24DIXXX MODBUS RTU Command

MODBUS command (function code 06/16 is Control command,02/03 is Read status command)

Note :
1 MODBUS command must be HEX
2 Slave ID (RS485 Address) must be correct, the default slave address is 01, Slave ID is set through the DIP switch.
3 The baud rate and parity check must be correct
4 If the communication fails, please short the RES jumper for 5 seconds to restore the factory settings.

The default baud rate is 9600 , 8 data bits, one stop bit, and no parity bit.

Product Type

Channels	Product Model	Product ID	Input Type
16	24DIA16	2416	NPN
32	24DIB32	2432	NPN/PNP
48	24DIC48	2448	NPN

Supported function codes:

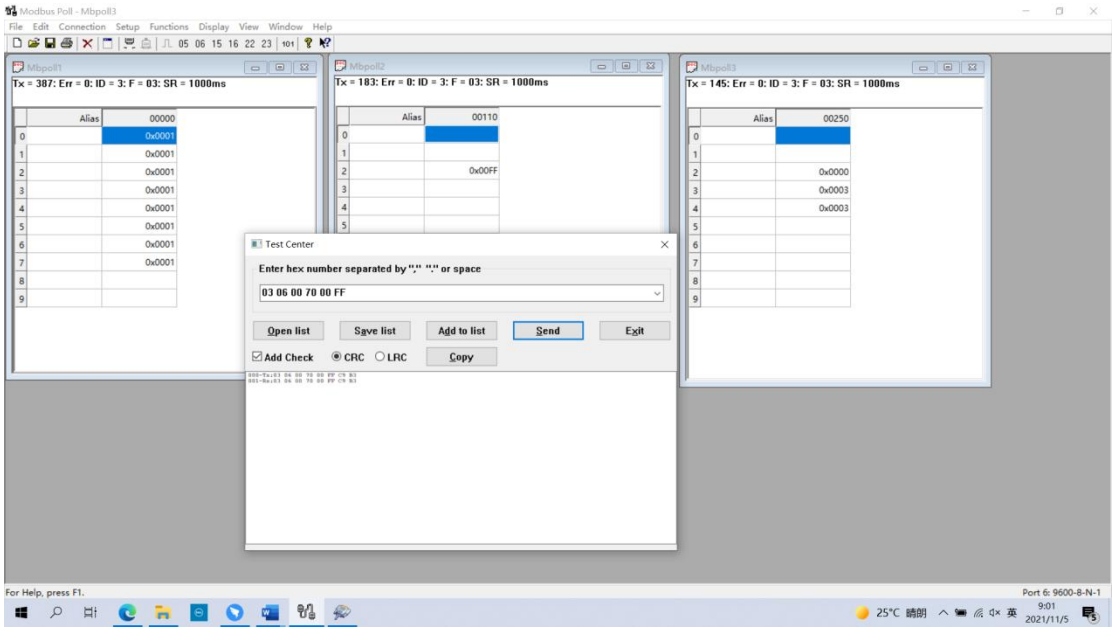
Function Code	Modbus Address (PLC)	Register Address	Describe
02	10001	0x0000-0x002F (0-/15/31/47)	Read DI digital input (optical isolation input)
03	40001		
		0x0080-0x00FF (128-255)	Read special function registers (baud rate 485 address, etc.)
06	40001		
		0x0080-0x00FF (128-255)	Write a single special 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
0x0080-0x00AF (128-175)	DI digital input (Register)	0x0001 has Input; 0x0000 has no Input		R/W
0X00C0-0X00C2 (192-194)	DI digital input(bit)	0X00C0: 0-15 Channels 0X00C1: 16-31 Channels 0X00C2: 32-47 Channels 1 has Input; 0 has no Input		R
Special Function Register:				
0x00F7 (247)	Product ID	SKU ID 24DIA16 2416 24DIB32 2432 24DIC48 2448		R/W
0x00F8 (248)	Automatic reporting of digital input(DI) status	0X00C0-0X00C2 register is 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		R/W
0x00FB (251)	Factory Reset .Enter the following command at the current baud rate: FF 06 00 FB 00 00 ED E5			R/W
0x00FC (252)	Command Return Time	Time interval for command return (unit: 40MS) Setting value: 0-25		R/W
0x00FD (253)	RS485 address (Station address)	Products with DIP switches can only read Read address: FF 03 00 FD 00 01 00 24;		R
0x00FE (254)	Baud rate	0-7	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 2 Odd Parity	R/W

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 DI digital input status (NPN/PNP photoelectric isolation input):

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)：10001-100016/32/48
RS485 address : 0x01~0x3F
Function code: 0x02
Register address:0x0000-0x00015/31/47
Read number :0x0001-0x00016/32/48

For example, read the status of DI digital input of channel 0-7:
Send data(address 1): 01 02 00 00 00 08 79 CC
Return data : 01 02 01 89 60 2E
01 RS485 address, 02 function code, 01 length, 89 refers to the current DI digital input status, converted to binary 10001001, indicating that 0/3/7 channels have input, and other channels have no input.

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

Modbus Address(PLC)：40145
RS485 address : 0x01~0x3F
Function code:0x03
Register address:0x0090
Read number: 0x0001

For example, read the status of DI digital input of channel 0-7:
Send data(address 1): 01 03 00 90 00 01 84 27
Return data : 01 03 02 00 56 38 7A
01 RS485 address, 03 function code, 02 length, 0056 refers to the current DI digital input status, converted to binary 01010110, indicating that 1/2/4/6 channels have input, and other channels have no input.

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 Read 0x03
Register address:0x00FD(253)
Value: 2 bytes (values 1-248)

For example 1: Set the current device address to 0x02
Turn the second bit of the DIP switch to ON, and the other to OFF

For example 2: Read device address,only one RS485 device can be connected
Send data　: FF 03 00 FD 00 01 00 24
Return data : 01 03 02 00 01 79 84

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

2.Set 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 DI digital input status to automatically report (16/232/48 channels are set at the same time): (Automatic reporting of digital input(DI) status)

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)：40249

RS485 address :0x01~0x3F
Function code:Write 0x06/0x16;Read 0x03
Register address:0x00F8(248)
Value: 2 bytes (values 0-255)

After setting, the content of register 0X00C0-0X00C2 is automatically reported

For example : For example, the current query function should be changed to automatic reporting:

1 second automatic report : 01 06 00 F8 00 01 C9 FB
2 second automatic report : 01 06 00 F8 00 02 89 FA
3 second automatic report : 01 06 00 F8 00 03 48 3A
4 second automatic report : 01 06 00 F8 00 04 09 F8
5 second automatic report : 01 06 00 F8 00 05 C8 38
10 second automatic report : 01 06 00 F8 00 0A 88 3C

Disable reporting function(Query function): 01 06 00 F8 00 00 08 3B

4.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

5. 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.

6. 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

Hardware reset: short the RESET/RST/RES jumper of the board for 5 seconds, then power on again.