



Smart DBUS Extension Module User Manual²⁵⁰⁸⁰⁷

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Note: Partial EBUS The module has been renamed

DBUS Module, Appearance markings EM Change to DM Equipment only

The name, function, and usage remain unchanged.

Gongbei DBUS The module offers abundant expansion resources, including analog modules, digital modules, and temperature modules. Each module has two built-in communication interfaces for transmitting resources to the host computer. DBUS One interface supports Modbus RTU The agreement 485 interface.

DBUS Interface It is specifically designed for Smart A low-cost expansion solution designed by the original equipment manufacturer (OEM), through DBUS Digital input points connected to the host (e.g., those connected to the host) IO.0, IO.1 This enables communication with the host. (Using...) DBUS Interface, maximum number of connections 2 Each module.

485 Interface: DBUS The module is also configured with one channel. 485 Interface, supports Modbus RTU The protocol enables remote, multi-device communication.

You can choose to use either of these two interfaces.

1, DBUS Expansion Module Product Selection

Digital input/output module	describe	Power consumption
DM DE16-16DI	Digital quantity 16 enter	2.5W
DM QR16-16DQ	Digital quantity 16 Output (	4.5W
DM DR16-8DI8DQ	Digital quantity 8 enter 8	3.5W
DM DE32-32DI	Digital quantity 32 enter	3W
DM QR32-32DQ	Digital quantity 32 Output (	5W
DM DR32-16DI16DQ	Digital quantity 16 enter 1	4.5W
Analog module		
DM AE08-8AI	Analog quantity 8 Input (supports voltage and current)	3W
DM AE16-16AI	Analog quantity 16 Input (current only)	4W

DM AE32-32AI	Analog quantity32Input (current only)	5W
DM AQ04-4AQ	Analog quantity4Output (supports voltage and current)	4W
DM AQ08-8AQ	Analog quantity8Output (supports voltage and current)	6W
DM AM06-4AI2AQ	Analog quantity4enter2Output (both input and output support voltage and current)	3.5W
DM AM12-8AI4AQ	Analog quantity8enter4Output (Input supports current only, output supports both voltage and current)	4W
Temperature module	describe	
DM AR08-8PT100	8roadPT100enter	3W
DM AE08-8NTC	8roadNTCenter(10K 3950)	3W
DM AT08-8TC	8roadKType thermocouple	3W
DM AE16-8NTC8AI	8roadNTCenter8Analog input (current only)	4W
DM AE16-12NTC4AI	12roadNTCenter4Analog input (current only)	4W
DM AM06-4NTC2AQ	4roadNTCenter2Analog output (supports voltage and current)	3W
DM AM12-8NTC4AQ	8roadNTCenter4Analog output (supports voltage and current)	4W
Hybrid Module	describe	
DM DR16AM12-8DI8DQ8AI4AQ	Digital quantity8enter8Relay output, analog signal8Input (current only)4Output	8W

2.DBUSInterface Usage Instructions

DBUSIt is a communication bus protocol that communicates with the host computer through digital inputs (switch signals) without occupying the host computer's memory.

Communication port. Extended resources can be accessed directly with just one library instruction; it is now compatible.SMARTSeries mainframes.

DBUSDevices related to the expansion module include2kind:

1. DBUSExtended modules (such as)DM AE08-8NTC,DM AM12-8AI4AQwait)
2. DBUSDedicated expansion signal board (in)SBIn the connection method, it is used to connectSmarthost andDBUSExtended Module

(This is for block use only and cannot be used alone.)

Simple to use, requiring only three steps:

- 1.Hardware connection, most models only require connection2One cable is all it takes to connect to the host computer.
- 2.InstallDBUSDownload and install the corresponding library.DBUSLibrary,
- 3.Configure and callDBUSCommand. Only one command is needed to truly achieve rapid installation and quick use.

2.1No.1step:DBUSInterface hardware connection

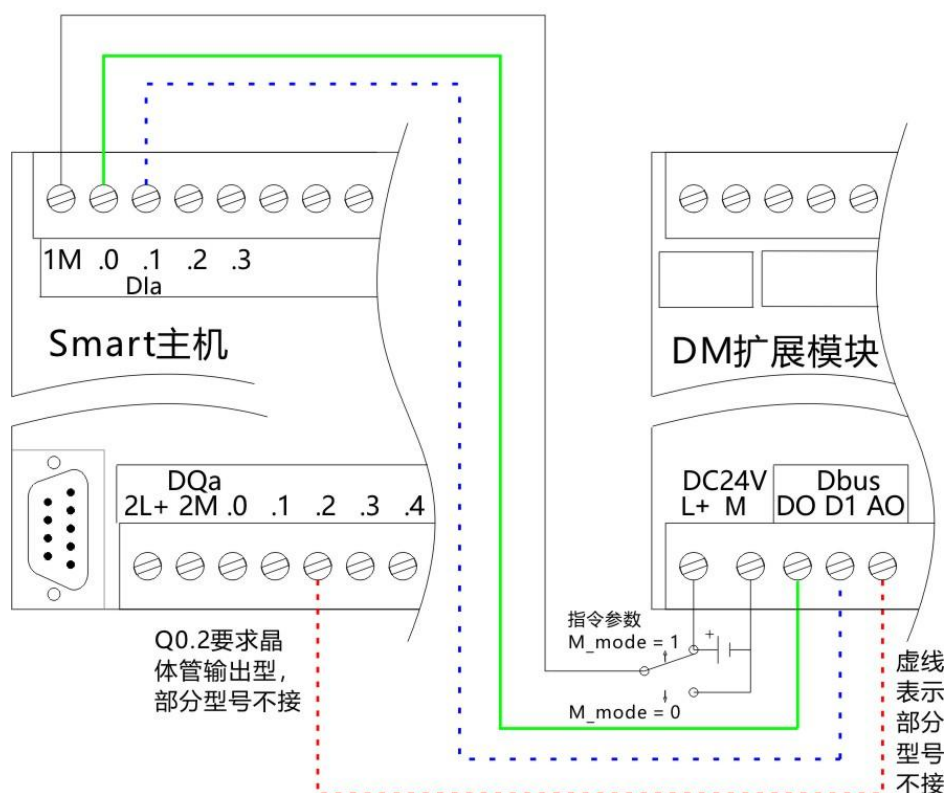
DBUSThe extension module has3Connection methodssmartThe main unit is selected by the customer based on their operating conditions.

1. P1Method, connect to hostI0.0,I0.1,Q0.2See the image below.DBUSbusP1Wiring method.
2. P2Method, forP1The method is occupied, or you want to expand to a second one.DBUSThe modular system can be selectedP2Way,
Connect to hostI0.2,I0.3,Q0.4See the image below.DBUSbusP2Wiring method .
3. SBMethod, forP1mouth,P2The port is occupied, or a connection is needed.Q0.2,Q0.4However, the main unit uses relay output.

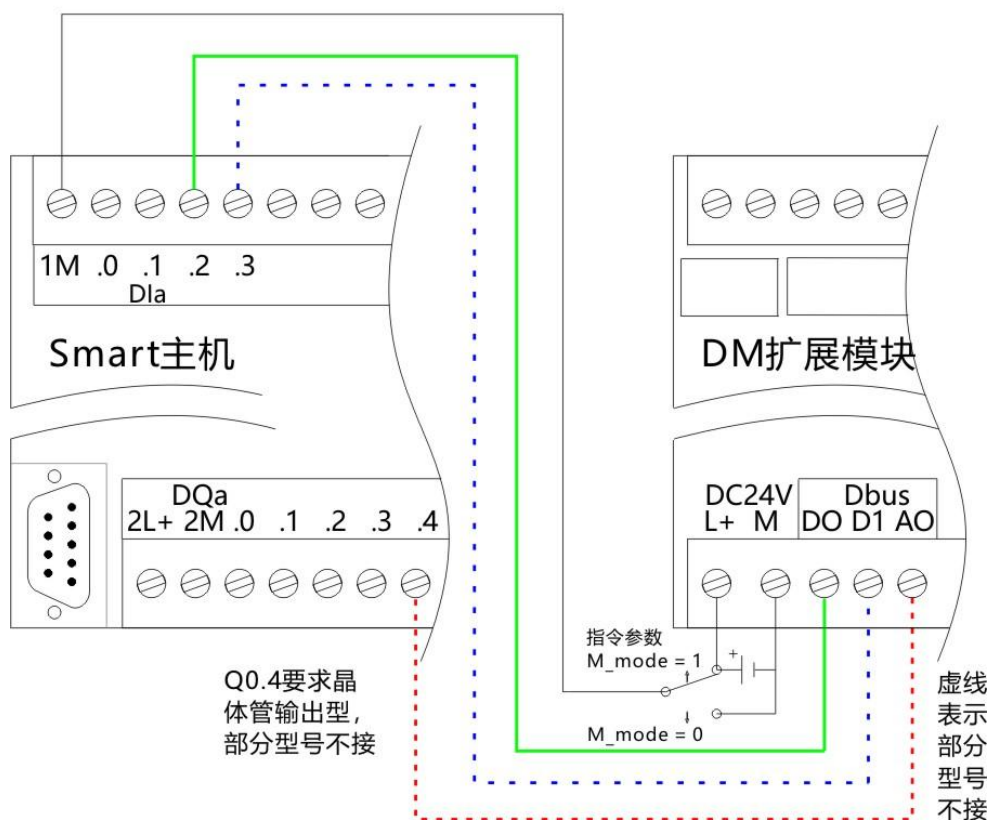
The system can be selectedSBMethod, i.e.DBUSDedicated expansion board method. See the diagram below.DBUSbusSBwiring

Way".DBUSThe dedicated expansion board needs to be purchased separately.

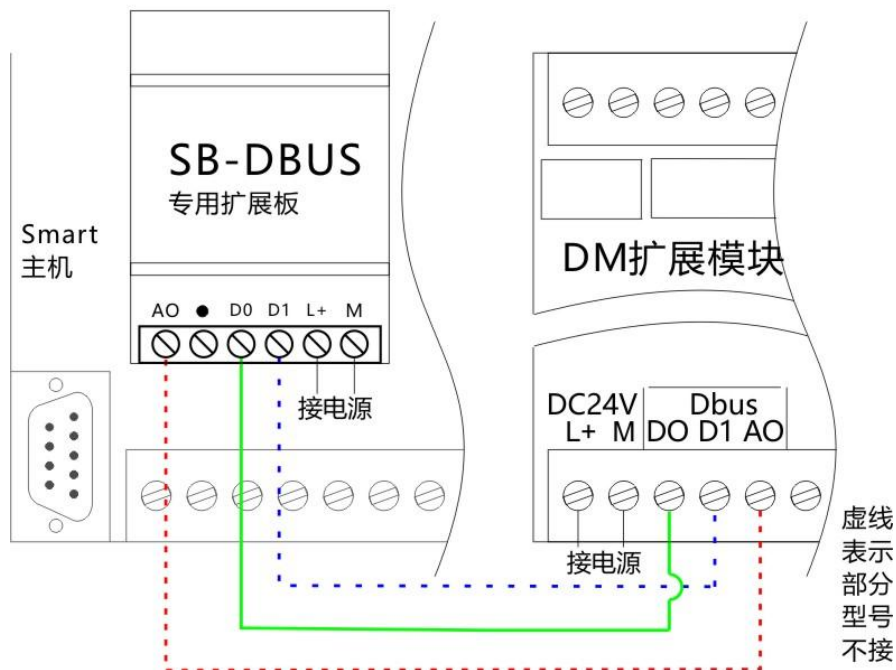
DBUS总线P1接线方式



DBUS总线P2接线方式



DBUS总线SB接线方式



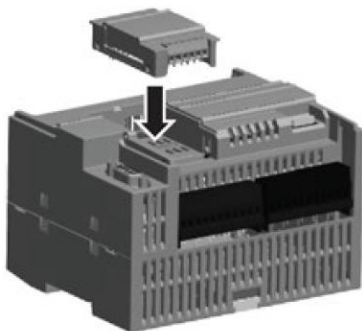
Special Note1:someDBUSExtension modules, noneA0Terminals do not require connection.A0Line, therefore selectedP1The method does not require a connection.Q0.2,chooseP2The method does not require a connection.Q0.4,for exampleDM AE08,DM DE16The characteristic of this type of expansion module is that it only has input points and no output points. Some models also lack this feature.D1Terminals do not need to be connected.D1Line, therefore selectedP1The method does not require a connection.I0.1,chooseP2The method does not require a connection.I0.3,for exampleDM QR16-16DR,DM AQ08 Such modules are characterized by having only output points and no input points. For extension modules that have both input and output points,D0, D1,A0All need to be connected, for exampleDM DR16-8DI8DR,AM06-4AI2AQWait. If you chooseP1orP2This method requires the host to be a transistor output type. Therefore, most expansion modules only need two wires to connect to the host.

Special Note2:forDBUSThe bus hasA0The interface's expansion module requires the host.Q0.2,Q0.4If the host is not a transistor output type, you can select [the appropriate option].DBUSConnect using a dedicated signal board, i.e.SBConnection method, this is also part of the design.SB-DBUS The purpose of a dedicated expansion board.

Special Note3:P1,P2In the wiring method,SmarthostI0group1MThe terminal can be connected to the power supply of the expansion module.24V+It can also be connected24V-This is done to meet the needs of different customers.I0Group inputs can implement both source and sink inputs. For different connections, only the instruction parameters need to be modified.M_mode;0:1Mcatch24V-;1:1Mcatch24V+;

Special Note4Each systemP2Interface andSBThe interface can only be used once, meaning it can be used a maximum of two times.DBUSThe bus implements twoDBUSDevice connection. To connect more modules, consider using...485For details on bus-based systems, please refer to [Gongbei Electronics].SmartExtended Module485Interface usage instructions.pdf》

Special Note5:DBUSHardware connection of dedicated expansion signal board



In useSBThe connection method requires the use ofDBUSA dedicated expansion signal board can be directly inserted into the original signal board slot.

2.2No.2Step: InstallationDBUSLibrary

2.2.1Download library, select library

Log in www.jngbdz.com Find the signal board or expansion module product you purchased and download it from the download tab.DBUS The instruction library set contains a total of 2Seed bank:



- **Standard Library of Extension Modules**(EBUS_ST_P1/P2/SB.smartlib)Most extension modules use this library.
- **Large library of extension modules**(EBUS_AE_P1/P2/SB.smartlib)only AE16 and AE32 (Only used)

Therefore, our library files are very concise and easy to use. Please refer to the table below for selective installation and use.

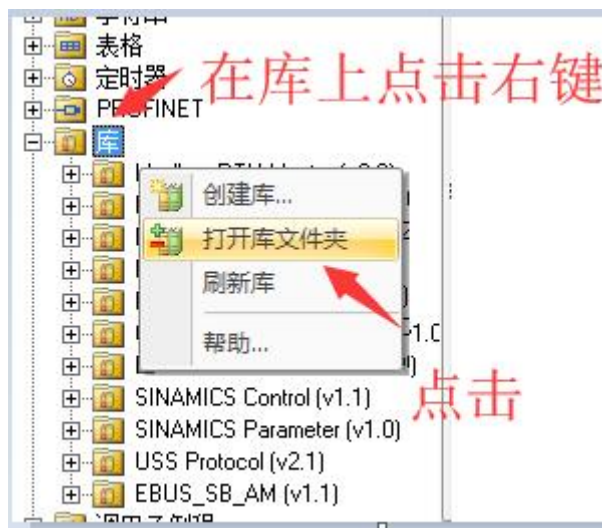
Product Model	Wiring method	DBUSInstruction library
DM DE16-16DI		
DM QR16-16DQ		
DM DR16-8DI8DQ		
DM DE32-32DI		
DM QR32-32DQ		
DM DR32-16DI16DQ		
DM AE08-8AI		
Standard DM AR08-8PT100	P1interface:	use"DBUS_ST_P1.smartlib"
allow DM AE08-8NTC	P2interface:	use"DBUS_ST_P2.smartlib"
Allow DM AT08-8TC	SBinterface:	use"DBUS_ST_SB.smartlib"
quantity DM AM06-4AI2AQ		
Library DM AM06-4NTC2AQ		
DM AM12-8AI4AQ		
DM AM12-8NTC4AQ		
DM AQ04-4AQ		
DM AQ08-8AQ		
DM DR16AM12-8DI8DQ8AI4AQ DM		
DR16AM12-8DI8DQ8NTC4AQ		
big DM AE16-16AI	P1interface:	use"DBUS_AE_P1.smartlib"
Allow DM AE16-8NTC8AI	P2interface:	use"DBUS_AE_P2.smartlib"
quantity DM AE16-12NTC4AI	SBinterface:	use"DBUS_AE_SB.smartlib"
Library DM AE32-32AI		

Note:DMAE08 DMAR08

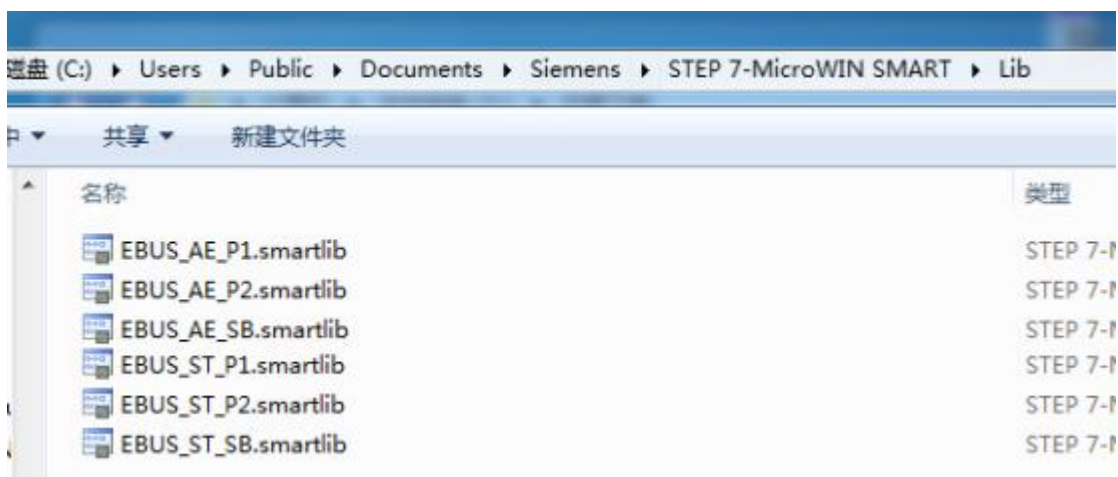
You can also use a large-capacity library, and from a performance perspective, it is recommended to use a large-capacity library.

2.2.2 Installation Library

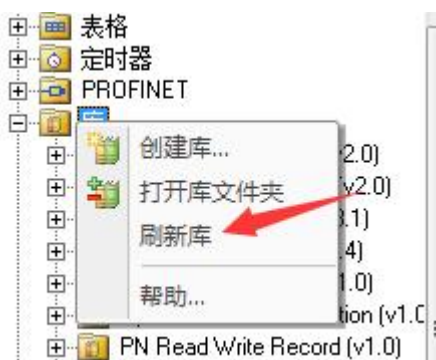
Open the software, inSTEP 7 - MicroWIN SMARTInstruction List



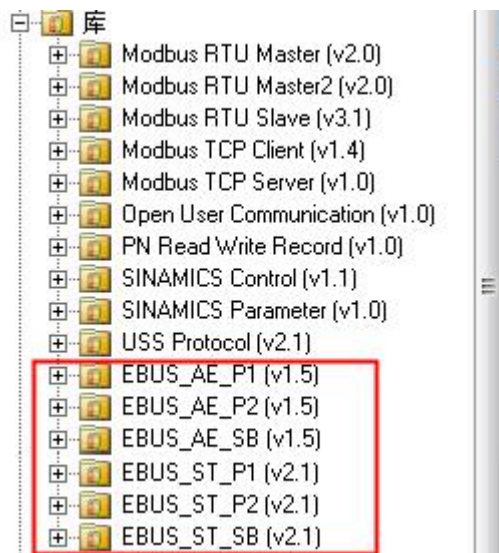
Copy the library files to the opened folder. All files have been copied as shown in the image below; users only need to copy the ones they need.



Then right-click on the library command and select "Refresh Library," as shown in the image below.



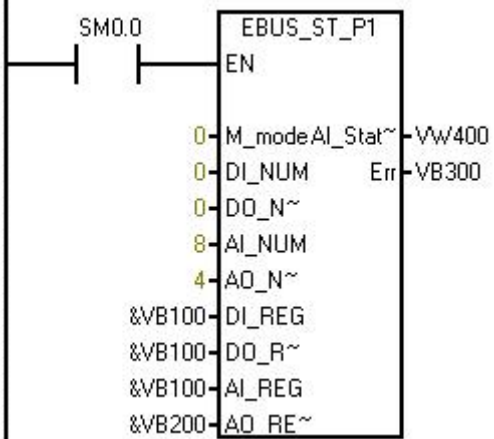
Finally, the installation command library appears.

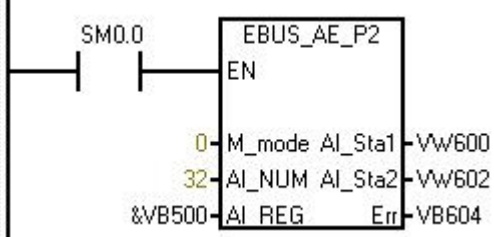


2.2.3 Library instruction parameter description

Each DBUS extended device corresponds to only one library instruction, making them very easy to use.

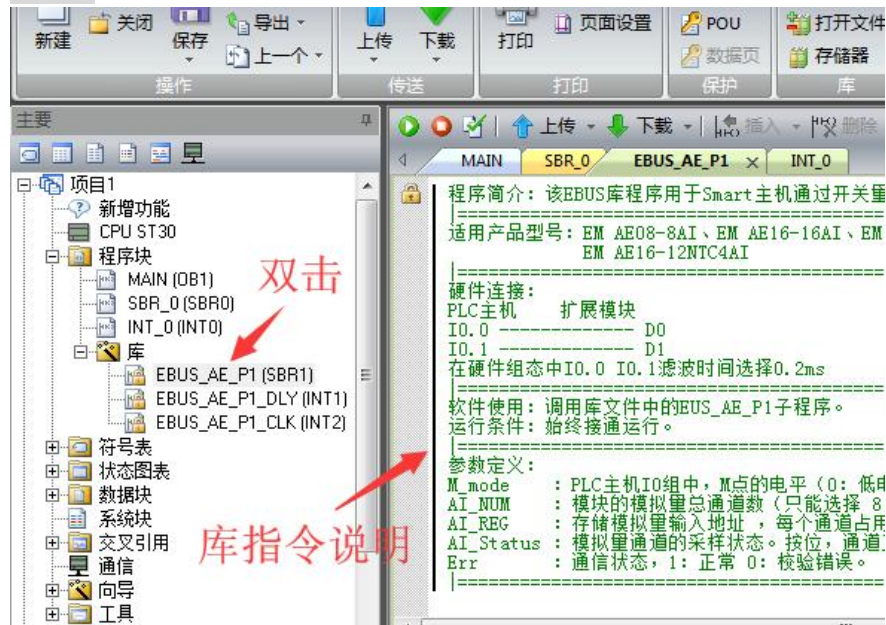
Example of standard library instructions for extended modules	Parameter Description
---	-----------------------

	EN:The operating conditions must be:SM0.0It cannot be anything else. M_mode:PLChostIOIn the group,MPoint level (0Low level1(High level) DI_NUM:Number of digital input channels in the module (selectable only)0,8,16,32). DO_NUM:Number of digital output channels for the module (selectable only)0,8,16,32). AI_NUM:Number of analog input channels in the module (selectable only) select0,4or8).Note: If it is16or32channelAI (Modules should use a large library of extended modules) AO_NUM:Number of analog output channels of the module (selectable only)0,2,4or8) . DI_REG:A two-byte pointer variable stores the starting address of the switch input signal; each channel occupies [a certain number of bytes].1Units digit. For example &VB200Total16One channel, front8Each channel is stored sequentially.V200.0~V200.7,back8Each channel is stored Versions 201.0 to 201.7If there is no channel to fill in.0. DO_REG:A two-byte pointer variable stores the starting address of the switch output signal; each channel occupies [a certain number of bytes].1Ones. If there is no channel to fill in...0. AI_REG:A two-byte pointer variable, representing the starting address of the analog input channel; each channel occupies [a certain number of bytes].2 Bytes. For example &VB300:Total4Each channel is stored sequentially. VW300~VW306If there is no channel to fill in.0. AO_REG:A two-byte pointer variable, representing the starting address of the analog output channel; each channel occupies [a certain number of bytes].2One byte. If no channel is available to fill.0. AI_Status:The sampling status of the analog signal channel. By bit, the normal bit position of the channel is...1.for exampleAI_StateA binary number equal to 00000000 11111101 indicates that the second channel is faulty or invalid. The first 8 bits are all 0, indicating that the high 8 bits are invalid. Err:Communication status1Normal position 0This indicates a verification error.
---	---

Example of instructions for a large capacity library of extended modules	Parameter Description
	EN:The operating conditions must be:SM0.0It cannot be anything else. M_mode:PLChostIOIn the group,MPoint level (0Low level1(High level) AI_NUM:Number of analog input channels in the module (selectable only)8,16or32) AI_REG:A two-byte pointer variable, representing the starting address of the analog input channel; each channel occupies [a certain number of bytes].2Bytes. For example &VB300:Total16Each channel is stored sequentially. VW300~VW330.

	AI_Sta1:Low16The sampling status of the analog signal channel. By bit, the normal bit position of the channel is...1.for exampleAI_StateA binary number equal to 00000000 11111101 indicates that the second channel is faulty or invalid. AI_Sta2:high16Sampling status of analog signal channels. Err:Communication status1:normal0Verification error.
--	--

Tips : The installed libraries all come with usage instructions. , Call the library command , The library program will appear in the instruction list. , Double-click to view illustrate.

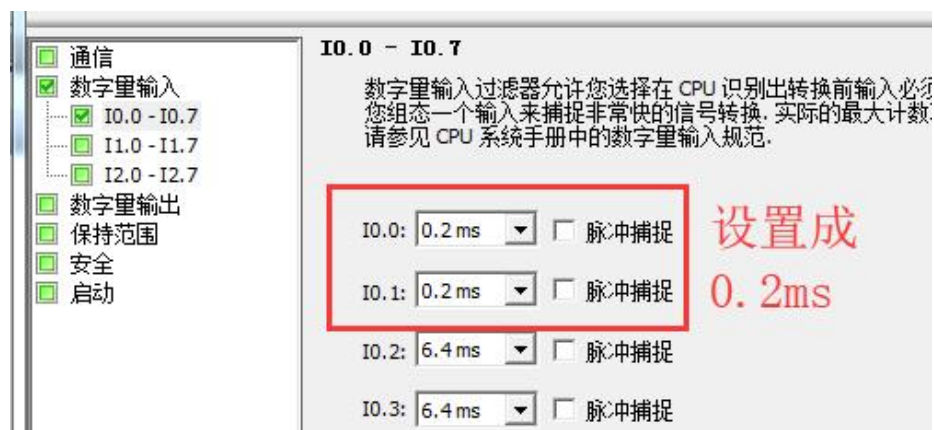


2.3No.3Step: Configuration

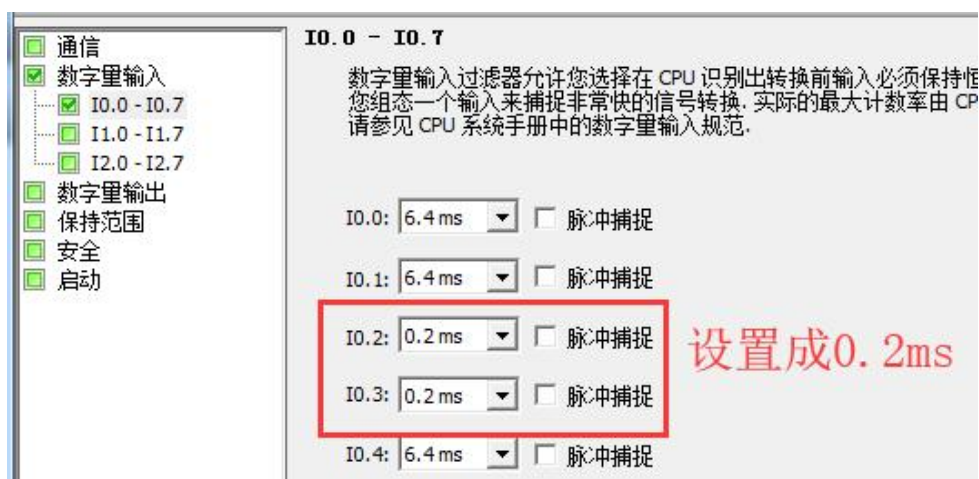
2.3.1ConfigurationIOThe filtering time is0.2ms

The DBUS connection to the digital input point on the host should be set to a 0.2ms filter time. For

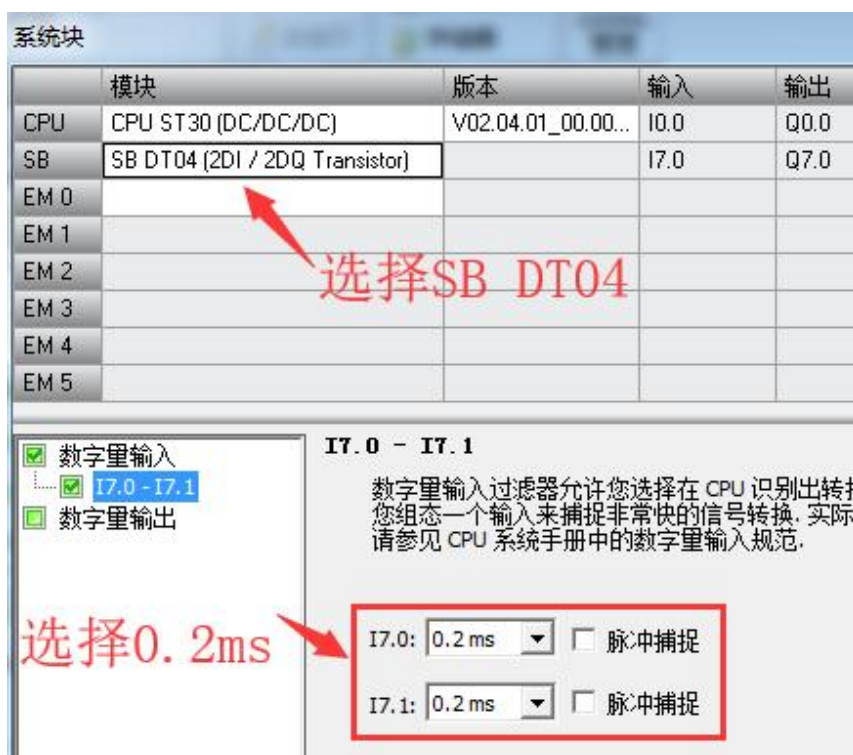
expansion modules...**P1 wiring**The method is set as shown in the image below.



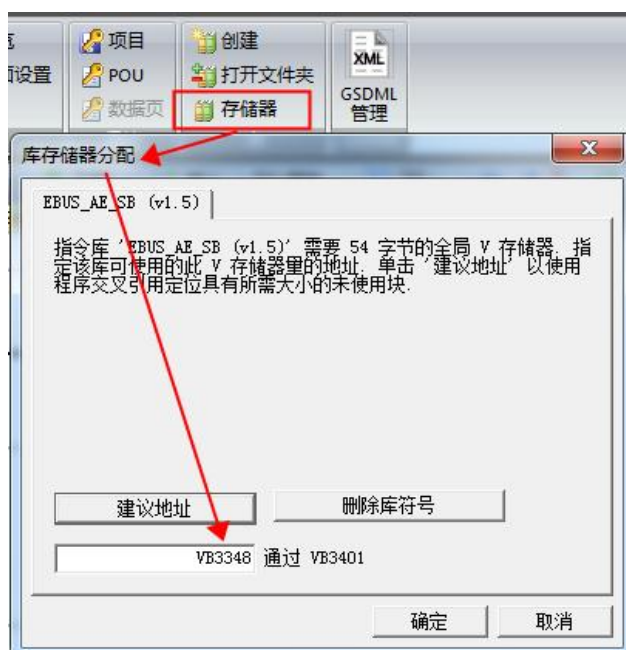
For use of extension modules**P2 wiring**The method is set as shown in the image below.



For expansion modules, use the SB wiring method, that is, use...DBUS Dedicated Expansion Signal BoardThe settings are shown in the image below.;



2.3.2 Configuration DBUS Library storage area



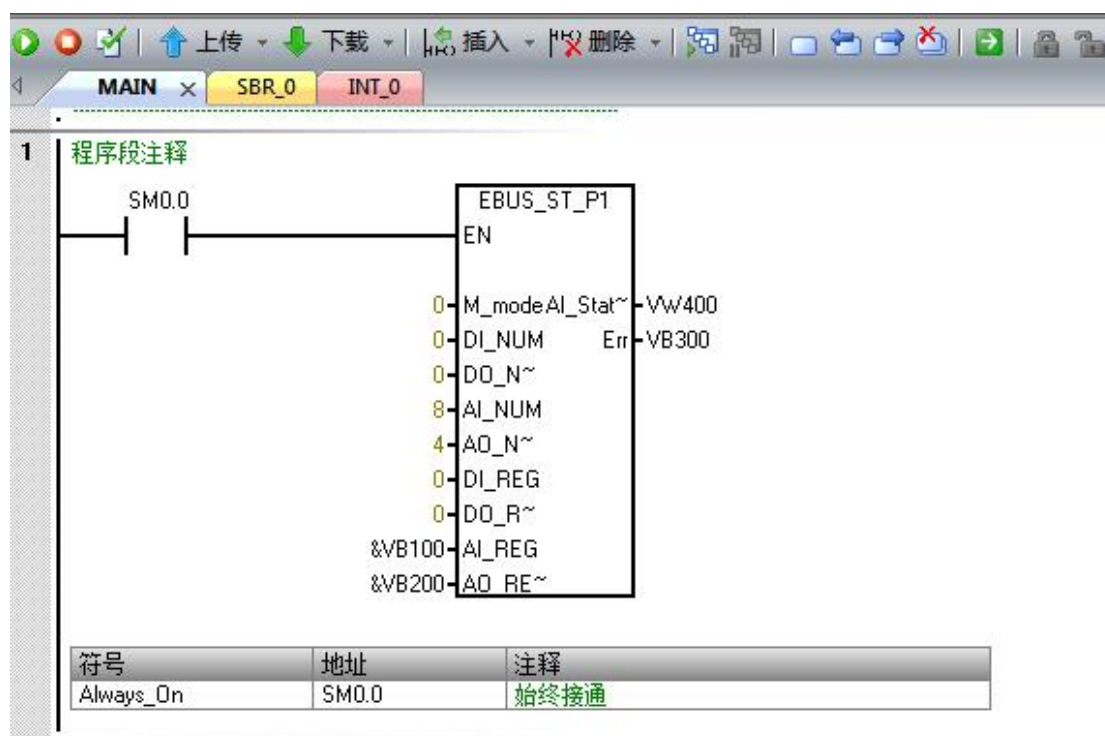
The addresses allocated in this library storage area are reserved for internal use by the DBUS library. You can allocate them by clicking "Suggested Address" or by manually entering them. The allocated address range cannot be used again in other parts of the program, otherwise it will cause problems.

Notice: pass " Suggested address " The address assigned to the button may not be correct. You must check it yourself. It is recommended to allocate address ranges

The program's usage V The area is a bit far.

2.3.3 Invoke instructions

The process can be completed simply by calling a single library instruction in the program, as shown in the image below.



3, DBUSCommon API Usage Issues

1.No response, no effect.

Answer: ViewDBUSIn the instructionsErrCheck the parameters to see if the communication is unsuccessful or if data cannot be collected.

2.Communication failed.

answer:2.1forP1orP2Connection method: Please take a look.I0.0,I0.1,I0.2,I0.3Does the corresponding indicator light flash?

If it doesn't flash, it means there's a problem with the hardware wiring.

examineI0.0,I0.1,I0.2,I0.3Is the filter time set to...0.2ms.

examineSmarthostI0Group corresponding1MWhether to connect the wires, and whether it matches the instructions.M_modeIf the polarities are consistent, if usedQpoint,Q0ofLandMIt also needs to be wired.

examinedBUSCommand parametersM_modeIs it withsmarthostI0ofMThe wiring is consistent.

2.2forSBExtension modules connected in this way: NoteSBsignal boardD0,D1,A0There are no indicator lights; check.SBIs the signal board configuration set to...DT04Then check if it has been correctly identified. (Select from menu bar)PLCSelect again

PLC)



examineI7.0,I7.1Is the filter time set to...0.2ms. examinedBUSDedicated

expansion signal boardL,MIs it connected to a power source?

2.3 DBUSextension moduleL,MIs the power supply available?

2.4Check if the library storage area allocation overlaps with other parts of the program.3.3Festival.

2.5DownloadedDBUSThe installation library includes examples; run the examples to test them. Note that the examples...CPUdifferent

The agreement must be consistent; if it is modified...CPUThe model number needs to have its filtering time reset.

2.6Disconnect all sensor wires and test again. Incorrectly connected sensor wires may also cause communication failure.

3.Communication is normal, but measurement data is abnormal.

answer:3.1Refer to the product manual.

3.2examinedBUSWhether to add the "&" symbol to the pointer parameter in the instruction.

3.3forDBUSCheck the signal board and see if the DIP switches on the back are set correctly.

3.4The data fluctuates greatly, requiring inspection.I0.0,I0.1,I0.2,I0.3,I7.0,I7.1Do not set the filter time incorrectly.0.2us,

It should be0.2msPulse capture should also be turned off.

4.An expansion module with inputs and outputs is present; the output point is normal, but the input point has no data.

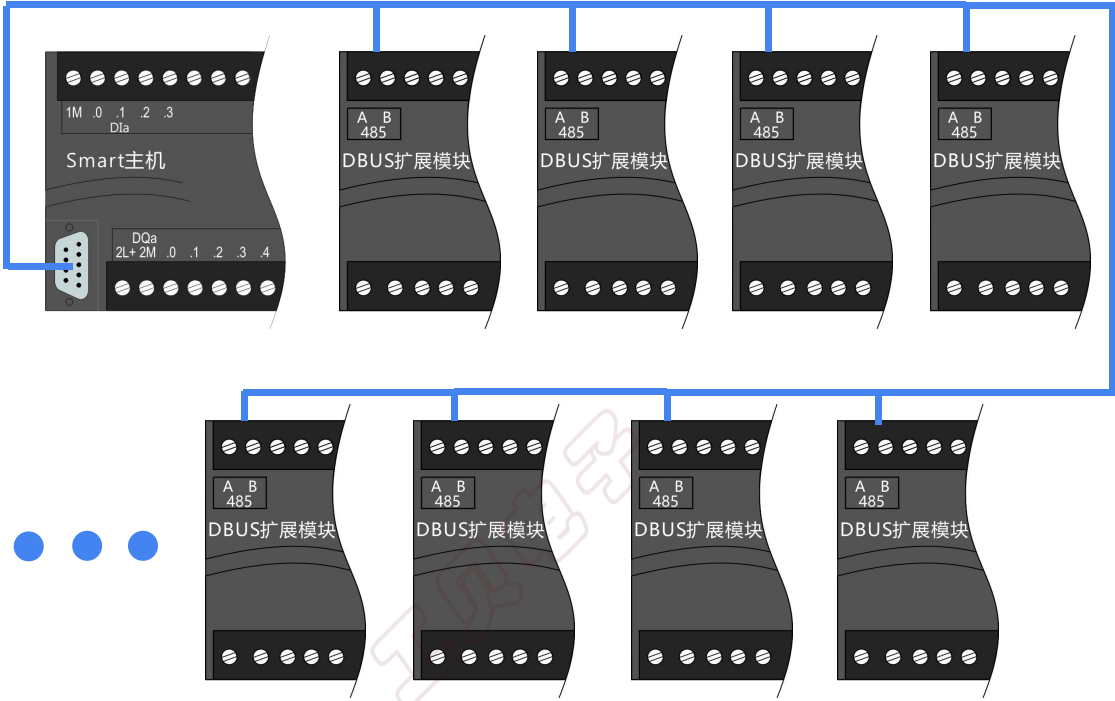
answerGenerally due tosmarthostI0Group1MThis is caused by an incorrect level configuration.1Mcatch24V-, In the programM_modeTo be set to0,if1Mcatch24V+In the programM_modeTo be set to1.

5.DBUSAfter the library is installed, retrieveDBUSThe command reported an error.

Answer: UpgradeS7Software to2.5Version. Our library is in2.5Created using an older versionS7The software cannot run; the image below is an example.2.5Version.



4,485Interface Usage Instructions



GongbeiDBUSSeries of expansion modules, each with one built-in channel485Interface, supportsModbus RTUThe protocol enables the connection of multiple remote expansion modules.

4.1,485Interface definition

Specification	parameter	
Physical layer specifications	RS485	
Communication Protocol	MODBUS RTU	
baud rate	2400,4800,9600(Factory default)19200,38400,57600,115200	
Check bit	No parity (factory default), odd parity, even parity	
Stop bit	1(factory default)2Bit	
interface	definition	PORT2
	A:RS485SignalA	Note that definitions A and B are based on the 485 standard, which is the opposite of Siemens' definition. If connected to Siemens... The DB9 interface has pin A corresponding to pin 3 and pin B corresponding to pin 8. If you encounter communication problems, you can try... Try changing the wiring between A and B to solve the problem.
	B:RS485SignalB	

4.2,485Parameter modification and configuration software usage

The device station address, baud rate, parity, and other information can be modified using the following two methods.
method1,use"SmartExtended ModuleModbusThe "Debugging Software" has been modified; please refer to the next section for specific usage instructions.

method2For customers who do not have a communication cable on site, an emergency method can be used: [The text abruptly ends here, likely due to an incomplete sentence or a formatting error.]SmartHost modification tool smartextension module485Parameter examples."smart"Program writingPLCHost, usingPLCModify module parameters on the host computer; see the program comments for specific instructions.

Download the dedicated configuration software from the official website.SmartExtended ModuleModbusDebugging software.zipRun after decompression "SmartPlatform.exe"As shown in the figure below.



Computer andsmartExtended Module485Connect the ports, click the "Not Connected" icon, then click "Serial Port", select the parameters, and click "Start Connection".



The "serial port number" is the computer's...COMSlogan, view Device Manager, test computer.COM2Therefore, we choose here.COM2It needs to be compared with the Device Manager.COMCorrespondingly.

The "Baud Rate" should be selected based on the device's baud rate; this is the default setting at the factory.9600baud rate, so it can be used the first time.

Direct selection 9600 This way the software will be in 9600 Search for devices under Baud Rate. If you forget the Baud Rate, select "Automatic" to search, and the software will search from... 2400 The baud rate search for the device will take a relatively long time. The "Parity" setting should be selected based on the device's parity bit setting; the default setting is no parity. The "Stop Bits" setting should be selected based on the device's stop bits setting; the default setting is also [missing information]. 1 Stop bit.

Note: For customers who have forgotten their device settings, the baud rate should be set to automatic scanning, and the parity and stop bits should also be switched during scanning.

After the connection is established,  未连接 Become  已连接 If it fails to open, please check the communication cable. Finally, close the current dialog box.

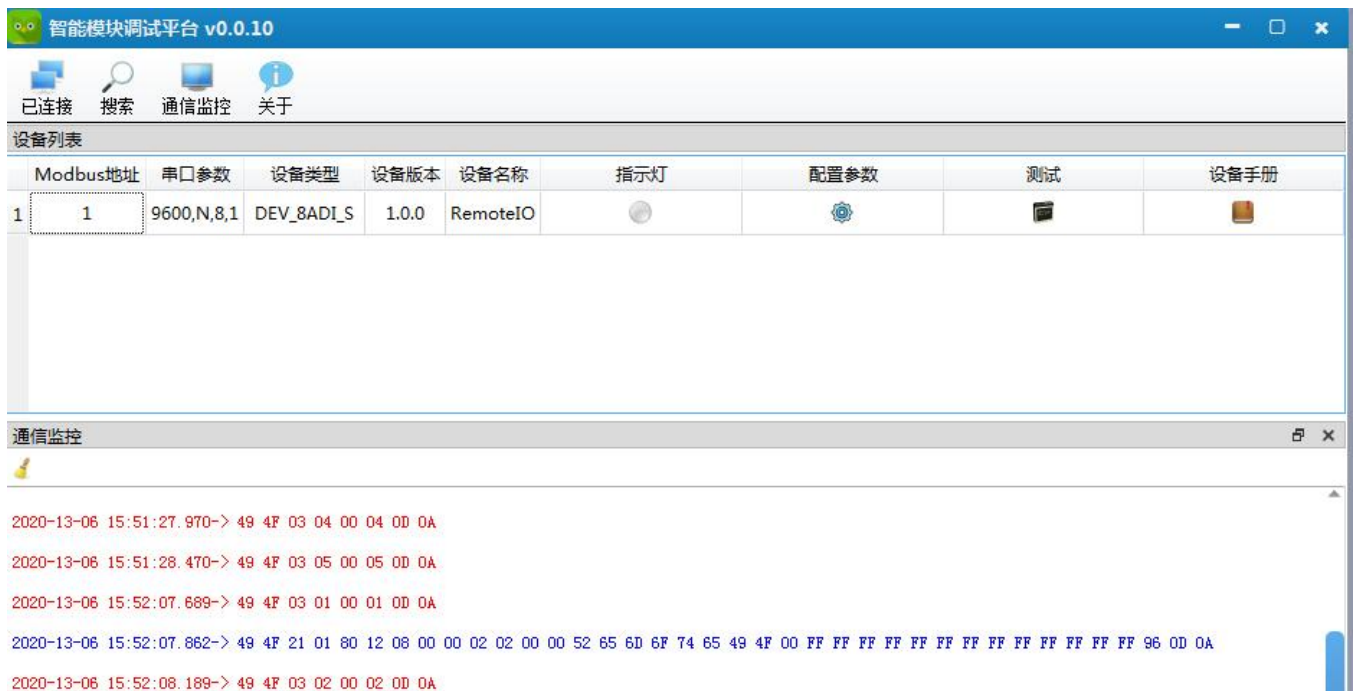


Click the search icon, then click the "Start Search" button to search based on the serial port information you just configured. If no results are found, change the serial port connection settings and search again.



The communication monitoring window displays the transmitted and received data in real time.

After the search is complete, the found devices will be displayed, as shown in the image below.



As you can see, one was found. DM AE08-8AI equipment, Modbus The slave address is 1. The device name is RDMoteIO (Modifiable, supports only letters and numbers). Communication port is... 9600 Baud rate, no parity 8 Bit data bits, 1 Stop bits. These parameters can be set via the "Configure Parameters" button.

The "Indicator Light" button is used to quickly locate equipment on-site. Clicking this button will display the equipment. The indicator light will flash. 300 The flashing will stop automatically after a few seconds, or it will stop flashing again when the indicator light is clicked again. The "Test" button is used to read and write the device's resources, such as... AE08As shown in the image below.



You can also switch to the actual value for easier observation.

4.3, ModbusAddress Table

System parameter address 4, address zone (starting from 1) (read/write)			System parameter address 4, address zone (starting from 1) (read/write)		
40101	baud rate	0=2400; 1=4800; 2=9600 (default); 3 = 19200; 4 = 38400 5 = 57600; 6 = 115200	40104	From station address	Default 1
40102	Parity check	0 = Odd Check 1 = Even parity 2 = No validation (default)	40105	Filter coefficients	0 = Level 0 filtering (default); 1 = Level 1 filtering 2 = 2-stage filtering; 3 = 3-stage filtering; 4-level filtering is the most stable but also the slowest to respond.
40103	Stop bit	0=1 Stop bit (default) 1=2 Stop position	40106	Save Enable	Writing 16#1234 will save system parameters. The written parameters will be lost after a restart. Note that this is in hexadecimal.

DM DE16-16DI Zone 1 address (starting from 1) (read-only)							
10001	Input DIa.0	10005	DIA.4 Input	10009	Input DIb.0	10013	Input DIb.4
10002	Dia.1 Input	10006	Dia.5 Input	10010	Input DIb.1	10014	DIb.5 Input
10003	D1a.2 Input	10007	Dia.6 Input	10011	Input DIb.2	10015	Input DIb.6
10004	DIA.3 Input	10008	Dia.7 Input	10012	DIb.3 Input	10016	Input DIb.7

DM DE32-32DI 1 Zone Address (Starting from 1) (Read-only)							
10001	Input DIa.0	10009	Input DIb.0	10017	Input DIc.0	10025	Input DIId.0
10002	Dia.1 Input	10010	Input DIb.1	10018	Input DIc.1	10026	Input DIId.1
10003	D1a.2 Input	10011	Input DIb.2	10019	Input DIc.2	10027	DIId.2 Input
10004	DIA.3 Input	10012	DIb.3 Input	10020	Input DIc.3	10028	DIId.3 Input
10005	DIA.4 Input	10013	Input DIb.4	10021	DIc.4 Input	10029	DIId.4 Input
10006	Dia.5 Input	10014	DIb.5 Input	10022	Input DIc.5	10030	Input DIId.5
10007	Dia.6 Input	10015	Input DIb.6	10023	Input DIc.6	10031	Input DIId.6
10008	Dia.7 Input	10016	Input DIb.7	10024	Input DIc.7	10032	Input DIId.7

DM QR16-16DQ 0th zone address (starting from 1) (read/write)							
00001	DRa.0 output	00005	DRa.4 output	00009	DRb.0 output	00013	DRb.4 output
00002	DRa.1 output	00006	DRa.5 output	00010	DRb.1 output	00014	DRb.5 output
00003	DRa.2 output	00007	DRa.6 output	00011	DRb.2 output	00015	DRb.6 output
00004	DRa.3 Output	00008	DRa.7 Output	00012	DRb.3 output	00016	DRb.7 output

DM QR32-32DQ 0th zone address (starting from 1) (read/write)							
00001	DRa.0 output	00009	DRb.0 output	00017	DRc.0 output	00025	DRd.0 output
00002	DRa.1 output	00010	DRb.1 output	00018	DRc.1 output	00026	DRd.1 output
00003	DRa.2 output	00011	DRb.2 output	00019	DRc.2 output	00027	DRd.2 output
00004	DRa.3 Output	00012	DRb.3 output	00020	DRc.3 output	00028	DRd.3 output
00005	DRa.4 output	00013	DRb.4 output	00021	DRc.4 output	00029	DRd.4 output

00006	DRa.5 output	00014	DRb.5 output	00022	DRc.5 output	00030	DRd.5 output
00007	DRa.6 output	00015	DRb.6 output	00023	DRc.6 output	00031	DRd.6 output
00008	DRa.7 Output	00016	DRb.7 output	00024	DRc.7 output	00032	DRd.7 output

DM DR16-8DI8DQ							
Zone 0 address (starting from 1) (read/write)				Zone 1 address (starting from 1) (read-only)			
00001	DRa.0 output	00005	DRa.4 output	10001	Input DIb.0	10005	Input DIb.4
00002	DRa.1 output	00006	DRa.5 output	10002	Input DIb.1	10006	DIb.5 Input
00003	DRa.2 output	00007	DRa.6 output	10003	Input DIb.2	10007	Input DIb.6
00004	DRa.3 Output	00008	DRa.7 Output	10004	DIb.3 Input	10008	Input DIb.7

DM DR32-16DI16DQ							
Zone 0 address (starting from 1) (read/write)				Zone 1 address (starting from 1) (read-only)			
00001	DRa.0 output	00009	DRb.0 output	10001	Input DIa.0	10009	Input DIb.0
00002	DRa.1 output	00010	DRb.1 output	10002	Dia.1 Input	10010	Input DIb.1
00003	DRa.2 output	00011	DRb.2 output	10003	D1a.2 Input	10011	Input DIb.2
00004	DRa.3 Output	00012	DRb.3 output	10004	DIA.3 Input	10012	DIb.3 Input
00005	DRa.4 output	00013	DRb.4 output	10005	DIA.4 Input	10013	Input DIb.4
00006	DRa.5 output	00014	DRb.5 output	10006	Dia.5 Input	10014	DIb.5 Input
00007	DRa.6 output	00015	DRb.6 output	10007	Dia.6 Input	10015	Input DIb.6
00008	DRa.7 Output	00016	DRb.7 output	10008	Dia.7 Input	10016	Input DIb.7

DM AE08-8AI 3rd District Address (Starting from 1) (Read-only)					
30001	AI0	Values range from 0 to 27648.	30006	AI5	Values range from 0 to 27648.
30002	AI1	Values range from 0 to 27648.	30007	AI6	Values range from 0 to 27648.
30003	AI2	Values range from 0 to 27648.	30008	AI7	Values range from 0 to 27648.
30004	AI3	Values range from 0 to 27648.	30009	Channel status	Bitwise: 0 is abnormal, 1 is normal
30005	AI4	Values range from 0 to 27648.			

DM AE16-16AI 3rd Zone Address (Starting from 1) (Read-only)					
30001	AI0	Values range from 0 to 27648.	30010	AI9	Values range from 0 to 27648.
30002	AI1	Values range from 0 to 27648.	30011	AI10	Values range from 0 to 27648.
30003	AI2	Values range from 0 to 27648.	30012	AI11	Values range from 0 to 27648.
30004	AI3	Values range from 0 to 27648.	30013	AI12	Values range from 0 to 27648.
30005	AI4	Values range from 0 to 27648.	30014	AI13	Values range from 0 to 27648.
30006	AI5	Values range from 0 to 27648.	30015	AI14	Values range from 0 to 27648.
30007	AI6	Values range from 0 to 27648.	30016	AI15	Values range from 0 to 27648.
30008	AI7	Values range from 0 to 27648.	30017	Channel status	Bitwise: 0 is abnormal, 1 is normal
30009	AI8	(0~27648)			

DM AE32-32AI 3rd Zone Address (Starting from 1) (Read-only)					
30001	AI0	Values range from 0 to 27648.	30018	AI17	Values range from 0 to 27648.
30002	AI1	Values range from 0 to 27648.	30019	AI18	Values range from 0 to 27648.
30003	AI2	Values range from 0 to 27648.	30020	AI19	Values range from 0 to 27648.
30004	AI3	Values range from 0 to 27648.	30021	AI20	Values range from 0 to 27648.
30005	AI4	Values range from 0 to 27648.	30022	AI21	Values range from 0 to 27648.
30006	AI5	Values range from 0 to 27648.	30023	AI22	Values range from 0 to 27648.
30007	AI6	Values range from 0 to 27648.	30024	AI23	Values range from 0 to 27648.
30008	AI7	Values range from 0 to 27648.	30025	AI24	Values range from 0 to 27648.
30009	AI8	Values range from 0 to 27648.	30026	AI25	Values range from 0 to 27648.
30010	AI9	Values range from 0 to 27648.	30027	AI26	Values range from 0 to 27648.
30011	AI10	Values range from 0 to 27648.	30028	AI27	Values range from 0 to 27648.
30012	AI11	Values range from 0 to 27648.	30029	AI28	Values range from 0 to 27648.
30013	AI12	Values range from 0 to 27648.	30030	AI29	Values range from 0 to 27648.
30014	AI13	Values range from 0 to 27648.	30031	AI30	Values range from 0 to 27648.
30015	AI14	Values range from 0 to 27648.	30032	AI31	Values range from 0 to 27648.
30016	AI15	Values range from 0 to 27648.	30033	Channel status 1-16	Bitwise: 0 is abnormal, 1 is normal
30017	AI16	Values range from 0 to 27648.	30034	Channel status 17-32	Bitwise: 0 is abnormal, 1 is normal

DM AQ04-4AQ 4. Zone Address (Starting from 1) (Read/Write)					
40001	AQ0	(0~27648)	40003	AQ2	(0~27648)
40002	AQ1	(0~27648)	40004	AQ3	(0~27648)

DM AQ08-8AQ 4th Zone Address (Starting from 1) (Read/Write)					
40001	AQ0	(0~27648)	40005	AQ4	(0~27648)
40002	AQ1	(0~27648)	40006	AQ5	(0~27648)
40003	AQ2	(0~27648)	40007	AQ6	(0~27648)
40004	AQ3	(0~27648)	40008	AQ7	(0~27648)

DM AM06-4AI2AQ					
Zone 3 Address (Starting from 1) (Read-only)			4. Zone Address (Starting from 1) (Read/Write)		
30001	AI0	(0~27648)	40001	AQ0	(0~27648)
30002	AI1	(0~27648)	40002	AQ1	(0~27648)
30003	AI2	(0~27648)			
30004	AI3	(0~27648)			

DM AM06-4NTC2AQ					
Zone 3 Address (Starting from 1) (Read-only)			4. Zone Address (Starting from 1) (Read/Write)		

30001	NTC channel 1 value, magnified 10 times.	40001	AQ0	(0~27648)
30002	NTC channel 2 value, magnified 10 times.	40002	AQ1	(0~27648)
30003	NTC channel 3 value, magnified 10 times.			
30004	NTC channel 4 value, magnified 10 times.			

DM AM12-8AI4AQ					
Zone 3 Address (Starting from 1) (Read-only)			4. Zone Address (Starting from 1) (Read/Write)		
30001	AI0	(0~27648)	40001	AQ0	(0~27648)
30002	AI1	(0~27648)	40002	AQ1	(0~27648)
30003	AI2	(0~27648)	40003	AQ2	(0~27648)
30004	AI3	(0~27648)	40004	AQ3	(0~27648)
30005	AI4	(0~27648)			
30006	AI5	(0~27648)			
30007	AI6	(0~27648)			
30008	AI7	(0~27648)			

DM AR08-8PT100		
Zone 3 Address (Starting from 1) (Read-only)		
30001	Channel 1 Temperature Value	Range: -1900 to 6000, magnified 10 times
30002	Channel 2 temperature value	Range: -1900 to 6000, magnified 10 times
30003	Channel 3 Temperature Value	Range: -1900 to 6000, magnified 10 times
30004	Channel 4 Temperature Value	Range: -1900 to 6000, magnified 10 times
30005	Channel 5 Temperature Value	Range: -1900 to 6000, magnified 10 times
30006	Channel 6 Temperature Value	Range: -1900 to 6000, magnified 10 times
30007	Channel 7 Temperature Value	Range: -1900 to 6000, magnified 10 times
30008	Channel 8 Temperature Value	Range: -1900 to 6000, magnified 10 times
30009	Channel status value	Bitwise: 0 is abnormal, 1 is normal

DM AE08-8AI					
Zone 3 Address (Starting from 1) (Read-only)					
30001	AI0	(0~27648)	30006	AI5	(0~27648)
30002	AI1	(0~27648)	30007	AI6	(0~27648)
30003	AI2	(0~27648)	30008	AI7	(0~27648)
30004	AI3	(0~27648)	30009	Channel status	Bitwise: 0 is abnormal, 1 is normal
30005	AI4	(0~27648)			

DM AE08-8NTC					
Zone 3 Address (Starting from 1) (Read-only)			Zone 3 Address (Starting from 1) (Read-only)		
30001	NTC Channel 1 Value	Magnify 10 times	30009	reserve	

30002	NTC Channel 2 Value	Magnify 10 times	30010	NTC1 status	0 = Normal; 1 = Disconnected; 2 = Short Circuit
30003	NTC Channel 3 Value	Magnify 10 times	30011	NTC2 status	0 = Normal; 1 = Disconnected; 2 = Short Circuit
30004	NTC Channel 4 Value	Magnify 10 times	30012	NTC3 status	0 = Normal; 1 = Disconnected; 2 = Short Circuit
30005	NTC Channel 5 Value	Magnify 10 times	30013	NTC4 status	0 = Normal; 1 = Disconnected; 2 = Short Circuit
30006	NTC Channel 6 Value	Magnify 10 times	30014	NTC5 status	0 = Normal; 1 = Disconnected; 2 = Short Circuit
30007	NTC Channel 7 Value	Magnify 10 times	30015	NTC6 status	0 = Normal; 1 = Disconnected; 2 = Short Circuit
30008	NTC Channel 8 Value	Magnify 10 times	30016	NTC7 status	0 = Normal; 1 = Disconnected; 2 = Short Circuit
			30017	NTC8 Status	0 = Normal; 1 = Disconnected; 2 = Short Circuit

DM AE16-8NTC8AI					
Zone 3 Address (Starting from 1) (Read-only)			Zone 3 Address (Starting from 1) (Read-only)		
30001	NTC Channel 1 Value	Magnify 10 times	30017	Channel state value	Bitwise: 0 is abnormal, 1 is normal Example: Current channel 7 has current, NTC Channel 1 is connected to a sensor. Register 30017 = 0100 0000 0000 0001 (binary)
30002	NTC Channel 2 Value	Magnify 10 times			
30003	NTC Channel 3 Value	Magnify 10 times			
30004	NTC Channel 4 Value	Magnify 10 times			
30005	NTC Channel 5 Value	Magnify 10 times			
30006	NTC Channel 6 Value	Magnify 10 times	30018	NTC1 status	0 = Normal; 1 = Disconnected; 2 = Short Circuit
30007	NTC Channel 7 Value	Magnify 10 times	30019	NTC2 status	0 = Normal; 1 = Disconnected; 2 = Short Circuit
30008	NTC Channel 8 Value	Magnify 10 times	30020	NTC3 status	0 = Normal; 1 = Disconnected; 2 = Short Circuit
30009	AI0	(0~27648)	30021	NTC4 status	0 = Normal; 1 = Disconnected; 2 = Short Circuit
30010	AI1	(0~27648)	30022	NTC5 status	0 = Normal; 1 = Disconnected; 2 = Short Circuit
30011	AI2	(0~27648)	30023	NTC6 status	0 = Normal; 1 = Disconnected; 2 = Short Circuit
30012	AI3	(0~27648)	30024	NTC7 status	0 = Normal; 1 = Disconnected; 2 = Short Circuit
30013	AI4	(0~27648)	30025	NTC8 Status	0 = Normal; 1 = Disconnected; 2 = Short Circuit
30014	AI5	(0~27648)			
30015	AI6	(0~27648)			
30016	AI7 (Current Channel 8)	(0~27648)			

DM AE16-12NTC4AI					
Zone 3 Address (Starting from 1) (Read-only)			Zone 3 Address (Starting from 1) (Read-only)		
30001	NTC Channel 1 Value	Magnify 10 times	30017	Current channel status	Bitwise: 0 is abnormal, 1 is normal Example: Current channel 3 has current, NTC Channel 1 is connected to a sensor. Register 30017 = 0100 0000 0000 0000 (binary)
30002	NTC Channel 2 Value	Magnify 10 times			
30003	NTC Channel 3 Value	Magnify 10 times			
30004	NTC Channel 4 Value	Magnify 10 times			
30005	NTC Channel 5 Value	Magnify 10 times	30018	NTC1 status	0 = Normal; 1 = Disconnected; 2 = Short Circuit
30006	NTC Channel 6 Value	Magnify 10 times	30019	NTC2 status	0 = Normal; 1 = Disconnected; 2 = Short Circuit
30007	NTC Channel 7 Value	Magnify 10 times	30020	NTC3 status	0 = Normal; 1 = Disconnected; 2 = Short Circuit
30008	NTC Channel 8 Value	Magnify 10 times	30021	NTC4 status	0 = Normal; 1 = Disconnected; 2 = Short Circuit

30009	NTC Channel 9 Value	Magnify 10 times	30022	NTC5 status	0 = Normal; 1 = Disconnected; 2 = Short Circuit
30010	NTC Channel 10 Value	Magnify 10 times	30023	NTC6 status	0 = Normal; 1 = Disconnected; 2 = Short Circuit
30011	NTC Channel 11 Value	Magnify 10 times	30024	NTC7 status	0 = Normal; 1 = Disconnected; 2 = Short Circuit
30012	NTC Channel 12 Value	Magnify 10 times	30025	NTC8 Status	0 = Normal; 1 = Disconnected; 2 = Short Circuit
30013	Current channel 1	(0~27648)	30026	NTC9 Status	0 = Normal; 1 = Disconnected; 2 = Short Circuit
30014	Current channel 2	(0~27648)	30027	NTC10 Status	0 = Normal; 1 = Disconnected; 2 = Short Circuit
30015	Current channel 3	(0~27648)	30028	NTC11 Status	0 = Normal; 1 = Disconnected; 2 = Short Circuit
30016	Current channel 4	(0~27648)	30029	NTC12 Status	0 = Normal; 1 = Disconnected; 2 = Short Circuit

DM DR16AM12-8DI8QR8AI4AQ					
Zone 0 address (starting from 1) (read-only)			Zone 1 Address (Starting from 1) (Read/Write)		
00001	DRa.0 output		10001	Input DIa.0	
00002	DRa.1 output		10002	Dia.1 Input	
00003	DRa.2 output		10003	D1a.2 Input	
00004	DRa.3 Output		10004	DIA.3 Input	
00005	DRa.4 output		10005	DIA.4 Input	
00006	DRa.5 output		10006	Dia.5 Input	
00007	DRa.6 output		10007	Dia.6 Input	
00008	DRa.7 Output		10008	Dia.7 Input	
Zone 3 Address (Starting from 1) (Read-only)			4. Zone Address (Starting from 1) (Read/Write)		
30001	AI0	(0~27648)	40001	AQ0	(0~27648)
30002	AI1	(0~27648)	40002	AQ1	(0~27648)
30003	AI2	(0~27648)	40003	AQ2	(0~27648)
30004	AI3	(0~27648)	40004	AQ3	(0~27648)
30005	AI4	(0~27648)			
30006	AI5	(0~27648)			
30007	AI6	(0~27648)			
30008	AI7	(0~27648)			

DM DR16AR12-8DI8QR8NTC4AQ					
Zone 0 address (starting from 1) (read/write)			Zone 1 address (starting from 1) (read-only)		
00001	DRa.0 output		10001	Input DIa.0	
00002	DRa.1 output		10002	Dia.1 Input	
00003	DRa.2 output		10003	D1a.2 Input	
00004	DRa.3 Output		10004	DIA.3 Input	
00005	DRa.4 output		10005	DIA.4 Input	
00006	DRa.5 output		10006	Dia.5 Input	
00007	DRa.6 output		10007	Dia.6 Input	
00008	DRa.7 Output		10008	Dia.7 Input	

Zone 3 Address (Starting from 1) (Read-only)			4. Zone Address (Starting from 1) (Read/Write)		
30001	NTC Channel 1 Value	Magnify 10 times	40001	AQ0	(0~27648)
30002	NTC Channel 2 Value	Magnify 10 times	40002	AQ1	(0~27648)
30003	NTC Channel 3 Value	Magnify 10 times	40003	AQ2	(0~27648)
30004	NTC Channel 4 Value	Magnify 10 times	40004	AQ3	(0~27648)
30005	NTC Channel 5 Value	Magnify 10 times			
30006	NTC Channel 6 Value	Magnify 10 times			
30007	NTC Channel 7 Value	Magnify 10 times			
30008	NTC Channel 8 Value	Magnify 10 times			

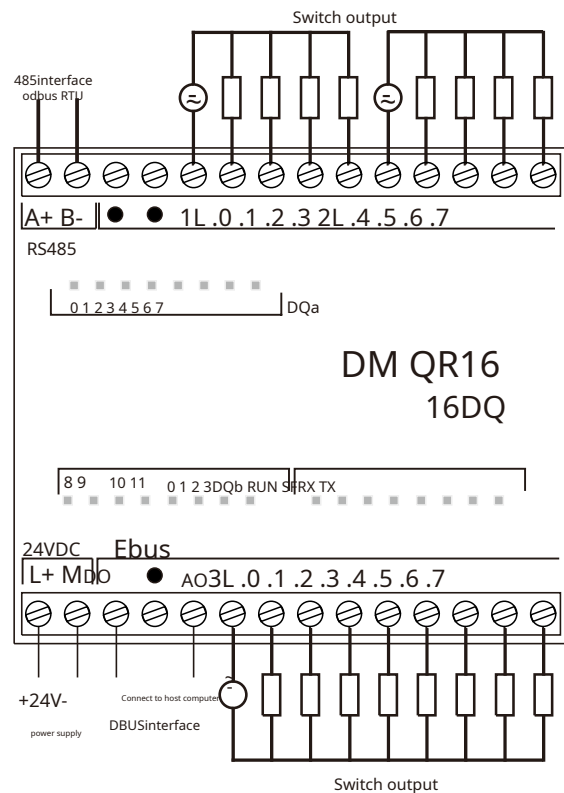
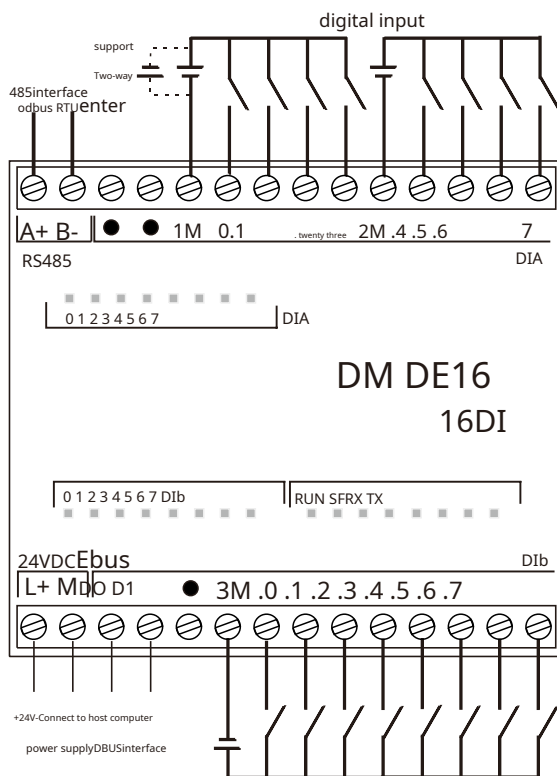
5 Technical parameters

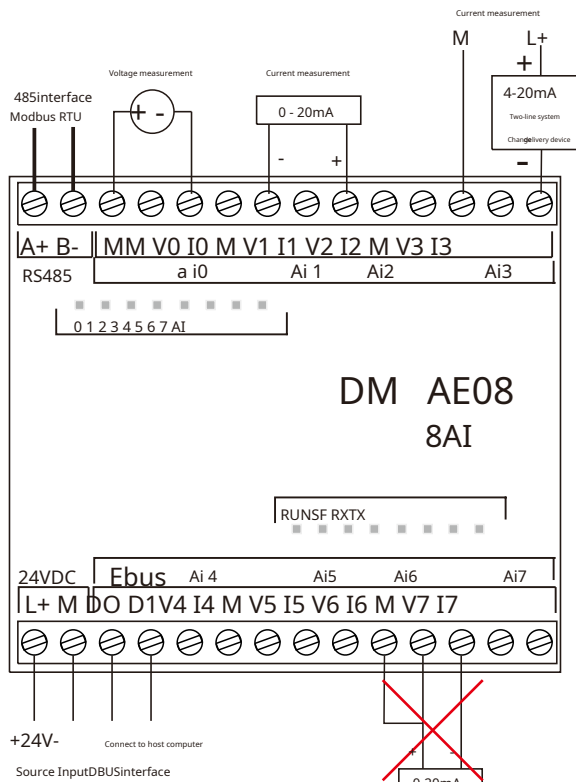
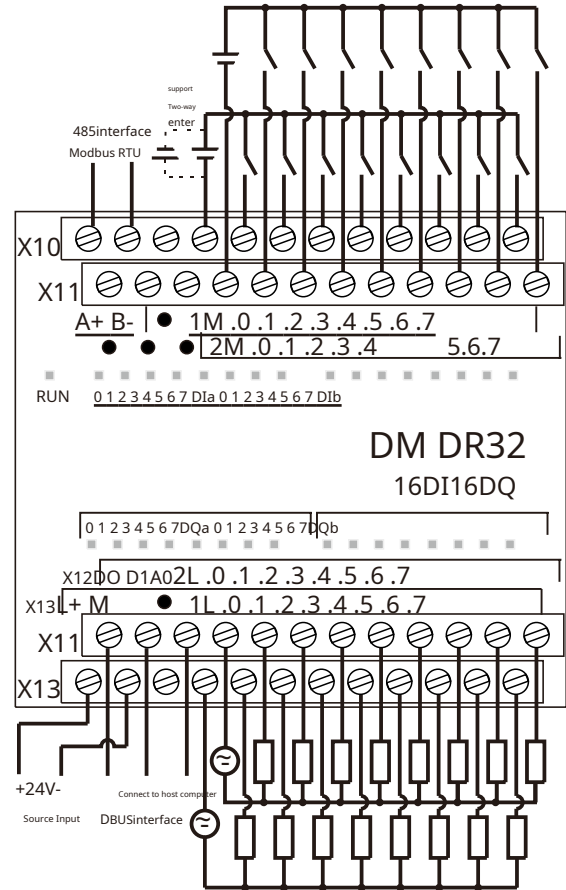
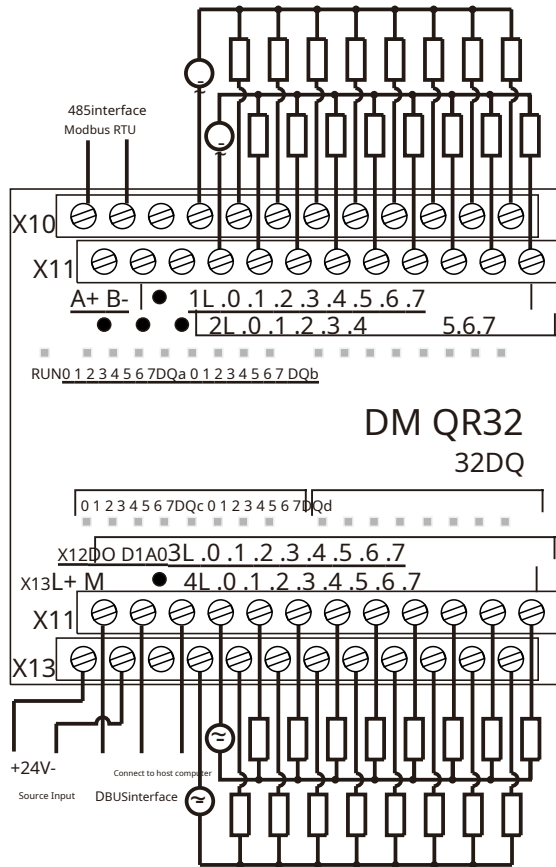
General parameters	parameter
size	70×100×81
powered by	24VDC
Digital input	parameter
type	Sinking/Source (Bidirectional Input)
Voltage	Rated voltage: 24VDC, maximum continuous voltage: 30VDC
Logic signals	1. Signal (Minimum): 18VDC, 0. Signal (Maximum): 5VDC
isolation	Field side and logic side, 500VAC, for 1 minute
Digital output	parameter
type	Relay, dry contact
Voltage range	5 to 30VDC or 5 to 250VAC
Rated current	Resistive load: Maximum 5A. Capacitive/inductive load: Maximum 5A 0.5A.
Common terminal current	Maximum 8A
isolation	Field side and logic side, 1500VAC, for 1 minute (coil and contacts).
Switch delay	Maximum 10ms
Mechanical life	No-load: 5,000,000 on/off cycles. Rated load: 50,000 on/off cycles.
Analog Input Channel Specification	
Input data word format	Unipolar, full scale:0to27648
Input impedance	Voltage >2MΩ Current 150Ω
Input maximum voltage	30VDC
Maximum input current	30mA
Input resolution	12Bit
Input precision	Voltage input: Current input:

Input type	Non-difference
Input isolation	none
Analog output channel specifications	parameter
Output signal range	Voltage output:0~10V Current output:0~20mA
Output data format	Voltage output:0to27648correspond0~10V Current output:0to27648correspond0~20mA
Output resolution	Voltage output:12Bit(1Hand bit) Current transmission
Output accuracy	Voltage transmission Current transmission
Output driver	Voltage transmission Current transmission
Output isolation	none
PT100Channel Input Specifications	parameter
Sensor type:	PT100
Sensor wire length	longest30rice
Temperature range	- 200.0°C to600.0°C
Data word format	- 2000to6000 (correspond-200.0°C to600.0The value read from the register is (°C).123,express12.3°C, magnification10times
Exceeding the upper temperature limit	+ 32767
Sensor disconnection value	- 32767
resolution	0.1°C
accuracy	0.1°C
Isolation (of the scene and the logic)	isolation
Alarm status	It can detect open circuits, short circuits, and normal operation.
NTCChannel Input Specifications	parameter
NTCmodel	10K 3950
resolution	12Bit
Temperature range	- 40.0°C
Data format	- 400to 50.0°C) Read 12.3°C, magnification10times
Exceeding the lower limit or short circuit	Exceeding limits -4 Degree, lower than approximately -52°Display+32767
Exceeding the limit or disconnection	Exceeding limits1 50Degree, higher than approximately -157°Display-32767
resolution	0.1Spend
accuracy	0.3Spend

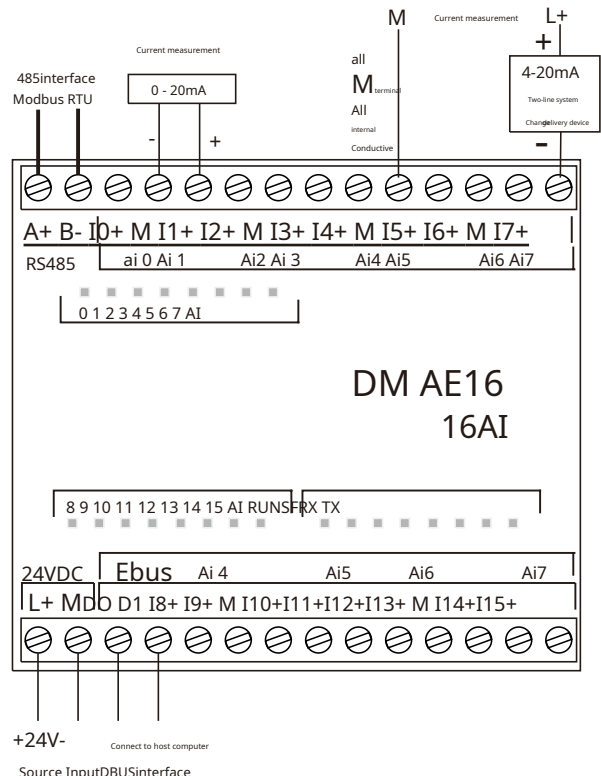
Isolation (of the scene and the logic)	none
Alarm status	It can detect open circuits, short circuits, and normal operation.
TC Thermocouple Channel Input Specifications	parameter
isolation	500VAC
Input type	KType thermocouple
Temperature measurement range	- 200°C to1300°C
Data format: Bipolar	- 2000arrive13000(correspond-200°C to1300The value read from the register is (°C).123,express12.3°C, magnification10times
Input resolution	0.1°C
Module update time: All channels	400ms
Wire length	The longest distance to the sensor is100m
Alarm status	It can detect open circuits, short circuits, and normal operation.

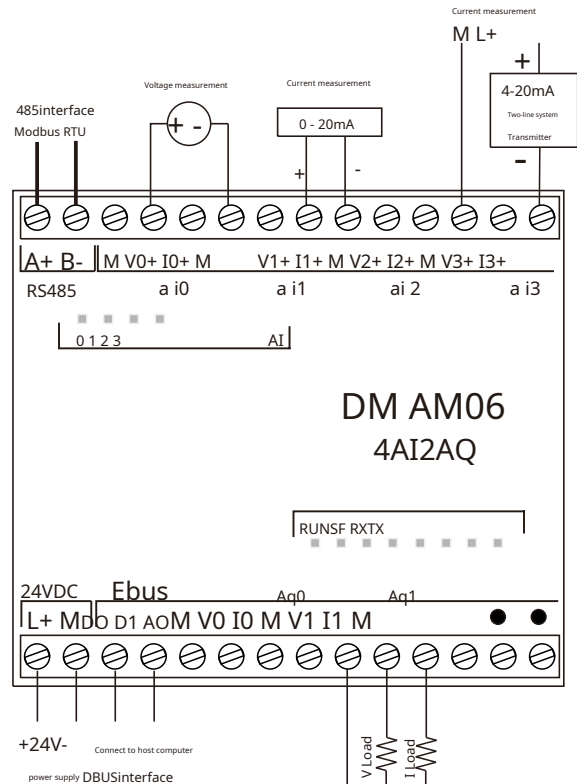
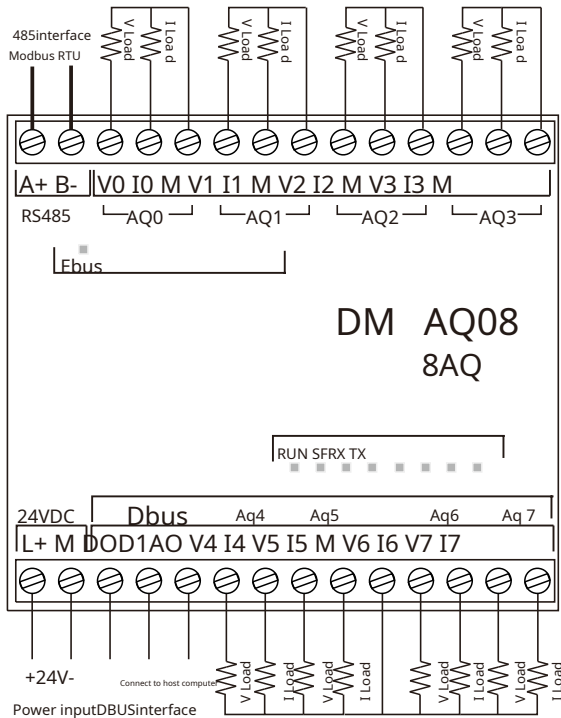
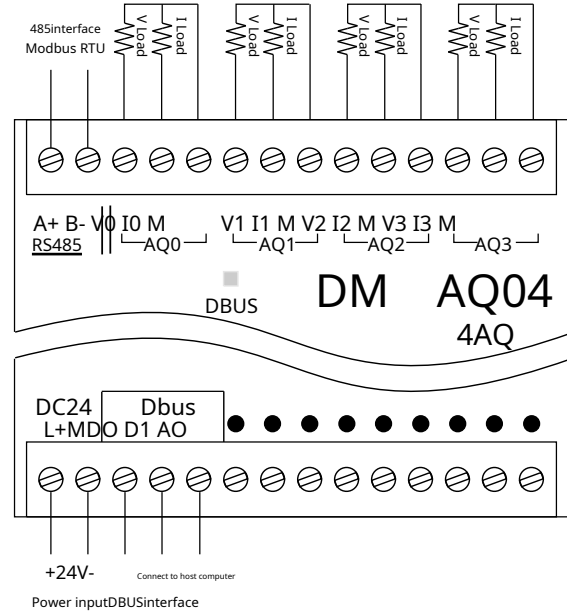
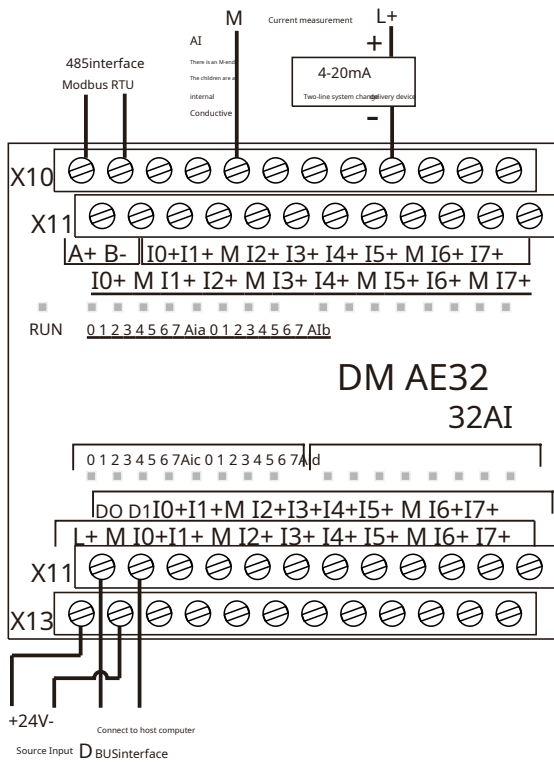
6Wiring diagram

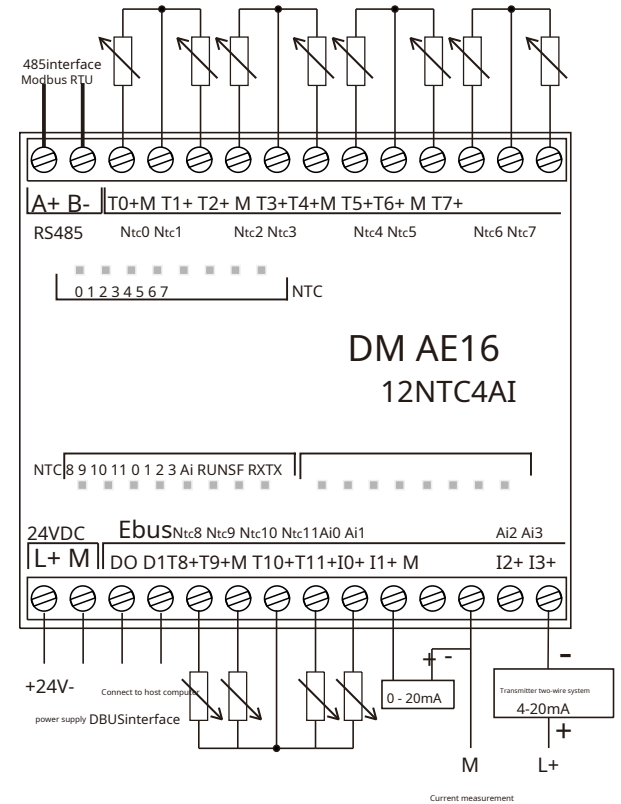
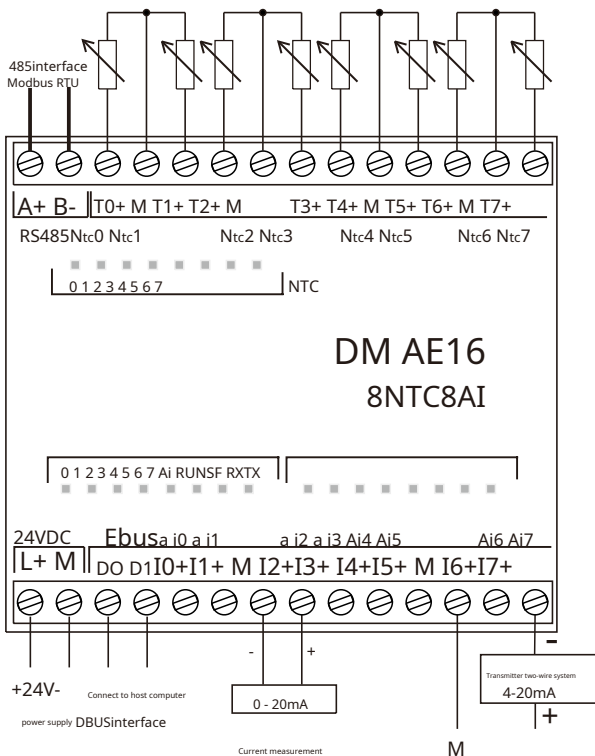
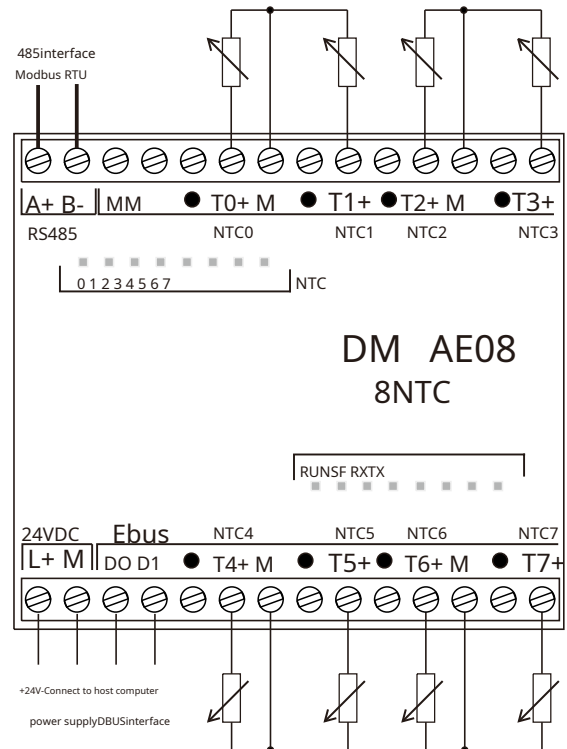
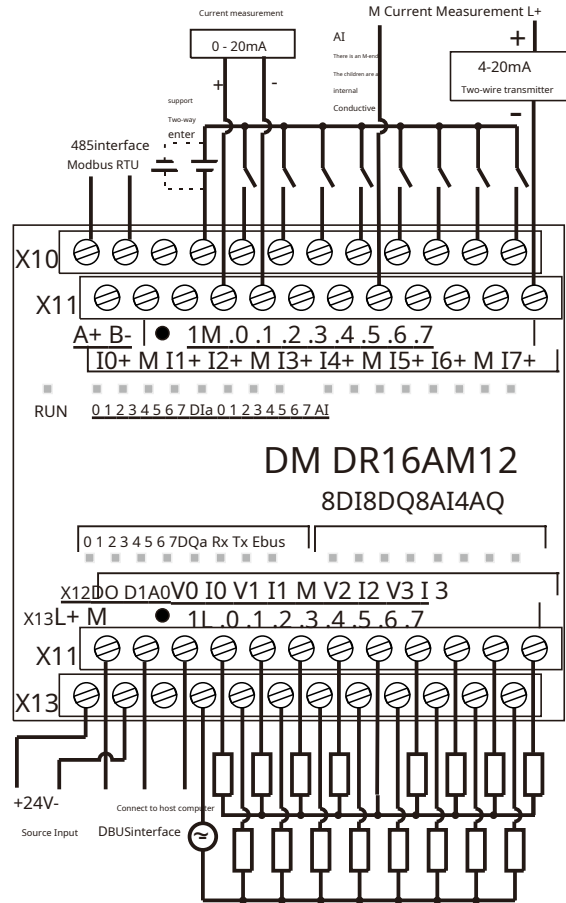




Error: Shorting V and I is not allowed.

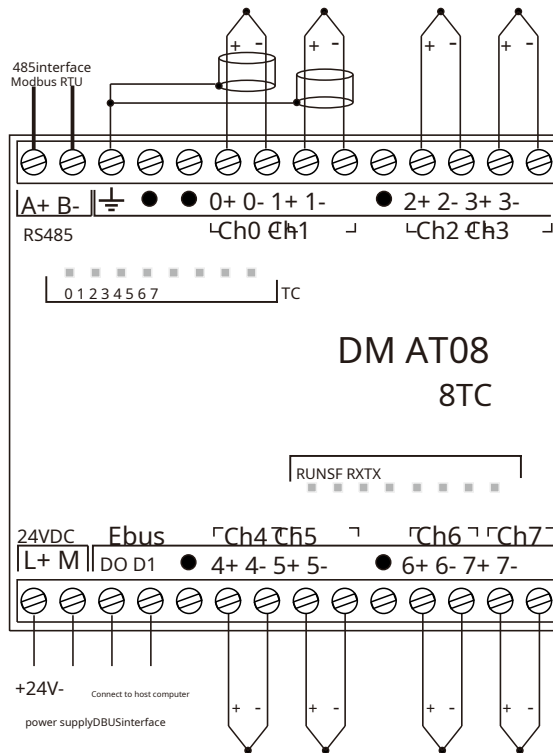
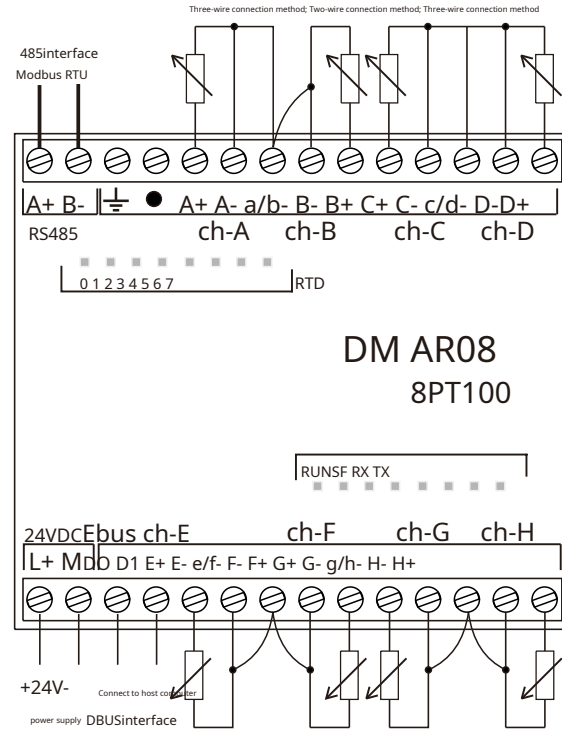
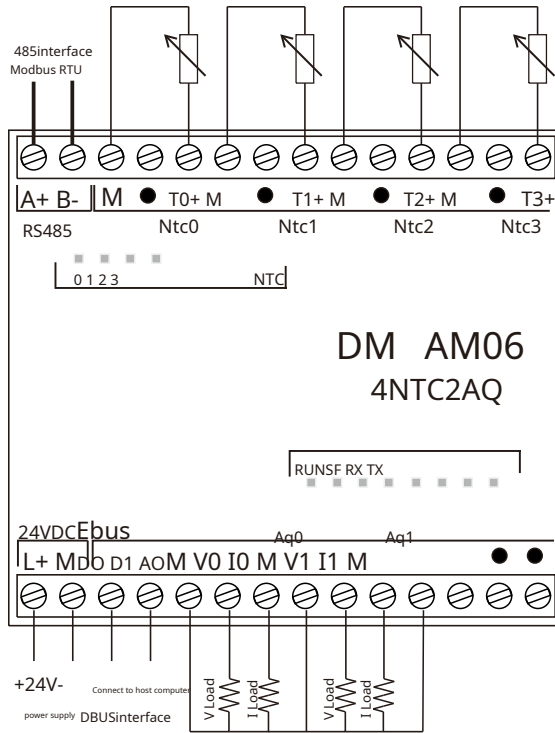






The addresses of the temperature input channels are listed first.

The addresses of the temperature input channels are listed in order.



7Indicator light description

Digital I/O module indicator lights	Function Description
Digital input indicator	Always off: No signal; Always on: Signal present.
Digital output indicator	Always off: No output; Always on: Output.

Analog input indicator	Constant off: No signal; Constant on: Normal; Flashing: Exceeding limits.
Temperature channel indicator light	Constantly off: Open circuit; Constantly on: Temperature measurement normal; Flashing: Short circuit.
EBUS	Constantly extinguished: NoneEBUSCommunications; Chang Liang:EBUSCommunication is normal
RUN	Operating indicator light. Normally illuminated.
SF	Fault indicator light / Communication lookup indicator light.
RX	485Communication receiving indicator light.
TX	485Communication transmission indicator light.

8 Terminal block instructions

Terminal blocks		Function Description	
DC24	L+	Power input24VDC+.	
	M	Power input24VDC-.	
RS485	A	485Communication busA+	Note: Compliant485Protocol specifications, The definition is the opposite of that of the original manufacturer's main unit.
	B	485Communication busB-	
DI		Digital input terminals.	
DQ		Digital output terminal.	
AI	Vx + (x = 0 ~ 7)	Analog voltage input terminal.	
	Ix + (x = 0 ~ 15)	Analog voltage/current input terminal.	
AO	Vx(0~3)	Analog voltage output terminal.	
	Ix(0~3)	Analog current output terminal.	
RTD	X + (X = A, B, C...)	PT100Sensor measurement end	
	X - (X = A, B, C...)	PT100Sensor common terminal	
	x + (x = a, b, c...)	PT100Sensor compensation end	
NTC	Tx+(x=0~11)	NTCSensor wiring terminals.	
	M	NTCSensor wiring terminals.	
TC	X+(X=0,1,2..)	KType thermocouple + terminal.	
	X-(X=0,1,2..)	KType thermocouple - end.	
DBUSInterface	D0	Connect to host computerI0.0orI0.2orDBUSDedicated expansion boardD0	
	D1	Connect to host computerI0.1orI0.3orDBUSDedicated expansion boardD1	
	A0	Connect to host computerQ0.2orQ0.4orDBUSDedicated expansion boardA0	
	PLChostI0Public terminal1MMake sure to connect the expansion module power supply.L+orMTo implement source or sink connection methods (connection method if no specific requirements are specified).MThen configure it in the library instructions.MInput method of the terminal.		

9Dimension drawing

