AMAIE08 MODBUS RTU Commamd

MODBUS command (function code, write 06/16, read 04/03)

Note :

1 MODBUS command must be HEX

2 Slave address (device address) must be the same as the setting. You can also use this command to query the current device address: FF 03 00 FD 00 01 00 24

3 The Baudrate and parity should be consistent

Command overview:

Channels	SKU	Product ID	Channel assignment
16	N4AIA08	2508	CH1-CH8 : 0-20MA
32	N4AIB16	2516	CH1-CH15 : 0-20MA CH16 : 0-30V
48	N4AIC24	2524	CH1-CH22 : 0-20MA CH23-CH24 : 0-30V

Supported function codes:

Function Code	Modbus Address (PLC)	Register Address	Describe
04:	30001	0x0000-0x00017 (0-23) Unit: 0.01MA/0.01V	N4AIA08 : 0x0000-0x0007 : 0-20MA
			N4AIB16 : 0x0000-0x000E : 0-20MA 0x000F : 0-30V
			N4AIC24 : 0x0000-0x0015 : 0-20MA 0x0016-0x0017 : 0-30V
03	40001		
		0x0080-0x00FF (128-255)	Read special function registers (baud rate 485 address, etc.)
06	40001		
		0x0080-0x00FF (128-255)	Write a single special function register (baud rate 485 address, etc.)
16(0x10)	40001		
		0x0080-0x00FF (128-255)	Write multiple special function registers (baud rate 485 address, etc.)

All states are mapped into 4xxxx range registers. The user can monitor the input and output status of the module by reading or modifying the value of the 4xxxx interval register (03 06 16 function code)

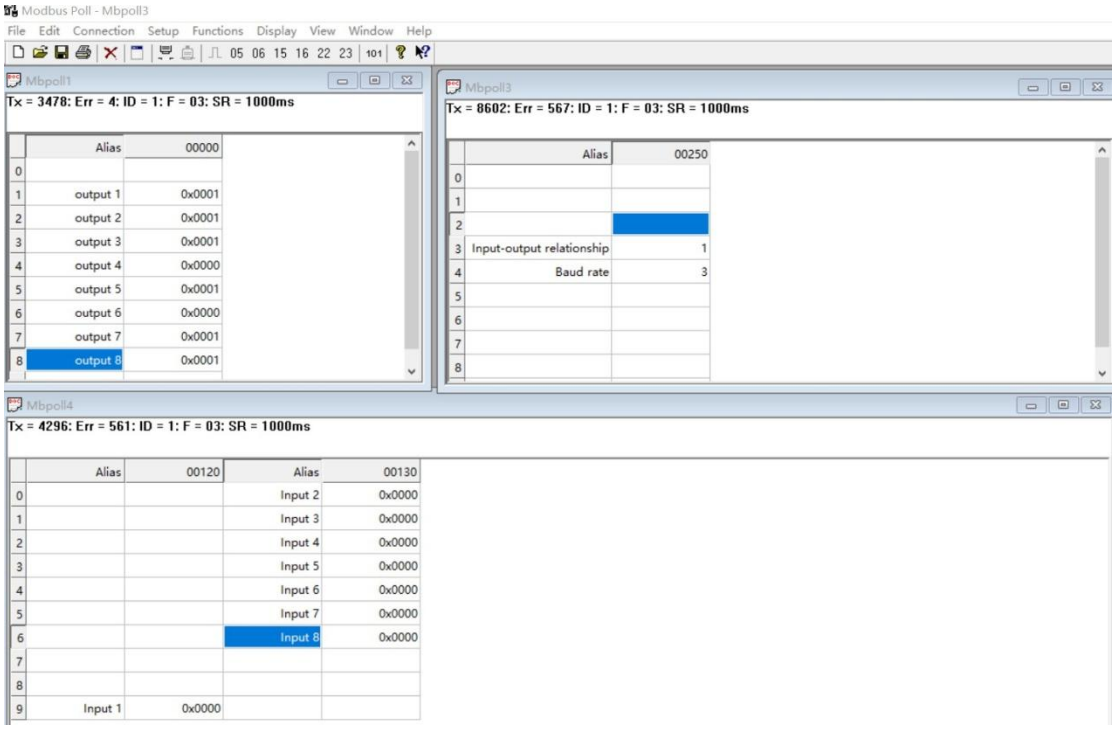
Register address	Register contents	Register value	Remarks	R/W
0x00A0-0x00B7 (160-183)	AI analog input Current unit: 0.01ma Voltage unit: 0.01V	N4AIA08 : 0x00A0-0x00A7 : 0-20MA		R
		N4AIB16 : 0x00A0-0x00AE : 0-20MA 0x00AF : 0-30V		
		N4AIC24 : 0x00A0-0x00B5 : 0-20MA 0x00B6-0x00B7 : 0-30V		
0x00C0-0x00D7 (192-215)	This value can be corrected when the current reading deviation is greater than 1%, such as: 1000 means 1:1 1010: 1% increase 990: 1% decrease			R/W
0X00F6 (246)	AI analog automatic reporting Registers (160-167) are automatically reported	0: Query function (default) 1-255: Automatically report, the unit is second. 1: Report every 1 second 2: Report every 2 seconds 10: Report every 10 seconds Maximum interval of 255 seconds		
0x00F7 (247)	Product ID	0-65535	SKU ID N4AIA08 2508 N4AIB16 2516 N4AIC24 2524	
0x00FB (251)	Factory Reset	Factory Reset: 1 1 Short the RES jumper for 5 seconds 2 Enter the following command at the current baud rate: FF 06 00 FB 00 00 ED E5		R/W
0x00FC (252)	Command Return Time	0-25	Time interval for command return (unit: 40MS) Setting value: 0-25	R/W
0x00FD (253)	RS485 address (Station address)	Read address: FF 03 00 FD 00 01 00 24; Set address to 0x02: FF 06 00 FD 00 02 8C 25		R/W
0x00FE (254)	Baud rate	0-255	0:1200 1:2400 2:4800 3:9600 (default) 4:19200 5:38400 6: 57600 7: 115200 Others: Factory reset	R/W
0x00FF (255)	Parity	0-2	0 None Parity 1 Even Parity	R/W

			2 Odd Parity	

9600 Band ,8 Data bits,None Parity,1 Stop Bit。

MODBUS commands you can use "Modbus Poll" input, as shown below

（CRC check generated automatically）



You can also use HyperTerminal serial input, as shown below

（Manually add CRC check）

1.Read AI analog input value:

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)

Modbus Address(PLC)：30001-30008
RS485 address : 0x01~0x3F
Function code: 0x04
Register address:0x0000-0x0007
Read number :0x0001-0x0008

For example, Read the value of AI analog input of channel 1-8 (channel 8 is 3.95MA, other channels are 0MA):
Send data(address 1): 01 04 00 00 00 08 F1 CC
Return data : 01 04 10 00 00 00 00 00 00 00 00 00 00 00 00 00 00 01 8B 14 DB
01 RS485 address, 04 function code, 10 length, 018B represents the value of channel 8, which is 395 in decimal, /100=3.95MA.

In addition, the AI analog input is also mapped to the 40000 interval register. The user can read the value of the AI analog input through the 03 function code.

Modbus Address(PLC)：40161-40168
RS485 address : 0x01~0x3F
Function code:0x03
Register address:0x00A0-0x00A7
Read number: 0x0008

For example, Read the value of AI analog input of channel 1-8 (channel 8 is 3.95MA, other channels are 0MA):
Send data(address 1): 01 03 00 A0 00 08 44 2E
Return data : 01 03 10 00 00 00 00 00 00 00 00 00 00 00 00 00 00 01 8B A5 AE

01 RS485 address, 03 function code, 10 length, 018B represents the value of channel 8, which is 395 in decimal, /100=3.95MA.

2. Set the AI scale value (correction value) :

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)

Modbus Address(PLC)：40193-40200

RS485 address : 0x01~0x3F

Function code:Write 0x06/0x10,Read 0x03

Register address:0x00C0-0x00C7

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

For example 1: The actual voltage of channel 1 is 5.00V, but the read value is only 4.00V. The ratio deviation is 5/4=1.25, and the correction voltage ratio is changed to 1250, which can correct the voltage.

Send frame: 01 06 00 C0 04 E2 0B 7F

Return frame: 01 06 00 C0 04 E2 0B 7F

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 voltage of channel 1 is 4.00V, but the read value is only 5.00V. The ratio deviation is 4/5=0.8, and the correction voltage ratio is changed to 800, which can correct the voltage.

Send frame: 01 06 00 C1 03 20 D9 1E

Return frame: 01 06 00 C1 03 20 D9 1E

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

Special function Register

1.Set the 485 address(Slave ID)

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)

Modbus Address(PLC)：40254
RS485 address :0x01~0Xf8/0XFF
Function code:Write 0x06/0x10,Read 0x03
Register address:0x00FD(253)
Value: 2 bytes (values 1-248)

For example 1: Set the current device address to 0x02
Send data(address is 1): 01 06 00 FD 00 02 99 FB
Return data : 01 06 00 FD 00 02 99 FB
Send data(don't know the address): FF 06 00 FD 00 02 8C 25
Return data : FF 06 00 FD 00 02 8C 25

For example 2: Read device address(0X0001)
Send data : FF 03 00 FD 00 01 00 24
Return data : FF 03 02 00 01 50 50

Note：With this command, there can be only one module on the bus 485, More than one will go wrong!

2.Write 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)

Modbus Address(PLC)：40255
RS485 address :0x01~0x3F
Function code:Write 0x06/0x16;Read 0x03
Register address:0x00FE(254)
Value: 2 bytes (values 0-7)

For example 1, Change the baud rate to 4800bps:
Send data(address 1):01 06 00 FE 00 02 69 FB
Return 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 5:38400 6:57600 7: 115200 8: Factory reset
Note: 1 The baud rate will be updated only when the module is powered on again when this command is used!
2 When the number corresponding to the baud rate is 8, the factory settings can be restored
For example:01 06 00 FE 00 08 E9 FC

For example 2 Read the current baud rate:
Send data(address 1):01 03 00 FE 00 01 E5 FA
Return 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 5：38400 6:57600 7: 115200

3.Set Command(Date) Return Time

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)

Modbus Address(PLC)：40253
RS485 address :0x01~0x3F
Function code:Write 0x06/0x16;Read 0x03

Register address:0x00FC(252)
Value: 2 bytes (values 0-25)

For example, set the data return delay to 200ms
Send data(address 1):01 06 00 FC 00 05 89 F9
Return data :01 06 00 FC 00 05 89 F9
Return the delay time calculation formula:X = 05 * 40 = 200MS

Note: The maximum can be set to 1000MS. If it exceeds 1000MS, that is, the setting value is greater than 25, and the data return delay will be initialized.
That is: 01 06 00 FC 00 20 48 22 can make the data return delay to restore initialization 0

4.Set Parity

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)

Modbus Address(PLC)：40256
RS485 address :0x01~0x3F
Function code:Write 0x06/0x16;Read 0x03
Register address:0x00FF(255)
Value: 2 bytes (values 0-2)

For example, set the parity to Even parity
Send data(address 1):01 06 00 FF 00 01 78 3A
Return data :01 06 00 FF 00 01 78 3A
0 None Parity 1 Even Parity 2 Odd Parity
Note: 1. When using this command, the module is powered on again, and the check digit will be updated!
2. When the setting is greater than 2, the default value will be restored to 0 after powering on again, and there will be no verification.

5. Factory reset:

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)

Modbus Address(PLC): 40252
RS485 address : 0x01~0x3F
Function code:Write 0x06;
Register address:0x00FB(251)
Send data(address 1):FF 06 00 FB 00 00 ED E5
Return data :FF 06 00 FB 00 00 ED E5

For Command reset details, see: "AMIOA08 Factory Reset"

Link :https://1drv.ms/u/s!Av4PLxH_z8f1mBCFrTZWZSsyyg4l?e=fgC5o

Hardware reset: Short the RES jumper of the board for 5 seconds, then power on again.