**N43IC04 4 Channel 485 0-20MA current acquisition module setup protocol**

Main station sent

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| address  (Station address)  (1) | Function (1) | Register address (2) | Read number (2) | CRC16 (2) |
|  | 03 Read |  |  |  |
|  | 06 Write |  |  |  |
|  | 16(0x10) Write multiple registers |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Read-only register,Read Function code Is 03 | | | | |
| Register address | Register contents | Number of bytes | Units | Remarks |
| 0x0000 | (CH1) current value | 2 | 0.01MA | For example: Read 0X00C8  decimal system 200  Current = 200\*0.01=2MA |
| 0x0001 | (CH2)current value |
| 0x0002 | (CH3)current value | 2 |
| 0x0003 | (CH4)current value |
| Read / write register; Read function code is 03 ,Write function code is 06 or 16 | | | | |
| 0X0070  (112) | (CH1)Current ratio value | 2 | 0.1%  millesimal | Current value ratio value, which can be corrected when the current reading deviation is greater than 1%, such as:  Defdefault 1000 indicates 1:1  1010 Represents a 1% increase in the current value  990 Represents a 1% decrease in the current value |
| 0X0071  (113) | (CH2)Current ratio value |
| 0X0072  (114) | (CH3)Current ratio value |
| 0X0073  (115) | (CH4)Current ratio value |
|  |  |  |  |  |
| 0x00FB  (251) | Restore factory setting |  | Address code is 0XFF, enter the following instructions to the current port rate to restore the factory setting:  FF 06 00 FB 00 00 ED E5 | |
| 0x00FC  (252) |  | 2 | 0-1000 Data return time delay | Return to data interval (after receiving the command in 40MS)  For example: Read out 0X0019  decimal system 25  Time-lapse time =25 \* 40=1000ms |
| 0x00FD  (253) |  | 2 | RS485 address | Read the address:0XFF  Write the address:1-247 |
| 0x00FE  (254) | Baud rate | 2 | 0x0000-0x0005 | 0~5 0:1200  1:2400 2:4800  3:9600（tacitly approve）  4:19200  5：factory data reset |
| 0x00FF  (255) |  | 2 | 0-1000 Data return time delay | Return to data interval (after receiving the command in 40MS)  For example: Read out 0X0019  decimal system 25  Time-lapse time =25 \* 40=1000ms |

**Serial baud rate：9600（**default**），N，8，1**

**Modbus RTU Communication protocol：**

1. **Read the current 1-4 channel current values**

Send data

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| RS485 address  (Station address)  (1) | Function (1) | Register address (2) | Read number (2) | CRC16(2) |

Returns data

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| RS485 address  (Station address)  (1) | Function (1) | Number of bytes (1) | data (n) | CRC16(2) |

**RS485 address(Slave ID)** : 0x01~0xFE

**Function code** 0x03

**Register address：**0x0000-0x0003, Indicates 1-4 channel value

**Read number：**0x0001-0x0004

The returned current data length is two bytes. After the high level is in the front low, the two bytes are converted into 10 decimal numbers and divided by 10 is the current current value in 0.01MA;

Such as:

Send data(RS485 address is 1)：01 03 00 02 00 01 25 CA

Returns data：01 03 02 00 03 F8 45

01 address，03 Function，02 length，F8 45 crc16

0078 is the Current value, it is converted to decimal = 120, 120/10=1.2MA；

1. **Read RS485 address**

Send data

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| RS485 address  (Broadcast address)  (1) | Function (1) | Register address (2) | Read number (2) | CRC16(2) |

Returns data

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| RS485 address  ( Broadcast address )  (1) | Function (1) | Number of bytes (1) | data (n) | CRC16(2) |

Broadcast address 0xff

**Function code** 0x03

**Register address**：0x00FD

**Read number：**0x0001

**For example:**

**send data**：FF 03 00 FD 00 01 00 24

**Returns data：**FF 03 02 00 01 50 50

FF Broadcast address，03 Function，02 length，01 is the current module RS485 address , 50 50 crc16

Note: When using this command, only one temperature module can be connected to the RS485 bus, more than one will be wrong!

1. **Write RS485 address**

Send data

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| RS485 address  (Station address)  (1) | Function (1) | Register address (2) | Setting Content (2) | CRC16(2) |

Returns data

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| RS485 address  (Station address)  (1) | Function (1) | Register address  (2) | Register value (2) | CRC16(2) |

**RS485 address(Slave ID) :** 0x01~0xFE

**Function code** 0x06

**Register address**：0x00FD

**Setting Content**：2Bytes(1-247)

**For example,** The current RS485 address is 1, We need to change the RS485 address to 3:

**send data(RS485 address is 1)：01 06 00 FD 00 03 58 3B**

**Returns data：01 06 00 FD 00 03 58 3B**

1. Read baud rate

Send data

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| RS485 address  (Station address)  (1) | Function (1) | Register address (2) | Read number (2) | CRC16(2) |

Returns data

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| RS485 address  (Station address)  (1) | Function (1) | Number of bytes (1) | data (n) | CRC16(2) |

**RS485 address(Slave ID)** : 0x01~0xFE

**Function code** 0x03

**Register address**：0x00FE

**Read number：**0x0001

**For example:**

**send data(RS485 address is 1)：01 03 00 FE 00 01 E5 FA**

**Returns data：01 03 02 00 03 F8 45**

01 RS485 address，03 Function，02 length，F8 45 crc16

03 means the current baud rate is 9600bps

Baud rate corresponds to the number: 0: 1200 1: 2400 2: 4800 3: 9600 4: 19200

1. **Write baud rate**

Send data

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| RS485 address  (Station address)  (1) | Function (1) | Register address (2) | Setting Content (2) | CRC16(2) |

Returns data

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| RS485 address  (Station address)  (1) | Function (1) | Register address  (2) | Register value (2) | CRC16(2) |

**RS485 address(Slave ID)** : 0x01~0xFE

**Function code** 0x06

**Register address：**0x00FE

**Setting Content：**2Bytes(0-4)

**For example**, Change the baud rate to 4800bps:

**send data(RS485 address is 1)：01 06 00 FE 00 02 69 FB**

**Returns data：01 06 00 FE 00 02 69 FB**

Baud rate corresponds to the number: 0: 1200 1: 2400 2: 4800 3: 9600 4: 19200 5: Factory reset

Note: 1 The baud rate will be updated when the module is powered up again!

2 The factory setting can be restored when the baud rate corresponding to the number is 5. For example: 01 06 00 0F 00 05 79 CA

1. **Read voltage/current ratio:**

The current ratio can be corrected by this value when the current reading deviation is greater than 1%. The default value is 1000 (3E8).

Send data

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| RS485 address  (Station address)  (1) | Function (1) | Register address (2) | Read number (2) | CRC16(2) |

Returns data

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| RS485 address  (Station address)  (1) | Function (1) | Number of bytes (1) | data (n) | CRC16(2) |

**RS485 address(Slave ID) :** 0x01~0xFE

**Function code** 0x03

**Register address**：0x0070-0x0073 ; Indicates 1-4 channel value

**Read number：**0x0001-0x0004

**Return data:** 0.1% millesimal

**For example 1:**

**send data(RS485 address is 1)：01 03 00 70 00 01 85 D1**; 70 is Channel 1

**Returns data：01 03 02 03 E8 B8 FA 03 E8**

03E8 is the current ratio, which is 1000 in decimal and divided by 1000=1; indicating that channel 1 does not need to modify the voltage value.

**For example 2**:

**send data(RS485 address is 1)：01 03 00 71 00 01 D4 11**; 71 is Channel 2

**Returns data：01 03 02 03 DE 38 EC**

03DE is the current ratio, which is 990 in decimal and divided by 1000=0.99; Indicates that channel 2 reads 0.99 times the actual acquisition value.

1. **Set current ratio**

The current ratio can be corrected by this value when the current reading deviation is greater than 1%. The default value is 1000 (3E8).

Send data

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| RS485 address  (Station address)  (1) | Function (1) | Register address (2) | Setting Content (2) | CRC16(2) |

Returns data

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| RS485 address  (Station address)  (1) | Function (1) | Register address  (2) | Register value (2) | CRC16(2) |

**RS485 address(Slave ID) :** 0x01~0xFE

**Function code** 0x06

**Register address**：0x0007-0x000A; Indicates 1-7 channel value

**Setting Content**：2Bytes

**Setting value:** 2 bytes, unit 0.1%. When this value is set to 1000 (3E8), the current value does not change.

**For example 1:**The actual voltage of channel 1 is 5mA, but the read-out value is only 4mA. The ratio deviation is 5 / 4=1.25, and change the corrected value to 1250, namely the voltage can be corrected

**Send data: 01 06 00 07 04 E2 BA 82**

**Return data: 01 06 00 07 04 E2 BA 82**

The return frame is the same as the send frame. 07 means channel 1, 04 E2 means correction voltage ratio is 1250

**For example 2:** The actual current of channel 2 is 4mA, but when the readout value reaches 5mA. The ratio deviation is 4 / 5=0.8, and change the corrected value to 800, namely, the current can be corrected.

**Send data: 01 06 00 08 03 20 09 20**

**Return data: 01 06 00 08 03 20 09 20**

The return frame is the same as the send frame. 08 means channel 2, 03 20 means correction voltage ratio is 800

1. **Read the interval value**

Time time value, the user can return the data interval time, the default value is 0

Send data

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| RS485 address  (Station address)  (1) | Function (1) | Register address (2) | Read number (2) | CRC16(2) |

Return data

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| RS485 address  (Station address)  (1) | Function (1) | Register address (2) | Read number (2) | CRC16(2) |

**Address code:** 0x01~0xFE

**Function code:** 0x0003

**Register address：**0x00FC

**Number of reads:**0x0001

Such as：

**Send data（address is 1）:01 03 00 FC 00 01 44 3A**

**Return data：01 03 02 00 00 B8 44**

**01** address code，**03** function code ，**02** length，00 00 refers to the current interval value of 0 ，**B8 44** crc16

1. **Set the interval time value:**

Interval time value, the user can return the data interval time after changing the sending command by setting the value.

Send data

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| RS485 address  (Station address)  (1) | Function (1) | Register address (2) | Read number (2) | CRC16(2) |

Return data

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| RS485 address  (Station address)  (1) | Function (1) | Register address (2) | Read number (2) | CRC16(2) |

**Address code:** 0x01~0xFE

**Function code:** 0x0006

**Register address：**0x00FC

**Set content：**2bytes (value 0-25)

**For example**, to change the delay time to 1,000 m s:

**Send data（address is 1）:01 06 00 FC 00 19 88 30**

**Return data**：**01 06 00 FC 00 19 88 30**

**01** address code，**06** function code ，**02** length，00 19 A 25 with a decimal interval，**88 30**  crc16

The module receives the command interval 25 \* 40=1000ms before returning data

Notes： The module is repowered when using this command and the interval is updated！

1. **Write multiple register operations simultaneously：**

This module supports writing on multiple registers simultaneously.

Send data

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| address code (1) | function code (1) | Register Address (2) | Number of writes (2) | Bytes (1) | Setting Up Content (n) | CRC16(2) |

Return data

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| RS485 address  (Station address)  (1) | Function (1) | Register address (2) | Read number (2) | CRC16(2) |

**Address code:** 0x01~0xFE

**Function code:** 0x10

**Register address：**0x0070-0x0073，Corresponding to the voltage ratio value of the 1-4 channel

0x00FC-0x00FE，Corresponding to the delay time value, 485 address value, serial port port rate value

**Number of writes:**0x0001-0x0004

**for instance 1:**The delay time value is also set as 25 (interval 1000ms), 485 address value 2 and serial port port rate value 1 (2400).

**Send data: 01 10 00 FC 00 03 06 00 19 00 02 00 01 5E BE** ，Where the 00FC is the starting register address

**Return data**：**01 10 00 FC 00 03 40 38**

**01** address code，**10** function code ，**00 03** Number of written registers **40 38**  crc16

Notes： The module repowers the interval with this command and the serial port baud rate are updated!

**for instance 2:**Change the voltage ratio of channel 1-4 to 3F2 (1010)

**Send data: 01 10 00 70 00 04 08 03 F2 03 F2 03 F2 03 F2 7D FB**

**Return data**：**01 10 00 70 00 04 C0 11**

1. **Factory data reset:**

In addition to restoring the factory setting by setting the serial port Baud rate value, this module can also restore the module to the factory state through the register at the current Baud rate

Send data

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| RS485 address  (Station address)  (1) | Function (1) | Register address (2) | Read number (2) | CRC16(2) |

Return data

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| RS485 address  (Station address)  (1) | Function (1) | Register address (2) | Read number (2) | CRC16(2) |

**Address code:** 0xFF

**Return data**：0x0006

**Register address**：0x00FB

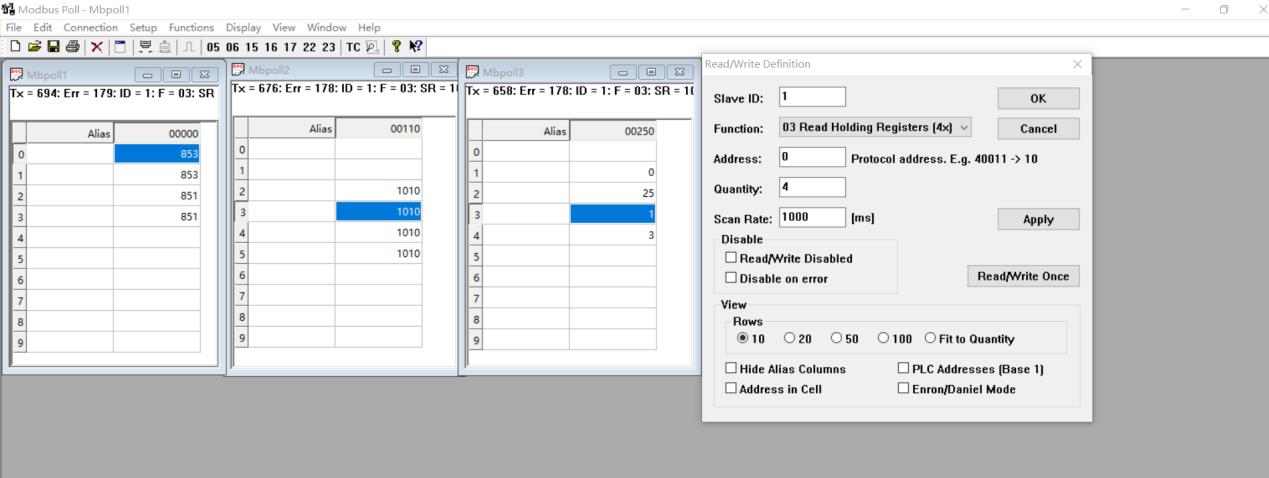
**Set content：**2bytes (value 0)

**Send data（address is FF）:FF 06 00 FB 00 00 ED E5**

**Return data**：**FF 06 00 FB 00 00 ED E5**

Notes： The module repowers the interval with this command and the serial Baud rate are updated!

The MODBUS instruction can be entered with "Modbus Poll", in the figure below



You can also use the serial port super-terminal input, as shown in the figure below