



The number of cars on road is increasing day by day and available parking space is not able to keep that pace, resulting in finding a suitable place in parking. To use the available space more people are employed to manage the parking space effectively. Our parking guidance system provides the right solution to manage parking space intelligently, reducing the man power. It gives a pleasant experience to car driver as he is quickly guided to the nearest parking slot right from the entrance. The Parking Guidance system is fully automatic with fuzzy logic and uses 8 microprocessor at every step and it is fully wireless so that there no wiring hassle reducing the down time.

#### Advantages to Parking Area Management

- Increase in Car Park Capacity -Due to reduction of circulation space
- Increase in slot Utilization - slot in hidden / obscured areas get used
- Reduces Congestion and Improves Traffic Flow - Drivers know where to go
- Vast improvement in the image & ambience of the Car Park
- Faster Turnaround of Cars into the Car Park
- Self Diagnostic Features - Convenient for management.
- Customer Satisfaction - More likely to return
- Statistical Information - Trends can be monitored
- Increased Security within the Car Park
- Increase in Revenue
- Less pollution
- Cost Effective Solution

#### Advantage to Car driver.

- Shorter Waiting Time at Car Park Entrance
- Guided to Nearest Available Parking Space
- No Need to Search, Less Stressful
- Saves Fuel and Reduces Tyre Wear
- Gains Precious Time, More time to Shop or Dine
- Prevent Drivers Fighting over Parking Space
- Car Parking – A pleasant experience for the motorist

#### How it works

Ultrasonic parking guidance system provides visual indication to driver while searching for a vacant parking slot ultrasonic sensor at each slot monitors real-time occupancy and reports by changing color of individual lighted parking indicator. When a car enters a parking lot, available parking slots will be displayed at large counter display, and will guide the driver to nearest empty parking slot. A green light signifies that the space is vacant while a red light indicates that the space is already occupied. The availability information will be accordingly updated on decision point with counter display. No more guess work for the driver as to which parking level has available slots for parking. Parking guidance system consists of various components and depending on number of parking slots and sophistication required components can be chosen.

#### System Components

**Ultrasonic Detector** - This state of the art vehicle detection device uses the latest ultrasonic technology and is widely used in car parking systems. This device is placed right above the parking slot and identifies any vehicle that has entered in the slot. On successful detection, the detector relays information to Parking Light in that particular slot. The Parking light indicates the status of parking bay, empty or full.



**Parking light** – The parking light is mounted outside the parking slot in such manner, that it is visible from entrance to parking lot. The parking light is connected to ultrasonic sensor by a small 3 core wire. It contains bright LED of red and green colors. When the parking slot is empty as detected by ultrasonic sensor, the light turns green and when a car enters in parking slot, the light turns red. Optionally the parking light also has a wireless interface and communicates the slot status to a Zone controller. The parking light is also able to diagnostic fault in ultrasonic detector, pixels of the LED lamp, communication failure etc. These faults are also conveyed to Zone Monitor for easy maintenance and display on PC



RED ON – Parking Slot is occupied.

GREEN ON - Parking Slot is available.

RED FLASHING – Optional

YELLOW FULL ON – Ultrasonic detector or Parking Light or communication failure

ORANGE FLASHING – Optional

**Zone Controller**- The large parking guidance system can be divided in zones for effective management. The zone controller gets the data from each parking lights and keeps the status of all the parking slot in that zone. Every zone controller is connected to multiple parking lamps wirelessly. One zone control unit can accept signal from maximum 200 parking slots from a maximum distance of 200 meters. The zone controller can also drive large display counter, by a RS485 bus, which can be placed at decision making point. Since RS485 bus is used for display counter, multiple counters can be connected to one Zone controller.



**Zone Monitor** – The Zone monitor is similar to Zone Controller, but does not communicate with parking light. It just listens to the traffic between Zone Controller and Parking light and stores the status of all the parking slots in memory. When a request for data comes from computer it sends the complete data for 200 slots to computer. The computer then analyzes this and gives a graphical representation of parking area. The computer can connect to 60 Zone monitors. The data from Zone controller is sent by RS485 bus. The data packet received at computer is as under.



#### **Following Reports can be generated by Computer.**

Current Parking status like occupied, vacant, defective, and time since when parked

Total cars in and out with time during hour, shift, day and month.

Parking slot utilization data with time

Statistical reports

Diagnostic report.

Revenue Reports

Email selected reports to management

**System Configuration** – The parking guidance and management system can be configured using above components. The various configurations are listed as under.

**Basic System** – If the parking lot has less than 200 bays and a low cost system is required, you need an ultrasonic detector and LED lamp. The status of parking bay will be shown on LED lamp which is located outside of parking bay and visible from entire parking area.

**Advance System** – If the parking bay has 200 -1000 bay, then you need ultrasonic detector, wireless LED Lamp and zone controller. This will provide zone wise data on large LED display at a central location.

**Complete System** – If you have more than 1000 bay in car park, then just addition of central zone monitor will provide all the real time data at one location. This data can be taken to PC for graphical representation of parking lot and also various reports can be generated.



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