

Modbus protocol specification

● Instrument parameter specification

1. The instrument adopts Modbus RTU communication format
2. Communication baud rate: 9600,8, n, 1
3. Instrument address: The default value is 0x01. The instrument address can be modified in theAddr option of the secondary menu.
4. Function code, read as 0x03 and write as 0x10;

This instrument is compatible with Siemens PLC communication,
Read as 0x06, write as 0x06

5. Address list of instrument registers

Register address	Parameter name	variable declaration
00 00	Sv	The target pressure of PID control (readable and writable)
00 01	AL-1	Alarm value of AL-1 channel (readable and writable) Alarm value of AL-1 channel (readable and writable)
00 02	AL-2	Alarm value of AL-1 channel (readable and writable) Alarm value of AL-1 channel (readable and writable)
00 03	A/M	Manual and automatic state switching (read/write) Manual and automatic state switching (read/write)
00 04	PID_OUT	PID output percentage (readable and writable) PID output percentage (readable and writable)
00 05	PV	Read the real-time value of the pressure (read only) Read the real-time value of the pressure (read only)

6. CRC16 check, polynomial 0xA001, the low byte is in front and the high byte is in the back.
7. The data of each register is a 2-byte integer with a sign (network byte order).

● Examples of reading parameters

1、 fetch Sv

Control the host to send:

Instrumentation address	FC	Register address	Number of data points	CRC16 check
1 byte	1 byte	2 bytes	2 bytes	2 bytes
0x01	0x03	0x00 0x00	0x00 0x01	0x84 0x0A

Instrument return:

Instrumentation address	FC	Number of bytes	data	CRC16 check
1 byte	1 byte	1 byte	2 bytes	2 bytes
0x01	0x03	0x02	0x00 0x64	0xB9 0xAF

Note: The current instrument PySv = 100, if the decimal point of the instrument is set to one decimal place, it will be displayed as 10.0. If there is no special note below, the principle is the same as this example.

2、 Read AL-1

Control the host to send:

Instrumentation address	FC	Register address	Number of data points	CRC16 check
1 byte	1 byte	2 bytes	2 bytes	2 bytes
0x01	0x03	0x00 0x01	0x00 0x01	0xD5 0xCA

Instrument return:

Instrumentation address	FC	Number of bytes	data	CRC16 check
1 byte	1 byte	1 byte	2 bytes	2 bytes
0x01	0x03	0x02	0x00 0x64	0xB9 0xAF

3、 Read AL-2

Control the host to send:

Instrumentation address	FC	Register address	Number of data points	CRC16 check
1 byte	1 byte	2 bytes	2 bytes	2 bytes
0x01	0x03	0x00 0x02	0x00 0x01	0x25 0xCA

Instrument return:

Instrumentation address	FC	Number of bytes	data	CRC16 check
1 byte	1 byte	1 byte	2 bytes	2 bytes
0x01	0x03	0x02	0x00 0x64	0xB9 0xAF

4、 fetch A/M

Control the host to send:

Instrumentation address	FC	Register address	Number of data points	CRC16 check
1 byte	1 byte	2 bytes	2 bytes	2 bytes
0x01	0x03	0x00 0x03	0x00 0x01	0x74 0x0A

Instrument return:

Instrumentation address	FC	Number of bytes	data	CRC16 check
1 byte	1 byte	1 byte	2 bytes	2 bytes
0x01	0x03	0x02	0x00 0x01	0x79 0x84

Note: Data 0 is manual status and data 1 is automatic status

5、 Read PID_OUT

Control the host to send:

Instrumentation address	FC	Register address	Number of data points	CRC16 check
1 byte	1 byte	2 bytes	2 bytes	2 bytes
0x01	0x03	0x00 0x04	0x00 0x01	0xC5 0xCB

Instrument return:

Instrumentation address	FC	Number of bytes	data	CRC16 check
1 byte	1 byte	1 byte	2 bytes	2 bytes
0x01	0x03	0x02	0x00 0x64	0xB9 0xAF

Note: The output percentage is 0.0-100.0%, and the corresponding data reading is 0-1000.

6、 fetch PV

Control the host to send:

Instrumentation address	FC	Register address	Number of data points	CRC16 check
1 byte	1 byte	2 bytes	2 bytes	2 bytes
0x01	0x03	0x00 0x05	0x00 0x01	0x94 0x0B

Instrument return:

Instrumentation address	FC	Number of bytes	data	CRC16 check
1 byte	1 byte	1 byte	2 bytes	2 bytes
0x01	0x03	0x02	0x00 0x64	0xB9 0xAF

● Examples of parameter settings

1、 set up Sv

Control the host to send:

Instrumentation address	FC	Register address	Number of registers	Number of bytes	data	CRC16 check
1 byte	1 byte	2 bytes	2 bytes	1 byte	2 bytes	2 bytes
0x01	0x10	0x00 0x00	0x00 0x01	0x02	0x00 0x64	0xA7 0xBB
0x01	0x06 (Siemens)	0x00 0x00	0x00 0x01	0x02	0x00 0x64	0x26 0x9D

Instrument return:

Instrumentation address	FC	Register address	Number of registers	CRC16 check
1 byte	1 byte	2 bytes	2 bytes	2 bytes
0x01	0x10	0x00 0x00	0x00 0x01	0x01 0xC9
0x01	0x06 (Siemens PLC)	0x00 0x00	0x00 0x01	48 0A

2、 Setting up AL-1

Control the host to send:

Instrumentation address	FC	Register address	Number of registers	Number of bytes	data	CRC16 check
1 byte	1 byte	2 bytes	2 bytes	1 byte	2 bytes	2 bytes
0x01	0x10	0x00 0x01	0x00 0x01	0x02	0x00 0x64	0xA6 0x6A

Instrument return:

Instrumentation address	FC	Register address	Number of registers	CRC16 check
1 byte	1 byte	2 bytes	2 bytes	2 bytes
0x01	0x10	0x00 0x01	0x00 0x01	0x50 0x09

3、 Setting up AL-2

Control the host to send:

Instrumentation address	FC	Register address	Number of registers	Number of bytes	data	CRC16 check
1 byte	1 byte	2 bytes	2 bytes	1 byte	2 bytes	2 bytes
0x01	0x10	0x00 0x02	0x00 0x01	0x02	0x00 0x64	0xA6 0x59

Instrument return:

Instrumentation address	FC	Register address	Number of registers	CRC16 check
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1 byte	1 byte	2 bytes	2 bytes	2 bytes
0x01	0x10	0x00 0x02	0x00 0x01	0xA0 0x09

4、Setting the status to automatic

Control the host to send:

Instrumentation address	FC	Register address	Number of registers	Number of bytes	data	CRC16 check
1 byte	1 byte	2 bytes	2 bytes	1 byte	2 bytes	2 bytes
0x01	0x10	0x00 0x03	0x00 0x01	0x02	0x00 0x01	0x67 0xA3

Instrument return:

Instrumentation address	FC	Register address	Number of registers	CRC16 check
1 byte	1 byte	2 bytes	2 bytes	2 bytes
0x01	0x10	0x00 0x03	0x00 0x01	0xF1 0xC9

5、Set the manual status

Control the host to send:

Instrumentation address	FC	Register address	Number of registers	Number of bytes	data	CRC16 check
1 byte	1 byte	2 bytes	2 bytes	1 byte	2 bytes	2 bytes
0x01	0x10	0x00 0x03	0x00 0x01	0x02	0x00 0x00	0xA6 0x63

Instrument return:

Instrumentation address	FC	Register address	Number of registers	CRC16 check
1 byte	1 byte	2 bytes	2 bytes	2 bytes
0x01	0x10	0x00 0x03	0x00 0x01	0xF1 0xC9

6、Set PID_OUT

Control the host to send:

Instrumentation address	FC	Register address	Number of registers	Number of bytes	data	CRC16 check
1 byte	1 byte	2 bytes	2 bytes	1 byte	2 bytes	2 bytes
0x01	0x10	0x00 0x04	0x00 0x01	0x02	0x00 0x64	0xA6 0x3F

Instrument return:

Instrumentation address	FC	Register address	Number of registers	CRC16 check
1 byte	1 byte	2 bytes	2 bytes	2 bytes
0x01	0x10	0x00 0x04	0x00 0x01	0x40 0x08

Note: If the instrument status is automatic, the PID OUT operation is invalid.