Split type Ultrasonic Parking Guidance System Proposal

1,Overview

With the modernization of China's cities and the development of internationalization, the number of car ownership of urban residents has increased sharply. The contradiction between cars and parking spaces has become more and more prominent in crowded urban areas. Public parking lots are increasingly unable to meet the growing demand for parking. How to make full use of the limited parking lot resources to meet the parking demand of vehicles to the greatest extent has become an urgent problem to be solved.

The current problems in parking lots are:

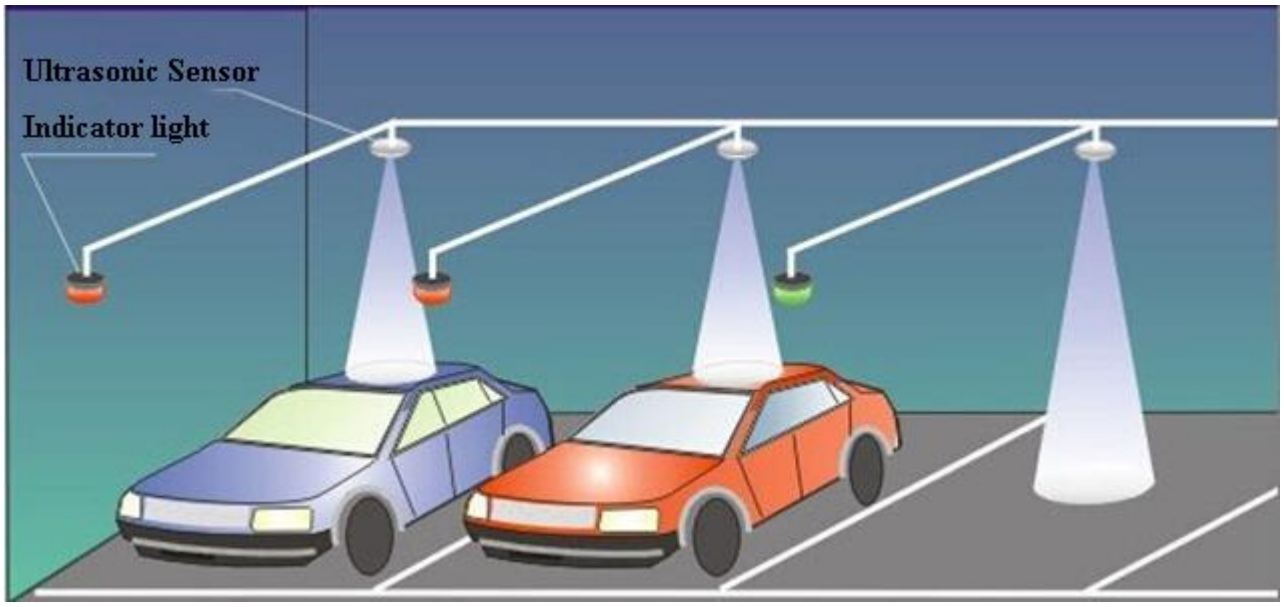
1. There are still many parking spaces available in the field. The manager knows nothing and can only investigate by hand;

2. After the parking lot enters the parking lot, it cannot quickly enter the parking position to park the vehicle. It can only find the empty parking space in the disorderly flow in the field, which not only takes up the resources of the main lane, but also causes traffic congestion inside the venue;

3, must be equipped with a large number of full-time management personnel to manually guide vehicles in the parking lot to increase the cost of parking management;

4. Managers cannot timely calculate the traffic volume in different periods in time, and cannot optimize the allocation of parking space resources in time, resulting in low utilization of parking lots.

In order to improve the informationization and intelligent management level of the parking lot, the car owner is provided with a safer, more comfortable, convenient, fast and open environment to realize the high efficiency, energy saving and environmental protection of the parking lot operation. Technology, combined with the actual situation in the country, developed this parking lot parking space guidance system, used for parking space parking guidance, enhanced information management of parking lots, stable control and management of vehicle access; the system can automatically guide vehicles to quickly enter Empty parking spaces, eliminating the trouble of finding a parking space, saving time and making the parking lot image more perfect; the system can provide parking space reservation, VIP special parking space function, and bring a distinguished experience to the owner.



2,The advantage of using parking space guidance system

1) Improve the parking environment and improve customer satisfaction:

By using the parking space parking guidance system, it is possible to guide the vehicle owner to quickly stop, thereby reducing the residence time of the owner due to finding a parking space.

Thereby, the parking lot turnover rate of the parking lot is increased, and the parking turnover rate is increased by more than 30% compared with that before installation. At the same time, the disputes and unhappiness caused by finding the parking space are reduced, and the satisfaction of the owner of the overall service level of the parking lot is improved.

2) Reduce corporate management costs:

With the development of society, the cost of manpower management will become higher and higher. The parking space guidance system will effectively reduce the management personnel in the parking lot, reduce the management cost of the enterprise, and improve the refined management level of the parking lot. Reasonably allocate parking lot management personnel and be able to know the remaining parking spaces in the field in real time.

3) Energy saving and environmental protection:

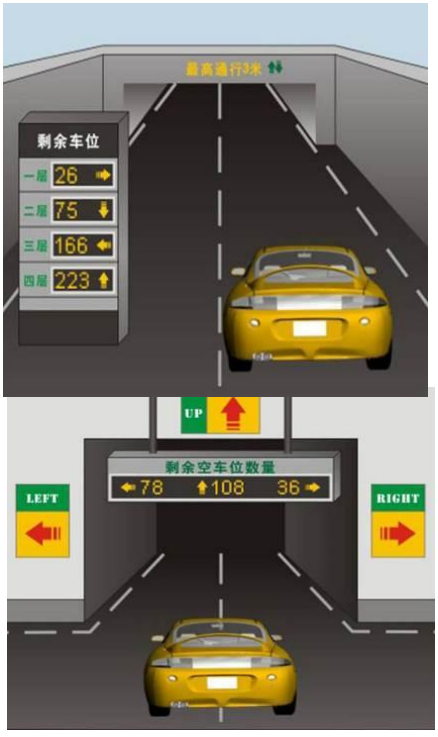
By using the parking lot parking guidance system, the average saving time for finding the parking space is 15 minutes, saving 45% of the mileage of the searched parking space, thereby reducing

The automobile exhaust emissions are in line with the social development trend of low-carbon energy conservation.

4) Enhance corporate image and enhance competitiveness:

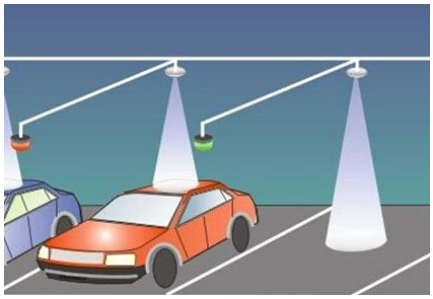
The use of the parking lot parking guidance system not only brings convenience to the parking of the parking lot, but also enhances the corporate image and shows the strong hard power and soft power of the enterprise.

3,Split type ultrasonic parking guidance system process



After the vehicle enters the parking lot, it is located above each fork in the parking space and is equipped with an"indoor parking space guide screen"to display the current number of empty spaces in each area of the branch road.

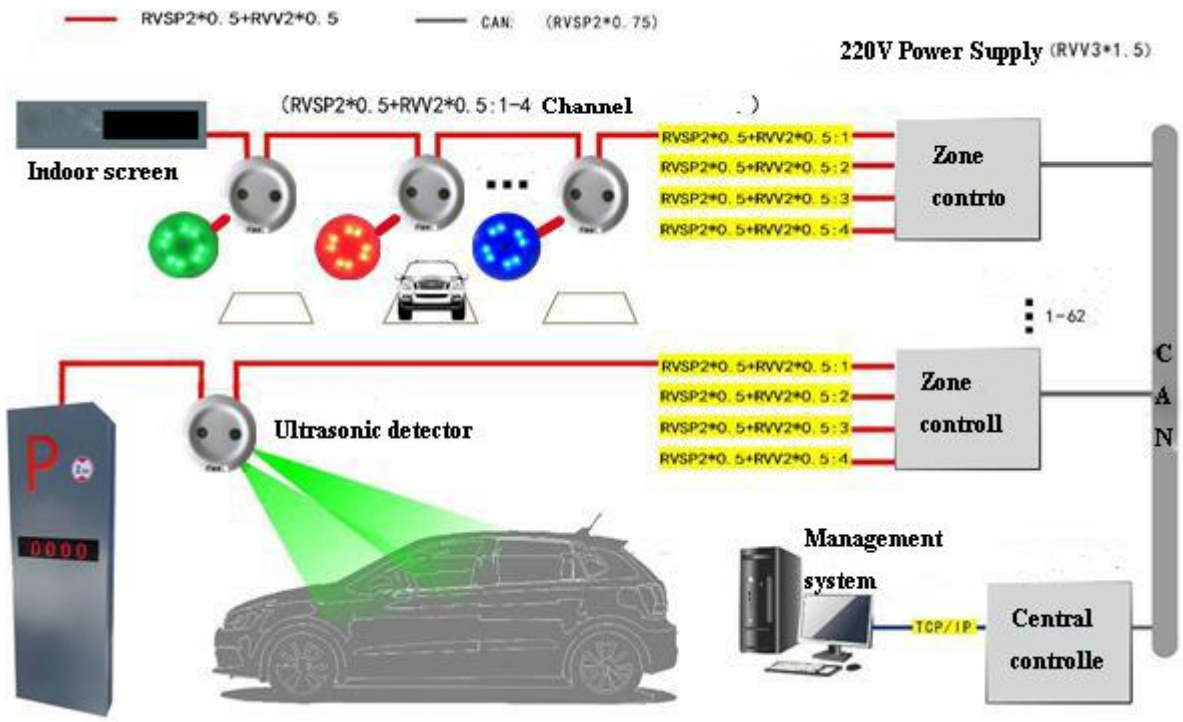
"Separate ultrasonic parking position detector" and "parking position indicator" are installed above each parking space. When the green is displayed, it represents the empty parking space, and the red color represents the existing vehicle. When the owner parks the vehicle in the empty parking space, the indicator light changes from green to red, indicating that the vehicle is parked on the parking space. The blue light can be used as a reserved parking space.



After the vehicle is parked, the outdoor total screen and the parking space guide screen in the corresponding area will automatically deduct the number of empty spaces in the current area.

4,The system architecture

The parking space information of each parking space of the parking lot is collected in real time through a split type ultrasonic parking position detector installed directly above each parking space. When the vehicle is parked in the current parking space, the parking space indicator directly above the parking line changes from green to red. The area controller connected to the detector collects the connected detector information according to the polling method, and compresses and encodes the data according to certain rules and feeds back to the central controller, and the central controller completes the data processing, and The processed parking space data is sent to each parking space guide screen of the parking lot to display the empty parking space information, thereby realizing the function of guiding the vehicle into the empty parking space. The system simultaneously transmits the data to the computer, and the computer stores the data to the database server. The user can query the real-time parking space information of the parking lot and the annual, monthly and daily statistical data of the parking lot through the computer terminal.



The split car position guide separates the ultrasonic probe from the indicator light. The detector is installed directly above the middle of the parking space. The split indicator light is installed directly in front of each parking space line. The parking space status data is collected in real time, and the parking space indicator is displayed corresponding to red, green or blue according to the full empty state of the parking space.

Advantages of using split-type ultrasonic parking guidance system

The split-type ultrasonic parking position detector is installed in front of the middle of each parking space. The indicator light is installed directly in front of the parking space line, which can accurately detect the parking space of the vehicle and the use of the extended parking space, and detect sensitive;

The detector is red, green and blue, and can use up to 7 colors.

The split-type parking space indicator light is directly installed on the bridge above the front of each parking space, effectively avoiding the column blocking, and the installation effect is more neat and beautiful;

Split-type ultrasonic parking position detector adopts one-to-one ultrasonic circuit design, which effectively covers the detection area, and works independently, double-switching and redundant backup, which greatly improves the life and stability of the detector.

The whole system architecture adopts Ethernet, CAN-bus, RS485 hybrid networking, compared with the traditional ultrasonic guiding system using RS485 networking, long communication distance, high communication efficiency, high bus utilization, reliable fault tolerance mechanism, great Improve system networking capabilities, ensure data transmission is stable and reliable, and effectively respond to the construction and implementation of super large parking space parking guidance system;

Adopt advanced intelligent learning anti-interference algorithm, which effectively solves the crosstalk, ultrasonic interference, and interference of ultrasonic in the detection process, and ensures the stable reliability of parking position detection;

The overall industrial design, after strict static, lightning and surge, group pulse and other tests, effectively ensure the reliable use under the influence of harsh environmental factors such as fluorescent lamps, large electromechanical equipment, lightning strikes and surges in the parking lot environment;

All equipments have short-circuit, reverse connection and misconnection protection design to prevent electrical damage to related equipment caused by short circuit, reverse connection and misconnection caused by wiring errors during construction;

The parking space partition information is not affected by the physical location of the detector and display installation, and can be associated with any detector and display below it;

After the parking space related information is downloaded, it will be permanently saved and can be run independently from the computer;

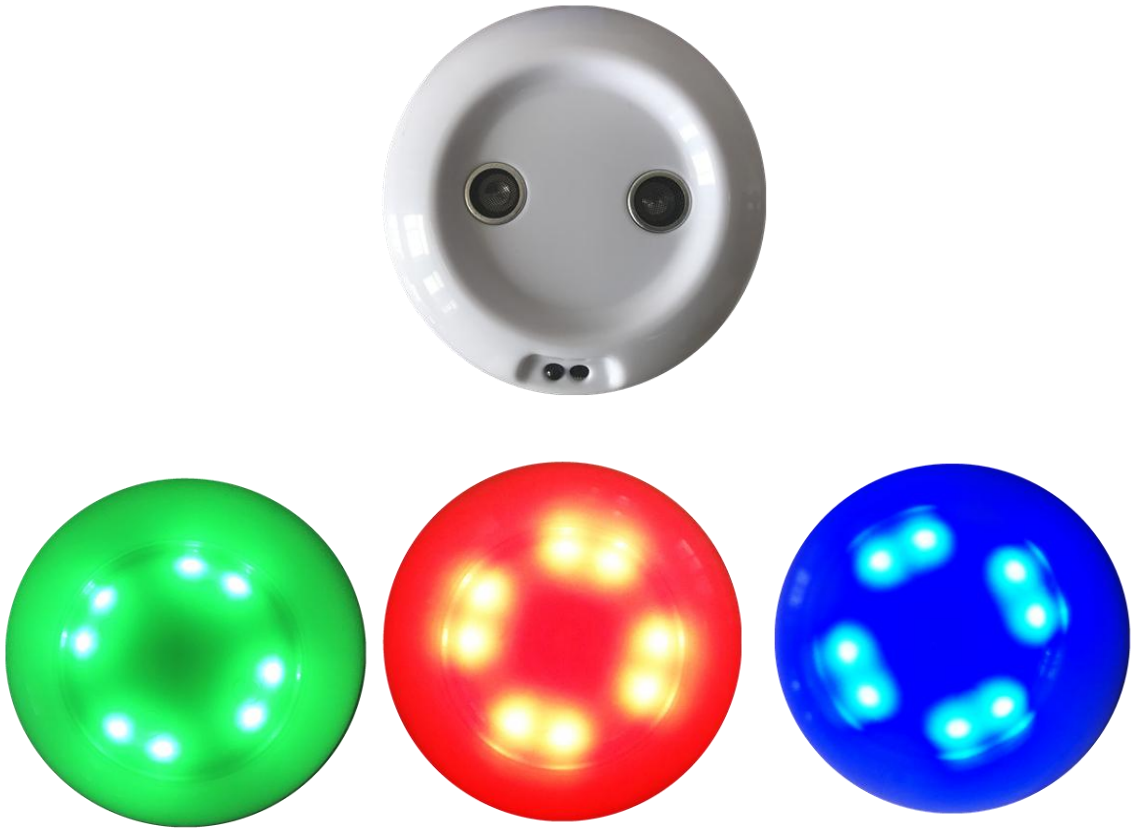
The entire system controller can be upgraded remotely to meet user needs at all times;

The controller has the on-site debugging function of the project. After the installation is completed, the communication status of the device is detected by one button;

Debugging uses infrared remote control for debugging, which greatly reduces the difficulty of debugging and reduces construction costs. Simple debugging

5,Equipment list and parameters

1. Split type ultrasonic parking detector



Detector is an important part of parking guidance system. The probe is installed directly above the

middle of each parking space. The principle of ultrasonic ranging is to collect real-time parking data, control the display of parking indicator and provide parking information in time. It is transmitted to the area controller through 485 network.

A split type ultrasonic parking position detector is composed of a detector body and an indicator light. The detector body is an ultrasonic probe for detecting the empty state of the parking space, and the integrated integrated indicator light displays different colors according to the instruction of the detector. **When there is no vehicle parking in the parking space, the indicator light is green. When the vehicle is parked, the indicator light is red, the fixed parking space indicator light is blue, and the reserved parking space indicator light is purple, which can be selected in multiple colors.**

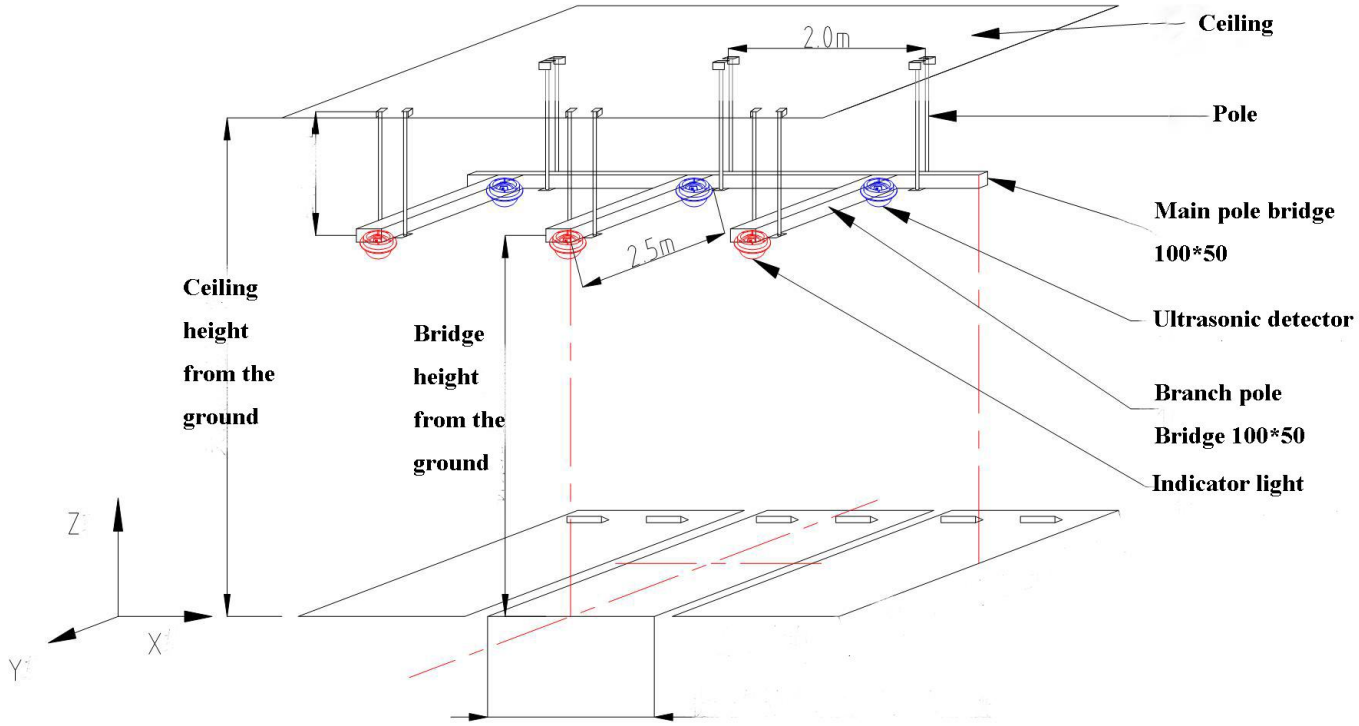
- The split-type ultrasonic parking position detector is installed in the front of the front of each parking space. The indicator light is installed in front of the parking line, which can accurately detect the parking space of the vehicle and the use of non-standard parking spaces. Sensitive
- The indicator light is installed on the bridge above the front of each parking space to effectively avoid the occlusion of the column, and the installation effect is more neat and tidy;
- Adopting one-to-one transmission and ultrasonic circuit design to effectively cover the detection area, while working independently, dual-way switching, redundant backup, greatly improving the life and stability of the detector;
- The receiving circuit adopts multiple combinations of judgment methods to enhance the anti-interference and detection stability of the device;
- Adopt advanced intelligent learning anti-interference algorithm, which effectively solves the crosstalk, ultrasonic interference, and interference of ultrasonic in the detection process, and ensures the stable reliability of parking position detection;
- The whole process has passed strict tests such as static electricity, lightning strikes, surges and group pulses to ensure reliable use under the influence of harsh environmental factors such as fluorescent lamps, large electromechanical equipment, lightning strikes and surges in the parking lot environment;
- Short-circuit, reverse connection, and misconnection protection design to prevent electrical damage to related equipment caused by short circuit, reverse connection, misconnection, etc. caused by wiring errors during construction;
- The connection port is connected by plug-in terminal. When connecting, the device connection can be completed with a single plug, which greatly reduces the labor cost of the traditional wiring, reduces the short circuit caused by poor wiring, and poor contact; Connection additional consultation)
- External dual LED status indication, only the ground observation can understand the working state of the equipment, and the abnormal situation can be seen at a glance;
- The internal status indicator adopts LED lamp bead design, which has long service life and long visible distance;
- Unique design, simple atmosphere;
- Support passive switch input detection, switch output, can detect parking lock and other external equipment signals (upgrade version);
- Support for booking function. (Upgraded version).
- **Technical parameters**

Product number:	Ultrasonic sensor	Operating Voltage:	DC 10~28V（24V）

Detection accuracy	>99.9%	Power consumption:	<1W
Operating temperature:	-20 ~ +65℃	Net weight	180g
communication method:	RS485 @9600bps	Communication distance:	≤150m（RVSP2*0.5）
Installation height:	Vertical 2 ~ 4m (recommended 2.5m)	Housing material:	Gray ABS project*
Installation location:	The probe is installed in the center of the parking space, and the indicator light is installed in front of the parking space.	Standard sizes:	Φ110mm*60mm

Separate parking space indicator installation

The split parking indicator is installed above the parking line. The horizontal distance from the parking line is 0 ~ 1 m, recommended 0.3 ~ 0.5 m; the installation height is between 2 and 3 meters, the recommended installation height is 2.5 meters



1. Set the remote control

Set the remote control as a substitute for the generation of the DIP switch, and set the probe distance remotely. The traditional DIP switch needs to be up and down the ladder to debug the probe

during debugging. The remote remote setting can be set by holding the remote control under the probe.

Instructions:

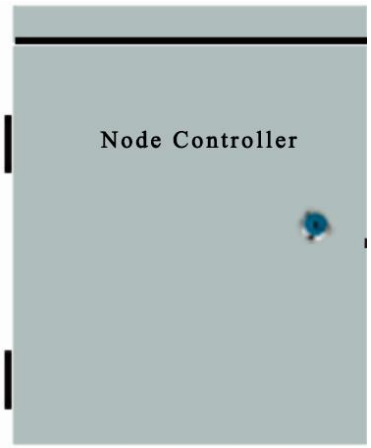
1. Initialization is completed after about 1 second after power-on, and the above data is displayed on the screen.

2. Press the read key to read the current device value (this step can be skipped)

3. Use the up, down, left, and right to select the parameter to be modified, and press Add or Decrease to the desired value.

4. After modifying, press the setup button to complete the modification. If the device receives the modification information and the modification is successful, it will flash blue.

2. Controller



The node controller cyclically detects the status of the connected probes and uploads the relevant information to the central controller. **We recommend that each node controller control the maximum of 80 probes.**

- The node controller is used to connect the central controller and the parking space detector, LED display, etc., and adopts the mixed communication mechanism of RS485 and CAN bus to solve the problem of unreliable long-distance communication, the problem of network node number expansion, and group management problems.
- Using internationally imported 32-bit ARM processor, all industrial-grade design ensures stable and reliable products, and the entire system controller can be upgraded remotely to meet user needs at all times;
- Adopt CAN bus industrial grade communication interface design, signal communication is stable and reliable, and the transmission distance can reach 1.2 kilometers;
- The node controller uses RS485 industrial bus to communicate with terminal devices such as lower-level detectors and display screens;
- Adopt four RS485 communication interface design, the four channels are completely independent of each other, and each router can connect up to 31 RS485 devices, and the communication efficiency is high;
- The overall industrial design, after strict static, lightning and surge, group pulse and other tests, effectively ensure the reliable use of equipment;
- The equipment has short-circuit, reverse connection and misconnection protection design to prevent electrical damage to related equipment caused by short circuit, reverse connection and

misconnection caused by wiring errors during construction;

- The power supply adopts industrial grade design and has short circuit, overload and overvoltage protection functions;
- The communication bus adopts advanced anti-collision, fault-tolerant and troubleshooting algorithms to ensure the stability and reliability of communication;
- It can quickly and effectively detect various states of the device. After the installation is completed, the RS485 device communication status can be detected by one button, and the bus connection can be quickly diagnosed.

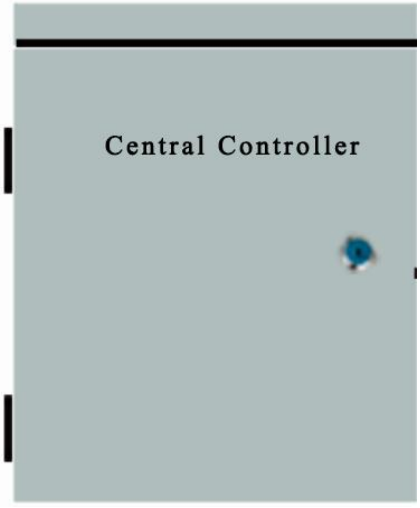
Technical parameters

Product number:	Zone controller	Operating Voltage:	AC 110～240V
Operating temperature:	-20 ~ +65℃	Power consumption:	≤2W（Self power consumption, no detector）
Standard sizes:	350×300×150mm	net weight:	6Kg
communication method:	1 way CAN @ 20kbps 4 way RS485 @ 9600bps	Communication distance:	CAN：≤1000m（RVSP 0.75*2） RS485：≤150m（RVSP2*0.5）
Installation height:	Vertical 2 ~ 3m (recommended 2.5m)	Housing material:	Gray cold steel paint
horizontal position:	Level 0~1m (recommended 0.3~0.5m)	Single node capacity:	31 (including detector and guide split screen)

Node controller installation

The node controller is usually mounted on a column or wall. It is recommended to install a height of 2 meters or more.

Central controller



- The central controller is the core of the whole system. It is the collection and control center of the entire intelligent parking space guidance system. Through the update of the real-time data of the parking space guidance screen, the guiding function of the vehicle is realized. **A central controller can control up to 62 node controllers.**

- The central controller communicates with the host computer using Ethernet communication;
- The central controller adopts the internationally advanced 32-bit ARM processor, which is designed by the whole industry to ensure the stability and reliability of the products. The entire system controller can be upgraded remotely to meet the needs of users at all times.
- Adopt CAN bus industrial grade communication interface design, signal communication is stable and reliable, and the transmission distance can reach 1.2 kilometers;
- The overall industrial design, after strict static, lightning and surge, group pulse and other tests, effectively ensure the reliable use of equipment;
- The equipment has short-circuit, reverse connection and misconnection protection design to prevent electrical damage to related equipment caused by short circuit, reverse connection and misconnection caused by wiring errors during construction;
- The power supply adopts industrial grade design and has short circuit, overload and over voltage protection;
- The communication bus adopts advanced anti-collision, fault-tolerant and troubleshooting algorithms to ensure the stability and reliability of communication;
- Ethernet and CAN bus hybrid combination communication increases system capacity, communication is safe and reliable, and communication chips are protected and isolated by industrial grade;
- Automatically scan the terminal devices such as detectors and displays, and have automatic alarm function prompts for equipment failures;
- The largest management partition is 256 (supports 256 association methods);
- The partition information is not affected by the physical location of the detector and display installation, and can be associated with any detector and display screen of the company;
- After the related information is downloaded, the associated information is automatically saved and run independently from the computer.

Technical parameters

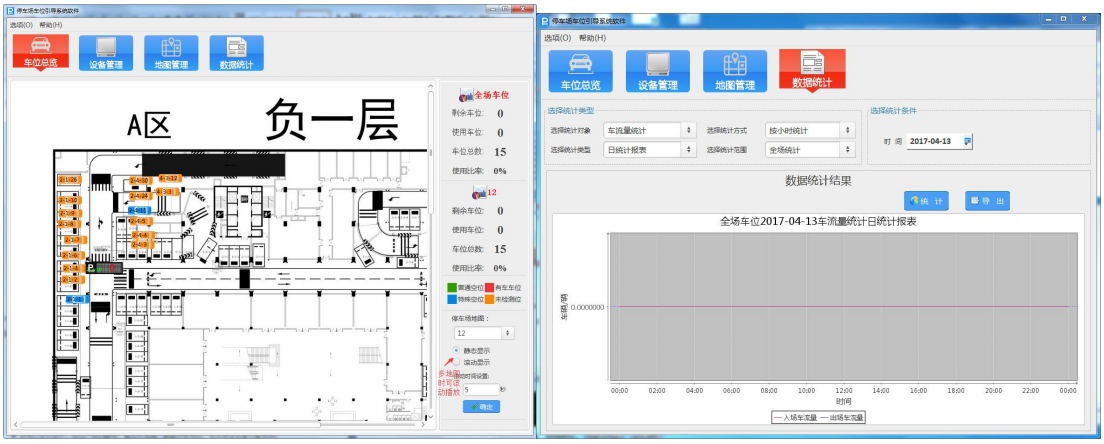
Product number:	Central controller	Operating Voltage:	AC 110～240V
Operating temperature:	-20 ~ +65℃	Power consumption:	≤3W
Standard sizes:	350×300×150mm	net weight	6Kg
communication method:	1 way CAN @ 20kbps 1 way 10/100BaseT Ethernet	Communication distance：	CAN: ≤1000m (RVSP 0.75*2) Ethernet: 100m (5e network cable)
Node capacity:	62	Housing material:	Gray cold steel paint

Central controller installation

The central controller is usually mounted on a column or wall. It is recommended to install a height of 2 meters or more.

Parking guidance system software

(software provided: Simplified Chinese, English, Traditional Chinese)
More languages can be customized



1.1. Parking guidance function:

Control the display to guide the owner to quickly enter the free parking space in the shortest time, improve the usage rate of the parking lot, optimize the parking environment, and improve customer satisfaction.

1.2. Fixed parking space protection function (customized):

Through the evasive guidance, the reservation of special parking spaces for fixed insurance, monthly insurance and fixed is realized.

1.3. Real-time monitoring of parking space status:

The system can display the occupancy of the parking space in real time, count the number of occupied parking spaces, the number of spares, and the number of vehicles entering and leaving the various time periods during the statistical period, which is convenient for management personnel to monitor and manage the parking lot.

1.4. Statistics function:

It can count the daily and monthly usage rate of the parking lot, the usage rate of the time zone, etc., so that the owner can understand the usage status of the parking lot.

1.5. Parking time detection function:

The car starts to time after it stops in the parking space, and the yard management can know the parking situation of the parking space at any time in the control room.

1.6. Authority Control Function:

Multi-level access control function to facilitate the control and confidentiality of related information.

1.7. Other functions can be modified according to user requirements

Projects

Philippines--Solaire


SOLAIRE


SOLAIRE
CARPARK LOT
AVAILABLE
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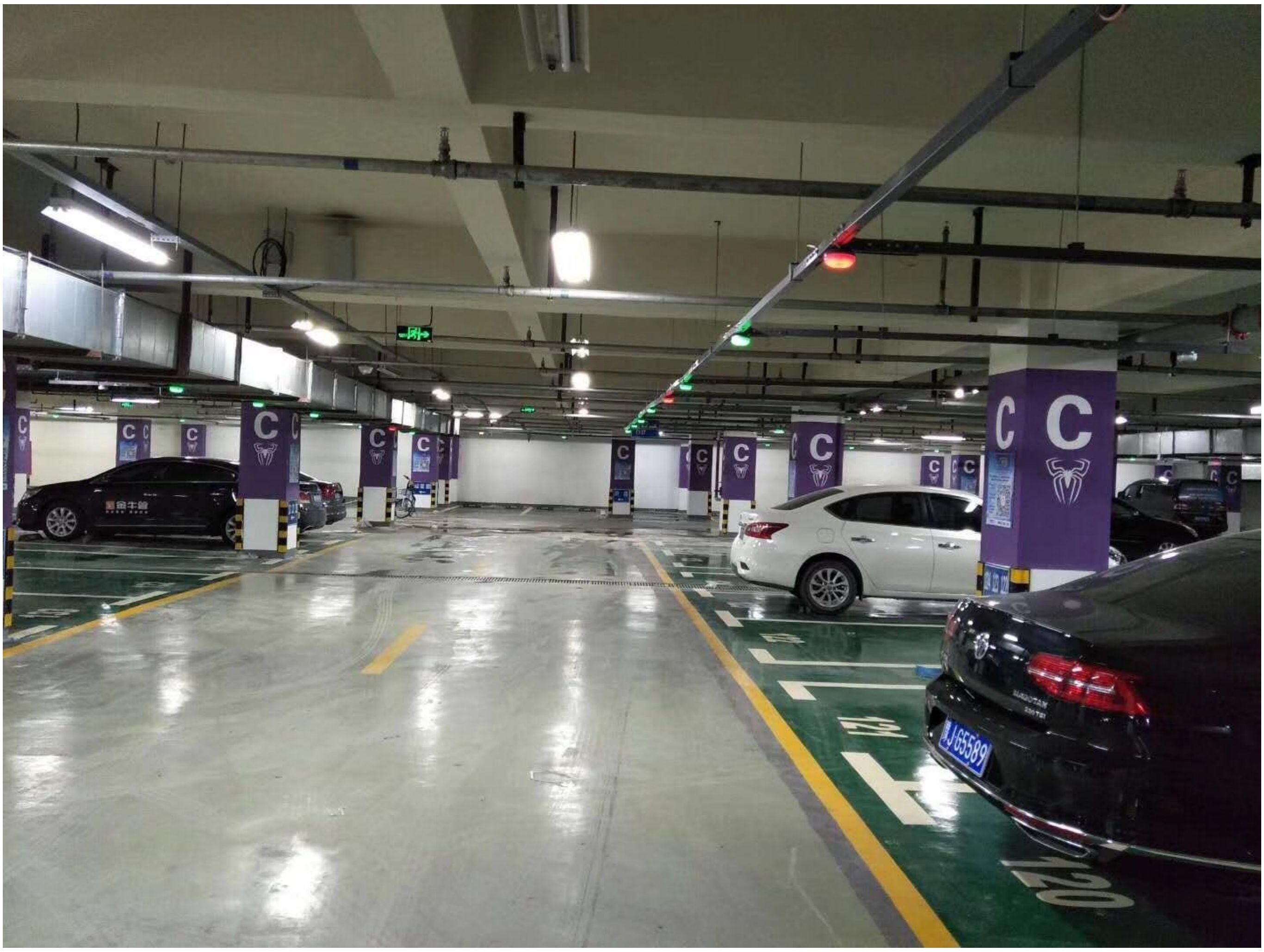
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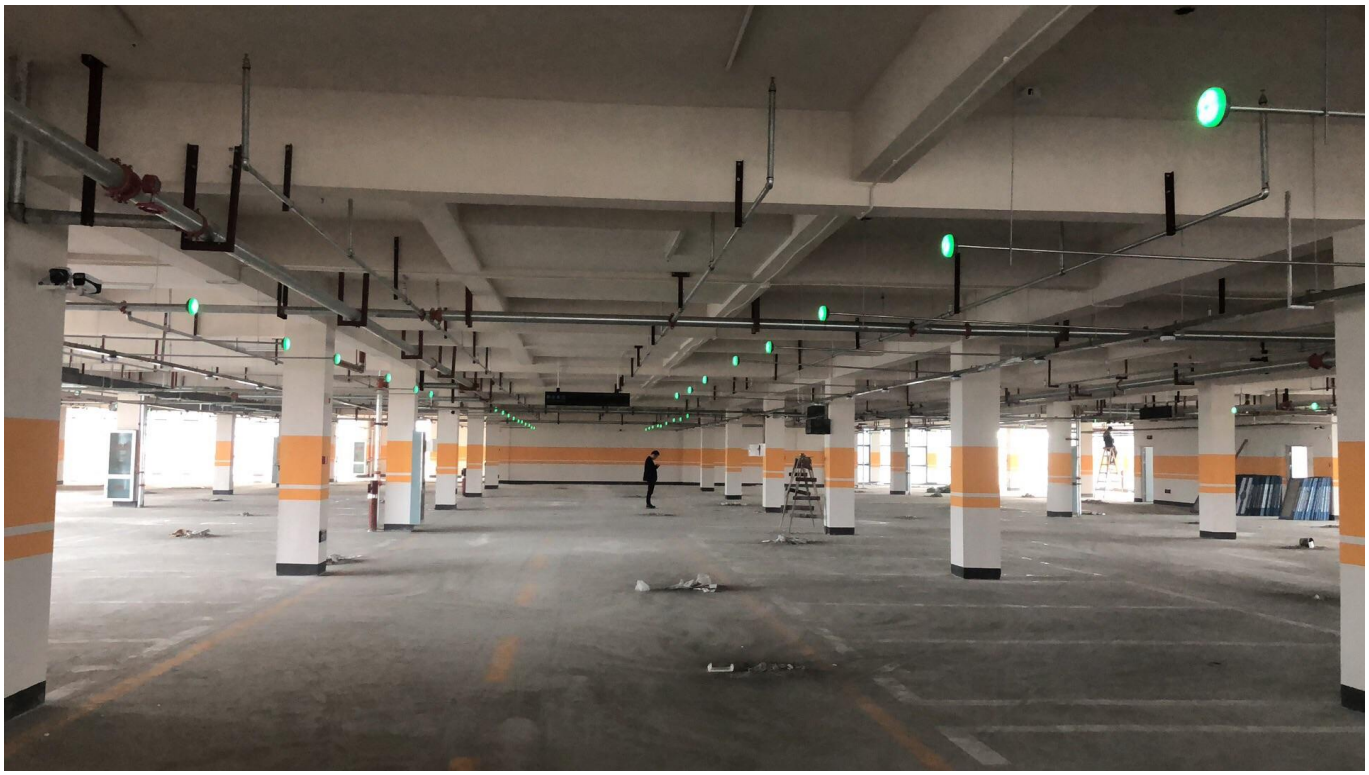


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