CARLO GAVAZZI
Automation Components

CARLO GAVAZZI

Parking Guidance System

Fieldbus

Parking Guidance System
A cost-effective solution for carparks

The Dupline® parking guidance system guides you to the right spot.

This new innovative system saves time and reduces stress for drivers by leading them to free parking bays by the shortest possible route. Networked ultrasonic sensors monitor parking bay occupancy, and intelligent displays show the number of free places in the pointing direction, thereby preventing drivers from entering driveways or areas with no free places. The system is completely scalable and can be used within any type and size of indoor parking lot. In spite of the advanced function, the system is surprisingly easy to install and configure.

The users of busy parkings will experience an improved parking service, resulting in a higher perceived value. Precious time is saved, the level of comfort is increased, and furthermore, the stress and emotion created by the search and "fight" for free places is avoided.

Easy configuration and advanced features

Increased productivity
The carpark facility can be utilized more efficiently. Parking bays can be announced free and sold faster, because availability is detected immediately when the car leaves the parking bay.

Reduced operating cost
With the Dupline® parking guidance system, driving can be reduced by 20 %, whereby the amount of exhaust gases decreases correspondingly.
The reduced need for ventilation provides direct savings in energy costs.

Clear indication of free places
The Dupline® parking guidance system is characterized by a very clear indication of the free places. The parking bay indicators and the guidance displays are based on high-bright LEDs making them visible from a distance, and the guidance displays are featuring "moving arrows" attracting the attention of the drivers.

Improved information level
By use of PC software it is possible to graphically monitor the real-time status of the entire parking system from one or several central locations.
Furthermore, all parking events are recorded, thus enabling a powerful statistical analysis of the parking system performance.

Easy handling
Easy design, planning, installation and commissioning are inherent features of the Dupline® bus. In fact, the entire carpark can be programmed and installed without the use of a PC. Addressing, testing and calibration of sensors are performed with simple handheld tools.

### Robust and reliable system
The products are based on Carlo Gavazzi's years of experience with sensing and communication technology within the industrial sector. The patented Dupline® 3-wire bus is a proven network with more than 150,000 installations worldwide.

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Stand-alone solution

One segment of the Dupline® 3-wire bus can link together and supply power for 120 sensors. Each segment can have several monitor modules, which are intelligent devices programmed to monitor a certain range of sensor addresses and calculate the number of free parking bays within that segment. The monitor module is connected to a slave display for indication of direction and number of free parking bays. The monitor modules can be linked together

via an upper level Dupline® 3-wire bus, thereby enabling master monitor modules to add together and display the number of free parking bays from sev-

eral segments. The system operates as a stand-alone solution not depending on a PC. However, it is possible to connect a PC for monitoring and booking purposes.
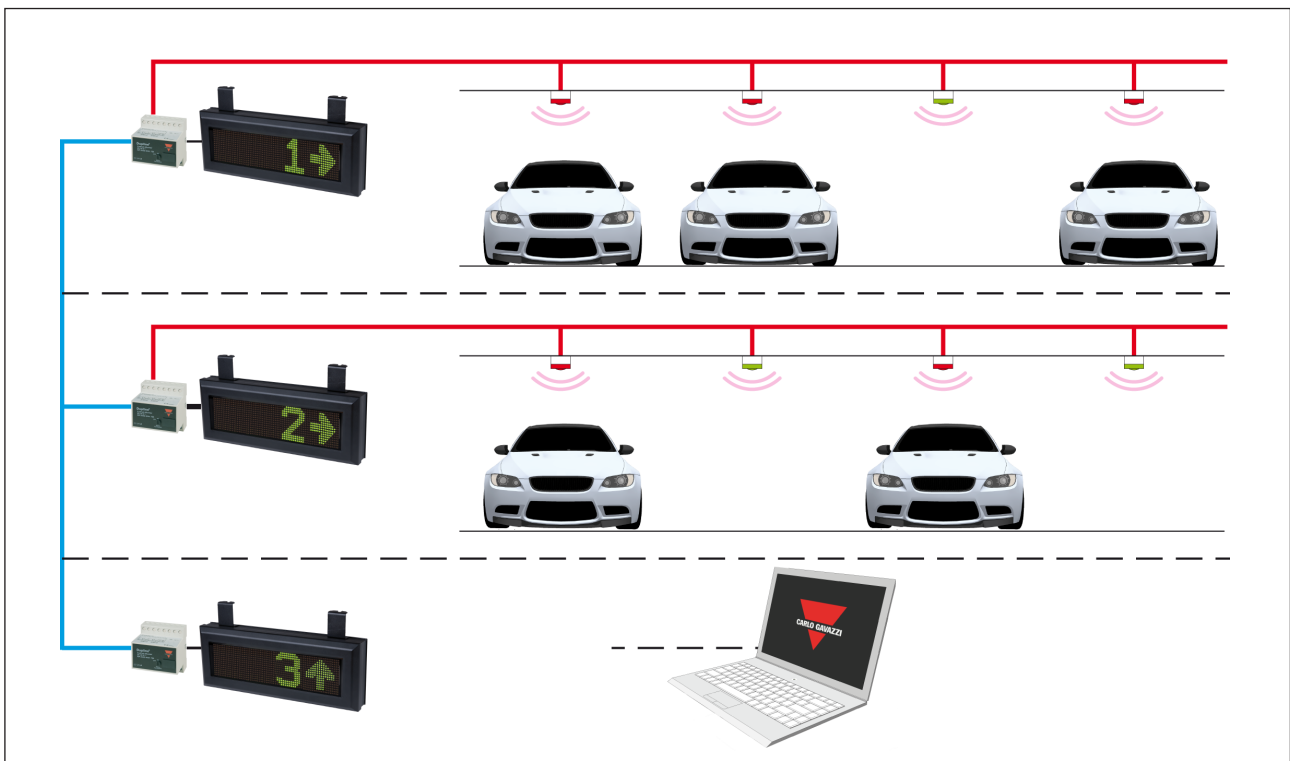
PC software for monitoring and control

With the PC software it is possible to monitor and control the parking system from one or several central locations. Features include monitoring of real-time status based on graphical images and key figures for the various floors and areas, monitoring of alarms, and the possibility to book places in the parking system. In order to provide useful statistical information, all parking
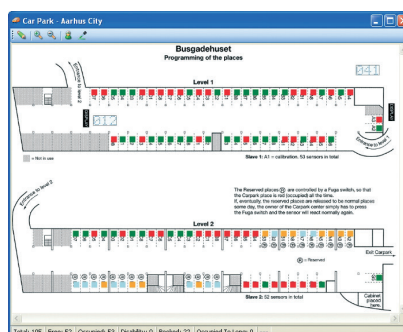
events are stored in a database. Based on this it is possible to obtain historical reports e.g. for occupancy rates, place rotation frequencies, place popularity rates and alarms.

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Car detection with ultrasonic sensor

The ultrasonic sensor for car detection is a key component in the parking guidance system. At regular intervals, the sensor emits an ultrasonic pulse and measures the time delay until the echo pulse is received. If the echo time deviates from the floor echo time measured during calibration, the sensor will assume a car is present. Multiple sensors can be calibrated simultaneuously by issuing a calibration command via the network. The sensor is available with built-in 2-colour or 3-colour LED's for indication of the space status, but in many cases it is a better solution in terms of visibility to use external LED indicators mounted externally along the carpark driving lanes.
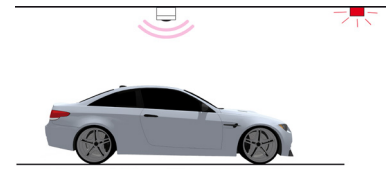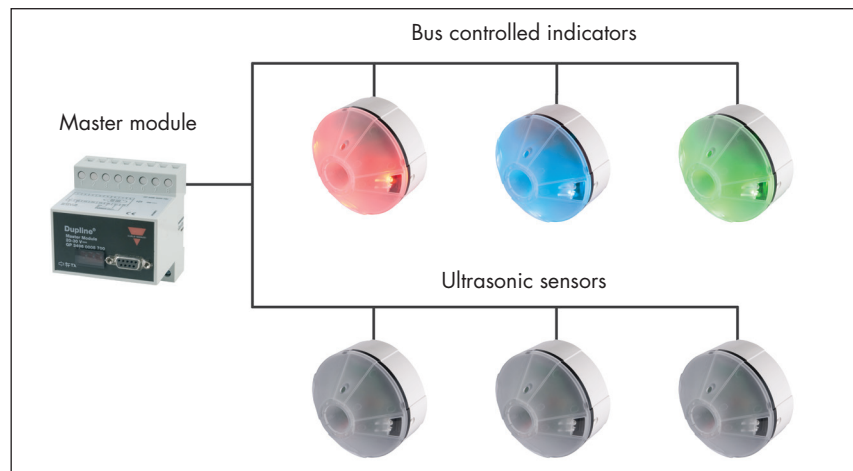

The sensor is equipped with a Dupline® 3-wire bus interface for power supply and communication.
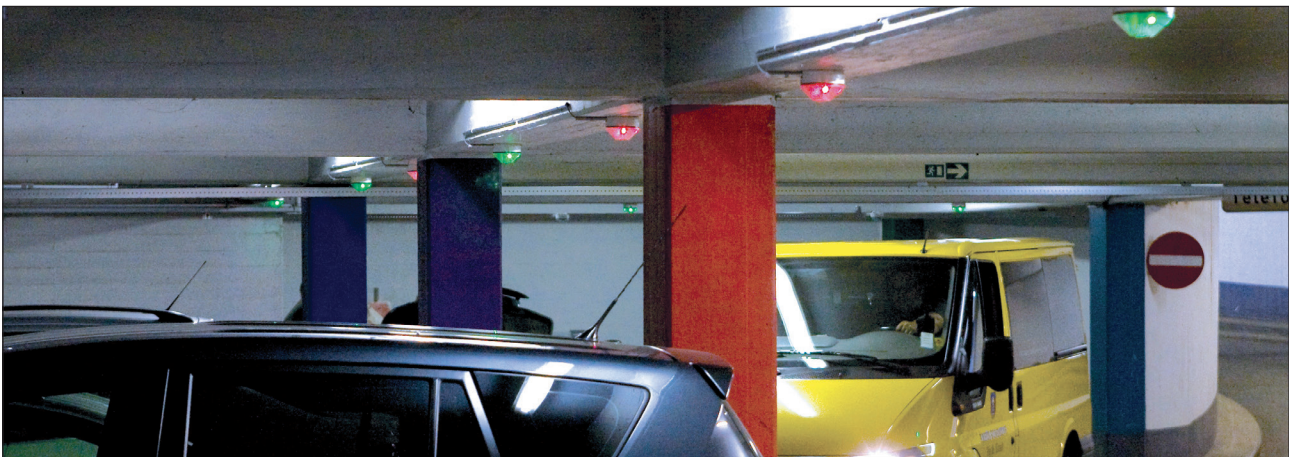
Multi-colour indication

With the external bus-controlled 3-colour LED-indicator it is possible to indicate 4 different states for each space, for example with green for free space, no light for occupied space, red light for exceeding pre-paid time, and amber for booked space. In such cases the colour is typically controlled from a PC software. The installation is faster and easier, even in a 2-colour system, because the bus-controlled indicators can be installed in one long multidrop line, thereby eliminating the need for perpendicular connections to the sensors. Furthermore, it is possible to configure an indicator to monitor multiple parking spaces. If all the selected spaces are occupied, the light will be red, but if one space or more are available, the light will be green. This reduces the amount of indicators in the installation.

Master module
Bus controlled indicators
Ultrasonic sensors

Zone counting *system*

For roof tops and other outdoor parking areas, where ultrasonic sensors cannot be installed, the solution is to implement a zone counting system. This integrates seamlessly with the single spot part to form a combined system. It is also an option to reduce cost by implementing zone counting in the entire carpark, but then the guidance is limited to zone displays with number of available spaces, and accuracy is less. The master zone counter keeps track of the available spaces in each zone and updates the displays accordingly. The entry and exit points of the zones are equipped with sensors, which are typically ultrasonic or loop detectors, but can also be photo-electric. For optimized accuracy, two sensors can be used at each detection point, this allows car direction detection. The sensors are linked to the Master zone counter via the Dupline L_1 3-wire bus. The built-in web-server makes it easy to monitor and adjust the zone count values simply by using the browser of your laptop or smart phone.
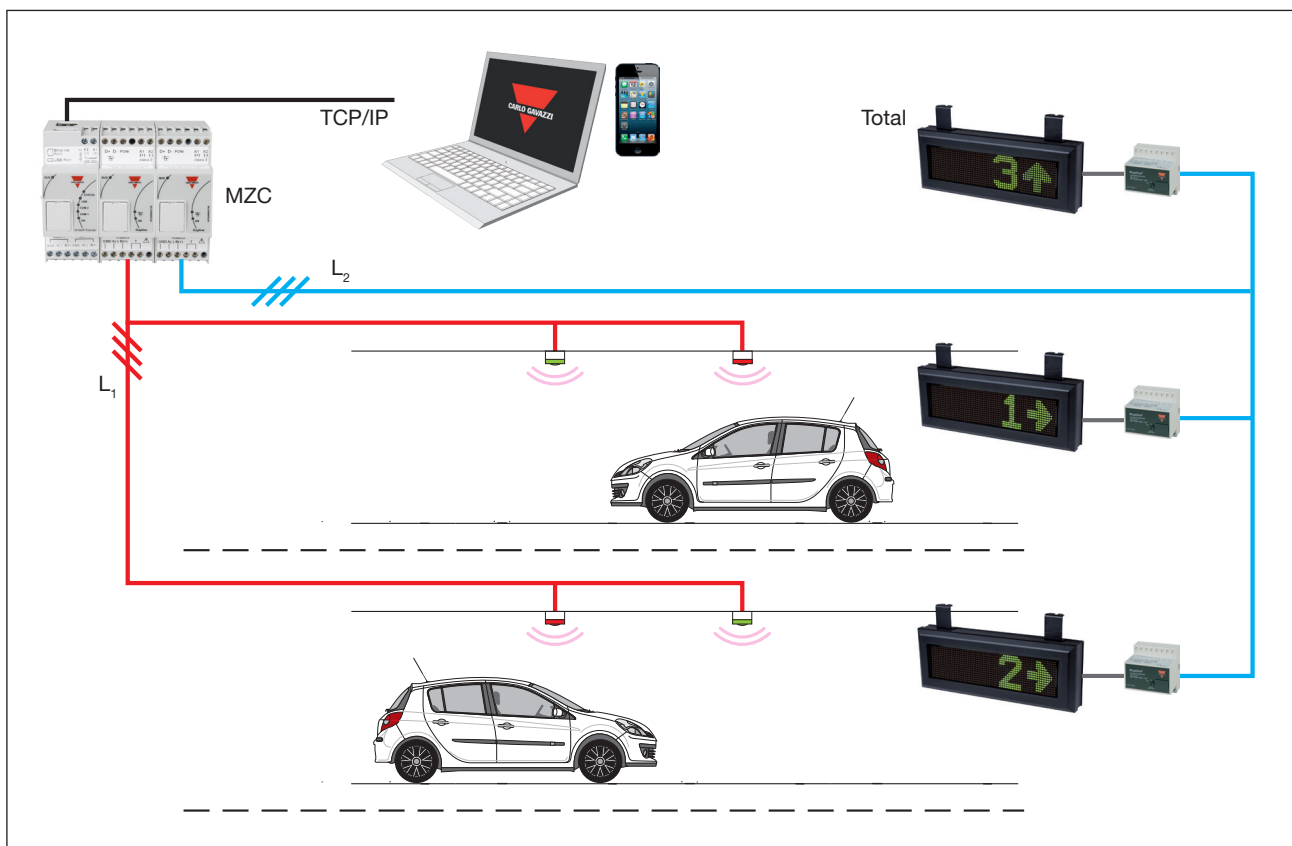
Zone counting combined with handicap *single spot detection*

One of the issues in zone count systems is that they are not able to distinguish between standard and handicap spaces. This makes it impossible to display exact availability information outside the parking facility. However, the Dupline carpark guidance system allows a split system where the handicap spaces, which are usually a limited number, are monitored as a single spot system. This enables the master zone counter to calculate the split between the two types of spaces, and thereby display exact availability information on the signs. An economical way to achieve accurate zone availability data for both standard and handicap spaces.

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Ultrasonic sensor
GP6220xxxx724

- Ultrasonic sensor for detection of cars
- Power and communication via Dupline 3-wire bus
- Option for built-in 2-colour LED indication (red/green , red/blue)
- Option for built-in bus-controlled 3-colour LED indication (red/green/amber, red/green/blue, red/blue/amber)
- Option to use external LED indicator (2-colour or 3-colour)
- Protected against dust and moisture
- cUL approved

2-colour LED indicator
GP6289000x724

- External LED indicator for ultrasonic sensor
- 2-colour LED indication (red/green , red/blue)
- Controlled directly from carpark sensor G62402224724 output
- Low power consumption
- Protected against dust and moisture
- cUL approved

3-colour LED indicator
GP6265230x724

- External 3-colour LED indication (red/green/amber, red/green/blue, red/blue/amber)
- Power and control of colour via Dupline 3-wire bus
- LED colour can be controlled from PC software or Controller
- Protected against dust and moisture
- cUL approved

Dupline master module
GP34960005700

- Driver of power and communication for one bus segment with up to 120 sensors
- Powered from 28 VDC
- Modbus-RTU communication over RS485 / TCP with server running software
- DIN-rail mounting
- cUL approved

Carpark monitor
GP34829091724

- Programmable device for monitoring of several spaces
- Controls carpark displays via RS485 connection
- Slave mode for local segment monitoring, master mode for area monitoring
- DIN-rail mounting
- cUL approved

Test unit
GP73800080

- Portable Configuration and Test Unit
- Configures the Carpark sensors, indicators and monitors
- Option to monitor the status of Dupline® addresses
- LCD-display
- 12-key tactile keyboard
- Supplied by standard 9V battery
- Multi calibration of the carpark sensors

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Count module	Channel generator	Masterzone counter
GP32950030700	**GP32900003700**	**GPMZC-SET**

- Controller in the Dupline® zone counting system
- Micro Linux PC with Ethernet port and Web-server
- Manages up to 3840 parking spaces in multiple zones
- Each zone can have multiple entry and exit points
- Easy configuration, monitoring and count adjustment via web-server
- Mixed systems with zone counting and single space detection possible
- Option to detect the split between handicap and standard spaces occupancy
- Requires 2 pcs GP32900003700 for external bus connection
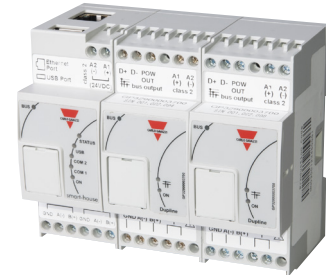
- Channel generator for the Dupline® 3-wire bus in zone count systems
- Provides power supply and communication line for the carpark sensors and monitors
- Connect up to 120 count sensors via Dupline® L$_1$ 3-wire bus
- 24 VDC Power Supply

- Complete set of cabinet modules required for zone counting
- Controller in the Dupline® zone counting system
- Connect up to 120 count sensors via Dupline® L$_1$ 3-wire bus
- Dupline® ultrasonic sensors, loop detectors or photoelectric sensors can be used
- Manages up to 3840 parking spaces in multiple zones
- Each zone can have multiple entry and exit points
- Easy configuration, monitoring and count adjustment via web-server
- Mixed systems with zone counting and single space detection possible

Carpark displays

GP676301XX	GP676301XX	GP676301XX

- Carpark display for guiding the drivers in the right direction with arrows and crosses
- Option to indicate the number of available spaces in the pointed direction
- Indoor and outdoor versions available
- 24 VDC DC-powered

- Carpark display for guiding handicapped drivers in the right direction with arrows and crosses
- Option to indicate the number of available spaces in the pointed direction
- Indoor and outdoor versions available
- 24 VDC DC-powered

- Alpha-numerical carpark display for indication of available spaces
- Typically used outdoor to indicate the status of the entire carpark or a large area
- Indoor and outdoor versions available
- 24 VDC DC-powered

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