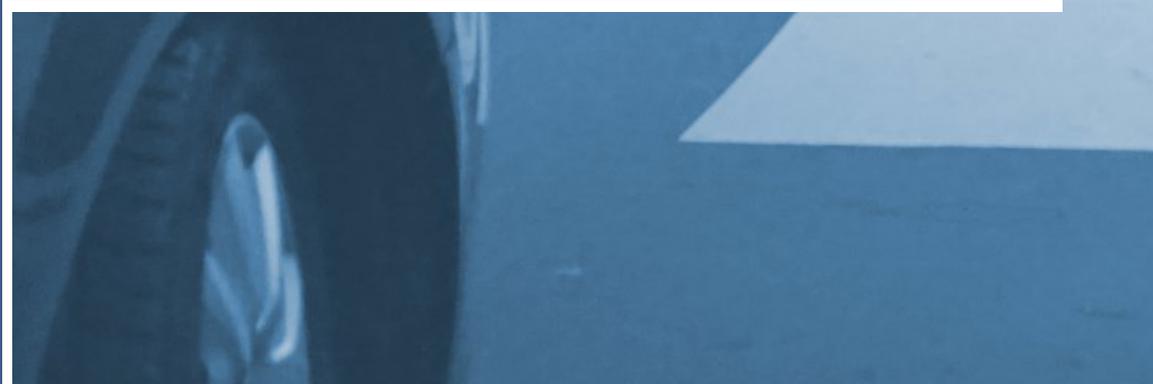




CUR Parking Guidance System

The perfect solution for every car park





CUR Parking Guidance in Weissach / Germany



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What are the advantages of the CUR Parking Guidance System?

A parking guidance system not only saves a lot of time and nerves in finding a free parking space, it also reduces the traffic searching for parking spaces in a car park and therefore reduces the emission of pollutants and noise. The capacity utilization and the acceptance of the car park is increased.

Accurate sizing to the requirements

The CUR parking guidance system has a modular structure. Almost all components of the CUR parking guidance system are equipped with a basic functionality, which can be extended with additional modules according to customer demands. Whether it is an additional indication of the parking space occupancy in the driving lane or a relay output for controlling a traffic light by one of our controllers. The system can precisely match your requirements, regardless of whether you want to monitor 10 or 10,000 parking spaces. The chance of an expensive oversizing is practically eliminated.

Innovative technology

Our development department is continuously working to advance our products. An example: our LED displays. Ultra-bright LEDs are used to assure visibility even in direct sunlight, and not only for front view but in quite every angle around the display. Motorists under an overcast sky or at night are not blinded by the display as it uses a light sensor to dim the LEDs.



**CUR Parking Guidance System at
CentrO, Oberhausen / Germany**

Low installation costs

Time is money. For this reason, great value is placed on a simple and quick installation of our components. For example, spring terminals are used in the sensor to easily loop the cable through, no need for time consuming cable assembly.

Easy integration of customer specific systems

The CUR parking guidance system can be expanded by various input and output modules. The communication protocol is disclosed, providing easy integration of customer specific systems. And if there is no suitable solution available for your problem, we can develop one in collaboration with you.

Everything from one source

Single space or directional sensors, residual space and open / full / closed displays, visualization and control of the entire car park on a PC, everything from a single supplier.

Visualisation & Control

CUR Visual Control Center

The parking guidance software CUR Visual Control Center (VCC) communicates with the components of the parking guidance system and visualizes the operating states and the current parking and traffic situation in an easy-to-use graphical user interface.

VCC provides reservation management, automatic time- or event-controlled intervention in the guidance system and monitoring of the parking facilities and components. By means of statistical analysis you get an exact overview of the current occupancy situation at any time. VCC can also pass on these data to external systems and mobile devices via network. By means of VCC, the communication and behavior of the hardware components can be configured and administered. The software integrates the parking guidance system in an existing IT infrastructure and takes care of the communication with external third-party components.

Keeping an overview

In its graphical user interface, VCC displays access roads, car parks, parking levels and spaces in a layout map of the car park. All parking guidance components, like sensors, signs, residual space displays and traffic lights, are represented by symbols showing the current states and values. Single space sensors are colored according to their current status and the occupancy totals of the parking levels are clearly represented in every map as well. - A quick look is all it takes to realize the parking situation and react to critical traffic situations.

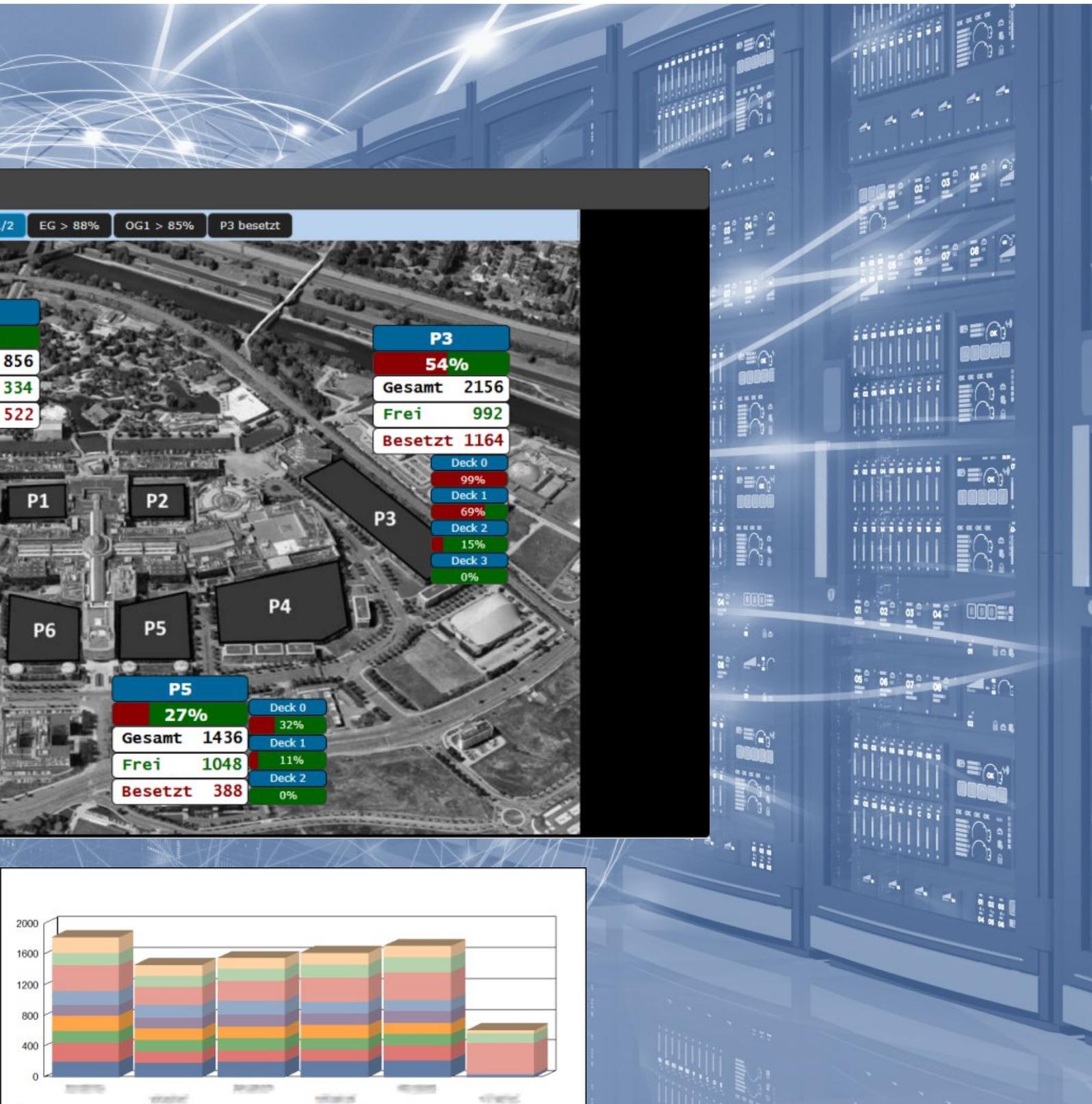


Analyzing trends

VCC permanently stores all state changes of the sensors over the years and generates occupancy reports in tabular form or as diagrams on demand. These reports are a valuable data basis to analyze long-term occupancy trends and usage profiles. – VCC makes the car park a data source for your business strategies.

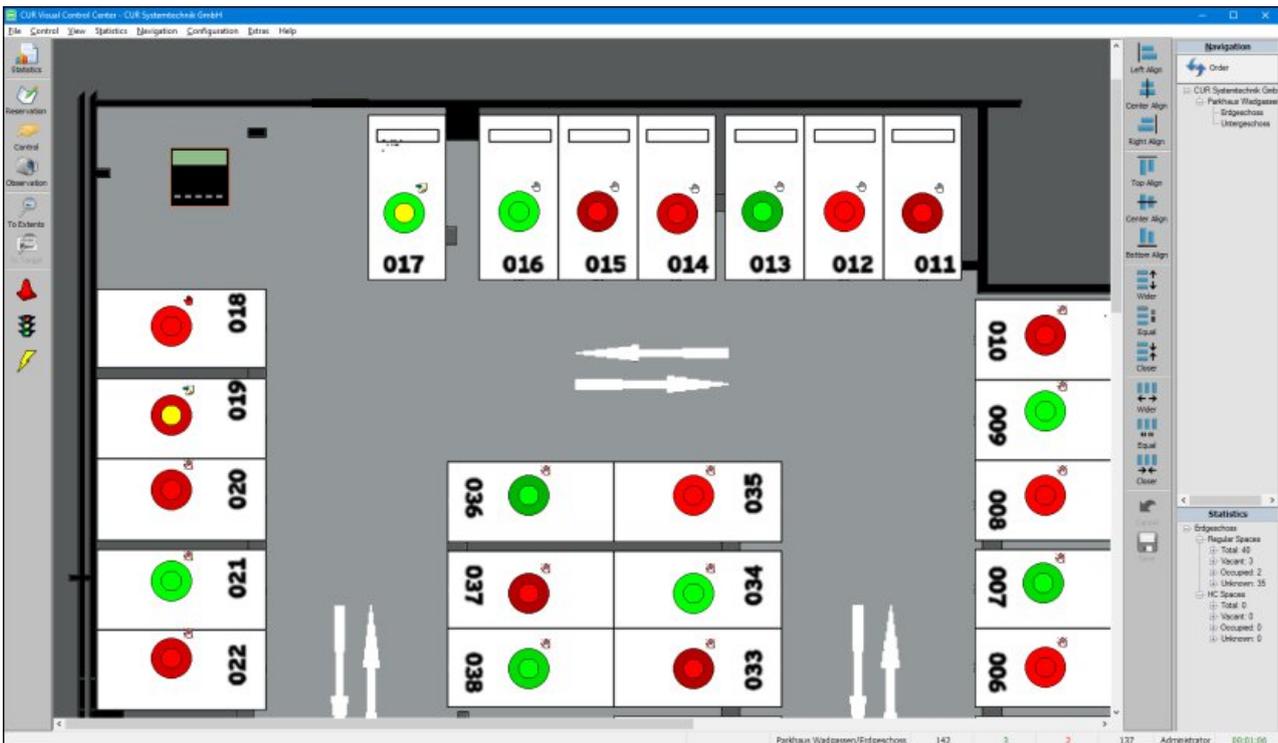
Access via Internet

By means of VCC, the parking guidance system can be monitored, controlled and administered via Internet from anywhere in the world. In order to get access, VCC provides the Windows application VCC Client and the cross-platform browser app VCC Panel. Both can run on pcs and mobile devices and are optimized for administrators (VCC Client) and parking managers in control rooms (VCC Panel). In addition, the VCC web interface allows car park operators to publish the current parking situation in the Internet, whether on a web page or inside a company app. – Informing people made easy.



Getting notified

VCC can send you a notification message if a certain event occurs, for instance, if a parking lot gets vacant or the occupation time exceeds a certain limit. These messages can be configured individually to pop up on the screen or to be sent via email to you. Component malfunctions can also be signaled by pop-ups on the screen. As an alternative, monitoring systems in the network can request and control a list of malfunctioning components. – VCC always keeps you updated.



Controlling the traffic flow

The components of the CUR parking guidance system are working in automatic mode, but in VCC they can be configured and controlled individually. Reservations can be made easily and signs and displays can be changed immediately if necessary. Such interventions can be installed as automatic time-controlled and recurring control events. For instance, all parking guidance components can be switched off automatically over night for saving energy. Operators can establish time schedules, which automatically reserve parking spaces for companies, e.g. on workdays between 8 am and 5 pm, and release them for the rest of the time for public use.

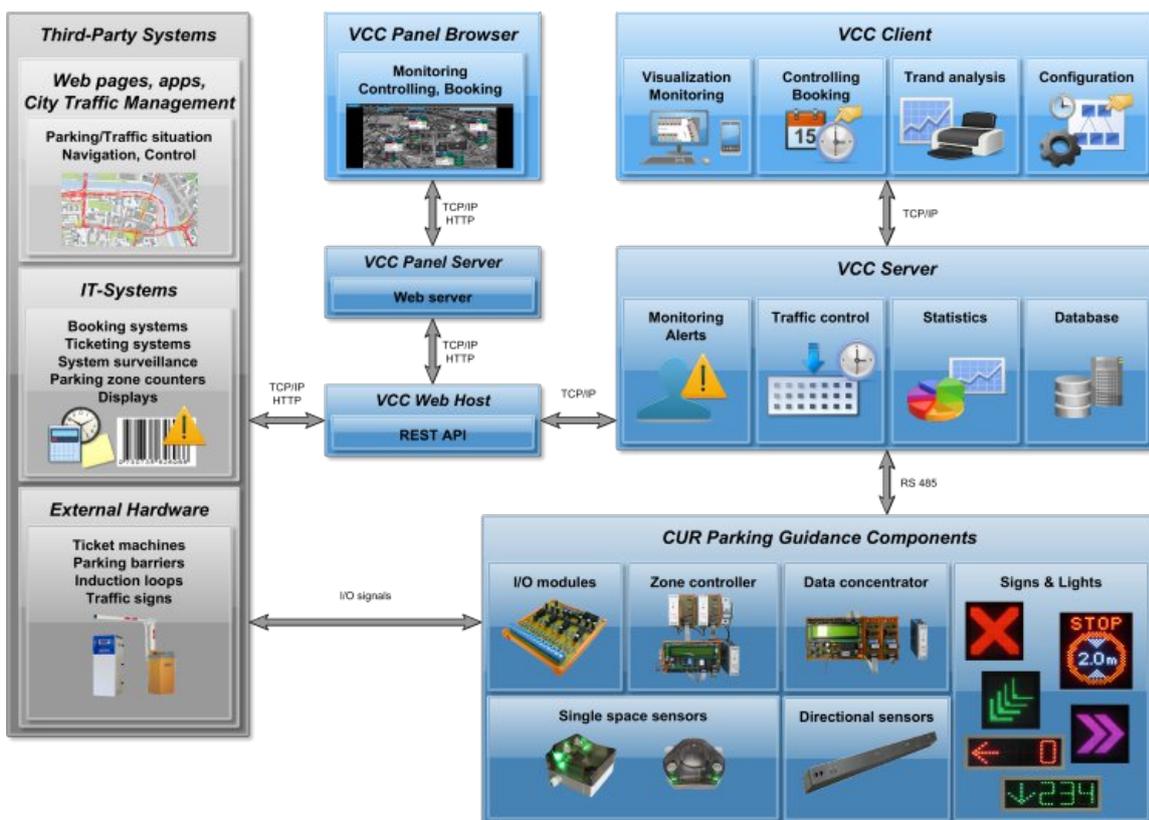
In VCC, the traffic can be controlled automatically by configurable trigger events, based on pre-defined traffic scenarios. For instance, traffic flow detectors recognize the jam at the exits and change the signalization for incoming cars accordingly. If a certain fill level of a parking area has been reached, occupancy detectors can block entrances automatically and redirect drivers to less busy parking areas. Event-triggered control tasks also allow the blocking of unroofed top floors during snowfalls on a mouse-click. – Just let VCC react on the traffic flow and optimize the occupancy density for you.



Easy to integrate and cooperative

By means of the modularity and open interfaces, CUR parking guidance systems can be integrated and adapted to existing IT and hardware infrastructures easily. For example, external signals from barriers or induction loops can invoke individual control tasks in the parking system. By means of its web interface, VCC can exchange data with other

systems and can even be controlled by them. For instance, reservation data can be exchanged with CRM or ticket management systems. And city traffic systems or navigation apps can get the parking situation of car parks and parking areas and even the state of individual parking lots to react accordingly. – VCC takes care of a seamless cooperation.





CUR parking guidance in Weissach / Germany

Single Space Detection

Single space detection is the best solution when it comes to accuracy and comfort. Since it is known that no car park is like the other, there are three different sensor models to deal with special wishes or with specific architectonic properties of your carpark.



High visibility

To get an even better visibility of the sensors, we have one type which can be installed in the lane instead centered above parking space, so it will not get covered by downstand beams and pillars. It is therefore visible from distance in the lane.

Reliable technology

All single space sensors are based on reliable ultrasonic technology, so no maintenance is needed. The sensors are equipped with internal high power LEDs to show the driver the situation of the parking spaces from distance. The colors can be chosen to show all different types of parking lots like handicapped or family spaces. It is possible to implement a third color into the sensors which can be used to show a reserved parking space.

Easy installation

All along the installation costs play a big role for decision makers. Because of the parted housing, the mounting and cabling can be made in advance. Spring terminals make sure that the wiring is fixed fast and safe. With the easy installation and commissioning of the single space system, you will save much time and money.



USS350e Single Space Sensor



USS350d Single Space Sensor





Counting

Single space monitoring or vehicle counting?

The answer to this question depends on several aspects. Essential is the environment of the car parks. The USDS300 directional sensor offers you a wholesome replacement for the conventional induction loop. Especially parking spaces without a roof are profiting from this type of sensor. The mounting of single space sensors can be difficult or impossible in such areas.

Flexibility trough combination

The CUR parking guidance system is able to combine single space monitoring and vehicle counting. The best examples are parking decks, where the top deck has no roof and therefore you will need an alternative to the single space sensors. Here we can monitor the lower decks with our single space sensors and the uncovered areas can be detected by our USDS300 directional sensor.



USDS300 drive through sensor

Counting for every car park

The directional sensor USDS300 has many advantages over common induction loops. Based on the fully developed ultrasonic technology which is also used for the single space detectors, cars are counted depending to their driving direction. Modern car parks are often built in element-based construction, therefore the floor often can't be cut for the induction loops.

Reliable detection

The sensor ignores smaller objects like people and is therefore very accurate. It is equipped with automatic ceiling height detection. Thus, the commissioning can be made very fast. Through its robust stainless steel case the sensor is protected and good looking in the carpark. In order to collect the data, you can easily connect the sensor to our counting controller via RS485 or use the internal potential free counting contacts to evaluate the current status by an existing system. You obtain a reliable and very reasonable product since the detector is maintenance-free.

LED Display

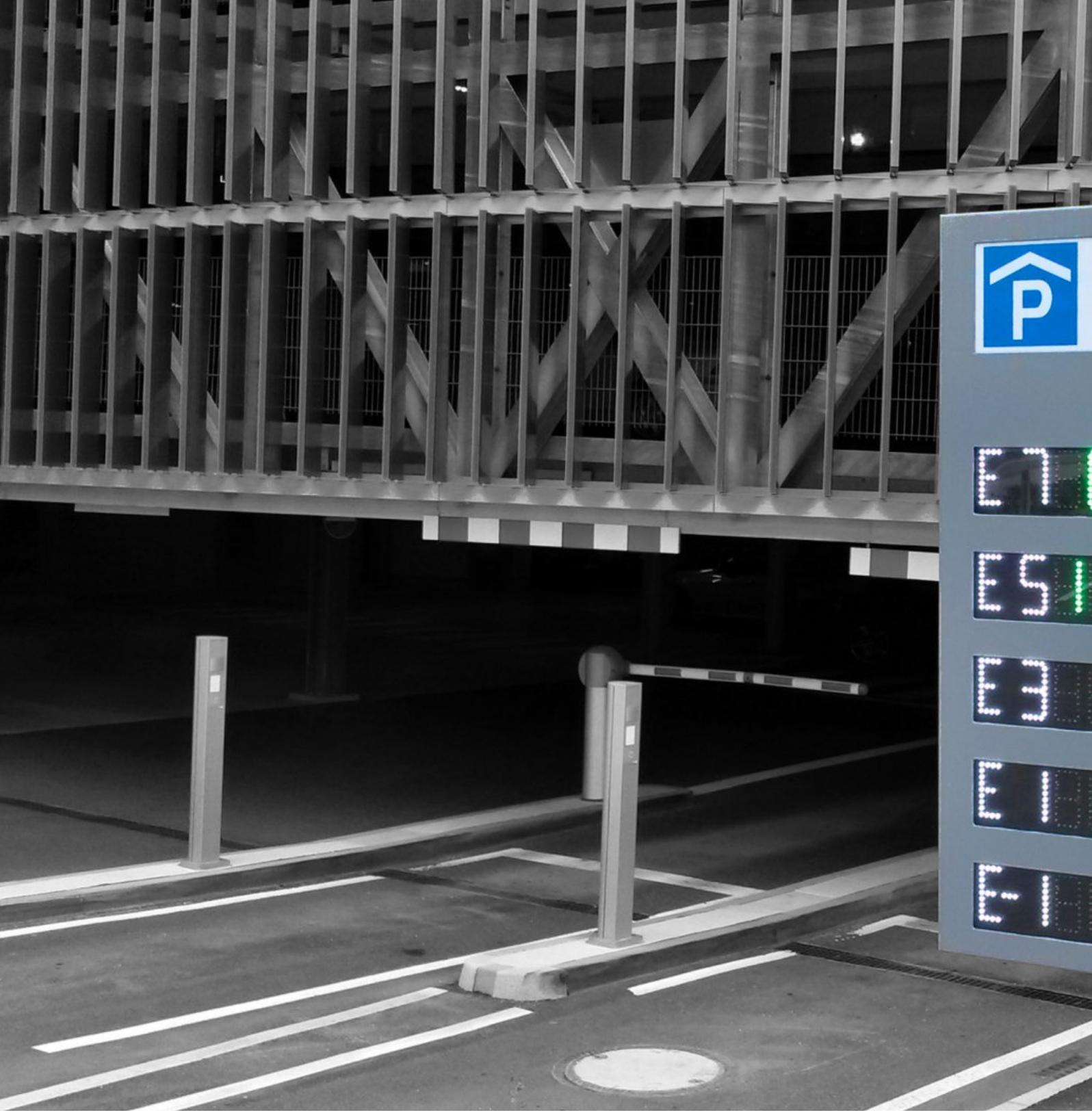


During the search for a parking space, an information board, which shows free spaces, is the best invitation you can give to your customer. These boards inform the driver on the streets and in the garage about parking spaces and how they are able to find them.

Intelligent electronic

No matter which kind of display you need, all of the CUR displays have common properties which make our components to the favorable product. One of those is the implemented automatic brightness control. Problems like unreadable displays caused by very bright sunlight belong to the past. In addition, nobody will be glared in the evening and during the night time. The used LEDs are very durable and guaranty long lifetime. Dependent on the type of display, the control can be done via RS485 bus or with potential free contacts.





Different types for different needs

We offer a big range of displays as residual space and direction arrow displays in different sizes and different cases for indoor and outdoor. For outdoor areas, we can also deliver backlit information signs. You can get every LED sign as module without case, so you can implement it in existing signs or in your own housing.

Individual solutions

You want an individual solution? No problem: from the start CUR developed customer specific displays and other electronic devices. Especially for indoor use we developed a lot of different signs with combined displays and with a new housing.

Parkleitsystem
Parkhaus Bau 68

04
18
0
10
6

E8 134
E6 84
E4 12
E2 0
E0 6

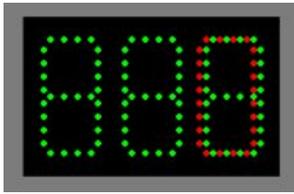
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Information signs

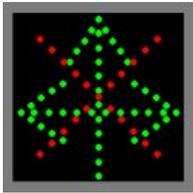
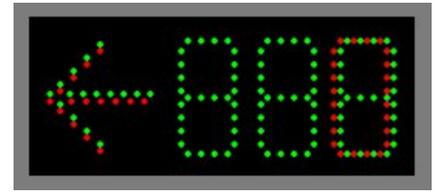
To display the actual parking situation outside of the car park, we can rely on many different information signs. The standard sizes are: 980 x 730 x 140 mm (H x W x D) and 1480 x 980 x 140 mm (H x W x D). The information signs can be built one- or two-sided and can be mounted via to a wall or pole. The homogenous and maintenance-free LED backlight is

an eye catcher and leads to low power consumption. The information signs are based on a modular system. There is almost no limitation in size, individual design or position of LED modules.



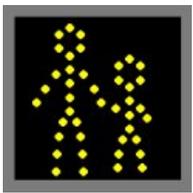
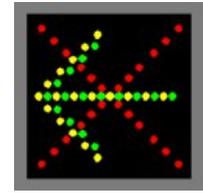
Residual Space Displays

- 1 to 4 digits
- Different digit heights
- Combined with red "0", "XXX" or "Full"
- Combinable with direction arrow



Direction Arrow Displays

- 1- and 3-direction arrow with choosable symbol height
- Combined with red "X" and yellow direction arrow



Symbol Displays

- Most used displays: handicapped, family parking, traffic light and electric vehicle
- Lots of different symbols available



Alternating Text Display

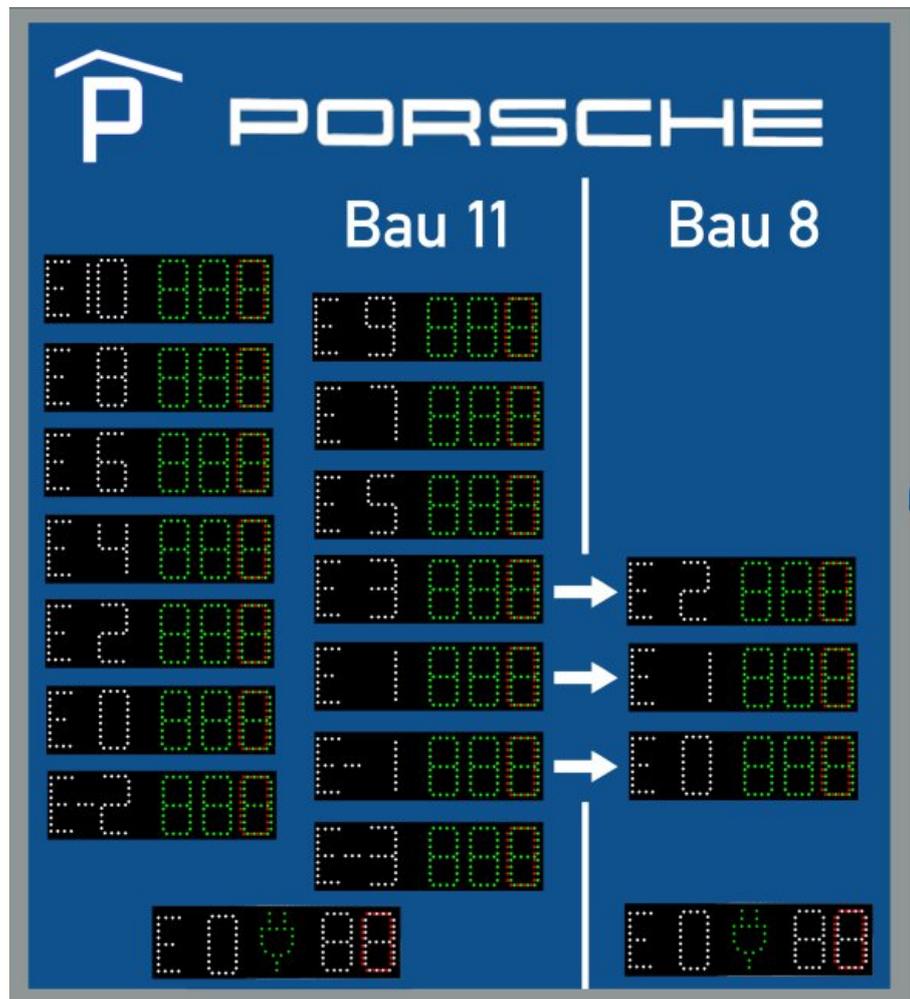
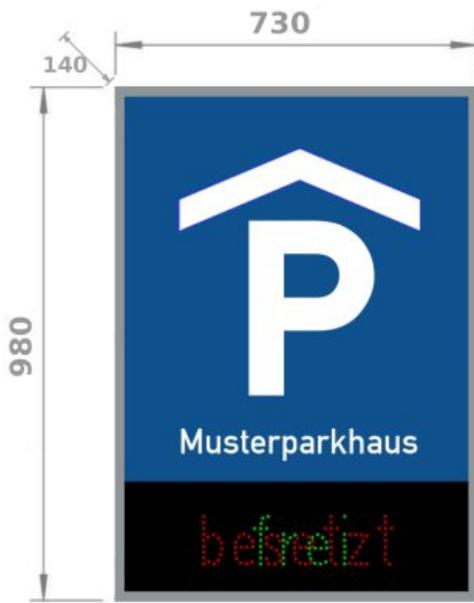
- Available with fixed text or up to three changing texts
- Individual text and heights possible
- Standardized Open/Full signs in different languages



Individual Displays



Information Signs





Case Study

Shopping Center CentrO Oberhausen / Germany

A new parking guidance system brightens visitors' experience at Europe's biggest shopping and leisure center

Offering the best shopping and leisure experience has top priority for the operators of the CentrO mall in Oberhausen, Germany. One important aim is to provide sufficient and easy-to-find parking spaces

close to the stores and recreational facilities. To achieve this, CentrO is using a parking guidance system from CUR Systemtechnik to quickly guide visitors to free parking spaces in the mall's eight car parks.





Deck 1

179↑

Kino ↑
Legoland | Sealife ↑



F1
P3

← 30

← 21



G1 DECK
P3

Managing the volume of visitors

The CentrO is the biggest shopping and leisure center in Europe, with 14,000 free parking spaces used by more than 20 million people a year. To manage the large numbers of visitors, the operators decided in 2016 to install a parking guidance system. Until 2019 the system will cover the whole CentrO area and help drivers navigate by means of displays, signals, colored lights and single-space sensors. This saves time, takes stress away from visitors, helps minimize traffic jams and optimizes occupancy rates of the parking lots.

Guidance by LED signs

The guidance begins on the approach roads to lead the cars to one of the eight car parks. Upon completion, more than 500 LED signs will guide visitors to the nearest available parking spaces.

The LED signs are so bright, that they can even be read in direct sunlight. An automatic brightness control is implemented to dim the displays at night, so they do not blind the drivers.

The multi-digit displays show the exact number of available parking spaces inside and outside the driving lanes in all possible directions. The signalization is intuitive - available parking areas are signalized by green numbers and arrows, complete occupation is indicated by a red zero.

Large-scaled LED matrix displays with variable color symbols are visible easily from afar and redirect the traffic in critical situations to free parking spaces by blinking. In rush hours, these large color symbols help to bypass and disperse the usual traffic jam caused by leaving cars.



Easy administration

The parking guidance software Visual Control Center (VCC) communicates with the parking guidance components and visualizes the current parking situation in a convenient user interface.

VCC provides reservations, automatic time- or event-triggered intervention in the guidance system and monitoring of components. At any time, VCC offers an exact overview about the current occupancy situation. VCC can also pass on these data to other systems or mobile devices. The software integrates the parking guidance system in an existing IT infrastructure and takes care of the communication with external third-party components.



Single space detection for indoor areas

To detect the occupation of parking spaces inside CentrO's car parks, the ultrasonic single space sensors USS350e with integrated signalization are used. The advantages of this type of sensor is the freedom of maintenance, the high detection rate with nearly 100% precision and the bright signalization to highlight available parking spaces from distance. The sensors are installed at the driving lane and measure vehicles using ultrasonic spatial analysis. Because of the good visibility of the sensors and their position at the lane, there is no need for additional space lamps on every parking lot.

Different sensor colors indicate available parking lots for standard parking (green), charging stations for electric vehicles (white) and for special parking of handicapped (blue) or families and women (pink). Occupied or reserved lots are signalized by a red color.

Counting outdoor areas

On the top floor of the car parks, ultrasonic drive-through sensors are used to count cars coming from the lower parking levels. The advantage of using ultrasonic drive-through sensors instead of induction loops is their simple installation on the ceiling above the lane. In most cases, this is the only way to count cars inside a car parking facility, because it is not always allowed to cut into the floor in order to install induction loops. Furthermore, the drive-through sensor USDS300 detects cars based on the direction they are traveling in, which results in higher counting accuracy.

Economic system

The whole parking guidance system is designed to be very energy-efficient. With an average power consumption of less than 1W per sensor and 4W per LED sign, very little energy is needed for the parking guidance system to work. Even the traffic signs of the outer steles and gates are backlit with LEDs to reduce energy and maintenance costs. From an environmental perspective, the electric power consumption of the parking guidance system is compensated many times by the reduced fuel consumption of the parking traffic.

Controlling the traffic

A key feature is that the system can react quickly to critical traffic situations using automatic traffic control. At CentrO, the guidance system uses traffic-flow detectors and monitors parking occupancy rates to control flow. It detects traffic jams inside the parking lots and automatically redirects drivers to less busy parking areas. It also optimizes the occupancy density of parking areas by controlling access depending on fill levels.

All this is done automatically by configurable system tasks in the parking guidance software VCC. These tasks are triggered by traffic and occupancy situations, by predefined time schedules or by manual intervention from parking managers.

To recognize a traffic jam, CUR Systemtechnik developed a new traffic-flow detector that signals the flow status to the monitoring system. Critical

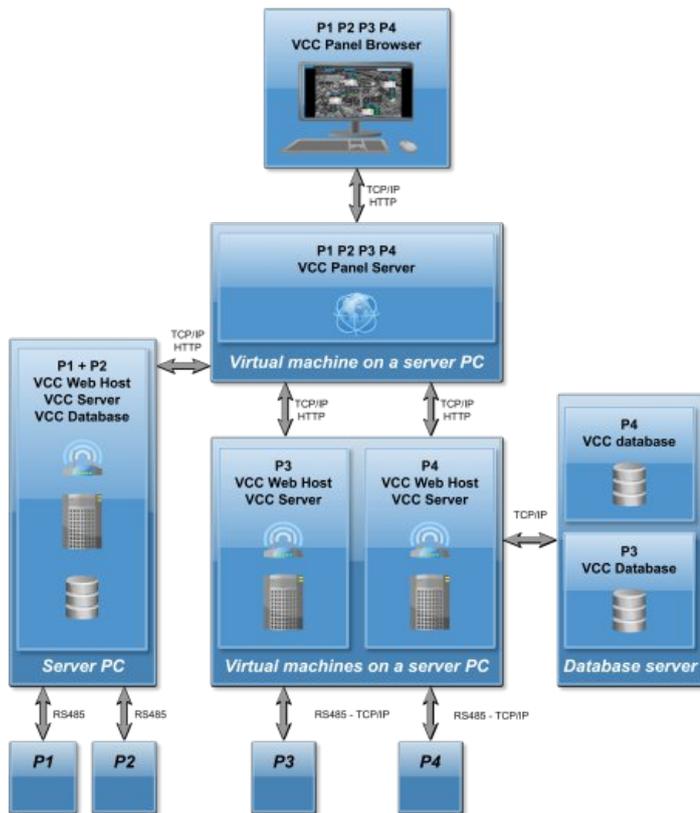
occupancy states in parking areas are quickly recognized in the system software by SmartButtons. They generate alerts if parking areas exceed a certain fill level so that traffic can be redirected. This way, the control tasks are activated automatically to guide the drivers accordingly.



Keeping an overview

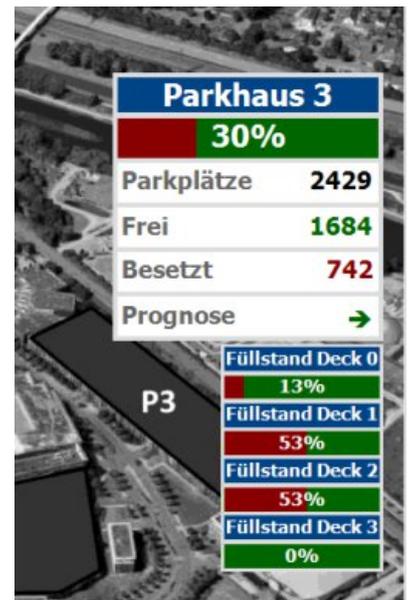
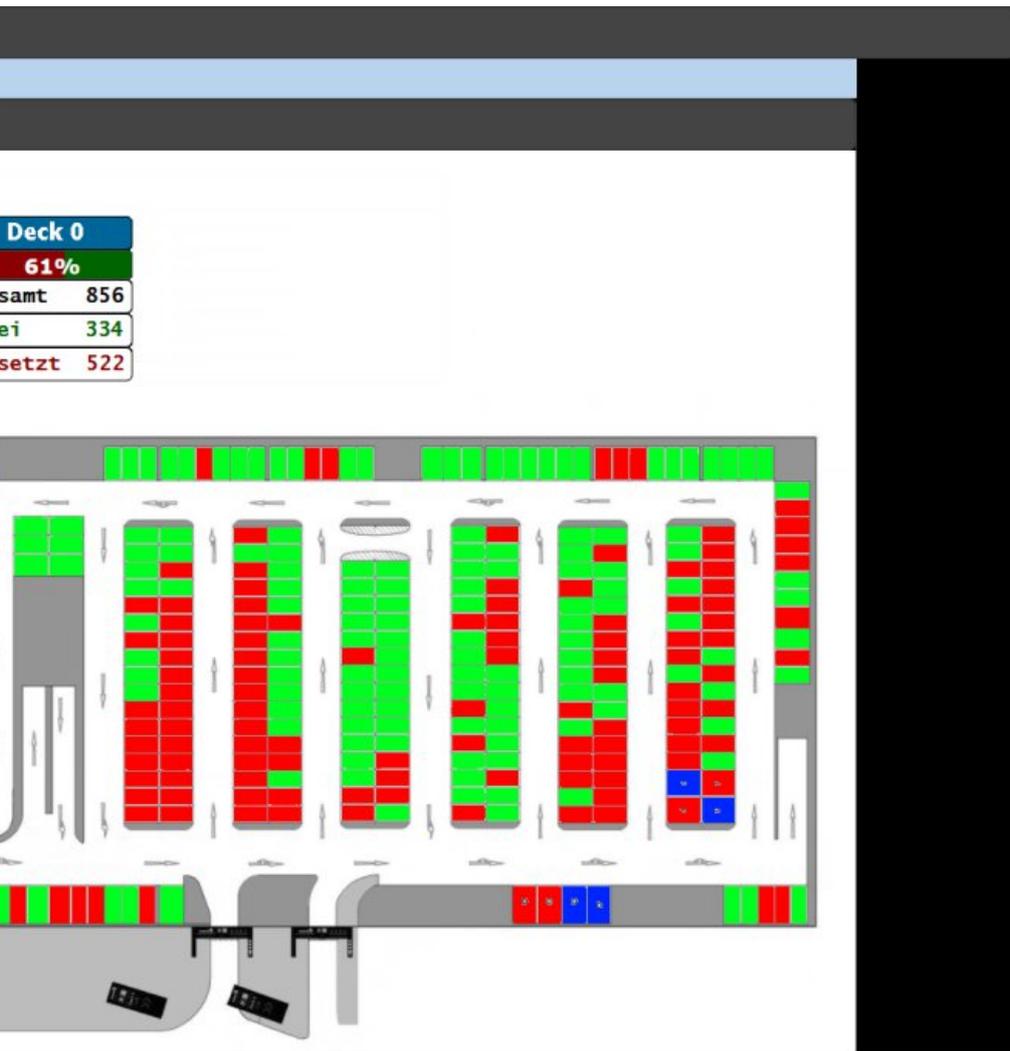
Keeping on top of the situation in eight car parks at rush hour is a challenge for any parking manager in a control room. At CentrO, parking managers are using the software VCC Panel, which combines all VCC servers in one user interface. VCC Panel is a new, cross-platform software from CUR Systemtechnik that needs only a web browser to operate. It can be used on desktop computers, laptops and mobile device, does not need any installation and is implicitly up-to-date after a server update. It provides a graphical interface for viewing the occupancy situation and for managing reservations and the traffic flow in parking lots. It enables the parking manager to quickly control manual and automatic interventions in the traffic flow.





Seamless system integration

For CentrO's operators, a seamless integration of the parking guidance system into their existing IT infrastructure is another very important point. Because of the modular structure of the hardware and software components and the open interfaces of the CUR system, external systems and applications can be adapted and integrated easily. At CentrO the VCC servers and databases are installed and maintained on virtual machines in the central server room. The user interface for administrators (VCC Client) and for parking managers (VCC Panel) can be accessed from everywhere inside the company's network. In addition, the company's web server and the CentrO App have access to the current occupancy data by means of the VCC web interface (REST API).



Unexpected parking experience

For CentrO, using a parking guidance system to direct the stream of visitors goes very well with its slogan 'Unexpected Shopping'. According to this motto, reaching shops and facilities quickly and easily is also the visitor's 'Unexpected Parking' experience and guarantees relaxed customers arriving at the stores.

Recent projects

Germany

CentrO, Oberhausen, Shopping center with several car parks.

Included in delivery: 3540 single space sensors USS350e, 46 zone controller, 12 ultrasonic drive through sensors, 249 indoor combination displays, 34 LED matrix displays, 3 PC with CUR Visual Control Center Software, VCC panel software for easy visualisation and control of all car parks in one combined webinterface

Completion in 2019

Croatia

Arena Centar, Zagreb, Shopping center with 2197 spaces.

Included in delivery: 2197 single space sensors USS350e, 28 zone controllers, 153 indoor combination displays, PC with CUR Visual Control Center Software

Completion in 2018

India

Deloitte, Mumbai, Staff parking with 151 spaces.

Included in delivery: 1900 single space sensors USS350d, 25 zone controllers, 16 residual space displays, 16 traffic lights, CUR Visual Control Center software

Completion in 2019

Austria

Jahnplatz, Feldkirch, underground car park with 151 spaces.

Included delivery: 151 single space sensors USS350e, 2 zone controllers, 2 residual space displays

Completion in 2019

Germany

Rheinauhafen, Cologne, underground car park with 1480 spaces.

Included delivery: 1480 single space sensors USS350e, 21 zone controllers, 50 indoor combination displays, PC with CUR Visual Control Center software

Completion in 2018

Effective February 2019