Ultrasonic parking sensor communication protocol

Scope of application: split ultrasonic parking detector, front integrated ultrasonic parking detector.

1. Interface electrical standards
Comply with RS485 standard

2. Data format

(1) Baud rate 9600bps
(2) Data frame format 1 starting bit, 8 data bit, 1 stop bit
(3) Command format:

Get status command	**START ADDR CMD CHK**
Other commands	**START ADDR CMD LEN DATA CHK**

START indicates the start character and contains 1Byte

Command type	Send	Response	Remark
Get status command	0xFA	0xF5	This command does not have a length/data field.
Other commands	0xAA	0x55	

ADDR indicates the address of the detector. The value is 1Byte long and the address range is 00-1fH and FFH.

FFH is a special address that is used when the data concentrator is in broadcast mode.

CMD indicates a specific operation command. The command length is 1Byte. For details about the command code, see the command description.

LEN data length (get sensor status command, no value).

DATA represents the command parameter.

CHK indicates the verification code. The value contains 1Byte and the verification mode is

```
unsigned char CheckXor(INT8U *str,INT8U len)
{
    INT8U i;
    INT8U sum =3;
    if(len ==0)return sum;
    for(i=0;i<len;i++)
    {
    sum ^=*str++;
    }
    return sum;
}
```

Command function:

No.	Command	Send	Back	Statement
1	Acquire sensor status (0x01)	start（0xFA）+ sensor address (1Byte)+ command (0x01)+ check (1Byte)	Start（0Xf5）+ sensor address (1Byte)+ status (1Byte)+ check (1Byte)	Status: 0x01 have car 0x02 no car 0x03 sensor fault
	Eg: 01 address: FA 01 01 F9 04 address: FA 04 01 FC			
2	Sensor Multicast detector (0x16)	Start（0xAA）+ Multicast Address(1Byte)+command(0x16)+length(1Byte)+ check(1Byte) AA 81 16 00 XX (5Byte)	This command is multicast, and multiple detectors will receive this command, so there is no response	Multicast Address 0x80/0x81/0x82/0x83
	Eg: [10:54:36.324]AA 80 16 00 3F [10:54:36.505]AA 81 16 00 3E [10:54:36.685]AA 82 16 00 3D [10:54:36.865]AA 83 16 00 3C Note: The multicast command did not answer			
3	Data eg: Send:AA 01 0E 01 C5 62 Receive: 55 01 01 01 C5 92			

【important note】

1	When the detector is in offline mode (no command is received), it will automatically detect and change the indicator light according to the detection result. When in online mode, sensors must receive 0x16 (Multicast probe) before the probe starts!
2	The general process: 1.Periodically send multicast (it is recommended to send a group of 250ms, and 4 groups are sent in about 1 second); You can send them in turn in the following format AA 80 16 00 3F AA 81 16 00 3E AA 82 16 00 3D AA 83 16 00 3C If the field interference is relatively large, you can try to send a group of 500ms 2, get the status (another thread has been polling, when the timing to start sending, pause polling);
3	Probe Multicast probe (0x16) : The probe must receive this command in order to probe while avoiding interference from neighboring probes, and the probe is divided into 4 groups and takes turns at the address 0x80/81/82/83.
4	Command response times out:: <50ms