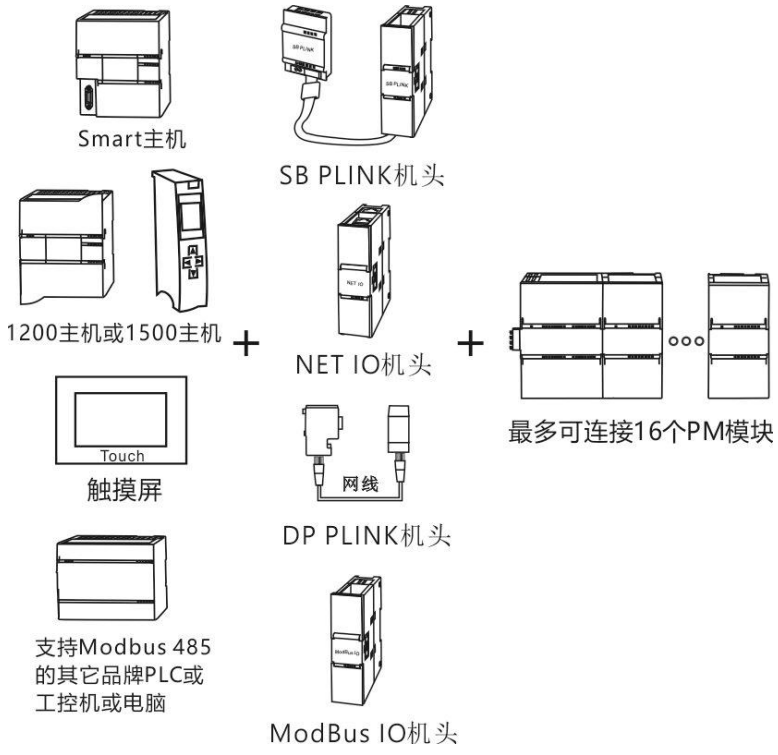
PM Head Unit and Expansion Module User ManualV20250812

1. Overview and Selection

PMAn extension module is a cascaded extension module, which can be cascaded up to [number] times.16One, needs to be matchedPMUsed with the machine head only, not alone. To make...PMThe expansion module can adapt to more application scenarios. Various head units have been developed to enable one end to connect to user equipment and the other end to...PMExtension modules enable protocol conversion or bridging.



Refer to the table below to select the appropriate head unit.

Machine head classification	Features
Net IOmachine head	Designed specifically for devices with network ports, such asSmartHost (supports)V3.0(host)1200host,1500The main unit has a touchscreen with a network port; other units also have network ports.PLCWait. Support3This protocol allows for both short-range expansion near the device and long-range distributed remote expansion.IO. **protocol1:SmartClient protocol (default protocol)**Connect one end of the network cable toSmartThe host, the other end connectedNet IOThe most distinctive feature of the nose isSmartThe host computer requires no programming.PMModule resources can be automatically mapped toSmartinternal. **protocol2:1200/1500Client Protocol**Connect one end of the network cable to1200or1500The host, the other end connectedNet IOThe most distinctive feature of the nose section is...1200or1500The host computer requires no programming.PMModule resources can be automatically mapped to1200or 1500 PLCinternal. **protocol3:Modbus TCPServer-side protocol**Anyone who supportsModbus TCPDevices using the client protocol can connect, including those from other brands.PLCA configuration panel with a network port, configuration software for an industrial control computer or PC, or a self-written host computer software.
SB PLINKmachine head	OnlySmarthostSR/STSeries design (supports)V3.0Host, but only1(One unit), one end is installed in the slot of the main unit's signal board, and the other end is plugged in.PMThe biggest feature of extension modules is that they do not require programming; resources are automatically mapped to specific registers inside the host. They are only suitable for short-distance extensions.
DP PLINKmachine head	OnlySmarthostCR/CRsThis series of designs features a low-priced main unit, but it lacks a signal board slot, making it unusable.SB PLINKMachine head,DP PLINKOne end is installed on the hostPORT0At the other end, insertPMThe biggest advantage of extension modules is that they require no programming; resources are automatically mapped to specific registers within the host machine. They are only suitable for short-range expansion.
Modbus IOmachine head	support485 Modbus RTUSlave protocol, specifically designed for485Distributed remoteIOScene design, all supported485 Modbus RTUDevices using the master protocol can be directly connected, such asPLCTouchscreens, industrial PCs, computers, etc. Only has a network port.485For devices with open ports, this head is recommended; otherwise, choose [other options].NTE IOMachine head.

Digital input/output module	describe	Digital input/output module	describe
PM DE08-8DI	8Digital input	PM DE16-16DI	16Digital input
PM DR08-8DQ	8Relay output	PM QR16-16DQ	16Relay output
PM QT16-16DQ	16transistor output	PM DR16-8DI8DQ	8Digital input8Relay output
PM DT16-8DI8DQ	8Digital input8transistor output	PM DR32-16DI16DQ	16Digital input16Relay output
Analog module	describe	**Analog module**	describe
PM AE04-4AI	4Input (supports voltage or current)	PM AE08-8AI	8Input (supports voltage or current)
PM AQ02-2AQ	2Output (supports voltage or current)	PM AQ04-4AQ	4Output (supports voltage or current)
PM AQ08-8AQ	8Output (supports voltage or current)	PM AM04-2AI2AQ	2enter2Output (supports voltage or current)
PM AM06-4AI2AQ	4enter2Output (supports voltage or current)	PM AM08-4AI4AQ	4enter4Output (supports voltage or current)
PM AM12-8AI4AQ	8enter4Output (supports voltage or current)	PM AM16-8AI8AQ	8enter8Output (supports voltage or current)
Temperature acquisition module	describe	Temperature acquisition module	describe
PM AR04-4PT100	Temperature acquisition4roadPT100	PM AR08-8PT100	Temperature acquisition8roadPT100
PM AN04-4NTC	Temperature acquisition4roadNTC (10K, 3950)	PM AN08-8NTC	Temperature acquisition8roadNTC (10K, 3950)
PM AT04-4TC	Temperature acquisition4roadKType thermocouple		

2.NET IO Head Unit

1.Parameter configuration method: Access via computer browserNET IOBuilt-in webpage, by defaultIP: 192.168.2.2

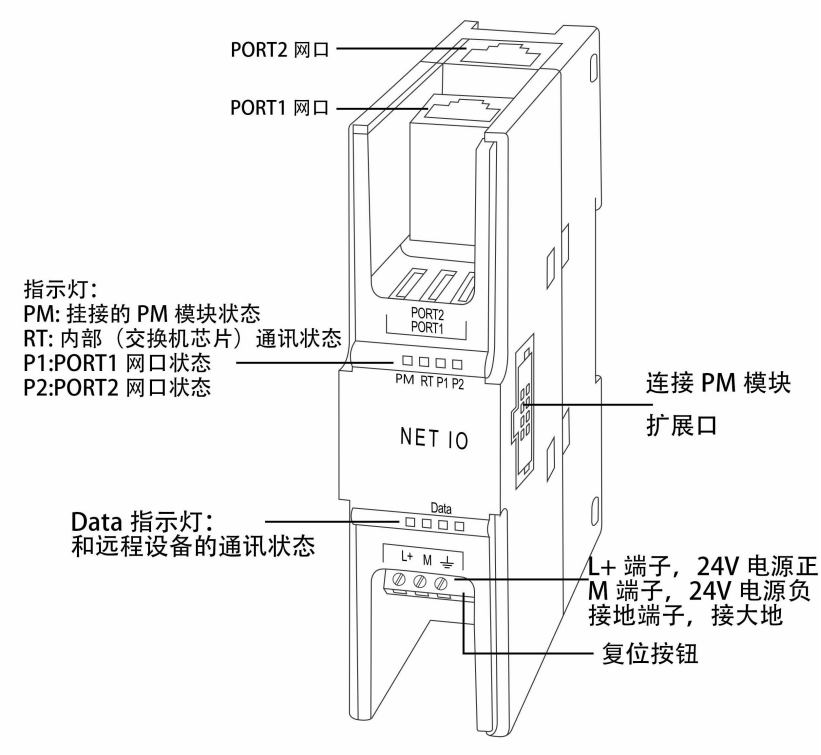
2.ExtendPMMaximum number of modules:16

3.ExtendPMMaximum number of points in the module: Maximum number of digital inputs256Point, maximum digital output256Point. Maximum analog input.128Point, maximum analog output128point.

4.Network cable connection length:200Mine.

5.Support when connecting to a remote end3Protocol:SmartClient protocol (default protocol)1200/1500Client protocolModbus TCPServer-side protocol.

2.1 NET IONose appearance and configuration



illustrate1:NET IOThe unit features a dual-port network design, with both ports offering identical functionality. One port connects to remote devices, while the other can connect to a network-connected touchscreen or be cascaded with other devices.NET IOMachine head.

illustrate2:

Terminal block definition		
L+terminal,24VThe power supply is positive.	Mterminal,24VNegative power supply.	The grounding terminal is connected to the earth.

illustrate3Indicator light status description

indicator lights	describe	state
PM	Instructions for connectionPLINKModule status	The light is always on, indicating normal power supply and connection.PMModule communication is normal. Flashing, andPMModule communication error.
RT	Internal (switch chip) communication status	Flashing or solid light: Communication is normal. Extinction: Communication failed.
P1	PORT1Network port status	Flashing or constantly lit: Data exchange is taking place. Extinction: No data exchange or failure.
P2	PORT2Network port status	Flashing or constantly lit: Data exchange is taking place. Extinction: No data exchange or failure.

Data	Indicator and communication status of remote devices	Flashing: Failed to connect to remote device. Always lit: Connection to remote device successful.

illustrate4Reset button: There is a reset button on the right side of the terminal. Press and hold it.12seconds,PMThe indicator light flashes rapidly, and all parameters are restored to factory default settings. This function is useful if you forget...IPUsed when referring to an address.

NET IO Head Unit Basic Configuration

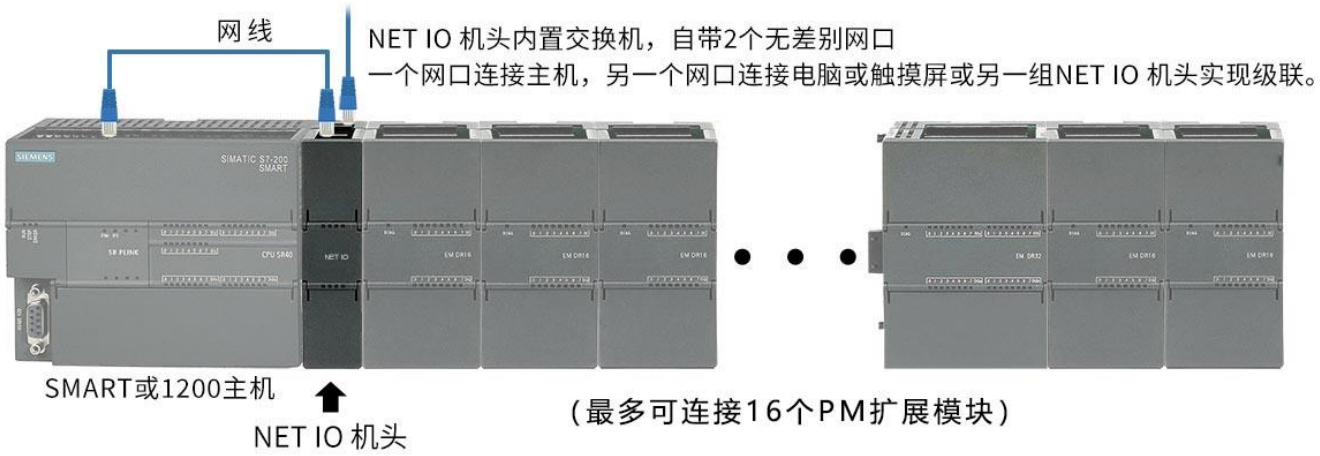
NET IOThe device has a built-in web browser. Connect your computer to the device using a network cable and enter the browser...IPAddress (factory default)IP:192.168.2.2)This will open the login page, as shown in the image below. The default username and password are both...admin.

Click to log in and enter the information overview interface, as shown in the image below.

illustrate6:ReviseNET IOThe noseIPThe address is shown below.

2.2 NET IOandSmartHost communication

The most common use case isSmarthost andNET IOThe units are installed close together, as shown in the figure below.



The configuration is also very simple.

first step Modify in system configurationNET IOofIPandSmartThe host is on the same network segment. **Step 2**In the communication configuration, select the options shown in the image below. The image below also shows the default configuration parameters.

Note 1: Remote PLC address, referring to the Smart host IP address.

Note 2**Address Range:** This refers to the starting address within the Smart host where the resources of the PM expansion modules connected to the NET IO head unit are mapped. For example, if a PM DR16 (8-input 8-output digital mixed module) and a PM AM06 (4-input 2-output analog mixed module) are connected, and configured as shown in the diagram, the digital input resources of the PM DR16 are mapped to I700.0~I700.7 on the Smart host. The digital output resources are mapped to Q700.0~Q700.7. The analog input resources of the PM AM06 are mapped to IW800~IW806. The analog output resources are mapped to QW800~Q802. The Smart host requires no programming and can directly use the mapped registers. For multiple expansion modules, the addresses are arranged in a compact manner. This mapping information can also be viewed in the "Information Overview".

Explanation 3 For Smart PLCs with firmware versions 2.4 and below, the maximum address for the I zone is IB1152, and the maximum address for the Q zone is QB1152; for firmware versions 2.5 and above, the maximum address for the I zone is IB1279, and the maximum address for the Q zone is QB1279. Do not use addresses exceeding these limits. For details, please refer to the original Smart PLC manual, "PROFINET Process Image".

Note 4 Extended device information area address refers to the starting address where some special registers are located. Taking area I, 530, as an example in the above diagram:

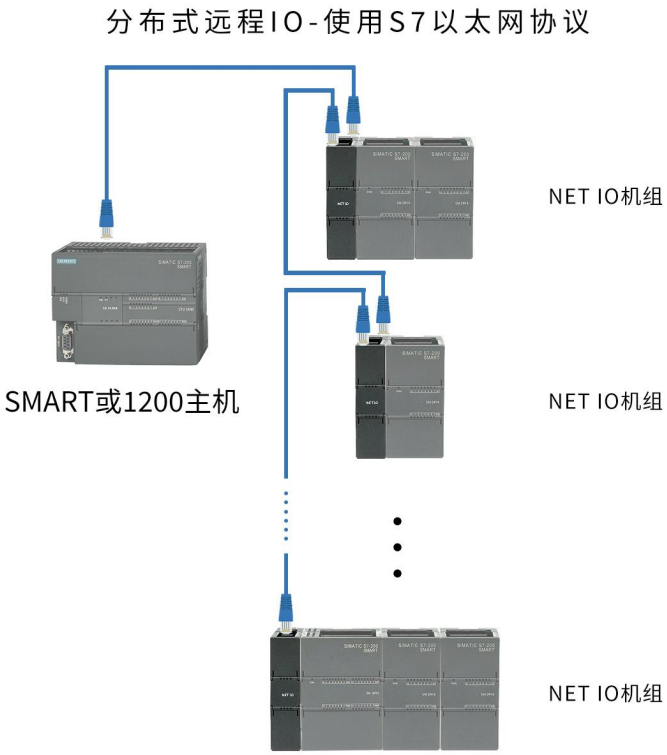
Register address	describe	Register address	describe
IW530	The heartbeat of the aircraft head, every second0,1Reversal	ID564	8Model number of extension bit module
IW532	The online status of the extension module is represented bitwise, with the most significant bit indicating the first module.For example... rear of the nose2Each module, at this timeIW602=2#1100 0000 0000 0000	ID568	9Model number of extension bit module
IW534	Number of online extension modules	ID572	10Model number of extension bit module

ID536	1The extension bit module model number is indicated by a character or...ASCIIshow	ID576	11Model number of extension bit module
ID540	2Model number of extension bit module	ID580	12Model number of extension bit module
ID544	3Model number of extension bit module	ID584	13Model number of extension bit module
ID548	4Model number of extension bit module	ID588	14Model number of extension bit module
ID552	5Model number of extension bit module	ID592	15Model number of extension bit module
ID556	6Model number of extension bit module	ID596	16Model number of extension bit module
ID560	7Model number of extension bit module		

Note 5: Disconnection output status. If communication between the NET IO head unit and the remote device fails, will the PM resource point retain its previous state or reset? Note that this status does not apply to web-based debugging of remote devices, excluding the NET IO head unit. Directly manipulating resource points via the web interface is not affected by this status.

Note 6: Communication watchdog enabled. If the NET IO head fails to communicate with the remote device within a set time, the NET IO device will automatically reconnect.

Note 7 Besides the most commonly used expansion modules being placed close to the Smart host, multiple NET IO hosts can also be equipped with PM modules for simultaneous use, enabling distributed remote I/O functionality, as shown in the diagram below.



Setting up this use case is also very simple:

Step 1: Set the IP address of each NET IO head unit to be different and on the same network segment as the remote device.

Step 2: In the "Communication Configuration" interface, set the zone addresses to be different and non-overlapping.

2.3 NET IOand1200/1500Host communication

Because the 1200 and 1500 use the same communication protocol, the method for NET IO to communicate with the 1200 or 1500 PLC is similar to that of 'NET IO and Smart communication method', which can also realize distributed remote IO scenarios. The hardware connection can be referred to the diagram above.

Configuration method:

first step In the system configuration interface, change the IP of NET IO and the IP of host 1200 to the same network segment. **Step 2**In the communication configuration interface, referring to section 2.1, simply select "1200" for "Remote PLC Model" in the "Communication Configuration" interface. Set the remote PLC address to the IP address of 1200 or 1500; refer to section 2.1 for other parameters.

Step 3 For multiple NET IO groups used simultaneously, the IP address of each NET IO group and the IP address of 1200 or 1500 must be in the same network segment and none of them can be the same. In the communication configuration interface, the area address of each group must also be set to be different and cannot overlap.

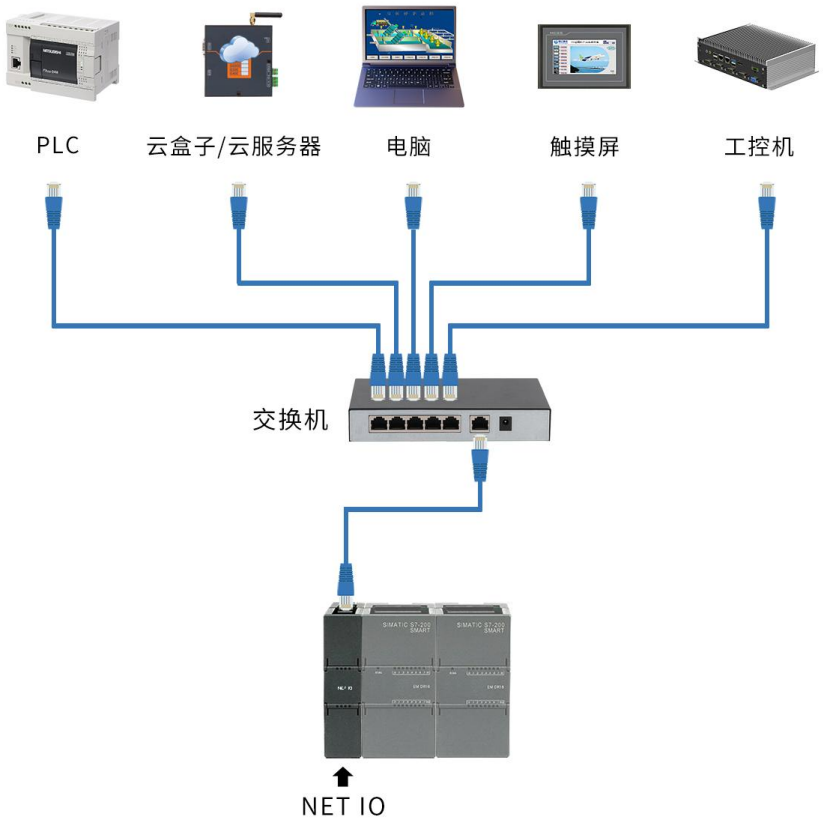
Explanation 3 The maximum address in the I zone of the 1200 PLC is I1024, and the maximum address in the Q zone is Q1024. Do not use addresses exceeding these limits. For details, please refer to the original 1200 PLC manual, "Process Image Size".

Note: If communication fails, please refer to the frequently asked questions at the end of this chapter, or download the programming case study for testing.

2.4 NET IOandModbus TCPDevice communication

In order to connect with a wider variety of devices,NET IOThe head unit also supportsModbus TCPStandard protocol, at this timeNET IOThe main unit operates as a server, and the remote device operates as a client. Both can be used simultaneously.5Accessed by a client. See the diagram below:

分布式远程IO-使用ModBus TCP协议



The usage is very simple, and the settings are shown in the image below:

illustrate1The configuration shown in the image above does not include any devices.ID(equivalent to)Modbus RTU(device address in the protocol), because inModbus tcp

The agreement wasIPAddress replacement, soNET IOIgnore this parameter; when accessing the site from the client, enter any device.IDEither is fine. (Explanation)2:

Modbus TCPDuring communication,PMThe resource points corresponding to the extension moduleModbusaddress:

Digital input resources	correspondModbusIn the agreement1Zone, starting address10000Begin with a compact arrangement;
Digital output resources	correspondModbusIn the agreement0Zone, starting address00000Begin with a compact arrangement;
Analog input or temperature acquisition channel	correspondModbusIn the agreement3Zone, starting address30000Begin with a compact arrangement;
Analog output channel	correspondModbusIn the agreement4Zone, starting address40000Begin with a compact arrangement;

You can also view it in the information overview, as shown in the image below.

Note: If communication fails, download the programming examples to test.

illustrate3Enable the communication watchdog. If this is checked, the watchdog timer will detect any valid watchdog within the set time.Modbus TCPcommunication,NET IO The unit will restart; note that it cannot remain in the previous state.

2.5 NET IOCommon problems in machine head usage

2.5.1 NET IOThe built-in webpage on the device cannot be opened.

answer:**method1 :**NET IOdefaultIPyes192.168.2.2The computer must be on the same network segment as the computer. Check the computer.IP. **method2:** Please refer to the next question for a factory reset.**method3:** FirstPINGStep down on the machine head and check if the hardware is working. **method4:** Restart your computer.NET IOOr try a different browser.

2.5.2 NET IOmachine headIPI forgot the address, how do I restore it to factory settings?

A: InNET IOThere is a reset button on the right side of the terminal below the machine head. Press and hold it.12seconds,PMThe indicator light flashes rapidly, and all parameters are restored to factory default settings.

2.5.3useSmartWhen using the client protocol,smartHow many groups can be connected at most?NET IOunit? A: If using the originalsmartAs a server, it can support8GroupNET IOunit.

If using a machinesmartAs a server, it can support6GroupNET IOunit.

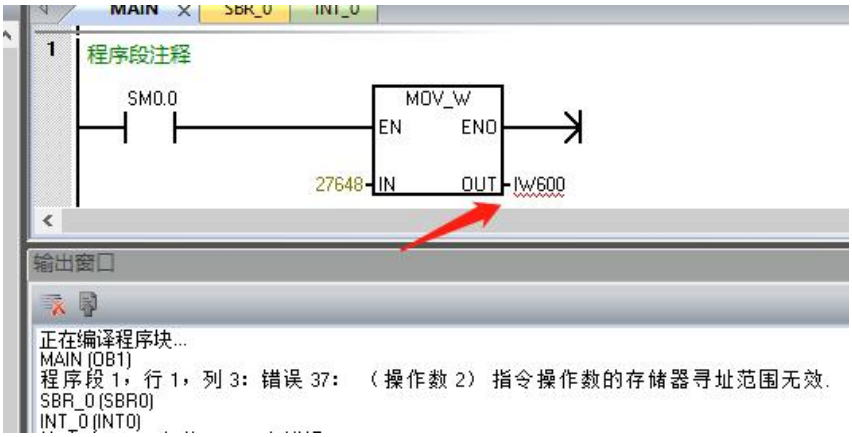
2.5.4use1200When using the client protocol,1200How many groups can be connected at most?NET IOunit? A: If using1200As a server, it can support8GroupNET IOunit.

2.5.5use1500When using the client protocol,1500How many groups can be connected at most?NET IOunit? A: It depends.1500Simultaneously supportsPUT/GETThe quantity varies depending on the model.

2.5.6useModbus TCPWhen a server protocol is used, aNET IOWhat is the maximum number of clients (e.g., configuration screens) that a generator can connect to simultaneously?

answer:5indivual.

2.5.4References in programmingIW600orQW600The register has a red underline, and compilation will fail as shown in the image below.

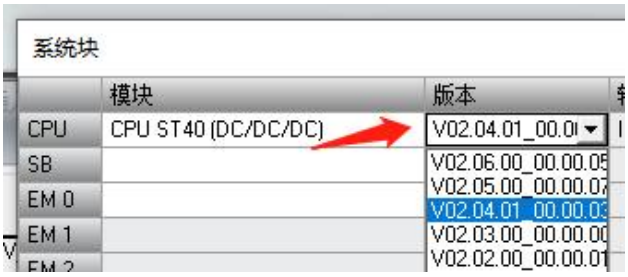


A: Yes3One possibility.

possible1. SMARTThis is caused by an outdated software version; it must be...2.04Or above. The method for viewing is as follows:

The picture is2.05Version, meets requirements.

possible2.Configuration interfacePLCThe selected host version is too low; it must be [version number].2.04Or above. The method for viewing is as follows:



possible3. PLCThe firmware version is too low, it must also be2.03For versions 1 and above, the method for checking is as follows. If your version is lower, you need to upgrade.PLC

Firmware upgrade method consultationPLCMain unit manufacturer.

2.5.5 NET IOand1200or1500 PLCCommunication failed.

1.examineNET IOofIPWhether or not1200or1500 PLCofIPThey are on the same network segment, but different.

2.examineNET IOIs it set in the communication configuration interface?1200The pattern was entered.1200or1500 PLCofIPaddress.

3.examineNET IOThe noseDataIf the indicator light is constantly on, it indicates that...1200or1500 PLCA connection has been established, but that doesn't mean

communication is working. Check the next item.

4.In the TIA Portal programming software, go to Device View -> Properties tab -> General -> Protection and Security -> Connection Mechanism -> Make sure to check "Allow connections from remote objects".PUT/GET(This operation is for enabling Ethernet communication; do not select it.)Data The indicator light is constantly on, but communication is unsuccessful.

5.In the TIA Portal programming software, hardware compilation and downloading are mandatory. This is done within the project tree.

PLCRight-click on the project, select "Compile" -> "Hardware and Software (Change Only)" in the project tree.PLCRight-click on the screen,

select "Download to Device" -> click "Hardware and Software (Change Only)"

6.Try using the test cases on our website.

2.5.6 NET IOMachine headS7The special register is malfunctioning during protocol communication.

In the head unit configuration interface, try changing the starting address of the special register.

2.5.7Use multipleNET IOSometimes, the data is garbled or flickering.

The address mappings overlap; open...NET IOIn the address mapping table, web pages should have their addresses spaced further apart.

2.5.8 NET IOThe machine head failed to control the output resources via a web page. A: Try disconnecting the network cable from the remote device. The issue might be caused by the remote device itself, preventing successful output.

2.5.8 NET IOHead unit connection and useSmartWhen using the client protocol,PMResponse speed of extended modules. A: For digital points, the response speed is approximately...100msFor analog signal points, modify the filter coefficients to achieve the fastest response, approximately...200ms.

3. SB PLINK head unit

The SB PLINK head unit is compatible with Xizi Smart SR/ST series PLC main units (supports V3.0, but only one head unit is supported). No programming is required after connection; resources are automatically mapped into the PLC main unit, making it very easy to use. Note: It cannot be hosted on the Gongbei host because the Gongbei host does not support... It has 12 expansion modules, 6 more than Xizi, and its The extra expansion modules also occupy IW and QW. area overlaps with that of the SB PLINK head unit.

SB PLINK connection diagram

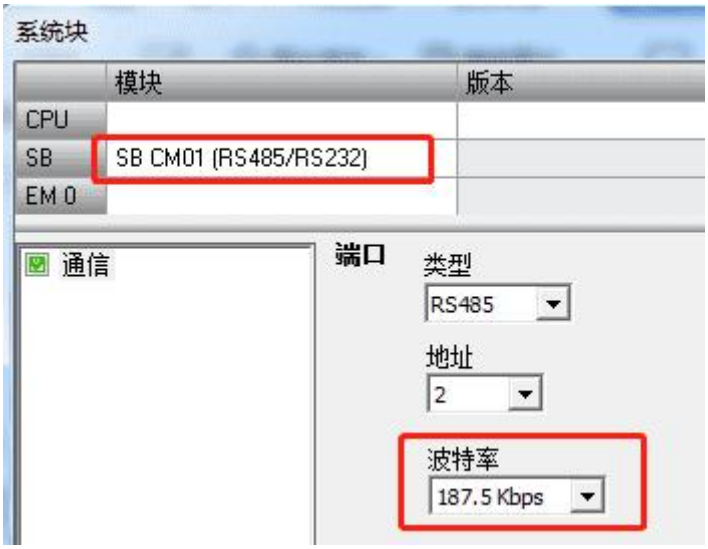
Note: Length of connecting wire 50cm Pay attention to the on-site working conditions.

3.1 SB PLINKWiring, installation and setup

The SB PLINK head unit consists of two parts connected by a ribbon cable, as shown in the diagram above. The SB PLINK-A is installed in the slot of the Smart host signal board. NOTE: terminals L and N A power cord needs to be connected. 24V. SB PLINK-B

It directly plugs into the PLINK expansion module. The "●" on the top row of terminals indicates that it is empty and should not be wired.

The setup requires only one step, configuring within the system block.SB CM01baud rate set to187.5KAs shown in the picture below



Once the system block is downloaded and run, resource points will be automatically mapped into CPU registers.

Indicator light status	
PM indicator light	Constant light indicates that the power supply to the head unit is normal and communication with the Smart host is normal.
PS indicator light	Constant light indicates that the power supply to the head unit is normal and communication with the PM expansion module is also normal.

3.2 SB PLINKRegister mapping relationship

Using the SB PLINK head unit address mapping table		
Analog input	describe	For example
IW800	Input Channel0Collected values	For example: behind the nose1The extension bit isPM AM06-4AI2AQ,2The extension bit is PM AM04. PM AM06-4AI2AQThe analog signal acquisition values are stored sequentially inIW800,IW802, IW804,IW806In the middle. If the collected value is27648, indicating that input was made10Vor 20mA. GiveQW800Assignment27648Analog output1The channel can output10Vor20mA. Give QW802Assignment13824, Analog output2The channel can output5Vor10mA. PM AM04-2AI2AQThe analog signal acquisition values are stored sequentially inIW808,IW810 In the middle. Analog output channels are mapped toQW804,QW806middle.
IW802	Input Channel1Collected values	
IW804	Input Channel2Collected values	
...	...	
IW1054	Input Channel127Collected values	
Analog output	describe	
QW800	Output Channel0Setting value	
QW802	Output Channel1Setting value	
QW804	Output Channel2Setting value	
...	...	
QW1054	Output Channel127Setting value	
Digital input	describe	For example
I700.0	Input Channel0	For example, behind the nose of the aircraft1The extension bit isPM DE08-8DI,2The extension bit isPM DR16-8DI8DQ. PM DE08-8DINo.1The digital input channel has a signal.I700.0Place1, No.8 The digital input channel has a signal.I700.7Place1. PM DR16-8DI8DQNo.1The digital input channel has a signal.I701.0Place 1 SetQ700.0, No.1The digital output of the circuit is closed.
I700.1	Input Channel1	
I700.2	Input Channel2	
...	...	
I731.6	Input Channel254	
I731.7	Input Channel255	
Digital output	describe	
Q700.0	Output Channel0	
Q700.1	Output Channel1	
Q700.2	Output Channel2	
...	...	
Q731.6	Output Channel254	
Q731.7	Output Channel255	
Special registers	describe	For example
IB630	Nose heartbeat	I630.0Bit,0and1Every0.5sA single change can determine the communication status of the aircraft head.
IW632	Online status of extension modules	Online status of the extension module. Represented bitwise.1Online. The highest digit indicates the first...1Extend.
IW634	Number of online extension modules	The number of extension modules.
ID636	1Model number of extension bit module	ASCIICode display. (Number)1Extension module model. For example, "AM06"
ID640	2Model number of extension bit module	ASCIICode display. (Number)2Expansion module model.
ID644	3Model number of extension bit module	ASCIICode display. (Number)3Expansion module model.
ID648	4Model number of extension bit module	ASCIICode display. (Number)4Expansion module model.
ID652	5Model number of extension bit module	ASCIICode display. (Number)5Expansion module model.
ID656	6Model number of extension bit module	ASCIICode display. (Number)6Expansion module model.
ID660	7Model number of extension bit module	ASCIICode display. (Number)7Expansion module model.
ID664	8Model number of extension bit module	ASCIICode display. (Number)8Expansion module model.
ID668	9Model number of extension bit module	ASCIICode display. (Number)9Expansion module model.

ID672	10Model number of extension bit module	ASCIICode display. (Number)10Expansion module model.
ID676	11Model number of extension bit module	ASCIICode display. (Number)11Expansion module model.
ID680	12Model number of extension bit module	ASCIICode display. (Number)12Expansion module model.
ID684	13Model number of extension bit module	ASCIICode display. (Number)13Expansion module model.
ID688	14Model number of extension bit module	ASCIICode display. (Number)14Expansion module model.
ID692	15Model number of extension bit module	ASCIICode display. (Number)15Expansion module model.
ID696	16Model number of extension bit module	ASCIICode display. (Number)16Expansion module model.

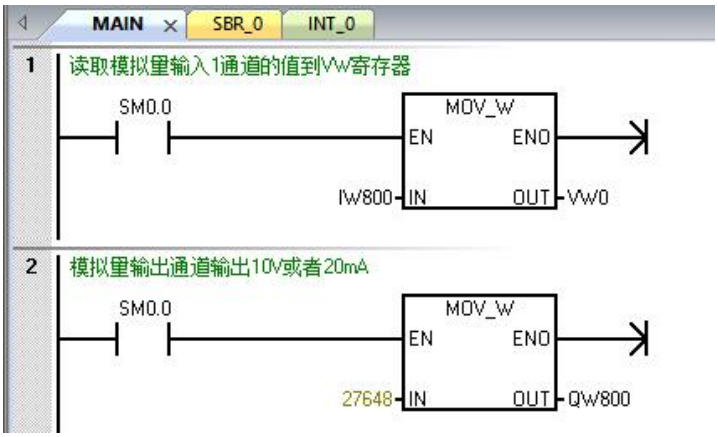
Note 1: Maximum analog input 128 Point, maximum analog output 128 Point, maximum number of digital inputs 256 Point, digital output big 256 point.

Note 2: Consecutive extension modules, with addresses arranged compactly and consecutively. For quick identification, it can also be... PM Expansion module machine Header page (http://jngbdz.com/web-PM_H.html The download tab can be quickly calculated using a starting address tool, as shown in the image below. :

Note 3: Special registers can be viewed in the status table as shown in the following figure:

3.3 SB PLINKRead/Write Registers

Taking a directly read/write mapped register, such as PM AM06, as an example, see the following diagram.



Network 1 indicates that the value of the first analog input channel is read into VW0;

Network 2 indicates that the first analog output channel outputs 20mA or 10V. (27648 corresponds to full-scale 10V and 20mA)

3.4 SB PLINKCommon problems in machine head usage

3.4.1All indicator lights are off.

examineSB PLINFor the signal board section, are the terminals powered?24V.

3.4.2 PMThe indicator light is not on.

answer:PMIndicator lights are used to indicate the head andCPUThe host communication is normal, and the head unit is powered on.24VFurthermore, the configuration settings are correct, and the system block has been downloaded.PLCIt will stay lit up continuously after that.

If usedDP PLINKMachine head inspectionPORT0Whether it is used asmodbusFunction, if usedSB PLINK Machine head, inspectionPORT1Whether it is used asmodbusFunctionality occupied by the head unit485The port can no longer be used for other communications; simply delete the corresponding program.

3.4.3 PSThe indicator light is not on.

answer:PSIndicator lights are used to indicate the head andPMThe expansion module is communicating normally, and the head unit is powered on.24VAnd the connectionPM The light will only stay on after the expansion module is installed. (Check)PMCheck whether the connectors between modules are inserted crookedly or bent.

3.4.4useSB PLINKDoes the head unit need to have any libraries installed? Does it require additional programming? A: No.

3.4.5useSB PLINKHead unit, direct reading of analog signal channelsAIW,AQWRegisters? A: No, it's remapping to...IW,QWThe area is cleared; direct reading and writing are possible.IW,QWThe register can be used.

3.4.6References in programmingIW600orQW600The register has a red underline, and compilation will fail. A: Refer to "NET IOThe section on "Common Problems in Using the Head Unit" is titled "Common Problems in Using the Head Unit".

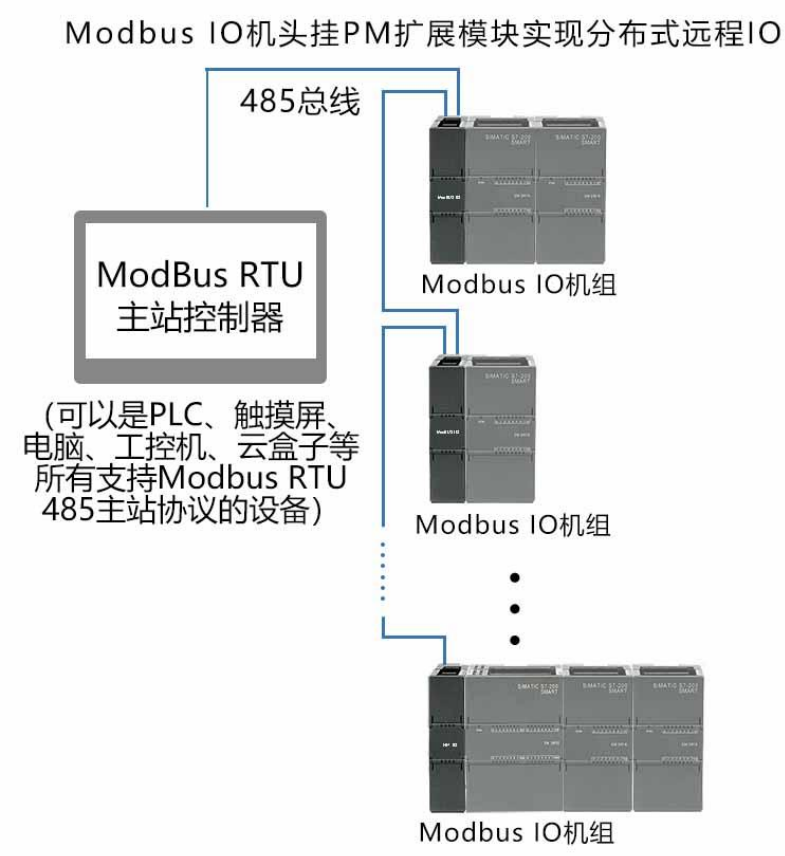
3.4.7 SB PLINKCan the head unit be connected to the original host? Can it be connected to the Gongbei host? A: Yes, it can be connected to the original host. However, it cannot be hosted on the Gongbei host, because the Gongbei host does not support...12One more expansion module, than before.6There are one extension module, and any extra extension modules also take up space.IWandQWDistrict, andSB PLINKThe areas occupied by the nose overlap.

3.4.8 SB PLINKThe head unit can be connectedV3.0Version host,2Are any of the signal board slots acceptable? A: Yes, you can. But...2There are one signal board slot, and only one slot can be selected to expand one head unit.

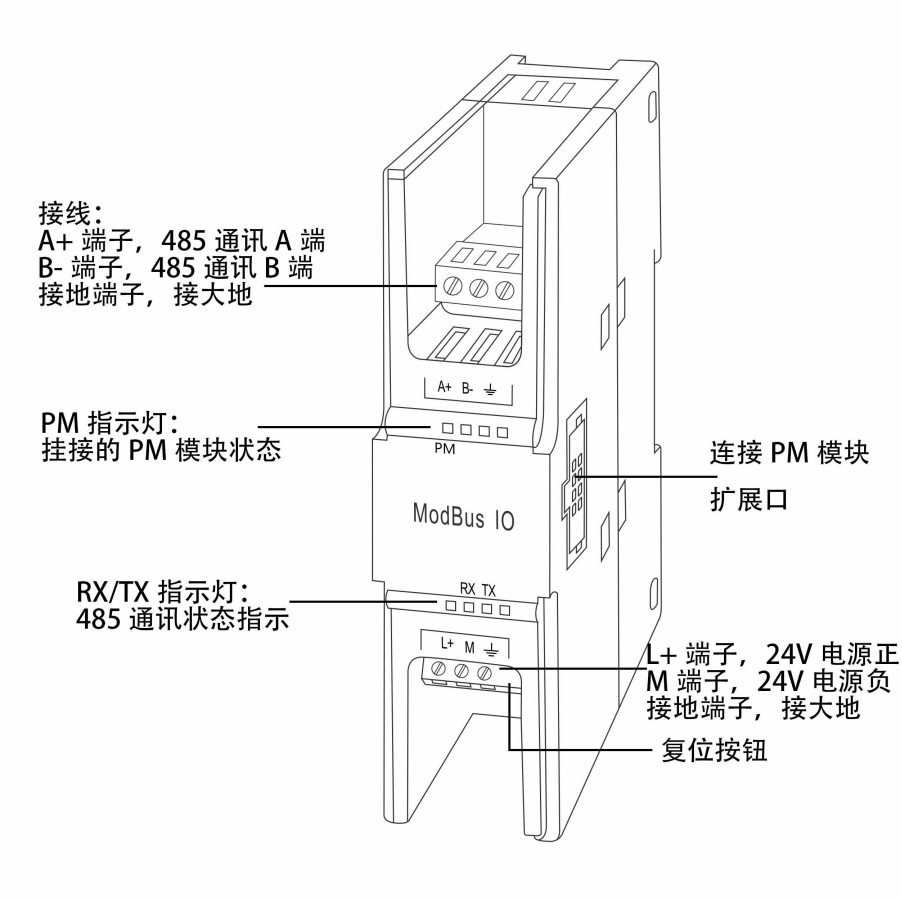
4. ModBus IO Head Unit

Product Name:Modbus IOmachine head	powered by:24VDC
Parameter configuration method: Computer software	Supported protocols when connecting to remote devices:485 Modbus RTUSlave Protocol
defaultModbus IOHead unit address:2 Default baud rate:9600 Default validation: No validation Default data bits:8Bit Default stop bits:1Bit	Maximum ExpansionPMNumber of modules:16 Maximum digital input256point; Maximum digital output256point; Analog input maximum128point; Analog output maximum128point;

ModBus IOHead support485 Modbus RTUSlave protocol, applicable to support485 Modbus RTUMain site protocolPLCIt can communicate with touchscreens and any other devices that conform to this protocol.ModBus IOThe nose can be hung backwards16indivualPMModules, when combined, can be understood as485remoteIOModules allow for flexible combination of resource modules. See the diagram below.



4.1 ModBus IOHead wiring and settings



illustrate1Terminal block definition

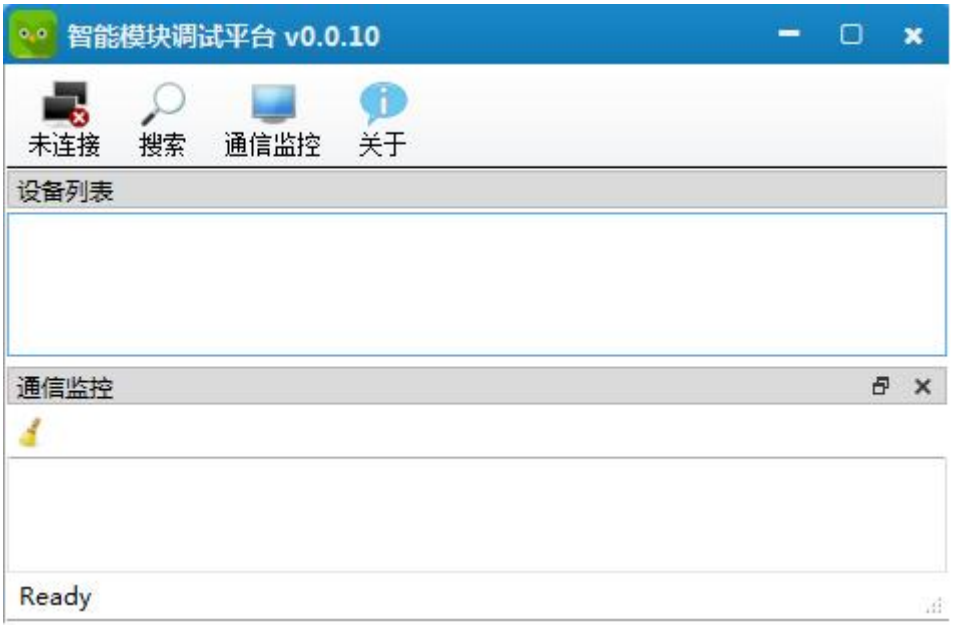
A+terminal,485communicationAend.	B-terminal,485communicationBend.	The grounding terminal is connected to the earth.
L+terminal,24VThe power supply is positive.	Mterminal,24VNegative power supply.	The grounding terminal is connected to the earth.

illustrate2Indicator light status description.

indicator lights	describe	state
PM	Instructions for connectionPMModule status	The light is always on, indicating normal power supply and connection.PMModule communication is normal. Flashing, andPMModule communication error.
RX	485Communication status indication	Flashing or constantly lit: Bus data received. Extinction: No bus data received.
TX	485Communication status indication	Flashing or solid: Sending data to485bus. Extinction: No data was sent.

illustrate3Reset button: There is a reset button on the right side of the lower terminal block. Press and hold.12seconds,PMThe indicator light flashes rapidly, and all parameters are restored to factory default settings. This function is useful if you forget...ModbusUsed when communicating parameters.

illustrate4:Modbus IOThe head unit uses computer software for debugging and parameter setting, which can be done on the official website. jngbdz.comDownload, extract, and run "SmartPlatform.exeAs shown in the figure below.



Use the computer and the head unit485Connect the communication cable and power it. Click the "Not Connected" icon, then click "Serial Port," select the parameters, and click "Start Connection."

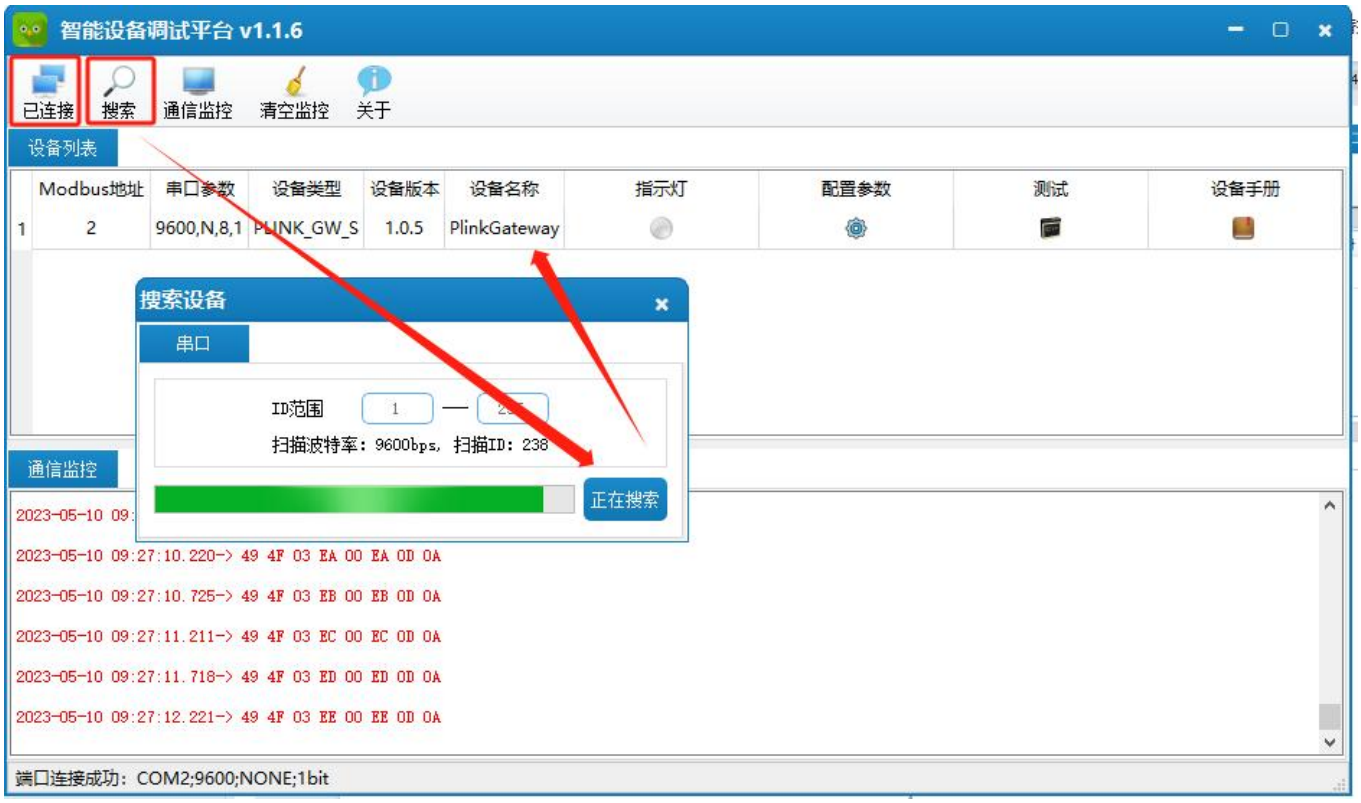
The "serial port number" is used to connect the computer and...Modbus IOThe nose485Communication linesCOMThe slogan can be viewed in Device Manager.

After the connection is established, 

Become 

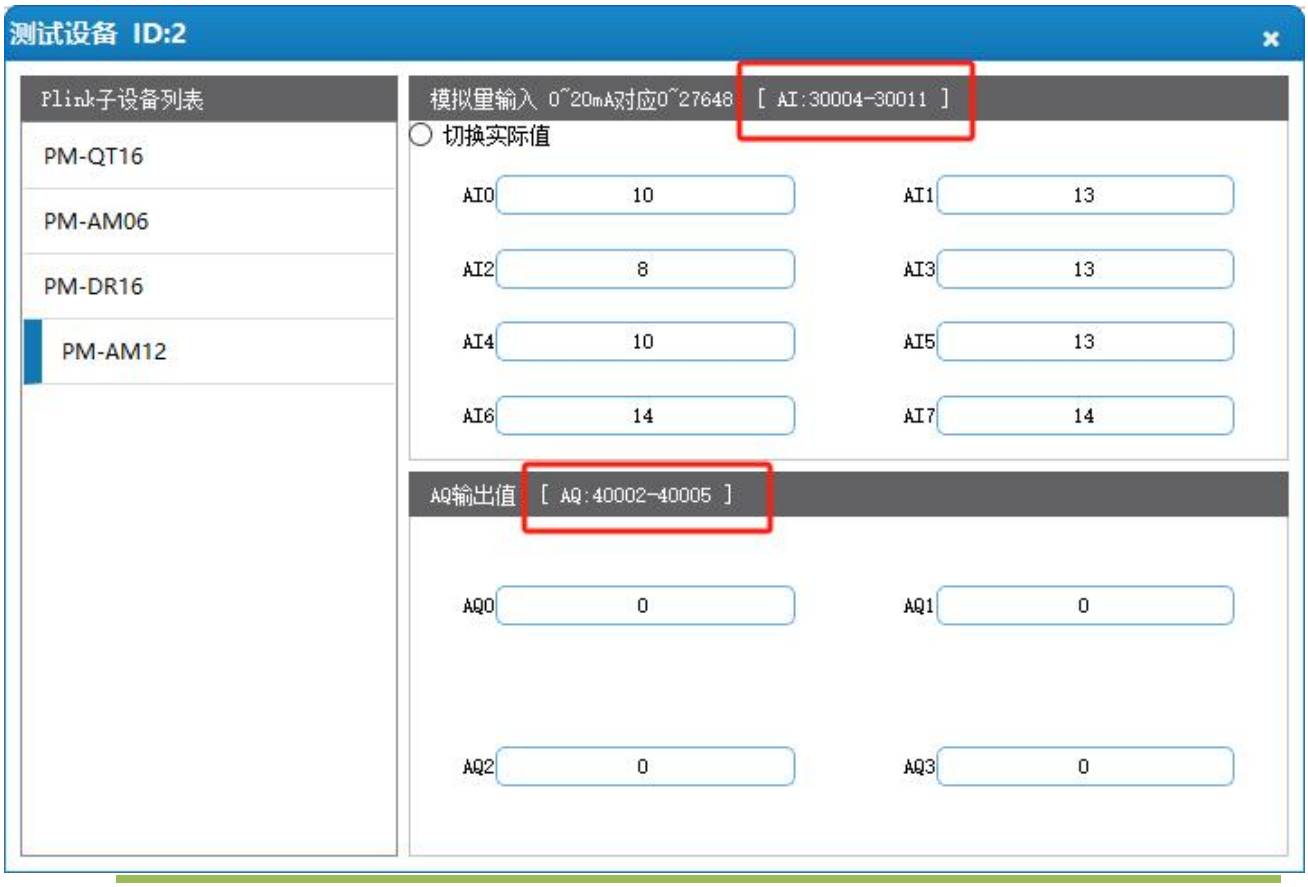
If it cannot be turned on, please check the communication cable.

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.



If the device is online, the searched devices will appear, as shown in the image above.

Clicking "Configure Parameters" allows you to modify communication parameters; clicking "Test" displays the results.Modbus IOAll connected to the headPMModules, and each module can be controlled independently. See the diagram below.



4.2 ModbusRegister mapping relationship

Digital input resources	correspondModbusIn the agreement1Zone, starting address10000Begin with a compact arrangement;
Digital output resources	correspondModbusIn the agreement0Zone, starting address00000Begin with a compact arrangement;
Analog input or temperature acquisition channel	correspondModbusIn the agreement3Zone, starting address30000Begin with a compact arrangement;
Analog output channel	correspondModbusIn the agreement4Zone, starting address40000Begin with a compact arrangement;

If you don't know how to calculate the starting address, you can also check it in the test interface of the configuration software, as shown in the red box in the image above.

Special registers	describe	Special registers	describe
4district40256	Head baud rate	4district40259	Head unit equipmentID
4district40257	Head unit verification position	4district40260	Analog filter coefficient of the nose
4district40258	Machine head stop position		

4.3 ModBus IOCommon problems in machine head usage

4.3.1 Modbus IOI forgot the communication address of the head unit. How can I restore it to factory settings?

A: InModbus IOThere is a reset button on the right side of the terminal below the machine head. Press and hold it.12seconds,PMThe indicator light flashes rapidly, and all parameters are restored to factory default settings.

5. DP PLINK Head Unit

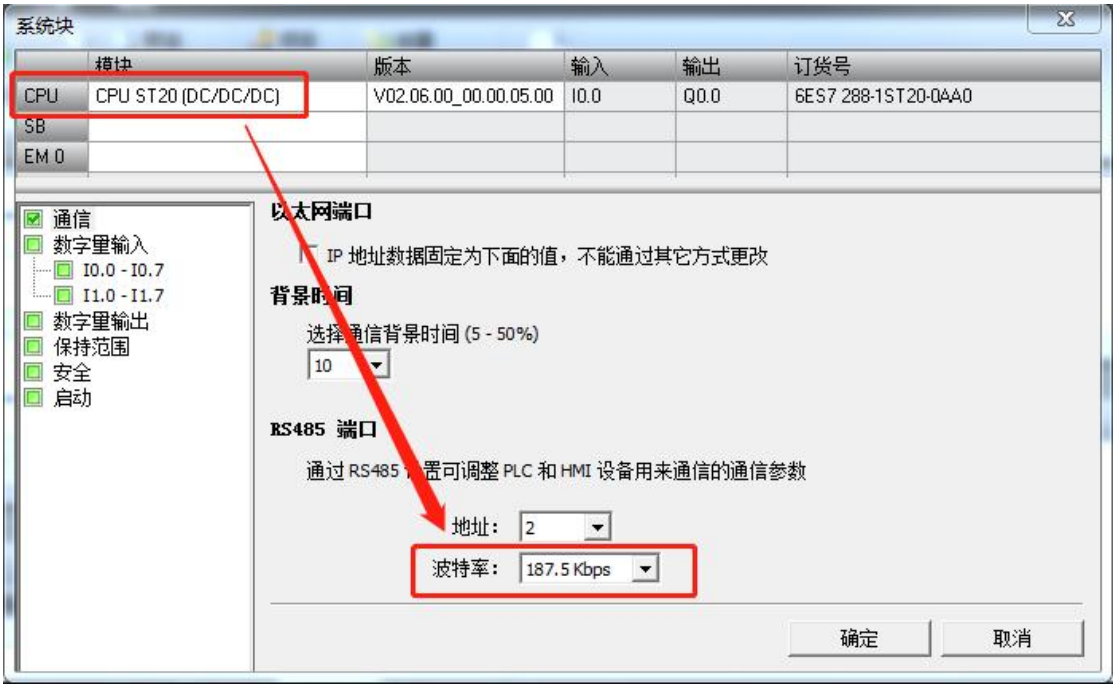
The DP PLINK head unit is compatible with Smart CR/CRs series PLC main units. After connection, no programming is required, and resources are automatically mapped into the PLC main unit, making it very easy to use.

DP PLINK connection diagram

Note: The network cable used should be a straight-through (non-crossover) cable, with a maximum length of [missing 3 meters]. Standard configuration includes 1 Rice network cable.

5.1 DP PLINKInstallation and setup

The DP PLINK head unit is compatible with Smart's CR/CRs series main units and is installed on the main unit's Port0 485 port. In the system block, after selecting the CPU, set the port baud rate to 187.5K, as shown in the figure below. After setting, download the data to the PLC; the PM indicator light on the DP PLINK head unit will illuminate, and the resource points will be automatically mapped into the CPU registers.



5.2 DP PLINKRegister mapping relationship

Using the DP PLINK head unit address mapping table			
Digital input	describe	Analog input	describe
V7200.0	Digital input channel0	VW7400	Analog input channel0Collected values
V7200.1	Digital input channel1	VW7402	Analog input channel1Collected values
V7200.2	Digital input channel2	VW7404	Analog input channel2Collected values
…	…	…	…
V7231.7	Digital input channel255	VW7654	Analog input channel127Collected values
Digital output	describe	Analog output	describe
V7300.0	Digital output channel0	VW7700	Analog output channel0Setting value
V7300.1	Digital output channel1	VW7702	Analog output channel1Setting value
V7300.2	Digital output channel2	VW7704	Analog output channel2Setting value
…	…	…	…
V7331.7	Digital output channel255	VW7954	Analog output channel127Setting value
Special registers	describe	Special registers	describe
VB7130	Nose heartbeat	VD7164	8Model number of extension bit module
VW7132	Online status of extension modules	VD7168	9Model number of extension bit module
VW7134	Number of online extension modules	VD7172	10Model number of extension bit module
VD7136	1Model number of extension bit module	VD7176	11Model number of extension bit module
VD7140	2Model number of extension bit module	VD7180	12Model number of extension bit module
VD7144	3Model number of extension bit module	VD7184	13Model number of extension bit module
VD7148	4Model number of extension bit module	VD7188	14Model number of extension bit module
VD7152	5Model number of extension bit module	VD7192	15Model number of extension bit module
VD7156	6Model number of extension bit module	VD7196	16Model number of extension bit module
VD7160	7Model number of extension bit module		

Note1 Detailed explanation, precautions, and usage instructions for registers (see reference). 2.2 Section and 2.3 The section will not be repeated here.

Note2 For unused resource points, registers will not be occupied.

5.3 DP PLINKHead indicator light

PMIndicator light - constantly on: Power supply to the machine head is normal and...CPUCommunication is normal. PSIndicator light - constantly on: Power supply to the machine head is normal and...PMThe expansion module is communicating normally.

5.4 DP PLINKCommon problems in machine head usage

5.4.1 PM,PSThe indicator light is not on. A: Refer to "SB PLINKThe section on "Common Problems in Using the Head Unit" is titled "Common Problems in Using the Head Unit".

5.4.2useDP PLINKDoes the head unit need to have any libraries installed? Does it require additional programming? A: No.

5.4.3useDB PLINKHead unit, direct reading of analog signal channelsAIW,AQWRegisters? A: No, it's remapping to...IW,QWThe area is cleared; direct reading and writing are possible.IW,QWThe register can be used.

5.4.4References in programmingIW600orQW600The register has a red underline, and compilation will fail.

A: Refer to "NET IOThe section on "Common Problems in Using the Head Unit" is titled "Common Problems in Using the Head Unit".

6.PM Extension Module

6.1Technical parameters

Digital input/output module	PM DE08	PM DE16	PM DR08	PM QR16	PM QT16	PM DR16	PM DT16	PM DR32
Number of channels	8	16	8 Relays out	16 Relays out	16 transistors out	8-in-8 relay Device output	8-in-8 crystals Pipe outlet	16-in-16 relay Device output
Digital input type	Sink or source input (supports bidirectional input; common terminal can be positive or negative).							
Digital input voltage	Logic 1 Minimum voltage: 15VDC at 2.5mA							
	Logic 0 Maximum voltage: 5VDC at 1mA							
Digital input isolation	Internal opto-isolation							
Maximum output current	Relay: 5A for resistive load; 0.5A for inductive load; 0.5A for capacitive load; Transistor: 0.5A;							
Digital output isolation	Internal opto-isolation							
L+,M Rated Voltage	24VDC (maximum 30VDC)							
Power consumption	2W	3W	5W	6W	3W	6W	3W	10W
Dimensions (mm)	45x100x81							70x100x81
PM indicator lights	Green light always on: Module24VThe power supply is normal, and...PMMachine head or machine toolSmartHost communication is normal. Green light remains off.PMBus power supply or communication is faulty.							
aisle indicator lights	Green light always off:0Vor0mA(Disconnection or no signal indication) Green light remains on:0V<Signal<10Vor0mA<Signal<20mA(Normal) Green light flashing: Signal >10VOr signal >20mA(Over-range alarm)							

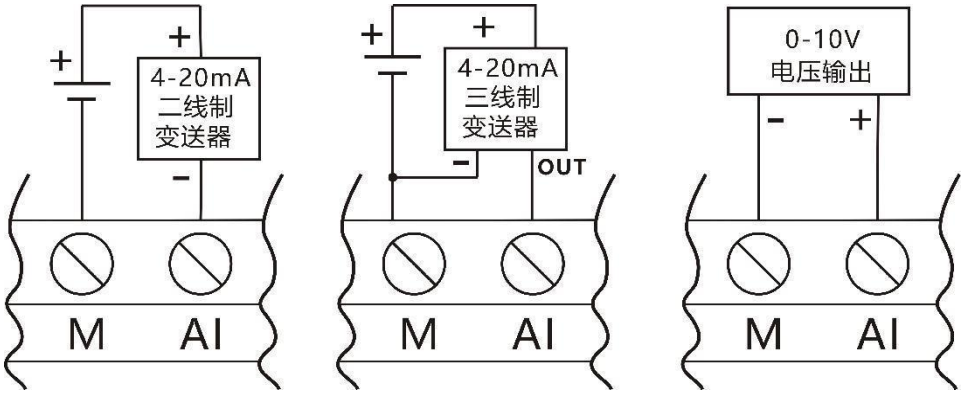
Analog module	PM AE04	PM AE08	PM AQ02	PM AQ04	PM AQ08	PM AM04	PM AM06	PM AM08	PM AM12	PM AM16

Input number	Route 4	Route 8	-	-	-	Route 2	Route 4	Route 4	Route 8	Route 8
Number of output channels	-	-	Route 2	Route 4	Route 8	Route 2	Route 2	Route 4	Route 4	Route 8
Input range	0-10V or 0-20mA									
Input precision	0.3% of full scale									
Output range	0-10V and 0-20mA									
Output resolution	Voltage: 11 bits + sign; Current: 11 bits									
Output impedance	Voltage: ≥1000Ω Current: ≤500Ω									
Full scale range	0 to 27,648 corresponds to 0-10V and 0-20mA.									
isolation	none									
Output cable	Maximum length: 10m shielded twisted pair cable									
Power consumption	2W	3W	2W	3W	5W	3W	4W	5W	6W	7W
Dimensions (mm)	45x100x81				70x100x81	45x100x81			70x100x81	
PM indicator lights	Green light always on: Module24VThe power supply is normal, and...PMMachine head or machine toolSmartHost communication is normal. Flashing green light: Power supply abnormality on the field side, i.e.PMextension module24VPower supply failure. Green light remains off.PMBus power supply or communication is faulty.									
aisle indicator lights	Green light always off:0Vor0mA(Disconnection or no signal indication) Green light remains on:0V<Signal<10Vor0mA<Signal<20mA(Normal) Green light flashing: Signal >10VOr signal >20mA(Over-range alarm)									

Temperature acquisition module	PM AR04	PM AR08	PM AN04	PM AN08	PM AT04
Number of channels	Route 4	Route 8	Route 4	Route 8	Route 4
Sensor type	2, 3, and 4-wire PT100		NTC (10K, 3950)		K-type thermocouple
Temperature measurement range	- 200.0℃~600.0℃		- 50.0℃~150.0℃		- 270.0℃~1372.0℃
Corresponding reading range	- 2000~6000 (Magnified 10 times)		- 500~1500 (Magnified 10 times)		- 2700~13720 (Magnified 10 times)
Open circuit and short circuit readings	+32000 or -32000		+32000 or -32000		+32000 or -32000
resolution	0.1℃		0.1℃		0.1℃
accuracy	0.1% of full scale		0.5% of full scale		0.1% of full scale
Collection time	500ms	500ms	500ms	800ms	800ms
Wire length	Maximum 100 meters		Maximum 30 meters		Maximum 30 meters
PM Indicator green light	Green light always on: Module24VThe power supply is normal, and...PMMachine head or machine toolSmartHost communication is normal. Flashing green light: Power supply abnormality on the field side, i.e.PMextension module24VPower supply failure. Green light remains off.PMBus power supply or communication is faulty.				
Green light for lane indication	A solid green light indicates that the temperature is within the normal measurement range. Green light always off: Do not answer. Flashing green light: clear the way (M+ I+wiring,I-(No wiring) or short circuit (M+ I+ I-(Together)		A solid green light indicates normal temperature. Green light always off: Do not answer. Flashing green light: Short circuit.		A solid green light indicates normal temperature. Green light is always off: Temperature exceeds limit Flashing green light: Not connected or disconnected Wire.

Power consumption	2W	3W	3W	4W	3W
Dimensions (mm)	45x100x81				

6.2 Wiring diagram of analog input channel



6.3 PM Frequently Asked Questions about Extension Modules

3.3.1 How to determine if the purchased module is a PM extension module? A: There is an indicator light on the front of the expansion module, printed with "..."PMWords.

3.3.2 When connecting to the Gongbei standard Smart host, is it necessary to purchase a PM reader? A: No, you don't need to. Just plug it into the host expansion port and then configure it in the system block to use it.

3.3.3 When connecting to the Gongbei standard Smart host, is the channel configuration effective during configuration? A: It doesn't work.

3.3.4 Can it connect to the original Smart expansion module?

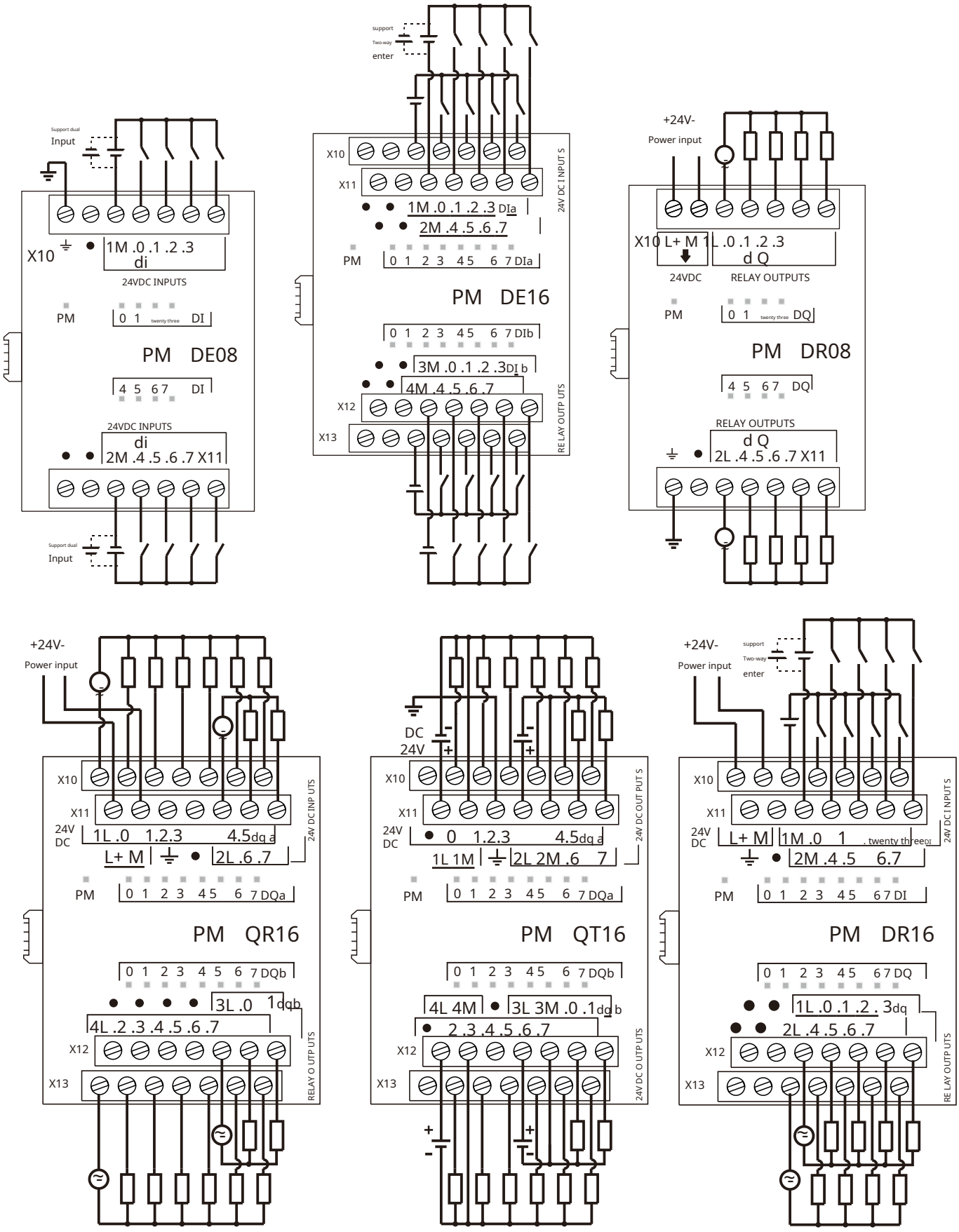
A: You cannot directly insert it into the original...SmartThe expansion module has an expansion port, but it can be accessed through...PMHead unit adapter. See this document for details.PMThe nose section.

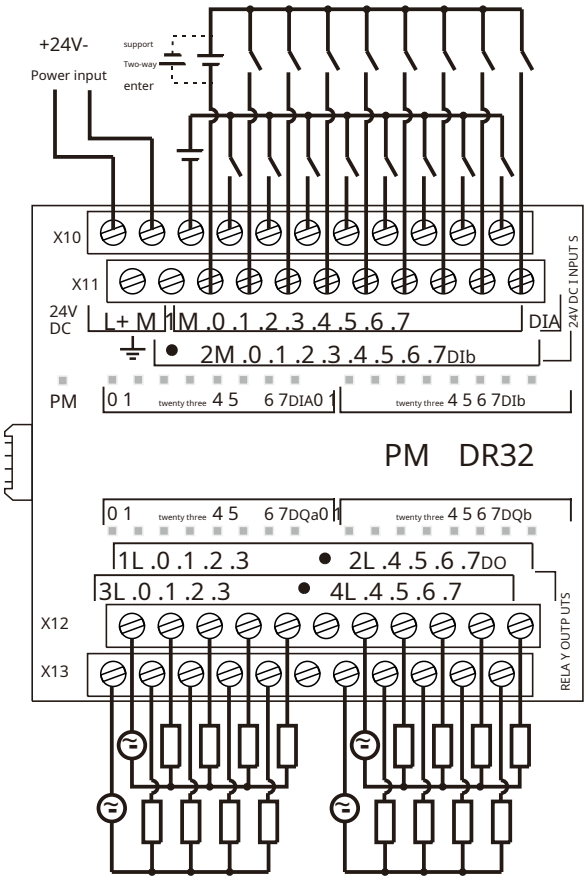
3.3.5 What do the on/off statuses of the indicator lights on/off in analog modules represent? What about the temperature module? A: Each model is different; please refer to this chapter.6.1.Technical Specifications section.

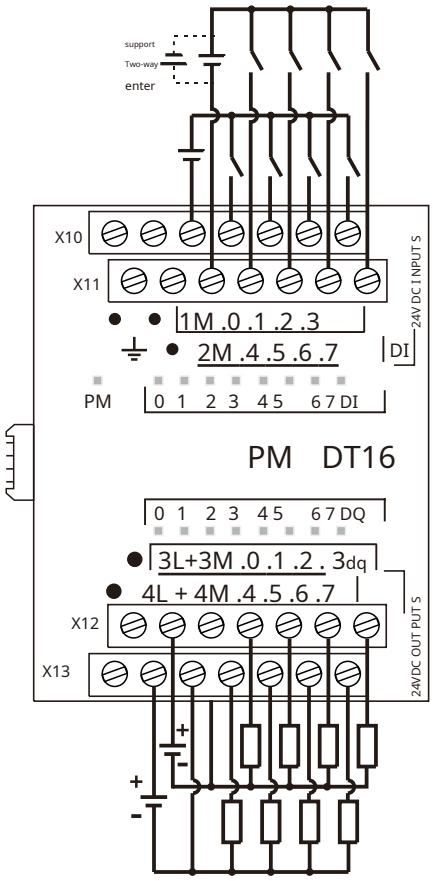
3.3.6 Is the value read from the temperature extension module channel a temperature value?

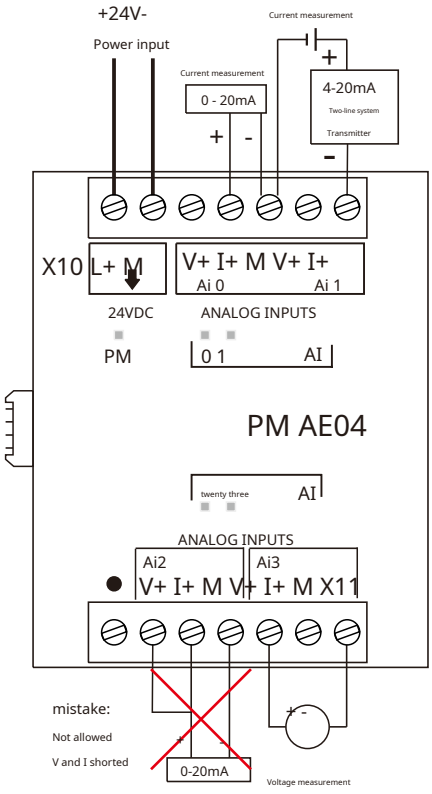
A: Yes, it's magnified.10The temperature value is multiplied, so no further conversion is needed. For example, reading...123,express12.3Celsius.

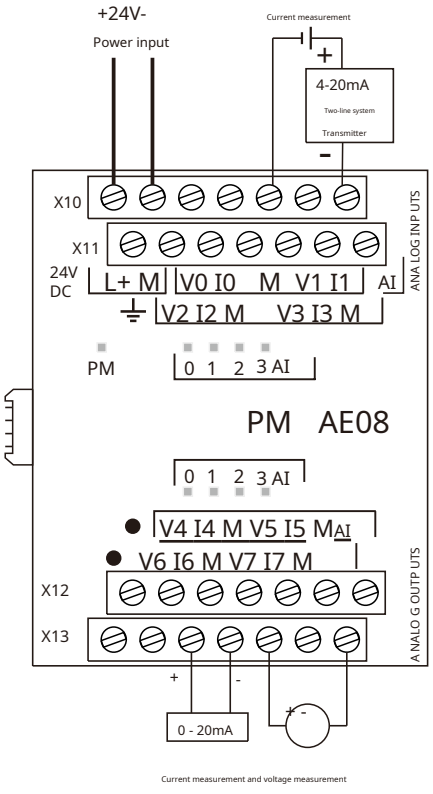
6.4 PM Expansion Module Wiring Diagram

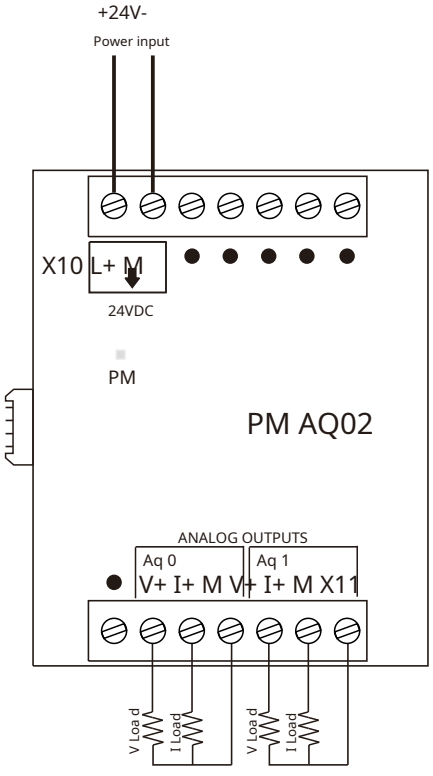


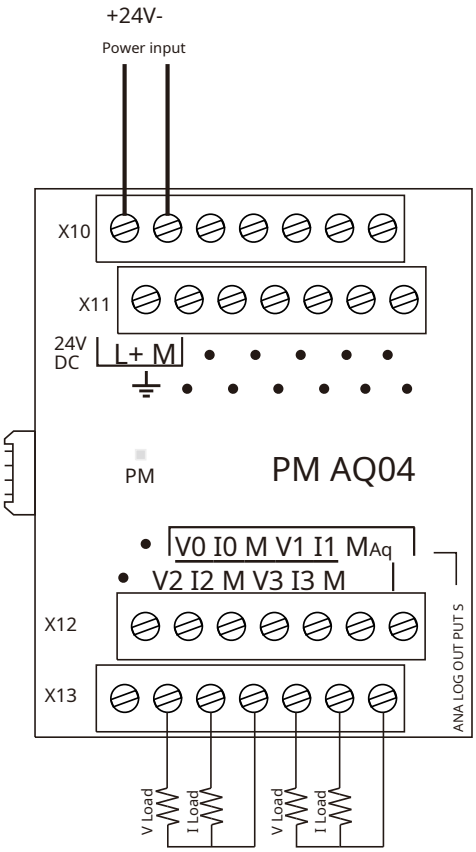

+24V-
Power input
support
Two-way
enter
X10
X11
24V DC
L+ M
M .0 .1 .2 .3 .4 .5 .6 .7
DIA
2M .0 .1 .2 .3 .4 .5 .6 .7DIb
24V DC I NPUT S
PM
0 1
twenty three 4 5
6 7DIA0 1
twenty three 4 5 6 7DIb
PM DR32
0 1
twenty three 4 5
6 7DQa0
twenty three 4 5 6 7DQb
1L .0 .1 .2 .3
2L .4 .5 .6 .7DO
3L .0 .1 .2 .3
4L .4 .5 .6 .7
X12
X13
RELA Y OUTP UTS

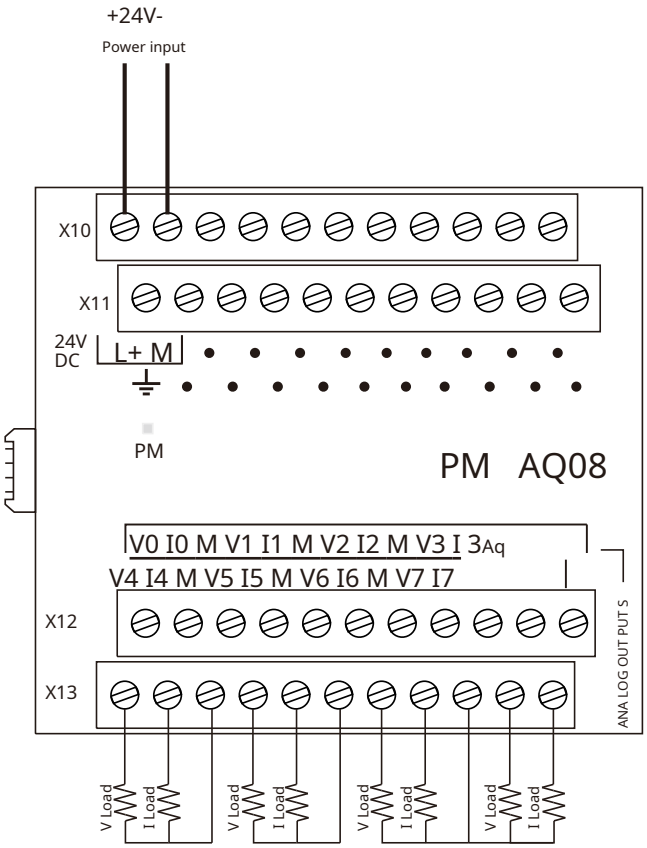

support
Two-way
enter
X10
X11
1M .0 .1 .2 .3
2M .4 .5 .6 .7
DI
24V DC I NPUT S
PM
0 1 2 3 4 5 6 7 DI
PM DT16
0 1 2 3 4 5 6 7 DQ
3L+3M .0 .1 .2 . 3dq
4L + 4M .4 .5 .6 .7
X12
X13
24VDC OUT PUT S

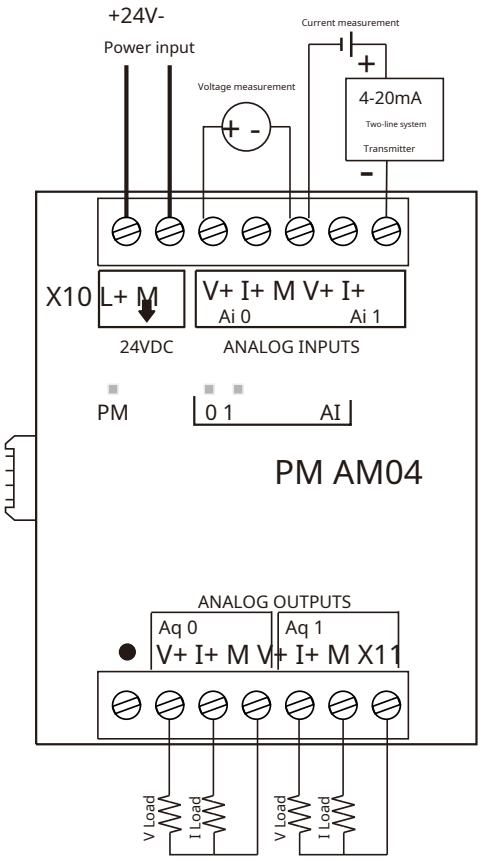

+24V-
Power input
Current measurement
0 - 20mA
4-20mA
Two-line system
Transmitter
X10
L+ M
V+ I+ M V+ I+
Ai 0
Ai 1
24VDC
ANALOG INPUTS
PM
0 1
AI
PM AE04
twenty three
AI
ANALOG INPUTS
Ai2
Ai3
V+ I+ M V+ I+ M X11
mistake:
Not allowed
V and I shorted
0-20mA
Voltage measurement

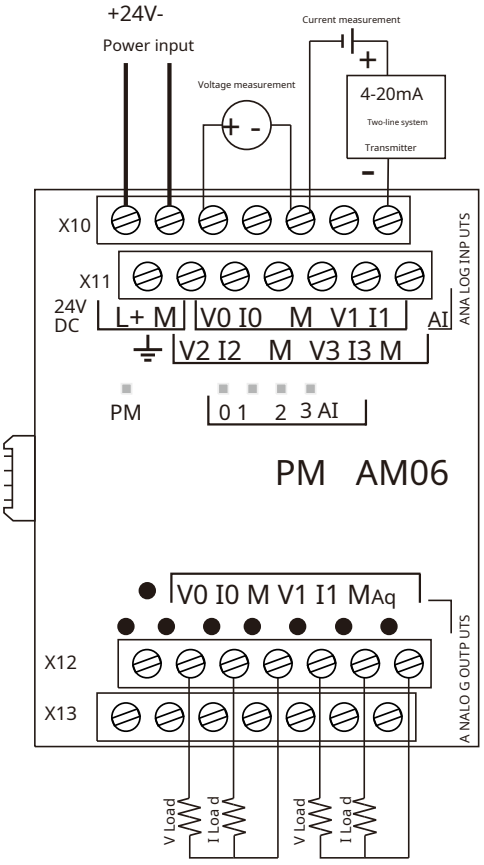

+24V-
Power input
Current measurement
4-20mA
Two-line system
Transmitter
X10
X11
24V DC
L+ M
V0 I0 M V1 I1
AI
V2 I2 M V3 I3 M
ANA LOG INP UTS
PM
0 1 2 3 AI
PM AE08
0 1 2 3 AI
V4 I4 M V5 I5 MAI
V6 I6 M V7 I7 M
X12
X13
A NALO G OUTP UTS
0 - 20mA
Current measurement and voltage measurement

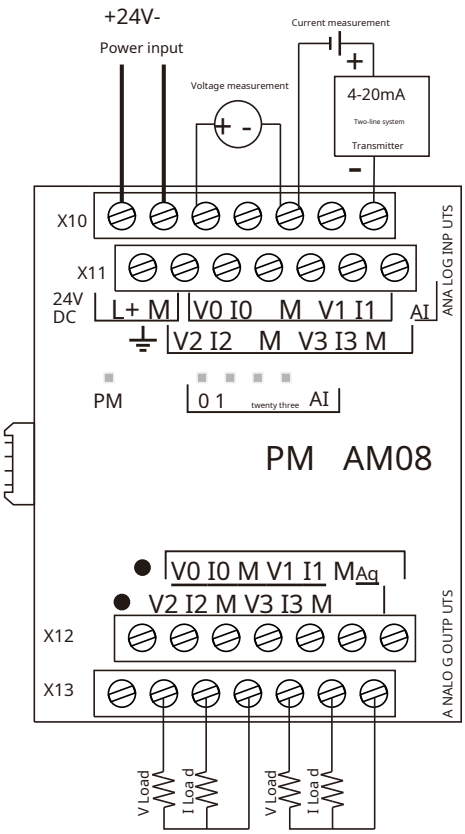

+24V-
Power input
X10
L+ M
24VDC
PM
PM AQ02
ANALOG OUTPUTS
Aq 0
Aq 1
V+ I+ M V+ I+ M X11
V Load
I Load
V Load
I Load

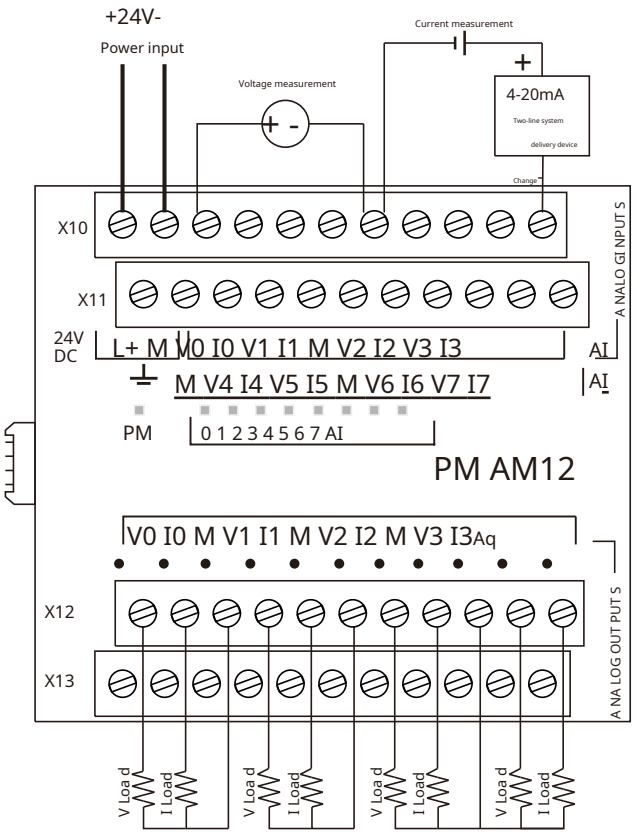

+24V-
Power input
X10
X11
24V DC
L+ M
PM
PM AQ04
V0 I0 M V1 I1 MAq
V2 I2 M V3 I3 M
X12
X13
ANA LOG OUT PUT S
V Load
I Load

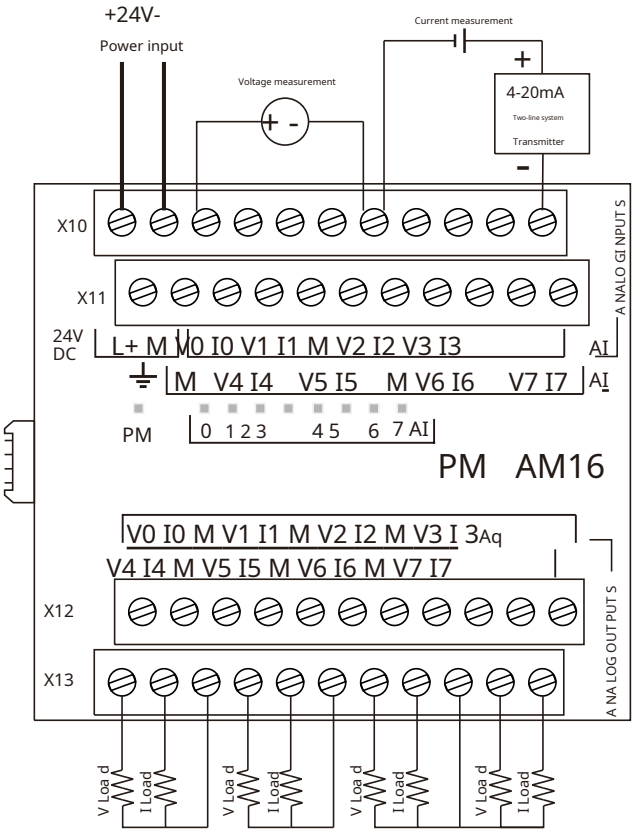

+24V-
Power input
X10
X11
24V DC
L+ M
PM
PM AQ08
V0 I0 M V1 I1 M V2 I2 M V3 I 3Aq
V4 I4 M V5 I5 M V6 I6 M V7 I7
X12
X13
ANA LOG OUT PUT S
V Load
I Load

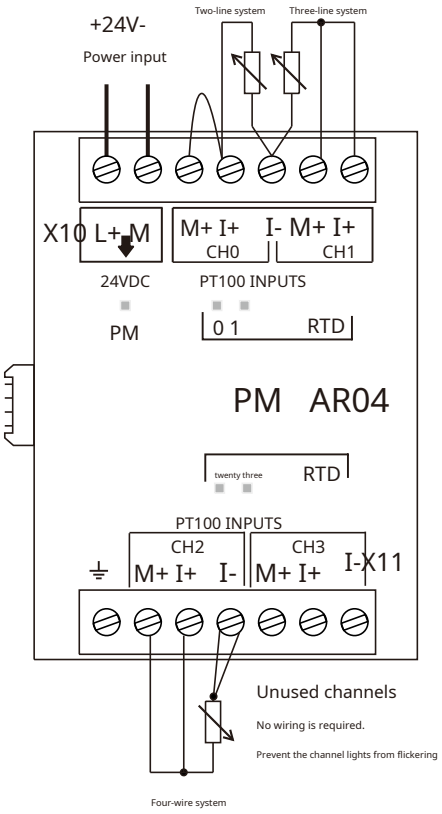

+24V-
Power input
Current measurement
Voltage measurement
4-20mA
Two-line system
Transmitter
X10
L+ M
V+ I+ M V+ I+
Ai 0
Ai 1
24VDC
ANALOG INPUTS
PM
0 1
AI
PM AM04
ANALOG OUTPUTS
Aq 0
Aq 1
V+ I+ M V+ I+ M X11
V Load
I Load

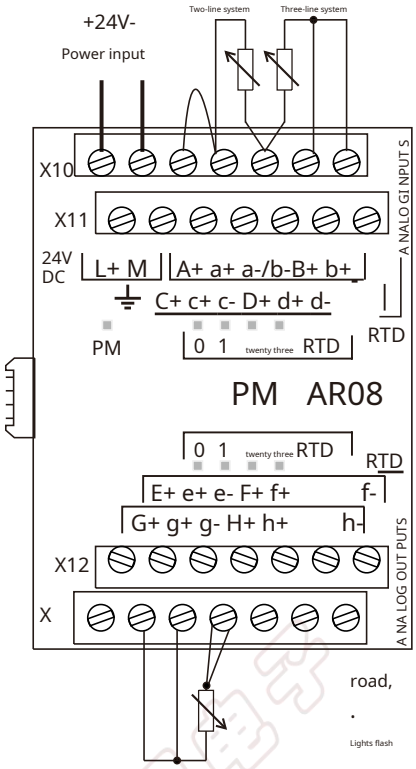

+24V-
Power input
Current measurement
Voltage measurement
4-20mA
Two-line system
Transmitter
X10
X11
24V DC
L+ M
V0 I0 M V1 I1
AI
V2 I2 M V3 I3 M
ANA LOG INP UTS
PM
0 1 2 3 AI
PM AM06
V0 I0 M V1 I1 MAq
X12
X13
A NALO G OUTP UTS
V Load
I Load

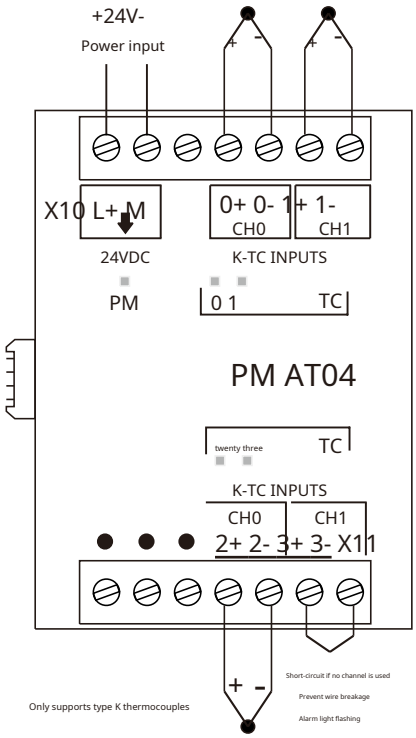

+24V-
Power input
Current measurement
Voltage measurement
4-20mA
Two-line system
Transmitter
X10
X11
24V DC
L+ M
V0 I0 M V1 I1
AI
V2 I2 M V3 I3 M
PM
0 1
twenty three
AI
PM AM08
V0 I0 M V1 I1 MAq
V2 I2 M V3 I3 M
X12
X13
V Load
I Load
ANALOG INPUTS
ANALOG OUTPUTS

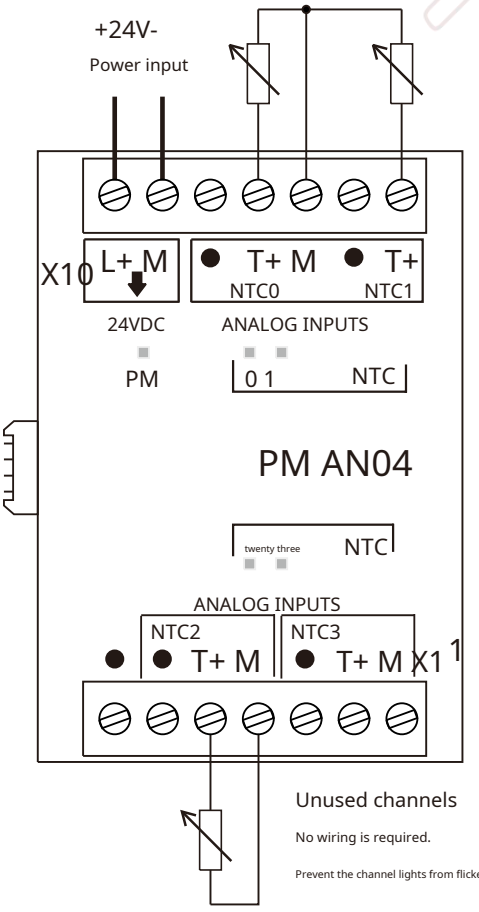

+24V-
Power input
Current measurement
Voltage measurement
4-20mA
Two-line system
delivery device
X10
X11
24V DC
L+ M V0 I0 V1 I1 M V2 I2 V3 I3
AI
M V4 I4 V5 I5 M V6 I6 V7 I7
AI
PM
0 1 2 3 4 5 6 7 AI
PM AM12
V0 I0 M V1 I1 M V2 I2 M V3 I3Aq
X12
X13
V Load
I Load
ANALOG INPUTS
ANALOG OUTPUTS

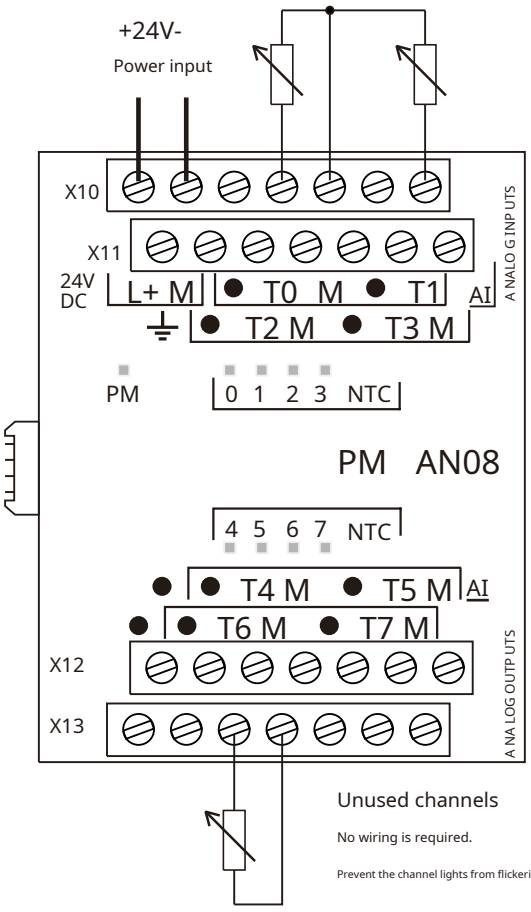

+24V-
Power input
Current measurement
Voltage measurement
4-20mA
Two-line system
Transmitter
X10
X11
24V DC
L+ M V0 I0 V1 I1 M V2 I2 V3 I3
AI
M V4 I4 V5 I5 M V6 I6 V7 I7
AI
PM
0 1 2 3 4 5 6 7 AI
PM AM16
V0 I0 M V1 I1 M V2 I2 M V3 I 3Aq
V4 I4 M V5 I5 M V6 I6 M V7 I7
X12
X13
V Load
I Load
ANALOG INPUTS
ANALOG OUTPUTS


+24V-
Power input
Two-line system
Three-line system
X10 L+ M
M+ I+ I- M+ I+
CH0 CH1
24VDC
PT100 INPUTS
PM
0 1 RTD
PM AR04
twenty three RTD
PT100 INPUTS
CH2 CH3
M+ I+ I- M+ I+ I-
X11
Unused channels
No wiring is required.
Prevent the channel lights from flickering
Four-wire system


+24V-
Power input
Two-line system
Three-line system
X10
X11
24V DC
L+ M
A+ a+ a-/b-B+ b+
C+ c+ c- D+ d+ d-
PM
0 1 twenty three RTD
RTD
PM AR08
0 1 twenty three RTD
RTD
E+ e+ e- F+ f+ f-
G+ g+ g- H+ h+ h-
X12
X
A NALO GI NPUT S
A NA LOG OUT PUTS
road,
.
Lights flash

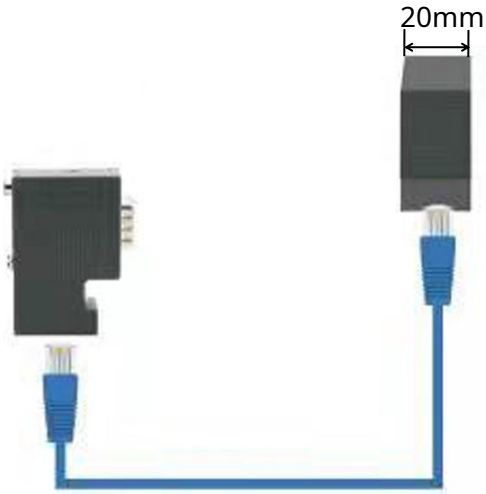

+24V-
Power input
X10 L+ M
0+ 0- 1+ 1-
CH0 CH1
24VDC
K-TC INPUTS
PM
0 1 TC
PM AT04
twenty three TC
K-TC INPUTS
CH0 CH1
2+ 2- 3+ 3- X11
Only supports type K thermocouples
Short-circuit if no channel is used
Prevent wire breakage
Alarm light flashing


+24V-
Power input
X10 L+ M
T+ M T+
NTC0 NTC1
24VDC
ANALOG INPUTS
PM
0 1 NTC
PM AN04
twenty three NTC
ANALOG INPUTS
NTC2 NTC3
T+ M T+ M X1
Unused channels
No wiring is required.
Prevent the channel lights from flickering


+24V-
Power input
X10
X11
24V DC
L+ M
T0 M T1
AI
T2 M T3 M
PM
0 1 2 3 NTC
PM AN08
4 5 6 7 NTC
T4 M T5 M
AI
T6 M T7 M
X12
X13
A NALO G INP UTS
A NA LOG OUTP UTS
Unused channels
No wiring is required.
Prevent the channel lights from flickering

7.Head unit and expansion module dimensions

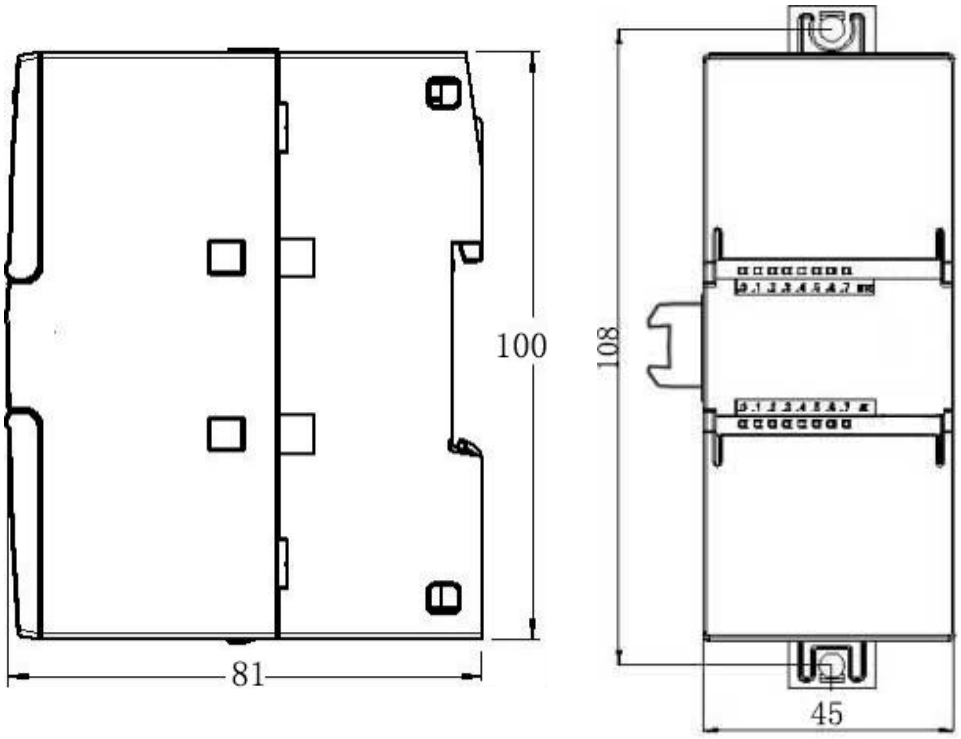
SB PLINK head unit (25*80*100mm)



DP PLINK head unit (20mm wide)

NET IO head (25*80*100mm)

ModBus IO head unit (25*80*100mm)


100
81
108
45