LOBO
Dynamic parking guidance system
The automotive traffic caused by people searching for a parking place in inner cities amounts to roughly 40 percent of the total traffic in Germany. According to a recent study, every German citizen spends more than 40 hours each year trying to find a suitable parking space. Stressed-out car drivers and more air pollution are the result.

The car of the future will find its own parking space. Simply drop off the car at a transfer point at the destination and let the vehicle find a parking space, perhaps with the use of an app – this vision is within close reach. “Autonomous Parking” is the keyword increasingly drawing the attention of planners responsible for parking and traffic, because this makes it possible to better utilize existing capacity than was previously the case.
With the LOBO dynamic parking guidance system, RTB is equipped to meet future requirements. The system comprises the following components:

- Infrared parking sensor for each parking space
- Multicolored LED for each parking space, alternatively one multicolored LED for two parking spaces
- Camera systems
- Data concentrators
- Entrance displays
- Zone displays
- Numerical displays of remaining parking spaces
- Parking guidance system server with LOBO.control software

The LOBO system is hierarchically structured. At the top, there is the parking guidance system server with the central LOBO.control software from RTB (control level). The basis is formed by the components of the parking guidance system, such as sensors, counting units and route guidance signs. This field level also includes the components, such as induction loops or barriers, which can be controlled by the digital I/Os (DIO). The data concentrators and DIOs act as a link between the server and the components, which relay the information provided via Ethernet. A data concentrator can be assigned to up to 240 field devices.
The infrared sensor of the LOBO system detects, from an angled position at the front, whether a parking space is occupied or not and signals the availability status via the external LED.

Compared to conventional ultrasonic sensors, the main advantage is that infrared light is diffusely reflected by all objects. While ultrasound, for example, doesn’t work when it strikes the sloping surfaces of a vehicle (e.g., a windshield), the infrared sensor also captures these reflections from an angled position. Occupied parking bays are thus reliably recognized.

- Usage as a prepayment counter possible (avoidance of backed-up car congestion)
- Integration into the existing building infrastructure with electrical cable conduits and rail systems
- No interference from adjacent sensors
- Unique CAN address
- Interface: CAN bus and LIN bus for data transfer
- Data storage by a central storage unit and local device memory
In order to make optimum use of the available space in parking garages, innovative technologies – such as a 3D camera – are available. With the help of modulated light, which is emitted by an infrared LED and then reflected by the object to be detected, pixel-accurate depth information is provided. This is made possible by run-time differences of the backscattered light from objects at different distances. With the resulting 3D image, each vehicle can be accurately captured – even if it is in motion.

In addition, the vehicle length and height are recorded precisely and a corresponding parking space is assigned to this vehicle.

- Optimum utilization of existing parking areas
- Depiction of the occupancy situation for noncovered parking lots
- Combination of radar and 3D sensor data possible
The entrance display is installed in front of the parking garage entrance. It can be mounted on a mast, grid or a wall. The display has LED full-matrix modules to show numerical information about the occupancy status in a parking garage. If the entire parking garage is full, for example, either “ooo” or “xxx” will be displayed.

- Connection is made via CAN bus
- Receipt printing according to customer requirements
- Background lighting can be switched on or off
- Suitable for indoors and outdoors

Numerical displays are deployed primarily at strategic points where information about the exact number of available parking spaces is necessary. They are installed at entrances and exits or at intersections to other levels. If there are no parking places available, this can be shown with a green zero, three green zeros or three red crosses. In addition, numeric displays can be integrated into larger signs in order to show the assignment status of individual levels or different parking garages.

- Ceiling and wall mounting possible
- Connection via CAN bus
- Variable number of LED modules and digits
- Numerical full-matrix
- Receipt printing according to customer requirements
- Text and colors can be chosen freely
- Display of remaining parking spaces for the entire parking garage or a specific level
Zone indicators are positioned at decision points. Here, it is not necessary to show the exact number of free parking spaces. The zone displays inform drivers about the availability status with a single display facing in all three directions of travel. Additionally, the display can be used to block lanes or steer the traffic, which is particularly important at the parking garage entrance.

The zone navigation guides the driver to the nearest available parking space. These are equipped with three green arrows (left, straight ahead, right) and a red cross. The red cross is normally used only for “Occupied” or for a locked parking area. Transit areas without available parking spaces are marked by a dark status indicator as “Occupied.”

Dynamic zone displays are used especially as an individual control system. Animated displays can, for example, be used quite specifically to guide electric cars the next available charging station. Especially large or small vehicles or cars for disabled persons or VIPs can be quickly and individually guided to their designated parking spaces this way. Particularly at peak times, dynamic displays provide for controlled vehicle entry and thus prevent backed-up car congestion.
LOBO.control is an online application for managing parking garages that are equipped with single parking space sensors. It offers the following benefits:

- Overview of the occupancy rate of all connected parking garages and levels.
- User-friendly tree structure with a schematic layout of all levels.
- Overview of all parking places and sensors.
- Clear statistical evaluations and user-friendly control of all sensors and displays.
- Easy navigation thanks to clear button icons.

LOBO.control shows the occupancy states of the individual levels, differentiated in color depending on the status, in the respective schematic layouts. Configuration according to specific user groups is also possible. For example, parking for VIPs, disabled persons, families with children, electric cars, etc., can be assigned and correspondingly visually monitored by the color of the LED indicated for the parking space.
Numerous evaluation options are available, both for individual levels and for the entire parking garage:

- **Message**: Compiling of all the feedback signals from the sensors
- **Parking**: Visualization of all parking operations
- **Time monitoring**: Display of all parking operations in the specified time period for which the parking time period was exceeded

In addition, it is possible to implement customer-specific functions in the “Extras” menu; these go beyond the functionalities of the standard application.
The holistic approach stands in the forefront of integration into the parking guidance system. The networking of the RTB systems LOBO and ZORRO offers a complete solution from a single source.

ZORRO is the name of the intelligent charging system that differs significantly from those of other manufacturers’ systems and has now been designed to already meet future technical and legal requirements. Thus, for instance, the individual recharging points are charging-voltage-free in the standby mode and therefore especially safe.

More ZORRO advantages are

- Individual billing of all recharging points via secure interfaces
- Support for all payment systems - whether cash or card payment systems, employee payment systems, salary charging and cost center billing or settlement via charge card provider (e.g., plug surfing), including secure protection of data transmission according to ECC256
- Incorporation of the parking guidance system, parking area monitoring, automated billing and recharging stations in an integrated system
- Simplified dispatching for fleet managers according to energy type, vehicle or priority
- Pre-reservation of parking spaces and recharging stations, as well as the required energy type, via smart phone app or dispatching system
- Fulfillment of the legal calibration requirements
By combining the two systems, parking will be even faster, easier and more comfortable in the future. Thus, for example, the LOBO dynamic parking guidance system already shows parking spaces/charging stations reserved through ZORRO as “red.” Furthermore, the animated display very quickly guides the corresponding vehicle to the reserved parking space.

The advantages are obvious!

For drivers:
- Complete and immediate information about parking availability
- Finding the fastest route to an available parking space
- No traffic jams when searching for a parking space
- Reservation of specific parking spaces

For operators:
- Better utilization
- Usage of difficult-to-find parking spaces through directed guidance
- Guidance of special customers (VIPs, disabled persons, etc.)
- Time monitoring
- Reduction of traffic searching for a parking space/CO2 emissions
- Usage statistics, information and security
Drawing on many years of experience, RTB develops, produces and sells innovative solutions for road traffic. In addition to supplemental equipment for traffic light signal systems, radar and laser systems for speed reduction and BASt-certified traffic data recording systems, our product range also includes parking ticket machines, innovative systems for electromobility and effective parking lot management.

RTB places the greatest emphasis on the user-friendliness, quality and design of its products. We combine this with friendly, responsive and customer-oriented service. In close dialog with our customers, we constantly develop new solutions with a high utility value.