

# Parking Lot Sensor | PLS

## Wireless sensors for detecting parking space occupancy

---

Wireless sensors detect and report parking space occupancy, thus enabling active parking lot management features, such as search, navigation and reservation.

The easy retrofit solution for off-street parking is installed in minutes. It was designed for detecting with the highest reliability if a parking space is occupied or available.

### KEY FEATURES

- ▶ Robust algorithm for parking space occupancy detection
- ▶ Two independent sensor principles: magnetometer and radar
- ▶ Up to 5 years battery lifetime

### PERFORMANCE PARAMETERS

- ▶ Model based optimized parking state detection algorithm development with millions of data points from real parking events
- ▶ 96% average parking state change detection performance proven in field-tests with more than 2000 sensors and more than 46 different car types in real parking environments.
- ▶ Adaptive algorithms ensure highest detection reliability during the whole sensor lifetime
- ▶ Self-learning calibration during the first five parking events
- ▶ Reporting of parking state changes within 35 seconds (typical)
- ▶ Passenger cars with ground clearance of < 30 cm

### INSTALLATION AND MAINTENANCE

- ▶ Easy and fast installation: sensor is glued to different surfaces or screwed in the ground<sup>4</sup>
- ▶ No maintenance needed
- ▶ Exchangeable sensor core
- ▶ Low cost, low power, easily replicable sensor solution
- ▶ Sensor core exchangeable without removing the base from the ground

### COMMUNICATION

- ▶ LoRaWAN
- ▶ Wireless device management

### TARGET MARKETS

- ▶ EU (Frequency Band 868MHz)
- ▶ JP (Frequency Band 923MHz)

### OPERATING CONDITIONS

- ▶ Operating temperature range: -30 to +65°C
- ▶ Humidity range: 0 to 95%
- ▶ Resistant to mechanical influences<sup>1</sup>: snow-plough<sup>2</sup>, heavy goods vehicles (CV) (N1 - N3)<sup>3</sup> and high-pressure cleaning

### SENSOR SPECIFICATIONS

- ▶ Diameter 145.4 mm
- ▶ Max height 30.5 mm
- ▶ Weight 191 g
- ▶ Power supply Lithium battery
- ▶ Protection grade IP67/IPx9K

---

<sup>1</sup> According to product specifications

<sup>2</sup> Max. weight of 5,5 tons, shield: flexible flap towards ground, weight max. 1 ton, max. speed 20km/h

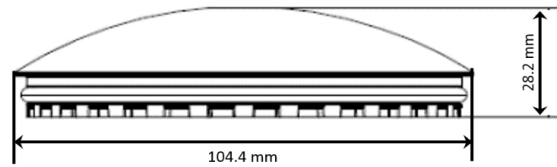
<sup>3</sup> Definition of Commercial Vehicles Categories: 2007/46/EC as last amended by 385/2009

<sup>4</sup> Requires separate 2K-Epoxy based adhesive or screws anchor belts and sealing

# Sensor Core (TPS110)

## GENERAL DESCRIPTION

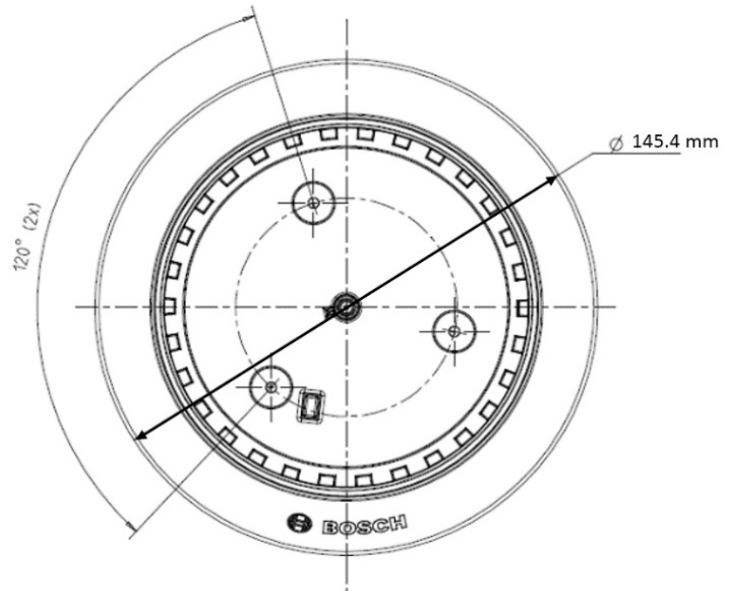
- ▶ Color RAL9005 / black  
RAL7011 / irongrey
- ▶ Weight 124 g
- ▶ Size height: 28.2 mm  
diameter: 104.4 mm
- ▶ Material PA6 GF35
- ▶ Description The Sensor-Core contains the sensing unit. It consists of a housing with integrated battery, electronics and O-rings.



# Sensor-Base (plasma treated)

## GENERAL DESCRIPTION

- ▶ Color RAL7011 / irongrey
- ▶ Weight 65 g
- ▶ Size height: 17.9mm  
diameter: 145.4mm
- ▶ Material PA6 GF35
- ▶ Description The Sensor-Base is the in the ground anchored unit of the parking sensor. It is the mount for the sensor core.



# Cover Cap

## GENERAL DESCRIPTION

- ▶ Color RAL9005 / black
- ▶ Weight 2g
- ▶ Size height: 10.3mm | diameter: 14.8 mm
- ▶ Material PA6 GF35
- ▶ Description The cap with O-ring is positioned on top of the sensor core to protect the screw.

