SBPSUSCNT

CARLO GAVAZZI

Carpark Counter Sensor

Benefits

- **Easy and fast** installation
- Automatic temperature **compensation**
- Clearly visible LED indication in a **360° visual angle**
- Fast detection of cars at a speed of **up to 20 Km/h**
- **Straightforward commissioning**: programming and test over the network 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 SBPSUSCNT counter is a sensor designed to count cars that pass under the sensor at a speed of up to 20 Km/h.

The sensor has to be installed in the driving lane, in ramps among floors or entrances and exits of a parking area.

To reach the best measuring result, use two SBPSUSCNT sensors for each detection point.

All the sensor parameters are freely configurable, and they can be changed in daily operation through the UWP 3.0 configuration software.

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 counts the numbers of cars entering or leaving the parking area and shows the result on the connected displays.
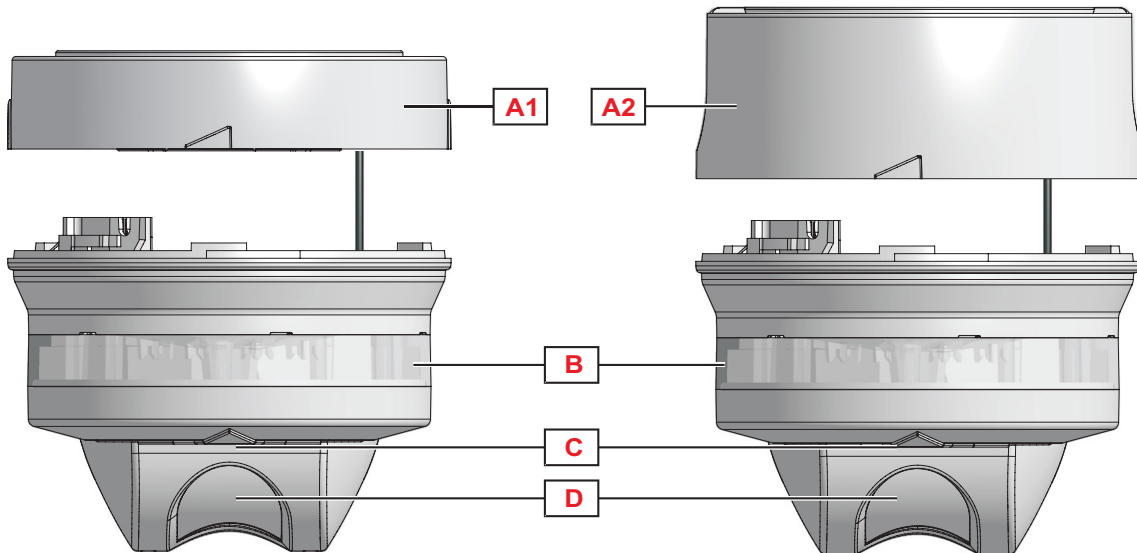
Applications

Parking Guidance Systems

Main functions

- Transit detections of cars in the driving lane.

▶ **Structure**

Element	Component			Function
A1 / A2	Carpark base holder. The available versions are: 			• This is designed for mounting the SBPSUSCNT sensor; • This contains the wiring terminals and the chip with SIN code; The SBPSUSCNT can be connected to the base with a RJ12 connector
	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			
B	High-bright RBG LEDs with a 360° visual angle			
C	Local calibration button			This can be used to perform the sensor calibration by pressing it locally
D	Ultrasonic counter sensor with vertical detection angle			

Features

![General]

General

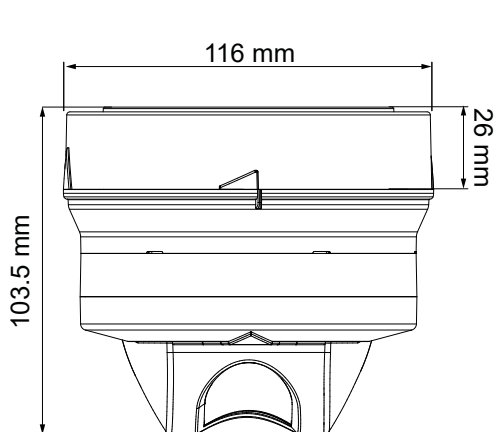| Material	ABS	
LED protection	Transparent polycarbonate	
Housing colour	Light grey	
Dimensions	Base SBPBASEA + Sensor	103.5 x 116 mm
	Base SBPBASEB + Sensor	122 x 116 mm
Weight	Base SBPBASEA + Sensor	275 g
	Base SBPBASEB + Sensor	300 g
RJ12 connector	Female: in base Male: with cable in sensor	Internal communication between sensor and base

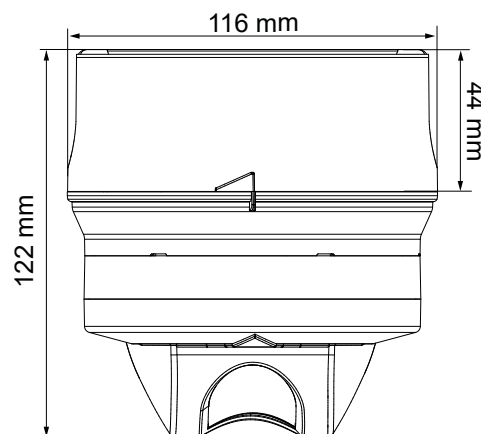**Fig. 1** *Rail mounting - base A + Sensor*

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*.
Impact protection	IK07
Humidity	5-98% Relative humidity
Pollution degree	3 (IEC60664)

▶ **Compatibility and conformity**

CE-marking	C E
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 2.0 m and 2.5 m
Vertical mounting deviation	±5 degree max
Total time response from sensor to UWP 3.0	4.0 s @ 8 measures filter
Temperature compensation	The built-in temperature compensation makes the sensor stable and reliable

▶ **Communication**

Protocol	Smart-Dupline®

Connection Diagrams
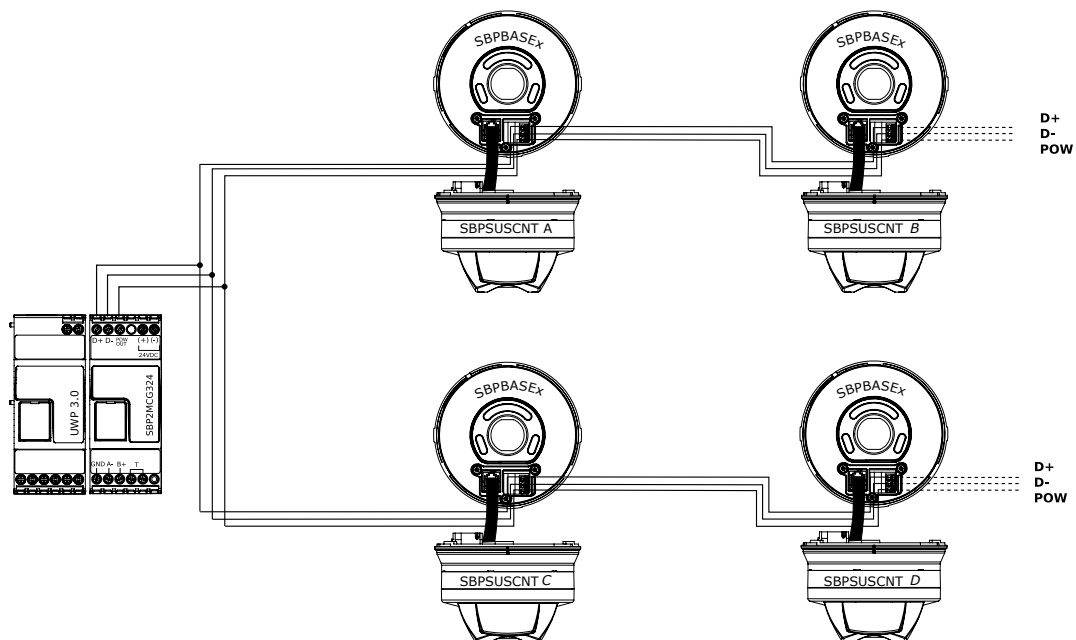
Mode of operation

▶ **Installation**

The sensor should be mounted in the driving lane at a height between 2.0 to 2.5 m.
For each detection point the system permits the usage of one sensor or multiple sensors. In order to avoid crosstalk and false detections two sensors should be used. In this way, the system is also able to detect the direction of the cars.
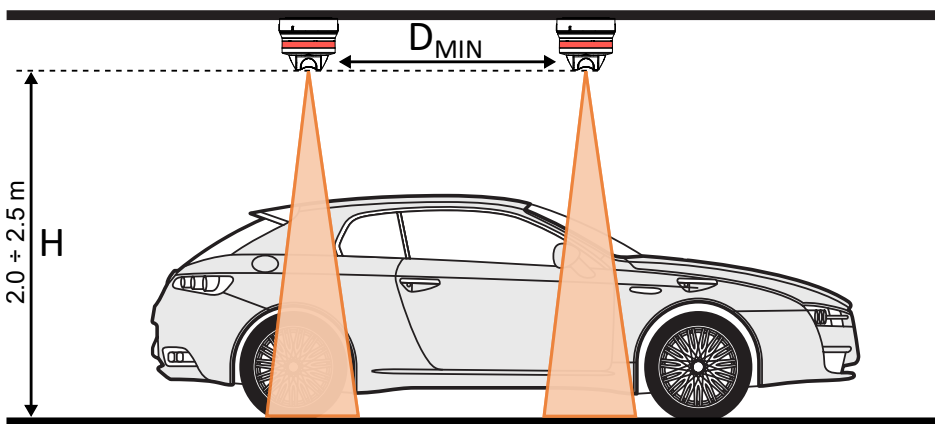Please refer to the table 1 to place the two sensors at the proper distance.
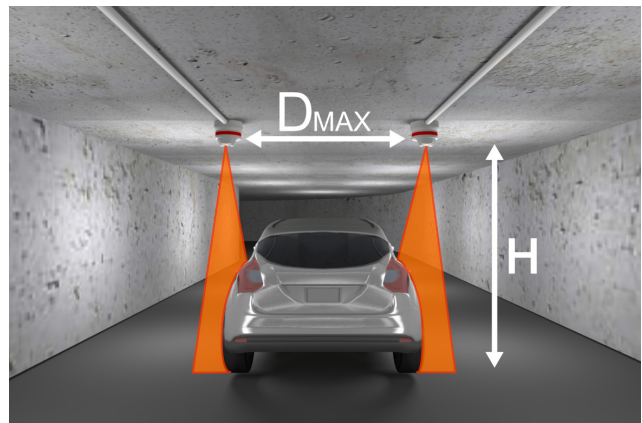

Fig. 3 *Sensor height*

Sensor height (m)	Min. distance (m)
2.5	0.91
2.4	0.88
2.3	0.84
2.2	0.80
2.1	0.77
2.0	0.73

Tab. 1 *Minimum distance between sensors*

Should the driving lane be larger than the standard (2.5 to 3.25 m), please refer to table 2 to place the two sensors at the proper distance.

The sensor placed in the middle does not cover the whole driving lane

❌

Two sensors cover completely the width of the driving lane

✅

Sensor height (m)	2.5	2.4	2.3	2.2	2.1	2.0
Max. distance (m)	2.53	2.45	2.38	2.31	2.23	2.16

Tab. 2 *Maximum distance between sensors*

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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 SBPSUSCNT and the SBPBASEx.

Example 1

In a one-way lane larger than the standard (2.5 to 3.25 m), SBPSUSCNT sensors should be placed in the middle of the lane.

One of the sensors has been placed too far from the middle of the lane
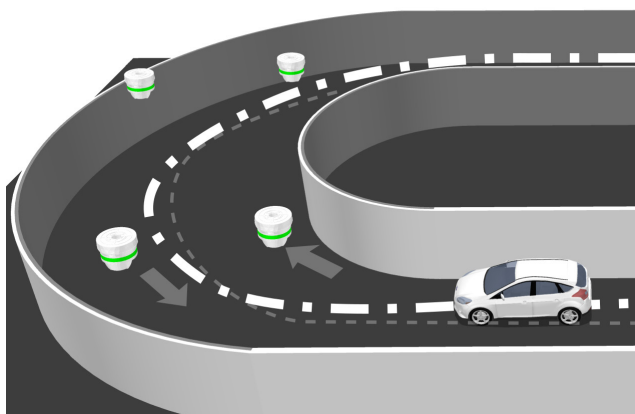
❌

The sensors are placed in the middle of the driving lane where the car passes
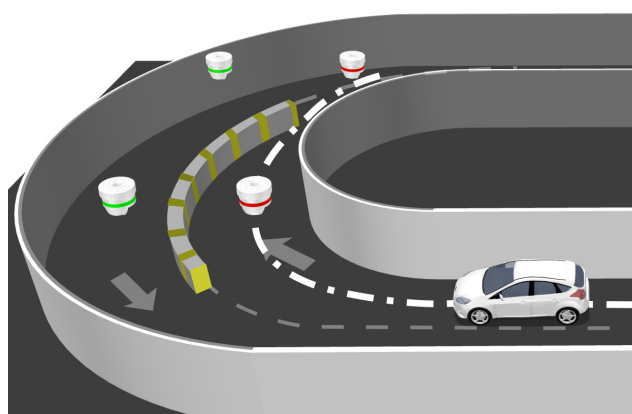
✅

Example 2

In a two-way lane a delineator should be placed between the lanes to prevent cars from passing in the middle and to permit the correct cars counting.

The car passes in the middle of the lane without activating any sensors

❌

The delineator permits the correct counting for both the lanes

✅

Example 3

To prevent queues from increasing/decreasing the counter wrongly, the SBPSUSCNT sensors should be placed in the center of the ramp among the floors instead of at the beginning/end. In queue situations, due to slow speed or bumper-to-bumper driving, the sensors might not be able to distinguish one car from another and the counting might not be performed correctly.

Note: should queues be frequent in the areas where the SBPSUSCNT sensors are placed, a single-bay monitoring solution has to be considered by using the SBPSUSLxx sensors.
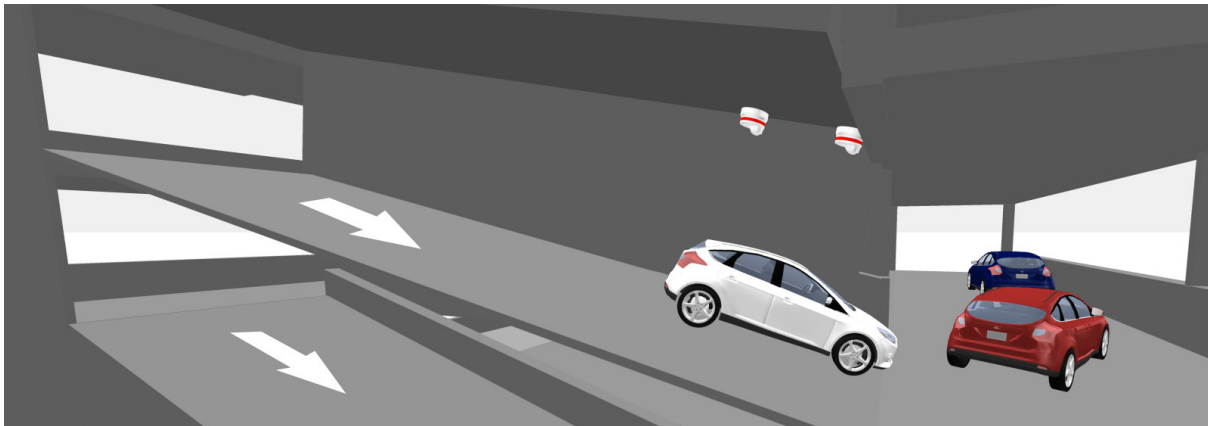
The SBPSUSCNT sensors have been placed at the end of the ramp
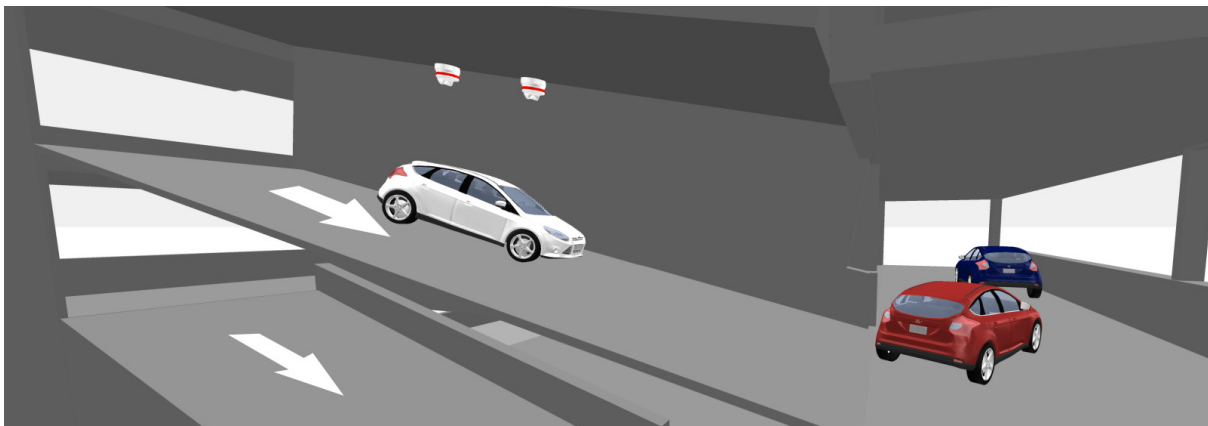
The SBPSUSCNT sensors work properly if placed in the middle of the ramp

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 20 cm (if they are at the same height of the sensor) and they must have a maximum height of 65 cm. (see figure below).
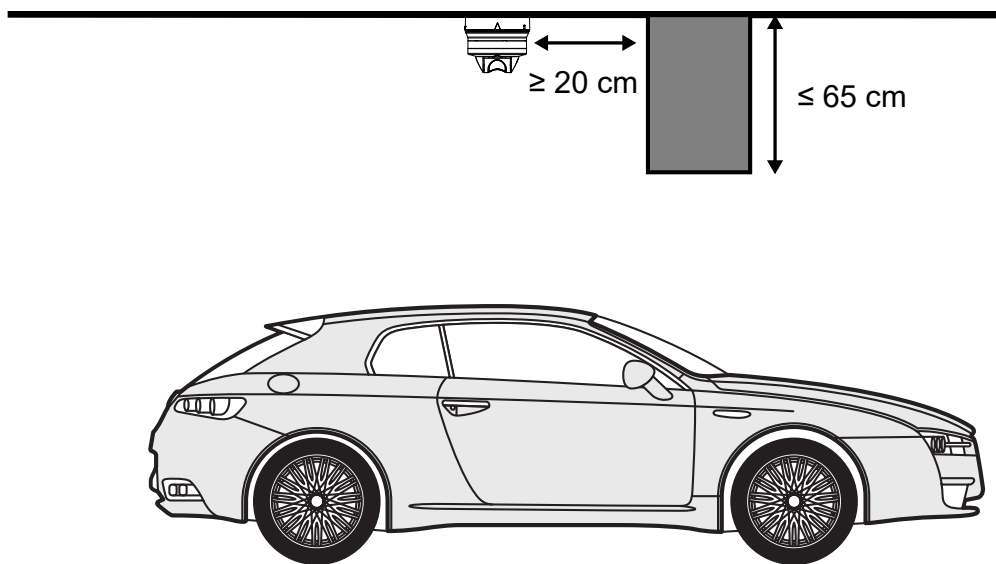

Fig. 4 *The obstacles decrease the detection capability of the sensor*

Example 4

In this example the obstacles (beam and conduit) obstruct the sensor and they are too close (< 20 cm).

The sensor is obstructed by the lateral obstacles

Put the SBPBASEA at least 5 cm below the obstacles

Example 5

If there is an obstacle hiding the sensor (which can not be removed) be sure to place the sensor at least 5 cm below it, by using the SBPBASEA together with a pipe.

The sensor is completly obstructed by the obstacle

❌

The sensor is placed outside the obstacle by using the SBPBASEA and a pipe

✅

▶ 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.

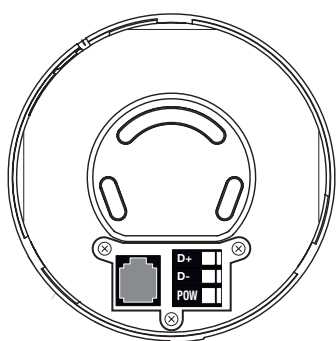Release the sensor by turning it anti-clockwise.
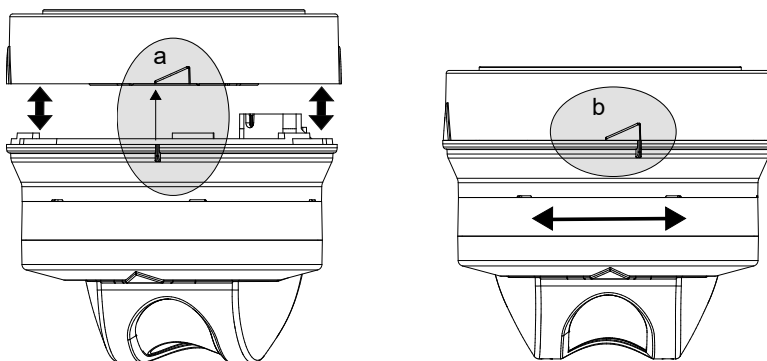

Fig. 5 *Base part: mounted on the ceiling*

Fig. 6 *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.
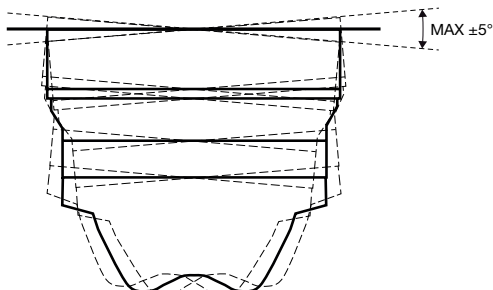See drawing below.

MAX ±5°

Fig. 7 *Maximum ±5° vertical deviation*

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 if a car passes under the sensor and returned to the sensor. The calibration has to be carried out with no cars in transit and any time structural changes are made in the parking facility.
All programming of the sensor is thoroughly described in the UWP 3.0 Carpark software manual: http://productselection.net/searchproduct.php
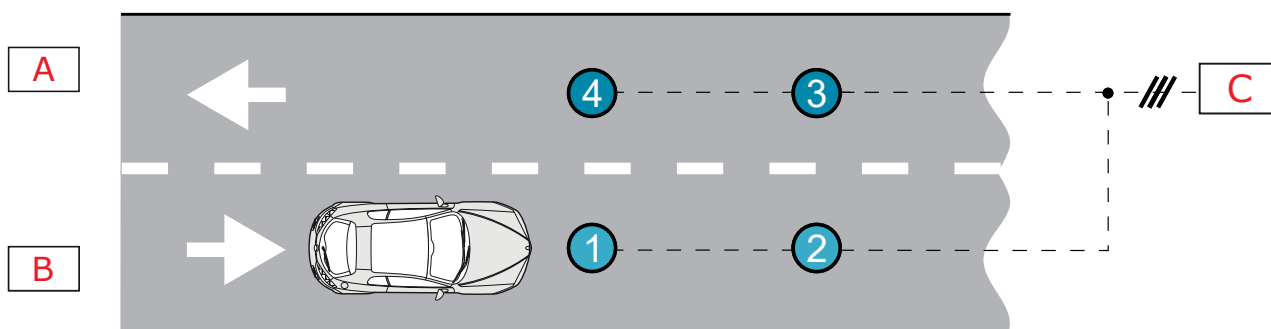

Fig. 8 *A simple parking facility with one entrance and one exit, two sensors are used for each detection point*

A	Exit (sensors 3, 4)	C	Dupline® bus
B	Entrance (sensors 1, 2)		

Sensor status and calibration

Status	Condition	LED status	Note
Normal	Car in transit	Colour for car in transit	By default, the colour is configured to be blue
	No car in transit	Colour for no car in transit	By default, the colour is configured to be OFF
Addressing procedure*	Disabled	Blue/OFF, according to 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

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	http://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 SBPSUSCNT	www.productselection.net/MANUALS/UK/IM_SBPSUSCNT.pdf
Carpark conventional warranty	Additional conventional warranty - Performances and proper functioning	www.gavazziautomation.com

▶ **Order code**

👉 **SBPSUSCNT**

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	
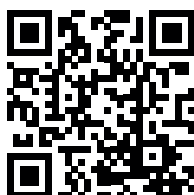
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