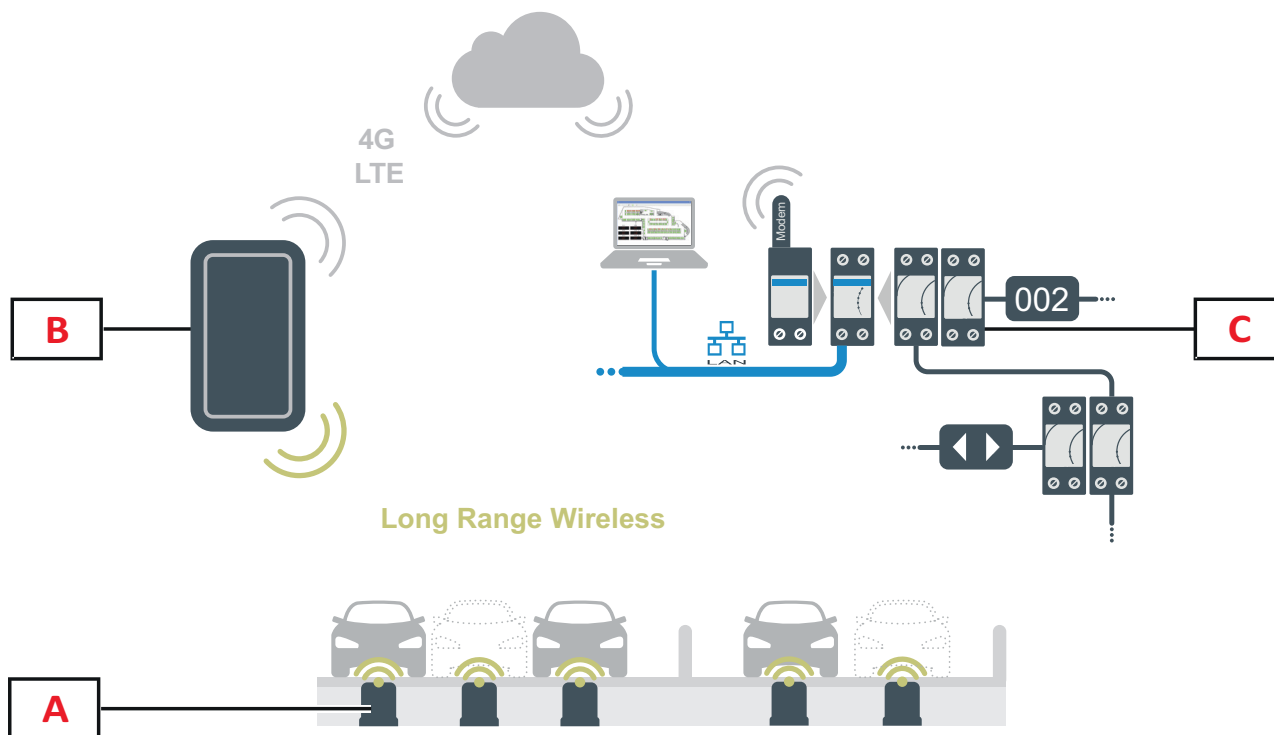
Element	Component	Function
A	SBPWSI1 sensor	Detects changes to the earth's magnetic field caused by the presence of ferrous objects (cars).
B	SBPCWSI1 central gateway	Collects via long range wireless the bay status that is sent by each sensor in real-time. It can manage up to 100 sensors and can be positioned up to 250 m far from sensors.
C	UWP 3.0/SBP2CPY system	Receives via cloud the data collected by SBPCWSI1 gateways. The bay status is managed in the same way as all the other sensors (ultrasonic, IP camera).

Architecture (LoRaWAN® network)
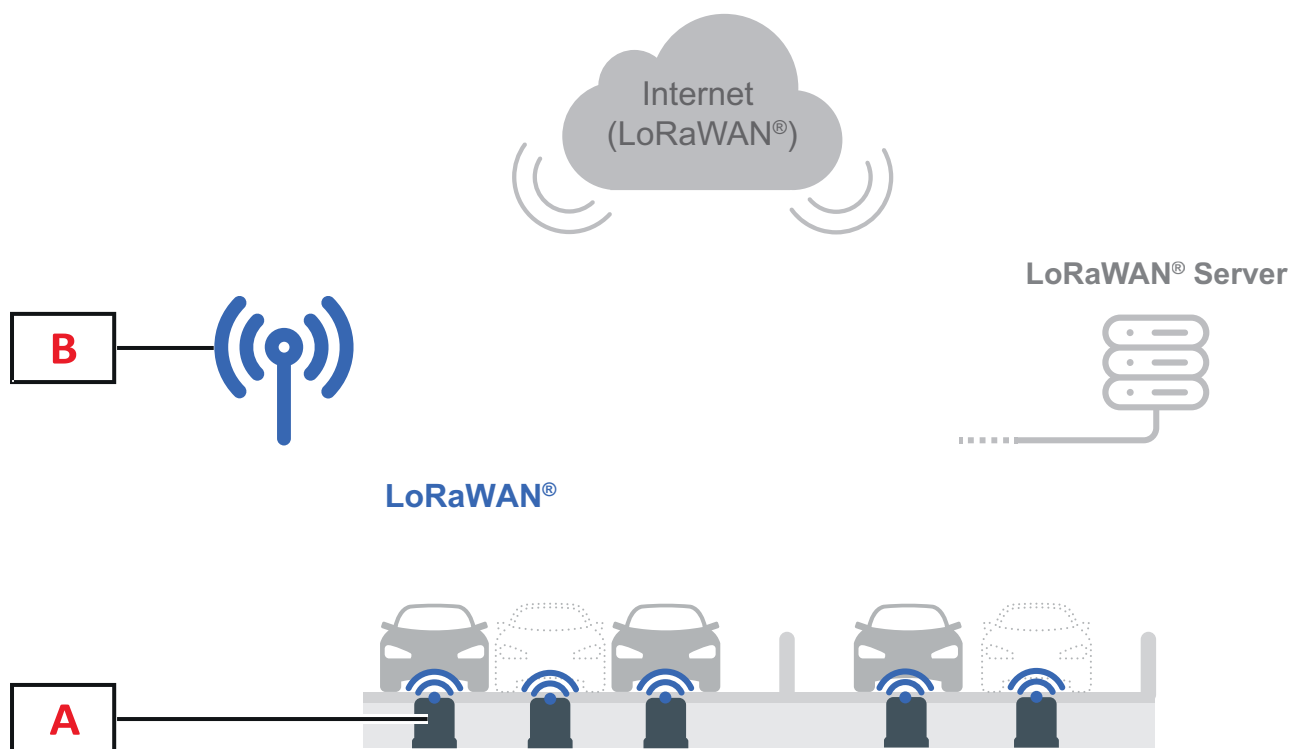
Internet
(LoRaWAN®)

LoRaWAN® Server

B

((•))

LoRaWAN®

A

| Element	Component	Function
A	SBPWSI1 sensor	Detects changes to the earth's magnetic field caused by the presence of ferrous objects (cars).
B	Gateway/Network LoRaWAN®	Collects via standard LoRaWAN® gateways/networks the bay status that is sent by each sensor in real-time.

Architecture (NB-IoT network)

4G LTE

B

C

NB-IoT

A

Element	Component	Function
A	SBPWSI2 sensor	Detects changes to the earth's magnetic field caused by the presence of ferrous objects (cars).
B	NB-IoT bridges	Collects via NB-IoT network the bay status that is sent by each sensor in real-time.
C	UWP 3.0/SBP2CPY system	Receives via cloud the data collected by NB-IoT bridges. The bay status is managed in the same way as all the other sensors (ultrasonic, IP camera).

Features

▶ General

Material	Black plastic (ABS)
Dimensions	Ø min. 90.6 mm, max 96.5 mm Height 84.2 mm
Weight	500 g
Protection degree	IP68 Note: completely sealed housing
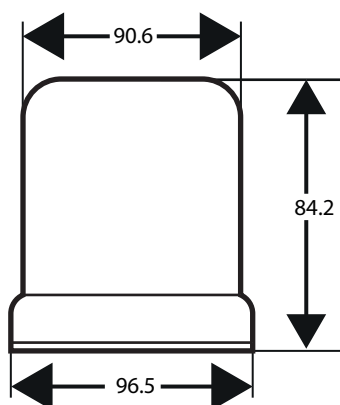
▶ Environmental

Operating temperature	-40 to 85°C (-40 to 185°F)
Storage temperature	-40 to 80°C (-40 to 176°F)
Humidity (non-condensing)	0 to 100% RH

▶ Compatibility and conformity

Approvals	C E
Conformity	ETSI EN 300 220-1 (v 3.1.1) ETSI EN 300 220-2 (v 3.1.1) ETSI EN 301 489-1 (v 2-2-0 draft) ETSI EN 301 489-3 (v 2.2.1 final draft) EN62311:2008

Power Supply

Power supply		Built-in lithium battery
Battery	Type	Li-SOCl2 metallic lithium non-rechargeable, non-replaceable; 4.53 g
	Voltage	3.6 V
	Capacity	SBPWSI1: 17.5/19 Ah SBPWSI2: 13 Ah
	Lifetime	SBPWSI1: 8-10 years SBPWSI2: up to 5 years Note: depending on the use and the enviroment.

Note: The device contains metal-ion batteries. For the sending, you must comply with the relevant packaging and labeling regulation.

Sensor

Technology	Three-axis magnetic field regression
Detection distance	0 - 50 cm

Communication

Protocol	SBPWSI1	Long Range wireless/LoRaWAN® **Note:** the protocol is selectable by means of the Sensor Manager software
	SBPWSI2	NB-IoT **Important: each sensor SBPWSI2 needs a SIM card (2FF) to communicate**
Operating frequency	Long Range wireless	ISM, 863-870 MHz (EU)
	LoRaWAN®	
	NB-IoT	Licensed band, 5/8/20 LTE
Transmission power	Long Range wireless, Lo-RaWAN®	<14dBm (25mW)
	NB-IoT	Up to 23 dBm
Communication distance		SBPWSI1: up to 250 m SBPWSI2: up to 2000 m **Note**: maximum distance depends on the SBPWSIx model and on enviroment condition
Antenna		Integrated

Mode of operation

▶ **Installation**

The sensor should be buried in the center of the parking bay at a depth of 15-20 mm and at 1.25-1.50 m from the parking bay head. See picture below.
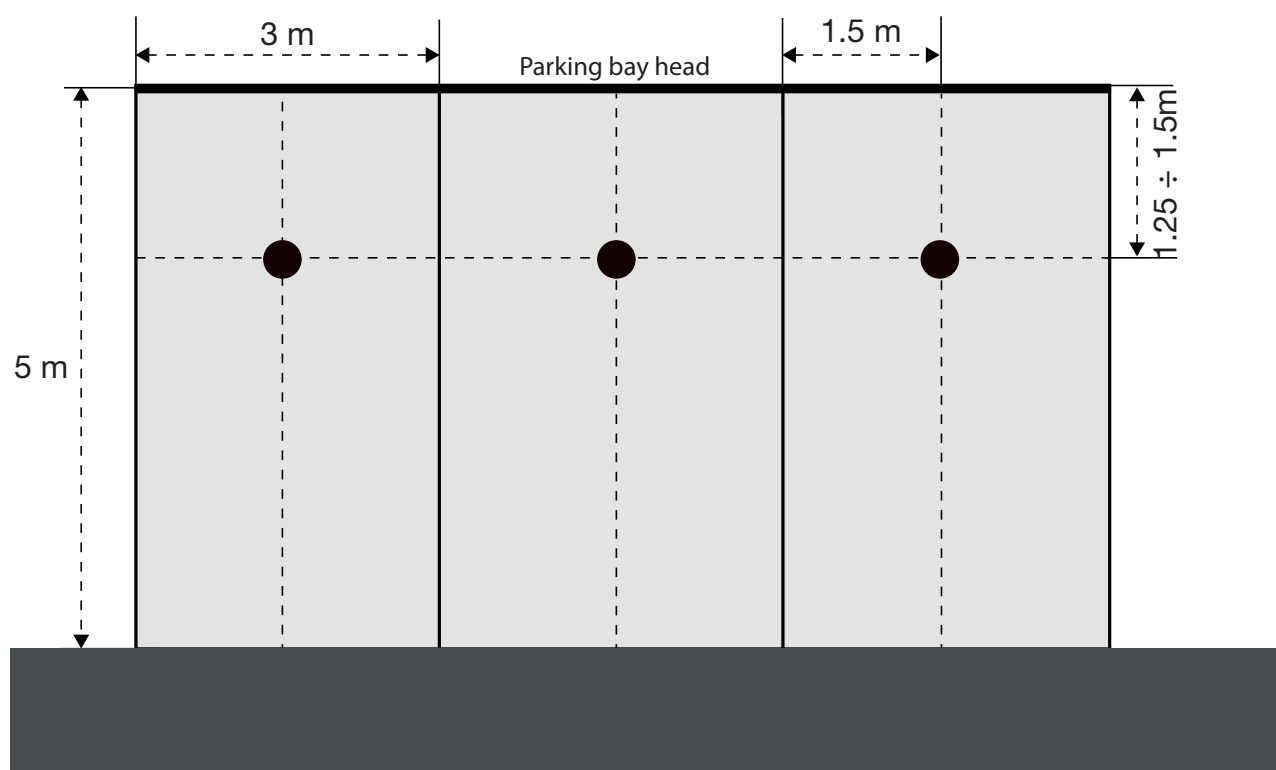
▶ **Calibration**

The calibration will be carried out after the installation using the Sensor Manager software and the SBPCAL calibration unit.
Make sure there are no cars and metal objects within 5 m.
The procedure is described in the Sensor Manager User manual: http://productselection.net/searchproduct.php

References

▶ **Further reading**

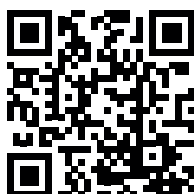| Information	Document	Where to find it
Installation manual	IM SBPWSI1	www.productselection.net/MANUALS/UK/IM_SBPWSI1.pdf
	IM SBPWSI2	www.productselection.net/MANUALS/UK/IM_SBPWSI2.pdf
User manual	Sensor Manager software	www.productselection.net/MANUALS/UK/SPS_user_manual.pdf

▶ **Order code**

☞ **SBPWSI☐**

Complete the code entering the corresponding option instead of ☐

Code	Options	Description
SBP	**-**	Carpark
W	**-**	Wireless
SI	**-**	Sensor
☐	**1**	Long Range wireless/LoRaWAN®
	2	NB-IoT

▶ **CARLO GAVAZZI compatible components**

Purpose	Component name/code key	Notes
Central gateway	SBPCWSI1	
Controller	UWP30RSEXXX	
Carpark server	SBP2CPY24	