

# SBPSUSL



## Carpark Sensor



### Benefits

- **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 SBPSUSL sensor has to be installed in the middle of the parking bay above the car.

The parking bay status is indicated by the built-in high-bright RGB LEDs, clearly visible in a 360° visual angle. If these LEDs are not visible from the lane, the SBPSUSL can be used together with the SBPILED indicator which is installed at the lane side.

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.

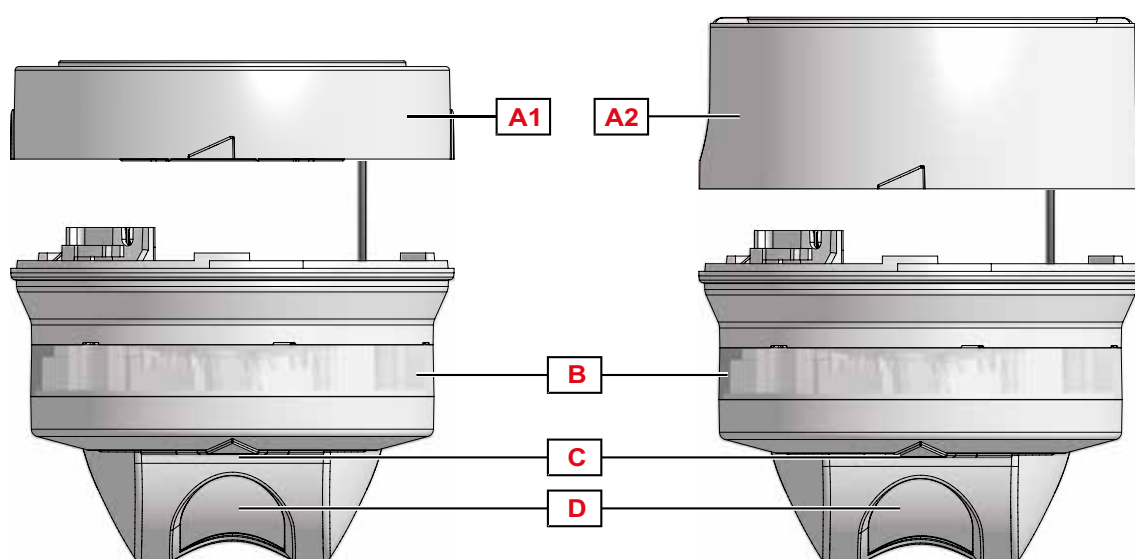
### Applications

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		
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 0 degrees detection angle	This detects the parking bay occupied status by using 40 kHz ultrasonic waves	

# Features

## General

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

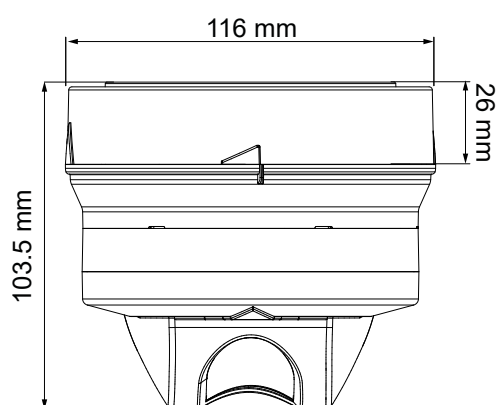


Fig. 1 Rail mounting - base A + Sensor

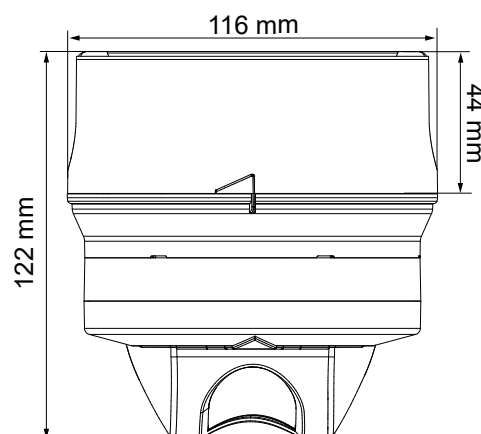


Fig. 2 Ceiling mounting - base B + Sensor

## Environmental

<b>Operating temperature</b>	-40 to 70°C ( -40 to 158°F)
<b>Storage temperature</b>	-40 to 80°C ( -40 to 176°F)
<b>Degree of protection</b>	IP34 The circuit board is treated to be protected against fumes and fine dust. The sensor is protected against water dripping from the ceiling.
<b>Humidity</b>	5-98% Relative humidity
<b>Pollution degree</b>	3 (IEC60664)

## Compatibility and conformity

<b>CE-marking</b>	CE
<b>Approvals</b>	cULus

## 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

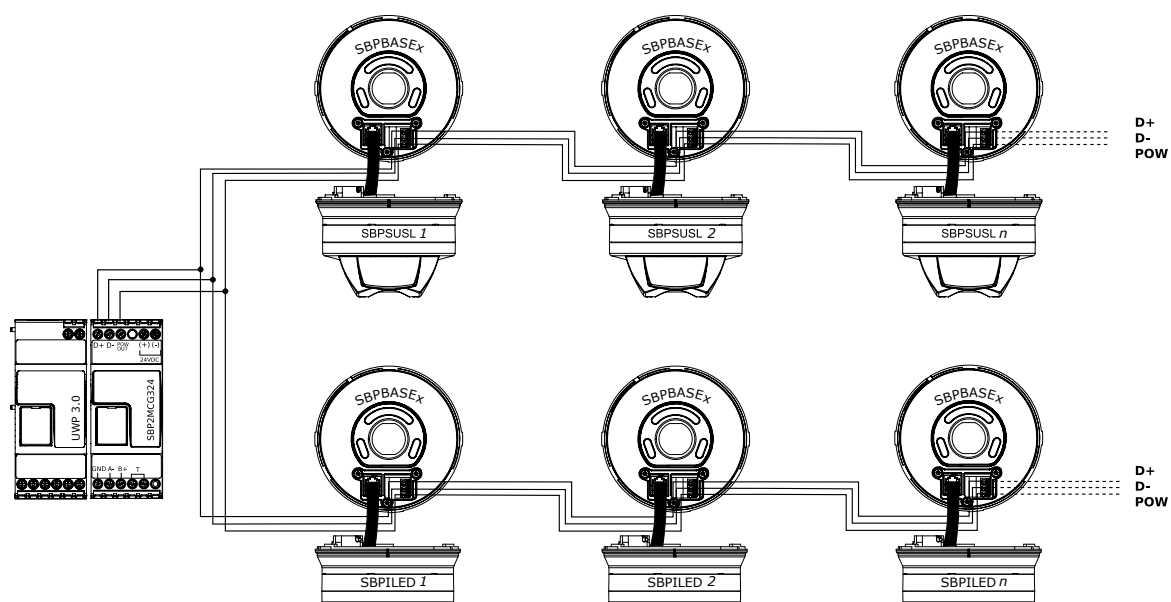
## Sensor

Technology	40 kHz ultrasonic element
Max. distance between sensor and floor	Between 2.0 m and 4.0 m
Vertical mounting deviation	±5 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®
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# Connection Diagrams



## Mode of operation

### Installation

The sensor should be placed in the middle of the parking bay at a height between 2.0 to 4.0 m.

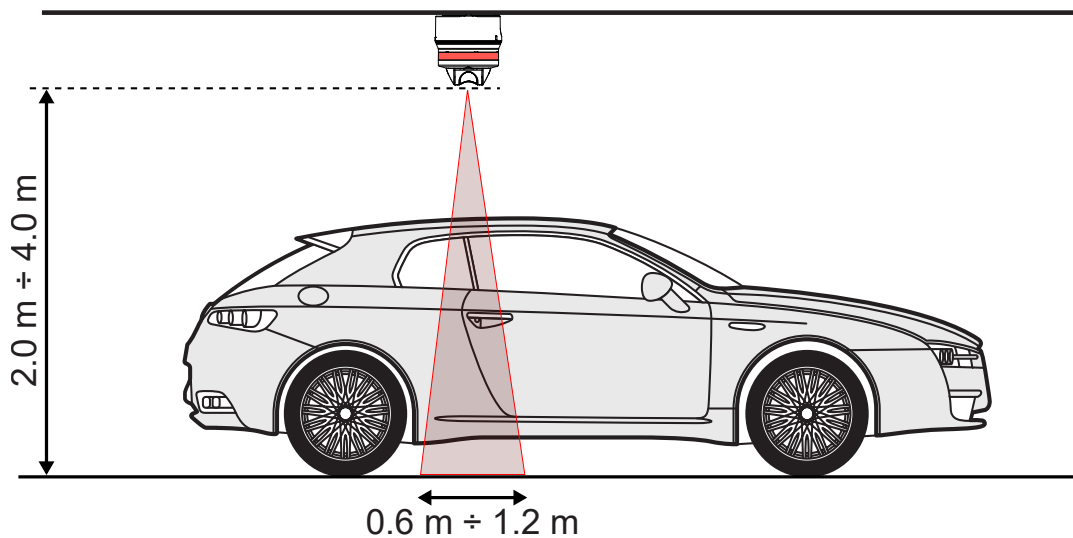


Fig. 3 Sensor height and distance

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

#### Example 1



The sensor is wrongly mounted in the lane



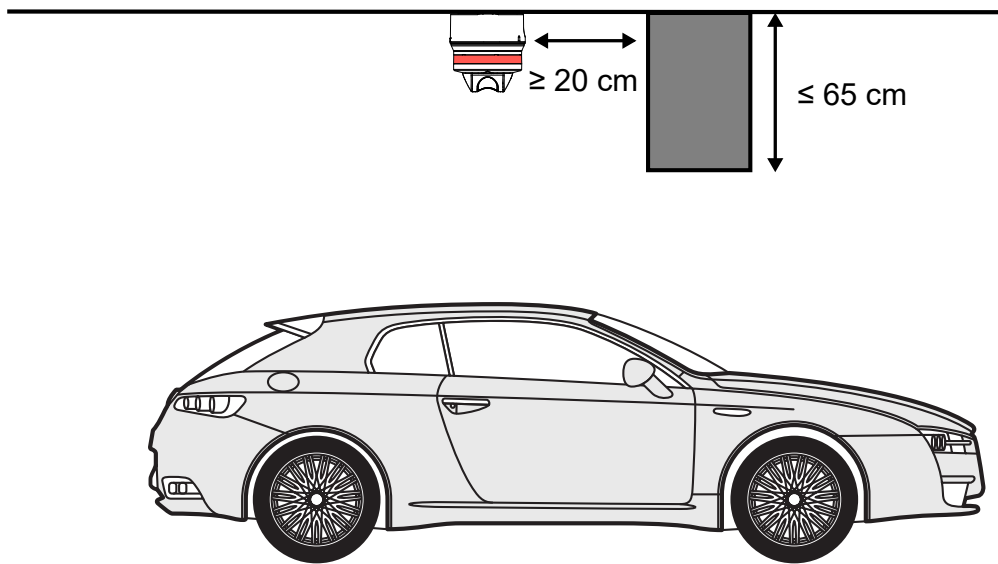
The sensor is properly mounted in the middle of the parking bay above the car



### Obstacles

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

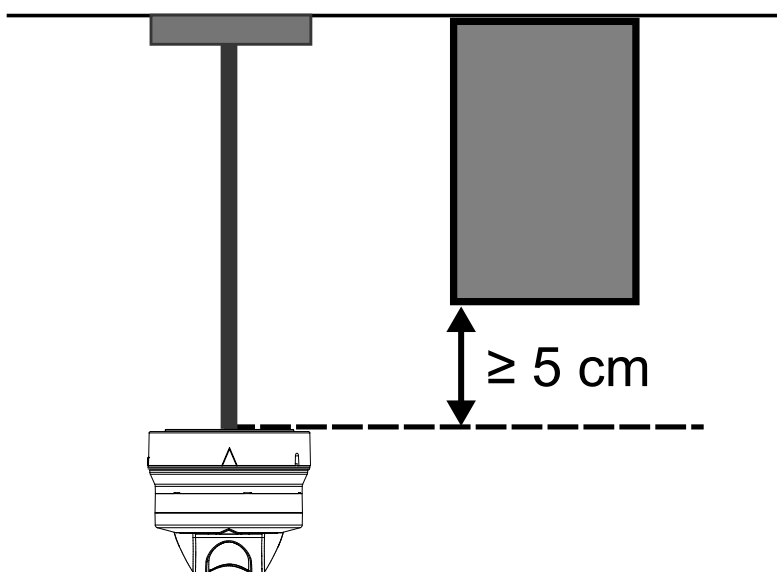
The obstacles on the ceiling (pipes, beams, lamps, fans and ducts) that can obstruct the sensor, must be at a minimum distance of 20 cm (if they are at the same height of the sensor) and they must have a maximum height/thickness of 65 cm. (see figure below).



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

If the distance between the obstacle and the sensor is less than 20 cm, the base of the sensor must be installed at least 5 cm below the obstacle.

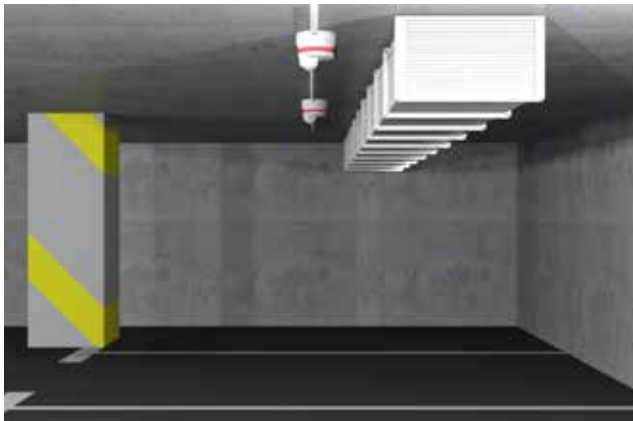
**Note:** The SBPBASEA base has to be used for conduit/pipe mounting



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

**Example 2**

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 3**

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 4**

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 completely obstructed by the obstacle



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



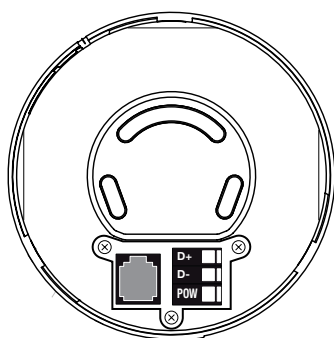
## SBPBASEx mounting

The sensor must be mounted on either base holder SBPBASEA (cable tray or conduit) or base holder SBPBASEB (ceiling mount).

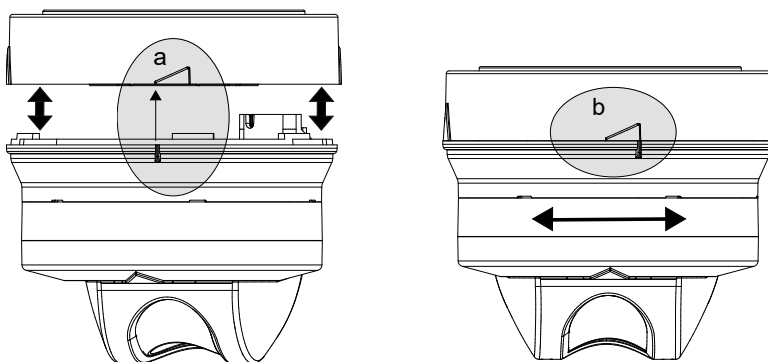
Place the sensor with the vertical mark at the tip of the triangle base.

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.



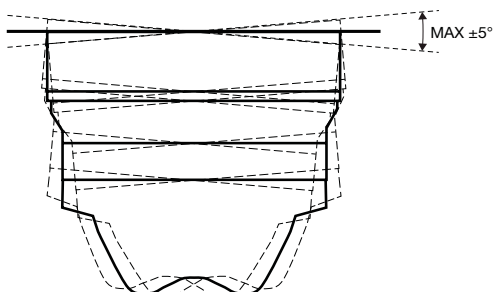
**Fig. 6** Basepart: mounted on the ceiling



**Fig. 7** Mount / Unmount

When mounting the sensor on the ceiling or in a rail, the sensor must be installed at an angle of maximum  $\pm 5^\circ$  degrees deviation from the ceiling surface.

See drawing below.



**Fig. 8** Maximum  $\pm 5^\circ$  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.

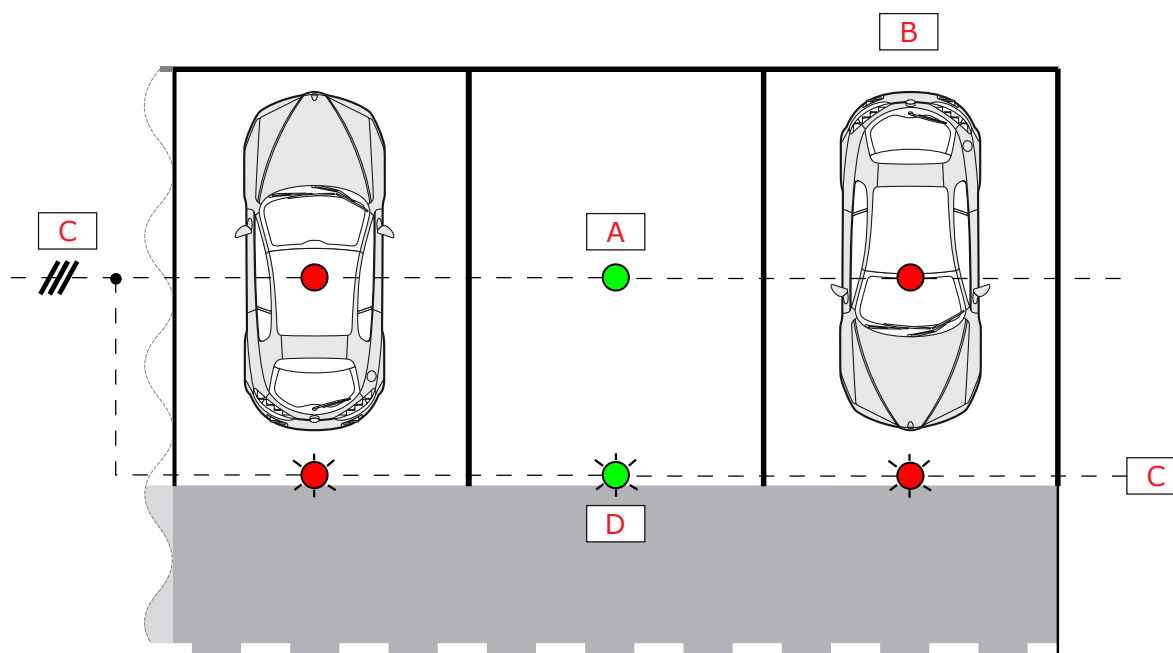
Once this has been done, the user assigns addresses to the sensors connected simply by walking from sensor to sensor and pressing the configuration button on the bottom.

The SBPILED indicators can be configured and associated to one or many SBPSUSL sensors.

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. 9** Sensor installation - SBPSUSL in combination with SBPILED indicators

<b>A</b>	SBPSUSL (sensor)	<b>C</b>	Dupline® bus
<b>B</b>	Parking spaces	<b>D</b>	SBPILED (programmable LED indicator)

## Sensor status and calibration

Status	Condition	LED status	Note
<b>Normal</b>	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
<b>Addressing procedure*</b>	Disabled	Red/green, 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
<b>Remote calibration</b>	In progress	Yellow, fast flash (for 15 sec)	
	Error	Red, normal flash (for 3 s.)	
	OK	Green, normal flash (for 3 s.)	
<b>Local calibration</b>	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.)	
<b>Calibration required</b>		White, fast flash	The sensor needs to be calibrated
<b>Start-up</b>		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

## References

### Further reading

Information	Document	Where to find it
Carpark installation	CP3 manual	<a href="http://www.productselection.net/MANUALS/UK/cp3_manual.pdf">http://www.productselection.net/MANUALS/UK/cp3_manual.pdf</a>
UWP 3.0 installation guide	System manual	<a href="http://www.productselection.net/MANUALS/UK/system_manual.pdf">www.productselection.net/MANUALS/UK/system_manual.pdf</a>
UWP 3.0 software manual	UWP 3.0 tool manual	<a href="http://www.productselection.net/MANUALS/UK/uwp3.0_tool.pdf">www.productselection.net/MANUALS/UK/uwp3.0_tool.pdf</a>
CP3 troubleshooting guide	Troubleshooting guide	<a href="http://www.productselection.net/MANUALS/UK/troubleshooting_guide.pdf">www.productselection.net/MANUALS/UK/troubleshooting_guide.pdf</a>
Installation manual	IM_SBPSUSL	<a href="http://www.productselection.net/MANUALS/UK/IM_SBPSUSL.pdf">www.productselection.net/MANUALS/UK/IM_SBPSUSL.pdf</a>

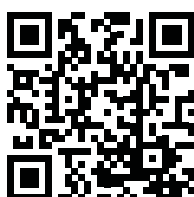
### Order code


**SBPSUSL**

**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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