

Industrial Control Equipment Protocol

1. Communication Protocol Description

1.1. The communication between control board and host computer using standard MODBUS.

1.2. Parameter range 0 ~ REGBASE is read-only parameter, more than REGBASE range is read and write parameters. Supports 03 and 16 commands to support group control.

1.3. Data format example as below table:

To read single or multiple data registers:										
Send from Master mode	Receiver device address	Function code	Register address (High byte)	Register address (Low byte)	The Number of Data (High byte)	The Number of Data (Low byte)	Low CRC	High CRC		
	0x01~0xFE	3	0	0~19	0	1~20				
Return mode	Receiver device address	Function Code	Data Bytes	Data 1 (High byte)	Data 1 (Low byte)	-----	Data n High	Data n Low	Low CRC	High CRC
	0x01~0xFE	3	The number of data x 2	data1 H	data1 L	-----	Data n H	Data n L		

Change single or multiple data registers:											
Send from Master mode	Receiver device address	Function code	Register address (High byte)	Register address (Low byte)	The number of register (High byte)	The number of register (Low byte)	Data Bytes	Data value1~n High Byte	Data value1~n Low Byte	Low CRC	High CRC
	0x01~0xFE	16	0	20~30	0	1~11	The number of register x 2	Data 1~n H	Data 1~n L		
Return mode	Receiver device address	Function code	Register address (High byte)	Register address (Low byte)	The number of register (High byte)	The number of register (Low byte)	Low CRC	High CRC			
	0x01~0xFE	16	0	20~30	0	1~11					

Communication duration: After receiving the host information from the main machine, it takes about 10ms ~ 25ms waiting time, then the main machine return data to the host.

Communication baud rate is 9600, no odd parity, communication data with CRC check code.

Actuator equipment communication address: 1 ~ 254.

Register address	Minimum value	Defaults	Maximum value	Parameter	Remarks
0	0		255	Equipment model	0: CON Series, 1: K Series
1	0	50	1000	Temperature	Temperature=(Value-500)/10 °C
2	0	50	999	Humidity	RH=Value/10
3	0	500	999	PM1.0	0~999 ug/m3
4	0	500	999	PM2.5	0~999 ug/m3
5	0	500	999	PM10	0~999 ug/m3
6	0	150	247	VOC	Correspond (0~247)/100 mg/m3
7	0	1000	2000	CO2	0~2000 Ppm
8	0	500	2000	CO	(0~2000)/10 Ppm
9	0	2500	5000	Formaldehyde	(0~5000)/1000 mg/m ³
10	0	0	65535	Purification Filter Life Span	0-65535 Hours
11	0	0		Wind Speed Current Output Status	0:Closed 1:Low 2:Mid 3:High
12	0	0		Reserve	
13	0	0	99	The UI of the APP is adjusted according to this table	The UI of the APP is adjusted according to the combination table number, and the back table is changed to the combination table. Refer to the table below.
14	0	0	0xffff	Equipment ID1	Equipment ID{ID4, ID3, ID2, ID1} Example Data: 0x0123456789ABCDEF Equipment ID: "0123456789ABCDEF "
15	0	0	0xffff	Equipment ID2	
16	0	0	0xffff	Equipment ID3	
17	0	0	0xffff	Equipment ID4	
18	0	0	0xffff	Equipment Faulty Code	1: Control panel communication failure 2: Control partner communication failure
19	0	0		Reserve	

1.4. CRC Check Value

CRC Check function:

```
unsigned char M_cnj,M_chk;
```

```
unsigned int M_hi,M_lo,M_crc1,M_cni,;
```

```
////////////////////////////////////
```

```
unsigned int M_calccrc(unsigned char crcbuf,unsigned int crc)
```

```
{
```

```
    crc=crc ^ crcbuf;
```

```
    for(M_cnj=0;M_cnj<8;M_cnj++)
```

```
    {
```

```
        M_chk=crc&1;
```

```
        crc=crc>>1;
```

```
        crc=crc&0x7fff;
```

```

        if (M_chk==1)
        {
            crc=crc^0xa001;
        }
    }
    return crc;
}
////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////
//unsigned int M_chkcrc(unsigned char *buf,unsigned char len);
//Parameter Description: unsigned char *buf -This is the pointer address of the check string
// unsigned char len -This is the number of data to verify the string
// Return Value: This CRC checks the return value as 16-bit data
////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////
unsigned int M_chkcrc(unsigned char *buf,unsigned char len)
{
    M_crc1=0xFFFF;
    for (M_cni=0;M_cni<len;M_cni++)
    {
        HWWDT_ClearRegister();
        M_crc1=M_calccrc(*buf,M_crc1);
        buf++;
    }
    return M_crc1;
}

```

Reference

1. Computer issued hex code to probe data 02 03 00 01 00 09 D4 3F to query No. 2 air probe first to tenth register data.
2. The computer sends the hex code to the probe data 02 06 00 14 00 00 C9 FD to set the No. 2 probe the 0X34 bit register to 0.