

# RS485 control board communication protocol

## 一、Hardware interface:

- 1.Communication method: RS485 communication, 2.Baud rate 9600; data bit 8; stop bit 1; flow control None.
- 3.The unlock command is hexadecimal; the data format is Hex.
- 4.Working voltage DC12~24V
- 4.Support up to 31 control boards in series.
- 5.Can control normally closed electric locks. (Control normally open electromagnetic locks need to be customized)

## 二、Control Commands :

1. Full open command (Send this command to open all electric locks of a control panel)

Command header	Board address	Lock address	Function code	Check code /BCC
8A	01	00	11	9A

For example, the host computer sends 8A 01 00 11 9A to the lock board of address 1 and after receiving this command, all the locks on the No. 1 board are opened at an interval of 300 milliseconds; until the last one.

2. Unlock command:

Command header	Board address	Lock address	Function code	Check code /BCC
8A	01	01	11	9B

·The board address is the address number set by the DIP switch on the lock board.

·Lock address is the number of the channel that needs to be unlocked.

·The unlock function code is fixed at 11

3. For example, the host computer sends 8A 01 01 11 9B (hexadecimal) and returns the following data after 500 milliseconds. (The feedback data includes the board number, lock number and the current status of unlocking.)

The format of the feedback data is as follows:

Command header	Board address	Lock address	Unlocked state 11/00	Check code /BCC
8A	01	01	00	8A

·Note: The unlocking state is related to the lock. Locks are divided into door opening feedback type and door closing feedback type.

·Door closing feedback type: the door opening feedback status is 00, which means unlocking is successful; 11 means unlocking failed;

·Door opening feedback type: unlocking feedback 11 means unlocking is successful; 00 means unlocking failed

For example, a closed door feedback type electric lock will feedback the following data after unlocking:

·8A 01 01 00 8A (indicating successful unlocking)

·8A 01 01 11 9B (indicating unlock failure)

### 三、Query the status of the lock

#### 1. Query the status of a single lock :

Command header	Board address	Lock address	Function code	Check code /BCC
80	01	01	33	B3

·For example: the upper computer sends 80 01 01 33 B3 (hexadecimal)

200ms after the lock board will feedback the following data :

Command header	Board address	Lock address	Feedback status 00/11	Check code /BCC
80	01	01	33	B3

·Door open feedback type lock: query status feedback 11 means the lock status is open; 00 means the current lock status is closed.

·Closed door feedback type lock: query status feedback 00 indicates that the lock state is open; 11 indicates that the current lock state is closed.

·For example, the lock query status feedback of the closed door feedback type is in the following format:

80 01 01 00 80 (indicating that the lock is open)

80 01 01 11 91 (indicating that the lock is closed)

### 四、Query the status of all locks

In actual use, the user needs to know the status of all the locks of each cabinet, so it is possible to query all the lock statuses and query the status of all the locks on a lock board.

#### 1. Query command:

Command header	Board address	Fixed code	Function code	Check code /BCC
80	01	00	33	B2

For example, the host computer sends 80 01 00 33 B2 (hexadecimal) to read the status of all electric locks on board 1

·After the query, the following data is returned:

Command header	Board address	State 1	State 2	State 3	Function code	Check code /BCC
80	01	CH 17-24 lock	CH 9-16 lock	CH 1-8 lock	33	XX

Taking the 24-channel lock board as an example, there are three byte states for feedback of all lock states.

1. State 1 is the lock state of channels 17-24. 01 02 04 08 10 20 40

80 represents the state of 8 locks。

2. State 2 is the lock state of channels 9-16. 01 02 04 08 10 20 40

80 represents the state of 8 locks。

3. State 3 is the lock state of channels 1-8. 01 02 04 08 10 20 40

80 represents the state of 8 locks

·For example, closed door feedback type lock: the data returned by the command to query all lock states is 80 01 01 01 01 33 B3, which means that the three locks 17, 9, and 1 of the lock plate are closed, and the rest of the locks are open.

**·Note: The check code can be calculated by BCC check (exclusive OR check)**

#### 五、Multi-channel unlock command

Command header	Board address	State 1	State 2	State 3	Check code /BCC
90	01	CH 1-8 lock	CH 9-16 lock	CH 17-24 lock	XX

·For example, the host computer sends 90 01 02 02 02 93 (hexadecimal), which means to open the 2, 10, 18 channel lock.

·Note: The check code can be calculated by BCC check (exclusive OR check)

六、The following functions need to be customized by contacting us (the following functions are not included by default)

1. Active feedback function : After the lock status changes, the data is actively uploaded to the host computer to feedback the opening or closing information. The feedback data format is as follows :

Command header	Board address	Lock address	Lock state	Check code /BCC
82	01	01	00/11	**

For example: the No. 1 lock on the No. 1 board uses the lock with feedback of closing the door; the main upload after closing the lockThe data is 82 01 01 11 93; the status bit is 11; if the door open feedback lock is used, the status bit is 00 after the lock is closed.

2. Long power-on function :

This function is suitable for controlling the magnetic lock that is unlocked after power off, that is, the magnetic lock will be locked after the magnetic force is generated by the continuous power on; the magnetic lock will be unlocked after the power is off.

·The host computer sends the following data to turn on the long power-on:

Command header	Board address	Lock address	Function code	Check code /BCC
9A	01	01	11	**

For example, the host computer sends: 9A 01 01 11 8B; it represents the number 1 lock plate Channel 1 performs long power-on operation; and uploads the feedback status of the channel.

·The host computer sends the following data to turn off the long boot:

Command header	Board address	Lock address	Function code	Check code /BCC
9B	01	01	11	**

For example, the host computer sends: 9B 01 01 11 8A; it represents the number 1 lock plate Channel 1 closes the long power-on operation; and uploads the feedback status of the channel.

七、 Modify the communication baud rate (default baud rate is 9600)  
The baud rate can be modified to: 9600, 19200, 38400, 57600, 115200

八、 1~24 channel unlock commands corresponding to the 1st board

Full open command: 8A 01 00 11 9A

8A 01 01 11 9B Open channel 1	8A 01 02 11 98 Open channel 2
8A 01 03 11 99 Open channel 3	8A 01 04 11 9E Open channel 4
8A 01 05 11 9F Open channel 5	8A 01 06 11 9C Open channel 6
8A 01 07 11 9D Open channel 7	8A 01 08 11 92 Open channel 8
8A 01 09 11 93 Open channel 9	8A 01 0A 11 90 Open channel 10
8A 01 0B 11 91 Open channel 11	8A 01 0C 11 96 Open channel 12
8A 01 0D 11 97 Open channel 13	8A 01 0E 11 94 Open channel 14
8A 01 0F 11 95 Open channel 15	8A 01 10 11 8A Open channel 16
8A 01 11 11 8B Open channel 17	8A 01 12 11 88 Open channel 18
8A 01 13 11 89 Open channel 19	8A 01 14 11 8E Open channel 20
8A 01 15 11 8F Open channel 21	8A 01 16 11 8C Open channel 22
8A 01 17 11 8D Open channel 23	8A 01 18 11 82 Open channel 24

九、 1~24 channel query lock status command corresponding to No. 1 board

Query all lock status commands : 80 01 00 33 B2

80 01 01 33 B3 Query channel 1	80 01 02 33 B0 Query channel 2
80 01 03 33 B1 Query channel 3	80 01 04 33 B6 Query channel 4
80 01 05 33 B7 Query channel 5	80 01 06 33 B4 Query channel 6
80 01 07 33 B5 Query channel 7	80 01 08 33 BA Query channel 8
80 01 09 33 BB Query channel 9	80 01 0A 33 B8 Query channel 10
80 01 0B 33 B9 Query channel 11	80 01 0C 33 BE Query channel 12
80 01 0D 33 BF Query channel 13	80 01 0E 33 BC Query channel 14
80 01 0F 33 BD Query channel 15	80 01 10 33 A2 Query channel 16
80 01 11 33 A3 Query channel 17	80 01 12 33 A0 Query channel 18
80 01 13 33 A1 Query channel 19	80 01 14 33 A6 Query channel 20
80 01 15 33 A7 Query channel 21	80 01 16 33 A4 Query channel 22
80 01 17 33 A5 Query channel 23	80 01 18 33 AA Query channel 24

十、 Address code switch setting

·No. 12345 switch respectively represents the number 1, 2, 4, 8, and 16; this number can be added together; you can set the address of the No. 1-31 board at most.



Verification method:

```
#include <stdio.h>
```

```
/*
```

Use online tools to calculate the value of 485 input

```
*/
```

```
unsigned char txbuff[6]={0x90,0x01,0x01,0x11,0x01,0x00};
```

```
unsigned char CRC_XOR(unsigned char *buff,unsigned char len)
```

```
{
```

```
    unsigned char i;
```

```
    unsigned char temp;
```

```
    for(i=0; i<len; i++)
```

```
        temp ^= buff[i];
```

```
    return temp;
```

```
}
```

```
int main () {
```

```
    unsigned char i,j;
```

```
    for(i=0x00; i<0x19; i++)
```

```
    {
```

```
        txbuff[2] = i;
```

```
        txbuff[5] = CRC_XOR(txbuff,5);
```

```
        for(j=0; j<6; j++ )
```

```
        {
```

```
            if(txbuff[j]<0x10)
```

```
                printf("0%x
```

```
                ",txbuff[j]);
```

```
            else
```

```
                printf("%x ",txbuff[j]);
```

```
        }
```

```
        printf("\n");
```

```
    }
```

```
    return 0;
```

```
}
```