Installation and Operation Manual

GIN

REVIEW PAGE

Version	*description*	*Prepared by* *Reviewed by* *Approved by*	*Date*
Rv 01	Added ZC, UD and CC manuals	By: Tech.Dep	*15/08/23*

Installation and Operation Manual

GIN

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CONTENT

Congratulations! for purchasing the system GIN, Guidance on parking.

It provides several features and much flexibility installation and operation. In the ideal configuration will be interconnected with systems access control including access barriers, multiple inputs and outputs at different levels, different types of users, such as residents of area, loading and unloading, subscribers, clients of commercial establishments, schedules payment and free, integrated surveillance systems, number plate capture, detection of weight, signs and traffic lights.

With this equipment you offer a user interface easy to use for many types of payments, access or use of facilities, dispensing tickets, receipts, authorizations, personal information management, and also provides an efficient control, messaging exchange control systems of the series and complete compatibility with it.

Technically, the design allows integration with any type of communications systems on hardware and software levels. Meets all communications standards and environmental issue. It is green, clean and offers highly personalized designs and colors for the final customer.

Therefore, we congratulate you again for purchasing one of the equipment of the latest and best technology, which in turn is friendly to users, respectful of the environment and easy to install, configure, use, maintain and integrate.

We recommend you to take a few minutes of your time and read this manual carefully before starting to avoid unnecessary risks and proceed with security to the startup. The first part is aimed to installers, product sellers and technicians and is the process of unpacking, installation, configuration, integration and startup of the equipment. The second to operators and administrators and discusses topics of operation, maintenance and actions to take in case of occasional failures.

Your feedback is important to us. We ask you to send us any comments about the product or this manual contents to the Technical Support phone or email that is printed at the beginning of this manual.

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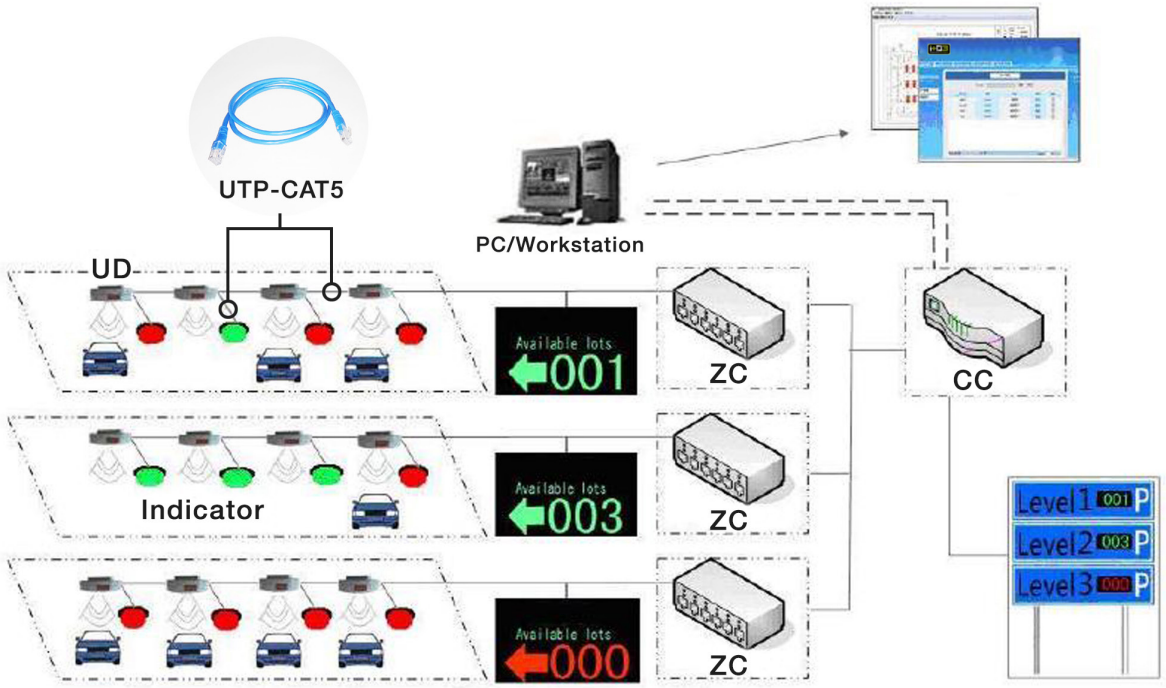
1. System Structure



2. Installation of System Equipments

2.1. All Entrances of carpark

The outdoor LED display will be installed at main entrances of carpark.The LED display is made of LED module, driving circuit, control circuit, bracket and other parts. Set the total number of imported Led small screen in accordance with parking lots' divised regional parking number, seperately displaying the information of the carport amount in every region.

Through network switches, server transmits the carport statistical information to ZC controling the total screen. The total screen displays the available carport amount of the current parking lot in the terms of numbers and words to suggest that the driver of the vehicle ready to admission and it also can be used 24 hours a day. Internal procedures can be modified at any time based on the users'demands to display other information the users needed

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2.2. Fork Inside the Carpark

The important fork in the capark are suggested to install indoor led dislay. The number of led displat and displayed text are made according the need of the customers. The led display is comprised of indoor high-brightness LED modules, drive circuit, control circuit, frame and other components. It also receives the server's output information, displays the lot direction to guide the drivers to find the empty parking lot with number,arrows and words. Through network, every direction can be guided in each intersection.Thus,the traffic stream can be distributed to the most suitable location to ensure the smooth flow of parking lot and full use of carport.

Three-direction regional guiding screen: they are always be placed in the fork with three direction in the carpark. The location should be the place that the car owners can see clearly when they drive to the three-direction fork.

Displayed content: displaying the number of remaining empty lots of the regions the three direction forks seperately lead to.

Three-direction guiding system

Two-direction led display: They are generally placed in the fork with two directions in the carpark. The installation location should be the place that the owners can see clearly when they drive to the two-direction fork.

Displayed Content: Mainly displaying the remaining empty spaces in their respective regions.

Two-direction guiding screen

One-direction LED display: They are generally placed on the carpark corner, the installation location should be the place that the drivers can see clearly when they drive to the corner.

Displayed Content: Mainly displaying the remaining empty spaces after turning the corner.

One-direction guiding screen

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3. System Introduction and Connections

3.1. Zone Controller (ZC) RS485

3.1.1. What is ZC

3.1.1.1. Brief Introduction of ZC

ZC makes cycling inquiry to the ultrasonic detectors which are under its control by turns through the serial port of RS-485-B, and then sends the inquired queried parking information to CC through serial port of RS-485-C. Also, it sends the CC commands to control LED display through the serial port of RS-485-B.

3.1.1.2. Appearance

Just take a brief introduction of ZC appearance here. The specific functions of ZC will be introduced in the latter chapters.

1	2	3
To show the communication with CC	To show communication with detector	To show power supply

3.1.1.3. Physical Parameter

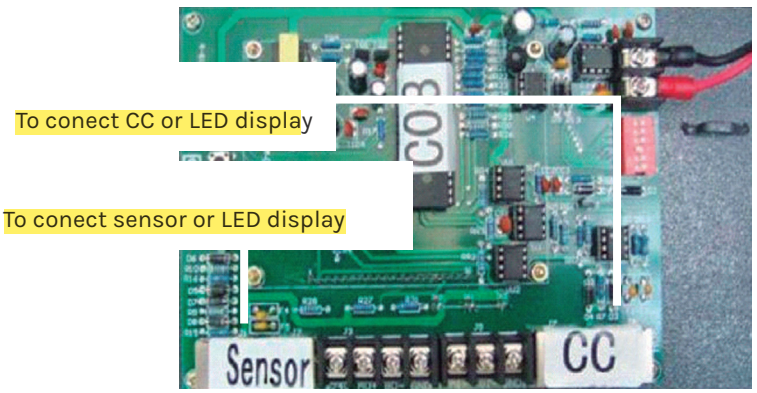
The physical parameter of ZC in normal working status is as table 3-1-3

Table 3-1-3

Operating voltage: DC 24V	Communication mode: 2 RS-485 serial ports (RS-485-B; RS-485-C)
Operating temperature: -20~+80°C	Communication rate: RS-485-B: 4800bps; RS-485-C:9600bps
Operating current: 70mA	

3.1.1.4. Wire Connections

Connect the wires in strict accordance with corresponding connecting tables before using ZC
Input: DC 24V
Notes: Connect ZC port to detectors, CC port to CC as below:



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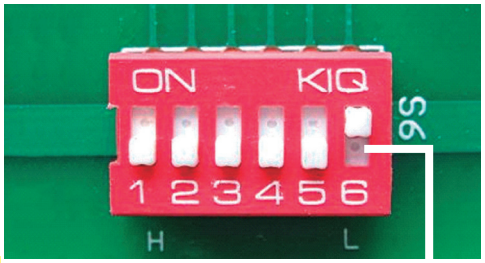
3.1.2. Address Settings

Dip switch (total6 bits, 1 is the highest bit) is used to set ZC address. ON is 1, OFF is 0. For example, if you set it as 001111, the address is 15. The detailed dip setting can be seen from the attached table 1.

For example, setting the address of ZC as 01, the dip will be 000001, which has been shown in the following picture.



The address of 000001 is 01

Table 1

Add.	DIP	Add.	DIP	Add.	DIP
01	000001	21	010101	41	101001
02	000010	22	010110	42	101010
03	000011	23	010111	43	101011
04	000100	24	011000	44	101100
05	000101	25	011001	45	101101
06	000110	26	011010	46	101110
07	000111	27	011011	47	101111
08	001000	28	011100	48	110000
09	001001	29	011101	49	110001
10	001010	30	011110	50	110010
11	001011	31	011111	51	110011
12	001100	32	100000	52	110100
13	001101	33	100001	53	110101
14	001110	34	100010	54	110110
15	001111	35	100011	55	110111
16	010000	36	100100	56	111000
17	010001	37	100101	57	111001
18	010010	38	100110	58	111010
19	010011	39	100111	59	111011
20	010100	40	101000	60	111100

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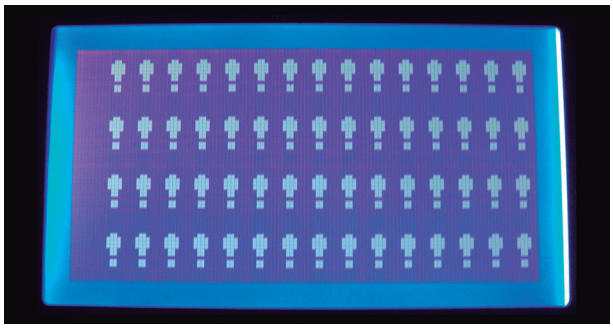
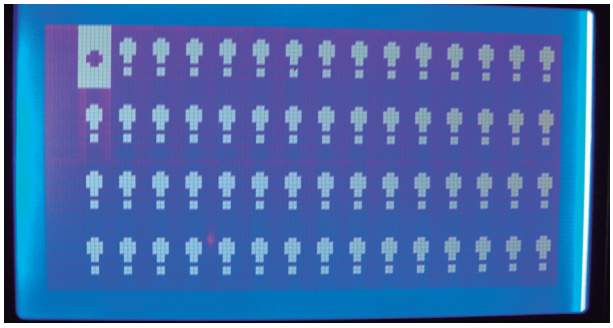
3.1.3. LCD Display Functions

There are 60 marks in normal display, which are corresponding with 60 ultrasonic detectors under ZC.

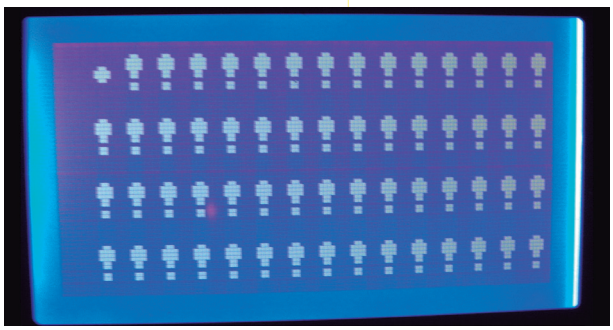
It will be shown 60 "!"as follows when sensor port doesn't connect to detectors after power on:



If the sensor port which is connected to the sensor whose address is 1 detects car after power on,it will show "[redacted]"as below:



If the sensor port which is connected to the sensor whose address is 1 detects no car after power on,it will show "*"as below:



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3.1.4. Command System

3.1.4.1. Port Setting

The command aggregation that ZC executes is the command system of ZC

1. **The port setting of RS485B serial ports:**

Baud rate 4800bps, no parity check, 8 data bits, 1 stop bit;

2. **The port setting of RS485C serial ports:**

Baud rate 9600bps, no parity check, 8 data bits, 1 stop bit. (ASCII code send and receive)

The Protocols of ZC

- **RS-485B Port Protocols:**

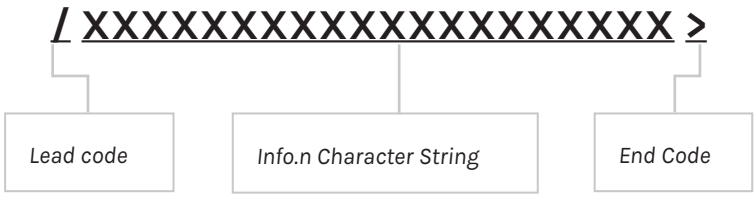
1. RS-485B port protocols use hexadecimal 4-byte cycling scanning mode to send commandformats.

2. Frame head :1 byte (OXA3) + address: 1 byte (OX01—OX3C) + command: 1 byte (OXA5) + check :1 byte (the XOR of the first 3 bytes)

3. When RS-485C port receives /CXXPXXXXXXX> (ASCII code) commands, RS-485B port inserts into LED display to control the commands/PXXXXXXX> (ASCII code).

- **RS-485C port protocol:**

After RS-485C port receives command /CXX> (ASCII code, XX is the ZC address, which is got by the DIP switch switching from set binary to decimal system).

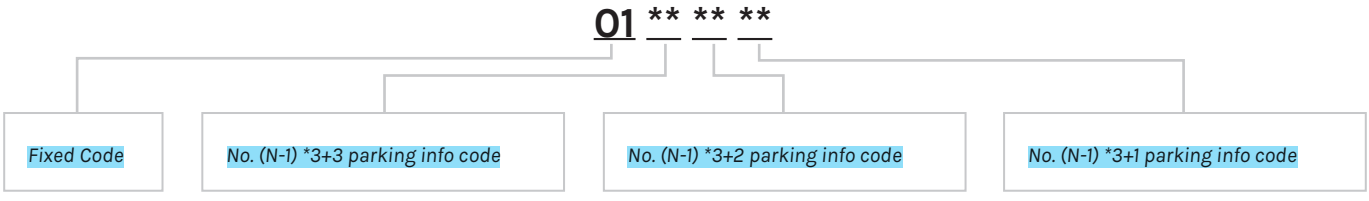


Lead code: the starting sign of command, whose fixed format will not be changed.

Message Character String: total 20 bytes. Each byte has 3 pieces of parking space information.

The format is shown as follow:

The binary system I of X is 01 ** ** **



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Notes: The N represents NO. N (1, 2, 3...) byte from left to right.

(1) **Fixed Code**: fix as "01"

(2) **Information code**: each two bits form 1 information code. Each information code carries 1 piece of parking space information. The information code is corresponding with the detectors status whose address is from 1 to 60.

01: means the parking space is occupied. 00 means the parking space is free. 10 means the detector is in malfunction.

Stop code: the end mark of command,the fixed format is not changed.

3.1.5. Attentions and Troubleshootings

3.1.5.1. Attentions

A. Read the instruction in details before using it.

B. Check connecting circuit before turning on the power in detail to avoid the burning and damage of the internal components.

3.1.5.2. Normal Operating Status

The power indicator is lit when it works normally. RS485B port sends inquiring commands.

When RS-485C receives the command /CXX>, it will reply the state value /XXXXXXXXXXXXXXXXXXX> of the 60 detectors.

3.1.5.3. Common Malfunction and Troubleshooting

A) Breakdown:red led indicator is not on.

Solutions:Check if the power line is correct,if the power supply is DC24V and if polarity reserved.

B) Breakdown: yellow indicators is not flashing.

Solutions:

1) Check if RS232 is transferred to RS485 when connect to PC

2) Check if serial port is 9600, N, 8, 1

3) Check if the address setting and the dispatching order format is correct

C) Breakdown: Green indicators is not flashing.

Solutions:

1) Check if RS232 is transferred to RS485 when connect to PC

2) Check if serial port is 4800, N, 8, 1

3) Check if there is data from 485B port

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3.2. Ultrasonic Detector (UD)

3.2.1. Brief Introduction

3.2.1.1. What is Ultrasonic Detector?

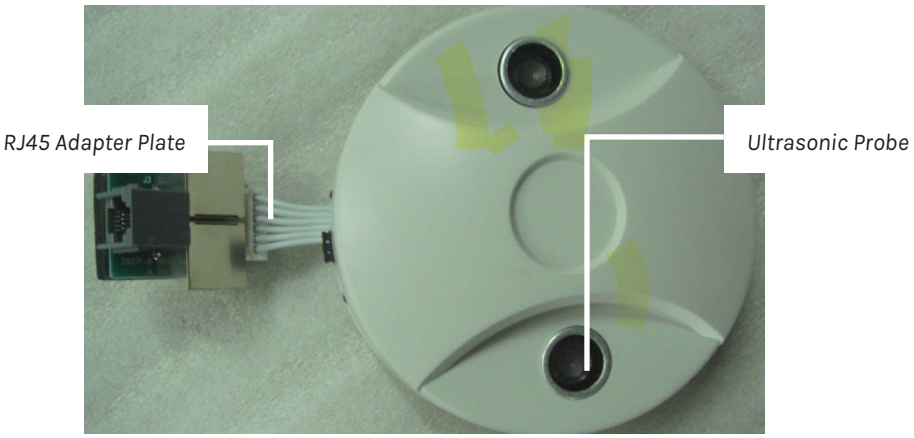
Ultrasonic detector, an important part of intelligent parking guidance system, can collect the parking space status at real time, control the display of LED indicator (free or occupied) and forward the parking bay info to ZC via RS485.

3.2.1.2. Appearance Introduction

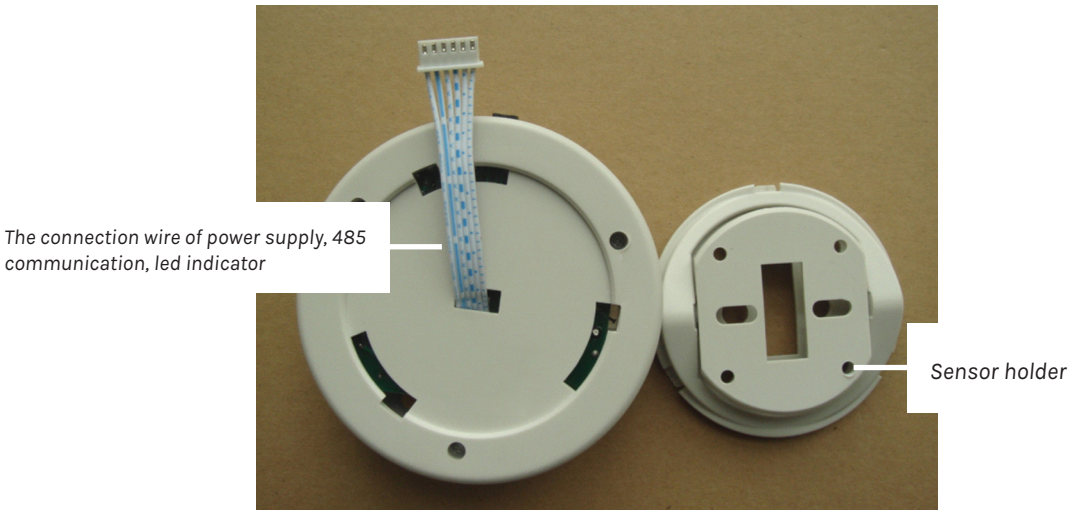
Take a brief introduction of ultrasonic detector appearance. The specific functions of UD will be introduced in detail in latter chapters.

Ultrasonic detector is comprised of UD main part and UD cassette (Picture 1-1).

The main components of UD's main part includes ultrasonic probe, parking indicator connecting lines, power supply, 485 network cables (Picture 1-2), detection range setting jumper wire, 485 communication indicator and parking space status indicator (Picture 1-3).



Picture 1-1: Front View of UD



Picture 1-2. Parking Space Indicators

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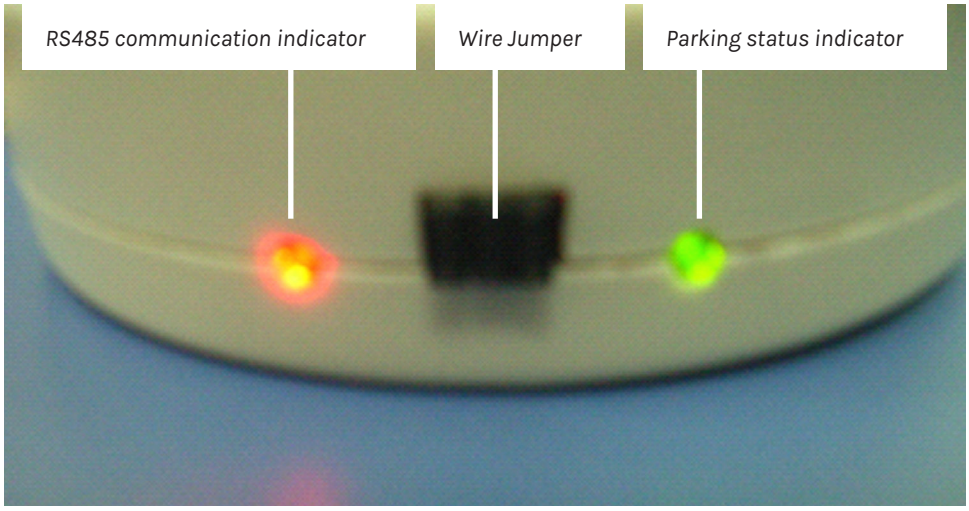


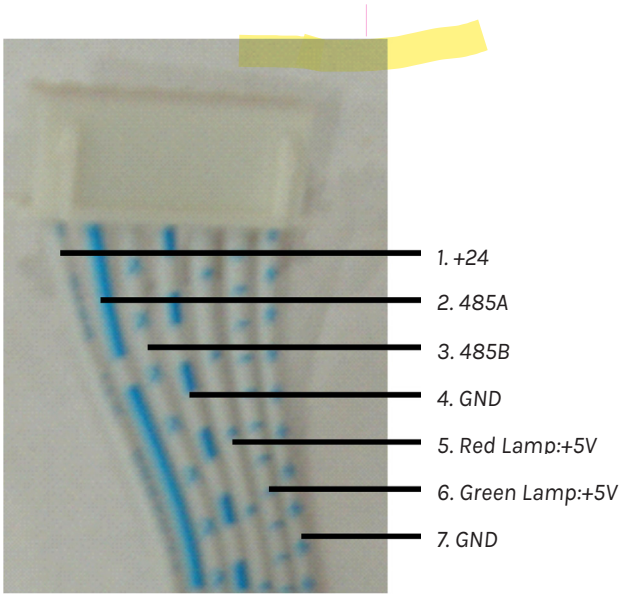
Picture 1-3. Parking space indicator

3.2.1.3. Physical Parameter

The physical parameter of UD in normal operation.

Operating Voltage:DC 12~24V	Size: 100*23 (mm)
Operating Current: 10mA (no indicator), 28mA (with indicator)	Weight:113g
Operating Temperature:-20~+80° C	Communication: RS-485
Detecting Distance: 0.1~3.5m	Communication distance: ≤1000m
Detecting Area (3.5m):0.4 sq.m	Serial port Setting: 4800bps, N, 8,1
Max Error: 0.1m	

3.2.1.4. Wire Connection



-Ultrasonic detector has a seven-core wire.
-wire 1. Connect to power supply + of DC12-24V.
-wire2. To connect 485A of UD
-wire 3.to connect 485B of UD
-wire 4.to connect power supply GND of DC12-24V.
-wire5.to connect +5V of the red lamp of LED indicator
-wire6.to connect +5V of green lamp of LED indicator.
-wire7.to connect to GND of DC12-24V.

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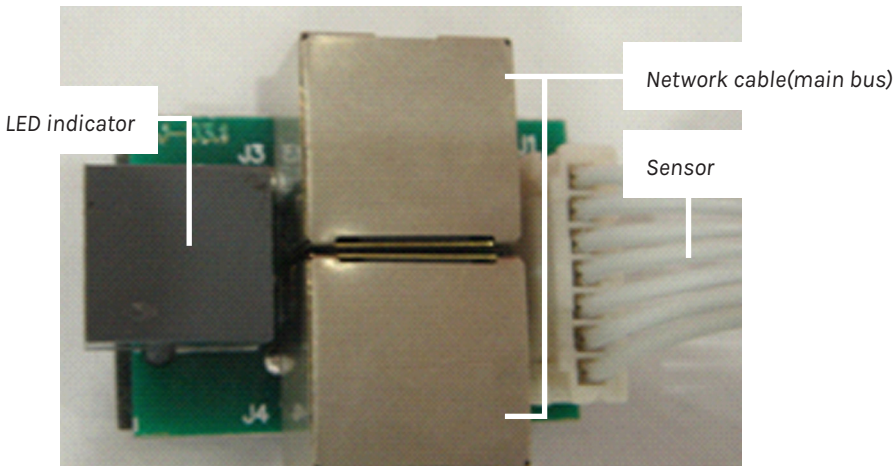
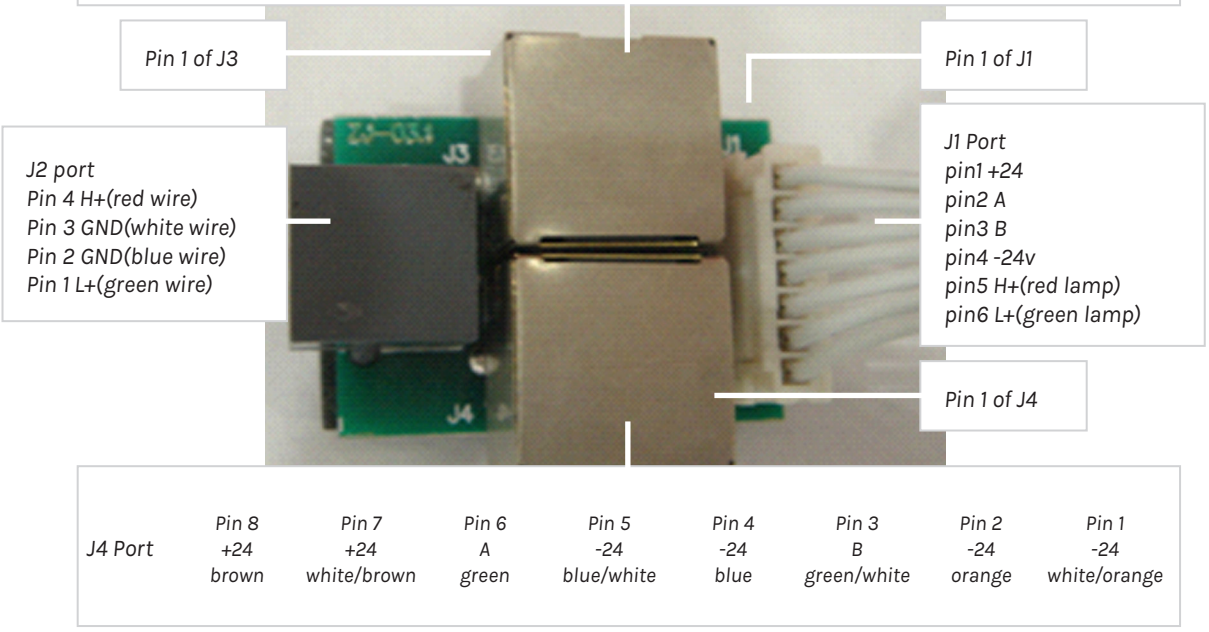


3.2.1.5. The Instruction of UD Network Cable(ZJ-03)

The ports' wire order of adapter plate (ZJ-03)

Main bus(network cable): it goes in from port J3 and out from port J4, or goes in from port J4 and out from J3.

J3 Port	Pin 1 +24 white/orange	Pin 2 +24 orange	Pin 3 B green/white	Pin 4 -24 blue	Pin 5 -24 blue/white	Pin 6 A green	Pin 7 -24 white/brow	Pin 8 -24 brown



J4 Port	Pin 8 +24 brown	Pin 7 +24 white/brown	Pin 6 A green	Pin 5 -24 blue/white	Pin 4 -24 blue	Pin 3 B green/white	Pin 2 -24 orange	Pin 1 -24 white/orange

Bus connection methods are as follow. (If each piece of network cable has length of 5 meters, it can connect 45 UD at max in normal working.)

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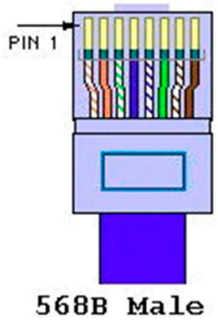
- **Network cable specification:** cat 5e,0.50mm,pure copper

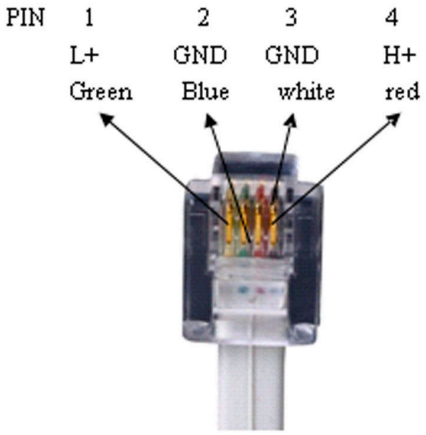
RJ45 Connector's connection order:

Standard 568B: white/orange, orange, white/green, blue, white/blue, green, white/brown, brown
Note: LED Indicator connects to RJ11 of adapter plate by telephone line with 4 cores



- **Telephone line specification**

RJ45 Connector's connection order:



3.2.2. Detection Range and Address Settings

For normal working of UD, we should set the detection range according to the installation height before installation and set the address.

Range Setting of UD

The detecting range method of UD is car detecting. It means that when the real detection range is less than the setting range, the sensor indicator (parking space status indicator) will turn ON and LED indicator will turn on RED. And when the real detection range is more than the setting, the sensor indicator will turn OFF and LED indicator will turn on GREEN.

Detecting range can be done through setting jumper wire. Jumper wire setting will increase 0.5m each rank and has 8 ranks totally (see table 2-1). When you set the jumper wire, you can decrease 0.5m based on the actual installation height, i.e., setting height= actual height -0.5m. As for the detailed setting, please refer to the next table.

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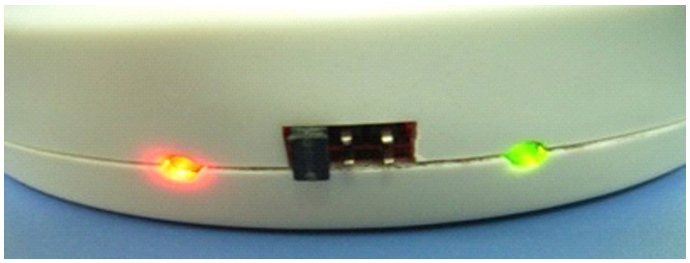
Jumper wire setting table

rank number	status	value	range (meter)
1	RED □□□ GREEN	000	0
2	RED □□■ GREEN	001	0.5
3	RED □■□ GREEN	010	1.0
4	RED □■■ GREEN	011	1.5
5	RED ■□□ GREEN	100	2.0
6	RED ■□■ GREEN	101	2.5
7	RED ■■□ GREEN	110	3.0
8	RED ■■■ GREEN	111	3.5

Notes: 1.RED sensor indicator means RS485, GREEN sensor indicator means parking bay's status.
2. The 1st rank is null, space status indicator at OFF means parking space always be empty.

Take an example of detection range setting, actual installation height is 2.6m, taking off 0.5m, (refer to this table,) get the near value of 2.0m. So we can set according to the 5th rank (RED ■□□ GREEN). At this time, if the detecting height is less than 2.0m, the sensor indicator will turn ON and LED indicator will turn on RED.

If the height is more than 2.0m, the sensor indicator will turn OFF and the LED indicator will turn on GREEN.



set height = 2.0m

3.2.2.1. The Address Setting of UD

UD's address read from dip switch. The dip switch has 7digits (bit1>bit7, ON=1, OFF=0). Each ZC can read maximum 60 sensors, e.g.: there is a UD whose ID=1, address=01, another UD whose ID=60, address=3C. For more details, please refer to table 4.2.6.2.

Eg: UD's address=04, the dip switch should be 0000100 (picture2-2)

Picture 2-2:address=04 (0000100)

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Table 4.2.6.2 UD address setting

UD's ID	Address(hex)	Dip switch	ID	Address(hex)	Dip switch
1	01	0000001	31	1F	0011111
2	02	0000010	32	20	0100000
3	03	0000011	33	21	0100001
4	04	0000100	34	22	0100010
5	05	0000101	35	23	0100011
6	06	0000110	36	24	0100100
7	07	0000111	37	25	0100101
8	08	0001000	38	26	0100110
9	09	0001001	39	27	0100111
10	0A	0001010	40	28	0101000
11	0B	0001011	41	29	0101001
12	0C	0001100	42	2A	0101010
13	0D	0001101	43	2B	0101011
14	0E	0001110	44	2C	0101100
15	0F	0001111	45	2D	0101101
16	10	0010000	46	2E	0101110
17	11	0010001	47	2F	0101111
18	12	0010010	48	30	0110000
19	13	0010011	49	31	0110001
20	14	0010100	50	32	0110010
21	15	0010101	51	33	0110011
22	16	0010110	52	34	0110100
23	17	0010111	53	35	0110101
24	18	0011000	54	36	0110110
25	19	0011001	55	37	0110111
26	1A	0011010	56	38	0111000
27	1B	0011011	57	39	0111001
28	1C	0011100	58	3A	0111010
29	1D	0011101	59	3B	0111011
30	1E	0011110	60	3C	0111100
Remark: the UD won't work if the address' value overflowed 3C					

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3.2.3. UD's Protocol System

The aggregation of the protocols UD can implement is its protocol system. UD communicates with others via RS485, so you have to set the COM port before sending any commands to the UDRS485, COM port settings are as follow:baud rate-- 4800bps, without parity check, 8 data bits, 1 stop bit, send/receive by hex.

3.2.3.1. UD's Protocol Format

The indicating way means protocol format. The protocol of UD is comprised by 4 parts, namely, frame head: 1 byte (fixed as A3), address: 1 byte (01-3C), command: 1 byte and checkout: 1 byte (XOR of the above 3 bytes).

3.2.3.2. UD's Protocol Classes

UD's protocol include RESET, RECOVER, Info INQUIRY, Detecting Interval Time Control, LED Indicator Control, Ranging Control (table 4.2.7.3).

3.2.3.3. UD Instruction System

Table 4.2.7.3 UD Instruction System

Instruction Name	Order	Instruction Description	Return Value	Max. Response Time	UDADD.:01
Activate Self-adaption function	A0	UD doesn't use the jumper wire's setting height,but use self-adaptive height after sending the command	Success:add.+EA Fail:add.+ED	50ms	A3 01 A0 02
Cancel self-adaption function	A1	UD uses the jumper wire's setting height,but not self-adaptive height after sending command	Add.+E9	50ms	A3 01 A1 03
Restart	A2	Restart software,read add. again	Add.+EB	600ms	A3 01 A2 00
Recover	A4	Recover UD default settings	Add.+E6	30ms	A3 01 A4 06
Inquire	A5	Inquire space status info.	full:add.+E2 free:add.+E1	30ms	A3 01 A5 07
Inquire	A6	Inquire setstate	01 A8 B0 B8 41 02 03 00 Note1	100ms	A3 01 A6 04
Self-test	A7	Self test of UD	Add.+E3	50ms	A3 01 A7 05

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Control Interval time of detecting	A8	Default interval:1S	Add.+EC	50ms	A3 01 A8 0A
	A9	Interval:2S			A3 01 A9 0B
	AA	Interval:4S			A3 01 AA 08
	AB	Interval:6S			A3 01 AB 09
	AC	Interval:8S			A3 01 AC 0E
	AD	Interval:10S			A3 01 AD 0F
	AE	Interval:15S			A3 01 AE 0C
	AF	Interval:20S			A3 01 AF 0D
Control led indicator	B0	full:green,free:red(default)	Add.+E5	50ms	A3 01 B0 12
	B1	red:off,green:off			A3 01 B1 13
	B2	red:off,green:on			A3 01 B2 10
	B3	red:on,green:off			A3 01 B3 11
	B4	red:on,green:on			A3 01 B4 16
	B5	red:off,green:on			A3 01 B5 17
	B6	red:on,green:off			A3 01 B6 14
	B7	red:on,green:on			A3 01 B7 15
Control detecting distance	B8	distance set by jumper wire(default)	Add. +E8	50ms	A3 01 B8 1A
	B9	set height:0.5m			A3 01 B9 1B
	BA	set height:1.0m			A3 01 BA 18
	BB	set height:1.5m			A3 01 BB 19
	BC	set height:2.0m			A3 01 BC 1E
	BD	set height:2.5m			A3 01 BD 1F
	BE	set height:3.0m			A3 01 BE 1C
	BF	set height:3.5m			A3 01 BF 1D
Self-adaption	F0	To measure installation height and save the data, it will replace wire jumper's setting height after activating self-adaption.	Success:add.+E7 fail:add.+E4	100ms	A3 01 F0 52
Fixed address	F3	To read DIP switch add. andNsave the data. It will read the storage add.,but not use DIP setting add. when next power on.	Add. +EF	50ms	A3 01 F3 51

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Cancel fixed add	F5	To cancel the fixed add. Use DIP switch to set add. instead of the storage add.	Add. +EE	50ms	A3 01 F5 57
Control detecting way	C0	Detect car (default)	Add. +E4	50ms	A3 01 C0 62
	C1	Detect ground			A3 01 C1 63
Note1:return value is compose of seven parts:UD add.,interval time,control led indicator,control detection distance, DIP switch value, distance, comparative distance					

3.2.4. UD's Notes and Maintenance and FAQ

3.2.4.1. Notes

- Please read the instruction in detail before using.

- Please check the circuit before you connect to power supply so as to avoid short-circuits.

- UD is a un-touched measure instrument, please don't touch the ultrasonic sensor's surface in case of message delay or potential damage.

3.2.4.2. UD's NormalWorking Status

- The sensor indicator (RED one: RS485 indicator) will blink when the UD receives a command.

- The sensor indicator (GREEN one: space info indicator) will turn ON when there is a car parking, otherwise the space info indicator will turn OFF when there is no car parking.

- The extended LED indicator will turn GREEN when the parking space is FREE and turn RED when the parking space is OCCUPIED.

3.2.4.3. FAQ

- Sensor indicator (RS485 & parking info.) do not turn on, please check the wire connection if there are any faulty / make sure the power supply (DC12-24V) works well/ make sure you didn't reverse the anode and cathode.

- There is no return value when you send a command: make sure you send the right command / check your RS485 wire connection / check your COM port setting: it should be 4800, , 8, 1./ It should be converted from RS232 to RS485 when connected to PC. / Check whether the address setting and sent commands are right.

- C. The extended LED indicators cannot work normally: check your height setting switch / adjust + 0.5m of the set height to try again / check if there are any pipe block the sensor or something piled on the parking bay like a car which may lead to miscarriage / make sure that UD are facing against the ground.

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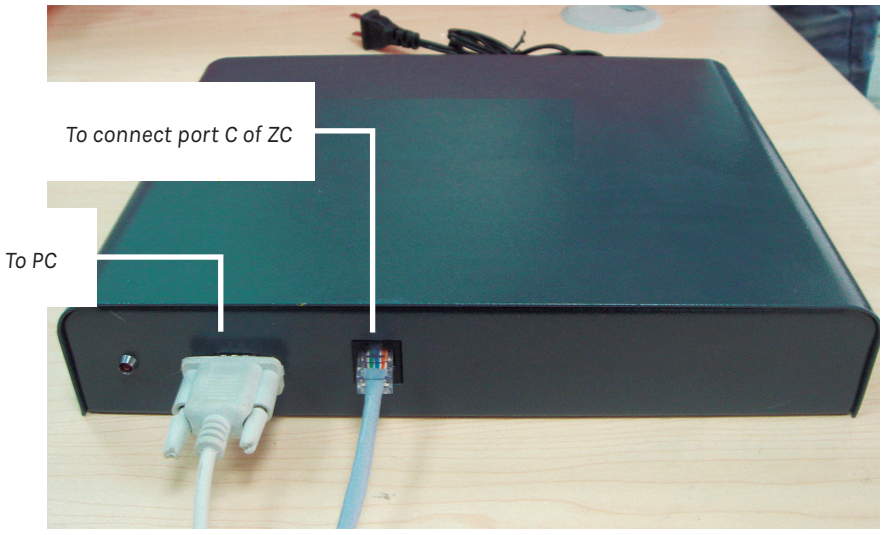
3.3. Central Control (CC) RS485

3.3.1. Parameter

Work Temperature	-20~+80°C
Work Voltage	DC 5V
Communication way:	1 RS-232 serial port (RS-232-PC), 1 RJ45-485 port (RS-485-NODE)
Communication Rate:	RS-485-NODE: 9600bps; RS-232-PC: 57600bps
Communication Distance:	≤1000m

3.3.2. Work Principle

CC's function is to get the ZC's data via RS485, process those data, and then send those processed data to the PC or to other designated equipment, the CC will update the LED panel's display data via RS232-NODE.



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3.3.3. Connections

Please connect cables strictly regarding to the manual before power on.

8 lines network cable (RS485 node): CC is connected to C port (CC) of ZC by network cable(regarding to 568 connection order)

The order of T568B flat cable is orange/white, orange, green/white, blue, blue/white, green, brown/white, brown)

Green/White stands for 485B, green stands for 485A, orange,blue and blue/white stands for GND. 232 cross wire with 3 lines(rs232-PC):connect to PC serial port directly or support RS232 communication equipment.

3.3.4. Command

•**Communication port rs485-node serial port settings:** 9600bps;no parity check,8 data bit,1 stop bit

RS-485-NODE protocol:

RS485-NODE protocol takes use of circulatory scan mode to send command format by turns:/CXX> (ASCII code, XX is corresponding to queried ZC's address)

CC sends control command /CXXPXXXXXXX> (ASCII code, LED display is under ZC's control) or /PXXXXXXX (ASCII code, LED display is under CC's control) after finishing scanning all ZCs every time.

•**Communication Port RS232-PC serial port settings:** 57600bps; no parity check; 8 data bit,1 stop bit.

•**RS-232-PC Protocol:**

RS232-PC protocol takes use of active transmit mode to send order format:/CXX?XXXXXXXXXXXXXXXXXXX> (ASCII code)

/C	XX	?	XXXXXXXXXXXXXXXXXXX	>
Lead code	ZC Address Code	Separator	Information Character	End Code

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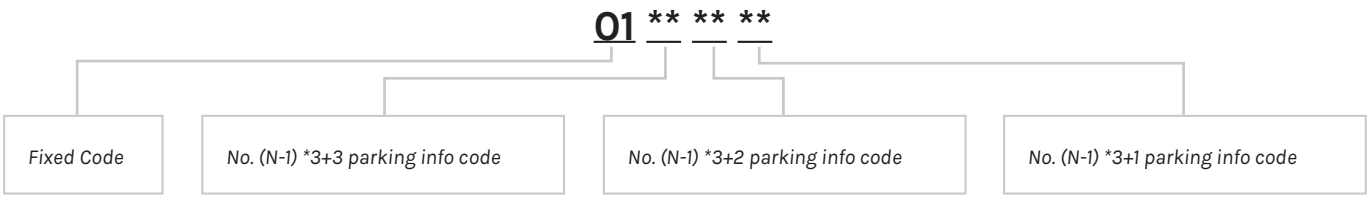
- Lead Code:the leading sign of command, fixed format is not changed
- ZCAddress Code:Indicate information character string belong to which ZC's address
- Separator: packet separate character,fixed format is not changed.
- Information character string: total 20 bytes. Every byte carrys 3 parking spaces information,the format is as below:the binary of X is ** ** **.



Remark: N stands for the No.N character(1,2,3...20)from left to right.

Fixed Code: it is fixed as "01"

1. **Information code:** Every two digits consist of 1 information code.Every information code carry 1 parking space information. Information code is corresponding to the sensor status whose address is 60.

   00 means the parking space is free

   01 means the parking space is occupied

   10 means the sensor us has breakdown

2. **End code:** the end mark of command,the fixed format is not changed.

3.3.5. Maintenance and Troubleshooting

1. The power supply is AC110V/220V transfers to DC5V, when there is power on,the indicator on circuit board will be on.Or the power supply is broken and need to change or the circuit board is broken and need to change.
2. RS485-node port /CXX>(XX is corresponding to the queried ZC address) and led display control command /CXXPXXXXXXX>(the led display is under ZC's control) or PXXXXXXX>(LED display is under CC's control),or rs485-node port's connecting wires has breakdown and need to be replaced by new one or circuit board of CC has breakdown and need to be replaced by new.
3. When RS485-NODE port has got return data /XXXXXXXXXXXXXXXXXXXX> from the relevant ZC, RS232-PC port will transmit data(ASCII code,baud rate 57600)/ CXX?XXXXXXXXXXXXXXXXXXX>, or RS232-PC port connecting cables have breakdown or circuit board of CC has breakdown and need to be replaced by new one.
4. RS485-node port transmits data acquisition instruction of ZCand LED display control instruction (ASCII code,baud rate:9600),but the command is not correct,if so the configuration of CC is incorrect(need configure again by the software of led settings).

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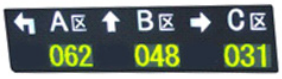
3.3.6. Attentions

1. Please read this manual carefully before operating.

2. Make sure all cables are connected well before power on to avoid the burning or damage of inside devices.

3.4. LED Display

LED display is comprised by LED module, drive circuit, control circuit, frame and other components. It receives the imformation from CC, displays the quantity of the available carport in the yard, suggest the drivers ready to admission and can be used 24hours a day. Internal procedures can be modified at any time based on the users' requirements, displaying the needed information.



3.4.1. Technical Parameters

Operating voltage: DC 5V	Working Current: 1.3~ 1.5A
Working temperature: -20 ° C ~ 80 ° C	Communication method: RS-485
Communication Set: 9600/4800bps, N, 8, 1	Communication distance: ≤ 1000m

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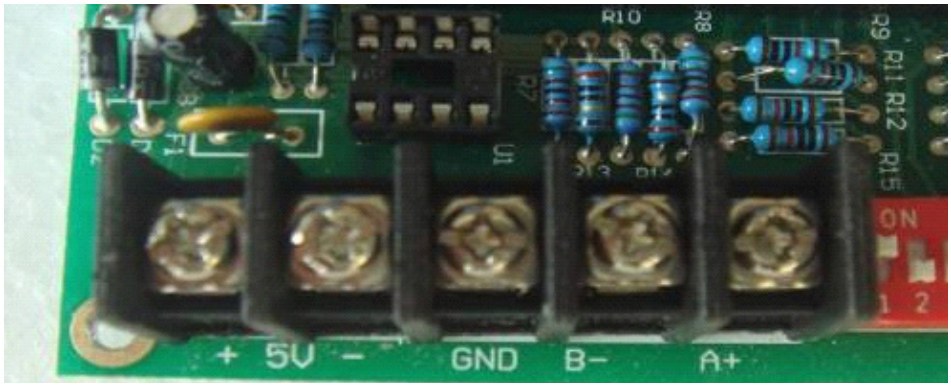
3.4.2. Connection

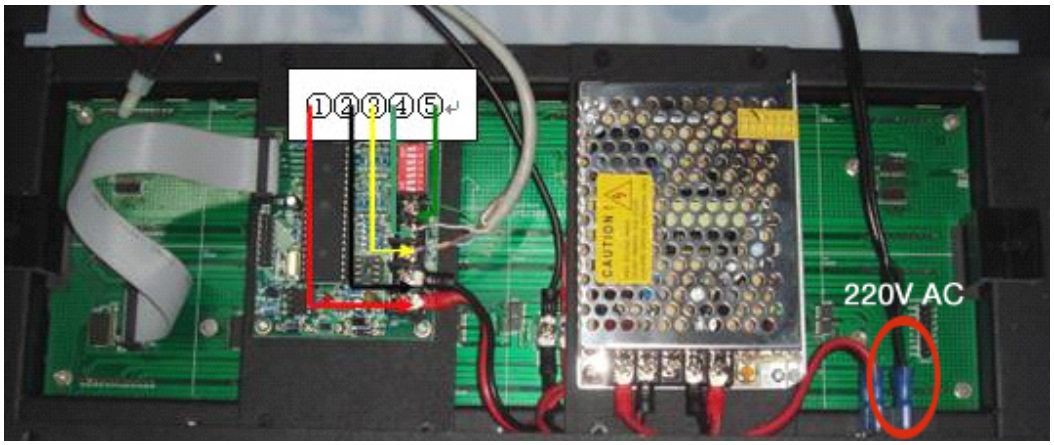
Connect according to connection correspondence table strictly.

Connect DC 5V to circuit boards, the signal line 485 are connected with port 3,4,5 as follow:



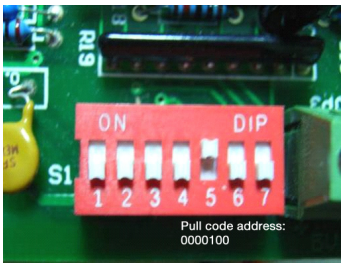
DC +	DC-	GND	485-B	485-A
1	2	3	4	5

Specific external circuit connection are showed as bellow:



3.4.3. Address Settings of LED Display

Pull code switch(totally 7 bits, 1 is the high position) is used to set Led display address. ON is one, OFF is O. Specific setting see the attached table 1 (Page 11). For example,to set the Led display address of 04, then dial the code of 0000100, showing as below:



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3.4.4. Instruction Set

The communication way of Led display is RS485. RS485 serial port and port are seperately set as follow: baud rate 4800bps, no parity, 8-bit data bits, 1-bit stop bit, ASSCII code transceiver.

Order format: /PXXXXXXX> (ASCII code)

/P	XX	XX	XXX	>
Start code	Address code of LED display	Control code	Number of free parking spaces	End code

- Lead code: the beginning sign of instruction, the fixed format is unchanged.
- Address code of LED screen: It is valid only if it coincides with LED screen address.
- Control word: Controlling LED displayed parameters.(Look at the table 3.4.4.1)
- Number of free parking spaces: Control the data to be displayed (When it displaysthe parking spaces for the disabled, only the last data is valid.)
- End code: the ending sign of instruction, the fixed format is unchanged

The first control word (0-7)	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*
Arrow location	right	right	right	right	left	left	left	left

The second control word (0-7)	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*
Digital color	red	orange	green	according to the number	red	orange	green	according to the data
Parking place type	Normal	Normal	Normal	Normal	Disabled	Disabled	Disabled	Disabled
Arrow direction	right	left	up	down	right	left	up	down

Note: According to the number: When the number is 0, it displays red; when the number is not 0, it displayed green.

For example: /P5151023>(code ASCII) signifies LED screen with the control address of 51,displaying 23 normal free carport and the arrow position are on the left, the arrow direction points left, the number pointed are displayed orange.

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3.4.5. Maintenance and Troubleshooting

- When the power are supplied, there are displayment of 000->. If all of them do not shine, check whether the power indicator of control panel is lit (If not, check whether the electric power source is input or not), whether the data cable is connected or reversed (check this if you have teared down, or it will be unnecessary). If all the above is normal, replace the control board. If the line spacing is not bright, the data line is not well connected. (unplug and connect again)

- If the data cannot be updated, the address set is wrong (need to reset) or the pull code switch are broken (find out which is damaged, set the other address to use or change the control panel) or the control panel are mulfunctioned.

3.4.6. Attentions

- Read the instruction carefully before using it.

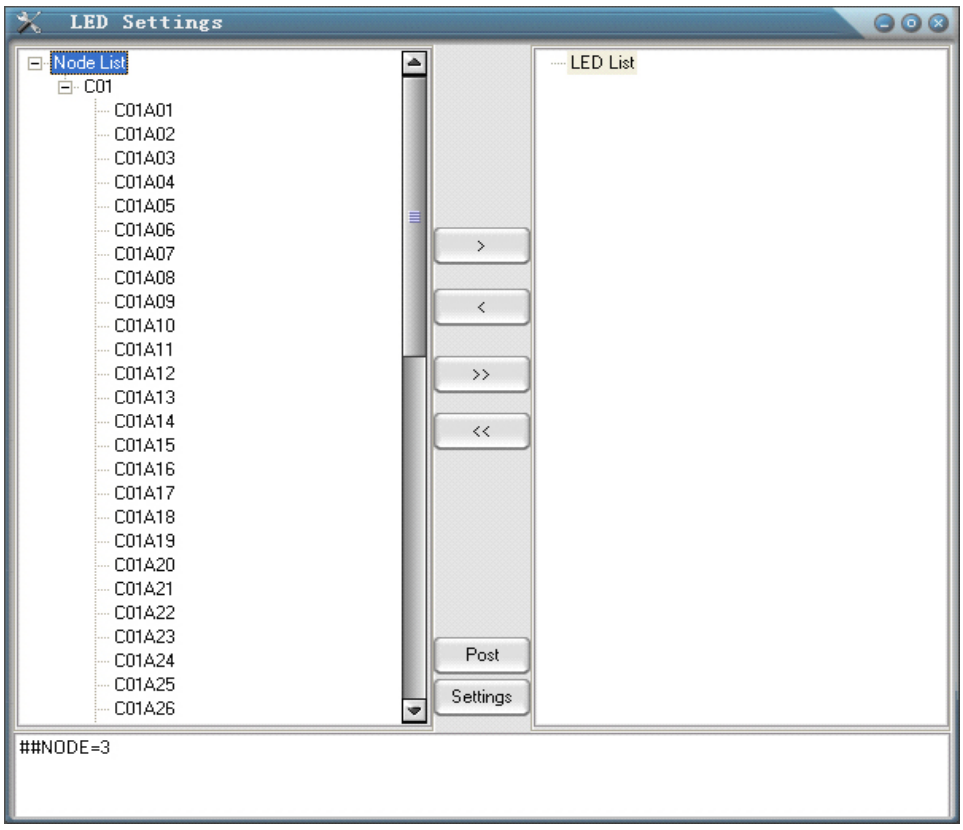
- Please check carefully the connected electric circuit before turning on the power to avoid the ruin or damage of the internal components.

3.5. Use of LED Settings Software

3.5.1. Main interfaces:

Settled format of address:

ZC: C01	UD: C01A01	Pantalla LED: C01P01



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3.5.2. Configuration

Node List: the list of all ZCs,

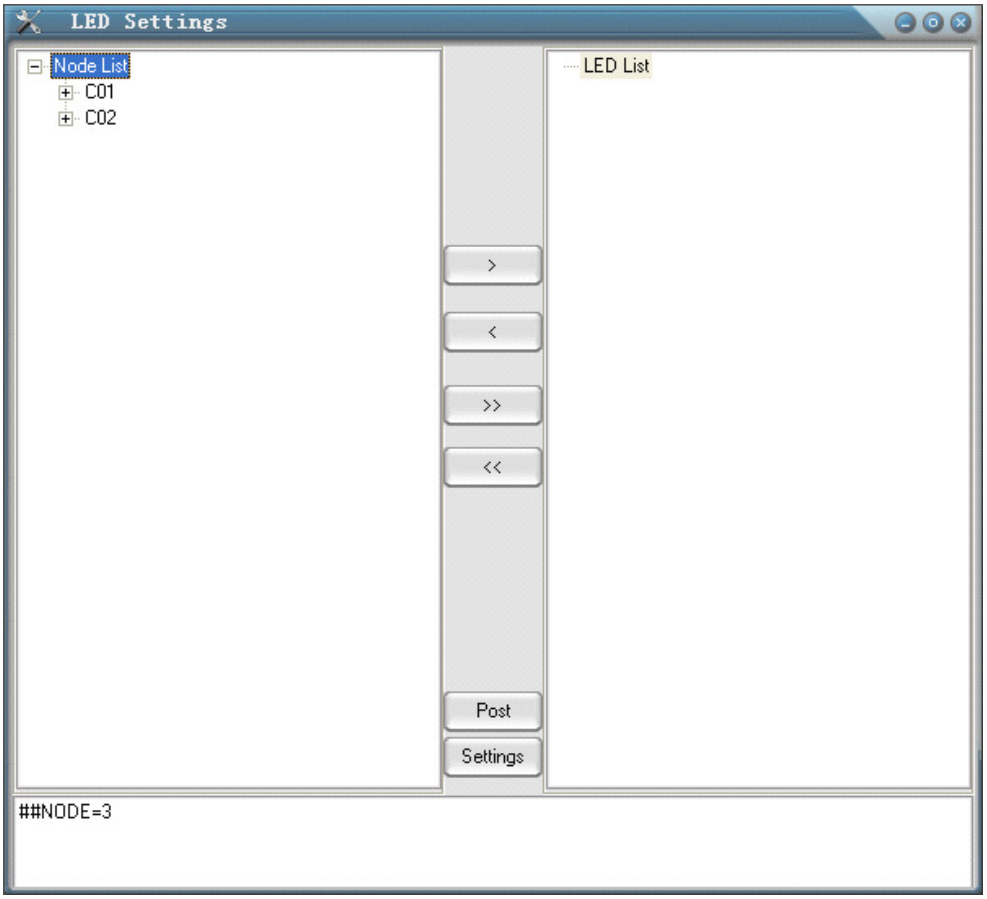
"C01" means a ZC whose dip switch address is 01(7 ON,others OFF),

"C01A01" means a UD whose dip switch address is "0" link to the ZC "C01"

Right click "Node List", to Add/Delete/Refresh ZC

•Add ZC

•Right click "Node List"



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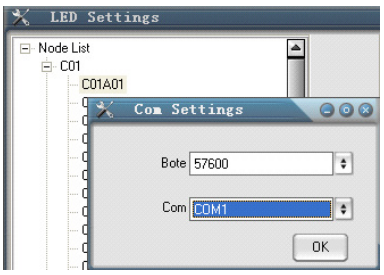
•Configure UD

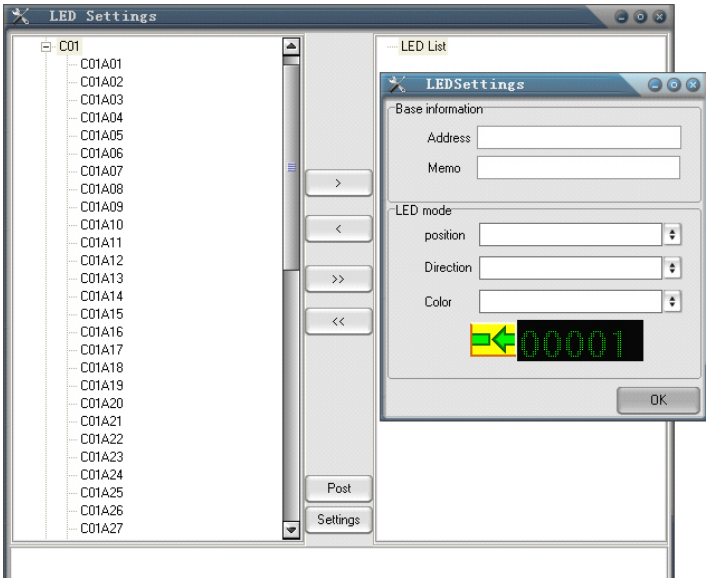
Choose a UD, then click "Settings" to set the COM details



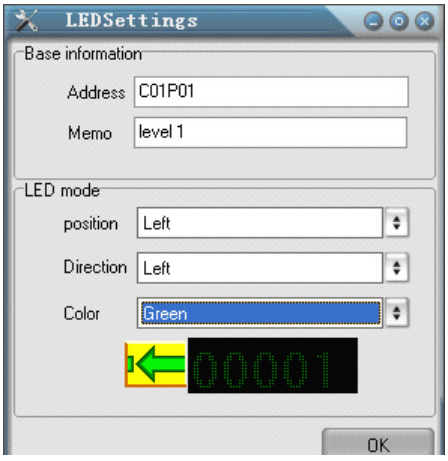
3.5.3. LED Display Configuration

•Add LED Display

Right Click "LED List",then choose "Add



Add the details of the LED Screen as follows:
C01means the name of the ZC to which this Screen link, P01 is the name of the Screen
eg: if you want to add the second LED Screen under ZC C03,the address is C03P02



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3.5.4. Configure your current system

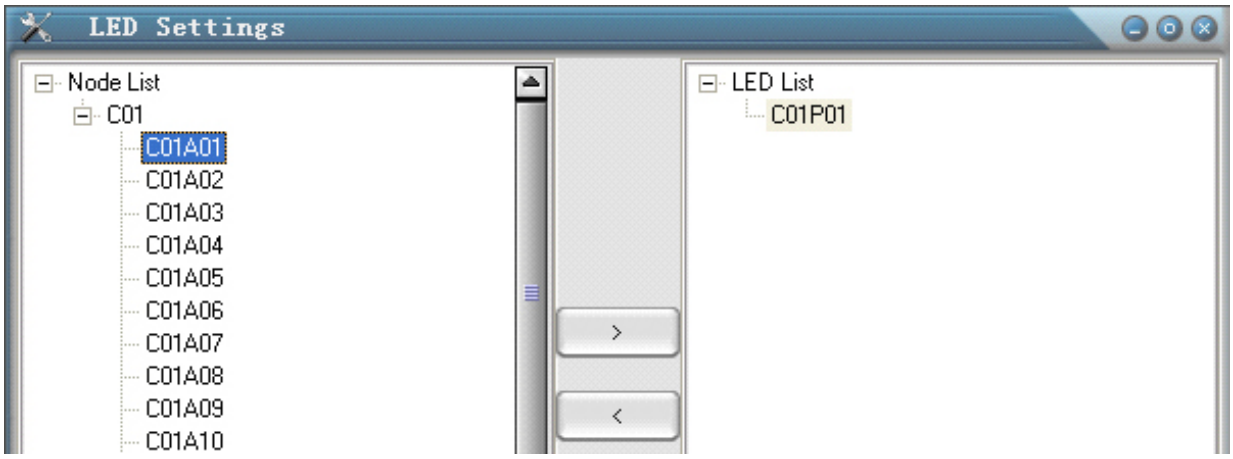
Now you have a sample system of 1*CC, 1*ZC(C01), 5*UD(C01A01, C01A02, C01A03, C01A04, C01A05), 2*LED Screen(C01P01,C01P02), how to manage them in the LED Setting?

Step 1: Add the ZC(C01) in Node list,

Step 2: Add the LED(C01P01) Screen in LED list

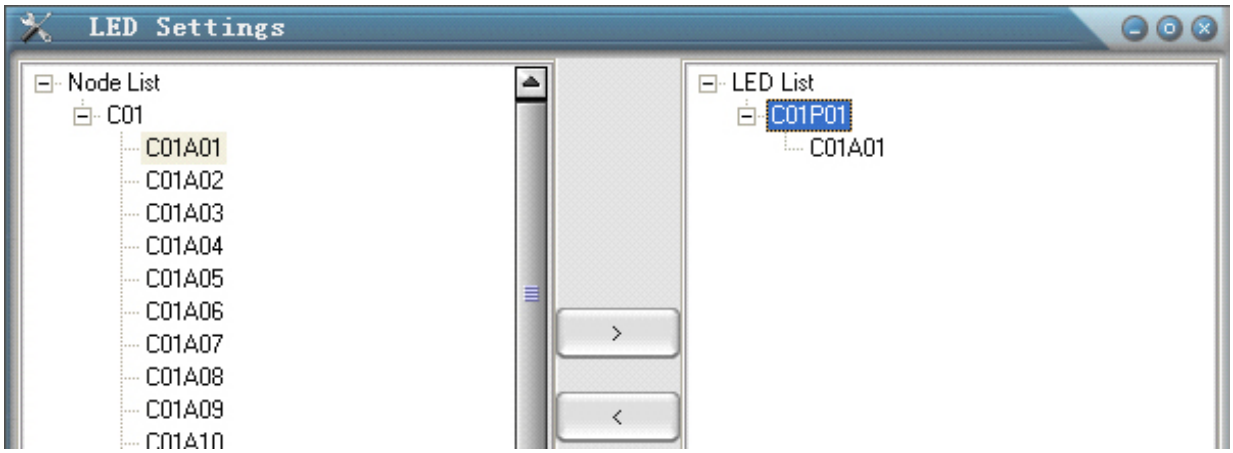
Step 3: Connect relevant ZC to LED Screen list

First, single click the name of the chose LED
Second, choose the relevant UD(C01A01)



Third, click the button [>], to add one UDC01A01 under the list of C01P01

Remark: to delete a UD from LED list, Click the button [<], to add all UD which under one ZC to relevant LED, Click the button [>>], to delete all UD under the chose LED list, Click the button [<<].



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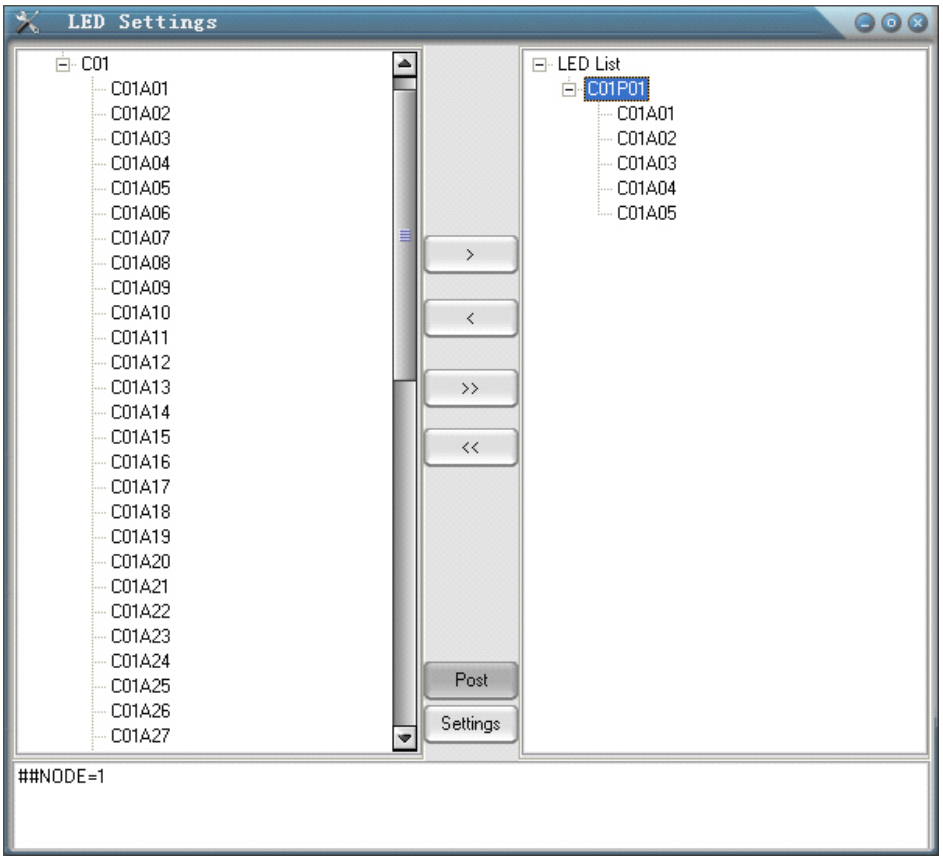
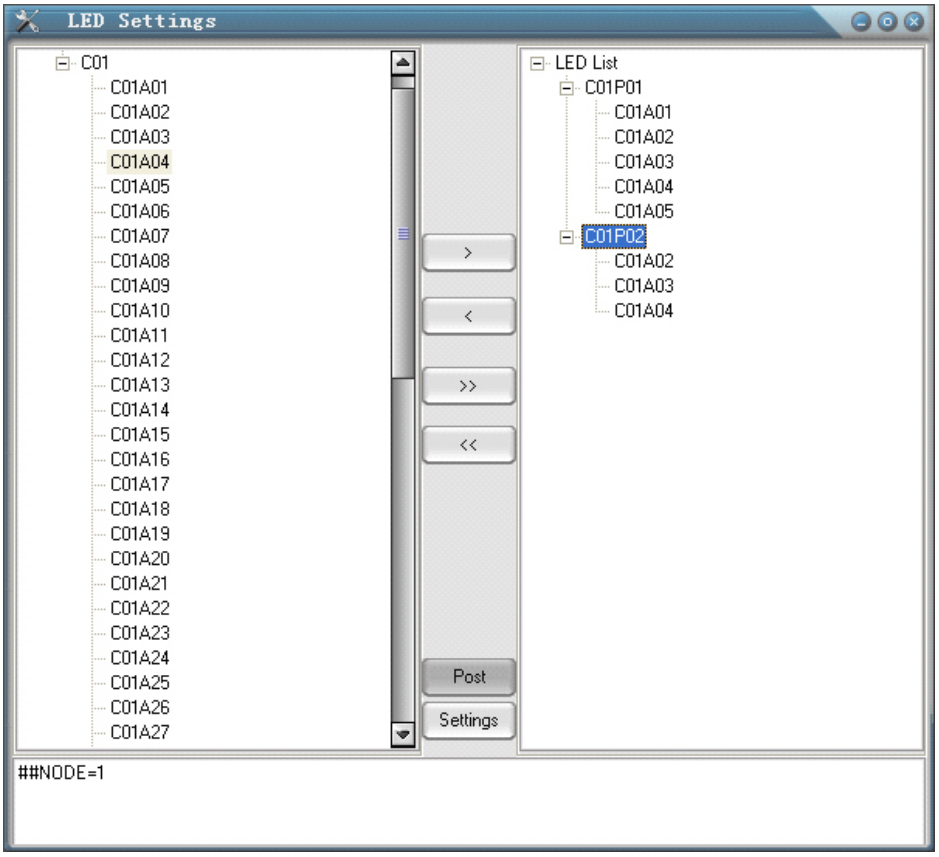
Step 4: Submit data, when you add one LED display,Click the Post as follows:





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3.6. Vehicle Tracking System Software

3.6.1. System Requirements

SO: Windows 2000,Windows XP , Windows 2003, Windows 10

Database: SQL2000, SQL2005

3.6.2. Installation

Step 1:Double click the icon of the ParkSystem.exe

Step 2:check the "Start Menu": There are two programs: ParkSystem & ParkData

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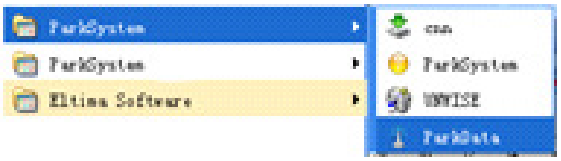
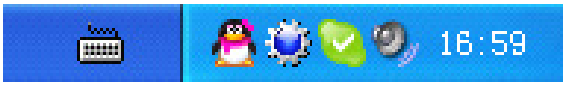
3.6.3. Operation

•ParkData configuration

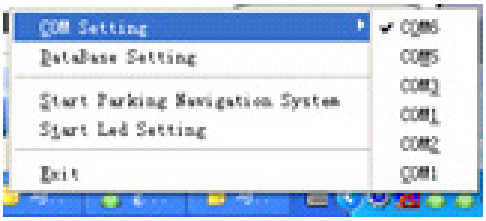
Step 1: Open the "ParkData" program from your "Start Menu"



Step 2: Check the ParkData Icon in your "inform region"

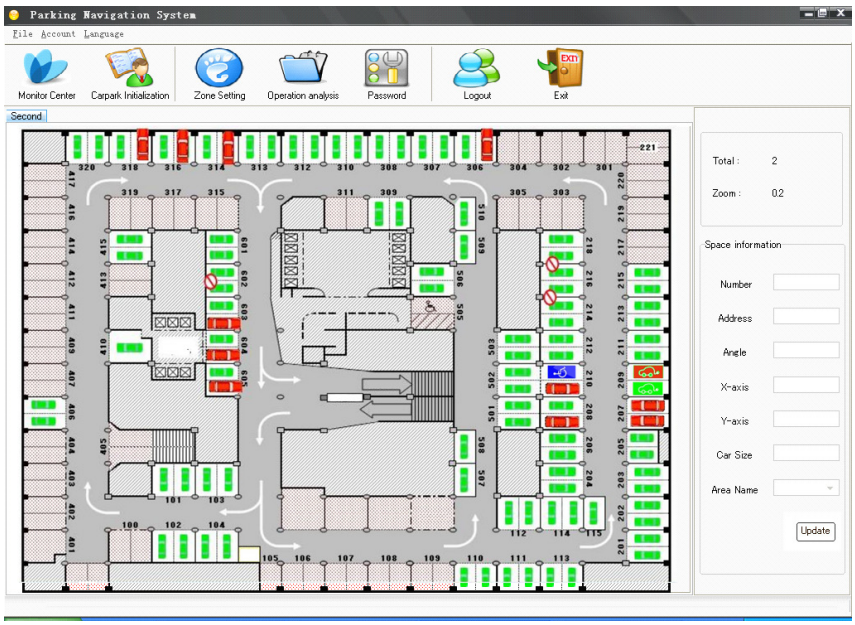


Step 3: Set your COM port parameter



•Carpark Initialization

Function: to initialize the information of your parking garage.



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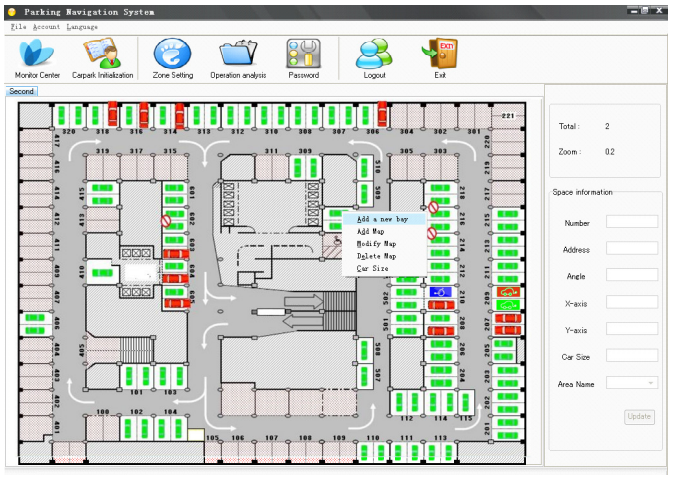
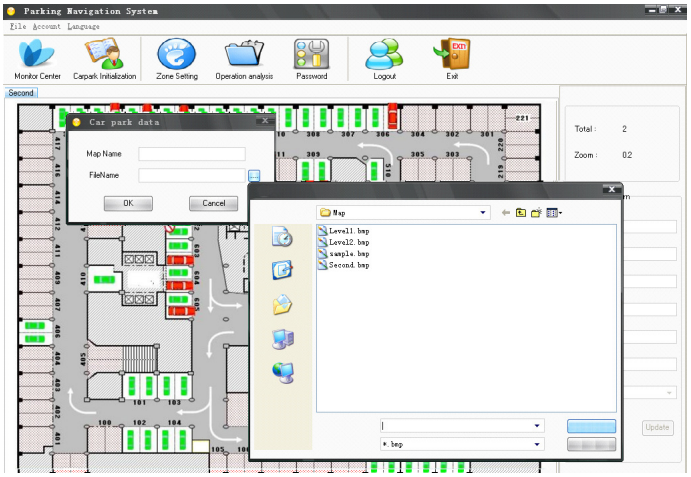
1. Add Map

Add the map of your parking garage into the system,please DO use .bmp format

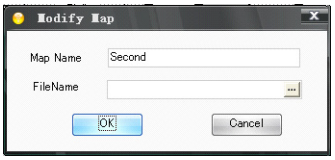
Step 1: Right click you mouse and choose "Add map"



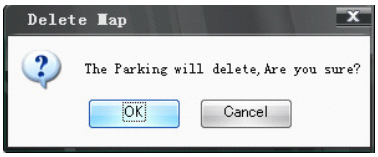
Step 2: Browse the files in your computer



2. Modify Map
   You can change your Map's name ,also you can change another map.



3. Delete Map
   You can delete the current map by this button



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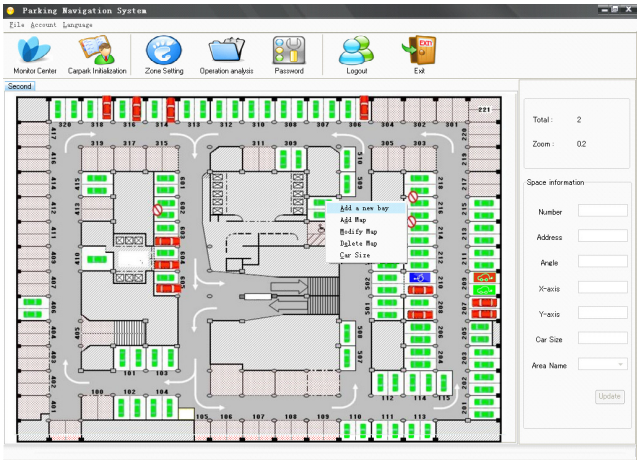
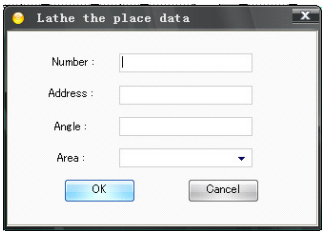
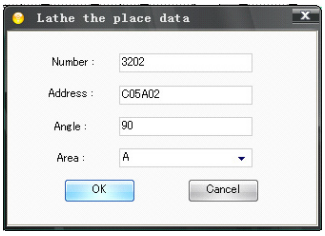
4. Add a New bay

Step 1: Right click you mouse and choose "Add a new bay"



Step 2: Input the parking bay's information





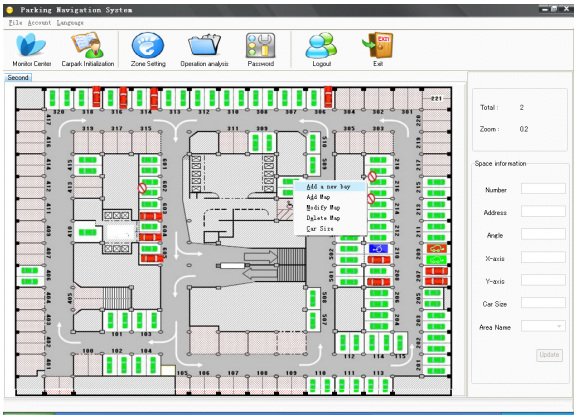
Number: To help you find the corresponding parking bay in your project, If this parking bay's ID is 3202 in your project, you can fill the blank as 3202

Address: To identify all the sensors in the software according to your project It has a fixed format as C**A**(C**:ZC's address,A**:sensor's address), If a sensor's IP address is 02(0000010),and it belong to the ZC 05(0000101), so you should filled the blank as C05A02..

Angle: This angle means the car model's angle against the horizontal direction.

Area: Fill the blank as the real Area's name in your project.

Notice: You should add all parking bays one by one as the aboved step.



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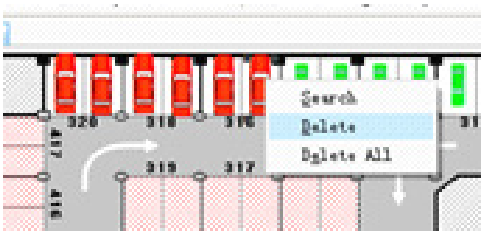
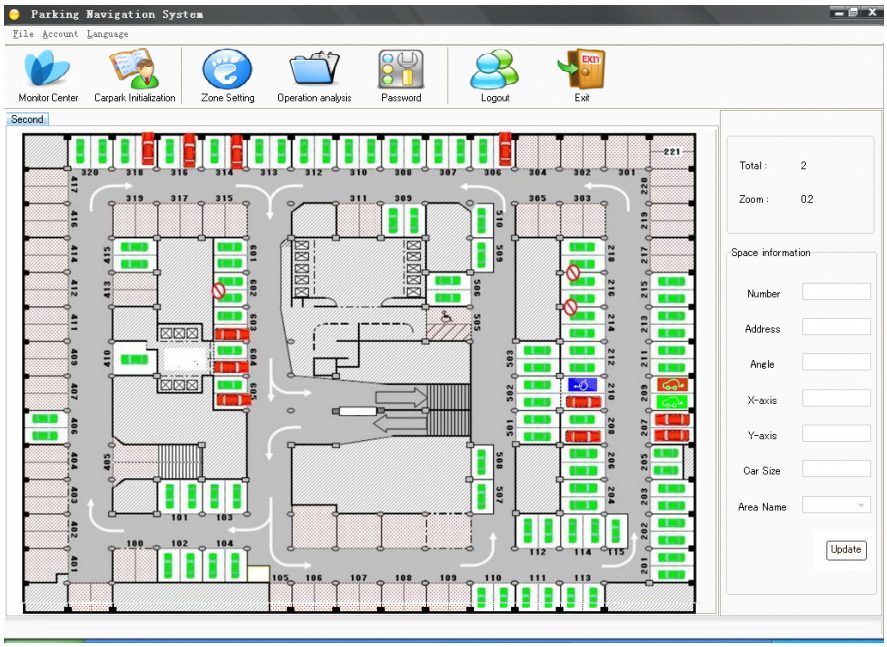
Step 3: Search/read/delete a car:
Choose a car,and right click your mouse,and you can delele a car/delete all car/search one car.

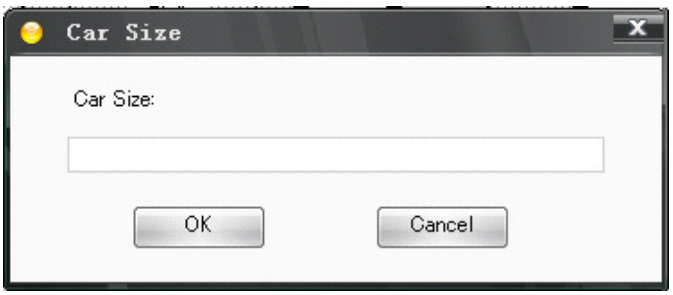


Step 4: Modify a car's information:
Choose a car, and then you can read its details in the right box, if you want to modify any information,please DO click the Update after you complete filling the blank.



5. Car Size

Function: To modify the size of Car(Parking Bay Icon),0.2 is the default size.



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•Monitor Center

Function:monitor the parking spaces' status in Real-time,

Interface:

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•Zone Setting

Function: to assign all the sensor into several zones,

For example, you have 4 LED screen in a parking garage who has 100 cars,

You want LED A display 001-050,

LED B display 051-060,

LED C display 061-085,

LED D display 086-100

Then you can assign the sensor(in the right of the box) into its corresponding LED screen

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Step 1: right click in the left box,there are 3 function:Add/Delete/Modify

- Add a display:

Right-click on the regional list, select 'Add'
Input its name, click OK

- Delete a display:

Choose a display, right click and select 'delete'
Click OKr

- Modify

Choose a display, right click, select 'Modify'
Input a new name, click OK to complete

Step 2:

Click on < - Select a sensor from sensor list to a choosen LED display

Click on > - Select a sensor from a choosen LED list to sensor list

Click on << - Select all sensor from sensor list to a choosen LED list

Click on >> - Select all the sensor from a Choosen LED display to sensor list

•Operation Analysis

Function: Specific statistics for the operation of the depot

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1. Flow Statistic means total car's quantity in your appointed time
   Eg:from 12:00 to 13:00,there are THREE cars into the CarPark in this one hour, that means Flow Statistic=3

2. Use Ratio = $\frac{\text{[sum(each space's use time)]}}{\text{(appointed time*total space in the CarPark)}}$

Eg:there are 5 spaces in a CarPark, today just few cars parking between12:00-13:00,other time are no car.

Space1 has been used 0.5 hour

Space2 has no car

Space3 has been use 0.6 hour

Space4 has been use 1 hour

Space5 didn't been used

So the Use Ratio between 12:00-13:00=
(0.5+0+0.6+1+0)/(1hour*5spaces)=2.1/5=42%

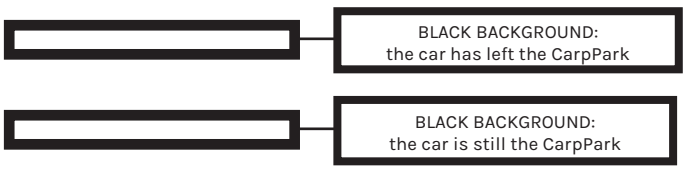
And today's Use Ratio=
(0.5+0+0.6+1+0)/(24*5spaces)=1.75%

Green as used(FULL),Red means not used(FREE)
Eg:suppose the the CarPark used between12:00-13:00 are as belowed:

time	*Free space*	*Full space*	*Total space*
12:01	4	1	5
12:30	3	2	5
12:33	2	3	5
12:45	5	0	5

Then the FREE space Use Ratio=
(4 +3 +2 +5) / (5 +5 +5 +5) = 70%

The FULL space Use Ratio=
(1 +2 +3 +0) / (5 +5 +5 +5) = 30%



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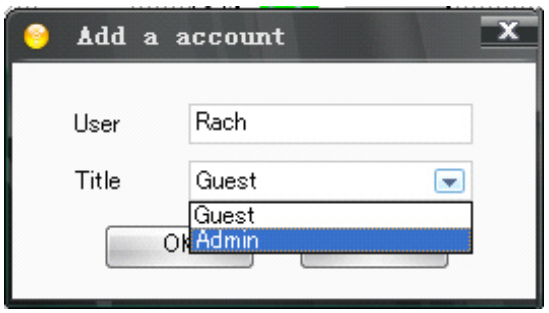
•Password

•Account

Function: Add users of the system

Interface:



Operation:

Enter user name and select the relevant title.
Click ‘OK’

Notice:

New user’s default password is: 123456
Admin can read/delete all the data
Guest just allow to use the "Monitor Center" and "Operation Analysis"

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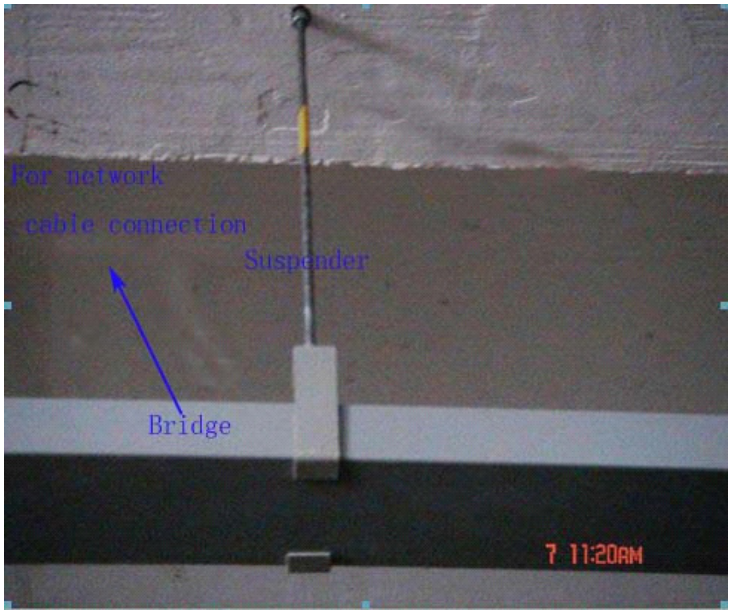
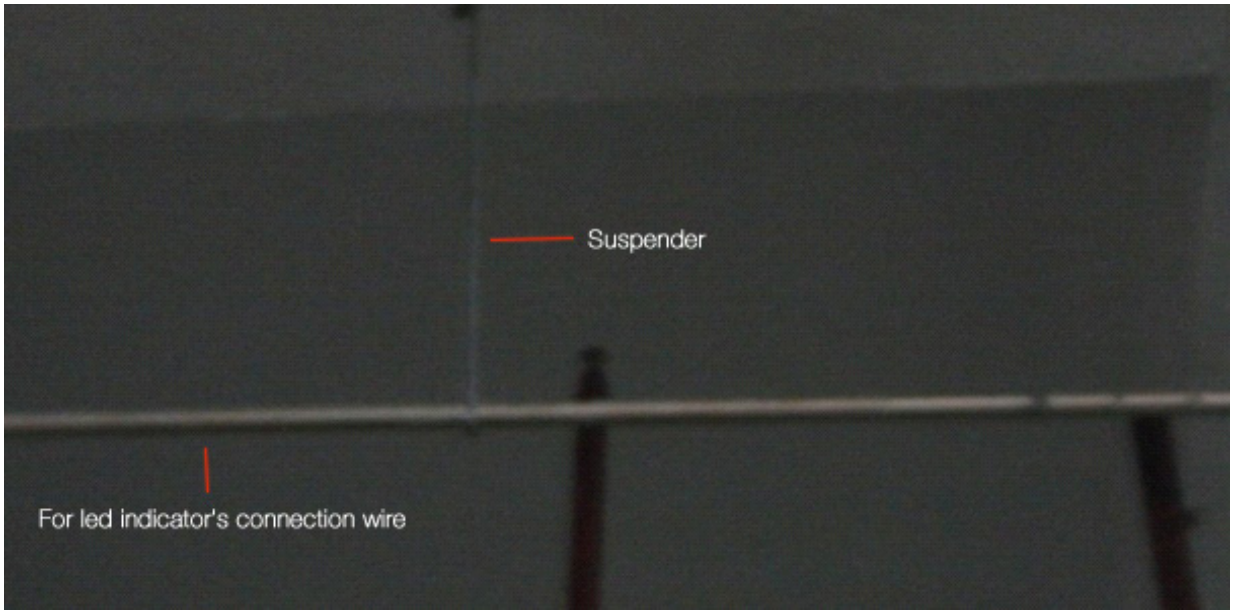
4. Site Operation

4.1. Installation of Typical Bridge

4.1.1. Installation of Boom

Embeding boom: Boom position should be placed in the center line of every carport which needed to fix bridge, then hammer the expansion screw and install the boom. After installing ultrasonic detector, it should be 2.5 m height from the ground. Beating boom should facilitate the further installation.





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4.1.2. Installation of KBG

KBG should pass the place which is just above the parking lot center. Install the KBG on the height of 2.5m from the center of every parking space to connect to the bridge of vehicle aisle.

4.1.3. Installation of Bridge

Install in the place of 2.5m high above the central part of Automotive aisle

4.1.4. Wiring

Use network lines and phone lines to connect the system

4.1.5. On-site installation picture

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4.2. Installation with Tubes

Another alternative is installing standard electrical tubes. The ultrasonic detector and the LED indicator are connected to the tubes with specific boxes for them (see 4.2.1 Accessories). Inside the tubes there are UTP-CAT5 cables, that are connecting between the different elements of the system.

4.2.1. Accessories

Box for Ultrasonic detector

Box for LED indicator

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5. System Debugging

- Connect to the collection box with notebook computer (convert the ultrasonic detector output analog signal into digital signal so that the notebook computer can see the image), then connect to ultrasonic parking place detection terminal so that the notebook computer can capture the shooting range of the ultrasonic parking place detection terminal. Ensure that the bottom of the image conincide with the line 40cm off the parking place.

- Turn on the power to test the system. Obverse if all the parking place indicator are lit, or the ultrasonic parking place detection terminal and the parking place detector are not well connected. Use network cable tester to test the telephone line between ultrasonic carport detection terminal and parking place status indicator.

- When the whole system is on power, observe if every parking place status indicator is lit. The not lit light means having not yet connected.

6. Routing Maintenance Notes

- Do not operate system facilities to prevent misuse and causing system failure if you are not the system maintenance person.

- Please make a backup after completing the system configuration file in case it cannot be restored after being damaged, reducing the maintenance workload.

- When the system cannot work normally, please check if the electric power source is carelessly cut off firstly.

- After cleaning some ultrasonic parking place detection terminal, must readjust the installing angle to make sure that it can take photo of this parking place normally.

- Must guarantee the light of the ultrasonic parking place detection terminal.

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