SBPSUSL45

Carpark Sensor

Benefits

- **2-in-1** : sensor and RGB LED Indicator in one unit
- **Easy and fast** installation
- Automatic temperature **compensation**
- Clearly visible LED indication in a **360° visual angle**
- Select between **8 LED colours** to indicate for instance "vacant", "occupied", "booked", "disabled people"
- **Straightforward commissioning**: programming and test by using the configuration software

Description

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

The SBPSUSL45 sensor is installed at the lane side pointing at the carpark bay at an angle of 45 degrees and detects cars parked in the bay.

The parking bay status is indicated by the built-in high-bright RGB LEDs, clearly visible in a 360° visual angle.

The LED colours to use for status indication are freely configurable, and they can be changed in daily operation through the UWP 3.0 configuration software. Typically, green is used for "vacant", red is used for "occupied", blue is used for "disabled people" and amber is used for "booked".

Each sensor needs to be connected to the Dupline® 3-wire bus.

The bus provides power and enables the sensors to transmit the status to the carpark controller UWP 3.0 / SBP2CPY24, which keep track of the number of available parking spaces in an area and shows the result on the connected displays.
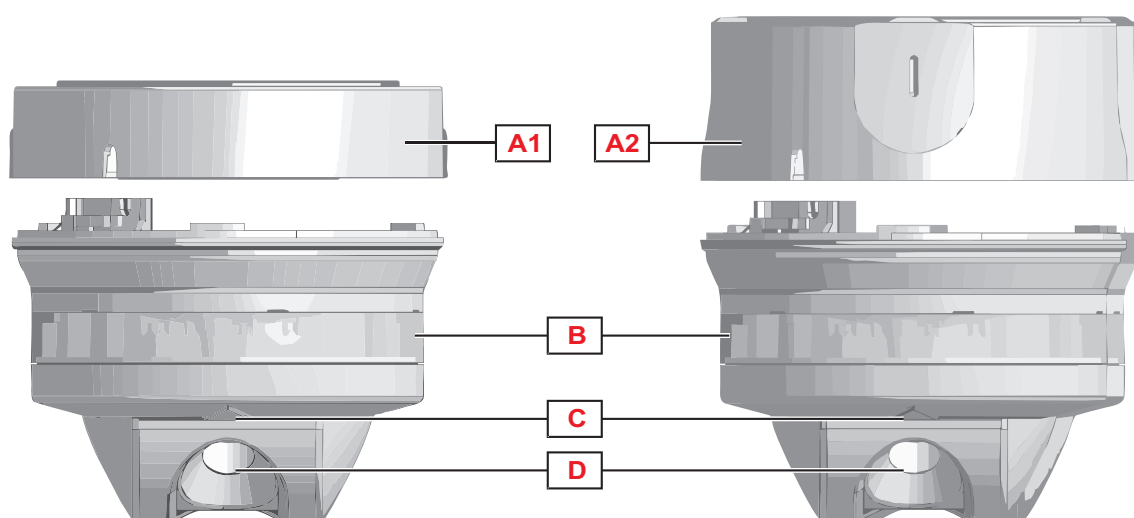
Applications

Parking Guidance Systems

Main functions

• Presence detections of cars in indoor parking space with coloured LED indication of space status.

Structure

Element	Component	Function
A1 / A2	Carpark base holder. The available versions are: | Element	Code	Function
A1	SBPBASEA	Small base for cable tray and conduit/pipe mounting
A2	SBPBASEB	Tall base for ceiling mounting | **NOTE: The sensor is delivered without a base. Please order SBPBASEA or SBPBASEB separately**	• This is designed for mounting the SBPSUSL45 sensor; • This contains the wiring terminals and the chip with SIN code; The SBPSUSL45 can be connected to the base with a RJ12 connector
B	High-bright RBG LEDs with a 360° visual angle	The LED colours indicate the parking bay status for the drivers
C	Local calibration button	This can be used to perform the sensor calibration by pressing it locally
D	Ultrasonic sensor with 45 degrees detection angle	This detects the parking bay occupied status by using 40 kHz ultrasonic waves

Features

General

Material	ABS	
LED protection	Transparent polycarbonate	
Housing colour	Light grey	
Dimensions	Base SBPBASEA + Sensor	103.5 x 116 mm
	Base SBPBASEB + Sensor	122 x 116 mm
Weight	Base SBPBASEA + Sensor	275 g
	Base SBPBASEB + Sensor	300 g
RJ12 connector	Female: in base Male: with cable in sensor	Internal communication between sensor and base
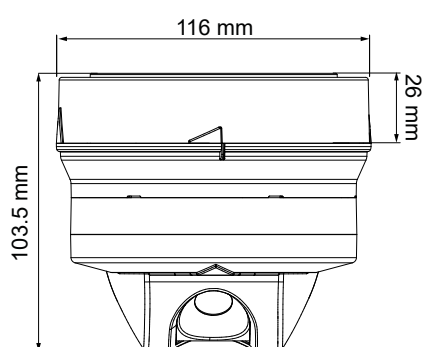
Fig. 1 *Rail mounting - base A + Sensor*
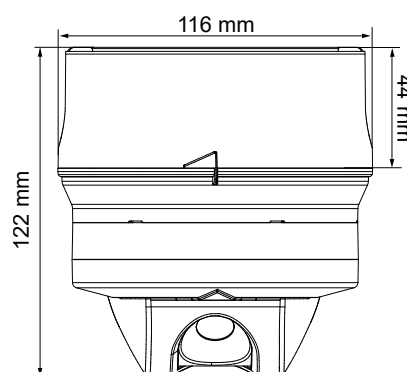
Fig. 2 *Ceiling mounting - base B + Sensor*

Environmental

Operating temperature	-40 to 70°C (-40 to 158°F)
Storage temperature	-40 to 80°C (-40 to 176°F)
Degree of protection	IP34 The circuit board is treated to be protected against fumes and fine dust. The sensor is protected against water dripping from the ceiling. For further information, see *Additional conventional warranty - Performances and proper functioning*.
Humidity	5-98% Relative humidity
Pollution degree	3 (IEC60664)

Compatibility and conformity

CE-marking	$C \in$
Approvals	c (UL) US

Power Supply

| Power supply	By the Dupline° bus via the RJ12 connector; POW 20-28 Vdc
Current consumption	1 mA on the Dupline° bus; 27 mA on POW

Sensor

Technology	40 kHz ultrasonic element
Max. distance between sensor and floor	Between 2.2 m and 2.4 m
Vertical mounting deviation	±5 degree max
Horizontal mounting deviation	±2 degree max
Total time response from sensor to UWP 3.0	4.0 s @ 8 measures filter
MTBF	70,000 hours
Temperature compensation	The built-in temperature compensation makes the sensor stable and reliable

Communication

Protocol	Smart-Dupline°

Connection Diagrams
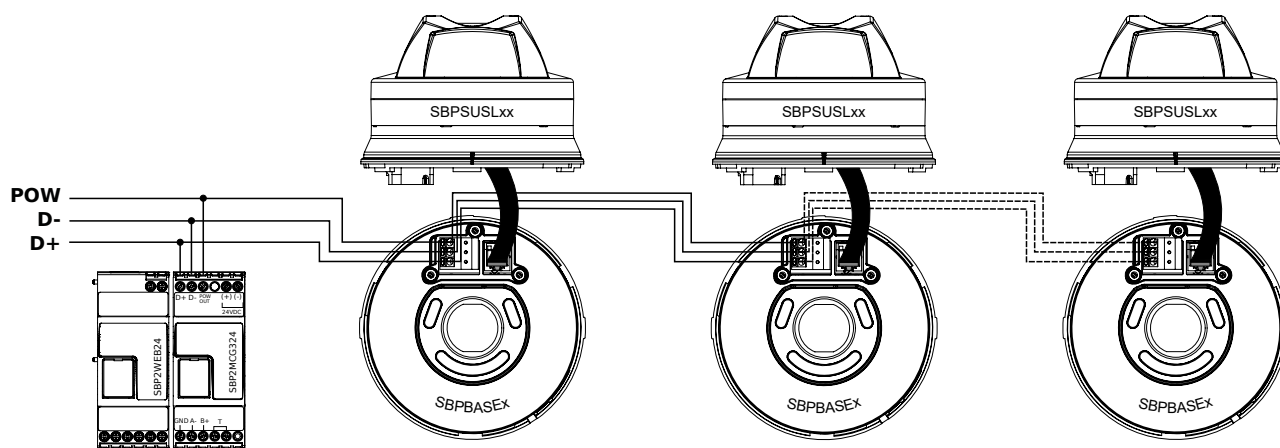
Mode of operation

▶ **Installation**

The sensor should be placed at a height between 2.2 to 2.4m.
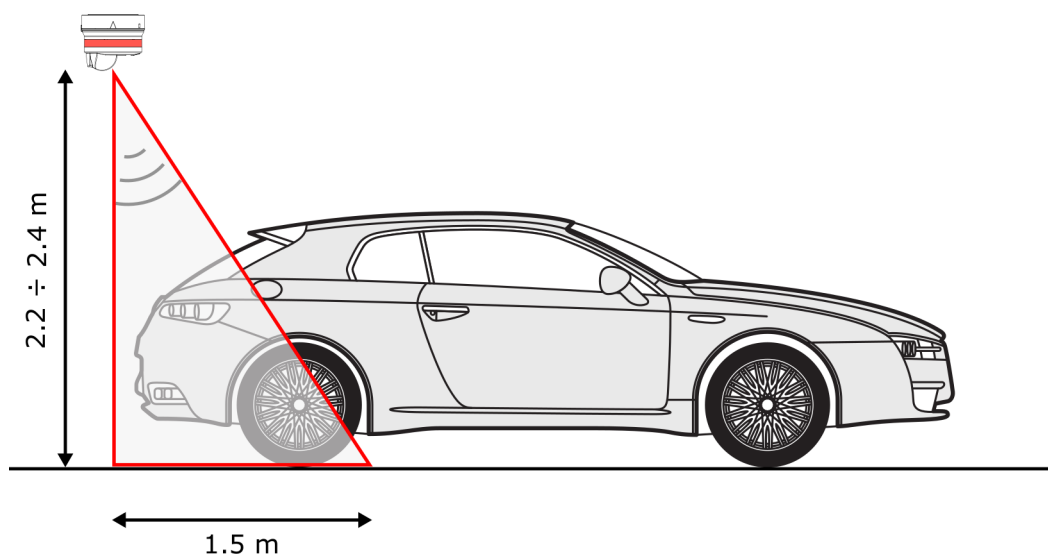The depth of detection is 1.5 m.

Fig. 3 *Sensor height and distance*

The following mounting suggestions are the standard ones; for any type of application other than those shown below, please <u>contact our technical assistance</u> before installing the SBPSUSL45 and the SBPBASEx.

Example 1
In this example the sensor is clearly visible for the drivers even if it is positioned more inside the parking bay, without renouncing the visibility. The detection capability of the sensor greatly increases, bringing the sensor closer to the parking bay: the detection range is 1.5 m.

The sensor is too far from the parking bay

Put the sensor as close as possible to the parking bay

Example 2

In this example the sensor could have been installed closer to the parking bay: it should be mounted on the right hand of the cable tray

The sensor is wrongly mounted on the left hand of the cable tray

Put the sensor on the right hand of the cable tray

Obtacles

The sensor must not be installed where it can encounter obstacles on the ceiling.

The obstacles on the ceiling (pipes, beams, lamps, fans and ducts) that can obstruct the sensor, must be at a minimum distance of 2.5 m (if they are at the same height of the sensor) and they must have a maximum height/thickness of 30 cm. (see figure below).
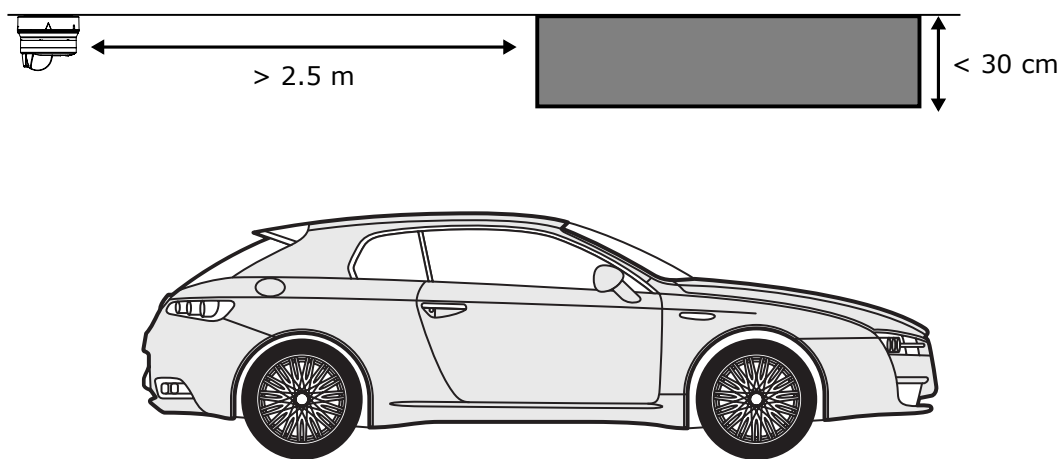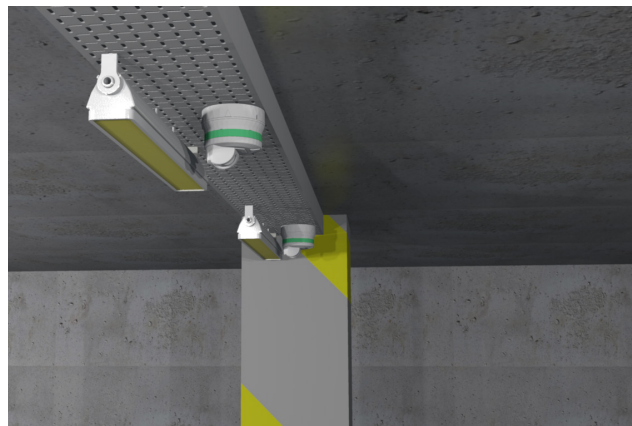

Fig. 4 *The obstacles decrease the detection capability of the sensor*

Example 3

In this example the LED lamp is too close to the sensor and wrongly mounted in front of the sensor, obstructing the visibility.
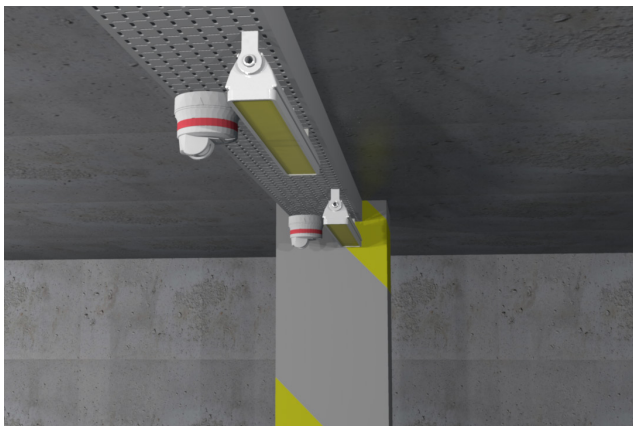
The LED lamp is wrongly mounted in front of the sensor

Put the sensor in front of the LED lamp

If the distance between the obstacle and the sensor is less than 2.5 m, the base of the sensor must be installed at least 5 cm below the obstacle.

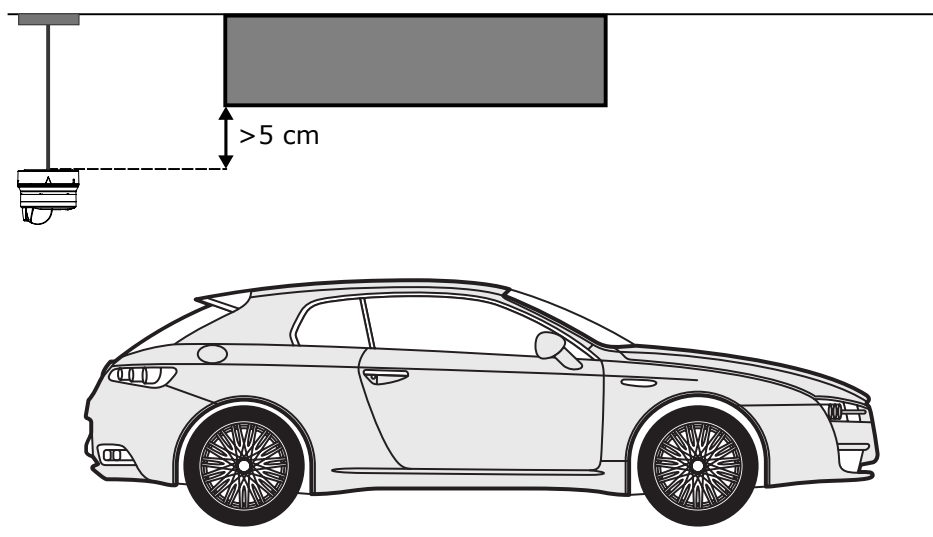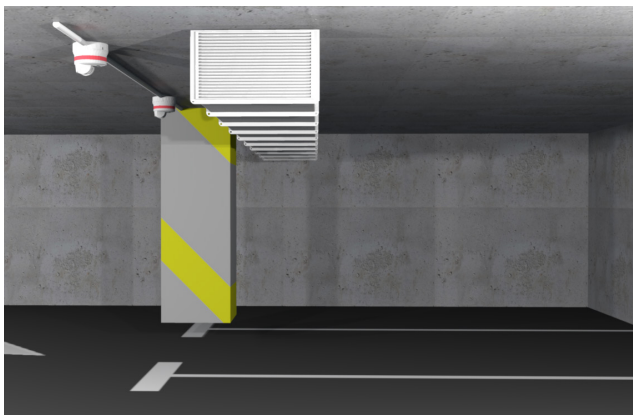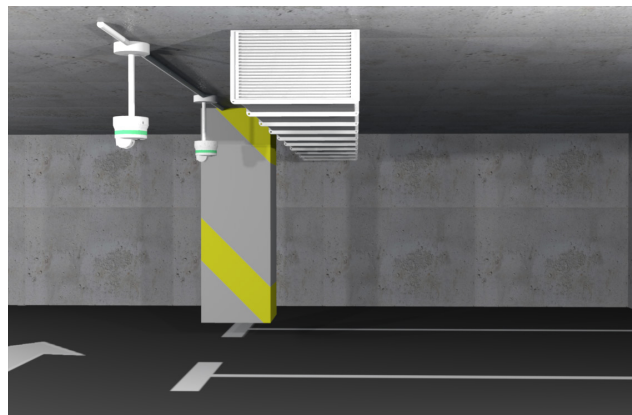**Note: The SBPBASEA base has to be used for conduit/pipe mounting**

>5 cm

Fig. 5 *The base of the sensor must be at least 5 cm below the obstacle*

Example 4

In this example the ventilation fan is lower than the sensor. The SBPBASEB (left picture) has to be replaced with SBPBASEA for conduit/pipe mounting.
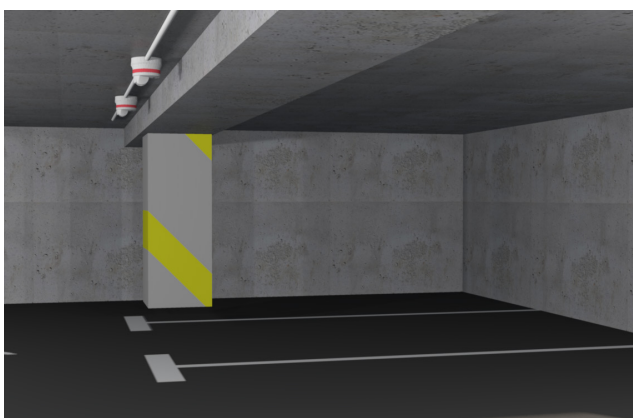

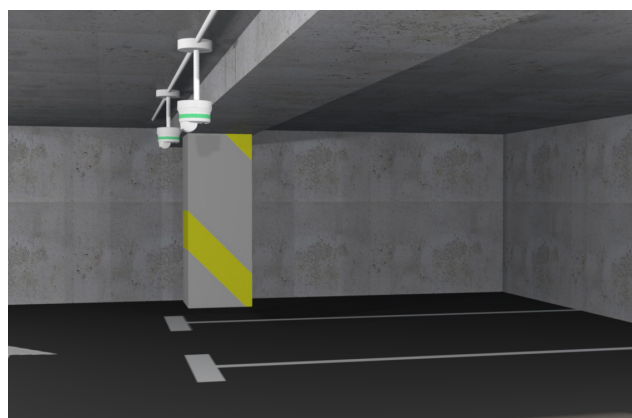The sensor is obstructed by the obstacle

❌

Put the SBPBASEA at least 5 cm below the obstacle

✅

Example 5

In this example the obstacle (beam) is lower than the sensor and it is too close (< 2.5 m).

The sensor is obstructed by the obstacle

❌

Put the SBPBASEA at least 5 cm below the obstacle

✅

Lateral obstacles

The same considerations above-mentioned have to be applied if the obstacle is on the side part of the sensor: in this case, the minimum distance between the lateral obstacle and the sensor must be at least 1 m. If they are at the same height of the sensor, they must have a maximum thickness of 30 cm.
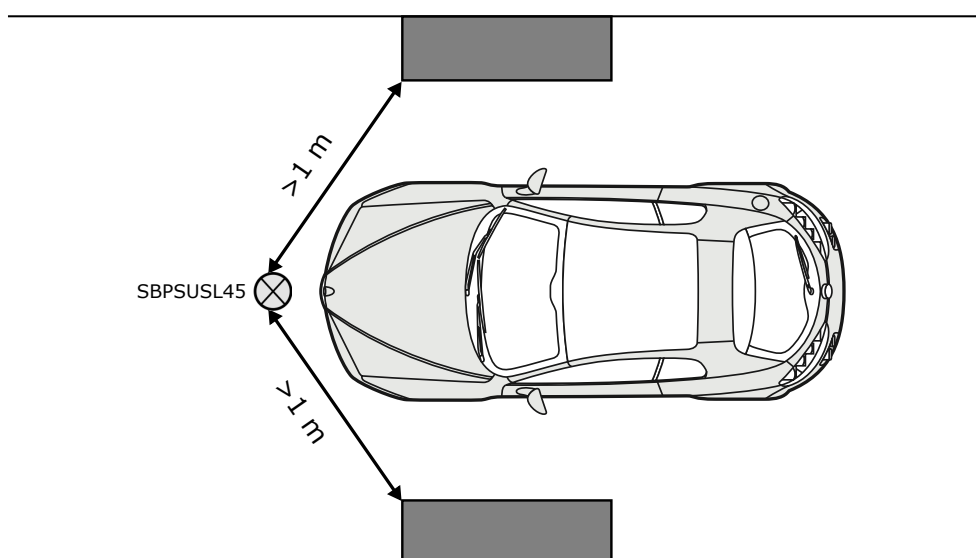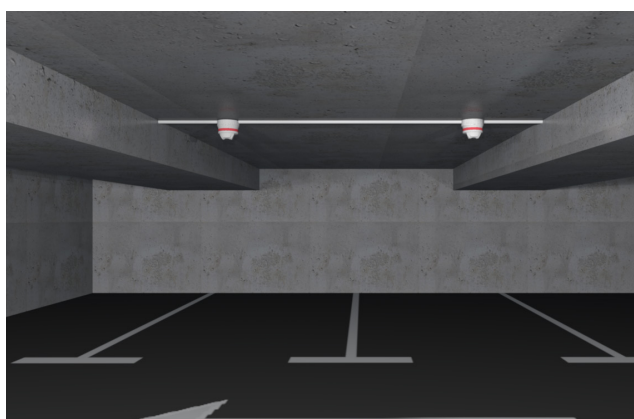

Fig. 6 *The lateral obstacle must be at a minimum distance of 1 m from the sensor*

Example 6

In this example the obstacle is on the side part of the sensor and the distance between them is less than 1 m. Moreover, the thickness of the obstacle is more than 30 cm. The SBPBASEA for conduit/pipe mounting has to be installed to mount the sensor at least 5 cm below the obstacles.

The obstacle is too close to the sensors
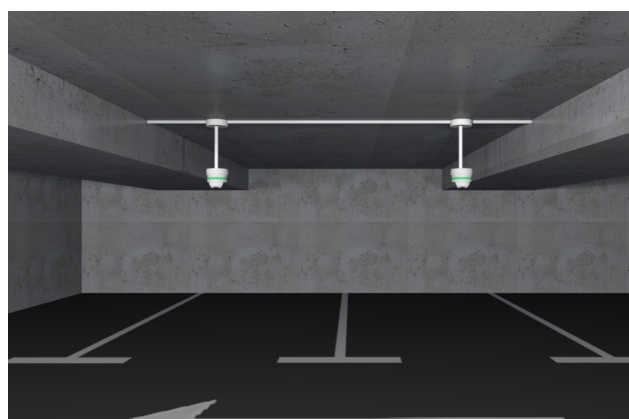
Put the SBPBASEA at least 5 cm below the obstacles

Increase reliability

To stop the vehicles at the parking bay area, especially for parking bays that are depth over 5 m, the **wheel-stoppers** are suggested.

The vehicle has been parked too far from the sensor

Wheel-stoppers avoid to park too far from the sensor

To increase reliability, it is mandatory to install the sensors when the lines on the parking lot have already been painted.

▶ **SBPBASEx mounting**

The sensor must be mounted on either base holder SBPBASEA (cable tray or conduit) or base holder SBPBASEB (ceiling mount).
Place the sensor with the vertical mark at the tip of the triangle base.
Turn the sensor clockwise until the vertical mark is positioned at the rear end of the triangle. The sensor is now attached to the base.
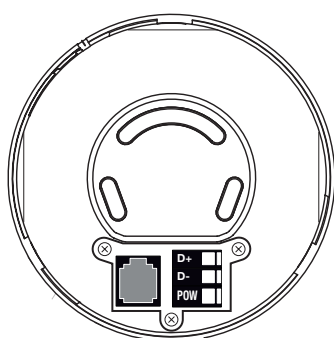Release the sensor by turning it anti-clockwise.

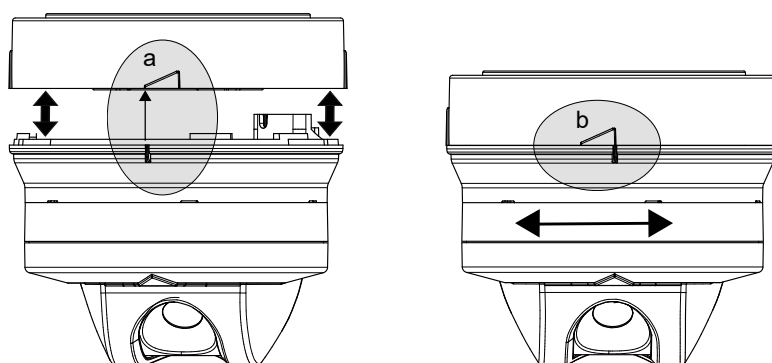**Fig. 7** *Basepart: mounted on the ceiling*

Fig. 8 *Mount / Unmount*

When mounting the sensor on the ceiling or in a rail, the sensor must be installed at an angle of maximum ± 5 degrees deviation from the ceiling surface and a ± 2-degrees' horizontal deviation to accomplish a safe and reliable signal from the sensor.
See drawing below.

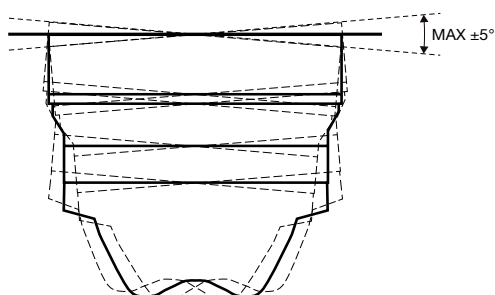**Fig. 9** *Maximum ±5° vertical deviation*

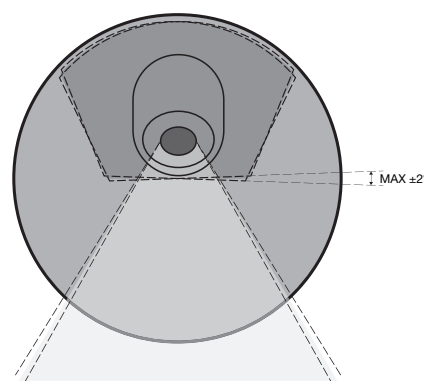**Fig. 10** *Maximum ±2° horizontal deviation. Bottom view*

Make sure that there is some extra wire for the sensor so that maintenance of the sensor/base in the future is enabled. Also place the wire correctly to avoid damage to the cable isolation.

▶ **Configuration**

When sensor and base are mounted and connected to the Dupline® 3-wire network with power and communication, they are ready for configuration.

The UWP 3.0 configuration software automatically scans the network and finds all the sensors and other connected devices.

Once this has been done, the user assigns addresses to the sensors connected simply by walking from sensor to sensor and pressing the configuration button on the bottom.

Please refer to the UWP 3.0 Carpark software manual for further details about configuration.

The sensor emits an ultrasonic signal at a frequency of 40 kHz which is reflected when it hits the floor or a parked car and returned to the sensor. Depending on the shape of the received echo signal, the sensor can determine if there is a car parked or not. The calibration has to be carried out with no cars and any time structural changes are made in the parking bay.

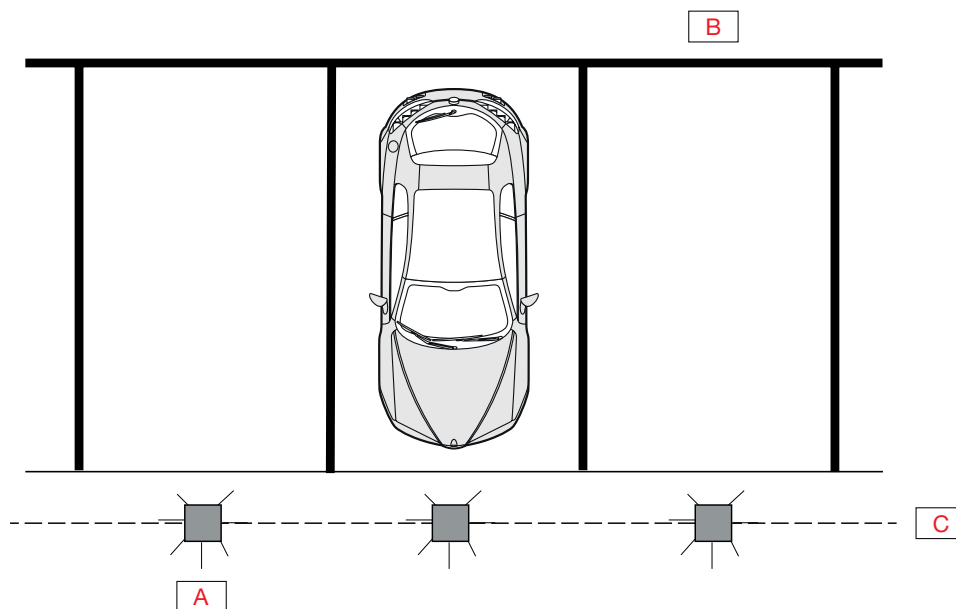All programming of the sensor is thoroughly described in the UWP 3.0 Carpark software manual: http://productselection.net/searchproduct.php

Fig. 11 *Sensor installation*

A	Sensor with LED	C	Dupline® bus
B	Parking spaces		

Sensor status and calibration

Status	Condition	LED status	Note
Normal	Bay is occupied	Colour for occupied	By default, the colour is configured to be red
	Bay is vacant	Colour for vacant	By default, the colour is configured to be green
Addressing procedure*	Disabled	Red/green, accordingto the programming	Module has no address
	Enabled	Yellow, normal flash	Module is waiting for receiving a new address
	Accepted	Green, fast flash (for 3 s.)	Module has received the new address
	Assigned	Green, normal flash	Module already has an address
Remote calibration	In progress	Yellow, fast flash (for 15 sec)	
	Error	Red, normal flash (for 3 s.)	
	OK	Green, normal flash (for 3 s.)	
Local calibration	Start delay	Yellow, slow flash (for 15 s.)	
	In progress	Yellow, fast flash (for 15 s.)	
	Error	Red, normal flash (for 3 s.)	
	OK	Green, normal flash (for 3 s.)	
Calibration required		White, fast flash	The sensor needs to be calibrated
Start-up		White, flash (for 3 s.)	If it is not white, LEDs are damaged

* Addressing procedure is described in the configuration manual.

All the LED status can be programmed by software

CARLO GAVAZZI

Additional conventional warranty

This product is provided with a ten-year warranty. For further information, please refer to the ***Additional conventional warranty - Performances and proper functioning.***

References

▶ **Further reading**

| Information	Document	Where to find it
Carpark installation	CP3 manual	www.productselection.net/MANUALS/UK/cp3_manual.pdf
UWP 3.0 installation guide	System manual	www.productselection.net/MANUALS/UK/system_manual.pdf
UWP 3.0 software manual	UWP 3.0 tool manual	www.productselection.net/MANUALS/UK/uwp3.0_tool.pdf
CP3 troubleshooting guide	Troubleshooting guide	www.productselection.net/MANUALS/UK/troubleshooting_guide.pdf
Installation manual	IM_SBPSUSL45	www.productselection.net/MANUALS/UK/IM_SBPSUSL45.pdf
Carpark conventional warranty	Additional conventional warranty - Performances and proper functioning	www.gavazziautomation.com

▶ **Order code**

👉 **SBPSUSL45**

Note: The sensor is delivered without a base. Please order SBPBASEA or SBPBASEB separately.

▶ **CARLO GAVAZZI compatible components**

Purpose	Component name/code	Notes
Controller	UWP30RSEXXX	
Bus generator	SBP2MCG324	
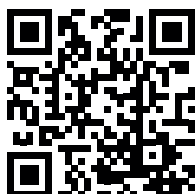
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Content subject to change. Download the PDF: www.productselection.net