



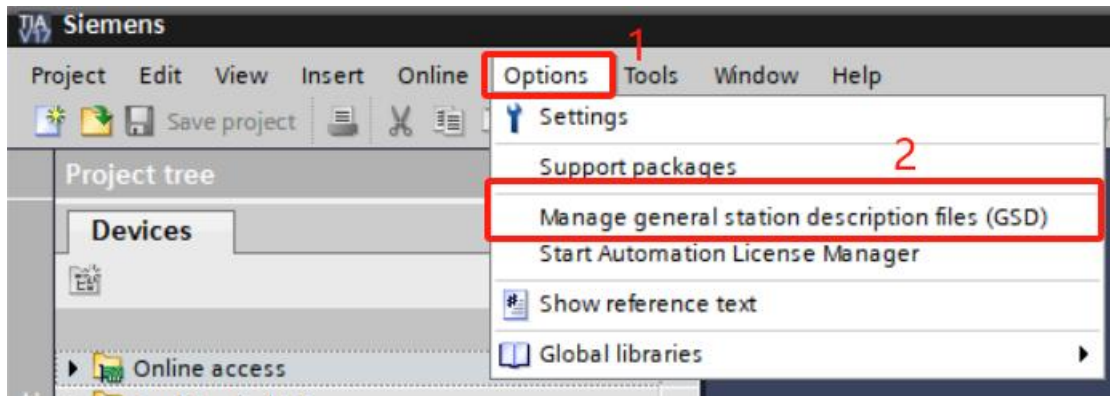
PROFINET to Modbus module control Kinco AC drive user manual

Content

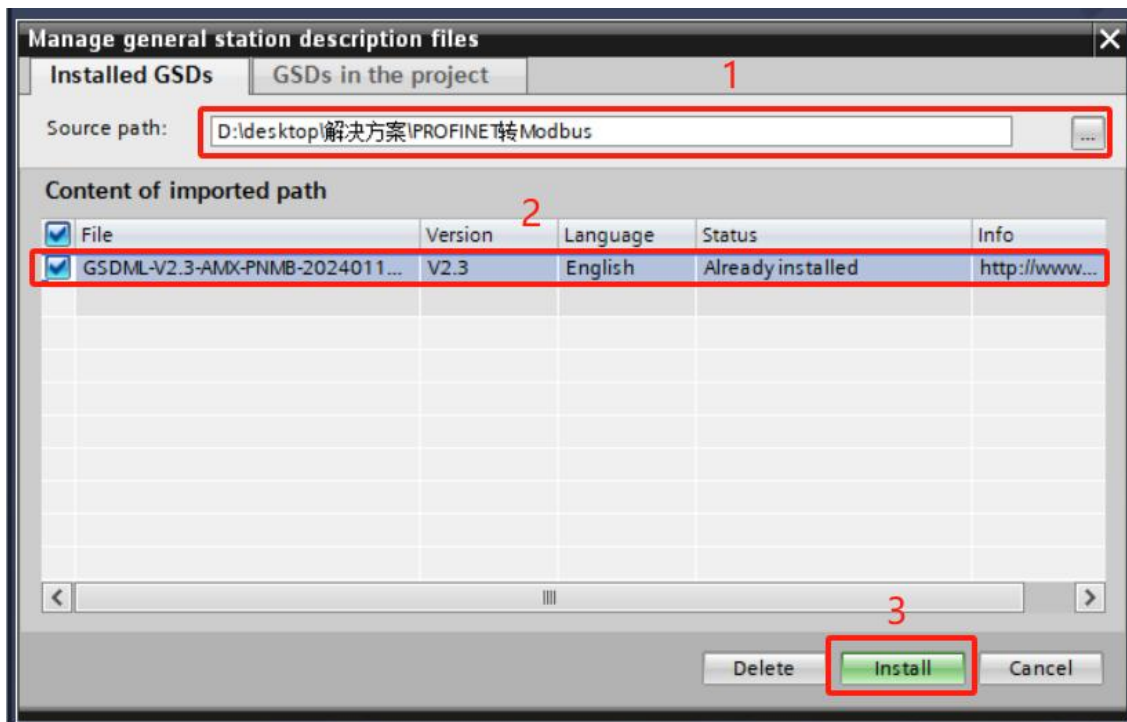
Add GSD description files	1
Assign IP and name	1
Device configuration	3
Communication status monitor:	5
Communication control bit	6
Kinco AC drive setting description	7
Communication control parameter group address description	8

Add GSD description files

Open TIA_Portal software,select project view,click Options Manage general station description files (GSD).

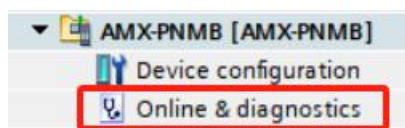


In the source path, select the path of the prepared GSDML folder ,then click file and the sofeware will automatically scan the GSDML file under this folder, select and install it.



Assign IP and name

Select "Online access" in the project tree, double-click "Update accessible device", and select "AMX-PNMB → Online & diagnosticS" after the scan is complete.



In the displayed window, select **Assign IP address**, enter the IP address and Subnet mask in the IP address box, and click **Assign IP address**.

Assign IP address

Assign IP address to the device

Devices connected to an enterprise network or directly to the internet must be appropriately protected against unauthorized access, e.g. by use of firewalls and network segmentation. For more information about industrial security, please visit <http://www.siemens.com/industrialsecurity>

MAC address: 00 - 00 - 00 - 00 - 00 - 00 Accessible devices

IP address: 0 . 0 . 0 . 0
Subnet mask: 0 . 0 . 0 . 0

☐ Use router

Router address: 0 . 0 . 0 . 0

Assign IP address

Click "**Assign PROFINET device name**", enter a device name, and click **Assign name**.

Assign PROFINET device name

Configured PROFINET device

PROFINET device name: [dropdown] (2)
Device type: [text field]

Online access

Device filter

☐ Only show devices of the same type
☐ Only show devices with bad parameter settings
☐ Only show devices without names

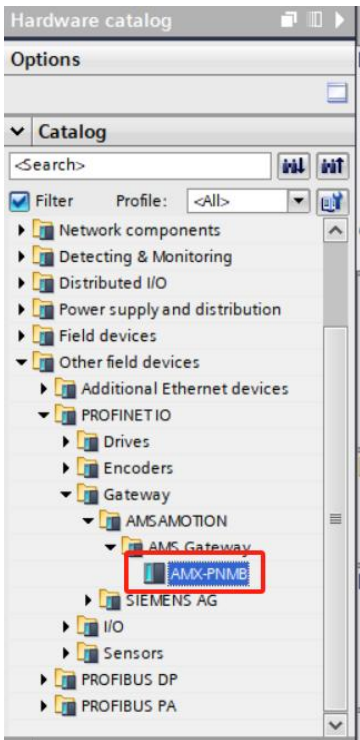
Accessible devices in the network:

IP address	MAC address	Device	PROFINET device name	Status

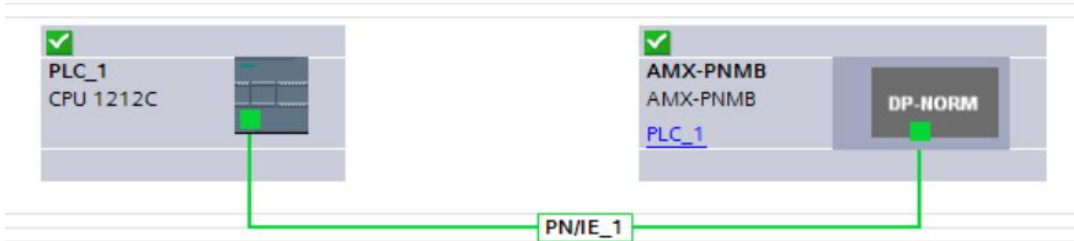
LED flashes [checkbox] Update list Assign name (3)

Device configuration

Double-click "Devices & networks" in the project tree, find "AMX-PNMB" in the hardware catalog and double-click to add it to the configuration network, as shown in the following figure.



Connect the module to the PLC in the network view, as shown in the following figure.

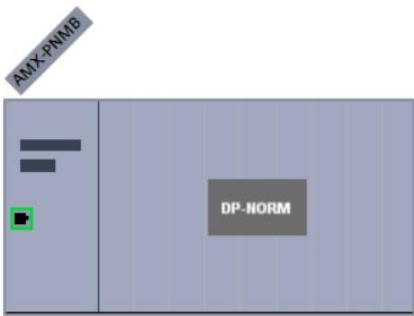


Double-click AMX-PNMB to enter the device view. In Device overview, select HEAD (Status Control Byte)_1.

KINCO-VFD > Ungrouped devices > AMX-PNMB [AMX-PNMB]

Topology view | Network view | **Device view**

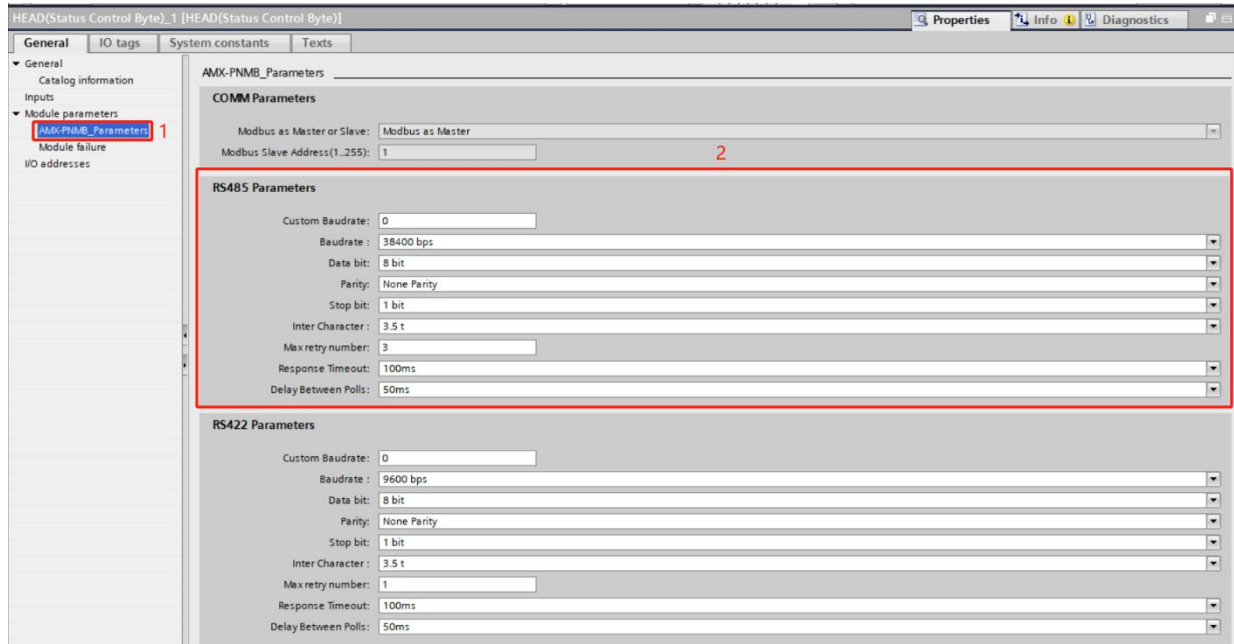
AMX-PNMB [AMX-PNMB]



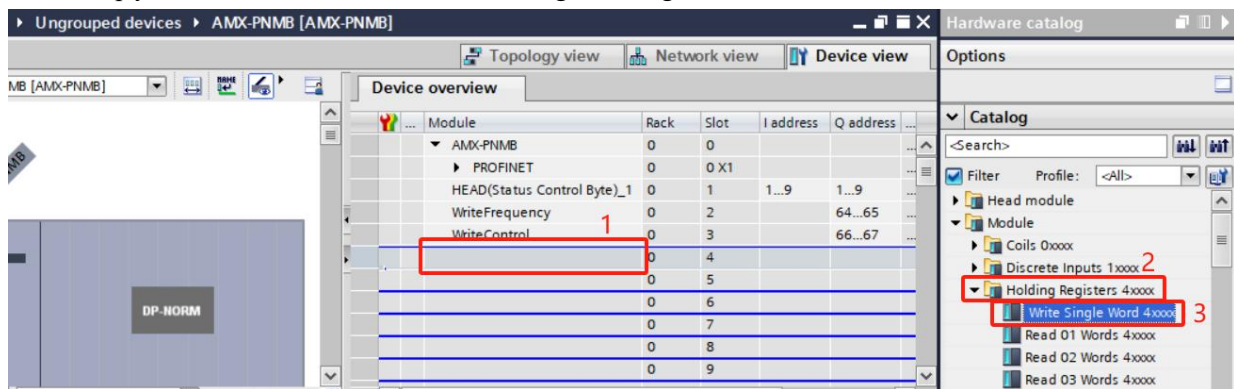
Device overview

Module	Rack	Slot	I address	Q address
AMX-PNMB	0	0		
PROFINET	0	0 X1		
HEAD(Status Control Byte)_1	0	1	1...9	1...9
WriteFrequency	0	2		64...65
WriteControl	0	3		66...67
	0	4		
	0	5		
	0	6		
	0	7		
	0	8		
	0	9		
	0	10		
	0	11		
	0	12		

Click "AMX-PNMB_Parameters" in the properties window , and set communication parameters (Baud rate, Data bit, Parity, Stop bit, Inter Character, Response Timeout, etc.), as shown in the following figure.

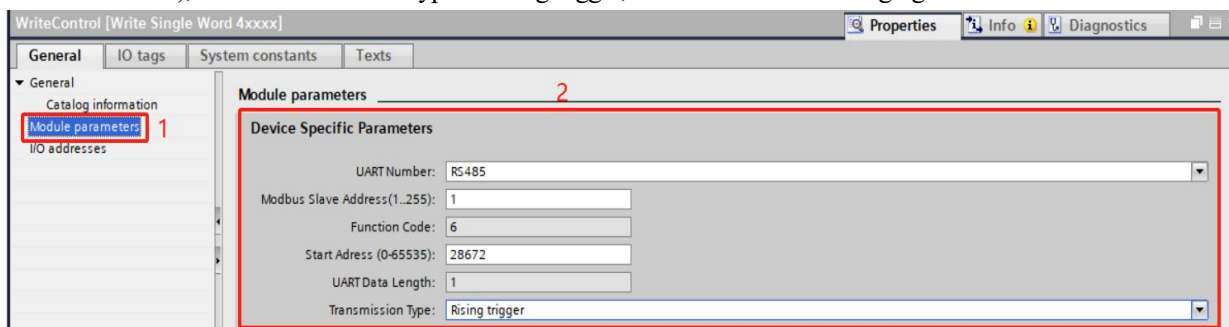


Select the empty slot of the module and add the write single hold register function module

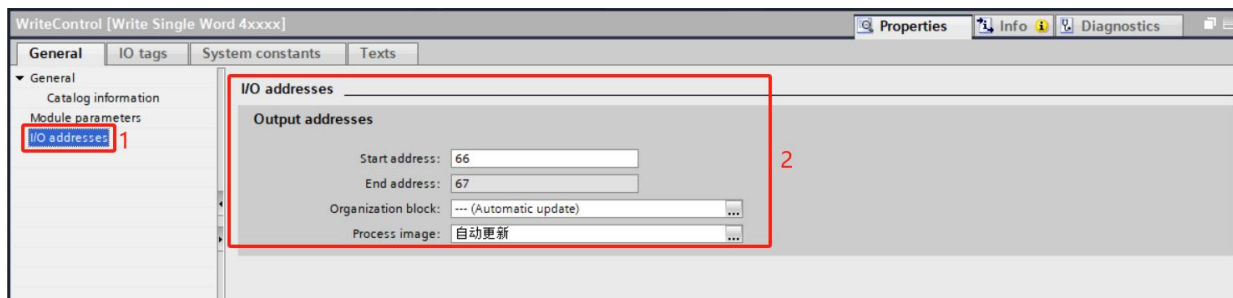


In the properties window , set the module parameters for write single hold register function module (select UART Number, Modbus Slave Address, Start Address and Transmission Type).

Set the UART Number to RS485, modbus slave address set to 1, start address set to 28672 (frequency setting address of AC drive), and set transmission type to rising trigger, as shown in the following figure.



Set the mapping address of the process data register



You can view the mapped address in the device overview window. As shown in the device overview configuration, slot 1 is automatically occupied by the system (HEAD(Status Control Byte)_1). In the I address column, the corresponding PROFINET addresses IB1-9 are communication status monitoring bits. In the Q address column, the corresponding PROFINET output address QB1-9, QB1 is the communication control word of the bus conversion module, and QB2-9 are the control bit for sending each packet.

Device overview						
	Module	Rack	Slot	I address	Q address	Type
	AMX-PNMB	0	0			AMX-PNMB
	PROFINET	0	0 X1			AMX-PNMB
	HEAD(Status Control Byte)_1	0	1	1...9	1...9	HEAD(Status Contr...
	WriteFrequency	0	2		64...65	Write Single Word ...
	WriteControl	0	3		66...67	Write Single Word ...
		0	4			

Communication status monitor:

First byte :RS485 error slot number

Second byte: RS485 error code

Third byte: RS422 slot number

Fourth byte: RS422 error code

Other bytes are reserved.

Error code	Description	
-1	No message is set and modbus is enabled	
-2	Without any node can be written, all nodes are disabled or single read / write for a single time	
21	If the receive byte length is less than 5 byte, data sent by modbus slave device is incomplete or the device does not reply	Check slave device status or increase the Inter Character parameter.
-22	CRC parity failure, the Modbus communication is disturbed or slave device send error ,the received byte length is greater than 5 bytes, but did not actually send complete packet	
1	Illegal function	Modbus slave device does not support this command
2	Illegal data address	The length of the read or write command is incorrect
3	Illegal data value	Write command data of the packet Settings is incorrect
4	Slave device fault	Modbus slave device cannot receive data command
6	Slave device busy	Modbus slave device busy

Communication control bit:

First byte:

Bit 0: Whether the RS485 port is enabled 1 = Enable, 0 = Disable

Bit 1: Whether the RS422 port is enabled 1 = Enable, 0 = Disable

Bit 4: Clear the fault code. When a rising edge (0→1) is detected, the communication status monitoring is cleared. Other bits are reserved.

Second byte —— Ninth byte :

Each slot corresponds to a bit. The corresponding forms are as follow table.

When message is set to rising edge triggering (0→1), message is enabled to be sent once.

When the message is set to level trigger, the bit=1 indicate that message is enabled cyclic sending and the bit=0 indicate that message is disabled cyclic sending

Second byte	Slot 8	Slot 7	Slot 6	Slot 5	Slot 4	Slot 3	Slot 2	Empty
Third byte	Slot 16	Slot 15	Slot 14	Slot 13	Slot 12	Slot 11	Slot 10	Slot 9
Fourth byte	Slot 24	Slot 23	Slot 22	Slot 21	Slot 20	Slot 19	Slot 18	Slot 17
Fifth byte	Slot 32	Slot 31	Slot 30	Slot 29	Slot 28	Slot 27	Slot 26	Slot 25
Sixth byte	Slot 40	Slot 39	Slot 38	Slot 37	Slot 36	Slot 35	Slot 34	Slot 33
Seventh byte	Slot 48	Slot 47	Slot 46	Slot 45	Slot 44	Slot 43	Slot 42	Slot 41
Eighth byte	Slot 56	Slot 55	Slot 54	Slot 53	Slot 52	Slot 51	Slot 50	Slot 49
Ninth byte	Slot 64	Slot 63	Slot 62	Slot 61	Slot 60	Slot 59	Slot 58	Slot 57

For example:

When slot 2 is configured to write single hold register and the message sending trigger is set to rise edge trigger, the assigned IO addresses are %QW64 to %QW65 and the target address is set to 28688.

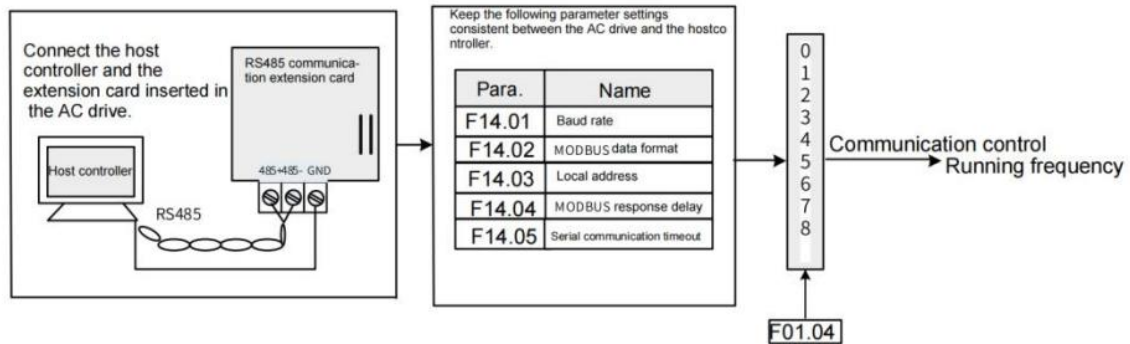
Set %Q1.0 to 1 and enable the RS485 interface. When address %Q2.2 is set from 0 to 1, PLC sends data from address %QW64 to %QW65 to the hold register of the target device at address 28688.

Kinco AC drive setting description

Set the parameter F01.03=2 (select the communication mode to set up the run command for the AC drive) on the control panel of the AC drive , which can realize the start, stop and other related command control .

Set parameter F01.04 = 5 (select communication as the main frequency given source).

Taking Modbus protocol as an example to illustrate the process of using communication to give running commands:



For Modbus communication, it is necessary to set F14.01 (baud rate), F14.02 (data format), and F14.03 (local address).

Parameter (address)	Name	Reference	Default (Setup range)	Adjustable properties
F14.01 (0x0E01)	MODBUS baud rate	0: 1200 BPS 1: 2400 BPS 2: 4800 BPS 3: 9600 BPS 4: 19200 BPS 5: 38400 BPS 6: 57600 BPS 7: 115200 BPS	5 (0 to 7)	Changeable at any time
F14.02 (0x0E02)	MODBUS data format	0: (N, 8,1) No check, data bit: 8, stop bit: 1 1: (E, 8,1) Even parity, data bit: 8, stop bit: 1 2: (O, 8,1) Odd parity, data bit: 8, stop bit: 1 3: (N, 8,2) No check, data bit: 8, stop bit: 2 4: (E, 8,2) Even parity, data bit: 8, stop bit: 2 5: (O, 8,2) Odd parity, data bit: 8, stop bit: 2	0 (0 to 5)	Changeable at any time
F14.03 (0x0E03)	Local address	This parameter defines the local communication address	1 (0 to 247)	Changeable at any time
F14.04 (0x0E04)	Response delay	Interval between the end of the AC drive receiving data and sending data to the host computer	2ms (0ms to 20ms)	Changeable at any time
F14.05 (0x0E05)	MODEBUS communication timeout	When set to 0.0s, the Modbus communication timeout is invalid. If not, it is valid. If the interval between this communication and the next communication exceeds F14.05 (MODBUS communication timeout), the system will report a communication fault	0.0 s (0.0s to 60.0s)	Changeable at any time

Communication control parameter group address description

Function description	Address definition	Data Meaning statement		R/W
Communication set frequency	0x7010 (F01.04=5)	0 ~ 10000 corresponds to a maximum frequency of 0.00% ~ 100.00% (F01.11)		W
Communication set auxiliary frequency	0x7010 (F01.05=5)	0 ~ 10000 corresponds to a maximum frequency of 0.00% ~ 100.00% (F01.11)		W
Communication command Settings	0x7000	0x0000: No command 0x0001: Run forward 0x0002: Run in reverse 0x0003: Forward turn dot move 0x0004: Reverse dot move	0x0005: Slow down and stop 0x0006: Emergency stop 0x0007: Free stop 0x0008: Fault reset	W
Communication write terminal	0x70XX	The address low is: 01: Write A01 03: Write D0 04: Write pulse output		W
AC drive fault code	0x6F00	Inverter current fault code (see fault code table)		R
Communication given upper limit frequency	0x7010 (F01.12=5)	0 ~ 10000 corresponds to a maximum frequency of 0.00% ~ 100.00% (F01.11 = 5)		W
Voltage setting for VF separation	0x7010 (F05.20=5)	0 ~ 10000 corresponds to 0.00% ~ 100.00% of the rated voltage value		W
Maximum torque source under speed control (electric)	0x7010 (F06.11=5)	0 ~ 10000 corresponds to 0.00% ~ 100.00% upper set value (F06.12)		W

Application Example

The frequency range corresponding to the given frequency range is 0% ~ 100.00%(100.00% corresponds to the maximum frequency).

If F01.11 "Max frequency" is set to 50.00Hz and the frequency value of the write command is 2710H (Decimalism:10000), then the actual written frequency value $50.00 \times 100\% = 50.00\text{Hz}$.

Taking Modbus protocol as an example to illustrate the process of using communication to give main frequency:

For example, when using the communication mode to set the frequency to 50.00Hz, send the write command : 01 06 70 10 27 10 88 F3.

Byte	Description
01H(configurable)	AC drive address
06H	Write command
7010H	Control command communication address
2710H(which is equivalent to 10000 in decimal, refers to 100% of the maximum frequency)	Target frequency
88F3H	CRC check

when using the communication mode to set the frequency to 25.00Hz, send the write command : 01 06 70 10 13 88 9F 99. among them, the decimal number of 1388 is 5000, which refers to 50% of the maximum frequency.

1. Enter the menu through the operation panel, set F01.03=2(Communication command channel)



2. Set parameter F01.04 = 5 (Communication given main frequency)



3. Set Modbus communication parameters F14.01 = 5 (Communication baud rate is 38400BPS)



4. Set F14.02 =0 (No check, data bit: 8, stop bit: 1)



5. Set F14.03=1 (AC drive communication station number is set to 1)



Add corresponding I/O to the monitor table for monitoring and modification.。

KINCO-VFD ▶ PLC_1 [CPU 1212C DC/DC/DC] ▶ 监控与强制表 ▶ 监控表_1

	名称	地址	显示格式	监视值	修改值		注释	变量注释
1	"变频器频率"	%QW64	无符号十进制	6100	6100	<input checked="" type="checkbox"/>	!	
2		%IB1	十六进制	16#00		<input type="checkbox"/>		RS485出错的槽号
3		%IB2	十六进制	16#00		<input type="checkbox"/>		RS485错误代码
4	"报文控制"	%QB2	十六进制	16#00	16#06	<input checked="" type="checkbox"/>	!	
5	"RS485使能"	%Q1.0	布尔型	TRUE	TRUE	<input checked="" type="checkbox"/>	!	
6		%Q1.4	布尔型	FALSE		<input type="checkbox"/>		清除错误码
7	"变频器控制字"	%QW66	十六进制	16#0005		<input type="checkbox"/>		

Before the communication, enable the RS485 port (%Q1.0). When the packet control bit receives an rising edge from 0 to 1, it sends %QW64 data and %QW66 data to the specified device address. When communication is abnormal, %IB1 can view the error slot number and %IB2 can view the error code. Writing an rising edge from 0 to 1 to %Q1.4 clears the error code.

For the conversion relationship between the control word and frequency of the AC drive, please refer to the **Communication control parameter group address description** and **Application example**.

For more details on the AC drive, please refer to the "KC100 Series inverter user manual".

For more details about PROFINET to Modbus module, please refer to the manual **PN-MB_ver1.0**.