circuit board Communication Protocol V2

1.1 Baud rate：19200bps

2.1 Format of upper computer command protocol (length 8 bits)

start bit	undefined	Machine number	command value	Data0	Data1	Data2	cumulative sum
0x7E	0x00	0x01	0x80	0x00	0x01	0x00	0x55

2.2 Data definition and explanation

Query Command

Data bits	command value	Data0	Data1	Data2
Data Definition	0x10	undefined	undefined	undefined
example	Query (read) device status：7E 00 01 10 00 00 00 70 *The polling interval should not be less than 200ms，and it is recommended to use 500ms or more			

reboot device

Data bits	command value	Data0	Data1	Data2
Data Definition	0x35	0x60	undefined	undefined
example	reboot device : 7E 00 01 35 60 00 00 EB			

Left open

Data bits	command value	Data0	Data1	Data2
Data Definition	0x80	Authorized Number of Passers	undefined	undefined
example	Left open and one passager : 7E 00 01 80 01 00 00 FF Left open and three passagers : 7E 00 01 80 03 00 00 FD Under this command，the gate opens and automatically closes when the waiting time for passage exceeds or the passage is completed.			

Left normally open

Data bits	command value	Data0	Data1	Data2
Data Definition	0x81	undefined	undefined	undefined
example	Left normally open：7E 00 01 81 00 00 00 FF The gate remains open under this command until the upper computer sends a closing command before closing the gate			

right open

Data bits	command value	Data0	Data1	Data2
Data Definition	0x82	Authorized Number of Passers	undefined	undefined
example	right open and one passager：7E 00 01 82 01 00 00 FD right open and three passagers：7E 00 01 82 03 00 00 FB Under this command，the gate opens and automatically closes when the waiting time for passage exceeds or the passage is completed.			

right normally open

Data bits	command value	Data0	Data1	Data2
Data Definition	0x83	undefined	undefined	undefined
example	right normally open：7E 00 01 83 00 00 00 FD The gate remains open under this command until the upper computer sends a closing command before closing the gate			

gate closed

Data bits	command value	Data0	Data1	Data2
Data Definition	0x84	undefined	undefined	undefined
example	Close the gate：7E 00 01 84 00 00 00 FC			

*The above examples are all listed with machine number 1，and the hexadecimal data is omitted as OX；
When a broadcast command is required，the sending machine number is 0，and the device will execute the command content directly without comparing the machine number.

3.1 The data protocol format returned by the lower computer (18 bits in length)

start bit	version number	Machine number	Fault Event	Door arms status	Alarm event	Accumulated number of left-open			Accumulated number of right-open			Infrared status	Command Execute	supply voltage	undefined	undefined	cumulative sum
						High 8 digits	Middle 8 digits	Low 8 digits	High 8 digits	Middle 8 digits	Low 8 digits	constantly	status				
0x7F	0x09	0x01	0x00	0x00	0x00	0x00	0x01	0x00	0x00	0x01	0x00	0xF0	0x55	0xE4	0x00	0x00	0x00

*Due to the limited lifespan of internal storage erasure in MCU, the accumulated number of users can only be written to the storage during power failure. To ensure that data is not lost, please choose the supercapacitor version.

3.2 Definition of Fault Events

numerical value	Data Definition
0x00	No fault
0x01	Unable to detect the master motor
0x02	Unable to detect the slave motor
0x03	Unable to detect the master and slave motor
0x04	Infrared abnormality during self inspection process
0x05	Motor abnormality during self inspection process
0x06	The master motor encounters resistance during operation
0x07	The slave motor encounters resistance during operation
0x08	Master-slave board communication failure
0x09	Insufficient voltage or power breaker

Definition of door arms status

numerical value	Data Definition
0x00	door closed properly
0x01	Left open properly
0x02	right open properly
0x03	During exercise or not open in place
0x04	Fire signal opening

Alarm event definition

numerical value	Data Definition
0x00	No fault
0x01	Left infrared alarm in case of unauthorized passage
0x02	right infrared alarm in case of unauthorized passage
0x03	pedestrian Reverse alarm
0x04	pedestrian stays in the channel
0x05	Unauthorized entry by pushing the door with external force
0x06	Trailing alarm

4.1 Explanation of Verification Algorithm

Verification range: including the starting bit.

Sender: Accumulate the required data to obtain a data sum, and invert the sum to obtain our checksum. Then send the data to be sent along with this checksum to the receiver

Receiver: Accumulate the received data (including checksum) and add 1. If 0 is obtained, it indicates that there is no transmission error in the data. (Note that the types used by the sender and receiver to store the accumulated results must be consistent here, otherwise adding 1 will not overflow and result in 0, and the verification will be invalid.)

Example:

Sender: To send 0xA8, 0x50, we use unsigned char (8 bits) to store the accumulated sum, which is 0xF8 (11111000), and take the inverse to obtain the checksum of 0x07 (00000 111). Then send these three pieces of data out.

Receiver: If received correctly, the cumulative sum of these three data is (11111111). Adding 1 at this time will result in 0 (the actual result should be 100000000, but because an unsigned char (8 bits) is used to store the cumulative sum, the high bits are truncated, leaving only the low eight bits of 0)

Sender verification algorithm function (C language)

```
unsigned char TX_CheckSum(unsigned char *buf, unsigned char len)//buf is array，len is Array length
{
 unsigned char i,ret=0;

 for(i=0;i<len;i++)
 {
  ret += *(buf++);
 }
 ret = ~ret;

 return ret;//Return verification value
}
```

Receiver verification algorithm function (C language)

```
unsigned char RX_CheckSum(unsigned char *buf, unsigned char len)//buf is array，len is Array length
{
 unsigned char i,ret=0;

 for(i=0; i<len;i++)
 {
  ret += *(buf++);
 }
 ret =ret;

 return ret+1;//If the value returned by the function is 0, it indicates that the data is correct
}
```