SBPSUSL45

Dupline® Carpark 3 Sensor

Benefits

- 45-degrees sensor to be mounted along the driving lane pointing at the carpark bay
- 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"
- Programming and test over network by use of a central PC based configuration tool

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 can be changed in daily operation through the Carpark software. Typically, green is used for “vacant”, red is used for “occupied”, blue is used for “disabled” 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 SBP2WEB24 / SBP2CPY24, which keeps 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

- Detection of presence of car in indoor parking space with coloured LED indication of space status.

Features

Power Supply

Nominal supply	20-30 VDC, 27 mA, CL. 2
Consumption	0.78 W
Consumption on the Dupline® bus	1 mA

Input /Output Specifications

RJ12 connector	Female: In base Male: With cable in sensor	Internal communication between sensor and base
2 x 3-pin Connector (Only base)	Max. 1.5 mm²	D+
		D-
		POW

Note: The base connectors are using the “push-wire-connection” method. Use a 1.5 mm² single core wire or a stranded wire with ferrules for the sensor installation.

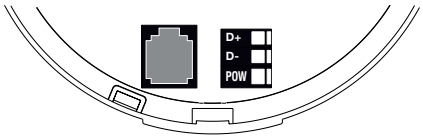


Fig. 1 *Input - Output*

Sensor

Technology	40 KHz ultrasonic element
Max. distance between ceiling and floor	Between 2 m and 2.5 m
Mounting deviation vertical	±5 degree max
Mounting deviation horizontal	±2 degree max
Time response total from sensor to SBP2WEB24	4.0 s
MTBF	70 000 hours
Sensor temperature compensation	The built-in temperature compensation makes the sensor stable and reliable without any calibration

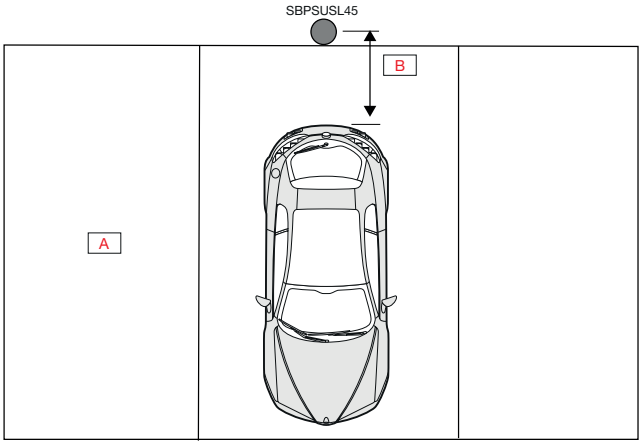


Fig. 2 *Parking bay*

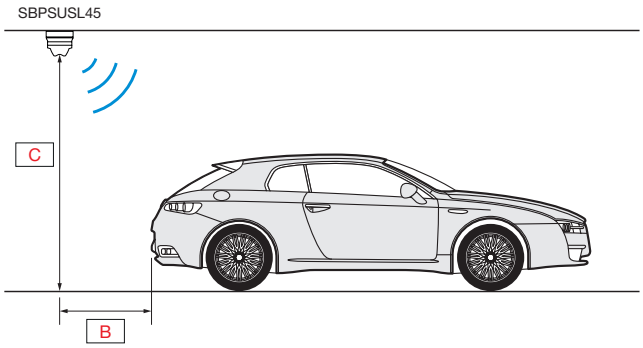


Fig. 3 *Sensor height and distance (See table)*

A	Parking bay	**C**	2 m ... 2.5 m (See table)
B	1.4 m ... 1.8 m (See table)		

To achieve the longest safe detection distance and best LED visibility for the drivers, we recommend to install the sensors at a height of 2.5 m at the parking space entry point, if possible.

Table for combination between sensor height and distance to car

Mounting height of sensor (C)	Safe detection distance (B)
2.0 m	1.4 m
2.1 m	1.5 m
2.2 m	1.55 m
2.3 m	1.6 m
2.4 m	1.7 m
2.5 m	1.8 m

Communication

Protocol	Smart-Dupline®

Environmental

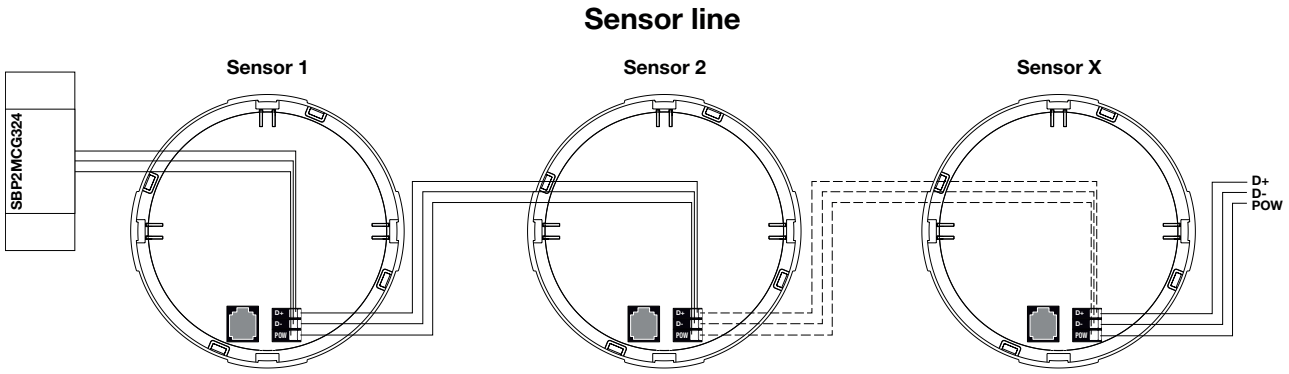
Operating temperature	-40 to 70°C (-40 to 158°F)
Storage temperature	-40 to 80°C (-40 to 176°F)
Degree of protection	IP34
Humidity	5-90% relative humidity
Pollution degree	3 (IEC60664)

Mechanics

Housing

Casing	ABS	
LED protection	Transparent polycarbonate	
Case colour	Light grey	
Dimensions	Base A + Sensor	103.5 x 116 mm
	Base B + Sensor	122 x 116 mm
Weight	Base A + Sensor	275 g
	Base B + Sensor	300 g

Wiring



Note: The wiring of the sensors must always be made with a 1.5 mm² single-core wire, or a stranded wire with ferrules.

Compatibility and conformity

Approvals

CE-marking	CE
Approvals	c UL us

UL notes

- This product is intended to be supplied by a Listed Information Technology Equipment AC Adaptor marked NEC Class 2 or LPS
- Max ambient temperature: 50°C (122°F)

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 central SBP2WEB24 PC based configuration tool 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 in the bottom.
Please refer to the design- and installation manual for further details about configuration.

Mode of operation

The ultrasonic sensor emits an acoustic 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 sensor is to be mounted at the entry to the parking space, pointing towards the parking space, at a max height from the floor of 2.5 m and minimum 2 m. It is important to mount the sensor close to the beginning of the parking space to increase the accuracy of the detection of the car. The table (Table for combination between sensor height and distance to car) shows the mounting height and the safe detection distance. It is important to follow these installation instructions to obtain the best performance of the PGS. If, for instance, the sensor is mounted at a height of 2.5 m, and the car is parked further than 1.8 m away (see Table for combination between sensor height and distance to car), the detection becomes inaccurate.
To provide the best measuring result, the sensor must follow the recommended installation distances in all circumstances.
See the drawings of the particular sensor installations below.
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 selected angle (vertically) and a ± 2-degrees' horizontal deviation to accomplish a safe and reliable signal from the sensor.
See drawing below.
The SBPSUSL45 has built-in high-bright RGB LEDs with up to 8 different colours.
The LED indication is visible in a 360° visual angle.
All programming of the sensor is thoroughly described in the SBP2WEB24 software manual: http://productselection.net/searchproduct.php

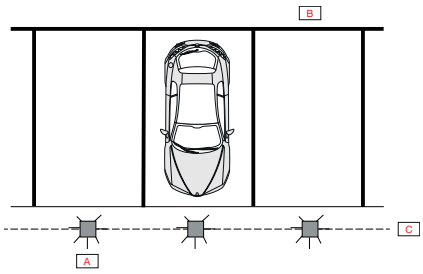


Fig. 4 *Sensor installation*

A	Sensor with LED	**C**	Dupline® bus
B	Parking spaces		

Mounting

The sensor must be mounted on either base holder A (cable tray or conduit) or base holder B (ceiling mount). Place the sensor with the vertical mark at the tip of the base's triangle.
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 pressing a screwdriver into the vertical slot on the base and turn the sensor anti-clockwise.
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 selected angle (vertically) and a ± 2-degrees' horizontal deviation to accomplish a

safe and reliable signal from the sensor.
See drawing below.

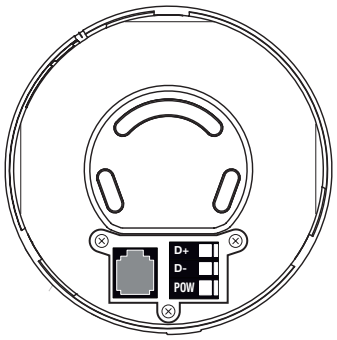


Fig. 5 *Basepart: mounted on the ceiling*

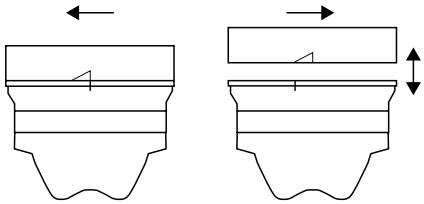


Fig. 6 *Open/close*

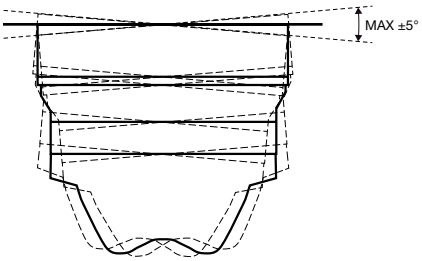


Fig. 7 *Maximum ±5° vertical deviation*

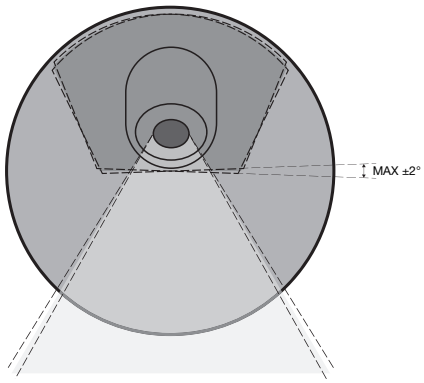
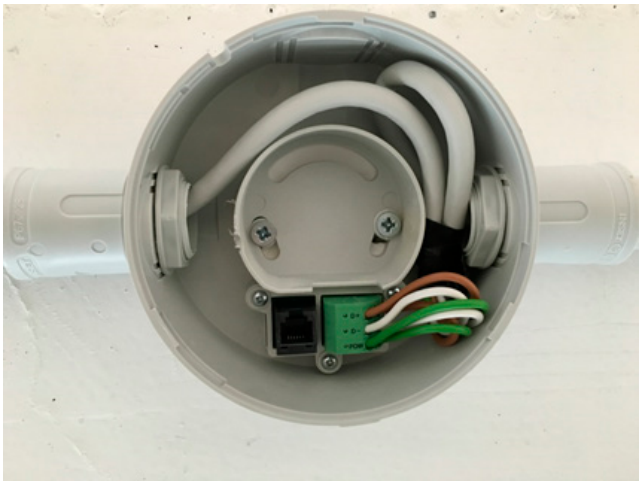


Fig. 8 *Maximum ±2° horizontal deviation. Bottom view*

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 on the cable isolation. See picture.



Place the wire around the inner part of the base to avoid damage of the isolation of the cable.

Sensor status and calibration

Status	Condition	LED status	Note
Normal	Occupied	Colour number OCC	By default, colour number 0 is selected, and it is configured to be red
	Vacant	Colour number VAC	By default, colour number 1 is selected, and it is configured to be green
Line procedure*	Disabled	Normal (occ / vac)	Module is not addressed by the line command
	Enable	Yellow normal flash	Module is addressed by the line command and is acknowledging the LINE POSITION
	Accepted	Green fast flash (for 3 sec)	Module is addressed by the line command and has acknowledged the line position number
	Assigned	Green normal flash	Module is addressed by the line command but has already got a valid line position number
Remote calibration	In progress	Yellow fast flash (About 15sec)	
	Error	Red normal flash (3sec)	
	OK	Green normal flash (3sec)	
Local calibration	Start delay	Yellow slow flash (About 15sec)	
	In progress	Yellow fast flash (About 15sec)	
	Error	Red normal flash (3sec)	
	OK	Green normal flash (3sec)	
Start-up	First 3 sec	White	If it is not white, LEDs are damaged

* Line procedure is described in the installation manual.

References

Product selection key

SBPSUSL45

Code	Option	Description
SB	-	Smart Building
P	-	Parking
SUS	-	Sensor
L	-	With built-in LED
45	-	45-degrees angled sensor

Note: The sensor is delivered without a base. Please order base A or B separately.