



PN 模块使用手册 PN module manual

-- V1.0
V1.0



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目录

Table of contents

一、产品概述	1
Product Overview 1	
1.1、产品简介	1
1.1	
1.2、特点功能	1
1.2. Features 1	
1.3、应用场景	1
1.3. Application Scenario 1	
二、产品规格	2
Product Specification 2	
2.1、产品参数	2
2.1, product parameter 2	
2.2、指示灯说明	3
2.2	
2.3、端子接线	3
2.3. Terminal Connection 3	
2.4、Boot 功能	4
2.4, Boot function 4	
三、博图 TIA 连接本模块	5
3. BOTU TIA is connected to this module 5	
4.1、连接前准备	5
4.1. Prepare for connection 5	
4.2、博图添加 GSDML 文件	5
Botou add GSDML file 5	
4.3、项目添加 PROFINET 设备	7
4.3. The project adds the PROFINET device 7	
4.4、使用 PROFINET 设备	10
4.4. Use the PROFINET device 10	
4.5、使用博图修改模块名称和 IP 地址	11
4.5. Modify the module name and IP address 11 using a BOTU	

五、STEP7-MicroWINSMART 连接本模块	15
Step 7-microwinsmart connect to this module	15
5.1、连接前准备	15
5.1. Prepare for connection	15
5.2、STEP7-MicroWINSMART 添加 GSDML 文件	15
Step 7-microwinsmart add GSDML file	15
5.3、项目添加 PROFINET 设备	16
Project ADD PROFINET device	16
5.4、使用 PROFINET 设备	19
5.4. Use the PROFINET device	19
5.5、STEP7-MicroWINSMART 修改模块名称和模块 IP 地址	20
Step 7-microwinsmart modify the module name and module IP address	20

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修订历史.....	1
Revision history 1	
关于我们.....	1
About US 1	

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一、产品概述

Product Overview

1.1、产品简介

1.1

PN 系列模块是一款支持 Profinet 协议的远程分布式 IO 模块，可以作为西门子 PLC 的 Profinet 从站模块，支持西门子 200smart, 300, 1200,1500 等 PLC，是一款经济稳定、安装简易，适用性强的产品。

PN series module is a Profinet protocol to support a remote distributed IO module, can be used as Siemens PLC Profinet slave module, support Siemens 200smart, 300,1200,1500 PLC, is an economic stability, easy installation, strong applicability of the product.

1.2、特点功能

1.2. Features and functions

- 采用标准 profinet 协议通信，可与 PLC、组态、上位机等进行组网
Using standard profinet protocol communication, with PLC, configuration, host computer and so on for networking
- 双网口系列内置以太网交换机功能
Dual-port series built-in Ethernet switch features
- 电源电路采用防反接设计
Anti-reverse connection design is adopted in power supply circuit
- 广泛用于工业现场设备的信号采集和控制
Widely used in industrial field equipment signal acquisition and control

1.3、应用场景

1.3. Application scenarios

PN 模块可应用范围很广，如：PLC 控制、工业自动化、楼宇自控、POS 系统、电力监控、门禁医疗、考勤系统、自助银行系统、电信机房监控、信息家电、LED 信息显示设备、测量仪表及环境动力监控系统等设备或系统。

PN module can be widely used, such as: PLC Control, industrial automation, building automation, POS system, power monitoring, access control medical, attendance system,

self-service banking system, telecom room monitoring, information appliances, LED information display equipment, measuring instruments and environmental power monitoring systems and other equipment or systems.

二、产品规格 Product specifications

2.1、产品参数 2.1. Product parameters

型号 Models	PN1-IO8R-A PN1-IO8R-A	PN2-IO8R-A PN2-IO8R-A	PN1-IO16R PN1-IO16R	PN2-IO16R PN2-IO16R	PN1-IO16T PN1-IO16T	PN2-IO16T PN2-IO16T
网口个数 The number of network ports	1	2	1	2	1	2
数字量输入 Digital quantity input						
输入点数 Enter the number of points	8 路 Route 8		16 路 Route 16			
输入信号类型 Type of input signal	NPN/PNP NPN/PNP					
输入信号电压 Input signal voltage	DC 20~28V DC 20 ~ 28V					
绝缘回路 Insulation Circuit	光耦隔离 Optocoupler isolation					
数字量输出 Digital quantity output						
输出点数 Output points	8 路 Route 8		16 路 Route 16			
输出类型 Output type	继电器输出, 常开触点 Relay output, always open contact				PNP 晶体管 PNP transistor	
输出能力 Output capability	2A/点 2A/point				0.5A/点 0.5 A/point	
绝缘回路 Insulation Circuit	机械绝缘 Mechanical insulation				光耦隔离 Optocoupler isolation	
模拟量输入 Analog input						
输入点数 Enter the number of points	6					
输入类型 Input type	电压或电流 Voltage or current					
输入范围 Input Range	0-10V 或者 0-20MA 0-10 V or 0-20 Ma					
模数转换 Analog-to-digital converter	0-10V 对应 0-10000 0-10V equals 0-10000 0-20MA 对应 0-20000 0-20 ma equals 0-					

	20,000
转换精度 Conversion accuracy	12 位 Twelve
误差 Error	1.2% FS 1.2% FS
模拟量输出 Analog output	
输出点数 Output points	2
输出类型 Output type	电压或电流 Voltage or current
输出范围 Output Range	0-10V 或者 0-20MA 0-10 V or 0-20 Ma
模数转换 Analog-to-digital converter	0-10V 对应 0-10000 0-10V equals 0-10000 0-20MA 对应 0-20000 0-20 ma equals 0-20,000
转换精度 Conversion accuracy	12 位 Twelve
误差 Error	1.2% FS 1.2% FS
电源参数 Power supply parameters	
工作电压 Operating Voltage	DC 24V;带防反接保护 DC 24V; with anti-reverse protection
功耗 Power consumption	2W~4W Two to four
工作环境 Working Environment	
工作温度 Operating temperature	-20°C~+70°C -20 ° C ~ + 70 ° C
存储温度 Storage temperature	-40°C~+85°C -40 ° C ~ + 85 ° C

其他 Other	
安装方式 Installation Mode	导轨 Guide rail
尺寸 Size	125MM(长)*80MM(宽)*50MM(高), 以实物为准 125MM (length) * 80MM (width) * 50MM (height) , in kind

2.2、指示灯说明

2.2

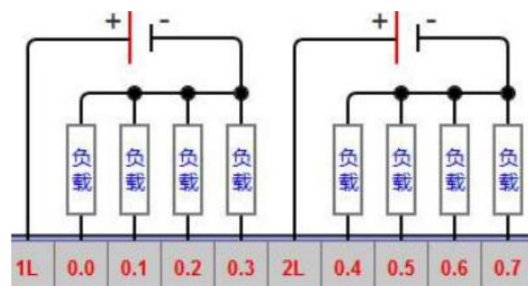
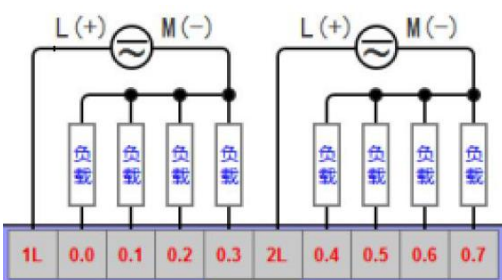
名称 Name	说明 Description
PWR Pwr	电源指示灯, 上电后即常亮 The power indicator lamp is always on when the power is on
STAUTS Stauts	状态指示灯: 当网络连接正常时, 绿灯亮; 不正常时, 红灯亮。 Status Indicator: green light when network connection is normal, red light when abnormal.
RUN Run	系统指示灯: 模块连接到 PLC 并正常运行时, 绿灯闪烁, 否则红灯闪烁。 System Indicator: module connected to the PLC and normal operation, green light flashing, otherwise red light flashing.

2.3、端子接线

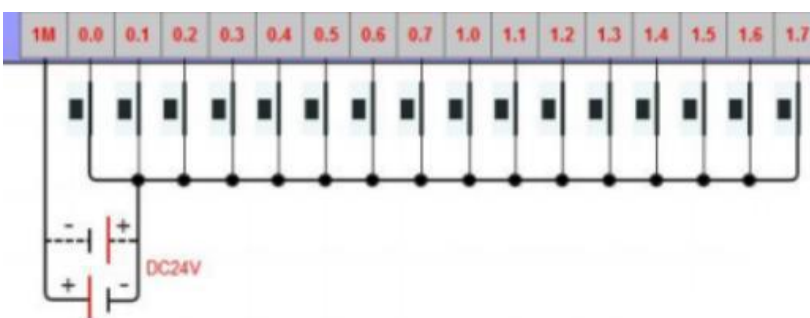
Terminal wiring

继电器输出
Relay output, transistor output

晶体管输出

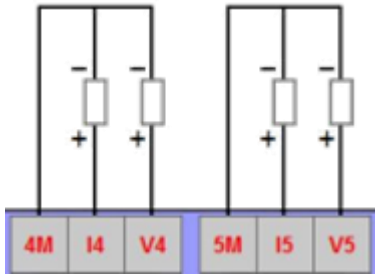


开关量输入
Switch quantity input

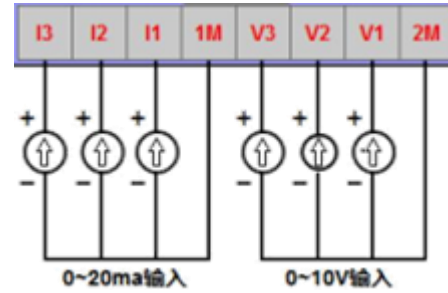


模拟量输出
Analog output, analog input

模拟量输入



2.4、Boot 功能 2.4, Boot function



模块上电时，按住 **Boot** 按钮，直到模块的 **stauts** 灯和 **run** 灯快速闪烁后松开按钮，模块即进入 **Boot** 模式，**Boot** 模式详细说明见 **Boot** 固件升级使用说明书。

When the module is powered on, press and hold the Boot button until the module's Stauts Light and run light flash quickly and then release the button, the module will enter Boot mode.

PN-IO8R-A 使用手册

三、博图 TIA 连接本模块 BOTU TIA link this module

本章节针对博图 TIA 连接 PN 模块的过程进行介绍，以实现相应功能需求。
In this chapter, we introduce the process of connecting the PN module to Booto Tia, in order to realize the corresponding functional requirements.

3.1、连接前准备 3.1

准备好 TIA 软件需要的 XML 文件，如下所示：
Prepare the XML file needed by the TIA Software as follows:

名称	修改日期	类型	大小
GSDML-V2.4-AMX-PN-IO-20220808.xml	2022/9/27 23:01	XML 文件	24 KB

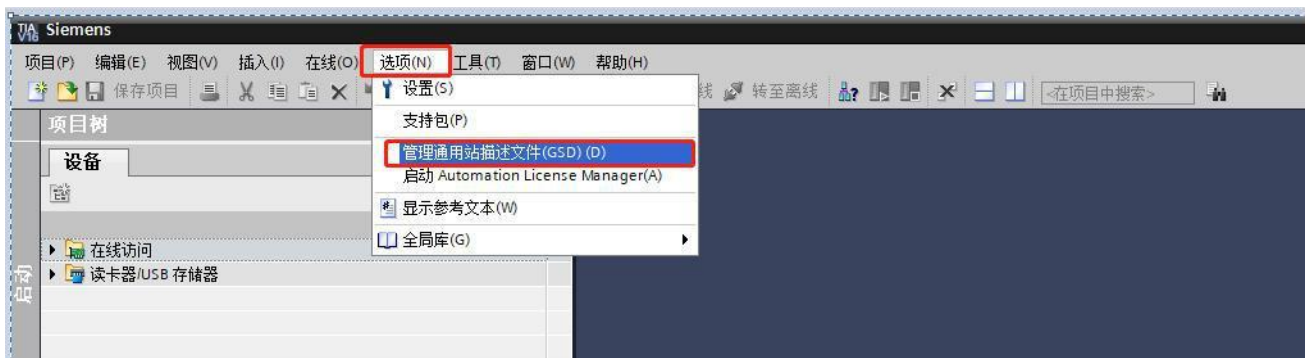
将 DC24V 外部电源接入模块并通电，通电前请检查电源正负极是否连接正确。

使用网线将模块连接到 PLC 控制器的 Profinet 接口上。

DC24V external power access module and power, power supply before please check the positive and negative connection is correct. Connect the module to the Profinet interface of the PLC controller using a network cable.

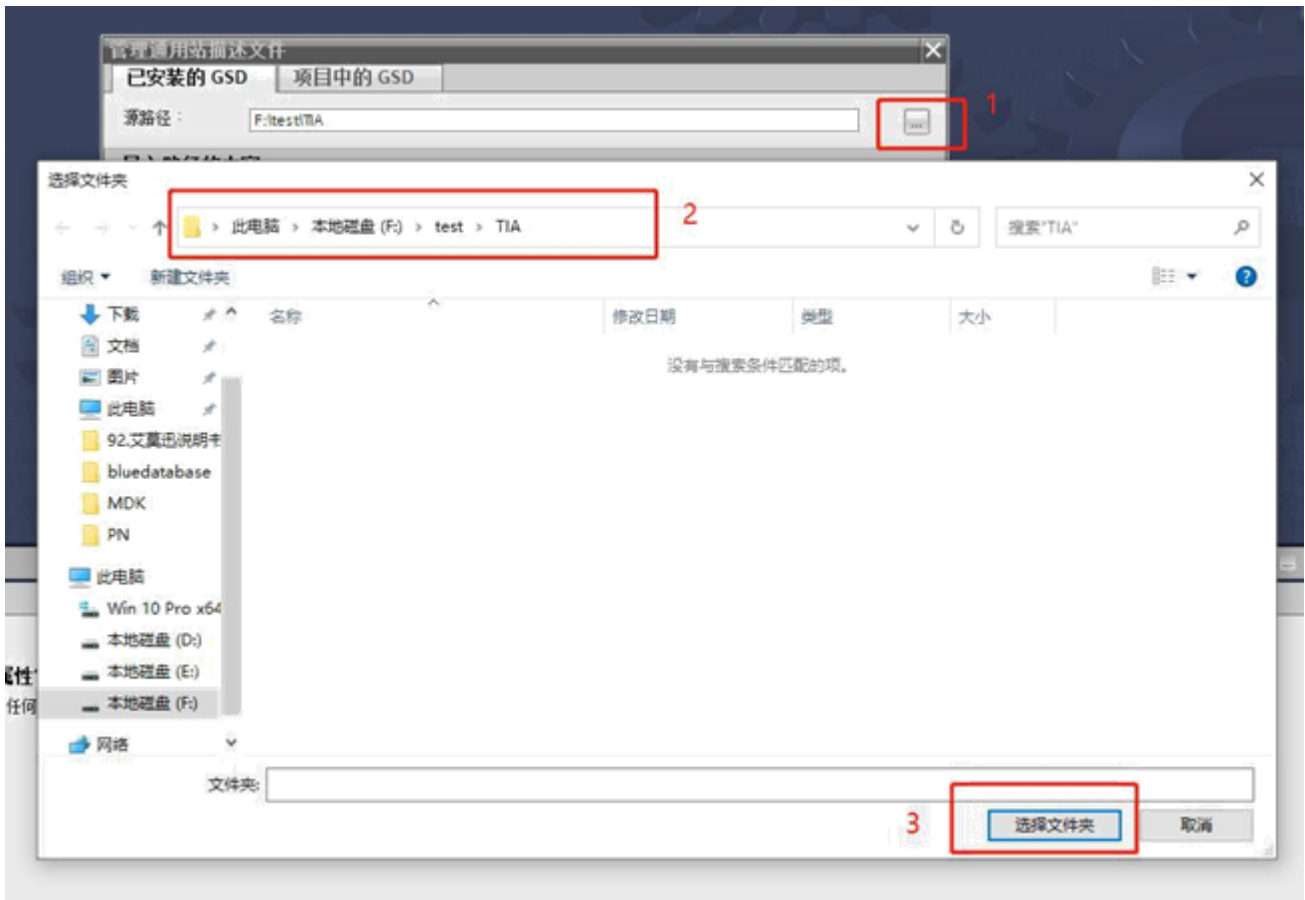
3.2、博图添加 GSDML 文件 Add the GSDML file to Botou

打开博图软件，选择项目视图，点击选项>管理通用站描述文件（GSD）(D)。
Open the chart software, select the project view, and click options > manage general station description file (GSD) (D) .



在源路径中选择放置之前准备 **GSDML** 的文件夹，完成后点击选择文件夹，博图将自动扫描该文件夹下的 **GSDML** 文件。

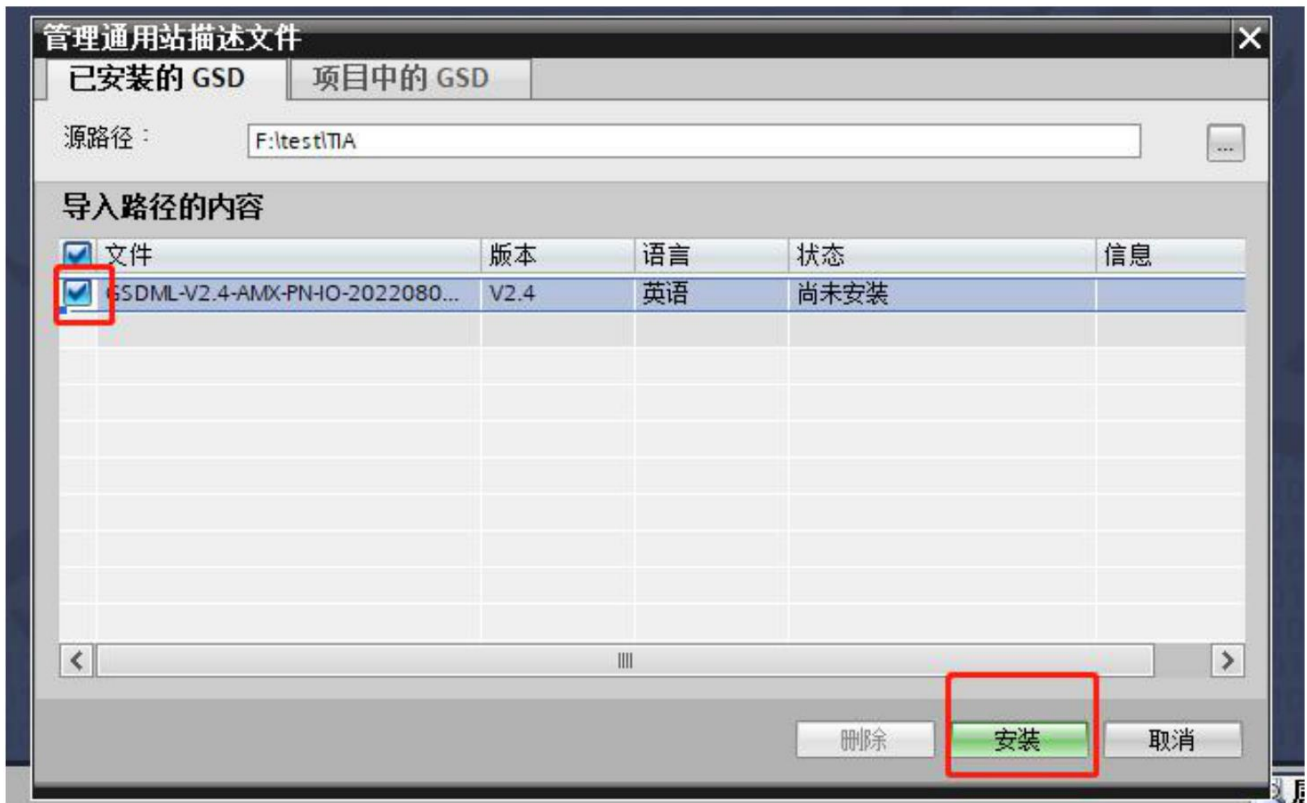
Select the folder where you prepared GSDML before placing it in the source path. Click on the select folder when you are finished, and the blog image will automatically scan the GSDML files under that folder.



点击要安装的 GSDML 文件左侧，勾选文件，后点击安装，即可安装好相应的 GSDML 文
Click the GSDML file to install the left, check the file, and then Click Install,
you can install the corresponding GSDML text

件。
Conditions.





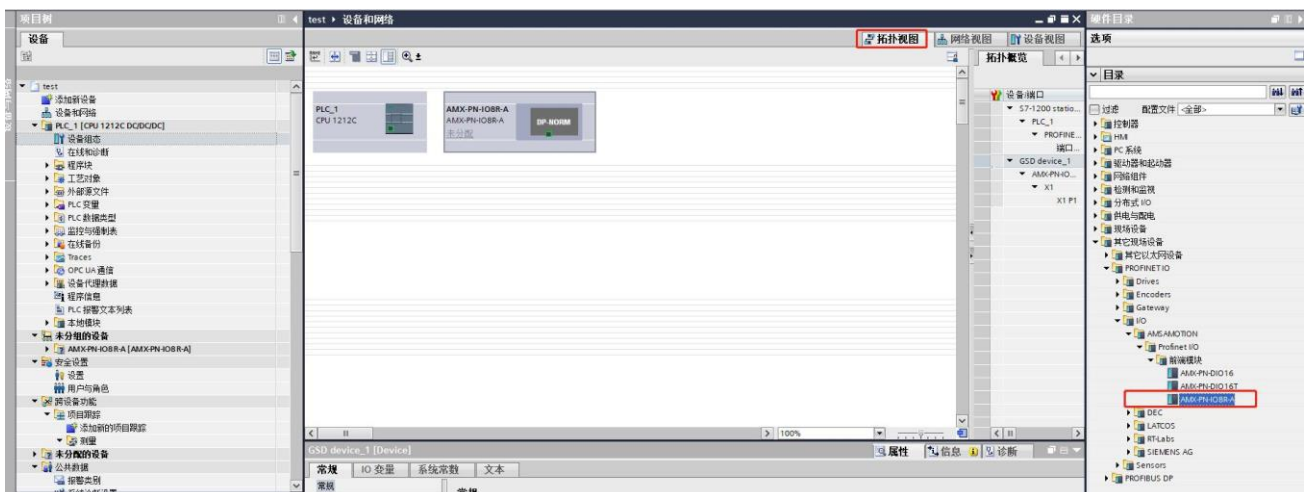
安装完成后点击关闭，GSDML 文件安装成功。

When the installation is complete, click close and the GSDML file is installed successfully.

3.3、项目添加 PROFINET 设备 3.3. The project adds the PROFINET device

新建或者打开项目，如果是新建项目，先添加控制器设备，然后再设备组态界面，添加相应 IO 模块，如下图：

New or open project, if it is a new project, first add controller device, and then device configuration interface, add the corresponding IO module, as follows:

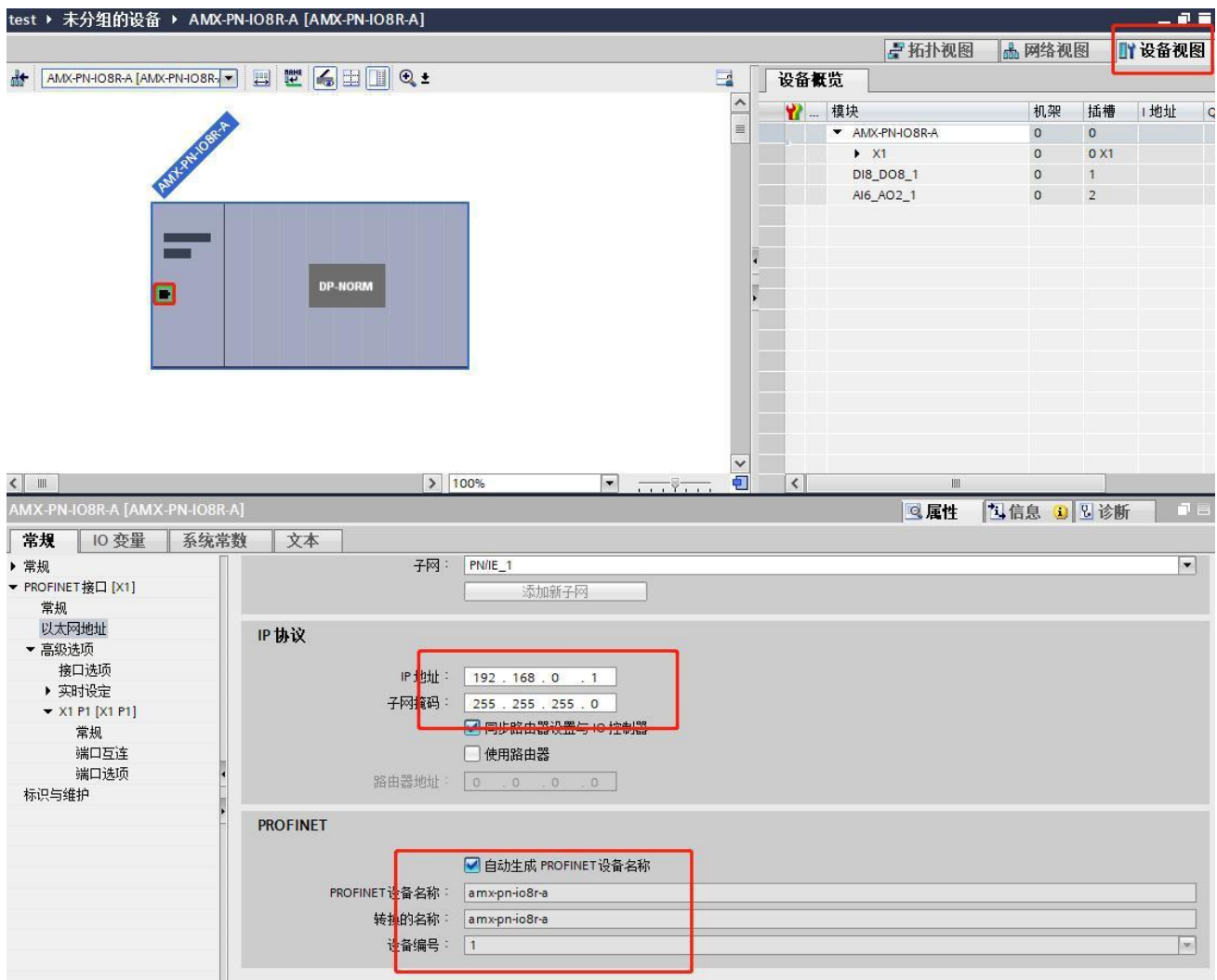


在设备视图中选中刚添加的设备，双击图中模块，完成后修改常规中以太网地址选项卡，修改 IP 地址和设备名称，和模块本身保持一致。

Select the device you just added in the device view, double-click the module in the diagram, and when you're done, change the General Ethernet address tab and change the IP address and device name to match the module itself.

注意：此时设置的 IP 地址和设备名称保持一致，如果不清楚设备 IP 地址和设备名称，可以先随意设置，后将模块的 IP 地址和设备名称更改一致即可，修改模块的 IP 地址和设备名称请参照 4.5 节“博图修改模块名称和模块 IP 地址”。

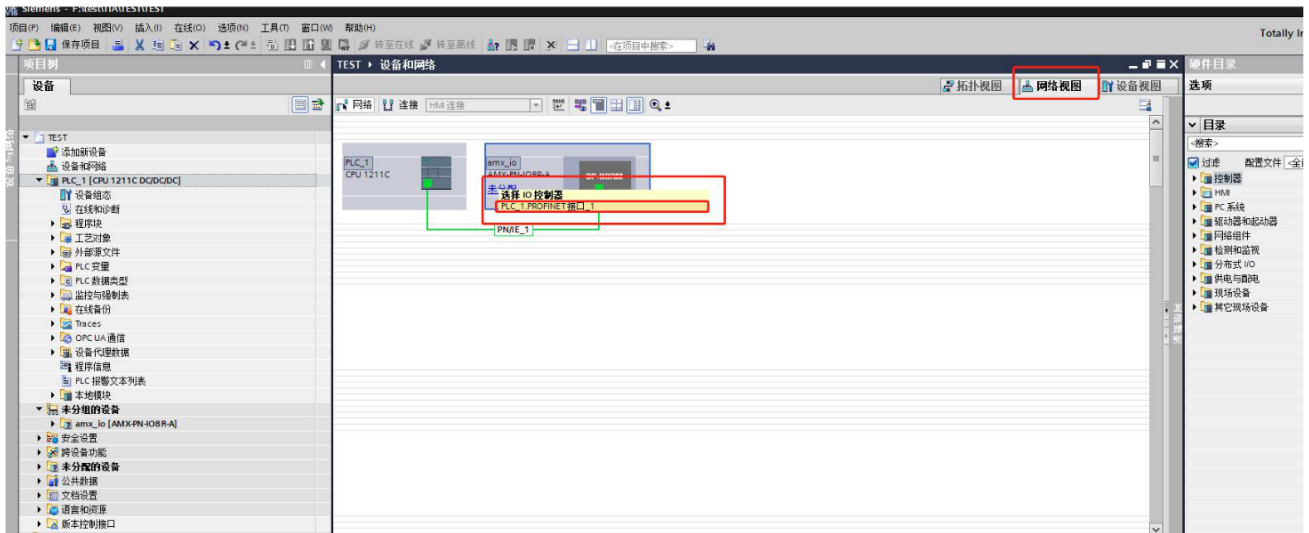
Note: At this point set the IP address and device name consistent, if you do not know the device IP address and device name, you can first set at will, after the module's IP address and device name change consistent can, please refer to section 4.5, "Botu modify module name and module IP address" for modifying module IP address and device name.



在网络视图中见添加的模块分配到 PLC 中：

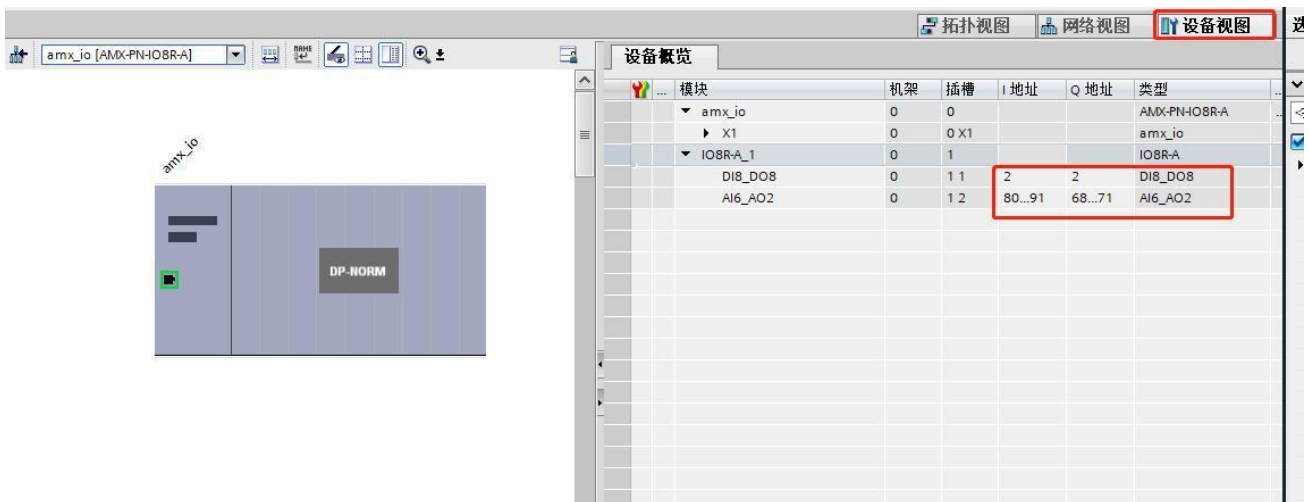
In the network view see the added module assigned to the PLC:

PN-IO8R-A 使用手册



完成后查看一下导入的地址表

When you are finished, take a look at the imported address table





3.4、使用 PROFINET 设备

3.4. Use the PROFINET device

通过 PROFINET 的向导，可以看到分配各子模块的地址和长度：
Through the PROFINET wizard, you can see the addresses and lengths assigned to each submodule:

数字量输入地址 2 一个字节，数字量输出 2 一个字节，表示 8 个数字量输出、8 个数字量输入。

Numerical input address 2 a byte, numerical output 2 a byte, representing 8 numeral output, 8 numeral input.

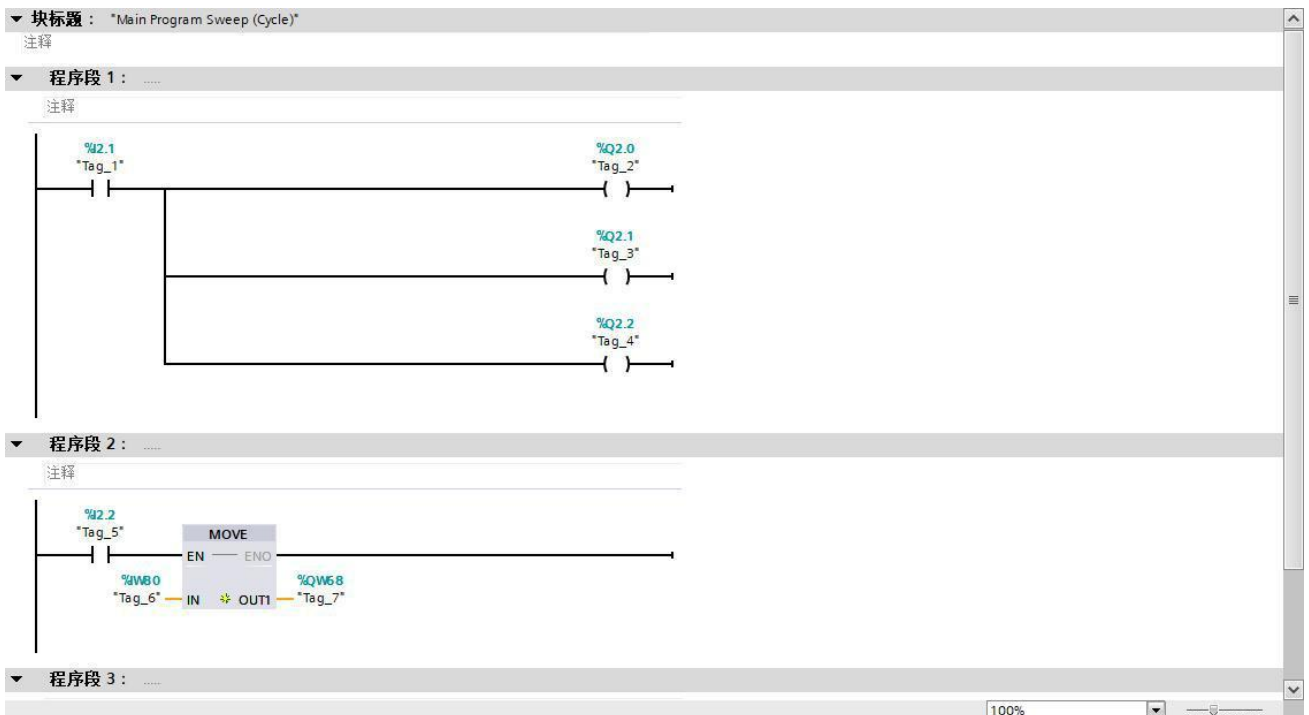
模拟量输入地址从 80 到 91 共 12 个字节，模拟量输出地址从 68 到 71 共 4 个字节，表
Analog input address from 80 to 91 total 12 bytes, analog output address from 68 to 71 total 4 bytes, table

示 6 路模拟量输入、2 路模拟量输出，每路模拟量占用 2 个字节。

编写 PLC 程序来使用这些 IO 单元：

6-way analog input, 2-way analog output, each analog takes 2

bytes. Write a PLC program to use these IO units:



示例程序当数字量 DI1 输入“1”时，输出数字量 DO0~DO2 输出“1”；当数字量 DI2 输入“1”时，模拟量输出 AI0 的值等于模拟量输入 AI0 的值。编写完成后点击编译下载即可进行测试调试。

Example program when the digital quantity DI1 input “1”, the output digital quantity DO0 ~ DO2 output “1”; when the digital quantity DI2 input “1”, analog quantity output AI0 value is equal to analog quantity input AI0 value. After the completion of writing click on the compile download can be tested and debugged.

3.5、使用博图修改模块名称和 IP 地址

3.5. Modify the module name and IP address using a BOTU

打开博图软件，选择进入项目视图。

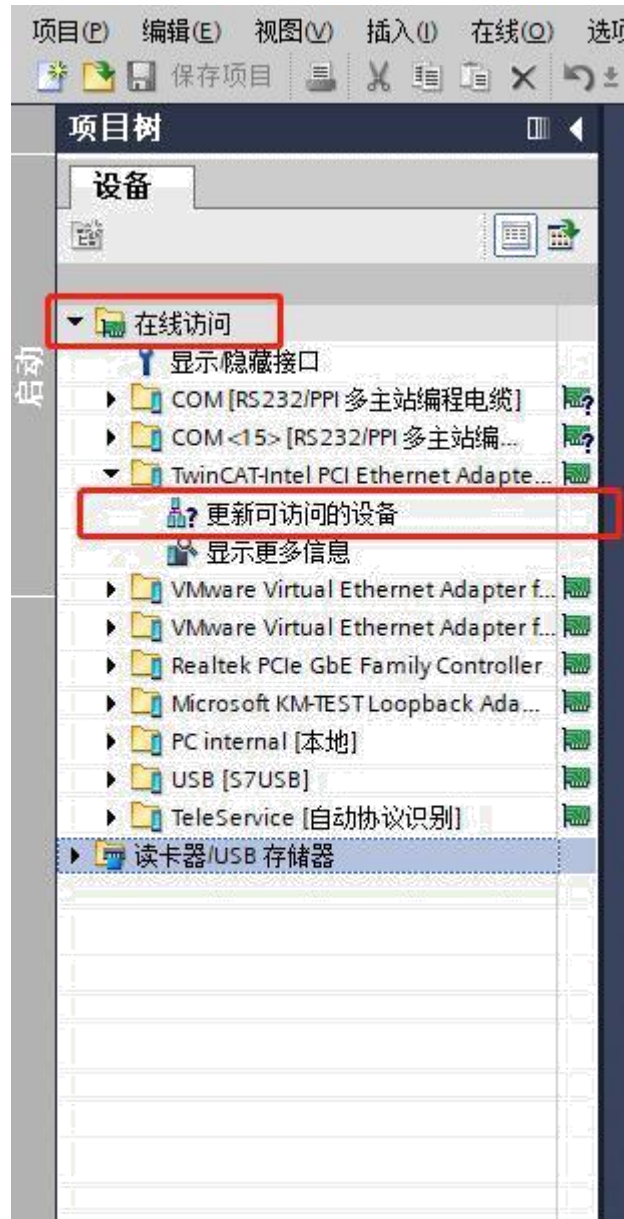
Open the chart software and select enter the project view.



展开在线访问，选中连接的和模块连接的网卡，展开后双击更新可访问的设备。

Expand online access, select the connected and module connected network card, expand and double-click to update the accessible device.

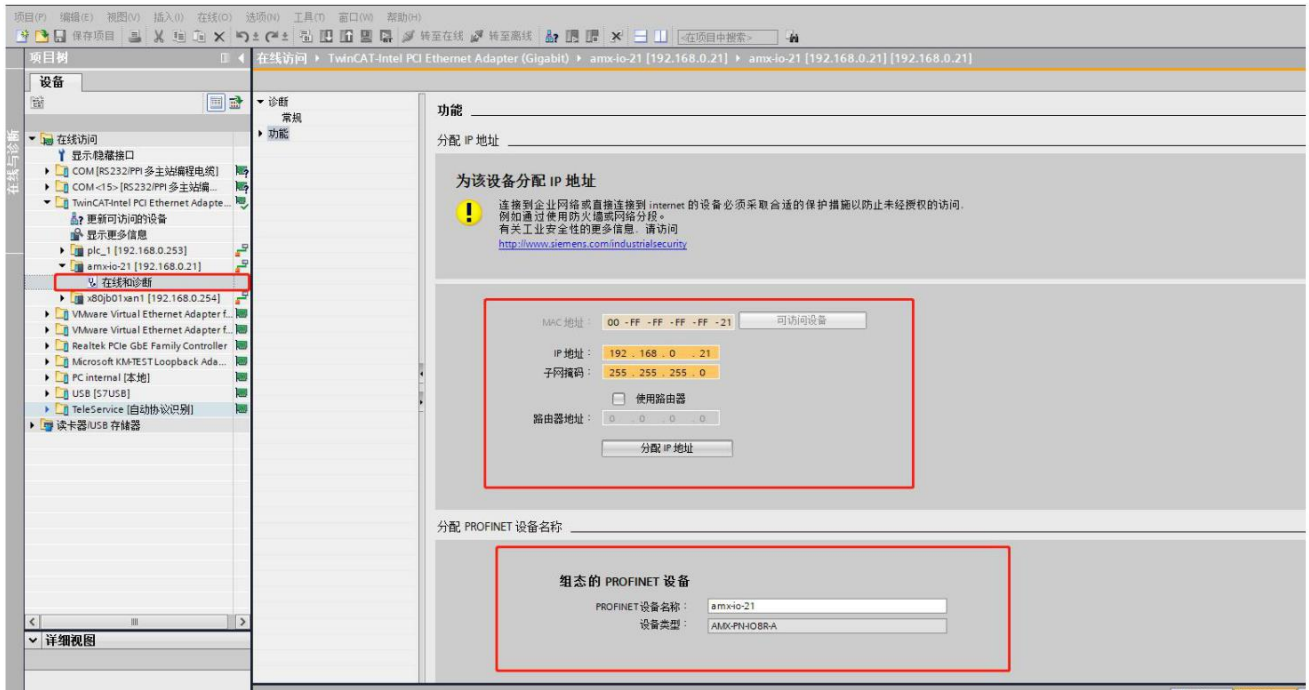
PN-IO8R-A 使用手册



如下图，更新出来该网卡连接了一个模组，一个 PLC 和一个交换机。点击要修改的模块，展开，双击在线和诊断，在弹出的界面中即可修改 IP 和模块名称。

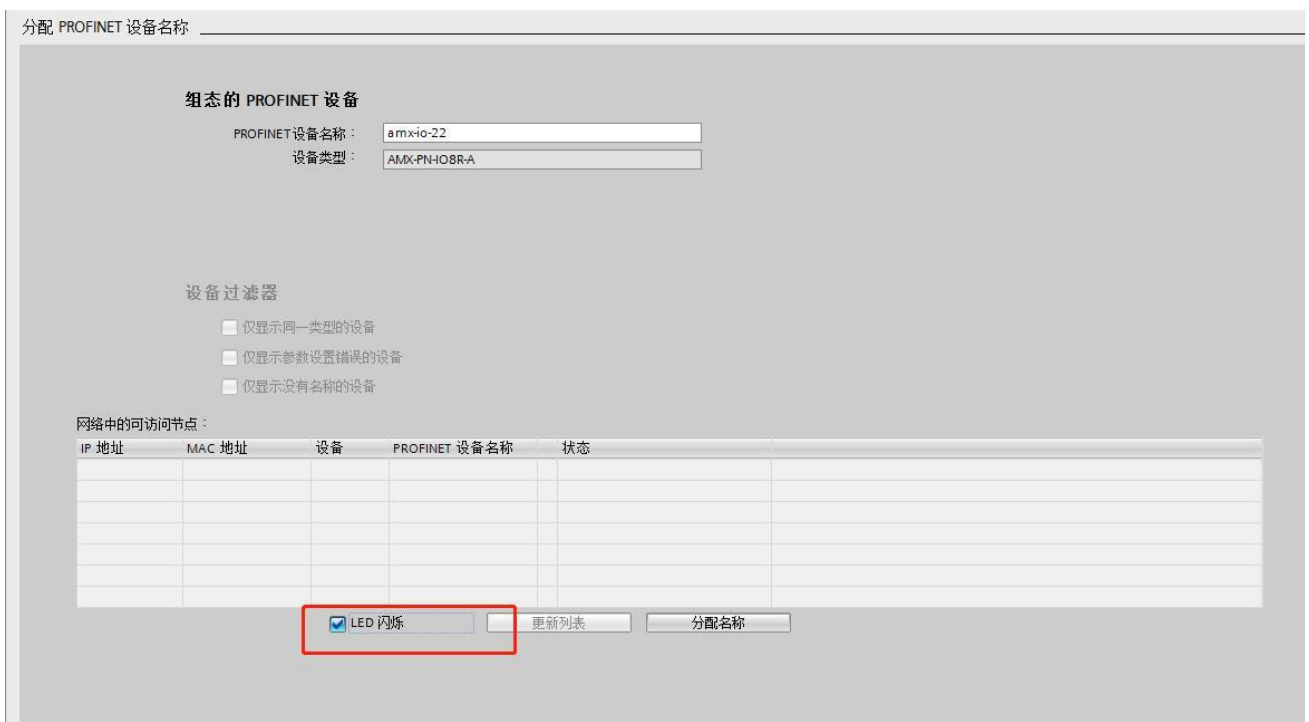
The following diagram, updated out of the network card connected to a module, a PLC and a switch. Click on the module to modify, expand, double-click on-line and diagnosis, in the pop-up interface to modify the IP and module name.

PN-IO8R-A 使用手册



当有多个模块不知道修改哪一个时，可以点击下图所示 LED 闪烁，此时模块上 LED 红色指示灯将开始闪烁。名称或 IP 修改好后点击分配名称和分配 IP 地址，将会更新模块名称和 IP 地址。

When there are multiple modules do not know which to modify, you can click on the following picture LED flashing, when the module LED red indicator will start flashing. The module name and IP address will be updated by clicking on the assigned name and assigned IP address after the name or IP has been modified.



重新双击左边栏的更新可访问设备，等待更新完成，后选中刚刚修改的模块站名和 IP，展开，双击在线和诊断。此时可以看到模块 IP 和站名已经更新。

Double-click the update accessible device in the left sidebar again, wait for the update to complete, then select the module name and IP that you just modified, expand, double-click online and diagnose. You can see that the module IP and station name have been updated.

The screenshot displays the Siemens TIA Portal interface for configuring a device. The breadcrumb path at the top reads: 在线访问 > TwinCAT-Intel PCI Ethernet Adapter (Gigabit) > amx-io-22 [192.168.0.22] > amx-io-22 [192.168.0.22] [192.168.0.22].

项目树 (Project Tree): Shows the device hierarchy. The '在线和诊断' (Online and Diagnostics) folder is highlighted with a red box.

功能 (Function): The '分配 IP 地址' (Assign IP Address) function is selected.

为该设备分配 IP 地址 (Assign IP Address for this device): A warning icon indicates that devices connected to the internet must have security measures. The configuration fields are as follows:

- MAC 地址: 00-FF-FF-FF-FF-21 (with a '可访问设备' button)
- IP 地址: 192.168.0.22
- 子网掩码: 255.255.255.0
- 使用路由器 (Use Router)
- 路由器地址: 192.168.0.22

分配 PROFINET 设备名称 (Assign PROFINET Device Name): The configuration fields are:

- PROFINET 设备名称: amx-io-22
- 设备类型: AMD-PN-H08RA

