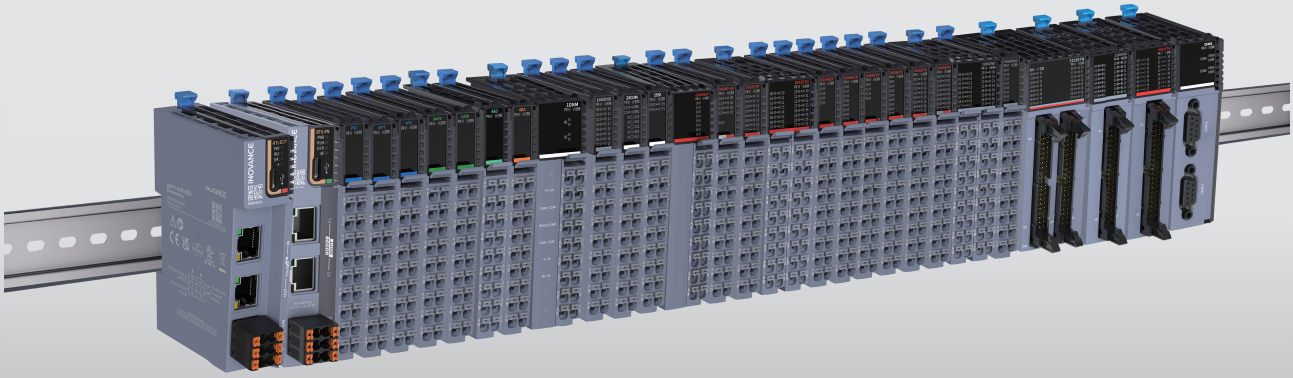
INOVANCE

Advancing industrial technology,
for a better world



GL20-INT Series Module

System Guide

Industrial Automation | New Energy Vehicle | Intelligent Elevator | Intelligent Robot | Digital Energy | Rail Transit

Data code PS00022193A00

Legal Information

Copyright

Copyright © 2026 Shenzhen Inovance Technology Co., Ltd. All rights reserved.

This documentation is the exclusive property of Shenzhen Inovance Technology Co., Ltd. No individual or entity may excerpt, reproduce, modify, translate, or distribute any content herein without written consent from Inovance.

Legal action will be taken against infringement.

Trademarks

INOVANCE is a registered trademark of Shenzhen Inovance Technology Co., Ltd. and its affiliates. All other trademarks or registered trademarks mentioned in this documentation are the property of their respective owners. Unauthorized use of these trademarks by third parties for any purpose without written authorization could violate the rights of their owners.

Disclaimer of Liability

Due to continuous updates and improvements of products and technologies, the content of this documentation may not fully match the actual products. In the event of any discrepancies, the actual products shall prevail.

The contents are subject to change without notice due to product upgrade.

Waste Disposal

The storage, use, and disposal of this product (including optional accessories) must comply with local laws and regulations.

Qualified Personnel

The product/system described in this documentation may be operated only by personnel qualified for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel can identify the risks of the product/system and prevent possible dangers.

Proper Use of the Product

Proper transportation, storage, assembly, installation, commissioning, operation, and maintenance are required to ensure the safe operation of the product without any problems. The required ambient conditions must be met. All operations must follow the guidelines provided in this documentation.

Preface

Introduction

This guide covers all scenarios of system use, including system introduction, installation, power supply system design, wiring, bus introduction, configuration and commissioning, troubleshooting, and maintenance.

Note

- The drawings in the user guide are shown for demonstration only, which may not match the product purchased.
- The user guide is subject to change without notice due to product upgrade, specification modifications as well as efforts to improve the accuracy and convenience of the user guide.

Documentation Guide

The product documentation package consists of an equipment guide and a system guide, enabling users to quickly access the information they need.

- Equipment guide: Contains a brief description of module properties, including model, components, technical specifications, and terminal wiring diagrams.
- System guide: Covers all typical application scenarios of the system, providing detailed system overview, installation, wiring, commissioning, and troubleshooting.

Standards compliance

The following table lists the certifications, directives, and standards that the product may comply with. For details about the acquired certificates, see the certification marks on the product nameplate.

Certification	Directive		Standards compliance
CE certification	EMC directive	2014/30/EU	**24 VDC products:** EN 61131-2 **220 VAC products:** EN 61131-2 EN 61000-3-2 EN 61000-3-3
	LVD directive	2014/35/EU	EN 61010-1 EN 61010-2-201
	RoHS directive	2011/65/EU amended by (EU) 2015/863	EN IEC 63000
UL/cUL certification	-		UL 61010-1 UL 61010-2-201 CAN/CSA-C22.2 No. 61010-1 CSA C22.2 NO. 61010-2-201
KCC certification	-		-
EAC certification	-		-

Certification	Directive		Standards compliance
UKCA certification	Safety regulations	Electrical Equipment (Safety) Regulations 2016	EN 61010-1 EN 61010-2-201
	EMC regulations	Electromagnetic Compatibility Regulations 2016	**24 VDC products:** EN 61131-2 **220 VAC products:** EN 61131-2 EN 61000-3-2 EN 61000-3-3
	RoHS regulations	Directive (RoHS) Regulations 2012	EN IEC 63000
TUV certification	-		ISO 13849-1 ISO 13849-2 IEC 62061 IEC 61508 IEC 61131-6

More documents

Name	Data code	Description
GL20-INT Series Module Guide Collection	xxx	Contains the GL20-INT series system guide and equipment guides of each module.
GL20-INT Series Module Equipment Guide	-	Introduces module properties, including model, components, technical specifications, and terminal wiring diagrams.
GL20-INT Series Module System Guide (This guide)	PS00022010	Covers all typical application scenarios of the system, providing detailed description of system overview, installation, wiring, commissioning, and troubleshooting.

The videos of the GL20-INT series cover product introduction, installation and removal, wiring, and commissioning (firmware upgrade and basic commissioning).

- For product introduction, see *https://zshcapp.dataserver.cn/h5/share/video/92e18606d63d11f0a96008c0ebc50f06*.
- For installation and removal, see *https://zshcapp.dataserver.cn/h5/share/video/a383a983d63d11f0a96008c0ebc50f06*.
- For wiring, see *https://zshcapp.dataserver.cn/h5/share/video/b16604bfd63d11f0a96008c0ebc50f06*.
- For firmware upgrade, see *https://zshcapp.dataserver.cn/h5/share/video/bf4c6b28d63d11f0a96008c0ebc50f06*.
- For simple commissioning, see *https://zshcapp.dataserver.cn/h5/share/video/ca54cf02d63d11f0a96008c0ebc50f06*.

Revision history

Date	Version	Description
2026-02	A00	First release.

Access to the guide

This guide is not delivered with the product. You can download the PDF version in the following ways:

- Visit https://www.inovance.com/global, and choose Service&Support > Support > Documentation Download.
- Scan the QR code on the product with your smartphone.
- Scan the QR code below to install My Inovance app, where you can search for and download the guide.



Warranty disclaimer

Inovance provides warranty service within the warranty period (as specified in your order) for any fault or damage that is not caused by improper operation of the user. Maintenance fees will be charged after the warranty period expires.

Within the warranty period, maintenance fee will be charged for the following damage:

- Damage caused by operations not following the instructions in the user guide
- Damage caused by fire, flood, or abnormal voltage
- Damage caused by using the product for unintended functions
- Damage caused by using the product outside the specified scope
- Damage or secondary damage caused by force majeure (natural disaster, earthquake, and lightning strike)

The maintenance fee will be charged according to the latest Price List of Inovance. If otherwise agreed upon, the terms and conditions in the agreement shall prevail.

For details, see the Warranty Card.

Table of Contents

Legal Information 1

Preface 1

1 Fundamental Safety Instructions 13

1.1 General Safety Instructions 13

1.2 Industrial Information Security 18

2 System Introduction 20

2.1 Overview 20

2.2 System Features 20

2.3 Components 20

3 Power Supply System Design 31

3.1 Introduction 31

3.1.1 Power Supply System and Type 31

3.1.2 GL20-PS2 Relay Power Module 32

3.2 Backplane Bus Power System Design 32

3.2.1 Procedure 32

3.2.2 Design Example 33

3.3 I/O Power Supply System Design 35

3.4 External Power Supply and Protective Device Selection 36

3.4.1 Backplane Bus Power Supply Selection 36

3.4.2 I/O Power Supply Selection 36

3.4.3 Protective Device Selection 37

4 Installation 38

4.1 安装前了解 38

4.1.1 Introduction 38

4.1.2 Installation Method 38

4.1.3 Installation Clearance 39

4.1.4 Installation Precautions 41

4.2 Preparations Before Installation 42

4.3 安装过程 43

4.3.1 Installation of DIN Rail 43

4.3.2 Installation of Communication Interface Module 43

4.3.3 Installation of I/O Expansion Module 44

4.3.4 Installing the End Cover 45

4.3.5 Installation of End Plate 46
4.4 Inspection After Installation 47
5 Wiring 48
5.1 接线前了解 48
5.1.1 Introduction 48
5.1.2 Basic EMC Information 48
5.1.3 Cable Routing Requirements 51
5.1.4 Grounding Requirements for Shielded Cables 54
5.1.5 Equipotential Grounding Requirements 54
5.1.6 Lightning and Overvoltage Protection 56
5.2 Communication Cable Connection 56
5.2.1 Wiring Precautions 56
5.2.2 Preparation Before Wiring 57
5.2.3 Cable Connection/Disconnection 58
5.3 Power Supply and Grounding Wire Connection 58
5.3.1 Wiring Precautions 58
5.3.2 Preparation Before Wiring 59
5.3.3 Cable Connection/Disconnection 59
5.4 USB Cable Connection 60
5.5 PUSH IN Cable Connection 61
5.6 Terminal Block Connection 62
6 Introduction to Bus 65
6.1 Introduction to EtherCAT Bus 65
6.1.1 Introduction 65
6.1.2 EtherCAT Communication Types 66
6.1.3 EtherCAT Communication 67
6.1.3.1 CAN Application Protocol Structure Based on EtherCAT (CoE) 67
6.1.3.2 EtherCAT Device Description File (ESI File) 68
6.1.3.3 EtherCAT Communication State Transition 69
6.1.3.4 Process Data Object (PDO) 70
6.1.3.5 Service Data Object (SDO) 71
6.1.3.6 Communication Between EtherCAT Master and Slave 72
6.1.3.7 EtherCAT Slave Addressing 72
6.1.3.8 Introduction to Network Devices 73
6.1.3.9 Typical Network Topology 74
6.2 Introduction to EtherNet/IP Bus 76

6.2.1 Introduction 76
6.2.2 Communication Specifications 77
6.2.3 Typical Network Topology 77
6.3 Introduction to PROFINET Bus 79
6.3.1 Introduction 79
6.3.2 Communication Specifications 82
6.3.3 Typical Topology 82
7 组态调试 85
7.1 GL20-RTU-ECT32 85
7.1.1 Compatibility with Inovance AutoShop 85
7.1.1.1 Configuration 85
7.1.1.2 Commissioning 90
7.1.2 Compatibility with Inovance InoProShop 92
7.1.2.1 Configuration 92
7.1.2.2 Commissioning 99
7.1.3 Compatibility with Inovance iFA Evolution 99
7.1.4 Compatibility with Omron Sysmac Studio 102
7.1.4.1 Configuration 102
7.1.4.2 Commissioning 116
7.1.5 Compatibility with Beckhoff TwinCAT 117
7.1.5.1 Configuration 117
7.1.5.2 Commissioning 131
7.2 GL20-RTU-EIP 133
7.2.1 Compatibility with Inovance AutoShop 133
7.2.2 Compatibility with Inovance InoProShop 139
7.2.3 Compatibility with Inovance iFA Evolution 146
7.2.4 Compatibility with Omron Sysmac Studio 149
7.2.5 Compatibility with Rockwell Studio5000 156
7.2.6 Compatibility with Keyence KV STUDIO 157
7.3 GL20-RTU-PN 159
7.3.1 Compatibility with Siemens TIA Portal 159
7.3.2 Compatibility with Siemens STEP7 MicroWIN 167
7.3.3 Compatibility with Siemens STEP7 170
7.3.4 Compatibility with Siemens SIMOTION SCOUT 175
7.3.5 Precautions 180
8 Troubleshooting 183
8.1 Introduction 183

8.2 故障诊断方式 183
8.2.1 Diagnostics via LEDs 183
8.2.1.1 GL20-RTU-ECT32 183
8.2.1.2 GL20-RTU-PN 185
8.2.1.3 GL20-RTU-EIP 187
8.2.2 Troubleshooting via Programming Software 188
8.2.2.1 Troubleshooting via Inovance AutoShop 188
8.2.2.2 Troubleshooting via Inovance InoProShop 190
8.2.2.3 Troubleshooting via Omron Sysmac Studio 194
8.2.2.4 Troubleshooting via Beckhoff TwinCAT 197
8.2.2.5 Troubleshooting via Siemens TIA Portal 198
8.2.2.6 Troubleshooting via Inovance IOManager 199
8.2.2.7 Troubleshooting via Inovance iFA Evolution 202
8.3 Fault Levels 202
8.4 Troubleshooting Procedure 202
8.5 Common Faults for ECT32 Module 203
8.5.1 How to Handle Frame Loss/Communication Disconnection 203
8.5.2 How to Solve the Absence of Analog Input Data 207
8.5.3 How to Solve Jitter in Analog Input Data 210
8.5.4 How to Solve Non-Operating Expansion Modules 211
9 Maintenance 214
9.1 Cleaning and Routine Inspection 214
9.1.1 Cleaning 214
9.1.2 Routine Inspection 214
9.2 Component Replacement 216
9.2.1 Communication Interface Module Replacement 216
9.2.2 Expansion Module Replacement 216
9.2.3 Power Terminal Replacement 217
9.2.4 End Cover Replacement 218
9.2.5 Push IN Terminal Block Replacement 218
9.3 固件升级 220
9.3.1 Introduction 220
9.3.2 Communication Interface Module Firmware Upgrade 221
9.3.2.1 Upgrade via InoProShop 221
9.3.2.2 Upgrade via InoEtnLoader 226
9.3.2.3 Upgrade via IOManager 226
10 Appendix 230

10.1 Dimension Diagram 230
10.2 Version Matching Information 239
10.2.1 GL20-RTU-ECT32 239
10.2.2 GL20-RTU-EIP 242
10.2.3 GL20-RTU-PN 246
10.2.4 IOManager 251
10.2.4.1 Communication Interface Module Versions 251
10.2.4.2 Applicable I/O Expansion Module Versions 251
10.3 Configuration Parameters 252
10.3.1 GL20-RTU-ECT32 252
10.3.1.1 GL20-0004ER 252
10.3.1.2 GL20-0004ETP-2A 253
10.3.1.3 GL20-0404ETP-5V 254
10.3.1.4 GL20-0008ETN/GL20-0008ETP/GL20-0008ER 255
10.3.1.5 GL20-0800END 256
10.3.1.6 GL20-0808ETN 257
10.3.1.7 GL20-1600END 258
10.3.1.8 GL20-0016ETP/GL20-0016ETN 259
10.3.1.9 GL20-0032ETN/GL20-0032ETN-M 260
10.3.1.10 GL20-3200END/GL20-3200END-M 261
10.3.1.11 GL20-3232ETN-M 262
10.3.1.12 GL20-4AD 263
10.3.1.13 GL20-4DA 266
10.3.1.14 GL20-8ADI 268
10.3.1.15 GL20-8ADV 271
10.3.1.16 GL20-8DAI 273
10.3.1.17 GL20-8DAV 275
10.3.1.18 GL20-4PT 278
10.3.1.19 GL20-4TC 281
10.3.1.20 GL20-2HC 285
10.3.1.21 GL20-2SSI 290
10.3.1.22 GL20-2SCOM 292
10.3.1.23 GL20-2SCOM-MDB 294
10.3.1.24 GL20-2S485 296
10.3.1.25 GL20-2S485-MDB 300
10.3.1.26 GL20-1DNM 302
10.3.2 GL20-RTU-EIP 304
10.3.2.1 GL20-0004ER 304
10.3.2.2 GL20-0004ETP-2A 305

10.3.2.3 GL20-0404ETP-5V....305
10.3.2.4 GL20-0008ER....306
10.3.2.5 GL20-0008ETP....307
10.3.2.6 GL20-0008ETN....308
10.3.2.7 GL20-0800END....309
10.3.2.8 GL20-0808ETN....309
10.3.2.9 GL20-0016ETN....310
10.3.2.10 GL20-0016ETP....311
10.3.2.11 GL20-1600END....312
10.3.2.12 GL20-0032ETN/GL20-0032ETN-M....312
10.3.2.13 GL20-3200END/GL20-3200END-M....313
10.3.2.14 GL20-3232ETN-M....314
10.3.2.15 GL20-4AD....315
10.3.2.16 GL20-4DA....317
10.3.2.17 GL20-8ADI....318
10.3.2.18 GL20-8ADV....318
10.3.2.19 GL20-8DAI....319
10.3.2.20 GL20-8DAV....320
10.3.2.21 GL20-2HC....321
10.3.2.22 GL20-2SSI....327
10.3.2.23 GL20-4PT....328
10.3.2.24 GL20-4TC....330
10.3.3 GL20-RTU-PN....331
10.3.3.1 GL20-0004ER....331
10.3.3.2 GL20-0004ETP-2A....332
10.3.3.3 GL20-0404ETP-5V....333
10.3.3.4 GL20-0008ER....334
10.3.3.5 GL20-0008ETN....335
10.3.3.6 GL20-0008ETP....335
10.3.3.7 GL20-0800END....336
10.3.3.8 GL20-0808ETN....336
10.3.3.9 GL20-0016ETP....337
10.3.3.10 GL20-0016ETN....338
10.3.3.11 GL20-1600END....338
10.3.3.12 GL20-0032ETN/GL20-0032ETN-M....339
10.3.3.13 GL20-3200END/GL20-3200END-M....340
10.3.3.14 GL20-3232ETN-M....340
10.3.3.15 GL20-4AD....341
10.3.3.16 GL20-4DA....342

10.3.3.17 GL20-8ADI 344
10.3.3.18 GL20-8ADV 345
10.3.3.19 GL20-8DAI 346
10.3.3.20 GL20-8DAV 347
10.3.3.21 GL20-4PT 348
10.3.3.22 GL20-4TC 349
10.3.3.23 GL20-2HC 351
10.3.3.24 GL20-2SSI 355
10.3.3.25 GL20-2SCOM-MDB 356
10.3.3.26 GL20-2S485-MDB 358
10.4 Process Data Reference 359
10.4.1 GL20-RTU-ECT32 359
10.4.1.1 GL20-0004ER 359
10.4.1.2 GL20-0004ETP-2A 361
10.4.1.3 GL20-0404ETP-5V 362
10.4.1.4 GL20-0008ETN/GL20-0008ETP/GL20-0008ER 364
10.4.1.5 GL20-0800END 365
10.4.1.6 GL20-0808ETN 367
10.4.1.7 GL20-1600END 369
10.4.1.8 GL20-0016ETP/GL20-0016ETN 370
10.4.1.9 GL20-0016ETP/GL20-0016ETN 371
10.4.1.10 GL20-0032ETN/GL20-0032ETN-M 372
10.4.1.11 GL20-3200END/GL20-3200END-M 374
10.4.1.12 GL20-3232ETN-M 376
10.4.1.13 GL20-4AD 378
10.4.1.14 GL20-4DA 379
10.4.1.15 GL20-8ADI 380
10.4.1.16 GL20-8ADV 382
10.4.1.17 GL20-8DAI 383
10.4.1.18 GL20-8DAV 384
10.4.1.19 GL20-4PT 385
10.4.1.20 GL20-4TC 386
10.4.1.21 GL20-2HC 387
10.4.1.22 GL20-2SSI 391
10.4.1.23 GL20-2SCOM 392
10.4.1.24 GL20-2SCOM-MDB 395
10.4.1.25 GL20-2S485 399
10.4.1.26 GL20-2S485-MDB 402
10.4.1.27 GL20-1DNM 407

10.4.1.28 GL20-PS2 407
10.4.2 GL20-RTU-EIP 407
10.4.2.1 GL20-RTU-EIP 407
10.4.2.2 GL20-0004ER 408
10.4.2.3 GL20-0004ETP-2A 408
10.4.2.4 GL20-0404ETP-5V 409
10.4.2.5 GL20-0008ER 409
10.4.2.6 GL20-0008ETP 410
10.4.2.7 GL20-0008ETN 410
10.4.2.8 GL20-0800END 411
10.4.2.9 GL20-0808ETN 411
10.4.2.10 GL20-0016ETP 412
10.4.2.11 GL20-0016ETN 413
10.4.2.12 GL20-1600END 413
10.4.2.13 GL20-0032ETN/GL20-0032ETN-M 414
10.4.2.14 GL20-3200END/GL20-3200END-M 415
10.4.2.15 GL20-3232ETN-M 416
10.4.2.16 GL20-4AD 417
10.4.2.17 GL20-4DA 417
10.4.2.18 GL20-8ADI 418
10.4.2.19 GL20-8ADV 418
10.4.2.20 GL20-8DAI 419
10.4.2.21 GL20-8DAV 419
10.4.2.22 GL20-4PT 419
10.4.2.23 GL20-4TC 420
10.4.2.24 GL20-2HC 420
10.4.2.25 GL20-2SSI 421
10.4.3 GL20-RTU-PN 422
10.4.3.1 GL20-0004ER 422
10.4.3.2 GL20-0004ETP-2A 422
10.4.3.3 GL20-0404ETP-5V 423
10.4.3.4 GL20-0008ER 423
10.4.3.5 GL20-0008ETN 423
10.4.3.6 GL20-0008ETP 424
10.4.3.7 GL20-0800END 424
10.4.3.8 GL20-0808ETN 424
10.4.3.9 GL20-0016ETP 425
10.4.3.10 GL20-0016ETN 425
10.4.3.11 GL20-1600END 425

10.4.3.12 GL20-0032ETN/GL20-0032ETN-M 426
10.4.3.13 GL20-3200END/GL20-3200END-M....426
10.4.3.14 GL20-3232ETN-M 427
10.4.3.15 GL20-4AD....427
10.4.3.16 GL20-4DA....428
10.4.3.17 GL20-8ADI 428
10.4.3.18 GL20-8ADV 429
10.4.3.19 GL20-8DAI 429
10.4.3.20 GL20-8DAV 430
10.4.3.21 GL20-4PT 431
10.4.3.22 GL20-4TC 431
10.4.3.23 GL20-2HC....432
10.4.3.24 GL20-2SSI....433
10.4.3.25 GL20-2S485-MDB....434
10.4.3.26 GL20-2SCOM-MDB....434
10.5 List of Fault Codes.... 434
10.5.1 Expansion Module Fault Codes 434
10.5.2 ECT32 Module Fault Codes 442
10.5.2.1 EtherCAT Application Layer Status Codes....442
10.5.2.2 SDO Communication Fault Codes....443
10.6 FAQ 444
10.6.1 How to Check if a Module is Online 444
10.6.2 How to Check if the Channel is Normal....447
10.6.3 How to View Module Firmware Version 452
10.6.3.1 View via InoProShop....452
10.6.3.2 View via IOManager 455
10.6.4 How to Set the Filter Time 456
Service and Support....458

1 Fundamental Safety Instructions

1.1 General Safety Instructions

Safety disclaimer

1. Read through the safety instructions before installing, operating, and servicing the equipment, and comply with these instructions.
2. To ensure personal and equipment safety, observe the notes indicated on the product labels and all the safety instructions in the user guide.
3. The "CAUTION", "WARNING", and "DANGER" are only supplements to the safety instructions.
4. Use this equipment according to the designated environment requirements. Damage caused by improper use is not covered by warranty.
5. Inovance shall take no responsibility for any personal injury or property damage caused by improper use.

Safety levels and definitions

	The "DANGER" sign indicates that failure to comply with the notice will result in severe personal injuries or even death.
	The "WARNING" sign indicates that failure to comply with the notice may result in severe personal injuries or even death.
	Indicates that failure to comply with the notice may result in minor or moderate personal injuries or equipment damage.

Unpacking

• Do not install the equipment if you find damage, rust, or signs of use on the equipment or accessories upon unpacking. • Do not install the equipment if you find water seepage or missing or damaged components upon unpacking. • Do not install the equipment if you find the packing list does not conform to the equipment you received.

• Check whether the packing is intact and whether there is damage, water seepage, dampness, and deformation before unpacking. • Unpack the package in accordance with the package sequence. Do not hit the package with force. • Check whether there is damage, rust, or scratches on the surface of the equipment and equipment accessories upon unpacking. • Check whether the package contents are consistent with the packing list after unpacking.

Storage and transportation

• Large-scale or heavy equipment must be transported by qualified professionals using specialized hoisting equipment. Failure to comply may result in personal injury or equipment damage. • Before hoisting the equipment, ensure the equipment components such as the front cover and terminal blocks are secured firmly with screws. Loosely-connected components may fall off and result in personal injuries or equipment damage. • Never stand or stay below the equipment when the equipment is being hoisted by the hoisting equipment. • When hoisting the equipment with a steel rope, ensure the equipment is hoisted at a constant speed without suffering from vibration or shock. Do not turn the equipment over or let the equipment stay hanging in the air. Failure to comply may result in personal injuries or equipment damage.

Storage and transportation

CAUTION

- Handle the equipment with care during transportation and mind your steps to prevent personal injuries or equipment damage.
- When carrying the equipment with bare hands, hold the equipment casing firmly with care to prevent parts from falling. Failure to comply may result in personal injuries.
- Store and transport the equipment based on the storage and transportation requirements. Failure to comply can result in equipment damage.
- Do not store or transport the drive in environments with water splash, rain, direct sunlight, strong electric field, strong magnetic field, and strong vibration.
- Do not store the drive for more than three months. Long-term storage requires stricter protection and necessary inspections.
- Pack the drive strictly before transportation. Use a sealed box for long-distance transportation.
- Never transport the drive with other device or materials that may harm or have negative impacts on the drive.

Design

DANGER

- Design a safety circuit and add an error handling program in the software to ensure the product remains in a safe state upon external power failure or product faults.
- Add an external fuse or circuit breaker because the module may smoke or catch fire due to long-time overcurrent caused by operation above rated current or load short-circuit.

WARNING

- When the output units such as relays or transistors in this product are damaged, the output may become uncontrollable and remain continuously ON or OFF.
- The product design must comply with the overvoltage category requirements specified in the environmental specifications. The power supply must have a system-level lightning protection device, assuring that overvoltage due to lightning shock cannot be applied to the power supply input terminals, signal input terminals, or output terminals, preventing equipment damage.
- Make sure that measures have been taken to avoid malfunction caused by the communication faults between the product and related equipment, preventing personal injury or equipment damage.

CAUTION

Do not create, on the touch screen of the HMI, switches that may result in personal injury of the operator or equipment damage . Use independent switches for performing critical operations. Failure to comply may result in accidents caused by wrong outputs or faults.

Installation

DANGER

The equipment must be operated only by professionals with electrical knowledge. Non-professionals are not allowed.

WARNING

Installation

- Read through the guide and safety instructions before installation.
- Do not install this equipment in places with strong electric or magnetic fields.
- Before installation, ensure that the mechanical strength of the installation site can bear the weight of the equipment. Failure to comply will result in mechanical hazards.
- Before installation, ensure that the installation environment meets the specifications. Failure to comply will result in product damage.
- Do not wear loose clothes or accessories during installation. Failure to comply may result in an electric shock.
- When installing the equipment in a closed environment (such as a cabinet or casing), use a cooling device (such as a fan or air conditioner) to cool the environment down to the required temperature. Failure to comply may result in equipment over-temperature or a fire.
- Do not retrofit the equipment.
- Do not fiddle with the bolts used to fix equipment components or the bolts marked in red.
- The equipment shall be installed in a cabinet or terminal device. Protection measures such as a fireproofing shell, electric protection shell, or mechanical protection shell must be provided for the cabinet or terminal device. The IP level must meet IEC standards and local laws and regulations.
- Before installing devices with strong electromagnetic interference, such as a transformer, install a shielding device for the equipment to prevent malfunction.
- Install the equipment onto an incombustible object such as a metal. Keep the equipment away from combustible objects. Failure to comply will result in a fire.
- For products not supporting hot swapping, disconnect all external power supplies of the system before installing/disassembling the product. Failure to comply may result in electric shock, module fault, or malfunction.

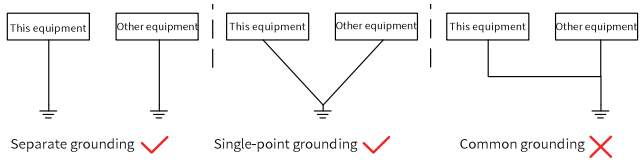
CAUTION

- Cover the top of the equipment with a piece of cloth or paper during installation. This is to prevent unwanted objects such as metal chippings, oil, and water from falling into the equipment and causing faults. After installation, remove the cloth or paper on the top of the equipment to prevent over-temperature caused by poor ventilation due to blocked ventilation holes.
- During installation, ensure the product is connected to the respective connector securely and hook the module firmly. Improper installation may result in malfunction, fault, or fall-off.

Wiring

DANGER

- The equipment must be operated only by professionals with electrical knowledge. Non-professionals are not allowed.
- Before wiring, cut off all the power supplies of the equipment. Wait for at least the time designated on the equipment warning label before further operations because residual voltage still exists after power-off. After waiting for the designated time, measure the DC voltage in the main circuit to ensure the DC voltage is within the safe voltage range. Failure to comply can result in an electric shock.
- Do not perform wiring, remove the equipment cover, or touch the circuit board with power on. Failure to comply can result in an electric shock.
- Check that the equipment is grounded properly. Failure to comply can result in electric shock. Separate grounding or single-point grounding, other than common grounding, is recommended.



- Perform good insulation on terminals so that insulation distance between cables will not reduce after cables are connected to terminals. Failure to comply may result in electric shock or damage to the equipment.
- Install the terminal cover attached to the product before power-on or operation after wiring is completed. Failure to comply may result in electric shock.

WARNING

Wiring

- Do not connect the input power supply to the output end of the equipment. Failure to comply will result in equipment damage or even a fire.
- Cables used for wiring must meet cross-sectional area and shielding requirements. The shield of the cable must be reliably grounded at one end.
- Fix the terminal screws with the tightening torque specified in the user guide. Improper tightening torque may overheat or damage the connecting part, resulting in a fire.
- After wiring is done, check that all cables are connected properly and no screws, washers or exposed cables are left inside the equipment. Failure to comply may result in electric shock or equipment damage.



- Follow the proper electrostatic discharge (ESD) procedure and wear an anti-static wrist strap to perform wiring. Failure to comply may result in damage to the equipment or to the internal circuit of the product.
- Use shielded twisted pairs for the control circuit. Connect the shield to the grounding terminal of the equipment for grounding purpose. Failure to comply will result in equipment malfunction.

Power-on



- The equipment must be operated only by professionals with electrical knowledge. Non-professionals are not allowed.
- Before power-on, check that the equipment is installed and wired properly.
- Check that the power supply meets equipment requirements before power-on to prevent equipment damage or a fire.
- After power-on, do not open the cabinet door or protective cover of the equipment, touch any terminal, or disassemble any unit or component of the equipment. Failure to comply may result in death or personal injury.



Perform a trial run after wiring to ensure the equipment operates safely. Failure to comply may result in personal injuries or equipment damage.

Operation



- The equipment must be operated only by professionals. Failure to comply will result in death or personal injury.
- Do not touch any connecting terminals or disassemble any unit or component of the equipment during operation. Failure to comply will result in an electric shock.



- Do not touch the equipment enclosure, fan, or resistor with bare hands. Failure to comply may result in personal injury.
- Prevent metal or other objects from falling into the equipment during operation. Failure to comply may result in a fire or equipment damage.
- During operation, do not bring live parts into contact with the metal enclosure of the product. Failure to comply may result in a fire or equipment damage.



Operation
• Operate the product strictly within the required environmental conditions. Failure to comply may result in equipment fault or damage. • Touch the HMI panel with hands only during use. Do not use tools to touch the HMI panel. Inovance assumes no responsibility for panel damage caused by excessive external force.
Safety recommendations • In the position where the operator directly touches the machinery part, for example, where a machinery tool is loaded/unloaded, or where a machine runs automatically, manually-operated devices or similar must be installed independently of the product to start or stop the automatic operation of the system. • If you need to modify the program while the system is running, use the lock function or other protective measures. Ensure that only authorized personnel can make the necessary modifications.

Battery usage
 • Do not use batteries that do not meet the product requirements. Failure to comply may result in death, personal injuries, explosion, or fire. • Do not throw batteries into a fire or heat oven. Do not crush or cut the battery. Failure to comply may result in death, personal injuries, explosion, or fire. • Do not expose the battery to extremely high temperatures. Failure to comply may result in death, personal injuries, explosion, or fire. • Do not swallow the battery to prevent the risk of chemical burns. • If a button battery is swallowed by accident, seek medical treatment immediately. Failure to comply may result in severe internal burns within two hours and could result in death.
 • Keep the battery away from children. • If the battery compartment is not shut tight, stop using the device and keep it away from children.

Maintenance
 • Maintenance and inspection must be carried out by personnel who have the necessary electrical training and experience. • Do not maintain the equipment with power ON. Failure to comply will result in an electric shock. • Before maintenance, cut off all the power supplies of the equipment and wait for at least the time designated on the equipment warning label. • Disconnect all external power supplies of the system before cleaning the product or re-tightening screws on the terminal block or screws of the connector. Failure to comply may result in electric shock. • Disconnect all external power supplies of the system before removing the product or connecting/removing wirings. Failure to comply may result in electric shock or malfunction.
 Perform routine and periodic inspection and maintenance on the equipment according to maintenance requirements and keep a maintenance record.

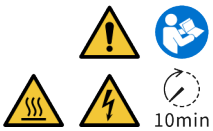
Repair
 • Product repair must be carried out by personnel who have the necessary electrical training and experience. • Do not repair the equipment with power ON. Failure to comply can result in an electric shock. • Before inspection and repair, cut off all the power supplies of the equipment and wait for at least the time designated on the equipment warning label.

Repair
WARNING • Submit the repair request according to the warranty agreement. • When the fuse is blown or the circuit breaker or earth leakage circuit breaker (ELCB) trips, wait as specified on the product warning sign before power-on or further operations. Failure to comply may result in personal injuries, equipment damage or even death. • When the equipment is faulty or damaged, require professionals to perform troubleshooting and repair by following repair instructions and keep a repair record. • Replace quick-wear parts of the equipment according to the replacement instructions. • Do not use damaged equipment. Failure to comply may result in death, personal injuries, or severe equipment damage. • After the equipment is replaced, check the wiring and set parameters again.

Disposal
WARNING • Dispose of retired equipment in accordance with local regulations and standards. Failure to comply may result in property damage, personal injury, or even death. • Recycle retired equipment by observing industry waste disposal standards to avoid environmental pollution. • Dispose of retired batteries as industrial waste according to local laws and regulations.

Safety label

For safe equipment operation and maintenance, comply with the safety labels on the equipment. Do not damage or remove the safety labels. The following table describes the meaning of the safety labels.

Safety label	Description
	• Read through the safety instructions before operating the equipment. Failure to comply may result in death, personal injuries, or equipment damage. • Do not touch the terminals or remove the cover with power ON or within 10 min after power-off. Failure to comply will result in an electric shock. • The surface of the product may become very hot during operation. Do not touch these hot areas, as this may cause burns!

1.2 Industrial Information Security

The product provides interfaces for network connection and data transmission. To protect factories, systems, machines, and networks from cyberattacks, it is essential to implement proper protection mechanism for industrial security.

Customers are responsible for providing and maintaining a secure connection between the product and their network or any other network to protect their factories, systems, machines, and networks from unauthorized access. Such systems or machines can be connected to an enterprise network or the Internet only when a secure connection is established and appropriate security measures (such as using antivirus software or installing firewalls) are in place.

Inovance continuously develops and improves its products and solutions to enhance safety. It is strongly recommended that you update the product promptly and always use the latest version.



Tampering with software (such as viruses, Trojans, and Worms) can lead to unsafe drive state, which can put the device in an unsafe operation state. This may result in death, serious injury, and property damage. Observe the following strictly.

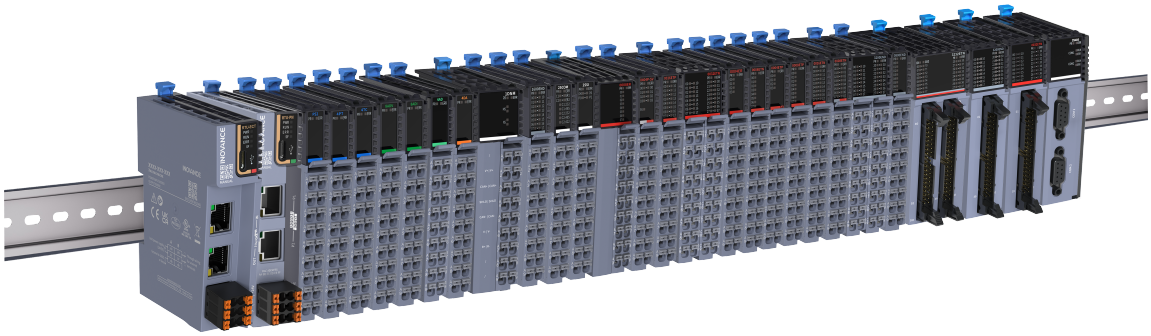
- Always use the latest software version. If the product version is no longer supported or the latest version of the program is not applied, customers are at increased risk of cyber-attacks.
- Take proper protection measures (including but not limited to deploying antivirus software, firewall, WAF, IPS/IDS, situational awareness system, ID verification, and data encryption) to prevent files in the mobile storage device from being damaged by malware and protect products, networks, systems, and interfaces from unauthorized access, disturbance, intrusion, data disclosure, or information theft.
- Check all safety-related interfaces and settings after commissioning.

2 System Introduction

2.1 Overview

The GL20 series blade-type modules, introduced by Inovance, represent the next generation of modules designed for common EtherCAT, EtherNet/IP, and PROFINET bus networks. They can be used to quickly and reliably capture input and output signals in the system. With an ultra-slim profile of as thin as 12 mm, they achieve as fast response as in microseconds, along with a flexible I/O system and a stable structural design.

Take the GL20-RTU-ECT32 communication interface module as an example. The following figure shows the configuration for expanding various I/O modules through the local bus.



Applicable fields: Printing and packaging, food and beverage, automotive, mobile phones, 3C, semiconductors, display, crystalline silicon, and lithium batteries.

Core functions: Exceptional performance in continuous operation and fast response.

2.2 System Features

This product features the following advantages:

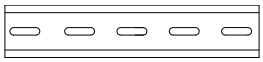
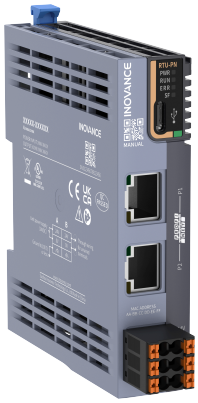
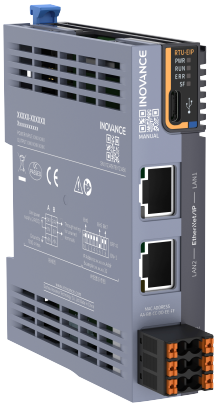
- Leading performance with microsecond-level response speed
- Compact design with tool-free installation and wiring
  - Ultra-thin 12 mm and 24 mm designs for optimized cabinet space
  - Easy wiring with PUSH IN terminals
  - Quick module replacement with removable terminal design
- More stable and reliable design
  - D-BUS design for connectors, offering better stability than traditional surface mount design
  - Gold-plated connectors, resistant to sweat corrosion
  - EMC design exceeding industry standards, adaptable to complex industrial control environments

2.3 Components

Components of the GL20 series modules are divided into basic components and accessories.

Basic components

The basic components of the GL20 series modules include DIN rail, communication interface module, and I/O expansion modules (including digital, analog, temperature, communication, and process modules).

Type	Model	Product Code	Diagram	Description
DIN rail	-	-		The DIN rail serves as the rack for the GL20 series modules to install the communication interface module and various I/O modules. It is compatible with both DIN35-7.5 and DIN35-15 rails.
Communication interface module	GL20-RTU-PN	01441377		The GL20-RTU-PN communication interface module is connected to the PROFINET network as a PROFINET slave. The module can be used to connect local I/O modules of the GL20 series, such as digital, analog, and temperature detection modules.
Communication interface module	GL20-RTU-EIP	01441341		The GL20-RTU-EIP communication interface module is connected to the EtherNet/IP network as an EtherNet/IP slave. The module can be used to connect local I/O modules of the GL20 series, such as digital, analog, and temperature detection modules.
Communication interface module	GL20-RTU-ECT32	01441287		The GL20-RTU-ECT32 communication interface module is connected to the EtherCAT network as an EtherCAT slave. The module can be used to connect local I/O modules of the GL20 series, such as digital, analog, and temperature detection modules.

Type	Model	Product Code	Diagram	Description
Digital input module	GL20-0800END	01441362		GL20 series 8-channel digital input module
Digital input module	GL20-1600END	01441375		GL20 series 16-channel digital input module
Digital input module	GL20-3200END	01441349		GL20 series 32-channel digital input module
Digital input module	GL20-3200END-M-INT	01441365		GL20 series 32-channel digital input module (ejector header)

Type	Model	Product Code	Diagram	Description
Digital output module	GL20-0016ETP	01441374		GL20 series 16-channel digital PNP transistor output module
Digital output module	GL20-0016ETN	01441373		GL20 series 16-channel digital NPN transistor output module
Digital output module	GL20-0004ETP-2A	01441340		GL20 series 4-channel high-current digital PNP output module
Digital output module	GL20-0008ETN	01441364		GL20 series 8-channel digital NPN transistor output module

Type	Model	Product Code	Diagram	Description
Digital output module	GL20-0008ETP	01441363		GL20 series 8-channel digital PNP transistor output module
Digital output module	GL20-0004ER	01441344		GL20 series 4-channel relay output general-purpose module
Digital output module	GL20-0032ETN	01441348		GL20 series 32-channel digital NPN transistor output module
Digital output module	GL20-0032ETN-M	01441366		GL20 series 32-channel digital NPN transistor output module (ejector header)

Type	Model	Product Code	Diagram	Description
Digital output module	GL20-0008ER	01441372		GL20 series 8-channel relay output general-purpose module
DI/DO module	GL20-0808ETN	01441369		GL20 series module with 8-channel digital input and 8-channel NPN transistor output
DI/DO module	GL20-0404ETP-5V	01441342		GL20 series 4-channel digital input and 4-channel digital output 5V module
DI/DO module	GL20-3232ETN-M	01441376		GL20 series module with 32-channel digital input and 32-channel NPN transistor output (ejector header)

Type	Model	Product Code	Diagram	Description
Analog input module	GL20-4AD	01441378		GL20 series 4-channel analog input module (differential input)
Analog input module	GL20-8ADI	01441343		GL20 series 8-channel current analog input module
Analog input module	GL20-8ADV	01441346		GL20 series 8-channel voltage analog input module
Analog output module	GL20-4DA	01441379		GL20 series 4-channel (voltage, current) analog output module

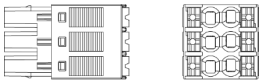
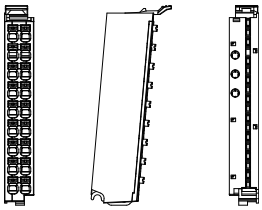
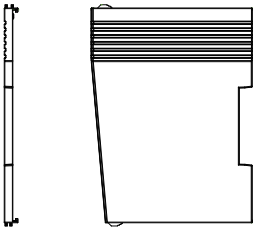
Type	Model	Product Code	Diagram	Description
Analog output module	GL20-8DAI	01441283		GL20 series 8-channel current analog output module
Analog output module	GL20-8DAV	01441282		GL20 series 8-channel voltage analog output module
Temperature module	GL20-4PT	01441371		GL20 series 4-channel input thermal resistor temperature detection module
Temperature module	GL20-4TC	01441370		GL20 series 4-channel input thermocouple temperature detection module

Type	Model	Product Code	Diagram	Description
Process module	GL20-2SSI	01441354		GL20 series 2-channel SSI communication module
Process module	GL20-2HC	01441334		GL20 series 2-channel high-speed counting module
Communication module	GL20-2S485-MDB	01441266		GL20 series 2-channel RS485 communication module (Modbus)
Communication module	GL20-2S485	01441353		GL20 series 2-channel RS485 communication module
Communication module	GL20-2SCOM-MDB	01441275		GL20 series 2-channel serial communication module (Modbus)
Communication module	GL20-2SCOM	01441350		GL20 series 2-channel serial communication module

Type	Model	Product Code	Diagram	Description
Communication module	GL20-1DNM	01441345		GL20 series 1-channel DeviceNet master module
Relay power supply module	GL20-PS2	01441244		GL20 series relay power supply module with 2 A output current

Accessories

Accessories of the GL20 series modules include the 24 V power supply terminal, PUSH IN terminal block, and end cover.

Type	Product Code	Diagram	Description	Remarks
24 V power supply terminal	15210903		Connects a 24 VDC power supply.	The I/O module and the 24 V power terminal are factory-assembled. The terminal is designed to be replaceable by the user.
PUSH IN terminal block	• 15212496 • 15212635		Plug-in terminal block with spring clamp wiring. The terminal block features "AB" silkscreen marking and comes in two versions, one of which features high clamping force (code: 15212635).	The I/O module and the PUSH IN terminal block are factory-assembled. The PUSH IN terminal block can be replaced.
	15212634		Pluggable terminal block with spring clamp wiring. The terminal block features "CD" silkscreen marking with high clamping force.	
End cover	20212484		Seals the interface of the last module to prevent dust, foreign matters, and liquids, and to prevent accidental contact with internal electrical contacts.	The communication interface module comes with an end cover. No separate purchase is required.

3 Power Supply System Design

3.1 Introduction

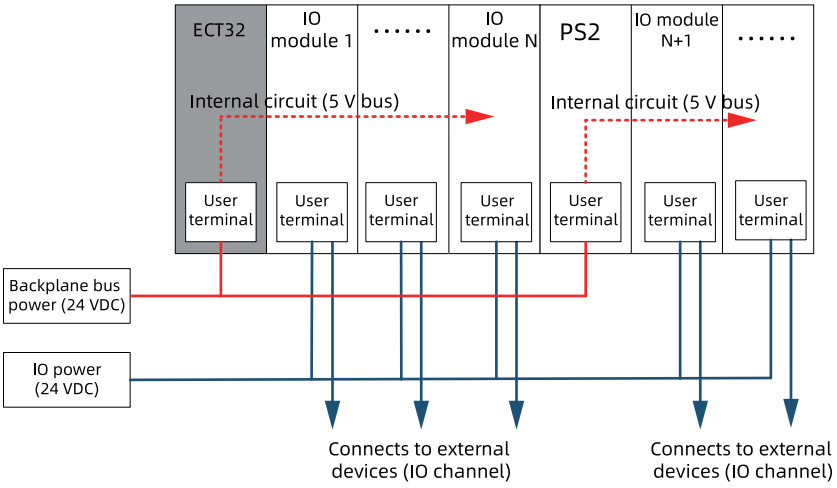
3.1.1 Power Supply System and Type

The GL20 series includes three communication interface modules: GL20-RTU-EIP, GL20-RTU-PN, and GL20-RTU-ECT32. Their power supply system designs are identical. This section takes GL20-RTU-ECT32 as an example.

- GL20-RTU-ECT32 supports up to 32 GL20 series I/O expansion modules.
- GL20-RTU-EIP supports up to 16 GL20 series I/O expansion modules.
- GL20-RTU-PN supports up to 16 GL20 series I/O expansion modules.

Power supply system

The following figure shows the power supply system configuration of the GL20-RTU-ECT32 module and its I/O expansion modules.



Power supply type

There are two types of power supply: backplane bus power and I/O power, as shown below.

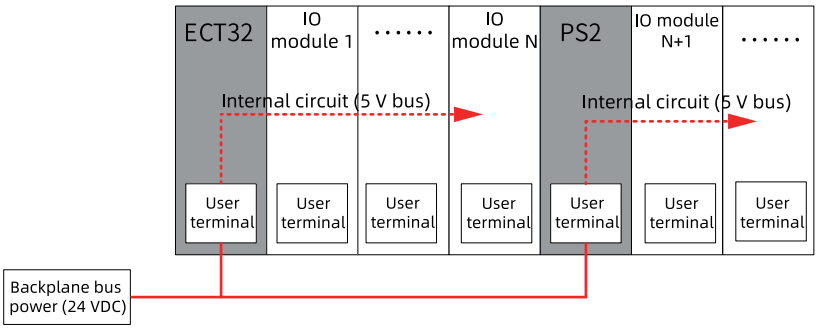
Power Supply Type	Description
Backplane bus power supply (24 VDC)	Connects to the 24 V power terminal of the product and the GL20-PS2 relay power module, powering the system
I/O power supply	Connects to the 24 V power terminal of the I/O module, powering the internal circuits of the I/O module and the external loads on the field.

Caution

Use separate power supplies for the backplane bus power and the I/O power. Using the same power supply for both may result in system failures due to noise.

3.1.2 GL20-PS2 Relay Power Module

GL20-RTU-ECT32 provides the 5 V bus power for the connected expansion modules, with the maximum bus current of 2 A. If a higher bus current is required, use the GL20-PS2 relay power module (hereafter referred to as the GL20-PS2 module). The GL20-PS2 module is also required when the number of connected expansion modules exceeds 16. The GL20-PS2 module consumes a bus current of 55 mA and provides a bus current of 2 A.



Note

- The number of GL20-PS2 modules used must also be counted within the total number of expansion modules of this product.
- Do not place the GL20-PS2 module in the last slot of the configuration.
- This module and the GL20-PS2 module must be powered on simultaneously (with a maximum allowable delay of 2 seconds for the GL20-PS2 module to be powered on after this module), otherwise addressing may fail.

3.2 Backplane Bus Power System Design

3.2.1 Procedure

Calculate the total power consumption of the expansion modules for this product. For the specific power consumption of each module, see "Version Matching Information".

Calculation formula: Total bus current consumption of expansion modules = Bus consumption current of expansion module #1 + Bus consumption current of expansion module #2 + ... + Bus consumption current of expansion module #n

If the total bus current consumption of the expansion modules exceeds the bus power supply current of this product (2 A), or if the number of expansion modules exceeds 16, an additional GL20-PS2 module must be added to the right of the corresponding module before the limit is exceeded.

Determine the configuration and form of the bus power supply based on the above two steps.

Note

- The bus power supply current of the GL20-PS2 module is 2 A. If the total power consumption of the modules on the right exceeds 2 A, an additional GL20-PS2 module must be added before the limit is exceeded.
- The bus current consumption of the GL20-PS2 module is 55 mA, which needs to be calculated within the current capacity of the bus power supply of this product or the upstream GL20-PS2 module.
- During operation, pay attention to the limit of the bus output current due to the ambient temperature. The bus output current derating is described as follows.
  - GL20-RTU-ECT32: The module operates at full load when the ambient temperature is 45°C or below (output current ≤ 2 A). It operates at 85% of full load when the ambient temperature rises to 55°C (output current ≤ 1.7 A).
  - GL20-PS2: The module operates at full load when the ambient temperature is 45°C or below (output current ≤ 2 A). It operates at 85% of full load when the ambient temperature rises to 55°C (output current ≤ 1.7 A).

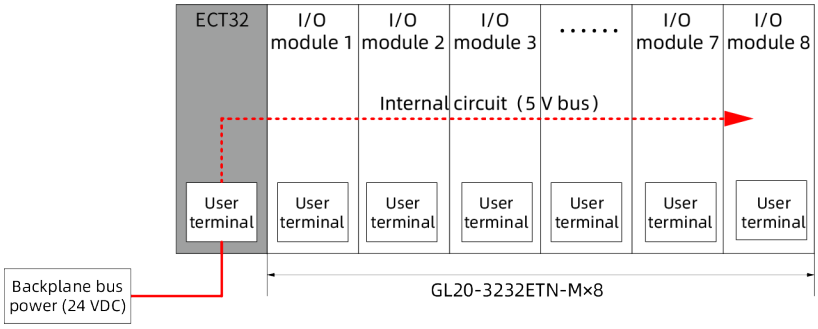
3.2.2 Design Example

Example 1: Eight GL20-3232ETN-M expansion modules

Expansion Module	Model	Quantity	Power Consumption/mA
Digital input and output	GL20-3232ETN-M	8	250

1. Calculate the total power consumption of the 5 V bus for the I/O expansion module.
   250 mA × 8 = 2000 mA
2. Determine whether the power consumption and the number of expansion modules exceed the limit.
   The current bus power consumption is 2000 mA, not exceeding the communication interface module's power supply capacity of 2 A. The current number of expansion modules is 8, not exceeding 16.
3. Confirm the configuration.
   In summary, the communication interface module can support the above configuration without the need to add a GL20-PS2 module.

   Based on the aforementioned expansion module configuration, take the GL20-RTU-ECT32 module as an example. The system configuration is shown in the following figure.



Example 2: Eight GL20-3232ETN-M modules + Two GL20-0008ETP modules

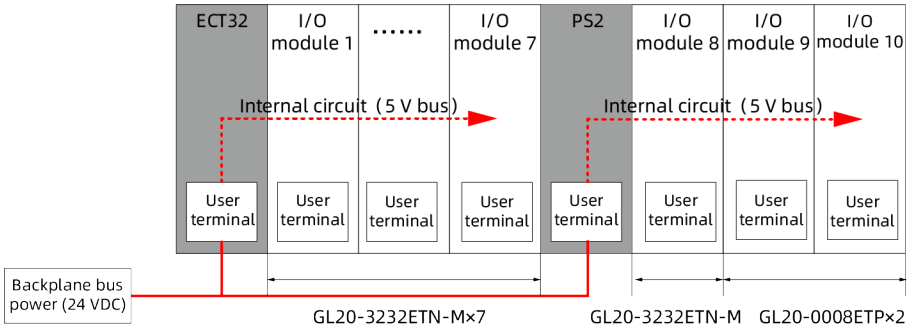
Expansion Module	Model	Quantity	Power Consumption/mA
Digital input and output	GL20-3232ETN-M	8	250
Digital output	GL20-0008ETP	2	80

1. Calculate the total power consumption of the 5 V bus for the expansion module.
   250 mA × 8 + 80 mA × 2 = 2160 mA > 2 A

2. Determine whether the power consumption and the number of expansion modules exceed the limit.
   The current bus power consumption is 2160 mA, exceeding the product's power supply capacity of 2 A. The current number of expansion modules is 10, not exceeding 16.

3. Confirm the configuration.
   In summary, this product does not support the above configuration. It is necessary to add a GL20-PS2 module.

   Based on the aforementioned expansion module configuration, take the GL20-RTU-ECT32 module as an example. The system configuration is shown in the following figure.



Note

- With the addition of a GL20-PS2 module, the number of expansion modules for this product is 11.
- The bus consumption current of the GL20-PS2 module is 55 mA, which needs to be calculated within the capacity of this product. With the current configuration, this product cannot have eight GL20-3232ETN-M modules installed in a row. A power supply margin must be reserved for the GL20-PS2 module.

Example 3: 20 GL20-0008ETP modules

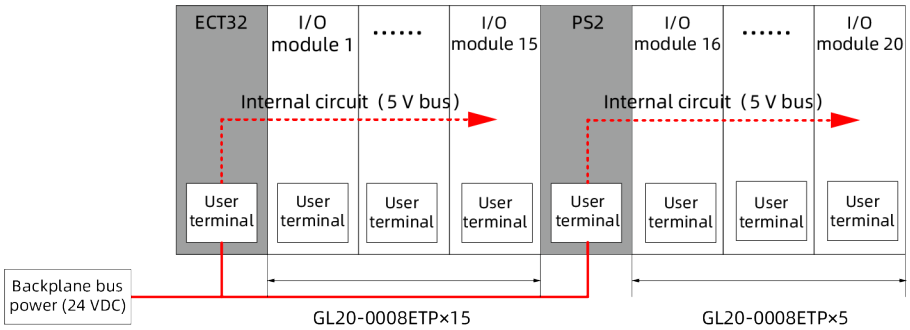
Expansion Module	Model	Quantity	Power Consumption/mA
Digital output	GL20-0008ETP	20	80

1. Calculate the total power consumption of the 5 V bus for the expansion module.
   80 mA × 20 = 1600 mA < 2 A

2. Determine whether the power consumption and the number of expansion modules exceed the limit.
   The current bus power consumption is 1600 mA, not exceeding the product's power supply capacity of 2 A. The current number of expansion modules is 20, exceeding 16.

3. Confirm the configuration.
   In summary, the bus power consumption does not exceed the power supply capacity of this product, but the number of modules exceeds 16. It is necessary to add a GL20-PS2 module.

   Based on the above expansion unit conditions, the system configuration is shown below. With the addition of a GL20-PS2 module, the number of expansion modules for this product is 21.

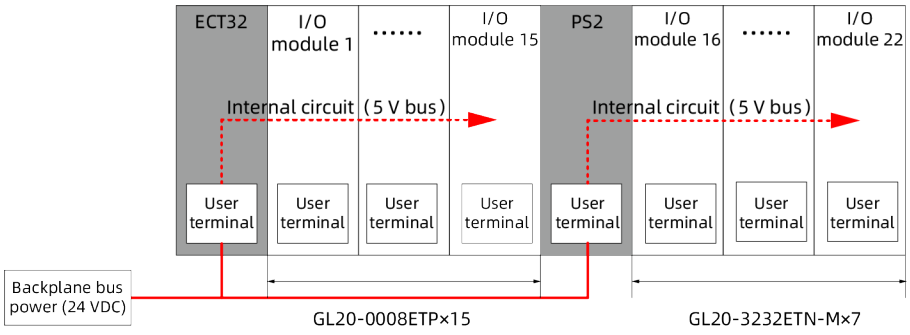


Example 4: 15 GL20-0008ETP modules + 7 GL20-3232ETN-M modules

Expansion Module	Model	Quantity	Power Consumption/mA
Digital output	GL20-0008ETP	15	80
Digital input and output	GL20-3232ETN-M	7	250

1. Calculate the total power consumption of the 5 V bus for the expansion module.
   80 mA x 15 + 250 mA x 7 = 2950 mA > 2 A
2. Determine whether the power consumption and the number of expansion modules exceed the limit.
   The current bus power consumption is 2950 mA, not exceeding the communication interface module's power supply capacity of 2 A. The current number of expansion modules is 22, exceeding 16.
3. Confirm the configuration.
   In summary, the bus power consumption exceeds the power supply capacity of this product, and the number of modules exceeds 16. It is necessary to add a GL20-PS2 module.

   Based on the above expansion unit conditions, the system configuration is shown below. With the addition of a GL20-PS2 module, the number of expansion modules for this product is 23.



3.3 I/O Power Supply System Design

Unlike the backplane bus power system design, there is no need to consider the GL20-PS2 module, and there is no specific design method for the I/O power supply system.

Calculate the total current consumption of the I/O power supply based on the actual power consumption of the field devices connected to the I/O modules, to select the appropriate I/O power supply specification.

3.4 External Power Supply and Protective Device Selection

3.4.1 Backplane Bus Power Supply Selection

Power Supply Specifications

The backplane bus power supply must support:

- Supports overcurrent protection.
- Supports double or reinforced insulation between the input and output.
- An output voltage of 24 VDC (20.4 VDC to 28.8 VDC)

Power capacity calculation

Select a backplane bus power supply with a proper capacity based on the number of communication interface modules and GL20-PS2 relay power modules in the field configuration, as well as the power consumption of each module.

The rated current of module terminal input power supply is shown below.

Backplane Bus Power Load Module	Rated Current of Terminal Input Power Supply
GL20-RTU-ECT32/GL20-RTU-EIP/GL20-RTU-PN	0.6 A (typical value at 24 V)
GL20-PS2	0.5 A (typical@24 V)

Calculation example:

The number of communication interface modules and relay power supply modules in the field configuration is shown below.

Module	Model	Quantity
Communication interface module	GL20-RTU-ECT32/GL20-RTU-EIP/GL20-RTU-PN	1
Relay power supply module	GL20-PS2	2

Take the backplane bus power supply that provides 24 VDC output as an example. The current output by the backplane bus power supply is 1.6 A (0.6 A x 1 + 0.5 A x 2).

To achieve an output current capacity of more than 1.6 A, a 24 VDC/2 A power supply can be selected as the backplane bus power supply.

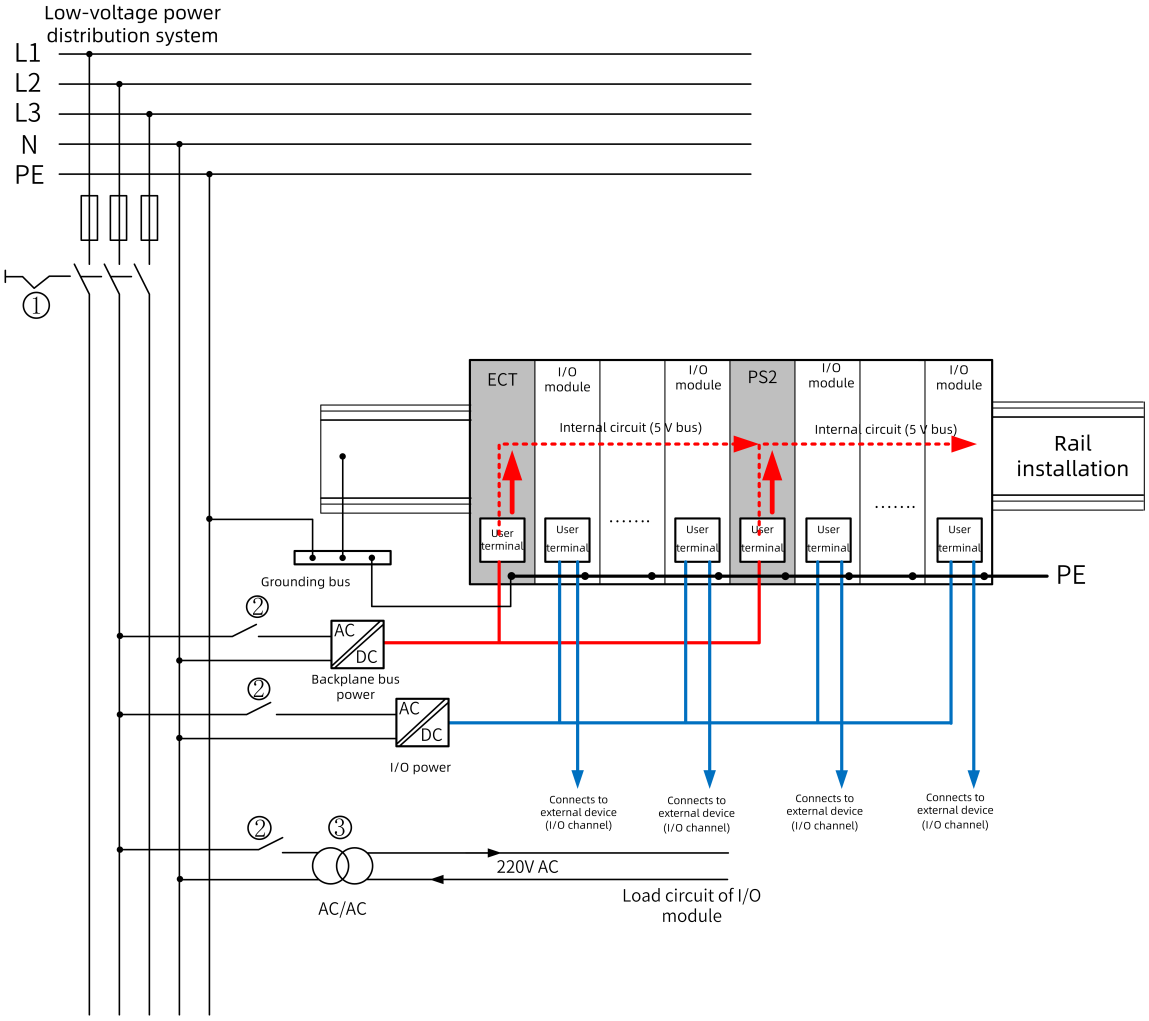
3.4.2 I/O Power Supply Selection

For I/O power supply, the following conditions must be met:

- Supports overcurrent protection.
- Supports double or reinforced insulation between the input and output.
- For details on the output voltage, see "Technical Specifications > Power Supply Specifications" in the equipment guide of each I/O module.

3.4.3 Protective Device Selection

To ensure stable system operation and user safety, appropriate protective devices must be selected to provide overload, short-circuit, and electrical isolation protection. The following figure illustrates the electrical connections between the low-voltage power distribution system and the expansion module configuration (using the GL20-RTU-ECT32 communication interface module as an example), and shows the types and installation locations of protective devices.



No.	Type	Description
①	Power distribution system switch	Circuit breaker, used to disconnect the controller, sensors, and actuators.
②	Short circuit/ Overload protection device	Short-circuit and overload protection measures are necessary during system installation. The specific requirements for protective devices depend on the control system configuration and the actual power consumption of the connected field devices.
③	Electrical isolation	It is recommended to use a transformer for electrical isolation.

4 Installation

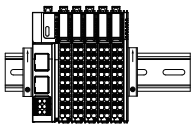
4.1 安装前了解

4.1.1 Introduction

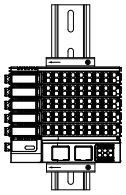
Although this product has been designed to strict standards, the following installation requirements, such as installation method, installation space, and installation precautions, must still be met to ensure stable operation of the product.

4.1.2 Installation Method

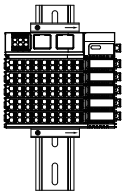
This series supports the following five installation methods. The horizontal DIN rail installation is recommended for better ventilation and heat dissipation.



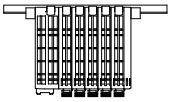
Installation on a horizontal rail



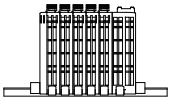
Installation of the vertical rail (Communication interface module at the bottom)



Installation of the vertical rail (Communication interface module at the top)



Suspending installation on the top of the cabinet

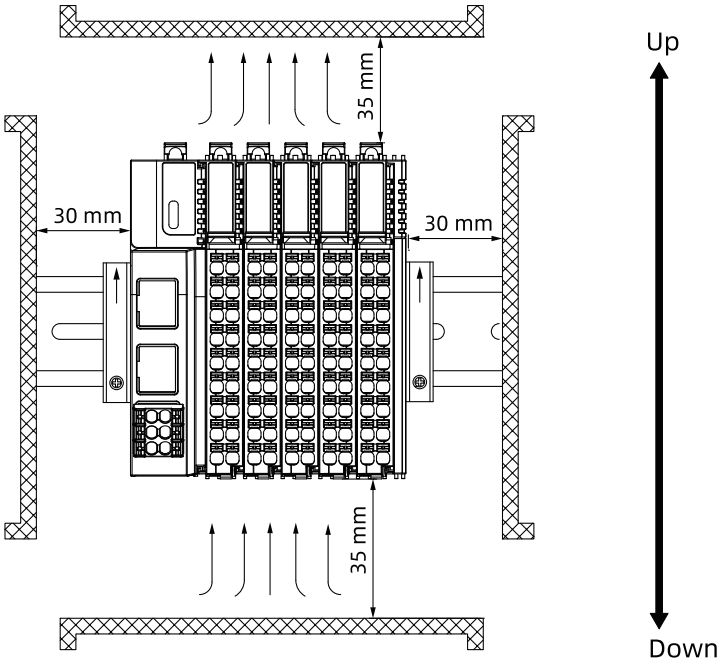


Installation at the bottom of the cabinet

Caution

- When the cabinet is installed on a vertical rail (with the communication interface module at the bottom), on a vertical guide rail (with the communication interface module at the top), on the top of the cabinet, or at the bottom of the cabinet, the cabinet must be equipped with a fan. The wind speed around the module must be at least 1 m/s to ensure heat dissipation.
- In case of installation on a vertical rail:
  - If the module is mounted to the PLC, make sure the PLC is below all I/O modules (with communication interface module at the bottom). The number of modules must not exceed 6, and the type of modules is not limited.
  - Hold the cables with a cable duct to prevent the weight of cables being applied to the lower end plate, which may result loose of the product from the DIN rail.

To ensure proper ventilation and cooling and to reserve sufficient wiring space, a minimum installation clearance must be maintained around the product, as shown below (take horizontal installation as an example).



Caution

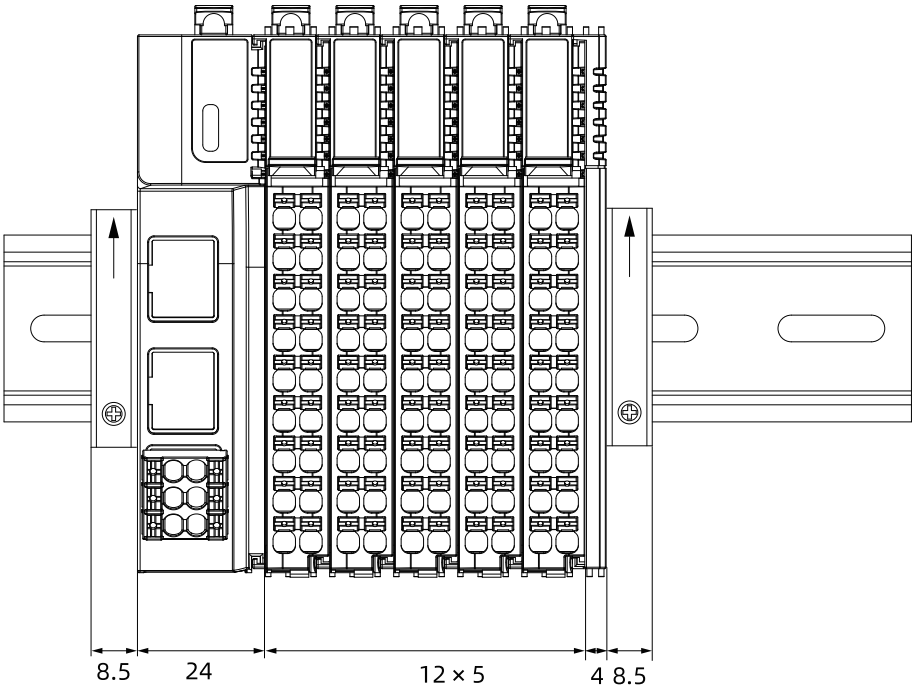
Do not install this product directly above high-temperature heat sources (such as heaters, transformers, and large resistors). Ensure at least a 100 mm gap between the product and other high-temperature heat sources.

4.1.3 Installation Clearance

Installation width calculation example

For example, when using 1 GL20-RTU-ECT32 module + 5 expansion modules + 1 end cover + 2 end plates, the installation width is shown below in mm.

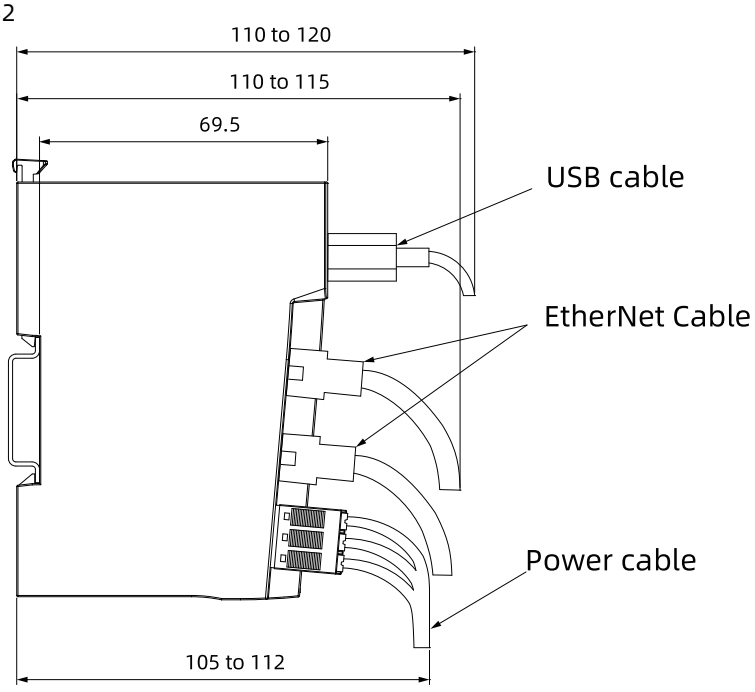
Total installation width = 24 mm + (12 x 5) mm + 4 mm + (2 x 8.5) mm



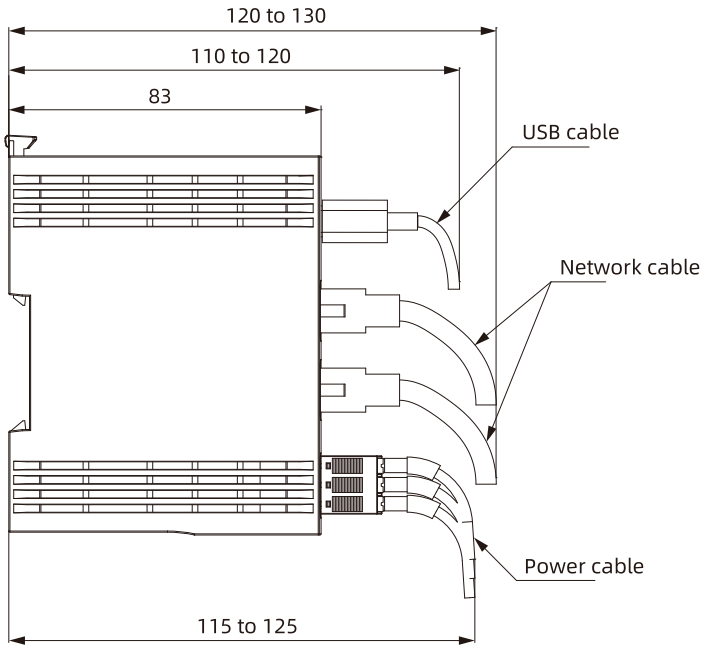
Reserved space for cables

When installing this product, allow space for connection cables, with installation dimensions (in mm) shown as follows.

- GL20-RTU-ECT32



- GL20-RTU-PN and GL20-RTU-EIP



4.1.4 Installation Precautions

To ensure the reliability and functional integrity of this product, comply with the following installation requirements:

Do not install this product in environments with the following conditions:

- A temperature exceeding the range of -20°C to +55°C
- A humidity exceeding 95% RH
- An altitude exceeding 2000 m (79.5kPa)
- Drastic temperature changes and condensation
- Corrosive or flammable gas
- Conductive powders (such as dust and iron powder), water, oil mist, salt, or organic solvents
- Direct sunlight
- Severe vibrations or repetitive impact to the product

Appropriate isolation measures shall be taken when installing this product in environments with the following conditions:

- Static electricity or other forms of noise
- Strong electromagnetic fields
- Potential expose to radiation
- Close to power cables

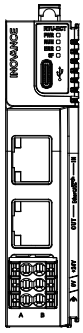
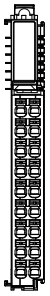
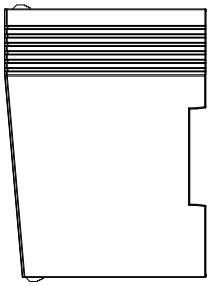
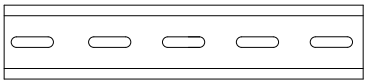
Precautions for installing this product:

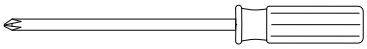
- It is recommended to separate 2 high-power modules (with 1.7 W and above, including bus power consumption + user-side power consumption + thermal loss) from 1 low-power module (with less than 1.7 W) either by a physical barrier or by spacing them apart.
- For vertical installation, install high-power modules at the top and communication interface modules at the bottom.

- For multi-layer configurations, insert high-power modules on the side so that waste heat can rise to the top unobstructed.
- Before installation, ensure that the product has been powered off.
- To avoid damage to the product, do not drop or strike on the product enclosure, terminal block, or connector.
- Do not disassemble this product, as it may result in severe damage.
- Do not tighten screws with excessive torque (for torque requirements, see *" Installation Procedure" on page 43*) to avoid damage to the product.
- After installation, remove the dust-proof label on the top of the peoduct to ensure the ventilation holes are unobstructed.

4.2 Preparations Before Installation

The equipment and related tools required before installation are listed in the table below.

Name	Quantity	Remark	Diagram
Communica-tion interface module	1	Included (The diagram takes GL20-RTU-ECT32 as an example.)	
I/O expansion module	Several	Included (The diagram takes GL20-0808ETN as an example.)	
End cover	1	Purchase	
DIN rail	1	Provided by user • Compliant with IEC60715 standard (35 mm in width and 1.0 mm in thickness). For details, see *"10.1 Dimension Diagram" on page 230* • The DIN rail length should be selected based on the actual installation width of the product. For calculation of the installation width, see *"4.1.3 Installation Clearance" on page 39*	

Name	Quantity	Remark	Diagram
End plate	2	At least two end plates (a pair) to be used together with the DIN rail	
Phillips screwdriver	1	User-supplied; ϕ5 mm	
Straight screwdriver	1	User-supplied; ϕ2.5 mm	

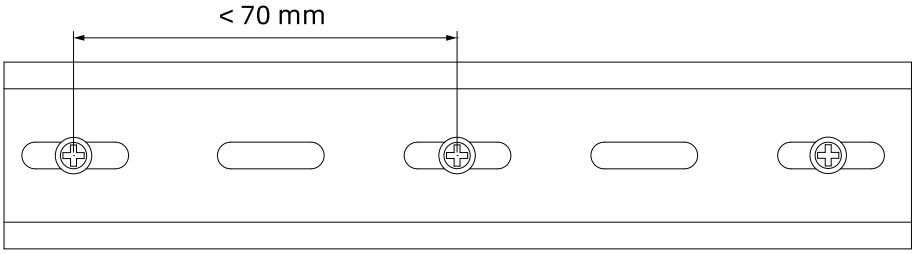
4.3 安装过程

4.3.1 Installation of DIN Rail

Note

If the thickness of the DIN rail is not as required, the product cannot fit in or function properly as the DIN rail mounting hook does not work.

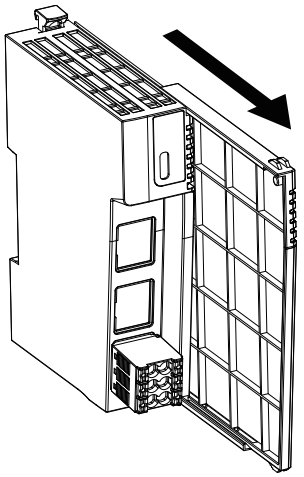
Tighten the screws on the DIN rail with a Phillips screwdriver. Use M4 screws spaced at intervals of 70 mm or less, and tighten them to a torque of 1.2 N·m.



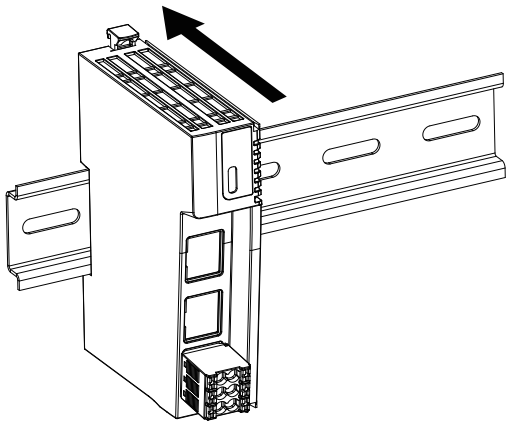
4.3.2 Installation of Communication Interface Module

The following takes the GL20-RTU-ECT32 module as an example.

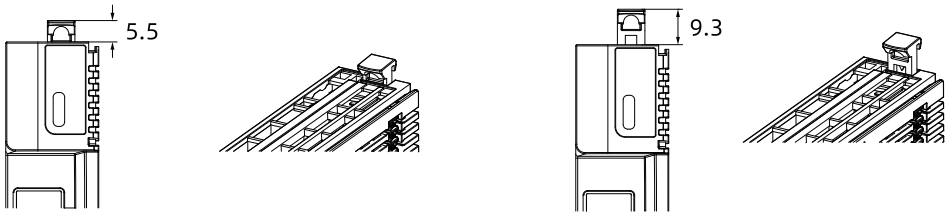
1. Remove the rear cover in the direction indicated by the arrow, as shown below.



2. Align the module with the DIN rail and push the module in the direction indicated by the arrow until you hear a click, as shown below.



3. Ensure that the DIN rail buckles of the module are locked. The following figures show the locked and unlocked states of the buckles.
   Pressing the buckles locks them.



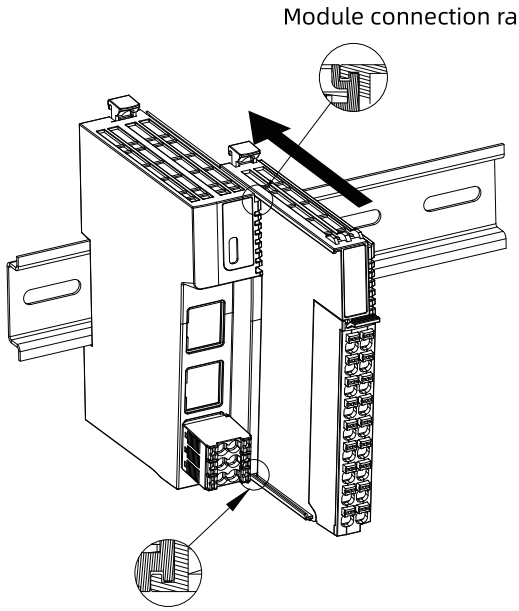
Locked state　　Unlocked state

Caution

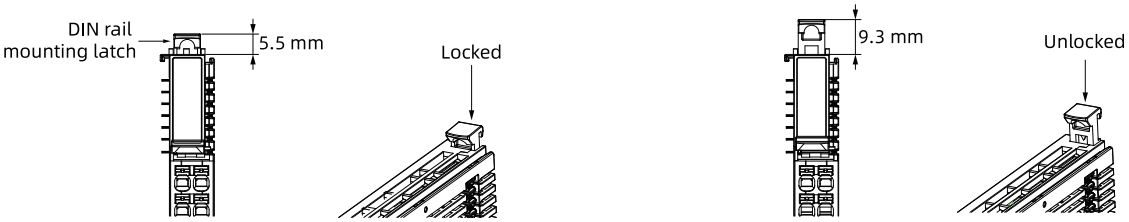
When the module is not installed on the DIN rail, keep the rail buckles in locked state. If the rail buckles remain in unlocked state for a long period of time, they will be invalidated.

4.3.3 Installation of I/O Expansion Module

1. Align the expansion module with the guide rails on the top and bottom of the communication interface module. Press the module in the direction of the arrow until a click is heard, indicating that the module is fully seated, as shown in the figure below.



2. Ensure that the snap-fit joint of the rail is locked, as shown below.
   Pressing the buckles locks them.



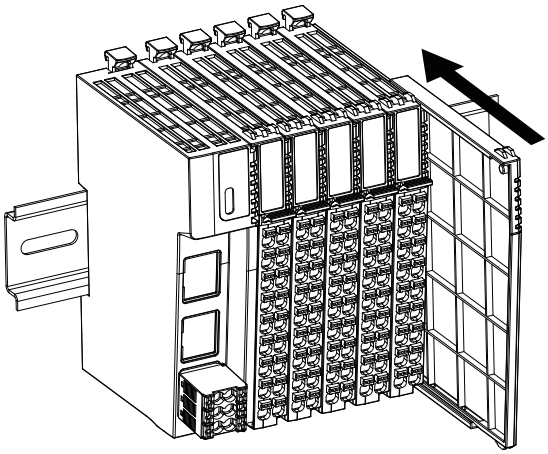
Caution

Some I/O expansion modules have slot limits during installation, as described below:

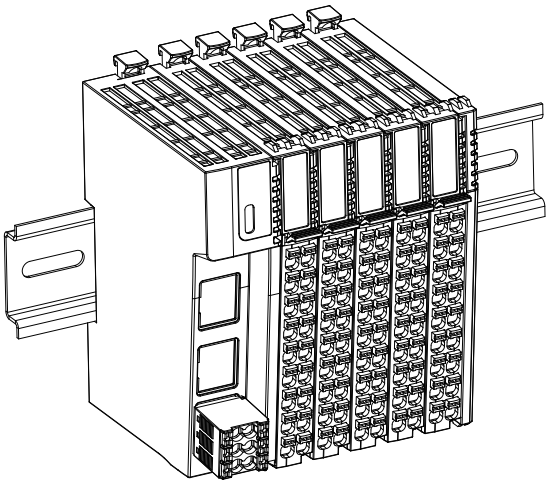
- When the firmware version of the GL20-8TC-PID and GL20-2HC modules is 4.0.1.0 or below, they must be installed in the first four slots. When the firmware version is above 4.0.1.0, there is no limit on the slot.
- The communication modules GL20-2SCOM, GL20-2SCOM-MDB, GL20-2S485, GL20-2S485-MDB, GL20-2CAN, and GL20-1DNM must be installed in the first four slots.

4.3.4 Installing the End Cover

1. Align the end cover with the guide rail of the last expansion module. Slide the end cover in the direction indicated by the arrow.



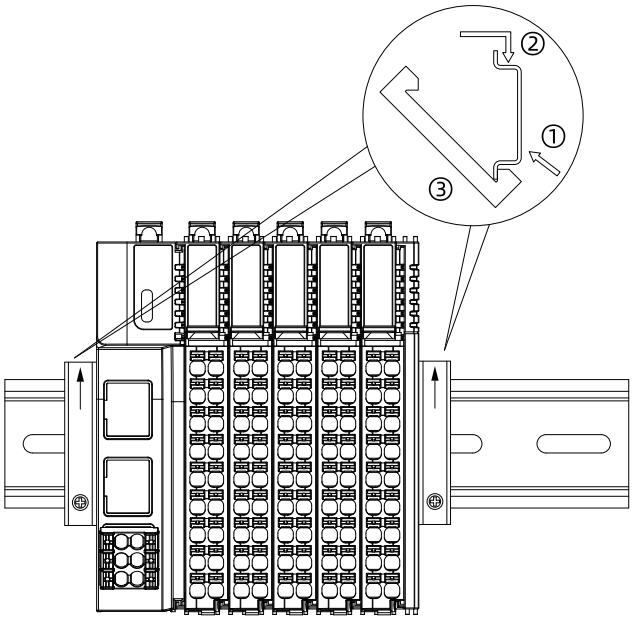
2. Ensure the end cover is flush with the end of the expansion module to prevent the metal pins from being exposed, as shown below.



4.3.5 Installation of End Plate

Install an end plate at each end of the module to prevent the module from sliding sideways.

When you install a rail retainer, hook the bottom of the retainer to the bottom of the rail, rotate the retainer to make its top hook the top of the rail, and then tighten the screw with a Phillips screwdriver to fasten the rail retainer, as shown in the figure below.



4.4 Inspection After Installation

No.	Check Item	Confirmation
1	The DIN rail mounting hooks of the communication interface module and expansion module are locked.	
2	Ensure that the end plates on both sides are securely locked.	
3	After installation, ensure that there are no foreign objects on the ventilation surfaces.	
4	Ensure that the installation environment meets the environmental requirements mentioned in the precautions.	

5 Wiring

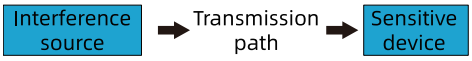
5.1 接线前了解

5.1.1 Introduction

The purpose of standard wiring practices in industrial environments is to reduce electromagnetic interference (EMI) effects on equipment and systems, ensuring the stable operation of industrial control systems and the accuracy of data. Although Inovance has designed industrial products to meet harsh environments, proper external wiring and cable routing should still be considered during use.

5.1.2 Basic EMC Information

Interference occurs when electromagnetic sources affect sensitive devices. The three elements that constitute interference are: interference source, transmission path, and sensitive devices.

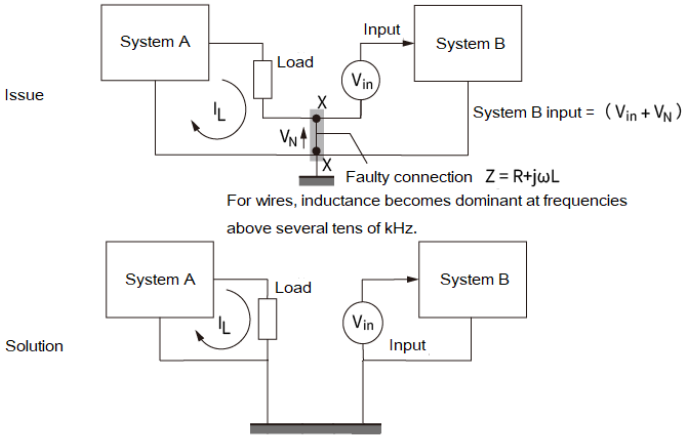


EMC (Electro Magnetic Compatibility) issues are system-related. This section primarily addresses how to reduce interference by adjusting the transmission path. Common solutions include shielding, isolation, and proper wiring.

Different coupling modes require different solutions. The following describes the causes and solutions of interference in several common coupling modes.

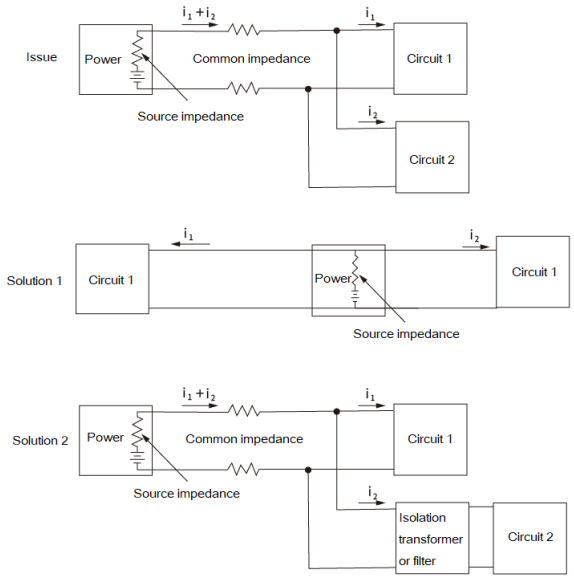
Common impedance coupling

- Cause: Grounding cables serve as one of the signal circuit paths. Due to its impedance (approximately several hundred nH/m), the interference in System A can result in a voltage difference in grounding wires, affecting System B.
- Solution: Separate single-point grounding



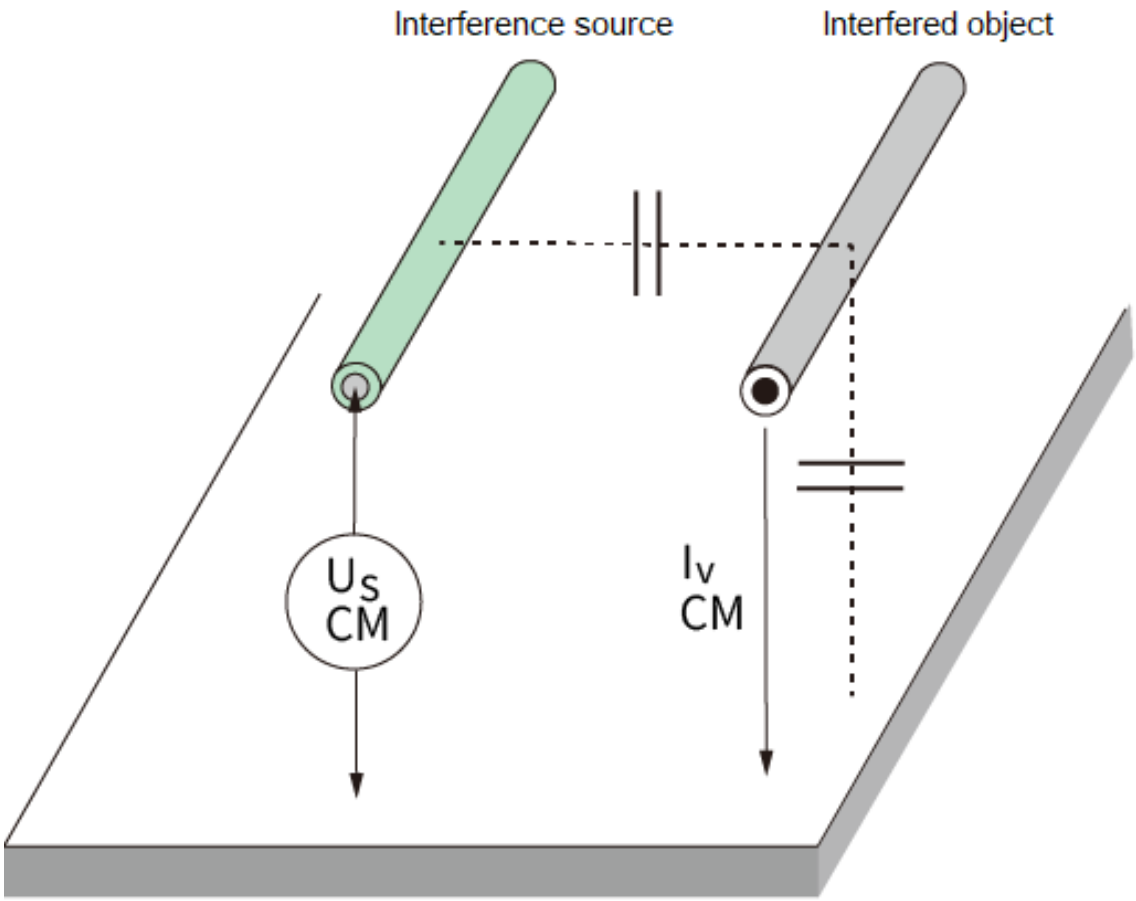
Common power coupling

- Cause: Any change in the power current required by Circuit 2 will affect Circuit 1, making it easy for interference from Circuit 2 to affect Circuit 1.
- Solution:
  - ① Connect Circuit 2 directly to the power supply output terminal.
  - ② Use an isolation transformer or a filter.



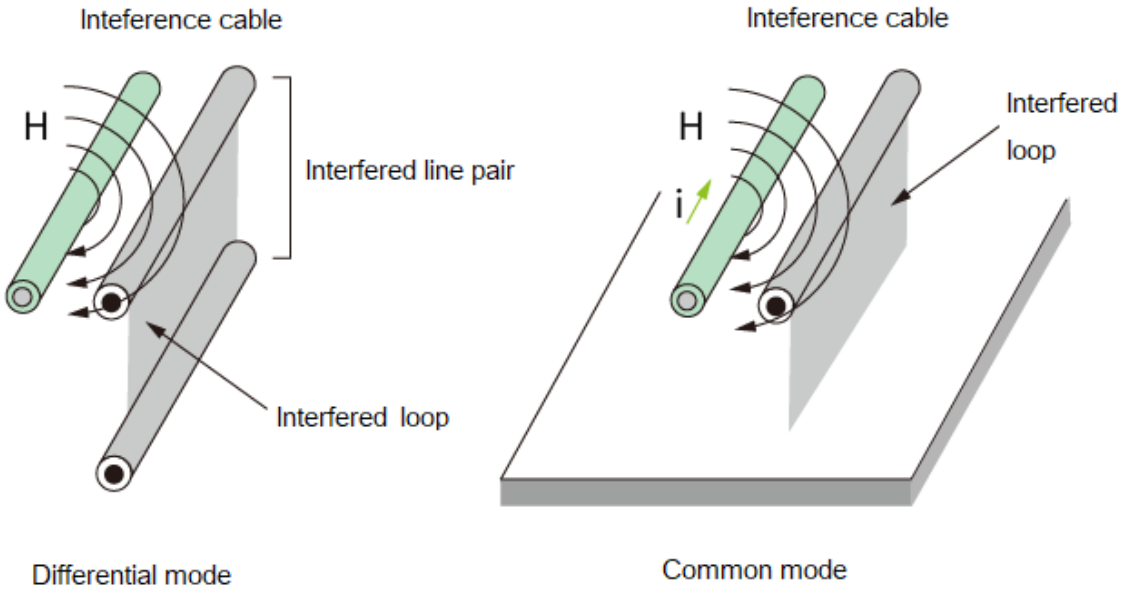
Receptive coupling

- Cause: A capacitor consists of two conductors separated by a dielectric material. When different signal cables are in parallel with air as the dielectric, interference can occur between signals, causing capacitive coupling.
- Solution: Shield the signals and increase the distance between signal cables.



Inductive coupling

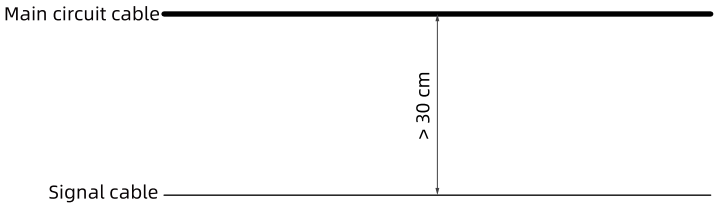
- Cause: Cables act as inductors. When varying current flows through the cable, a magnetic field and electric field are generated around it. These fields can induce voltages and currents in sensitive circuits, affecting their operation.
- Solution: Increase the spacing to reduce mutual inductance and ground both ends of the shielded cables.



5.1.3 Cable Routing Requirements

Routing requirements

- Main circuit routing requirements
  Main circuit power input cables and motor cables may generate strong electromagnetic interference. To prevent the electromagnetic interference incurred by long-distance parallel routing and coupling between disturbing cables and control cables, keep a clearance of at least 30 cm between main circuit cables and signal cables. Main circuit cables include the input R/S/T cable, output U/V/W cable, DC bus, and braking cable. Signal cables include the I/O signal cable and communication cable. Cable slots must be properly connected and grounded. Aluminum slots can ensure equipotential between devices. Properly connect the PLC and I/O module to the system (machines or devices). Protect all connections with spray coating and ensure full contact with the conductive metal.

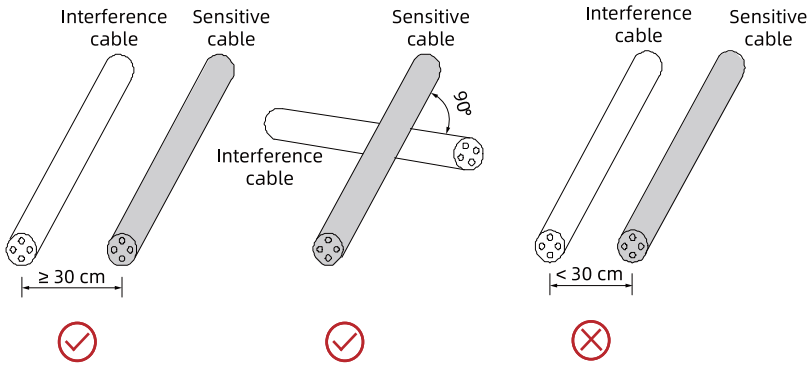


- Requirements on cabling I/O signal cables
  I/O signals include analog input (AI) signals, analog output (AO) signals, digital input (DI) signals, digital output (DO) signals, and relay output signals. To avoid interference to the I/O signals, separate the I/O signal cables at least 30 cm from the main circuit cables (R, S, and T cables and U, V, and W cables) and other power cables or power supply cables.

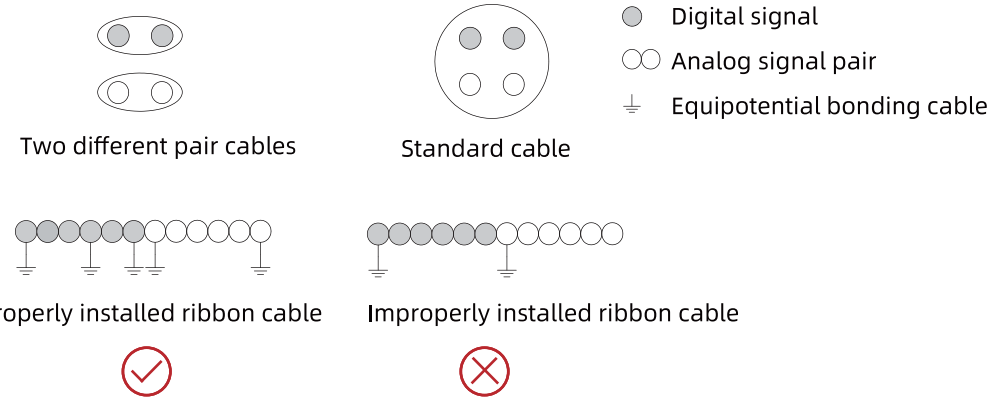
Routing recommendations

- Routing of disturbing cables and sensitive cables

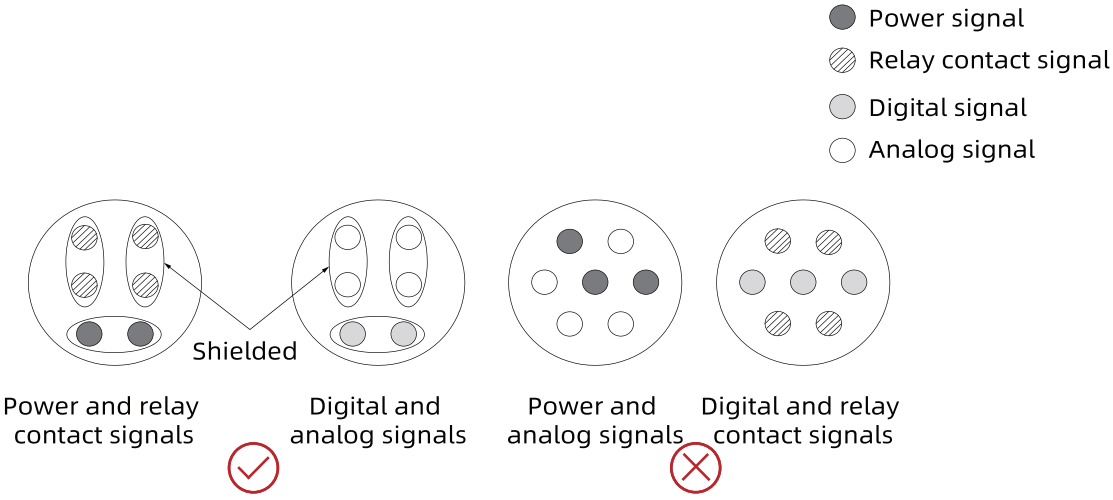
Route cables that transmit different types of signals through different routes. Separate the disturbing cables from sensitive cables by a distance of at least 30 cm. When two types of cables must be intersected, the intersection angle must be 90 degrees to avoid interference, as shown in the following figure.



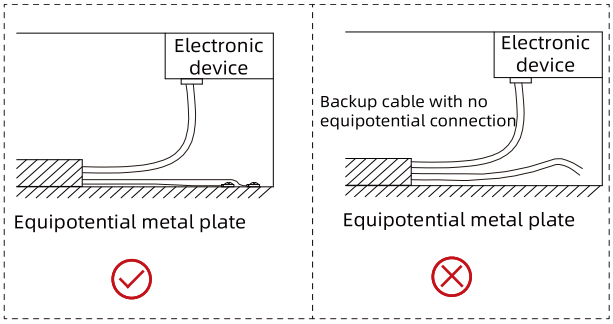
- Routing of cables transmitting different types of signals
  Route cables that transmit different types of signals through different routes and separate them with equipotential signal cables. When routing cables that transmit the same type of signals, the equipotential signal cable stays in the outer layer and equipotential signals should stay in the middle if possible, as shown in the following figure.



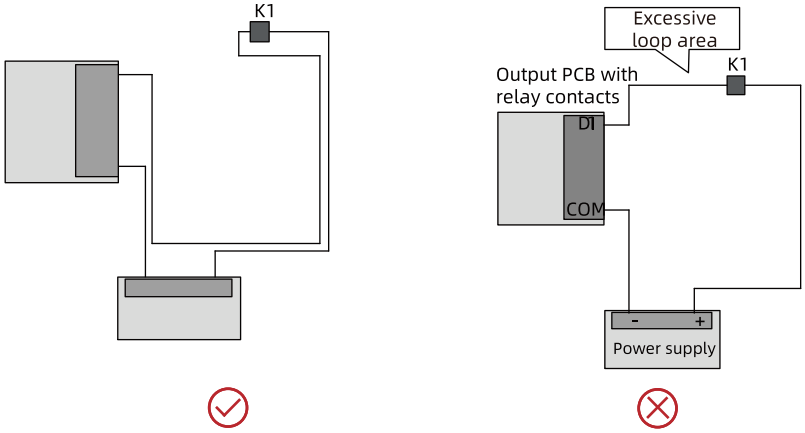
- Routing multi-conductor cables
  For multi-conductor cables, it is recommended that one cable transmits one type of signals. If one cable is used to transmit different types of signals, use the cable with conductors shielded, as shown in the following figure.



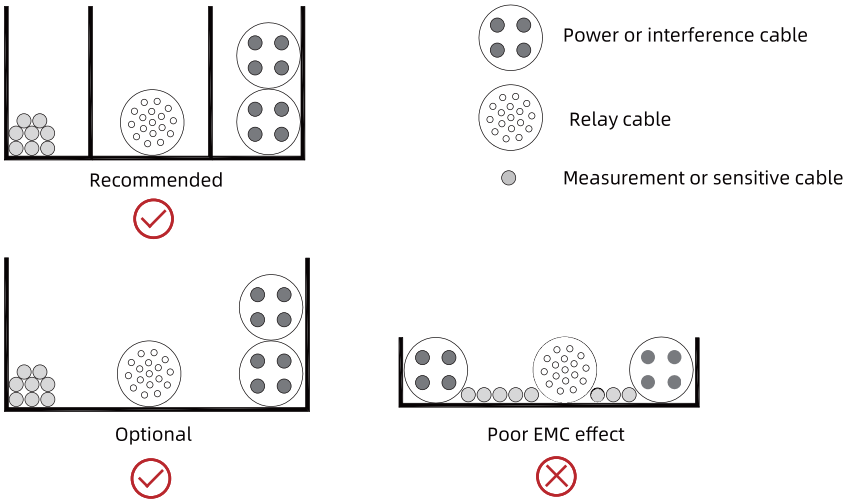
If certain conductors in a multi-conductor cable are reserved or unused, connect these conductors to the equipotential bondings (do not leave them unconnected), as shown below.



- Requirements on the wiring loop area
  For cables that transmit low-level sensor signals and shared cables that transmit relay signals, lay them close to each other to avoid forming a loop area. Use twisted pair cables for analog signals. Lay digital signal cables close to each other, as shown below.



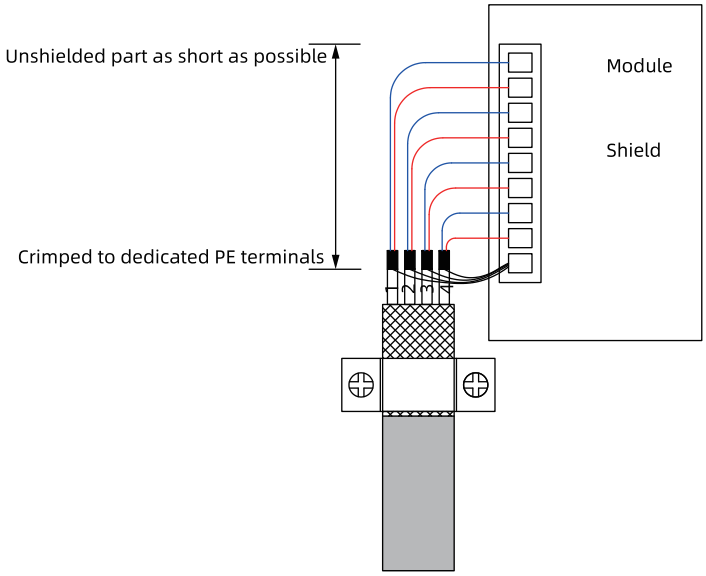
- Laying multiple types of cables
  For cables of different types, route the cables along the equipotential metal plate. To enhance the internal EMC performance, separate different types of cables or separate cables with metal separators (recommended) in the same metal (zinc-iron or stainless steel) duct, as shown below.



5.1.4 Grounding Requirements for Shielded Cables

Shielded cables can reduce interference from magnetic fields, electric fields, or electromagnetic fields by diverting interference currents from the shielding layer to ground.

Minimize the length of the unshielded part of a shielded cable, and connect the shield to the nearest PE terminal. If the unshielded part is too long, the cable conductor is prone to signal interference. For modules without a dedicated PE terminal, connect the shield to an external PE terminal, as shown below.

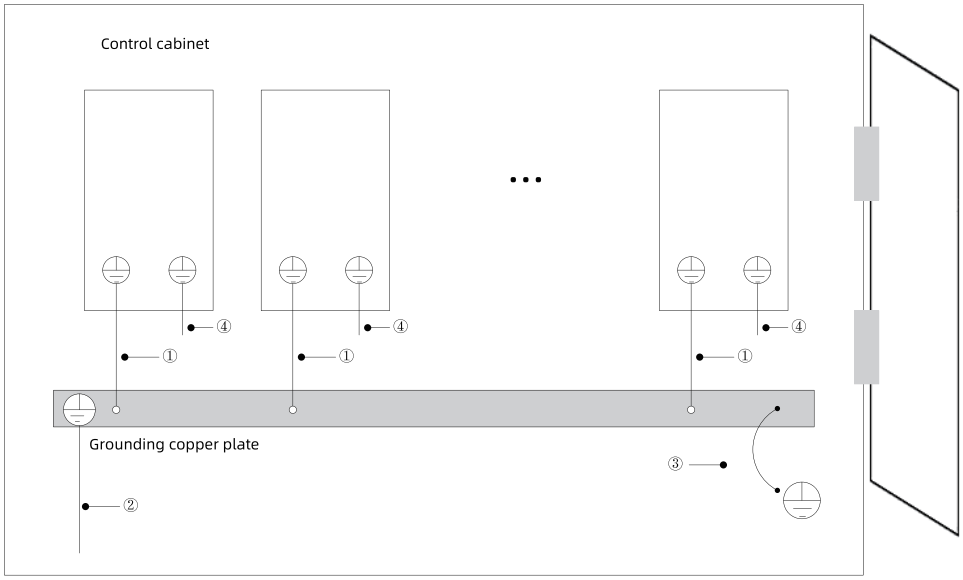


5.1.5 Equipotential Grounding Requirements

Equipotential grounding connects the electrical equipment body and external conductive parts to the same or nearly the same potential. This not only prevents electric shock but also meets EMC requirements.

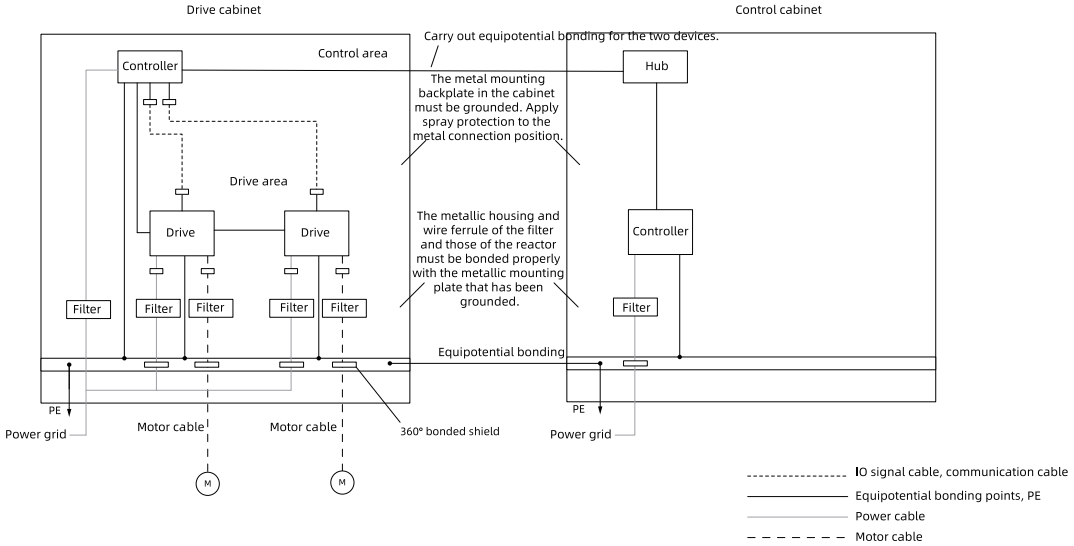
- General grounding requirements
  To ensure proper grounding of the product, observe the following requirements.
  - Ensure that the grounding terminal is properly grounded in accordance with the relevant electrical regulations of the country or region, preventing improper operation or damage to the equipment. The grounding terminal cannot be used as the neutral (N) terminal of the power supply.
  - Ensure that the protective grounding conductor meets the technical specifications and local safety standards. Keep the grounding cable as short as possible. The protective grounding conductor must be made of yellow-green copper conductor and cannot be connected in series with circuit breakers or other switching devices.
  - Observe the grounding requirements of all the devices as improper grounding can lead to malfunction.
  - Install the device on a conductive metal mounting surface. Ensure that the whole conductive bottom of the device is attached properly to the mounting surface.
  - Fasten the grounding screws using the recommended torque to prevent the screws from being loose or overtightened.

- Grounding requirements for multiple devices
  The following shows parallel grounding of multiple devices.



No.	Wiring description
①	Connect the main circuit input PE terminal to the grounding copper busbar of the control cabinet through the protective grounding conductor.
②	Connect the PE cable on the input power supply end to the grounding copper busbar of the control cabinet.
③	Connect the grounding copper busbar of the control cabinet to the metal enclosure of the control cabinet through the protective grounding conductor.
④	Connect the motor output cable shield to the output PE terminal of the drive.

- Grounding requirements for the cabinet
  A cost-effective method of suppressing interference in a cabinet is to isolate the interference source from the equipment that may be interfered with. Divide the cabinet into multiple EMC compartments or use multiple cabinets based on the intensity of interference sources, and install each device in accordance with the following wiring principles.



No.	Grounding Rules
①	Place the control unit and the drive unit in two separate cabinets.
②	If multiple cabinets are used, use grounding cables with a cross-sectional area of at least 16 mm^2 to connect different cabinets, therefore realizing equipotential bonding between the cabinets.
③	If only one cabinet is used, place the devices in different compartments of the cabinet based on signal intensity.
④	Perform equipotential bonding for devices in different compartments of the cabinet.
⑤	Shield all communication (for example, RS485) and signal cables that routed out from the cabinet.
⑥	Place the power input filter in a position near the input interface of the cabinet.
⑦	Provide spray coating protection for all grounding points in the cabinet.

5.1.6 Lightning and Overvoltage Protection

The surge protection device (SPD) is installed on the input side of the I/O module to ensure that electrical systems and important electrical and electronic equipment are protected from damage caused by lightning overvoltage.

The SPD is mainly used to limit transient overvoltage and operating overvoltage caused by lightning in power supply and signal systems. Lightning surges can be transmitted to the I/O module through the power supply or signal cable. When a lightning strike occurs, the ground potential increases, which may damage the drive. The induced voltage can be produced in the cable and loop when a pulse electromagnetic field is generated by a lightning strike on the building or in the vicinity. External lightning protection measures, such as lightning rods, grounding wires, and grounding devices, cannot prevent the conduction of lightning induction surge along the cable and secondary lightning strike. Therefore, it is also necessary to install an SPD.

5.2 Communication Cable Connection

5.2.1 Wiring Precautions

When connecting the communication cable, note the following:

- Use the recommended cables and adapter boards for connection. It is recommended that shielded cables be used as extension cables to enhance anti-interference capacity.
- When connecting the cable to the Ethernet/EtherCAT/PROFINET port of this product, insert it firmly into the port until it locks into place.
- Route communication cables separately from power cables (with high voltage and current) that produce strong interference signals, and avoid parallel routing.
- Do not place communication cables near noise-generating equipment. If unavoidable, take measures to mitigate noise, such as placing the equipment in a metal enclosure.
- Do not place communication cables in environments with high temperatures or high humidity.
- Do not place communication cables in environments with excessive dust, oil mist, or other harmful contaminants.

- There are restrictions on the bending radius of communication cables. Check the bending radius according to the communication cable specifications.

5.2.2 Preparation Before Wiring

Cable requirements

The EtherCAT, EtherNet/IP, and PROFINET buses use standard RJ45 connectors. Use shielded twisted-pair cable of Category 5e or higher, with metal-shell plugs and injection-molded boots. Shielded cables are used for network data transmission, with no short circuits, miswires, or poor connections. The specifications for shielded cables are shown in the table below.

Item	Specification
Cable type	Flexible crossover cable, double-layer shielded (SFTP or SFTPP), Cat5e or above (100BASE-TX)
Double-shielded	Braided shield (coverage: 85%), aluminum foil shield (coverage: 100%)
Standards compliance	EIA/TIA568A, EN50173, ISO/IEC11801 EIA/TI Abulletin TSB, and EIA/TIA SB40-A&TSB36
Cross-sectional area	AWG26 and above
Conductor type	Twisted pair
Number of pairs	4
Certification	UL
Environment	• Resistant to industrial oil, corrosive acid and alkali • Operating environment temperature: -30℃ to +60℃



The cable length between devices cannot exceed 100 m. Failure to comply can lead to signal attenuation, affecting the communication performance.

Recommended cable

Recommended network cables are as follows.

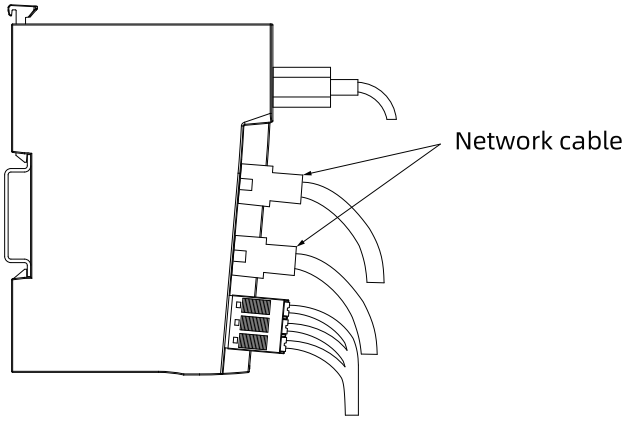
No.	No.	Name	Specification
1	15040261	Complete cable set - S6-L-T04-0.3-100M network communication cable - 0.3m (RoHS)	CAT.5e SFTP 26AWG
2	15040262	Complete cable set - S6-L-T04-3.0-100M network communication cable - 3m (RoHS)	CAT.5e SFTP 26AWG
3	15041960	Complete cable set - S6-L-T04-0.2-100M network communication cable - 0.2 m (RoHS)	CAT.5e SFTP 26AWG
4	15041961	Complete cable set - S6-L-T04-0.5-100M network communication cable - 0.5 m (RoHS)	CAT.5e SFTP 26AWG
5	15041962	Complete cable set - S6-L-T04-1.0-100M network communication cable - 1.0 m (RoHS)	CAT.5e SFTP 26AWG
6	15041963	Complete cable set - S6-L-T04 - 2.0m - 100M network communication cable - 2.0 m (RoHS)	CAT.5e SFTP 26AWG

No.	No.	Name	Specification
7	15041964	Complete cable set - S6-L-T04-5.0-100M network communication cable - 5.0 m (RoHS)	CAT.5e SFTP 26AWG
8	15041965	Complete cable set - S6-L-T04-10.0-100M network communication cable - 10.0 m (RoHS)	CAT.5e SFTP 26AWG
9	1504A819	Complete cable set - S6-L-T04-1.5-100M network communication cable - 1.5 m (RoHS)	CAT.5e SFTP 26AWG

5.2.3 Cable Connection/Disconnection

Cable connection

Hold the connector of the network cable and insert the cable into the port until you hear a click, as shown below.



Caution

When connecting cables, ensure that the EtherCAT output port of the previous device is connected to the EtherCAT input port of the next device. Incorrect connection will prevent proper communication.

Cable disconnection

Press and hold the clip of the cable and pull it out along the direction parallel with the module.

5.3 Power Supply and Grounding Wire Connection

5.3.1 Wiring Precautions

When connecting power cables, note the following:

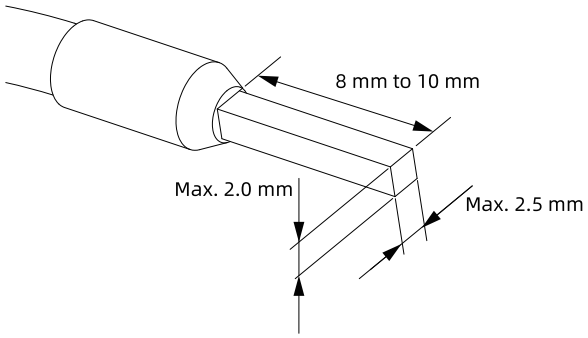
- Before wiring, ensure that the external power supply is disconnected.
- Route extension cables separately from high-voltage and high-current power cables that produce strong interference signals, and avoid parallel routing.

5.3.2 Preparation Before Wiring

Use power cables with the cable lug and cable diameter specified in the following table. Adjustments can be made based on actual usage. It is recommended to use a 3-core unshielded cable with a maximum length of 20 m.

Material Name	Cable Diameter		KST		Suzhou Yuanli	
	mm^2	AWG	Model	Crimping Tool	Model	Crimping Tool
Tubular lug	0.3	22	E0308	KST2000L	0308	YAC-5
	0.5	20	E0508		0508	
	0.75	18	E7508		7508	
	1.0	18	E1008		1008	
	1.5	16	E1508		1508	

To use another type of tubular lug, crimp the lug to stranded wire according to the shape and dimension requirements shown below.

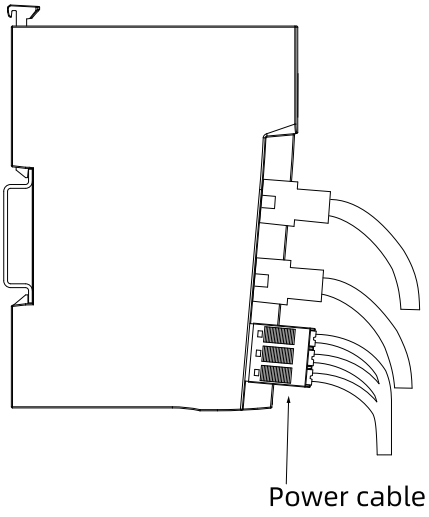


5.3.3 Cable Connection/Disconnection

The power terminal uses a push-in design.

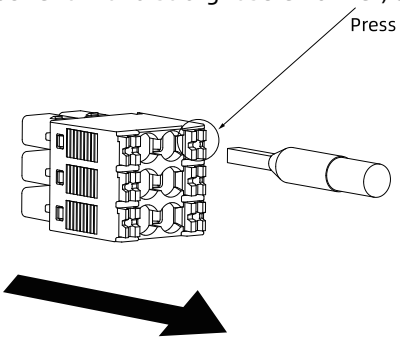
Cable connection

Insert the cables into the power terminals.

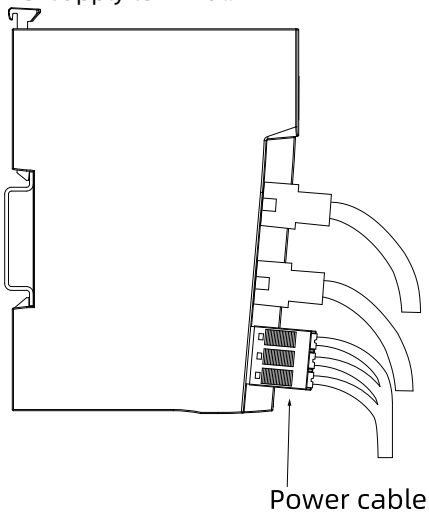


Cable disconnection

1. Press the terminal release component with a straight screwdriver, as shown below.



2. Remove the cable from the power supply terminal.



5.4 USB Cable Connection

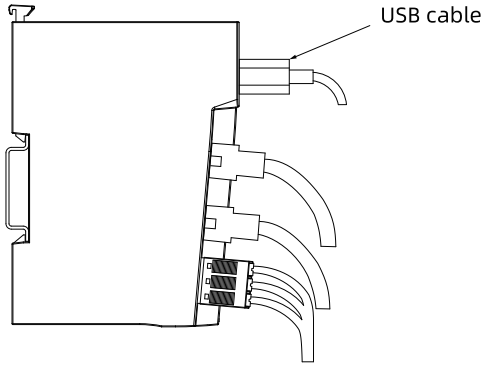
This product can be directly connected to a PC with the programming software or IOManager configuration tool installed via a USB cable for firmware upgrade.

Prerequisites

A USB cable and a PC

Procedure

Insert one end of the USB cable into the Type-C port of the product, and the other end into the PC.



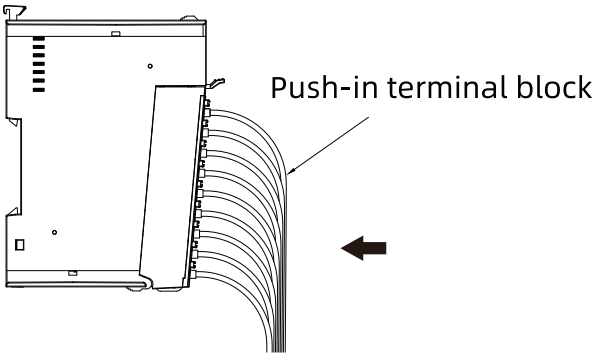
Note

To remove the cable, simply pull out the USB cable directly.

5.5 PUSH IN Cable Connection

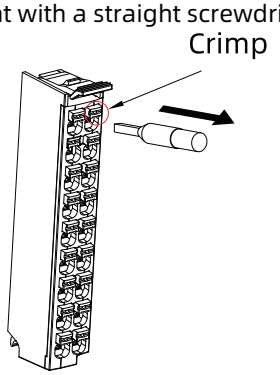
Cable connection

Insert the cables into the PUSH IN terminals, as shown below.

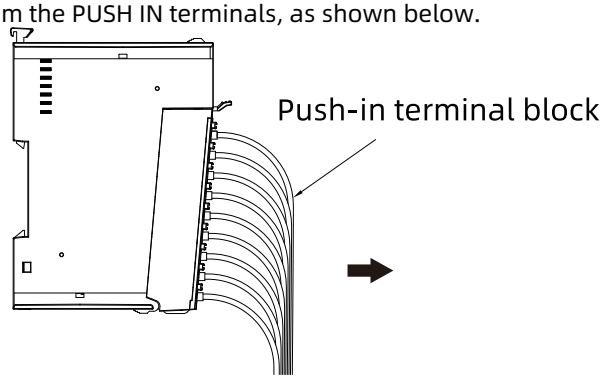


Cable disconnection

1. Press the terminal release component with a straight screwdriver, as shown below.



2. Remove the cables from the PUSH IN terminals, as shown below.



5.6 Terminal Block Connection

The GL20-3200END-M, GL20-0032ETP-M, GL20-0032ETN-M, and GL20-3232ETN-M modules feature ejector headers. After installation, these modules must be connected to external I/O terminal blocks using cables.

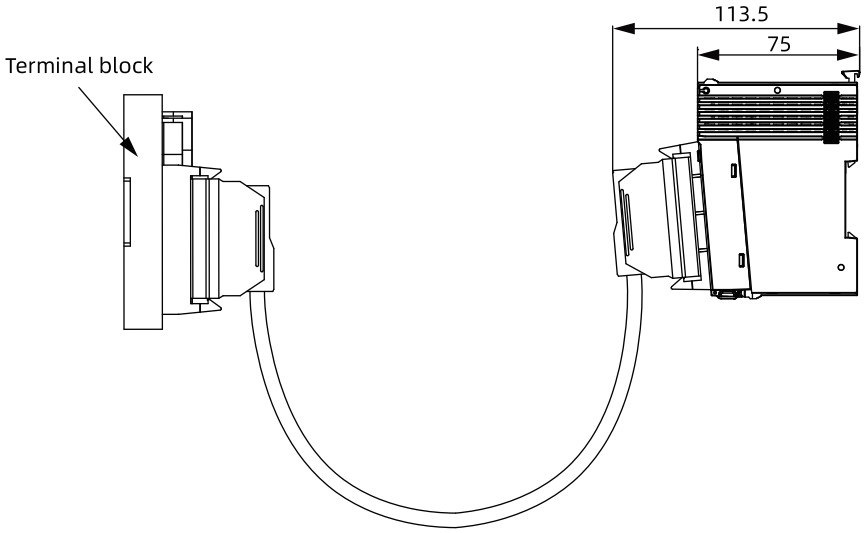
External terminal block and cable selection

The following table describes the order data of the terminal block and the cable.

Name	Material code	Specification and Model	Description	Remarks
Cable (connector not provided)	15310167	XA3210A-40-L0.5M-01	40PIN MIL cable (500 mm)	High density adapter cable, including two 40PIN MIL connectors (500 mm)
	15310166	XA3210A-40-L2M-01	40PIN MIL cable (2000 mm)	High density adapter cable, including two 40PIN MIL connectors (2000 mm)
Terminal block	15020452	T024-K	40-pin MIL-to-screw wiring terminal block	T024-K

Cable connection

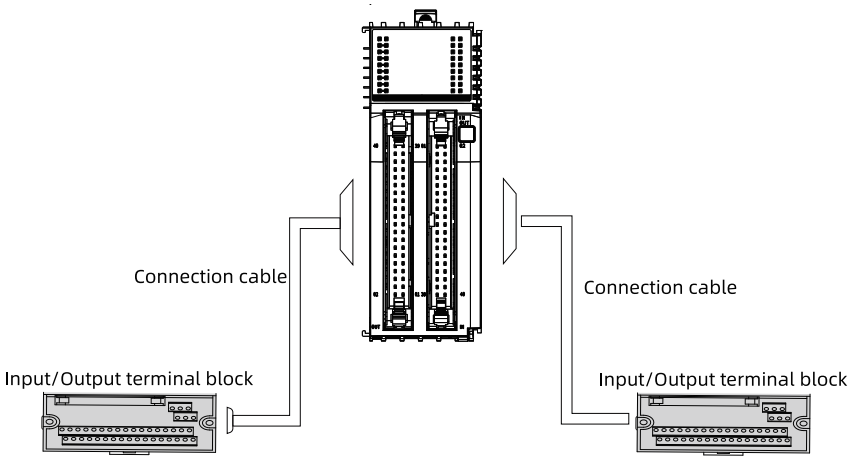
The following figure shows the cable connections and dimensions (in mm).



Terminal block connection

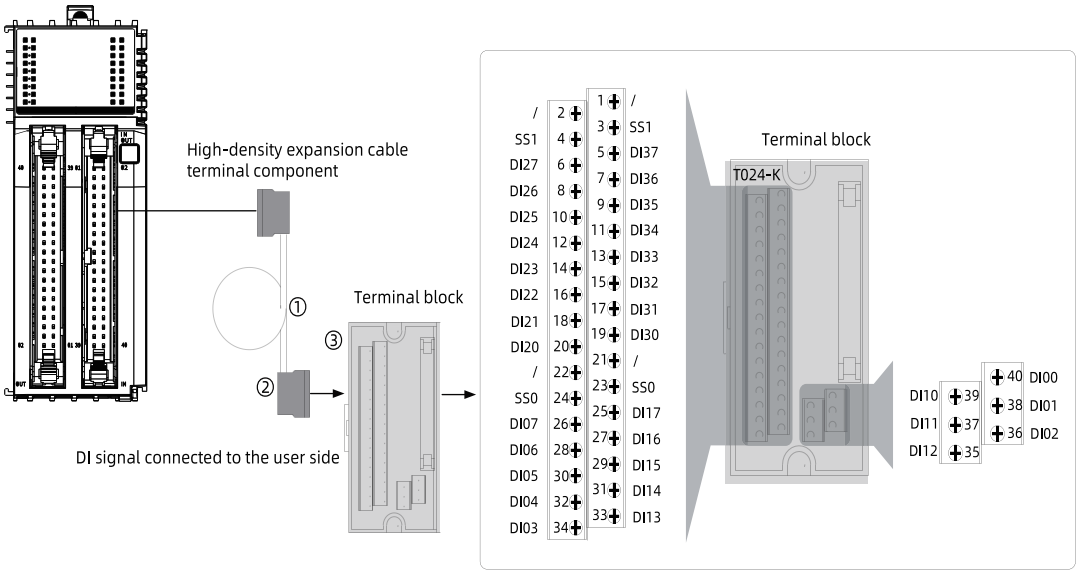
Connect the module to the external I/O terminal block through a connecting cable. The GL20-3232ETN-M module supports two external terminal blocks. The GL20-3200END-M, GL20-0032ETP-M, and GL20-0032ETN-M modules support one external terminal block.

- GL20-3232ETN-M

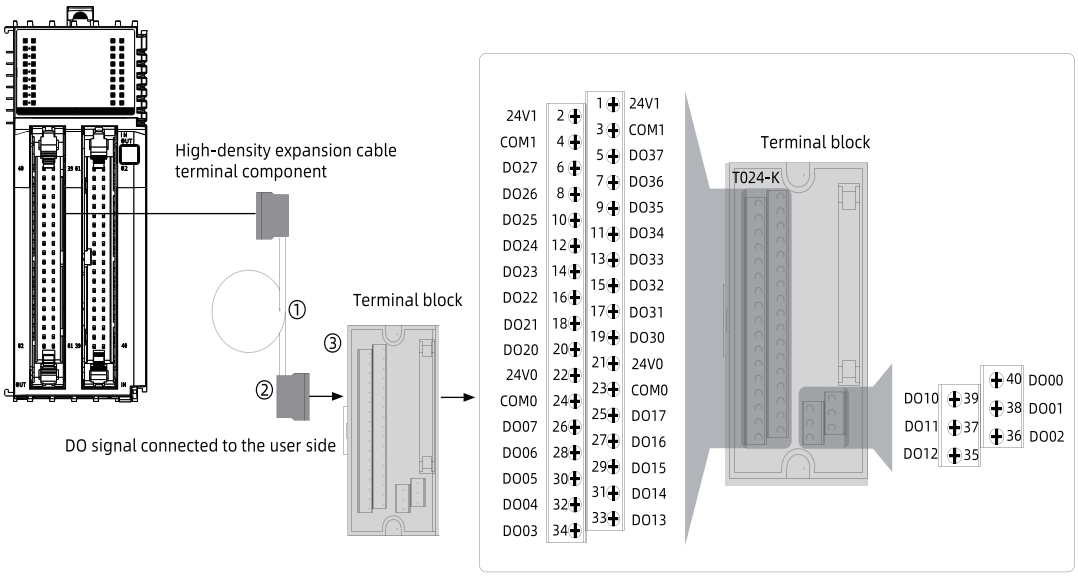


When the T024-K adapter terminal block is used for connection, the correspondence between the terminals of the terminal block and the terminals of the module is shown in the figure below (When other types of adapter terminal blocks are used, check the terminal correspondence.)

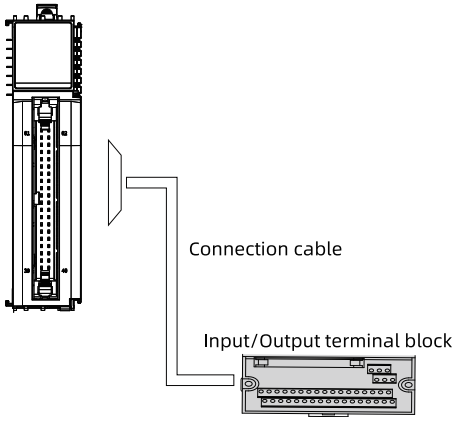
- DI signal



- DO signal

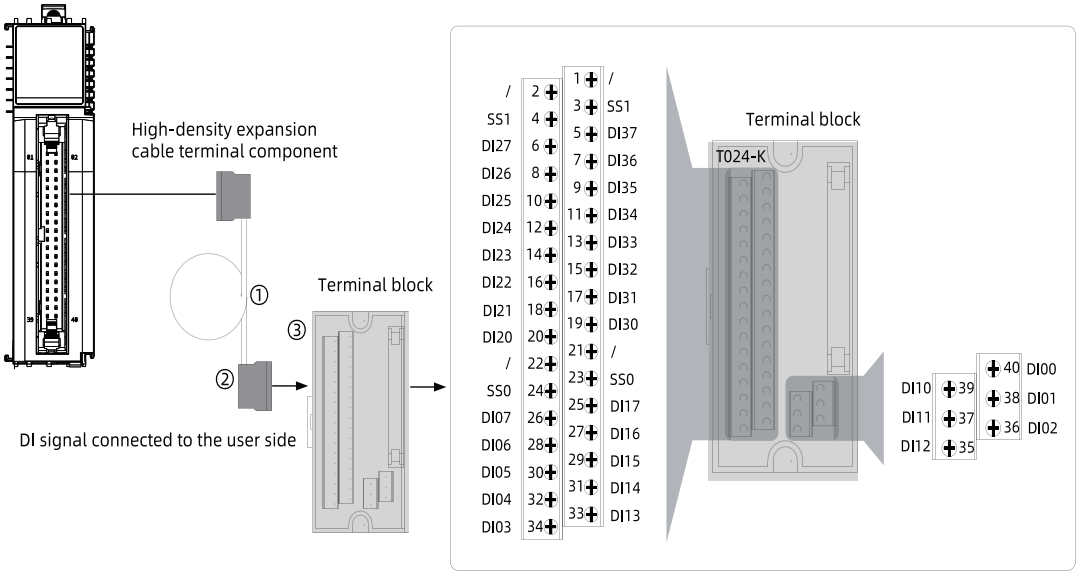


- GL20-3200END-M, GL20-0032ETP-M, and GL20-0032ETN-M

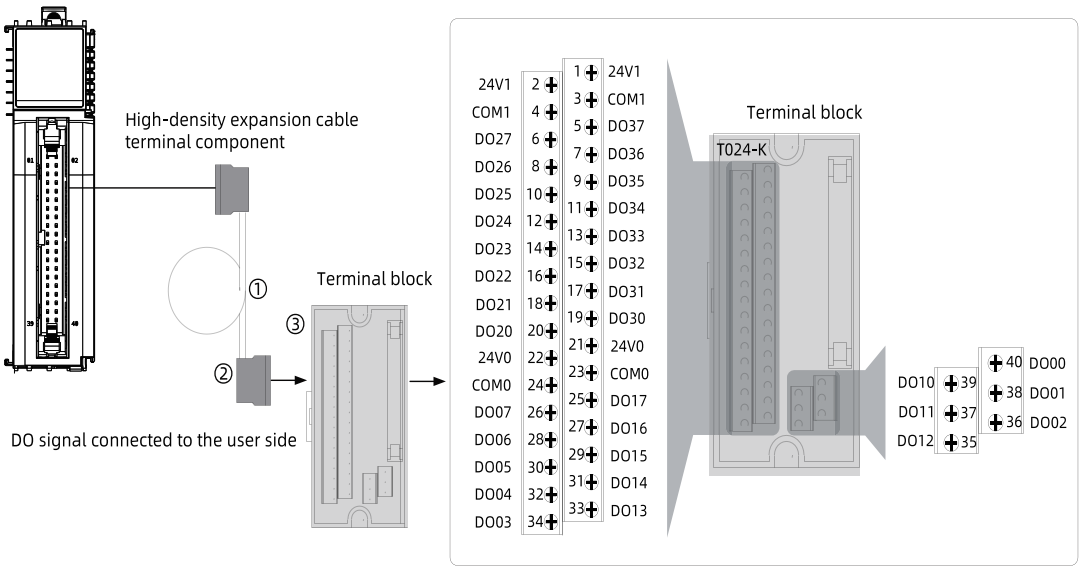


When the T024-K adapter terminal block is used for connection, the correspondence between the terminals of the terminal block and the terminals of the module is shown in the figure below (When other types of adapter terminal blocks are used, check the terminal correspondence.)

- DI signal (GL20-3200END-M)



- DO signal (GL20-0032ETP-M and GL20-0032ETN-M)



6 Introduction to Bus

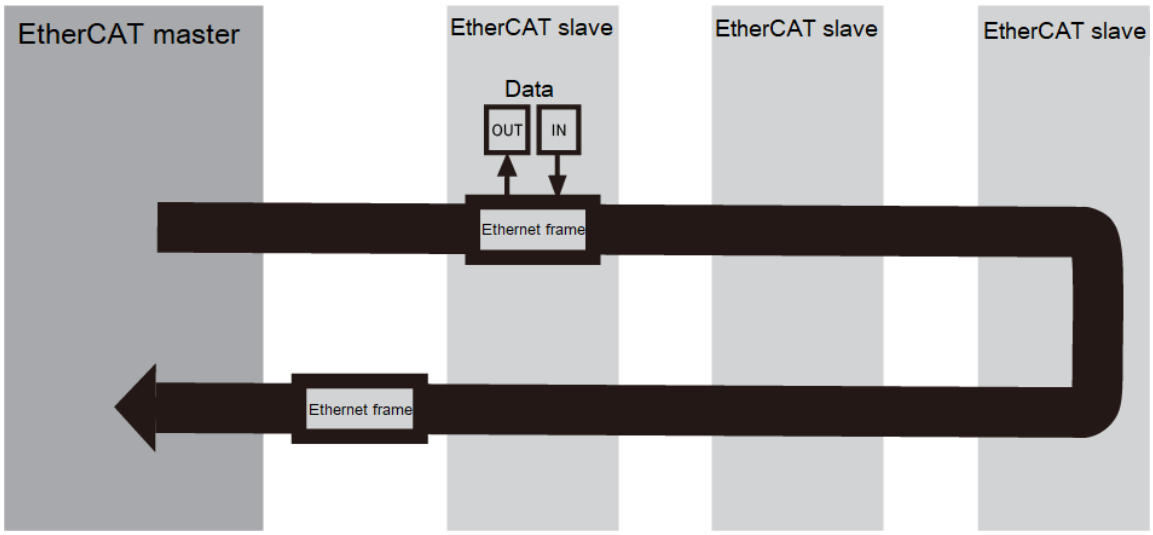
6.1 Introduction to EtherCAT Bus

6.1.1 Introduction

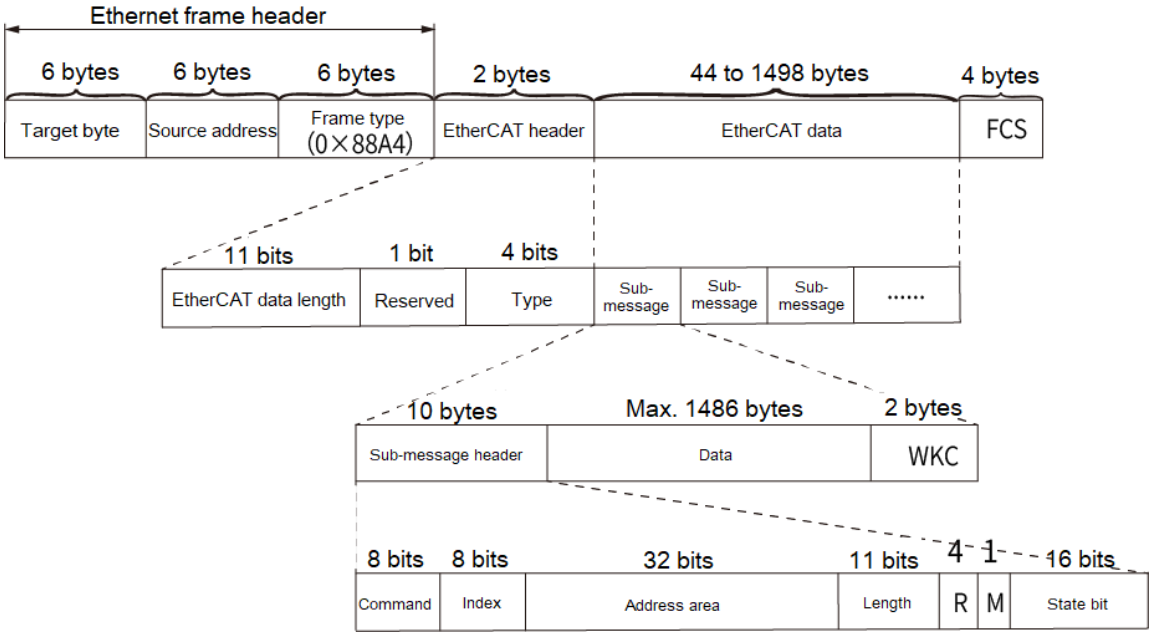
EtherCAT is an Ethernet-based fieldbus system primarily used for data transmission in industrial automation. Its unique communication method overcomes the system limitations of other Ethernet solutions, making data transmission more efficient. In an EtherCAT network, data is transmitted through a ring or linear network structure. Each slave reads and writes data, and then immediately passes the data packet to the next slave. The last slave in the network segment sends the fully processed data frame back to the master as a response frame.

EtherCAT adopts a master-slave communication mode, where one EtherCAT master communicates with multiple EtherCAT slaves. The master is responsible for sending data frames and receiving responses from slaves, while the slaves are responsible for receiving data frames from the master, executing corresponding operations, and then writing the result back into the frames to return to the master. This transmission method enables data communication within one cycle, significantly improving bandwidth utilization.

EtherCAT features real-time performance, flexibility, and efficiency. It supports various device connection topologies, such as ring and linear structures. Slave nodes use dedicated control chips, which offer low latency and precise synchronization, making it very suitable for industrial automation applications.



EtherCAT data is transmitted directly using Ethernet data frames, with the frame type 0x88A4. The EtherCAT data message consists of a header (EtherCAT header) of two bytes and EtherCAT data of 44 to 1498 bytes. The data area consists of one or more EtherCAT sub-messages, each corresponding to the memory space of an independent device or slave. The master uses different addressing methods to exchange data with slaves through EtherCAT sub-messages.

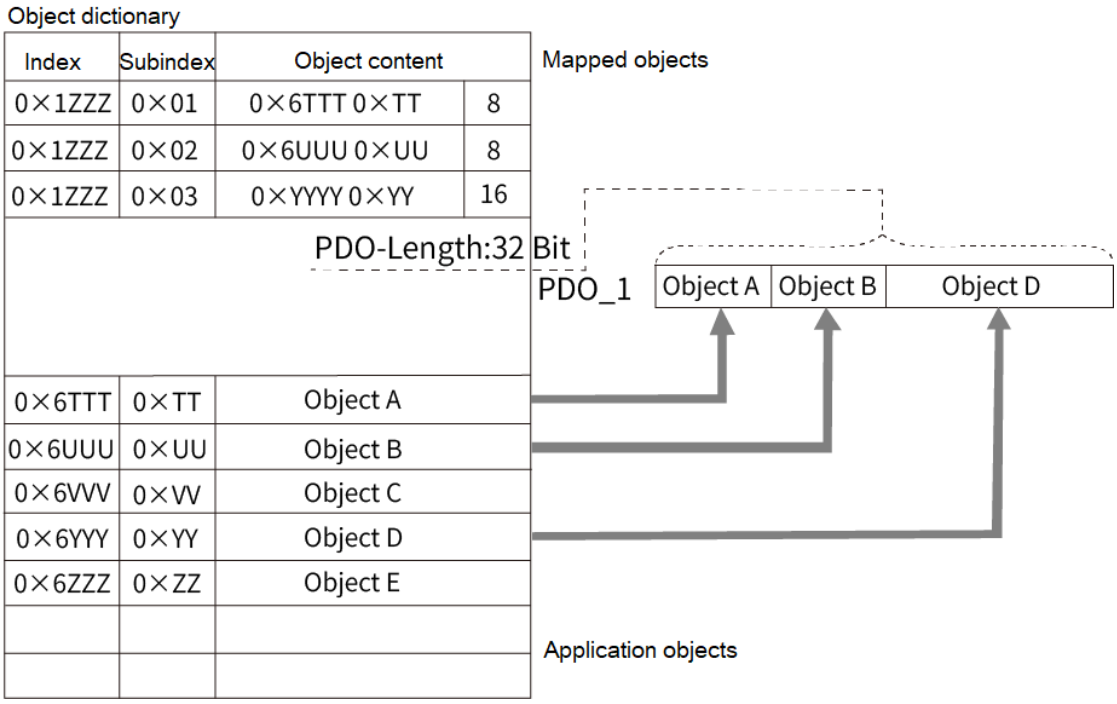


6.1.2 EtherCAT Communication Types

EtherCAT communication types primarily include process data objects (PDO) and service data objects (SDO). PDO is used for periodic data exchange, while SDO is used for aperiodic data exchange.

PDO Communication

PDO communication refers to the periodic data exchange between the master and slaves in the EtherCAT bus network. It is primarily used for periodic data reading and control with fast speeds. When the master and slaves exchange data via PDO, the receiving party does not need to respond after the sending party transmits data. The PDO list can be regarded as an array space, where each array element stores different parameters. These parameters are used to perform corresponding operations in a cycle.



SDO Communication

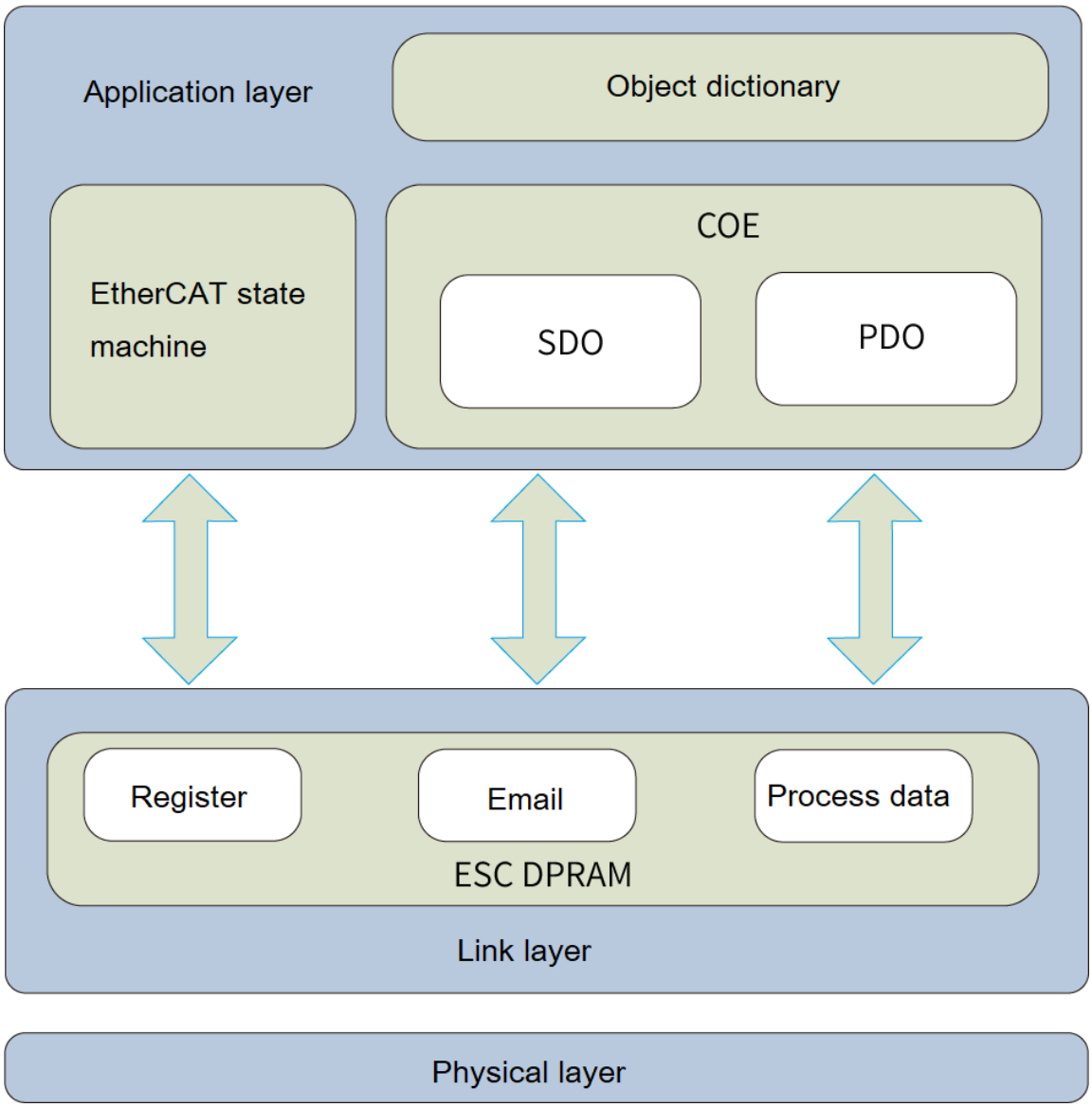
SDO communication is a request-response data exchange method, also known as mailbox communication. It is used for aperiodic data configuration and status information reading. When aperiodic data exchange is required, the master sends a request via SDO, and the slave responds to this request and returns data. SDO is primarily used for data exchanges that require a response, such as device configuration and diagnosis.

6.1.3 EtherCAT Communication

6.1.3.1 CAN Application Protocol Structure Based on EtherCAT (CoE)

The object dictionary in the application layer includes communication parameters, application process data and PDO mapping data. The PDO process data object, which contains real-time data during the operation of the device, periodically performs read and write operations. SDO mailbox communication enables acyclic access and modification of communication parameter objects and PDOs.

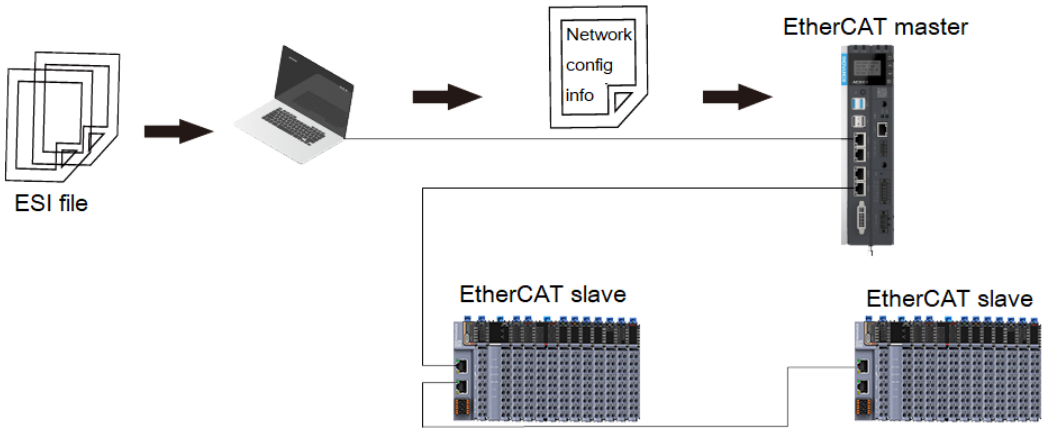
- Inherits the object dictionary concept from CANopen, facilitating unified management of device parameters.
- Supports SDO and PDO communication.
- Commonly used for real-time data exchange and configuration of devices such as sensors and actuators.



6.1.3.2 EtherCAT Device Description File (ESI File)

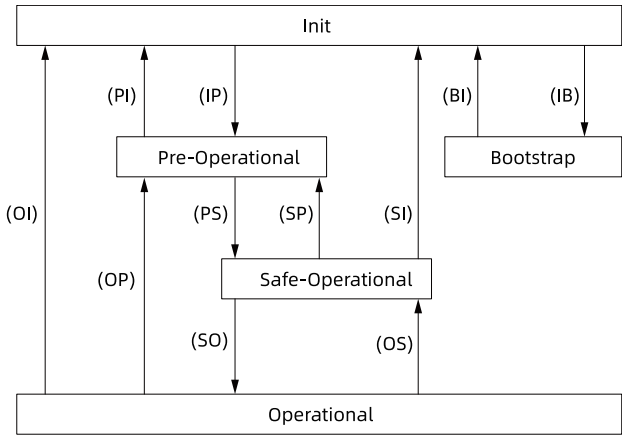
In EtherCAT, the ESI device description file is an XML file used to describe the configuration and functions of a slave. It includes the hardware and software parameters of the slave, as well as the communication rules with other slaves.

This file can be used to configure and identify the slaves in an EtherCAT network, ensuring that all devices in the network can properly exchange data and work in coordination.



6.1.3.3 EtherCAT Communication State Transition

The following figure shows the state transition diagram of EtherCAT.



The EtherCAT state machine must support four states and coordinates the state relationship between the master and slave applications during initialization and operation.

- Init: Initialization, shortened as I.
- Pre-Operational: Shortened as P.
- Safe-Operational: Shortened as S.
- Operational: Shortened as O

Transition from Init state to Operational state must be in the sequence of Init, Pre-Operational, Safe-Operational. Skipping any step is not allowed. When returning from the Operational state to a lower-level state, skipping steps is allowed. The following table describes the state transition and the initialization process.

State and Transition	Procedure
Init (I)	No communication available in the application layer, EtherCAT slave controller (ESC) register can only be read/written by the master.
IP	• The master configures the slave addresses. • The master configures the mailboxes. • The master configures the distributed clocks (DCs). • The master requests the Pre-Operational state.

State and Transition	Procedure
Pre-Operational (P)	Service Data Object (SDO) in the application layer
PS	• The master initializes PDO mapping through mailbox communication. • The master configures the Sync Manager channel used during process data communication. • The master configures the FMMU. • The master requests the Safe-Operational state.
Safe-Operational (S)	Process data communication is available. However, the system allows only input data reading, and does not generate output signals (SDO, TPDO).
SO	The master sends valid output data to make a request for the Operational state.
Operational (O)	All inputs and outputs are valid, and mailbox communication (SDO, TPDO, RPDO) is still available.
IB	Enters the Boot state
Boot state (B)	Supports FOE communication, providing file transfer services and firmware updates.
BI	Restarts the device.

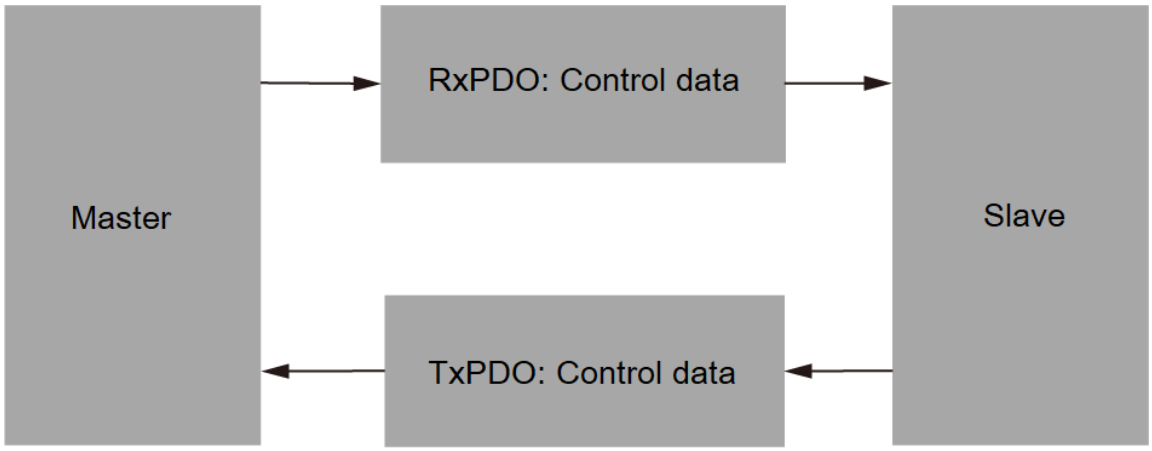
6.1.3.4 Process Data Object (PDO)

Introduction

The process data object (PDO) is used for cyclic data exchange between the master and slave.

Input process data objects (TxPDOs): Used by slaves to feed back their status to the master.

Output process data objects (RxPDOs): Used by slaves to receive commands from the master.



PDO mapping

PDO mapping is used to map the process data object dictionary required for communication. The mapping types are divided into RxPDO mapping (index range: 0x1600-0x17FF) and TxPDO mapping (index range: 0x1A00-0x1BFF).

The object dictionary for PDO mapping contains the indexes, subindexes, and data lengths of process data objects required for PDO communication. Its basic structure is as follows:

bit	31	...	16	15	...	8	7	...	0
Definition	Index			Subindex			Object length		

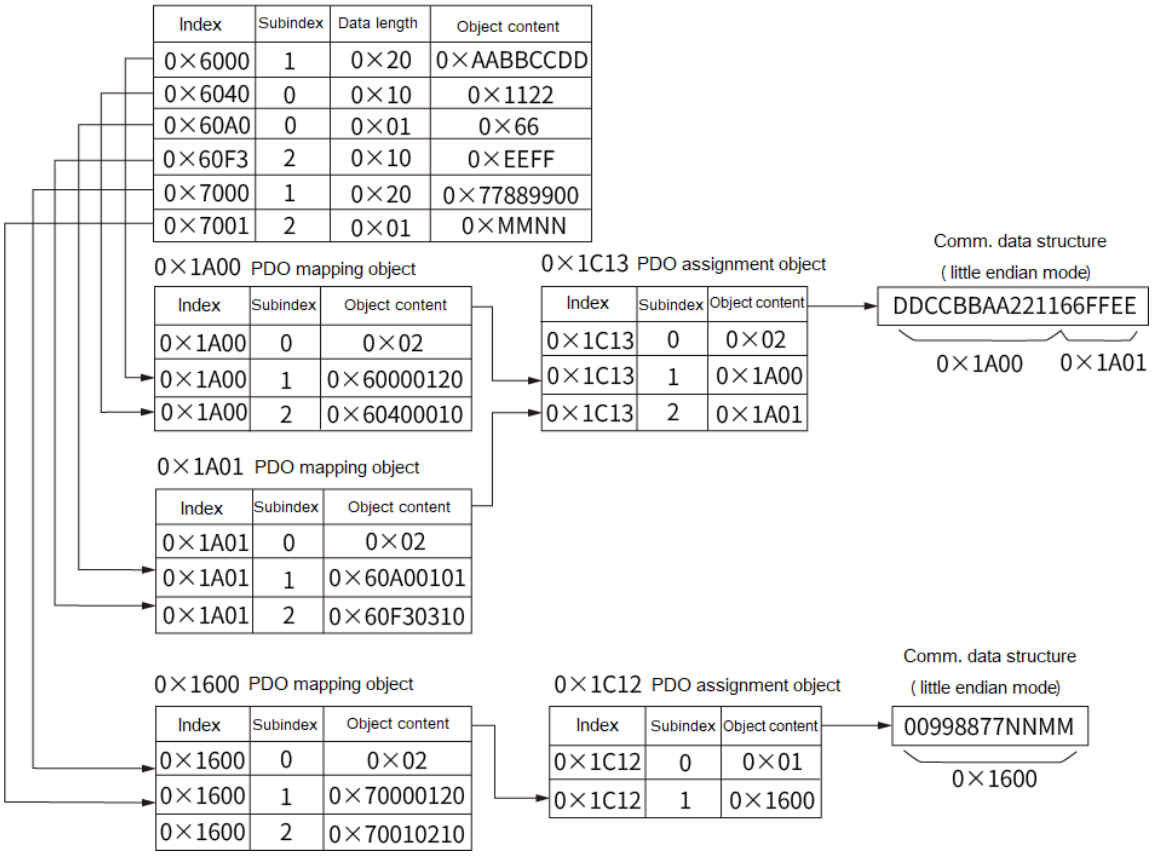
The index and subindex together define the position of an object in the object dictionary. The object length indicates the bit length of the object in hexadecimal, as shown below:

Bit Length	Object Length
8 bits	08h
16 bits	10h
32 bits	20h

PDO assignment

PDO assignment is used to configure the PDO mapping. It consists of two object dictionaries: RxPDO assignment (object dictionary: 0x1C12) and TxPDO assignment (object dictionary: 0x1C13).

The complete process of object dictionary mapping and assignment is shown below.



6.1.3.5 Service Data Object (SDO)

In an EtherCAT network, a service data object (SDO) is a data structure used for exchanging slave configuration, status information, and application layer data between the EtherCAT master and slaves. SDO can be used to transmit configuration parameters of slaves in an EtherCAT network, such as hardware configuration and operating parameters.

For the abort codes of SDO communication fault, see *"10.5.2.2 SDO Communication Fault Codes" on page 443*.

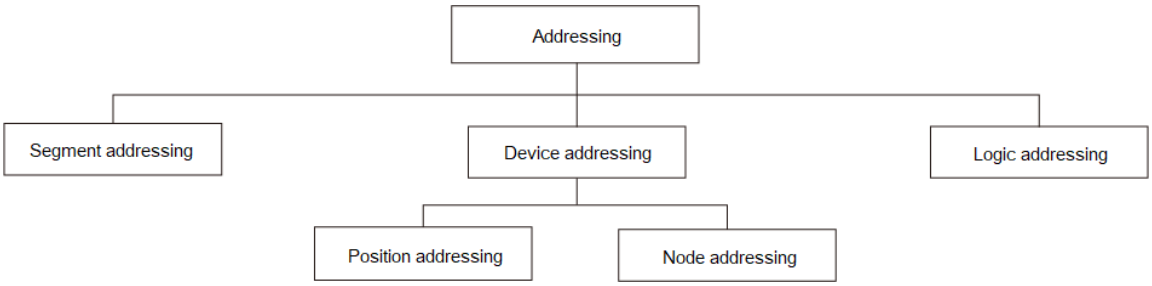
6.1.3.6 Communication Between EtherCAT Master and Slave

In an EtherCAT network, time synchronization between the master and slaves is a critical issue. EtherCAT provides three synchronization modes.

- Free Run mode: In this mode, the control cycle of the slave station is generated by the local timer. Since the start times of each slave station in the EtherCAT network are different, each slave station refreshes its I/O according to its own operating cycle, which is considered asynchronous operation.
- SM (Sync Manager) mode achieves data synchronization through SM channels. When the data frame sent from the master reaches the slave, a Sync Manager event is triggered. Upon receiving this signal, the slave immediately enters the interrupt service program to execute data exchange and I/O refresh. In this mode, since data frames arrives at each slave at different times, there is a time deviation in when each slave receives the data. The more slaves there are and the more complex the system configuration, the worse the synchronization effect will be.
- DC (Distributed Clock) synchronization mode achieves data synchronization through distributed clocks. The master periodically reads the local clock of the slave that supports DC synchronization (typically the first slave in the network that supports DC synchronization), and then periodically sends this clock as the system clock to other slaves. Upon receiving the system clock, the other slaves compare it with their own clocks and dynamically adjust their own clocks based on the time deviation. The slaves generate precise synchronization signals through SYNC0 and trigger interrupts, thereby controlling the synchronous execution of tasks across devices.

6.1.3.7 EtherCAT Slave Addressing

EtherCAT slave devices support different addressing modes. A 32-bit address in the frame header of the EtherCAT data frame is used for either physical node addressing or logical addressing.



An EtherCAT segment is equivalent to an Ethernet device. EtherCAT data is transmitted via Ethernet frames. The master station addresses the EtherCAT segment through the MAC destination address in the Ethernet frame header. This process is known as segment addressing.

8bit	8bit	32bit		11bit	2	1	1	1	16bit
Cmd	Idx	Address		Len	R	C	R	M	IRQ
		16bit	16bit						
APxx		Position	Offset	Auto Increment Addressing					
FPxx		Position	Offset	Fixed Physical Addressing					
Lxx		Logical Address		Logical Addressing					

During device addressing, the 32-bit address within the EtherCAT sub-message is divided into a 16-bit slave device address and a 16-bit address for the internal physical memory space of the slave

device (slave memory offset address). The 16-bit slave device address can address up to 65,535 slave devices, with each device having up to 64K bytes of internal storage. During device addressing, each sub-message addresses only one unique slave device.

During logical addressing, the 32-bit address within the sub-telegram is an entity representing a logical address. The device data exchange area addresses across the entire EtherCAT segment are mapped to logical addresses through FMMU. During data communication, the master station does not distinguish between specific device addresses but treats the entire EtherCAT segment as a single data storage space for access. This method does not require complex memory mapping, allowing direct data transfer within the segment, significantly improving data transmission speed. The logical addressing method is particularly suitable for periodic data exchange.

Positional addressing determines the address of a slave station based on its connection position within the network segment. During the network initialization phase, the master station sends a message with a negative address. As the message passes through each slave station, its position address is incremented by 1. When the address reaches 0, it indicates that the message is addressed to the particular station. This addressing method is also known as auto increment addressing. The master station uses positional addressing to set the station addresses of the slave stations, for example, 1001, 1002, etc. Subsequently, the master station can use station addresses that are independent of the physical location to address the slave stations.

When addressing a node, the address of the slave station is independent of its connection position. The master station addresses a specific device through the station address or station address alias, and then accesses the data based on the offset address within the device. Node addressing is also known as setup addressing.

The EtherCAT communication interface module supports the station address alias function. The station address is automatically set by the master station to the slave station through positional addressing during network startup. The station address alias is configured and enabled on the host computer, with priority over the station address. The master station can choose which address to use for node addressing, defaulting to the station address.

The GL20-RTU-ECT32 module can only have its station address alias set via the host controller.

6.1.3.8 Introduction to Network Devices

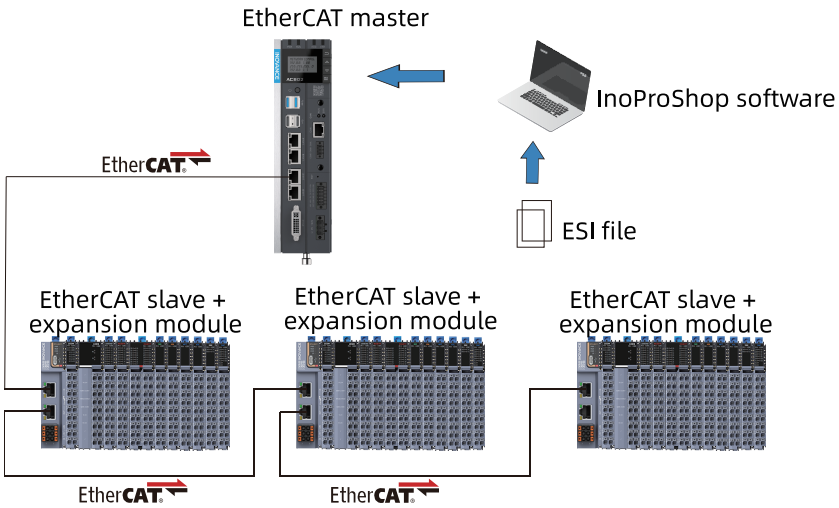
Network Device/File Name	Description
EtherCAT master	The manager in the EtherCAT network, responsible for initiating data in the network.
EtherCAT slave	The executor in the EtherCAT network, responsible for real-time data exchange and the implementation of control logic.
Expansion module	A function module that can be mounted on a communication interface module or a master, responsible for executing control commands issued by the master and refreshing I/O.
ESI file	An EtherCAT slave information file, which is an XML configuration file that contains the functions and properties provided by the slave. This file is used for the master to initialize the slave.
EDS file	An EtherNet/IP slave information file, which is an XML configuration file that contains the functions and properties provided by the slave. This file is used for the master to initialize the slave.

Network Device/File Name	Description
GSD file	A PROfinat slave information file, which is an XML configuration file that contains the functions and properties provided by the slave. This file is used for the master to initialize the slave.
InoProShop software	An industrial host controller software running on a PC. It is used for configuring the EtherCAT network, masters, and slaves, as well as PLC software programming, status monitoring, and troubleshooting.
Communication cable	Used for transmitting EtherCAT data frames. It adopts shielded twisted pair Ethernet cables of Cat5e (100Base-TX) or higher and requires straight-through wiring.
EtherCAT branch module	Used for building star topology networks in multi-axis complex equipment and production line networking (ring topology is not supported).
GR20-1OP-EN optical fiber module	Used for conversion between Ethernet and optical fiber, enabling long-distance communication via the EtherCAT bus. This module can be used to extend communication distance when the network cable exceeds 100 m.
Optical fiber	Used for long-distance data transmission between optical fiber modules.

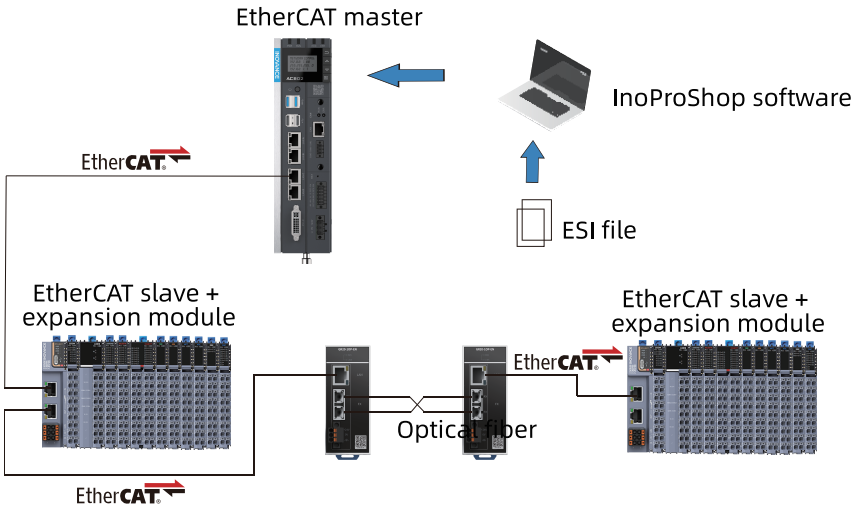
6.1.3.9 Typical Network Topology

This section introduces typical EtherCAT network configuration examples, including linear, star, and ring topologies. The linear topology supports short-distance direct communication and long-distance communication via optical fiber modules. The following figures illustrate these topologies using the AC802 EtherCAT master as an example.

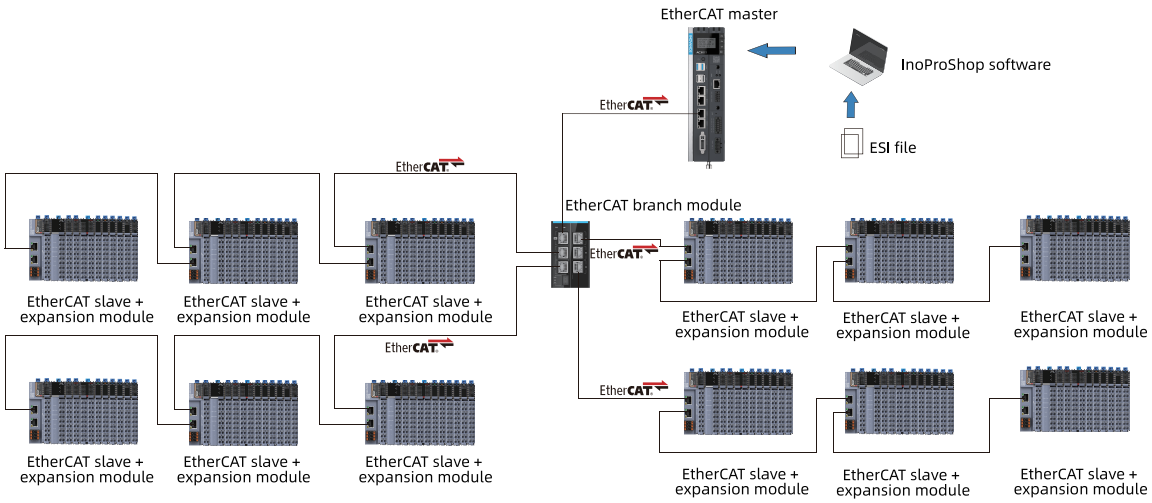
Linear topology



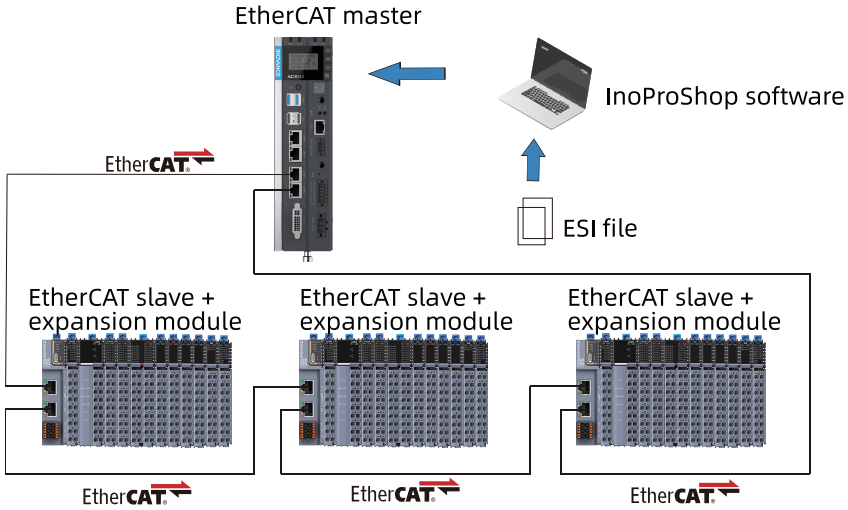
Linear topology (for long-distance communication via optical fiber modules)



Star topology



Ring topology



6.2 Introduction to EtherNet/IP Bus

6.2.1 Introduction

EtherNet/IP (EtherNet Industrial Protocol) is an industrial communication protocol based on standard Ethernet technology, designed for industrial automation and control systems, and developed and maintained by ODVA (Open DeviceNet Vendors Association). With its openness and compatibility, EtherNet/IP has become one of the mainstream protocols in the field of industrial automation.

EtherNet/IP communication characteristics

Characteristics of the EtherNet/IP protocol:

- Standardization: EtherNet/IP is built on top of standard TCP/UDP protocol and fully compliant with the standard IEEE 802.3U. It supports star, tree, ring, line and other topologies, and all devices with standard Ethernet nodes can join this network.
- Real-time performance: EtherNet/IP data transmission adopts implicit and explicit messaging communication, serving real-time control and data exchange respectively. It is applicable to manufacturing, process control and other fields.
- High communication efficiency: EtherNet/IP uses the producer/consumer technology, which allows nodes on the network to access data from the same source at the same time. In the producer/consumer mode, each data is assigned a unique identifier, and each data source sends the data to the network at one time, and the other nodes read the data selectively, which greatly improves the communication efficiency of the system.
- Wide application: EtherNet/IP communication devices support various device types such us PLCs, sensors, and drives, including simple I/O devices, sensors (e.g., scanners and cameras), actuators, and complex control devices (e.g., robots, PLCs, and welders).

EtherNet/IP communication mode

EtherNet/IP communication operates in explicit messaging and implicit messaging modes.

- Explicit messaging
  - Purpose: Non-real-time communication for device configuration, parameter reading/writing and diagnosis
  - Protocol: Based on TCP/IP with client-server mode
  - Features:
    - Implemented through a request-response mechanism, similar to HTTP.
    - Adopt the CIP object model to describe device functions (e.g., Identity Object, Assembly Object).
- Implicit messaging
  - Purpose: Real-time communication for high-speed data transmission (e.g., I/O control, motion control).
  - Protocol: Based on UDP/IP with producer-consumer mode.
  - Features:

- Data is transmitted in periodic or event-driven mode with low latency.
- Multicast is supported so multiple devices can receive the same data packet at the same time.

With the flexibility of explicit messaging and the real-time performance of implicit messaging, EtherNet/IP meets diverse requirements ranging from device configuration to high-speed control.

6.2.2 Communication Specifications

Communication Specifications			EtherNet/IP Network
CIP service	Implicit (I/O) messaging	Number of I/O connections	16
		RPI (communication cycle)	1 ms to 50,000 ms
		Bandwidth allowable for implicit (I/O) messaging (@ 500 bytes)	2000 (pps①)
		Maximum data size per connection	5040 bytes
	Explicit messaging		This function is supported by instruction modules and adapters.

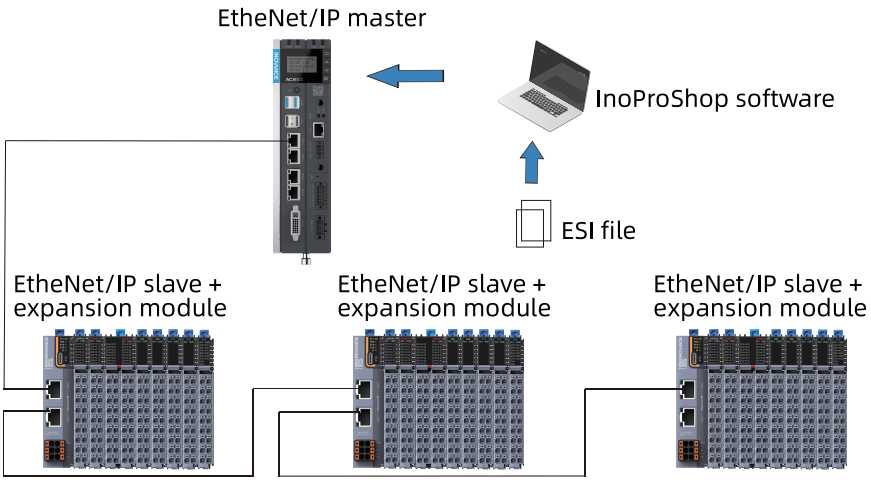
Note

①: pps stands for Packet Per Second, indicating the number of I/O packets processed per second.

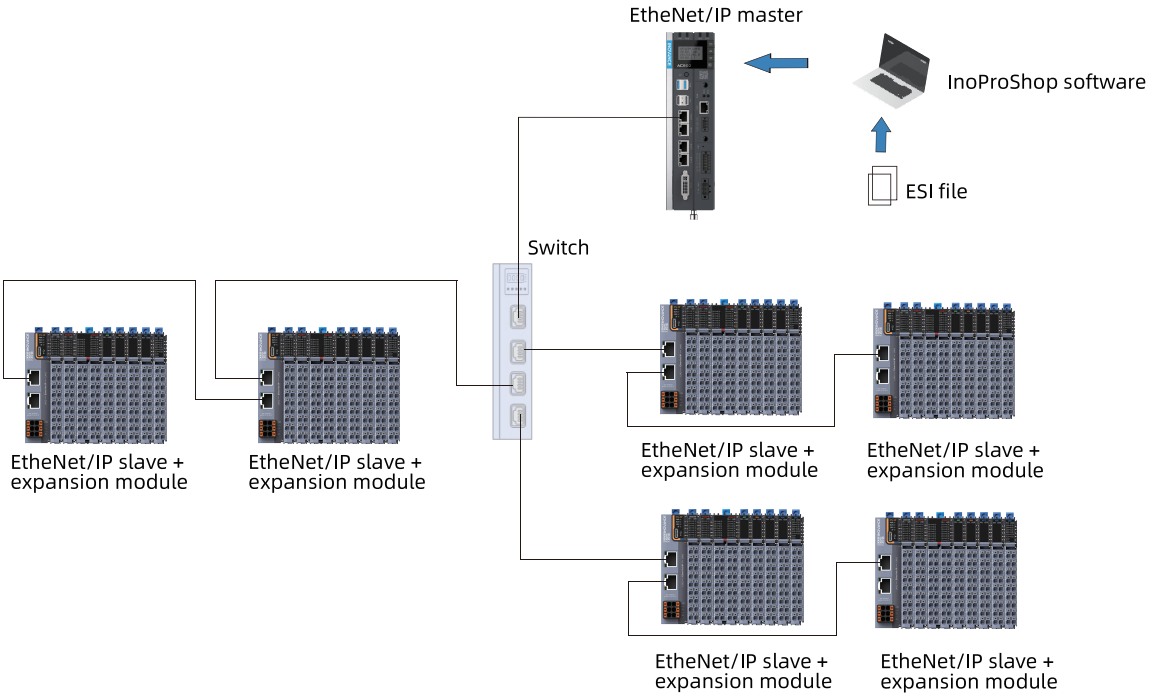
6.2.3 Typical Network Topology

This section provides examples of typical EtherNet/IP network topologies, including linear, star, tree, and ring types, as shown in the following figures.

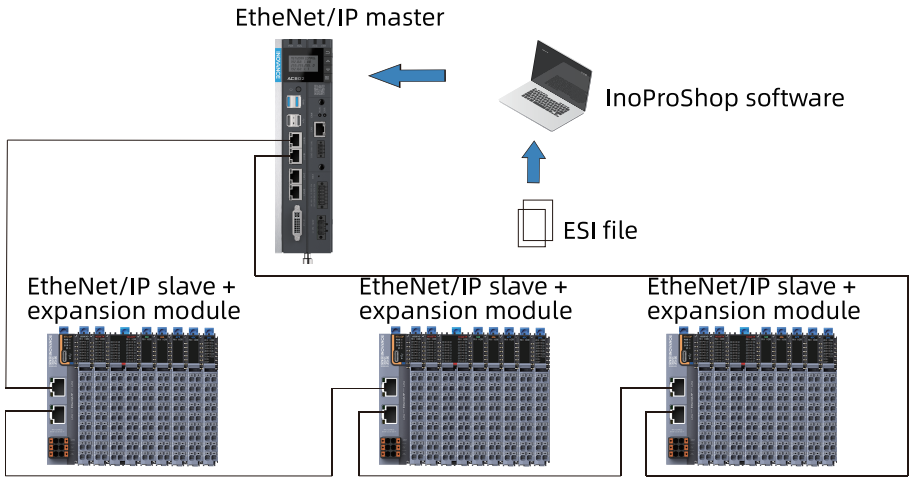
Line topology



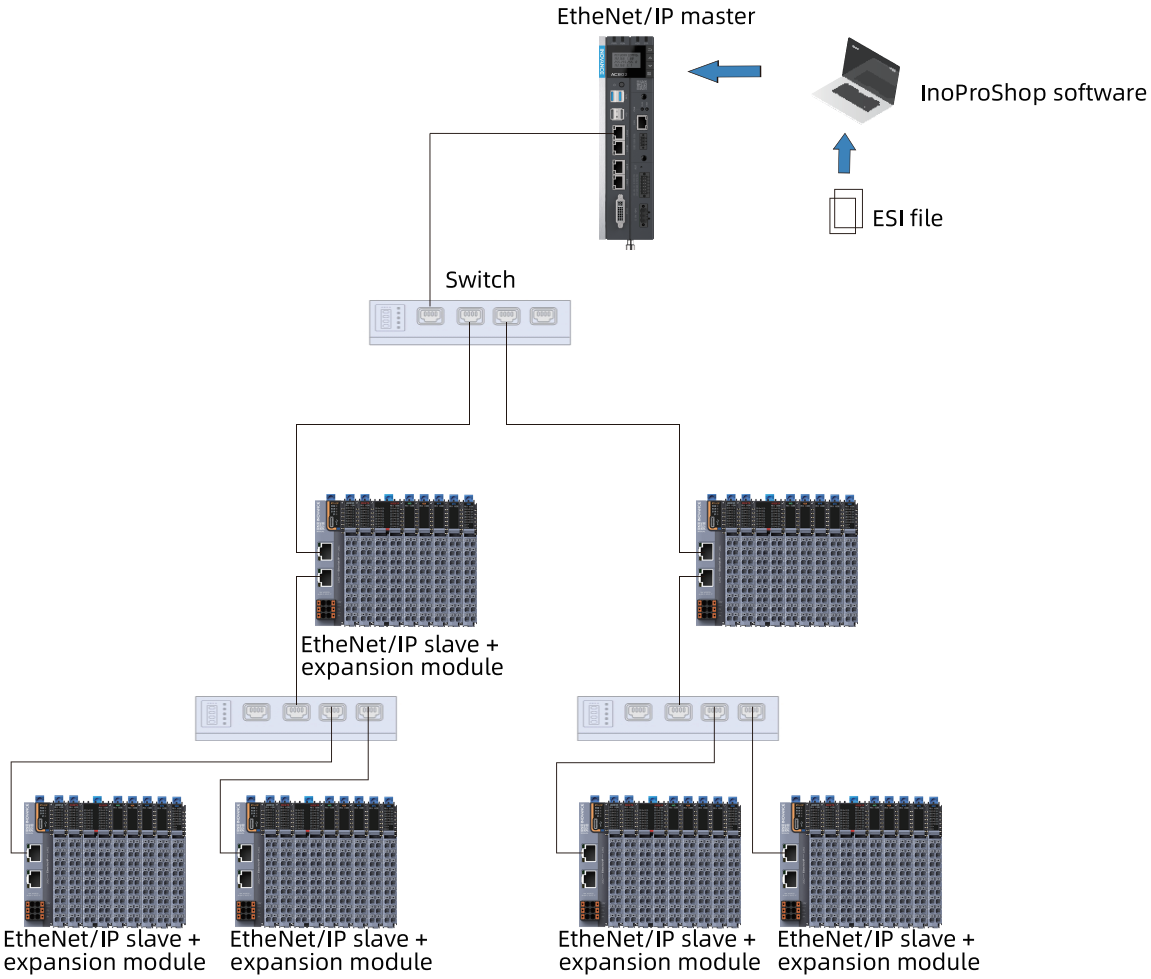
Star topology



Ring topology



Tree topology



6.3 Introduction to PROFINET Bus

6.3.1 Introduction

PROFINET, launched by PROFIBUS International (PI), is a new generation of automation bus standards based on the industrial Ethernet technology. As a strategic technical innovation, PROFINET provides a complete network solution for automation communication, encompassing hot topics in automation such as real-time Ethernet, motion control, distributed automation, fail-safe and network security. As a cross-supplier technology, it is fully compatible with industrial Ethernet and existing fieldbus (such as PROFIBUS) technologies, protecting existing investments.

PROFINET is a comprehensive solution covering eight key functional modules: real-time communication, distributed field devices, motion control, distributed automation, network installation, IT standards and information security, fail-safe, and process automation.

Features

- **Real-time communication**
  PROFINET supports the following three communication modes based on the response time.

- TCP/IP standard communication
  PROFINET is based on industrial Ethernet technology and uses TCP/IP and IT standards. TCP/IP is the implementation standard for communication protocols in the IT field. Although its response time is about 100 ms, it is sufficient for factory control-level applications.
- Real-time (RT) communication
  For data exchange between sensors and actuators, the system requires a response time of 5 to 10 ms.

  Currently, this response time can be achieved using fieldbus technology, such as PROFIBUS DP. For industrial Ethernet technology based on TCP/IP, handling process data packets through a standard communication stack is time-consuming. To address this, PROFINET provides an optimized real-time communication channel based on Ethernet Layer 2. This channel greatly reduces the processing time within the communication stack, enabling PROFINET to achieve real-time performance comparable to, or even exceeding, that of traditional fieldbus systems.
- Isochronous real-time (IRT) communication
  At the field level, motion control imposes the highest real-time requirements. The isochronous real-time (IRT) technology of PROFINET can meet these high-speed communication requirements. It delivers a response time of less than 1 ms and a jitter error of less than 1 µs with 100 nodes, ensuring timely and reliable response.

- **Rich application scenarios**
  - Distributed field devices
    Through the integrated PROFINET interface, distributed field devices can be directly connected to PROFINET. For existing fieldbus communication systems, transparent connection to PROFINET can be realized through a proxy server. For example, a PROFIBUS network can be transparently integrated into PROFINET through IE/PB Link (a proxy server between PROFINET and PROFIBUS). The rich device diagnostic functions of PROFIBUS also apply to PROFINET.

    The network of other types of fieldbuses can also be integrated into PROFINET using a proxy server in the same way.
  - Motion control
    The motion control system can be controlled easily through PROFINET IRT. In PROFINET IRT communication, each communication cycle is divided into two parts: a cyclic, deterministic real-time channel, and a standard channel used for standard TCP/IP data.

    In the real-time channel, a time window for a fixed cycle interval is reserved for real-time data, which is always inserted in a fixed order and transmitted at fixed intervals. The remaining time in the cycle is used for standard TCP/IP data. The two types of data can be transmitted in PROFINET at the same time without interfering with each other. The independent real-time channel ensures reliable control of servo motion systems.
  - Process automation
    PROFINET can be used not only in factory automation but also in process automation. Standards and solutions for Ethernet bus power supply and applications in intrinsically safe areas are currently under development. The PROFIBUS international organization has proposed solutions for using PROFINET at the field level in process automation.

Through proxy server technology, PROFINET can be seamlessly integrated with fieldbus PROFIBUS and other bus standards. PROFIBUS is the only fieldbus standard worldwide that covers both factory automation and process automation. The integrated PROFINET with PROFIBUS fieldbus solution delivers an ideal experience for process automation applications.

As an important part of the international standard IEC61158, PROFINET is a fully open protocol and a future-oriented new generation of industrial communication network standard. It brings greater benefits and convenience to automation control systems.

- **Network installation**
  PROFINET supports star, linear, and tree topology. To reduce wiring costs and ensure high availability and flexibility, PROFINET provides a wide range of tools to facilitate PROFINET installation. The specially designed industrial cables and durable connectors meet EMC and temperature requirements and are standardized within the PROFINET framework to ensure compatibility between devices from different manufacturers.
- **Security**
  - Standards and network security
    An important feature of PROFINET is its ability to transmit real-time data and standard TCP/P data at the same time. In the common channel that transmits TCP/IP data, various proven IT technologies can be used (such as HTTP, HTML, SNMP, DHCP, and XML). These IT standards strengthen management and maintenance of the entire network, reducing commissioning and maintenance costs.

    PROFINET enables vertical communication integration from the field level to the management level. On the one hand, this facilitates access to field-level data from management; on the other hand, the data security issues that once existed at the management level now extend to the field level. To ensure the security of field-level control data, PROFINET provides dedicated security mechanisms. By using specialized security modules, it protects automation control systems and minimizes security risks in automation communication networks.
  - Fail-safe
    In process automation, fail-safe is an important concept. It means that the system can recover to a safe state (that is, "zero" state) when a fault occurs or a fatal error occurs. This ensures the safety of both the operator and the entire system. Because in process automation, a system fault or fatal error could lead to an explosion or destruction of the entire system.

    The fail-safe mechanism ensures that the system can automatically recover to a safe state after a fault, without harming the operator or the process control system. PROFINET integrates the PROFIsafe profile to enable fail-safe of SIL3 level as specified in IEC61508, ensuring overall system safety.

6.3.2 Communication Specifications

Item		Specification
Basic specifications	Intput PDO data size	Max. 1,440 bytes
	Output PDO data size	Max. 1,440 bytes
	Communication mode	RT mode
	Minimum communication cycle	1 ms
	I&M data	I&M0 to I&M3
	Profinet version	V2.3
	Expansion capability	• Versions below 2.2.0.0: Support up to 16 expansion modules • Version 2.2.0.0 and above: Support up to 32 expansion modules
	Number of PROFINET interfaces	2
	PROFINET switch capability	Networking
	Open IE	Support standard Ethernet protocols, such as TCP/IP, SNMP, and LLDP
	Alarm/diagnosis/ status information	Supports for uploading of fault code from local to PLC
I/O service	Physical layer	100BASE-TX
	Communication rate	10 Mbps (standard Ethernet), 100 Mbps (PROFINET)
	Communication mode	Full duplex
	Topology	Supports linear, star, and tree topologies.
	Transmission medium	Cat5e and above
	Transmission distance	Less than 100 m between two nodes
	Priority boost	Supported
	MRP	Supported
	Port disable	Supported
	Zero configuration for module replacement	Supported (for PN modules of the same type)
	Factory reset of GL20-RTU-PN	Supported
	Factory reset of expansion module	Not supported
	PLC firmware upgrade	Supported

Note

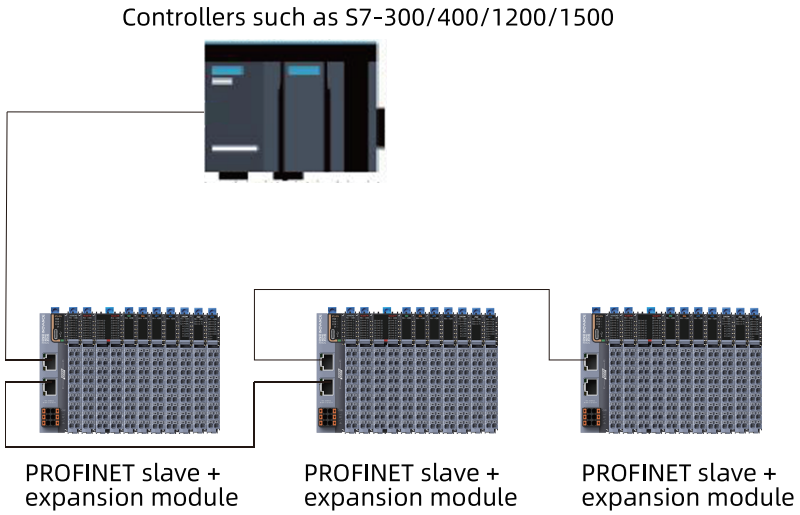
Each GL20-RTU-PN communication interface module can be configured with a maximum of 120 modules (the sum of actual expansion modules and sub-modules). Exceeding this limit will cause the GL20-RTU-PN communication interface module to go offline and cease operation.

For example, if the configuration includes one GL20-2SCOM-MDB expansion module and one GL20-1600END expansion module, where the GL20-2SCOM-MDB expansion module contains multiple "Master Read Holding Register Modules (referred to as sub-modules)", the total current module count is the sum of GL20-2SCOM-MDB expansion module, GL20-1600END expansion module, and sub-modules. Given that the total number of expansion modules is 2, the number of sub-modules cannot exceed 118.

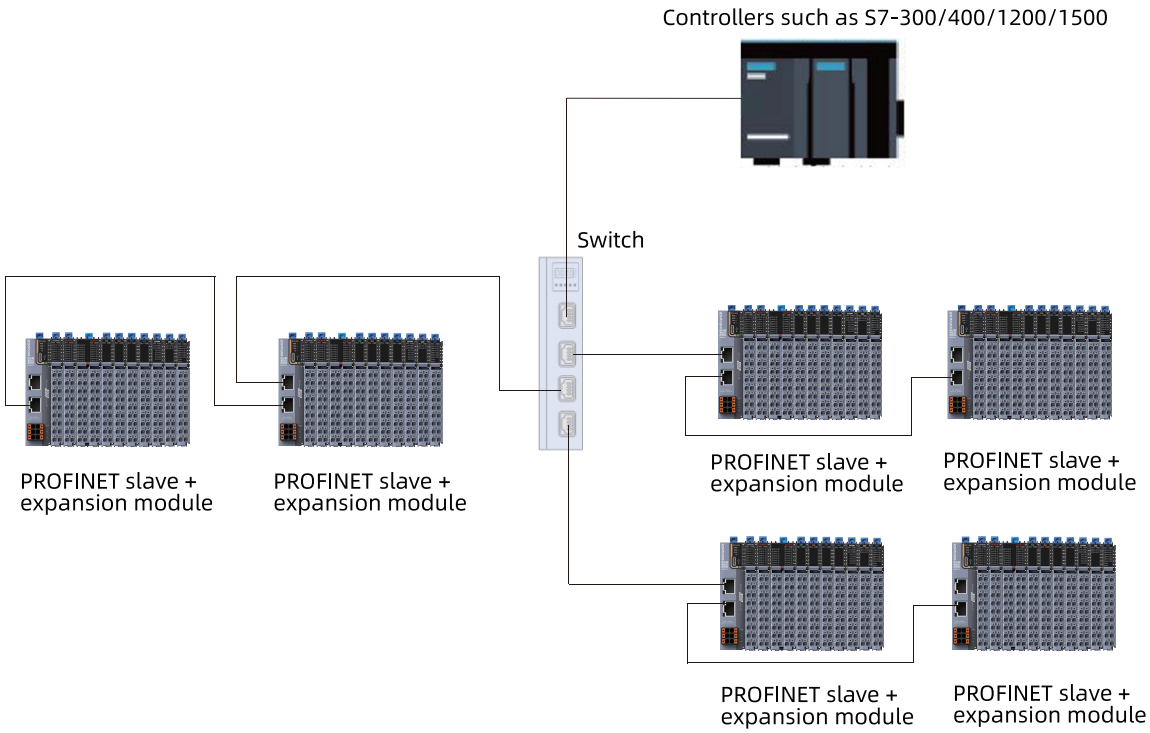
6.3.3 Typical Topology

This section provides examples of typical PROFINET network topologies, including linear, star, and tree types, as shown in the following figures.

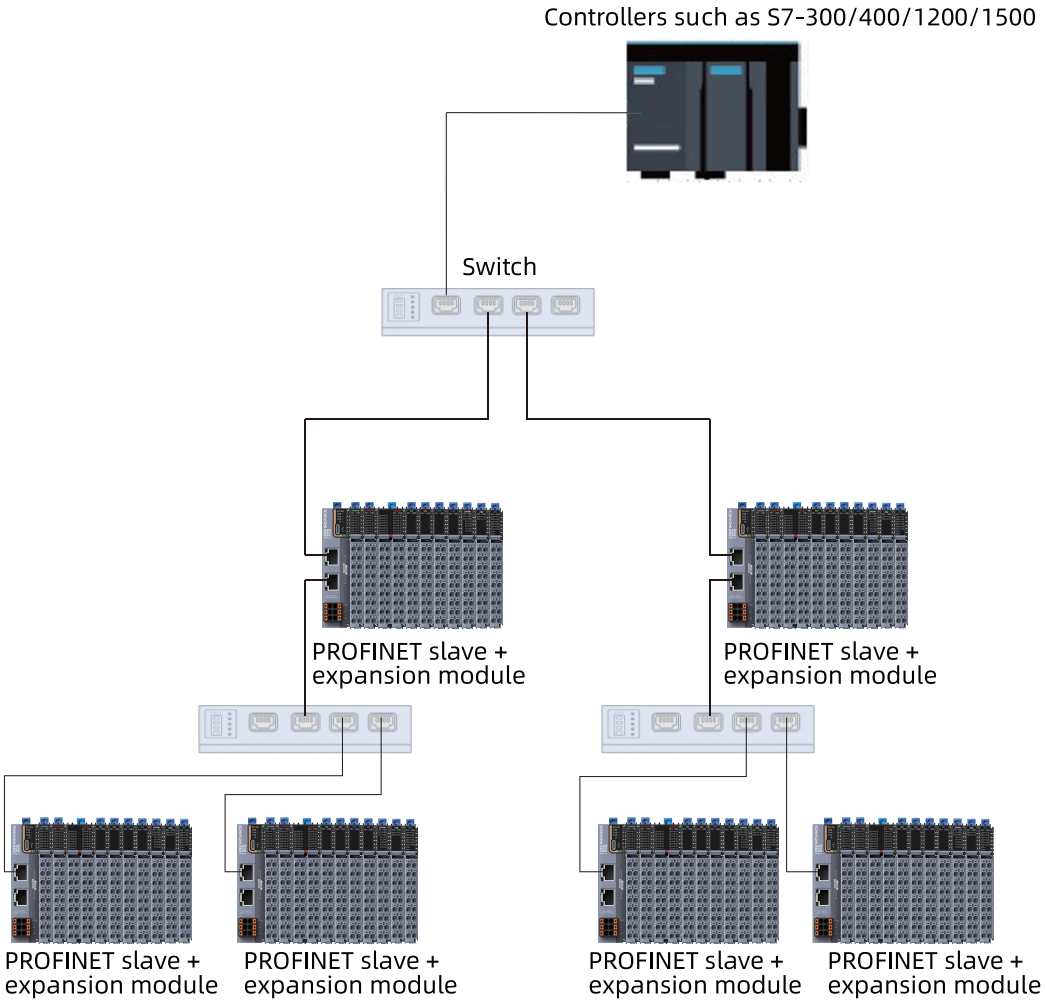
Line topology



Star type



Tree topology



7 组态调试

7.1 GL20-RTU-ECT32

7.1.1 Compatibility with Inovance AutoShop

7.1.1.1 Configuration

Prerequisites

- The hardware installation and wiring in the configuration example is complete.
- All the devices in the configuration example are powered on and started.
- The PC equipped with AutoShop programming software is connected to the Easy521 via a network cable.
- It is necessary to understand the compatible expansion modules of this product and the compatibility between the firmware version of this product and the AutoShop programming software version. For details, see "Version Matching Information". To upgrade the firmware of this product, see *" Firmware Upgrade" on page 220*.

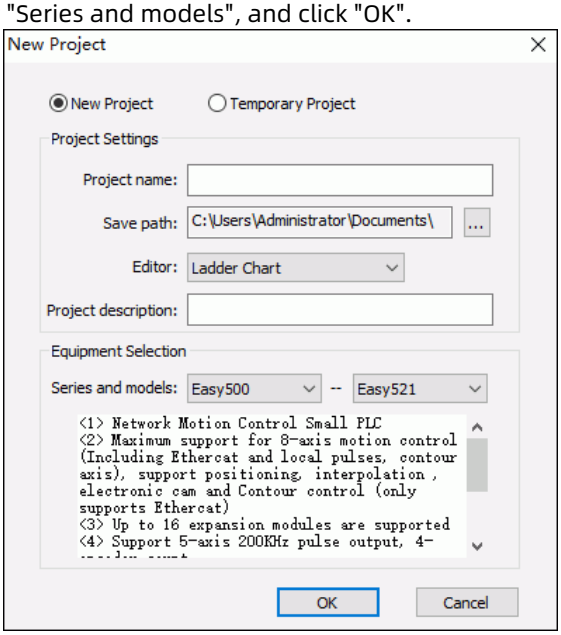
Procedure

1. Create a project.

   a. Double-click the AutoShop shortcut icon on the PC desktop to open the AutoShop programming software.

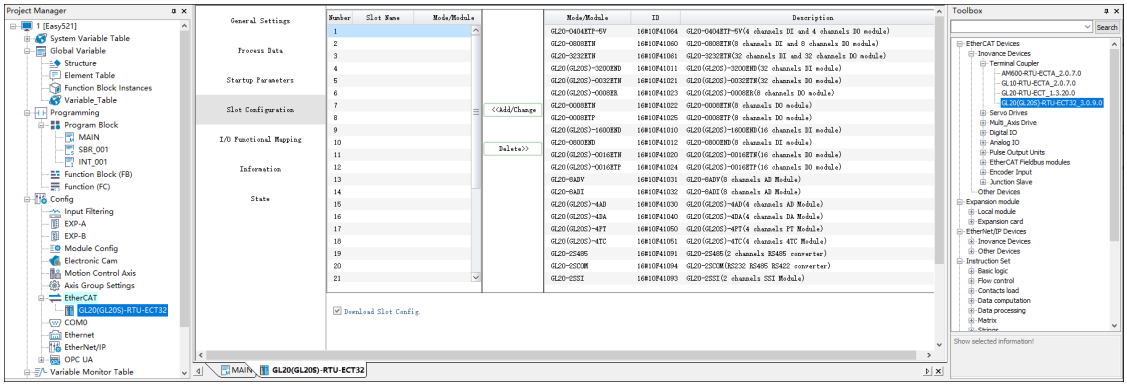
   b. Select File > New Project in the menu bar to open the "New Project" dialog box.

   c. Set the name, save path, programming language, and description of the project. Select "Easy500 - Easy521" for "Series and models", and click "OK".



2. Add the GL20-RTU-ECT32 module.

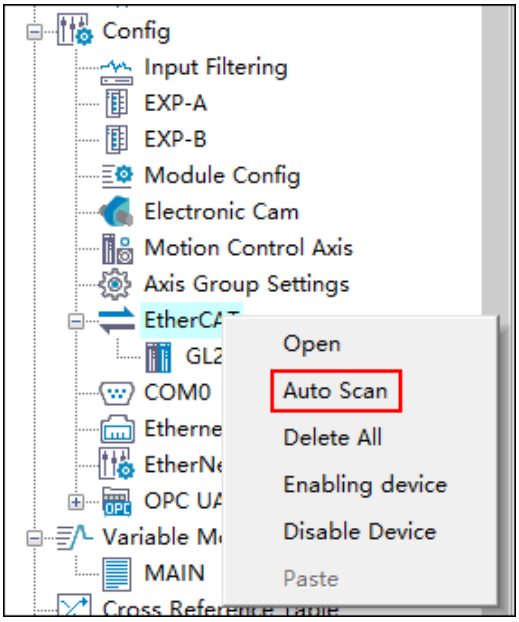
In the "Toolbox" on the right, select "EtherCAT Devices" > "Inovance Devices" > "Terminal Coupler", and double-click "GL20-RTU-ECT32" to add a "GL20-RTU-ECT32" slave node under the "EtherCAT" node.



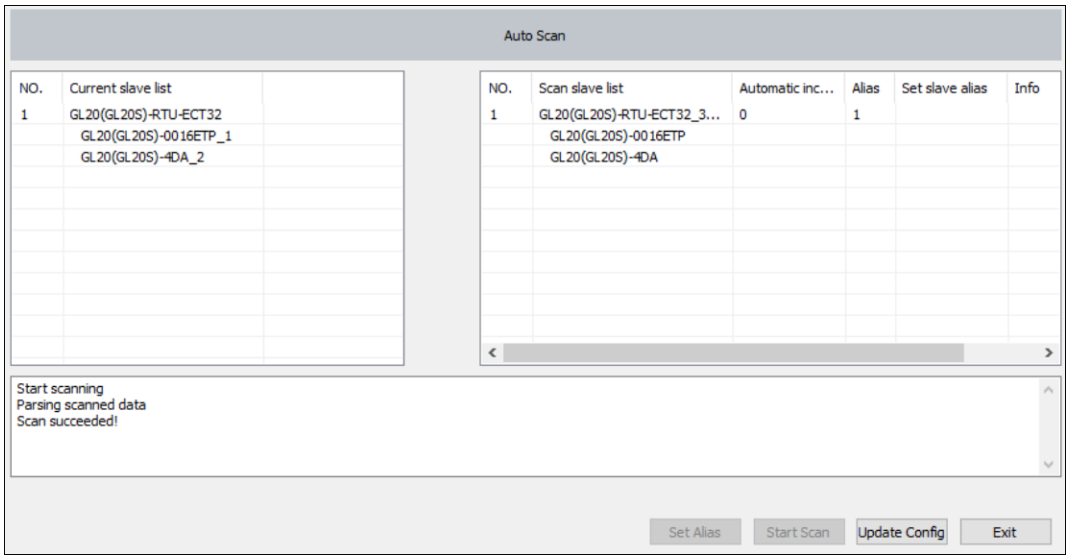
3. Add the GL20 series expansion modules.

- Method 1: Auto scan

  a. In the "Project Manager" navigation tree on the left, right-click "EtherCAT" and select "Auto Scan".



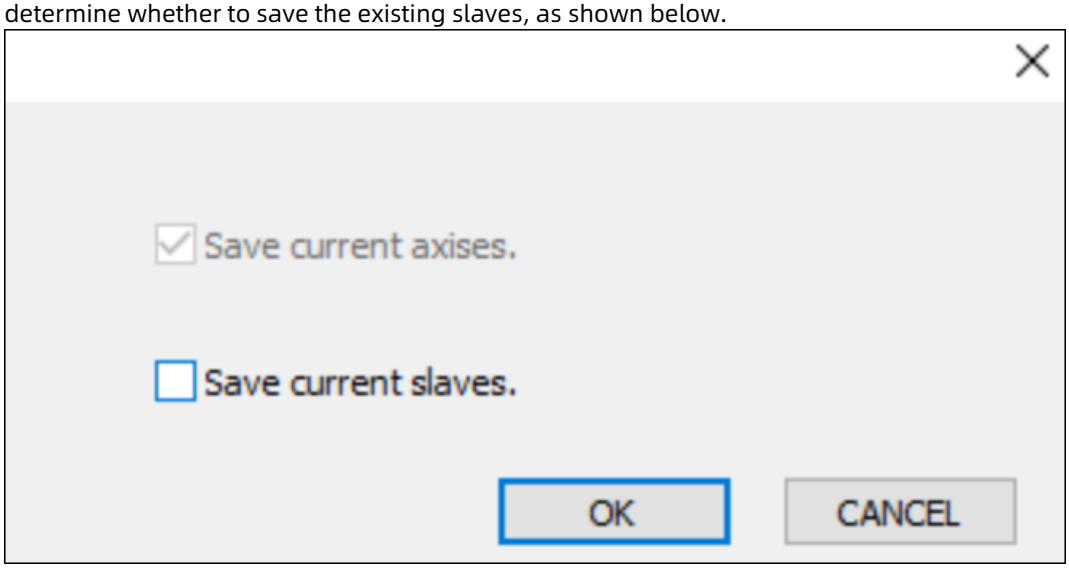
  b. In the opened dialog box, click "Start Scan" to display the actually connected GL20 series expansion modules.



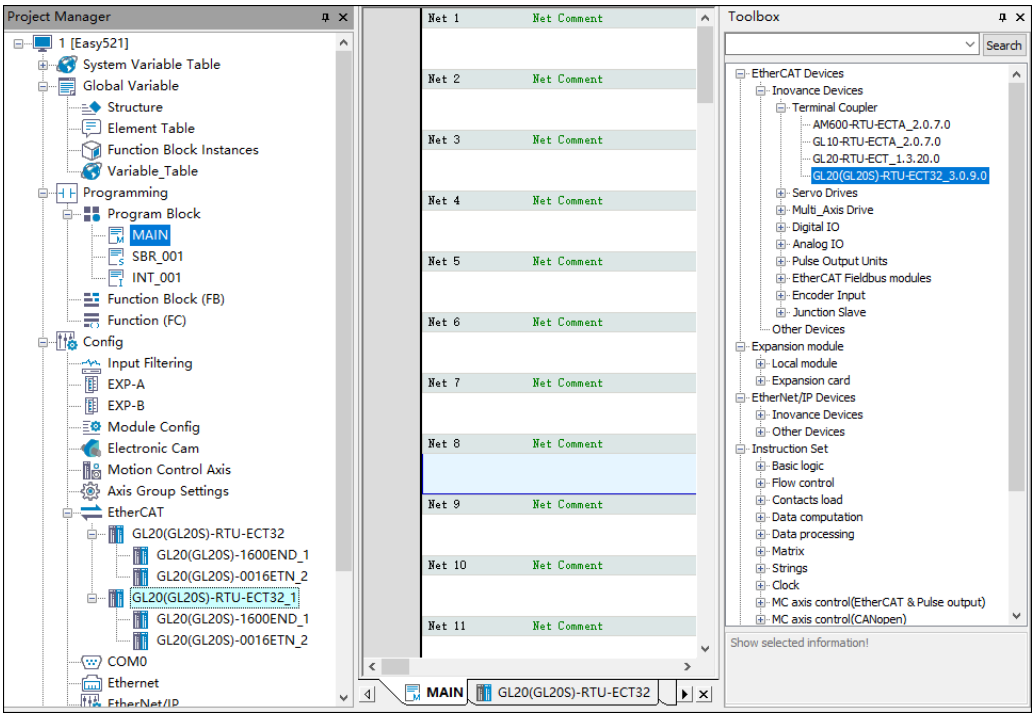
Note

AutoShop V4.10.1.0 and later support module power consumption detection. If the total power consumption of the scanned modules exceeds the maximum power, the configuration can still be updated normally, but an alarm will be displayed during compilation.

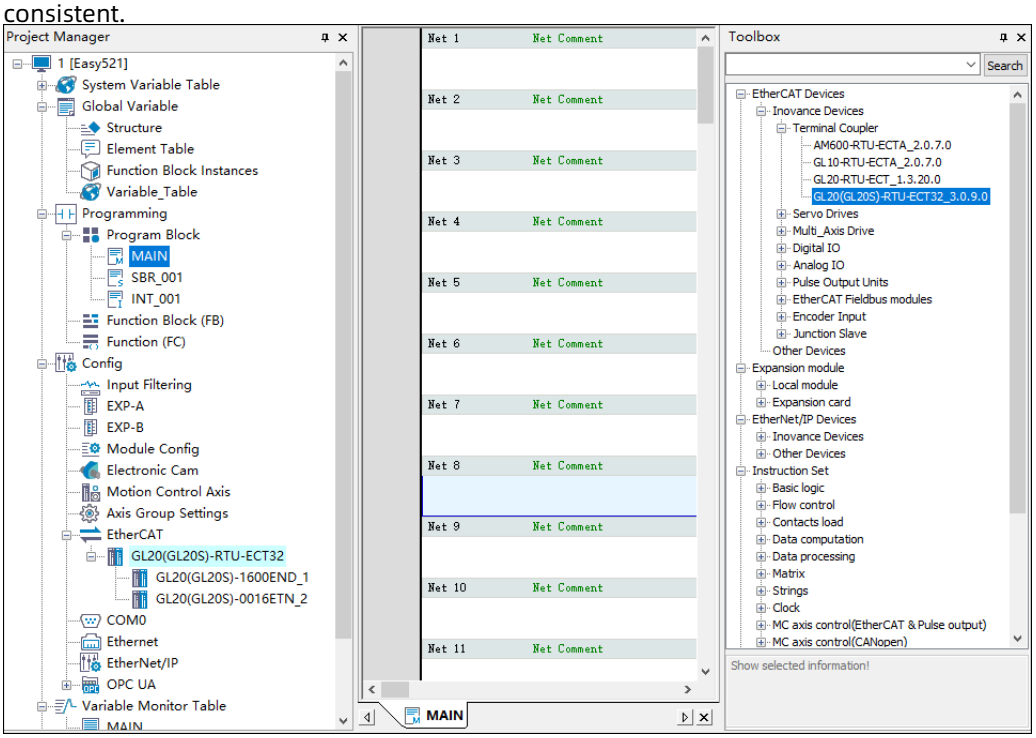
c. Click "Update Config" to update the current configuration. In the opened dialog box, determine whether to save the existing slaves, as shown below.



- If users choose to save the existing slaves, the scanned slaves will be added to the existing slaves, allowing for multiple scans to add multiple slaves.



- If users choose not to save the existing slaves, the existing slaves will be deleted and the scanned slaves will then be added. The result of manual addition and scanned addition is consistent.



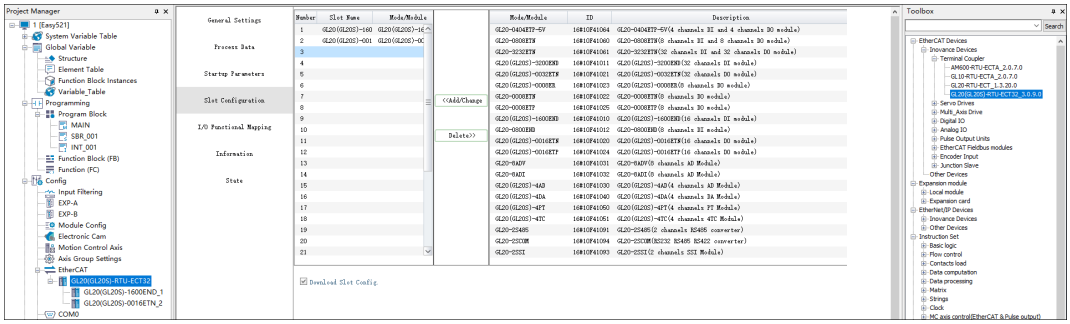
- Method 2: Manual addition

  a. Click "Slot Configuration" to access the slot configuration page.

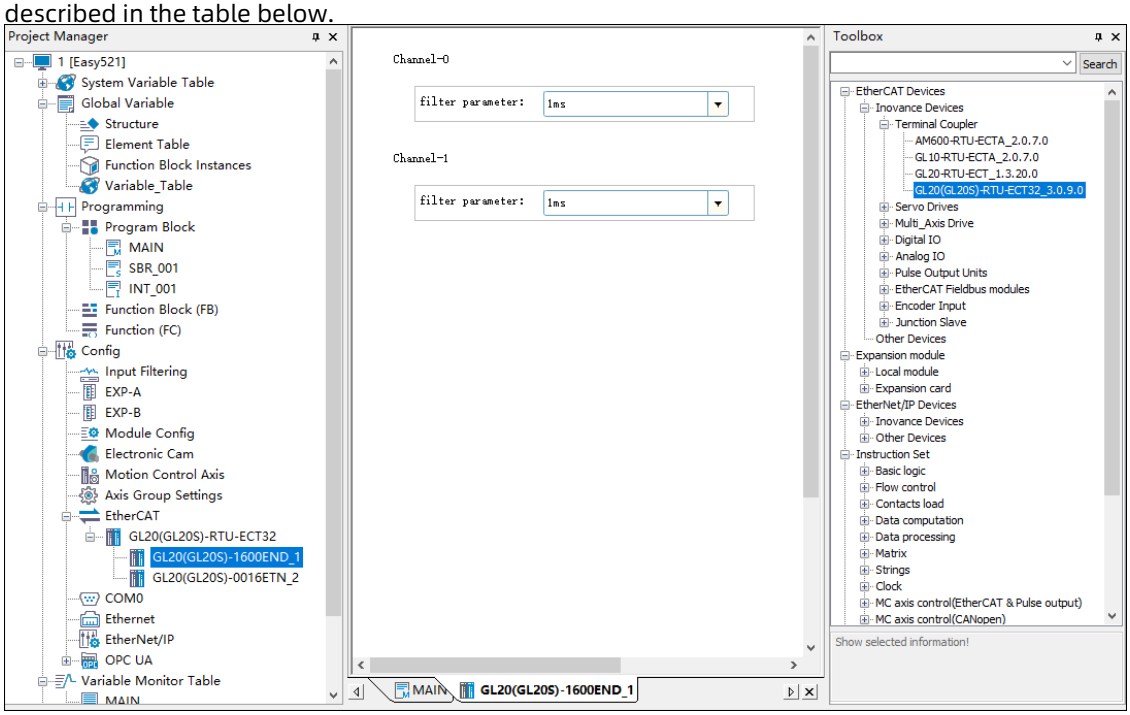
  b. Select the module on the right side of the interface, and click "Add/Change" to add GL20 expansion modules. This example uses two actual modules: GL20-1600END and GL20-0016ETN.

Note

- AutoShop V4.10.1.0 and later support module power consumption detection. When the total power consumption of the added modules exceeds the maximum power, a pop-up alarm will be displayed.
- To delete the added module, select the module on the left of the interface and click "Delete".

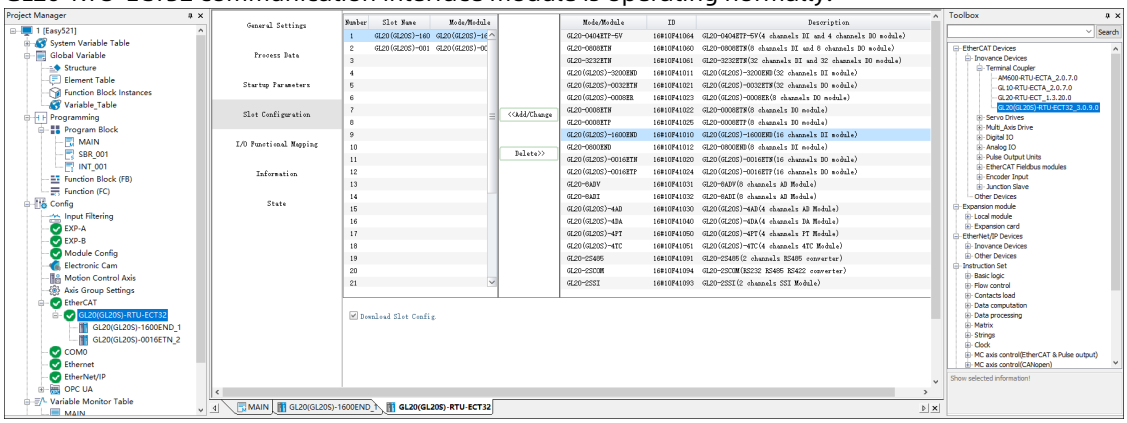


4. In the "Project Manager" navigation tree on the left, double-click "GL20-RTU-ECT32" under the "EtherCAT" directory to open the configuration interface. Configure the module parameters as described in the table below.



Module	Parameter		Description
GL20-1600END	Filter parameter		Input filter time Options: No filter, 0.25 ms, 0.5 ms, 1 ms, 2 ms, 4ms, 8ms, 16ms, 32ms, 64ms, 128ms Default: 1 ms
GL20-0016ETN	Disconnect and stop output mode	Output last value/ Output preset value	• Output last value: Keeps the present output status • Output preset value: Outputs according to the preset value
		ON/OFF	Output preset value: • ON: Outputs 1 • OFF: Outputs 0

5. Click "Download" in the toolbar to download the program to the PLC. After the download is complete, click "Run" to start the program.
6. Click the monitor button in the toolbar. In the opened interface, if the EtherCAT nodes and GL20-RTU-ECT32 nodes are displayed with green icons, and the PLC shows no faults, it indicates that the GL20-RTU-ECT32 communication interface module is operating normally.



7.1.1.2 Commissioning

After successfully configuring and downloading this product and the expansion modules, a simple commissioning is required to ensure normal functioning.

Prerequisites

Connect the output terminals DO0 and DO1 of the GL20-0016ETN module to the input terminals DI0 and DI1 of the GL20-1600END module, respectively.

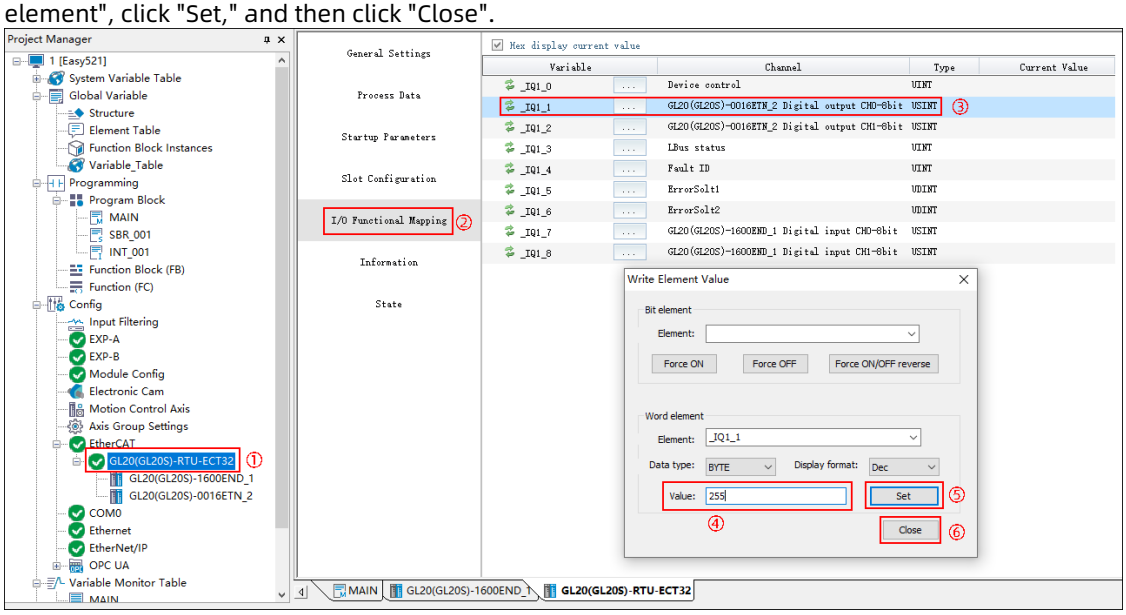
Procedure

1. Determine the status of the communication interface module and expansion modules through the signal indicators. For details on the signal indicators of the communication interface module, see *"8.2.1.1 GL20-RTU-ECT32" on page 183*. For details on the signal indicators of the expansion modules, see the user guide of each module.

   - If the signal indicator status is normal, proceed to step 2.
   - If the signal indicator status is abnormal, determine the cause according to the signal indicator status and resolve the fault.

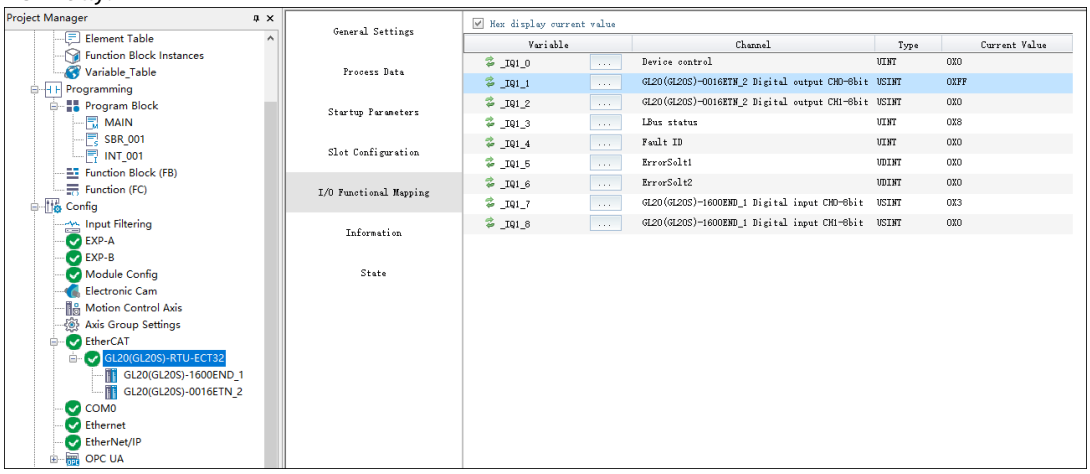
- If the fault is resolved, proceed to step 2.
- If the fault remains unresolved, use the programming software for troubleshooting. For details, see *"8.2.2.1 Troubleshooting via Inovance AutoShop" on page 188*.

2. In the navigation tree of "Project Manager" on the left, double-click "GL20-RTU-ECT32" to open the configuration window. Click "I/O Mapping", and then double-click the row of "GL20-0016ETN_2 digital output CH0-8bit". In the pop-up dialog box, enter "255" in the value field of "Word element", click "Set," and then click "Close".



3. Check whether the output and input channels of the GL20-0016ETN and GL20-1600END modules function normally.

- In the "I/O Mapping" interface, if the current value of "GL20-1600END_1 digital input CH0-8bit" is "0X3", it indicates that the DI0 and DI1 input channels of this module are functioning normally.



- If the signal indicators (00-07) of the GL20-0016ETN module and the signal indicators (00-01) of the GL20-1600END module are solid on, it indicates that the input and output channels of both modules are functioning normally.

7.1.2 Compatibility with Inovance InoProShop

7.1.2.1 Configuration

Prerequisites

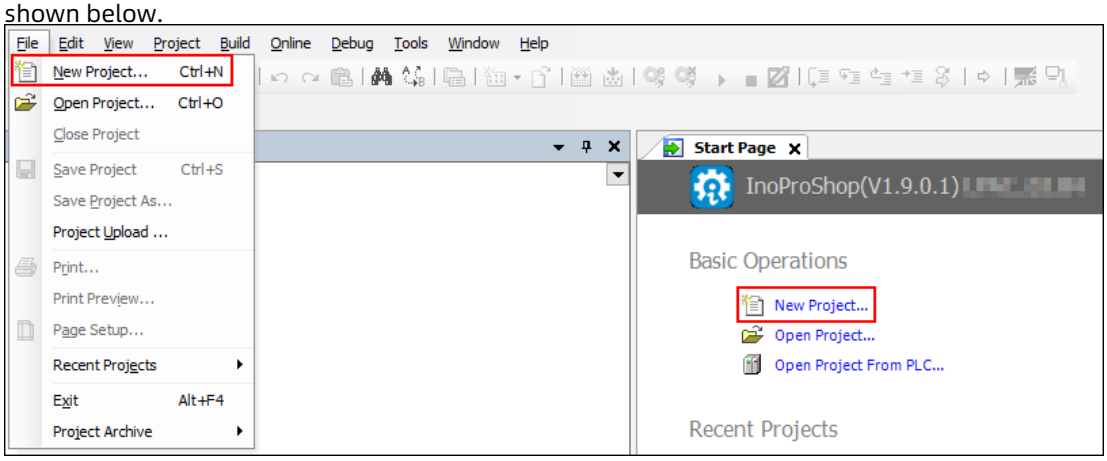
- The hardware installation and wiring in the configuration example is complete.
- All the devices in the configuration example are powered on and started.
- The PC equipped with InoProShop programming software is connected to the AC802 via a network cable.
- The IP address of the local PC and that of the AC802 are set to the same subnet.
- It is necessary to understand the compatible expansion modules of this product and the compatibility between the firmware version of this product and the InoProShop programming software version. For details, see "Version Matching Information". To upgrade the firmware of this product, see *" Firmware Upgrade" on page 220*.

Procedure

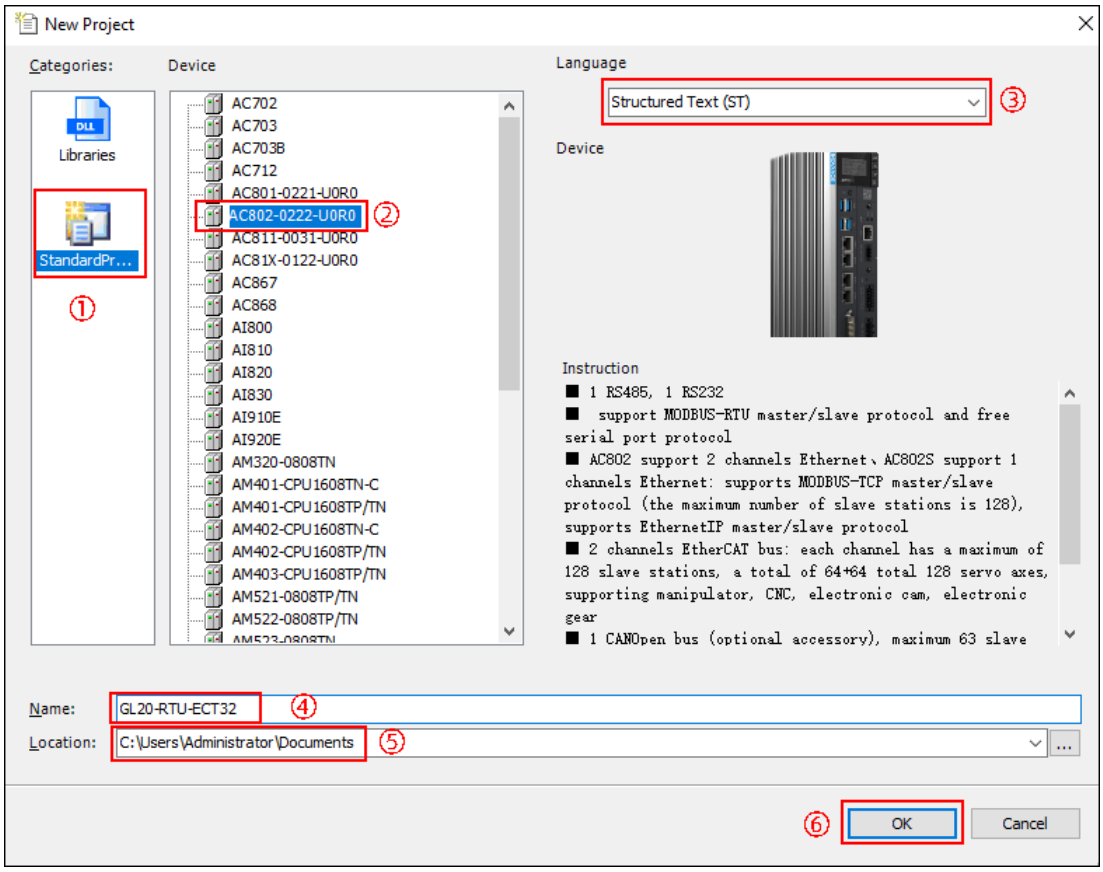
1. Create a project.

   a. Double-click the InoProShop shortcut icon on the PC desktop to open the InoProShop programming software.

   b. On the start page, click "New Project", or select "File > New Project" from the menu bar, as shown below.

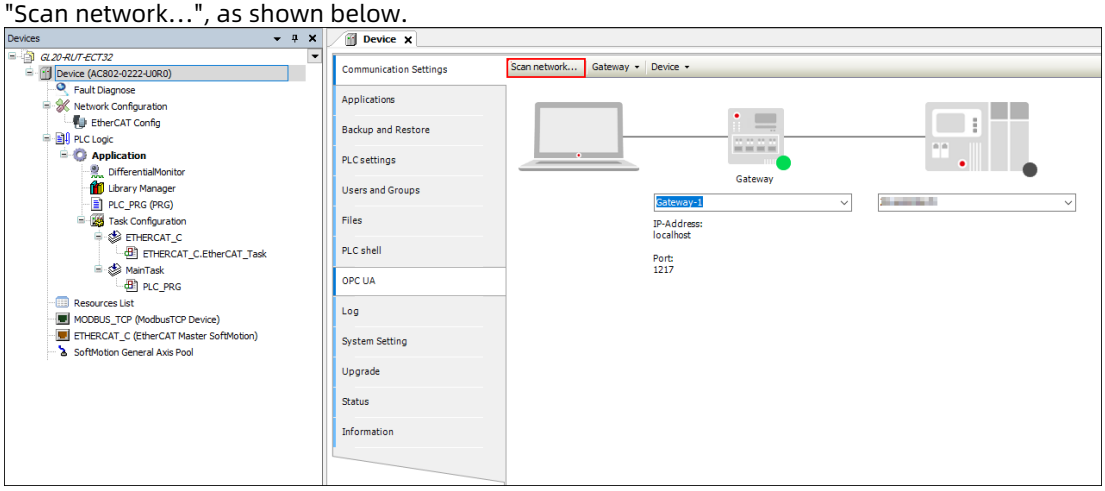


   c. In the opened dialog box, select "Standard Project" under "Categories" ①, and "AC802-0222-U0R0" under "Device" ②. Select the "Language" based on actual needs ③, enter the "Name" ④ and "Location" ⑤, and click "OK" ⑥.

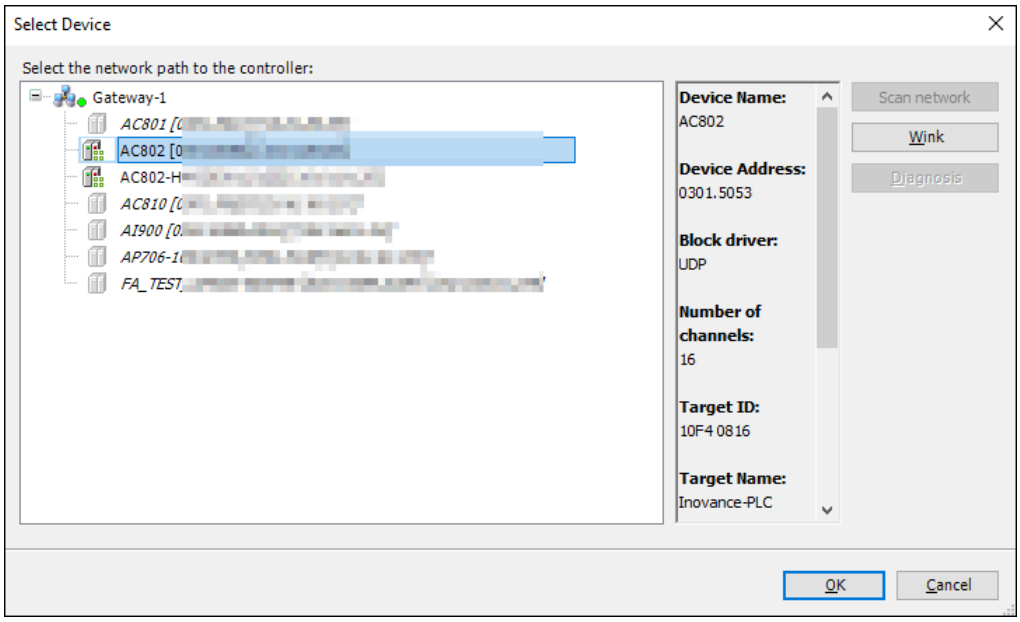


2. Scan and connect to the AC802 host.

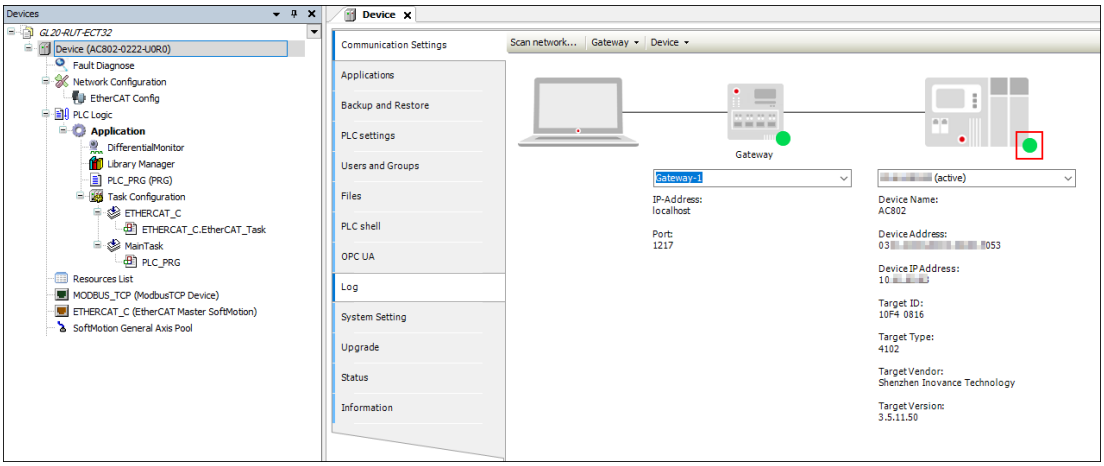
a. In the "Devices" navigation tree on the left, double-click "Device". In the opened interface, click "Scan network...", as shown below.



b. In the opened dialog box, click "Scan network", select the controller to connect, and click "OK".

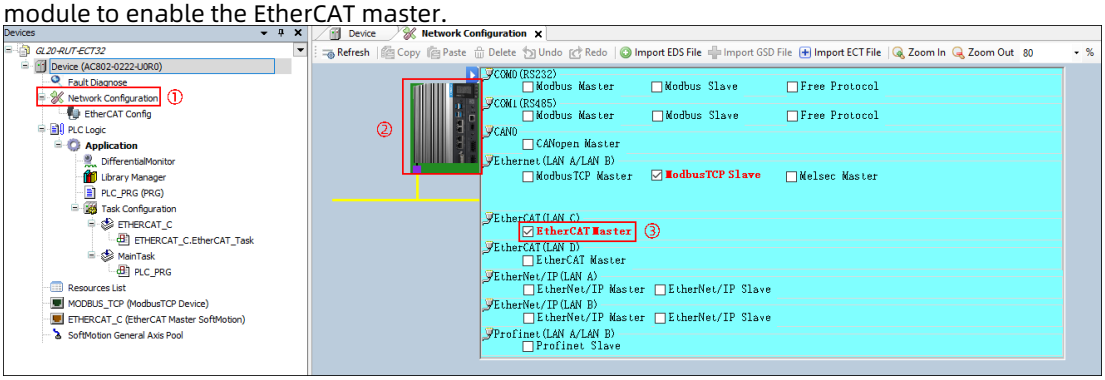


When the icon in the lower right corner of the connected controller turns green, the connection is successful.



3. Enable the AC802 PLC as the EtherCAT master and add the GL20-RTU-ECT32 module.

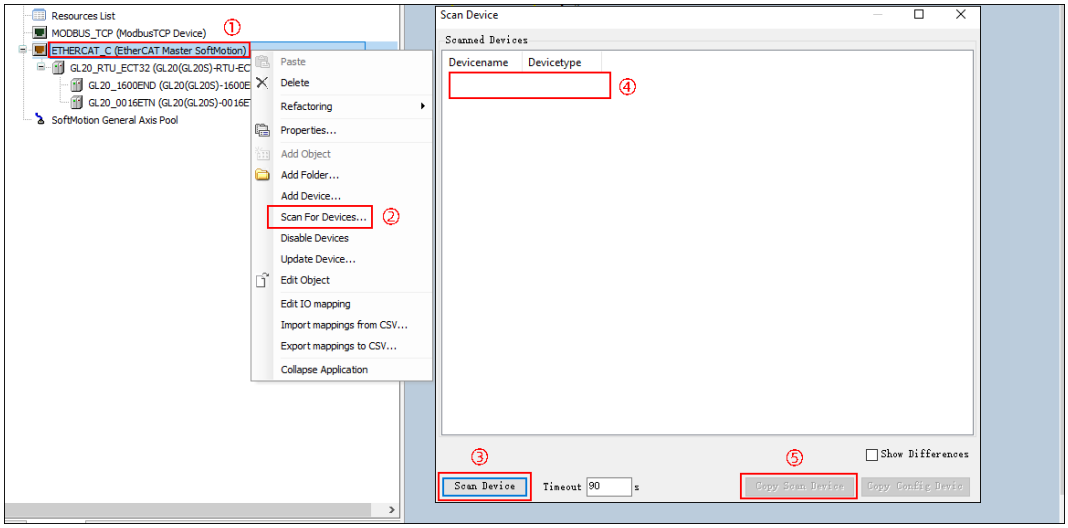
a. In the "Devices" navigation tree on the left, double-click "Network Configuration". In the opened interface, click the AC802 image and check the "EtherCAT Master" corresponding to the actual physical network port of the host connected to the GL20-RTU-ECT32 communication interface module to enable the EtherCAT master.



b. Add the GL20-RTU-ECT32 communication interface module.

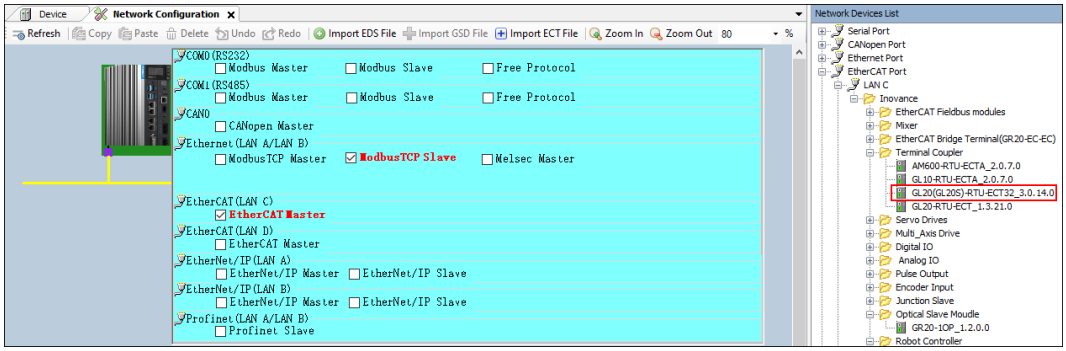
- Method 1:

In the "Devices" navigation tree on the left, right-click "ETHERCAT" and select "Scan For Devices". Click "Scan Device", select the GL20-RTU-ECT32 module, and click "Copy Scan Device".



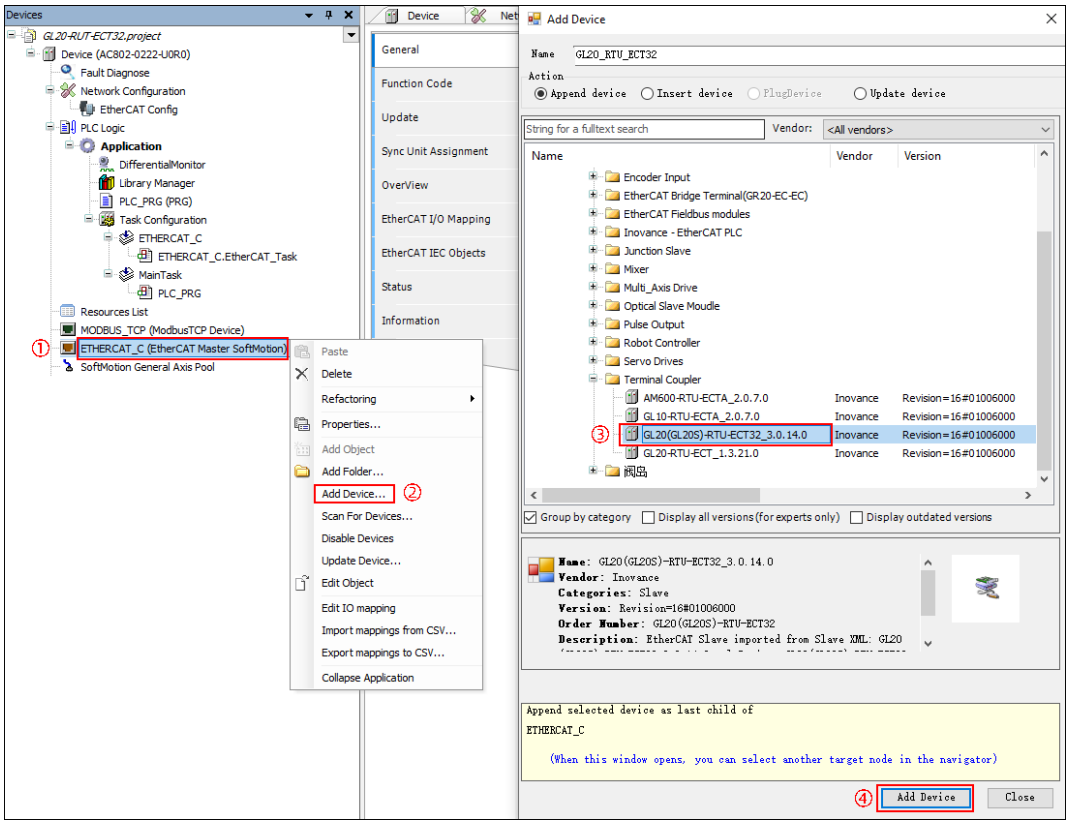
- Method 2:

  In the "Network Devices List" on the right, double-click "GL20(GL20S)-RTU-ECT32x.x.x.x" to add the GL20-RTU-ECT32 communication interface module.



- Method 3:

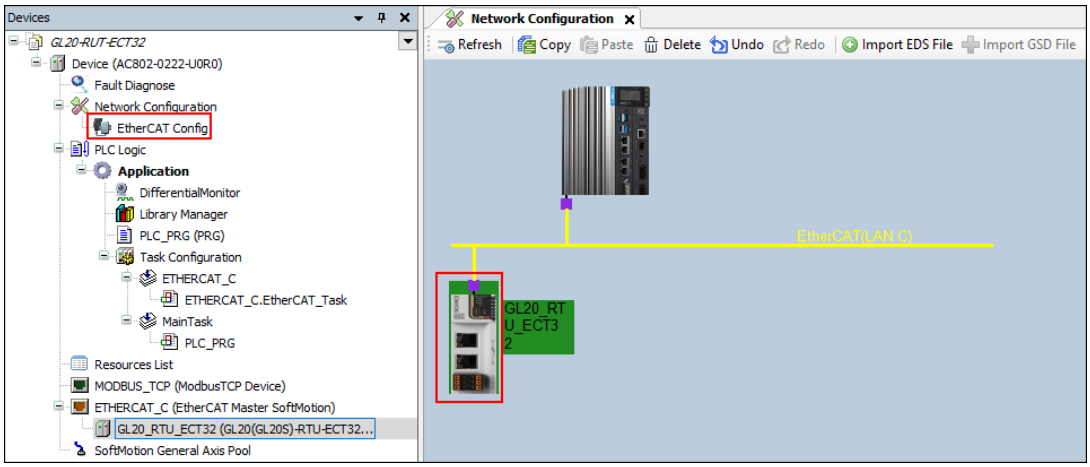
  In the "Devices" navigation tree on the left, right-click "ETHERCAT_C" and click "Add Device". In the opened interface, click "GL20(GL20S)-RTU-ECT32x.x.x.x" under "Inovance > Terminal Coupler", and click "Add Device" to add the GL20-RTU-ECT32 communication interface module.

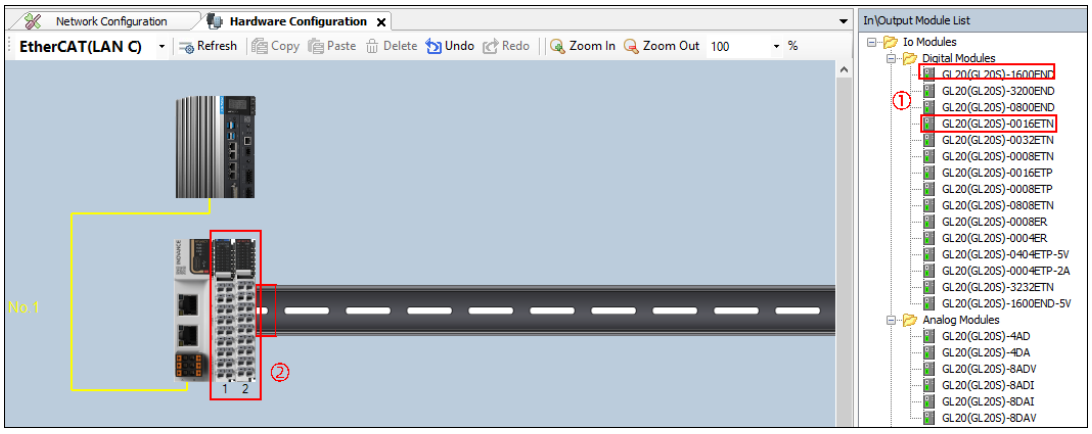


4. Add the module.

- Method 1:
  In the device tree on the left, double-click "EtherCAT Config" or double-click the GL20-RTU-ECT32 diagram in the "Network Configuration" interface to open the "Hardware Configuration" interface.

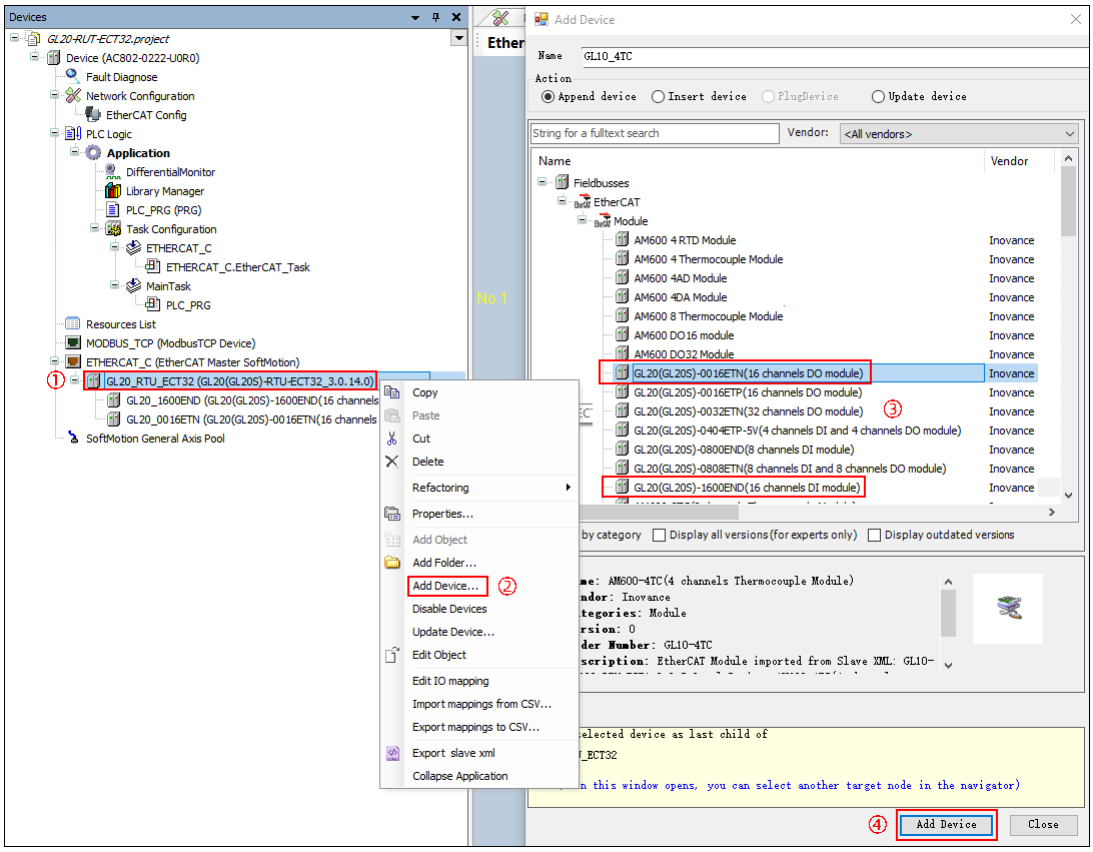
  In the module list on the right, double-click "GL20(GL20S)-1600END" / "GL20(GL20S)-0016ETN" or drag it to the right of the GL20-RTU-ECT32 module, as shown below.





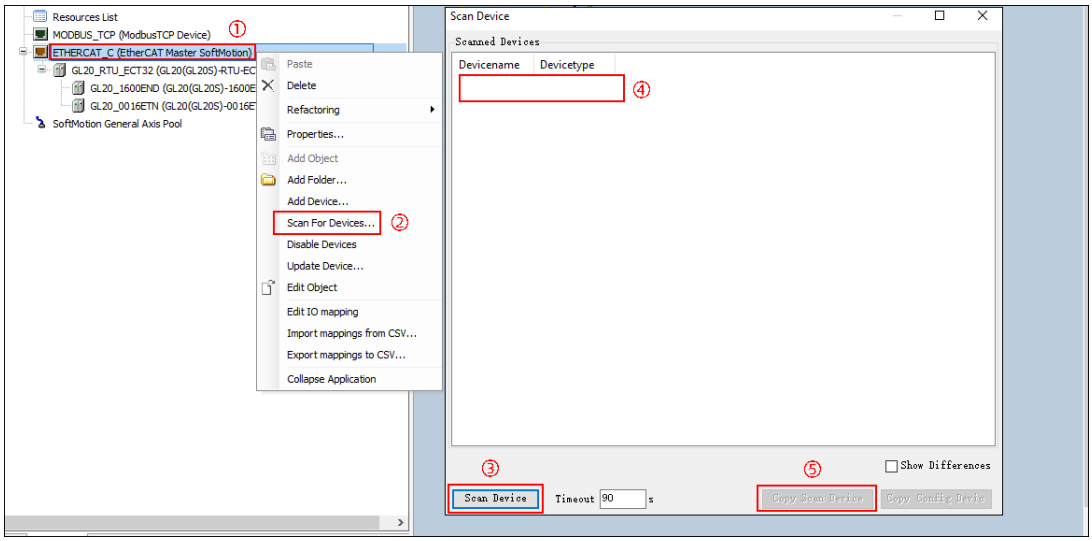
- Method 2:

  In the "Devices" navigation tree on the left, right-click "GL20-RTU-ECT32" under the "ETHERCAT (EtherCAT Master SoftMotion)" and select "Add Device". In the opened interface, select "GL20 (GL20S)-1600END" / "GL20(GL20S)-0016ETN", and click "Add Device".

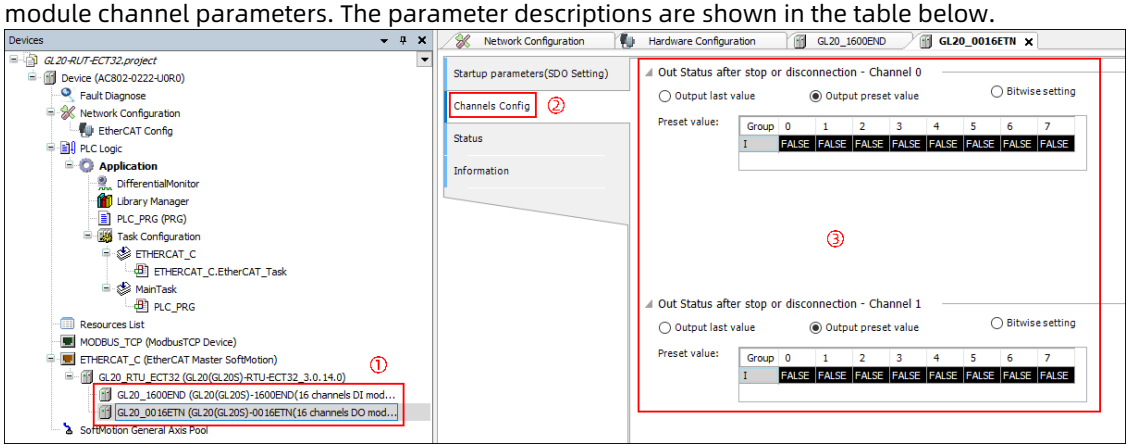


- Method 3:

  In the "Devices" navigation tree on the left, right-click "ETHERCAT_C" and select "Scan For Devices". In the opened interface, click "Scan Device", select "GL20(GL20S)-1600END" / "GL20 (GL20S)-0016ETN", and click "Copy Scan Device".



5. In the "Devices" navigation tree on the left, double-click the "GL20(GL20S)-1600END" / "GL20 (GL20S)-0016ETN" module. In the opened interface, click "Channels Config" and configure the module channel parameters. The parameter descriptions are shown in the table below.



Module	Parameter		Description
GL20-1600END	Filter time		Input filter time Options: No filter, 0.25 ms, 0.5 ms, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms Default: 1 ms
GL20-0016ETN	Out status after stop or disconnection	Output last value	Check "Output last value" to maintain the current output status.
		Output preset value	Check "Output preset value" and set the preset value for each bit to "TRUE" or "FALSE", indicating that all bits are output according to the preset values.
		Bitwise setting	Check "Bitwise setting" and set each bit to "TRUE" or "FALSE", indicating that all bits are output according to the set values.

6. On the toolbar, click the program check icon, compile icon, login icon, and run icon in order to download and run the program, as shown below.



7.1.2.2 Commissioning

After successfully configuring and downloading this product and the expansion modules, a simple commissioning is required to ensure normal functioning.

Prerequisites

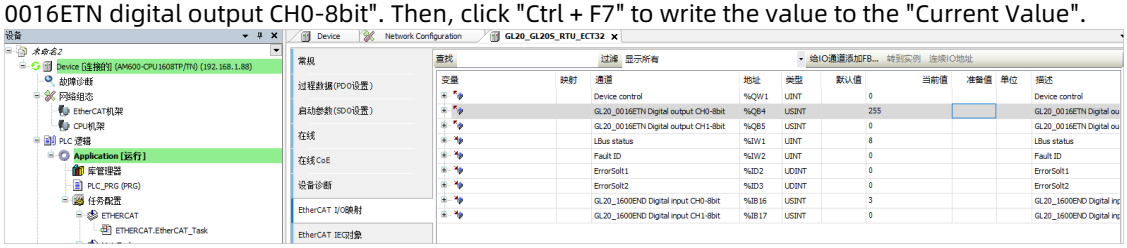
Connect the output terminals DO0 and DO1 of the GL20-0016ETN module to the input terminals DI0 and DI1 of the GL20-1600END module, respectively.

Procedure

1. Determine the status of the communication interface module and expansion modules through the signal indicators. For details on the signal indicators of the communication interface module, see *"8.2.1.1 GL20-RTU-ECT32" on page 183*. For details on the signal indicators of the expansion modules, see the user guide of each module.

   - If the signal indicator status is normal, proceed to step 2.
   - If the signal indicator status is abnormal, determine the cause according to the signal indicator status and resolve the fault.
     - If the fault is resolved, proceed to step 2.
     - If the fault remains unresolved, use the programming software for troubleshooting. For details, see *"8.2.2.2 Troubleshooting via Inovance InoProShop" on page 190*.

2. In the "Devices" navigation tree on the left, double-click "GL20_GL20S_RTU_ECT32" to open the configuration window. Click "I/O Mapping", and enter "255" in the "Prepared Value" field of "GL20-0016ETN digital output CH0-8bit". Then, click "Ctrl + F7" to write the value to the "Current Value".



3. Check whether the output and input channels of the GL20-0016ETN and GL20-1600END modules function normally.

   - In the "I/O Mapping" interface, if the current value of "GL20_1600END Diagital input CH0-8bit" is "3", it indicates that the DI0 and DI1 input channels of this module are normal.
   - If the signal indicators (00-07) of the GL20-0016ETN module and the signal indicators (00-01) of the GL20-1600END module are solid on, it indicates that the input and output channels of both modules are functioning normally.

7.1.3 Compatibility with Inovance iFA Evolution

This section describes the combination of iFA Evolution and EVO700 series PLC system.

Prerequisites

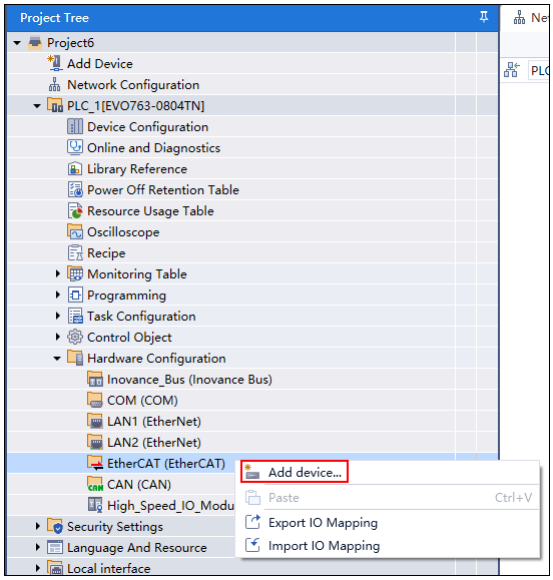
- iFA Evolution software (version V1.4.2.5 or higher) has been installed.
- The hardware installation and wiring in the configuration example is complete.
- All the devices in the configuration example are powered on and started.

Procedure

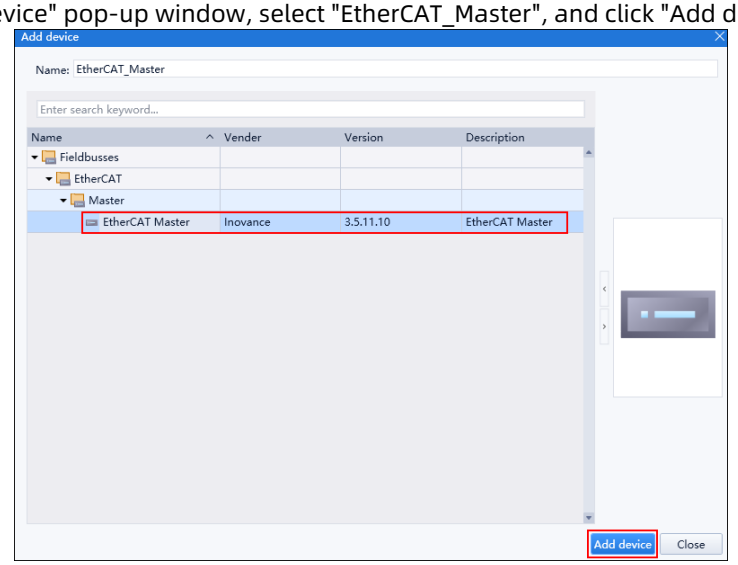
1. Add a device.

a. Add the GL20-RTU-ECT32 communication interface module.

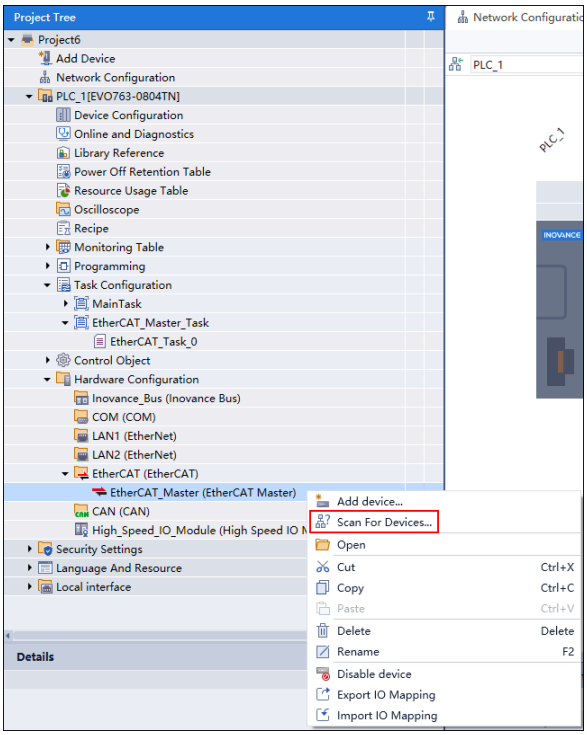
1). In the project tree on the left, right-click "EtherCAT (EtherCAT)" under "Hardware configuration" and select "Add device".



2). In the "Add device" pop-up window, select "EtherCAT_Master", and click "Add device".



b. In the device tree on the left, right-click "EtherCAT_Master (EtherCAT Master)" and select "Scan for devices".



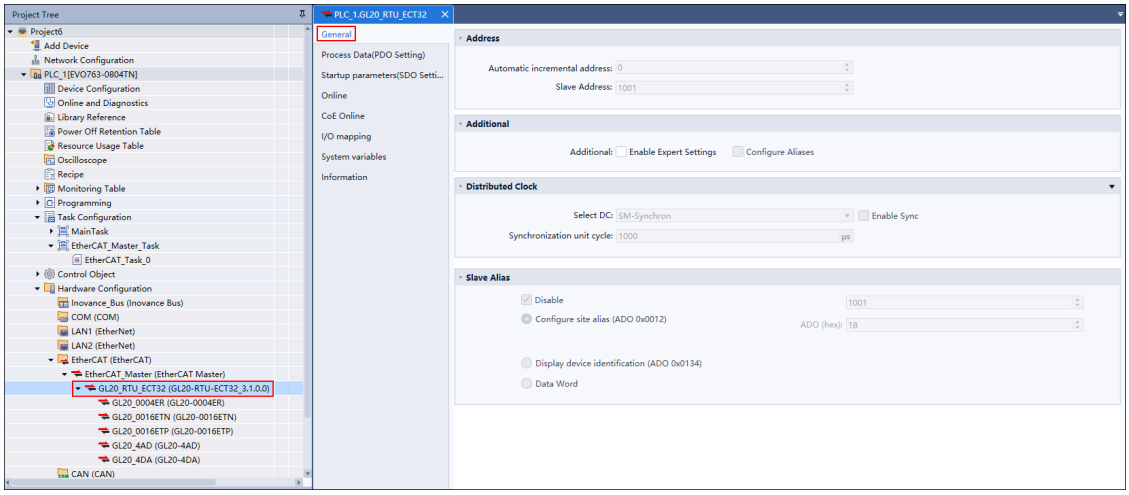
1). After scanning, click the left arrow in the middle operation column to add the scanned device to the "FA project" area on the left.

2). Click "OK" in the pop-up window.

3). Click "Apply physical network configuration" to apply the configuration of all scanned devices to the project.

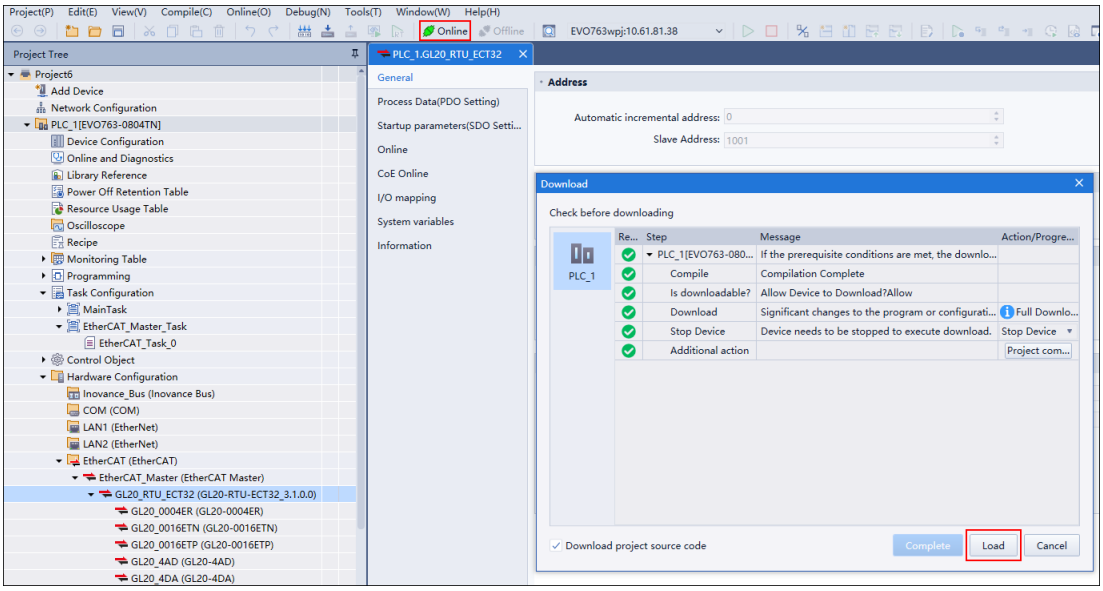
2. Configure the GL20-RTU-ECT32 communication interface module.

In the device tree on the left, double-click the communication interface module added to open the configuration interface. On the "General" tab, view the module information, as shown in the figure below.

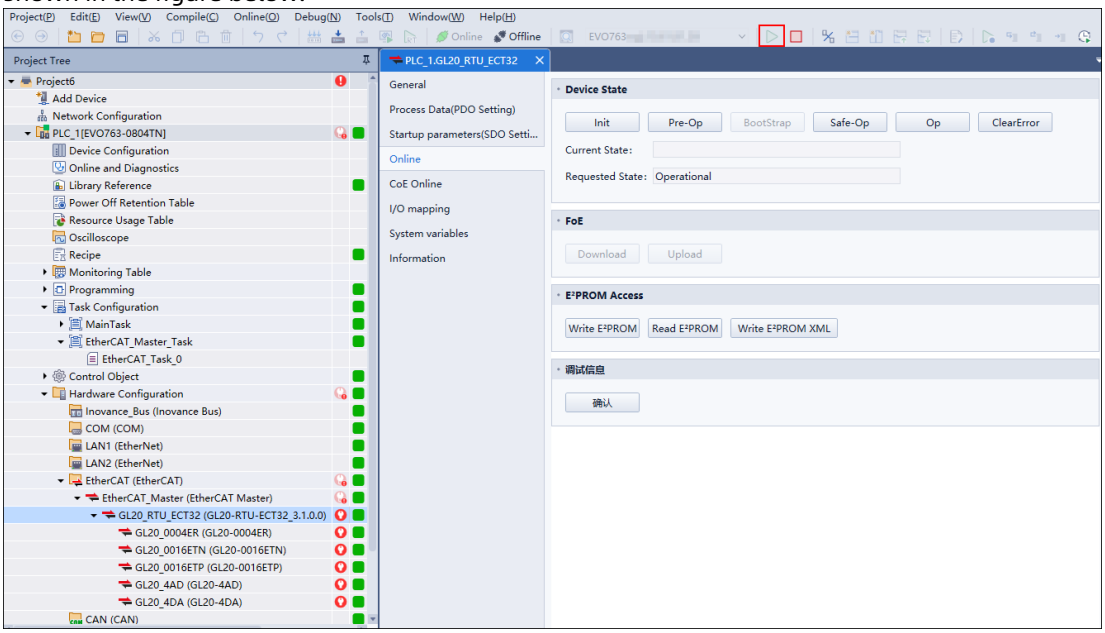


3. Log in to the PLC and operate the GL20-RTU-ECT32 communication interface module.

a. Select "Online > Online" in the menu bar, or click Online in the toolbar. Click "Load" in the pop-up window to load the project, as shown in the figure below.



b. Select "Commissioning > Start" in the menu bar, or click ▷ in the toolbar to start the PLC, as shown in the figure below.



7.1.4 Compatibility with Omron Sysmac Studio

7.1.4.1 Configuration

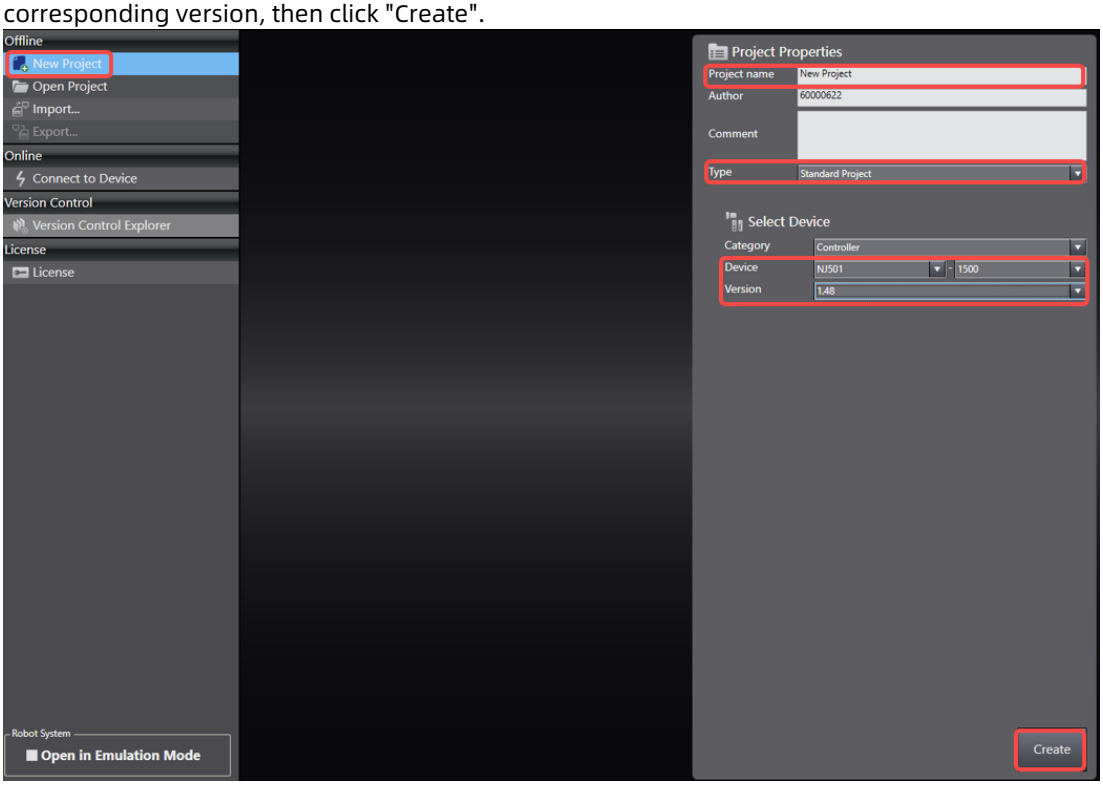
Prerequisites

- The hardware installation and wiring in the configuration example is complete.
- All the devices in the configuration example are powered on and started.
- The PC equipped with Sysmac Studio programming software is connected to the NJ501-1500 via a network cable (no specific requirements for PLC model, PLC firmware version, or programming software version).
- The EtherCAT configuration file "INOVANCE-GL20(GL20S)-RTU-ECT32-3.0.11.0.xml" is obtained from the Inovance official website (www.inovance.com).

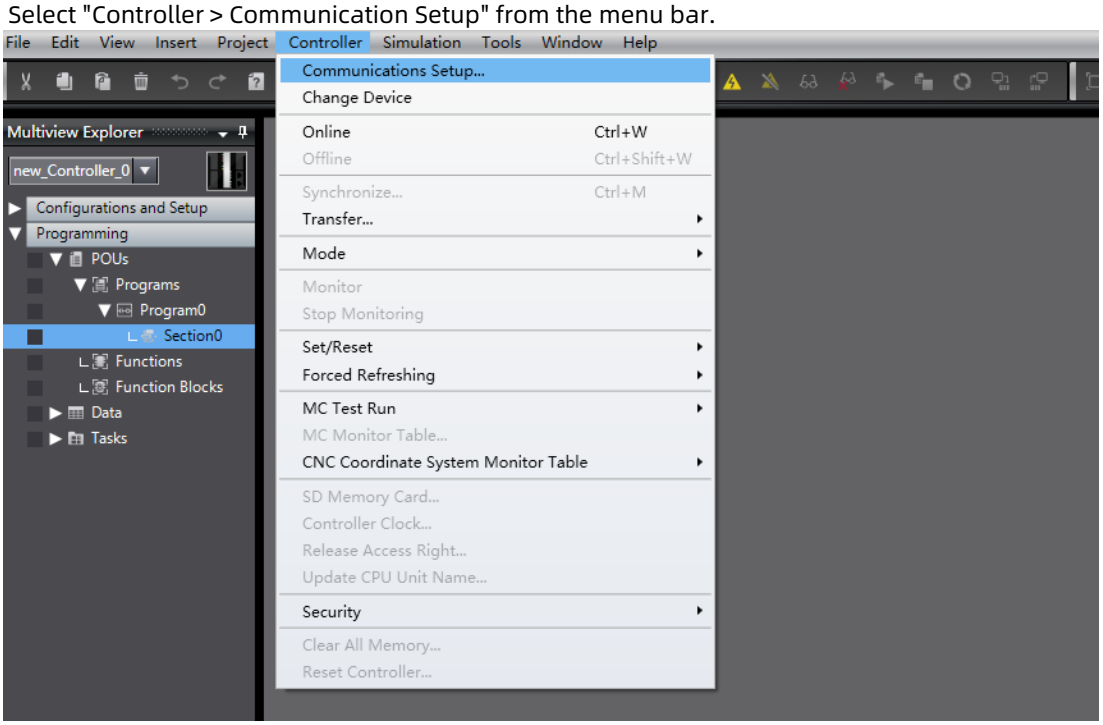
Procedure

1. Connect to the target PLC.

a. Open the Sysmac Studio software and click "New Project". In the "Project Property" window, set the project name, select "Standard Project" for "Type", "NJ501-1500" for "Device" and select the corresponding version, then click "Create".

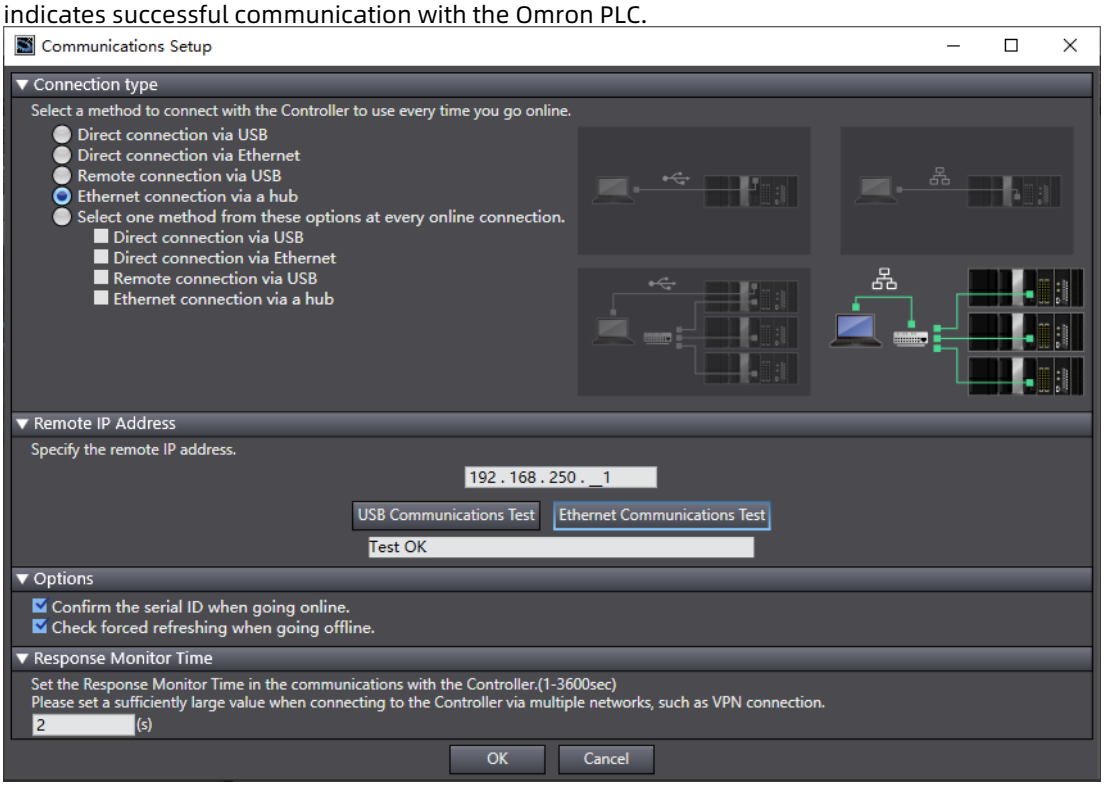


b. Select "Controller > Communication Setup" from the menu bar.



c. In the "Communication Setup" window, set the connection type. As an example of direct connection to the controller, click "Ethernet connection via a hub", enter the IP address of the

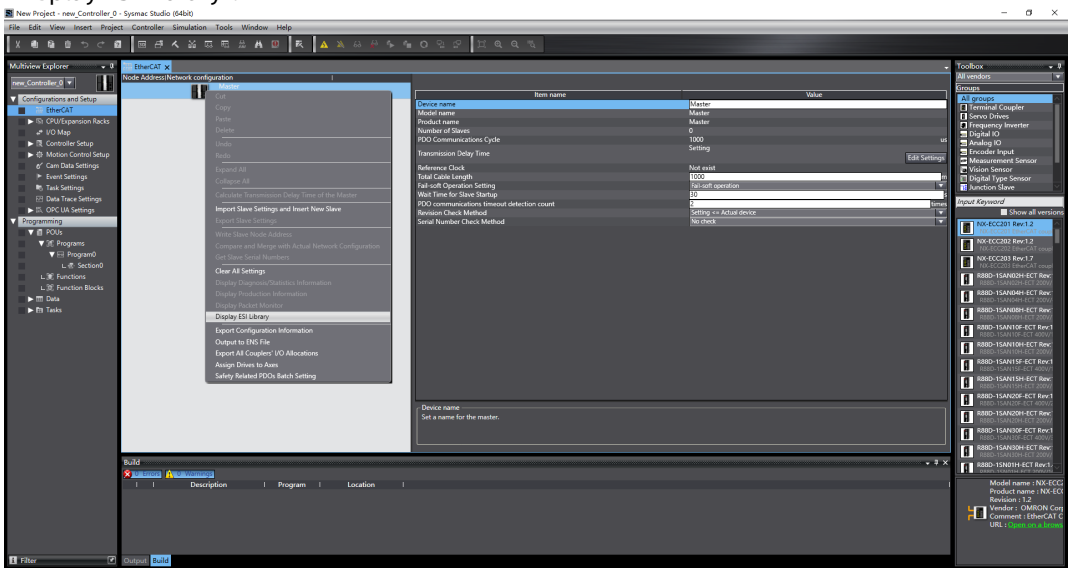
Omron PLC, and click "Ethernet Communication Test". If a successful prompt is displayed, it indicates successful communication with the Omron PLC.



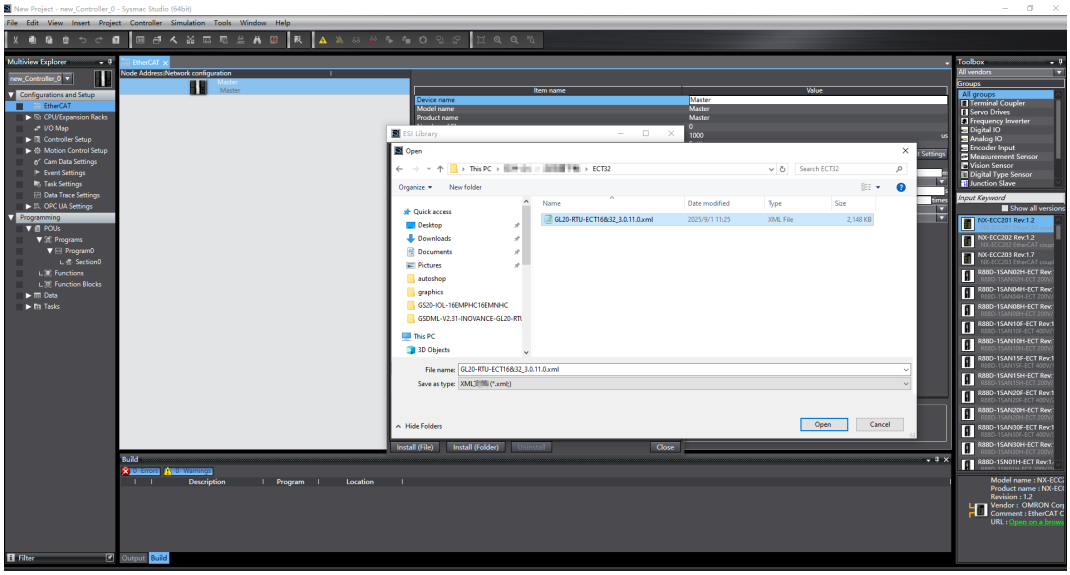
2. Import the XML file.

- Method 1:

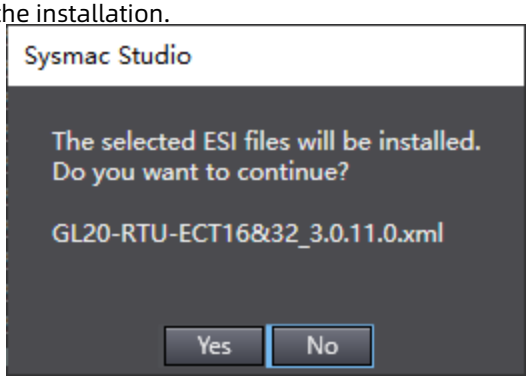
  a. In the "MultiView Explorer" navigation tree on the left, double-click "EtherCAT" under "Configuration and Setup". In the opened interface, right-click the master device and select "Display ESI Library".



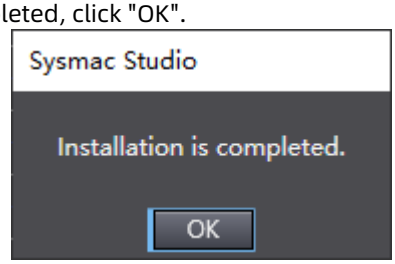
  b. Click "Install (File)", select the target XML file on the local PC, and click "Open".



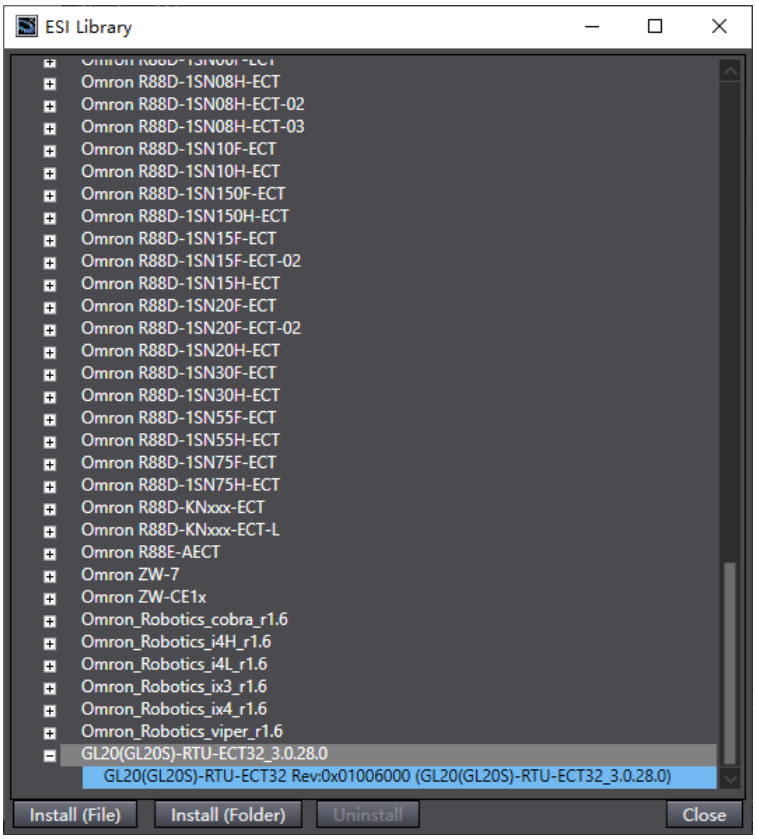
c. Click "Yes" to continue the installation.



d. After the installation is completed, click "OK".



e. Browse the ESI library to view the installed XML file.

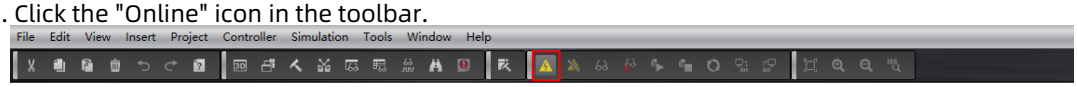


- Method 2: Place the XML file in the installation directory "\program file\Sysmac Studio \IODeviceProfiles\EsiFiles\UserEsiFile", then restart the software.

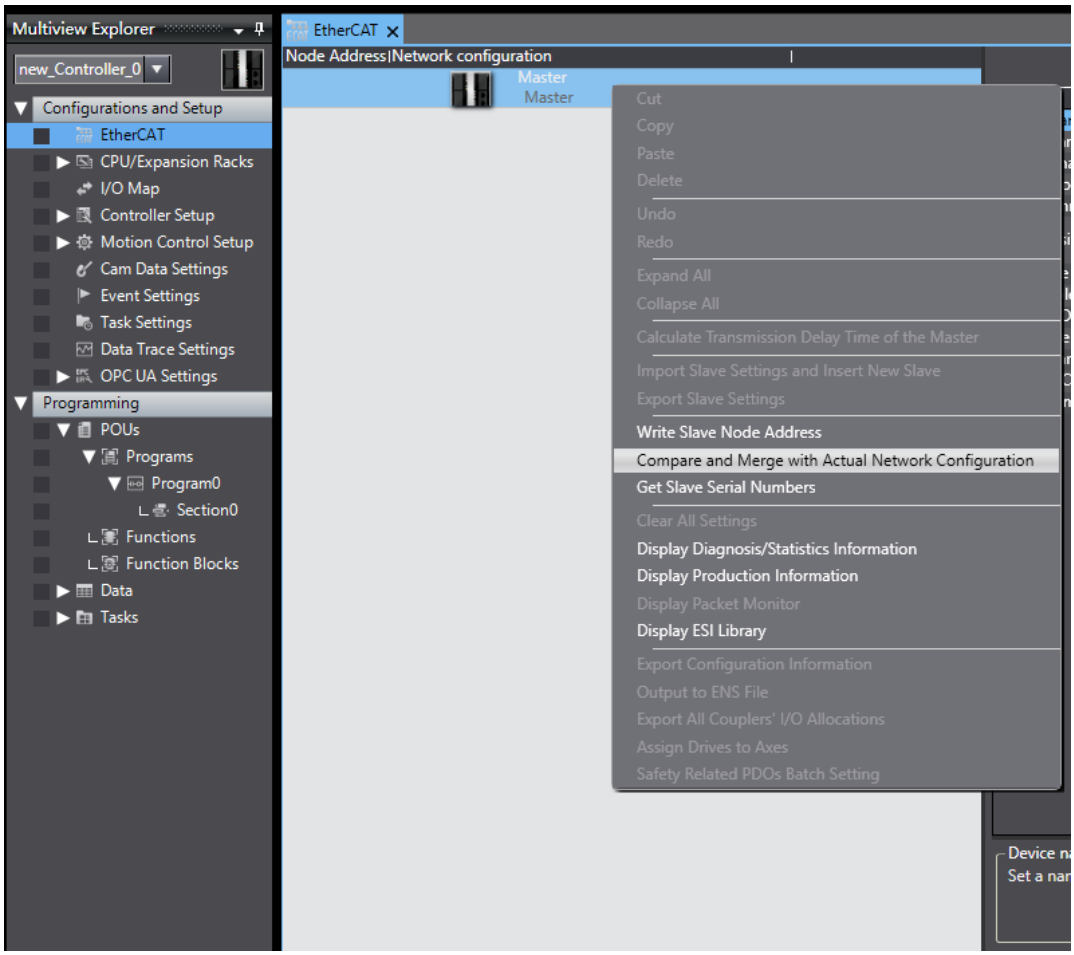
3. Add the I/O module.

- Method 1: Online scan

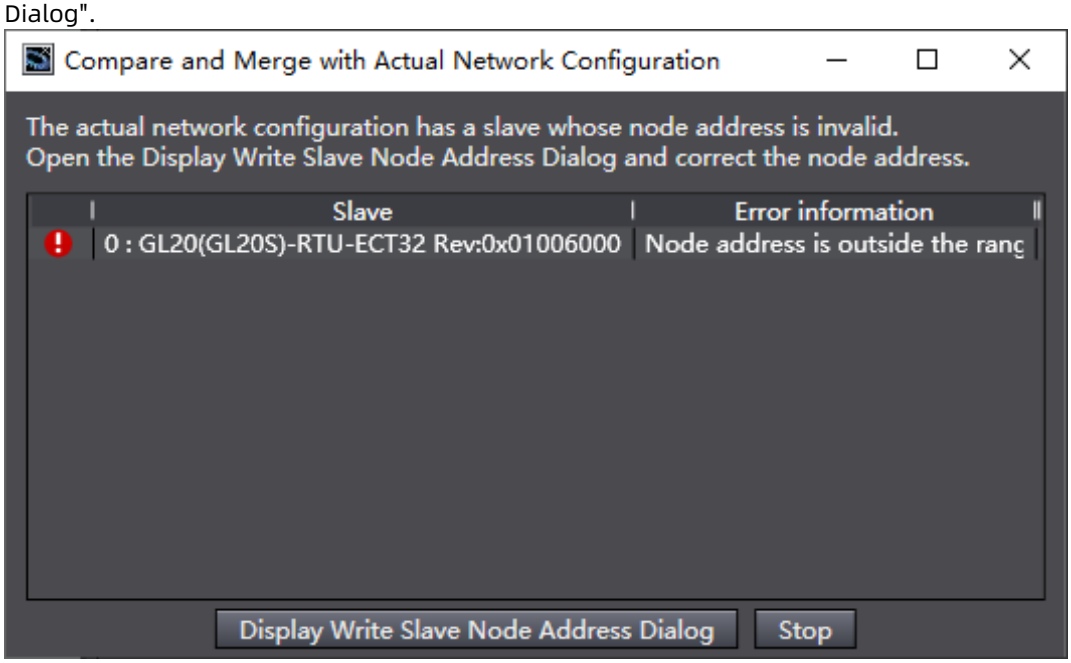
  a. Click the "Online" icon in the toolbar.



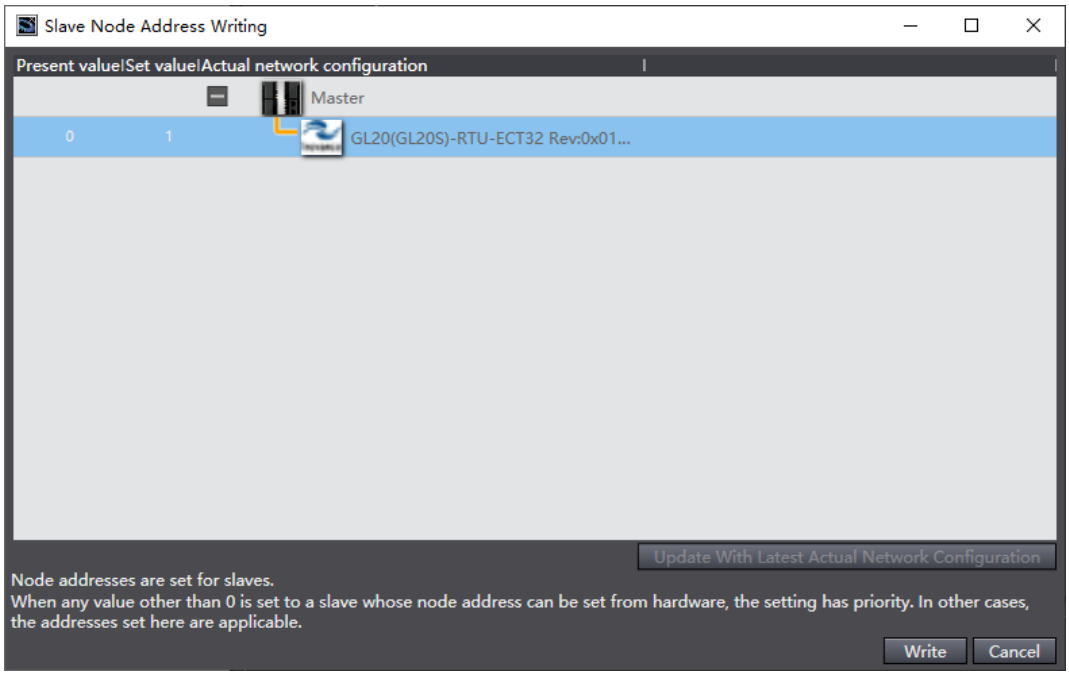
  b. In the "MultiView Explorer" navigation tree on the left, double-click "EtherCAT". In the opened interface, right-click the master device and select "Compare and Merge with Actual Network Configuration".



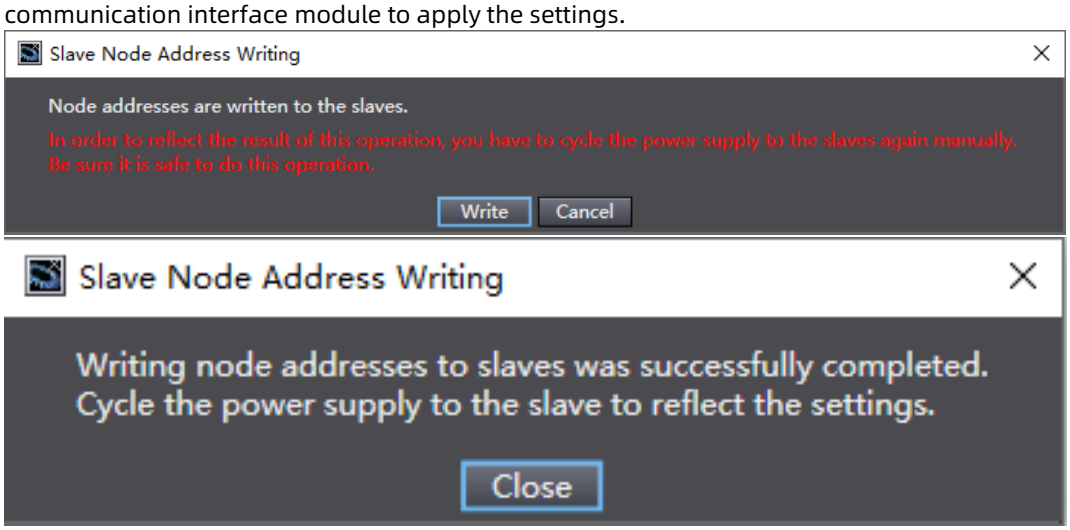
c. (Optional) If the node address of the GL20-RTU-ECT32 communication interface module is out of range, it is necessary to modify the node address. Click "Display Write Slave Node Address Dialog".



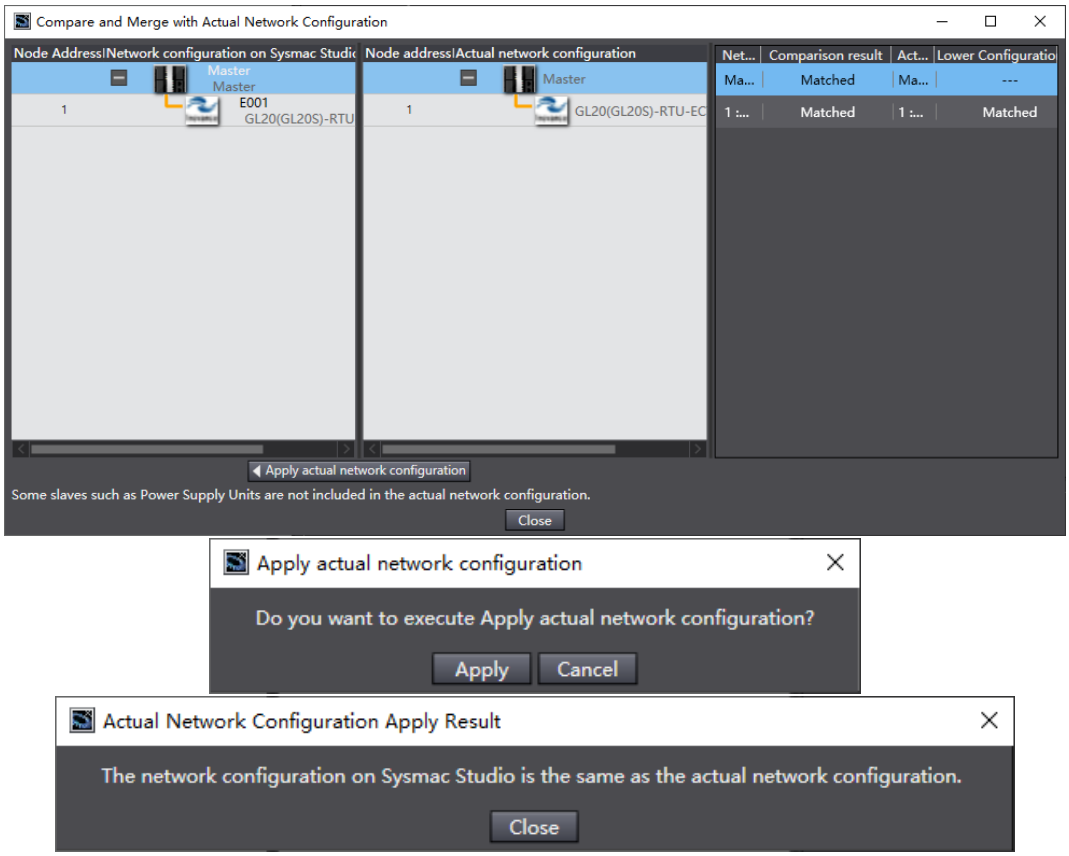
d. (Optional) Modify the "Set value" to the slave node address, set the node address to a value between 0 and 192, and click "Write".



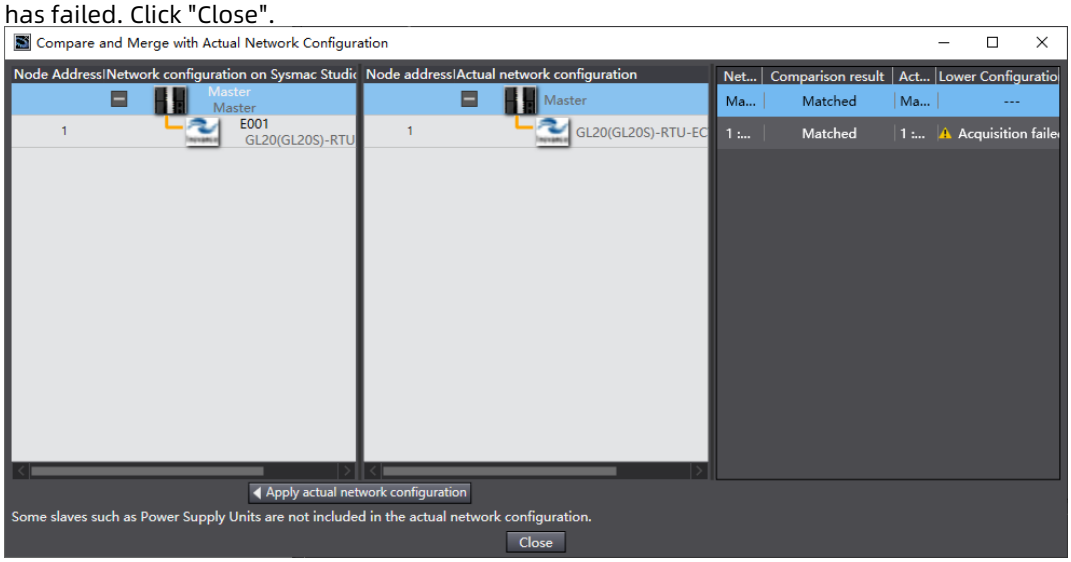
e. After successfully writing the slave node address, power off and on the GL20-RTU-ECT32 communication interface module to apply the settings.



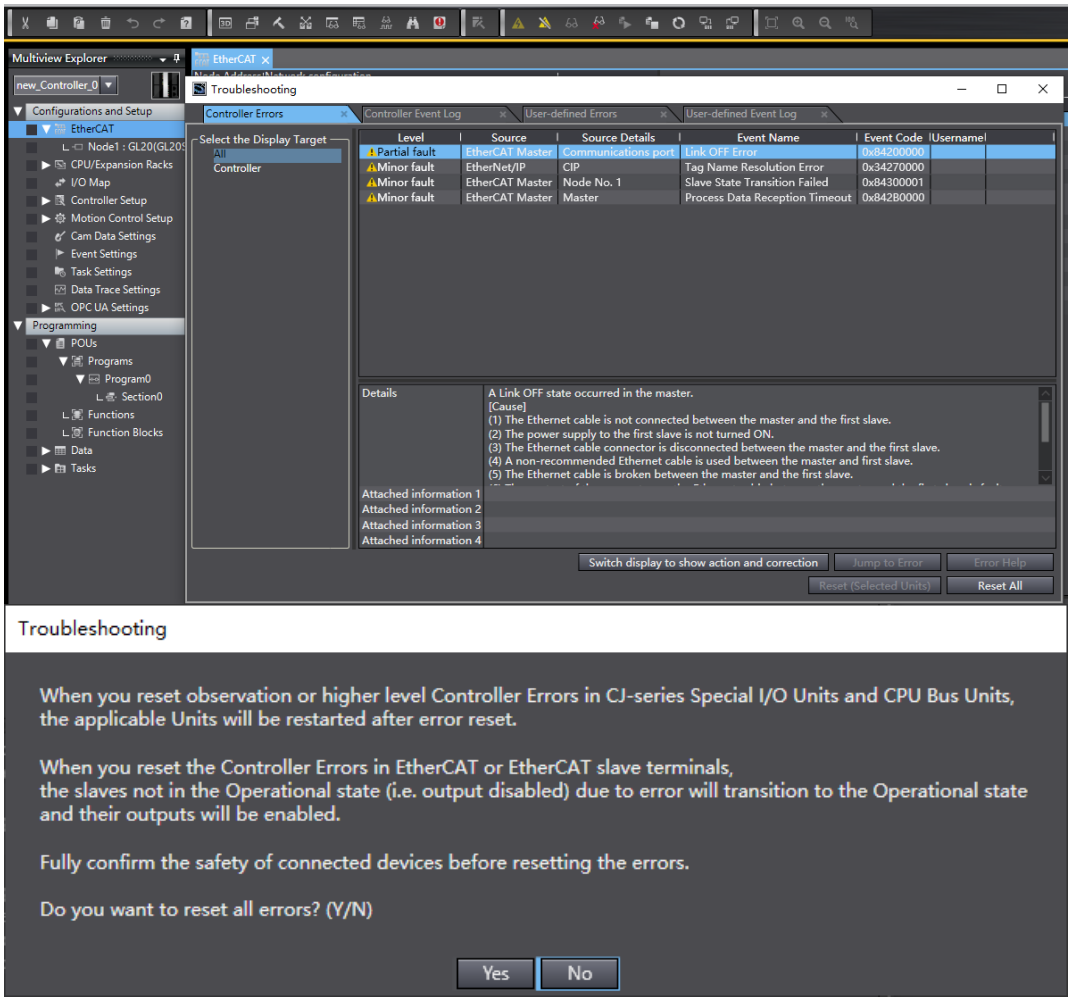
f. Repeat step b and click "Apply actual network configuration". In the pop-up window, click "Apply". In the pop-up "Actual Network Configuration Apply Result" window, click "Close".



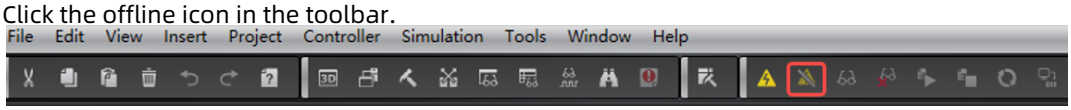
g. (Optional) If the lower configuration displays "Get failed", it indicates that the module scanning for the devices connected to the GL20-RTU-ECT32 communication interface module has failed. Click "Close".



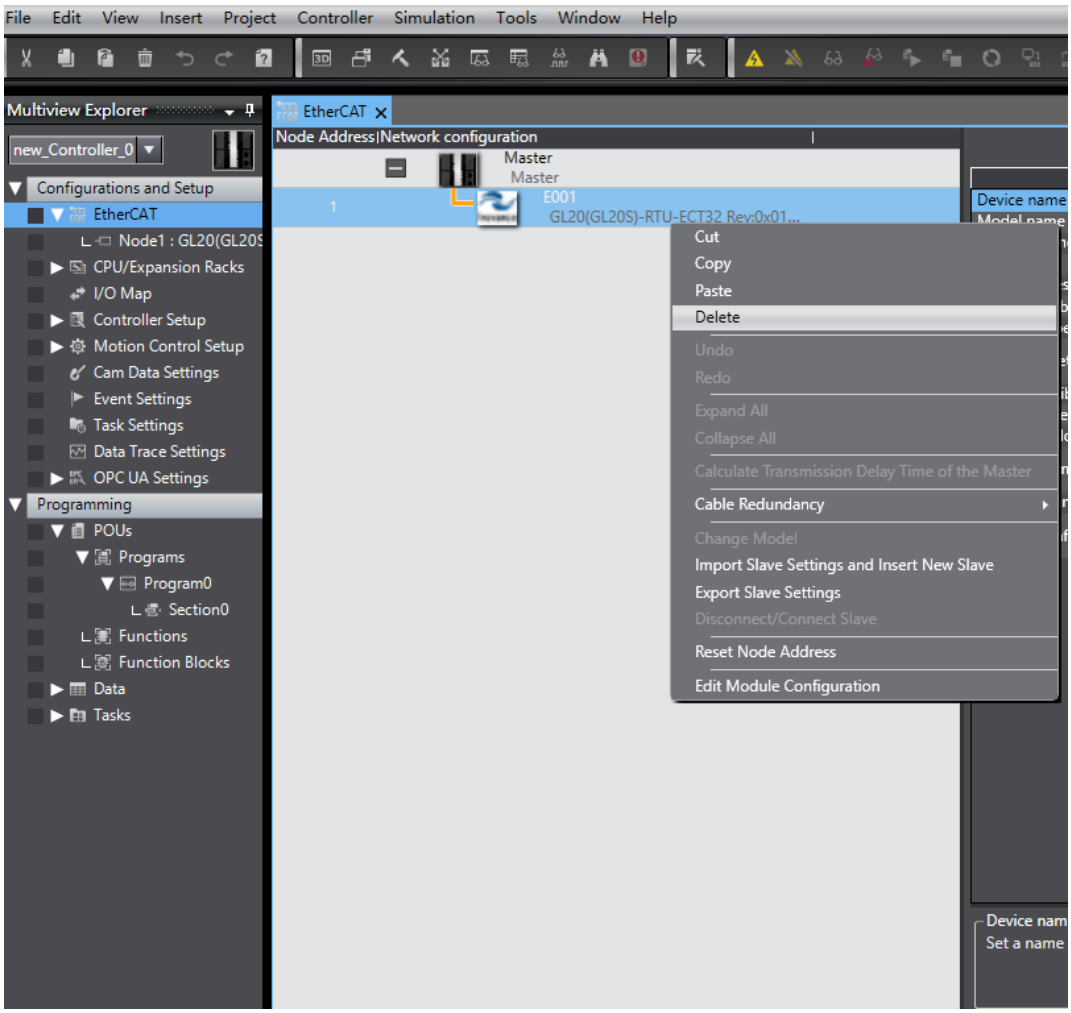
h. Click the troubleshooting button in the toolbar, as shown below. In the pop-up "Troubleshooting" window, select "All" for the display target and click "Yes" in the pop-up window to reset all faults.



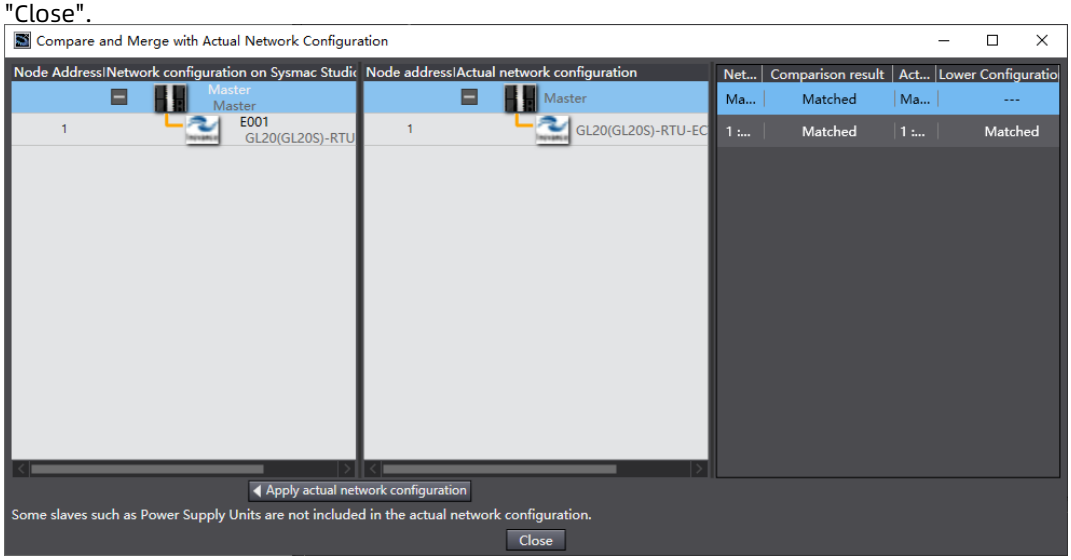
i. Click the offline icon in the toolbar.



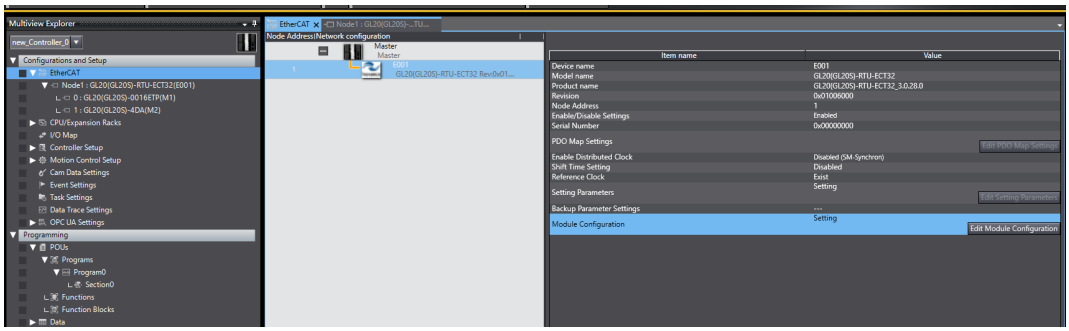
j. In the "MultiView Explorer" navigation tree on the left, double-click "EtherCAT". In the opened interface, right-click "GL20-RTU-ECT32" and select "Delete".



k. Click the online button in the toolbar and repeat step b. If the comparison result and the lower configuration result are both "Match", the I/O device is scanned successfully. Click "Close".

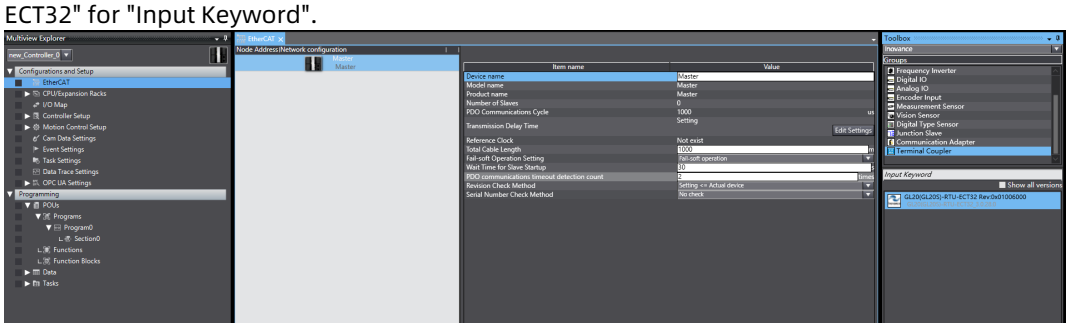


The scan result is shown in the figure below.

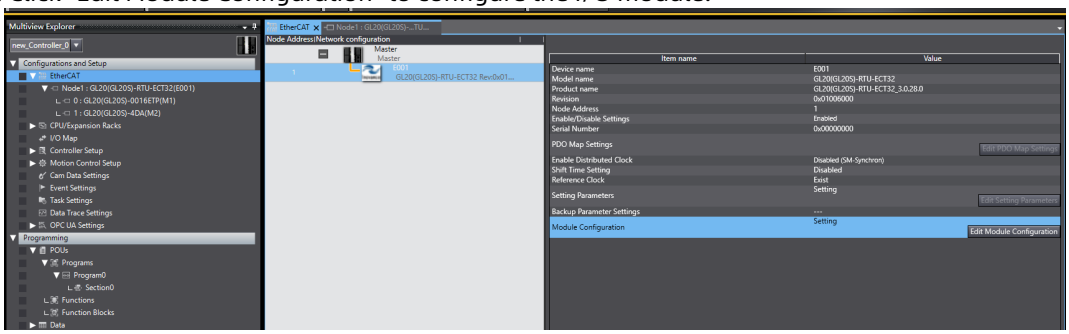


- Method 2: Manual configuration

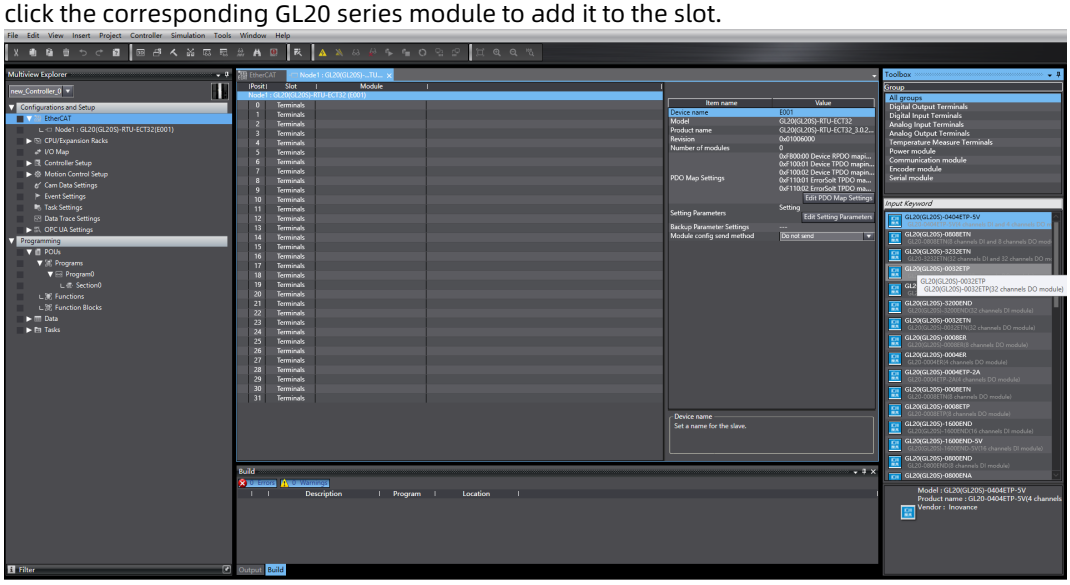
  a. In the "MultiView Explorer" navigation tree on the left, double-click "EtherCAT". In the opened interface, select "Inovance" for "Toolbox", "Terminal Coupler" for "Groups", and "GL20-RTU-ECT32" for "Input Keyword".



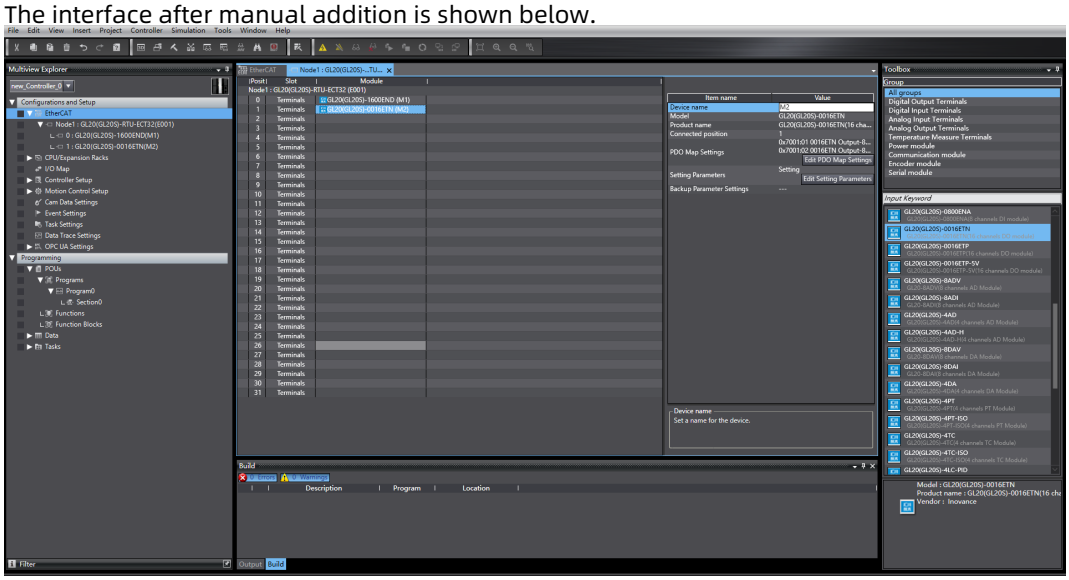
  b. Click "Edit Module Configuration" to configure the I/O module.



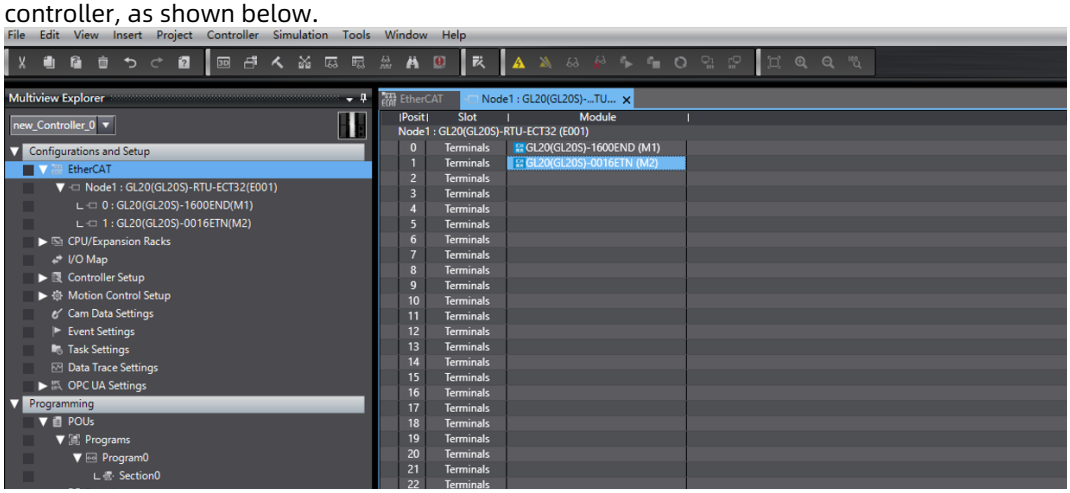
  c. Click the expansion slot of the interface communication module. In the "Toolbox", double-click the corresponding GL20 series module to add it to the slot.



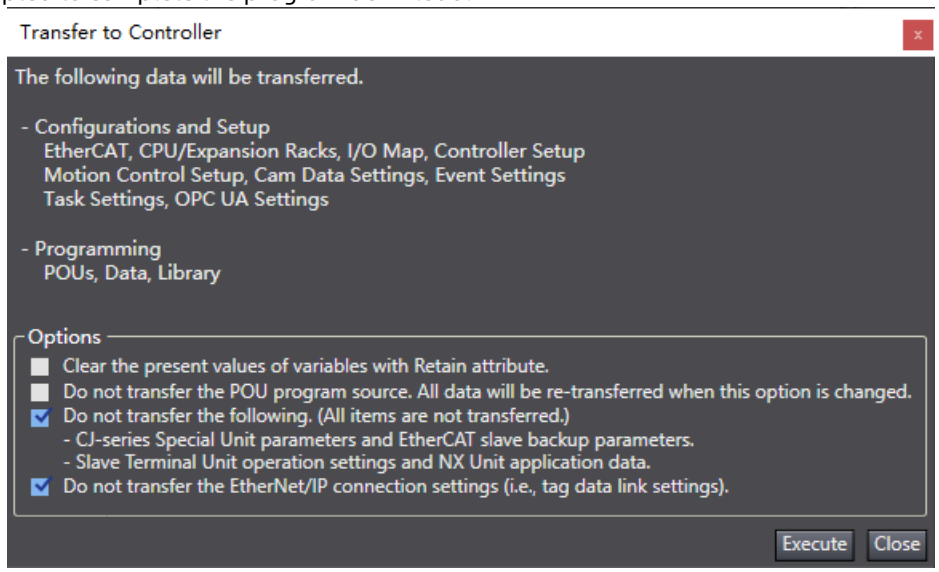
The interface after manual addition is shown below.

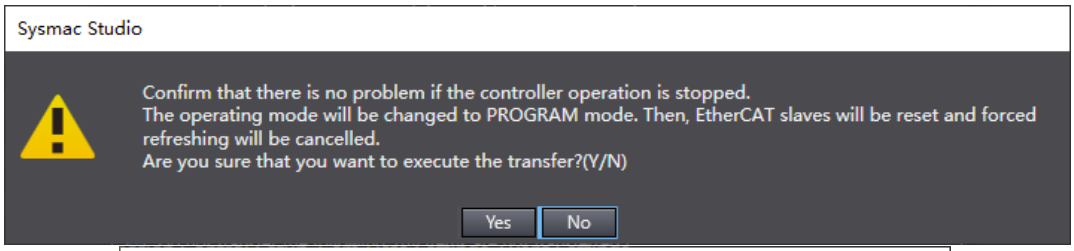


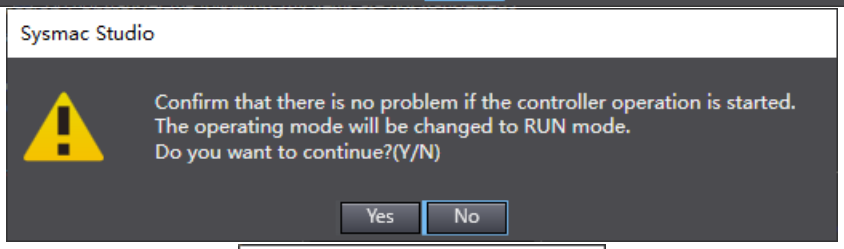
d. After configuration, click the download icon in the toolbar to download the program to the controller, as shown below.

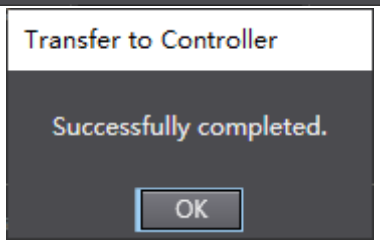


e. In the opened "Transfer to Controller" dialog box, click "Execute", then click "Yes" and "OK" as prompted to complete the program download.



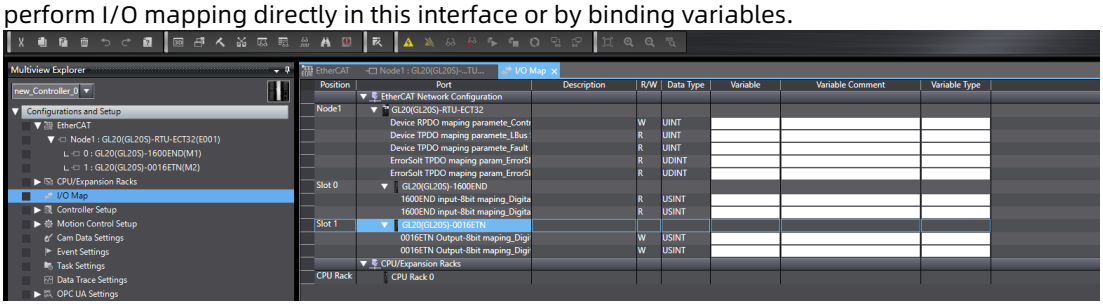






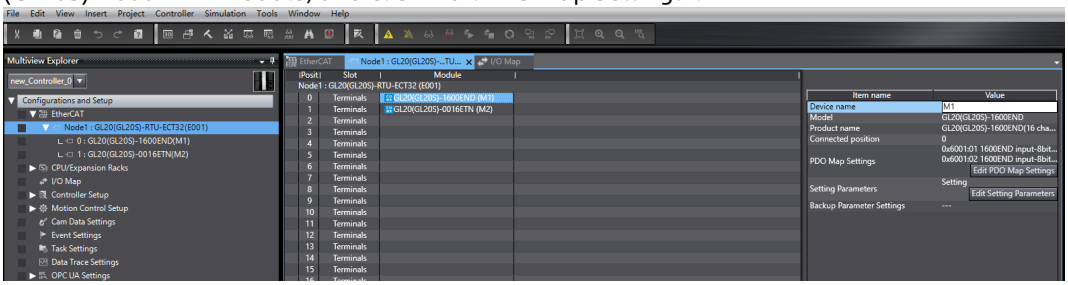
4. Perform I/O mapping.

a. In the "MultiView Explorer" navigation tree on the left, double-click "I/O Map" to view the process data information of the communication interface module and the GL20 module. You can perform I/O mapping directly in this interface or by binding variables.



b. For example, for digital modules, there are three addressing methods: by bit, 8-bit, and 16-bit. The following introduces how to modify the PDO settings by using the GL20(GL20S)-1600END module as an example.

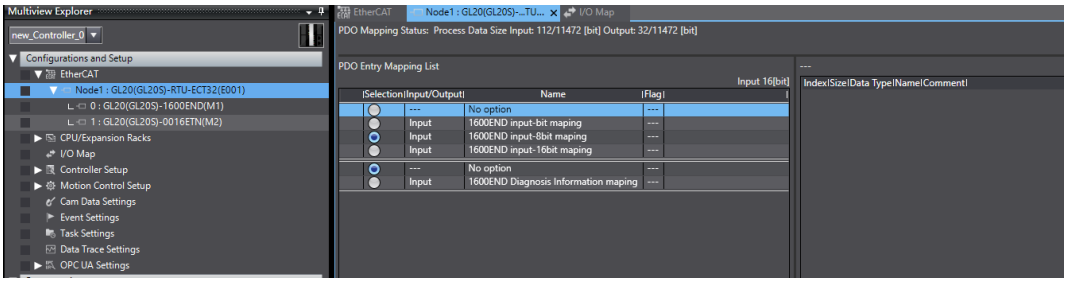
1). Double-click "Node 1: GL20(GL20S)-RTU-ECT32". In the opened interface, select the "GL20 (GL20S)-1600END" module, and click "Edit PDO Map Settings".



2). Select one of the three addressing methods based on actual needs, and click "OK" to complete the PDO mapping settings.

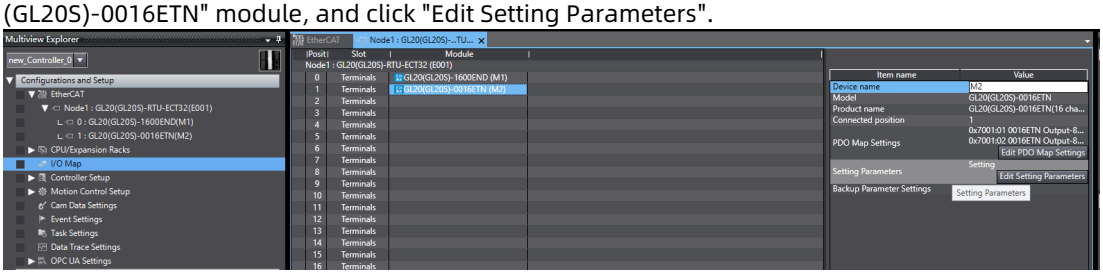
Note

After completing the PDO mapping settings, the project must be re-transmitted to the controller for the settings to take effect.



5. Configure the startup parameters of the module. The following takes the GL20(GL20S)-0016ETN module as an example.

   a. Double-click "Node 1: GL20(GL20S)-RTU-ECT32". In the opened interface, select the "GL20(GL20S)-0016ETN" module, and click "Edit Setting Parameters".



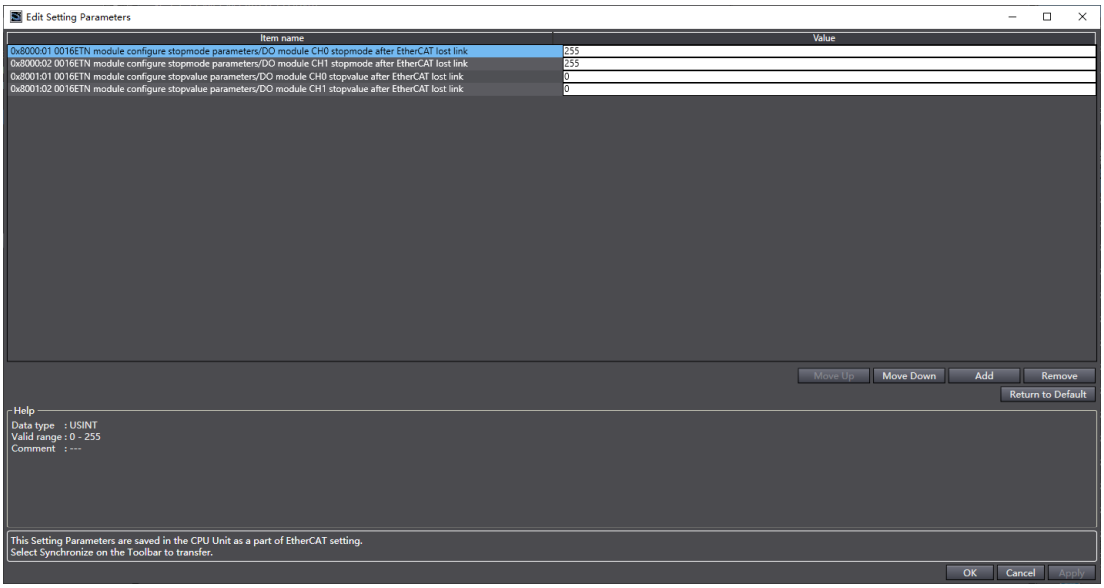
Note

If the controller is NX701, the "Edit Setting Parameters" approach is unavailable and users need to use IOManager for parameter configuration.

   b. In the opened "Edit Setting Parameters" interface, the startup parameters can be modified. Click "OK" to complete the modification.

Note

- After modification, the project must be re-transmitted to the controller for the modifications to take effect.
- If no modifications are made to this interface, the module will operate with default parameters.



7.1.4.2 Commissioning

After successfully configuring and downloading this product and the expansion modules, a simple commissioning is required to ensure normal functioning.

Prerequisites

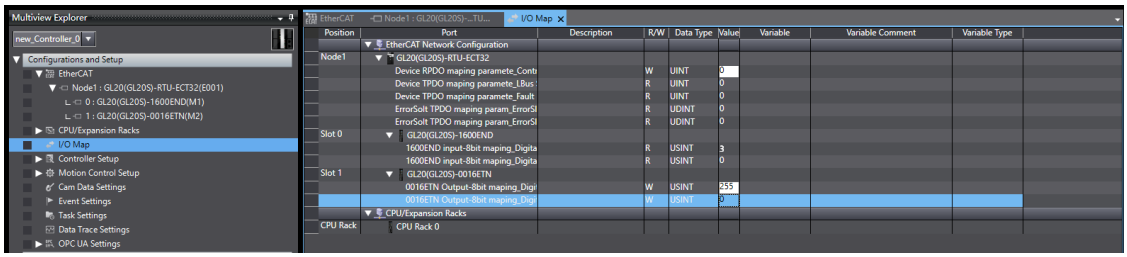
Connect the output terminals DO0 and DO1 of the GL20-0016ETN module to the input terminals DI0 and DI1 of the GL20-1600END module, respectively.

Procedure

1. Determine the status of the communication interface module and expansion modules through the signal indicators. For details on the signal indicators of the communication interface module, see *"8.2.1.1 GL20-RTU-ECT32" on page 183*. For details on the signal indicators of the expansion modules, see the user guide of each module.

   - If the signal indicator status is normal, proceed to step 2.
   - If the signal indicator status is abnormal, determine the cause according to the signal indicator status and resolve the fault.
     - If the fault is resolved, proceed to step 2.
     - If the fault remains unresolved, use the programming software for troubleshooting. For details, see *"8.2.2.3 Troubleshooting via Omron Sysmac Studio" on page 194*.

2. In the "MultiView Explorer" navigation tree on the left, double-click "I/O Map". In the opened interface, expand slot 1 "GL20(GL20S)-0016ETN", enter "255" in the "Value" field for "xx_Digital output CH0-8bit_xx", and press "Enter" to confirm. Then, expand slot 0 "GL20(GL20S)-1600END" and the online value for "Digital input CH0-8bit" is 3.



3. Check whether the output and input channels of the GL20-0016ETN and GL20-1600END modules function normally.

   - In the "I/O Map" interface, expand slot 0 "GL20(GL20S)-1600END" and check whether the value for "xx_Diagital input CH0-8bit_xx" is "3". This indicates that the DI0 and DI1 input channels of the module are functioning normally.
   - If the signal indicators (00-07) of the GL20-0016ETN module and the signal indicators (00-01) of the GL20-1600END module are solid on, it indicates that the input and output channels of both modules are functioning normally.

7.1.5 Compatibility with Beckhoff TwinCAT

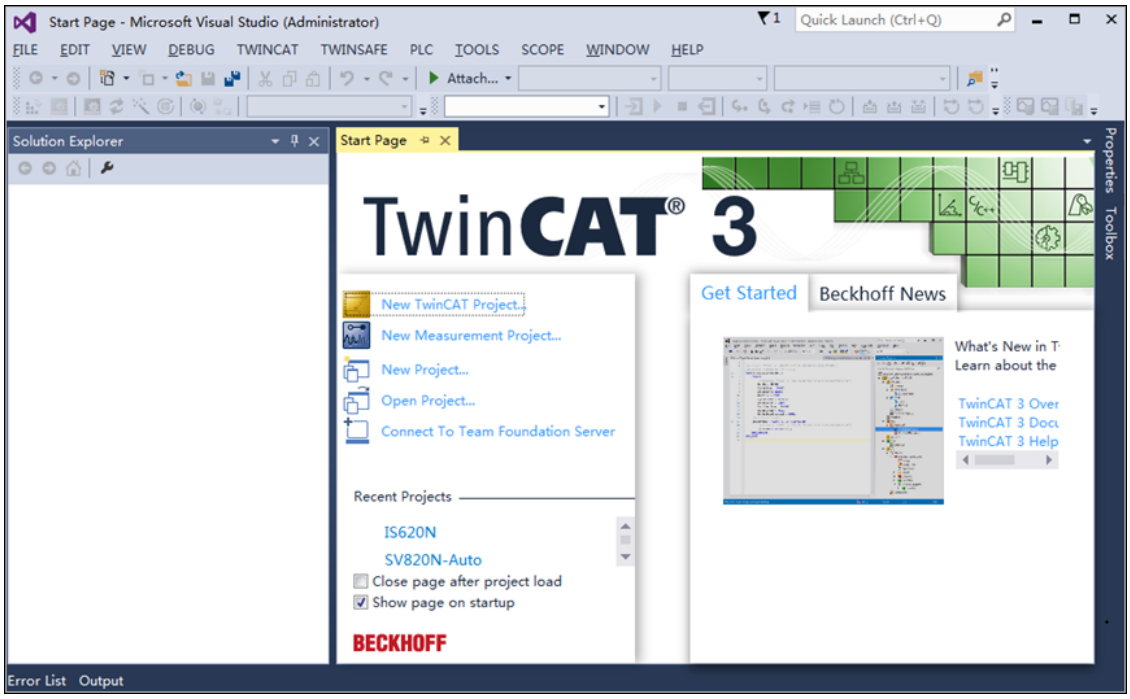
7.1.5.1 Configuration

Prerequisites

- The PC is equipped with TwinCAT software (TwinCAT V3.1.4024.25 is recommended).
- This product is connected to the PC and the PLC host via a network cable (no requirements for PLC model, PLC firmware version, or programming software version).
- The device is powered on and started.
- The EtherCAT configuration file "INOVANCE-GL20(GL20S)-RTU-ECT32-3.0.11.0.xml" is obtained from the Inovance official website (www.inovance.com).

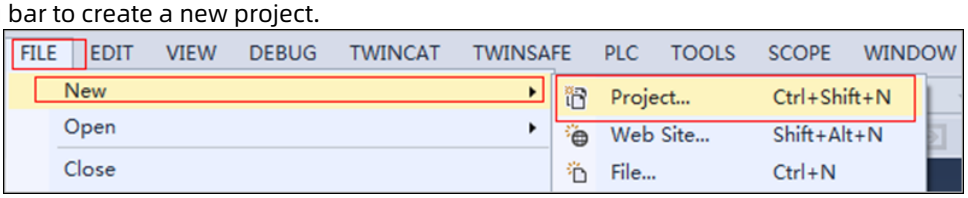
Procedure

1. Copy the EtherCAT configuration file (.xml) to "C:\TwinCAT\3.1\Config\Io\EtherCAT".
2. Double-click the TwinCAT software shortcut on the PC desktop to open TwinCAT.

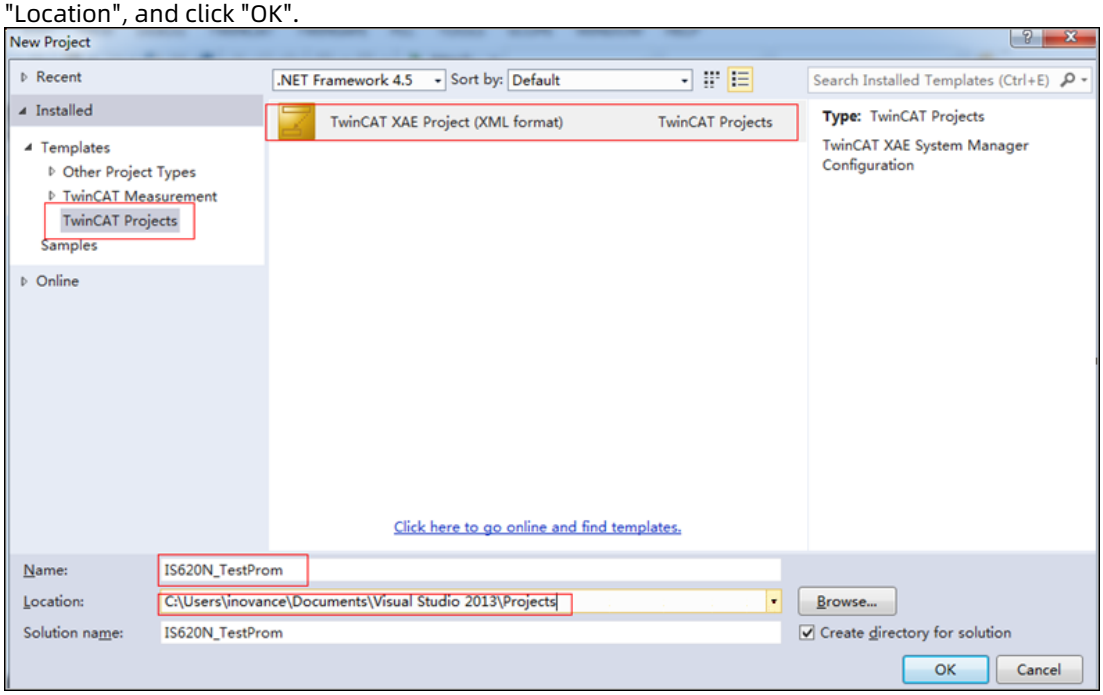


3. Create a project.

a. On the startup page, click "New TwinCAT Project", or select "FILE > New > Project..." from the menu bar to create a new project.

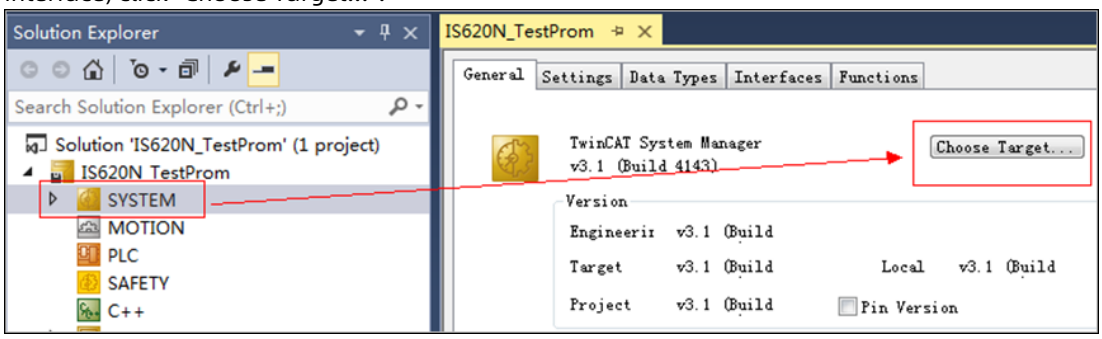


b. In the opened dialog box, click "TwinCAT Projects" and select "TwinCAT XAE Project (XML format)". Enter the project name in "Name" (Chinese characters are not allowed), save path in "Location", and click "OK".

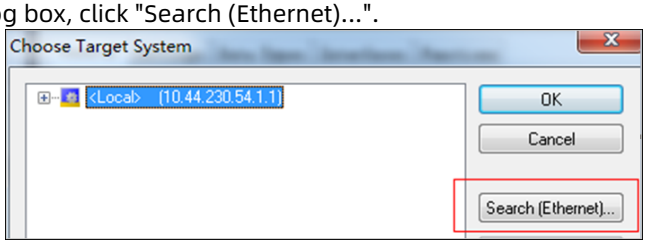


4. Connect to the target controller.

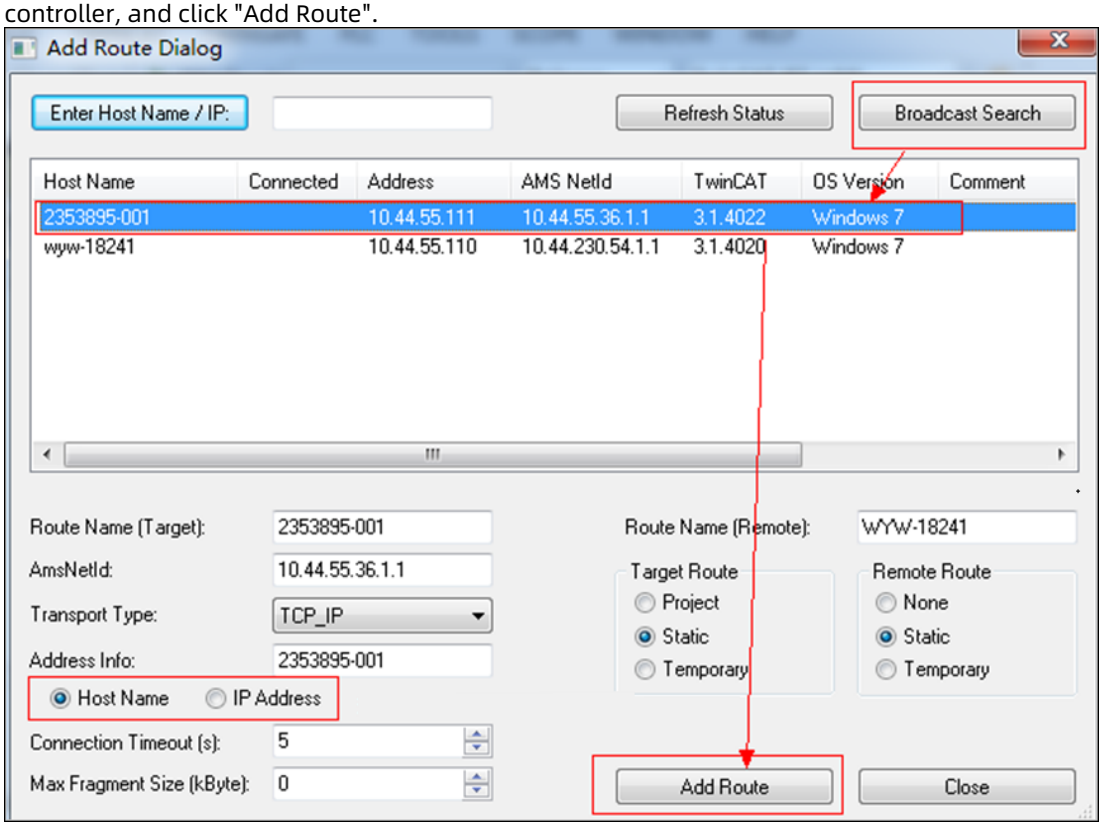
a. In the "Solution Explorer" navigation tree on the left, double-click "SYSTEM". In the opened interface, click "Choose Target...".



b. In the opened dialog box, click "Search (Ethernet)...".

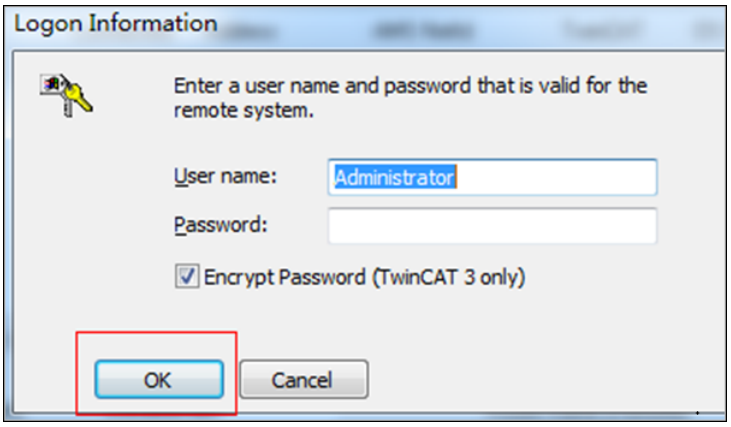


c. In the opened dialog box, click "Broadcast Search". In the search result list, click the target controller, and click "Add Route".

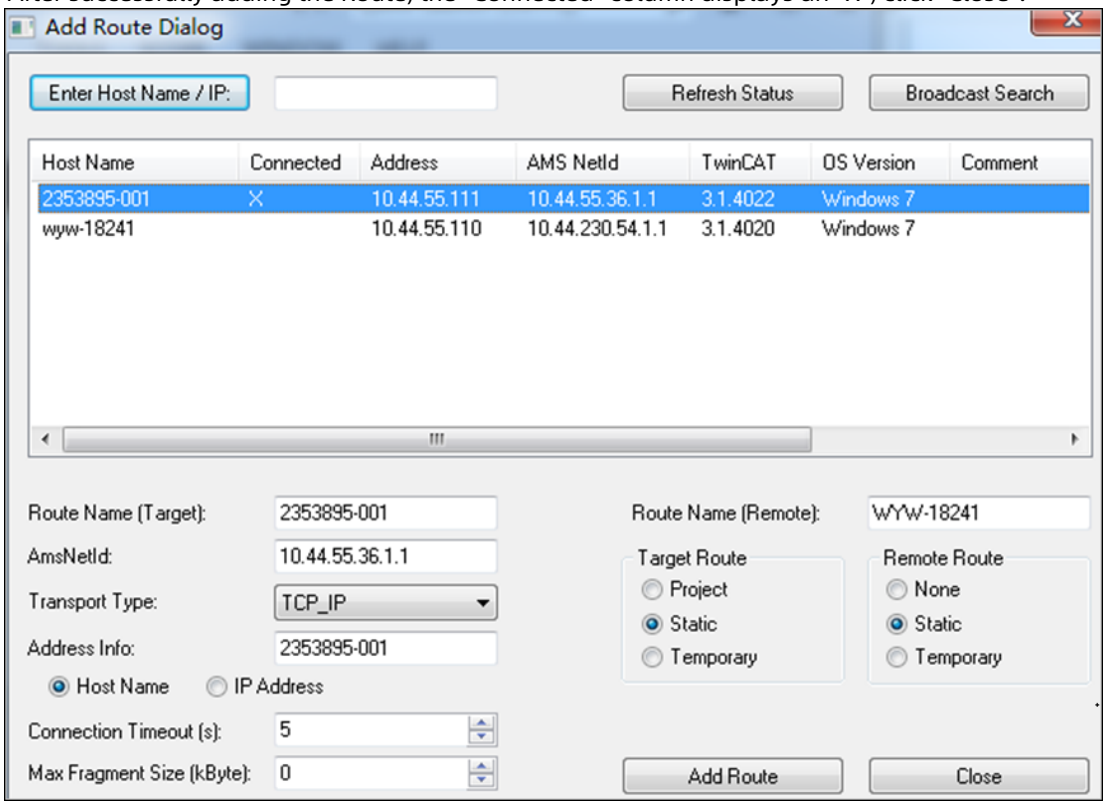


d. In the opened dialog box, enter the username and password, then click "OK".

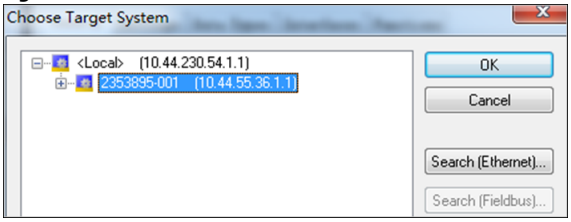
- For Windows 7 operating system, the username is set to the default value "Administrator", and the password is "1".
- For Windows CE operating system, the username is set to the default value "Administrator", and the password is left blank.



e. After successfully adding the Route, the "Connected" column displays an "X", click "Close".



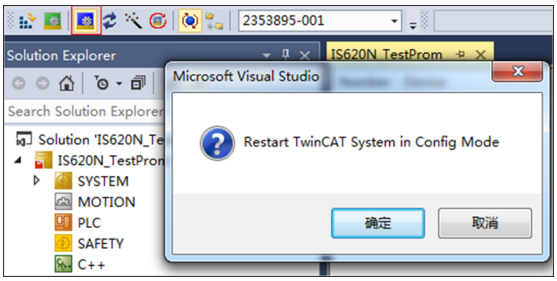
f. In the "Choose Target System" dialog box, select the target controller, and click "OK" to complete the connection to the target controller.



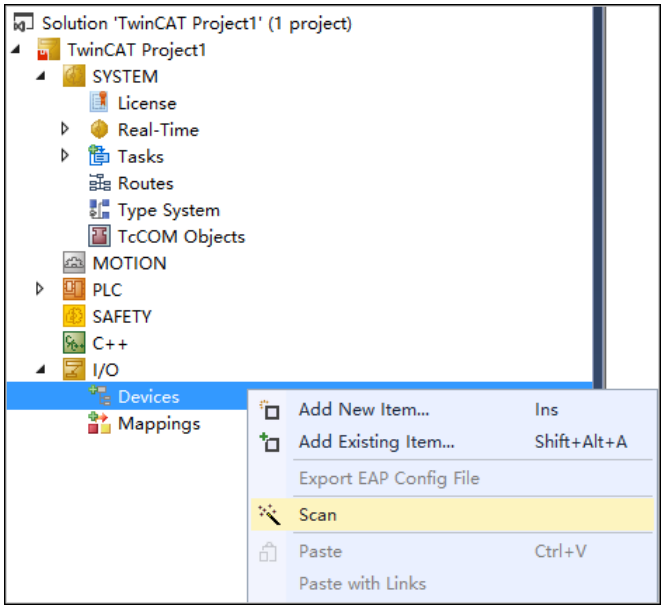
View the controller name in the toolbar. If it is the name of the added target controller, it indicates that the connection is successful.

5. Scan I/O.

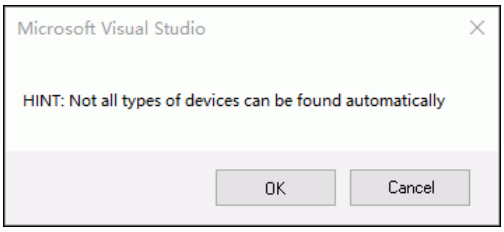
a. Click the button in the red box in the toolbar, then click "OK" in the opened dialog box to switch to the configuration mode.



b. In the "Solution Explorer" navigation tree on the left, right-click "Devices" and select "Scan" to scan I/O devices.

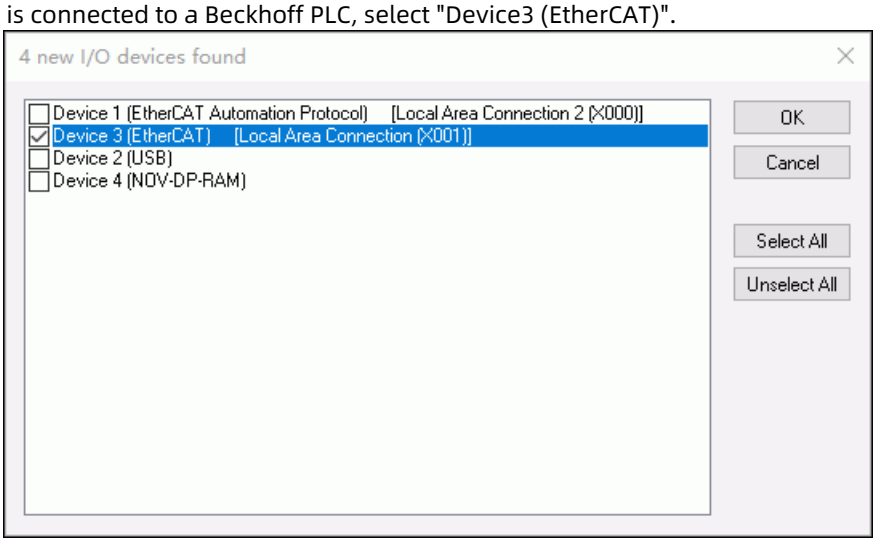


c. Click "OK".

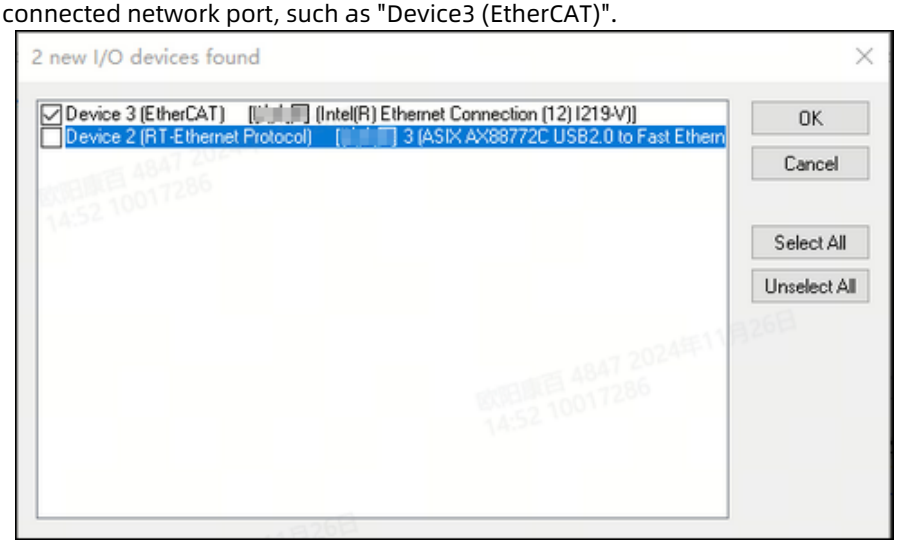


d. Select the scanned I/O devices and click "OK".

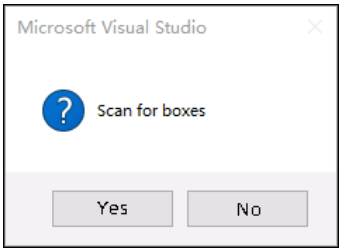
- If the PC is connected to a Beckhoff PLC, select "Device3 (EtherCAT)".



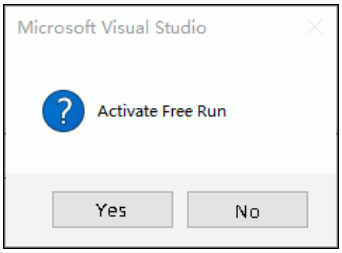
- If the PC is directly connected to this product, select the appropriate device based on the actual connected network port, such as "Device3 (EtherCAT)".



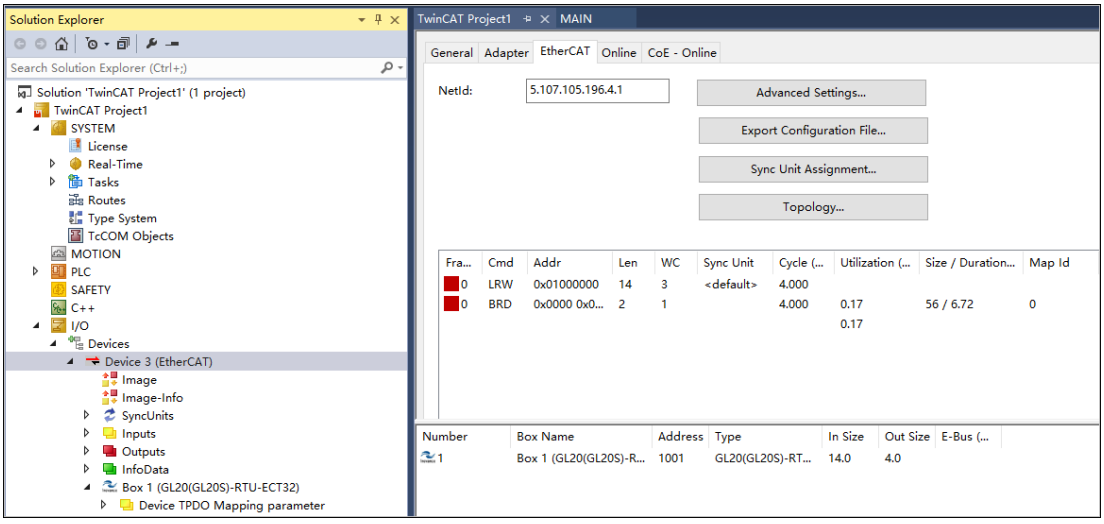
e. In the opened dialog box, click "Yes" to scan the device.



f. In the opened dialog box, click "Yes" to enter the Free Run mode.



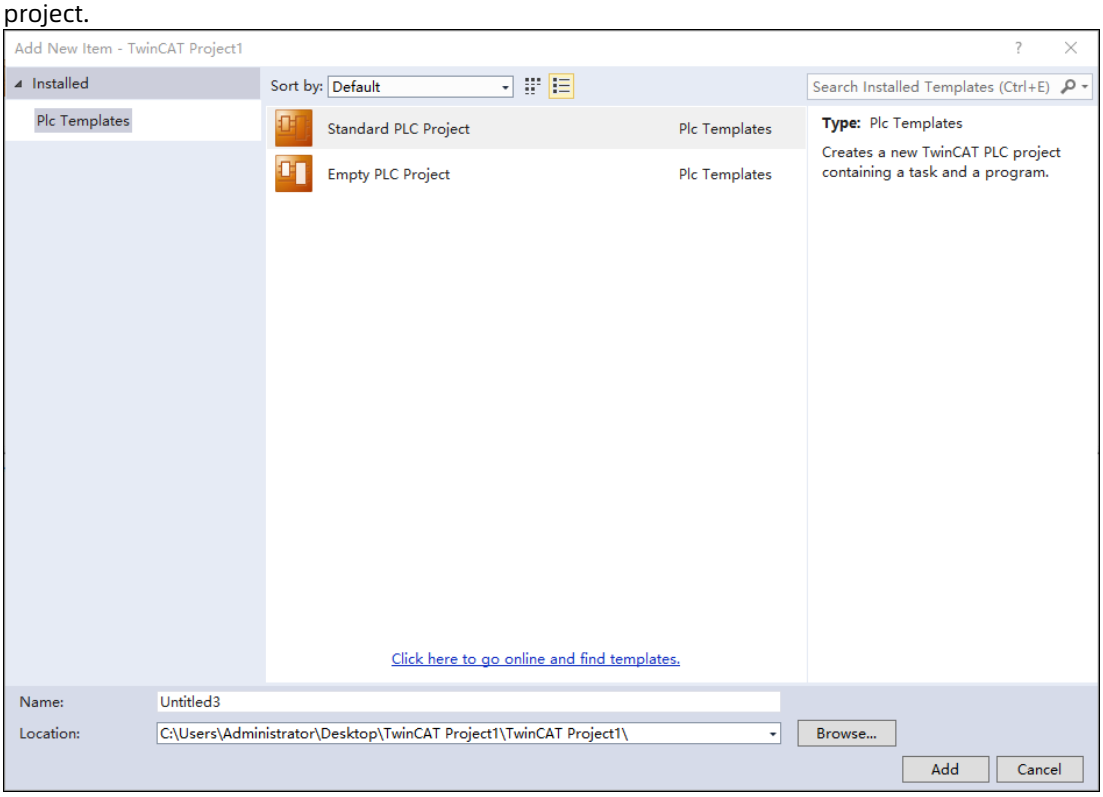
The scanning results are as follows.



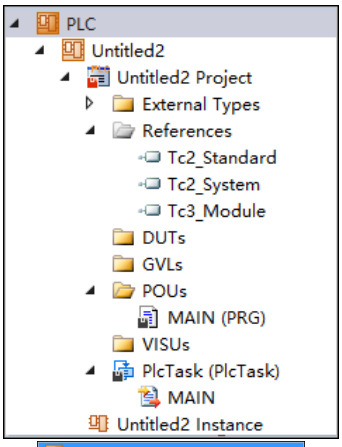
6. Create a PLC project and bind I/O mapped variables.

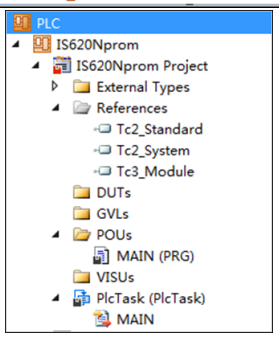
a. In the "Solution Explorer" navigation tree on the left, right-click "PLC" and select "Add New Item...".

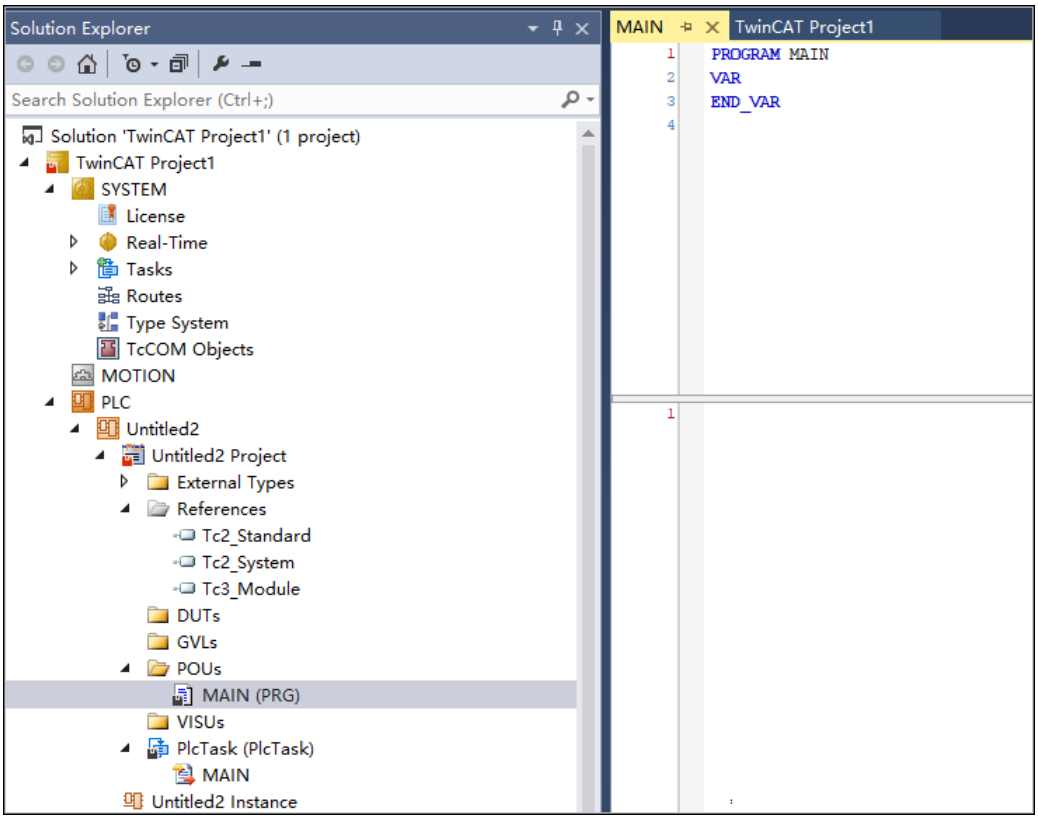
b. In the opened dialog box, click "Plc Templates". Select "Standard PLC Project", enter the PLC project name in "Name" (Chinese characters are not allowed), and click "Add" to create the PLC project.



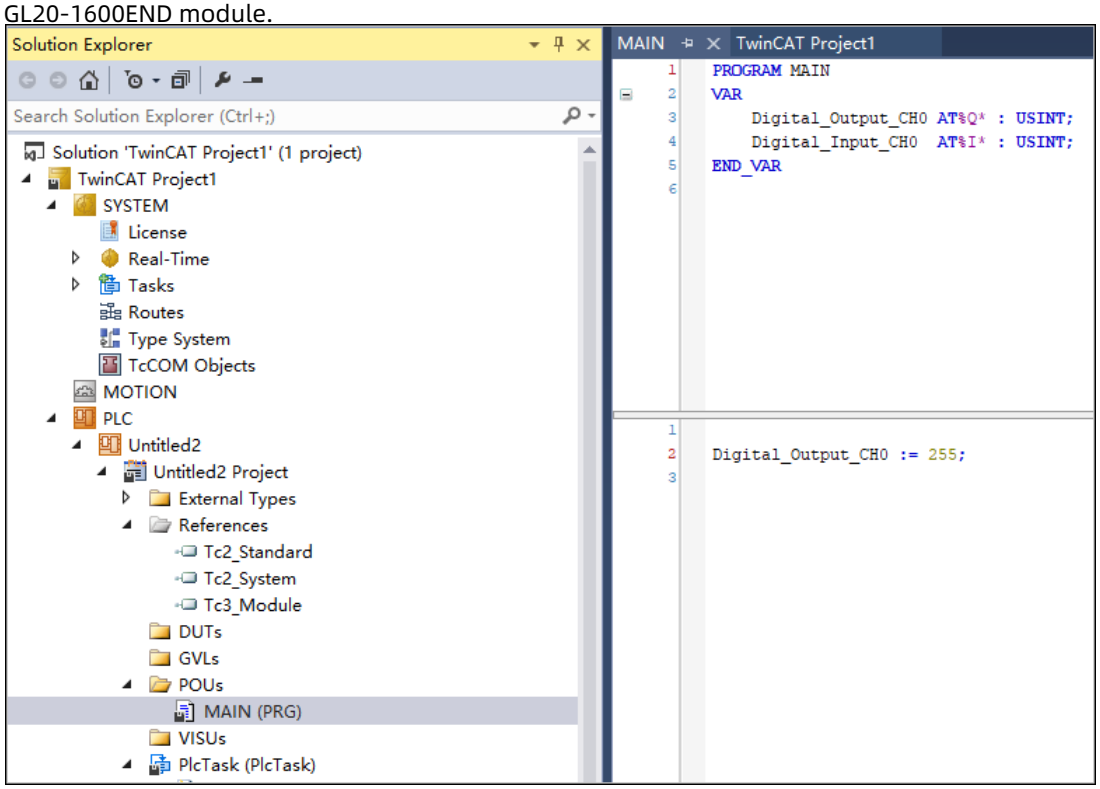
c. After creating the PLC project, double-click "MAIN(PRG)" under "PLC > POUs" node to start programming, as shown below.



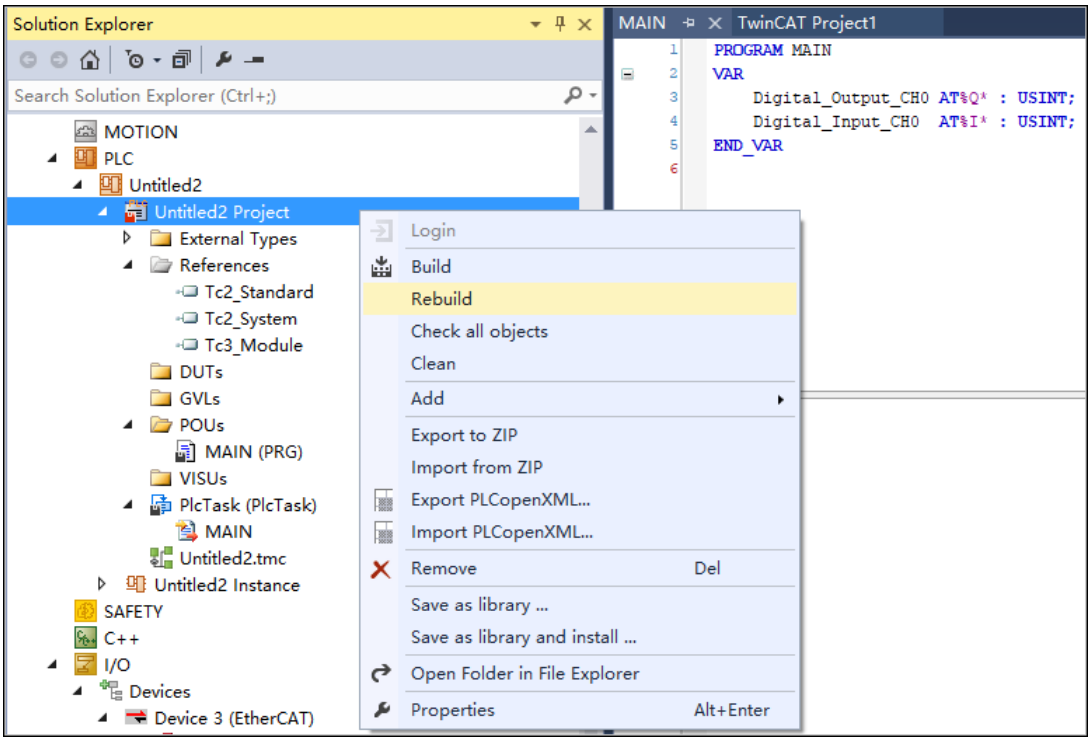




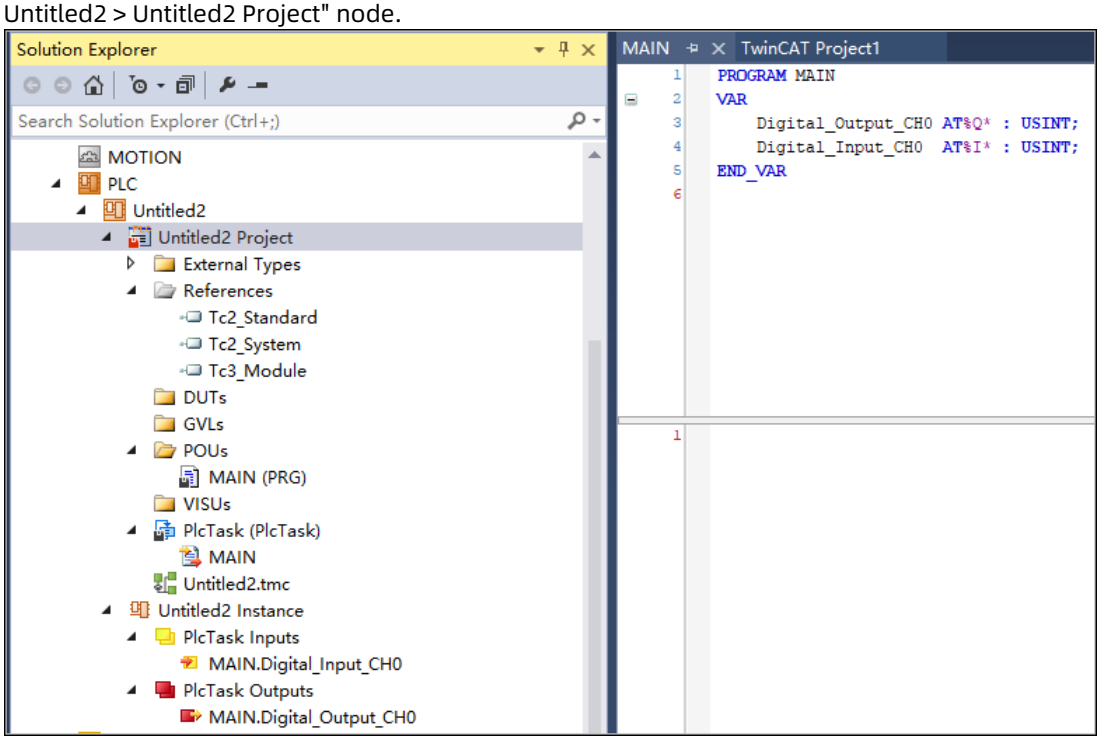
d. Define a CH0 output variable for the GL20-0016ETN module and a CH0 input variable for the GL20-1600END module.



e. Right-click "Untitled2 Project" under "PLC > Untitled2" node, and select "Rebuild" to generate the mapping variables.

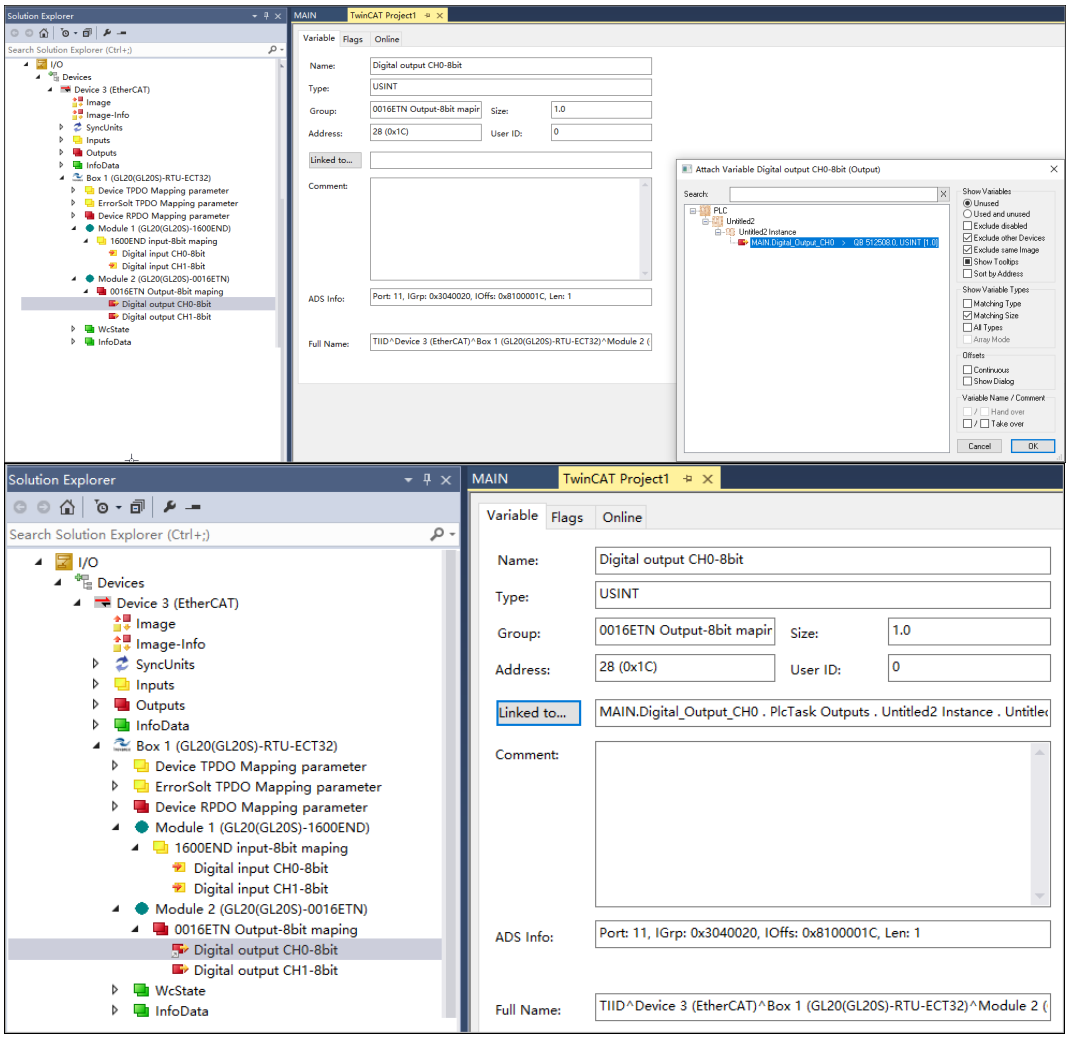


f. The generated mapping variables can be viewed in the "Untitled2 Instance" under the "PLC > Untitled2 > Untitled2 Project" node.

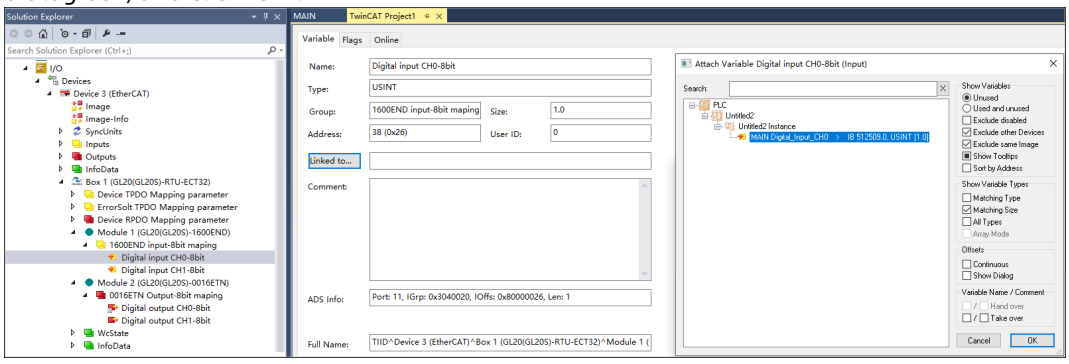


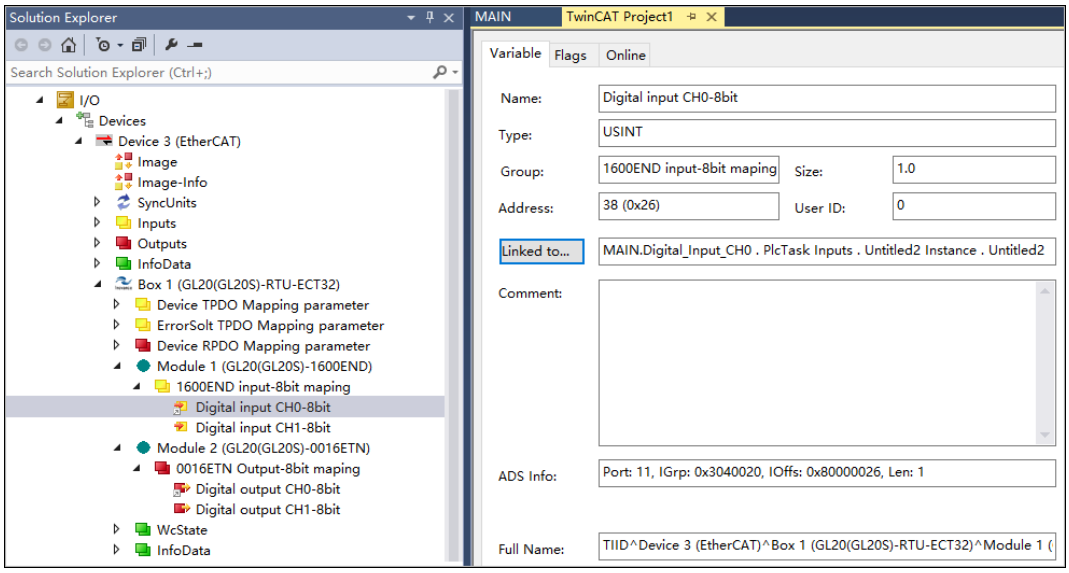
g. Bind the corresponding variable.

- Double-click "Digital output CH0-8bit" under "I/O > Devices > Devices3 (EtherCAT) > Box 1 (GL20(GL20S)-RTU-ECT32) > Module 2 (GL20(GL20S)-0016ETN) > 0016ETN Output-8bit mapping". In the opened interface, click "Linked to...", select "MAIN.Digital_Output_CH0" in the pop-up dialog box, and click "OK".



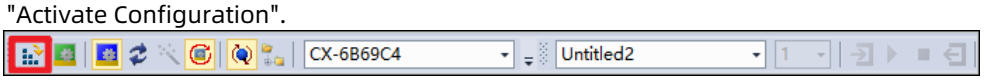
- Double-click "Digital input CH0-8bit" under "I/O > Devices > Devices3 (EtherCAT) > Box 1 (GL20 (GL20S)-RTU-ECT32) > Module 2 (GL20(GL20S)-1600END) > 1600END Input-8bit mapping". In the opened interface, click "Linked to...", select "MAIN.Digital_Input_CH0" in the pop-up dialog box, and click "OK".





7. Run the program.

a. Click "Activate Configuration".



b. In the opened dialog box, click "Yes" to restart the TwinCAT system in run mode.



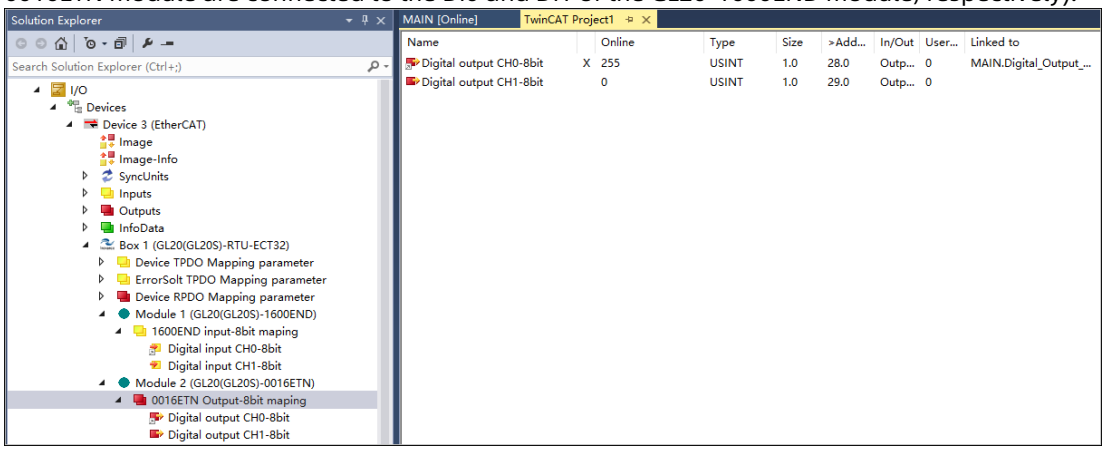
c. Click "Login" to log in to the system.

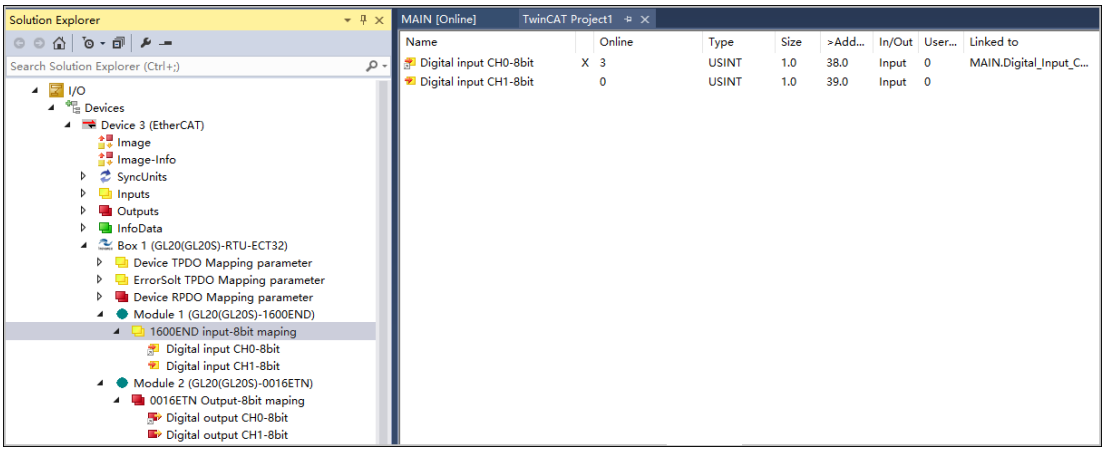


d. Click the start button and the system begins to run, as shown below.

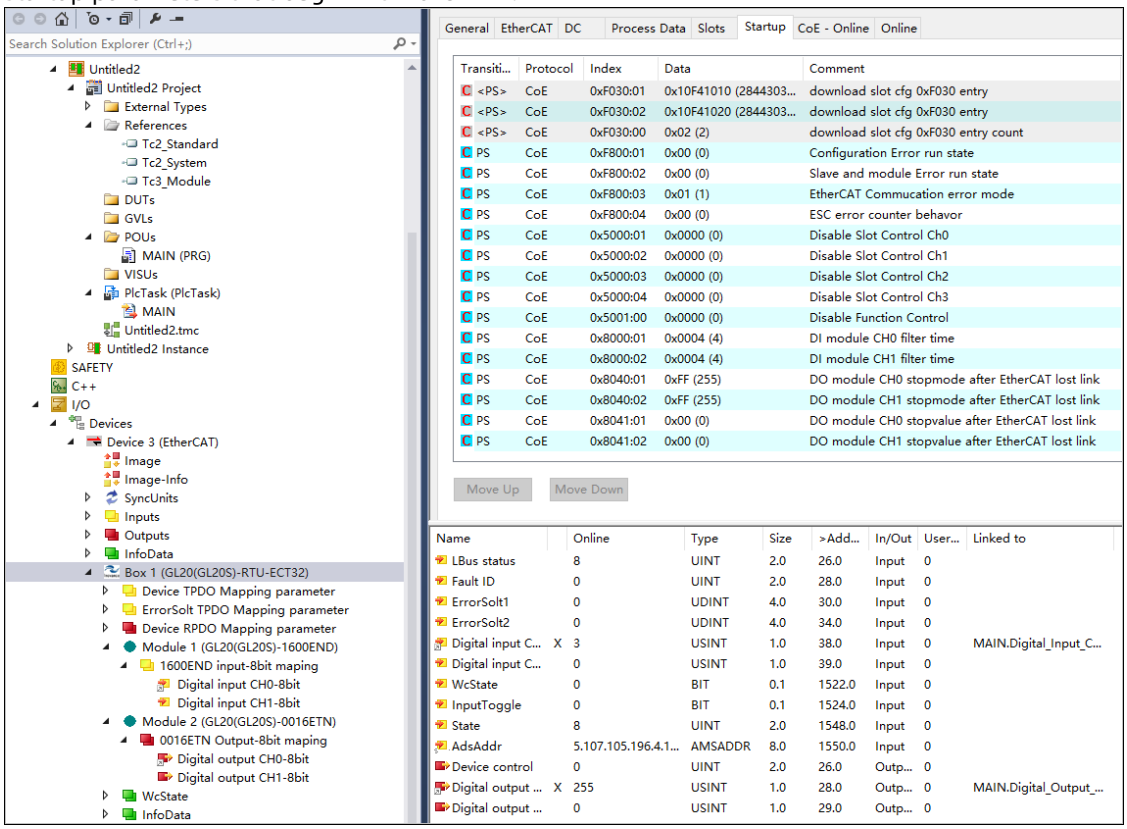


e. The online value of "Digital output CH0-8bit" for the GL20-0016ETN module is "255", and that of "Digital input CH0-8bit" for the GL20-1600END module is "3" (the DO0 and DO1 of the GL20-0016ETN module are connected to the DI0 and DI1 of the GL20-1600END module, respectively).



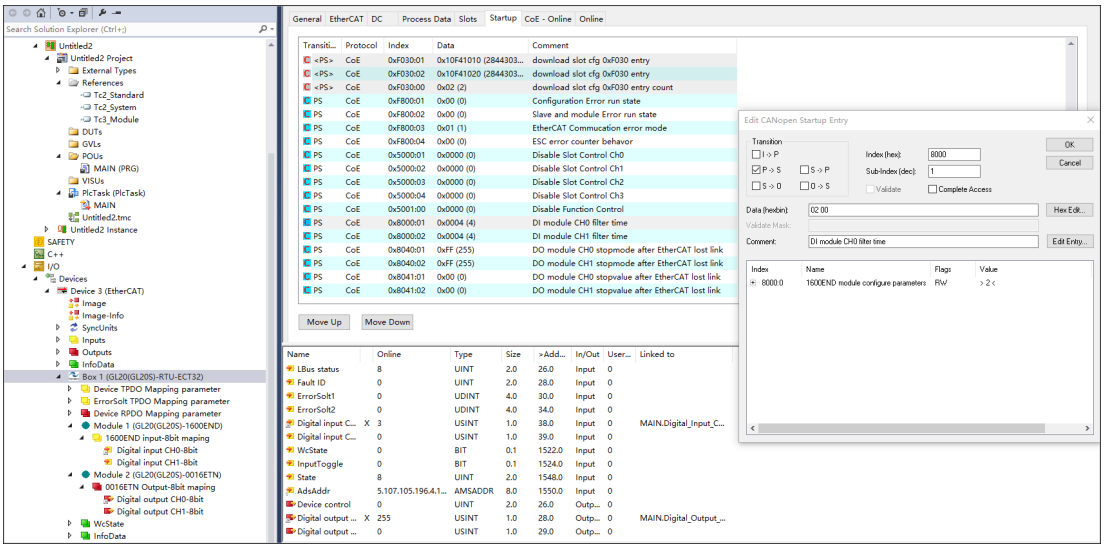


8. Configure the module startup parameters (SDO). Click "Box 1 (GL20(GL20S)-RTU-ECT32)". In the opened interface, select "Startup" and configure the expansion module functions through SDO startup parameters that begin with "0x8nnn".

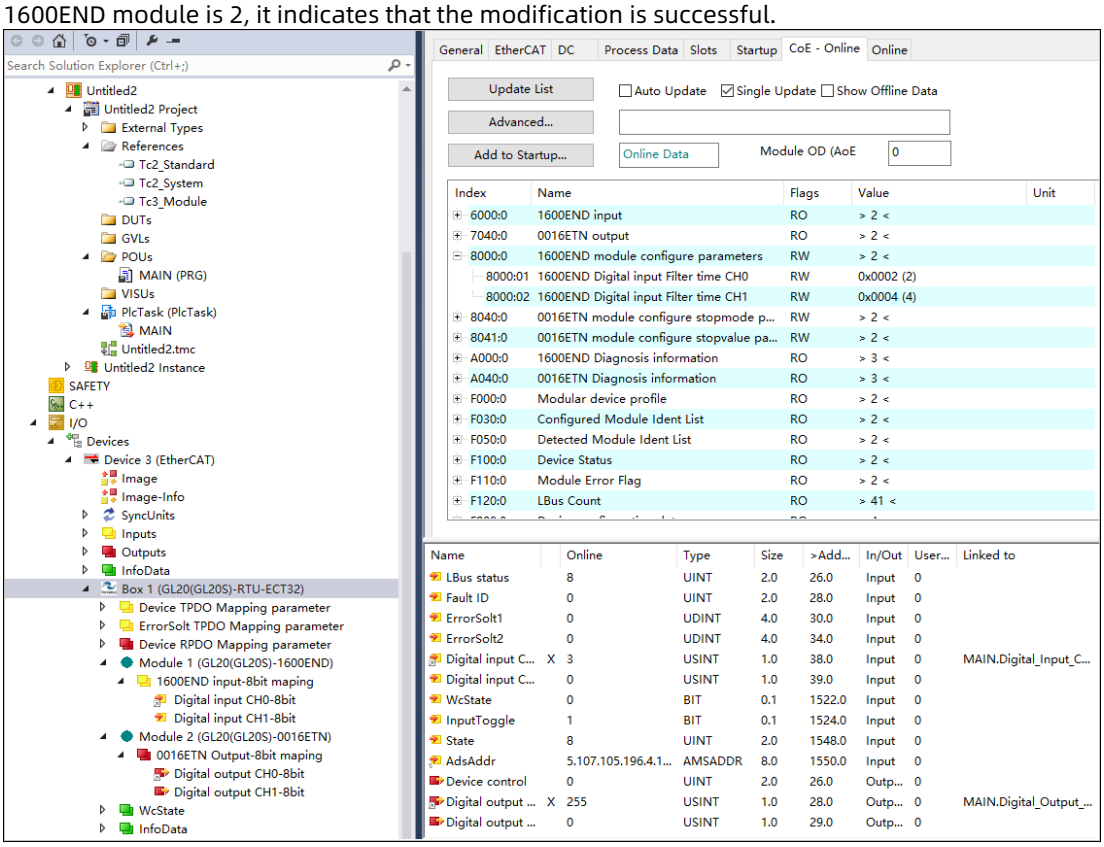


Example: The default filter parameter for channel 0 of the GL20-1600END module is 4, indicating a filter time of 1ms. The following example shows how to modify the filter parameter for channel 0 to 2 (indicating a filter time of 0.5 ms).

a. Double-click the row containing "0x8000:01 DI module CH0 filter time". In the pop-up window, modify the value of "Data(hexbin)" to "02 00", then click "OK".

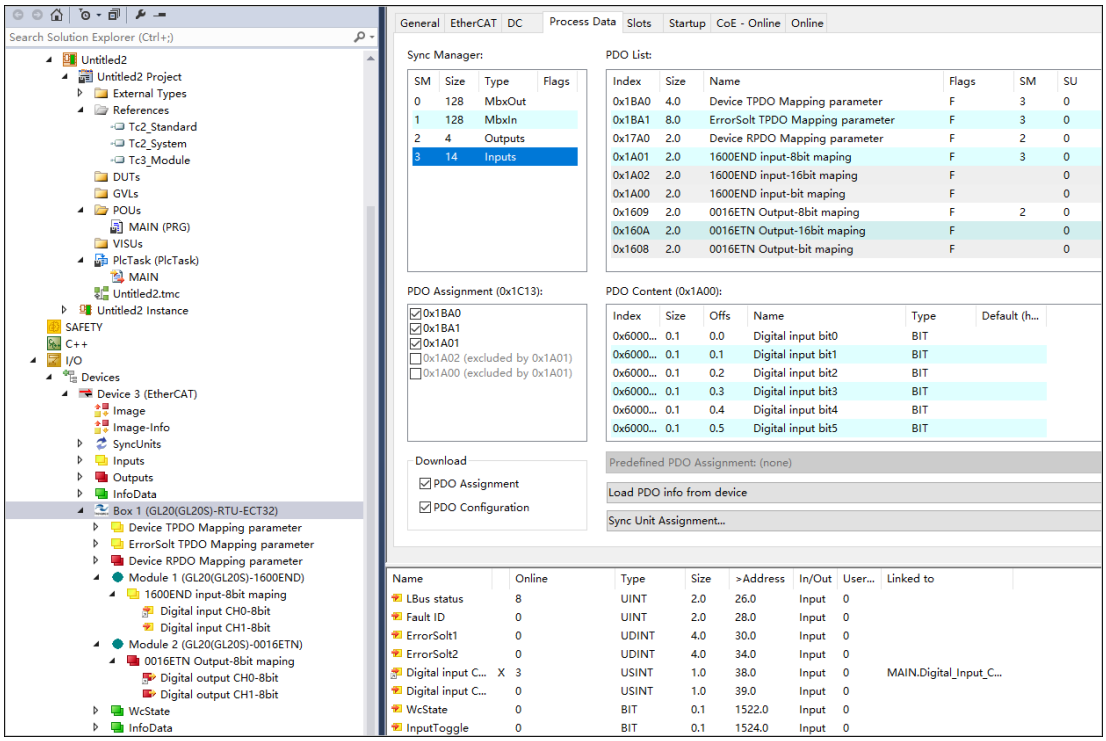


b. Click "Activate Configuration" and re-download the project to apply the modified startup parameters. In the "CoE - Online" interface, if the filter parameter for channel 0 of the GL20-1600END module is 2, it indicates that the modification is successful.



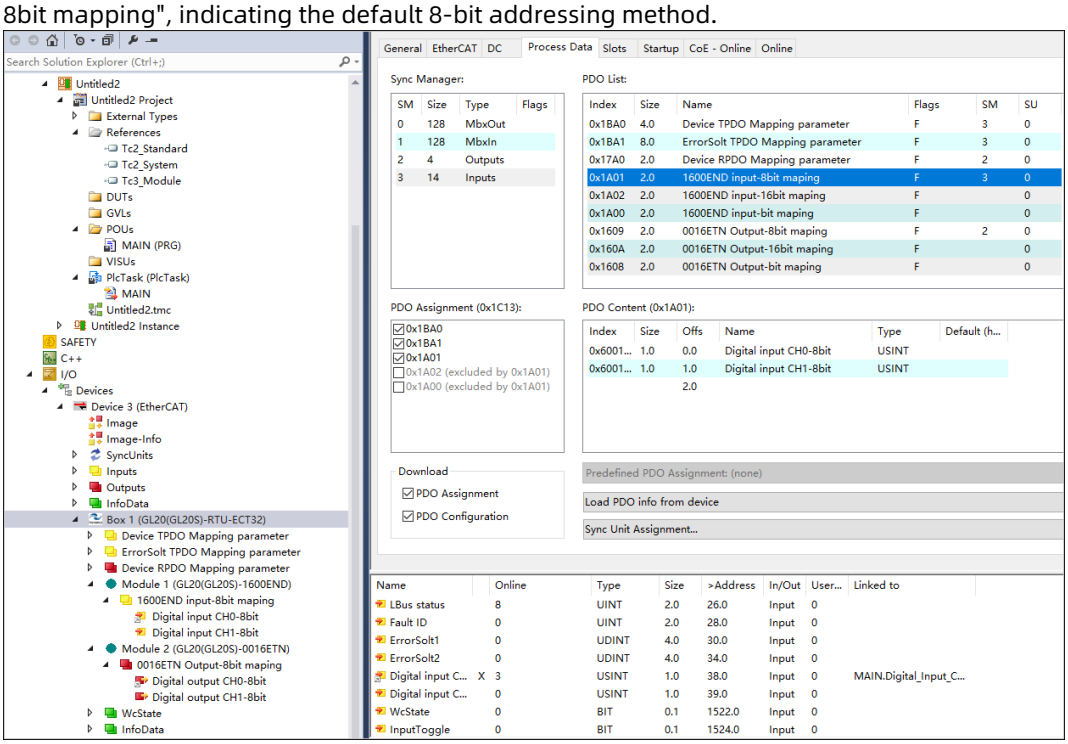
9. Configure the process data objects (PDOs).

a. Click "Box 1 (GL20(GL20S)-RTU-ECT32)". In the opened interface, select "Process data" to configure process data.

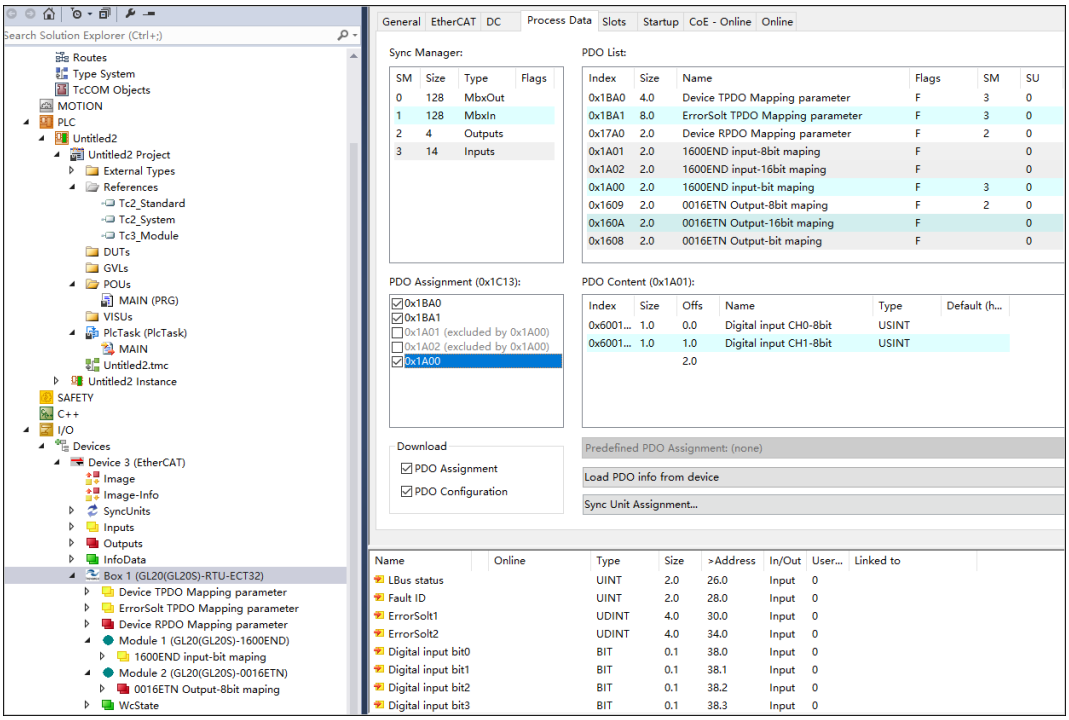


b. Take digital modules as an example, there are three addressing methods: by bit, 8-bit, and 16-bit. The following takes the GL20(GL20S)-1600END module as an example, showing how to modify the addressing method from 8-bit addressing (default) to bit addressing.

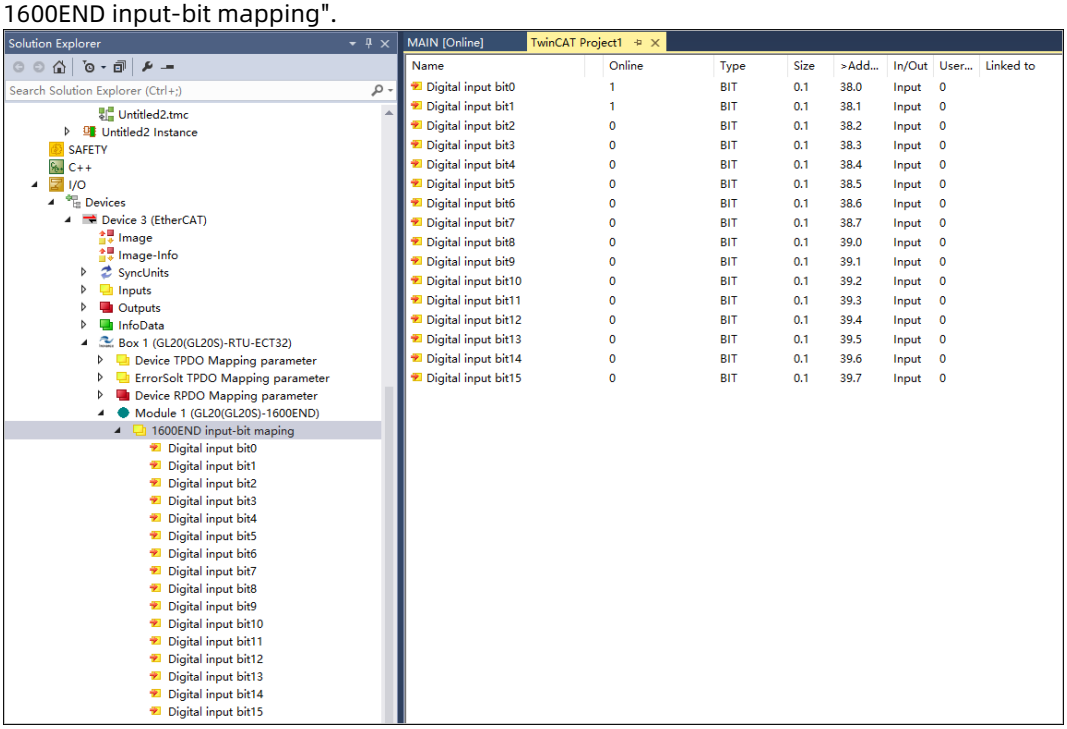
1). In the "Process Data" interface, click "Inputs" under "Sync Manager". "PDO Assignment" is set to "0x1A01" by default. In the "PDO List", the index "0x1A01" is defined as "1600END input-8bit mapping", indicating the default 8-bit addressing method.



2). In "PDO Assignment," uncheck "0x1A01", and then check "0x1A00".



3). Click "Activate Configuration" and re-download the project to apply the modified process data configuration. The modified process data configuration can be viewed in "I/O > Devices > Devices3 (EtherCAT) > Box 1 (GL20(GL20S)-RTU-ECT32) > Module 1 (GL20(GL20S)-1600END) > 1600END input-bit mapping".



7.1.5.2 Commissioning

After successfully configuring and downloading this product and the expansion modules, a simple commissioning is required to ensure normal functioning.

Prerequisites

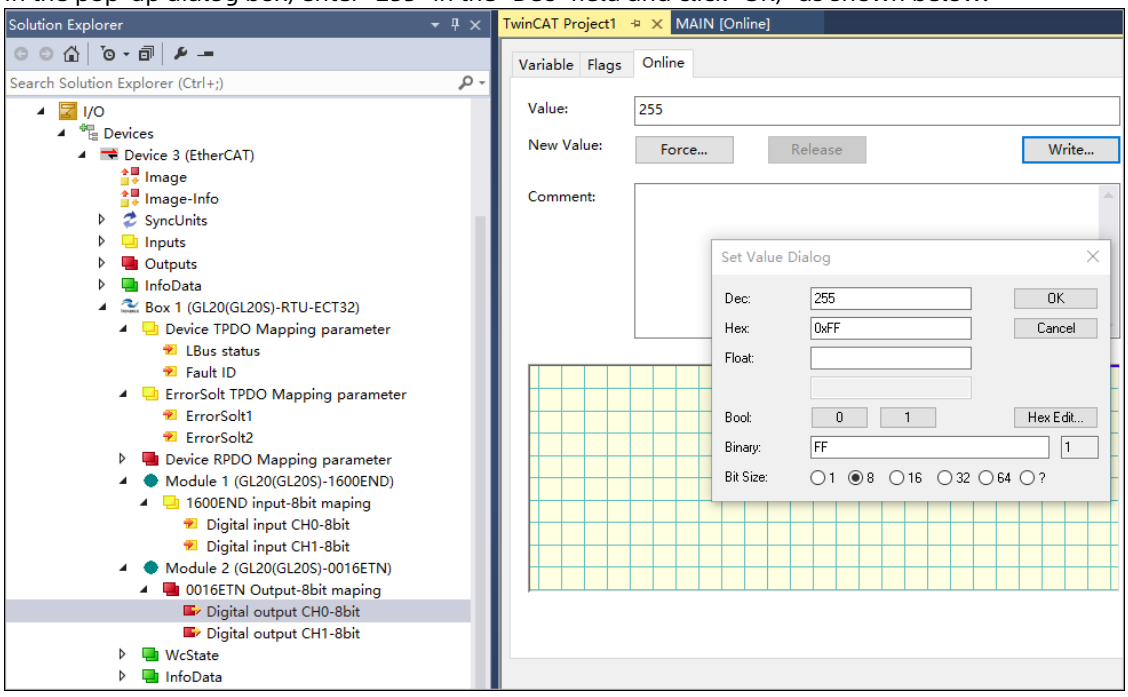
Connect the output terminals DO0 and DO1 of the GL20-0016ETN module to the input terminals DI0 and DI1 of the GL20-1600END module, respectively.

Procedure

1. Determine the status of the communication interface module and expansion modules through the signal indicators. For details on the signal indicators of the communication interface module, see *"8.2.1.1 GL20-RTU-ECT32" on page 183*. For details on the signal indicators of the expansion modules, see the user guide of each module.

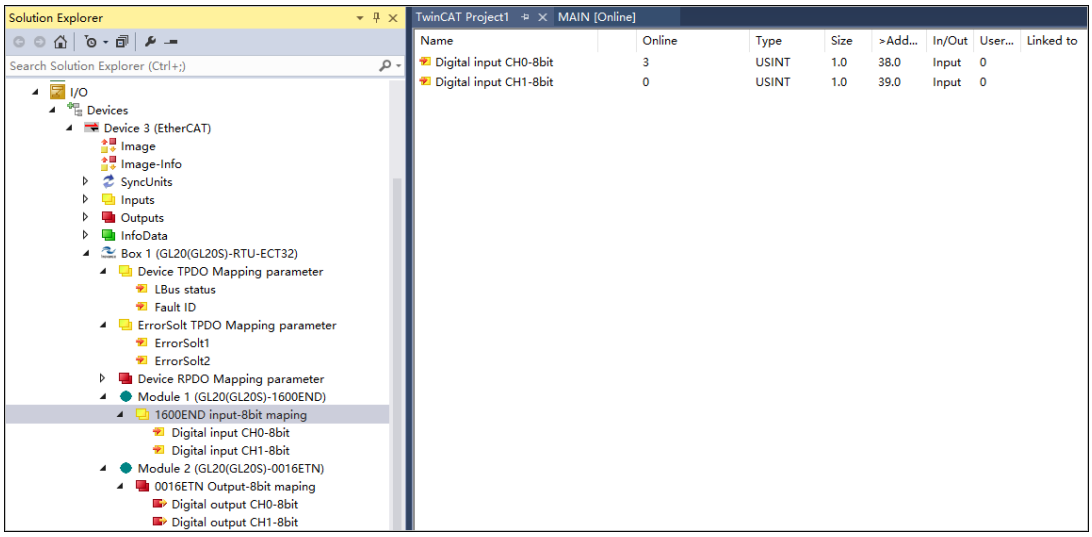
   - If the signal indicator status is normal, proceed to step 2.
   - If the signal indicator status is abnormal, determine the cause according to the signal indicator status and resolve the fault.
     - If the fault is resolved, proceed to step 2.
     - If the fault remains unresolved, use the programming software for troubleshooting. For details, see *"8.2.2.4 Troubleshooting via Beckhoff TwinCAT" on page 197*.

2. In the "Solution Explorer" navigation tree on the left, click "Digital output CH0-8bit" under "Module 2(GL20(GL20S)-0016ETN) > 0016ETN Output-8bit mapping". In the opened interface, click "Write...". In the pop-up dialog box, enter "255" in the "Dec" field and click "OK," as shown below.



3. Check whether the output and input channels of the GL20-0016ETN and GL20-1600END modules function normally.

   - In the "Solution Explorer" navigation tree, double-click "1600END input-8bit mapping" under "Module 1(GL20(GL20S)-1600END)". In the opened interface, if the "Online" value for "Digital input CH0-8bit" is "3", it indicates that the DI0 and DI1 input channels of this module are functioning normally.



- If the signal indicators (00-07) of the GL20-0016ETN module and the signal indicators (00-01) of the GL20-1600END module are solid on, it indicates that the input and output channels of both modules are functioning normally.

7.2 GL20-RTU-EIP

7.2.1 Compatibility with Inovance AutoShop

The following takes the Easy500xx series PLC as an example.

Prerequisites

- Inovance AutoShop software has been installed successfully and the EDS file is ready. You can get the AutoShop software and the EDS file at *https://www.inovance.com*.
- The hardware installation and wiring is complete.
- All the devices in the configuration example are powered on and started.

Procedure

1. Add a device.

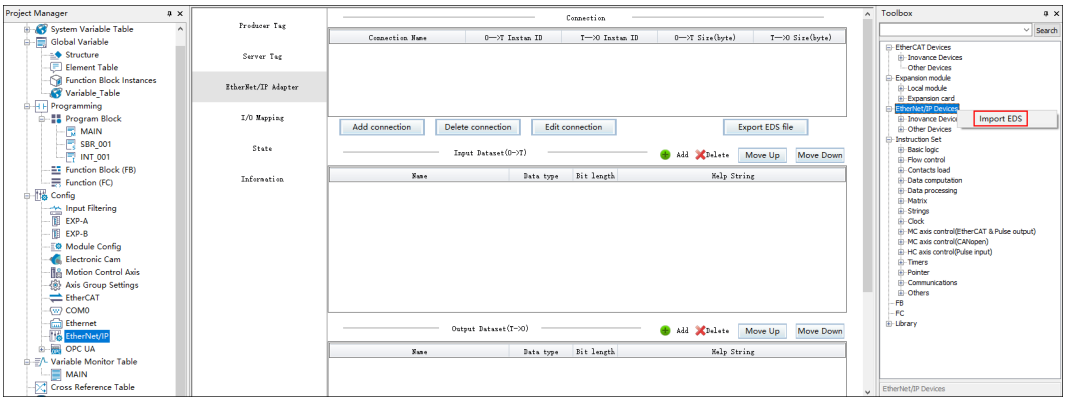
   a. Add EDS file of the GL20-RTU-EIP communication interface module.

Note

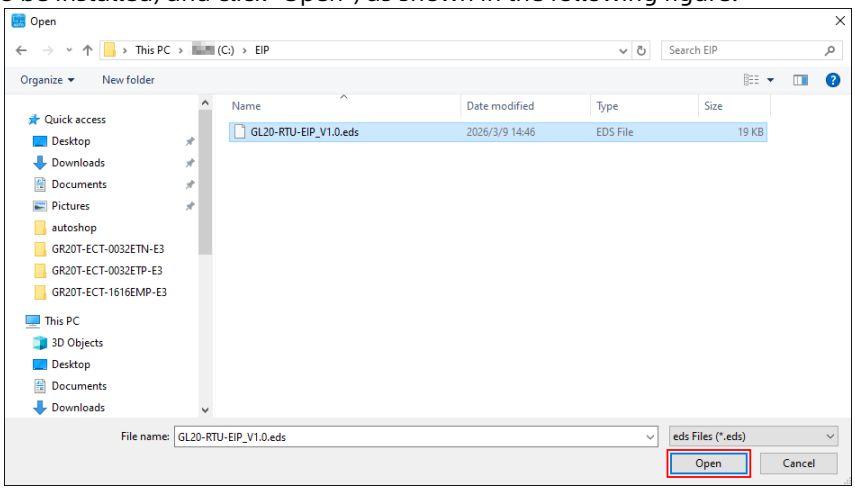
If the EDS file is not installed successfully, the GL20-RTU-EIP device cannot be scanned.

---

1). In the right toolbox, right-click "EtherNet/IP Devices" and select "Import EDS", as shown in the figure below.



2). In the pop-up window, select the EDS file of the GL20-RTU-EIP communication interface module to be installed, and click "Open", as shown in the following figure.

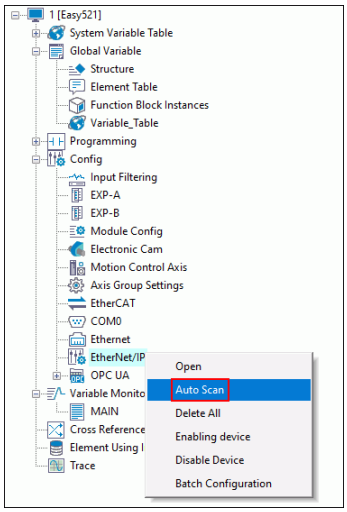


b. Add the GL20-RTU-EIP communication interface module.

Add the GL20-RTU-EIP communication interface module through automatic scanning or manual addition.

- **Automatic scan**

1). In the left list, right-click "EtherNet/IP" and select "Auto Scan", as shown in the figure below.



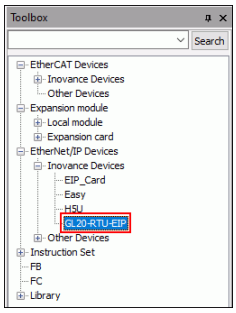
2). In the pop-up window, click "Start Scan", select the device scanned, and click "Update Config".

Caution

Currently, it is not possible to add modules mounted on a communication interface module through automatic scanning.

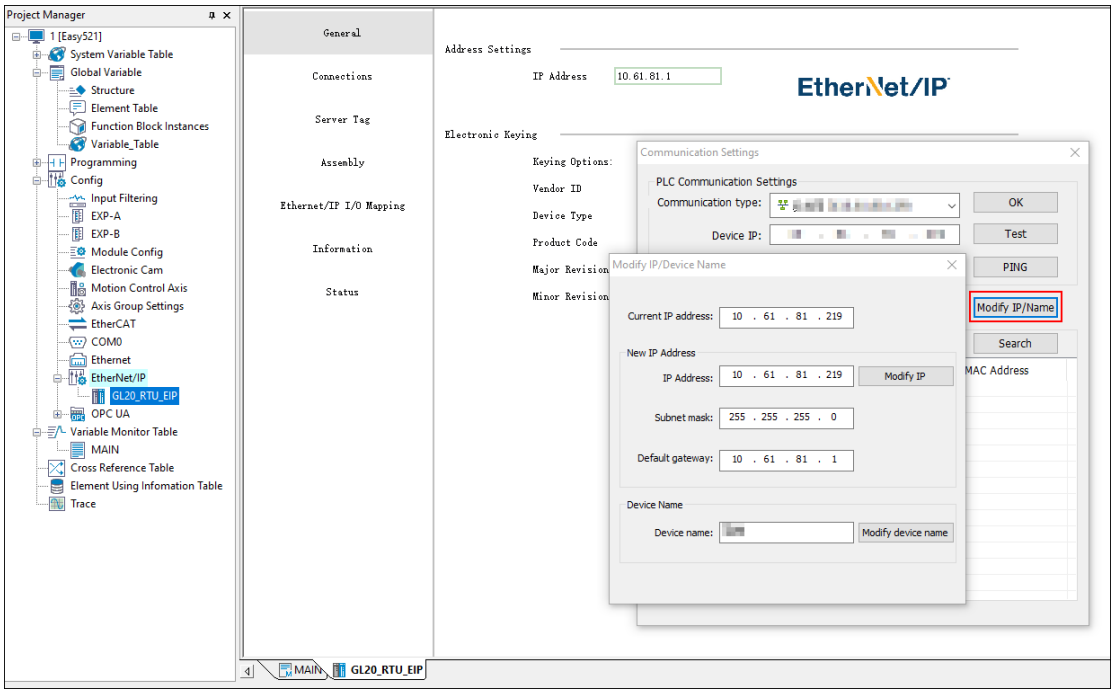
- **Manual addition**

  In the right toolbox, expand "EtherNet/IP Devices > Inovance Device" and double-click "GL20-RTU-EIP" to add it.



2. Configure the IP address of the PLC.

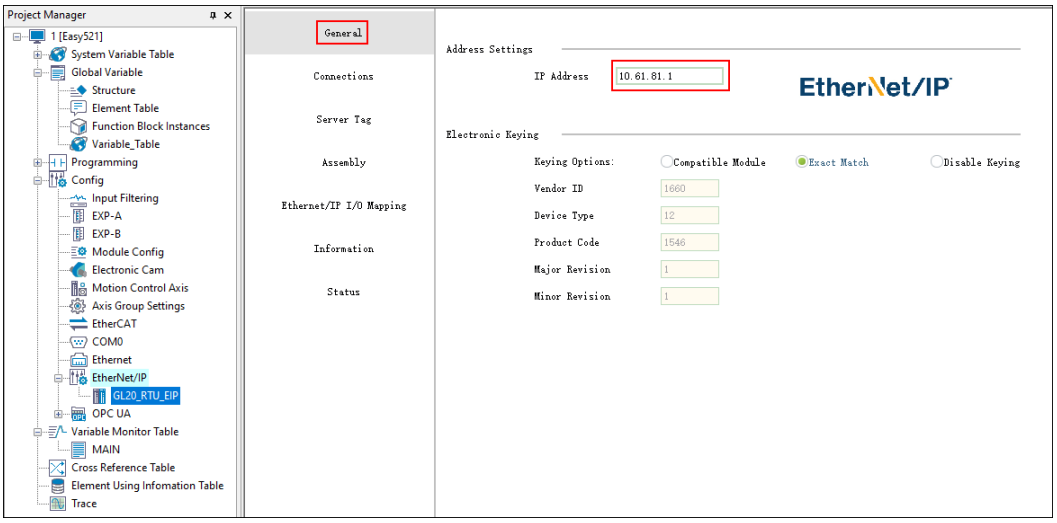
   Select "Tools > Communication Settings" in the toolbar to view the IP address of the PLC. If it is not in the same network segment as the that of the GL20-RTU-EIP module, click "Modify IP/device name" to modify it, as shown in the figure below.



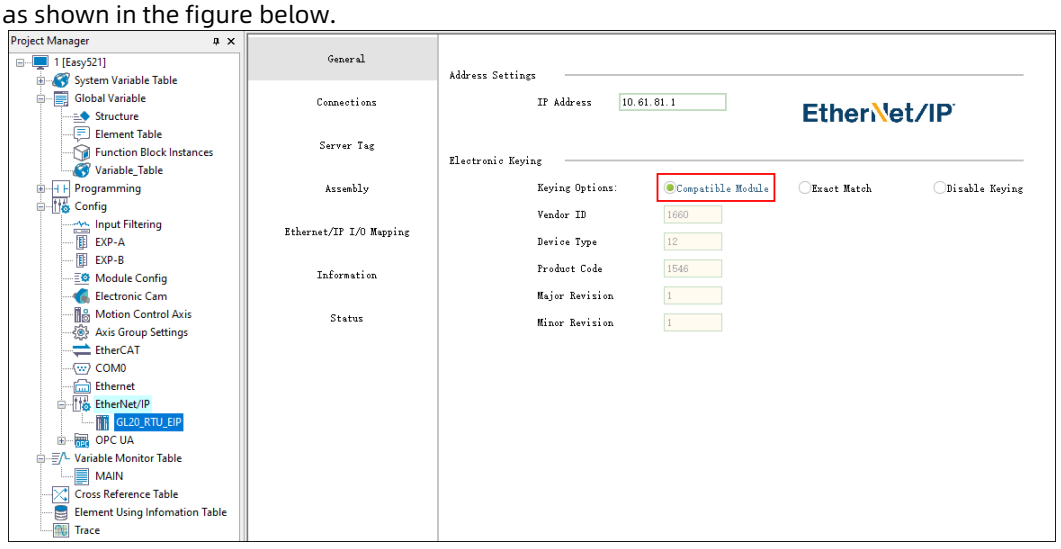
3. Configure the GL20-RTU-EIP communication interface module.

   a. Configure the general information of the GL20-RTU-EIP communication interface module.

      1). In the left device list, double-click "GL20_RTU_EIP". On the "General" tab, check whether the "IP address" is consistent with the that of the EtherNet/IP network adapter (GL20-RTU-EIP module). If not, modify the IP address, as shown in the figure below.



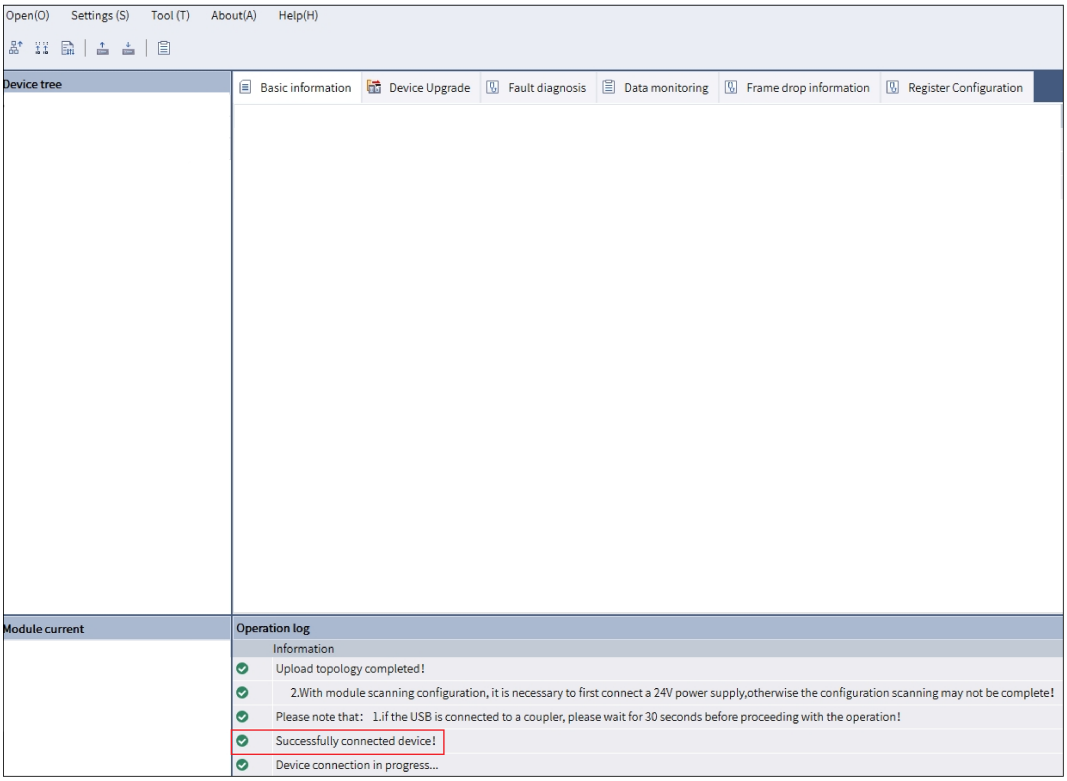
2). On the "General" tab, set the electronic keying mode. If you use version 1.1.15.7 or earlier, use the default "Exact Match". If you use version 1.2.2.0 or later, check "Compatible Module", as shown in the figure below.



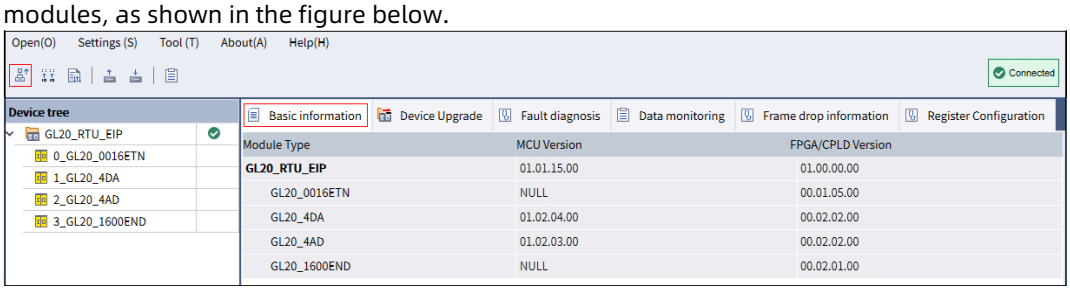
b. View modules connected to the GL20-RTU-EIP communication interface module.

1). Connect the communication interface module and the PC using a Type-C USB cable.

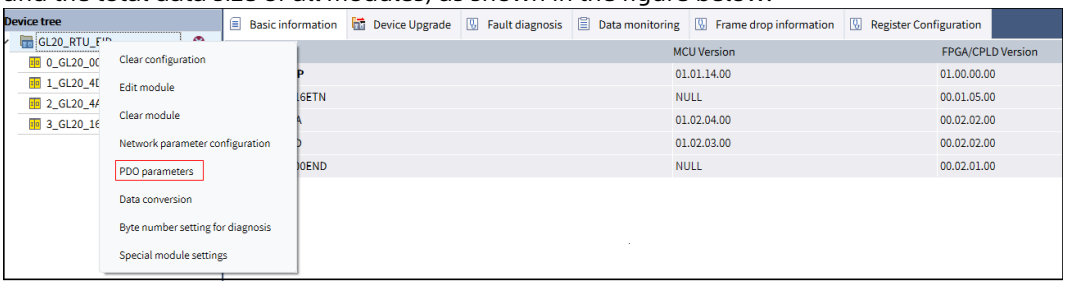
2). Double-click the shortcut icon IOManager to open the IOManager software, select "Open > Connected device". The device status ("Connected") is displayed in the upper right corner of the interface, and the operation log prompts successful device connection, as shown in the figure below.

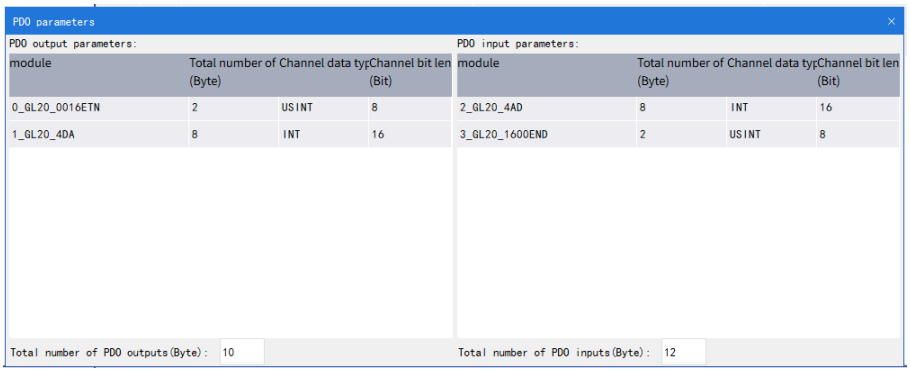


3). Click the "Upload topology" icon , and on the "Basic information" tab, check the information of the successfully scanned communication interface modules and expansion modules, as shown in the figure below.



4). Right-click the "GL20-RTU-EIP" communication interface module, and select "PDO parameters" to view the data type and data length of input/output cycle of each module, and the total data size of all modules, as shown in the figure below.

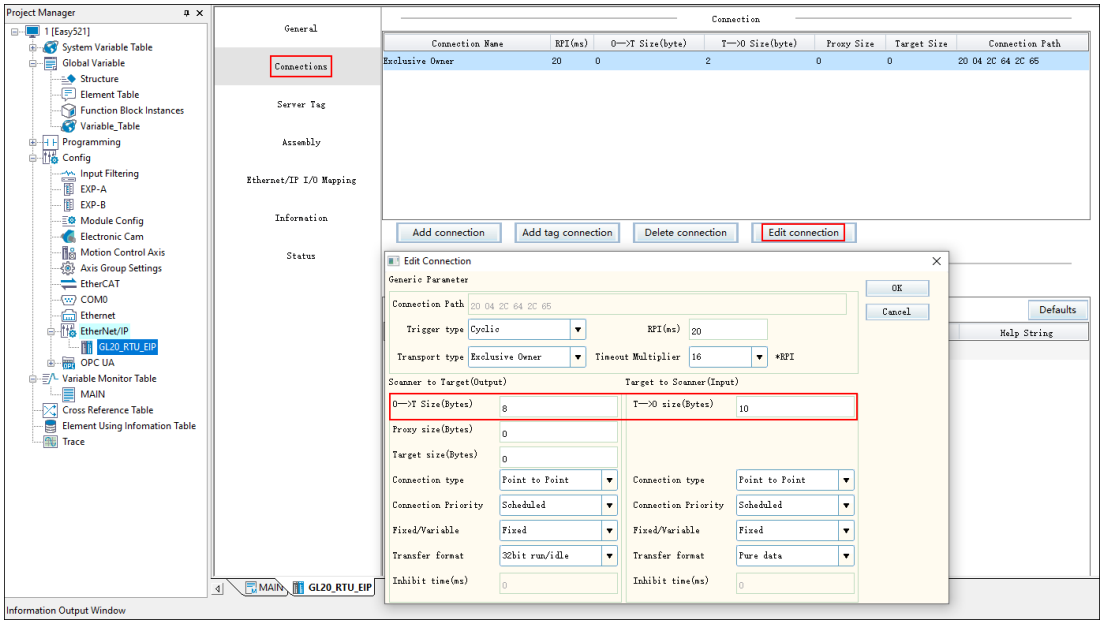




c. Configure the connection information of the GL20-RTU-EIP communication interface module.

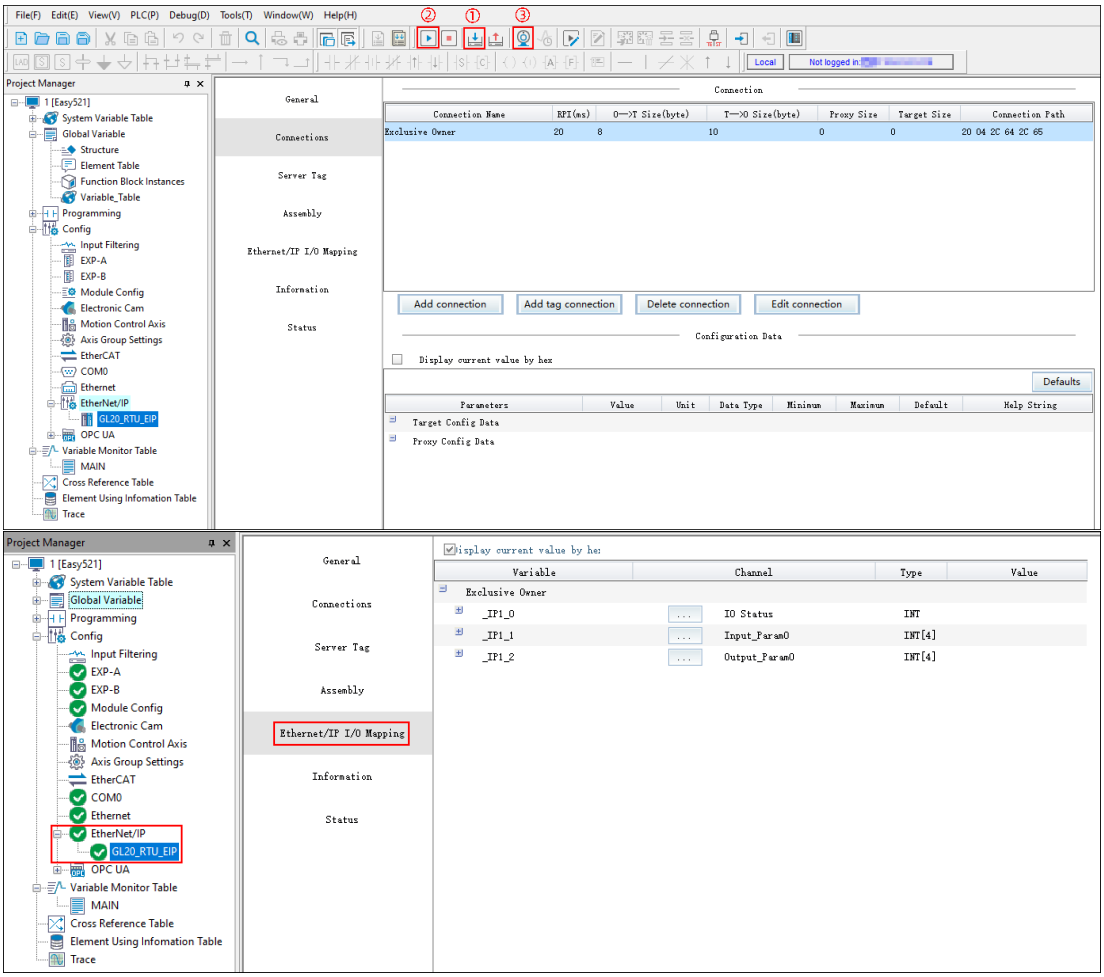
I/O data statistics are available in the host controller. You can configure the connection parameters of the GL20-RTU-EIP communication interface module through I/O data statistics, as shown below.

The OUT and IN byte statistics are known. In the "Devices" pane, go to "GL20_RTU_EIP > Connections". Configure the input/output assembly based on the type and channels of the module. For example, configure "O→T Size" to 8 bytes and "T→O Size" to 10 bytes.



d. Log in to and operate the GL20-RTU-EIP communication interface module.

After downloading the program and running the PLC, click the "Monitoring" icon in the toolbar to view the connection status. In the "Devices" pane, select "GL20_RTU_EIP (GL20-RTU-EIP) > EtherNet/IP I/O Mapping", and operate the data of the module, as shown below.



Note

The bytes occupied by OUT and IN of each module are stored in sequence according to the module ID, and can be displayed in the order of the dataset after the dataset is established.

7.2.2 Compatibility with Inovance InoProShop

Prerequisites

Inovance InoProShop software has been installed successfully and the EDS file is ready. You can get the InoProShop software and the EDS file at *https://www.inovance.com*.

Procedure

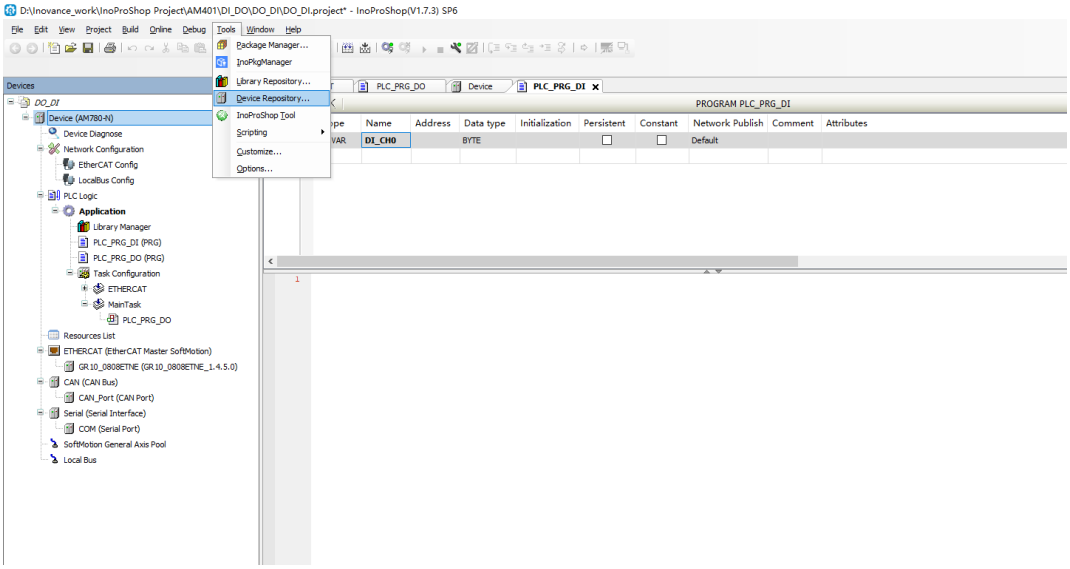
1. Add a device.

   a. Add EDS file of the GL20-RTU-EIP communication interface module.

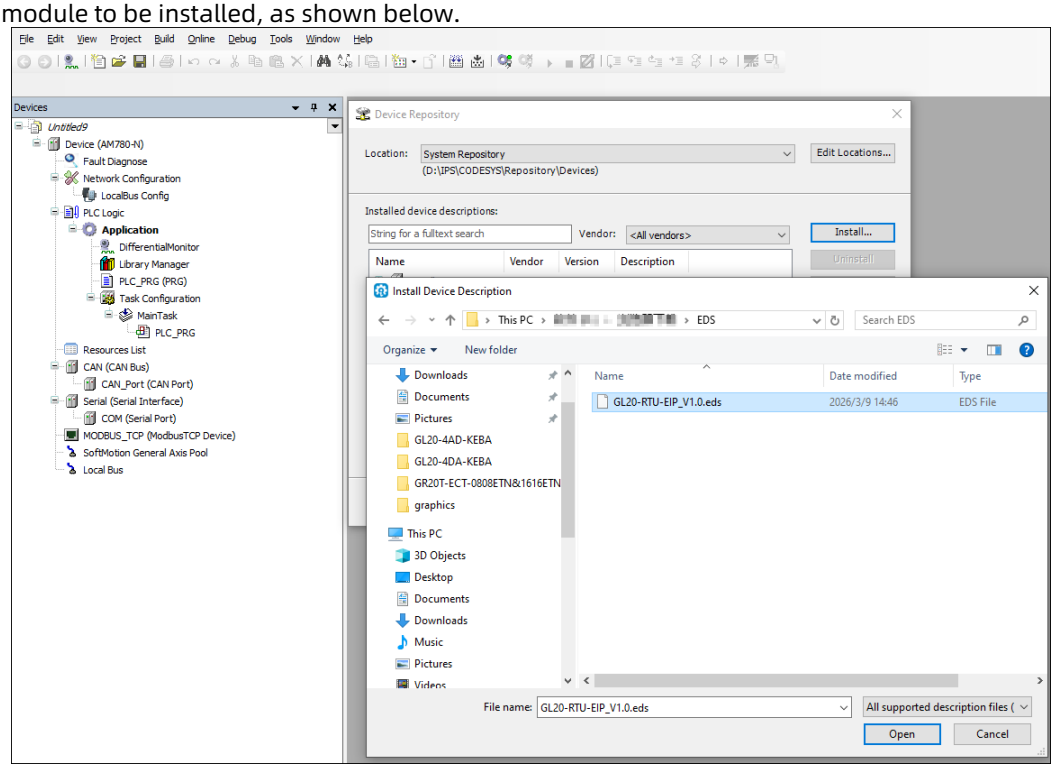
Note

If the EDS file is not installed successfully, the GL20-RTU-EIP device cannot be scanned.

1). In the menu bar, select "Tools > Device Repository" to open the "Device Repository" window, as shown below.

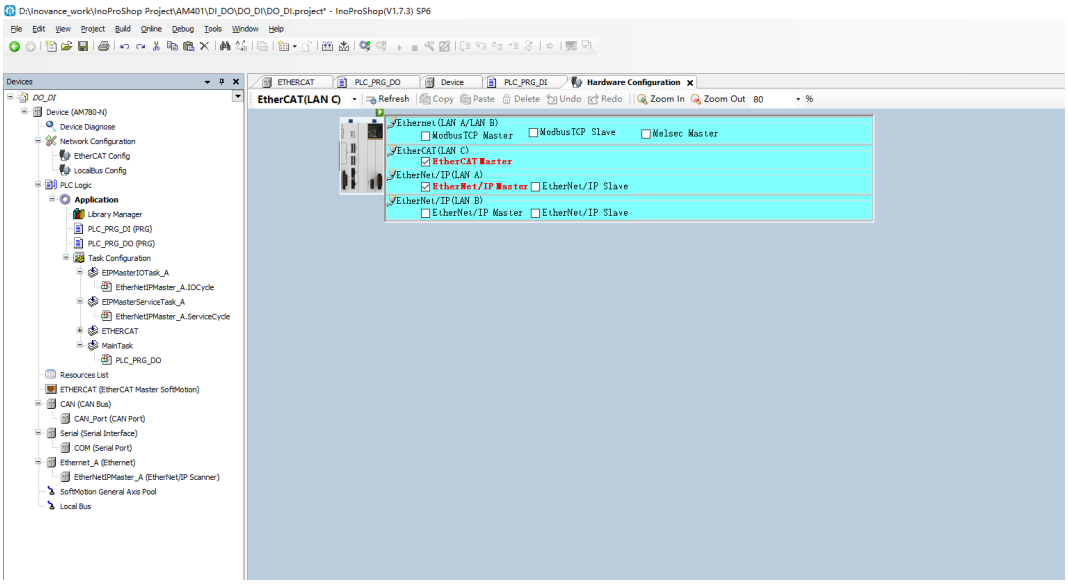


2). In the pop-up window, open the EDS file of the GL20-RTU-EIP communication interface module to be installed, as shown below.



b. Add the GL20-RTU-EIP communication interface module.

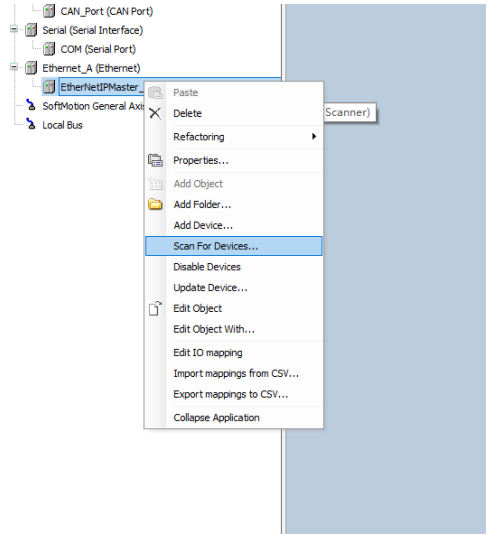
1). Double-click "Network Configuration", and select "EtherNet/IP Master", as shown in the figure below.



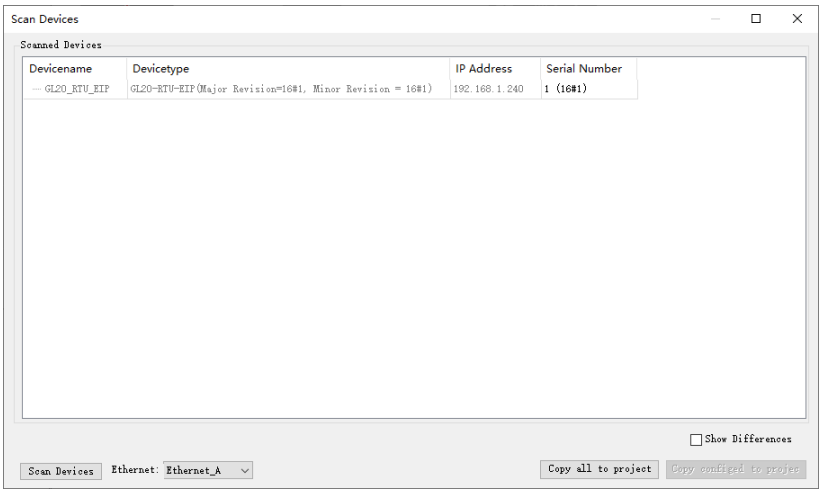
2). Add the GL20-RTU-EIP communication interface module through automatic scanning or manual addition, as shown below.

- Auto scanning

i. In the "Devices" pane, right-click "EtherNetIPMaster_A (EtherNet/IP Scanner)" and select "Scan for Devices", as shown below.

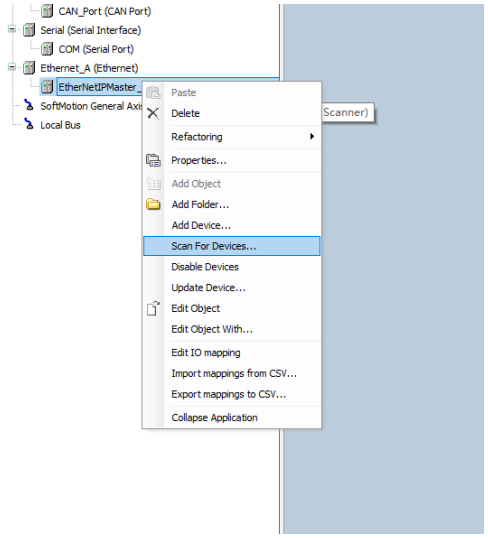


ii. Click "Scan Devices" and select the scanned device. Click "Copy Scan Device" to add the GL20-RTU-EIP communication interface module. (Currently, the modules mounted to the communication interface module cannot be added through scanning.)

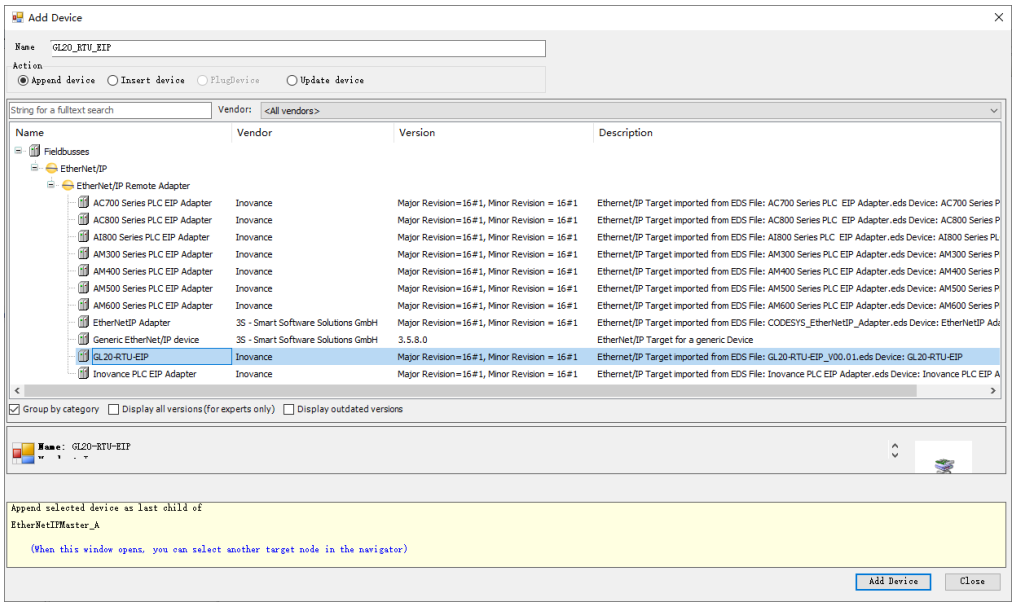


- Manual addition

  i. Right-click "EtherNetIPMaster_A (EtherNet/IP Scanner)" and select "Add Device", as shown in the figure below.

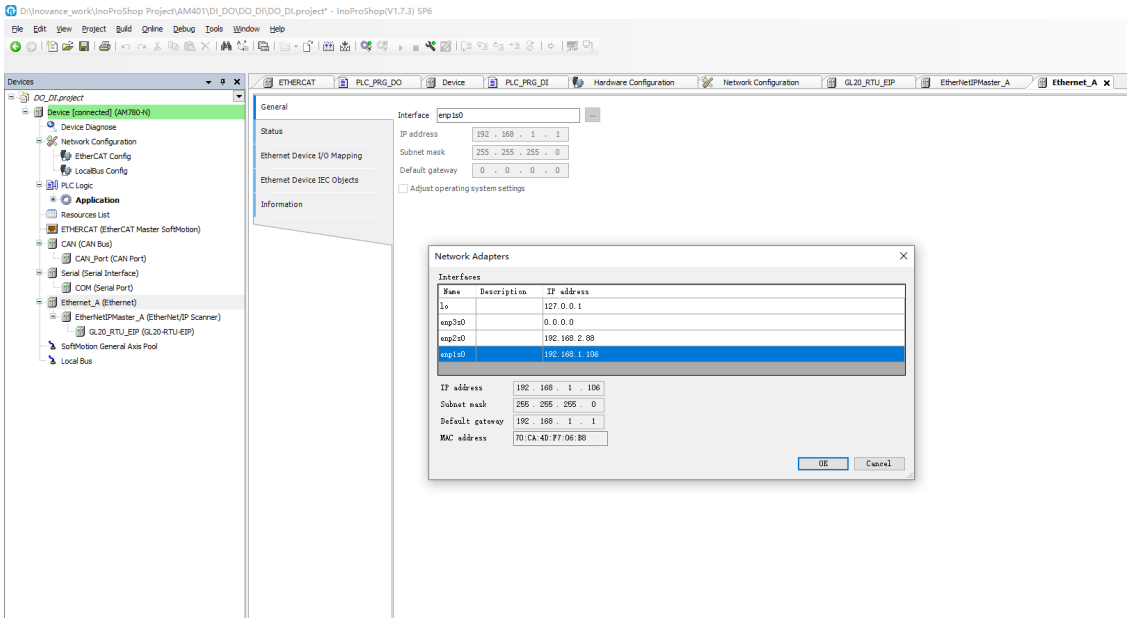


  ii. In the pop-up window, select the GL20-RTU-EIP communication interface module and click "Add Device", as shown below.



2. Configure the EtherNet/IP network adapter.

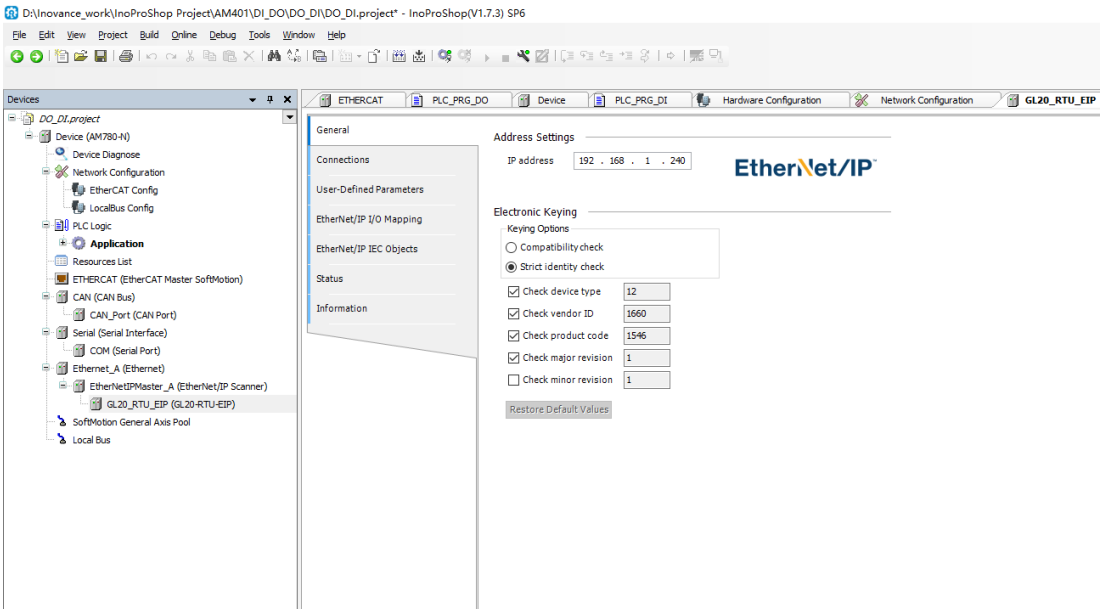
   In the left "Devices" pane, double-click "EtherNet_A (EtherNet)". On the "General" tab, click "..." to the right of "Interface". In the "Network Adapter" pop-up window, select the network adapter with the same IP as the communication interface module, as shown in the figure below.



3. Configure the GL20-RTU-EIP communication interface module.

   a. Configure the general information of the GL20-RTU-EIP communication interface module.

      In the left "Devices" pane, double-click "GL20_RTU_EIP (GL20-RTU-EIP)". On the "General" tab, ensure the "IP address" is consistent with that of the EtherNet/IP network adapter, as shown in the figure below.

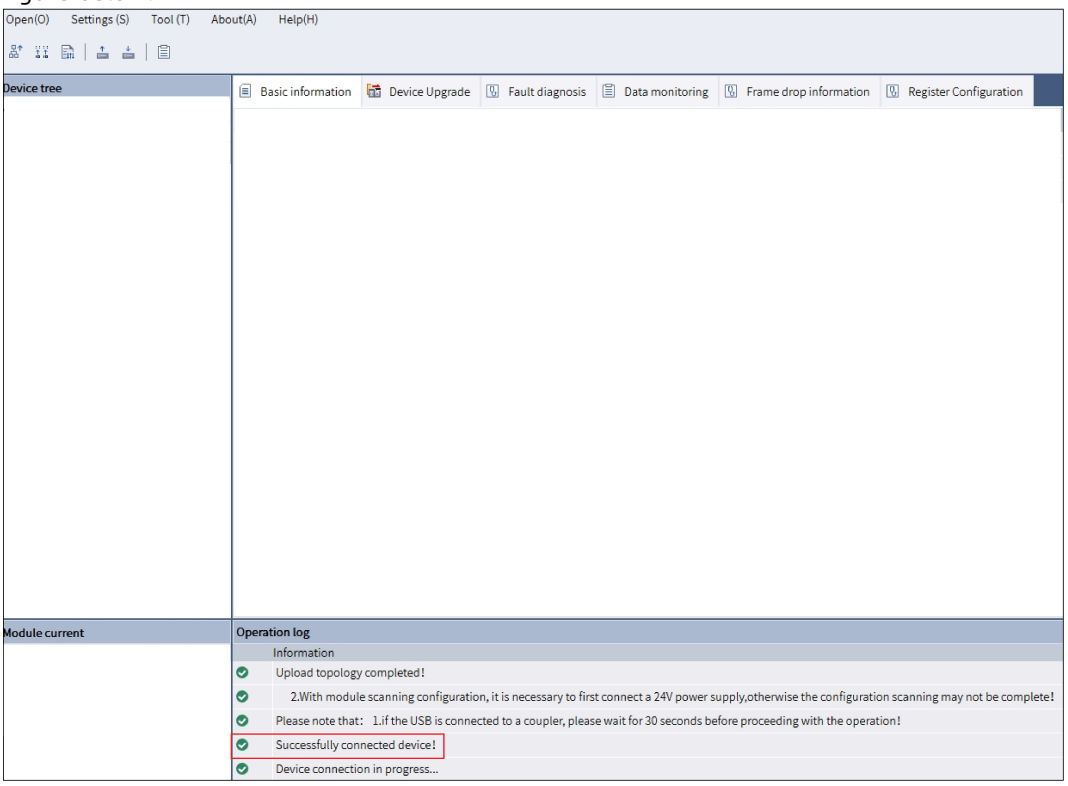


b. View modules connected to the GL20-RTU-EIP communication interface module.

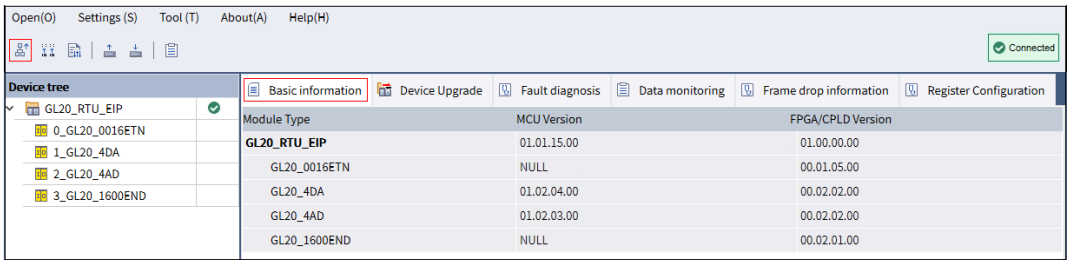
1). Connect the communication interface module and the PC using a Type-C USB cable.

2). Double-click the shortcut icon 

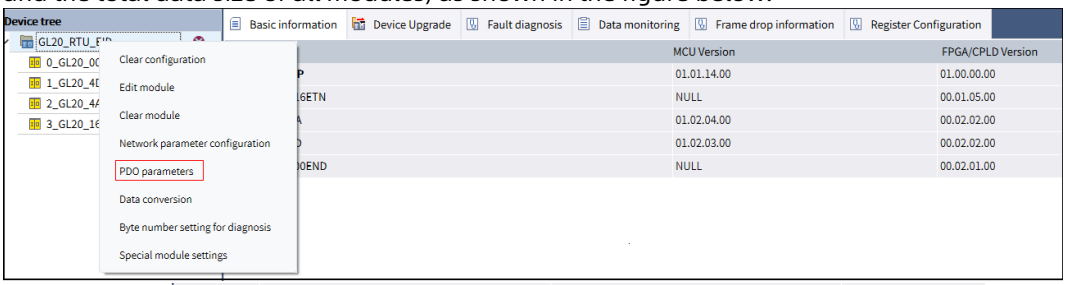
to open the IOManager software, select "Open > Connected Device". The device status ("Connected") is displayed in the upper right corner of the interface, and the operation log prompts successful device connection, as shown in the figure below.

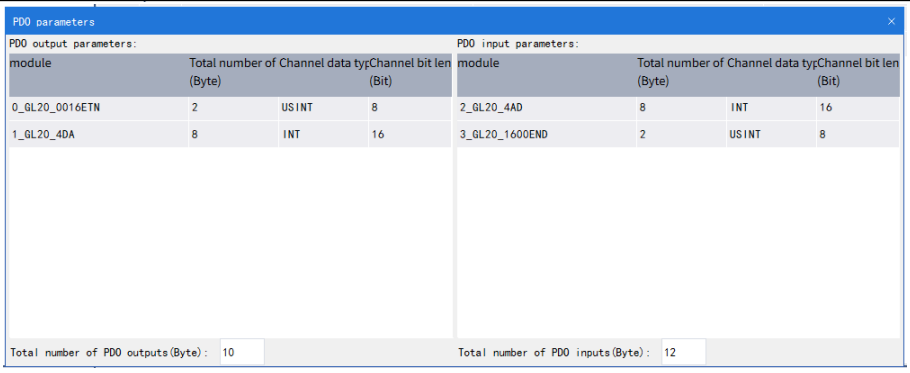


3). Click the "Upload topology" icon , and on the "Basic information" tab, check the information of the successfully scanned communication interface modules and expansion modules, as shown in the figure below.



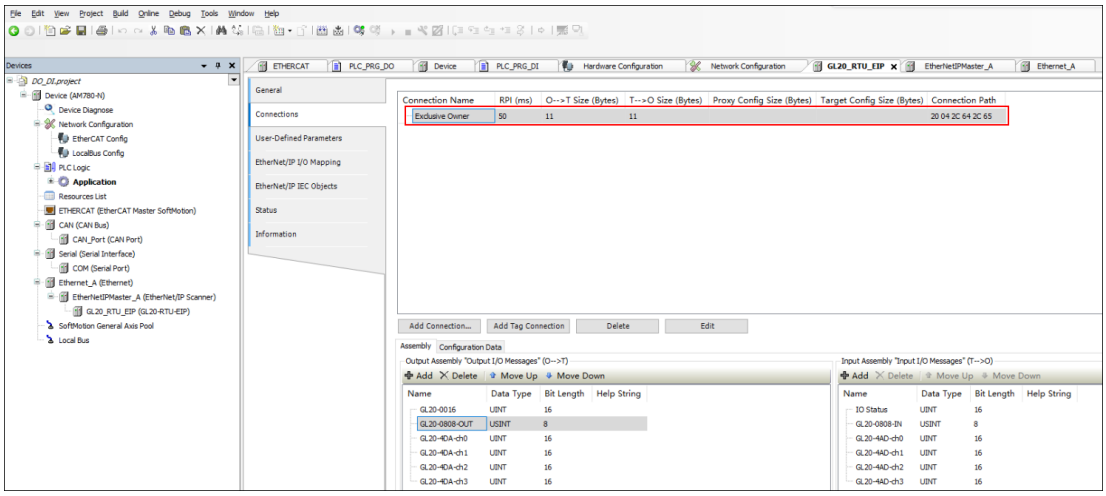
4). Right-click the "GL20-RTU-EIP" communication interface module, and select "PDO parameters" to view the data type and data length of input/output cycle of each module, and the total data size of all modules, as shown in the figure below.





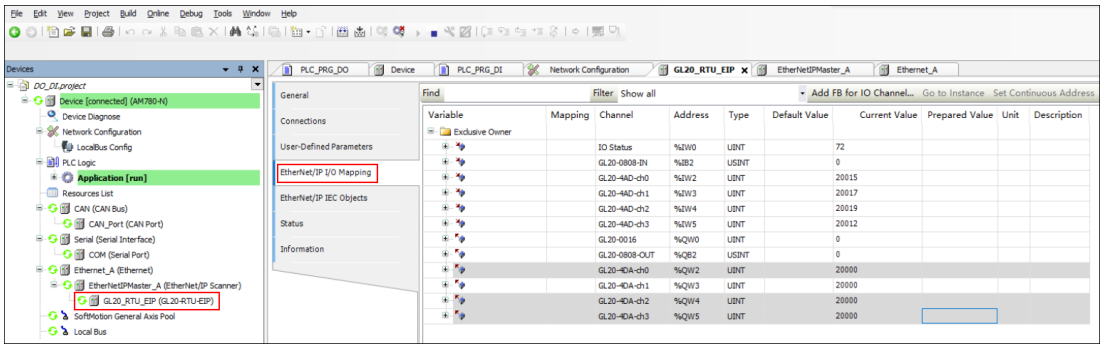
c. Configure the connection information of the GL20-RTU-EIP communication interface module. I/O data statistics are available in the host controller. You can configure the connection parameters of the GL20-RTU-EIP communication interface module through I/O data statistics, as shown below.

The OUT and IN byte statistics are known. In the "Devices" pane, go to "GL20_RTU_EIP (GL20-RTU-EIP) > Connections". Configure the input/output assembly based on the type and channels of the module. For example, configure "O→T Size" to 10 bytes and "T→O Size" to 12 bytes.



d. Log in to and operate the GL20-RTU-EIP communication interface module.

Log in to InoProShop. In the "Devices" pane, select "GL20_RTU_EIP (GL20-RTU-EIP) > EtherNet/IP I/O Mapping", as shown below. You can operate the data of the module.



Note

The bytes occupied by OUT and IN of each module are stored in sequence according to the module ID, and can be displayed in the order of the dataset after the dataset is established.

7.2.3 Compatibility with Inovance iFA Evolution

This section describes the combination of iFA Evolution and EVO700 series PLC system.

Prerequisites

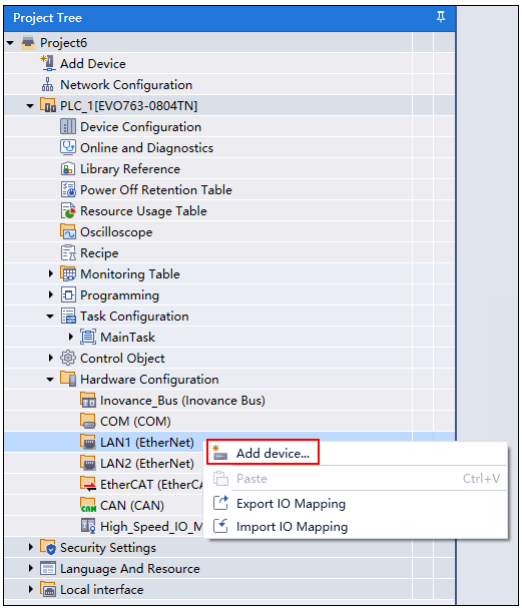
- iFA Evolution software (version V1.4.2.5 or higher) has been installed.
- The hardware installation and wiring in the configuration example is complete.
- All the devices in the configuration example are powered on and started.

Procedure

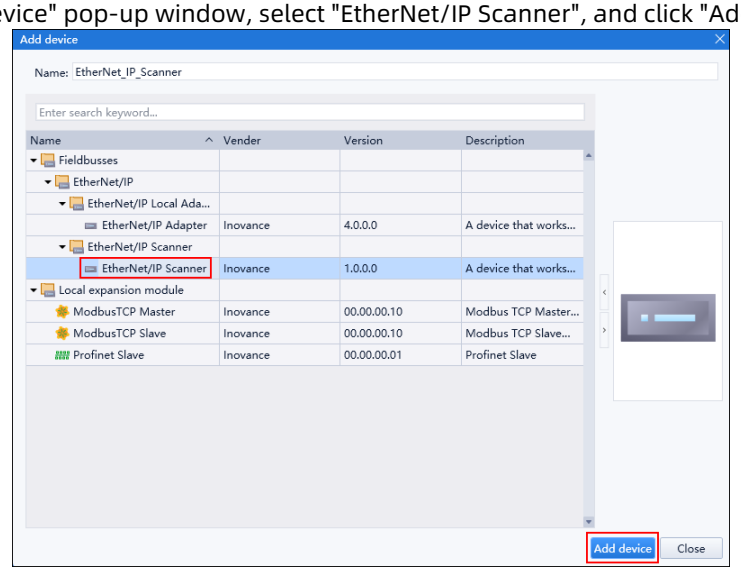
1. Add a device.

a. Add the GL20-RTU-EIP communication interface module.

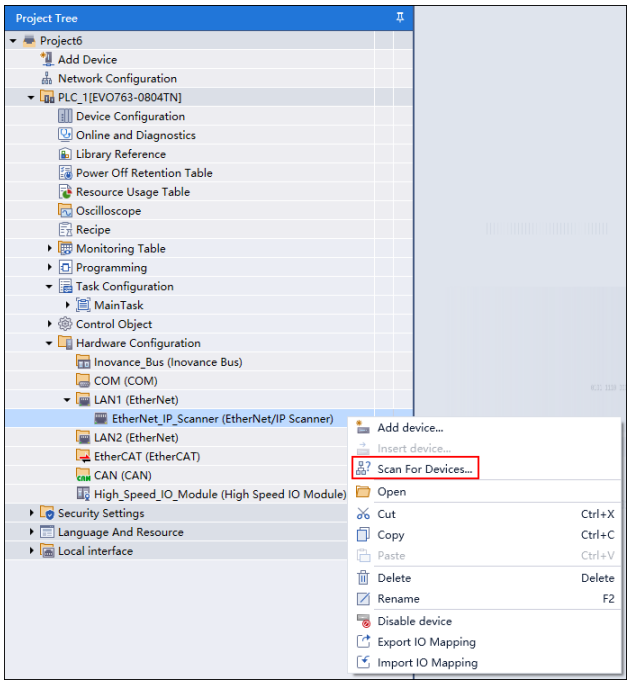
1). In the project tree on the left, select "Hardware configuration > LAN1 (EtherNet)" under the PLC device. Right-click "LAN1 (EtherNet)" and select "Add device".



2). In the "Add device" pop-up window, select "EtherNet/IP Scanner", and click "Add device".



b. In the device tree on the left, right-click "EtherNet_IP_Scanner (EtherNet/IP Scanner)" and select "Scan for devices".



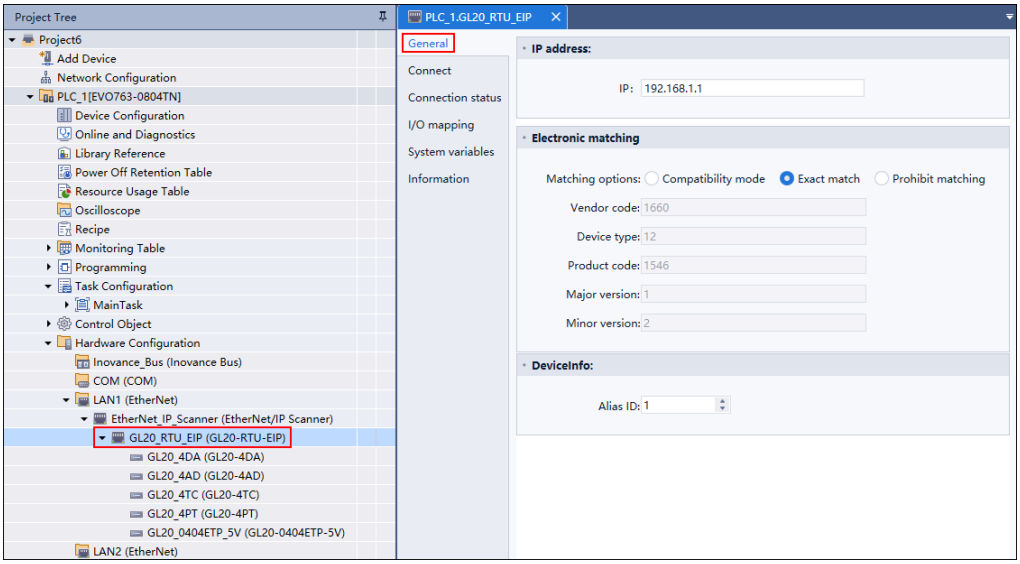
1). After scanning, click the left arrow in the middle operation column to add the scanned device to the "FA project" area on the left.

2). Click "OK" in the pop-up window.

3). Click "Apply physical network configuration" to apply the configuration of all scanned devices to the project.

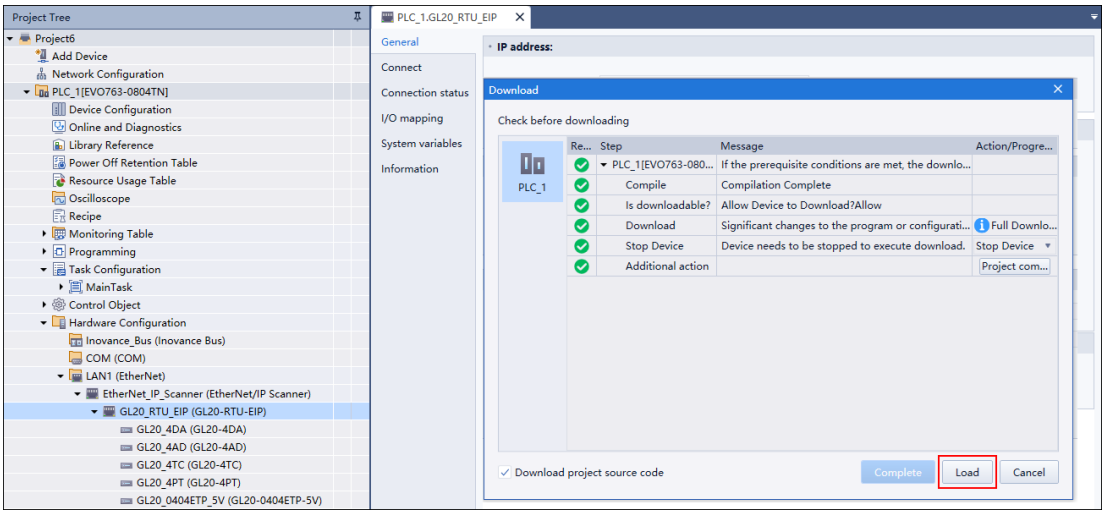
2. Configure the GL20-RTU-EIP communication interface module.

In the device tree on the left, double-click "GL20-RTU-EIP" to open the configuration page. View the communication interface module information on the "General" tab.

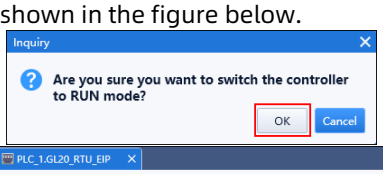


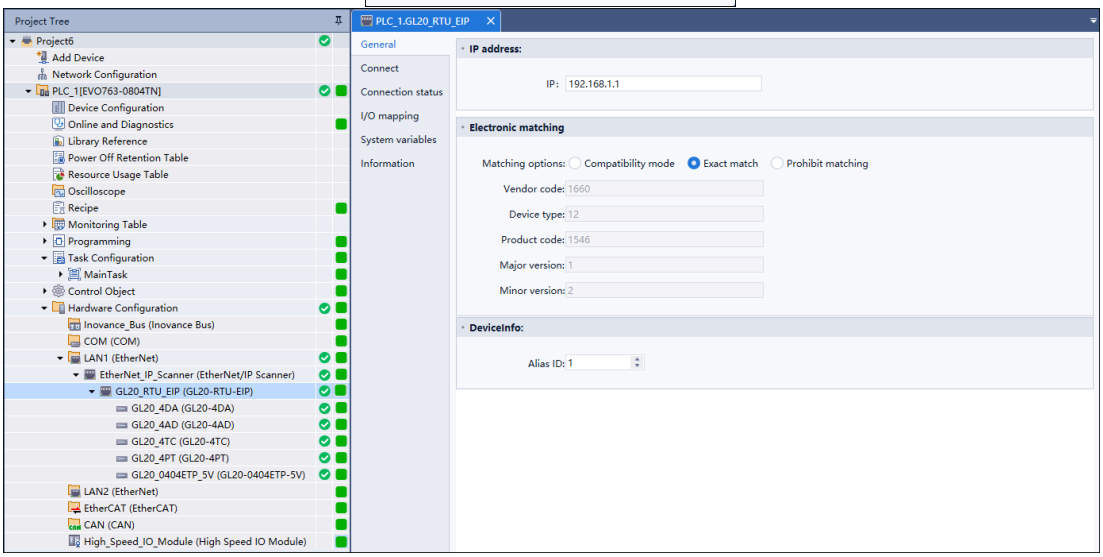
3. Log in to the PLC and operate the GL20-RTU-EIP communication interface module.

a. Select "Online > Online" in the menu bar, or click Online in the toolbar. Click "Load" in the pop-up window to load the project, as shown in the figure below.



b. Select "Commissioning > Start" in the menu bar, or click ▷ in the toolbar to start the PLC. Click "OK" in the pop-up window, as shown in the figure below.





7.2.4 Compatibility with Omron Sysmac Studio

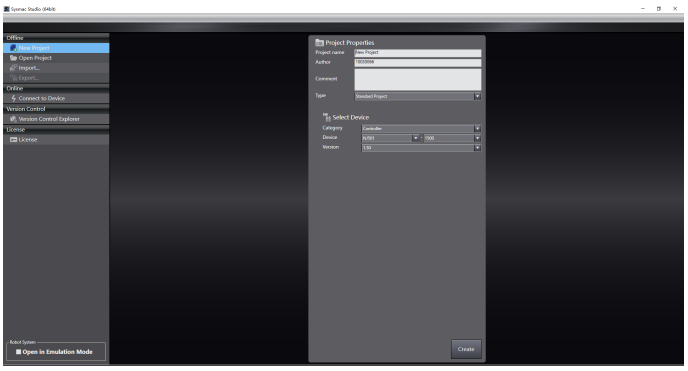
Prerequisites

The Omron Sysmac Studio software has been installed successfully.

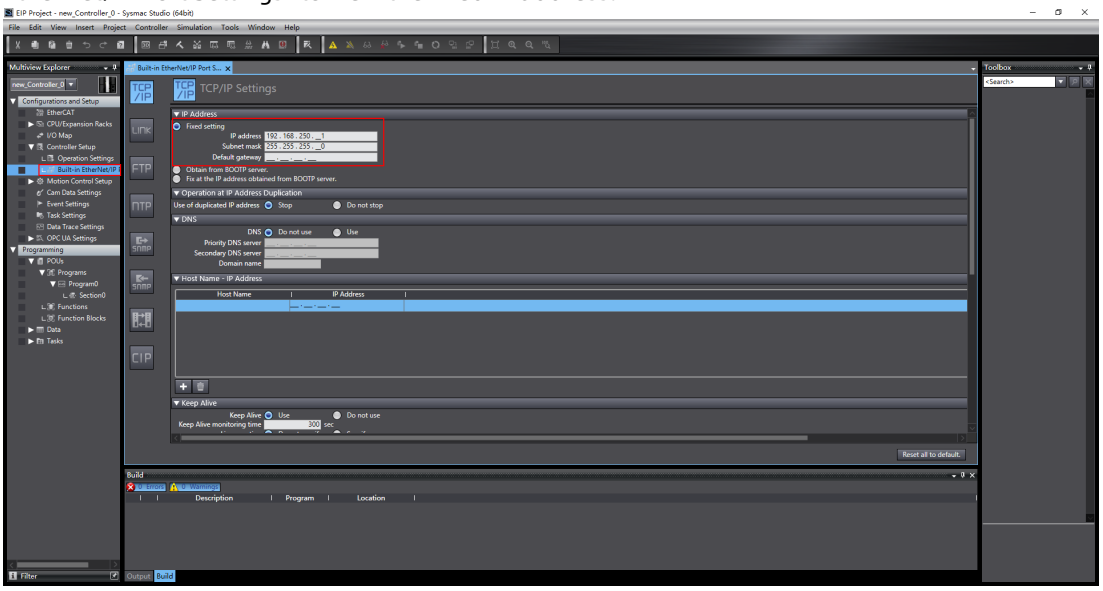
Procedure

1. Create a project.

a. Open the Sysmac Studio software, click "New Project". In the "Project Properties" window, select the device and click "Create".

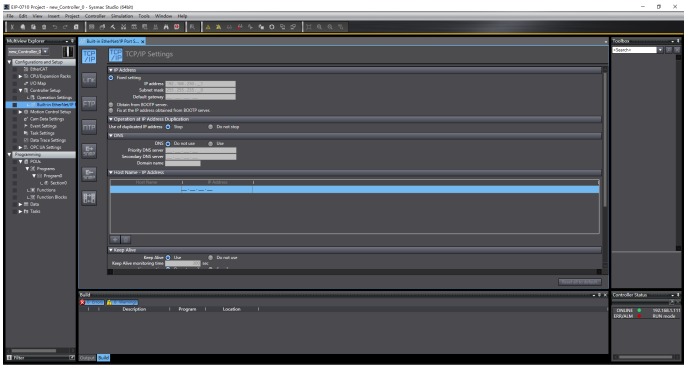


b. In the left navigation pane, select "Configurations and Setup > Controller Setup > Built-in EtherNet/IP Port Settings" to view the fixed IP address.



c. Check the network segment of the local network card.

d. Set the PC to be on the same network segment as the PLC, and click . Monitor the connection status and operation mode on the right. To switch the PLC to the offline status, click , as shown below.



Note

The connected PLC takes effect at next power-on.

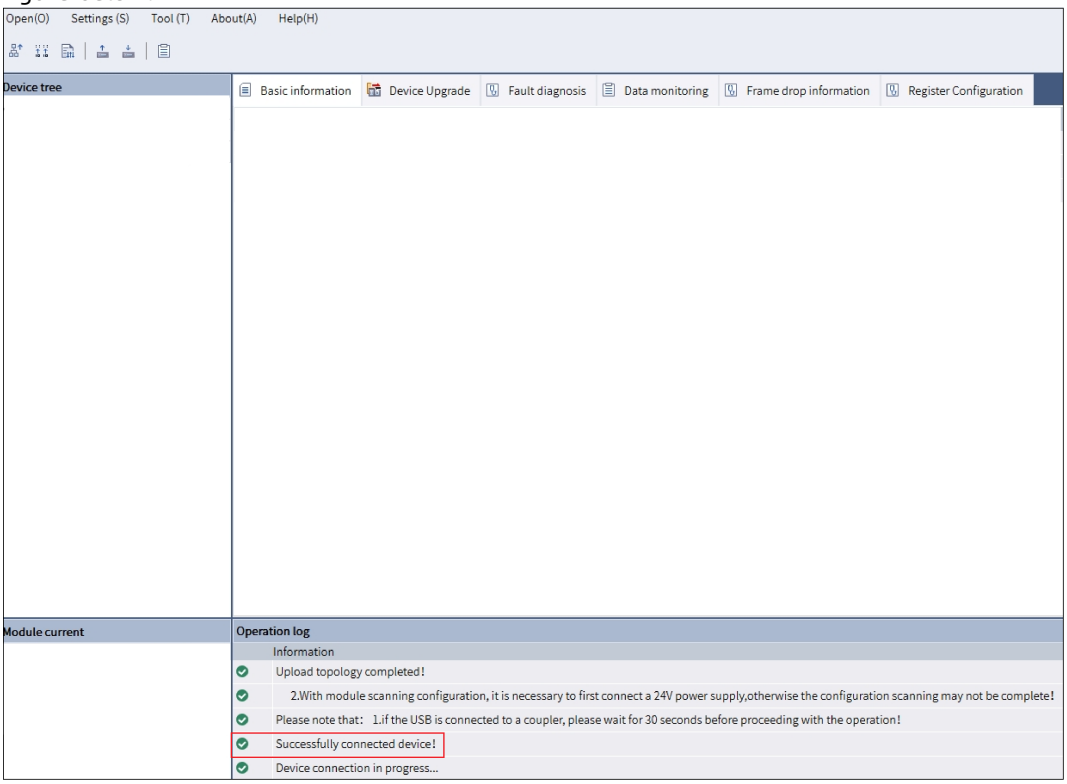
2. Configure the project.

a. Determine the input/output data area size. You can configure the connection parameters of the GL20-RTU-EIP communication interface module by configuring "PDO Parameters" in IOManger software.

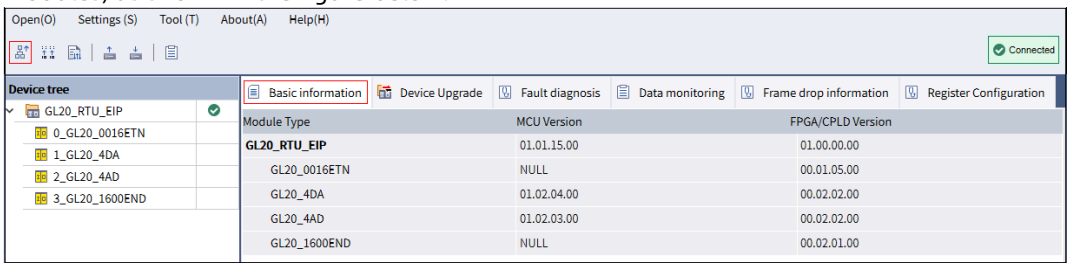
1). Connect the communication interface module and the PC using a Type-C USB cable.

2). Double-click the shortcut icon 

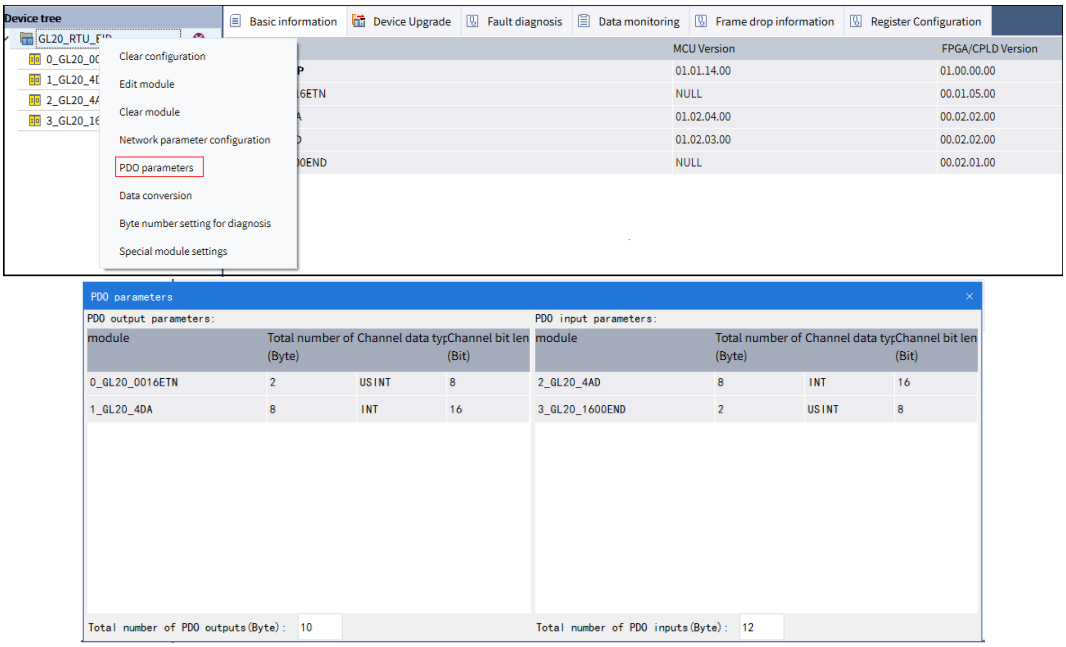
to open the IOManager software, select "Open > Connected Device". The device status ("Connected") is displayed in the upper right corner of the interface, and the operation log prompts successful device connection, as shown in the figure below.



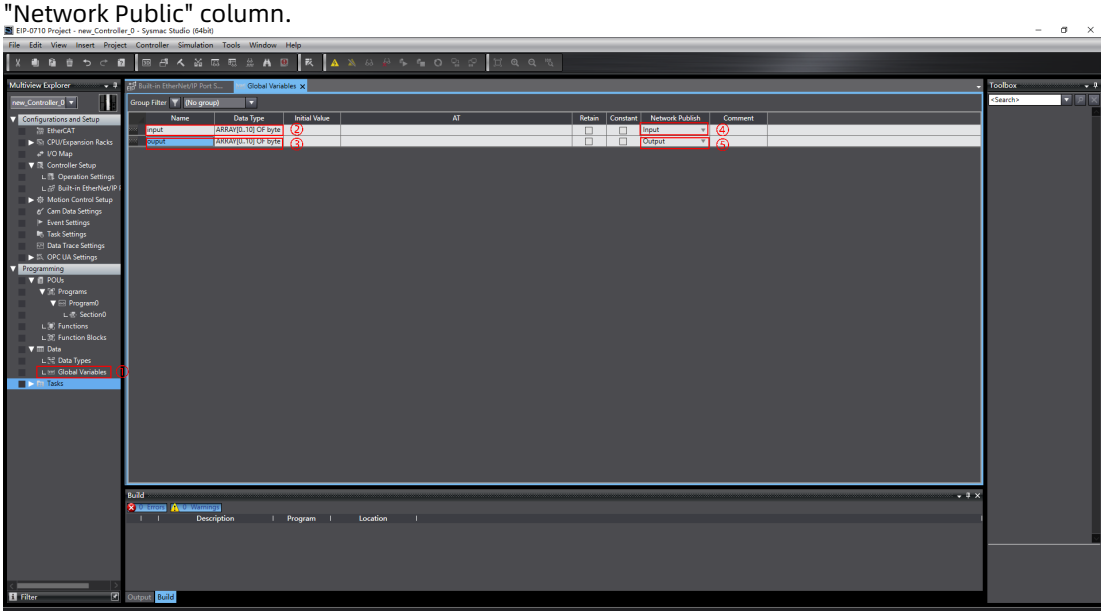
3). Click the "Upload topology" icon , and on the "Basic information" tab, check the information of the successfully scanned communication interface modules and expansion modules, as shown in the figure below.



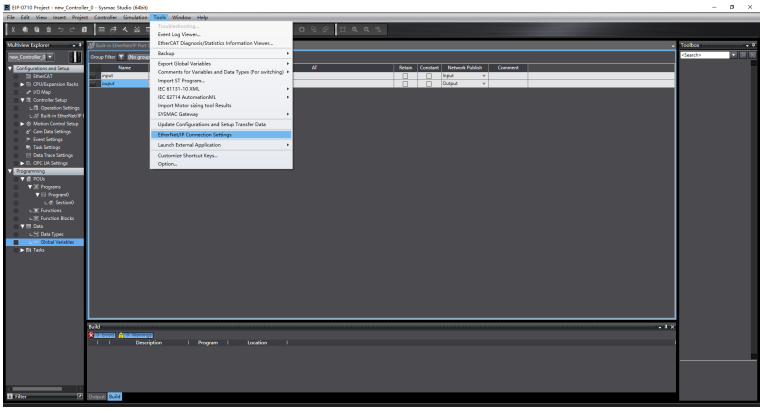
4). Right-click the "GL20-RTU-EIP" communication interface module, and select "PDO parameters" to view the data type and data length of input/output cycle of each module, and the total data size of all modules, as shown in the figure below.



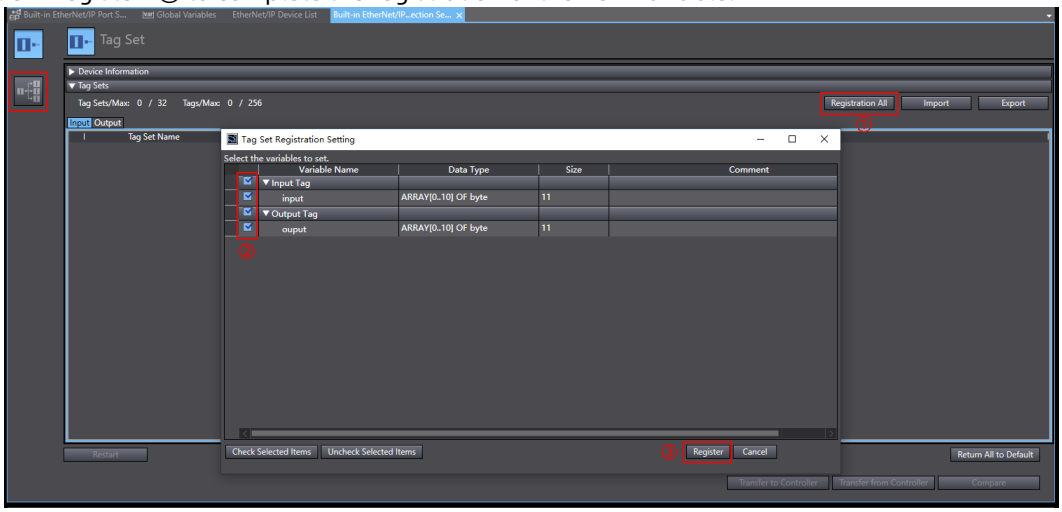
b. Create input and output variables based on the size of the input/output data area of the I/O module. Click "Global Variables" ① to create an input variable (ARRAY[0..11] OF byte) ② and an output variable (ARRAY[0..9] OF byte) ③. Select "Input" ④ and "Output" ⑤ respectively in the "Network Public" column.



c. Set the EtherNet/IP communication. In the menu bar, select "Tools > EtherNet/IP Connection Settings". In the pop-up window, double-click PLC to access the "Built-in EtherNet/IP Port Settings > Connection Settings" interface, as shown in the figure below.

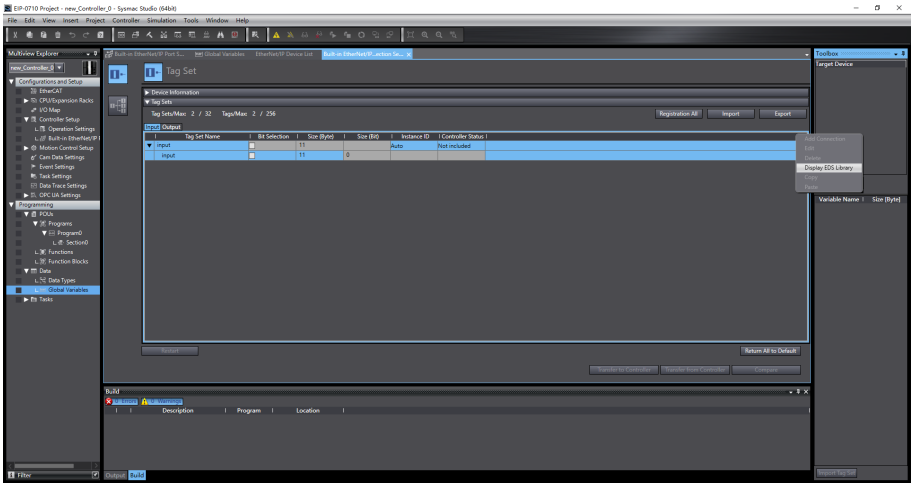


d. Click "Register All" ①, select the input/output variable defined by the global variable ②, and click "Register" ③ to complete the registration of the new variable.



3. Import the EDS file.

a. In the right "Toolbox" pane, right-click the blank space and select "Display EDS Library" to open the EDS library.



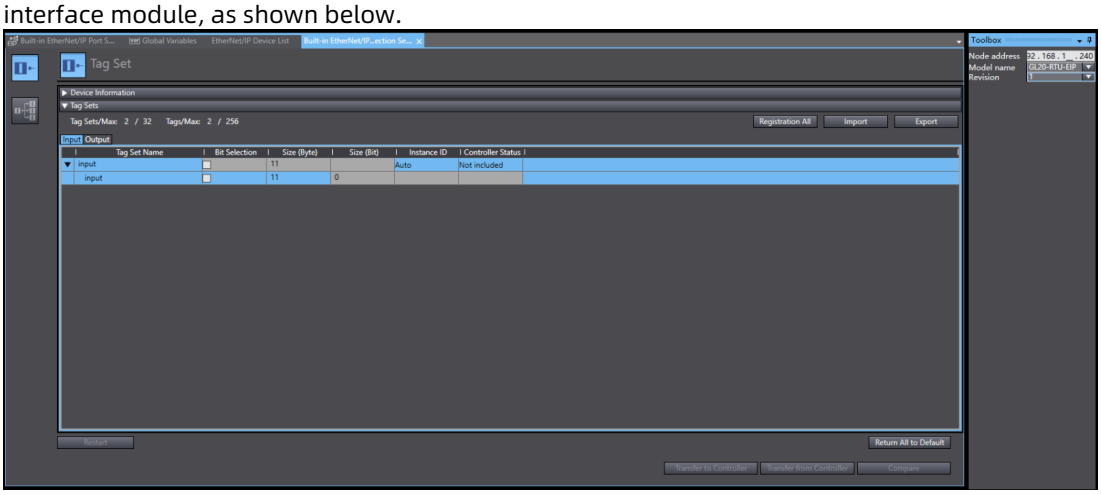
b. In the pop-up window, click "Install". Then in the pop-up dialog, open the EDS file of the GL20-RTU-EIP communication interface module to be installed. After successful installation, the EDS library displays the Inovance logo.

4. Add a configuration module.

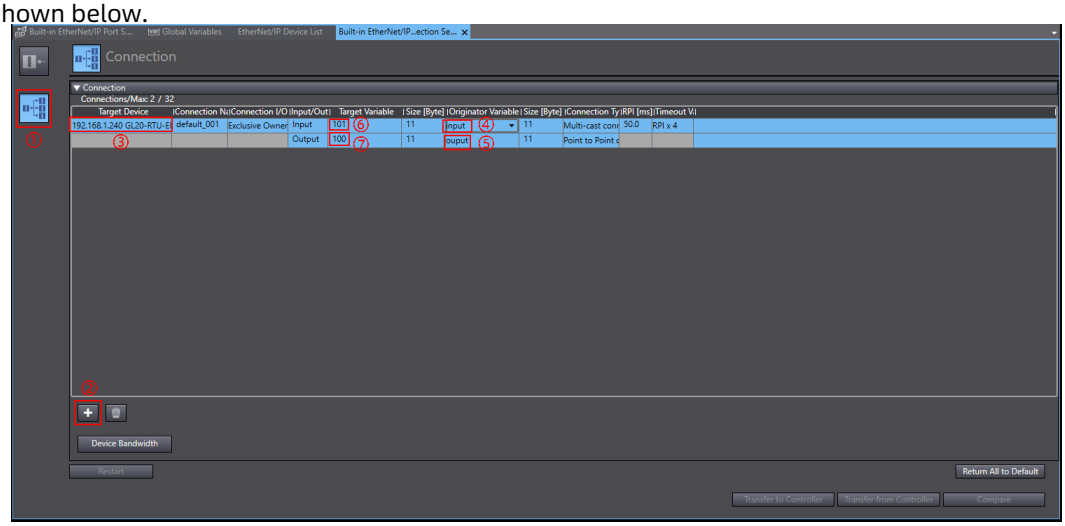
a. In the right "Toolbox" pane, select "Target Device" and then click "+" to add a GL20-RTU-EIP network configuration module.



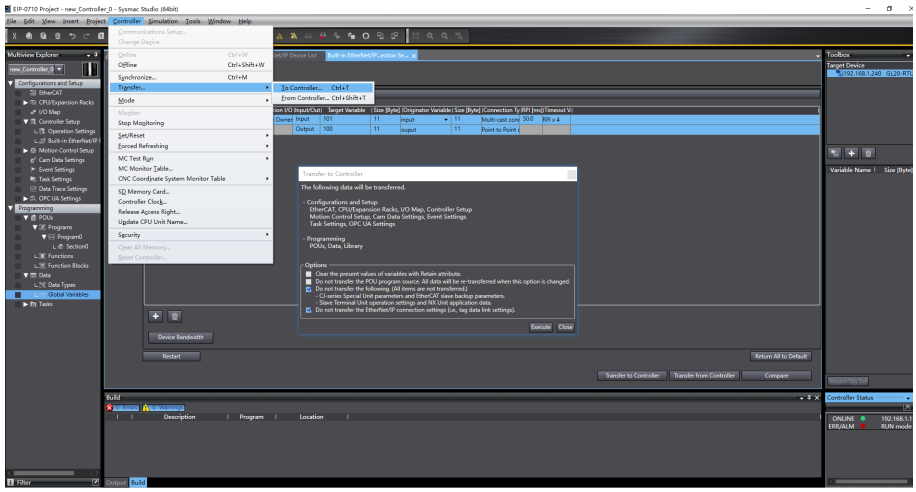
b. In the right "Toolbox" pane, modify the node address to the IP address of the communication interface module, as shown below.



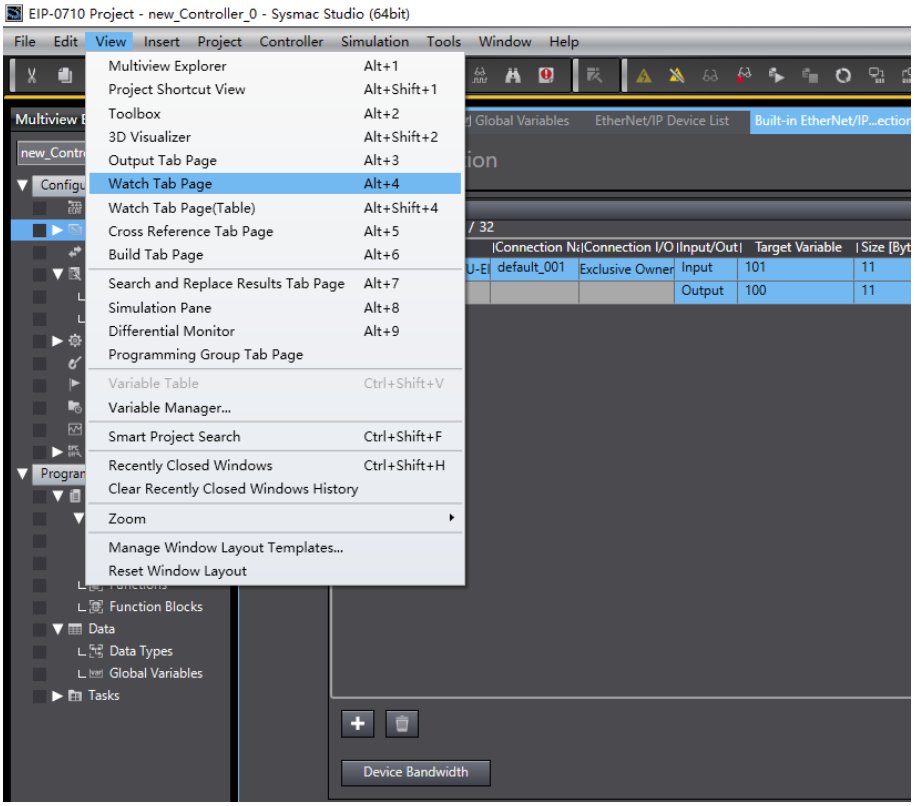
c. Select ① > ② . Select "192.168.250.20 GL20-RTU-EIP" for "Target Device" ③. Set "Originator Variable" to "input" ④ or "output" ⑤. Set Target Variable to "101" ⑥ for input and "100" ⑦ for output. Ensure that the target variable and originator variable have the same size (byte), as shown below.



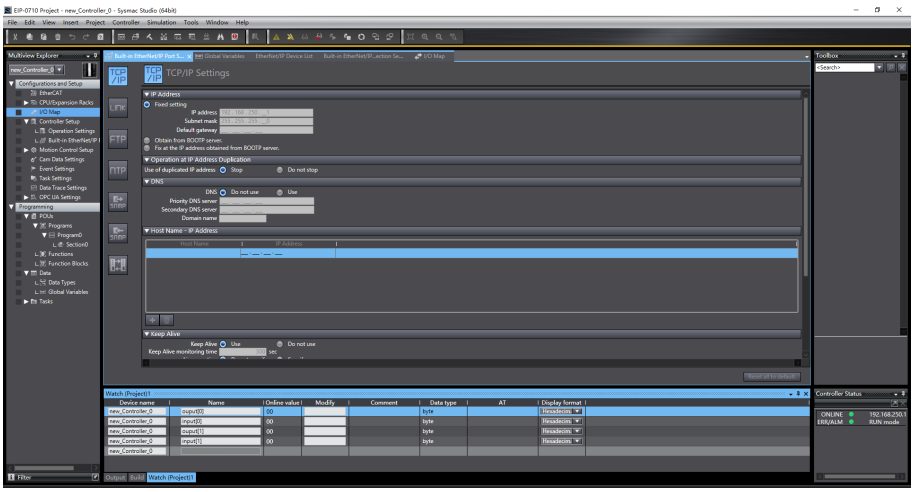
d. Select > in the function bar or select "Controller > Transfer > To Controller > Execute" in the menu bar to complete the transfer, as shown below.



e. In the menu bar, select "View > Watch Tab Page" to open the watch window, as shown in the figure below.



f. Add input/output variables in the watch tab page for data monitoring.



7.2.5 Compatibility with Rockwell Studio5000

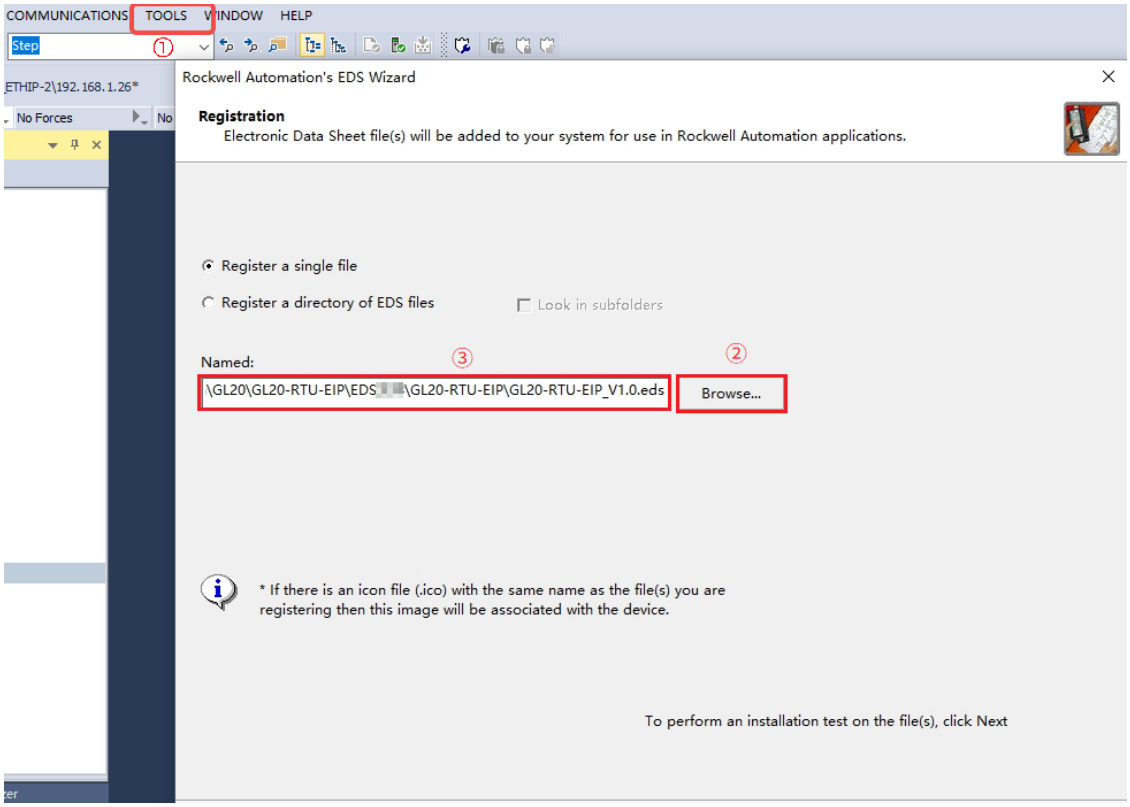
Prerequisites

The Rockwell Studio5000 software has been installed successfully.

Procedure

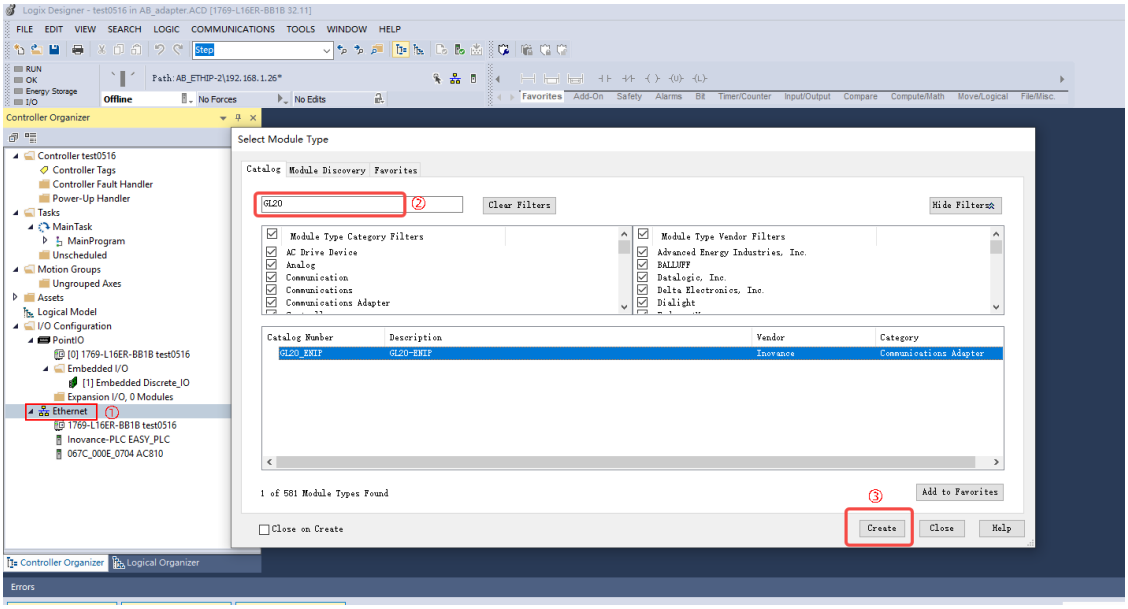
1. Import the EDS file.

   Open the Studio5000 software. Select "Tools > EDS Hardware Installation Tool" ①, click "Browse" ②, and then import the EDS file of the communication interface module in the tool list ③, as shown in the following figure.



2. Configure the device.

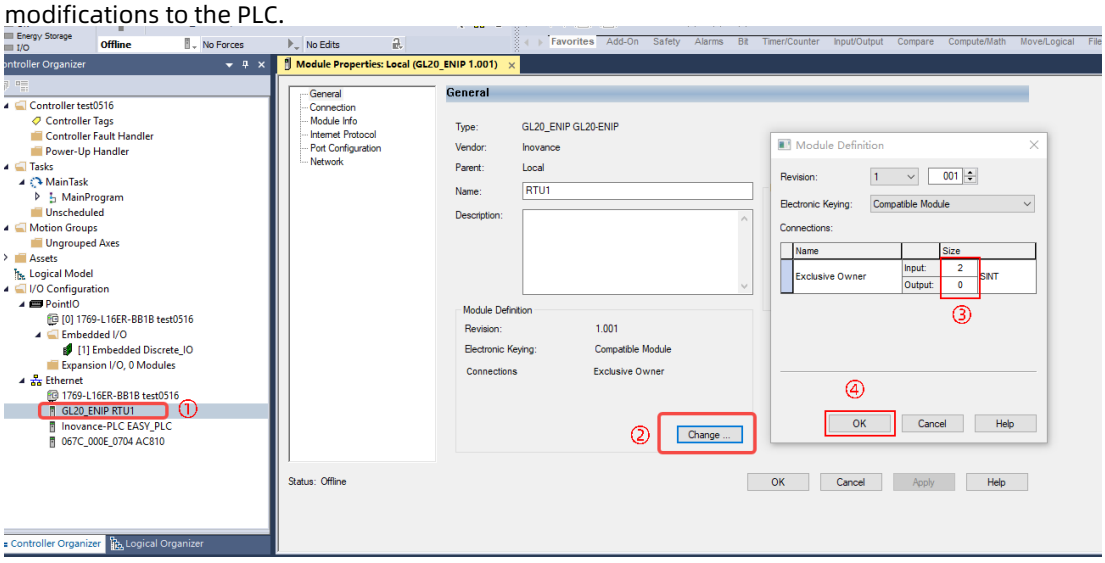
In the left project tree, right-click "Ethernet" ① to add a configuration. Search for "GL20" ② in the pop-up dialog box to display the configuration description file of GL20. Click "Create" ③, as shown in the following figure.



3. Modify the configuration parameters.

a. In the left project tree, click "GL20-RTU-EIP1_32" to enter the configuration and modify the input/output parameters of the communication interface module.

b. Modify the configuration parameters based on the actual input/output byte size of the communication interface module ③. With the correct IP address setting, you can download the modifications to the PLC.



7.2.6 Compatibility with Keyence KV STUDIO

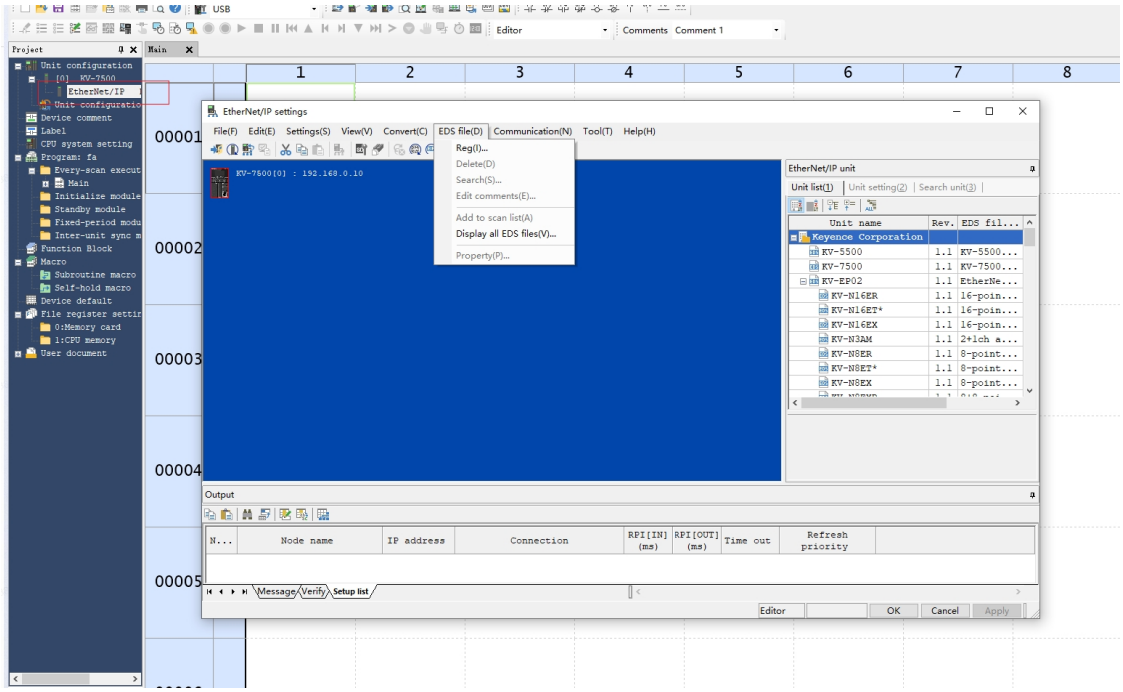
Prerequisites

The Keyence KV STUDIO software has been installed successfully.

Procedure

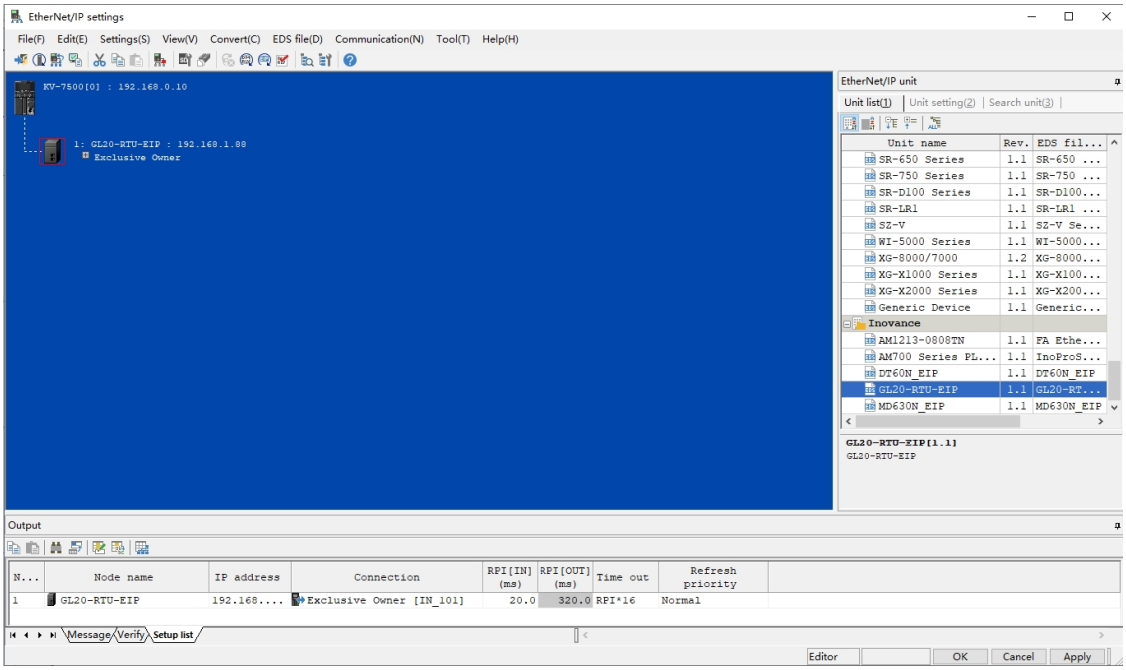
1. Import the EDS file.

   After creating the project, double-click to enter the EIP configuration interface and click EDS file to import the EDS file of the communication interface module.



2. Configure the device.

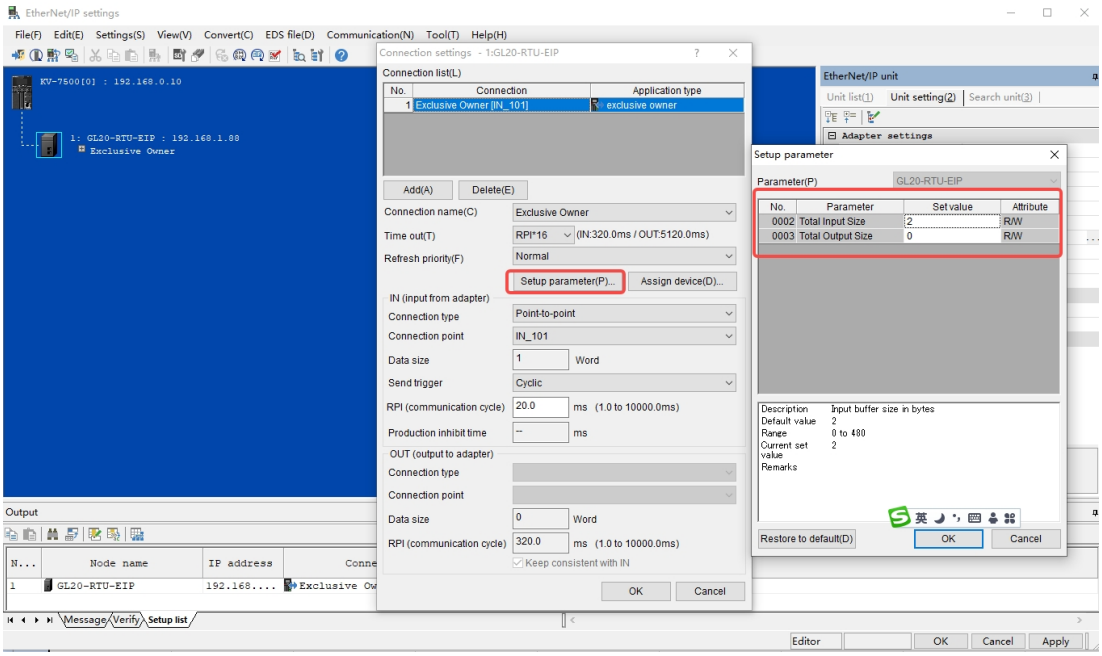
   Double-click the EDS file of the communication interface module to create the configuration.



3. Modify the configuration parameters.

   a. Double-click "Exclusive Owner" of the connection to enter the configuration and modify the input/output parameters of the communication interface module.

b. Modify the configuration parameters based on the actual input/output byte size of the communication interface module. With the correct IP address setting, you can download the modifications to the PLC.



7.3 GL20-RTU-PN

7.3.1 Compatibility with Siemens TIA Portal

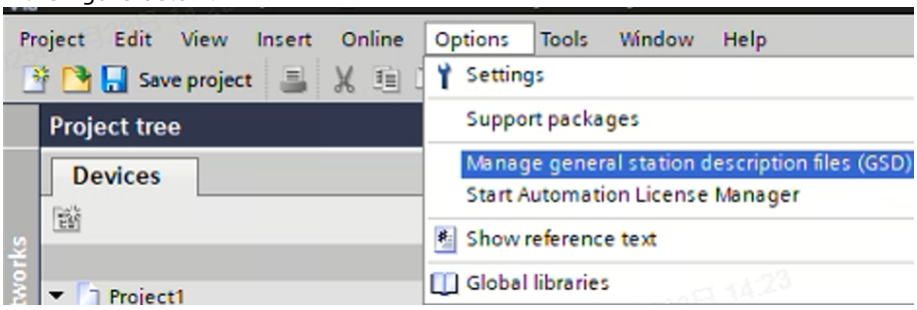
Prerequisites

- The relationship between the firmware version compatibility of the GL20-RTU-PN module, the expansion modules, their firmware versions, functionalities, and GSD file versions has been understood. For details, see "Version Matching Information".
- The GSD file is ready. You can get the GSD file from *https://www.inovance.com*.

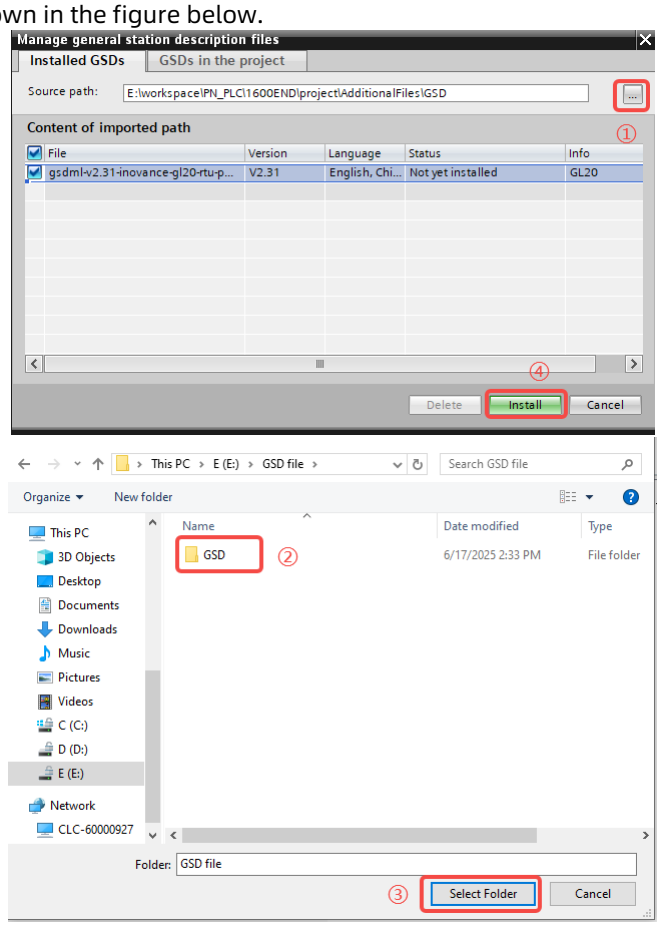
Procedure

1. Complete the cable connections, then power on and initiate the operation of this product.
2. Import the GSD file.

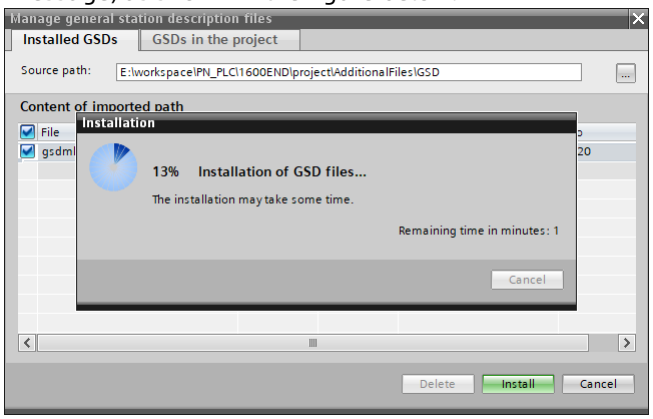
a. In the TIA Portal menu bar, select Options > Manage general station description files (GSD), as shown in the figure below.

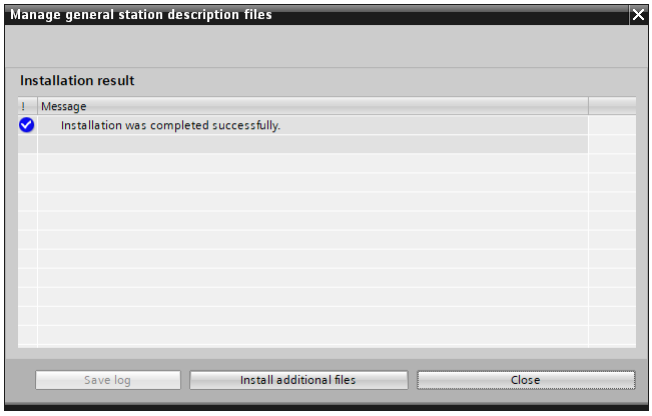


b. In the opened dialog box, click ... ①, select the source path where the GSD file is located (the software will automatically index the file) ②, check the GSD file ③, and click "Install" ④ to install the GSD file, as shown in the figure below.

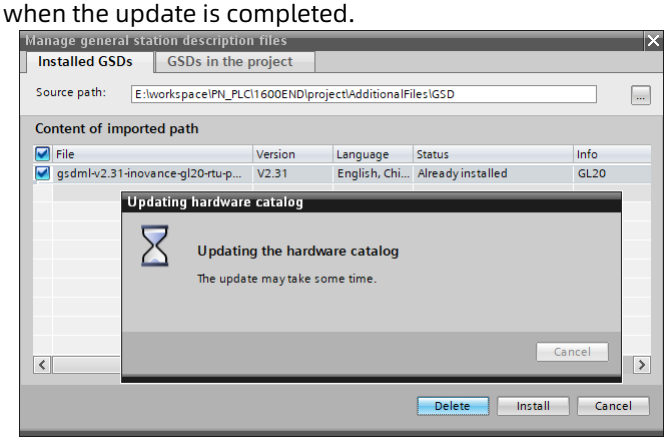


c. The progress of installing the GSD file will display, and a "Manage general station description files" dialog will pop-up upon completion, showing "Installation completed successfully" as the "Installation Result" message, as shown in the figure below.

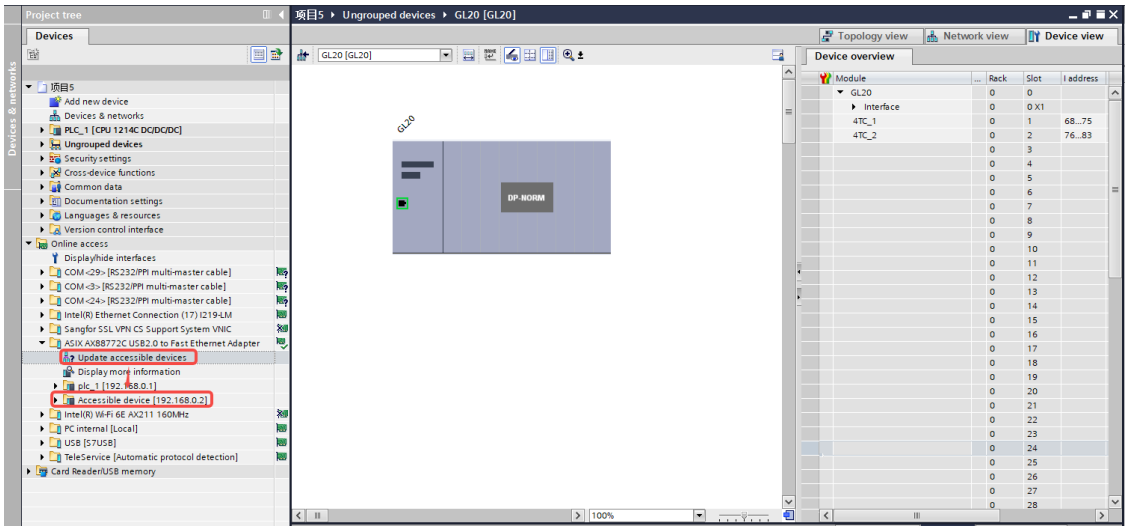




d. A GSD installation update information will display, and then the GSD installation interface will automatically exit when the update is completed.



3. On the main interface, select "Project tree > Devices > Online access", then double-click "Update accessible devices" under the corresponding network card of the PLC to scan for online GL20-RTU-PN module, as shown in the figure below.
   The scan result will be displayed below, such as "gl20_1" shown in the figure below.

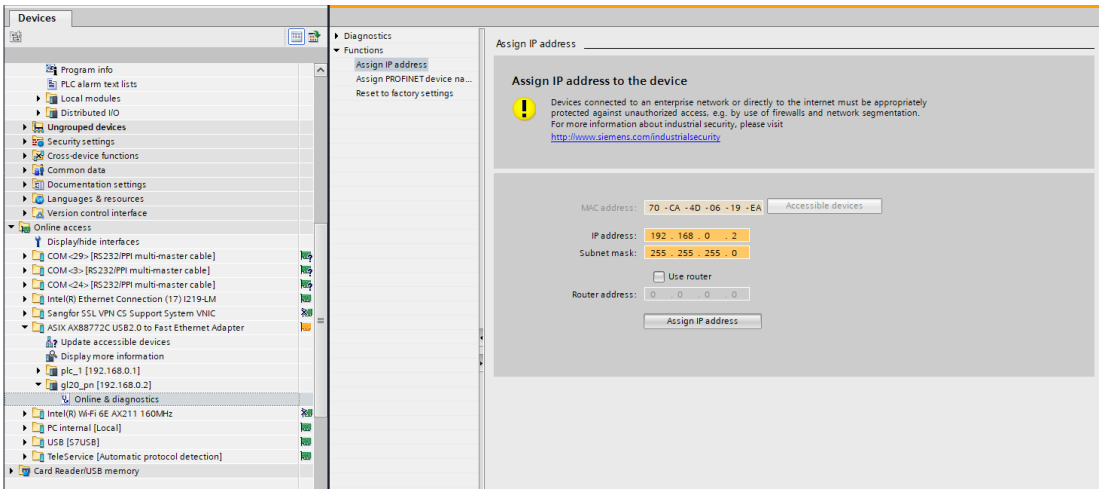


4. Assign an IP address and PROFINET device name to the GL20-RTU-PN module.

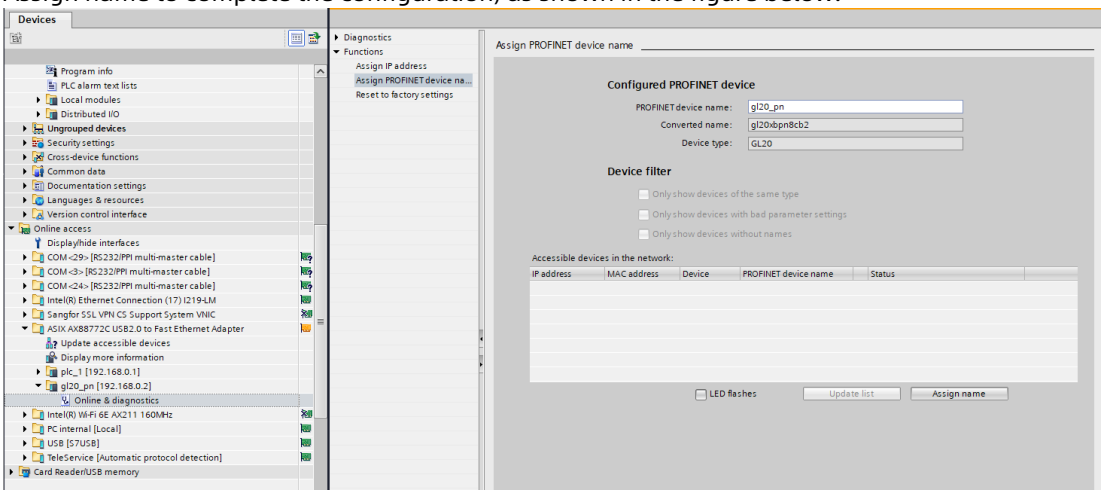
   a. Double-click Online & diagnostics under the scanned GL20-RTU-PN module. In the right-hand interface, select Functions > Assign IP address, configure the IP address and subnet mask for the GL20-RTU-PN module, then click Assign IP address, as shown in the figure below.

Note

The IP address of the GL20-RTU-PN module must be in the same subnet as the PLC.

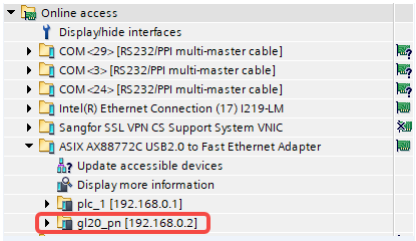


b. Select Functions > Assign PROFINET device name, configure the PROFINET device name and click Assign name to complete the configuration, as shown in the figure below.



c. Check the configuration result.

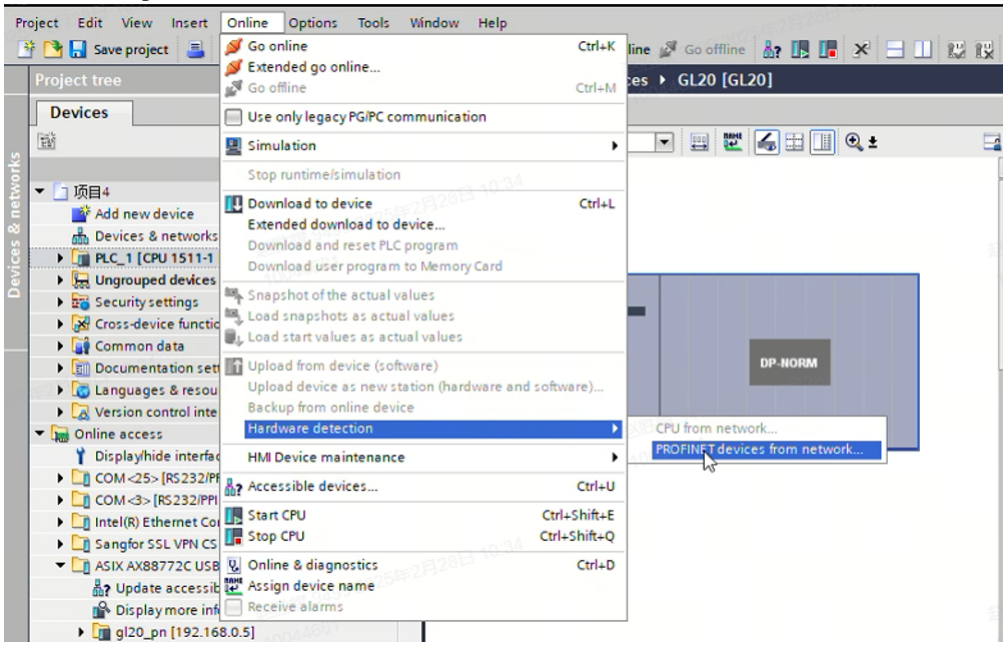
Upon successful configuration, the PROFINET device name and IP address will be displayed under the corresponding network card of the PLC in the left project tree, as shown in the figure below.



5. Configure the GL20-RTU-PN and expansion modules. Automatic and manual configuration methods are supported.

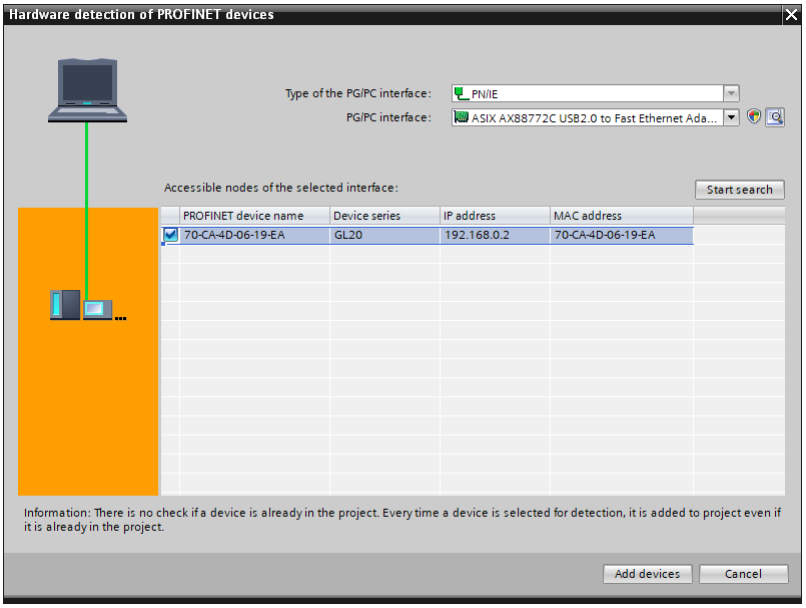
- **Automatic configuration**

a. In the menu bar, select Online > Hardware detection > PROFINET devices from network, as shown in the figure below.



b. Select the corresponding network card, click Start search, check the GL20-RTU-PN communication interface module to be configured, and click Add devices.

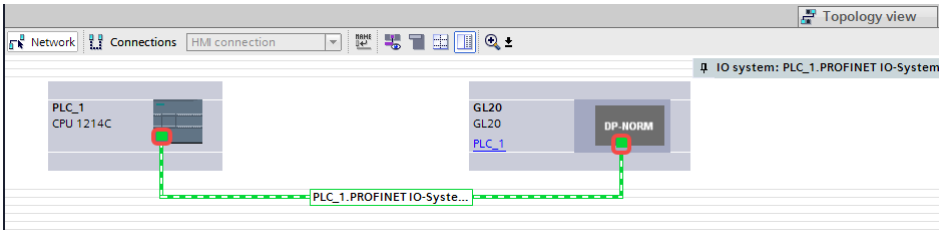
After the GL20-RTU-PN communication interface module is successfully added, a pop-up message displays indicating the hardware detection of the device has been successfully completed.



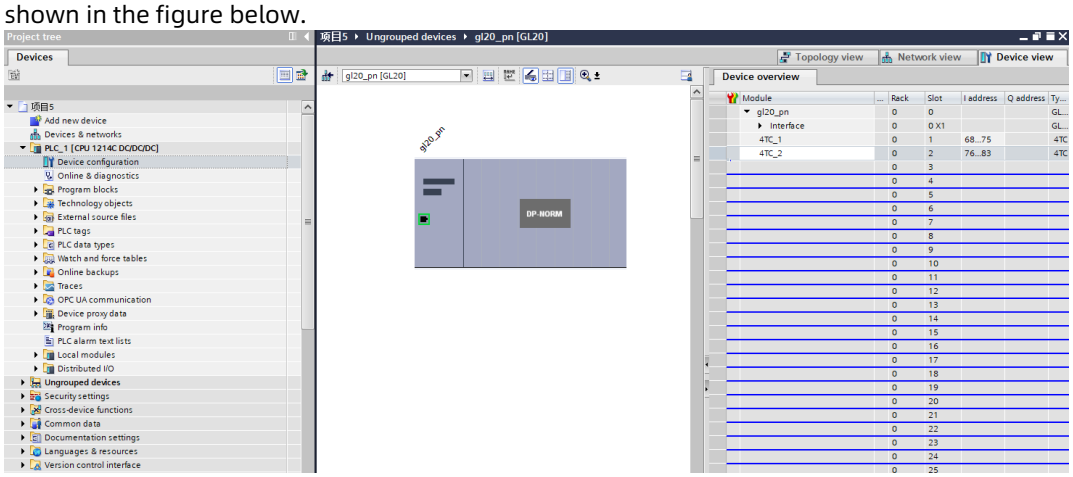
Note

If the addition fails, disconnect the network cable connection between the PLC and the GL20-RTU-PN module, then reconnect it, and repeat steps a to b.

c. Hold down the left mouse button and drag the green frame of the PLC to the green frame of the GL20-RTU-PN module to connect the PLC and the GL20-RTU-PN module, as shown in the figure below .



d. Double-click the GL20-RTU-PN module in the network view to open the device view, as shown in the figure below.



e. (Optional) Assign I address or Q address for the module.

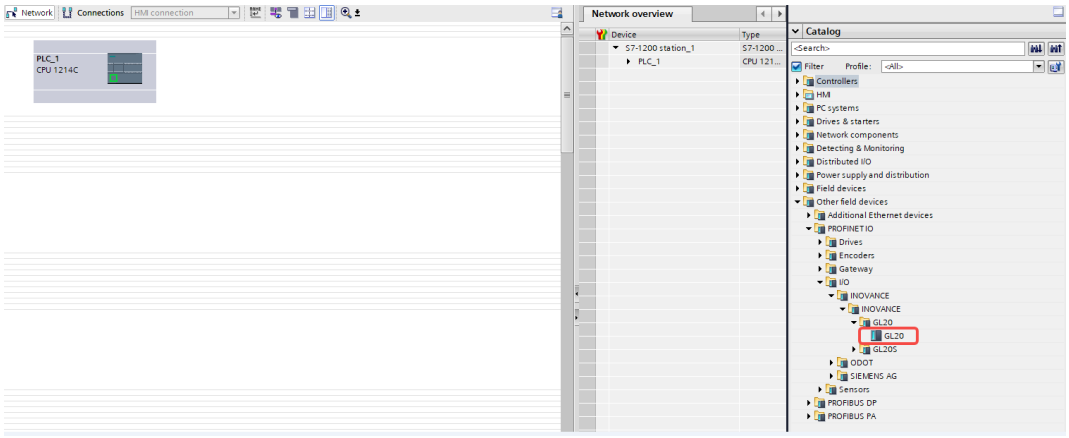
Note

If this product interfaces with the S7-300 series master and the CP343-1 Ethernet communication module, and only Inovance expansion modules are used, it is recommended to modify the I or Q address of the first module to start from "0" to facilitate parameter configuration when using the PNIO_SEND(FC11) and PNIO_RECV(FC12) program blocks later. Otherwise, attention must be paid to the relevant parameter configurations. For details, see *"7.3.5 Precautions" on page 180*.

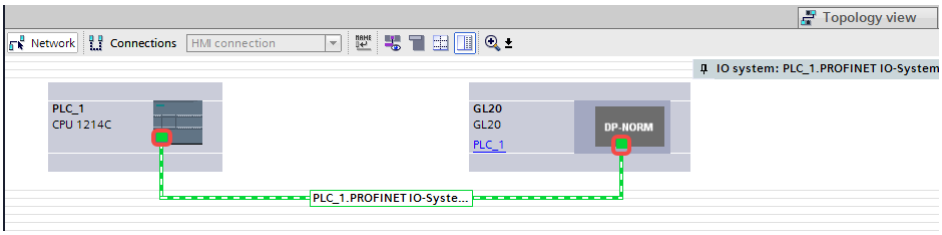
f. Click on the expansion module to be configured in the network view, then configure the corresponding module parameters under Properties > General > Module parameters. For detailed descriptions of the module parameters, see *" GL20-RTU-PN" on page 331*.

- **Manual configuration**

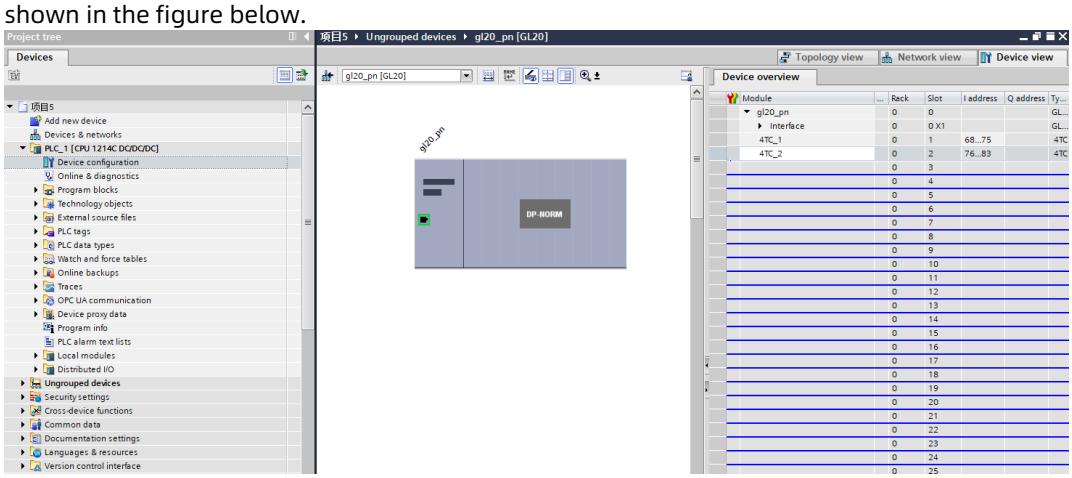
a. Double-click GL20 or drag GL20 to the network view in the hardware catalog, as shown in the figure below.



b. Hold down the left mouse button and drag the green frame of the PLC to the green frame of the GL20-RTU-PN module to connect the PLC and the GL20-RTU-PN module, as shown in the figure below



c. Double-click the GL20-RTU-PN module in the network view to open the hardware catalog, as shown in the figure below.



d. According to the actual module installation sequence, double-click the expansion modules in the hardware catalog on the right to add them and automatically assign addresses.

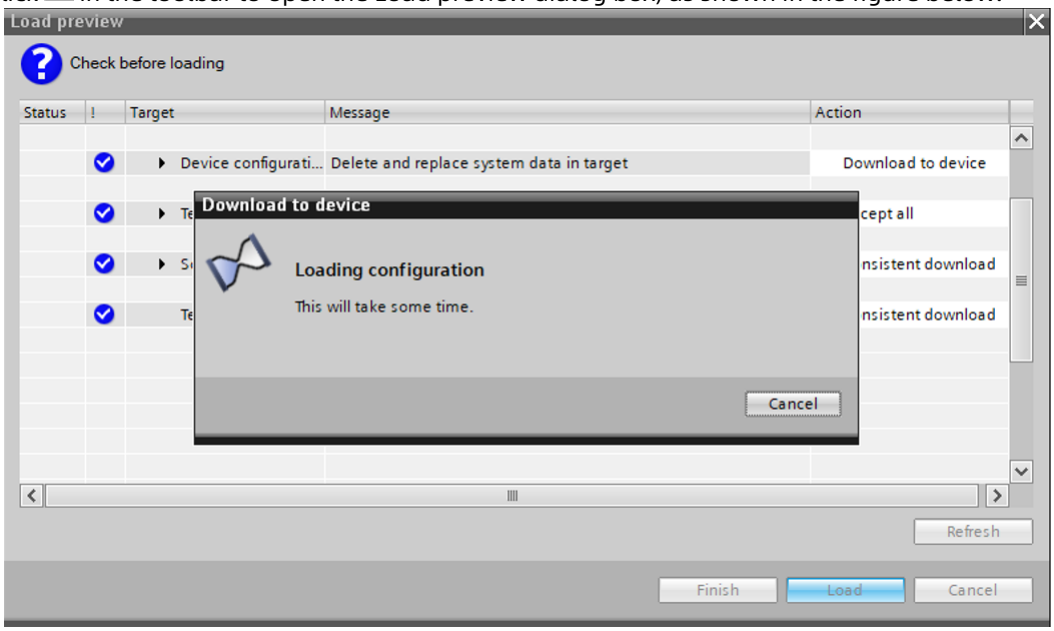
Note

If this product interfaces with the S7-300 series master and the CP343-1 Ethernet communication module, and only Inovance expansion modules are used, it is recommended to modify the I or Q address of the first module to start from "0" to facilitate parameter configuration when using the PNIO_SEND(FC11) and PNIO_RECV(FC12) program blocks later. Otherwise, attention must be paid to the relevant parameter configurations. For details, see *"7.3.5 Precautions" on page 180*.

e. Click on the expansion module to be configured in the network view, then configure the corresponding module parameters under Properties > General > Module parameters. For detailed descriptions of the module parameters, see *" GL20-RTU-PN" on page 331*.

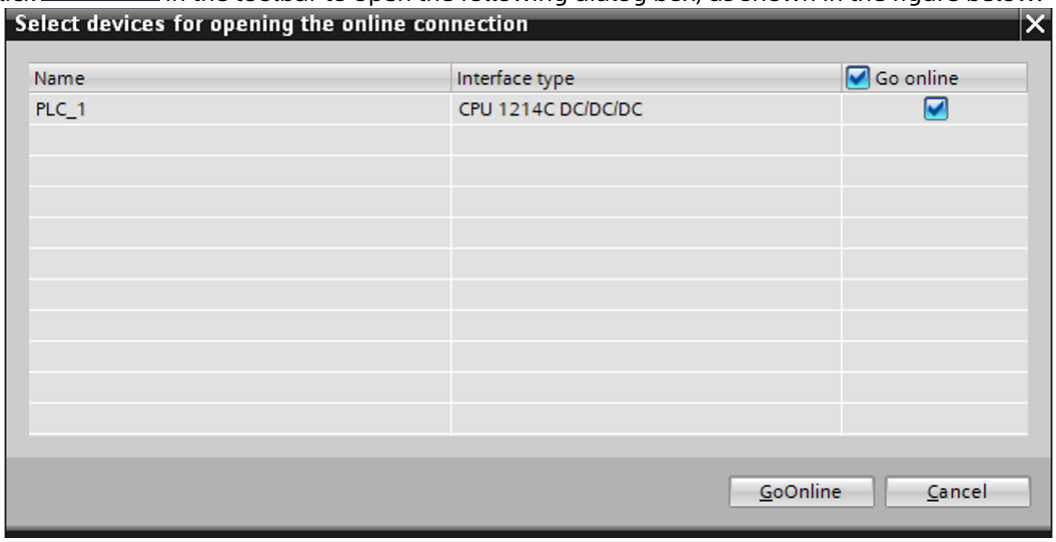
6. Download the program to the device and switch to online.

a. Click in the toolbar to open the Load preview dialog box, as shown in the figure below.



b. Click Load to download the program to the device.

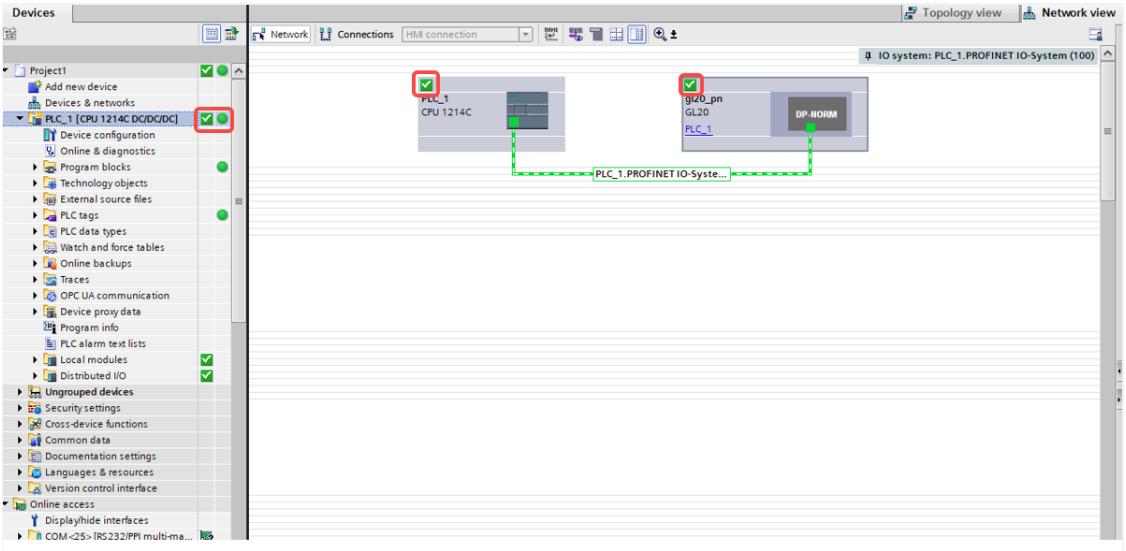
c. Click Go online in the toolbar to open the following dialog box, as shown in the figure below.



d. Check the PLC and click GoOnline.

7. Check that the GL20-RTU-PN module is successfully configured.

If green icons are displayed in both the project tree and network view, it indicates that the GL20-RTU-PN module is successfully configured; otherwise, the configuration is unsuccessful, as shown in the figure below.



If the configuration is unsuccessful, contact Inovance for technical support.

7.3.2 Compatibility with Siemens STEP7 MicroWIN

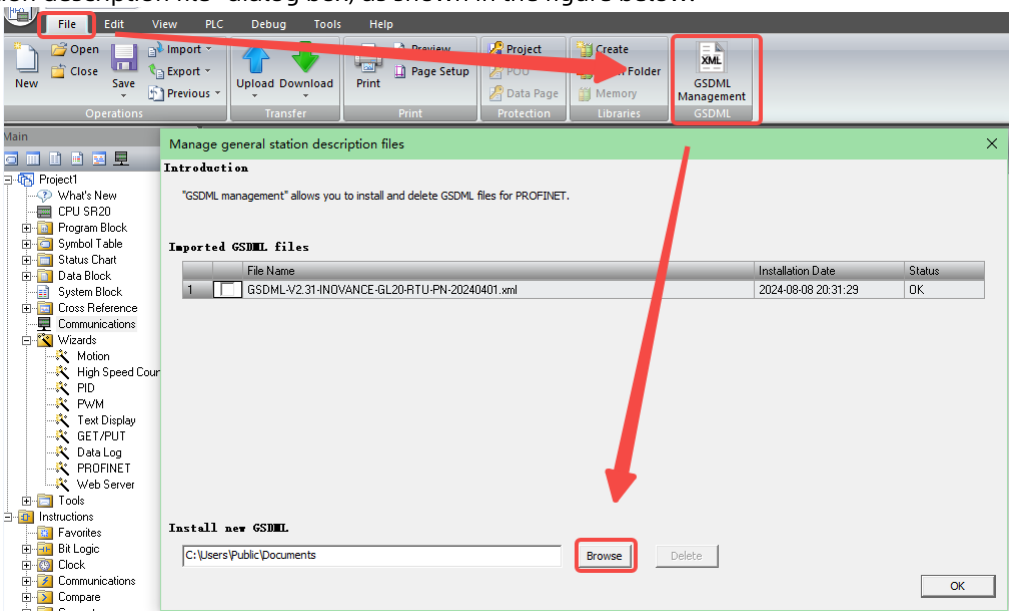
Prerequisites

- The relationship between the firmware version compatibility of the GL20-RTU-PN module, the expansion modules, their firmware versions, functionalities, and GSD file versions has been understood. For details, see "Version Matching Information".
- The GSD file is ready. You can get the GSD file from *https://www.inovance.com*.

Procedure

1. Complete the cable connections, then power on and initiate the operation of this product.
2. Import the GSD file.

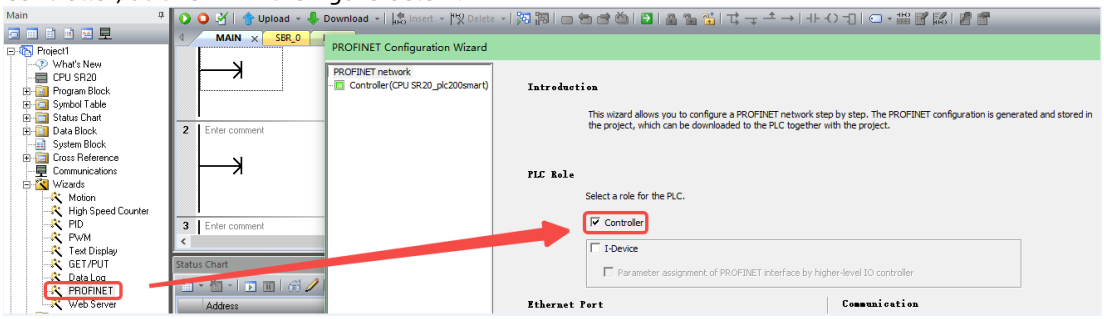
   a. In the STEP7 main interface, select File > GSDML Management to open the "Manage general station description file" dialog box, as shown in the figure below.



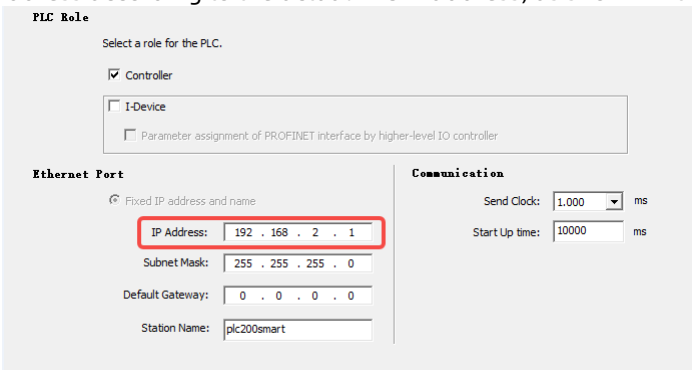
b. Click "Browse" to select the path where the GSD file is located, then click "OK".

3. Configure the PLC IP address.

a. Expand Wizards in the left project tree, double-click PROFINET, and check the PLC Role as Controller, as shown in the figure below.



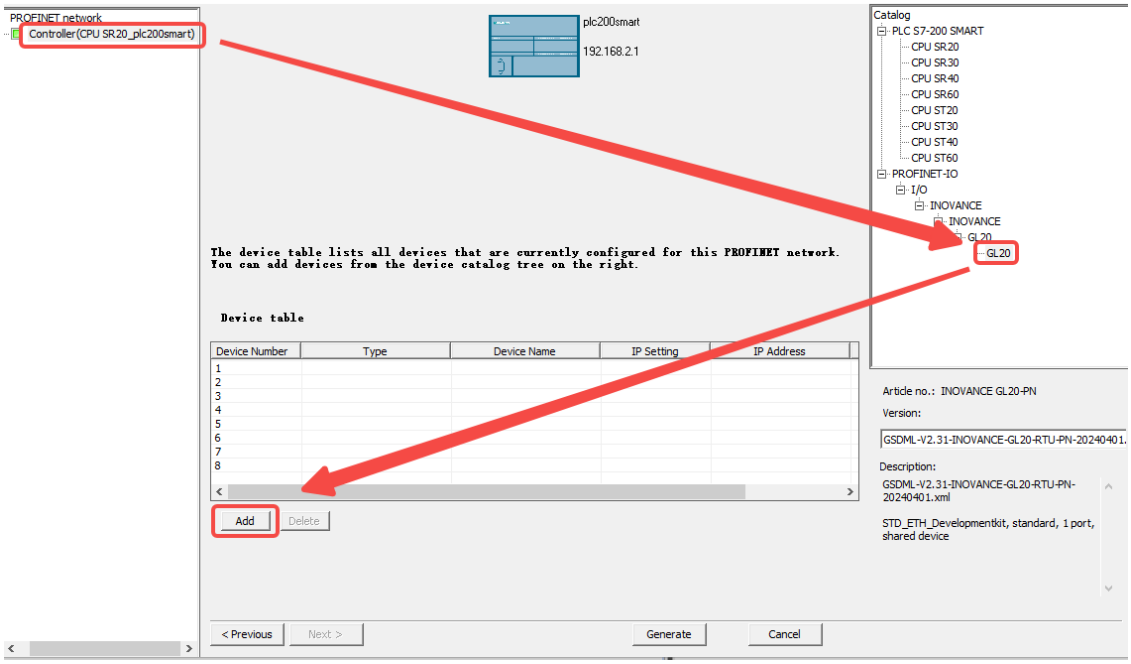
b. Configure the IP Address according to the actual PLC IP address, as shown in the figure below.



4. Configure the GL20-RTU-PN module.

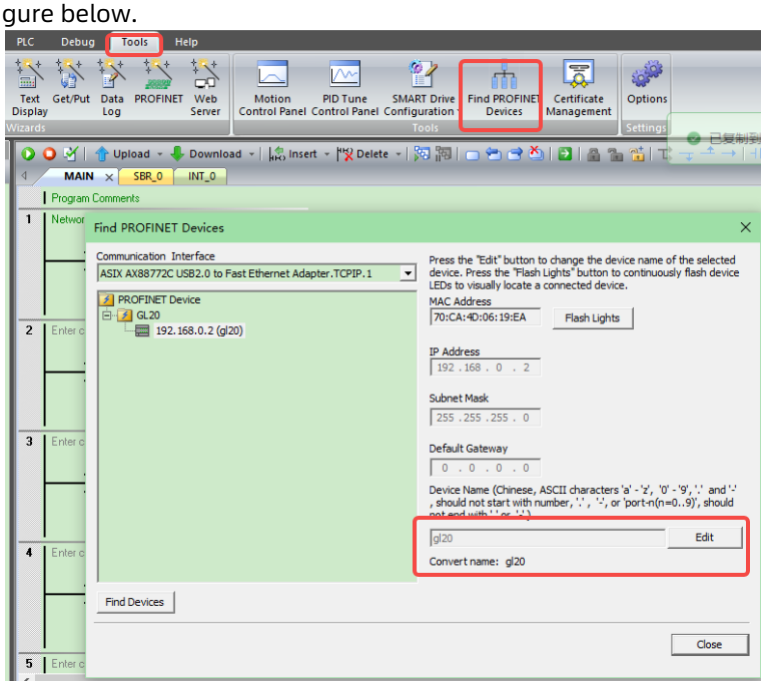
a. Double-click the Controller to enter the configuration interface.

b. In the configuration interface, expand the directory tree on the right to PROFINET-IO > I/O > INOVANCE > INOVANCE > GL20, select GL20, and click Add.

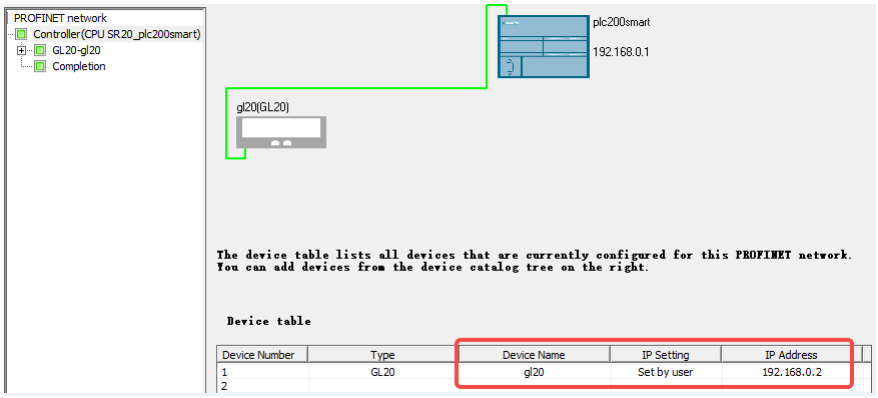


5. Modify the device name and IP address of the GL20-RTU-PN module.

a. In the STEP7 main interface, select Tools > Find PROFINET Devices to display the device name, as shown in the figure below.



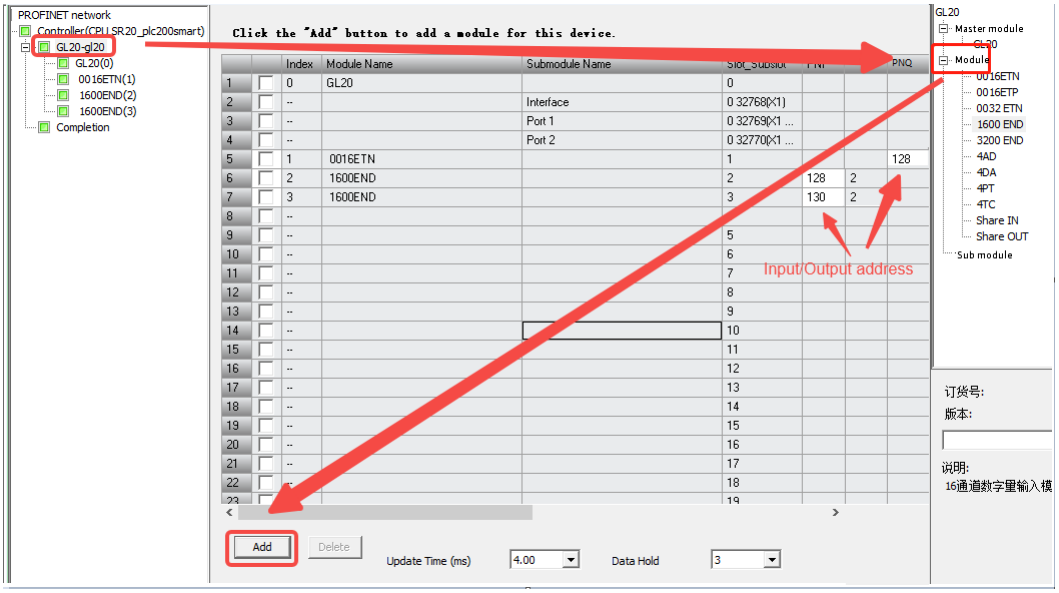
b. In the "Device Name" and "IP Address" lists, modify the device name and IP address of the GL20-RTU-PN module to match the actual device name and IP address, as shown in the figure below.



6. Configure the expansion module.

a. Double-click the configured GL20-RTU-PN module in the left project tree to access the expansion module configuration interface, as shown in the figure below.

b. Click the expansion modules in the right directory tree according to the actual installation sequence, then click Add to add the expansion modules and automatically assign input/output addresses (I area and Q area).



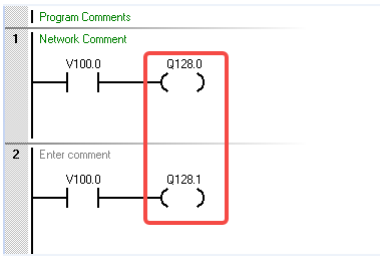
7. After configuration, click Generate to complete the configuration wizard setup.

Programming Examples

Taking the first GL20-0016ETN module in the figure above as an example, the address ranges are configured as follows:

- First 8 points: Q128.0 to Q128.7
- Post 8 points: Q129.0 to Q129.7

Program directly using the default assigned addresses, as shown in the figure below.



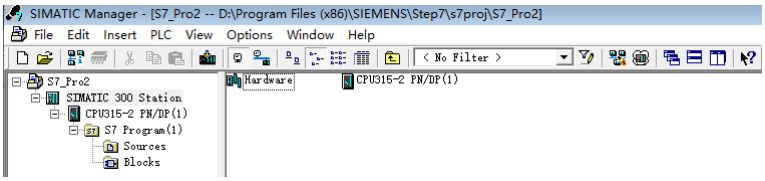
7.3.3 Compatibility with Siemens STEP7

Prerequisites

- The relationship between the firmware version compatibility of the GL20-RTU-PN module, the expansion modules, their firmware versions, functionalities, and GSD file versions has been understood. For details, see "Version Matching Information".
- The GSD file is ready. You can get the GSD file from https://www.inovance.com.

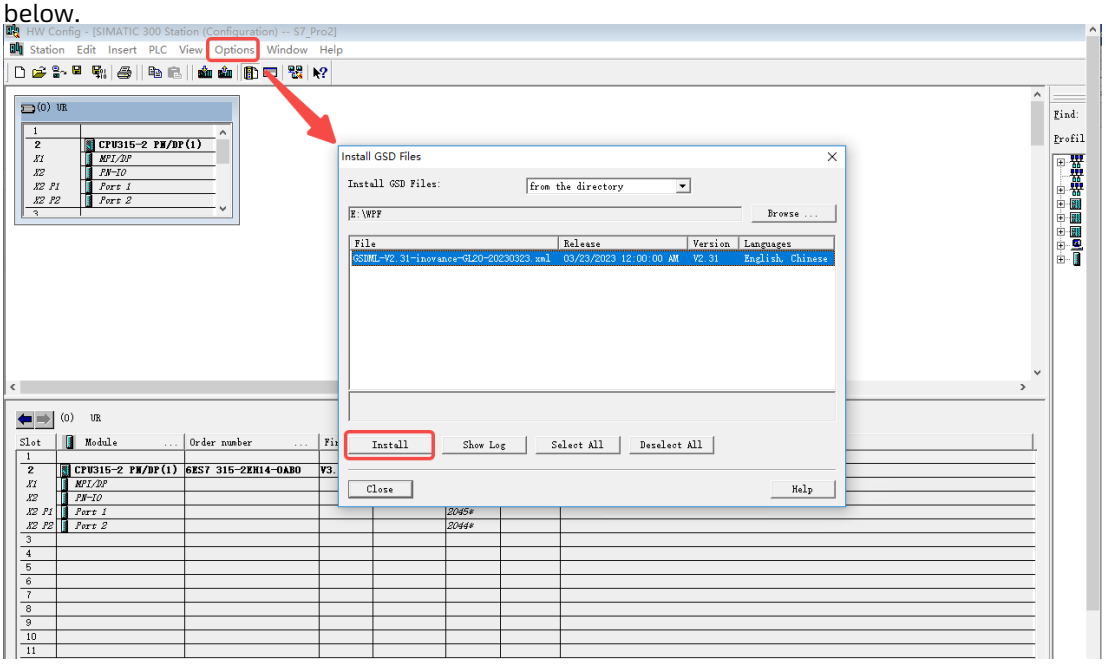
Procedure

1. Complete the cable connections, then power on and initiate the operation of this product.
2. Create a new project, taking the S7-300 CPU315-2 PN/DP as an example, as shown in the figure below.



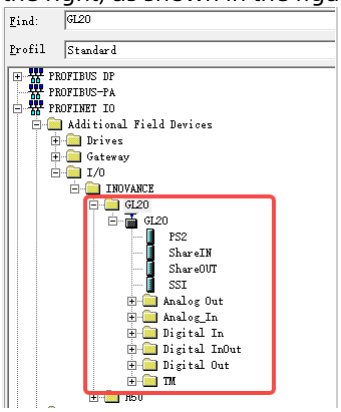
3. Import the GSD file.

a. Double-click the "Hardware" in the STEP7 main interface, then select "Options > Install GSD Files" from the menu bar to open the "Install GSD Files" dialog box, as shown in the figure below.



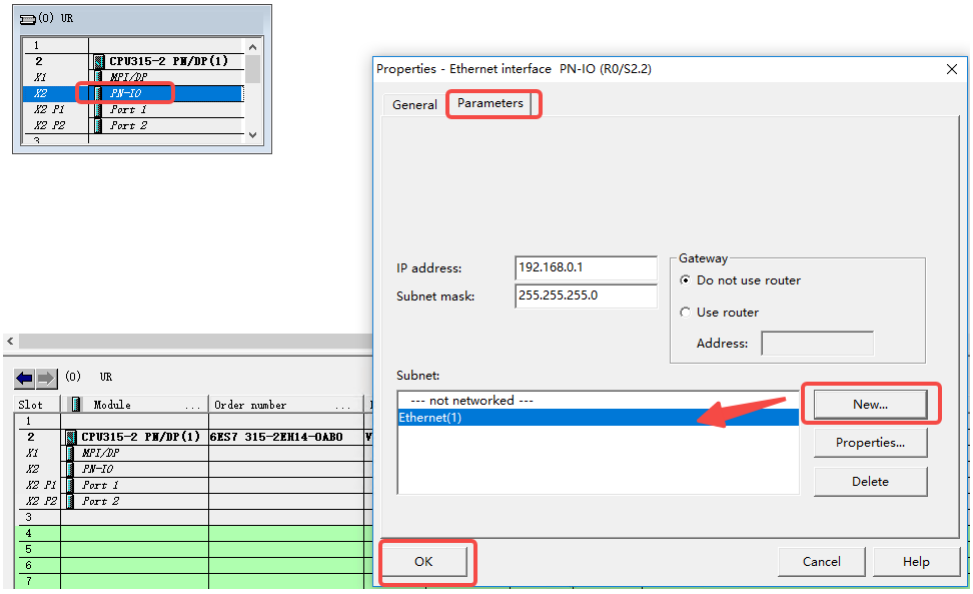
b. Click "Browse..." to select the path where the GSD file is located, then click "OK".

c. Click "Install" to start the installation. Once the installation is complete, the GL20 series module can be found in the device list on the right, as shown in the figure below.

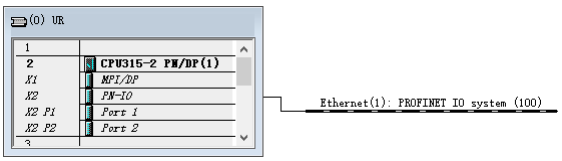


4. Configure the GL20-RTU-PN module.

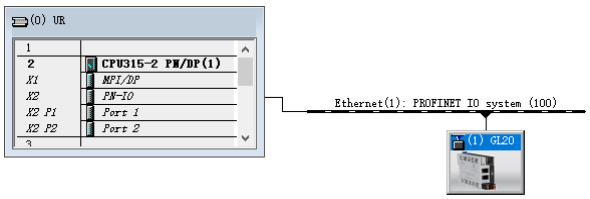
a. Right-click "PN-IO" in the "Hardware" configuration interface, select "Insert PROFINET IO System" from the context menu, and open the "Properties - Ethernet interface PN-IO" dialog box, as shown in the figure below.



b. Click the "Parameters" tab, click "New", then click "OK" to create the PROFINET subnet. Upon successful creation of the PROFINET subnet, the display appears as shown in the figure below.

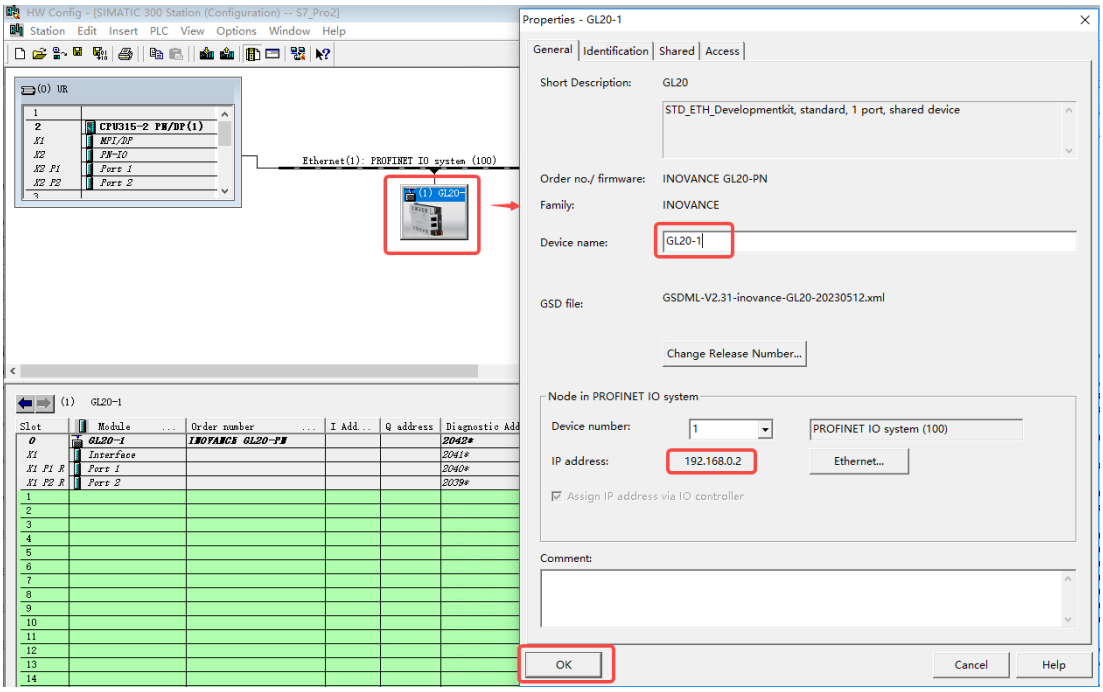


c. Double-click the GL20 series module in the right device list, or drag the GL20 series module to the "Ethernet (1): PROFINET IO system (100)" subnet to complete the configuration of the GL20-RTU-PN module.

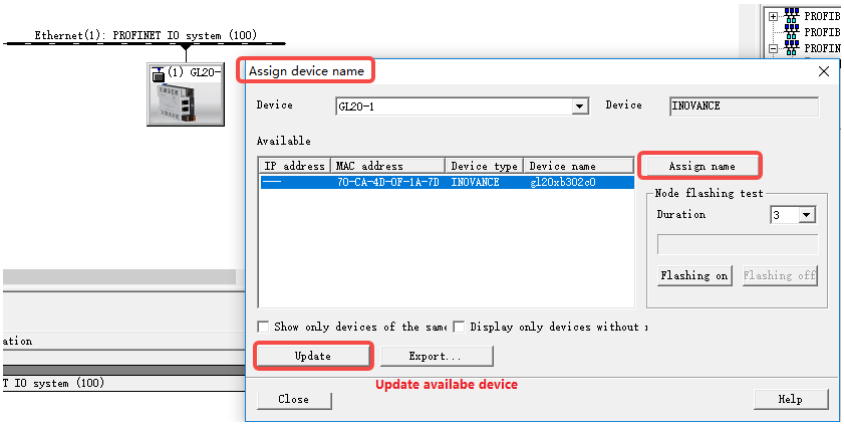


5. Modify the IP address and device name of the GL20-RTU-PN module, and assign the device name to the GL20-RTU-PN module.

a. Double-click the configured GL20-RTU-PN module, modify the device name and IP address, then click "OK", as shown in the figure below.

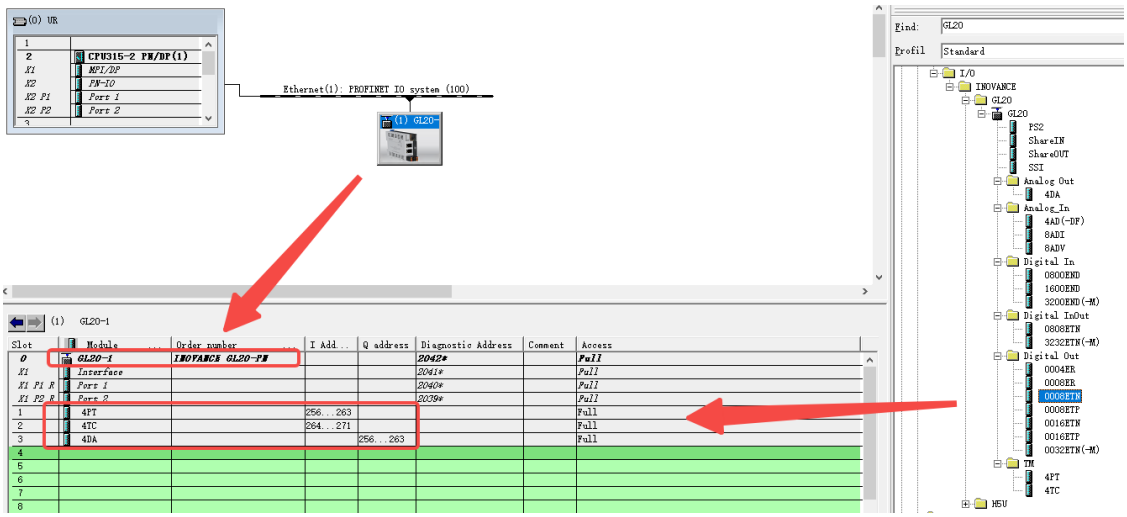


b. In the "Hardware" configuration interface, navigate to the menu bar and select "PLC > EtherNet > Assign Device Name". In the opened window, click "Update", then select the device from the available device list and click "Assign name" to assign the device name, as shown in the figure below.



6. Configure the expansion module.

In the "Hardware" configuration interface, click on the GL20-RTU-PN module, then sequentially double-click the expansion modules in the right device list according to the actual installation sequence to add them and automatically assign addresses, as shown in the figure below.

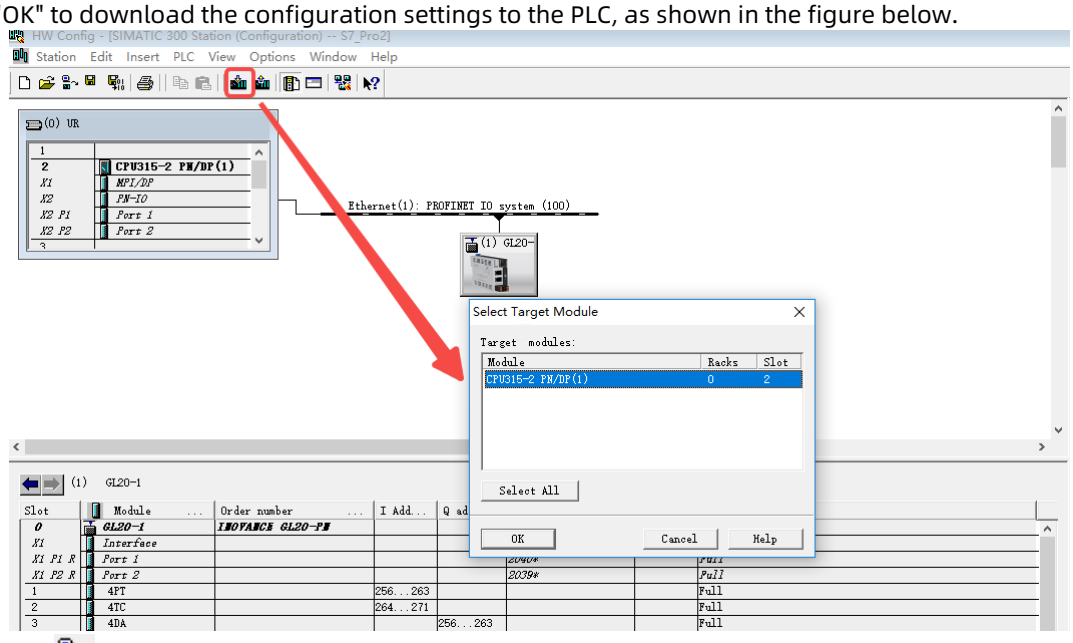


Note

If this product interfaces with the S7-300 series master and the CP343-1 Ethernet communication module, and only Inovance expansion modules are used, it is recommended to modify the I or Q address of the first module to start from "0" to facilitate parameter configuration when using the PNIO_SEND(FC11) and PNIO_RECV(FC12) program blocks later. Otherwise, attention must be paid to the relevant parameter configurations. For details, see *"7.3.5 Precautions" on page 180*.

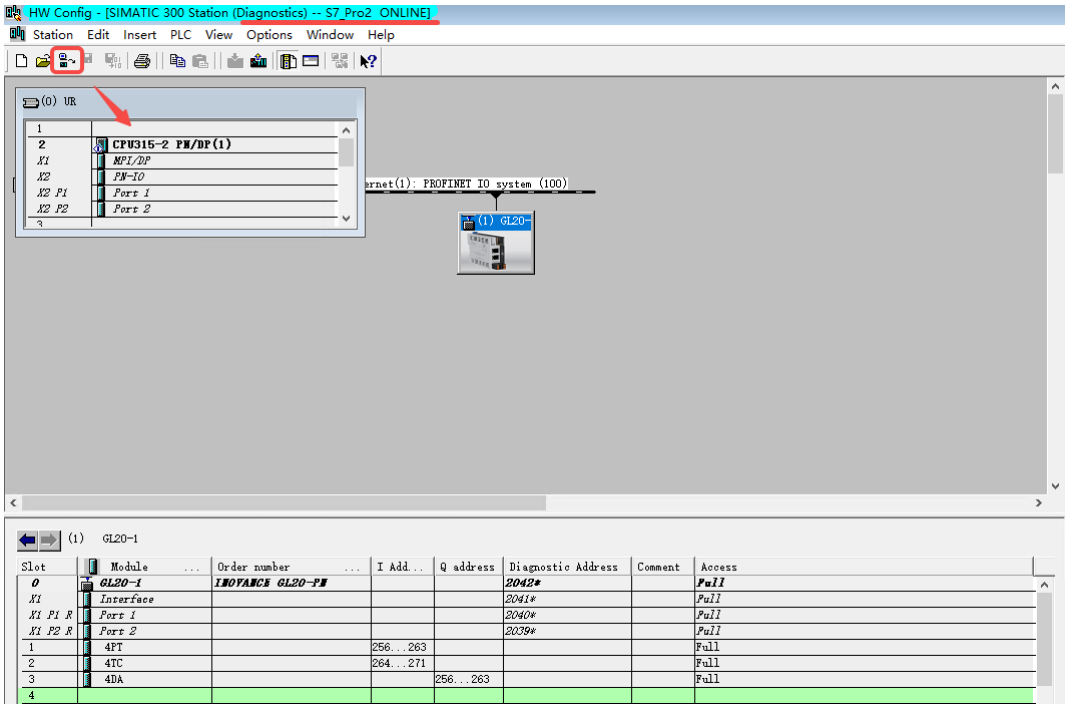
7. Download the configuration settings and perform online monitoring to verify the correctness of the configuration.

   a. Click  in the toolbar, select the corresponding PLC device in the opened dialog box, and click "OK" to download the configuration settings to the PLC, as shown in the figure below.



   b. Click  to access the online monitoring configuration, as shown in the figure below.

   If the configuration shows no errors, it indicates that the GL20-RTU-PN module configuration is successful; otherwise, the configuration has failed. If the configuration fails, contact Inovance for technical support.



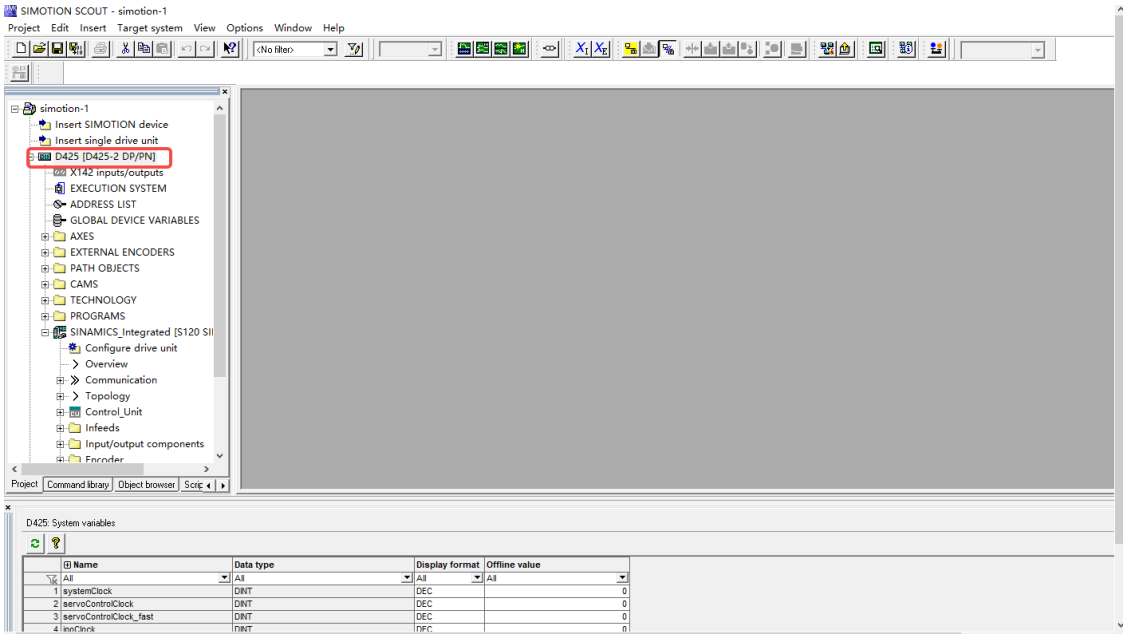
7.3.4 Compatibility with Siemens SIMOTION SCOUT

Prerequisites

- The relationship between the firmware version compatibility of the GL20-RTU-PN module, the expansion modules, their firmware versions, functionalities, and GSD file versions has been understood. For details, see "Version Matching Information".
- The GSD file is ready. You can get the GSD file from *https://www.inovance.com*.

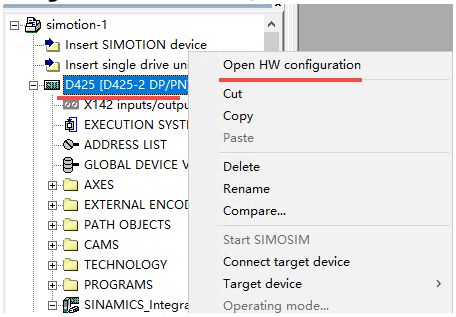
Procedure

1. Complete the cable connections, then power on and initiate the operation of this product.
2. Create a new project, taking the SIMOTION D425-2 DP/PN as an example, as shown in the figure below.

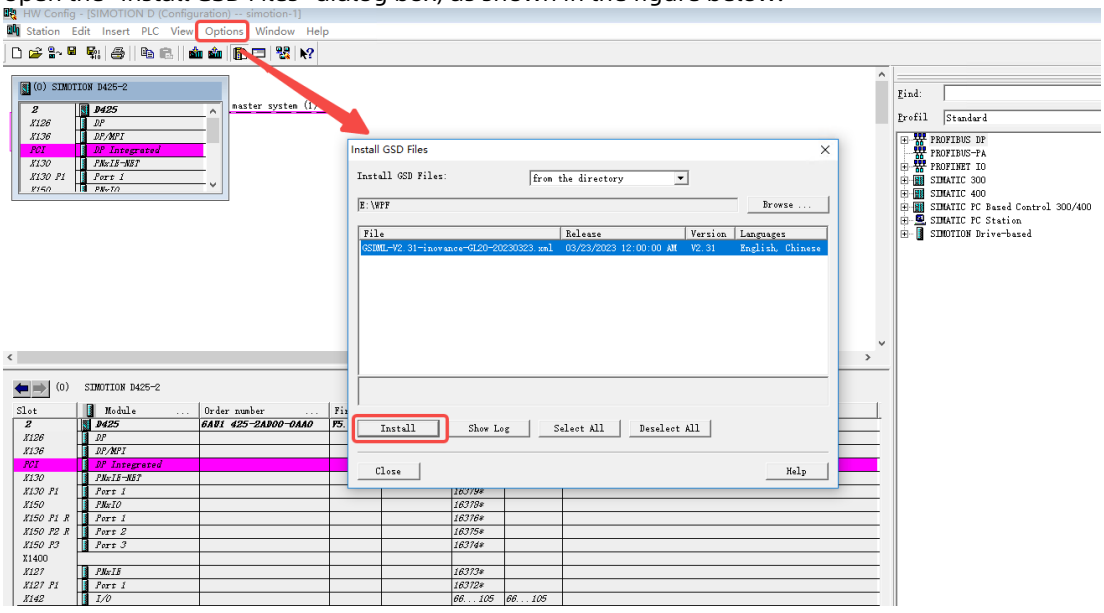


3. Import the GSD file.

a. In the navigation tree of SIMOTION SCOUT on the left, right-click "D425 [D425-2 DP/PN]", and select "Open HW configuration" from the right-click menu, or double-click "D425 [D425-2 DP/PN]" to enter the hardware configuration interface, as shown in the figure below.

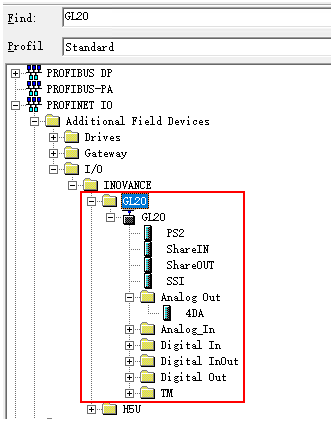


b. In the hardware configuration interface, select Options > Install GSD Files from the menu bar to open the "Install GSD Files" dialog box, as shown in the figure below.



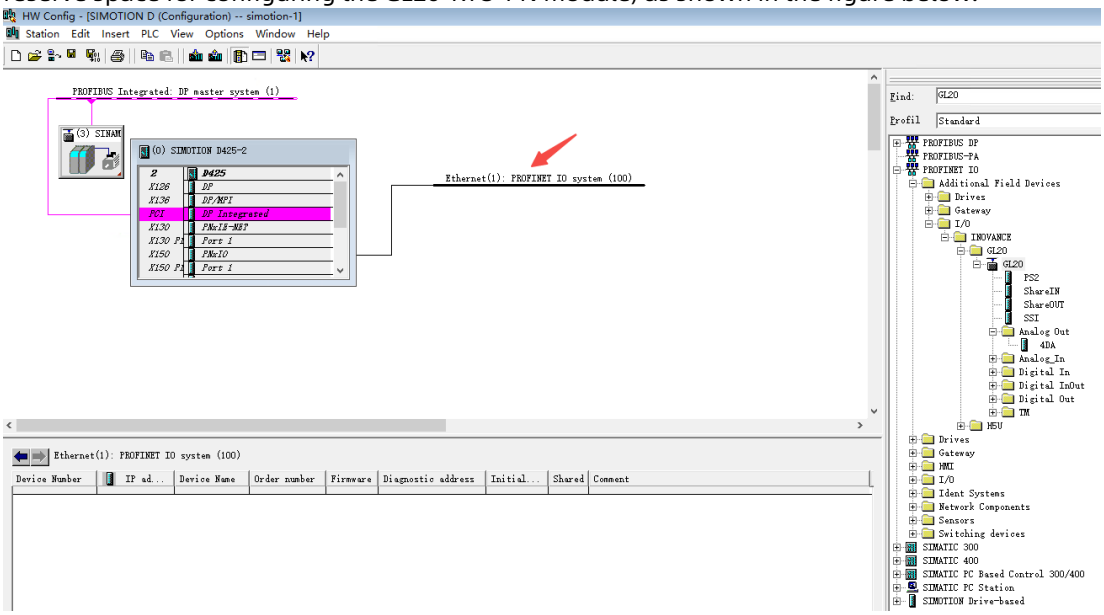
c. Click "Browse..." to select the path where the GSD file is located, then click "OK".

d. Click "Install" to start the installation. Once the installation is complete, the GL20 series module can be found in the device list on the right, as shown in the figure below.

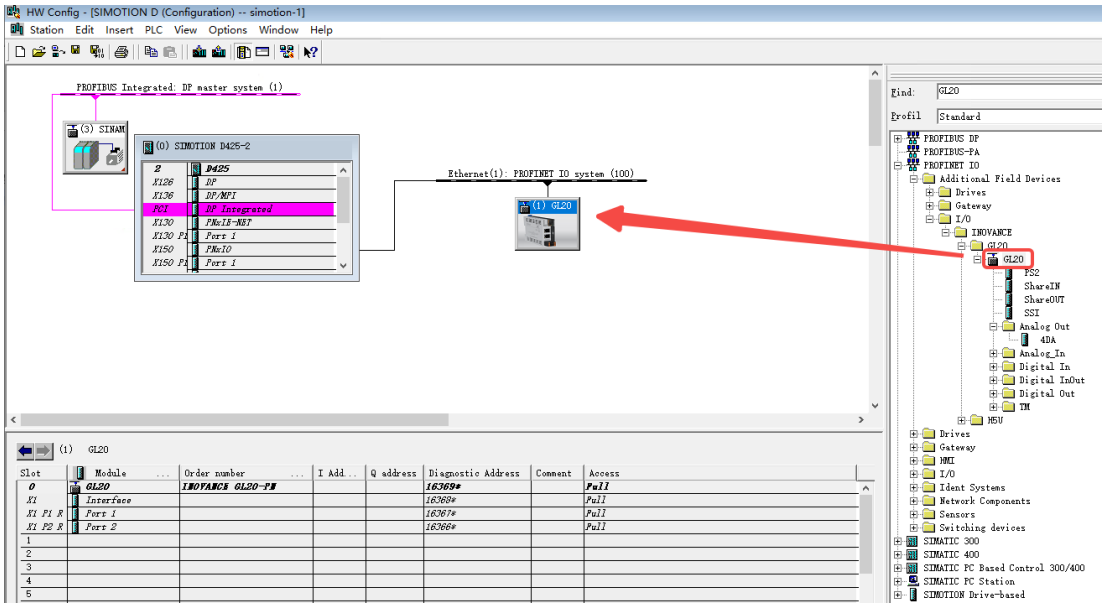


4. Configure the GL20-RTU-PN module.

a. In the hardware configuration interface, drag the "SIMOTION D425-2" configuration window and the "Ethernet(1): PROFINET IO system (100)" line segment to appropriate positions to reserve space for configuring the GL20-RTU-PN module, as shown in the figure below.

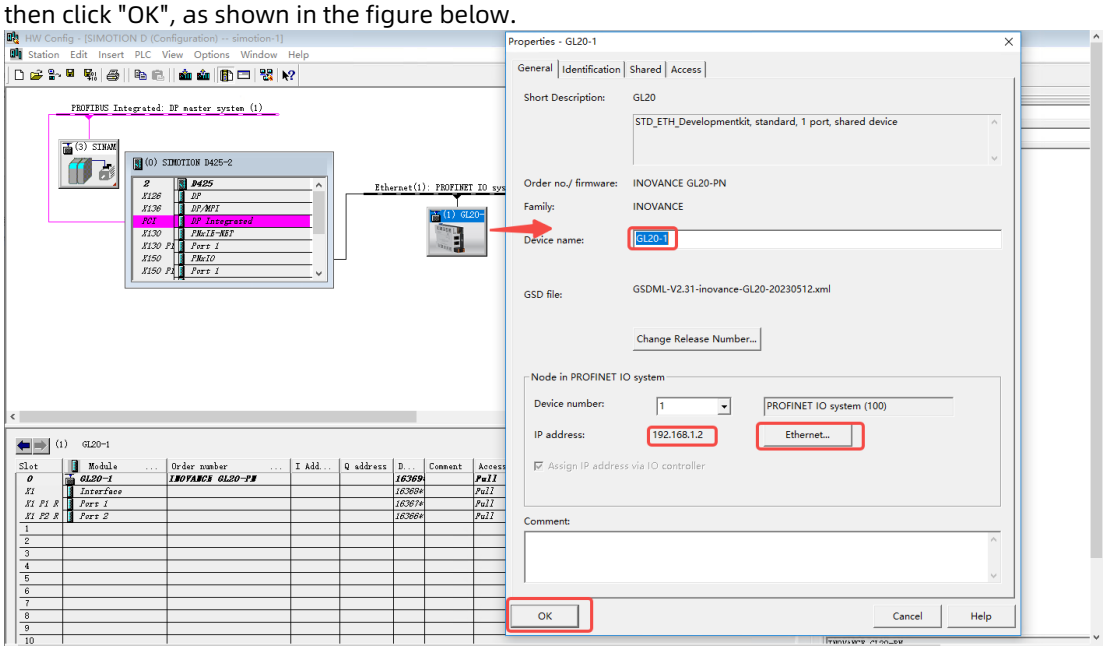


b. Double-click the GL20 series module in the right device list, or drag the GL20 series module to the "Ethernet (1): PROFINET IO system (100)" subnet to complete the configuration of the GL20-RTU-PN module.

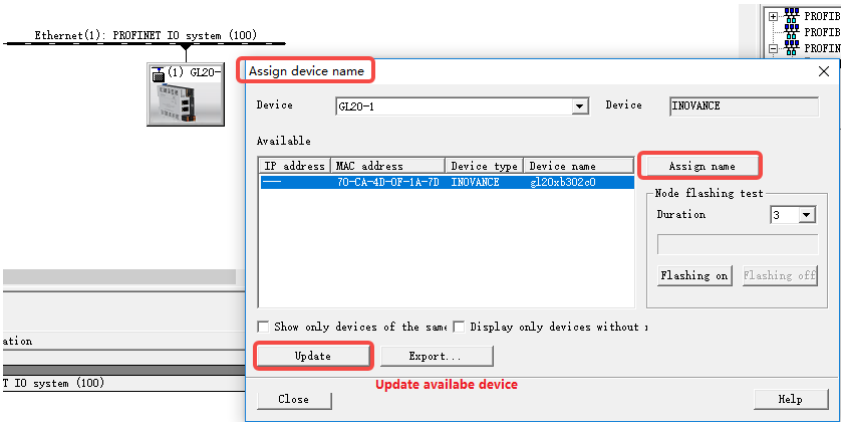


5. Modify the IP address and device name of the GL20-RTU-PN module, and assign the device name to the GL20-RTU-PN module.

   a. Double-click the configured GL20-RTU-PN module, modify the device name and IP address, then click "OK", as shown in the figure below.

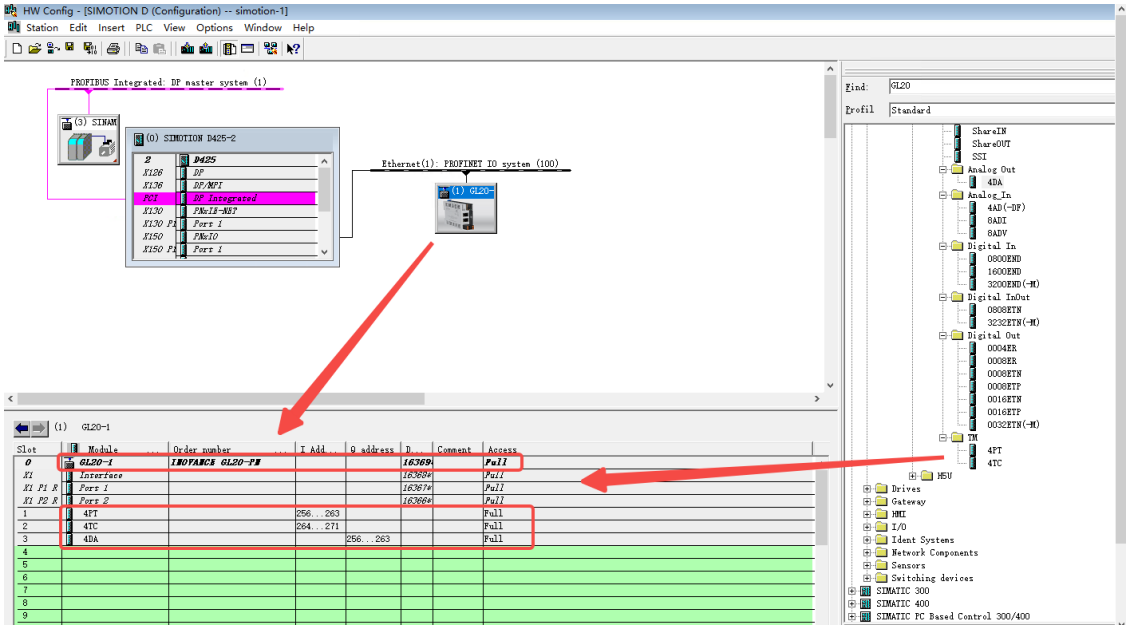


   b. In the "Hardware" configuration interface, navigate to the menu bar and select "PLC > EtherNet > Assign Device Name". In the opened window, click "Update", then select the device from the available device list and click "Assign name" to assign the device name, as shown in the figure below.



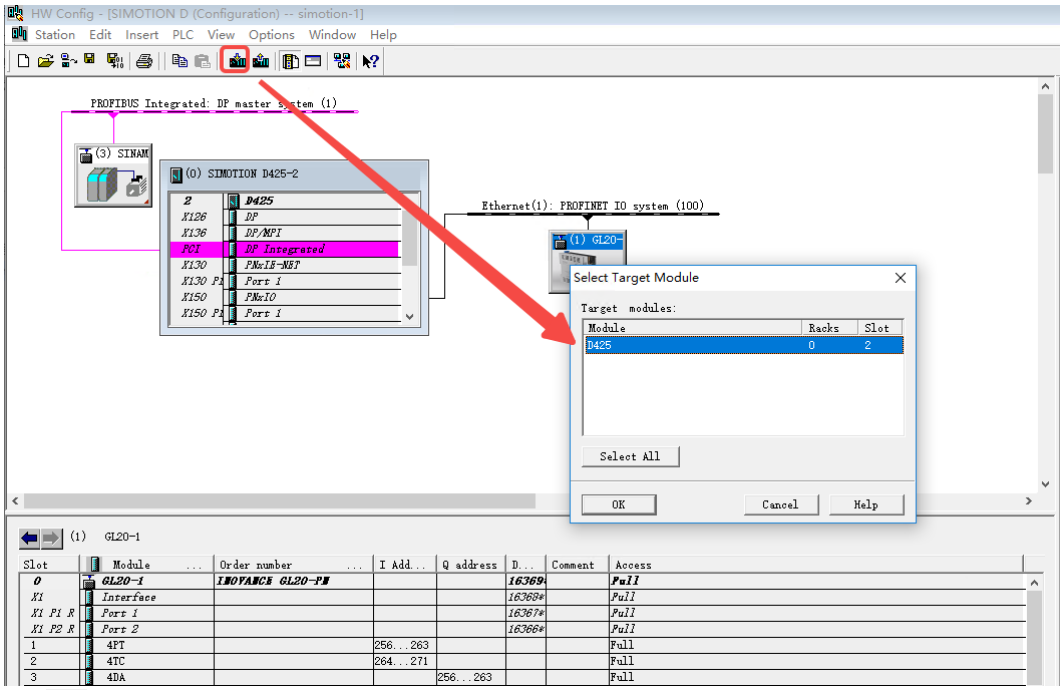
6. Configure the expansion module.

   In the "Hardware" configuration interface, click on the GL20-RTU-PN module, then sequentially double-click the expansion modules in the right device list according to the actual installation sequence to add them and automatically assign addresses, as shown in the figure below.



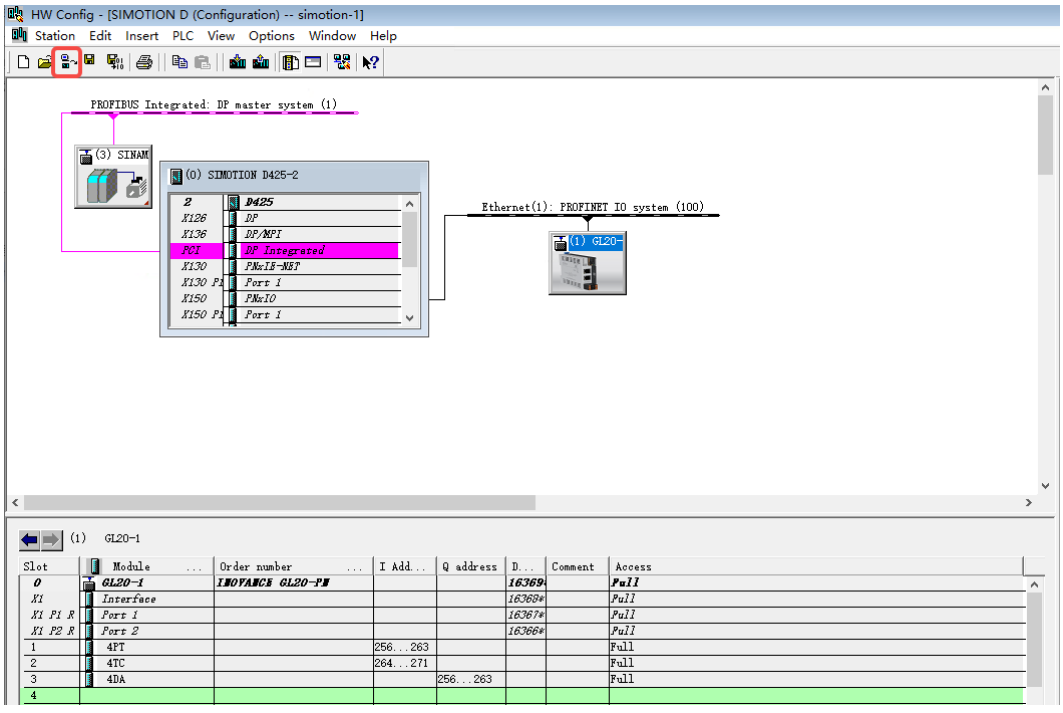
7. Download the configuration settings and perform online monitoring to verify the correctness of the configuration.

   a. Click  in the toolbar, select the corresponding PLC device in the opened dialog box, and click "OK" to download the configuration settings to the PLC, as shown in the figure below.



b. Click  to access the online monitoring configuration, as shown in the figure below.

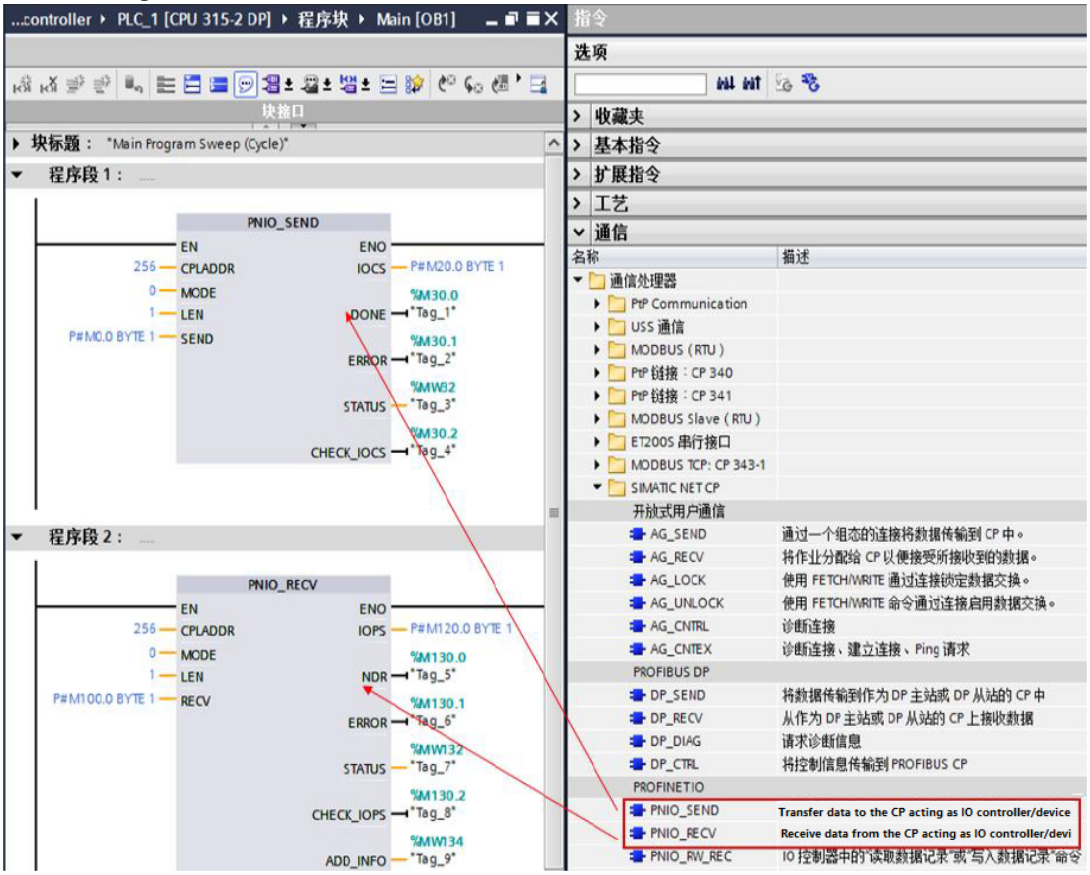
If the configuration shows no errors, it indicates that the GL20-RTU-PN module configuration is successful; otherwise, the configuration has failed. If the configuration fails, contact Inovance for technical support.



7.3.5 Precautions

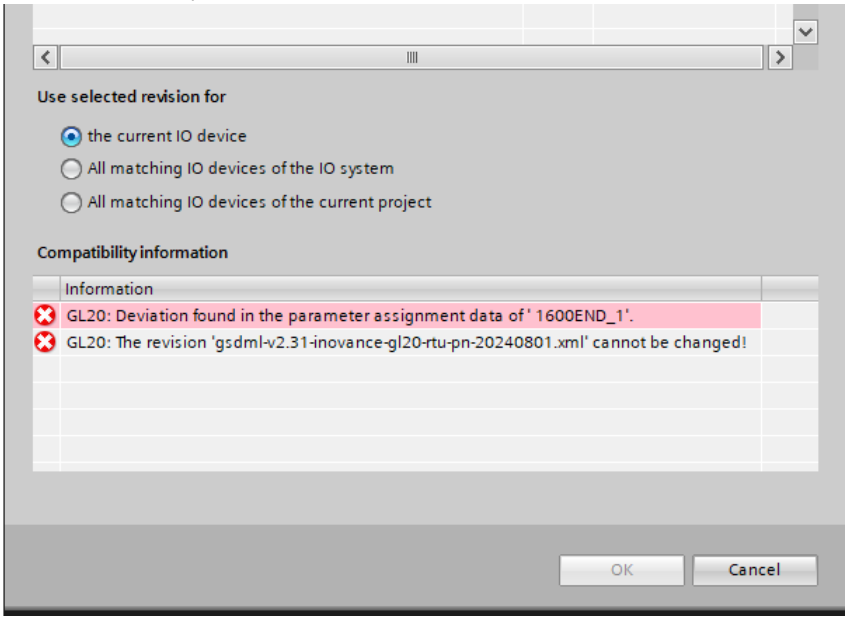
- When this product interfaces with the S7-300 series master and the CP343-1 Ethernet communication module, the PNIO_SEND(FC11) and PNIO_RECV(FC12) program blocks are

required, as shown in the figure below. The parameter configuration instructions are detailed in the following table.



Parameter	Variable Declaration	Data Type	Description
LEN	INPUT	INT	Indicates the length of the data area to be sent or received, which is measured in bytes, and always calculated starting from address 0 of the data area. • When the I or Q address of the first expansion module applicable to this product starts from 0, this parameter should be set according to the actual length of the last expansion module. For example, if the I address ranges from 0 to 9, then LEN should be set to 10. The same applies to the Q address. • When the I or Q address of the first expansion module applicable to this product does not start from 0, this parameter should be set according to the length calculated from the last expansion module's I or Q address starting at 0. For example, if the I address ranges from 68 to 83, then LEN should be set to 84. The same applies to the Q address.
SEND	IN_OUT	ANY	Indicates the data sending area, which is a peer data area with the expansion module, and used for data exchange between the S7-300 series master and the expansion modules. The format is: **P#Mx.0 BYTE y**, where x represents the starting address of the S7-300 series master data area, and y represents the length of the S7-300 series master data area, with the value of y being equal to the LEN value.
RECV	IN_OUT	ANY	Indicates the data receiving area, which is a peer data area with the expansion module, and used for data exchange between the S7-300 series master and the expansion modules. The format is: **P#Mx.0 BYTE y**, where x represents the starting address of the S7-300 series master data area, and y represents the length of the S7-300 series master data area, with the value of y being equal to the LEN value.

- For GSD file versions updated after 20240401, if encountering the issue shown in the figure below, it is necessary to delete the 1600END module from the corresponding configuration settings, update the GSD file, and then re-add the 1600END module.



8 Troubleshooting

8.1 Introduction

Troubleshooting aims to quickly identify faults during the operation of I/O modules and identify the corresponding solutions based on the fault information and status. This product and its expansion modules are integrated with the troubleshooting function, providing detailed diagnostic information for quickly detecting and resolving faults in the system. In industrial applications, using the troubleshooting function can minimize the probability of unexpected incidents.

This section covers troubleshooting methods, fault types, troubleshooting procedure, common fault cases, and a fault code list.

8.2 故障诊断方式

8.2.1 Diagnostics via LEDs

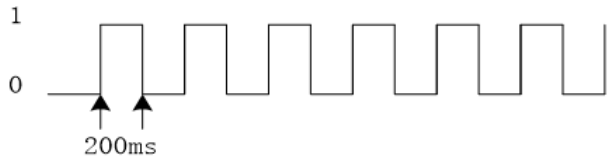
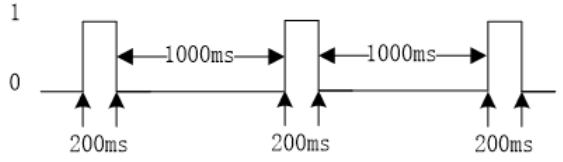
8.2.1.1 GL20-RTU-ECT32

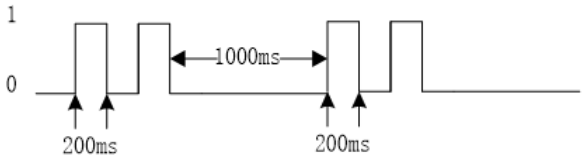
The product and the expansion modules are equipped with signal indicators, indicating the module status, including power supply, operation status, communication faults, and module faults.

Signal indicator status

The statuses of the signal indicators include: off, flashing, single flashing, double flashing, and solid on.

The definitions of the five statuses are shown in the following table.

Status	Icon
Off	
Flashing	
Single flashing	

Status	Icon
Double flashing	
Steady on	

Signal indicator function

The functions of signal indicators are shown in the following table.

LED Indicator	Function	Indicator Status	Description
PWR	Indicates the power supply status. It stays on when the module is connected to the 24 V power.	Off	The 24 V power supply is not connected or faulty.
		Steady green	The 24 V power supply is connected.
RUN	Indicates the status of EtherCAT communication state machine.	Off	The module is in the INIT state.
		Flashing green	The module is in the Pre-Operational state.
		Single flashing in green	The module is in the Safe-Operational state.
		Steady green	The module is in the Operational state.
ERR (BF)	Module communication fault status indicator indicates the faults of EtherCAT communication.	Off	EtherCAT communication is in normal state.
		Flashing red	EtherCAT receives status conversion instructions that cannot be executed
		Single flashing in red	The ECT communication interface module synchronization is faulty.
		Double flashing in red	A watchdog error occurs in EtherCAT communication.
SF	Module status indicator indicates the module fault status.	Off	The device is running properly.
		Flashing	• Configuration error • The EtherCAT port is disconnected. • Expansion module error

Troubleshooting via signal indicators

The following table lists the statuses, descriptions, and solutions for the signal indicators.

LED Indicator		Name	Solution
RUN	Off	The EtherCAT master station is not connected to the EtherCAT slave station.	• Check that the configuration and parameter assignment are correct. • Check that the communication address is correct. • Check that the length and other specifications of the network cable are as specified.
	Flas-hing	The EtherCAT slave station is in a non-OP state.	Check slave configuration for any missing, faulty or unconfigured module.
ERR	Flas-hing	No data exchange between EtherCAT master and slave	Check that the cable connector is inserted correctly.
		EtherCAT receives status conversion instructions that cannot be executed	Check that the network cable is intact.
		The EtherCAT module has a synchronization error.	Restart the power supply.
		A watchdog error occurs in EtherCAT communication.	Check whether the PDO configuration is correct.
SF	Flas-hing	Configuration error	Check that the host controller configuration is consistent with the module configuration.
		Expansion module error	Check whether the module is interfered with or not connected to the 24V power supply.

8.2.1.2 GL20-RTU-PN

The product and the expansion modules are equipped with signal indicators, indicating the module status, including power supply, operation status, communication faults, and module faults. See the following table for details.

LED Indicator Status		Description	Cause	Solution
ERR	Solid on (red)	Protocol stack failed to scan for modules	Expansion module does not exist	Check that the module is installed properly and supplied with power.
			No expansion module was scanned due to local bus communication failure.	Check the contact of the communication interface of the expansion module or restart the whole system
	Flashing (red)	• The number of I/O modules configured is more than the number of I/O modules actually scanned. • The number of I/O modules configured is less than the number of I/O modules actually scanned. • The type of I/O modules configured is inconsistent with that of the I/O modules actually scanned.	The actual slot of the expansion module is inconsistent with the configuration.	Check the number and installation sequence of expansion modules.
			The local bus communication failure causes that the module scanned is inconsistent with the configuration.	Check the contact of the communication interface of the expansion module or restart the whole system
		Share IN/Share OUT module position or number error	The Share IN or Share OUT module should be placed at the end of the module list. Only one Share IN module and one Share OUT module are allowed.	Check the slot or number of Share IN or Share OUT modules.
SF	Solid on (red)	• The I/O module is not configured successfully. • Switching I/O module status failed	The local bus communication failure causes an error when the master module interacts with the expansion module.	Check the contact of the communication interface of the expansion module or restart the whole system
		The I/O module is offline.	I/O module is powered off or unplugged	Check if the module is powered off or removed from the slot.
			The error occurs due to high frame loss rate of local bus communication.	Check the contact of the communication interface of the expansion module or restart the whole system

LED Indicator Status		Description	Cause	Solution
SF	Flashing (red)	The power supply voltage is too high.	Unstable power supply to the module or power failure	Check the power supply of the module.
		The power supply voltage is too low.		
		The external 24 V power supply fails.		
		The chip is overheating.	DAC device temperature is too high	1 .Check whether the module hardware is faulty. 2 .Replace the module.
		The ADC of the module malfunctions.	ADC device failure	
		The DAC of the module malfunctions.	DAC device failure	
		The reference channel is faulty.	TC module cold end sampling channel failure	1 .Check the cold junction channel hardware of the thermocouple (TC) module. 2 .Replace the module.
		Channel x disconnected	Analog channel wiring disconnected	1 .Check the external wiring of the module channel. 2 .In case of no external wiring error, check the internal hardware of the module or replace the module.
		Channel x shorted	Analog channel wiring shorted	
		Channel x data exceeds upper limit	Channel data is abnormal and out of normal range.	Check whether the external input signal of module is abnormal
		Channel x data exceeds lower limit		
		Channel x data overflow		
		Channel x data underflow		

8.2.1.3 GL20-RTU-EIP

The product and the expansion modules are equipped with signal indicators, indicating the module status, including power supply, operation status, communication faults, and module faults. See the following table for details.

LED Indicator		Name	Solution
RUN	Flashing	EIP connection not established	• Check that the network parameters (IP address, subnet mask, and gateway) are configured correctly. • Check the configured input/output data size and the configuration parameters sent down to the module. • Check whether the specifications and length of the network cable meet the requirements.
ERR	Flashing	A recoverable fault such as RPI timeout occurs.	• Check that the cable connector is inserted correctly. • Check that the network connection is stable.
	Steady on	An unrecoverable fault such as Ethernet hardware initialization failure occurs.	• Check that the cable connector is inserted correctly. • Check that the network cable is intact. • Restart the power supply.
SF	Flashing	Module error	Troubleshoot the error.

8.2.2 Troubleshooting via Programming Software

8.2.2.1 Troubleshooting via Inovance AutoShop

Introduction

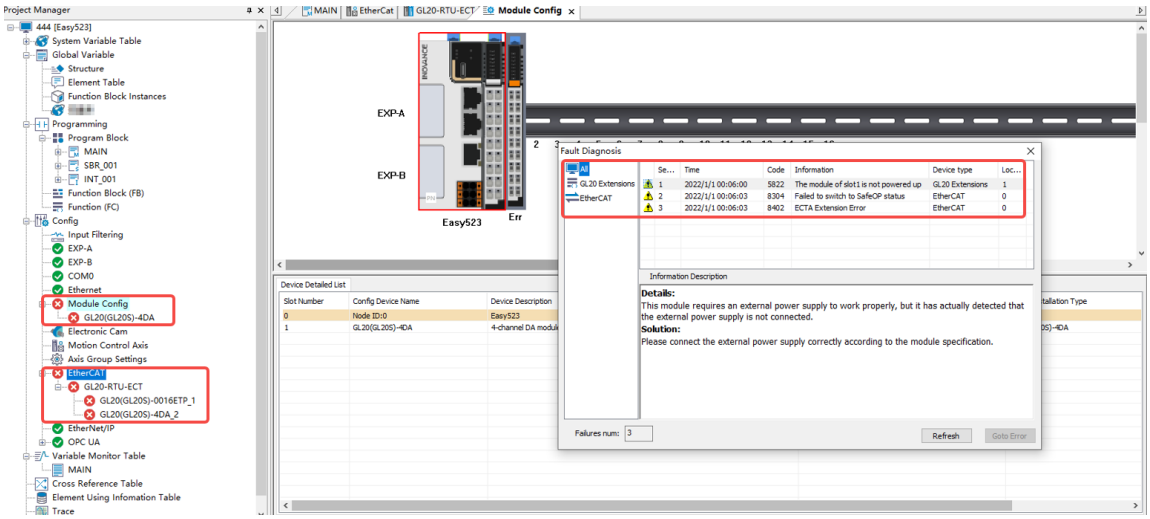
The steps to troubleshoot the GL20-RTU-EIP and GL20-RTU-ECT32 modules and their expansion modules through Inovance AutoShop software are the same. The following takes GL20-RTU-ECT32 as an example.

Caution

- This function is supported in H5U with firmware version 6.2.0.0 and later.
- This function is supported in Easy with firmware version 6.3.0.0 and later.

The fault information of this product and the expansion modules can be viewed through the "Failure status" indicator in the status bar or through "Debug (D) > System Run Log View" in the menu bar.

When this product or the expansion modules are faulty, a red cross icon will appear on the "EtherCAT" node in the "Project Manager" navigation tree on the left, and the "Failure status" indicator in the status bar will display a yellow background, as shown below.

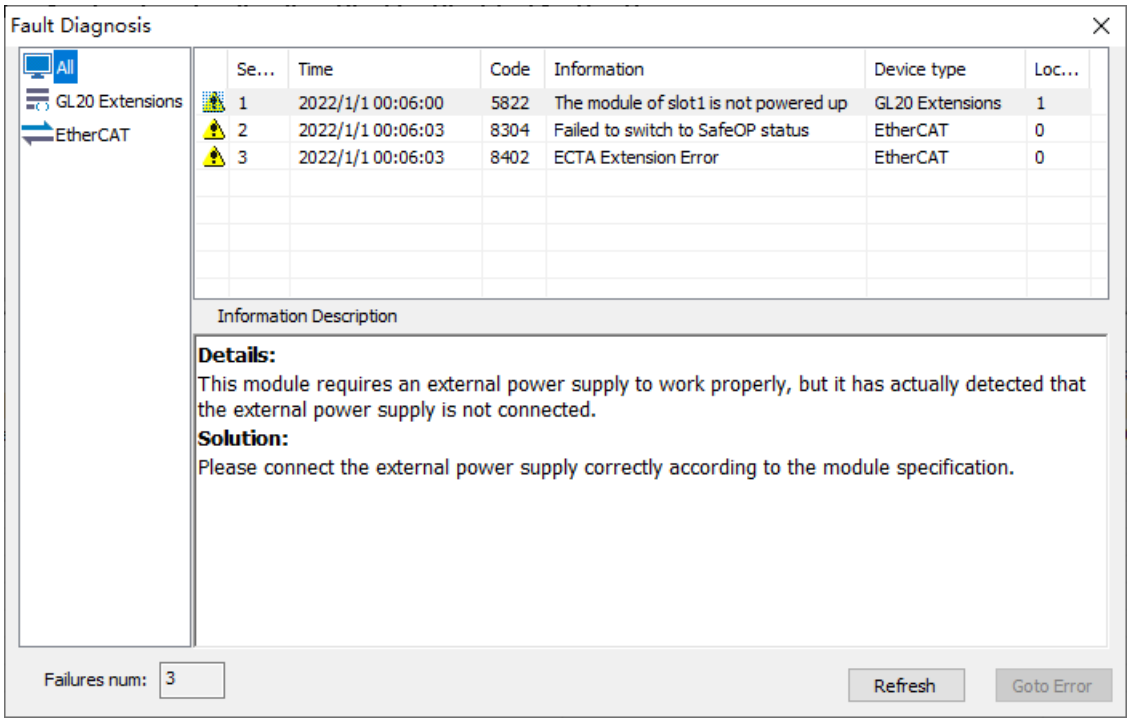


Prerequisites

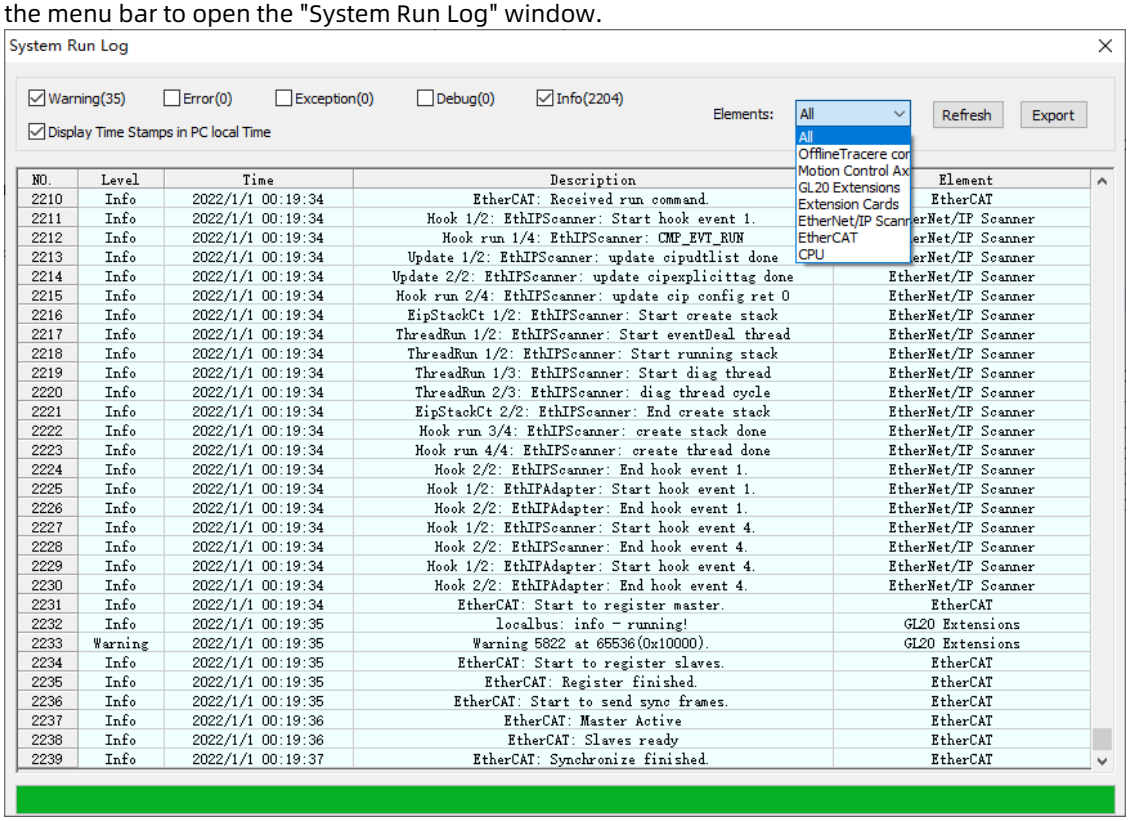
- This product is connected to a PC equipped with AutoShop programming software and the PLC host via a network cable.
- The device is powered on and started.

Procedure

1. Double-click "Failure status" in the status bar to open the "Fault Diagnosis" dialog box, as shown below.

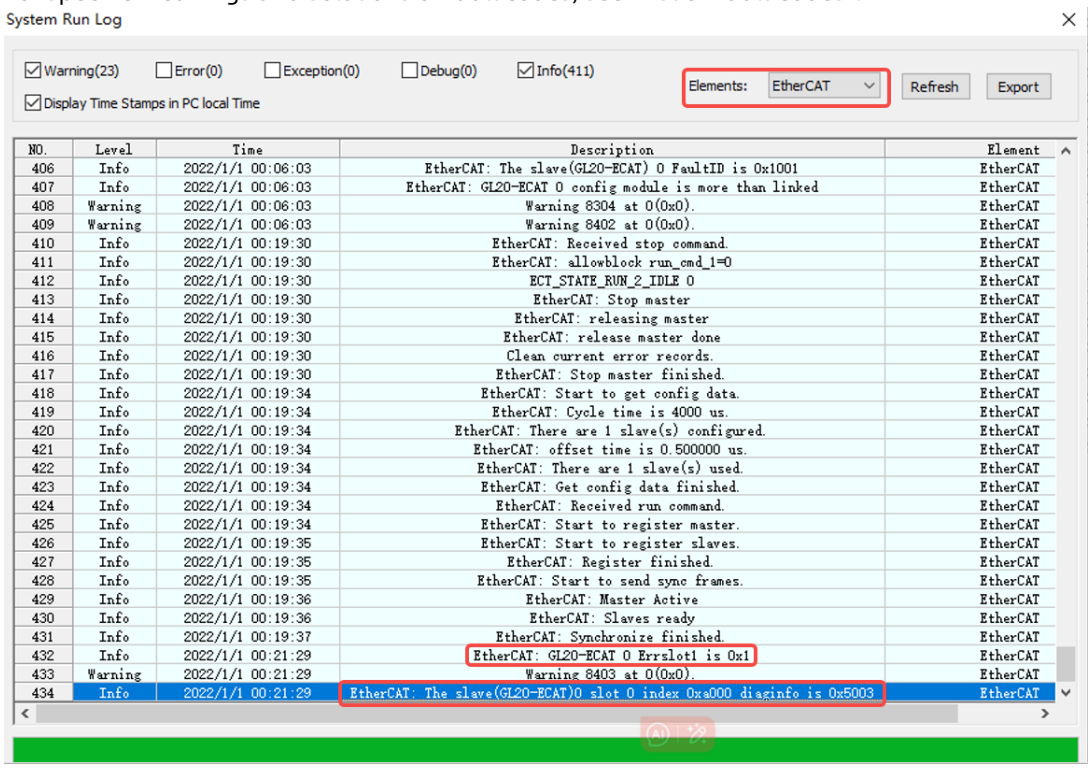


2. Click a fault message, and the detailed fault information and solution will be displayed at the bottom of the dialog box. Troubleshoot according to the solution.
3. (Optional) To view more detailed fault information, select "Debug (D) > System Run Log View" in the menu bar to open the "System Run Log" window.



4. Select "EtherCAT" for "Elements" to view EtherCAT component log information. The log includes fault codes, slave location, fault slot, and diagnostic information. The following figure shows an example of fault information analysis.

- "GL20-ECAT 0" indicates that the faulty module is in the 1st communication interface module, where "0" indicates the position of the communication interface module starting from 0.
- "0x2" indicates the module in the second slot is faulty. Converting "0x2" to binary yields "10", where each bit corresponds to an expansion module in an inverted order (meaning the last bit represents the 1st expansion module). In the binary representation, "0" indicates no fault and "1" indicates faulty.
- "Warning 8403 at 0(0x0)" indicates that the extension module connected to the GL20-RTU-ECT32 communication port module failed.
- "slot 1" indicates that the module in the first slot is faulty, with module positions counted starting from 0.
  I/O expansion module faults can indicate faults in both channels and modules. "Suindex 0x3" indicates a fault in the second channel and "Suindex 0x5" indicates a fault in the fourth channel. Channel positions are generally counted starting from channel 0x2.
- "0x5003" indicates a module fault code, which means an external 24 V power supply failure. For specific meanings and solutions of fault codes, see "List of Fault Codes".



NO.	Level	Time	Description	Element
406	Info	2022/1/1 00:06:03	EtherCAT: The slave(GL20-ECAT) 0 FaultID is 0x1001	EtherCAT
407	Info	2022/1/1 00:06:03	EtherCAT: GL20-ECAT 0 config module is more than linked	EtherCAT
408	Warning	2022/1/1 00:06:03	Warning 8304 at 0(0x0).	EtherCAT
409	Warning	2022/1/1 00:06:03	Warning 8402 at 0(0x0).	EtherCAT
410	Info	2022/1/1 00:19:30	EtherCAT: Received stop command.	EtherCAT
411	Info	2022/1/1 00:19:30	EtherCAT: allowblock run_cmd_1=0	EtherCAT
412	Info	2022/1/1 00:19:30	ECT_STATE_RUN_2_IDLE 0	EtherCAT
413	Info	2022/1/1 00:19:30	EtherCAT: Stop master	EtherCAT
414	Info	2022/1/1 00:19:30	EtherCAT: releasing master	EtherCAT
415	Info	2022/1/1 00:19:30	EtherCAT: release master done	EtherCAT
416	Info	2022/1/1 00:19:30	Clean current error records.	EtherCAT
417	Info	2022/1/1 00:19:30	EtherCAT: Stop master finished.	EtherCAT
418	Info	2022/1/1 00:19:34	EtherCAT: Start to get config data.	EtherCAT
419	Info	2022/1/1 00:19:34	EtherCAT: Cycle time is 4000 us.	EtherCAT
420	Info	2022/1/1 00:19:34	EtherCAT: There are 1 slave(s) configured.	EtherCAT
421	Info	2022/1/1 00:19:34	EtherCAT: offset time is 0.500000 us.	EtherCAT
422	Info	2022/1/1 00:19:34	EtherCAT: There are 1 slave(s) used.	EtherCAT
423	Info	2022/1/1 00:19:34	EtherCAT: Get config data finished.	EtherCAT
424	Info	2022/1/1 00:19:34	EtherCAT: Received run command.	EtherCAT
425	Info	2022/1/1 00:19:34	EtherCAT: Start to register master.	EtherCAT
426	Info	2022/1/1 00:19:35	EtherCAT: Start to register slaves.	EtherCAT
427	Info	2022/1/1 00:19:35	EtherCAT: Register finished.	EtherCAT
428	Info	2022/1/1 00:19:35	EtherCAT: Start to send sync frames.	EtherCAT
429	Info	2022/1/1 00:19:36	EtherCAT: Master Active	EtherCAT
430	Info	2022/1/1 00:19:36	EtherCAT: Slaves ready	EtherCAT
431	Info	2022/1/1 00:19:37	EtherCAT: Synchronize finished.	EtherCAT
432	Info	2022/1/1 00:21:29	EtherCAT: GL20-ECAT 0 Errslot1 is 0x1	EtherCAT
433	Warning	2022/1/1 00:21:29	Warning 8403 at 0(0x0).	EtherCAT
434	Info	2022/1/1 00:21:29	EtherCAT: The slave(GL20-ECAT)0 slot 0 index 0xa000 diaginfo is 0x5003	EtherCAT

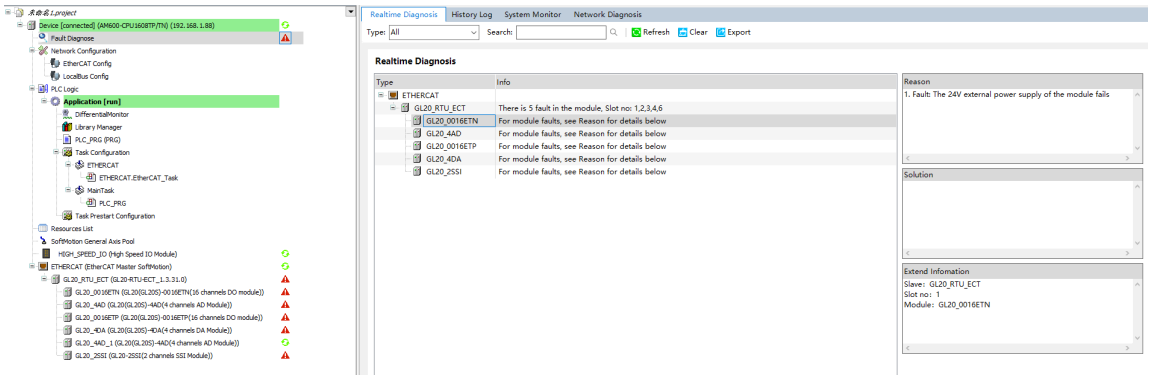
8.2.2.2 Troubleshooting via Inovance InoProShop

Introduction

The steps to troubleshoot the GL20-RTU-EIP and GL20-RTU-ECT32 modules and their expansion modules through Inovance InoProShop software are the same. The following takes GL20-RTU-ECT32 as an example.

The fault information of this product and the expansion modules can be viewed through the real-time diagnosis function and through the relevant object dictionary via the online CoE function.

When this product and the expansion modules are faulty, a fault icon appears on the right side of the "Devices" navigation tree. Hovering the mouse over the icon will display the fault information. Double-clicking the fault icon will navigate to the "Realtime Diagnosis" interface and automatically locate the corresponding fault, as shown below.



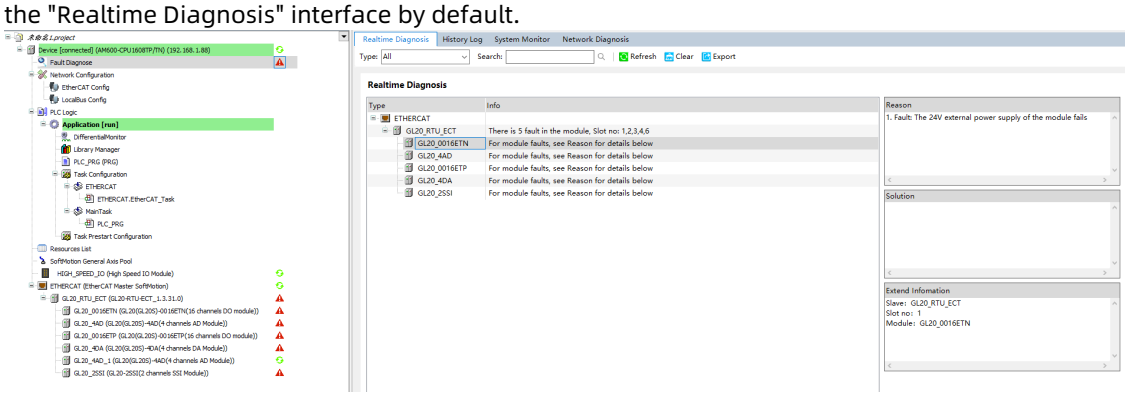
Prerequisites

- This product is connected to a PC equipped with InoProShop programming software and the PLC host via a network cable.
- The device is powered on and started.

Procedure

Method 1: Through real-time diagnosis function

1. In the "Devices" navigation tree on the left, double-click "Fault Diagnose" or the fault icon to open the "Realtime Diagnosis" interface by default.

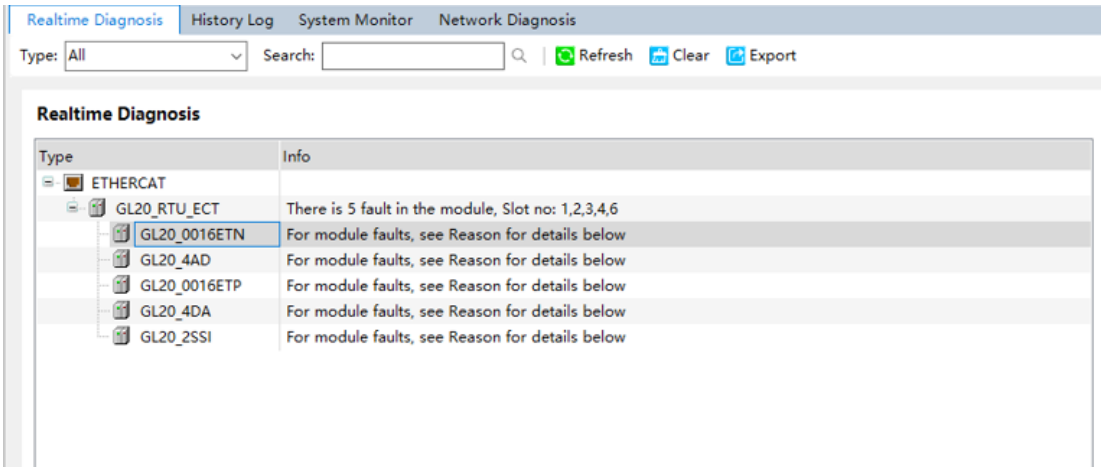


2. Filter the modules to display the required fault information.

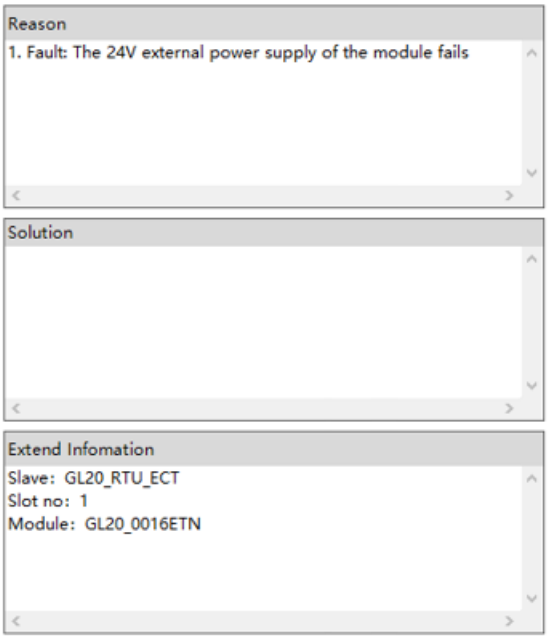
   a. Select the fault type in the "Type" drop-down box. Options include all (default), CPU module, Modbus module, ModbusTCP module, local module, and EtherCAT module.

   b. Enter a keyword for a module name or fault information in the "Search" box, and click the search button on the right.

   The fault information list will be displayed based on the module type or filter keyword. Module fault information includes module type, fault information, and operation.



3. Click a record and the corresponding information (including "Reason", "Solution", and "Extend Information") is displayed on the right of the interface. Follow the diagnostic information to troubleshoot the fault.

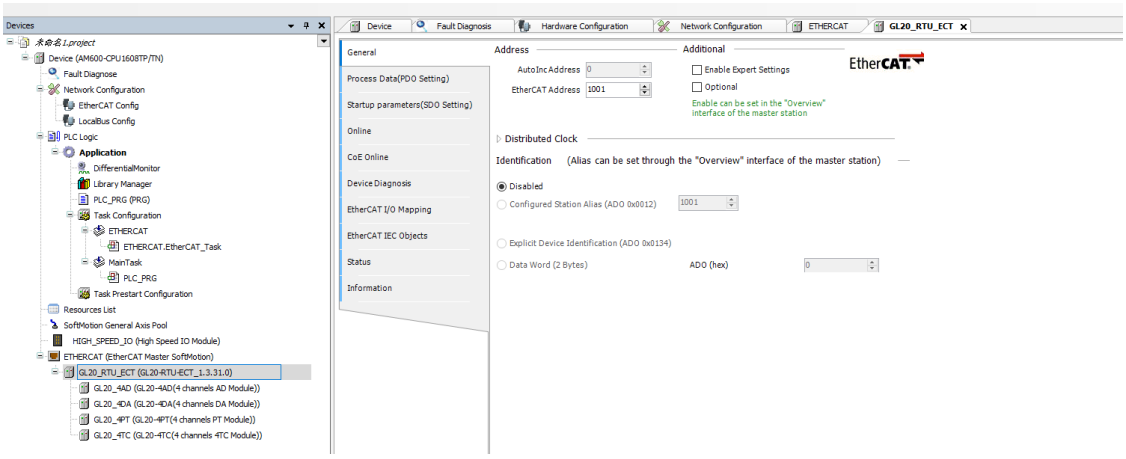


Note

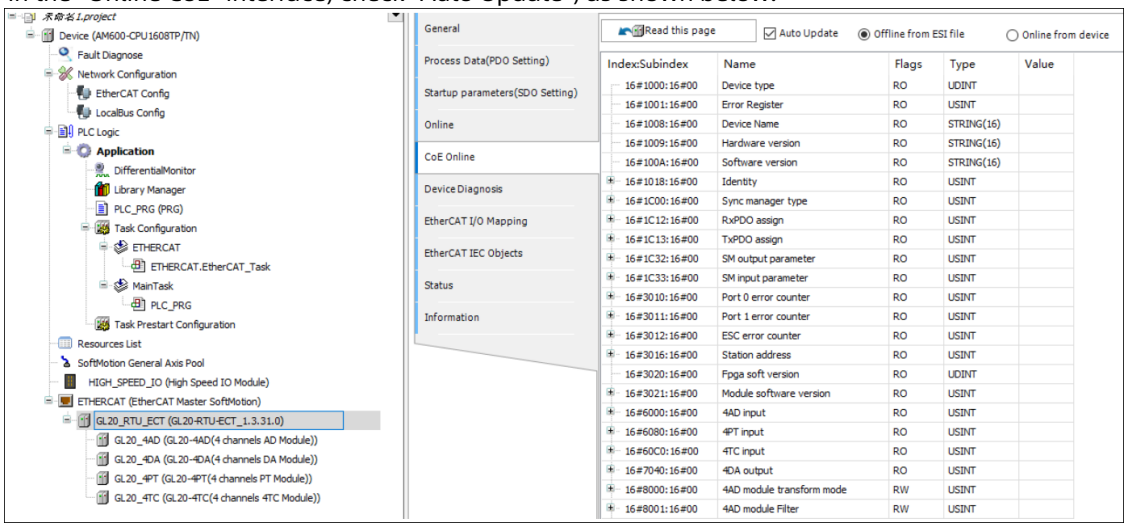
EtherCAT-related faults will trigger an entry to the overview. Click the entry to navigate to the overview page, where you can view the operating status and related faults of all slaves.

Method 2: Through relevant object dictionary via online CoE

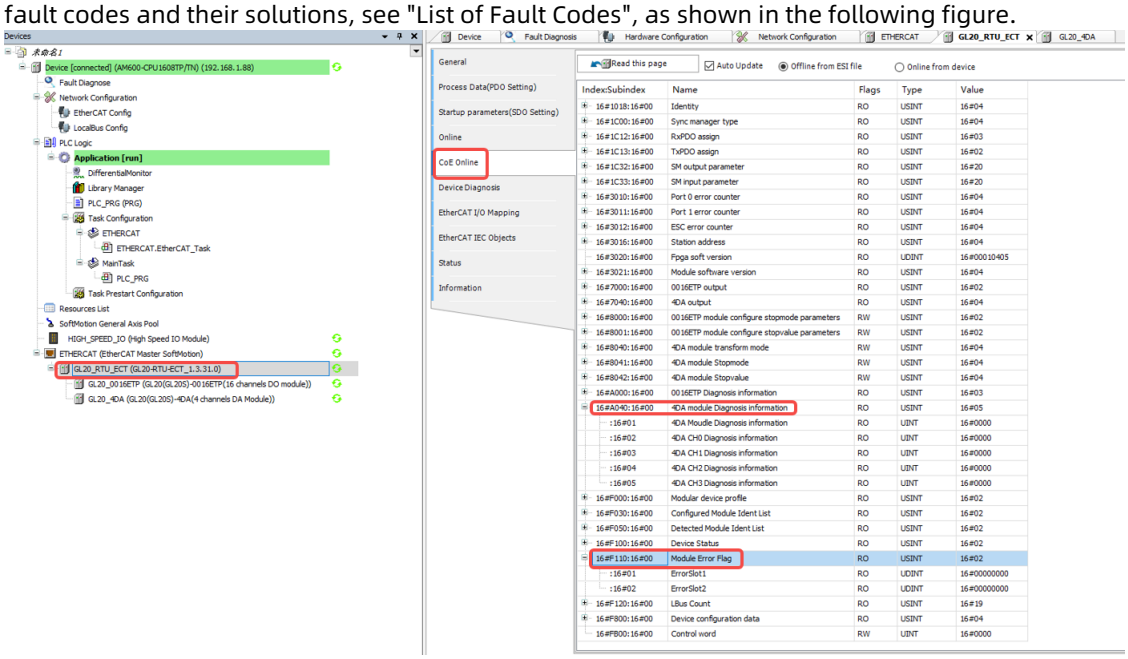
1. In the "Devices" navigation tree on the left, double-click "GL20_RTU_ECT32" under the "EtherCAT_C" node to open the configuration interface.



2. In the "Online CoE" interface, check "Auto Update", as shown below.



3. Expand the subindex to view the object dictionaries 0xF100 and 0xF110 (manufacturer parameter object dictionary) and the diagnostic object dictionary 0xAnnn of the expansion module (For details, see "Appendix 4: Expansion Module Object Dictionary Definition"). For the meaning of the fault codes and their solutions, see "List of Fault Codes", as shown in the following figure.



8.2.2.3 Troubleshooting via Omron Sysmac Studio

Introduction

The steps to troubleshoot the GL20-RTU-EIP and GL20-RTU-ECT32 modules and their expansion modules through Omron Sysmac Studio software are the same. The following takes GL20-RTU-ECT32 as an example.

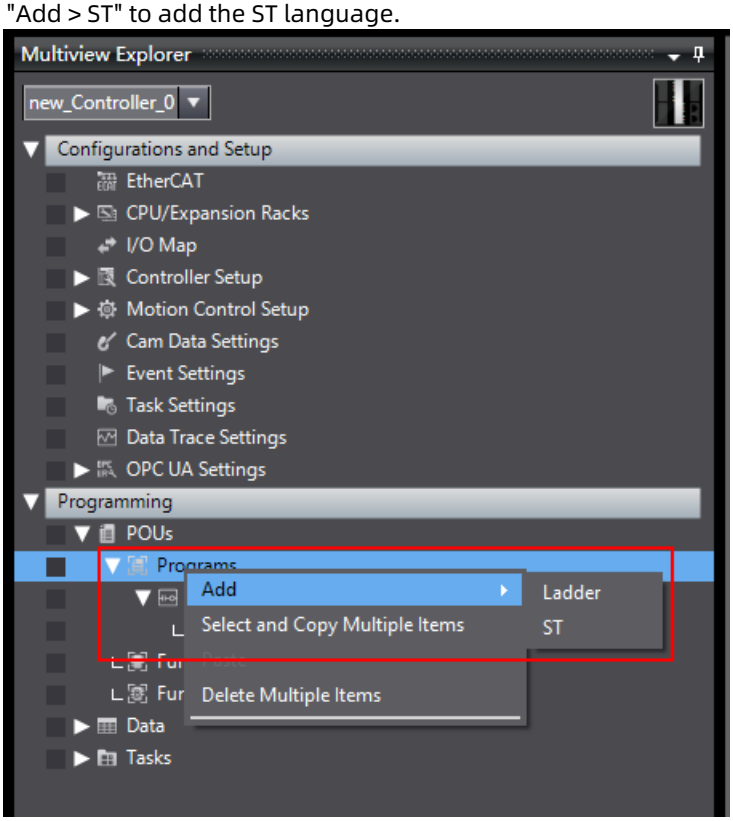
When using Omron PLC to troubleshoot this product, relevant function blocks are required to obtain fault information.

Prerequisites

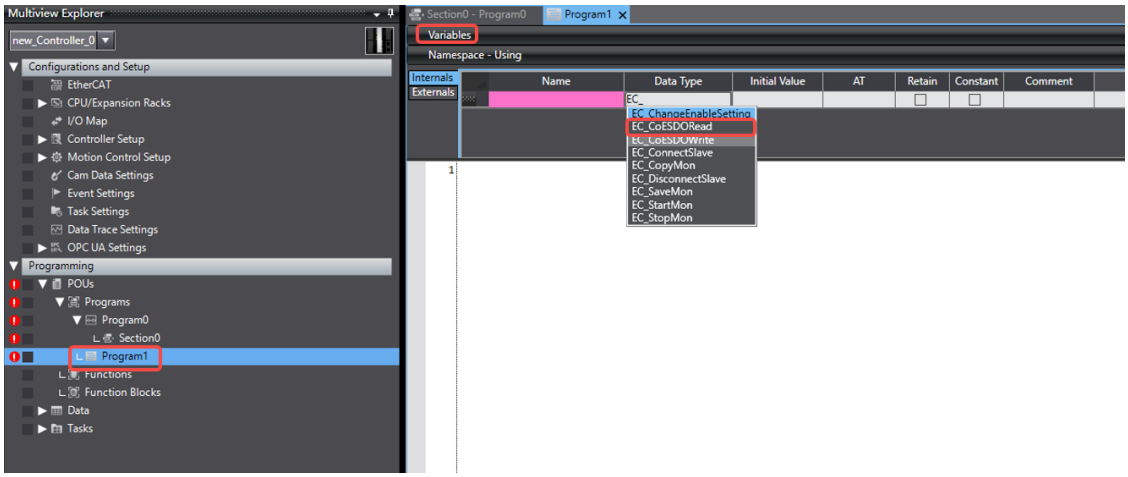
- This product is connected to a PC equipped with Sysmac Studio programming software and the PLC host via a network cable.
- The device is powered on and started.

Procedure

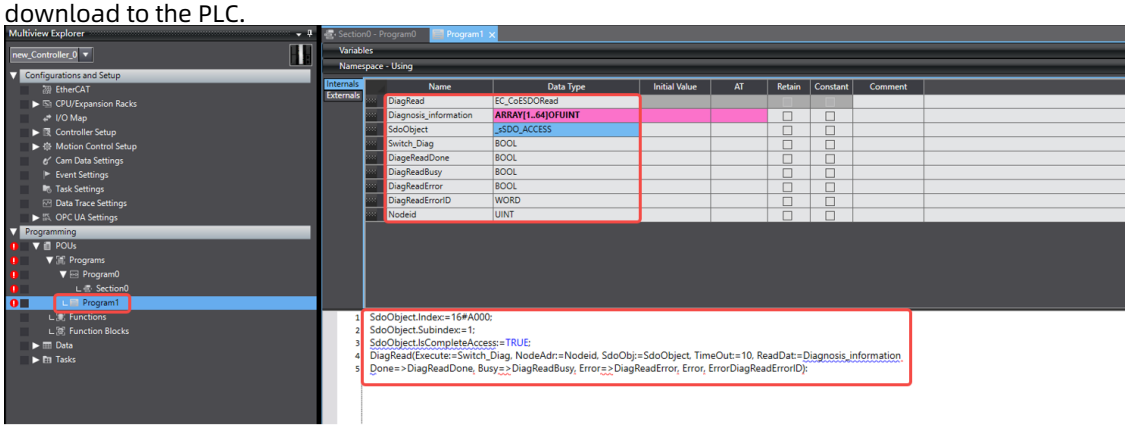
1. In the "Multiview Explorer" navigation tree on the left, click "Programs" under "Programming > POUs" and select "Add > ST" to add the ST language.



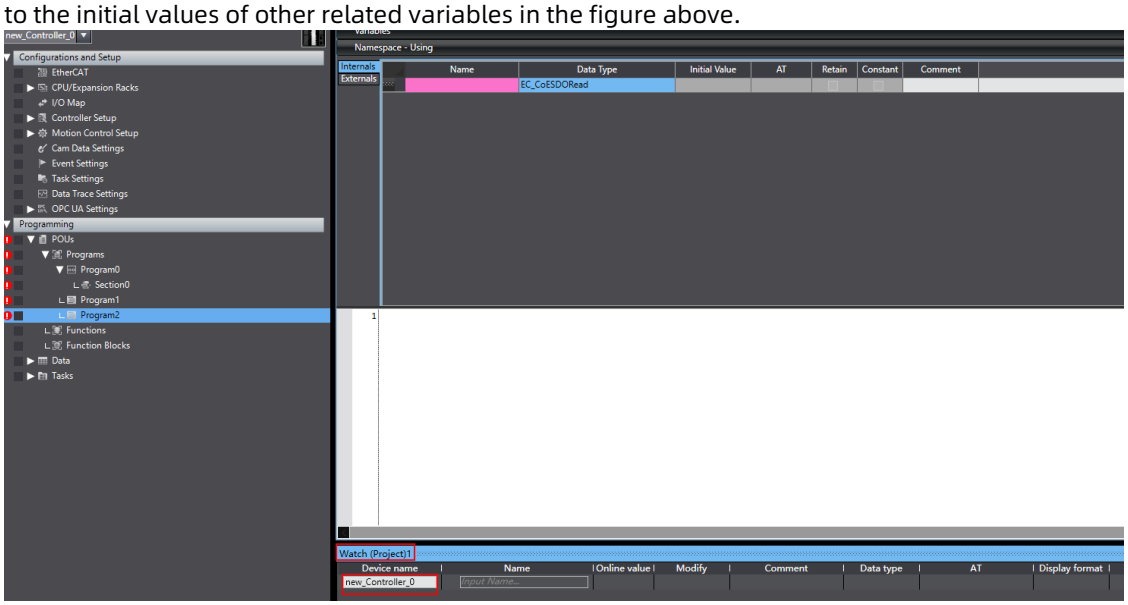
2. Double-click "Program 0", click "Variables", and create a variable of data type "EC_CoESDORead", as shown below.



3. Referring to the variable format in the following figure, create the relevant variables and download to the PLC.



4. Click "Watch (Project)" at the bottom of the interface, and set the value of the "ReadDat" variable as the monitoring target to reflect the fault codes of the currently selected object dictionary. Refer to the initial values of other related variables in the figure above.

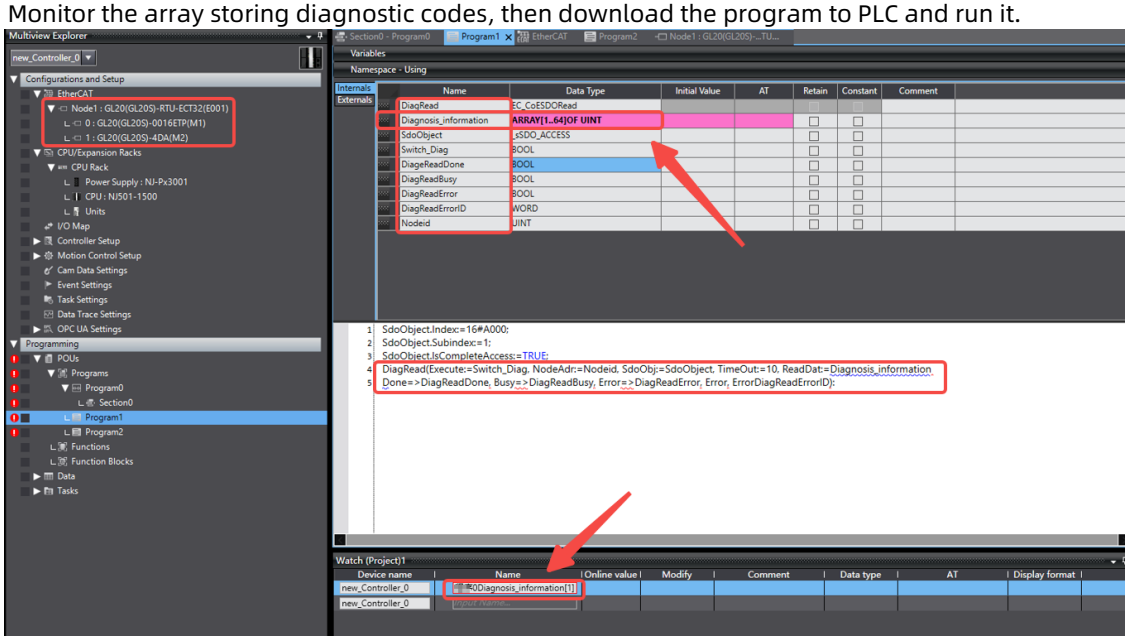


5. Create the relevant function block variables and write to the corresponding object dictionary index and values.

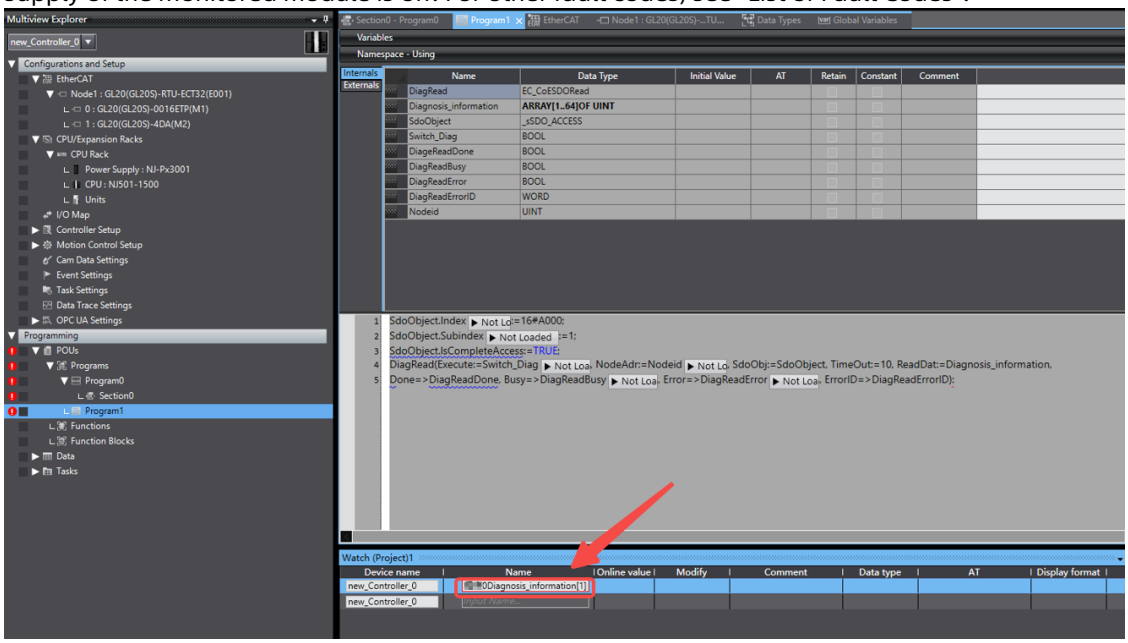
Note

The index of the object dictionary is determined based on the number of modules connected after the EtherCAT communication interface module.

6. Monitor the array storing diagnostic codes, then download the program to PLC and run it.



7. After the PLC is operating normally, if a module under monitoring is faulty, the relevant fault code will be displayed. The following figure shows the fault code 0x5003, indicating that the 24 V power supply of the monitored module is off. For other fault codes, see "List of Fault Codes".



8.2.2.4 Troubleshooting via Beckhoff TwinCAT

Introduction

The steps to troubleshoot the GL20-RTU-EIP and GL20-RTU-ECT32 modules and their expansion modules through Beckhoff TwinCAT software are the same. The following takes GL20-RTU-ECT32 as an example.

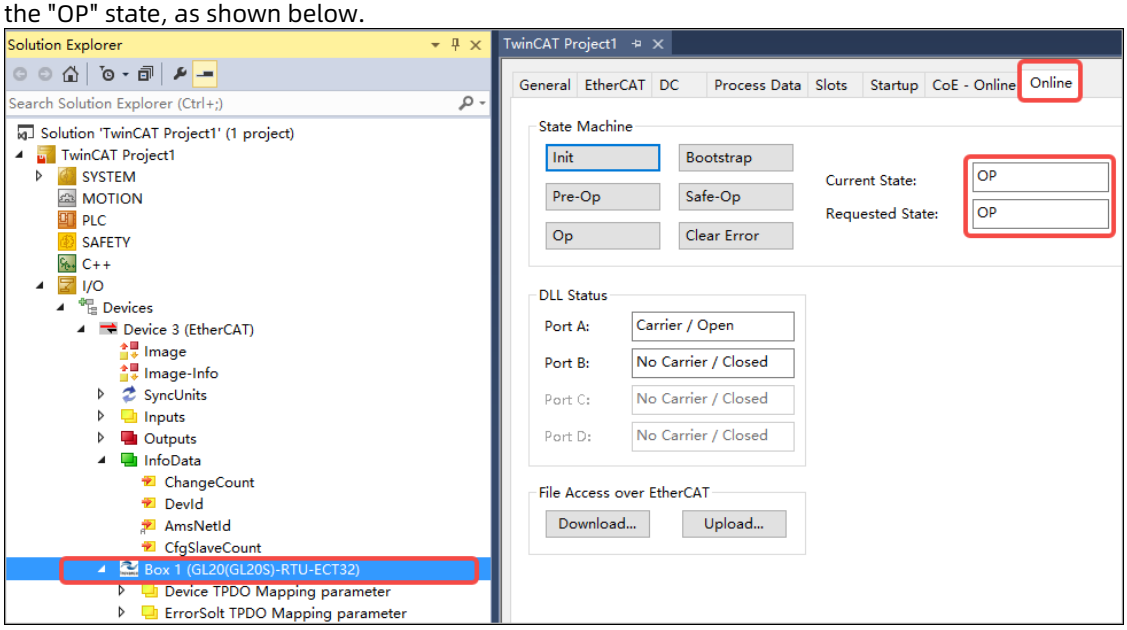
When using Beckhoff PLC to troubleshoot this product, the corresponding module fault codes can be obtained through the online CoE function, with no need to create other variables.

Prerequisites

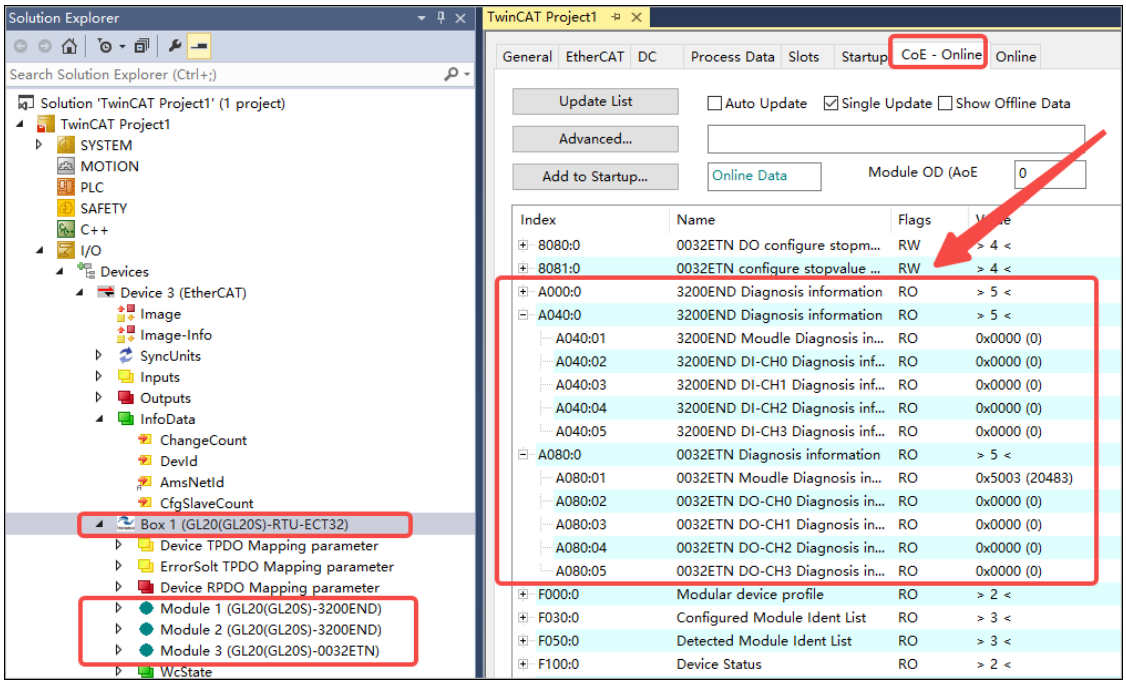
- This product is connected to the PC equipped with TwinCAT software and the PLC host via a network cable
- The device is powered on and started.

Procedure

1. In the "Solution Explorer" navigation tree on the left, double-click the "GL20-RTU-ECT32" communication interface module. In the "Online" interface, ensure that the module is currently in the "OP" state, as shown below.



2. Click "CoE - Online" to view the object dictionaries 0xF100 and 0xF110, and the diagnostic object dictionary 0xAnnn of the expansion module. Expand the object dictionary items to view the fault codes of the current module. For the meaning of the fault codes and their solutions, see "List of Fault Codes".



8.2.2.5 Troubleshooting via Siemens TIA Portal

Introduction

The troubleshooting steps for the GL20-RTU-PN module and its I/O expansion modules are identical. This section takes GL20-RTU-PN as an example.

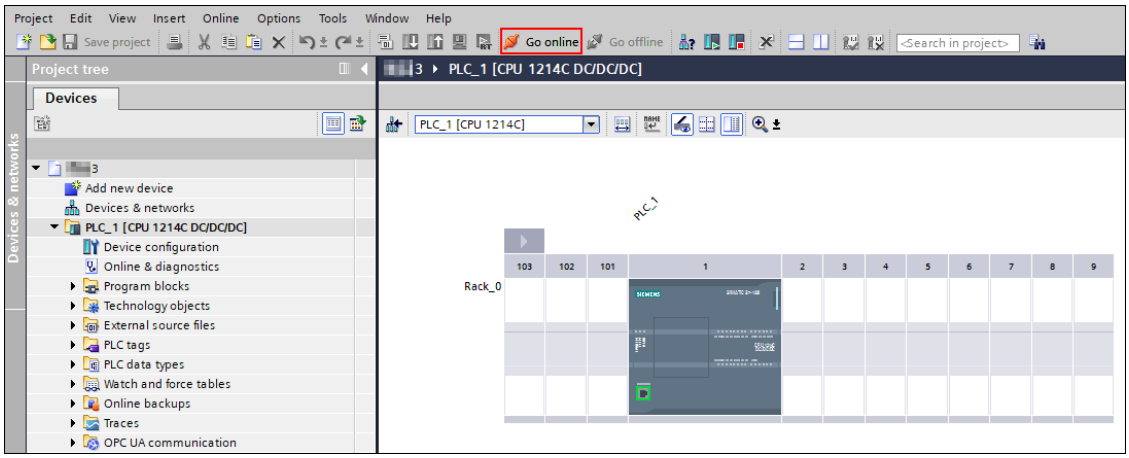
After the product and expansion modules are successfully configured and running, view the fault information of the communication interface module, expansion I/O module, and PLC in TIA Portal under "Online & diagnostics > Diagnostics buffer".

Prerequisites

- This product is connected to a PC equipped with Siemens TIA Portal software and a Siemens S7 series master via network cables.
- The device is powered on and started.

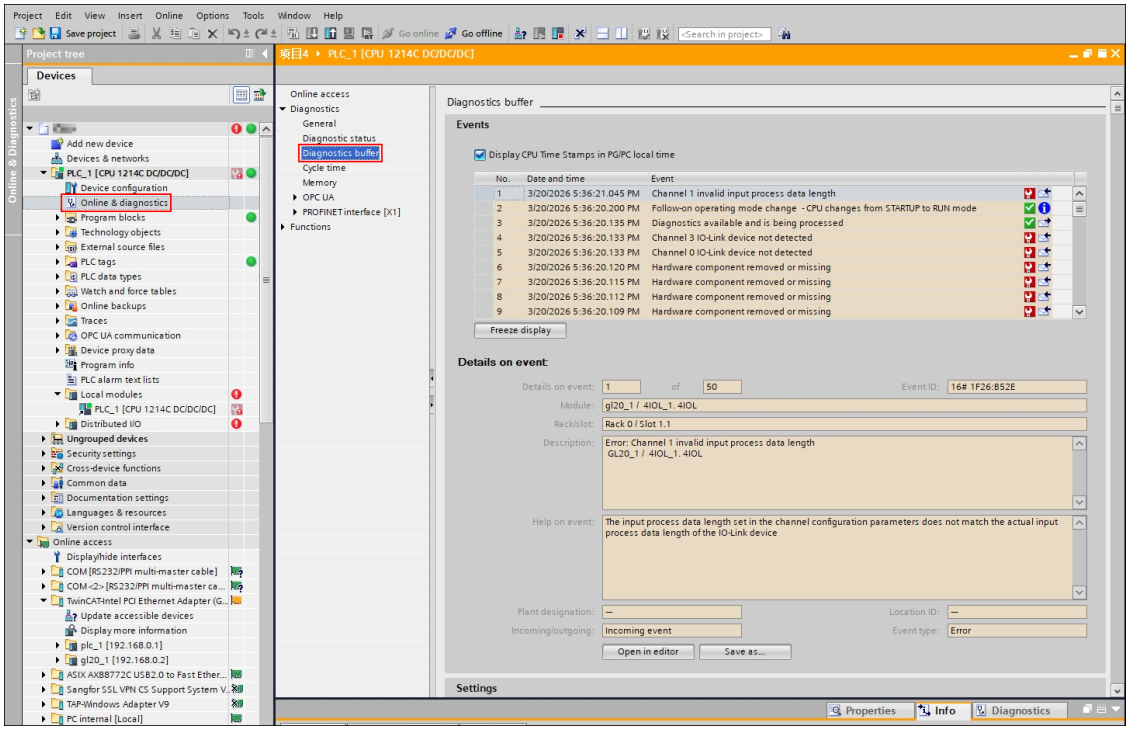
Procedure

1. In the TIA Portal toolbar, click "Go online" to ensure the software is connected to the device.



2. In the device tree on the left, click "Online & diagnostics". Select "Diagnostics > Diagnostics buffer" to view diagnostic event information, including events and details on events.

   - Events: Displays all error information of the communication interface module, expansion I/O modules, and PLC.
   - Details on events: Click an event in the "Events" pane to view its details, including event number, event ID, module, rack/slot, description, and help information.



8.2.2.6 Troubleshooting via Inovance IOManager

Introduction

The steps to troubleshoot the GL20-RTU-EIP, GL20-RTU-ECT32, and GL20-RTU-PN modules and their expansion modules through Inovance IOManager software are the same. The following takes GL20-RTU-ECT32 as an example.

The IOManager configuration tool can be used to obtain the corresponding fault codes of the communication interface module and expansion modules.

Caution

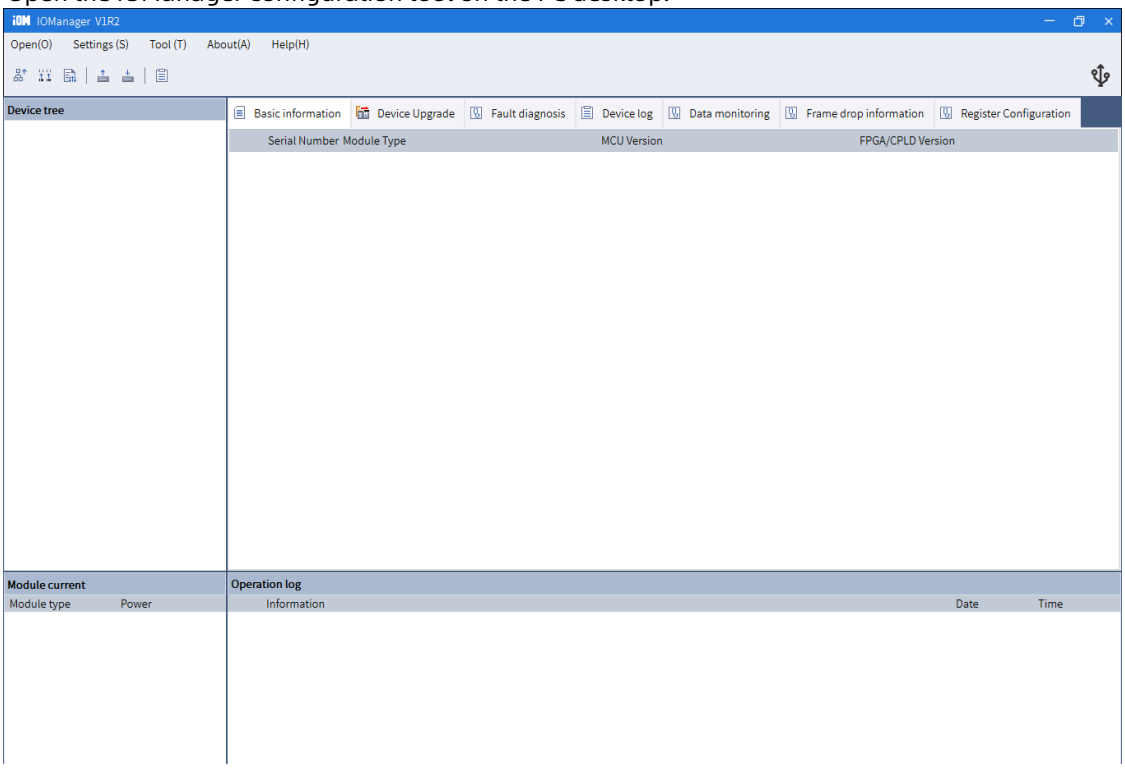
The troubleshooting function of the IOManager serves only as an auxiliary tool. It is necessary to identify the specific faulty module beforehand, then check the corresponding fault code to obtain the specific information.

Prerequisites

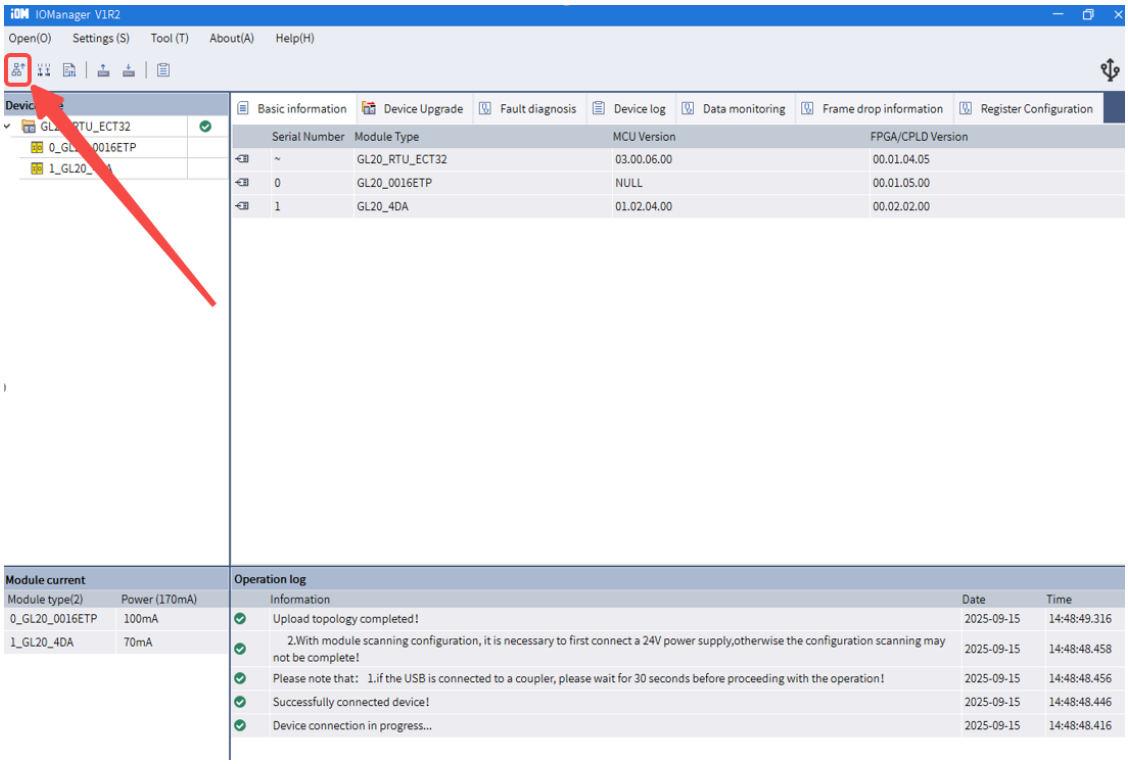
- This product is connected to a PC equipped with the IOManager configuration tool via a USB cable.
- The device is powered on and started.

Procedure

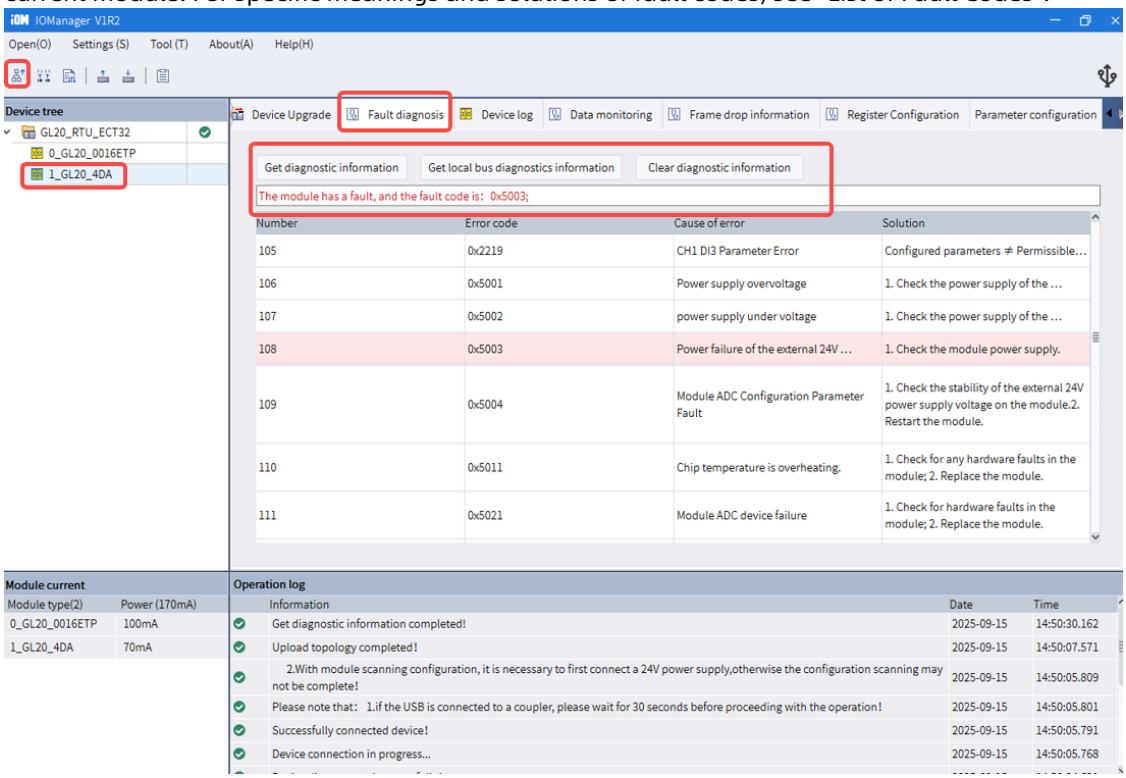
1. Open the IOManager configuration tool on the PC desktop.



2. In the menu bar, select "Open > Connected Device" to connect this product to IOManager.
   - If the connection succeeds, "Connected" is displayed in the upper right corner of the interface.
   - If the connection fails, check whether the driver is properly installed.
3. Click the configuration topology upload button on the upper left corner of the interface to view the configuration information, as shown below.



4. In the "Fault diagnosis" interface, select the faulty modules to be viewed in the "Device tree" on the left. Click "Get diagnostic information" to view the fault information of the current module. In the figure below, the fault code is 0x5003, indicating an external 24 V power supply failure for the current module. For specific meanings and solutions of fault codes, see "List of Fault Codes".



8.2.2.7 Troubleshooting via Inovance iFA Evolution

iFA Evolution software provides specific information, causes, and solutions for relevant faults of the product via the "Diagnostic info" page. For further analysis, view operation logs on the "Operation log" page.

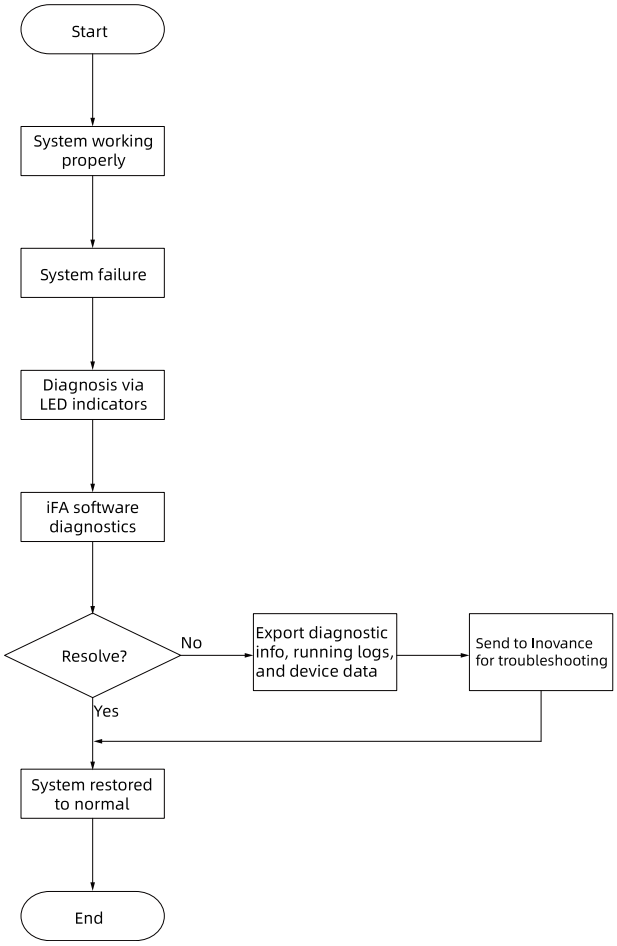
For detailed operations on viewing diagnostic information and operation logs, see the "PLC Programming > PLC Online Operations > Diagnostic Information/Operation Log" in the iFA Information System Guide.

8.3 Fault Levels

Level	Description
Fatal	The module cannot work properly due to hardware damage or cannot be started. Immediate action is required.
Critical	The module is faulty but can operate. Immediate action is required.
Alarm	There are potential fault risks. The module/channel is still operational, but requires scheduled maintenance.
Information	Information reminder. No action is required.

8.4 Troubleshooting Procedure

The following figure shows the troubleshooting process.



Troubleshooting steps:

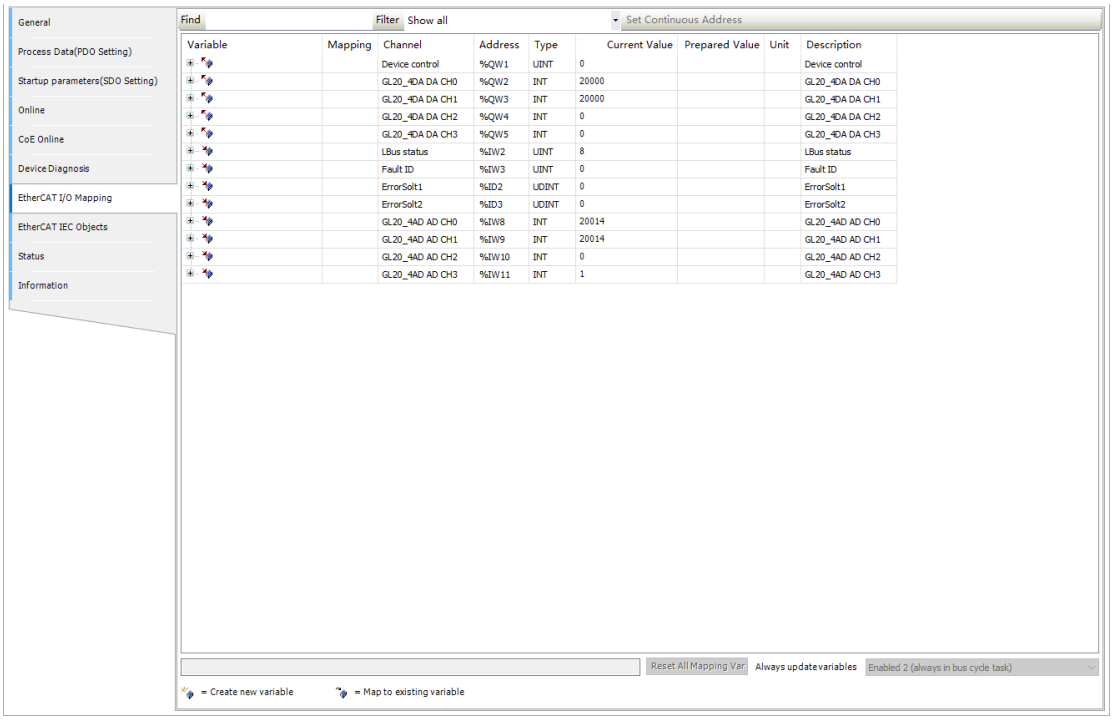
1. A fault occurs during normal operation.
2. Diagnose by checking the LED indicators of the corresponding device. For details, see “ *Diagnostics via LEDs” on page 183*. If the fault persists, perform further diagnosis using the "Online and diagnostics" function in iFA Evolution. Take the appropriate actions based on the diagnostic information (*“ List of Fault Codes” on page 434*) and operation logs. For detailed operations, see the "PLC Programming > Online Controller Operations > Diagnostic Information/Operation Log" in the iFA Information System Guide.
3. Resolve the fault based on diagnostic solutions and operation logs.
   - If resolved, the system returns to normal.
   - If not, proceed to Step 5.
4. Export the diagnostic information, operating logs, and device data.
   - In the iFA Evolution project tree, open the "Diagnostic information" and "Operation log" tabs under "Online and diagnostics" node, and then click "Export" respectively to export the diagnostic information and operating logs.
   - In the iFA Evolution menu bar, select "Online > Exporting device data" to export the device data.
5. Send the exported diagnostic information, operating logs, and device data to Inovance for analysis and troubleshooting. The system will return to normal after problem resolution.

8.5 Common Faults for ECT32 Module

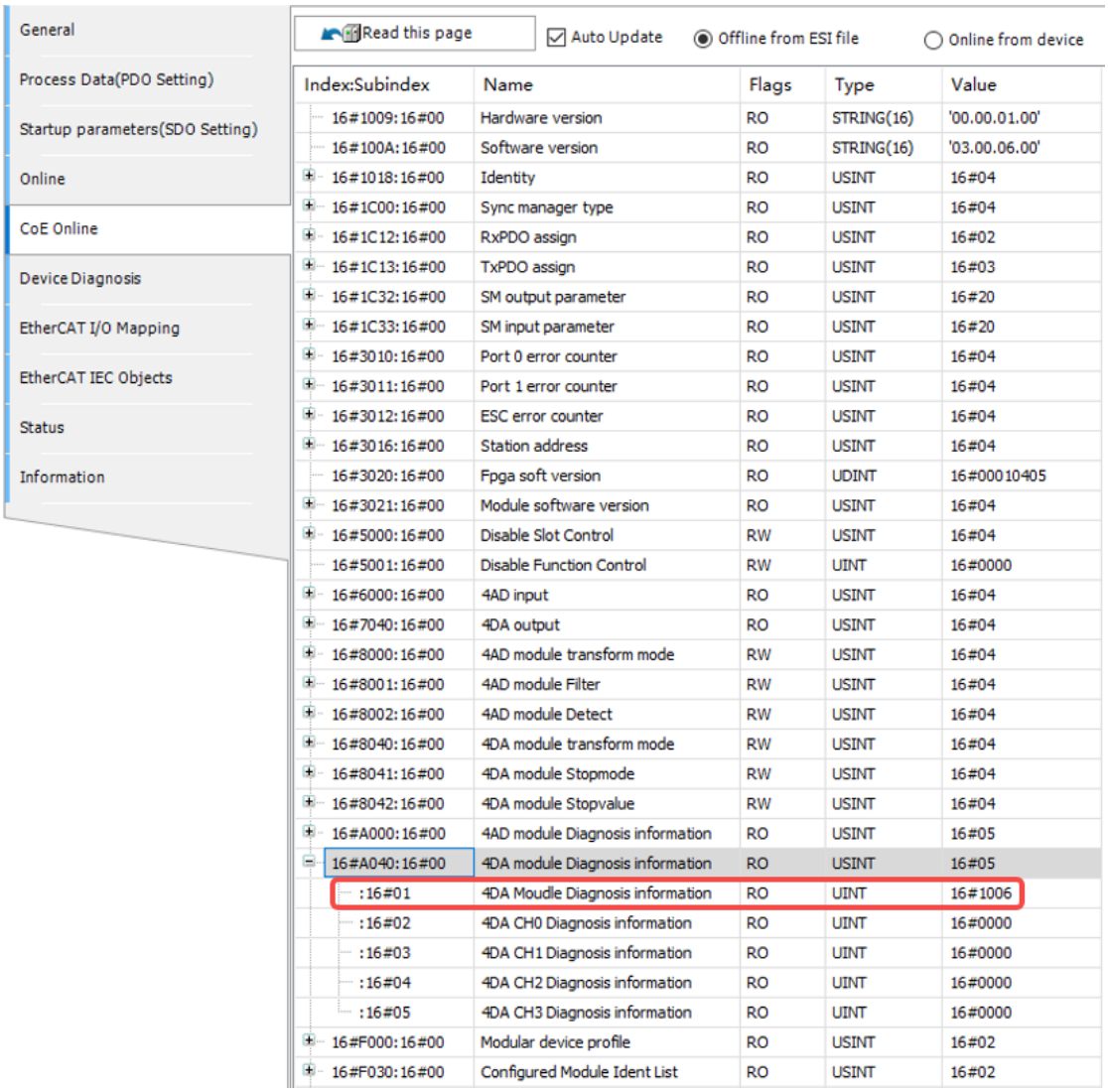
8.5.1 How to Handle Frame Loss/Communication Disconnection

Symptom

- The acquisition value of the analog input module remains unchanged.

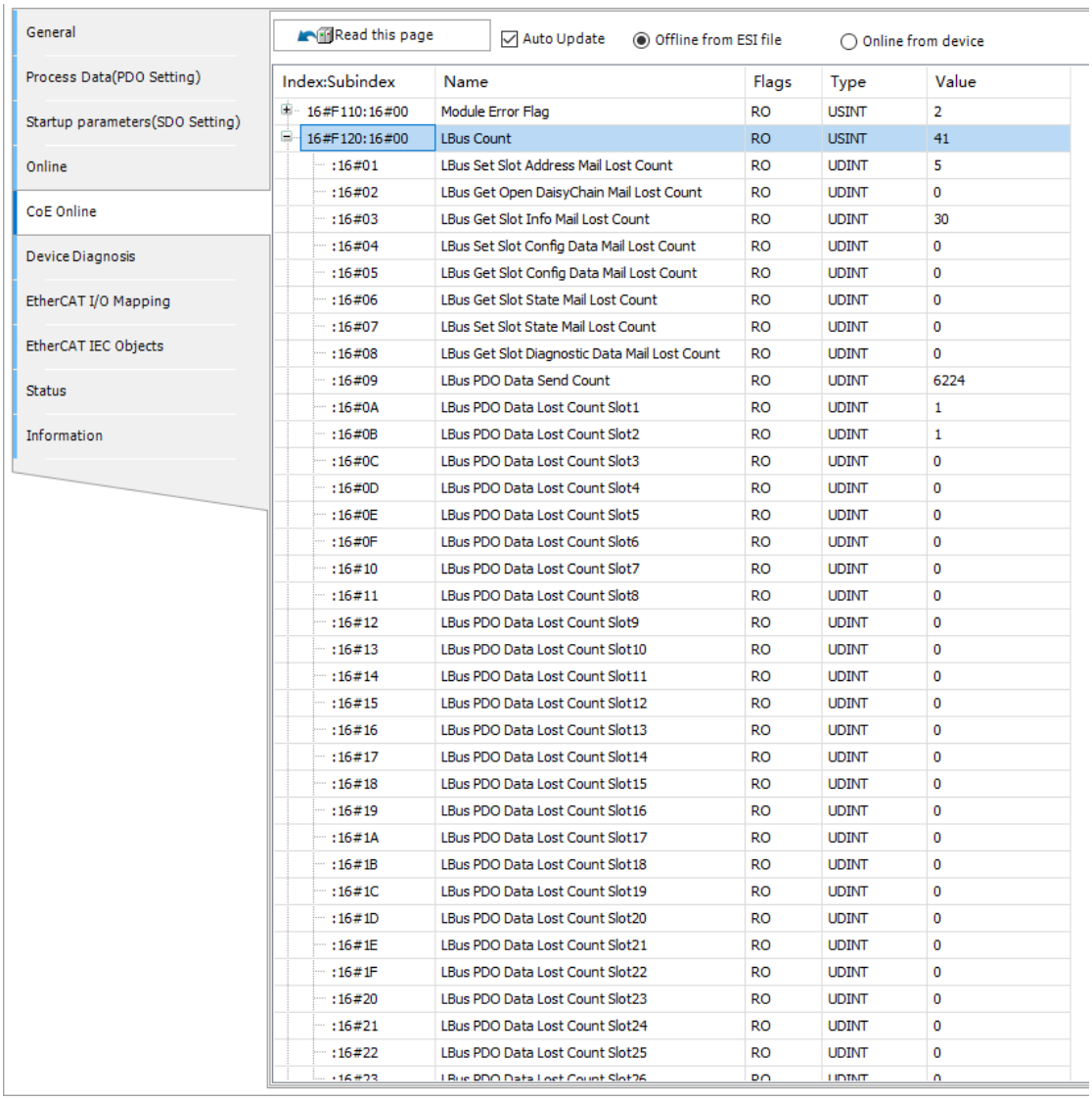


- The SF indicator of the communication interface module is flashing, and the PR indicator of the subsequent module is flashing quickly.
- In the "CoE Online" interface, the fault code 0x1006 (communication disconnection) is displayed.



Index:Subindex	Name	Flags	Type	Value
16#1009:16#00	Hardware version	RO	STRING(16)	'00.00.01.00'
16#100A:16#00	Software version	RO	STRING(16)	'03.00.06.00'
16#1018:16#00	Identity	RO	USINT	16#04
16#1C00:16#00	Sync manager type	RO	USINT	16#04
16#1C12:16#00	RxPDO assign	RO	USINT	16#02
16#1C13:16#00	TxPDO assign	RO	USINT	16#03
16#1C32:16#00	SM output parameter	RO	USINT	16#20
16#1C33:16#00	SM input parameter	RO	USINT	16#20
16#3010:16#00	Port 0 error counter	RO	USINT	16#04
16#3011:16#00	Port 1 error counter	RO	USINT	16#04
16#3012:16#00	ESC error counter	RO	USINT	16#04
16#3016:16#00	Station address	RO	USINT	16#04
16#3020:16#00	Fpga soft version	RO	UDINT	16#00010405
16#3021:16#00	Module software version	RO	USINT	16#04
16#5000:16#00	Disable Slot Control	RW	USINT	16#04
16#5001:16#00	Disable Function Control	RW	UINT	16#0000
16#6000:16#00	4AD input	RO	USINT	16#04
16#7040:16#00	4DA output	RO	USINT	16#04
16#8000:16#00	4AD module transform mode	RW	USINT	16#04
16#8001:16#00	4AD module Filter	RW	USINT	16#04
16#8002:16#00	4AD module Detect	RW	USINT	16#04
16#8040:16#00	4DA module transform mode	RW	USINT	16#04
16#8041:16#00	4DA module Stopmode	RW	USINT	16#04
16#8042:16#00	4DA module Stopvalue	RW	USINT	16#04
16#A000:16#00	4AD module Diagnosis information	RO	USINT	16#05
16#A040:16#00	4DA module Diagnosis information	RO	USINT	16#05
:16#01	4DA Moudle Diagnosis information	RO	UINT	16#1006
:16#02	4DA CH0 Diagnosis information	RO	UINT	16#0000
:16#03	4DA CH1 Diagnosis information	RO	UINT	16#0000
:16#04	4DA CH2 Diagnosis information	RO	UINT	16#0000
:16#05	4DA CH3 Diagnosis information	RO	UINT	16#0000
16#F000:16#00	Modular device profile	RO	USINT	16#02
16#F030:16#00	Configured Module Ident List	RO	USINT	16#02

- In the "CoE Online" interface, the frame loss count increases.



Index:Subindex	Name	Flags	Type	Value
16#F110:16#00	Module Error Flag	RO	USINT	2
16#F120:16#00	LBus Count	RO	USINT	41
:16#01	LBus Set Slot Address Mail Lost Count	RO	UDINT	5
:16#02	LBus Get Open DaisyChain Mail Lost Count	RO	UDINT	0
:16#03	LBus Get Slot Info Mail Lost Count	RO	UDINT	30
:16#04	LBus Set Slot Config Data Mail Lost Count	RO	UDINT	0
:16#05	LBus Get Slot Config Data Mail Lost Count	RO	UDINT	0
:16#06	LBus Get Slot State Mail Lost Count	RO	UDINT	0
:16#07	LBus Set Slot State Mail Lost Count	RO	UDINT	0
:16#08	LBus Get Slot Diagnostic Data Mail Lost Count	RO	UDINT	0
:16#09	LBus PDO Data Send Count	RO	UDINT	6224
:16#0A	LBus PDO Data Lost Count Slot1	RO	UDINT	1
:16#0B	LBus PDO Data Lost Count Slot2	RO	UDINT	1
:16#0C	LBus PDO Data Lost Count Slot3	RO	UDINT	0
:16#0D	LBus PDO Data Lost Count Slot4	RO	UDINT	0
:16#0E	LBus PDO Data Lost Count Slot5	RO	UDINT	0
:16#0F	LBus PDO Data Lost Count Slot6	RO	UDINT	0
:16#10	LBus PDO Data Lost Count Slot7	RO	UDINT	0
:16#11	LBus PDO Data Lost Count Slot8	RO	UDINT	0
:16#12	LBus PDO Data Lost Count Slot9	RO	UDINT	0
:16#13	LBus PDO Data Lost Count Slot10	RO	UDINT	0
:16#14	LBus PDO Data Lost Count Slot11	RO	UDINT	0
:16#15	LBus PDO Data Lost Count Slot12	RO	UDINT	0
:16#16	LBus PDO Data Lost Count Slot13	RO	UDINT	0
:16#17	LBus PDO Data Lost Count Slot14	RO	UDINT	0
:16#18	LBus PDO Data Lost Count Slot15	RO	UDINT	0
:16#19	LBus PDO Data Lost Count Slot16	RO	UDINT	0
:16#1A	LBus PDO Data Lost Count Slot17	RO	UDINT	0
:16#1B	LBus PDO Data Lost Count Slot18	RO	UDINT	0
:16#1C	LBus PDO Data Lost Count Slot19	RO	UDINT	0
:16#1D	LBus PDO Data Lost Count Slot20	RO	UDINT	0
:16#1E	LBus PDO Data Lost Count Slot21	RO	UDINT	0
:16#1F	LBus PDO Data Lost Count Slot22	RO	UDINT	0
:16#20	LBus PDO Data Lost Count Slot23	RO	UDINT	0
:16#21	LBus PDO Data Lost Count Slot24	RO	UDINT	0
:16#22	LBus PDO Data Lost Count Slot25	RO	UDINT	0
:16#23	LBus PDO Data Lost Count Slot26	RO	UDINT	0

Possible cause

- When the MCU of the analog module resets, the PR indicator of this module flashes slowly, the PR indicator of the subsequent module flashes quickly, and the SF indicator of the communication interface module flashes. It indicates that disconnection faults are triggered for this module and the subsequent ones and the frame loss count keeps increasing (the acquisition values of the analog input module displayed in the PLC remain unchanged, and the analog output module fails to output).
- When the CPLD of the analog module resets, the PR indicator of this module flashes. After the CPLD recovers, the PR indicator of this module turns solid on, the PR indicator of the subsequent module flashes quickly, and the SF indicator of the communication interface module flashes. It indicates that disconnection faults are triggered for this module and the subsequent ones and the frame loss count keeps increasing (the acquisition values of the analog input module displayed in the PLC remain unchanged, and the analog output module can output normally after the CPLD recovers).
- When the CPLD of the digital module resets, the PR indicator of this module flashes slowly, the PR indicator of the subsequent module flashes quickly, and the SF indicator of the communication

interface module flashes. It indicates that disconnection faults are triggered for this module and the subsequent ones and the frame loss count keeps increasing (the acquisition values of the digital input module displayed in the PLC remain unchanged, and the digital output module fails to output).

- EMC interference causes distortion of physical signals.

Solution

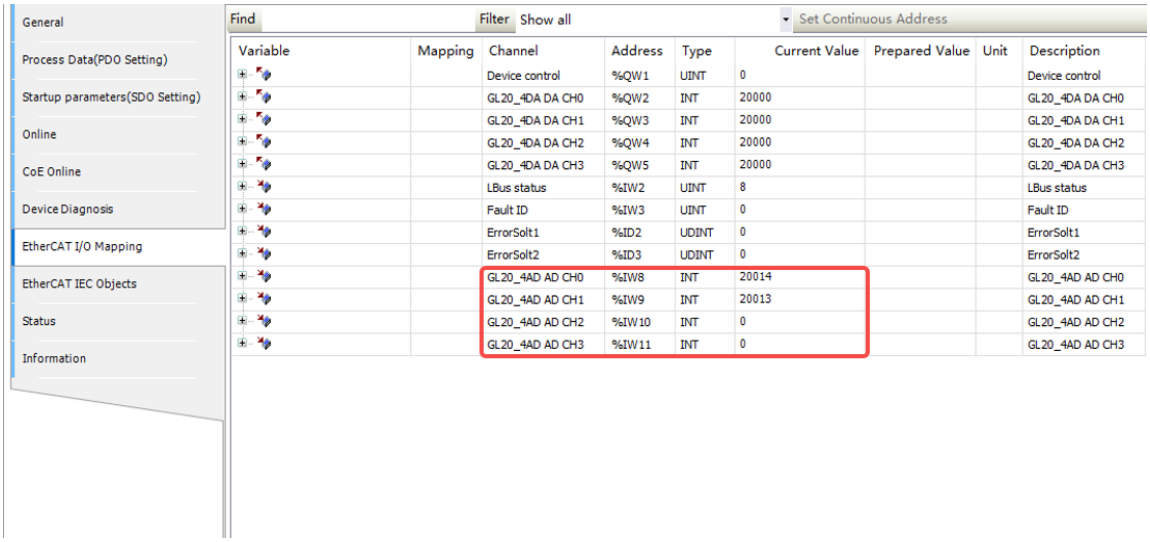
1. If the frame loss fault occurs every time the module is powered on without external signal interference, the module hardware is faulty and needs to be replaced.
2. In all other cases, the fault is due to EMC interference. Refer to the steps in the table below to solve it.

No.	Procedure
1	Check whether the communication cable meets the shielded Cat 5e cable specification and the communication cable length requirements. For details, see *"5.3.2 Preparation Before Wiring" on page 59*.
2	Check whether the communication port is connected properly and in good contact.
3	Check whether the distance between the signal cable and the power cable is greater than 30 cm. For details, see *"5.1.3 Cable Routing Requirements" on page 51*.
4	For multi-node communication, check whether an equipotential grounding wire is added between the nodes. For details, see *"5.1.5 Equipotential Grounding Requirements" on page 54*.
5	Add a magnetic buckle at each end of the communication cable.
6	Wind the magnetic ring around UVW cables of the drive.
7	Use shielded power cables and ground the shield properly.

8.5.2 How to Solve the Absence of Analog Input Data

Symptom

The analog input module fails to collect input data, as shown below.



Possible cause

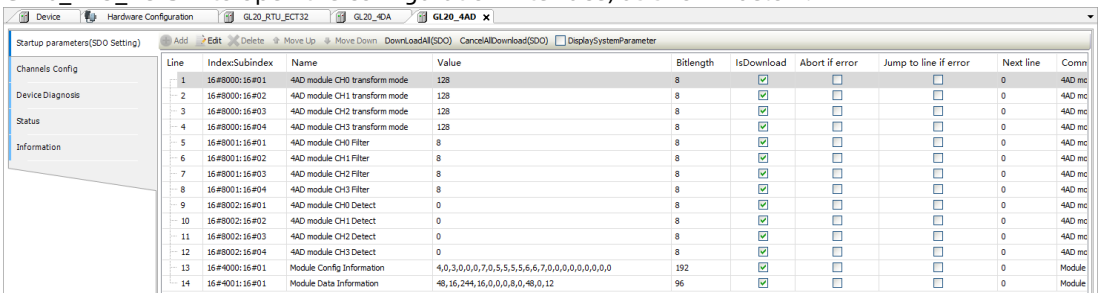
- The enabled channel is not activated.

- The wiring is incorrect.
  - The wiring of the 24V power supply is incorrect or in poor connection.
  - The wiring in voltage or current mode is incorrect or in poor connection.
- EMC interference
- Hardware damage

Solution

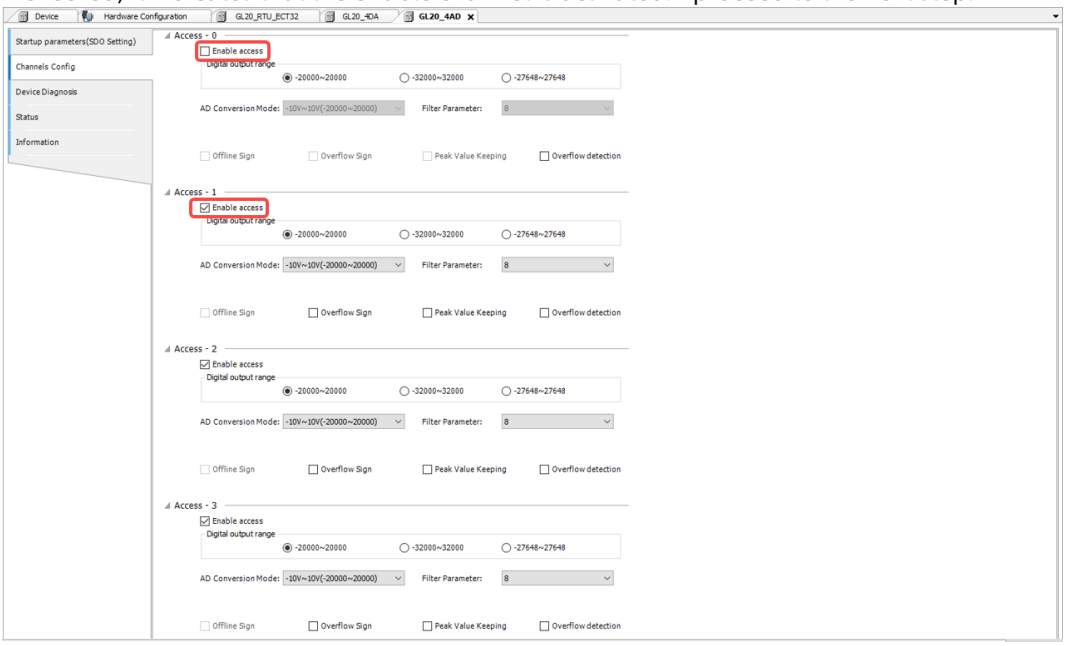
1. Check whether the enable channel of the module is activated.

   a. In the "Devices" navigation tree on the left, double-click "GL20_4AD" under "ETHERCAT_C > GL20_RTU_ECT32" to open the configuration interface, as shown below.



   b. In the "Channel Config" interface, check whether the "Enable access" of the corresponding channel is checked.

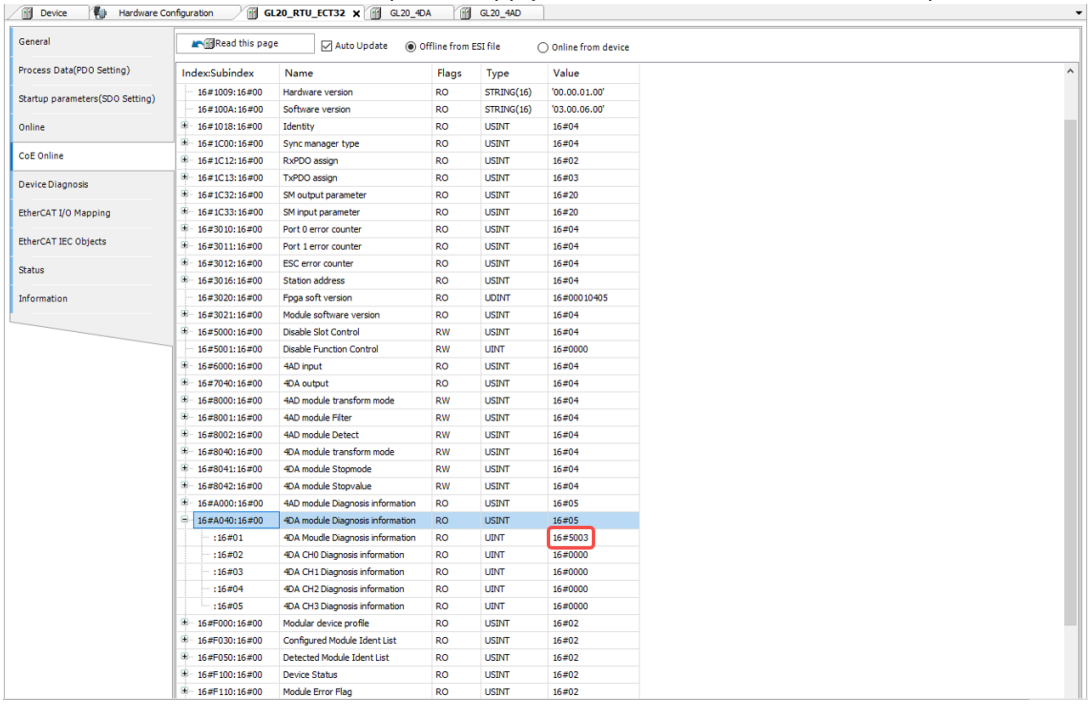
   - If unchecked, it indicates that the enable channel is not activated. Check "Enable access".
   - If checked, it indicates that the enable channel is activated. Pproceed to the next step.



2. Check whether the 24 V power supply for the module is normal.

   - If the ERR indicator of the module is solid on in red and the SF indicator of the communication interface module is flashing, double-click "GL20_RTU_ECT32" in the "Devices" navigation tree to open the configuration interface. In the "CoE Online" interface, the fault code 0x5003 indicates abnormal power supply. Check whether 24 V power supply is normal and wired correctly.

- If the ERR indicator of the module is off and the SF indicator of the communication interface module is off, it indicates that the power supply is normal. Proceed to the next step.



3. Check whether the terminal wiring of the module is correct.

   a. Check whether the terminal wiring is correct.

   - If the terminal wiring is incorrect, re-wire according to the wiring diagram.
   - If the terminal wiring is correct, proceed to the next step.

   b. Check whether the terminal wiring is in good connection.

   - If the connection is loose, re-connect the terminal cables.
   - If the connection is correct, proceed to the next step.

4. Check for EMC interference and identify the sources of on-site EMC interference.

- If there is EMC interference, refer to the steps in the table below to solve.

No.	Procedure
1	Check whether the distance between the signal cable and the power cable is greater than 30 cm. For details, see *"5.1.3 Cable Routing Requirements" on page 51*.
2	Check whether the analog signal cables are shielded cables and meet the grounding requirements. For details, see *"5.1.4 Grounding Requirements for Shielded Cables" on page 54*.
3	Wind five turns of magnetic rings around the analog signal cables and the power supply cables (L/N) of analog control devices such as PLCs.
4	Reliably connect the PE terminal of the motor to the PE terminal of the servo drive, and connect the PE terminal of the servo drive to the PE terminal of the grid terminal.
5	Add an equipotential bonding grounding cable between the host controller and drive. For details, see *"5.1.5 Equipotential Grounding Requirements" on page 54*.
6	Wind the magnetic ring around UVW cables of the drive by two to four turns.
7	Increase the filtering capacitance between AI and GND, with a recommended maximum of 0.22 μF.
8	Use a shielded power cable and properly ground its shield.

- If there is no EMC interference, proceed to the next step.

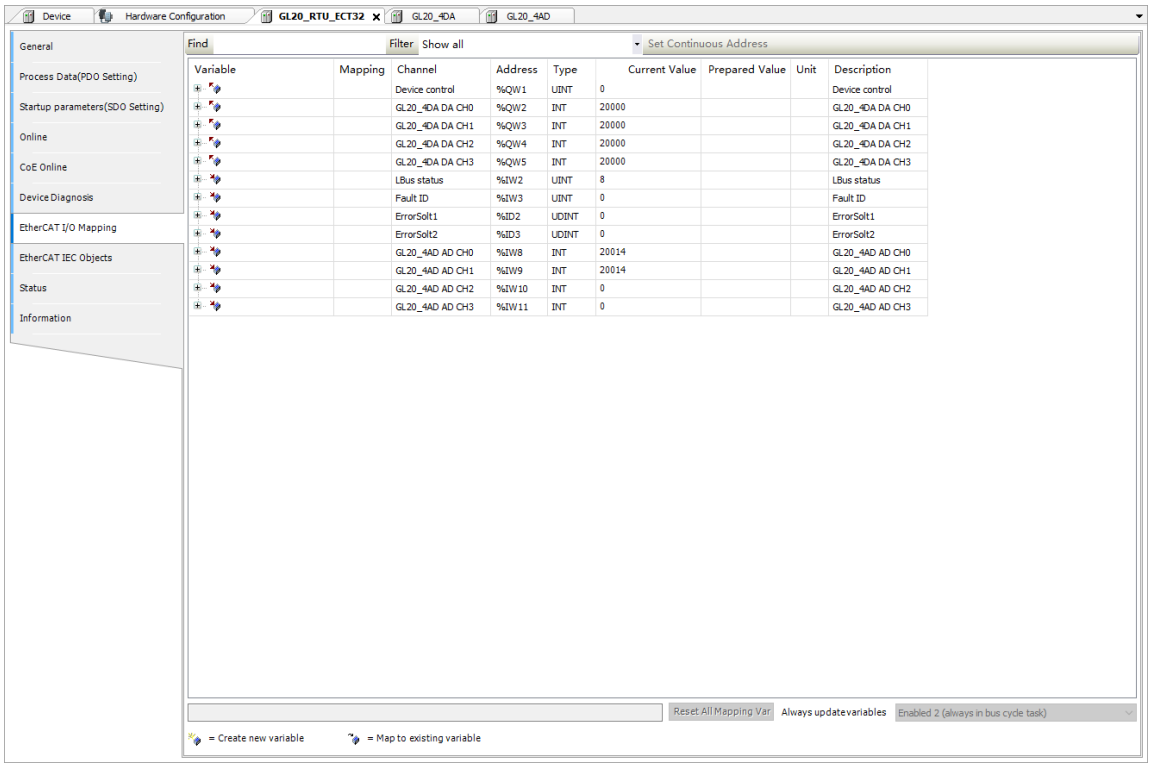
5. Check whether the module hardware is damaged.

- Replace the module. If the input data is normal, it indicates that the module hardware is damaged. Replace with a new module.
- Replace the module. If there is still no input data, remove the user terminal input wiring and directly connect the DA module output cable to the input terminal of the AD module. If the input is normal, it indicates a problem with the external device. Troubleshoot the external device.

8.5.3 How to Solve Jitter in Analog Input Data

Symptom

The collected values fluctuate significantly. For example, with an input code value of 20000, the collected value falls outside the accuracy range, as shown below.



Possible cause

- EMC interference
- Hardware damage

Solution

1. Check for EMC interference and identify the sources of on-site EMC interference.

- If there is EMC interference, refer to the steps in the table below to solve.

No.	Procedure
1	Increase the software filter parameter value.
2	Check whether the distance between the signal cable and the power cable is greater than 30 cm. For details, see "5.1.3 Cable Routing Requirements" on page 51.
3	Check whether the analog signal cables are shielded cables and meet the grounding requirements. For details, see "5.1.4 Grounding Requirements for Shielded Cables" on page 54.
4	Wind five turns of magnetic rings around the analog signal cables and the power supply cables (L/N) of analog control devices such as PLCs.
5	Reliably connect the PE terminal of the motor to the PE terminal of the servo drive, and connect the PE terminal of the servo drive to the PE terminal of the grid terminal.
6	Add an equipotential bonding grounding cable between the host controller and drive. For details, see "5.1.5 Equipotential Grounding Requirements" on page 54.
7	Wind the magnetic ring around UVW cables of the drive by two to four turns.
8	Increase the filtering capacitance between AI and GND, with a recommended maximum of 0.22 μF.
9	Use a shielded power cable and properly ground its shield.

- If there is no EMC interference, proceed to the next step.

2. Check whether the module hardware is damaged.

- Replace the module. If the input data is normal, it indicates that the module hardware is damaged. Replace with a new module.
- Replace the module. If data jitter still exists, remove the user terminal input wiring and directly connect the DA module output cable to the input terminal of the AD module. If the input is data normal, it indicates a problem with the external device. Troubleshoot the external device.

8.5.4 How to Solve Non-Operating Expansion Modules

Caution

This case primarily solves the fault of the expansion module failing to operate for the first time upon power-on. Operation failures after the first operation are considered module disconnection faults.

Symptom

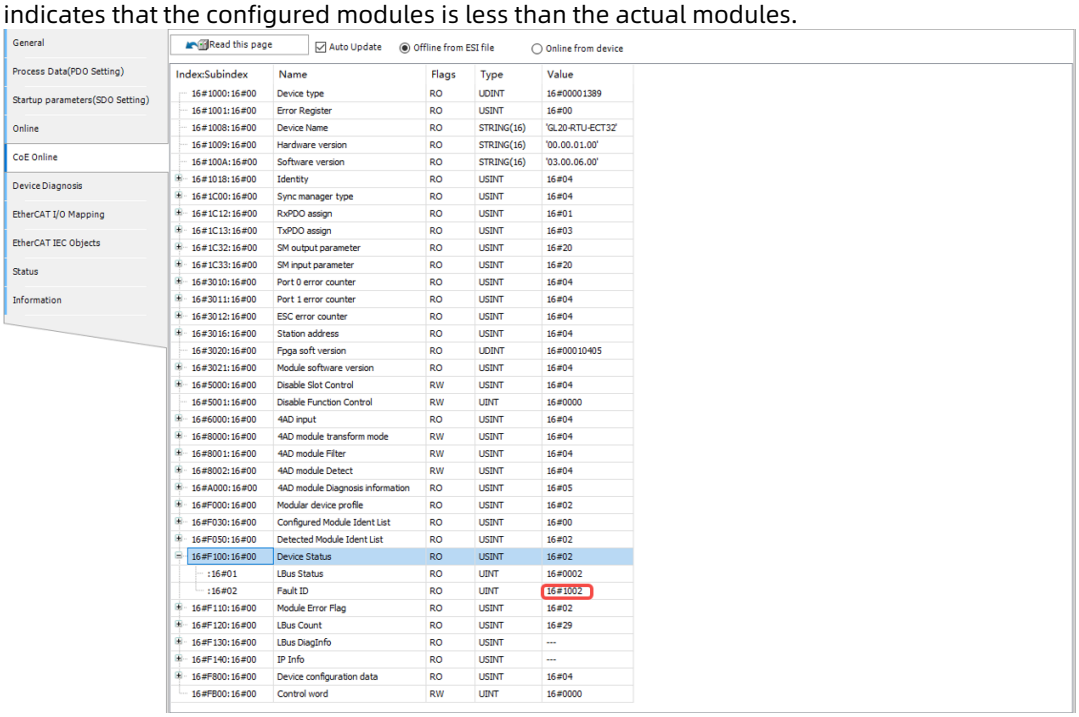
Symptom

- The PR indicator of the module flashes slowly.
- The PR indicator of the module flashes quickly, and the SF indicator of the communication interface module flashes in red.

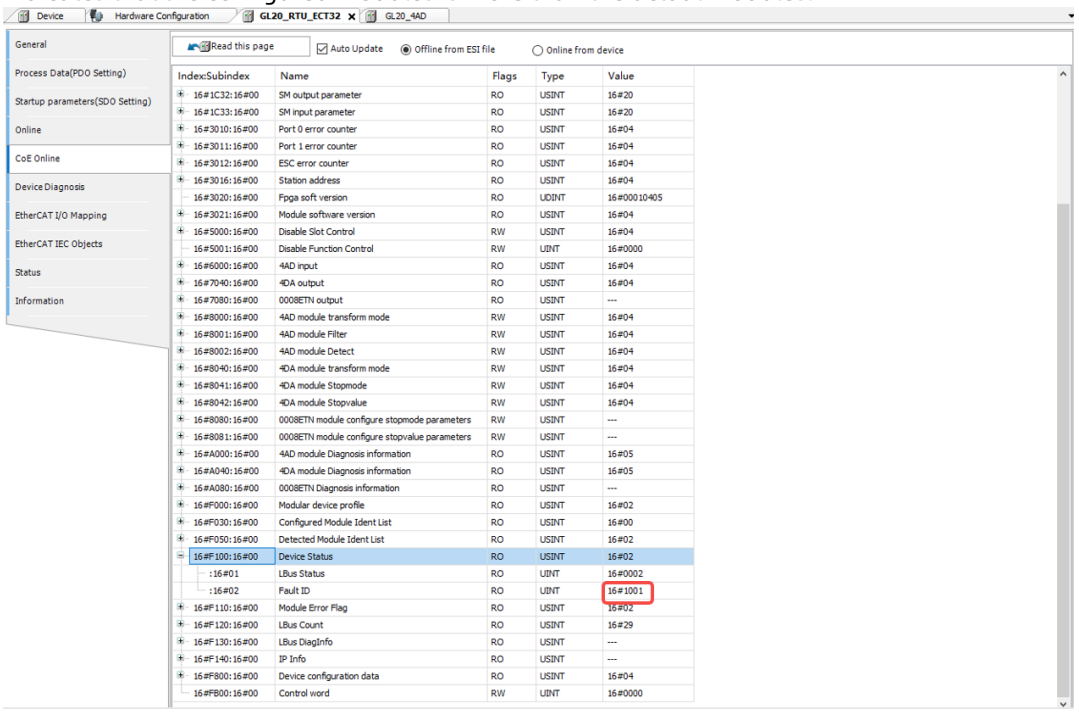
Possible cause

- If the PR indicator of the module flashes slowly, it indicates a local bus addressing failure.
- If the PR indicator of the module flashes quickly, and the SF indicator of the communication interface module flashes in red, it indicates an inconsistency between the configured modules and actual modules.

- In the "Devices" navigation tree, double-click "GL20_RTU_ECT32" to open the configuration interface. In the "CoE Online" interface, if the "Fault ID" under "Device Status" is "0x1002", it indicates that the configured modules is less than the actual modules.



- In the "Devices" navigation tree, double-click "GL20_RTU_ECT32" to open the configuration interface. In the "CoE Online" interface, if the "Fault ID" under "Device Status" is "0x1001", it indicates that the configured modules is more than the actual modules.



Solution

Local bus addressing failure

1. Check whether the expansion module is installed properly. Power off the expansion module, reconnect it, and then restart the system to check whether the expansion module operates normally.

   - If the expansion module operates normally, it indicates that the expansion module is not properly installed.
   - If the expansion module fails to operate, proceed to the next step.

2. Check for damage to the expansion module hardware.

   a. In the "Devices" navigation tree, double-click "GL20_RTU_ECT32" to open the configuration interface. In the "CoE Online" interface, if the "LBus Status" under "Device Status" is "0x80", it indicates a local bus fault.

16#F100:16#00	Device Status	RO	USINT	16#02	
:16#01	LBus Status	RO	UINT	16#0002	0x80

   b. Replace the expansion module. If the local bus addressing succeeds after power-on, it indicates that the expansion module hardware is damaged. Replace with a new expansion module.

Inconsistency between the configured modules and actual modules

Ensure consistency between the configured modules and actual modules. Power on and run the system again.

9 Maintenance

9.1 Cleaning and Routine Inspection

9.1.1 Cleaning



Before cleaning, ensure that the power supply has been switched off. Do not use volatile solvents such as paint thinner, benzene, or chemical wipes for cleaning.

For daily cleaning, wipe away dirt with a soft, dry cloth. If dirt remains, wipe with a cloth that has been dampened with a properly diluted detergent (2%) and wrung out.

9.1.2 Routine Inspection

The performance of this product may be affected by product aging or harsh operating conditions. Therefore, routine inspections are required to ensure the product is in proper working condition.

It is recommended to perform inspections every six months to one year. In harsh environments, shorten the inspection interval.

Preparation of tools

- Multimeter (for measuring voltage)
- Straight screwdriver (for removing modules and cables)
- ESD cleaning cloth (for wiping dust or dirt)
- Thermometer (for measuring temperature)
- Hygrometer (for measuring humidity)

Routine inspection items



Before performing inspections on environment and installation wiring, ensure the module is powered off. Failure to do so may result in electric shock, module fault, or malfunction.

Item	Description	Standard	Solution
24 VDC power supply inspection	Measure whether the input power supply voltage is within the specified range.	Voltage range: 20.4 VDC to 28.8 VDC	Use a multimeter to measure the input power voltage. If the power supply voltage does not meet the standard, check for faults in the power supply and ensure the voltage is within the normal range.
Environmental inspection	Check if the module's operating environment contains any corrosive or flammable gases.	No corrosive and flammable gas	If the environment does not meet the specifications, corrective actions must be taken on the environment.
	Check if there is accumulation of conductive dust in the module's working environment.	No noticeable accumulation of conductive dust	If the environment does not meet the specifications, regular cleaning and modifications must be made.
	Check if the module's operating environment is subject to vibration or shock.	Vibration or shock must meet the specifications; see the "Environmental Specifications" section of the GL20 Series Module Equipment Guide.	If the environment does not meet the specifications, corrective actions must be taken on the environment.
	Check if the module's operating environment temperature and humidity comply with the specifications.	• Temperature: -20°C to +55°C • Humidity: < 95% RH (30°C), without condensation	If the environment does not meet the specifications, corrective actions must be taken on the environment.
Installation and wiring inspection	Check whether the cables for the power terminal and EtherCAT interface terminal are securely connected.	Terminals and cables are securely connected with no looseness.	Securely connect the terminal to the cable.
	Check if the snap-fit joint of the module are securely locked onto the DIN rail.	The module is securely installed on the rail with no looseness.	Securely connect the module to the DIN rail.
PE grounding and shielding inspection	Check if the PE grounding is secure.	The screws for PE grounding are secure with no looseness.	Tighten the screws for PE grounding.
	Check the PE grounding cable conductor for any damage.	The PE grounding cable conductor layer is undamaged.	Replace the PE grounding cable.
	Check if there is any rust or oxidation at the PE grounding point.	No rust or oxidation at the PE grounding point.	Remove rust or oxidation from the PE grounding point.
	Check the shielding layer of the shielded cable for any damage, corrosion, or oxidation.	No damage, corrosion, or oxidation for the shielding layer of the shielded cable.	Replace the shielded cable.
	Check if the shielding layer of the shielded cable is reliably connected.	Ensure reliable connection of the shielding layer of the shielded cable.	Securely connect the shielding layer of the shielded cable.

9.2 Component Replacement

9.2.1 Communication Interface Module Replacement

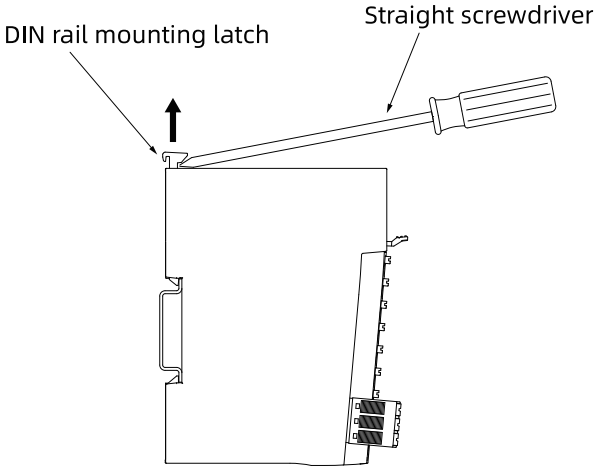
A damaged communication interface module can be replaced without updating the configuration.

Prerequisites

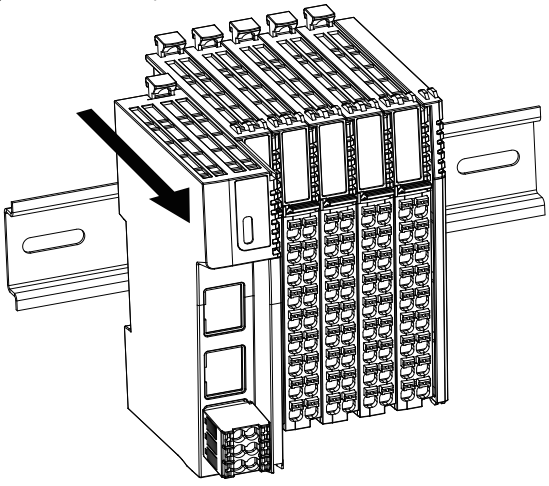
The communication interface module and expansion module are powered off.

Procedure

1. Use a flat screwdriver or similar tool to pry up the snap-fit joint of the DIN rail and remove the old module, as shown below.



2. Pull the old module away from the rail, as shown below.



3. Install a new communication interface module. For installation procedure, see *"4.3.2 Installation of Communication Interface Module" on page 43*.

9.2.2 Expansion Module Replacement

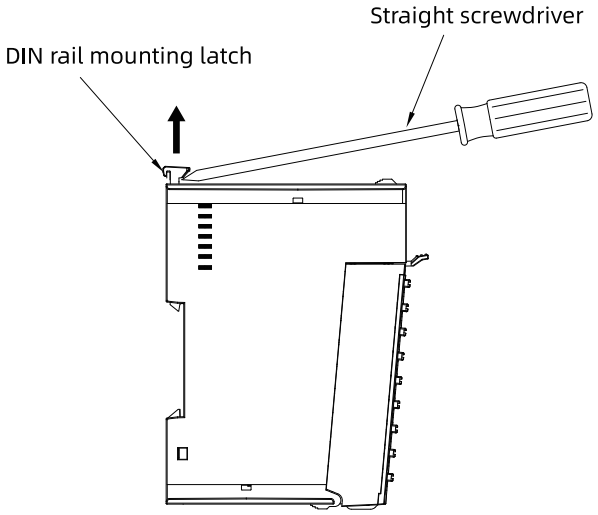
The expansion module can be replaced if it is damaged.

Prerequisites

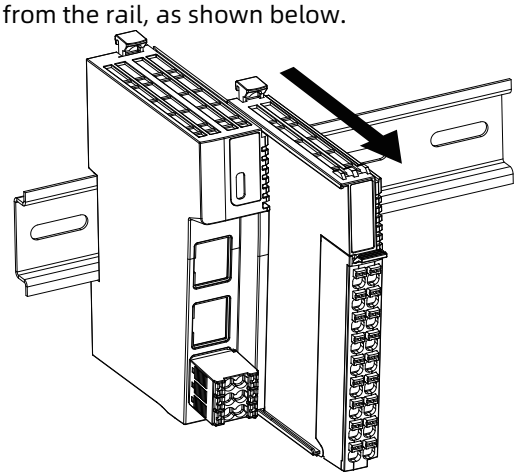
The communication interface module and expansion module are powered off.

Procedure

1. Use a flat screwdriver or similar tool to pry up the snap-fit joint of the DIN rail and remove the old module, as shown below.



2. Pull the old module away from the rail, as shown below.



3. Install a new expansion module. For the installation procedure, see *"4.3.3 Installation of I/O Expansion Module" on page 44*.

9.2.3 Power Terminal Replacement

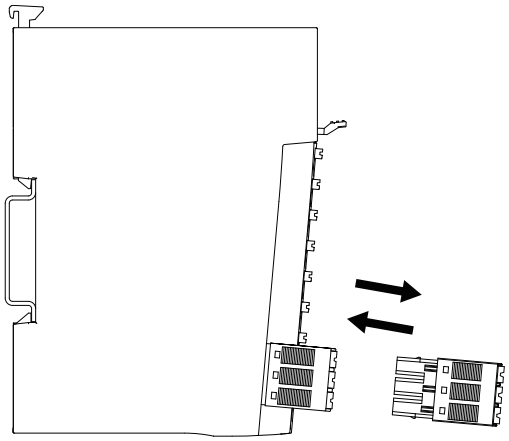
The power terminal of the communication interface module can be replaced if it is damaged.

Prerequisites

The power cable has been removed. For details, see *"5.3.3 Cable Connection/Disconnection" on page 59*.

Procedure

Pull out the old power terminal and insert the new one, as shown in the following figure.



9.2.4 End Cover Replacement

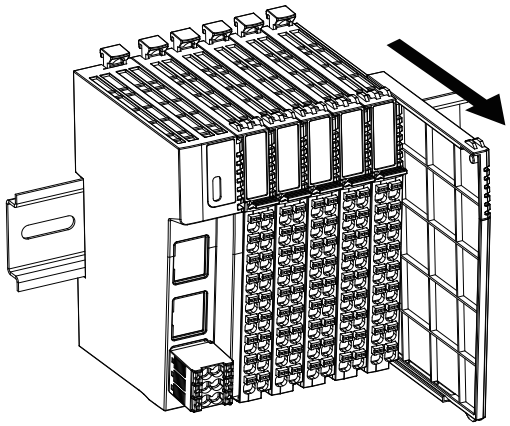
When the stopper plate is damaged or missing, it can be replaced.

Prerequisites

The communication interface module and expansion module are powered off.

Procedure

1. Remove the end cover, as shown below.



2. Replace with a new end cover. For details, see *"4.3.4 Installing the End Cover" on page 45*.

9.2.5 Push IN Terminal Block Replacement

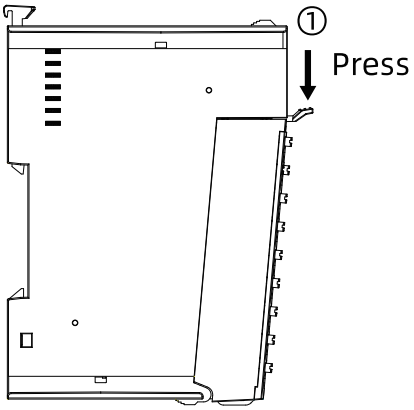
The PUSH IN terminal block can be replaced when it is damaged or not applicable.

Prerequisites

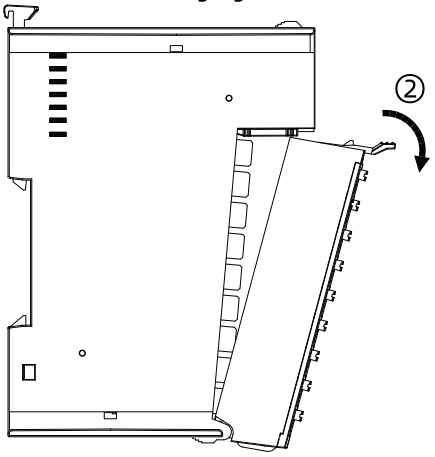
The communication interface module and expansion module are powered off.

Procedure

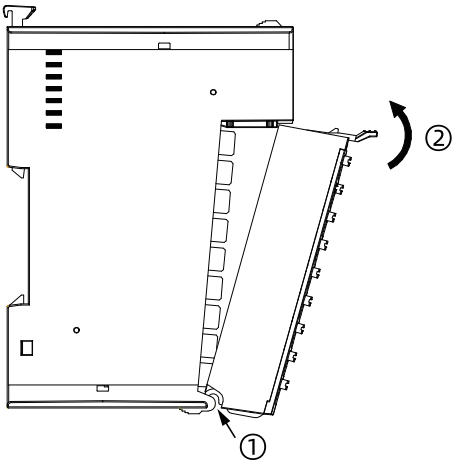
1. Press down the latch of the PUSH IN terminal block, as shown in the following figure.



2. Rotate the PUSH IN terminal block around the rotary axis in the direction of the arrow to remove the old terminal block, as shown in the following figure.



3. Replace with a new PUSH IN terminal block.
   Place the bottom of the terminal block on the rotary axis ①, rotate it in the direction of arrow ②, and press the terminal block until you hear a click sound, as shown in the following figure.



9.3 固件升级

9.3.1 Introduction

Communication interface module

For the communication interface module with a low firmware version, update the firmware using InoProShop, InoEtnLoader, and IOManager.

When updating the firmware of GL20-RTU-ECT32 and GL20-RTU-EIP, ensure a one-to-one correspondence between the MCU and FPGA version, as shown in the table below.

Product Model	MCU Version	FPGA Version	Upgrade Method
GL20-RTU-ECT32	3.1.5.0	1.4.0.11	• Ethernet upgrade (via Inoproshop) • USB upgrade (via IOManager)
	2.5.9.0	0.1.4.2	
	2.5.10.0	0.1.4.2	
	3.0.6.0	0.1.4.5	
GL20-RTU-EIP	1.2.2.0 and later	1.0.0.0	• Ethernet upgrade (via InoEtnLoader/ IOManager) • USB upgrade (via IOManager)
	1.1.15.0 and later	1.0.0.0	• Ethernet upgrade (via InoEtnLoader) • USB upgrade (via IOManager)
	1.1.9.0 and below	0.1.2.0	Ethernet upgrade (via InoEtnLoader)
GL20-RTU-PN	During firmware upgrade of GL20-RTU-PN, the MCU and FPGA firmware are merged into one file, and version matching is not required.		• Ethernet upgrade (via InoEtnLoader) • USB upgrade (via IOManager)

I/O expansion module

The I/O expansion module only supports MCU firmware upgrade. Check the version number before upgrading the module. For analog modules, check the chip solution.

The I/O expansion module supports upgrade to the minimum version number as shown in the table below.

Module Model	Upgraded MCU Version
GL20-0016ETN	-
GL20-0016ETP	-
GL20-1600END	-
GL20-4DA	• AD5755: 1.2.0.0 and later • SGM5349: 1.2.3.0 and later
GL20-4AD	• AD8684: 1.2.0.0 and later • SGM58601: 1.2.3.0 and later
GL20-0008ER	-
GL20-0800END	-
GL20-0008ETN	-
GL20-0008ETP	-
GL20-0808ETN	-
GL20-3232ETN(-M)	3.0.7.0 and later
GL20-3200END(-M)	3.0.7.0 and later
GL20-0032ETN(-M)	3.0.7.0 and later
GL20-3200END	-
GL20-0032ETN	-

Module Model	Upgraded MCU Version
GL20-4PT	Not supported
GL20-4TC	Not supported
GL20-2S485	1.1.8.5 and later
GL20-2S485-MDB	1.0.1.0 and later
GL20-PS2	-
GL20-8ADV	1.2.0.1 and later
GL20-8ADI	1.2.0.1 and later
GL20-0404ETP-5V	-
GL20-0004ER	-
GL20-0004ETP-2A	-
GL20-2SCOM	1.0.1.1 and later
GL20-2SCOM-MDB	1.0.0.C and later
GL20-2SSI	1.1.7.0 and later
GL20-1DNM	1.2.6.0 and later
GL20-2HC	1.2.3.0 and later

9.3.2 Communication Interface Module Firmware Upgrade

9.3.2.1 Upgrade via InoProShop

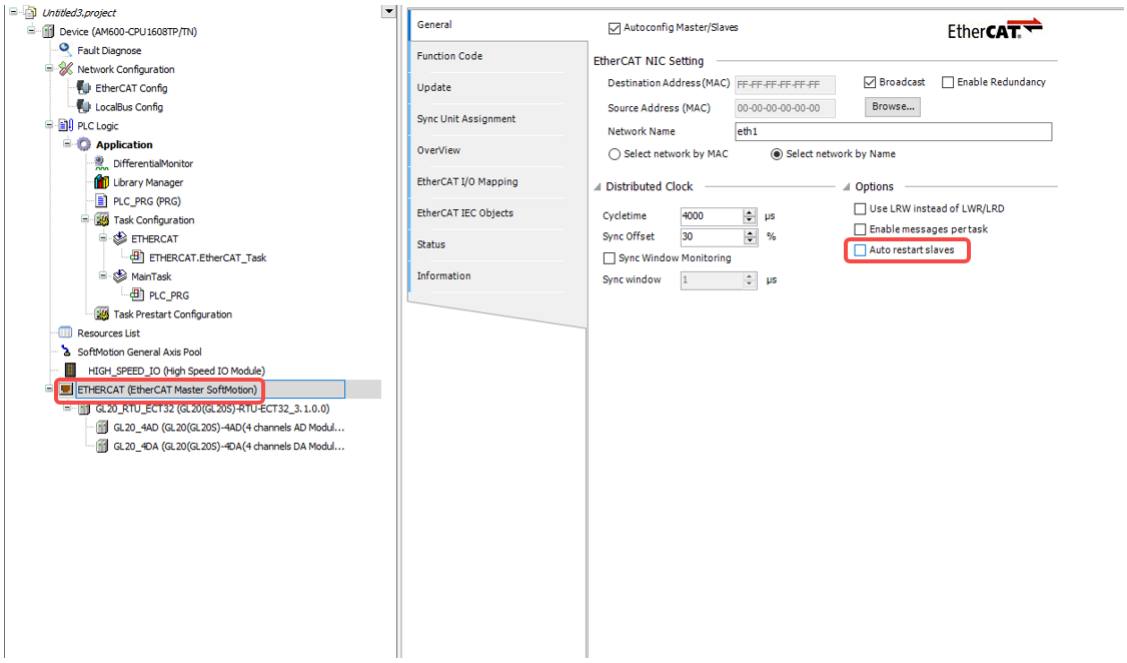
Only the GL20-RTU-ECT32 module supports firmware version upgrades through InoProShop.

Prerequisites

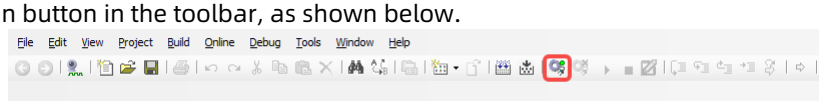
- Obtain the firmware for upgrade from Inovance technical support (MCU: GR10_RTE_APP_ECTA32_x.x.x.x.bin; FPGA: GR10_RTE_FPGA_x.x.x.x.bin).
- This product is connected to a PC equipped with InoProShop programming software via a network cable.
- The device is powered on and started.

Procedure

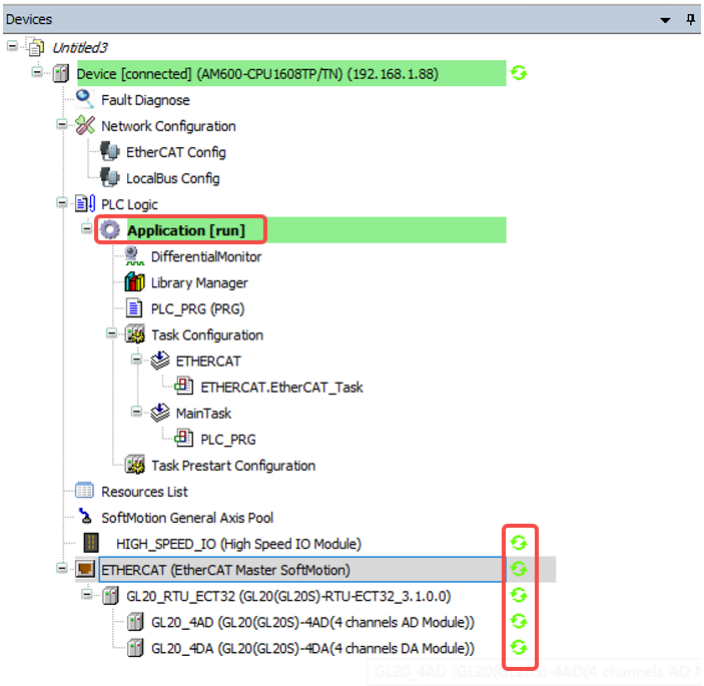
1. Open the InoProShop programming software on the PC desktop and open the project.
2. In the "Devices" navigation tree on the left, double-click the "ETHERCAT" node to open the configuration interface. In the "General" interface, uncheck "Auto restart slaves".



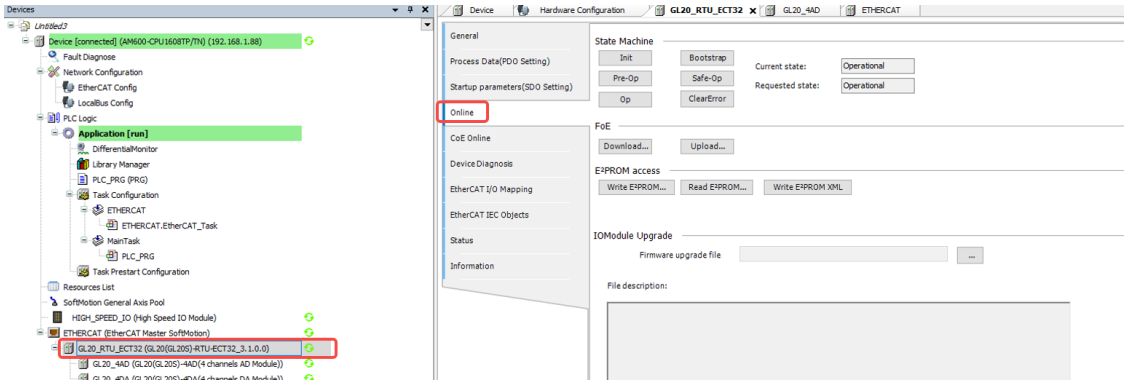
3. Click the login button in the toolbar, as shown below.



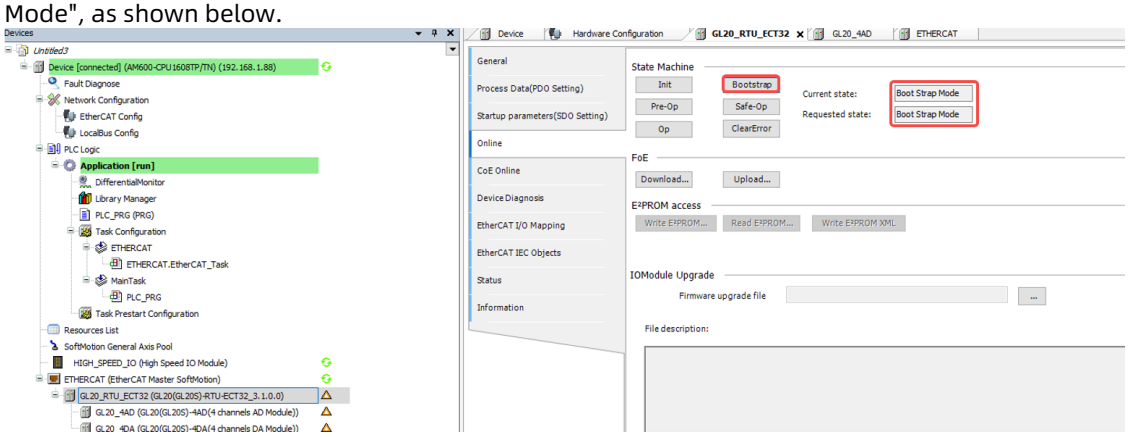
After a successful login, the "Application" node displays "run", as shown below.



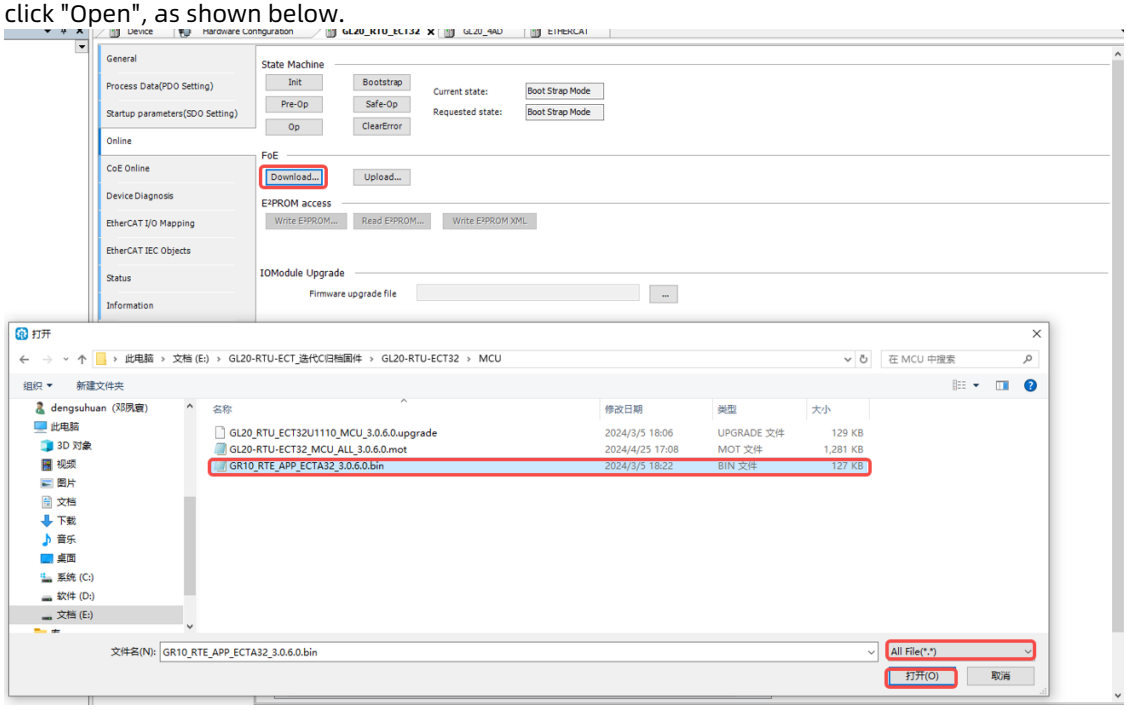
4. Double-click the EtherCAT communication interface module under the "ETHERCAT" node to upgrade the MCU firmware. In the opened interface, click "Online".
   The current status of the EtherCAT communication interface module is "Operational".



5. Click "Bootstrap" to switch the EtherCAT communication interface module status to "Boot Strap Mode", as shown below.



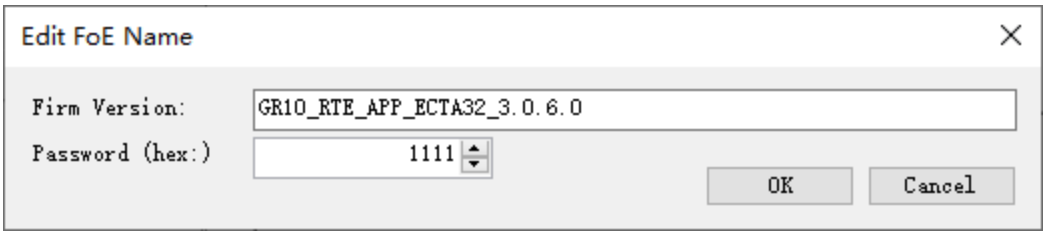
6. Click "Download", select the MCU or FPGA firmware upgrade file in the pop-up dialog box, and click "Open", as shown below.



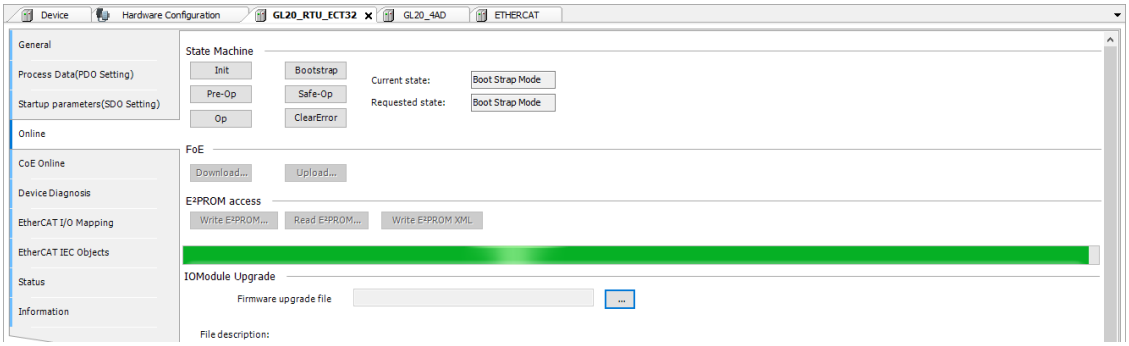
7. In the opened "Edit FoE Name" window, enter the password "1111" and click "OK".

- Upgrade MCU firmware: The password is "1111".
- Upgrade FPGA firmware: The password is "2222".

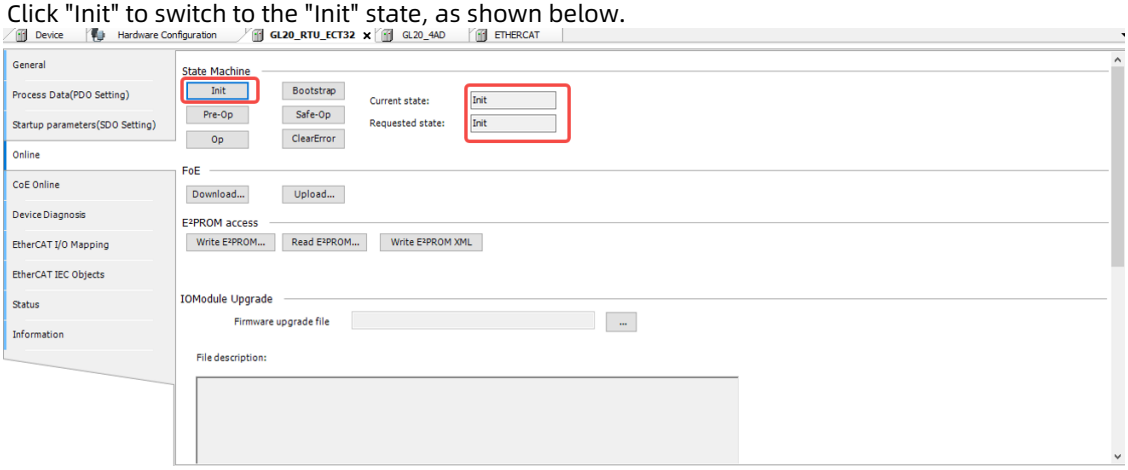
The upgrade process is displayed through a progress bar, as shown below.



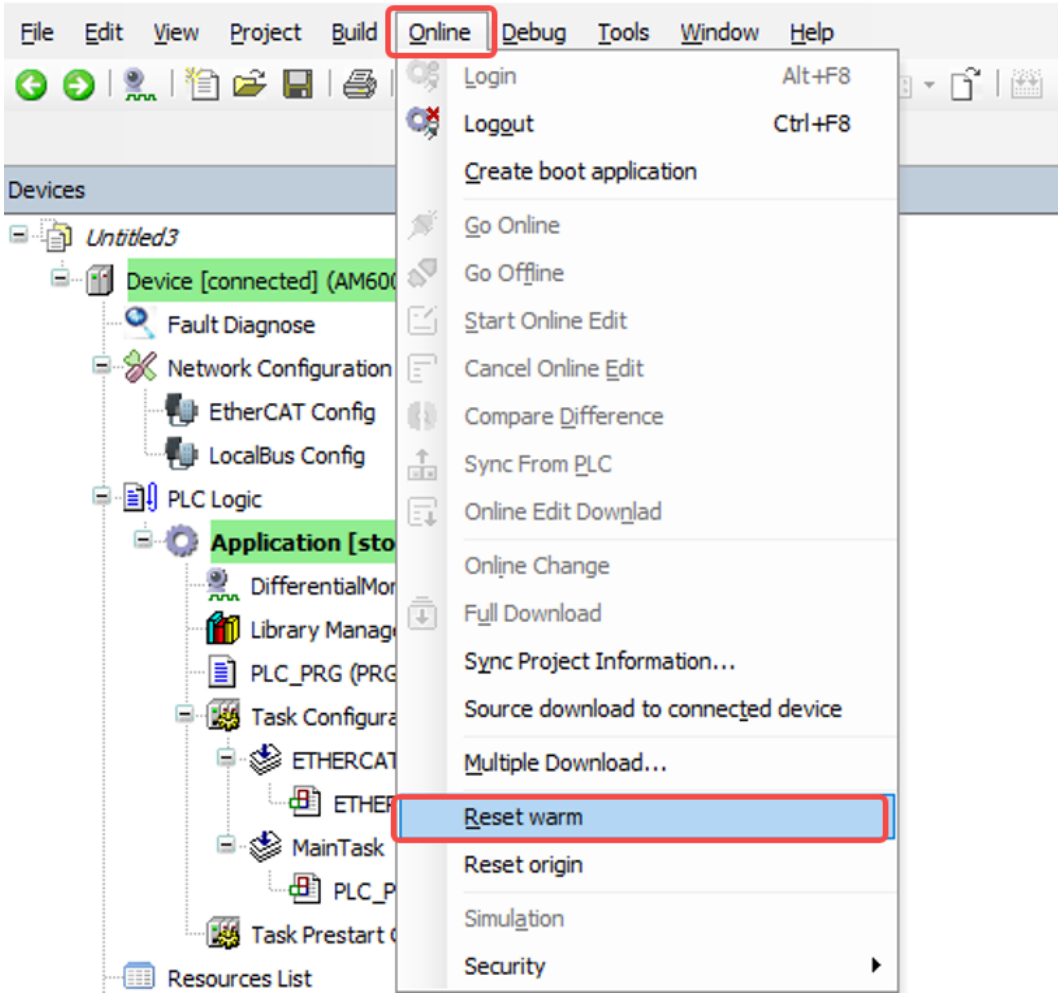
After the upgrade is complete, the file download successful prompt will be displayed in the message bar.



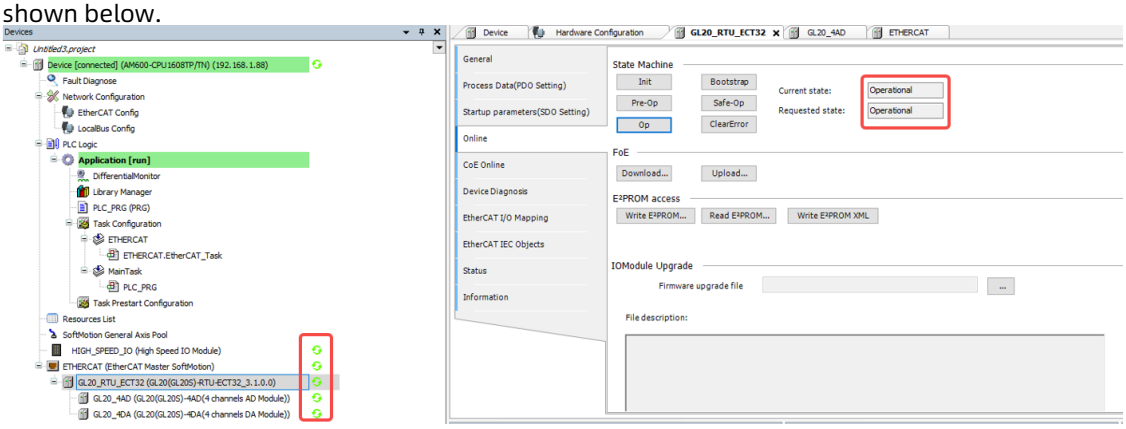
8. Click "Init" to switch to the "Init" state, as shown below.



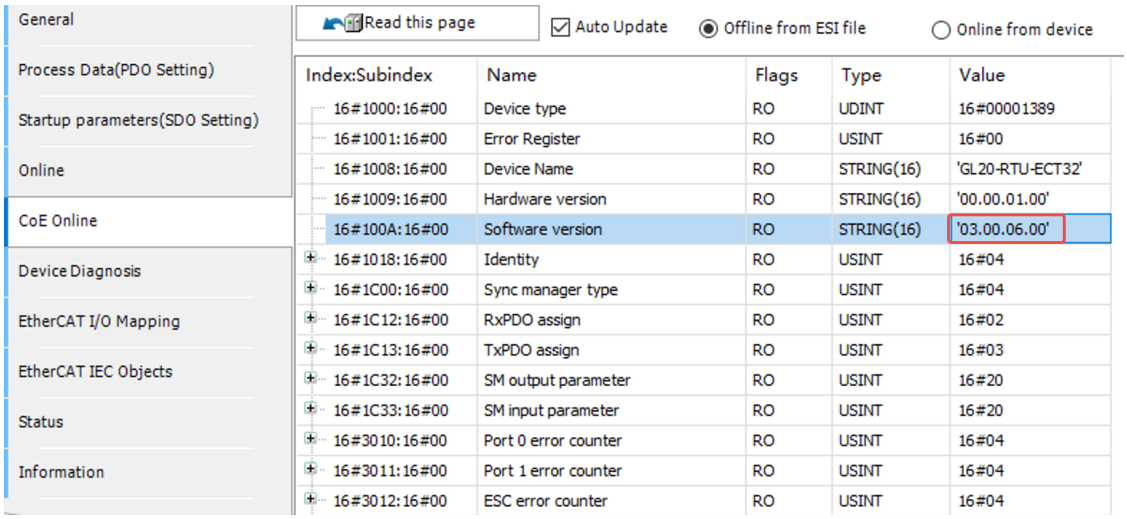
9. Select "Online > Reset warm" from the menu bar to perform a hot reset on the EtherCAT bus.



10. Click the start button in the toolbar and wait for the device status to change to "Operational", as shown below.



11. Power off and on again.
12. In the "CoE Online" interface, check if the "Value" of "Software version" is the upgraded version.



9.3.2.2 Upgrade via InoEtnLoader

Only GL20-RTU-EIP and GL20-RTU-PN support firmware upgrade through the module Ethernet interface using the InoEtnLoader software. The upgrade procedures for both modules are similar. The following takes GL20-RTU-EIP as an example.

Prerequisites

- The InoEtnLoader software package has been obtained from Inovance technical support.
- The InoEtnloader software has been successfully installed on the local PC.
- The IP address of the local PC and the GL20-RTU-EIP/GL20-RTU-PN communication interface module are set to the same network segment.

Procedure

1. Open the InoEtnLoader software.
2. Select a network card, and set the station number and local IP address. Select "EtherNet" for communication mode and check "Standard Ethernet scan". Then, click "..." and select the file to be programmed. Click "Scan device", check the scanned device, and click "Program".

Note

For the GL20-RTU-PN module upgrade, select "PN scan" for ⑤. Other steps are the same.

---

3. If the programming is successful, restart the GL20-RTU-EIP module.

9.3.2.3 Upgrade via IOManager

The GL20-RTU-ECT32, GL20-RTU-EIP, and GL20-RTU-PN modules all support firmware upgrades through the IOManager software. The operation steps are the same. The following takes the GL20-RTU-EIP module as an example.

The IOManager software supports firmware upgrades through the module's Ethernet interface and USB Type-C interface.

Upgrading firmware through Ethernet interface

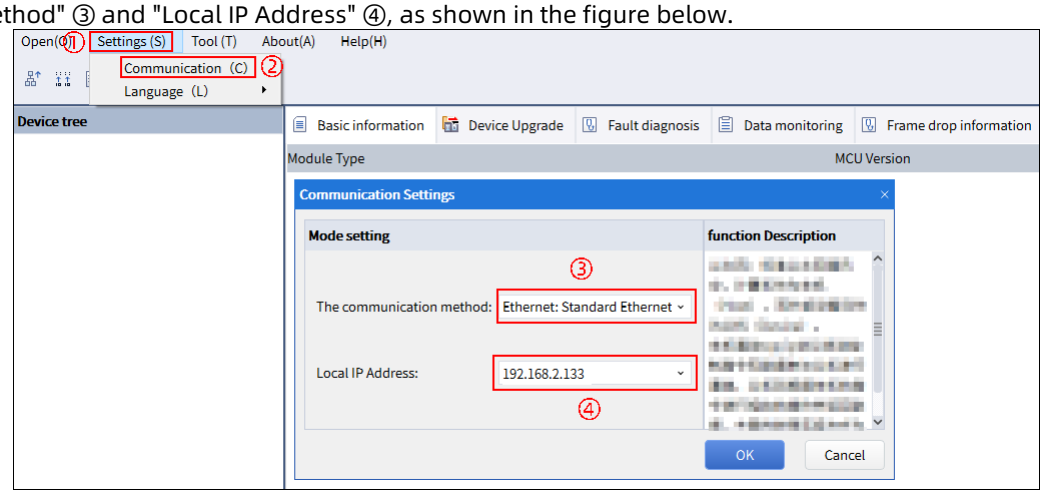
Prerequisites

- Obtain the firmware for upgrade from Inovance technical support (MCU: GL20_RTU_EIP_MCU_x.x.x.x.bin; FPGA: GL20_RTU_EIP_FPGA_x.x.x.x.bin).
- The IP of the PC on which the IOManager software is installed and that of the communication interface module have been set to the same subnet.

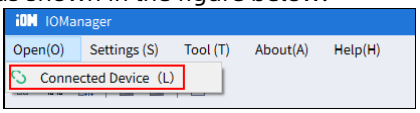
Procedure

The procedures for upgrading the MCU and FPGA are the same. The following takes upgrading the MCU as an example.

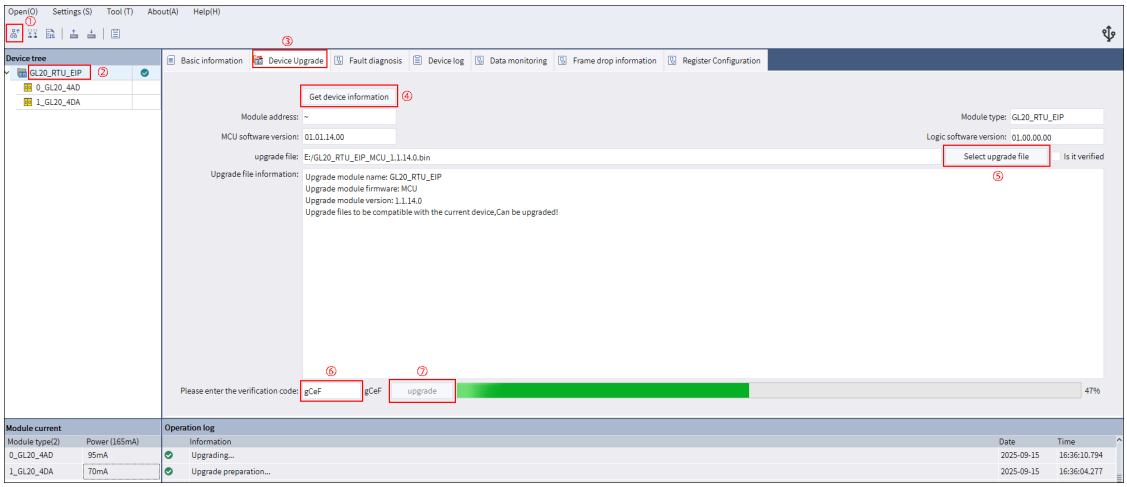
1. Open the IOManager software, and select "Settings ① > Communication ②". Set "Communication method" ③ and "Local IP Address" ④, as shown in the figure below.



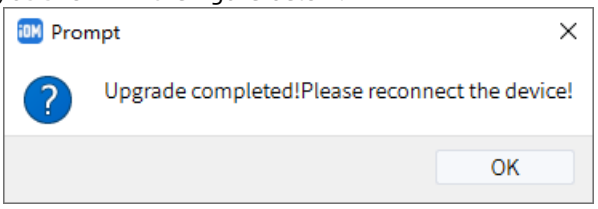
2. Click "Open > Connected Device". After the connection is successful, the operation log shows that the connection is established, as shown in the figure below.



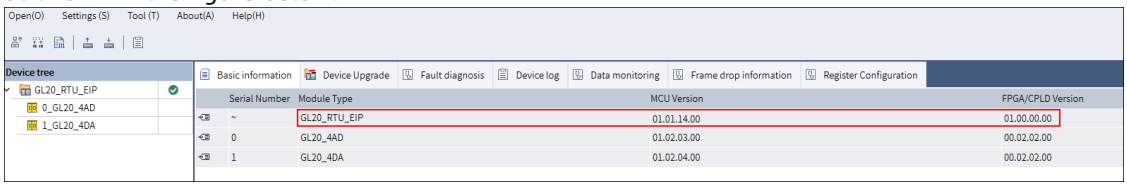
3. Click the "Upload configuration" icon ① to obtain the configuration. Select a coupler ② and click "Device Upgrade" ③. Click "Get device information" ④ to obtain the current version information. Click "Select upgrade file" ⑤ to select the MCU file in the local folder. Enter the verification code ⑥ and click "Upgrade" ⑦. The upgrade progress is displayed in the lower right corner of the interface, as shown in the figure below.



4. After the upgrade is complete, the "Upgrade completed. Please reconnect the device!" dialog box is displayed. Click "OK", as shown in the figure below.



5. Restart the communication interface module, connect the device, and rescan the configuration. View the "GL20_RTU_EIP" version under "Basic information" to check if the upgrade is successful, as shown in the figure below.



Upgrading firmware through USB Type-C interface

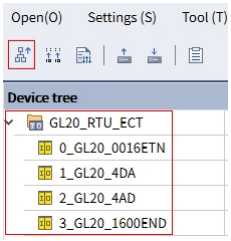
Prerequisites

- Obtain the firmware for upgrade from Inovance technical support (MCU: GL20_RTU_EIP_MCU_x.x.x.x.bin; FPGA: GL20_RTU_EIP_FPGA_x.x.x.x.bin).
- Disconnect the network cable between the product and the PLC, then power off and on again.
- This product is connected to a PC equipped with the IOManager configuration tool via a USB cable.

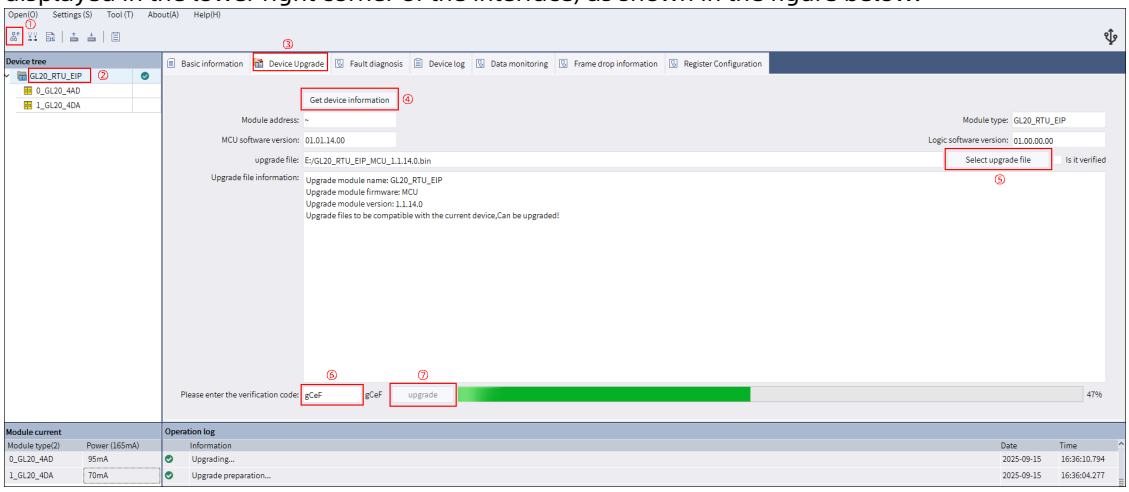
Procedure

The procedures for upgrading the MCU and FPGA are the same. The following takes upgrading the MCU as an example.

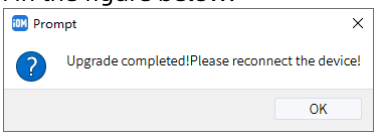
1. Double-click the shortcut icon IOManager to open the IOManager software, select "Open > Connected Device". The device status ("Connected") is displayed in the upper right corner of the interface, and the operation log prompts successful device connection.
2. Click to scan the configured devices, as shown below.



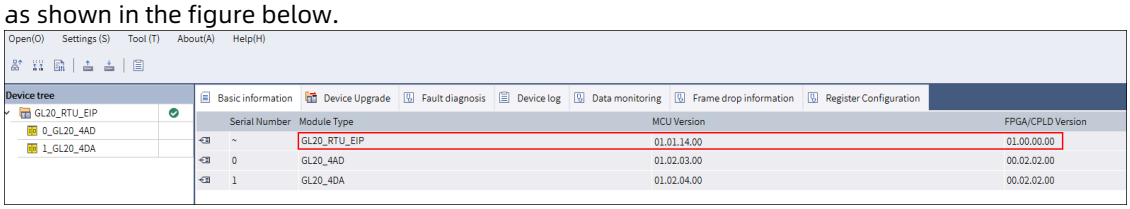
3. In the left "Device tree", select "GL20_RTU_EIP" ① and click "Device Upgrade" ②. Click "Get device information" ③ to obtain the MCU version. Click "Select upgrade file" ④ to select the MCU file in the local folder. Enter the verification code ⑤ and click "Upgrade" ⑥. The upgrade progress is displayed in the lower right corner of the interface, as shown in the figure below.



4. After the upgrade is complete, the "Upgrade completed. Please reconnect the device!" dialog box is displayed. Click "OK", as shown in the figure below.



5. Restart the communication interface module, connect the device, and rescan the configuration. View the "GL20_RTU_EIP" version under "Basic information" to check if the upgrade is successful, as shown in the figure below.

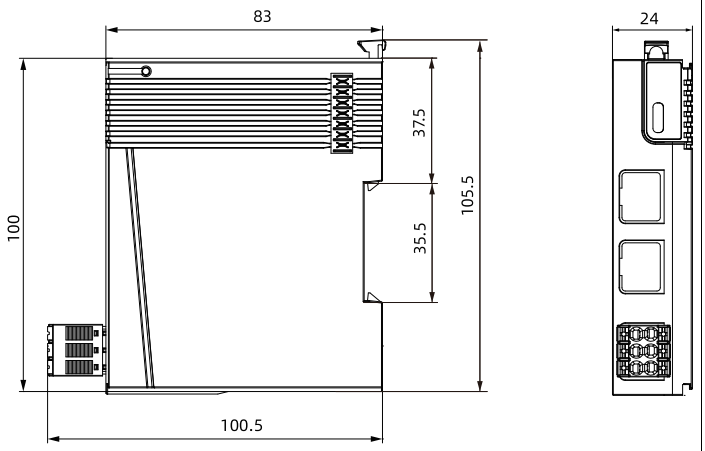
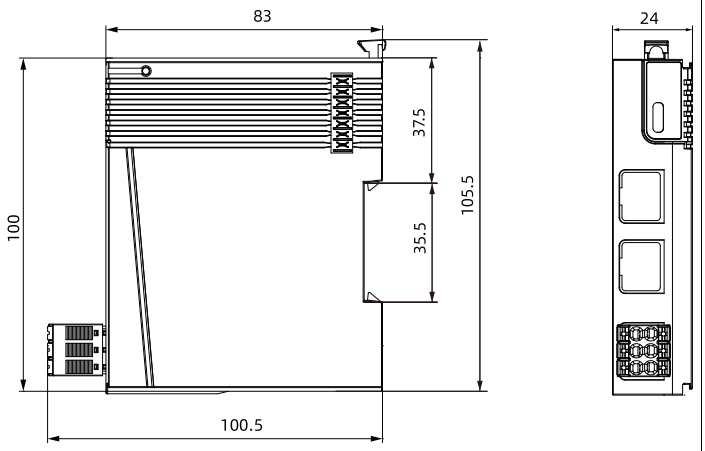
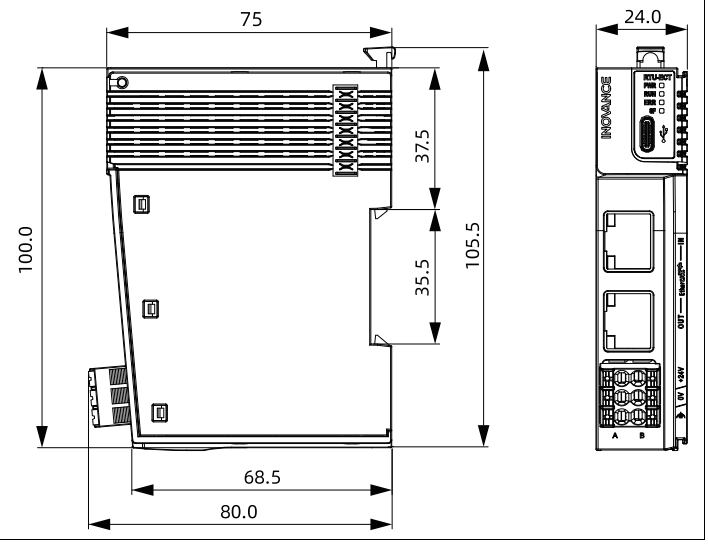


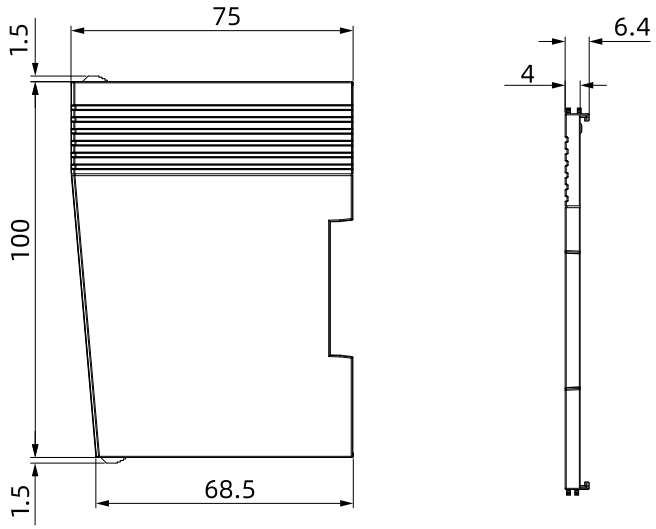
10 Appendix

10.1 Dimension Diagram

The dimension diagrams for each module of the GL20 series are as follows (unit: mm).

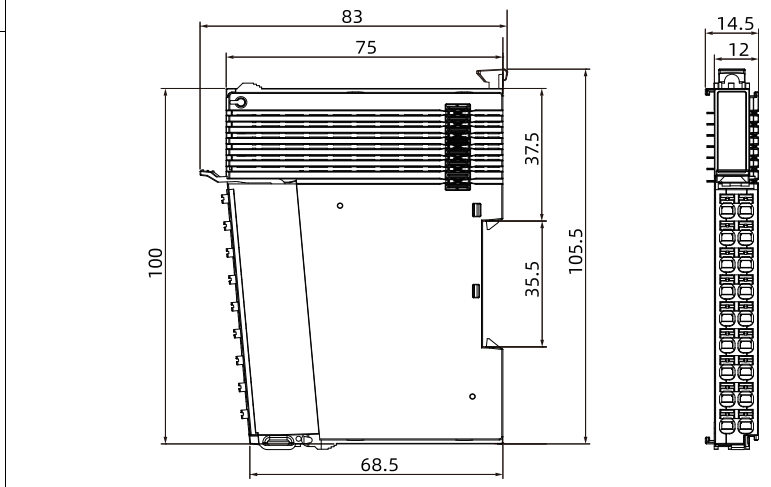
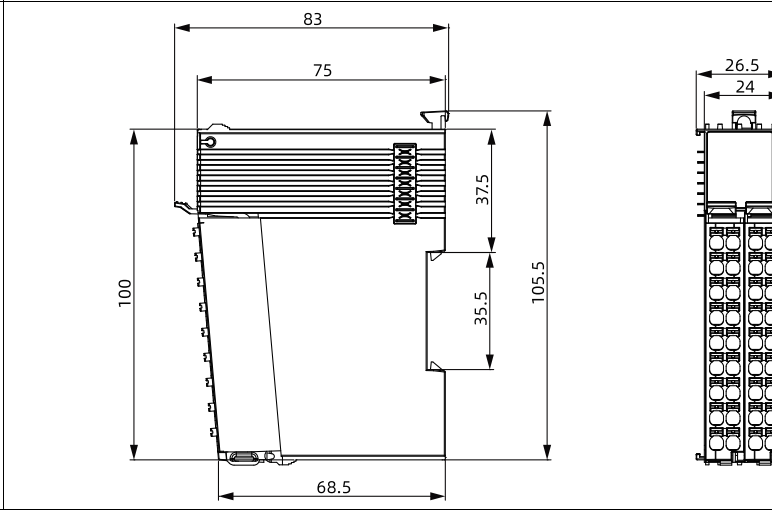
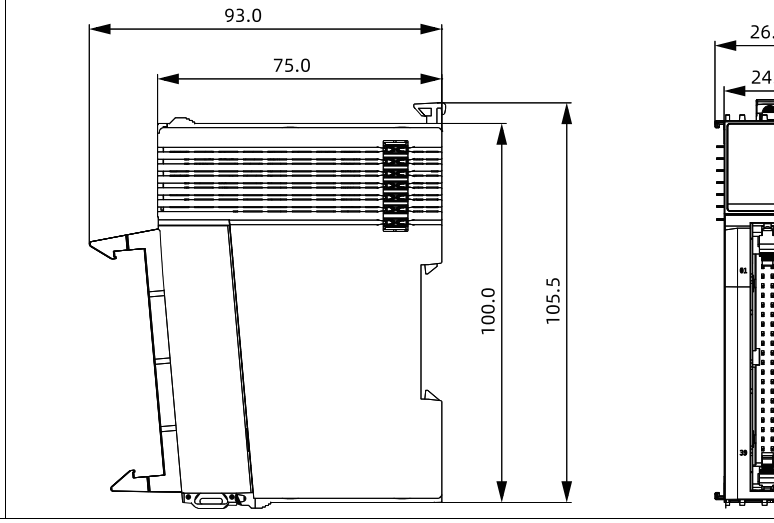
Communication interface module and end cover

Type	Model	Dimension Diagram
Communication interface module	GL20-RTU-PN	
	GL20-RTU-EIP	
	GL20-RTU-ECT32	

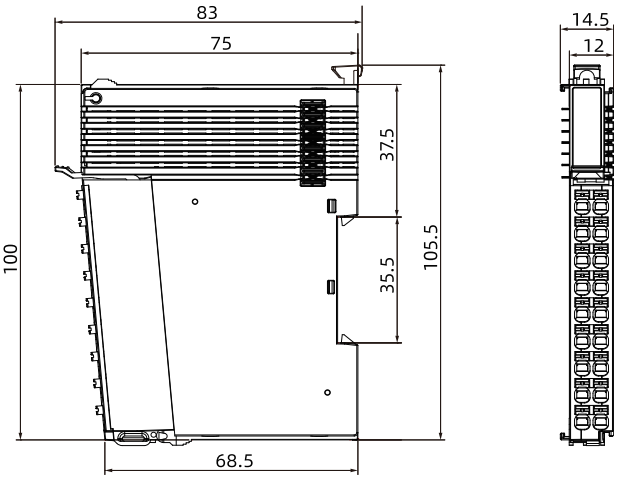
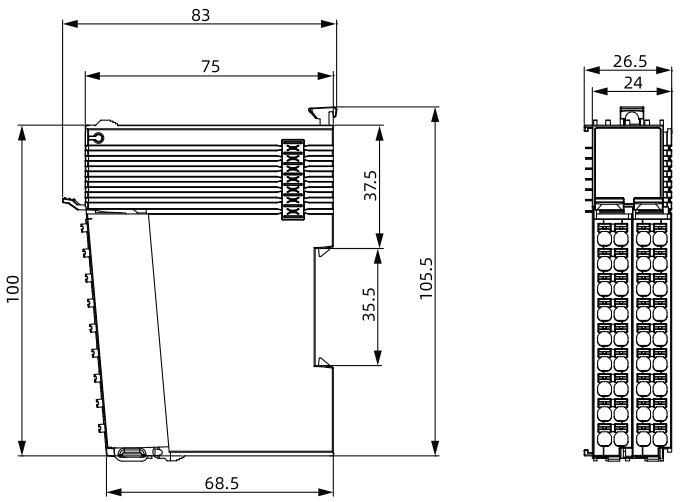
Type	Model	Dimension Diagram
End cover	-	

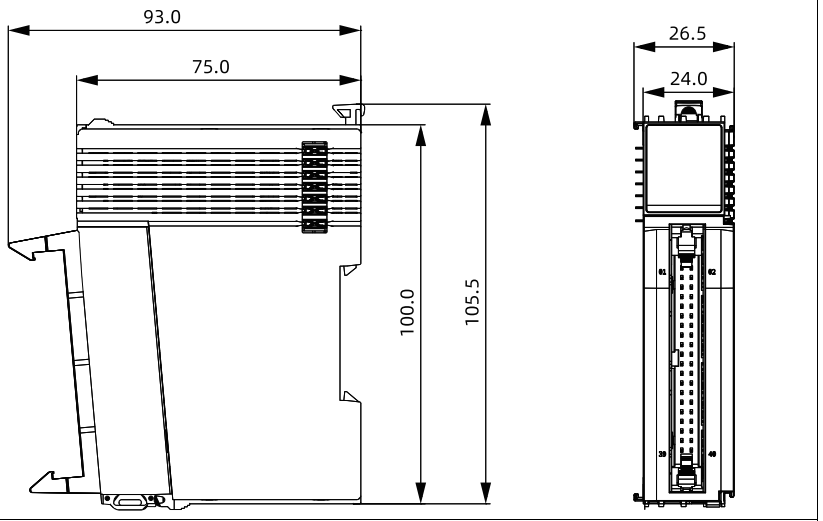
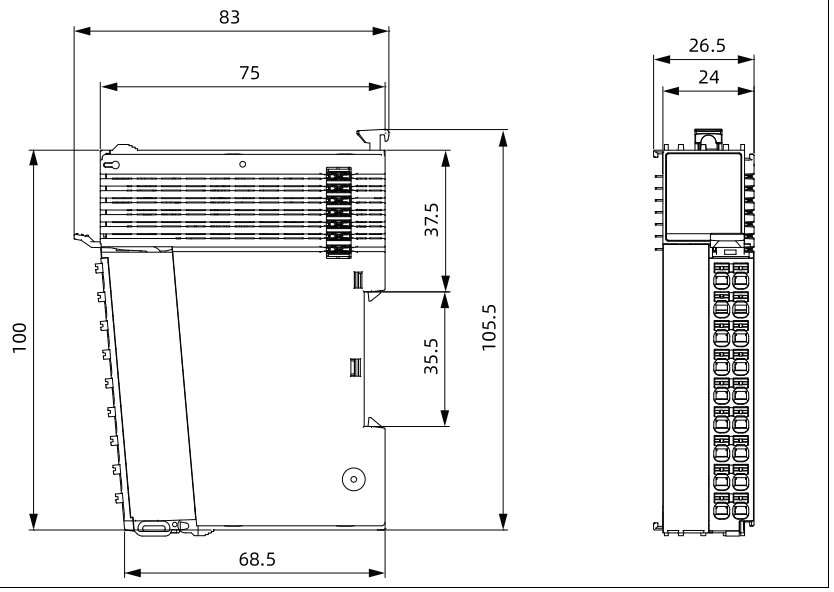
Digital module

- The dimensions of digital input modules are as follows:

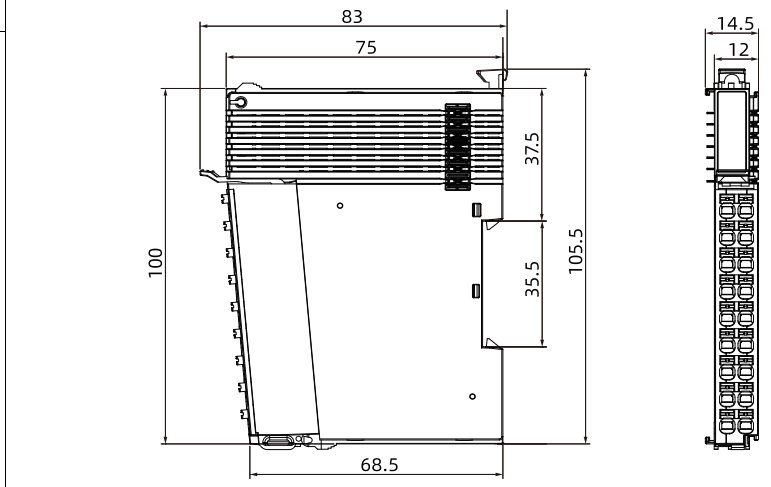
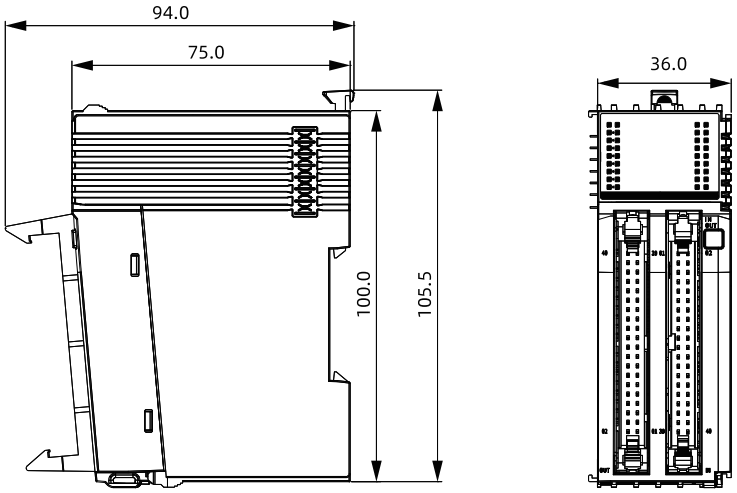
Model	Dimension Diagram
GL20-0800END GL20-1600END	
GL20-3200END	
GL20-3200END-M-INT	

- The dimensions of digital output modules are as follows:

Model	Dimension Diagram
GL20-0016ETP GL20-0016ETN GL20-0004ETP-2A GL20-0008ETN GL20-0008ETP GL20-0004ER	
GL20-0032ETN	

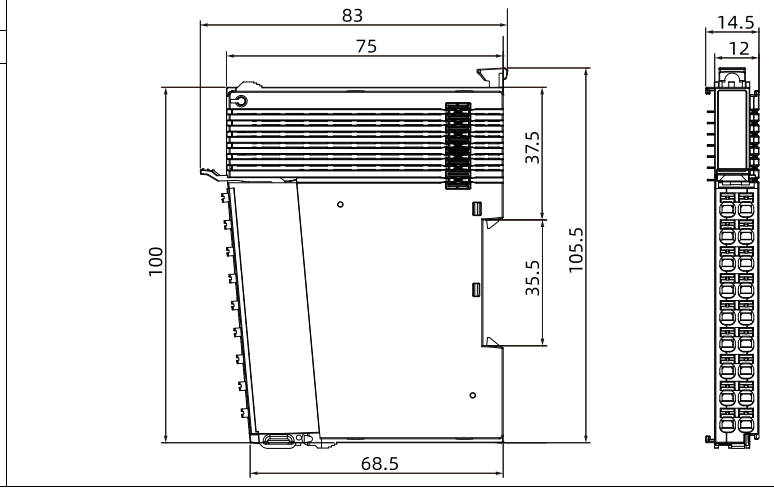
Model	Dimension Diagram
GL20-0032ETN-M	
GL20-0008ER	

- The dimensions of digital input/output modules are as follows:

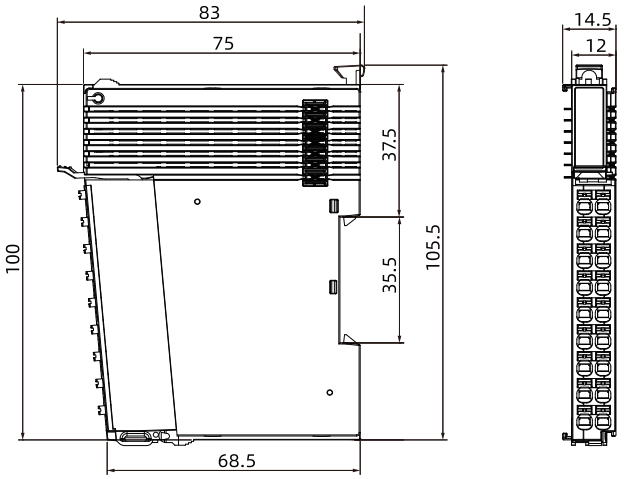
Model	Dimension Diagram
GL20-0808ETN GL20-0404ETP-5V	
GL20-3232ETN-M	

Analog module

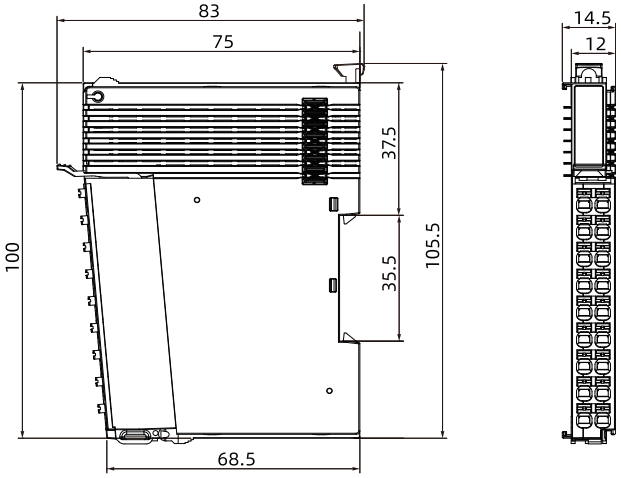
- The dimensions of analog input modules are as follows:

Model	Dimension Diagram
GL20-4AD GL20-8ADI GL20-8ADV	

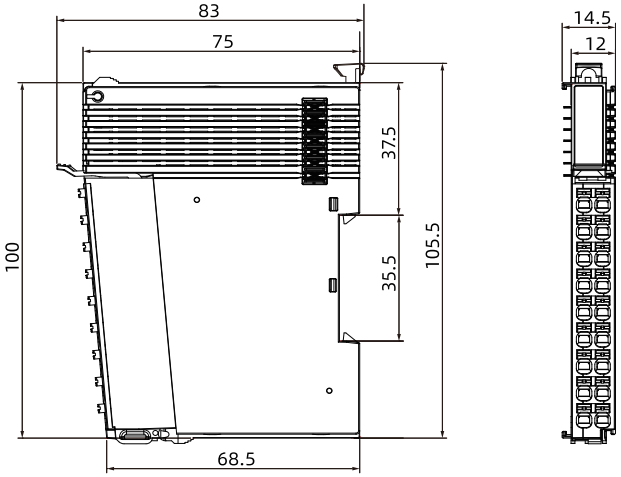
- The dimensions of analog output modules are as follows:

Model	Dimension Diagram
GL20-4DA GL20-8DAI GL20-8DAV	

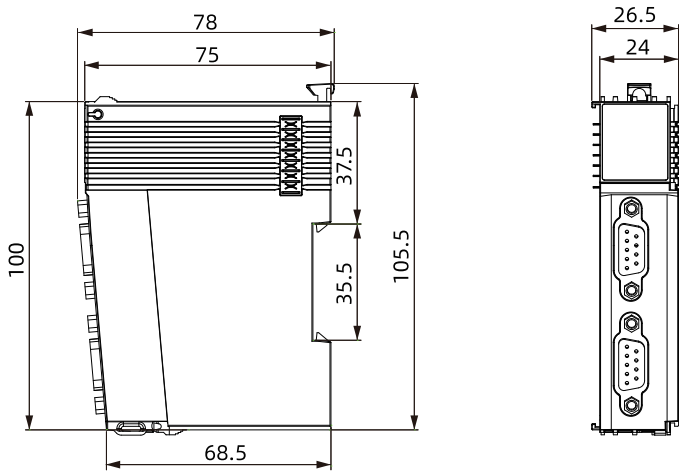
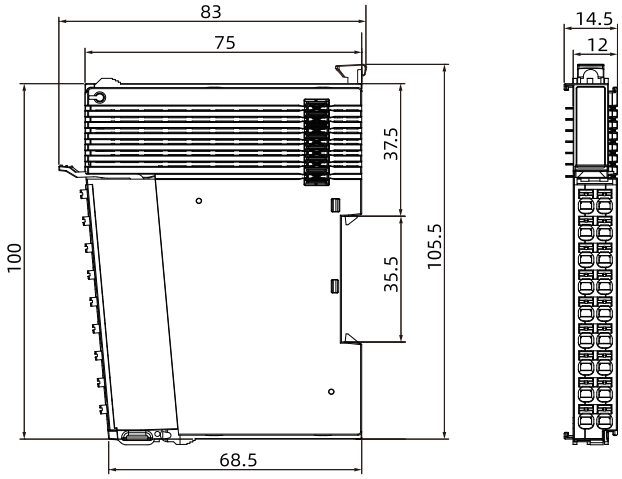
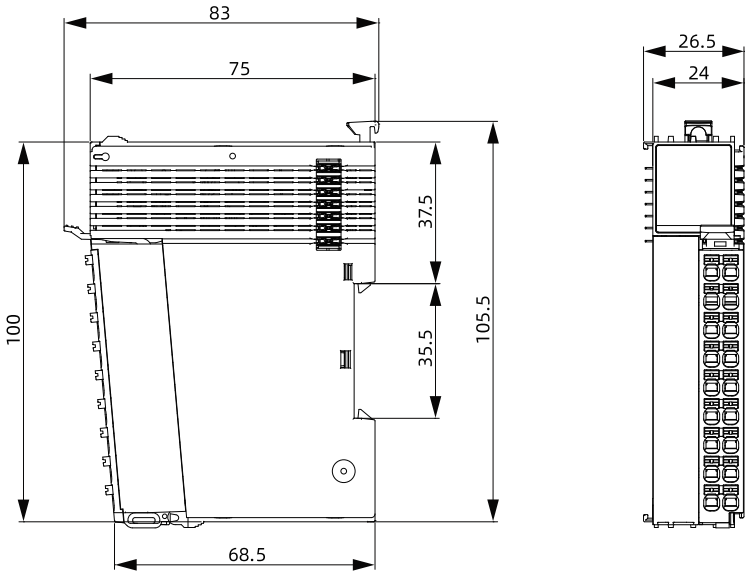
Temperature module

Model	Dimension Diagram
GL20-4PT GL20-4TC	

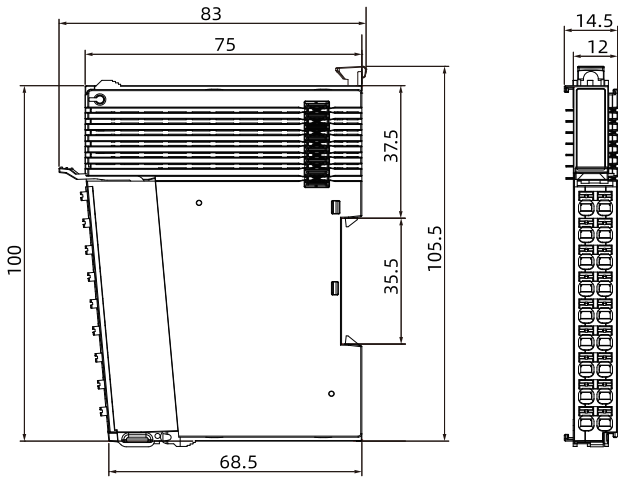
Process module

Model	Dimension Diagram
GL20-2SSI GL20-2HC	

Communication module

Model	Dimension Diagram
GL20-2S485-MDB GL20-2S485	
GL20-2SCOM-MDB GL20-2SCOM	
GL20-1DNM	

Relay power supply module

Model	Dimension Diagram
GL20-PS2	

10.2 Version Matching Information

10.2.1 GL20-RTU-ECT32

This section describes the firmware version, version of matching XML file, supported functions, version of matching module, and version of matching programming software, as shown in the table below.

Caution

The GL20-1DNM, GL20-2S485, GL20-2S485-MDB, GL20-2SCOM, and GL20-2SCOM-MDB modules have specific requirements for the firmware version of the matching PLC. For details, see the user guide of the related module.

Product Name	Product Code	Firmware Version	Programming Software Version/Device Description File (EDS/XML/GSD)	Bus Current Consumption
GL20-RTU-ECT32	01441023	3.1.10.0 and later	• AutoShop version: V4.10.0.0 and later • InoProShop version: V1.7.3 SP6 and later • XML: 3.0.11.0 and later	600 mA

Firmware Version	Matching XML file version	Supported Function	New Module Model	Product Code	Module Firmware Version	Programming Software Version	Bus Current Consumption
3.1.-10.0 3rd release	3.0.2-5.0	-	GL20-2SCOM-MDB	014412-75	• Board software: 1.1.5.0 and later • Logic software: 0.2.2.0 and later	Compatible with third-party PLCs: • Omron Sysmac Studio • Beckhoff TC3	170 mA
			GL20-2S485-MDB	014412-66	• Board software: 1.0.5.0 and later • Logic software: 0.2.2.0 and later		155 mA
			GL20-8DAI	014412-83	• Board software: 1.0.3.0 and later • Logic software: 0.2.2.0 and later	• iFA Evolution version: V1.4.2.5 + patched version or later • AutoShop version: V4.10.2.0 and later • InoProShop version: V1.9.0.1 and later	100 mA
			GL20-8DAV	014412-82			100 mA

Firmware Version	Matching XML file version	Supported Function	New Module Model	Product Code	Module Firmware Version	Programming Software Version	Bus Current Consumption
3.0.-6.0 2nd release	3.0.1-1.0	• Disables/Enable function • Online modification of SDO data for a single module • Upgrade of expansion modules with MCU • Parameter settings via I/O configuration tool	GL20-3200END	014413-49	Logic software: 0.1.2.0 and later	• iFA Evolution version: V1.4.2.5 + patched version or later • AutoShop version: V4.10.0.0 and later • InoProShop version: V1.7.3 SP6 and later	85 mA
			GL20-0032ETN	014413-48			80 mA
			GL20-8ADV	014413-46	• Board software: 1.2.0.1 and later • Logic software: 0.2.0.1 or later		65 mA
			GL20-8ADI	014413-43			65 mA
			GL20-0404ETP-5V	014413-42	Logic software: 0.1.11.0 and later	• iFA Evolution version: V1.4.2.5 + patched version or later • AutoShop version: V4.10.0.0 and later • InoProShop version: V1.7.3 SP5 and later	90 mA
			GL20-0004ER	014413-44	Logic software: 0.1.4.0 and later		90 mA
			GL20-0004ETP-2A	014413-40	Board software: 0.1.13.0 and later	• iFA Evolution version: V1.4.2.5 + patched version or later • AutoShop version: V4.10.0.0 and later • InoProShop version: V1.8.0.0 and later	80 mA
			GL20-1DNM	014413-45	Board software: 1.2.1.0 and above	• iFA Evolution version: V1.4.2.5 + patched version or later • InoProShop version: V1.8.0.0 and later	100 mA
			GL20-2HC	014413-34	• Board software: 4.0.1.2 and later • Logic software: 0.1.7.0 and later Note: For board software version 4.0.1.2 and later, the GL20-2HC module can be installed in any slot. For earlier versions, it can only be installed in the first four slots.	• iFA Evolution version: V1.4.2.5 + patched version or later • AutoShop version: V4.8.2.3 and later • InoProShop version: V1.7.3 SP6 and later	95 mA
			GL20-2SCOM-MDB	014412-75	• Board software: 1.1.5.0 and later • Logic software: 0.2.2.0 and later	• iFA Evolution version: V1.4.2.5 + patched version or later • InoProShop version: V1.7.3 SP6 and later	170 mA

Firmware Version	Matching XML file version	Supported Function	New Module Model	Product Code	Module Firmware Version	Programming Software Version	Bus Current Consumption
2.5.-10.0 1st release	3.0.2-.0	• Disables/Enable function • Encryption function	GL20-0016ETN	014413-73	Logic software: 0.1.2.0 and later	• iFA Evolution version: V1.4.2.5 + patched version or later • AutoShop version: V4.10.0.0 and later • InoProShop version: V1.7.3 SP6 and later	145 mA
			GL20-0016ETP	014413-74	Logic software: 0.2.1.0 and later		100 mA
			GL20-1600END	014413-75	Logic software: 0.1.2.0 and later		120 mA
			GL20-4DA	014413-79	Board software: 1.1.8.0 and later		70 mA
			GL20-4AD	014413-78	• Board software: 1.1.5.0 and later • Logic software: 0.1.3.0 and later		95 mA
			GL20-0008ER	014413-72	Logic software: 0.1.A.0 and later		110 mA
			GL20-0800END	014413-62	Logic software: 0.1.2.0 and later		105 mA
			GL20-0008ETN	014413-64			115 mA
			GL20-0008ETP	014413-63			80 mA
			GL20-0808ETN	014413-69	Logic software: 1.1.0.0 and later		130 mA
			GL20-3232ETN-M	014413-76	Logic software: 0.1.2.0 and later		250 mA
			GL20-3200END-M-INT	014413-65			95 mA
			GL20-0032ETN-M	014413-66			85 mA
			GL20-4PT	014413-71	Board software: 2.0.5.0 and later		95 mA
			GL20-4TC	014413-70			95 mA
			GL20-2S485	014413-53	Board software: 1.1.8.5 and later		155 mA
			GL20-PS2	014413-67	Logic software: 0.1.A.0 and later		55 mA

10.2.2 GL20-RTU-EIP

This section describes the expansion modules, functions, and GSD file versions compatible with the released firmware versions.

Product Name	Product Code	Firmware Version	Programming Software Version/Device Description File (EDS/XML/GSD)	Bus Current Consumption
GL20-RTU-EIP	01441135	Board software: 1.2.2.0 and later	• iFA Evolution version: V1.4.2.5 and later • EDS file: V1.0 and later	600 mA

Firmware Version	Matching EDS File Version	Supported Function	New Module Model	Product Code	Module Firmware Version	Programming Software Version	Bus Current Consumption
1.2.3.0 5th release	V1.0	Added compatibility for abnormal paths (to resolve the incompatibility issue with Keyence 1.2.2.0).	-	-	-	-	-
1.2.2.0 4th release	V1.0	• Supports AB PLC stop fault output. • Supports Inovance EVO series PLCs and Inovance large-sized PLCs. • Supports IOManager Ethernet communication function. • No restart required for diagnostics byte count configuration.	-	-	-	-	-

Firmware Version	Matching EDS File Version	Supported Function	New Module Model	Product Code	Module Firmware Version	Programming Software Version	Bus Current Consumption
1.1.15.0 3rd release	V1.0	• Supports MCU and FPGA version upgrade via USB cable using the IOManager software. • Supports the IOManager software to obtain detailed fault locations of the module through diagnostic PDO parameters.	GL20-0004ETP-2A	01441021	Logic software: 1.14.0 and later	• iFA Evolution version: V1.4.2.5 + patched version or later • AutoShop version: V4.10.0.0 and later • InoProShop version: V1.7.3 SP6 and later	80 mA
			GL20-0404ETP-5V	01441342	Logic software: 0.1.11.0 and later		90 mA
			GL20-8DAV	01441127	Logic software: 0.2.2.0 and later Board software: 1.0.3.0 and later		100 mA
			GL20-8DAI	01441128	Logic software: 0.2.2.0 and later Board software: 1.0.3.0 and later		100 mA
			GL20-2SSI	01441133	Board software: 1.1.6.0 and later		115 mA
			GL20-2HC	01441134	Logic software: 4.0.1.0 and later Board software: 4.0.1.1 and later IOManag-er: V1R2 and later		95 mA
1.1.9.0 2nd release	V1.0	• Supports USB configuration of IOManager parameters. • Supports obtaining detailed module fault codes through IOManager.	-	-	-	-	-

Firmware Version	Matching EDS File Version	Supported Function	New Module Model	Product Code	Module Firmware Version	Programming Software Version	Bus Current Consumption
1.1.-6.0 1st release	V1.0	-	GL20-0016ETN	014411-36	Logic software: 0.1.2.0 and later	• iFA Evolution version: V1.4.2.5 + patched version or later • AutoShop version: V4.10.0.0 and later • InoProShop version: V1.7.3 SP6 and later	145 mA
			GL20-0016ETP	014410-20	Logic software: 0.1.2.0 and later		100 mA
			GL20-1600END	014410-24	Logic software: 0.1.2.0 and later		120 mA
			GL20-4DA	014410-27	Board software: 1.1.5.0 and later		70 mA
			GL20-4AD	014410-22	Board software: 1.1.5.0 and later		95 mA
			GL20-8ADI	014411-24	PCB software: 1.1.0.5 or later		65 mA
			GL20-8ADV	014411-29	PCB software: 1.1.0.5 or later		65 mA
			GL20-0008ER	014410-25	Logic software: 0.1.2.0 and later		110 mA
			GL20-0800END	014414-90	Logic software: 0.1.2.0 and later		105 mA
			GL20-0008ETN	014413-64	Logic software: 0.1.2.0 and later		115 mA
			GL20-0008ETP	014413-63	Logic software: 0.1.2.0 and later		80 mA
			GL20-0808ETN	014414-92	Logic software: 0.1.2.0 and later		130 mA
			GL20-3232ETN-M	014413-76	Board software: 3.0.4.0 and later		250 mA
			GL20-3200END-M-INT	014413-65	Board software: 3.0.4.0 and later		95 mA
			GL20-0032ETN-M	014413-66	Board software: 3.0.4.0 and later		85 mA
			GL20-3200END	014411-38	Logic software: 0.1.2.0 and later		85 mA
			GL20-0032ETN	014411-25	Logic software: 0.1.2.0 and later		80 mA
			GL20-4DA	014410-27	Board software: 1.1.5.0 and later		70 mA
			GL20-4AD	014410-22	Board software: 1.1.5.0 and later		95 mA
			GL20-8ADI	014411-24	PCB software: 1.1.0.5 or later		65 mA
			GL20-8ADV	014411-29	PCB software: 1.1.0.5 or later		65 mA
			GL20-4PT	014410-28	Board software: 2.0.5.0 and later		95 mA
			GL20-4TC	014411-30	Board software: 2.0.5.0 and later		95 mA
			GL20-PS2	014411-26	Board software: 0.1.2.0 and later		55 mA

10.2.3 GL20-RTU-PN

This section describes the expansion modules, functions, and GSD file versions compatible with the released firmware versions.

Product Name	Product Code	Firmware Version	Programming Software Version/Device Description File (EDS/XML/GSD)	Bus Current Consumption
GL20-RTU-PN	01441026	Board software: 2.4.2.4 and later	• CPU version: 2.4.2.4 • GSD: 20250224 and later	600 mA

Firmware Version	Matching GSD File Version	Supported Function	New Module Model	Product Code	Module Firmware Version	Programming Software Version	Bus Current Consumption
2.4.2.4 6th release	20250224	• Supports firmware upgrade for couplers and expansion modules. • Supports reading module version and fault information. • For board version 1.1.5.0 and later, the GL20-2SCOM-MDB module supports submodules for input status and error code reading. • For board version 4.0.1.2 and later, the GL20-2HC module can be installed in any slot of the coupler. For earlier versions, the module can only be installed in the first four slots.	-	-	-	-	-

Firmware Version	Matching GSD File Version	Supported Function	New Module Model	Product Code	Module Firmware Version	Programming Software Version	Bus Current Consumption
2.4.1.0 5th release	20240401	Resolved the issue of the GL20-RTU-PN module going offline due to external TCP connec-tions.	GL20-8DAV	01441127	Logic software: 0.2.2.0 and later Board software: 1.0.3.0 and later	• iFA Evolution version: V1.4.2.5 + patched version or later • AutoShop version: V4.10.0.0 and later • InoProShop version: V1.7.3 SP6 and later	100 mA
			GL20-8DAI	01441128	Logic software: 0.2.2.0 and later Board software: 1.0.3.0 and later		100 mA
			GL20-2S485-MDB	01441131	Logic software: 0.2.2.0 and later Board software: 1.0.2.0 and later		155 mA
2.4.0.0 4th release	20240401	• Compatible with the GL20-2SCOM-MDB serial communi-cation module, supporting both Modbus protocol and free protocol. • Supports power overload fault alarm for the GL20-PS2 relay power module. • Optimized the fault diagnosis function.	GL20-2HC	01441134	Logic software: 0.1.7.0 and later Board software: 1.2.3.0 and later	• iFA Evolution version: V1.4.2.5 + patched version or later • AutoShop version: V4.10.0.0 and later • InoProShop version: V1.7.3 SP6 and later	95 mA
			GL20-0404ETP-5V	01441342	Logic software: 0.1.12.0 and later		90 mA
			GL20-0004ETP-2A	01441340	Logic software: 0.1.14.0 and later		80 mA
			GL20-2SCOM-MDB	01441132	Logic software: 0.2.2.0 and later Board software: 1.0.2.2 and later		170 mA

Firmware Version	Matching GSD File Version	Supported Function	New Module Model	Product Code	Module Firmware Version	Programming Software Version	Bus Current Consumption
2.2.0.0 3rd release	20230523	Supports TIA Portal online scanning and automatic configuration for GL20-RTU-PN module and expansion modules.	GL20-PS2	01441126	Logic software: 0.1.A.0 and later	• iFA Evolution version: V1.4.2.5 + patched version or later • AutoShop version: V4.10.0.0 and later • InoProShop version: V1.7.3 SP6 and later	55 mA
			GL20-2SSI	01441133	Board software: 1.1.6.0 and later		115 mA
			GL20-0032ETN	01441125	Logic software: 0.1.2.0 and later		80 mA
			GL20-3200END	01441138	Logic software: 0.1.2.0 and later		85 mA
			GL20-8ADI	01441124	Board software: 1.1.0.3 and later		65 mA
			GL20-8ADV	01441129	Board software: 1.1.0.3 and later		65 mA
			GL20-4AD-DF	01441347	Board software: 1.1.5.0 and later		95 mA
			GL20-0004ER	01441344	Logic software: 0.1.4.0 and later	• iFA Evolution version: V1.4.2.5 + patched version or later • AutoShop version: V4.10.0.0 and later • InoProShop version: V1.7.3 SP2 and later	90 mA

Firmware Version	Matching GSD File Version	Supported Function	New Module Model	Product Code	Module Firmware Version	Programming Software Version	Bus Current Consumption
2.1.1.0 2nd release	202303-23	• Supports the range of -27,648 to 27,648 for GL20-4AD and GL20-4DA modules. • Supports overflow detection enable function for GL20-4AD, GL20-4TC, and GL20-4PT modules. • Supports the MRP function.	GL20-0008ER	014410-25	Logic software: 0.1.2.0 and later	• iFA Evolution version: V1.4.2.5 + patched version or later • AutoShop version: V4.10.0.0 and later • InoProShop version: V1.7.3 SP6 and later	110 mA
			GL20-0800END	014414-90	Logic software: 0.1.2.0 and later		105 mA
			GL20-0808ETN	014414-92	Logic software: 0.1.2.0 and later		130 mA
			GL20-0008ETN	014413-64	Logic software: 0.1.2.0 and later	• iFA Evolution version: V1.4.2.5 + patched version or later • AutoShop version: V4.6.5.0 and later • InoProShop version: V1.7.3 SP5 and later	115 mA
			GL20-0008ETP	014413-63	Logic software: 0.1.2.0 and later		80 mA
			GL20-0032ETN-M	014413-66	Logic software: 0.1.2.0 and later	• iFA Evolution version: V1.4.2.5 + patched version or later • AutoShop version: V4.8.2.3 and later • InoProShop version: V1.7.3 SP6 and later	85 mA
			GL20-3200END-M-INT	014413-65	Logic software: 0.1.2.0 and later	• iFA Evolution version: V1.4.2.5 + patched version or later • AutoShop version: V4.8.2.4 and later • InoProShop version: V1.7.3 SP6 and later	95 mA
			GL20-3232ETN-M	014413-76	Logic software: 0.1.2.0 and later		250 mA
			GL20-4PT	014410-28	Board software: 2.0.5.0 and later	• iFA Evolution version: V1.4.2.5 + patched version or later • AutoShop version: V4.10.0.0 and later • InoProShop version: V1.7.3 SP6 and later	95 mA
			GL20-4TC	014411-30	Board software: 2.0.5.0 and later		95 mA
2.0.0.5 1st release	202209-30	-	GL20-1600END	014410-24	Logic software: 0.1.2.0 and later	• iFA Evolution version: V1.4.2.5 + patched version or later • AutoShop version: V4.10.0.0 and later • InoProShop version: V1.7.3 SP6 and later	120 mA
			GL20-0016ETP	014410-20	Logic software: 0.1.2.0 and later		100 mA
			GL20-0016ETN	014411-36	Logic software: 0.1.2.0 and later		145 mA
			GL20-4AD	014410-22	Board software: 1.1.5.0 and later		95 mA
			GL20-4DA	014410-27	Board software: 1.1.5.0 and later		70 mA

10.2.4 IOManager

10.2.4.1 Communication Interface Module Versions

Name	MCU Version	FPGA Version	XML Version/EDS Version/GSD Version
GL20-RTU-ECT32	3.0.6.0 and later	0.1.4.2 and later	GL20-RTU-ECT32_3.0.2.1.xml (without configurable parameters) and later Path: "IOManager\xml"
GL20-RTU-EIP	1.1.9.0 and later	0.1.2.0 and later	EDS: GL20-RTU-EIP_V00.01.eds and later
GL20-RTU-PN	2.4.1.0 and later	-	GSD: GSDML-V2.31-INOVANCE-GL20-RTU-PN-20240801.xml and later

10.2.4.2 Applicable I/O Expansion Module Versions

Model	GL20-RTU-ECT32	GL20-RTU-EIP	GL20-RTU-PN
GL20-0016ETN	Supported	Supported	Supported
GL20-0016ETP	Supported	Supported	Supported
GL20-1600END	Supported	Supported	Supported
GL20-4DA	Supported	Supported	Supported
GL20-4AD	Supported	Supported	Supported
GL20-0008ER	Supported	Supported	Supported
GL20-0800END	Supported	Supported	Supported
GL20-0008ETN	Supported	Supported	Supported
GL20-0008ETP	Supported	Supported	Supported
GL20-0808ETN	Supported	Supported	Supported
GL20-3232ETN(-M)	Supported	Supported	Supported
GL20-3200END(-M)	Supported	Supported	Supported
GL20-0032ETN(-M)	Supported	Supported	Supported
GL20-3200END	Supported	Supported	Supported
GL20-0032ETN	Supported	Supported	Supported
GL20-4PT	Supported	Supported	Supported
GL20-4TC	Supported	Supported	Supported
GL20-2S485	Supported	Not supported	Not supported
GL20-2S485-MDB	Supported	Not supported	Not supported
GL20-PS2	Supported	Supported	Supported
GL20-8ADV	Supported	Supported	Supported
GL20-8ADI	Supported	Supported	Supported
GL20-0404ETP-5V	Supported	Supported	Supported
GL20-0004ER	Supported	Supported	Supported
GL20-0004ETP-2A	Supported	Supported	Supported
GL20-2SCOM	Supported	Not supported	Not supported
GL20-2SCOM-MDB	Supported	Not supported	Not supported
GL20-2SSI	Supported	Supported	Supported
GL20-1DNM	Supported	Not supported	Not supported
GL20-2HC	Supported	Not supported	Supported
GL20-8DAV	Supported	Supported	Supported
GL20-8DAI	Supported	Supported	Supported

Note

If there are unsupported modules in the configuration, this function cannot be configured using the IOManager software and will require support in a future version.

10.3 Configuration Parameters

10.3.1 GL20-RTU-ECT32

10.3.1.1 GL20-0004ER

Introduction

The GL20-0004ER module is a 4-channel relay output module, primarily used for digital output control.

- Name: DO04 module
- Module category: Digital Out
- Module identification code: 0x10F41027

Configuration data

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8000+0x40*n is shown in the following table.

Index	0x8000+0x40*n: 0004ER module configure stop mode parameters				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	1
1	DO module CH0 stop mode after EtherCAT lost link	USINT	RW	No	0x0F

Subindex 1: DO module CH0 stop mode after EtherCAT lost link

bit0 to bit7	Output mode upon stop: each bit corresponds to an output port. 0: Keep present output status 1: Output to preset value defined in object dictionary 8001

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8001+0x40*n is shown in the table below.

Index	0x8001+0x40*n: 0004ER module configure stop value parameters				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	1
1	DO module 4bit stop value after EtherCAT lost link	USINT	RW	No	0

Subindex 1: DO module 4bit stop value after EtherCAT lost link

bit0 to bit7	Output preset value upon stop: each bit corresponds to the preset value of an output port. 0: Outputs 0 1: Outputs 1

10.3.1.2 GL20-0004ETP-2A

Introduction

GL20-0004ETP-2A is a 4-channel relay DO module, primarily used for digital output control.

- Name: DO04 module
- Module category: Digital Out
- Module identification code: 0x10F41028

Configuration data

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8000+0x40*n is shown in the following table.

Index	0x8000+0x40*n: 0004ETP-2A module configure stop mode parameters				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	1
1	DO module CH0 stop mode after EtherCAT lost link	USINT	RW	No	0x0F

Subindex 1: DO module CH0 stop mode after EtherCAT lost link

Bit	Description
bit0 to bit7	Output mode upon stop: each bit corresponds to an output port. 0: Keep present output status 1: Output to preset value defined in object dictionary 8001

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8001+0x40*n is shown in the table below.

Index	0x8001+0x40*n: 0004ETP-2A module configure stop value parameters				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	1
1	DO module 4bit stop value after EtherCAT lost link	USINT	RW	No	0

Subindex 1: DO module 4bit stop value after EtherCAT lost link

Bit	Description
bit0 to bit7	Output preset value upon stop: each bit corresponds to the preset value of an output port. 0: Outputs 0 1: Outputs 1

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8002+0x40*n is shown in the table below.

Index	0x8002+0x40*n: 0004ETP-2A module diagnosis enable				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	1
1	DO module diagnosis enable	UINT	RW	No	0xFF

Subindex 1: DO module diagnosis enable

Bit	Description
bit0	Open circuit to VDD 0: Inactive 1: Active
bit1	Switch ON disconnection 0: Inactive 1: Active
bit2	Switch OFF disconnection 0: Inactive 1: Active
bit3	Overload 0: Inactive 1: Active
bit4	Overcurrent 0: Inactive 1: Active
bit5	Power supply undervoltage 0: Inactive 1: Active
bit6	Overtemperature 0: Inactive 1: Active
bit7	24 V power outage 0: Inactive 1: Active
bit8 to bit5	Reserved

10.3.1.3 GL20-0404ETP-5V

Introduction

The GL20-0404ETP-5V module is provided with 4 digital inputs and 4 digital outputs.

- Name: DO04 module
- Module category: Digital Out
- Module identification code: 0x10F41064

Configuration data

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8000+0x40*n is shown in the following table.

Index	0x8000+0x40*n: 0404ETP DI-CH0 filter time parameters				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	2
1	Digital input Filter time 8bit	UINT	RO	No	0x04

The subindex represents the filter time configuration for detected digital inputs. Each group supports independent filter time configuration. Default is 0x0004, corresponding to a filter time of 1ms. The specific configuration range is shown below:

Filter time	Description	Filter time	Description
0x0000	No filter	-	-
0x0001	Filter time: 0.25 ms	0x0010	Filter time: 4 ms
0x0002	Filter time: 0.5 ms	0x0020	Filter time: 8 ms
0x0004	Filter time: 1 ms	0x0040	Filter time: 16 ms
0x0008	Filter time: 2 ms	0x0080	Filter time: 32 ms

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8001+0x40*n is shown in the table below.

Index	0x8001+0x40*n: 0404ETP module configure stop mode parameters				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	1
1	DO module CH0-8bit stop mode after EtherCAT link lost	USINT	RW	No	0x0F

Subindex 1: DO module CH0-8bit stop mode after EtherCAT lost link

Bit	Description
bit0 to bit4	Output mode upon stop: each bit corresponds to an output port. 0: Keep present output status 1: Output to preset value defined in object dictionary 8002

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8002+0x40*n is shown in the table below.

Index	0x8002+0x40*n: 0404ETP module configure stop value parameters				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	1
1	DO module 8bit stop value after EtherCAT lost link	USINT	RW	No	0

Subindex 1: DO module 8bit stop value after EtherCAT lost link

Bit	Description
bit0 to bit4	Output preset value upon stop: each bit corresponds to the preset value of an output port. 0: Outputs 0 1: Outputs 1

10.3.1.4 GL20-0008ETN/GL20-0008ETP/GL20-0008ER

Introduction

The GL20-0008xxx series modules are 8-channel DO modules, including GL20-0008ETN (0x1041022), GL20-0008ETP (0x10F41025), and GL20-0008ER (0x1041023). They are primarily used for digital output control. GL20-0008ETN/0008ETP/0008ER are referred to as 0008xxx in the table below.

- Name: DO08 module
- Module category: Digital Out

Note

GL20-0008ER is an 8-channel relay DO module and the others are transistor DO modules.

Configuration data

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8000+0x40*n is shown in the following table.

Index	0x8000+0x40*n: 0008ER module configure stop mode parameters				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	1
1	DO module CH0 stop mode after EtherCAT lost link	USINT	RW	No	0xFF

Subindex 1: DO module CH0 stop mode after EtherCAT lost link

Bit	Description
bit0 to bit7	Output mode upon stop: each bit corresponds to an output port. 0: Keep present output status 1: Output to preset value defined in object dictionary 8001

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8001+0x40*n is shown in the table below.

Index	0x8001+0x40*n: 0008ER module configure stop value parameters				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	1
1	DO module CH0 stop value after EtherCAT lost link	UINT	RW	No	0

Subindex 1: DO module CH0 stop value after EtherCAT lost link

Bit	Description
bit0 to bit7	Output preset value upon stop: each bit corresponds to the preset value of an output port. 0: Outputs 0 1: Outputs 1

10.3.1.5 GL20-0800END

Introduction

GL20-0800END is an 8-channel DI module, primarily used for digital input acquisition.

- Name: GL20-0800END
- Module category: Digital In
- Module identification code: 0x10F41012

Configuration data

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8000+0x40*n is shown in the table below.

Index	0x8000+0x40*n: 0800END module configure parameters				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	0800END Digital input filter time	USINT	RO	No	0x0004

The subindex represents the filter time configuration for detected digital inputs. Each group supports independent filter time configuration. Default is 0x0004, corresponding to a filter time of 1ms. The specific configuration range is shown below:

Filter time	Description	Filter time	Description
0x0000	No filter	-	-
0x0001	Filter time: 0.25 ms	0x0010	Filter time: 4 ms
0x0002	Filter time: 0.5 ms	0x0020	Filter time: 8 ms
0x0004	Filter time: 1 ms	0x0040	Filter time: 16 ms
0x0008	Filter time: 2 ms	0x0080	Filter time: 32 ms

10.3.1.6 GL20-0808ETN

Introduction

The GL20-0808ETN module supports eight digital inputs and eight digital outputs.

- Name: DO08 module
- Module category: Digital In/Out
- Module identification code: 0x10F41060

Configuration data

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8000+0x40*n is shown in the following table.

Index	0x8000+0x40*n: 0808ETN DI-CH0 filter time parameters				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	Digital input Filter time 8bit	USINT	RO	RO	0x04

The subindex represents the filter time configuration for detected digital inputs. Each group supports independent filter time configuration. Default is 0x0004, corresponding to a filter time of 1ms. The specific configuration range is shown below:

Filter time	Description	Filter time	Description
0x0000	No filter	-	-
0x0001	Filter time: 0.25 ms	0x0010	Filter time: 4 ms
0x0002	Filter time: 0.5 ms	0x0020	Filter time: 8 ms
0x0004	Filter time: 1 ms	0x0040	Filter time: 16 ms
0x0008	Filter time: 2 ms	0x0080	Filter time: 32 ms

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8001+0x40*n is shown in the table below.

Index	0x8000+0x40*n: 0808ETN DI-CH0 filter time parameters				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	DO module CH0-8bit stop mode after EtherCAT link lost	USINT	RW	RO	0xFF

Subindex 1: DO module CH0-8bit stop mode after EtherCAT lost link

Bit	Description
bit0 to bit7	Output mode upon stop: each bit corresponds to an output port. 0: Keep present output status 1: Output to preset value defined in object dictionary 8002

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8002+0x40*n is shown in the table below.

Index	0x8001+0x40*n: 0808ETN module configure stop value parameters				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	1
1	DO module 8bit stop value after EtherCAT lost link	USINT	RW	RO	0

Subindex 1: DO module 8bit stop value after EtherCAT lost link

Bit	Description
bit0 to bit7	Output preset value upon stop: each bit corresponds to the preset value of an output port. 0: Outputs 0 1: Outputs 1

10.3.1.7 GL20-1600END

Introduction

GL20-1600END is mainly used for digital input acquisition.

- Name: DI16 module
- Module category: Digital In
- Module identification code: 0x10F41010

Configuration data

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8000+0x40*n is shown in the following table.

Index	0x8000+0x40*n: 1600END module configure parameters				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	2
1	1600END Digital input filter time CH0	UINT	RW	No	0x04
2	1600END Digital input filter time CH1	UINT	RW	No	0x04

The subindex represents the filter time configuration for detected digital inputs. Each group supports independent filter time configuration. Default is 0x0004, corresponding to a filter time of 1ms. The specific configuration range is shown below.

Filter time	Description	Filter time	Description
0x0000	No filter	-	-
0x0001	Filter time: 0.25 ms	0x0010	Filter time: 4 ms
0x0002	Filter time: 0.5 ms	0x0020	Filter time: 8 ms
0x0004	Filter time: 1 ms	0x0040	Filter time: 16 ms
0x0008	Filter time: 2 ms	0x0080	Filter time: 32 ms

10.3.1.8 GL20-0016ETP/GL20-0016ETN

Introduction

The GL20-0016XXX series modules are 16-channel DO modules, including GL20-0016ETN (0x1041020) and GL20-0016ETP (0x10F41024). They are used for digital output control and are referred to as 0016XXX in the following tables

- Name: DO16 module
- Module category: Digital Out

Configuration data

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8000+0x40*n is shown in the following table.

Index	0x8000+0x40*n: 0016xxx module configure stop mode parameters				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	2
1	DO module CH0 stop mode after EtherCAT lost link	UINT	RW	No	0xFF
2	DO module CH1 stop mode after EtherCAT lost link	UINT	RW	No	0xFF

Subindex 1: DO module CH0 stop mode after EtherCAT lost link (Subindex 2 is the same as Subindex 1.)

bit0 to bit7	Output mode upon stop: each bit corresponds to an output port. 0: Keep present output status 1: Output to preset value defined in object dictionary 8001

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8001+0x40*n is shown in the table below.

Index	0x8001+0x40*n: 0016xxx module configure stop value parameters				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	2
1	DO module CH0 stop value after EtherCAT lost link	UINT	RW	No	0
2	DO module CH1 stop value after EtherCAT lost link	UINT	RW	No	0

Subindex 1: DO module CH0 stop value after EtherCAT lost link (Subindex 2 is the same as Subindex 1.)

Bit	Description
bit0 to bit7	Output preset value upon stop: each bit corresponds to the preset value of an output port. 0: Outputs 0 1: Outputs 1

10.3.1.9 GL20-0032ETN/GL20-0032ETN-M

Introduction

GL20-0032ETN and GL20-0032ETN-M are 32-point DO modules designed for digital output control. The configuration data of the two modules is the same.

- Name: GL20-0032ETN
- Module category: Digital Out
- Module identification code: 0x10F41021

Configuration data

Configuration data (Output): For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8000+0x40*n is shown in the table below.

Index	0x8000+0x40*n: 0032ETN DO configure stop mode parameters				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	DO module CH0 stop mode after EtherCAT lost link	USINT	RW	No	0xFF
2	DO module CH1 stop mode after EtherCAT lost link	USINT	RW	No	0xFF
3	DO module CH2 stop mode after EtherCAT lost link	USINT	RW	No	0xFF
4	DO module CH3 stop mode after EtherCAT lost link	USINT	RW	No	0xFF

Note

The subindex represents the handling method for digital output when the system is shut down or faulty. Each bit defines the handling method for the corresponding digital output, with each byte forming a group for configuration. When the bit is 0, maintain the current value; when the bit is 1 (0xFF, default), output the preset value.

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8001+0x40*n is shown in the table below.

Index	0x8001+0x40*n: 0032ETN configure stop value parameters				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	DO module CH0 stop value after EtherCAT lost link	USINT	RW	No	0x00
2	DO module CH1 stop value after EtherCAT lost link	USINT	RW	No	0x00
3	DO module CH2 stop value after EtherCAT lost link	USINT	RW	No	0x00
4	DO module CH3 stop value after EtherCAT lost link	USINT	RW	No	0x00

Note

The subindex represents the preset value for digital output upon shutdown. Each bit defines the preset value for the corresponding digital output, with each byte forming a group for configuration. When the bit is 0 (0x00, default), the preset value is 0; when the bit is 1, the preset value is 1.

10.3.1.10 GL20-3200END/GL20-3200END-M

Introduction

GL20-3200END and GL20-3200END-M are 32-point DI modules designed for digital input acquisition. The configuration data of the two modules is the same.

- Name: GL20-3200END
- Module category: Digital In
- Module identification code: 0x10F41011

Configuration data

Configuration data (Input): For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8000+0x40*n is shown in the table below.

Index	0x8000+0x40*n: 3200END DI filter time parameters				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	DI module CH0 filter time	UINT	RO	No	0x0004
2	DI module CH1 filter time	UINT	RO	No	0x0004
3	DI module CH2 filter time	UINT	RO	No	0x0004
4	DI module CH3 filter time	UINT	RO	No	0x0004

The subindex represents the filter time configuration for detected digital inputs. Each group supports independent filter time configuration. Default is 0x0004, corresponding to a filter time of 1ms. The specific configuration range is shown below:

Filter time	Description	Filter time	Description
0x0000	No filter	-	-
0x0001	Filter time: 0.25 ms	0x0010	Filter time: 4 ms
0x0002	Filter time: 0.5 ms	0x0020	Filter time: 8 ms
0x0004	Filter time: 1 ms	0x0040	Filter time: 16 ms
0x0008	Filter time: 2 ms	0x0080	Filter time: 32 ms

10.3.1.11 GL20-3232ETN-M

Introduction

The GL20-3232ETN-M is provided with 32 digital inputs for receiving the digital input, and 32 digital outputs for controlling the digital output.

- Name: GL20-3232ETN
- Module category: Digital In/Out
- Module identification code: 0x10F41061

Configuration data

Configuration data (Input): For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8000+0x40*n is shown in the table below.

Index	0x8000+0x40*n: 3232ETN DI filter time parameters				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	DI module CH0 filter time	UINT	RO	No	0x0004
2	DI module CH1 filter time	UINT	RO	No	0x0004
3	DI module CH2 filter time	UINT	RO	No	0x0004
4	DI module CH3 filter time	UINT	RO	No	0x0004

The subindex represents the filter time configuration for detected digital inputs. Each group supports independent filter time configuration. Default is 0x0004, corresponding to a filter time of 1ms. The specific configuration range is shown below:

Filter time	Description	Filter time	Description
0x0000	No filter	-	-
0x0001	Filter time: 0.25 ms	0x0010	Filter time: 4 ms
0x0002	Filter time: 0.5 ms	0x0020	Filter time: 8 ms
0x0004	Filter time: 1 ms	0x0040	Filter time: 16 ms
0x0008	Filter time: 2 ms	0x0080	Filter time: 32 ms

Configuration data (Output): For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8001+0x40*n is shown in the table below.

Index	0x8001+0x40*n: 3232ETN DO configure stop mode parameters				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	DO module CH0 stop mode after EtherCAT lost link	USINT	RW	No	0xFF
2	DO module CH1 stop mode after EtherCAT lost link	USINT	RW	No	0xFF
3	DO module CH2 stop mode after EtherCAT lost link	USINT	RW	No	0xFF
4	DO module CH3 stop mode after EtherCAT lost link	USINT	RW	No	0xFF

Note

The subindex represents the handling method for digital output when the system is shut down or faulty. Each bit defines the handling method for the corresponding digital output, with each byte forming a group for configuration. When the bit is 0, maintain the current value; when the bit is 1 (0xFF, default), output the preset value.

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8002+0x40*n is shown in the table below.

Index	0x8002+0x40*n: 3232ETN DO configure stop value parameters				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	DO module CH0 stop value after EtherCAT lost link	USINT	RW	No	0x00
2	DO module CH1 stop value after EtherCAT lost link	USINT	RW	No	0x00
3	DO module CH2 stop value after EtherCAT lost link	USINT	RW	No	0x00
4	DO module CH3 stop value after EtherCAT lost link	USINT	RW	No	0x00

Note

The subindex represents the preset value for digital output upon shutdown. Each bit defines the preset value for the corresponding digital output, with each byte forming a group for configuration. When the bit is 0 (0x00, default), the preset value is 0; when the bit is 1, the preset value is 1.

10.3.1.12 GL20-4AD

Introduction

GL20-4AD is a 4-channel analog input remote module. Powered by an external 24 VDC supply, the module supports voltage and current input modes, with a resolution of up to 16 bits, Also, it allows you to choose the input range level.

- Name: 4AD module
- Module category: Analog In
- Module identification code: 0x10F41030

Configuration data

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8000+0x40*n is shown in the following table.

Index	0x8000+0x40*n: 4AD module transformation mode				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	4AD module CH0 transform mode	USINT	RW	No	0x80
2	4AD module CH1 transform mode	USINT	RW	No	0x80
3	4AD module CH2 transform mode	USINT	RW	No	0x80
4	4AD module CH3 transform mode	USINT	RW	No	0x80

Subindex 1: 4AD module CH0 transform mode (Subindexes 2, 3, and 4 are the same as subindex 1.)

Bit	Description
bit0 to bit3	CH0 conversion method: 0: -10 V to +10 V 1: 0 V to 10 V 2: -5 V to +5 V 3: 0 V to 5 V 4: 1 V to 5 V 5: -20 mA to +20 mA 6: 0 mA to 20 mA 7: 4 mA to 20 mA
bit4	Reserved (for other additional voltage and current conversion methods)
bit5 to bit6	CHO range: 0: ±20000 1: ±32000 2: ±27648 (default for PN platform) and 20000 (default for other platforms)
bit7	Ch0 channel enabling 0: Disable 1: Active

PN adaptation version - digital to analog conversion table

	Rated Output Range	Digital Value for Rated Range	Output limit range	Digital Value for Limit Range
Analog voltage input	-10 V to +10 V	-20000 to 20000 -32000 to 32000 -27648 to 27648	-10.24 V to +10.24 V	-20400 to 20400 -32640 to 32640 -28200 to 28200
	0 V to 10 V	0 to 20000 0 to 32000 0 to 27648	-0.5 V to 10.24 V	-1000 to 20400 -1600 to 32640 -1382 to 28200
	-5 V to +5 V	-20000 to 20000 -32000 to 32000 -27648 to 27648	-5.12 V to +5.12 V	-20400 to 20400 -32640 to 32640 -28200 to 28200
	0 V to 5 V	0 to 20000 0 to 32000 0 to 27648	-0.25 V to 5.12 V	-1000 to 20400 -1600 to 32640 -1382 to 28200
	1 V to 5 V	0 to 20000 0 to 32000 0 to 27648	0.8 V to 5.12 V	-1000 to 20400 -1600 to 32640 -1382 to 28200
Analog current output	-20 mA to +20 mA	-20000 to 20000 -32000 to 32000 -27648 to 27648	-20.56 mA to +20.56 mA	-20400 to 20400 -32640 to 32640 -28200 to 28200
	0 to 20 mA	0 to 20000 0 to 32000 0 to 27648	-1 mA to 20.56 mA	-1000 to 20400 -1600 to 32640 -1382 to 28200
	4 mA to 20 mA	0 to 20000 0 to 32000 0 to 27648	3.2 mA to 20.56 mA	-1000 to 20400 -1600 to 32640 -1382 to 28200

For rated output ranges 0 V to 10 V, 0 V to 5 V, 1 V to 5 V, 0 mA to 20 mA, and 4 mA to 20 mA, when the digital values are 0 to 20000, the code value corresponding to the lower limit is -200. Only values less than -200 are determined as below the lower limit, and values greater than 20000 are determined as above the upper limit. In other modes, values exceeding the rated range are directly determined as beyond upper or lower limits, namely overflow or underflow.

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8001+0x40*n is shown in the table below.

Index	0x8001+0x40*n: 4AD module filter				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	4AD Module CH0 Filter	USINT	RW	No	0x80
2	4AD Module CH1 Filter	USINT	RW	No	0x80
3	4AD Module CH2 Filter	USINT	RW	No	0x80
4	4AD Module CH3 Filter	USINT	RW	No	0x80

Subindex 1: 4AD module CH0 filter (Subindexes 2, 3, and 4 are the same as Subindex 1.)

Bit	Description
bit0 to bit7	CH0 channel filter parameter

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8002+0x40*n is shown in the table below.

Index	0x8002+0x40*n: 4AD module detect				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	4AD Module CH0 Detect	USINT	RW	No	0
2	4AD Module CH1 Detect	USINT	RW	No	0
3	4AD Module CH2 Detect	USINT	RW	No	0
4	4AD Module CH3 Detect	USINT	RW	No	0

Subindex 1: Analog input CH0-Detect (Subindexes 2, 3, and 4 are the same as Subindex 1.)

Bit	Description
bit0	CH0 peak hold function 0: Disable; 1: Enable
bit1	CH0 wire break detection function 0: Disable; 1: Enable
bit2	CH0 overlimit flag 0: Disable; 1: Enable
bit3	CH0 overflow flag 0: Disable; 1: Enable
bit4 to bit7	Reserve

10.3.1.13 GL20-4DA

Introduction

The GL20-4DA module is a 4-channel analog output remote module. Powered by an external 24 VDC supply, the module supports voltage and current output modes, with a resolution up to 16 bits, and selectable output range levels.

- Name: 4DA module
- Module category: Analog Out
- Module identification code: 0x10F41040

Configuration data

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8000+0x40*n is shown in the following table.

Index	0x8000+0x40*n: 4DA module transformation mode				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	4DA module CH0 transform mode	USINT	RW	No	0x80
2	4DA module CH1 transform mode	USINT	RW	No	0x80
3	4DA module CH2 transform mode	USINT	RW	No	0x80
4	4DA module CH3 transform mode	USINT	RW	No	0x80

Subindex 1: 4DA module CH0 transform mode (Subindexes 2, 3, and 4 are the same as Subindex 1.)

Bit	Description
bit3 to bit0	CH0 conversion method: 0: -10 V to +10 V 1: 0 V to 10 V 2: -5 V to +5 V 3: 0 V to 5 V 4: 1 V to 5 V 5: 0 mA to 20 mA 6: 4 mA to 20 mA
bit4	Reserved (for other additional voltage and current conversion methods)
bit5 to bit6	CHO range: 0: ±20000 1: ±32000 2: ±27648 (default for PN platform) and 20000 (default for other platforms)
bit7	Ch0 channel enabling 0: Disable 1: Active

Different measurement ranges correspond to different digital ranges. See the following table for the analog-to-digital mapping:

	Rated Output Range	Digital Value for Rated Range	Output limit range	Digital Value for Limit Range
Analog voltage input	-10 V to +10 V	-20000 to 20000 -32000 to 32000 -27648 to 27648	-11 V to +11 V	-22000 to 22000 -32767 to 32767 -29030 to 29030
	0 V to 10 V	0 to 20000 0 to 32000 0 to 27648	-0.5 V to 10.5 V	-1000 to 21000 -1600 to 32767 -1382 to 29030
	-5 V to +5 V	-20000 to 20000 0 to 32000 -27648 to 27648	-5.5 V to +5.5 V	-22000 to 22000 -32767 to 32767 -29030 to 29030
	0 V to 5 V	0 to 20000 0 to 32000 0 to 27648	-0.25 V to 5.25 V	-1000 to 21000 -1600 to 32767 -1382 to 29030
	1 V to 5 V	0 to 20000 0 to 32000 0 to 27648	0.8 V to 5.2 V	-1000 to 21000 -1600 to 32767 -1382 to 29030
Analog current output	0 to 20 mA	0 to 20000 0 to 32000 0 to 27648	0 mA to 21 mA	0 to 21000 0 to 32767 0 to 29030
	4 mA to 20 mA	0 to 20000 0 to 32000 0 to 27648	3.2 mA to 20.8 mA	-1000 to 21000 -1600 to 32767 -1382 to 29030

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8001+0x40*n is shown in the table below.

Index	0x8001+0x40*n: 4DA module stop mode				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	4DA module CH0 stop mode	USINT	RW	No	0
2	4DA module CH1 stop mode	USINT	RW	No	0
3	4DA module CH2 stop mode	USINT	RW	No	0
4	4DA module CH3 stop mode	USINT	RW	No	0

Subindex 1: 4DA module CH0 stop mode (Subindexes 2, 3, and 4 are the same as subindex 1.)

Bit	Description
bit7 to bit0	Input status of CH0 in stop mode 0: Output reset 1: Output maintained 2: Outputs the preset value of subindex 4

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8002+0x40*n is shown in the table below.

Index	0x8002+0x40*n: 4DA module stop value				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	4DA module CH0 stop value	USINT	RW	No	0
2	4DA module CH1 stop value	USINT	RW	No	0
3	4DA module CH2 stop value	USINT	RW	No	0
4	4DA module CH3 stop value	USINT	RW	No	0

Subindex 1: 4DA module CH0 stop value (Sub-indices 2, 3, and 4 are the same as subindex 1.)

Bit	Description
bit0 to bit15	Output value after CH0 stops in stop mode

10.3.1.14 GL20-8ADI

Introduction

The GL20-8ADI module is an 8-channel analog input module. Powered by an external 24 VDC supply, the module supports current input mode, with a resolution of up to 16 bits, Also, it allows you to choose the input range level.

- Name: 8ADI module
- Module category: Analog In
- Module identification code: 0x10F41032

Configuration data

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8000+0x40*n is shown in the following table.

Index	0x8000+0x40*n: 8ADI module transformation mode				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	8
1	8ADI module CH0 transform mode	USINT	RW	No	0x85
2	8ADI module CH1 transform mode	USINT	RW	No	0x85
3	8ADI module CH2 transform mode	USINT	RW	No	0x85
4	8ADI module CH3 transform mode	USINT	RW	No	0x85
5	8ADI module CH4 transform mode	USINT	RW	No	0x85
6	8ADI module CH5 transform mode	USINT	RW	No	0x85
7	8ADI module CH6 transform mode	USINT	RW	No	0x85
8	8ADI module CH7 transform mode	USINT	RW	No	0x85

Subindex 1: 8ADI module CH0 transform mode (Subindexes 2 to 8 are the same as Subindex 1.)

Bit	Description
bit0 to bit3	CH0 conversion method: 5: -20 mA to +20 mA 6: 0 mA to 20 mA 7: 4 mA to 20 mA
bit4	Reserved (for other additional current conversion methods)
bit5 to bit6	0: ±20000 1: ±32000 2: ±27648 (default for PN platform) and 20000 (default for other platforms)
bit7	Ch0 channel enabling 0: Disable 1: Active

PN adaptation version - digital to analog conversion table

	Rated Output Range	Digital Value for Rated Range	Output limit range	Limited digital value
Analog current output	-20 mA to +20 mA	-20000 to 20000 -32000 to 32000 -27648 to 27648	-20.56 mA to +20.56 mA	-20400 to 20400 -32640 to 32640 -28200 to 28200
	0 to 20 mA	0 to 20000 0 to 32000 0 to 27648	-1 mA to 20.56 mA	-1000 to 20400 -1600 to 32640 -1382 to 28200
	4 mA to 20 mA	0 to 20000 0 to 32000 0 to 27648	3.2 mA to 20.56 mA	-1000 to 20400 -1600 to 32640 -1382 to 28200

For rated output ranges 0 mA to 20 mA and 4 mA to 20 mA, when the digital values are 0 to 20000, the code value corresponding to the lower limit is -200. Only values less than -200 are determined

as below the lower limit, and values greater than 20000 are determined as above the upper limit. In other modes, values exceeding the rated range are directly determined as beyond upper or lower limits, namely overflow or underflow.

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8001+0x40*n is shown in the table below.

Index	0x8001+0x40*n: 8ADI module filter				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	8
1	8ADI Module CH0 Filter	USINT	RW	No	0x08
2	8ADI Module CH1 Filter	USINT	RW	No	0x08
3	8ADI Module CH2 Filter	USINT	RW	No	0x08
4	8ADI Module CH3 Filter	USINT	RW	No	0x08
5	8ADI Module CH4 Filter	USINT	RW	No	0x08
6	8ADI Module CH5 Filter	USINT	RW	No	0x08
7	8ADI Module CH6 Filter	USINT	RW	No	0x08
8	8ADI Module CH7 Filter	USINT	RW	No	0x08

Subindex 1: 8ADI module CH0 filter (Subindexes 2 to 8 are the same as subindex 1.)

Bit	Description
bit0 to bit7	CH0 channel filter parameter

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8002+0x40*n is shown in the table below.

Index	0x8002+0x40*n: 8ADI module detect				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	8
1	8ADI Module CH0 Detect	USINT	RW	No	0
2	8ADI Module CH1 Detect	USINT	RW	No	0
3	8ADI Module CH2 Detect	USINT	RW	No	0
4	8ADI Module CH3 Detect	USINT	RW	No	0
5	8ADI Module CH4 Detect	USINT	RW	No	0
6	8ADI Module CH5 Detect	USINT	RW	No	0
7	8ADI Module CH6 Detect	USINT	RW	No	0
8	8ADI Module CH7 Detect	USINT	RW	No	0

Subindex 1: 8ADI module CH0 detect (Subindexes 2 to 8 are the same as subindex 1)

Bit	Description
bit0	CH0 peak hold function 0: Disable; 1: Enable
bit1	CH0 wire break detection function 0: Disable; 1: Enable
bit2	CH0 overlimit flag 0: Disable; 1: Enable
bit3	CH0 overflow flag 0: Disable (default) 1: Active
bit4 to bit7	Reserve

10.3.1.15 GL20-8ADV

Introduction

The GL20-8ADV module is an 8-channel analog input remote module. Powered by an external 24 VDC supply, the module supports voltage input mode, with a resolution of up to 16 bits, Also, it allows you to choose the input range level.

- Name: 8ADV module
- Module category: Analog In
- Module identification code: 0x10F41031

Configuration data

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8000+0x40*n is shown in the following table.

Index	0x8000+0x40*n: 8ADV module transform mode				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	8
1	8ADV module CH0 transform mode	USINT	RW	No	0x80
2	8ADV module CH1 transform mode	USINT	RW	No	0x80
3	8ADV module CH2 transform mode	USINT	RW	No	0x80
4	8ADV module CH3 transform mode	USINT	RW	No	0x80
5	8ADV module CH4 transform mode	USINT	RW	No	0x80
6	8ADV module CH5 transform mode	USINT	RW	No	0x80
7	8ADV module CH6 transform mode	USINT	RW	No	0x80
8	8ADV module CH7 transform mode	USINT	RW	No	0x80

Subindex 1: 8ADV module CH0 transform mode (Subindexes 2 to 8 are the same as subindex 1.)

Bit	Description
bit0 to bit3	CH0 conversion method: 0: -10 V to +10 V 1: 0 V to 10 V 2: -5 V to +5 V 3: 0 V to 5 V 4: 1 V to 5 V
bit4	Reserved (for other additional voltage conversion methods)

Bit	Description
bit5 to bit6	0: ±20000 1: ±32000 2: ±27648 (default for PN platform) and 20000 (default for other platforms)
bit7	Ch0 channel enabling 0: Disable 1: Active

PN adaptation version - digital to analog conversion table

	Rated Output Range	Digital Value for Rated Range	Output limit range	Digital Value for Limit Range
Analog voltage input	-10 V to +10 V	-20000 to 20000 -32000 to 32000 -27648 to 27648	-10.24 V to +10.24 V	-20400 to 20400 -32640 to 32640 -28200 to 28200
	0 V to 10 V	0 to 20000 0 to 32000 0 to 27648	-0.5 V to 10.24 V	-1000 to 20400 -1600 to 32640 -1382 to 28200
	-5 V to +5 V	-20000 to 20000 -32000 to 32000 -27648 to 27648	-5.12 V to +5.12 V	-20400 to 20400 -32640 to 32640 -28200 to 28200
	0 V to 5 V	0 to 20000 0 to 32000 0 to 27648	-0.25 V to 5.12 V	-1000 to 20400 -1600 to 32640 -1382 to 28200
	1 V to 5 V	0 to 20000 0 to 32000 0 to 27648	0.8 V to 5.12 V	-1000 to 20400 -1600 to 32640 -1382 to 28200

For rated output ranges 0 V to 10 V, 0 V to 5 V, and 1 V to 5 V, when the digital values are 0 to 20000, the code value corresponding to the lower limit is -200. Only values less than -200 are determined as below the lower limit, and values greater than 20000 are determined as above the upper limit. In other modes, values exceeding the rated range are directly determined as beyond upper or lower limits, namely overflow or underflow.

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8001+0x40*n is shown in the table below.

Index	0x8001+0x40*n: 8ADV module filter				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	8
1	8ADV Module CH0 Filter	USINT	RW	No	0x08
2	8ADV Module CH1 Filter	USINT	RW	No	0x08
3	8ADV Module CH2 Filter	USINT	RW	No	0x08
4	8ADV Module CH3 Filter	USINT	RW	No	0x08
5	8ADV Module CH4 Filter	USINT	RW	No	0x08
6	8ADV Module CH5 Filter	USINT	RW	No	0x08
7	8ADV Module CH6 Filter	USINT	RW	No	0x08
8	8ADV Module CH7 Filter	USINT	RW	No	0x08

Subindex 1: 8ADV module CH0 filter (Subindexes 2 to 8 are the same as subindex 1.)

Bit	Description
bit0 to bit7	CH0 channel filter parameter

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8002+0x40*n is shown in the table below.

Index	0x8002+0x40*n: 8ADV module detect				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	8
1	8ADV Module CH0 Detect	USINT	RW	No	0
2	8ADV Module CH1 Detect	USINT	RW	No	0
3	8ADV Module CH2 Detect	USINT	RW	No	0
4	8ADV Module CH3 Detect	USINT	RW	No	0
5	8ADV Module CH4 Detect	USINT	RW	No	0
6	8ADV Module CH5 Detect	USINT	RW	No	0
7	8ADV Module CH6 Detect	USINT	RW	No	0
8	8ADV Module CH7 Detect	USINT	RW	No	0

Subindex 1: 8ADV module CH0 detect (Subindexes 2 to 8 are the same as subindex 1.)

Bit	Description
bit0	CH0 peak hold function 0: Disable; 1: Enable
bit1	CH0 wire break detection function 0: Disable; 1: Enable
bit2	CH0 overlimit flag 0: Disable; 1: Enable
bit3	CH0 overflow flag 0: Disable (default) 1: Active
bit4 to bit7	Reserve

10.3.1.16 GL20-8DAI

Introduction

The GL20-8DAI module is a 8-channel analog output module. Powered by external 24V DC, it supports current output mode, with a resolution up to 16 bits, and selectable output range levels.

- Name: 8DAI module
- Module category: Analog Out
- Module identification code: 0x10F41042

Configuration data

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8000+0x40*n is shown in the following table.

Index	0x8000+0x40*n: 8DAI module transformation mode				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	8
1	8DAI module CH0 transform mode	USINT	RW	No	0x85
2	8DAI module CH1 transform mode	USINT	RW	No	0x85
3	8DAI module CH2 transform mode	USINT	RW	No	0x85
4	8DAI module CH3 transform mode	USINT	RW	No	0x85
5	8DAI module CH4 transform mode	USINT	RW	No	0x85
6	8DAI module CH5 transform mode	USINT	RW	No	0x85
7	8DAI module CH6 transform mode	USINT	RW	No	0x85
8	8DAI module CH7 transform mode	USINT	RW	No	0x85

Subindex 1: 8DAI module CH0 transform mode (Subindexes 2 to 8 are the same as subindex 1.)

Bit	Description
bit0 to bit3	CH0 conversion method: 5: 0 mA to 20 mA 6: 4 mA to 20 mA
bit4	Reserved (for other additional voltage and current conversion methods)
bit5 to bit6	0: ±20000 1: ±32000 2: ±27648 (default for PN platform) and 20000 (default for other platforms)
bit7	CH0 channel enabling 0: Disable 1: Active

Different measurement ranges correspond to different digital ranges. See the following table for the analog-to-digital mapping:

	Rated Output Range	Digital Value for Rated Range	Output limit range	Limited digital value
Analog current output	0 to 20 mA	0 to 20000 0 to 32000 0 to 27648	0 mA to 21 mA	0 to 21000 0 to 32767 0 to 29030
	4 mA to 20 mA	0 to 20000 0 to 32000 0 to 27648	3.2 mA to 20.8 mA	-1000 to 21000 -1600 to 32767 -1382 to 29030

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8001+0x40*n is shown in the table below.

Index	0x8001+0x40*n: 8DAI module stop mode				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	8DAI module CH0 stop mode	USINT	RW	No	0
2	8DAI module CH1 stop mode	USINT	RW	No	0
3	8DAI module CH2 stop mode	USINT	RW	No	0
4	8DAI module CH3 stop mode	USINT	RW	No	0
5	8DAI module CH4 stop mode	USINT	RW	No	0
6	8DAI module CH5 stop mode	USINT	RW	No	0
7	8DAI module CH6 stop mode	USINT	RW	No	0
8	8DAI module CH7 stop mode	USINT	RW	No	0

Subindex 1: 8DAI module CH0 stop mode (Subindexes 2 to 8 are the same as subindex 1.)

Bit	Description
bit0 to bit7	Input status of CH0 in stop mode 0: Output reset 1: Output maintained 2: Outputs the preset value of subindex 4

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8002+0x40*n is shown in the table below.

Index	0x8002+0x40*n: 8DAI module stop value				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	8DAI module CH0 stop mode	UINT	RW	No	0
2	8DAI module CH1 stop value	UINT	RW	No	0
3	8DAI module CH2 stop value	UINT	RW	No	0
4	8DAI module CH3 stop value	UINT	RW	No	0
5	8DAI module CH4 stop value	UINT	RW	No	0
6	8DAI module CH5 stop value	UINT	RW	No	0
7	8DAI module CH6 stop value	UINT	RW	No	0
8	8DAI module CH7 stop value	UINT	RW	No	0

Subindex 1: 8DAI module CH0 stop value (Subindexes 2 to 8 are the same as subindex 1.)

Bit	Description
bit0 to bit15	Output value after CH0 stops in stop mode

10.3.1.17 GL20-8DAV

Introduction

GL20-8DAV module is a 8-channel analog output module. Powered by an external 24 VDC supply, it supports voltage output mode, with a resolution up to 16 bits, and selectable output range levels.

- Name: 8DAV module

- Module category: Analog Out
- Module identification code: 0x10F41042

Configuration data

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8000+0x40*n is shown in the following table.

Index	0x8000+0x40*n: 8DAV module transform mode				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	8
1	8DAV module CH0 transform mode	USINT	RW	No	0x80
2	8DAV module CH1 transform mode	USINT	RW	No	0x80
3	8DAV module CH2 transform mode	USINT	RW	No	0x80
4	8DAV module CH3 transform mode	USINT	RW	No	0x80
5	8DAV module CH4 transform mode	USINT	RW	No	0x80
6	8DAV module CH5 transform mode	USINT	RW	No	0x80
7	8DAV module CH6 transform mode	USINT	RW	No	0x80
8	8DAV module CH7 transform mode	USINT	RW	No	0x80

Subindex 1: 8DAV module CH0 transform mode (Subindexes 2 to 8 are the same as subindex 1.)

Bit	Description
bit0 to bit3	CH0 conversion method: 0: -10 V to +10 V 1: 0 V to 10 V 2: -5 V to +5 V 3: 0 V to 5 V 4: 1 V to 5 V
bit4	Reserved (for other additional voltage and current conversion methods)
bit5 to bit6	0: ±20000 1: ±32000 2: ±27648 (default for PN platform) and 20000 (default for other platforms)
bit7	CH0 channel enabling 0: Disable 1: Active

Different measurement ranges correspond to different digital ranges. See the following table for the analog-to-digital mapping:

	Rated Output Range	Digital Value for Rated Range	Output limit range	Digital Value for Limit Range
Analog voltage input	-10 V to +10 V	-20000 to 20000 -32000 to 32000 -27648 to 27648	-10.25 V to 10.25 V	-20500 to 20500 -32767 to 32767 -28339 to 28339
	0 V to 10 V	0 to 20000 0 to 32000 0 to 27648	-0.5 V to 10.25 V	-1000 to 20500 -1600 to 32767 -1382 to 28339
	-5 V to +5 V	-20000 to 20000 0 to 32000 -27648 to 27648	-5.5 V to +5.5 V	-22000 to 22000 -32767 to 32767 -30412 to 30412
	0 V to 5 V	0 to 20000 0 to 32000 0 to 27648	-0.25 V to 5.25 V	-1000 to 21000 -1600 to 32767 -1382 to 29030
	1 V to 5 V	0 to 20000 0 to 32000 0 to 27648	0.8 V to 5.2 V	-1000 to 21000 -1600 to 32767 -1382 to 29030

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8001+0x40*n is shown in the table below.

Index	0x8001+0x40*n: 8DAV module stop mode				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	8DAV module CH0 stop mode	USINT	RW	No	0
2	8DAV module CH1 stop mode	USINT	RW	No	0
3	8DAV module CH2 stop mode	USINT	RW	No	0
4	8DAV module CH3 stop mode	USINT	RW	No	0
5	8DAV module CH4 stop mode	USINT	RW	No	0
6	8DAV module CH5 stop mode	USINT	RW	No	0
7	8DAV module CH6 stop mode	USINT	RW	No	0
8	8DAV module CH7 stop mode	USINT	RW	No	0

Subindex 1: 8DAV module CH0 stop mode (Subindexes 2 to 8 are the same as subindex 1.)

Bit	Description
bit0 to bit7	Input status of CH0 in stop mode 0: Output reset 1: Output maintained 2: Outputs the preset value of subindex 4

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8002+0x40*n is shown in the table below.

Index	0x8002+0x40*n: 8DAV module stop value				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	8DAV module CH0 stop value	UINT	RW	No	0
2	8DAV module CH1 stop value	UINT	RW	No	0
3	8DAV module CH2 stop value	UINT	RW	No	0

Index	0x8002+0x40*n: 8DAV module stop value				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
4	8DAV module CH3 stop value	UINT	RW	No	0
5	8DAV module CH4 stop value	UINT	RW	No	0
6	8DAV module CH5 stop value	UINT	RW	No	0
7	8DAV module CH6 stop value	UINT	RW	No	0
8	8DAV module CH7 stop value	UINT	RW	No	0

Subindex 1: 8DAV module CH0 stop value (Subindexes 2 to 8 are the same as subindex 1.)

Bit	Description
bit0 to bit15	Output value after CH0 stops in stop mode

10.3.1.18 GL20-4PT

Introduction

The GL10-4PT module is used for thermoresistance temperature collection. The module is equipped with 4 independent channels, allowing for simultaneous temperature collection through the four channels. Each channel is configured independently and does not interfere with the others.

- Name: 4PT module
- Module category: Temperature Measurement
- Module identification code: 0x10F41050

Configuration data

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8000+0x40*n is shown in the table below.

Index	0x8000+0x40*n: 4PT sampling time				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	4PT Sampling Time	USINT	RW	No	0x0003
2	Reserve0	USINT	RW	No	0x0000
3	Reserve1	USINT	RW	No	0x0000
4	Reserve2	USINT	RW	No	0x0000

Where:

Sampling Time	Sampling time 2: 250 ms; 3: 500 ms; 4: 1000 ms

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8001+0x40*n is shown in the table below.

Index	0x8001+0x40*n: 4PT temperature unit				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RW	No	4
1	4PT Temperature Unit	USINT	RW	No	0x0000
2	Reserve0	USINT	RW	No	0x0000
3	Reserve1	USINT	RW	No	0x0000
4	Reserve2	USINT	RW	No	0x0000

Where:

Temperature Unit	Temperature unit: 0: Celsius (default) 1: Fahrenheit

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8002+0x40*n is shown in the table below.

Index	0x8002+0x40*n: 4PT module transformation mode				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	4PT module CH0 transform mode	USINT	RW	No	0xC1
2	4PT module CH1 transform mode	USINT	RW	No	0xC1
3	4PT module CH2 transform mode	USINT	RW	No	0xC1
4	4PT module CH3 transform mode	USINT	RW	No	0xC1

Each subindex represents whether to enable temperature detection and the thermal resistance sensor model for each channel. Default is 0xC1, which corresponds to enabling Pt100 mode. In this mode, a fault is reported and triggers shutdown. The setting rule is as follows:

Bit	Description
bit0 to bit5	Thermoresistor sensor model 0: Reserved 1: Pt100 2: Pt500 3: Pt1000 4: Reserved 5: Reserved 6: Cu100 7: KTY84 8: NTC5K 9: NTC10K
bit6	Reserved
bit7	Channel 0: Disable 1: Active

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8003+0x40*n is shown in the table below.

Index	0x8003+0x40*n: 4PT module transform filter				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	4PT Module CH0 Filter	USINT	RW	No	0x05
2	4PT Module CH1 Filter	USINT	RW	No	0x05
3	4PT Module CH2 Filter	USINT	RW	No	0x05
4	4PT Module CH3 Filter	USINT	RW	No	0x05

Note

The input filter parameter of the temperature detection channel, range is 0 to 100, unit is s, default value is 0x05.

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8004+0x40*n is shown in the table below.

Index	0x8004+0x40*n: 4PT sensor input bias				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	4PT Sensor Input CH0 Bias	INT	RW	No	0x00000000
2	4PT Sensor Input CH1 Bias	INT	RW	No	0x00000000
3	4PT Sensor Input CH2 Bias	INT	RW	No	0x00000000
4	4PT Sensor Input CH3 Bias	INT	RW	No	0x00000000

Note

Temperature offset parameter for temperature detection channel, range is -204.8 to 204.7, unit is 0.1℃ (or corresponding Fahrenheit), default value is 0.

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8005+0x40*n is shown in the table below.

Index	0x8005+0x40*n: 4PT sensor input upper limit				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	4PT Sensor input CH0 UpLimit	INT	RW	No	0x00002134
2	4PT Sensor input CH1 UpLimit	INT	RW	No	0x00002134
3	4PT Sensor input CH2 UpLimit	INT	RW	No	0x00002134
4	4PT Sensor input CH3 UpLimit	INT	RW	No	0x00002134

Upper temperature limit of the temperature detection channel, the range is the set temperature range, unit is 0.1 temperature unit, default value is the maximum value of the set temperature range.

For Pt100, Pt500, and Pt1000, the lower limit is -200℃ (configured as -2000) and the upper limit is 850℃ (configured as 8500). For Cu100, the lower limit is -50° (configured as -500) and the upper limit is 150° (configured as 1500). For temperature configuration data, the unit is 0.1°. For KTY, NTC5K, and NTC10K temperature sensors, the upper and lower limits are configured as shown in the table below.

Sensor	Upper temperature limit	Upper temperature configuration data	Lower temperature limit	Lower temperature configuration data
KTY84	200°	2000	0	0
NTC5K	200°	2000	-30	-300
NTC10K	200	2000	-25	-250

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8006+0x40*n is shown in the table below.

Index	0x8006+0x40*n: 4PT sensor input down limit				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	4PT Sensor Input CH0 DownLimit	INT	RW	No	0xF830
2	4PT Sensor Input CH1 DownLimit	INT	RW	No	0xF830
3	4PT Sensor Input CH2 DownLimit	INT	RW	No	0xF830
4	4PT Sensor Input CH3 DownLimit	INT	RW	No	0xF830

Note

Lower temperature limit of the temperature detection channel, the range is the set temperature range, unit is 0.1 temperature unit, unit is 0.1°C (or the corresponding Fahrenheit), default value is the minimum value of the set temperature range.

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8007+0x40*n is shown in the table below.

Index	0X8007+0x40*n: 4PT sensor input detect				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	4PT Sensor Input CH0 Detect	USINT	RW	No	0x0000
2	4PT Sensor Input CH1 Detect	USINT	RW	No	0x0000
3	4PT Sensor Input CH2 Detect	USINT	RW	No	0x0000
4	4PT Sensor Input CH3 Detect	USINT	RW	No	0x0000

Input function and diagnostic option parameters for temperature detection. Default value is 0x0000. Temperature offset, wire break detection, and over-limit detection are prohibited. The setting rule is as follows:

Bit	Description
bit0	Temperature offset function. 0: Disable; 1: Enable
bit1	Disconnection detection. 0: Disable; 1: Enable
bit2	Overlimit detection. 0: Disable; 1: Enable
bit3	Overflow detection. 0: Disable; 1: Enable
bit4 to bit7	Reserved

10.3.1.19 GL20-4TC

Introduction

The GL20-4TC module is used for thermocouple temperature collection. It is equipped with four independent channels for simultaneous temperature collection. The configuration of each channel is independent from each other.

- Name: 4TC module
- Module category: Temperature Measurement
- Module identification code: 0x10F41051

Configuration data

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8000+0x40*n is shown in the table below.

Index	0x8000+0x40*n: 4TC sampling time				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	4TC sampling time	USINT	RW	No	0x0003
2	Reserve0	USINT	RW	No	0x0000
3	Reserve1	USINT	RW	No	0x0000
4	Reserve2	USINT	RW	No	0x0000

Where:

Sampling Time	Sampling time 2: 250 ms; 3: 500 ms; 4: 1000 ms (Options 0: 50 ms and 1: 125 ms are not included.)

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8001+0x40*n is shown in the table below.

Index	0x8001+0x40*n: 4TC temperature unit				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RW	No	0x0000
1	4TC Temperature Unit	USINT	RW	No	0x0000
2	Reserve0	USINT	RW	No	0x0000
3	Reserve1	USINT	RW	No	0x0000
4	Reserve2	USINT	RW	No	0x0000

Where:

Temperature Unit	Temperature unit: 0: Celsius (default) 1: Fahrenheit

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8002+0x40*n is shown in the table below.

Index	0x8002+0x40*n: 4TC module transformation mode				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	4TC module CH0 transform mode	USINT	RW	No	0xC0
2	4TC module CH1 transform mode	USINT	RW	No	0xC0
3	4TC module CH2 transform mode	USINT	RW	No	0xC0
4	4TC module CH3 transform mode	USINT	RW	No	0xC0

Each subindex represents whether to enable the temperature detection channel and the thermocouple sensor model. Default is 0xC0, which corresponds to enabling K-type thermocouple. In this mode, a fault is reported and triggers shutdown. The setting rule is as follows:

Bit	Description
bit0 to bit5	Thermocouple sensor models include: 0: K 1: J 2: E 3: B 4: N 5: R 6: S 7: T
bit6	Reserved
bit7	Channel 0: Disable 1: Active

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8003+0x40*n is shown in the table below.

Index	0x8003+0x40*n: 4TC module transform filter				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	4TC Module CH0 Filter	USINT	RW	No	0x05
2	4TC Module CH1 Filter	USINT	RW	No	0x05
3	4TC Module CH2 Filter	USINT	RW	No	0x05
4	4TC Module CH3 Filter	USINT	RW	No	0x05

Note

The input filter parameter of the temperature detection channel, range is 0 to 100, unit is s, default value is 0x05.

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8004+0x40*n is shown in the table below.

Index	0x8004+0x40*n: 4TC sensor input bias				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	4TC Module CH0 Bias	INT	RW	No	0x00000000
2	4TC Module CH1 Bias	INT	RW	No	0x00000000
3	4TC Module CH2 Bias	INT	RW	No	0x00000000
4	4TC Module CH3 Bias	INT	RW	No	0x00000000

Note

The subindex represents the temperature offset parameter for the temperature detection channel, with a range of -204.8 to 204.7 and a default of 0. The unit is 0.1℃/℉.

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8005+0x40*n is shown in the table below.

Index	0x8005+0x40*n: 4TC-ISO sensor input upper limit				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	4TC Sensor Input CH0 UpLimit	INT	RW	No	0x3584
2	4TC Sensor Input CH1 UpLimit	INT	RW	No	0x3584
3	4TC Sensor Input CH2 UpLimit	INT	RW	No	0x3584
4	4TC Sensor Input CH3 UpLimit	INT	RW	No	0x3584

Note

Upper temperature limit of the temperature detection channel, the range is the set temperature range, unit is 0.1 temperature unit, default value is the maximum value of the set temperature range.

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8006+0x40*n is shown in the table below.

Index	0x8006+0x40*n: 4TC sensor input down limit				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	4TC Sensor input CH0 DownLimit	INT	RW	No	0xF574
2	4TC Sensor Input CH1 DownLimit	INT	RW	No	0xF574
3	4TC Sensor Input CH2 DownLimit	INT	RW	No	0xF574
4	4TC Sensor Input CH3 DownLimit	INT	RW	No	0xF574

Note

The subindex represents the lower limit parameter of the temperature detection channel with a unit of 0.1°C/°F. The range is same as the setting temperature range of the current mode. The default value is the minimum value of the setting temperature range of the current mode.

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8007+0x40*n is shown in the table below.

Index	0x8007+0x40*n: 4TC sensor input detect				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	4TC Sensor Input CH0 Detect	USINT	RW	No	0x0000
2	4TC Sensor Input CH1 Detect	USINT	RW	No	0x0000
3	4TC Sensor Input CH2 Detect	USINT	RW	No	0x0000
4	4TC Sensor Input CH3 Detect	USINT	RW	No	0x0000

Input function and diagnostic option parameters for temperature detection. Default value is 0x0000. Temperature offset, wire break detection, and over-limit detection are prohibited. The setting rule is as follows:

Bit	Description
bit0	Temperature offset function. 0: Disable; 1: Enable
bit1	Disconnection detection. 0: Disable; 1: Enable

Bit	Description
bit2	Overlimit detection. 0: Disable; 1: Enable
bit3	Overflow detection. 0: Disable; 1: Enable
bit4 to bit6	Reserved
bit7	Default is 0. Value 1 is for test tooling only, used to block the cold junction temperature. In normal conditions, there is no need to configure this bit.

10.3.1.20 GL20-2HC

Introduction

The GL20-2HC module is a counting module with two high-speed input channels.

- Name: Encoder module
- Module category: Encoder
- Module identification code: 0x10F41082

Configuration data

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x8000+0x40*n is shown in the table below.

Index	0x8000+0x40*n 2HC CH0 Configuration Parameter				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	9
1	2HC CH0 Encoder type	UDINT	RW	No	0x00000000
2	2HC CH0 Input filter	UDINT	RW	No	0x00000702
3	2HC CH0 Time base for speed measurement	UDINT	RW	No	0x00000005
4	2HC CH0 Unit pulse increment	UDINT	RW	No	0x00000000
5	2HC CH0 Pulse rate sample time	UDINT	RW	No	0x0000000A
6	2HC CH0 Maximum count value	DINT	RW	No	0x7FFFFFFF
7	2HC CH0 Minimum count value	DINT	RW	No	0x80000000
8	2HC CH0 External input function selection	UDINT	RW	No	0x00000000
9	2HC CH0 External output function selection	UDINT	RW	No	0x00000000

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x8001+0x40*n is shown in the table below.

Index	0x8001+0x40*n 2HC CH1 Configuration Parameter				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	9
1	2HC CH1 Encoder type	UDINT	RW	No	0x00000000
2	2HC CH1 Input filter	UDINT	RW	No	0x00000702
3	2HC CH1 Time base for speed measurement	UDINT	RW	No	0x00000005
4	2HC CH1 Unit pulse increment	UDINT	RW	No	0x00000000
5	2HC CH1 Pulse rate sample time	UDINT	RW	No	0x0000000A
6	2HC CH1 Maximum count value	DINT	RW	No	0x7FFFFFFF

Index	0x8001+0x40*n 2HC CH1 Configuration Parameter				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
7	2HC CH1 Minimum count value	DINT	RW	No	0x80000000
8	2HC CH1 External input function selection	UDINT	RW	No	0x00000000
9	2HC CH1 External output function selection	UDINT	RW	No	0x00000000

Subindex 1: Encoder type

Bit	Description	Remark
bit0	Counter type 0: Linear 1: Annular	-
bit1	Counting direction 0: Phase A leads Phase B (forward) 1: Phase B leads Phase A (reverse)	-
bit2 to 3	Measured value 0: Not measured 1: Frequency 2: Cycle 3: Speed	-
bit4 to bit7	Pulse input mode 0: Phase A/B 1x frequency 1: Phase A/B 2x frequency 2: Phase A/B 4x Frequency 3: Pulse + Direction 4: CW/CCW 5: Single-phase counting (A) 6: Single-phase counting (B)	-
bit8	Wiring Mode 0: Differential interface 1: Single-ended interface	-
bit9	Disconnection detection 0: Disable 1: Enable	Valid for differential interface only.
bit10	Action upon exceeding count limit 0: Stop counting 1: Continue counting	Valid for linear counting only.
bit14	Sleep control 0: Disable sleep mode 1: Enable sleep mode	When this function is enabled, all functions of the entire channel are disabled.

Subindex 2: Input Filter

Bit	Description	Remark
bit0 to bit7	Counting signal filter parameter 1: 50 ns 2: 100 ns 3: 200 ns 4: 500 ns 5: 1 us 6: 2 us 7: 5 us 8: 10 us 9: 20 us 10: 50 us 11: 100 us 12: 200 us 13: 500 us 14: 1 ms 15: 2 ms 16: 5 ms 17: 10 ms 18: 20 ms 19: 50 ms 20: 100 ms	-

Bit	Description	Remark
bit8 to bit15	DI signal filter 0: No filtering Filter type 1: 1: 100 ns 2: 500 ns 3: 1 us 4: 100 us 5: 250 us 6: 500 us 7: 1 ms 8: 2 ms 9: 4 ms 10: 8 ms 11: 16 ms 12: 32 ms Filter type 2: 32: 100 ns 33: 500 ns 34: 1 us 35: 100 us 36: 250 us 37: 500 us 38: 1 ms 39: 2 ms 40: 4 ms 41: 8 ms 42: 16 ms 43: 32 ms	-

Subindex 3: Time base for speed measurement

Bit	Description	Remark
bit0 to bit7	Time base for speed measurement 1: 1 ms 2: 10 ms 3: 100 ms 4: 1s 5: 60s	-

Subindex 5: Pulse rate sample time

Bit	Description	Remark
bit0 to bit7	Frequency sampling time 3: 500 us; 4: 1 ms 5: 2 ms 6: 5 ms 7: 10 ms 8: 20 ms 9: 50 ms 10: 100 ms 11: 200 ms 12: 500 ms 13: 1s 14: 2s 15: 5s 16: 10s 17: 20s 18: 25s	-

Subindex 8: External input function selection

Bit	Description	Remark
bit0 to bit3	DI0 function selection: 0: Normal input 1: Probe function 2: Counting 3: Clear 4: Preset 5: Gating	DI0
bit4	DI0 level logic: 0: Positive logic 1: Negative logic	DI0
bit8 to bit11	DI1 function selection: 0: Normal input 1: Probe function 2: Counting 3: Clear 4: Preset 5: Gating	DI1
bit12	DI1 level logic: 0: Positive logic 1: Negative logic	DI1

Subindex 9: External output function selection

Bit	Description	Remark
bit0 to bit3	DO0 function selection: 0: Common output 1: Comparison output	DO0
bit4	DO0 level logic: 0: Positive logic 1: Negative logic	DO0
bit5 to bit6	Output settings when the module is not running: 0: Outputs 0 1: Outputs 1 2: Maintain	DO0

10.3.1.21 GL20-2SSI

Introduction

The GL20-2SSI module serves as an interface between absolute (SSI) type encoders and controllers, enabling the processing of periodically sampled encoder values within the controller.

- Name: 2SSI module
- Module category: Communication
- Module identification code: 0x10F41093

Configuration data

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8000+0x40*n is shown in the following table.

Index	0x8000: 2SSI Chn_0 ConfigData				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	12
1	Chn_0 Enable and BaudRate	USINT	RW	No	0x0401
2	Chn_0 Frame Format	USINT	RW	No	0x0104
3	Chn_0 Parity Check and Pulse interval	USINT	RW	No	0x0000
4	Chn_0 Frame Length and MSB	USINT	RW	No	0x1919
5	Chn_0 Reserve0	USINT	RW	No	0x0000
6	Chn_0 Reserve1	USINT	RW	No	0x0000
7	Chn_1 Enable and BaudRate	USINT	RW	No	0x0401
8	Chn_1 Frame Format	USINT	RW	No	0x0104
9	Chn_1 Parity Check and Pulse interval	USINT	RW	No	0x0000
10	Chn_1 Frame Length and MSB	USINT	RW	No	0x1919
11	Chn_1 Reserve0	USINT	RW	No	0x0000
12	Chn_1 Reserve1	USINT	RW	No	0x0000

Subindex 001:

Bit	Description	Remark
bit0	Channel 0 enable: 0: Inactive 1: Enable	-
bit1	Multi-sampling mode: 0: Inactive 1: Enable	-
bit2 to bit7	Reserved	-
bit8 to bit11	Baud rate, in kbit/s 0: 100 K 1: 200 K 2: 300 K 3: 400 K 5: 500 K 6: 1000 K 7: 1250 K 8: 1500 K 9: 2000 K	Unit: kbps
bit12 to bit15	Reserved	-

Subindex 002:

Bit	Description	Remark
bit0	Coding format: 0: Gray code 1: Binary code	-
bit1 to bit2	Data format conversion: 0: Gray code ->binary code 1: Binary code -> Gray code 2: None	-
bit3 to bit7	Reserved	-
bit8 to bit9	Frame type: 0: SinglTurn-13bit 1: MultiTurn-25bit 2: Variable	-
bit10 to bit15	Reserved	-

Subindex 003:

Bit	Description	Remark
bit0 to bit2	Parity check: 0: Without LC filter 1: Odd parity 2: Even parity	-
bit3	Direction inversion: 0: No invert sign 1: Invert sign	Inverts the encoder value to adapt to the direction of motor rotation.

Bit	Description	Remark
bit4 to bit7	Reserved	-
bit8 to bit10	Frame transmission interval: 0: 1024 1: 16 2: 32 3: 48 4: 64 5: 512	-
bit11 to bit15	Reserved	-

Subindex004:

Bit	Description	Remark
bit0 to bit7	Data frame length	-
bit8 to bit15	Data bit length	-

Subindex007 to Subindex0012 are the same as Subindex001 to Subindex006 respectively.

10.3.1.22 GL20-2SCOM

Introduction

GL20-2SCOM is a 2-channel communication module that supports RS232, RS485, and RS422 communication protocols.

- Name: GL20-2SCOM
- Module category: Communication
- Module identification code: 0x10F41094

Configuration data

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8000+0x40*n is shown in the table below.

Index	0x8000+0x40*n: 2SCOM setpar1				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	UINT	RW	No	12
1	2SCOM-1 enable and settings	UINT	RW	No	0x0284
2	2SCOM-1 timeout settings	UINT	RW	No	0x0023
3	2SCOM-1 datapacket_size	UINT	RW	No	0x0014
4	2SCOM-2 enable and settings	UINT	RW	No	0x0284
5	2SCOM-2 timeout settings	UINT	RW	No	0x0023
6	2SCOM-2 datapacket_size	UINT	RW	No	0x0014
7	module bar_code_H	UINT	RW	No	0x0200
8	module bar_code_L	UINT	RW	No	0x0200
9	Reserved parameters1	UINT	RW	No	0x0000
10	Reserved parameters2	UINT	RW	No	0x0000
11	Reserved parameters3	UINT	RW	No	0x0000
12	Reserved parameters4	UINT	RW	No	0x0000

Index	0x8000+0x40*n: 2SCOM setpar1				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
13	Reserved parameters5	UINT	RW	No	0x0000
14	Reserved parameters6	UINT	RW	No	0x0000
15	Reserved parameters7	UINT	RW	No	0x0000

Serial port enabling and configuration

Bit	Description	Remarks
bit0 to bit3	Baud rate. Options 3 to 8 correspond to: 4.8 k, 9.6 k, 19.2 k, 38.4 k, 57.6 k, and 115.2 k	Unit: bps
bit4 to bit6	Reserved	-
bit7	1: Enable port 0: Disable port	Default is 1.
bit8	Variable stop bit: 1: 2 bits 0: 1 bit	Default 0
bit9 to bit10	Variable parity bit: 2: Odd parity 1: Even parity 0: Inactive	Default is 1.
bit11	Variable data bit: 1: 7 bits 0: 8 bits	Default 0
bit12	TX flow control: 1: TX disabled 0: TX enabled	Default 0
bit13	RX flow control: 1: RX disabled 0: RX enabled	Default 0
bit14 to bit15	Port protocol type: 2: RS422 1: RS485 0: RS232	Default 0

2SCOM timeout settings

Bit	Description	Remarks
bit0 to bit15	Range: 0 to 10000. Default is 35.	Unit: 0.1 character

2SCOM data packet settings

Bit	Description	Remarks
bit0 to bit7	Options include 4, 8, 12, 16, 20 (default), 24, 28, 32, 36, 40, 44, 48, 52, 56, and 60.	Unit: byte.
bit8	1: Data is transmitted in packets of the configured size. 0: Data is automatically controlled and sent frame by frame.	Default 0

Bit	Description	Remarks
bit9	1: Discard old data when the TX buffer is full. 0: Discard new data when the TX buffer is full.	Default 0
bit10	1: Discard old data when the RX buffer is full. 0: Discard new data when the RX buffer is full.	Default 0
bit11 to bit15	Reserved	-

10.3.1.23 GL20-2SCOM-MDB

Introduction

GL20-2SCOM-MDB is a dual-channel communication module that supports RS232, RS485, and RS422 communication protocols.

- Name: GL20-2SCOM-MDB
- Module category: Serial
- Module identification code: 0x10F41098

Configuration data

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x8000+0x40*n is shown in the table below.

Index	0x8000+0x40*n				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	UINT	RW	No	15
1	COM0 (M/S/F) Mode/Port Protocol/ Baud Rate	UINT	RW	No	0x0400
2	COM0(M/S/F) Serial Port Settings	UINT	RW	No	0x0209
3	COM0(M/S/F) Char Pitch	UINT	RW	No	0x0023
4	COM0(M/F) Response Timeout	UINT	RW	No	0x03E8
5	COM0(M) Delay Between Polls	UINT	RW	No	0x0064
6	COM0(M/S) Master Control & Slave ID	UINT	RW	No	0x0110
7	COM0(S) Response Delay	UINT	RW	No	0x0032
8	COM1 (M/S/F) Mode/Port Protocol/ Baud Rate	UINT	RW	No	0x0400
9	COM1(M/S/F) Serial Port Settings	UINT	RW	No	0x0209
10	COM1(M/S/F) Char Pitch	UINT	RW	No	0x0023
11	COM1(M/F) Response Timeout	UINT	RW	No	0x03E8
12	COM1(M) Delay Between Polls	UINT	RW	No	0x0064
13	COM1 (M/S) Master Control & Slave ID	UINT	RW	No	0x0110
14	COM1(S) Response Delay	UINT	RW	No	0x0032
15	Reserve	UINT	RW	No	0x0000

Subindex 1: COM0 (M/S/F) Mode/Port Protocol/BaudRate

Bit	Description	Remarks
bit0 to bit1	Operating mode: 0: Modbus master 1: Modbus slave 2: Free protocol	Default 0
bit2	Reserved	Default 0
bit3 to bit4	Port protocol type: 2: RS422 1: RS485 0: RS232	Default 0
bit5 to bit7	Reserved	Default 0
bit8 to bit11	Baud rate: Options 3 to 8 respectively correspond to 48, 96, 192, 384, 576, and 1152.	Unit: 0.1 kbps. Default is 4.
bit12 to bit15	Reserved	Default 0

Subindex 2: COM0(M/S/F) Serial Port Settings

Bit	Description	Remarks
bit0	Data bit 0: 7 bits 1: 8 bits	Default is 1.
bit1 to bit2	Parity bit 0: No parity 1: Odd parity 2: Even parity	Default: 0
bit3 to bit4	Stop bit 1: 1 bit 2: 2 bits	Default is 1.
bit5	Serial mode 0: RTU 1: ASCII (Not supported)	Default is 0 (non-changeable).
bit6 to bit7	Reserved	Default: 0
bit8 to bit15	Free coefficient: 0 to 255	Default is 2.

Subindex 3: COM0(M/S/F) Char Pitch (Unit is 0.1 characters)

Bit	Description	Remarks
Unsigned16	Character spacing: frame interval detection time when receiving messages Range: 35 to 10000. Unit: 0.1 character.	Default is 35.

Subindex 4: COM0(M/F) Response Timeout

Bit	Description	Remarks
Unsigned16	Response timeout time: the time the master waits for the slave to respond after sending a command Range: 10 to 65535	Unit: ms. Default is 1000.

Subindex 5: COM0(M) Delay Between Polls

Bit	Description	Remarks
Unsigned16	Polling delay: the delay from receiving a response from the slave to sending the next command Range: 0 to 65535	Unit: ms. Default is 100.

Subindex 6: COM0(M/S) Master Control & Slave ID

Bit	Description	Remarks
bit0	Action upon read timeout 0: Maintain the last input value 1: Reset the input value	Default is 0.
bit1	Data output mode 0: Polling	Default is 0 (non-changeable).
bit2	Module control enabling 0: Disable 1: Active	Default is 0.
bit3	Module control method 0: Level triggered (active continuously) 1: Rising edge triggered (active only at the rising edge)	Default is 0.
bit4	Power-on time output 1: Active	Default is 1 (non-changeable).
bit5 to bit7	Reserved	-
bit8 to bit15	Slave ID: 1 to 247	Default is 1.

Note

- Module control enable. The Modbus read/write commands can be controlled by adjusting the value of "module control output".
- Module control method (default is level triggered) is only effective when the module control is enabled. This parameter is effective only when the module control is enabled.

Subindex 7: COM0(S) Response Delay

Bit	Description	Remarks
Unsigned16	Response delay: 0 to 65535	Default is 50.

Subindex 8 to 14: Same as serial port 0

10.3.1.24 GL20-2S485

Introduction

GL20-2S485 is a dual-channel RS485 communication module.

- Name: GL20-2S485
- Module category: Communication
- Module identification code: 0x10F41091

Configuration data

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x8000+0x40*n is shown in the table below.

Index	0x8000+0x40*n 2S485 setpar1				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RW	No	15
1	2S485-0 enable and settings	USINT	RW	No	0x0084
2	2S485-0 message_interval	USINT	RW	No	0x0023
3	2S485-0 Number_terminals	USINT	RW	No	0x001F
4	2S485-0 datapacket_size	USINT	RW	No	0x0014
5	2S485-0 TX_buffersize	USINT	RW	No	0x0600
6	2S485-0 RX_buffersize	USINT	RW	No	0x0600
7	2S485-1 enable and settings	USINT	RW	No	0x0084
8	2S485-1 message_interval	USINT	RW	No	0x0023
9	2S485-1 Number_terminals	USINT	RW	No	0x001F
10	2S485-1 datapacket_size	USINT	RW	No	0x0014
11	2S485-1 TX_buffersize	USINT	RW	No	0x0600
12	2S485-1 RX_buffersize	USINT	RW	No	0x0600
13	module bar_code_H	USINT	RW	No	0x0200
14	module bar_code_L	USINT	RW	No	0x0200
15	reserved parameters	USINT	RW	No	0x0000

Subindex 1: 2S485-0 enable and settings

Bit	Description	Remarks
bit0 to bit3	Baud rate 1 to 9: Corresponds to 12, 24, 48, 96, 192, 384, 576, 1152, and 2304.	Unit: 0.1 kbps.
bit4 to bit6	Reserved	-
bit7	1: Active 0: Inactive	-
bit8	Variable stop bit: 1: 2 bits 0: 1 bit	-
bit9 to bit10	Variable parity bit: 2: Odd parity 1: Even parity 0: Inactive	-
bit11	Variable data bit: 1: 7 bits 0: 8 bits	-
bit12 to bit13	Flow control 2: TX flow only 1: RX flow only 0: No flow control	-
bit14 to bit15	Reserved	-

Subindex 2: 2S485-0 message_interval

Bit	Description	Remarks
bit0 to bit15	0-65565, default 35	Unit: 0.1 characters

Subindex 3: 2S485-0 Number_terminals

Bit	Description	Remarks
bit0 to bit7	1 to N The maximum value of N is 32.	-
bit8 to bit15	RXPDO write interval, unit: milliseconds	0 defaults to 5ms.

Subindex 4: 2S485-0 datapacket_size

Bit	Description	Remarks
bit0 to bit7	Options include 4, 8, 12, 16, 20 (default), 24, 28, 32, 36, 40, 44, 48, 52, 56, and 60.	-
bit8 to bit14	Reserved	-
Bit15	1: Send data based on packet size 0: Send data according to software flow control	-

Subindex 5: 2S485-0 TX_buffersize

Bit	Description	Remarks
bit0 to bit14	TX buffer size setting	-
Bit15	TX buffer policy 1: Discard old data 0: Discard new data	-

Subindex6: 2S485-0 RX_buffersize

Bit	Description	Remarks
bit0 to bit14	RX buffer size setting	-
Bit15	RX buffer policy 1: Discard old data 0: Discard new data	-

Subindex 7: 2S485-1 enable and settings

Bit	Description	Remarks
bit0 to bit3	Baud rate 1 to 9: Corresponds to 12, 24, 48, 96, 192, 384, 576, 1152, and 2304.	Unit: 0.1 kbps.
bit5 to bit6	Reserved	-
bit7	1: Active 0: Inactive	-
bit8	Variable stop bit: 1: 2 bits 0: 1 bit	-
bit9 to bit10	Variable parity bit: 2: Odd parity 1: Even parity 0: Inactive	-

Bit	Description	Remarks
bit11	Variable data bit: 1: 7 bits 0: 8 bits	-
bit12 to bit13	Flow control 2: TX flow only 1: RX flow only 0: No flow control	-
bit14 to bit15	Reserved	-

Subindex 8: 2S485-1 message_interval

Bit	Description	Remarks
bit0 to bit15	0-65565, default 35	Unit: 0.1 characters

Subindex 9: 2S485-1 Number_terminals

Bit	Description	Remarks
bit0 to bit7	1 to N The maximum value of N is 32.	-
bit8 to bit15	RXPDO write interval, unit: milliseconds	0 defaults to 5ms.

Subindex 10: 2S485-1 datapacket_size

Bit	Description	Remarks
bit0 to bit7	Options include 4, 8, 12, 16, 20 (default), 24, 28, 32, 36, 40, 44, 48, 52, 56, and 60.	-
bit8 to bit14	Reserved	-
Bit15	1: Send data based on packet size 0: Send data according to software flow control	-

Subindex 11: 2S485-1 TX_buffersize

Bit	Description	Remarks
bit0 to bit14	TX buffer size setting	-
Bit15	TX buffer policy 1: Discard old data 0: Discard new data	-

Subindex 12: 2S485-1 RX_buffersize

Bit	Description	Remarks
bit0 to bit14	RX buffer size setting	-
Bit15	RX buffer policy 1: Discard old data 0: Discard new data	-

Subindex 13: module bar_code_H

Bit	Description	Remarks
bit0 to bit15	16 high bits of the machine barcode.	-

Subindex 14: module bar_code_L

Bit	Description	Remarks
bit0 to bit15	16 low bits of the machine barcode.	-

10.3.1.25 GL20-2S485-MDB

Introduction

GL20-2S485-MDB is a dual-channel RS485 communication module.

- Name: GL20-2S485-MDB
- Module category: Serial
- Module identification code: 0x10F41099

Configuration data

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x8000+0x40*n is shown in the table below.

Index	0x8000+0x40*n				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RW	No	15
1	2S485-0(M/S/F) Mode/BaudRate	USINT	RW	No	0x0400
2	2S485-0(M/S/F) Serial Port Settings	USINT	RW	No	0x0209
3	2S485-0(M/S/F) Char Pitch(Unit is 0.1 characters)	USINT	RW	No	0x0023
4	2S485-0(M/F) Response Timeout	USINT	RW	No	0x03E8
5	2S485-0(M) Delay Between Polls	USINT	RW	No	0x0064
6	2S485-0(M/S) Master Control And Slave ID	USINT	RW	No	0x0110
7	2S485-0(S) Response Delay	USINT	RW	No	0x0032
8	2S485-1(M/S/F) Mode/BaudRate	USINT	RW	No	0x0400
9	2S485-1(M/S/F) Serial Port Settings	USINT	RW	No	0x0209
10	2S485-1(M/S/F) Char Pitch(Unit is 0.1 characters)	USINT	RW	No	0x0023
11	2S485-1(M/F) Response Timeout	USINT	RW	No	0x03E8
12	2S485-1(M) Delay Between Polls	USINT	RW	No	0x0064
13	2S485-1(M/S) Master Control And Slave ID	USINT	RW	No	0x0110
14	2S485-1(S) Response Delay	USINT	RW	No	0x0032
15	Reserve	USINT	RW	No	0x0000

Subindex 1: 2S485-0(M/S/F) Mode/Port Protocol/BaudRate

Bit	Description	Remarks
bit0 to bit1	Operating mode: 0: Modbus master 1: Modbus slave 2: Free protocol	Default 0
bit2 to bit7	Reserved	Default 0

Bit	Description	Remarks
bit8 to bit11	Baud rate: Options 3 to 8 respectively correspond to 48, 96, 192, 384, 576, and 1152.	Unit: 0.1 kbps. Default is 4.
bit12 to bit15	Reserved	Default 0

Subindex 2: 2S485-0 (M/S/F) Serial Port Settings

Bit	Description	Remarks
bit0	Data bit 0: 7 bits 1: 8 bits	Default is 1.
bit1 to bit2	Parity bit 0: No parity 1: Odd parity 2: Even parity	Default: 0
bit3 to bit4	Stop bit 1: 1 bit 2: 2 bits	Default is 1.
bit5	Serial mode 0: RTU 1: ASCII (Not supported)	Default is 0 (non-changeable).
bit6 to bit7	Reserved	Default: 0
bit8 to bit15	Free coefficient: 0 to 255	Default is 2.

Subindex 3: 2S485-0 (M/S/F) Char Pitch (Unit is 0.1 characters)

Bit	Description	Remarks
Unsigned16	Character spacing: frame interval detection time when receiving messages Range: 35 to 10000. Unit: 0.1 character.	Default is 35.

Subindex 4: 2S485-0 (M/F) Response Timeout

Bit	Description	Remarks
Unsigned16	Response timeout time: the time the master waits for the slave to respond after sending a command Range: 10 to 65535	Unit: ms. Default is 1000.

Subindex 5: 2S485-0 (M) Delay Between Polls

Bit	Description	Remarks
Unsigned16	Polling delay: the delay from receiving a response from the slave to sending the next command Range: 0 to 65535	Unit: ms. Default is 100.

Subindex 6: 2S485-0 (M/S) Master Control & Slave ID

Bit	Description	Remarks
bit0	Action upon read timeout 0: Maintain the last input value 1: Reset the input value	Default is 0.
bit1	Data output mode 0: Polling	Default is 0 (non-changeable).
bit2	Module control enabling 0: Disable 1: Active	Default is 0.
bit3	Module control method 0: Level triggered (active continuously) 1: Rising edge triggered (active only at the rising edge)	Default is 0.
bit4	Power-on time output 1: Active	Default is 1 (non-changeable).
bit5 to bit7	Reserved	-
bit8 to bit15	Slave ID: 1 to 247	Default is 1.

Note

- Module control enable. The Modbus read/write commands can be controlled by adjusting the value of "module control output".
- Module control method (default is level triggered) is only effective when the module control is enabled. This parameter is effective only when the module control is enabled.

Subindex 7: 2S485-0 (S) Response Delay

Bit	Description	Remarks
Unsigned16	Response delay: 0 to 65535	Default is 50.

Subindex 8 to 14: Same as serial port 0

10.3.1.26 GL20-1DNM

Introduction

The GL20-1DNM module is a DeviceNet Master (DNM) module.

- Name: GL20-1DNM
- Module category: Communication
- Module identification code: 0x10F41095

Configuration data

The configuration data for the DNM module is divided into two parts. First is the basic configuration of the module, as shown in the object dictionary below. Second is the configuration items for each DeviceNet slave, which are packaged by the backend and sent to the PLC, and are not described in the object dictionary.

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x8000+0x40*n is shown in the table below.

Index	0x8000+0x40*n: 1DNM setpar0				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	UINT	RW	No	15
1	MAC_ID And Device_Type	UDINT	RW	No	0x0044003F
2	ProductName_0	UDINT	RW	No	0x30324C47
3	ProductName_1	UDINT	RW	No	0x4E44312D
4	ProductName_2	UDINT	RW	No	0x2020204D
5	ProductName_3	UDINT	RW	No	0x00000000
6	Vendor ID	UDINT	RW	No	0x0000067C
7	Product code	UDINT	RW	No	0x00000000
8	Revision	UDINT	RW	No	0x00000000
9	Serial number	UDINT	RW	No	0x00000000
10	Reserved_0	UDINT	RW	No	0x00000000
11	Reserved_1	UDINT	RW	No	0x00000000
12	Reserved_2	UDINT	RW	No	0x00000000
13	Reserved_3	UDINT	RW	No	0x00000000
14	Reserved_4	UDINT	RW	No	0x00000000
15	Reserved_5	UDINT	RW	No	0x00000000

Subindexes 1 to 9 are configuration data for the DN master module.

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x8001+0x40*n is shown in the table below.

Index	0x8001+0x40*n: 1DNM setpar1				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	UINT	RW	No	15
1	BaudRate	UINT	RW	No	0x007D
2	Config Verify Code	UINT	RW	No	0x0000
3	Transmission Flag	UINT	RW	No	0x0000
4	Reserved_0	UINT	RW	No	0x0000
5	Reserved_1	UINT	RW	No	0x0000
6	Reserved_2	UINT	RW	No	0x0000
7	Reserved_3	UINT	RW	No	0x0000
8	Reserved_4	UINT	RW	No	0x0000
9	Reserved_5	UINT	RW	No	0x0000
10	Reserved_6	UINT	RW	No	0x0000
11	Reserved_7	UINT	RW	No	0x0000
12	Reserved_8	UINT	RW	No	0x0000
13	Reserved_9	UINT	RW	No	0x0000
14	Reserved_10	UINT	RW	No	0x0000
15	LED For Produce	UINT	RW	No	0x0000

Subindex 2 is the configuration verification code. It is used to verify the DeviceNet configuration data stored in the Flash of the DNM module (This configuration verification code is not used in the new scheme).

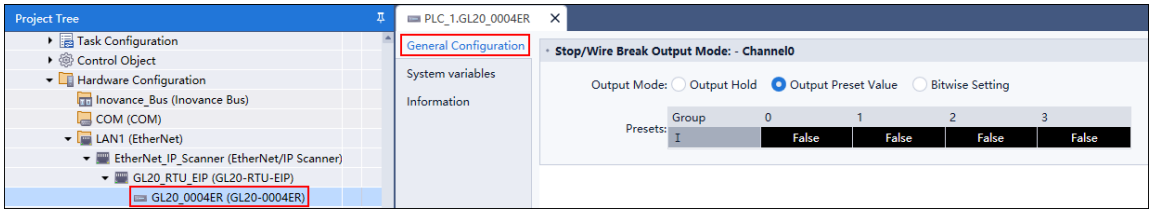
Subindex 3 is the transmission mode flag. When set to 0, it indicates the transmission mode where the address mapping is included in the PDO data, and the size of the data transmitted in one frame is 120 bytes. When set to 1, it indicates the transmission mode where addresses are pre-mapped before PDO data transmission. Default is 0.

Subindex 15 is used for test equipment indicator control. The test equipment controls the LED indicators on the module by sending SDO commands.

10.3.2 GL20-RTU-EIP

10.3.2.1 GL20-0004ER

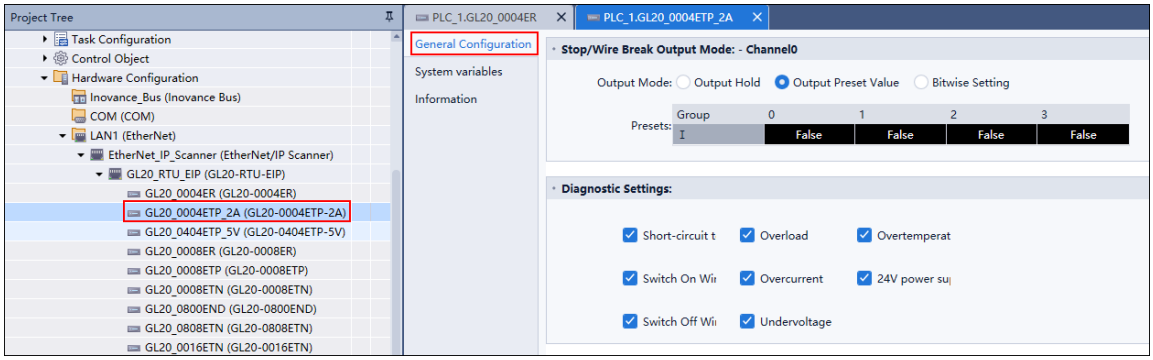
Double-click the "GL20-0004ER" module, select the "General configuration" tab, and configure the channel parameters, as shown below.



Parameter	Description	Default Value
Output mode	Defines the output mode of the output channel of the module in non-OP state (when the module is stopped or the coupler is disconnected). Supported options: • Output last value: All channels in the corresponding group retain the output state before module stop or network disconnection. • Output preset value: The output mode of each channel in the group matches the corresponding preset value. The preset value is matched by bit. • Bitwise setting: The output mode of each channel in the corresponding group is matched by bit.	Output preset value
Preset value	Defines the preset value for the corresponding output mode of each channel in the group. Click to switch the channel preset value to "False" or "True". One bit represents one channel. For example, bit0 represents channel 0. Set bit0 to False, and the output status of channel 0 is 0. Set bit0 to True, and the output status of channel 0 is 1. Note: This is available only when the output mode is set to "Output preset value" or "Bitwise setting".	FALSE
Bit setting	Defines the bitwise match value for the output mode of each channel in the group. Click to switch the channel bit setting to "False" or "True". One bit represents one channel. For example, bit0 represents channel 0. If bit0 is set to True, channel 0 outputs the preset value. If bit0 is set to False, channel 0 retains the last output state. Note: This is available only when the output mode is set to "Bitwise setting".	TRUE

10.3.2.2 GL20-0004ETP-2A

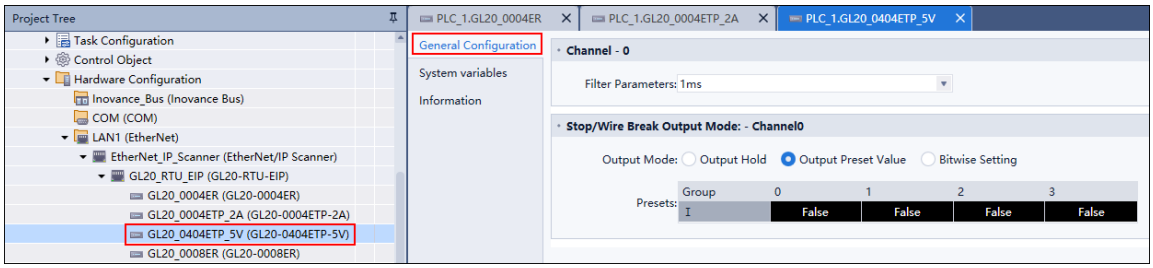
Double-click the "GL20-0004ETP-2A" module, select the "General configuration" tab, and configure the channel parameters, as shown below.



Parameter	Description	Default Value
Output mode	Defines the output mode of the output channel of the module in non-OP state (when the module is stopped or the coupler is disconnected). Supported options: • Output last value: All channels in the corresponding group retain the output state before module stop or network disconnection. • Output preset value: The output mode of each channel in the group matches the corresponding preset value. The preset value is matched by bit. • Bitwise setting: The output mode of each channel in the corresponding group is matched by bit.	Output preset value
Preset value	Defines the preset value for the corresponding output mode of each channel in the group. Click to switch the channel preset value to "False" or "True". One bit represents one channel. For example, bit0 represents channel 0. Set bit0 to False, and the output status of channel 0 is 0. Set bit0 to True, and the output status of channel 0 is 1. Note: This is available only when the output mode is set to "Output preset value" or "Bitwise setting".	FALSE
Bit setting	Defines the bitwise match value for the output mode of each channel in the group. Click to switch the channel bit setting to "False" or "True". One bit represents one channel. For example, bit0 represents channel 0. If bit0 is set to True, channel 0 outputs the preset value. If bit0 is set to False, channel 0 retains the last output state. Note: This is available only when the output mode is set to "Bitwise setting".	TRUE
Diagnostic setting	Defines different diagnostic functions of the enabled channel, including short circuit to VDD, overload, over-temperature, switch ON disconnection, overcurrent, 24 V power failure, switch OFF disconnection, and power supply undervoltage.	All enabled

10.3.2.3 GL20-0404ETP-5V

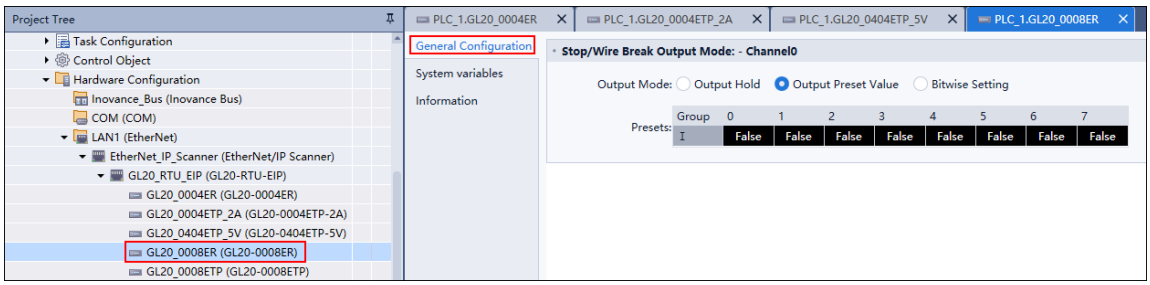
Double-click the "GL20-0404ETP-5V" module, select the "General configuration" tab, and configure the channel parameters, as shown below.



Parameter	Description	Default Value
Filter parameter	Defines the debounce filter time of the channel. Options: No filter, 0.25 ms, 0.5 ms, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms.	1 ms
Output mode	Defines the output mode of the output channel of the module in non-OP state (when the module is stopped or the coupler is disconnected). Supported options: • Output last value: All channels in the corresponding group retain the output state before module stop or network disconnection. • Output preset value: The output mode of each channel in the group matches the corresponding preset value. The preset value is matched by bit. • Bitwise setting: The output mode of each channel in the corresponding group is matched by bit.	Output preset value
Preset value	Defines the preset value for the corresponding output mode of each channel in the group. Click to switch the channel preset value to "False" or "True". One bit represents one channel. For example, bit0 represents channel 0. Set bit0 to False, and the output status of channel 0 is 0. Set bit0 to True, and the output status of channel 0 is 1. Note: This is available only when the output mode is set to "Output preset value" or "Bitwise setting".	FALSE
Bit setting	Defines the bitwise match value for the output mode of each channel in the group. Click to switch the channel bit setting to "False" or "True". One bit represents one channel. For example, bit0 represents channel 0. If bit0 is set to True, channel 0 outputs the preset value. If bit0 is set to False, channel 0 retains the last output state. Note: This is available only when the output mode is set to "Bitwise setting".	TRUE

10.3.2.4 GL20-0008ER

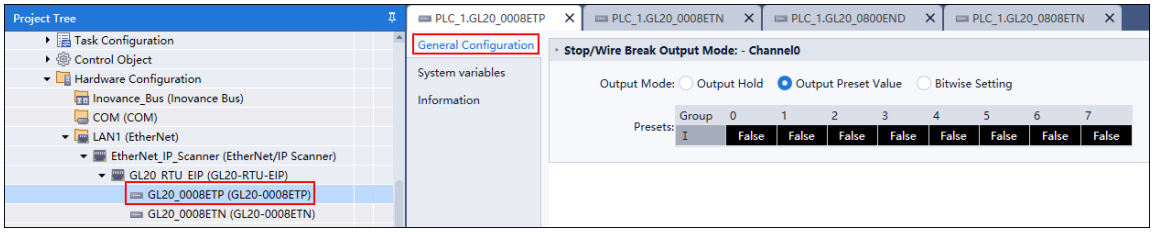
Double-click the "GL20-0008ER" module, select the "General configuration" tab, and configure the channel parameters, as shown below.



Parameter	Description	Default Value
Output mode	Defines the output mode of the output channel of the module in non-OP state (when the module is stopped or the coupler is disconnected). Supported options: • Output last value: All channels in the corresponding group retain the output state before module stop or network disconnection. • Output preset value: The output mode of each channel in the group matches the corresponding preset value. The preset value is matched by bit. • Bitwise setting: The output mode of each channel in the corresponding group is matched by bit.	Output preset value
Preset value	Defines the preset value for the corresponding output mode of each channel in the group. Click to switch the channel preset value to "False" or "True". One bit represents one channel. For example, bit0 represents channel 0. Set bit0 to False, and the output status of channel 0 is 0. Set bit0 to True, and the output status of channel 0 is 1. Note: This is available only when the output mode is set to "Output preset value" or "Bitwise setting".	FALSE
Bit setting	Defines the bitwise match value for the output mode of each channel in the group. Click to switch the channel bit setting to "False" or "True". One bit represents one channel. For example, bit0 represents channel 0. If bit0 is set to True, channel 0 outputs the preset value. If bit0 is set to False, channel 0 retains the last output state. Note: This is available only when the output mode is set to "Bitwise setting".	TRUE

10.3.2.5 GL20-0008ETP

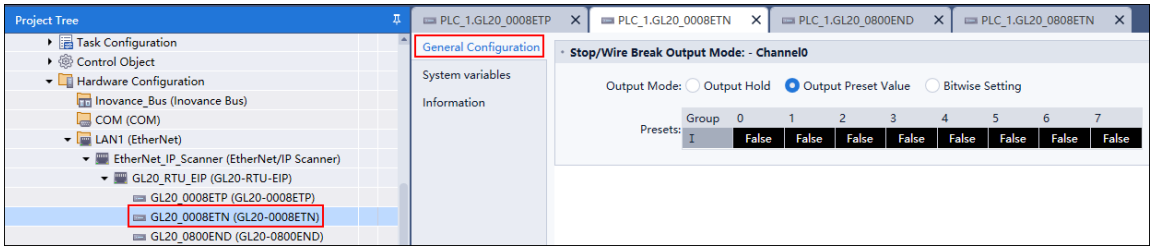
Double-click the "GL20-0008ETP" module, select the "General configuration" tab, and configure the channel parameters, as shown below.



Parameter	Description	Default Value
Output mode	Defines the output mode of the output channel of the module in non-OP state (when the module is stopped or the coupler is disconnected). Supported options: • Output last value: All channels in the corresponding group retain the output state before module stop or network disconnection. • Output preset value: The output mode of each channel in the group matches the corresponding preset value. The preset value is matched by bit. • Bitwise setting: The output mode of each channel in the corresponding group is matched by bit.	Output preset value
Preset value	Defines the preset value for the corresponding output mode of each channel in the group. Click to switch the channel preset value to "False" or "True". One bit represents one channel. For example, bit0 represents channel 0. Set bit0 to False, and the output status of channel 0 is 0. Set bit0 to True, and the output status of channel 0 is 1. Note: This is available only when the output mode is set to "Output preset value" or "Bitwise setting".	FALSE
Bit setting	Defines the bitwise match value for the output mode of each channel in the group. Click to switch the channel bit setting to "False" or "True". One bit represents one channel. For example, bit0 represents channel 0. If bit0 is set to True, channel 0 outputs the preset value. If bit0 is set to False, channel 0 retains the last output state. Note: This is available only when the output mode is set to "Bitwise setting".	TRUE

10.3.2.6 GL20-0008ETN

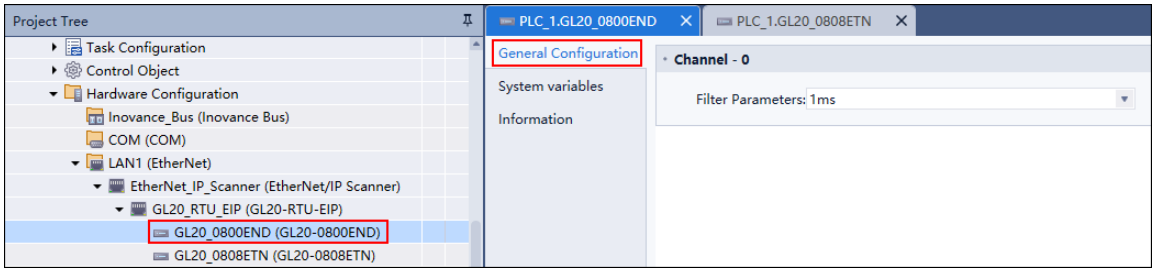
Double-click the "GL20-0008ETN" module, select the "General configuration" tab, and configure the channel parameters, as shown below.



Parameter	Description	Default Value
Output mode	Defines the output mode of the output channel of the module in non-OP state (when the module is stopped or the coupler is disconnected). Supported options: • Output last value: All channels in the corresponding group retain the output state before module stop or network disconnection. • Output preset value: The output mode of each channel in the group matches the corresponding preset value. The preset value is matched by bit. • Bitwise setting: The output mode of each channel in the corresponding group is matched by bit.	Output preset value
Preset value	Defines the preset value for the corresponding output mode of each channel in the group. Click to switch the channel preset value to "False" or "True". One bit represents one channel. For example, bit0 represents channel 0. Set bit0 to False, and the output status of channel 0 is 0. Set bit0 to True, and the output status of channel 0 is 1. Note: This is available only when the output mode is set to "Output preset value" or "Bitwise setting".	FALSE
Bit setting	Defines the bitwise match value for the output mode of each channel in the group. Click to switch the channel bit setting to "False" or "True". One bit represents one channel. For example, bit0 represents channel 0. If bit0 is set to True, channel 0 outputs the preset value. If bit0 is set to False, channel 0 retains the last output state. Note: This is available only when the output mode is set to "Bitwise setting".	TRUE

10.3.2.7 GL20-0800END

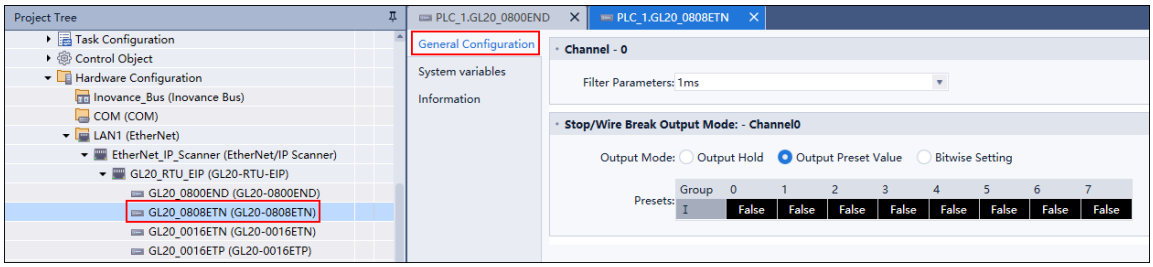
Double-click the "GL20-0800END" module, select the "General configuration" tab, and configure the channel parameters, as shown below.



Parameter	Description	Default Value
Filter parameter	Defines the debounce filter time of the channel. Options: No filter, 0.25 ms, 0.5 ms, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms.	1 ms

10.3.2.8 GL20-0808ETN

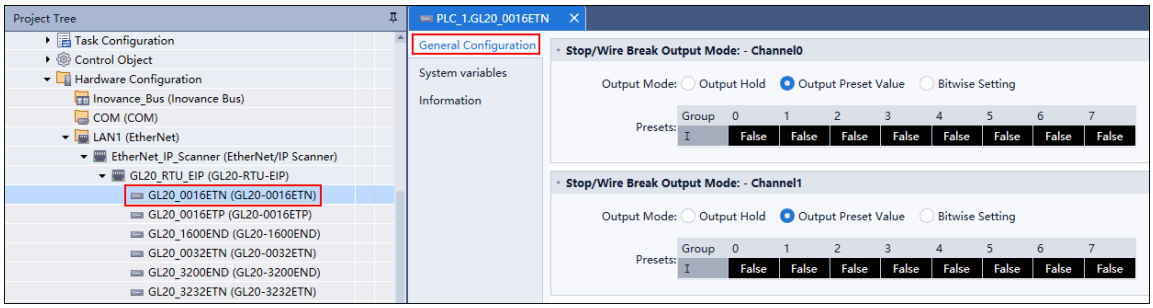
Double-click the "GL20-0808ETN" module, select the "General configuration" tab, and configure the channel parameters, as shown below.



Parameter	Description	Default Value
Filter parameter	Defines the debounce filter time of the channel. Options: No filter, 0.25 ms, 0.5 ms, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms.	1 ms
Output mode	Defines the output mode of the output channel of the module in non-OP state (when the module is stopped or the coupler is disconnected). Supported options: • Output last value: All channels in the corresponding group retain the output state before module stop or network disconnection. • Output preset value: The output mode of each channel in the group matches the corresponding preset value. The preset value is matched by bit. • Bitwise setting: The output mode of each channel in the corresponding group is matched by bit.	Output preset value
Preset value	Defines the preset value for the corresponding output mode of each channel in the group. Click to switch the channel preset value to "False" or "True". One bit represents one channel. For example, bit0 represents channel 0. Set bit0 to False, and the output status of channel 0 is 0. Set bit0 to True, and the output status of channel 0 is 1. Note: This is available only when the output mode is set to "Output preset value" or "Bitwise setting".	FALSE
Bit setting	Defines the bitwise match value for the output mode of each channel in the group. Click to switch the channel bit setting to "False" or "True". One bit represents one channel. For example, bit0 represents channel 0. If bit0 is set to True, channel 0 outputs the preset value. If bit0 is set to False, channel 0 retains the last output state. Note: This is available only when the output mode is set to "Bitwise setting".	TRUE

10.3.2.9 GL20-0016ETN

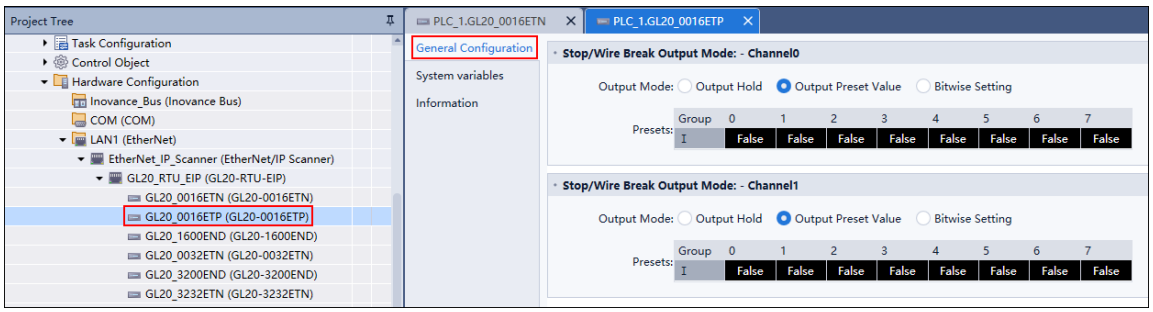
Double-click the "GL20-0016ETN" module, select the "General configuration" tab, and configure the channel parameters, as shown below.



Parameter	Description	Default Value
Output mode	Defines the output mode of the output channel of the module in non-OP state (when the module is stopped or the coupler is disconnected). Supported options: • Output last value: All channels in the corresponding group retain the output state before module stop or network disconnection. • Output preset value: The output mode of each channel in the group matches the corresponding preset value. The preset value is matched by bit. • Bitwise setting: The output mode of each channel in the corresponding group is matched by bit.	Output preset value
Preset value	Defines the preset value for the corresponding output mode of each channel in the group. Click to switch the channel preset value to "False" or "True". One bit represents one channel. For example, bit0 represents channel 0. Set bit0 to False, and the output status of channel 0 is 0. Set bit0 to True, and the output status of channel 0 is 1. Note: This is available only when the output mode is set to "Output preset value" or "Bitwise setting".	FALSE
Bit setting	Defines the bitwise match value for the output mode of each channel in the group. Click to switch the channel bit setting to "False" or "True". One bit represents one channel. For example, bit0 represents channel 0. If bit0 is set to True, channel 0 outputs the preset value. If bit0 is set to False, channel 0 retains the last output state. Note: This is available only when the output mode is set to "Bitwise setting".	TRUE

10.3.2.10 GL20-0016ETP

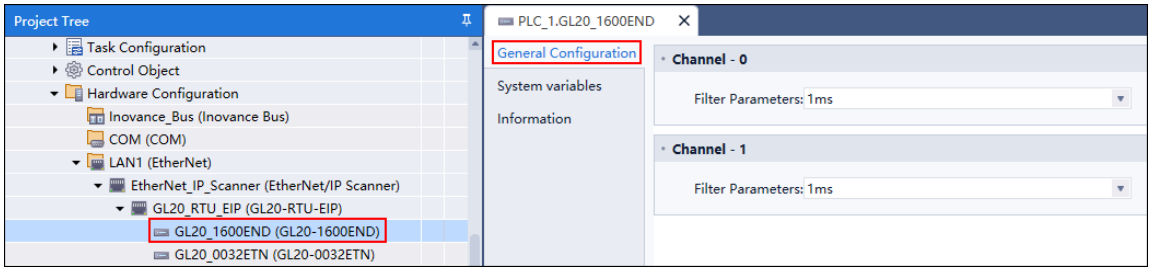
Double-click the "GL20-0016ETP" module, select the "General configuration" tab, and configure the channel parameters, as shown below.



Parameter	Description	Default Value
Output mode	Defines the output mode of the output channel of the module in non-OP state (when the module is stopped or the coupler is disconnected). Supported options: • Output last value: All channels in the corresponding group retain the output state before module stop or network disconnection. • Output preset value: The output mode of each channel in the group matches the corresponding preset value. The preset value is matched by bit. • Bitwise setting: The output mode of each channel in the corresponding group is matched by bit.	Output preset value
Preset value	Defines the preset value for the corresponding output mode of each channel in the group. Click to switch the channel preset value to "False" or "True". One bit represents one channel. For example, bit0 represents channel 0. Set bit0 to False, and the output status of channel 0 is 0. Set bit0 to True, and the output status of channel 0 is 1. Note: This is available only when the output mode is set to "Output preset value" or "Bitwise setting".	FALSE
Bit setting	Defines the bitwise match value for the output mode of each channel in the group. Click to switch the channel bit setting to "False" or "True". One bit represents one channel. For example, bit0 represents channel 0. If bit0 is set to True, channel 0 outputs the preset value. If bit0 is set to False, channel 0 retains the last output state. Note: This is available only when the output mode is set to "Bitwise setting".	TRUE

10.3.2.11 GL20-1600END

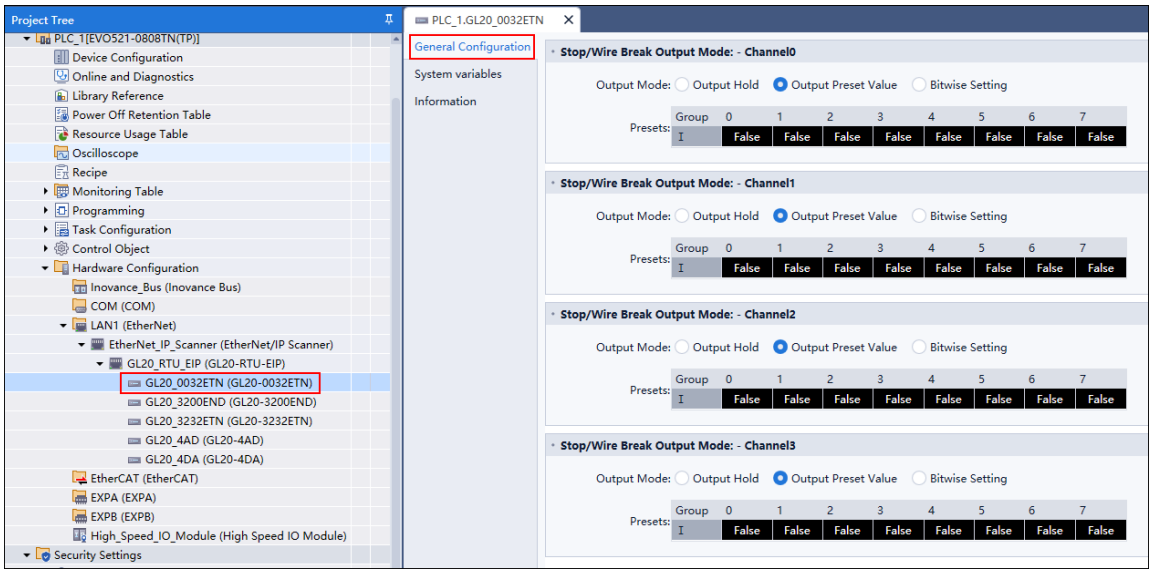
Double-click the "GL20-1600END" module, select the "General configuration" tab, and configure the channel parameters, as shown below.



Parameter	Description	Default Value
Filter parameter	Defines the debounce filter time of the channel. Options: No filter, 0.25 ms, 0.5 ms, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms.	1 ms

10.3.2.12 GL20-0032ETN/GL20-0032ETN-M

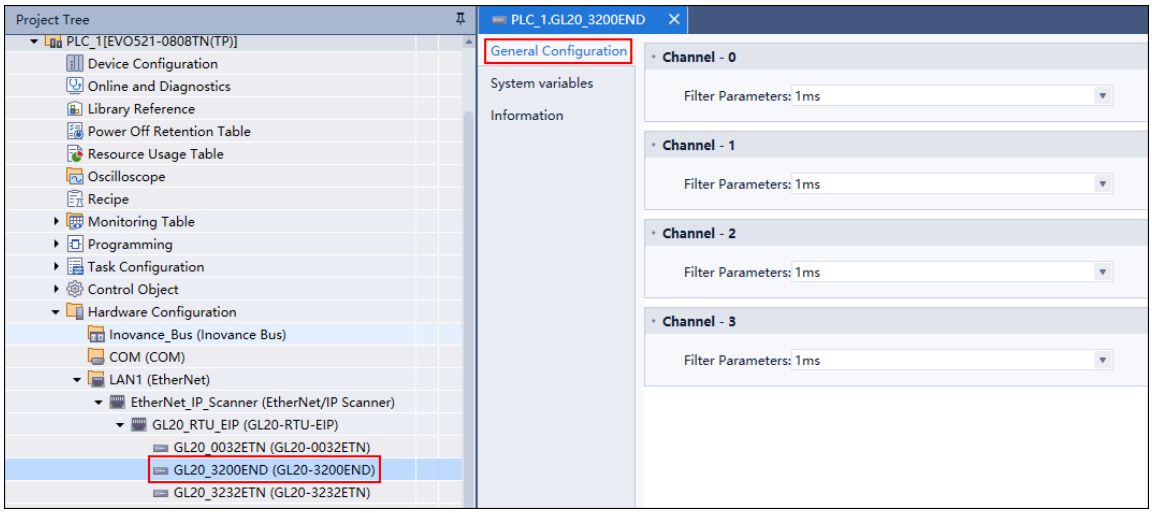
Double-click the "GL20-0032ETN" module, select the "General configuration" tab, and configure the channel parameters, as shown below.



Parameter	Description	Default Value
Output mode	Defines the output mode of the output channel of the module in non-OP state (when the module is stopped or the coupler is disconnected). Supported options: • Output last value: All channels in the corresponding group retain the output state before module stop or network disconnection. • Output preset value: The output mode of each channel in the group matches the corresponding preset value. The preset value is matched by bit. • Bitwise setting: The output mode of each channel in the corresponding group is matched by bit.	Output preset value
Preset value	Defines the preset value for the corresponding output mode of each channel in the group. Click to switch the channel preset value to "False" or "True". One bit represents one channel. For example, bit0 represents channel 0. Set bit0 to False, and the output status of channel 0 is 0. Set bit0 to True, and the output status of channel 0 is 1. Note: This is available only when the output mode is set to "Output preset value" or "Bitwise setting".	FALSE
Bit setting	Defines the bitwise match value for the output mode of each channel in the group. Click to switch the channel bit setting to "False" or "True". One bit represents one channel. For example, bit0 represents channel 0. If bit0 is set to True, channel 0 outputs the preset value. If bit0 is set to False, channel 0 retains the last output state. Note: This is available only when the output mode is set to "Bitwise setting".	TRUE

10.3.2.13 GL20-3200END/GL20-3200END-M

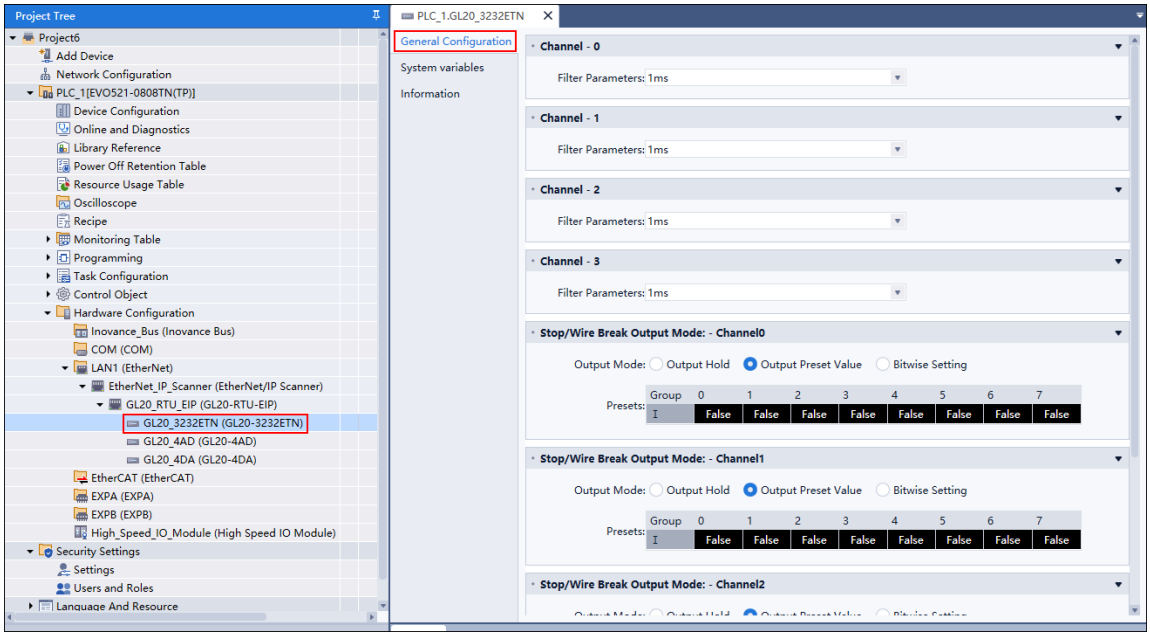
Double-click the "GL20-3200END" module, select the "General configuration" tab, and configure the channel parameters, as shown below.



Parameter	Description	Default Value
Filter parameter	Defines the debounce filter time of the channel. Options: No filter, 0.25 ms, 0.5 ms, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms.	1 ms

10.3.2.14 GL20-3232ETN-M

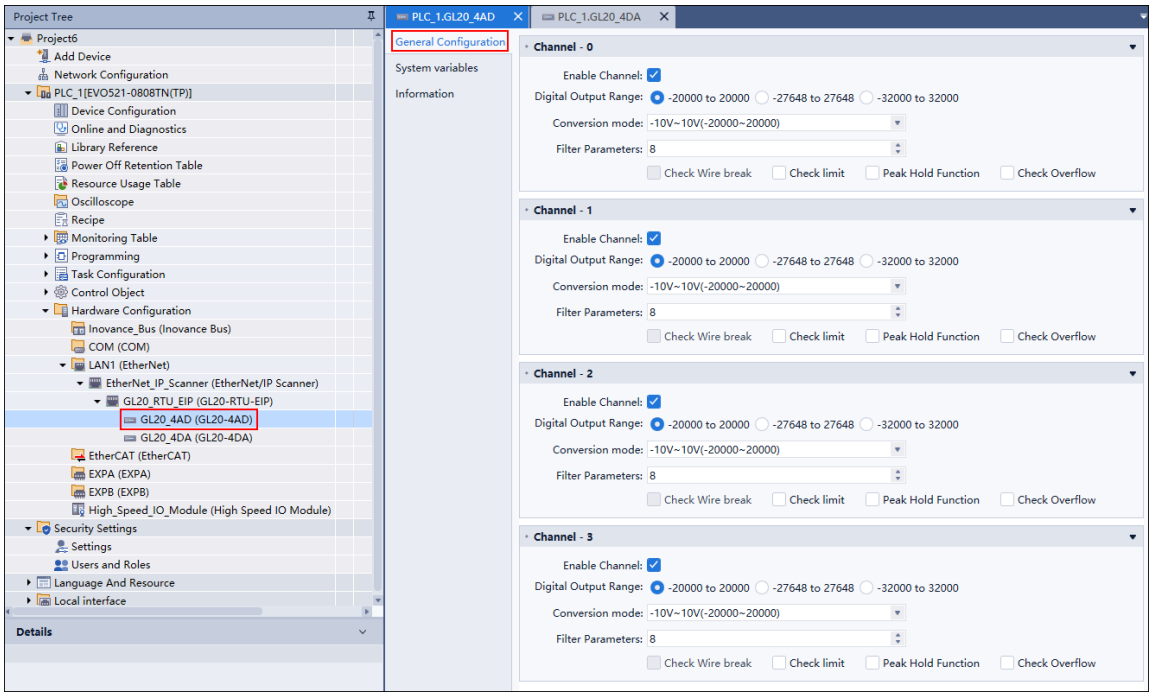
Double-click the "GL20-3232ETN" module, select the "General configuration" tab, and configure the channel parameters, as shown below.



Parameter	Description	Default Value
Filter parameter	Defines the debounce filter time of the channel. Options: No filter, 0.25 ms, 0.5 ms, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms.	1 ms
Output mode	Defines the output mode of the output channel of the module in non-OP state (when the module is stopped or the coupler is disconnected). Supported options: • Output last value: All channels in the corresponding group retain the output state before module stop or network disconnection. • Output preset value: The output mode of each channel in the group matches the corresponding preset value. The preset value is matched by bit. • Bitwise setting: The output mode of each channel in the corresponding group is matched by bit.	Output preset value
Preset value	Defines the preset value for the corresponding output mode of each channel in the group. Click to switch the channel preset value to "False" or "True". One bit represents one channel. For example, bit0 represents channel 0. Set bit0 to False, and the output status of channel 0 is 0. Set bit0 to True, and the output status of channel 0 is 1. Note: This is available only when the output mode is set to "Output preset value" or "Bitwise setting".	FALSE
Bit setting	Defines the bitwise match value for the output mode of each channel in the group. Click to switch the channel bit setting to "False" or "True". One bit represents one channel. For example, bit0 represents channel 0. If bit0 is set to True, channel 0 outputs the preset value. If bit0 is set to False, channel 0 retains the last output state. Note: This is available only when the output mode is set to "Bitwise setting".	TRUE

10.3.2.15 GL20-4AD

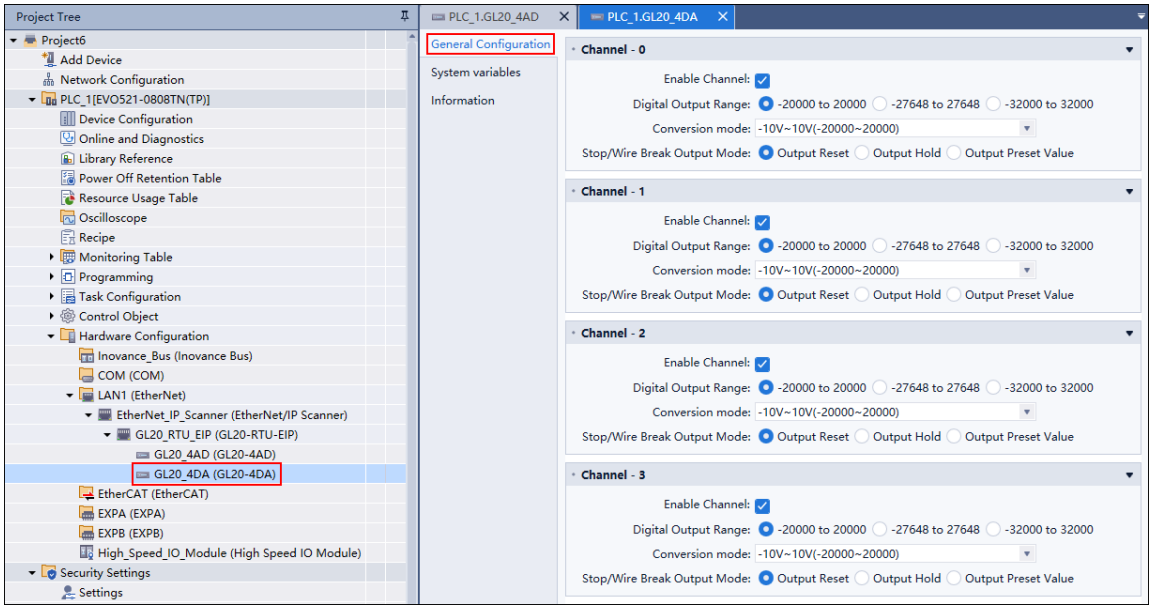
Double-click the "GL20-4AD" module, select the "General configuration" tab, and configure the channel parameters, as shown below.



Parameter	Description	Default Value
Enable	Enables or disables the corresponding channel. The module has four channels. • Enable: The channel samples data normally. • Disable: The channel does not sample data.	Four channels all enabled
Digital output range	Defines the digital range that corresponds to the physical signal range. For example, 0 V to 10 V corresponds to 0 to 20000. Supported options: • -20000 to 20000 • -27648 to 27648 • -32000 to 32000	-20000 to 20000
Conversion mode	Defines the range of output current or voltage. The above three digital output ranges are supported by any conversion mode. Supported options: • -10 V to 10 V (-20000 to 20000) • 0 V to 10 V (0 to 20000) • -5 V to 5 V (-20000 to 20000) • 0 V to 5 V (0 to 20000) • 1 V to 5 V (0 to 20000) • -20 mA to +20 mA (-20000 to +20000) • 0 mA to 20 mA (0 to 20000) • 4 mA to 20 mA (0 to 20000)	-10 V to 10 V (-20000 to 20000)
Filter parameter	Defines the channel filter parameter. The larger the filter parameter, the better the filtering effect. Range: 1 to 255.	8
Function settings	Select the diagnosis and peak hold functions for the enabled channel, including open circuit check, overlimit check, peak hold, and overflow check.	Not enabled

10.3.2.16 GL20-4DA

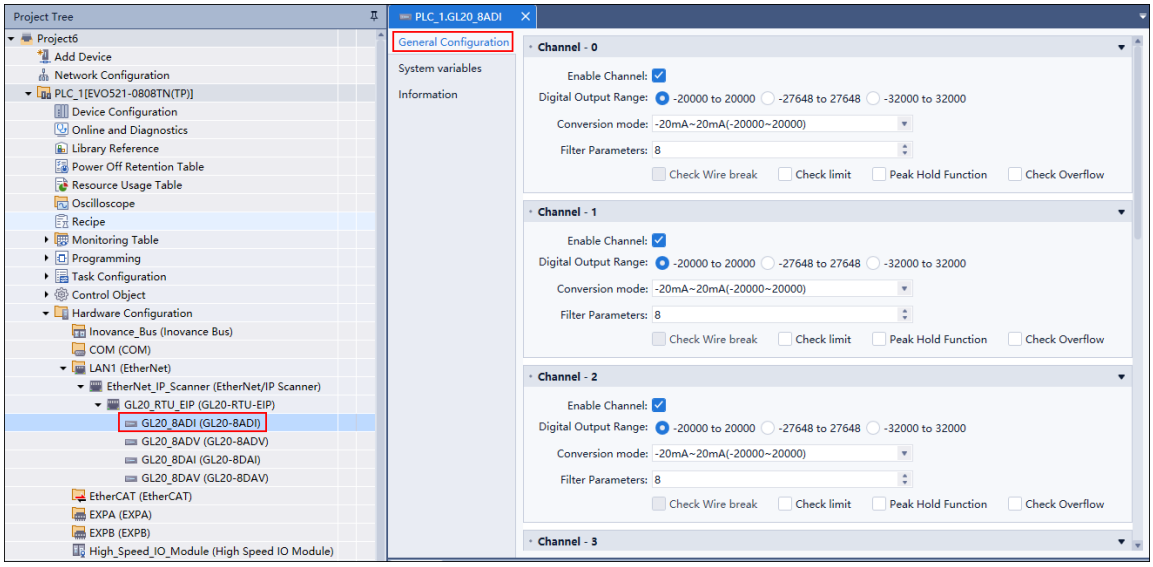
Double-click the "GL20-4DA" module, select the "General configuration" tab, and configure the channel parameters, as shown below.



Parameter	Description	Default Value
Enable	Enables or disables the corresponding channel. The module has four channels. • Enable: The channel samples data normally. • Disable: The channel does not sample data.	Four channels all enabled
Digital output range	Defines the digital range that corresponds to the physical signal range. For example, 0 V to 10 V corresponds to 0 to 20000. Supported options: • -20000 to 20000 • -27648 to 27648 • -32000 to 32000	-20000 to 20000
Conversion mode	Defines the range of output current or voltage. Supported options: • -10 V to 10 V (-20000 to 20000) • 0 V to 10 V (0 to 20000) • -5 V to 5 V (-20000 to 20000) • 0 V to 5 V (0 to 20000) • 1 V to 5 V (0 to 20000) • 0 mA to 20 mA (0 to 20000) • 4 mA to 20 mA (0 to 20000)	-10 V to 10 V (-20000 to 20000)
Output mode after stop/ disconnection	Defines the output mode of the output channel of the module in non-OP state (when the module is stopped or the coupler is disconnected). Supported options: • Output zero: After a fault occurs, the output is cleared. • Output last value: All channels in the corresponding group retain the output state before module stop or network disconnection. • Output preset value: Set the "Analog" value (-11 to 11) and "Digital" value (-22000 to 22000) as needed.	Output zero

10.3.2.17 GL20-8ADI

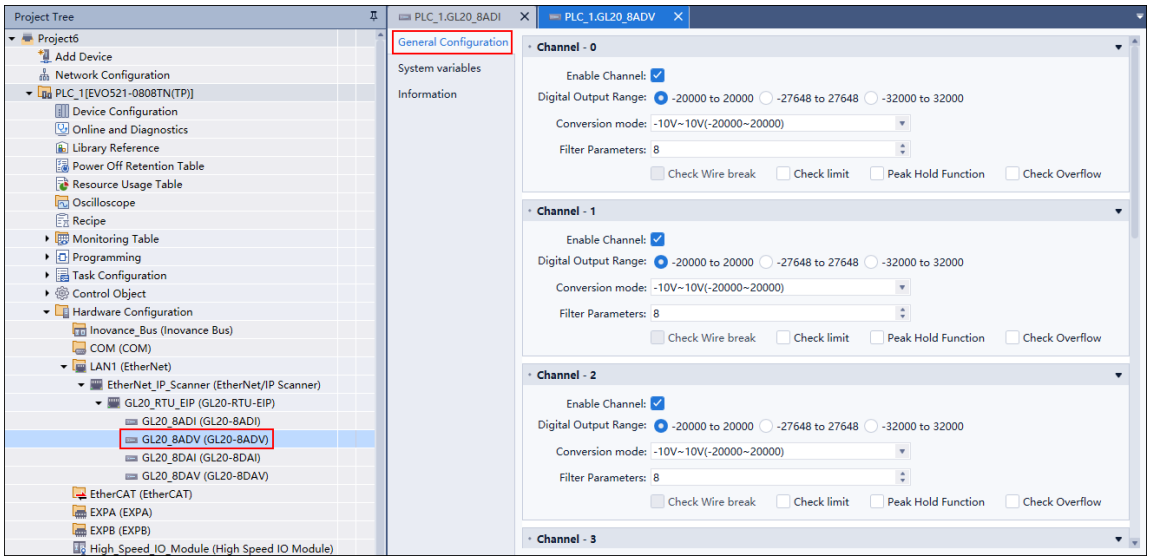
Double-click the "GL20-8ADI" module, select the "General configuration" tab, and configure the channel parameters, as shown below.



Parameter	Description	Default Value
Enable	Enables or disables the corresponding channel. The module has eight channels. • Enable: The channel samples data normally. • Disable: The channel does not sample data.	Eight channels all enabled
Digital output range	Defines the digital range that corresponds to the physical signal range. For example, 0 V to 10 V corresponds to 0 to 20000. Supported options: • -20000 to 20000 • -27648 to 27648 • -32000 to 32000	-20000 to 20000
Conversion mode	Defines the range of output current. The above three digital output ranges are supported by any conversion mode. Supported options: • -20 mA to +20 mA (-20000 to +20000) • 0 mA to 20 mA (0 to 20000) • 4 mA to 20 mA (0 to 20000)	-20 mA to +20 mA (-20000 to +20000)
Filter parameter	Defines the channel filter parameter. The larger the filter parameter, the better the filtering effect. Range: 1 to 255.	8
Function settings	Select the diagnosis and peak hold functions for the enabled channel, including open circuit check, overlimit check, peak hold, and overflow check.	Not enabled

10.3.2.18 GL20-8ADV

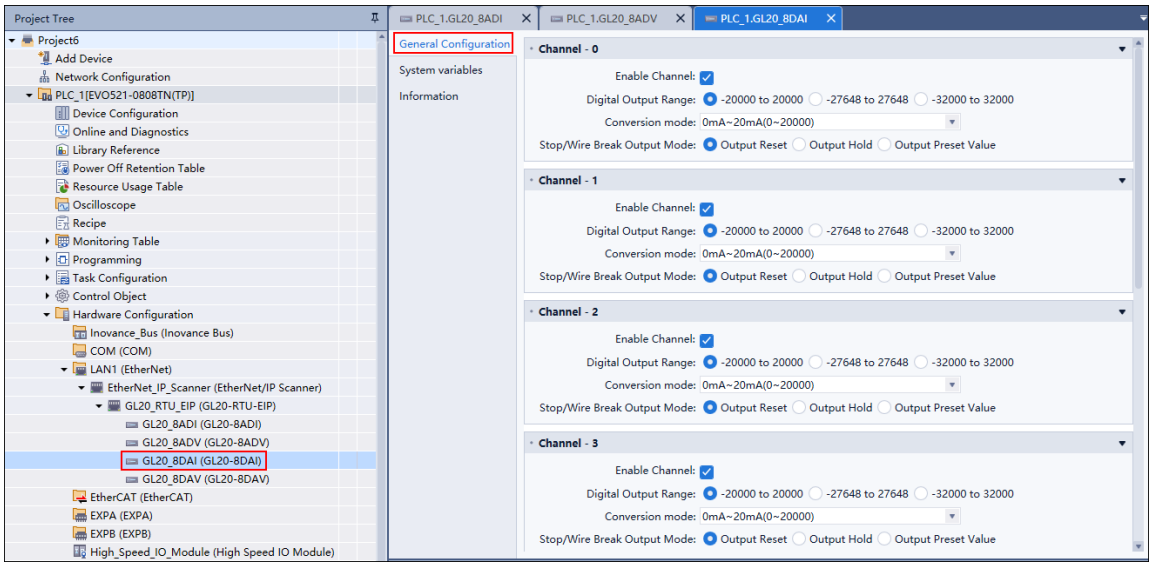
Double-click the "GL20-8ADV" module, select the "General configuration" tab, and configure the channel parameters, as shown below.



Parameter	Description	Default Value
Enable	Enables or disables the corresponding channel. The module has eight channels. • Enable: The channel samples data normally. • Disable: The channel does not sample data.	Eight channels all enabled
Digital output range	Defines the digital range that corresponds to the physical signal range. For example, 0 V to 10 V corresponds to 0 to 20000. Supported options: • -20000 to 20000 • -27648 to 27648 • -32000 to 32000	-20000 to 20000
Conversion mode	Defines the range of output voltage. The above three digital output ranges are supported by any conversion mode. Supported options: • -10 V to 10 V (-20000 to 20000) • 0 V to 10 V (0 to 20000) • -5 V to 5 V (-20000 to 20000) • 0 V to 5 V (0 to 20000) • 1 V to 5 V (0 to 20000)	-10 V to 10 V (-20000 to 20000)
Filter parameter	Defines the channel filter parameter. The larger the filter parameter, the better the filtering effect. Range: 1 to 255.	8
Function settings	Select the diagnosis and peak hold functions for the enabled channel, including open circuit check, overlimit check, peak hold, and overflow check.	Not enabled

10.3.2.19 GL20-8DAI

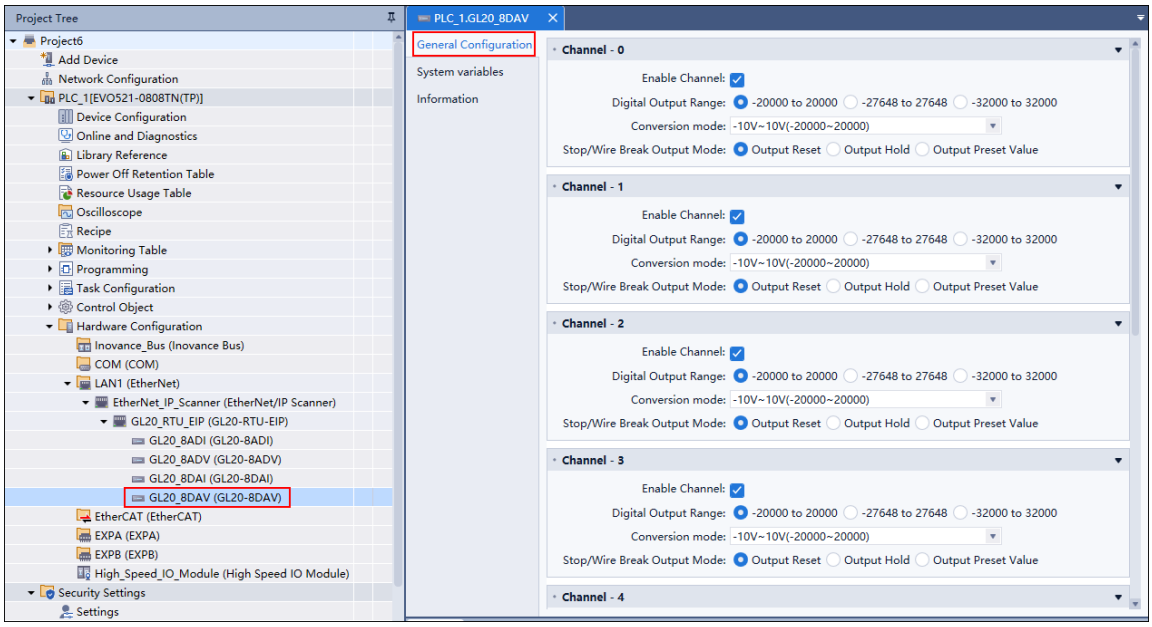
Double-click the "GL20-8DAI" module, select the "General configuration" tab, and configure the channel parameters, as shown below.



Parameter	Description	Default Value
Enable	Enables or disables the corresponding channel. The module has eight channels. • Enable: The channel samples data normally. • Disable: The channel does not sample data.	Eight channels all enabled
Digital output range	Defines the digital range that corresponds to the physical signal range. For example, 0 V to 10 V corresponds to 0 to 20000. Supported options: • -20000 to 20000 • -27648 to 27648 • -32000 to 32000	-20000 to 20000
Conversion mode	Defines the range of output current. The above three digital output ranges are supported by any conversion mode. Supported options: • 0 mA to 20 mA (0 to 20000) • 4 mA to 20 mA (0 to 20000)	0 mA to 20 mA (0 to 20000)
Output mode after stop/ disconnection	Defines the output mode of the output channel of the module in non-OP state (when the module is stopped or the coupler is disconnected). Supported options: • Output zero: After a fault occurs, the output is cleared. • Output last value: All channels in the corresponding group retain the output state before module stop or network disconnection. • Output preset value: Set the "Analog" value (-11 to 11) and "Digital" value (-22000 to 22000) as needed.	Output zero

10.3.2.20 GL20-8DAV

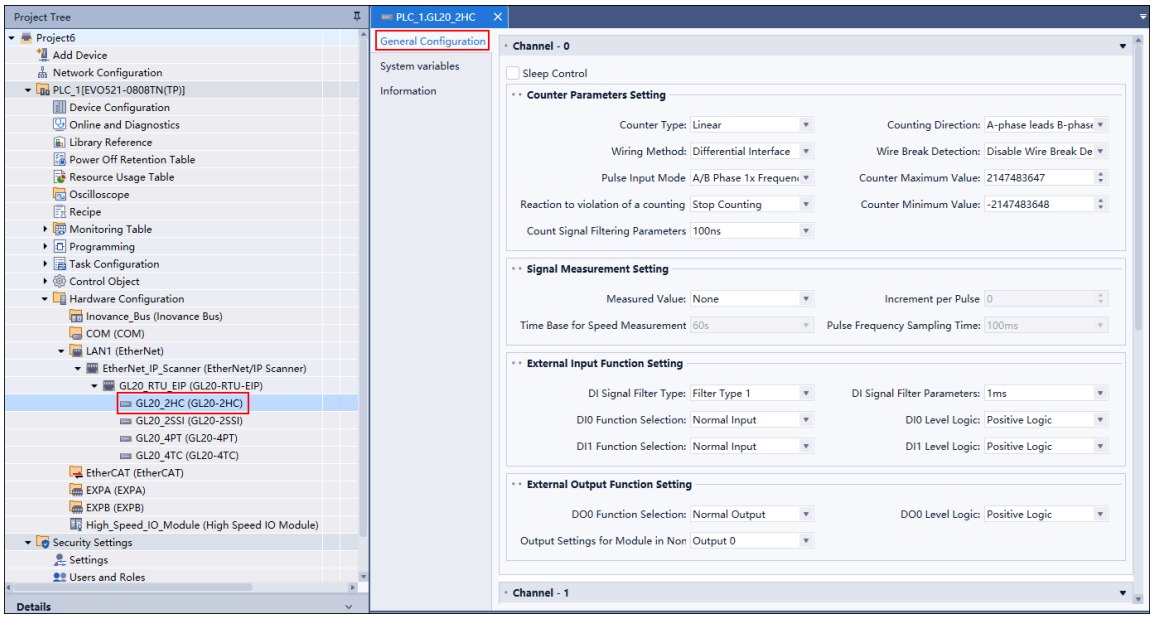
Double-click the "GL20-8DAV" module, select the "General configuration" tab, and configure the channel parameters, as shown below.



Parameter	Description	Default Value
Enable	Enables or disables the corresponding channel. The module has eight channels. • Enable: The channel samples data normally. • Disable: The channel does not sample data.	Eight channels all enabled
Digital output range	Defines the digital range that corresponds to the physical signal range. For example, 0 V to 10 V corresponds to 0 to 20000. Supported options: • -20000 to 20000 • -27648 to 27648 • -32000 to 32000	-20000 to 20000
Conversion mode	Defines the range of output voltage. The above three digital output ranges are supported by any conversion mode. Supported options: • -10 V to 10 V (-20000 to 20000) • 0 V to 10 V (0 to 20000) • -5 V to 5 V (-20000 to 20000) • 0 V to 5 V (0 to 20000) • 1 V to 5 V (0 to 20000)	-10 V to 10 V (-20000 to 20000)
Output mode after stop/ disconnection	Defines the output mode of the output channel of the module in non-OP state (when the module is stopped or the coupler is disconnected). Supported options: • Output zero: After a fault occurs, the output is cleared. • Output last value: All channels in the corresponding group retain the output state before module stop or network disconnection. • Output preset value: Set the "Analog" value (-11 to 11) and "Digital" value (-22000 to 22000) as needed.	Output zero

10.3.2.21 GL20-2HC

Double-click the "GL20-2HC" module, select the "General configuration" tab, and configure the channel parameters, as shown below.



Parameter	Description	Default Value
Sleep control	Enables or disables the sleep control function of the channel. When enabled, the power consumption and heat dissipation of the module can be effectively reduced, but all functions of the entire channel will be disabled.	Disabled

Parameter		Description	Default Value
Counter parameter setting	Counter type	Each channel supports a 32-bit counting range, which can be changed by setting the maximum and minimum values. • Linear type: Count between the maximum and minimum values. If the maximum or minimum value is reached, operations can be performed according to the setting for the scenario when the maximum or minimum value is exceeded. • Ring type: Count between the maximum and minimum values. When the count-up exceeds the maximum, the value skips to the minimum. When the count-down exceeds the minimum, the value skips to the maximum.	Linear
	Counting direction	This parameter sets the counting direction. Options: • Phase A leads Phase B (forward) • Phase A leads Phase B (reverse)	Phase A leads Phase B (forward)
	Wiring mode	Select the wiring mode according to actual conditions. Options: • Differential interface • Single-ended interface	Differential interface
	Disconnection detection	This function only supports detection of differential interface disconnection. Options: • Disable breakage detection • Enable breakage detection	Disable breakage detection
	Pulse input mode	Defines the input mode based on the actual counter input signal. • Phase A/B (frequency multiplication by 1/2/4): An incremental encoder that supports phase A/B signal can be connected. The phase difference between phase A signal and phase B signal must be 90°. • Pulse + direction: An incremental encoder that supports pulse and direction signals can be connected. • CW/CCW: An incremental encoder that supports CW/CCW signals can be connected. • Single-phase counting (A): A pulse encoder without direction signal can be connected. • Single-phase counting (B): A pulse encoder without direction signal can be connected.	Phase A/B single frequency

Parameter		Description	Default Value
Counter parameter setting	Action upon exceeding count limit	This parameter is related to the configuration of the parameter "Counter type". • Linear type: If "Stop counting" is selected, the counter stops and triggers an overflow alarm upon reaching the maximum or minimum count value; the counter must be re-enabled to resume counting. If "Continue counting" is selected, the forward count value jumps to the minimum when exceeding the maximum, and the reverse count value jumps to the maximum when falling below the minimum. • Ring type: Invalid parameter	Stop counting
	Counting signal filter parameter	This parameter is used to effectively suppress interference between phase A and phase B of the counter input. Signals whose holding time is shorter than the set time are suppressed. The filter parameter must be between 40% and 60% of the active signal. The filter parameter must meet the condition that the active input signal holding time is longer than the filter time. The larger the parameter, the stronger the anti-interference capability. Options: 50 ns, 100 ns, 200 ns, 500 ns, 1 μs, 2 μs, 5 μs, 10 μs, 20 μs, 50 μs, 100 μs, 200 μs, 500 μs, 1 ms, 2 ms, 5 ms, 10 ms, 20 ms, 50 ms, 100 ms.	100 ns
	Counter maximum value	The maximum value of the counter can limit the counting range. You must enter a value larger than the minimum value of the counter. Range: -2147483647 to +2147483647.	2147483647
	Counter minimum value	The minimum value of the counter can limit the counting range. You must enter a value smaller than the maximum value of the counter. Range: -2147483648 to +2147483646	-2147483648

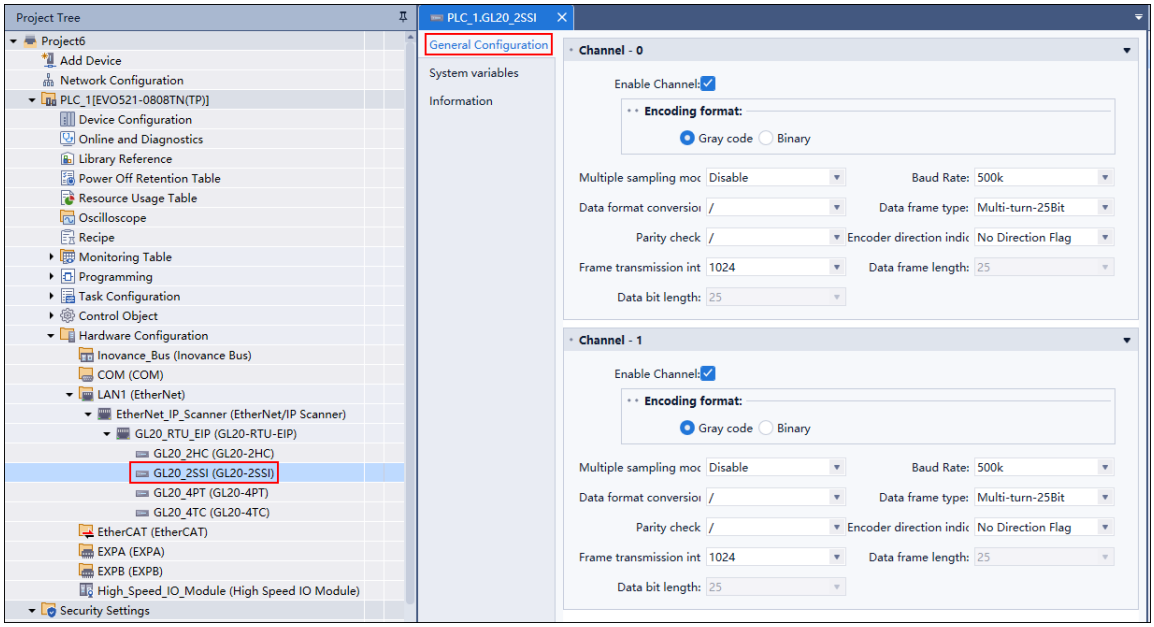
Parameter		Description	Default Value
Signal measure-ment setting	Measured value	The maximum frequency of the external input signal is affected by the wiring method. When the differential interface is used, the maximum input frequency is 4 MHz. When the single-ended interface is used, the maximum input frequency is 500 kHz. • Not measured: The signal measurement function and other related configuration parameters are invalid. • Frequency: Frequency of the counter input signal in the unit of Hz • Cycle: Cycle of the counter input signal in the unit of ms • Speed: Speed of the counter input signal. The unit depends on the time base of the speed measurement.	Not measuring
	Unit pulse increment	This parameter is related to the parameter "Measured value". Value range: 0 to 65535 • Speed: Number of pulses output per revolution. • Not measured, frequency, and cycle: This parameter is invalid.	0
	Time base for speed measurement	This parameter is related to the parameter "Measured value". Options: 1 ms, 10 ms, 100 ms, 1s, and 60s. • Speed: This parameter determines the unit of speed, which is r/min by default. • Not measured, frequency, and cycle: This parameter is invalid.	60s
	Pulse frequency sampling time	The sampling time selected must meet the condition that the cycle of the input signal is smaller than the sampling time. The larger the parameter, the more stable and accurate the measured value. • Not measured: This parameter is invalid. • Frequency, cycle, and speed: The signal frequency is used to measure the cycle and speed. This parameter is strongly related to the frequency calculation. Count the number of input pulse signals within the set time and calculate the signal frequency. Select appropriate values when using the parameter. The sampling time must meet the condition that the input signal cycle is smaller than the sampling time. The larger the parameter, the more accurate the measured value. Options: 500 us, 1 ms, 2 ms, 5 ms, 10 ms, 20 ms, 50 ms, 100 ms, 200 ms, 500 ms, 1s, 2s, 5s, 10s, 20s, 25s.	100 ms

Parameter		Description	Default Value
External input function setting	DI signal filter type	Defines the DI signal filter type. This is set through the DI signal filter parameter to effectively suppress the interference at the input. Signals whose holding time is shorter than the set time are suppressed. Options: • No filter • Filter type 1 • Filter type 2	Filter type 1
	DI signal filter	This parameter is related to the "DI signal filter type" configuration. The DI signal filter parameter must be between 40% and 60% of the active signal. The filter parameter must meet the condition that the active input signal holding time is longer than the filter time. The larger the parameter, the stronger the anti-interference capability. • No filter: This parameter is invalid. • Filter type 1/2: 100 ns, 500 ns, 1 μs, 100 μs, 250 μs, 500 μs, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms.	1 ms
	DI0 function selection	When used as a normal DI, the DI terminal must be configured as standard input. Options: • Common input • Probe function • Reset to 0 • Preset • Gating	Common input
	DI0 level logic	This parameter defines the level logic of the DI0 signal. Options: • Positive logic • Negative logic	Positive logic
	DI1 function selection	When used as a normal DI, the DI terminal must be configured as standard input. Options: • Common input • Probe function • Reset to 0 • Preset • Gating	Common input
	DI1 level logic	This parameter defines the level logic of the DI1 signal. Options: • Positive logic • Negative logic	Positive logic

Parameter		Description	Default Value
External output function setting	DO0 function selection	When used as a normal DO, the DI terminal must be configured as standard input. Options: • Common output • Comparison output	Common output
	DO0 level logic	This parameter defines the level logic of the DO0 signal. Options: • Positive logic • Negative logic	Positive logic
	Output setting when the module is not running	This parameter sets the output state of DO0 when the module is in a non-operating state. Options: • Output 0 • Output 1 • Retain	Output 0

10.3.2.22 GL20-2SSI

Double-click the "GL20-2SSI" module, select the "General configuration" tab, and configure the channel parameters, as shown below.

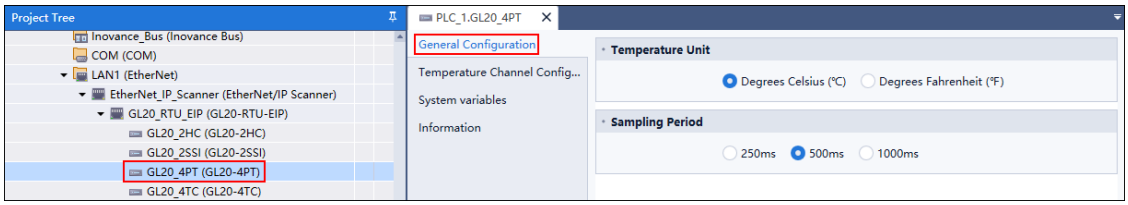


Parameter	Description	Default Value
Enable	Enables or disables the corresponding channel. The module has two channels. • Enable: The channel samples data normally. • Disable: The channel does not sample data.	Two channels all enabled
Encoding format	Select the code mode according to encoder type. Options: • Gray code • Binary	Gray code

Parameter	Description	Default Value
Multiple sampling mode	It determines the validity of the encoder position value and sends a fault code to the host if it is invalid. Options: • Disable • Enable	Disable
Data format conversion	When the coding format is Gray code or binary, if the data needs to be uploaded in another format, this parameter must be configured. Options: • N/A • Gray code -> Binary code (available when the encoding format is "Gray code") • Binary code -> Gray code (available when the encoding format is "Binary code")	N/A
Parity check	If the assigned parity check is for a 25-bit encoder, 26 bits can be read from the encoder. The bit after the least significant bit will be judged as the parity bit, and parity errors will be sent to the host in the form of a fault code. Options: • N/A • Odd check • Even check	N/A
Frame transmission interval	Set the interval according to the encoder specifications. If you need to increase the response speed of the encoder, you can adjust this parameter according to the performance of the encoder. This parameter is strongly related to the encoder performance. Options: 16/32/48/64/512/1024	1024
Data bit length	This parameter can be set only when "Data frame type" is set to "Variable". Range: 0 to 32.	-
Baud rate	The baud rate affects the accuracy of the encoder as well as the rate of position updates. You can adjust it according to the actual transmission rate and performance of the encoder. This parameter is strongly related to the encoder performance. Options: 100k/200k/300k/400k/500k/1000k/1250k/1500k/2000k	500k
Data frame type	It is recommended to select "Variable" when there are status bits in the encoder bits. This parameter should be used in combination with "DataBit Size" and "Frame Size". Options: • SingleTurn-13Bit • MultiTurn-25Bit • Variable	MultiTurn-25Bit
Encoder direction flag	The invert function can adjust the motion direction of the absolute encoder to the direction of the motion axis. Options: • No invert sign • Invert sign	No invert sign
Data frame length	This parameter can be set only when "Data frame type" is set to "Variable". Range: 0 to 32.	-

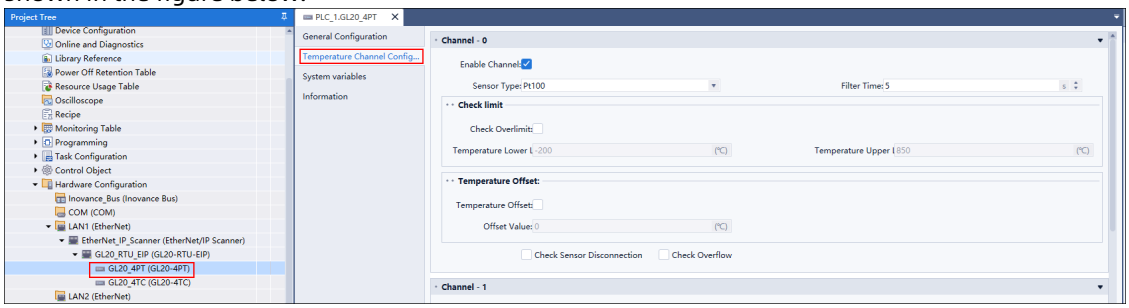
10.3.2.23 GL20-4PT

1. Double-click the "GL20-4PT" module, select the "General configuration" tab, and configure the "Temperature unit" and "Sampling cycle", as shown in the figure below.



Parameter	Description	Default Value
Temperature Unit	Defines the unit of temperature data collected by the module. Supported temperature units: • Centigrade degree (℃) • Fahrenheit degree (℉)	Centigrade degree (℃)
Sampling Time	Defines the sampling and polling time of temperature data for the 4-channel module. Supported sampling cycles: • 250 ms • 500 ms • 1000 ms	500 ms

2. Select the "Temperature channel configuration" tab and configure the channel parameters, as shown in the figure below.

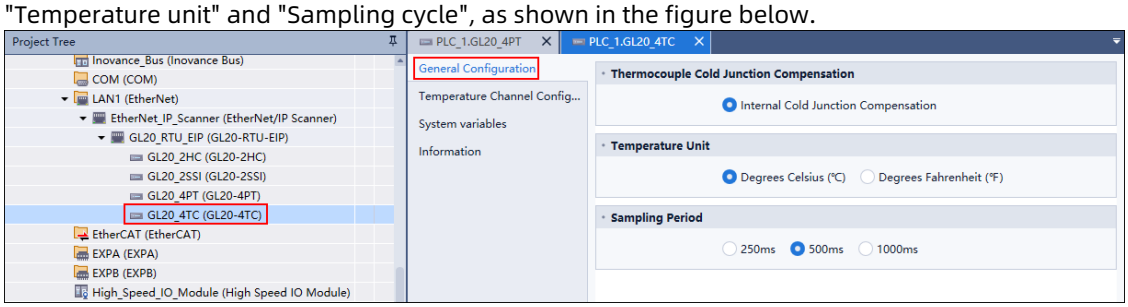


Parameter	Description	Default Value
Enable	Enables or disables the corresponding channel. The module has four channels. • Enable: The channel samples data normally. • Disable: The channel does not sample data.	Four channels all enabled
Sensor type	Defines the type of sensor connected to the module channel. Supported types: • Pt100 • Pt500 • Pt1000 • Cu100 • KTY84 • NTC5K • NTC10K	Pt100
Filter time	Defines the analog channel sampling filter time of the module. Unit: s. Range: 0 to 100.	5s
Check for overlimit	Enables or disables channel temperature overrun detection.	Disable
Temperature lower limit	Defines the lower limit of the channel temperature data. Range: -200℃ to +850℃.	-200℃
Temperature upper limit	Defines the upper limit of the channel temperature data. Range: -200℃ to +850℃.	850℃
Temperature offset	Enables or disables channel temperature offset detection.	Disable

Parameter	Description	Default Value
Offset value	Defines the offset of channel temperature data. Range: -204.8°C to +204.7°C.	0°C
Check sensor for disconnection	Enables or disables channel disconnection detection.	Disable
Check for overflow	Enables or disables channel data overflow detection.	Disable

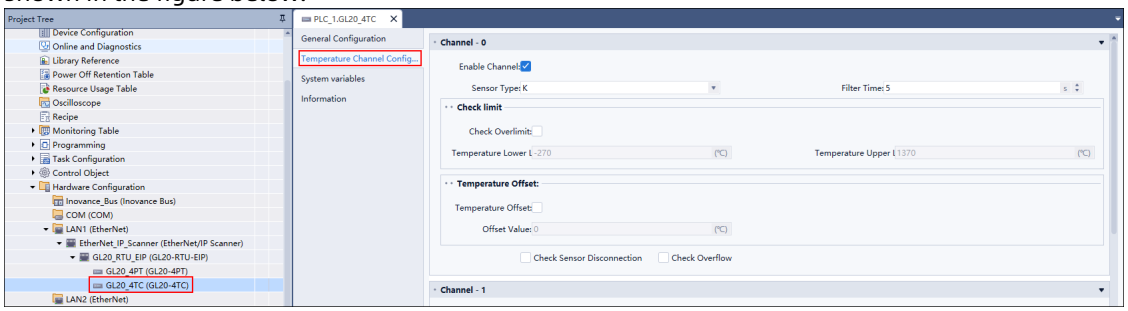
10.3.2.24 GL20-4TC

1. Double-click the "GL20-4TC" module, select the "General configuration" tab, and configure the "Temperature unit" and "Sampling cycle", as shown in the figure below.



Parameter	Description	Default Value
Temperature Unit	Defines the unit of temperature data collected by the module. Supported temperature units: • Centigrade degree (°C) • Fahrenheit degree (°F)	Centigrade degree (°C)
Sampling Time	Defines the sampling and polling time of temperature data for the 4-channel module. Supported sampling cycles: • 250 ms • 500 ms • 1000 ms	500 ms

2. Select the "Temperature channel configuration" tab and configure the channel parameters, as shown in the figure below.



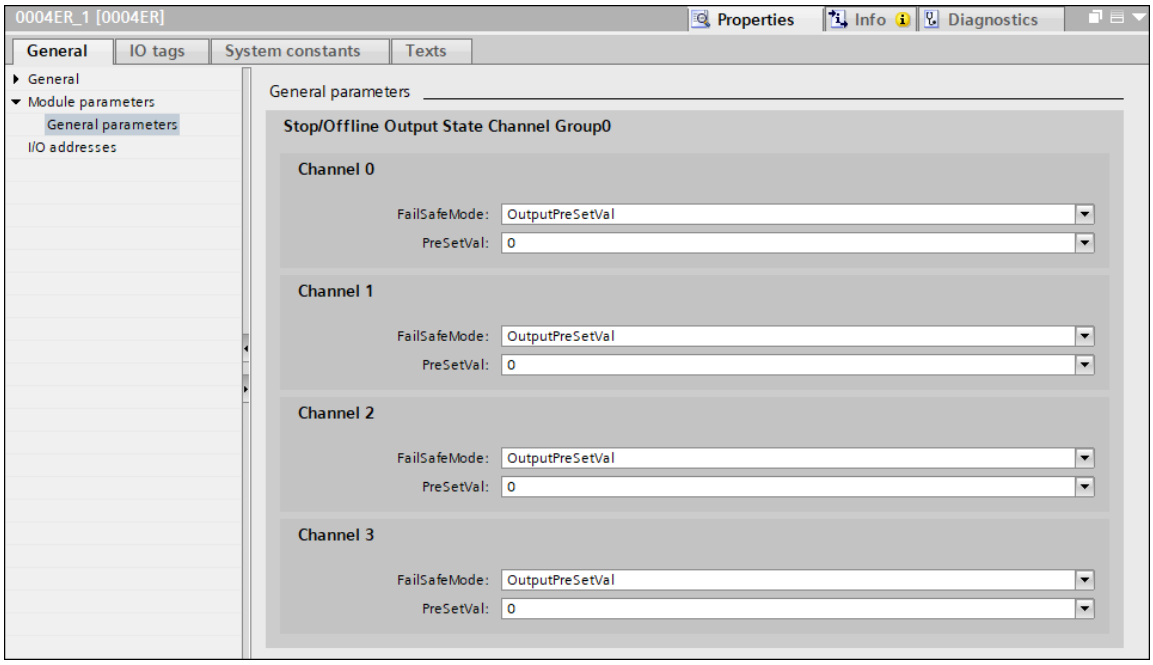
Parameter	Description	Default Value
Enable	Enables or disables the corresponding channel. The module has four channels. • Enable: The channel samples data normally. • Disable: The channel does not sample data.	Four channels all enabled
Sensor type	Select the type of external sensor connected to the module channel. Options: K, J, E, B, N, R, S, and T.	K

Parameter	Description	Default Value
Filter time	Defines the analog channel sampling filter time of the module. Unit: s. Range: 0 to 100.	5s
Check for overlimit	Enables or disables channel temperature overrun detection.	Disable
Temperature lower limit	Defines the lower limit of the channel temperature data. Range: -270°C to +1370°C.	-270°C
Temperature upper limit	Defines the upper limit of the channel temperature data. Range: -270°C to +1370°C.	1370°C
Temperature offset	Enables or disables channel temperature offset detection.	Disable
Offset value	Defines the offset of channel temperature data. Range: -204.8°C to +204.7°C.	0°C
Check sensor for disconnection	Enables or disables channel disconnection detection.	Disable
Check for overflow	Enables or disables channel data overflow detection.	Disable

10.3.3 GL20-RTU-PN

10.3.3.1 GL20-0004ER

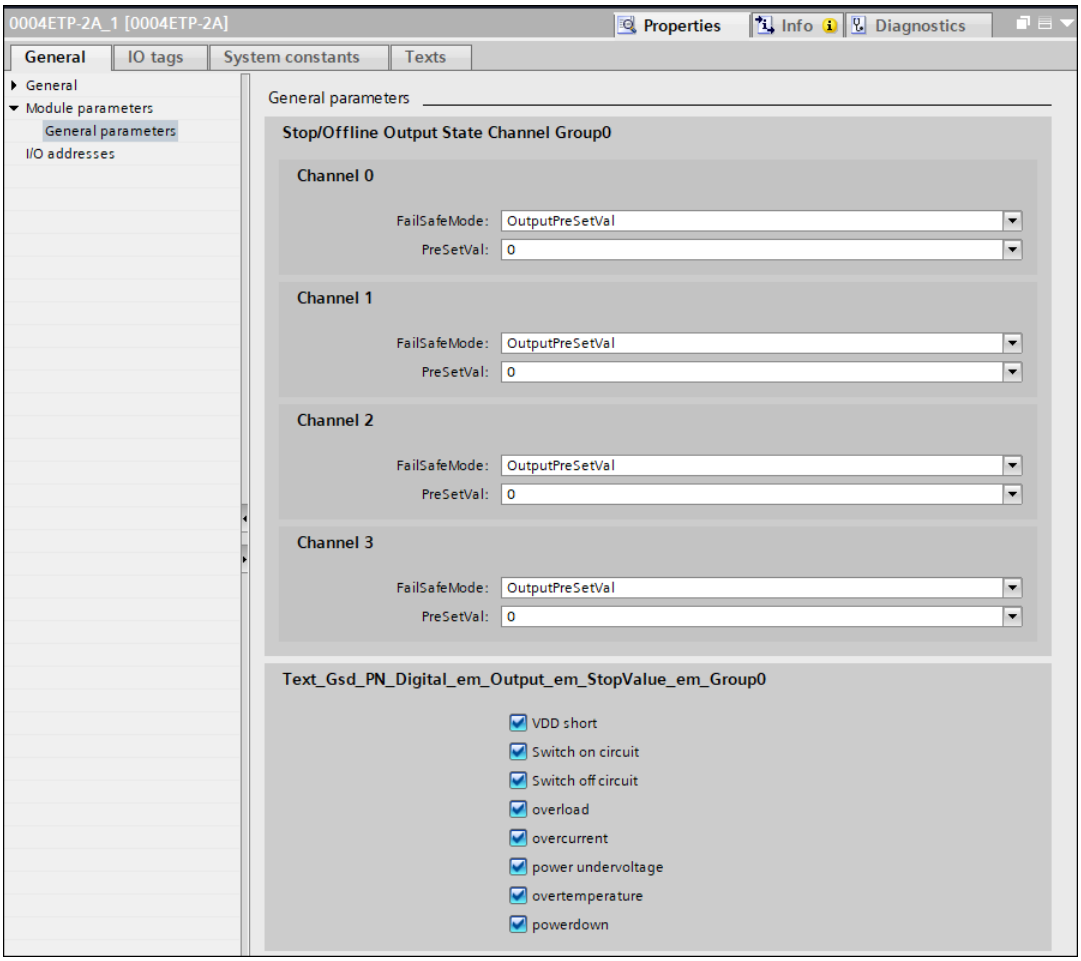
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Then, click the expansion module to be configured in the network view. Select "Properties > General > Module parameters" to configure the corresponding module parameters, as shown in the figure below.



Parameter	Description	Default Value
FailSafeMode	Defines the output mode of the output channel of the module in non-OP state (when the module is stopped or the coupler is disconnected). Supported options: • OutputHold: Keep present output status • OutputPreSetVal: Output according to preset value, used in combination with the "PreSetVal" parameter.	Output preset value
PreSetVal	Defines the preset value upon stop/disconnection. Set to "0" or "1" as needed.	0

10.3.3.2 GL20-0004ETP-2A

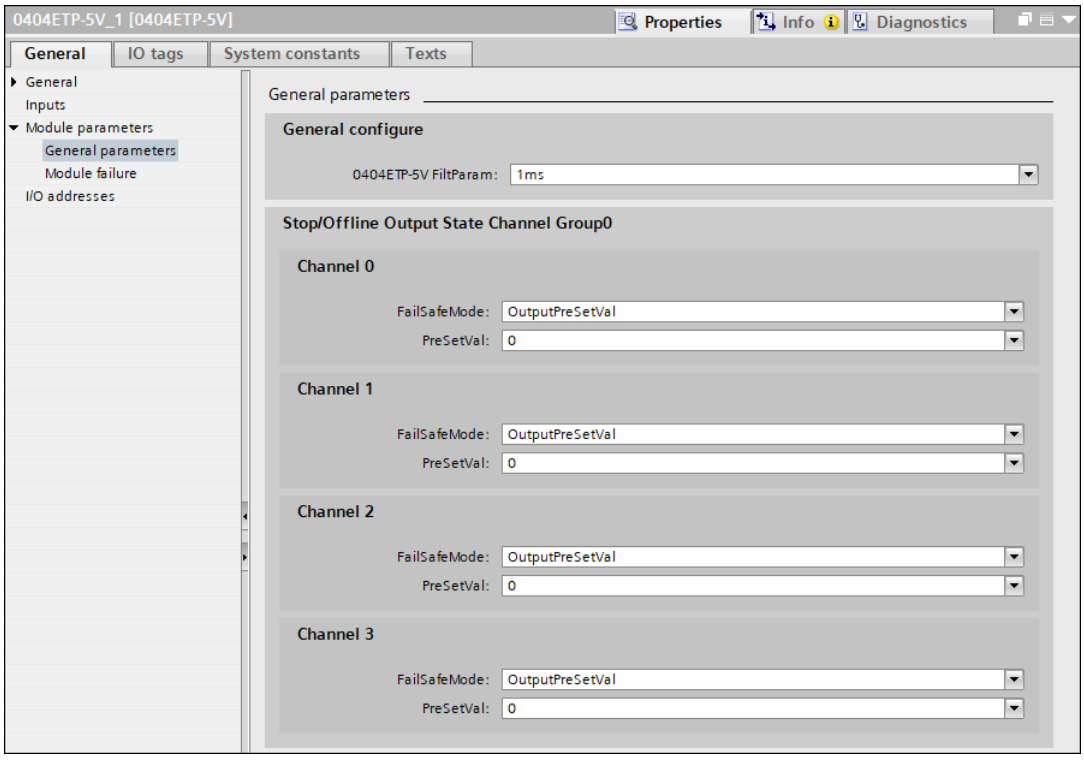
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Then, click the expansion module to be configured in the network view. Select "Properties > General > Module parameters" to configure the corresponding module parameters, as shown in the figure below.



Parameter	Description	Default Value
FailSafeMode	Defines the output mode of the output channel of the module in non-OP state (when the module is stopped or the coupler is disconnected). Supported options: • OutputHold: Keep present output status • OutputPreSetVal: Output according to preset value, used in combination with the "PreSetVal" parameter.	Output preset value
PreSetVal	Defines the preset value upon stop/disconnection. Set to "0" or "1" as needed.	0
Fault output enable	Defines the fault output diagnosis functions of the enabled channel, including VDD short, switch on circuit, switch off circuit, overload, overcurrent, power undervoltage, overtemperature, and power-down.	All enabled

10.3.3.3 GL20-0404ETP-5V

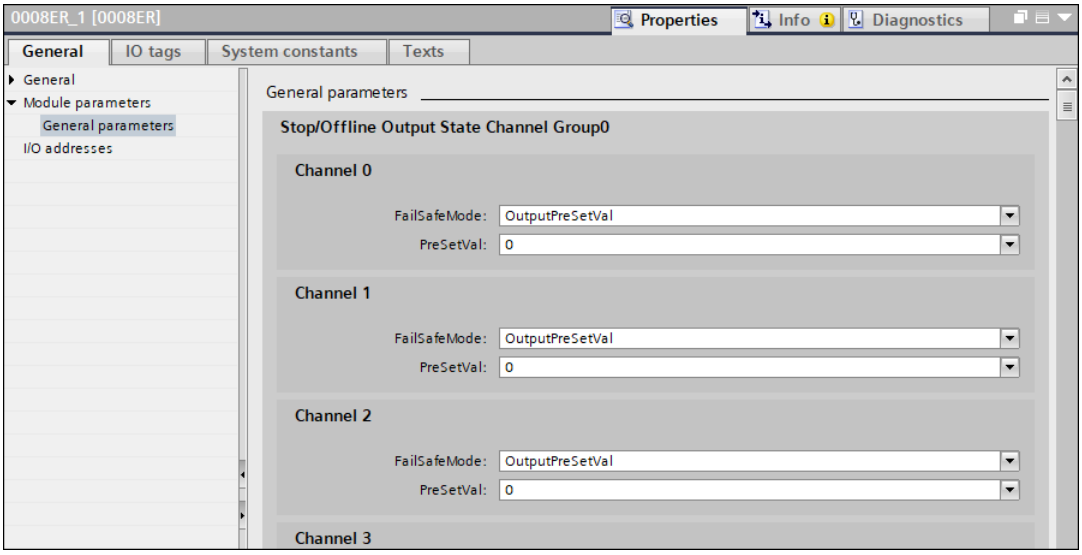
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Then, click the expansion module to be configured in the network view. Select "Properties > General > Module parameters" to configure the corresponding module parameters, as shown in the figure below.



Parameter	Description	Default Value
Filter parameter	Defines the debounce filter time of the channel. Options: No filter, 0.25 ms, 0.5 ms, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms.	1 ms
FailSafeMode	Defines the output mode of the output channel of the module in non-OP state (when the module is stopped or the coupler is disconnected). Supported options: • OutputHold: Keep present output status • OutputPreSetVal: Output according to preset value, used in combination with the "PreSetVal" parameter.	Output preset value
PreSetVal	Defines the preset value upon stop/disconnection. Set to "0" or "1" as needed.	0

10.3.3.4 GL20-0008ER

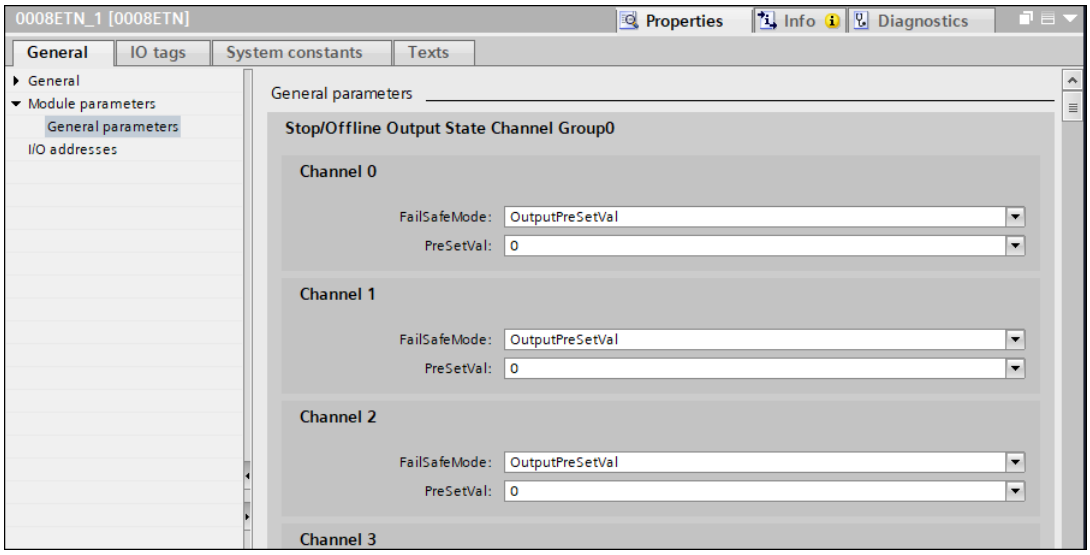
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Then, click the expansion module to be configured in the network view. Select "Properties > General > Module parameters" to configure the corresponding module parameters, as shown in the figure below.



Parameter	Description	Default Value
FailSafeMode	Defines the output mode of the output channel of the module in non-OP state (when the module is stopped or the coupler is disconnected). Supported options: • OutputHold: Keep present output status • OutputPreSetVal: Output according to preset value, used in combination with the "PreSetVal" parameter.	Output preset value
PreSetVal	Defines the preset value upon stop/disconnection. Set to "0" or "1" as needed.	0

10.3.3.5 GL20-0008ETN

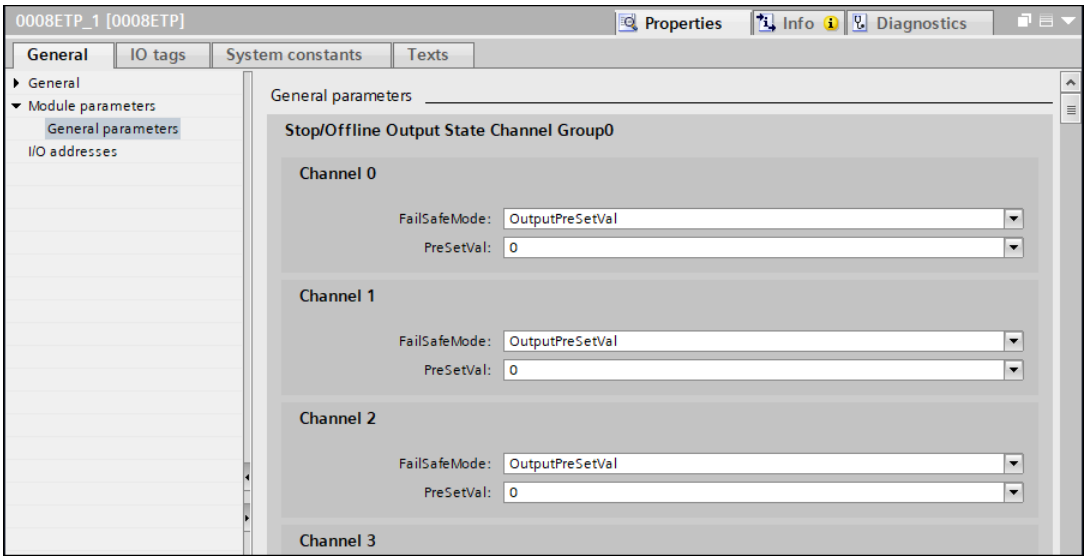
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Then, click the expansion module to be configured in the network view. Select "Properties > General > Module parameters" to configure the corresponding module parameters, as shown in the figure below.



Parameter	Description	Default Value
FailSafeMode	Defines the output mode of the output channel of the module in non-OP state (when the module is stopped or the coupler is disconnected). Supported options: • OutputHold: Keep present output status • OutputPreSetVal: Output according to preset value, used in combination with the "PreSetVal" parameter.	Output preset value
PreSetVal	Defines the preset value upon stop/disconnection. Set to "0" or "1" as needed.	0

10.3.3.6 GL20-0008ETP

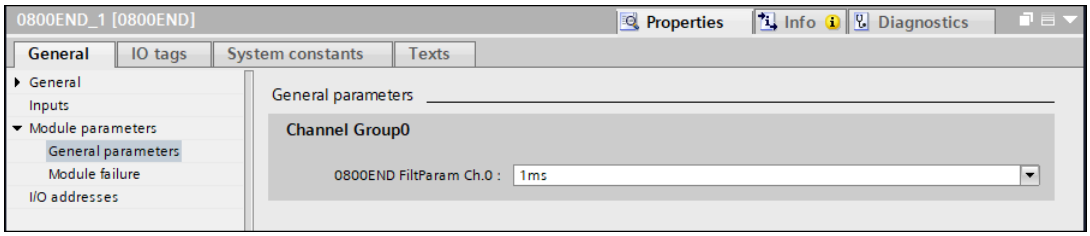
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Then, click the expansion module to be configured in the network view. Select "Properties > General > Module parameters" to configure the corresponding module parameters, as shown in the figure below.



Parameter	Description	Default Value
FailSafeMode	Defines the output mode of the output channel of the module in non-OP state (when the module is stopped or the coupler is disconnected). Supported options: • OutputHold: Keep present output status • OutputPreSetVal: Output according to preset value, used in combination with the "PreSetVal" parameter.	Output preset value
PreSetVal	Defines the preset value upon stop/disconnection. Set to "0" or "1" as needed.	0

10.3.3.7 GL20-0800END

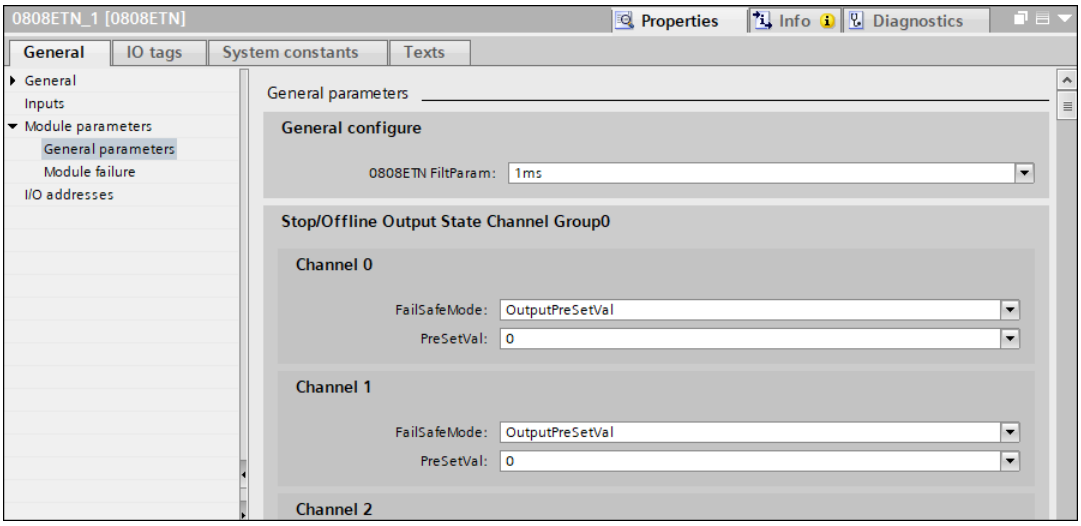
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Then, click the expansion module to be configured in the network view. Select "Properties > General > Module parameters" to configure the corresponding module parameters, as shown in the figure below.



Parameter	Description	Default Value
Filter parameter	Defines the debounce filter time of the channel. Options: No filter, 0.25 ms, 0.5 ms, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms.	1 ms

10.3.3.8 GL20-0808ETN

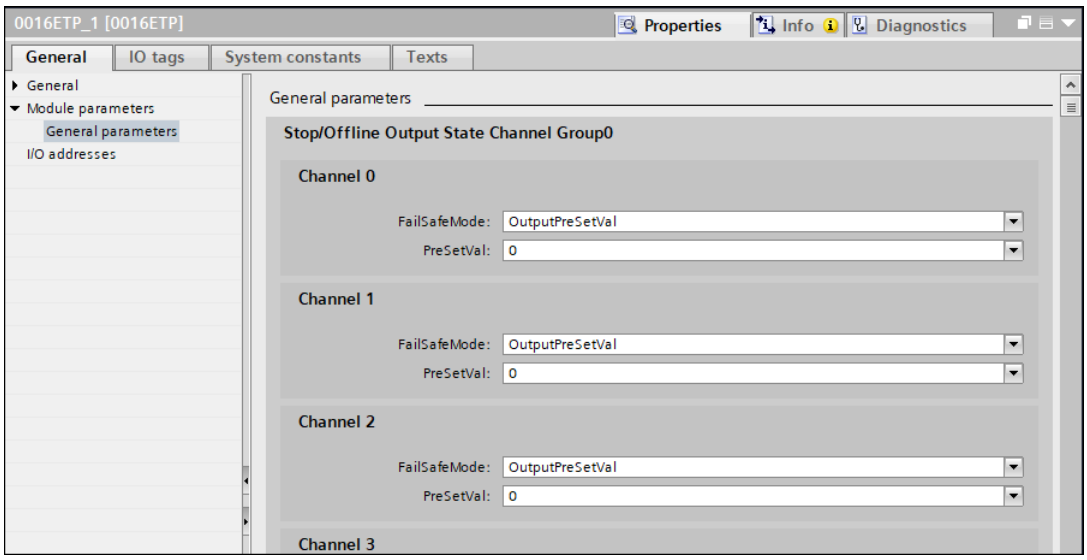
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Then, click the expansion module to be configured in the network view. Select "Properties > General > Module parameters" to configure the corresponding module parameters, as shown in the figure below.



Parameter	Description	Default Value
Filter parameter	Defines the debounce filter time of the channel. Options: No filter, 0.25 ms, 0.5 ms, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms.	1 ms
FailSafeMode	Defines the output mode of the output channel of the module in non-OP state (when the module is stopped or the coupler is disconnected). Supported options: • OutputHold: Keep present output status • OutputPreSetVal: Output according to preset value, used in combination with the "PreSetVal" parameter.	Output preset value
PreSetVal	Defines the preset value upon stop/disconnection. Set to "0" or "1" as needed.	0

10.3.3.9 GL20-0016ETP

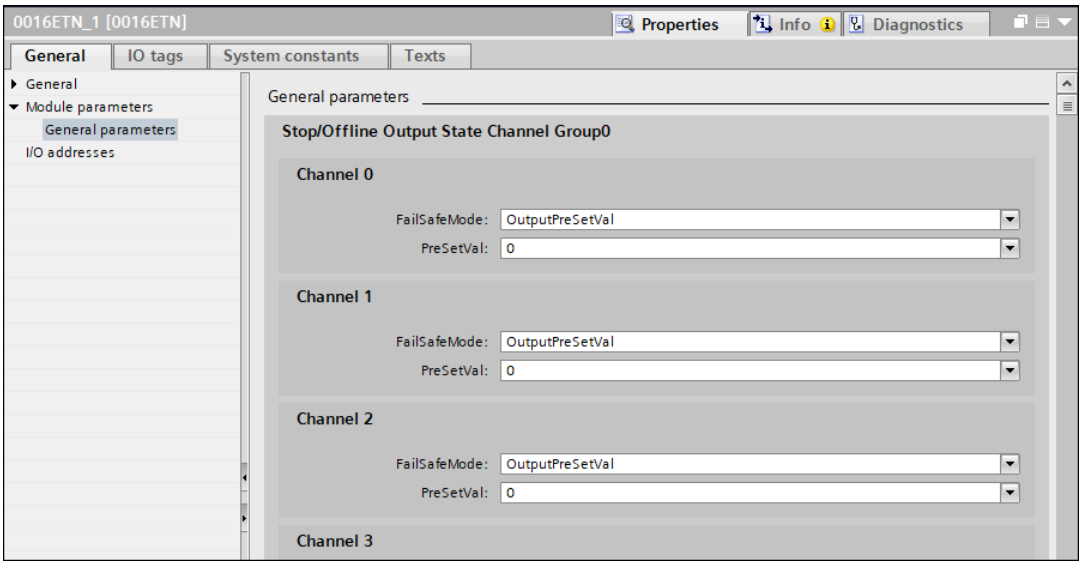
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Then, click the expansion module to be configured in the network view. Select "Properties > General > Module parameters" to configure the corresponding module parameters, as shown in the figure below.



Parameter	Description	Default Value
FailSafeMode	Defines the output mode of the output channel of the module in non-OP state (when the module is stopped or the coupler is disconnected). Supported options: • OutputHold: Keep present output status • OutputPreSetVal: Output according to preset value, used in combination with the "PreSetVal" parameter.	Output preset value
PreSetVal	Defines the preset value upon stop/disconnection. Set to "0" or "1" as needed.	0

10.3.3.10 GL20-0016ETN

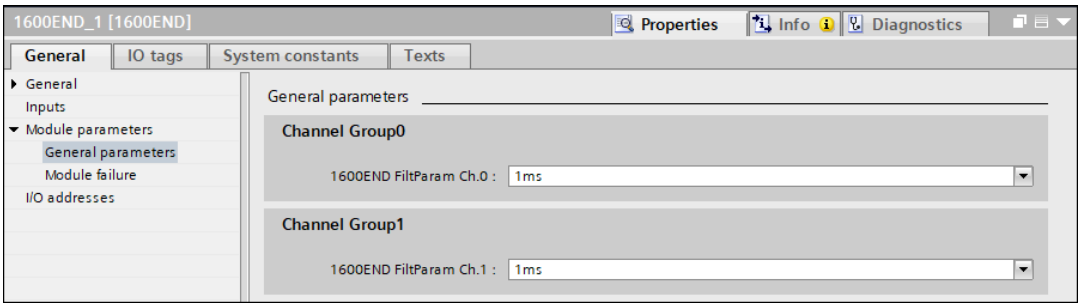
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Then, click the expansion module to be configured in the network view. Select "Properties > General > Module parameters" to configure the corresponding module parameters, as shown in the figure below.



Parameter	Description	Default Value
FailSafeMode	Defines the output mode of the output channel of the module in non-OP state (when the module is stopped or the coupler is disconnected). Supported options: • OutputHold: Keep present output status • OutputPreSetVal: Output according to preset value, used in combination with the "PreSetVal" parameter.	Output preset value
PreSetVal	Defines the preset value upon stop/disconnection. Set to "0" or "1" as needed.	0

10.3.3.11 GL20-1600END

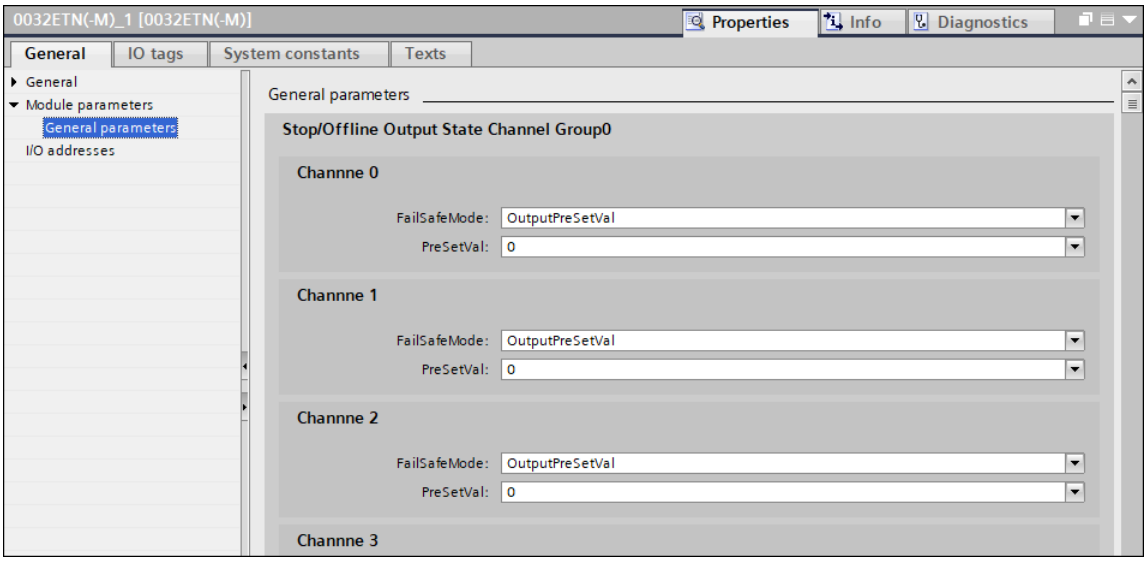
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Then, click the expansion module to be configured in the network view. Select "Properties > General > Module parameters" to configure the corresponding module parameters, as shown in the figure below.



Parameter	Description	Default Value
Filter parameter	Defines the debounce filter time of the channel. Options: No filter, 0.25 ms, 0.5 ms, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms.	1 ms

10.3.3.12 GL20-0032ETN/GL20-0032ETN-M

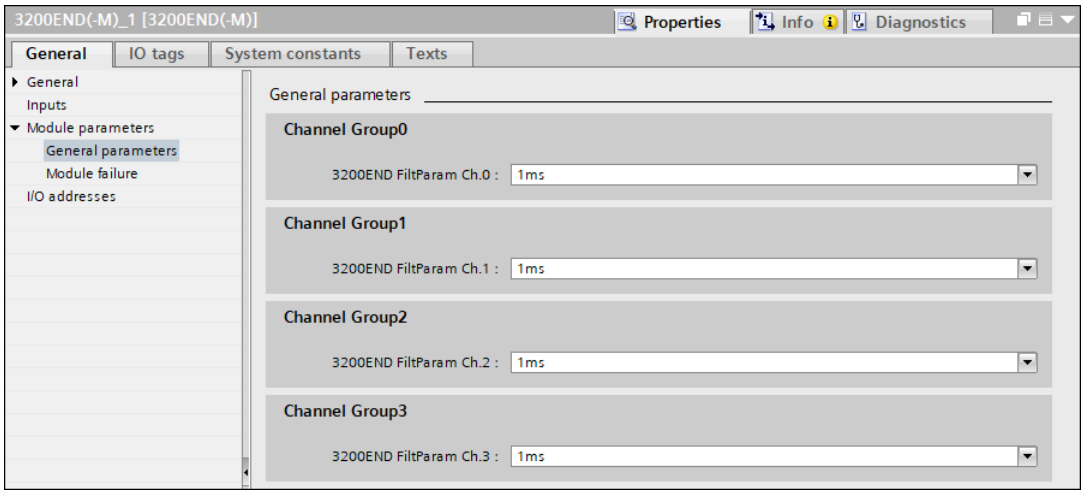
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Then, click the expansion module to be configured in the network view. Select "Properties > General > Module parameters" to configure the corresponding module parameters, as shown in the figure below.



Parameter	Description	Default Value
FailSafeMode	Defines the output mode of the output channel of the module in non-OP state (when the module is stopped or the coupler is disconnected). Supported options: • OutputHold: Keep present output status • OutputPreSetVal: Output according to preset value, used in combination with the "PreSetVal" parameter.	Output preset value
PreSetVal	Defines the preset value upon stop/disconnection. Set to "0" or "1" as needed.	0

10.3.3.13 GL20-3200END/GL20-3200END-M

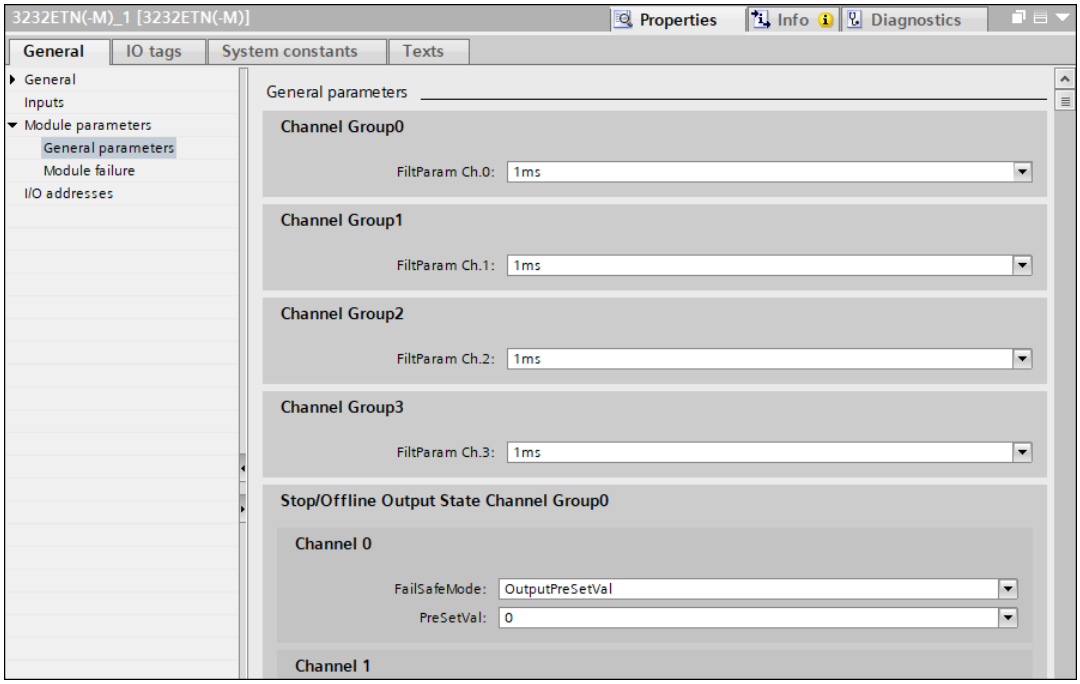
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Then, click the expansion module to be configured in the network view. Select "Properties > General > Module parameters" to configure the corresponding module parameters, as shown in the figure below.



Parameter	Description	Default Value
Filter parameter	Defines the debounce filter time of the channel. Options: No filter, 0.25 ms, 0.5 ms, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms.	1 ms

10.3.3.14 GL20-3232ETN-M

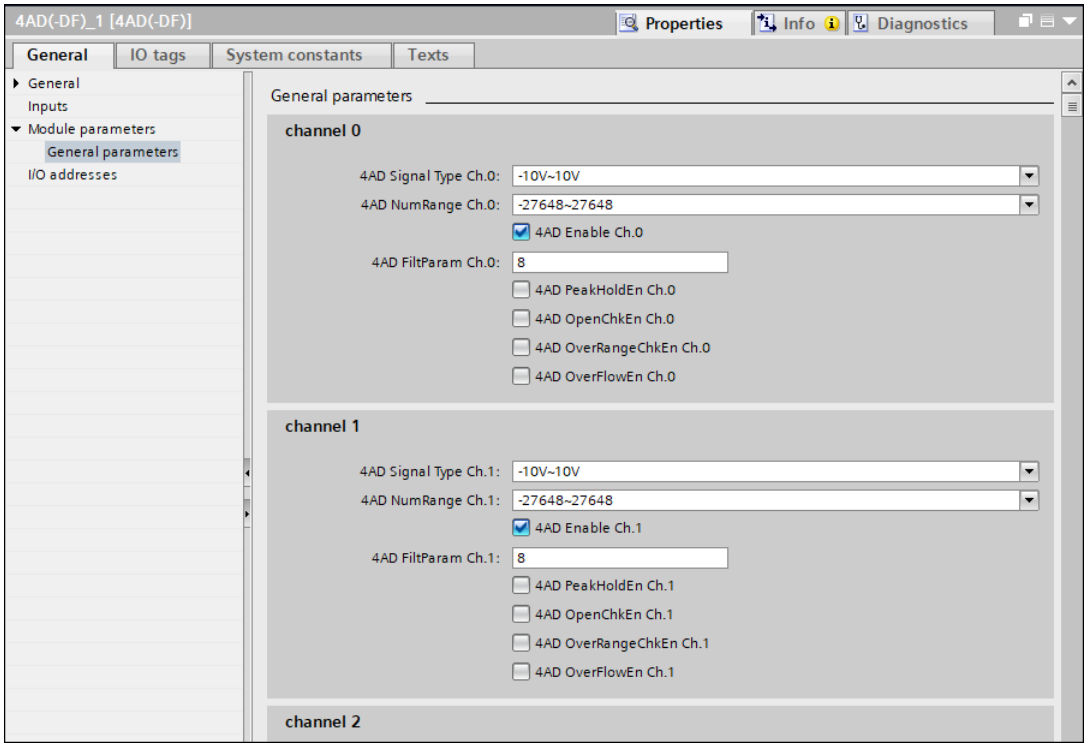
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Then, click the expansion module to be configured in the network view. Select "Properties > General > Module parameters" to configure the corresponding module parameters, as shown in the figure below.



Parameter	Description	Default Value
Filter parameter	Defines the debounce filter time of the channel. Options: No filter, 0.25 ms, 0.5 ms, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms.	1 ms
FailSafeMode	Defines the output mode of the output channel of the module in non-OP state (when the module is stopped or the coupler is disconnected). Supported options: • OutputHold: Keep present output status • OutputPreSetVal: Output according to preset value, used in combination with the "PreSetVal" parameter.	Output preset value
PreSetVal	Defines the preset value upon stop/disconnection. Set to "0" or "1" as needed.	0

10.3.3.15 GL20-4AD

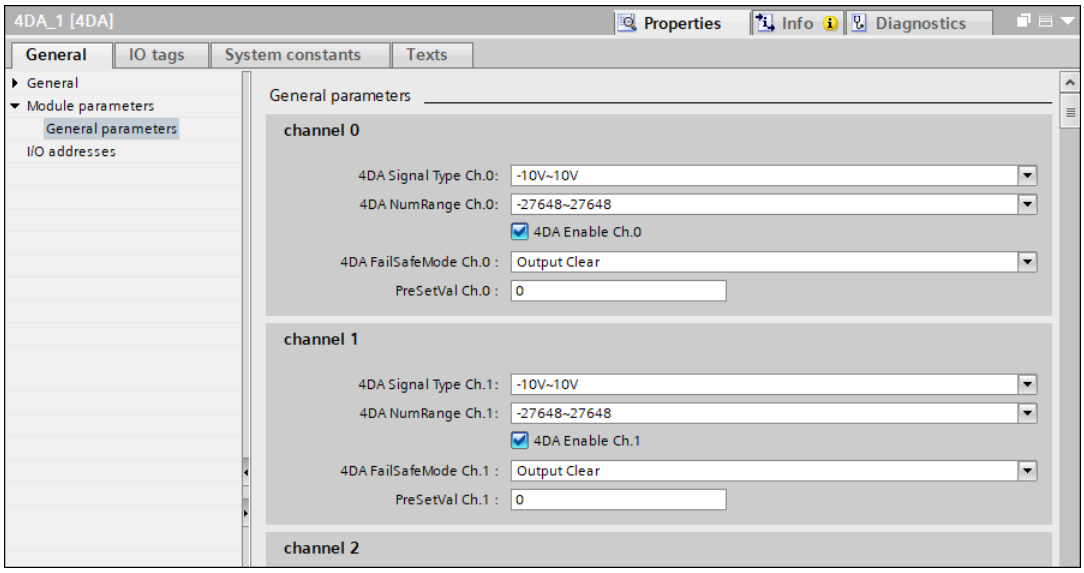
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Then, click the expansion module to be configured in the network view. Select "Properties > General > Module parameters" to configure the corresponding module parameters, as shown in the figure below.



Parameter	Description	Default Value
Conversion mode	Defines the range of output current or voltage. The above three digital output ranges are supported by any conversion mode. Supported options: • -10 V to 10 V (-20000 to 20000) • 0 V to 10 V (0 to 20000) • -5 V to 5 V (-20000 to +20000) • 0 V to 5 V (0 to 20000) • 1 V to 5 V (0 to 20000) • -20 mA to +20 mA (-20000 to +20000) • 0 mA to 20 mA (0 to 20000) • 4 mA to 20 mA (0 to 20000)	-10 V to +10 V
Digital output range	Defines the digital range that corresponds to the physical signal range. For example, 0 V to 10 V corresponds to 0 to 20000. Supported options: • -20000 to 20000 • -27648 to 27648 • -32000 to 32000 Due to limitations of the GSD file, only three ranges are displayed on the interface, though more ranges are supported. For example, if the conversion mode is set to 0 V to 10 V, the corresponding range is 0 to 20000. Since the range of -20000 to +20000 includes the range of 0 to 20000, you can directly select -20000 to +20000. The same applies to other ranges.	-27648 to 27648
Enable	Enables or disables the corresponding channel. The module has four channels. • Enable: The channel samples data normally. • Disable: The channel does not sample data.	Four channels all enabled
Filter parameter	Defines the channel filter parameter. The larger the filter parameter, the better the filtering effect. Range: 1 to 255.	8
Function settings	Select the diagnosis and peak hold functions of the channel, including peak hold, disconnection flag, overlimit flag, and overflow flag.	Not enabled

10.3.3.16 GL20-4DA

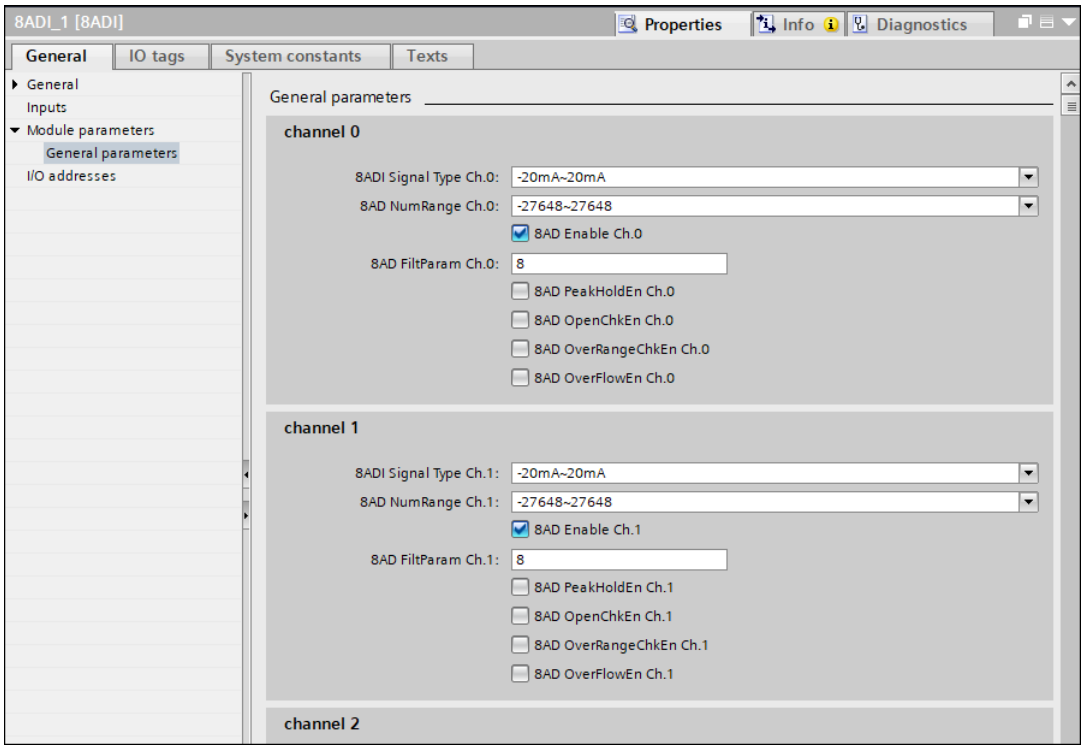
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Then, click the expansion module to be configured in the network view. Select "Properties > General > Module parameters" to configure the corresponding module parameters, as shown in the figure below.



Parameter	Description	Default Value
Conversion mode	Defines the range of output current or voltage. The above three digital output ranges are supported by any conversion mode. Supported options: • -10 V to 10 V (-20000 to 20000) • 0 V to 10 V (0 to 20000) • -5 V to 5 V (-20000 to +20000) • 0 V to 5 V (0 to 20000) • 1 V to 5 V (0 to 20000) • 0 mA to 20 mA (0 to 20000) • 4 mA to 20 mA (0 to 20000)	-10 V to +10 V
Digital output range	Defines the digital range that corresponds to the physical signal range. For example, 0 V to 10 V corresponds to 0 to 20000. Supported options: • -20000 to 20000 • -27648 to 27648 • -32000 to 32000	-27648 to 27648
Enable	Enables or disables the corresponding channel. The module has four channels. • Enable: The channel samples data normally. • Disable: The channel does not sample data.	Four channels all enabled
FailSafeMode	Defines the output mode of the output channel of the module in non-OP state (when the module is stopped or the coupler is disconnected). Supported options: • Output zero: After a fault occurs, the output is cleared. • Output last value: All channels in the corresponding group retain the output state before module stop or network disconnection. • Output preset value: Set the failsafe preset value as needed. After a fault occurs, the preset value will be outputted.	Output zero
PreSetVal	This parameter is valid when the "FailSafeMode" is set to "Output preset value".	0

10.3.3.17 GL20-8ADI

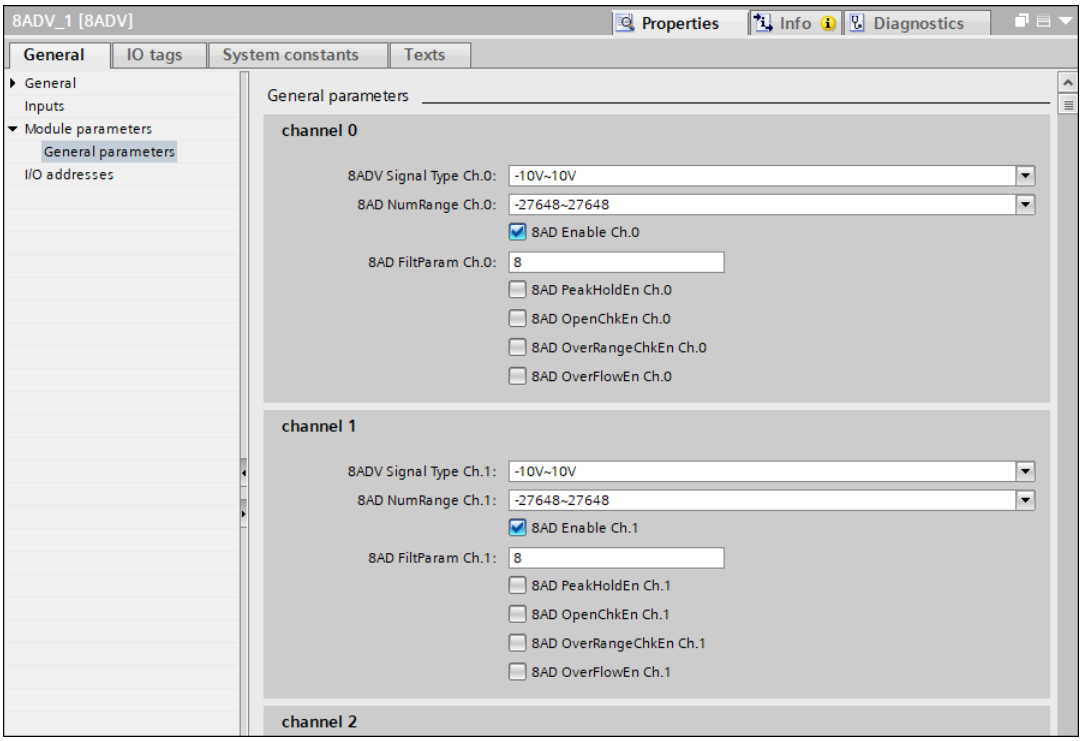
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Then, click the expansion module to be configured in the network view. Select "Properties > General > Module parameters" to configure the corresponding module parameters, as shown in the figure below.



Parameter	Description	Default Value
Conversion mode	Defines the range of output current or voltage. The above three digital output ranges are supported by any conversion mode. Supported options: • -20 mA to +20 mA • 0 to 20 mA • 4 mA to 20 mA	-20 mA to +20 mA
Digital output range	Defines the digital range that corresponds to the physical signal range. For example, 0 V to 10 V corresponds to 0 to 20000. Supported options: • -20000 to 20000 • -27648 to 27648 • -32000 to 32000	-27648 to 27648
Enable	Enables or disables the corresponding channel. The module has eight channels. • Enable: The channel samples data normally. • Disable: The channel does not sample data.	Eight channels all enabled
Filter parameter	Defines the channel filter parameter. The larger the filter parameter, the better the filtering effect. Range: 1 to 255.	8
Function settings	Select the diagnosis and peak hold functions of the channel, including peak hold, disconnection flag, overlimit flag, and overflow flag.	Not enabled

10.3.3.18 GL20-8ADV

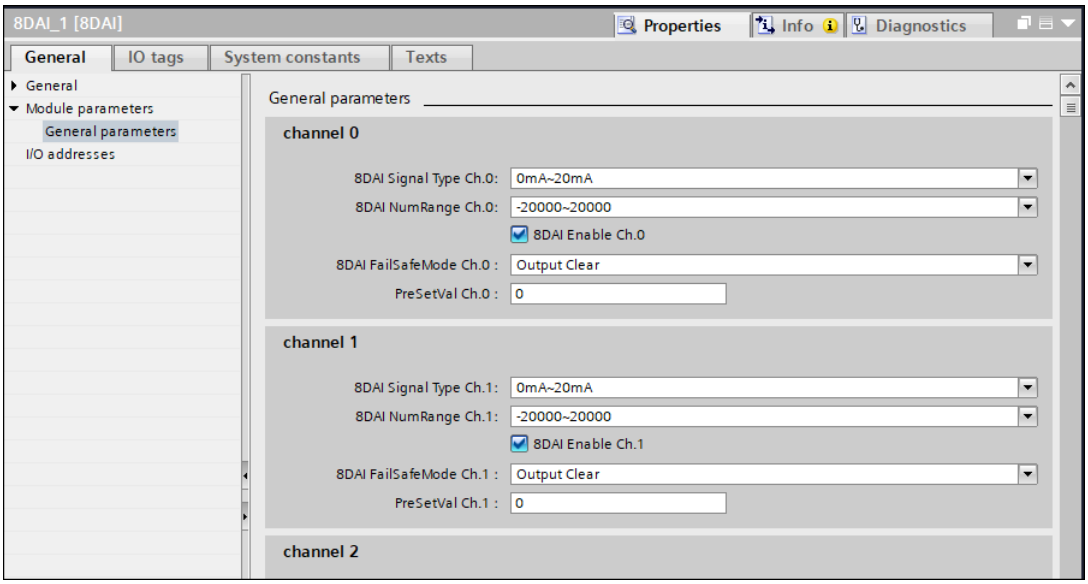
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Then, click the expansion module to be configured in the network view. Select "Properties > General > Module parameters" to configure the corresponding module parameters, as shown in the figure below.



Parameter	Description	Default Value
Conversion mode	Defines the range of output current or voltage. The above three digital output ranges are supported by any conversion mode. Supported options: • -10 V to +10 V • 0 V to 10 V • -5 V to +5 V • 0 V to 5 V • 1 V to 5 V	-10 V to +10 V
Digital output range	Defines the digital range that corresponds to the physical signal range. For example, 0 V to 10 V corresponds to 0 to 20000. Supported options: • -20000 to 20000 • -27648 to 27648 • -32000 to 32000	-27648 to 27648
Enable	Enables or disables the corresponding channel. The module has eight channels. • Enable: The channel samples data normally. • Disable: The channel does not sample data.	Eight channels all enabled
Filter parameter	Defines the channel filter parameter. The larger the filter parameter, the better the filtering effect. Range: 1 to 255.	8
Function settings	Select the diagnosis and peak hold functions of the channel, including peak hold, disconnection flag, overlimit flag, and overflow flag.	Not enabled

10.3.3.19 GL20-8DAI

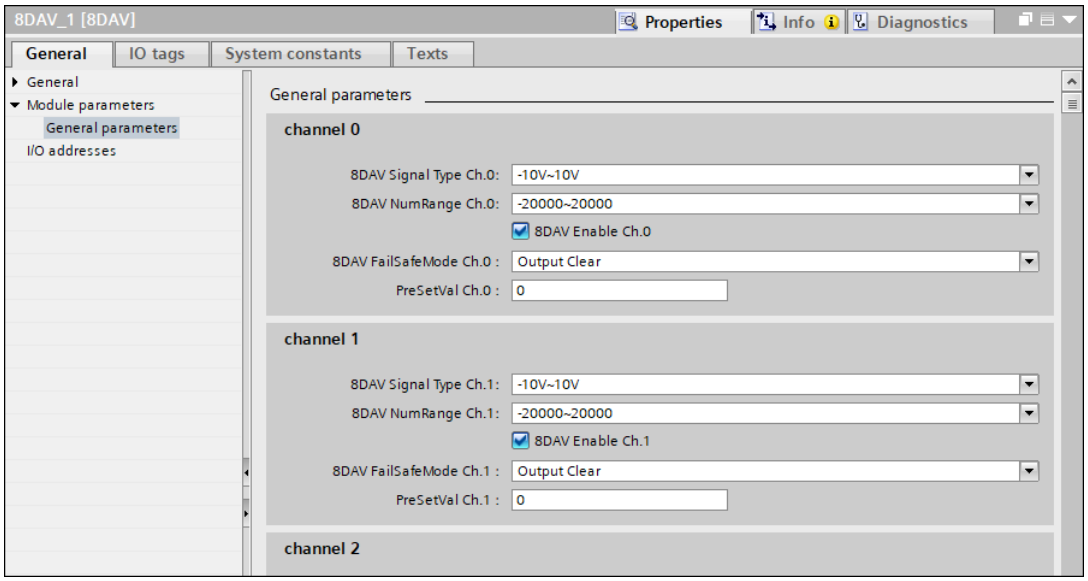
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Then, click the expansion module to be configured in the network view. Select "Properties > General > Module parameters" to configure the corresponding module parameters, as shown in the figure below.



Parameter	Description	Default Value
Conversion mode	Defines the range of output current or voltage. The above three digital output ranges are supported by any conversion mode. Supported options: • 0 to 20 mA • 4 mA to 20 mA	0 to 20 mA
Digital output range	Defines the digital range that corresponds to the physical signal range. For example, 0 V to 10 V corresponds to 0 to 20000. Supported options: • -20000 to 20000 • -27648 to 27648 • -32000 to 32000	-20000 to 20000
Enable	Enables or disables the corresponding channel. The module has eight channels. • Enable: The channel samples data normally. • Disable: The channel does not sample data.	Eight channels all enabled
FailSafeMode	Defines the output mode of the output channel of the module in non-OP state (when the module is stopped or the coupler is disconnected). Supported options: • Output zero: After a fault occurs, the output is cleared. • Output last value: All channels in the corresponding group retain the output state before module stop or network disconnection. • Output preset value: Set the failsafe preset value as needed. After a fault occurs, the preset value will be outputted.	Output zero
PreSetVal	This parameter is valid when the "FailSafeMode" is set to "Output preset value".	0

10.3.3.20 GL20-8DAV

In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Then, click the expansion module to be configured in the network view. Select "Properties > General > Module parameters" to configure the corresponding module parameters, as shown in the figure below.

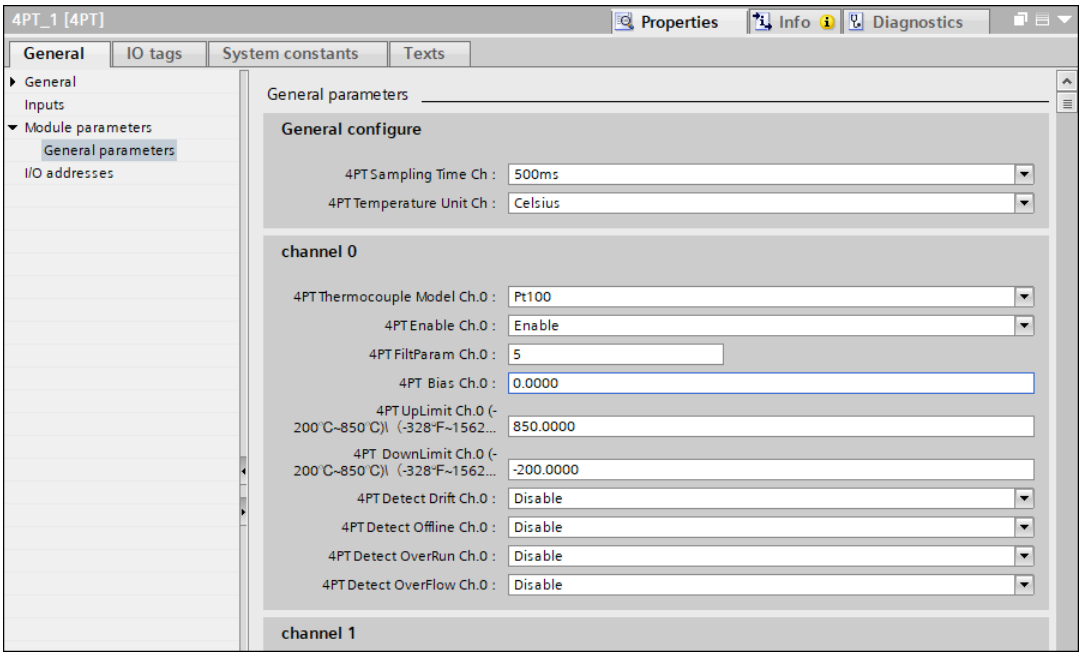


Parameter	Description	Default Value
Conversion mode	Defines the range of output current or voltage. The above three digital output ranges are supported by any conversion mode. Supported options: • -10 V to +10 V • 0 V to 10 V • -5 V to +5 V • 0 V to 5 V • 1 V to 5 V	-10 V to +10 V
Digital output range	Defines the digital range that corresponds to the physical signal range. For example, 0 V to 10 V corresponds to 0 to 20000. Supported options: • -20000 to 20000 • -27648 to 27648 • -32000 to 32000	-20000 to 20000
Enable	Enables or disables the corresponding channel. The module has eight channels. • Enable: The channel samples data normally. • Disable: The channel does not sample data.	Eight channels all enabled

Parameter	Description	Default Value
FailSafeMode	Defines the output mode of the output channel of the module in non-OP state (when the module is stopped or the coupler is disconnected). Supported options: • Output zero: After a fault occurs, the output is cleared. • Output last value: All channels in the corresponding group retain the output state before module stop or network disconnection. • Output preset value: Set the failsafe preset value as needed. After a fault occurs, the preset value will be outputted.	Output zero
PreSetVal	This parameter is valid when the "FailSafeMode" is set to "Output preset value".	0

10.3.3.21 GL20-4PT

In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Then, click the expansion module to be configured in the network view. Select "Properties > General > Module parameters" to configure the corresponding module parameters, as shown in the figure below.

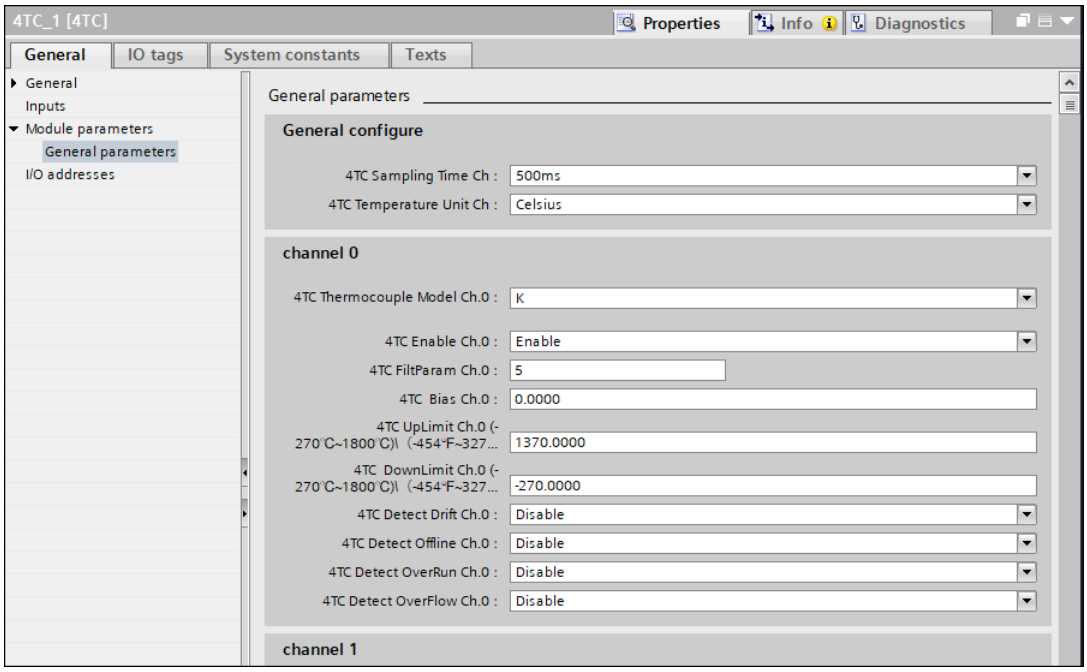


Parameter	Description	Default Value
Sampling Time	Defines the sampling and polling time of temperature data for the 4-channel module. Supported sampling cycles: • 250 ms • 500 ms • 1000 ms	500 ms
Temperature Unit	Defines the unit of temperature data collected by the module. Supported temperature units: • Centigrade degree (°C) • Fahrenheit degree (°F)	Centigrade degree (°C)

Parameter	Description	Default Value
Sensor type	Defines the type of sensor connected to the module channel. Supported types: • Pt100 • Pt500 • Pt1000 • Cu100 • KTY84 • NTC5K • NTC10K	Pt100
Enable	Enables or disables the corresponding channel. The module has four channels. • Enable: The channel samples data normally. • Disable: The channel does not sample data.	Four channels all enabled
Filter parameter	Defines the analog channel sampling filter time of the module. Unit: s. Range: 0 to 100.	5
Temperature offset/NTC material constant B value (K) (20000 to 6000)	Defines the offset of channel temperature data. Range: -204.8°C to +204.7°C.	0°C
Temperature upper limit	Defines the upper limit of the channel temperature data. Range: -200°C to +850°C.	850°C
Temperature lower limit	Defines the lower limit of the channel temperature data. Range: -200°C to +850°C.	-200°C
Detect Drift	Enables or disables channel temperature offset detection.	Disable
Detect Offline	Enables or disables channel disconnection detection.	Disable
Detect OverRun	Enables or disables channel temperature overrun detection.	Disable
Detect Overflow	Enables or disables channel data overflow detection.	Disable

10.3.3.22 GL20-4TC

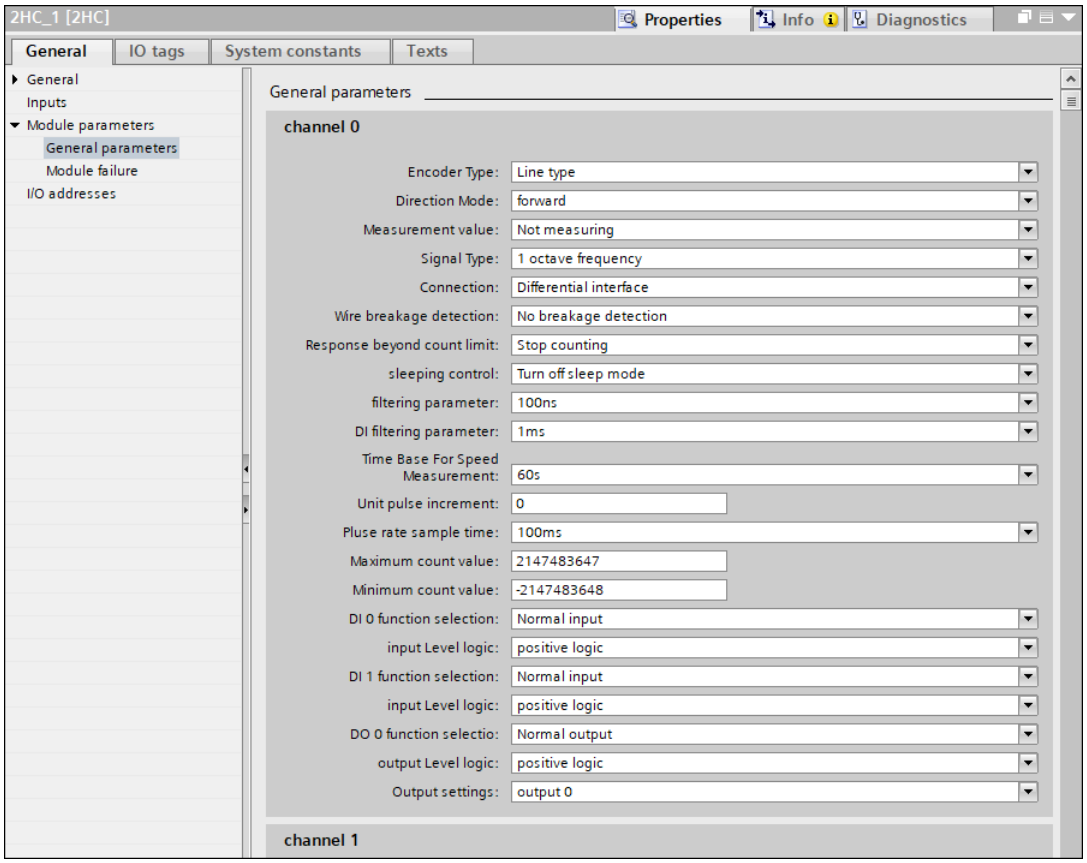
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Then, click the expansion module to be configured in the network view. Select "Properties > General > Module parameters" to configure the corresponding module parameters, as shown in the figure below.



Parameter	Description	Default Value
Sampling Time	Defines the sampling and polling time of temperature data for the 4-channel module. Supported sampling cycles: • 250 ms • 500 ms • 1000 ms	500 ms
Temperature Unit	Defines the unit of temperature data collected by the module. Supported temperature units: • Centigrade degree (°C) • Fahrenheit degree (°F)	Centigrade degree (°C)
Sensor type	Select the type of external sensor connected to the module channel. Options: K, J, E, B, N, R, S, and T.	K
Enable	Enables or disables the corresponding channel. The module has four channels. • Enable: The channel samples data normally. • Disable: The channel does not sample data.	Four channels all enabled
Filter parameter	Defines the analog channel sampling filter time of the module. Unit: s. Range: 0 to 100.	5
Temperature offset	Defines the offset of channel temperature data. Range: -204.8°C to +204.7°C.	0°C
Temperature upper limit	Defines the upper limit of the channel temperature data. Range: -270°C to +1800°C.	1800°C
Temperature lower limit	Defines the lower limit of the channel temperature data. Range: -270°C to +1800°C.	-270°C
Detect Drift	Enables or disables channel temperature offset detection.	Disable
Detect Offline	Enables or disables channel disconnection detection.	Disable
Detect OverRun	Enables or disables channel temperature overrun detection.	Disable
Detect Overflow	Enables or disables channel data overflow detection.	Disable

10.3.3.23 GL20-2HC

In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Then, click the expansion module to be configured in the network view. Select "Properties > General > Module parameters" to configure the corresponding module parameters, as shown in the figure below.



Parameter	Description	Default Value
Counter type	Each channel supports a 32-bit counting range, which can be changed by setting the maximum and minimum values. • Linear type: The counting function ranges from the maximum value to the minimum value. If the maximum or minimum value is reached, operations can be performed according to the setting for the scenario when the maximum or minimum value is exceeded. • Annual type: The counting function ranges from the maximum value to the minimum value. When the count-up exceeds the maximum, the value jumps to the minimum. When the count-down exceeds the minimum, the value jumps to the maximum.	Line topology
Direction	This parameter sets the counting direction. Options: • Forward: Phase A leads phase B • Reverse: Phase B leads phase A	Positive direction

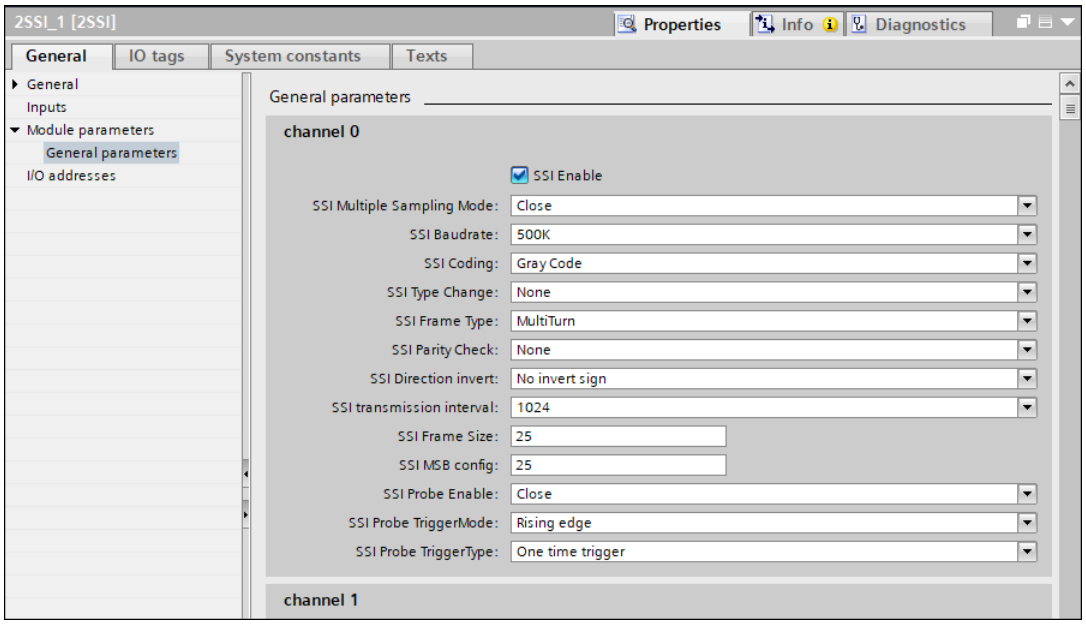
Parameter	Description	Default Value
Measured value	The maximum frequency of the external input signal is affected by the wiring method. When the differential interface is used, the maximum input frequency is 4 MHz. When the single-ended interface is used, the maximum input frequency is 500 kHz. • Not measured: The signal measurement function and other related configuration parameters are invalid. • Frequency: Frequency of the counter input signal in the unit of Hz • Cycle: Cycle of the counter input signal in the unit of ms • Speed: Speed of the counter input signal. The unit depends on the time base of the speed measurement.	Frequency
Signal type	Defines the input mode based on the actual counter input signal. • Phase A/B (frequency multiplication by 1/2/4): An incremental encoder that supports phase A/B signal can be connected. The phase difference between phase A signal and phase B signal must be 90°. • Pulse + direction: An incremental encoder that supports pulse and direction signals can be connected. • CW/CCW: An incremental encoder that supports CW/CCW signals can be connected. • Single-phase counting (A): A pulse encoder without direction signal can be connected. • Single-phase counting (B): A pulse encoder without direction signal can be connected.	1x frequency multiplication
Wiring Mode	Select the wiring mode according to actual conditions. Options: • Differential interface • Single-ended interface	Differential interface
Disconnection detection	This function only supports detection of differential interface disconnection. Options: • Disable breakage detection • Enable breakage detection	Disable breakage detection
Action upon exceeding count limit	This parameter is related to the configuration of the parameter "Counter type". • Linear mode: If "Stop counting" is selected, the counter stops and triggers an overflow alarm upon reaching the maximum or minimum count value; the counter must be re-enabled to resume counting. If "Continue counting" is selected, the forward count value jumps to the minimum when exceeding the maximum, and the reverse count value jumps to the maximum when falling below the minimum. • Ring mode: Invalid parameter	Stop counting
Sleep control	When enabled, the power consumption and heat dissipation of the module can be effectively reduced, but all functions of the entire channel will be disabled. Options: • Disabled • Enabled	Disabled

Parameter	Description	Default Value
filtering parameter	This parameter is used to effectively suppress interference between phase A and phase B of the counter input. Signals whose holding time is shorter than the set time are suppressed. The filter parameter must be between 40% and 60% of the active signal. The filter parameter must meet the condition that the active input signal holding time is longer than the filter time. The larger the parameter, the stronger the anti-interference capability. Options: 50 ns, 100 ns, 200 ns, 500 ns, 1 μs, 2 μs, 5 μs, 10 μs, 20 μs, 50 μs, 100 μs, 200 μs, 500 μs, 1 ms, 2 ms, 5 ms, 10 ms, 20 ms, 50 ms, 100 ms.	1 μs
DI filtering parameter	This parameter is used to suppress input interference. Signals whose holding time is shorter than the set time are suppressed. The filter parameter must be between 40% and 60% of the active signal. Two different filter types are set for DI signals. You can select a filter type based on actual conditions. The filter parameter must meet the condition that the active input signal holding time is longer than the filter time. The larger the parameter, the stronger the anti-interference capability. Options: 100 ns, 500 ns, 1 μs, 100 μs, 250 μs, 500 μs, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms.	1 ms
Time base for speed measurement	This parameter is related to the parameter "Measured value". Options: 1 ms, 10 ms, 100 ms, 1s, and 60s. • Speed: This parameter determines the unit of speed, which is r/min by default. • Not measured, frequency, and cycle: This parameter is invalid.	60s
Unit pulse increment	This parameter is related to the parameter "Measured value". Range: 0 to 65535 • Speed: Number of pulses output per revolution. • Not measured, frequency, and cycle: This parameter is invalid.	0
Frequency sampling cycle	The sampling time selected must meet the condition that the cycle of the input signal is smaller than the sampling time. The larger the parameter, the more stable and accurate the measured value. Options: 500 us, 1 ms, 2 ms, 5 ms, 10 ms, 20 ms, 50 ms, 100 ms, 200 ms, 500 ms, 1s, 2s, 5s, 10s, 20s, 25s. • Not measured: This parameter is invalid. • Frequency, cycle, and speed: The signal frequency is used to measure the cycle and speed. This parameter is strongly related to the frequency calculation. Count the number of input pulse signals within the set time and calculate the signal frequency. Select appropriate values when using the parameter. The sampling time must meet the condition that the input signal cycle is smaller than the sampling time. The larger the parameter, the more accurate the measured value.	100 ms

Parameter	Description	Default Value
Maximum count value	The maximum value of the counter can limit the counting range. You must enter a value larger than the minimum value of the counter. Range: -2147483647 to +2147483647	2147483647
Minimum count value	The minimum value of the counter can limit the counting range. You must enter a value smaller than the maximum value of the counter. Range: -2147483648 to +2147483646	-2147483648
DI0 function selection	When used as a normal DI, the DI terminal must be configured as standard input. Options: • Common input • Probe function • Counting • Reset to 0 • Preset • Gating	Common input
Level logic	Defines the level logic of the DI0 signal. Options: • Positive logic • Negative logic	Positive logic
DI1 function selection	When used as a normal DI, the DI terminal must be configured as standard input. Options: • Common input • Probe function • Counting • Reset to 0 • Preset • Gating	Common input
Level logic	Defines the level logic of the DI1 signal. Options: • Positive logic • Negative logic	Positive logic
DO 0 function selection	When used as a normal DO, the DI terminal must be configured as standard input. Options: • Common output • Comparison output	Common output
Level logic	Defines the level logic of the DO0 signal. Options: • Positive logic • Negative logic	Positive logic
Output setting when the module is not running	Defines the output state of DO0 when the module is in a non-operating state. Options: • Output 0 • Output 1 • Retain	Output 0

10.3.3.24 GL20-2SSI

In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Then, click the expansion module to be configured in the network view. Select "Properties > General > Module parameters" to configure the corresponding module parameters, as shown in the figure below.

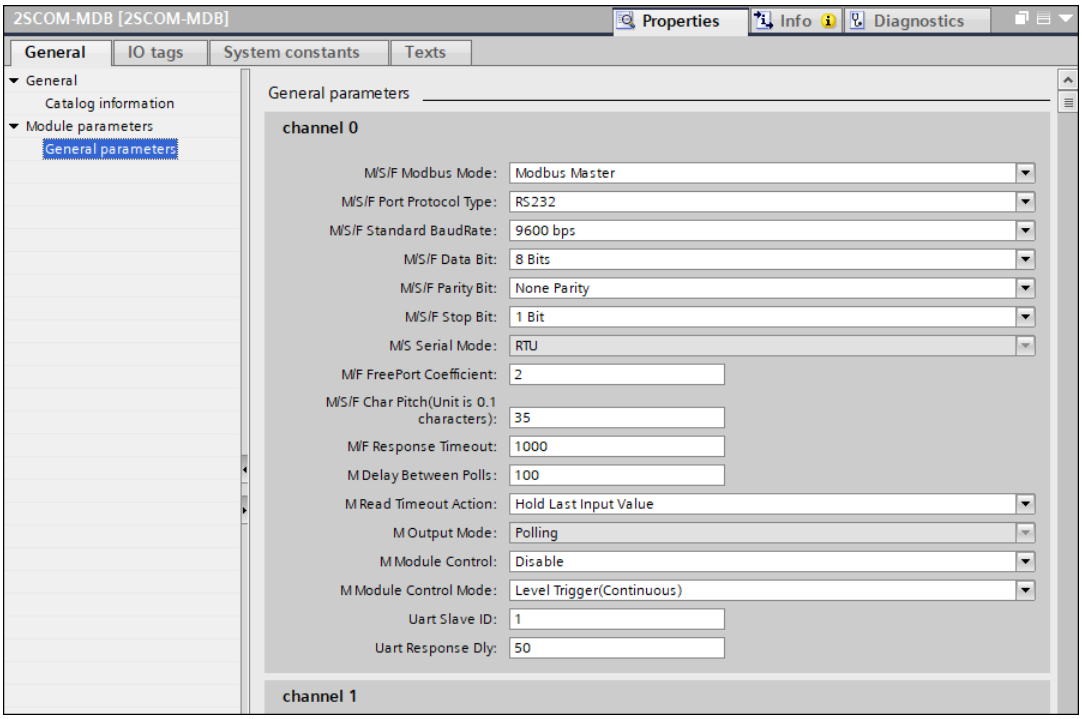


Parameter	Description	Default Value
Enable	Enables or disables the corresponding channel. The module has two channels. • Enable: The channel samples data normally. • Disable: The channel does not sample data.	Two channels all enabled
Multiple sampling mode	After the multi-sampling mode is enabled, it determines the validity of the encoder position value and sends a fault code to the host if it is invalid.	Disabled
Baud rate	The baud rate affects the accuracy of the encoder as well as the rate of position updates. You can adjust it according to the actual transmission rate and performance of the encoder. This parameter is strongly related to the encoder performance. Options: 100k/200k/300k/400k/500k/1000k/1250k/1500k/2000k	500k
Encoding format	Select the code mode according to encoder type. Options: • Gray code • Binary	Gray code
Data format conversion	When the coding format is Gray code or binary, if the data needs to be uploaded in another format, this parameter must be configured. Options: • N/A • Gray code -> Binary code (available when the encoding format is "Gray code") • Binary code -> Gray code (available when the encoding format is "Binary code")	N/A

Parameter	Description	Default Value
Data frame type	It is recommended to select "Variable" when there are status bits in the encoder bits. This parameter should be used in combination with "DataBit Size" and "Frame Size". Options: • SingleTurn-13Bit • MultiTurn-25Bit • Variable	MultiTurn-25Bit
Parity check	If the assigned parity check is for a 25-bit encoder, 26 bits can be read from the encoder. The bit after the least significant bit will be judged as the parity bit, and parity errors will be sent to the host in the form of a fault code. Options: • N/A • Odd check • Even check	N/A
Encoder direction flag	The invert function can adjust the motion direction of the absolute encoder to the direction of the motion axis. Options: • No invert sign • Invert sign	No invert sign
Frame transmission interval	Set the interval according to the encoder specifications. If you need to increase the response speed of the encoder, you can adjust this parameter according to the performance of the encoder. This parameter is strongly related to the encoder performance. Options: 16/32/48/64/512/1024	1024
Data frame length	This parameter can be set only when "Data frame type" is set to "Variable". Range: 0 to 32.	25
Data bit length	This parameter can be set only when "Data frame type" is set to "Variable". Range: 0 to 32.	25

10.3.3.25 GL20-2SCOM-MDB

In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Then, click the expansion module to be configured in the network view. Select "Properties > General > Module parameters" to configure the corresponding module parameters, as shown in the figure below.



Parameter	Description	Default Value
M/S/F Modbus Mode	Modbus-RTU master, Modbus-RTU slave, and free protocol	-
M/S/F port protocol type	RS232, RS485, and RS422	RS232
M/S/F Standard BaudRate	4800 bps, 9600 bps, 19200 bps, 38400 bps, 57600 bps, and 115200 bps	9600 bps
M/S/F Data Bit	7 bits or 8 bits	8 bits
M/S/F Parity Bit	Odd parity, even parity, and no parity	No parity
M/S/F Stop Bit	1 bit or 2 bits	1 bit
M/S Serial Mode	RTU	RTU
M/F FreePort Coefficient	Range: 0 to 255. In general, use the default value 2. If the module operates as a master or in free protocol mode and needs to immediately pull the RTS pin low to receive data from the slave after transmission, set this value to 0.	2
M/S/F Char Pitch (Unit is 0.1 characters)	Frame interval detection time when receiving messages. Range: 35 to 10000. Unit: 0.1 characters.	35
M/F Response Timeout	Maximum time the master waits for a response from the slave. Range: 10 to 65535. Unit: ms.	1000
M Delay Between Polls	Delay between the master receiving a response from the slave and sending the next command. Range: 0 to 65535. Unit: ms.	100
M Read Timeout Action	Hold last input value or clear the input value.	Hold last input value
M Output Mode	Manual configuration is not supported. The output mode changes with the parameter "M Module Control".	Polling
M Module Control	When enabled, serial port 0/1 is set to condition trigger mode. When disabled, serial port 0/1 is set to polling mode.	Disable
M Module Control Mode	The module control mode takes effect only when "M Module Control" is enabled. • Level triggered (continuous): The signal is sent continuously when the condition is met. • Rising edge triggered (single shot): The signal is sent only once when the condition is met.	Level triggered (continuous)

Parameter	Description	Default Value
Uart Slave ID	Range: 1 to 247. This parameter is only valid in slave mode.	1
Uart Response Delay	Time during which the slave station sends the response message to the master station after receiving a query message. Range: 0 to 65535. Unit: ms. This parameter is only valid in slave mode.	50

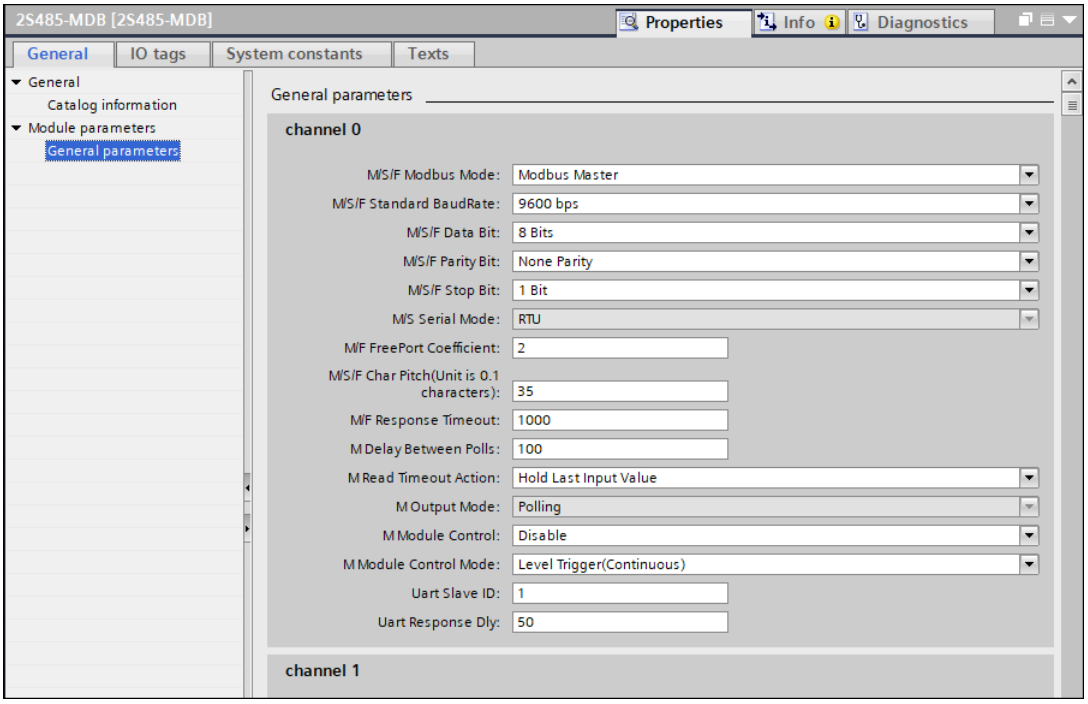
Note

The descriptions of M/S/F are as follows.

- M: Parameters effective in Modbus master mode.
- S: Parameters effective in Modbus slave mode.
- F: Parameters effective in free protocol mode.

10.3.3.26 GL20-2S485-MDB

In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Then, click the expansion module to be configured in the network view. Select "Properties > General > Module parameters" to configure the corresponding module parameters, as shown in the figure below.



Parameter	Description	Default Value
M/S/F Modbus Mode	Modbus-RTU master, Modbus-RTU slave, and free protocol	-
M/S/F Standard BaudRate	4800 bps, 9600 bps, 19200 bps, 38400 bps, 57600 bps, and 115200 bps	9600 bps
M/S/F Data Bit	7 bits or 8 bits	8 bits
M/S/F Parity Bit	Odd parity, even parity, and no parity	No parity
M/S/F Stop Bit	1 bit or 2 bits	1 bit
M/S Serial Mode	RTU	RTU

Parameter	Description	Default Value
M/F FreePort Coefficient	Range: 0 to 255. In general, use the default value 2. If the module operates as a master or in free protocol mode and needs to immediately pull the RTS pin low to receive data from the slave after transmission, set this value to 0.	2
M/S/F Char Pitch (Unit is 0.1 characters)	Frame interval detection time when receiving messages. Range: 35 to 10000. Unit: 0.1 characters.	35
M/F Response Timeout	Maximum time the master waits for a response from the slave. Range: 10 to 65535. Unit: ms.	1000
M Delay Between Polls	Delay between the master receiving a response from the slave and sending the next command. Range: 0 to 65535. Unit: ms.	100
M Read Timeout Action	Hold last input value or clear the input value.	Hold last input value
M Output Mode	Manual configuration is not supported. The output mode changes with the parameter "M Module Control".	Polling
M Module Control	When enabled, serial port 0/1 is set to condition trigger mode. When disabled, serial port 0/1 is set to polling mode.	Disable
M Module Control Mode	The module control mode takes effect only when "M Module Control" is enabled. • Level triggered (continuous): The signal is sent continuously when the condition is met. • Rising edge triggered (single shot): The signal is sent only once when the condition is met.	Level triggered (continuous)
Uart Slave ID	Range: 1 to 247. This parameter is only valid in slave mode.	1
Uart Response Delay	Time during which the slave station sends the response message to the master station after receiving a query message. Range: 0 to 65535. Unit: ms. This parameter is only valid in slave mode.	50

Note

The descriptions of M/S/F are as follows.

- M: Parameters effective in Modbus master mode.
- S: Parameters effective in Modbus slave mode.
- F: Parameters effective in free protocol mode.

10.4 Process Data Reference

10.4.1 GL20-RTU-ECT32

10.4.1.1 GL20-0004ER

Introduction

The GL20-0004ER module is a 4-channel relay output module, primarily used for digital output control.

- Name: DO04 module
- Module category: Digital Out

- Module identification code: 0x10F41027

Process data

Mapping data: For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1600 +0x08*n is shown in the table below.

Index	0x1600+0x08*n: 0004ER output-bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	8
1	Digital output bit0	UDINT	RO	No	0x7xx00101
2	Digital output bit1	UDINT	RO	No	0x7xx00201
3	Digital output bit2	UDINT	RO	No	0x7xx00301
4	Digital output bit3	UDINT	RO	No	0x7xx00401
5	Invalid bit0	UDINT	RO	No	0x7xx00501
6	Invalid bit1	UDINT	RO	No	0x7xx00601
7	Invalid bit2	UDINT	RO	No	0x7xx00701
8	Invalid bit 3	UDINT	RO	No	0x7xx00801

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1601+0x08*n is shown in the table below.

Index	0x1601+0x08*n: 0004ER output-8bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	1
1	Digital output CH0-8bit	UDINT	RO	No	0x7xx10108

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1602+0x08*n is shown in the table below.

Index	0x1602+0x08*n: 0004ER output-16bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	1
1	Digital output CH0-16bit	UDINT	RO	No	0x7xx20110

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A04+0x08*n is shown in the table below.

Index	0x1A04+0x08*n: 0004ER module diagnosis information mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	2
1	0004ER module diagnosis information	UDINT	RO	No	0xAxxx0110
2	0004ER CH0 diagnosis information	UDINT	RO	No	0xAxxx0210

Process data: For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x7000 +0x40*n is shown in the table below.

Index	0x7000+0x40*n: 0004ER output				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	1
1	0004ER digital output CH0-8bit	USINT	RW	Yes	0

10.4.1.2 GL20-0004ETP-2A

Introduction

GL20-0004ETP-2A is a 4-channel relay DO module, primarily used for digital output control.

- Name: DO04 module
- Module category: Digital Out
- Module identification code: 0x10F41028

Process data

Mapping data: For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1600 +0x08*n is shown in the table below.

Index	0x1600+0x08*n: 0004ETP-2A output-bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	8
1	Digital output bit0	UDINT	RO	No	0x7xx00101
2	Digital output bit1	UDINT	RO	No	0x7xx00201
3	Digital output bit2	UDINT	RO	No	0x7xx00301
4	Digital output bit3	UDINT	RO	No	0x7xx00401
5	Invalid bit0	UDINT	RO	No	0x7xx00501
6	...	...	...	...	...
8	Invalid bit 3	UDINT	RO	No	0x7xx00801

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1601+0x08*n is shown in the table below.

Index	0x1601+0x08*n: 0004ETP-2A output-8bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	1
1	Digital output CH0-8bit	UDINT	RO	No	0x7xx10108

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1602+0x08*n is shown in the table below.

Index	0x1602+0x08*n: 0004ETP-2A output-16bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	1
1	Digital output CH0-16bit	UDINT	RO	No	0x7xx20110

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A04+0x08*n is shown in the table below.

Index	0x1A04+0x08*n: 0004ETP-2A diagnosis information mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	5
1	0004ETP-2A module diagnosis information	UDINT	RO	No	0xAxxx0110
2	0004ETP-2A CH0 diagnosis information	UDINT	RO	No	0xAxxx0210
3	0004ETP-2A CH1 diagnosis information	UDINT	RO	No	0xAxxx0310
4	0004ETP-2A CH2 diagnosis information	UDINT	RO	No	0xAxxx0410
5	0004ETP-2A CH3 diagnosis information	UDINT	RO	No	0xAxxx0510

Process data: For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x7000 +0x40*n is shown in the table below.

Index	0x7000+0x40*n: 0004ETP-2A output				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	1
1	0004ETP-2A digital output CH0-8bit	USINT	RW	Yes	0

10.4.1.3 GL20-0404ETP-5V

Introduction

The GL20-0404ETP-5V module is provided with 4 digital inputs and 4 digital outputs.

- Name: DO04 module
- Module category: Digital Out
- Module identification code: 0x10F41064

Process data

Mapping data: For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1600 +0x08*n is shown in the table below.

Index	0x1600+0x08*n: 0404ETP output-bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	8
1	Digital output bit0	UDINT	RO	No	0x7xx00101
2	Digital output bit1	UDINT	RO	No	0x7xx00201
3	Digital output bit2	UDINT	RO	No	0x7xx00301
4	Digital output bit3	UDINT	RO	No	0x7xx00401
5	Invalid bit0	UDINT	RO	-	0x7xx00501
6	...	...	...	...	...
8	Invalid bit 3	UDINT	RO	No	0x7xx00801

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1601+0x08*n is shown in the table below.

Index	0x1601+0x08*n: 0404ETP output-8bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	1
1	Digital output CH0-8bit	UDINT	RO	No	0x7xx10108

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1602+0x08*n is shown in the table below.

Index	0x1602+0x08*n: 0404ETP output-16bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	1
1	Digital output CH0-16bit	UDINT	RO	No	0x7xx20110

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A00+0x08*n is shown in the table below.

Index	0x1A00+0x08*n: 0404ETP input-bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	8
1	Digital input bit0	UDINT	RO	No	0x6xx00101
2	Digital input bit1	UDINT	RO	No	0x6xx00201
3	Digital input bit2	UDINT	RO	No	0x6xx00301
4	Digital input bit3	UDINT	RO	No	0x6xx00401
5	Invalid bit0	UDINT	RO	No	0x6xx00501
6	...	...	...	...	...
8	Invalid bit 3	UDINT	RO	No	0x6xx00801

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A01+0x08*n is shown in the table below.

Index	0x1A01+0x08*n: 0404ETP input-8bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	1
1	Digital input CH0-8bit	UDINT	RO	No	0x6xx10108

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A02+0x08*n is shown in the table below.

Index	0x1A02+0x08*n: 0404ETP input-16bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	1
1	Digital input CH0-16bit	UDINT	RO	No	0x6xx20110

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A04+0x08*n is shown in the table below.

Index	0x1A04+0x08*n: 0404ETP module diagnosis information mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	6
1	0404ETP module 24 V diagnosis information	UDINT	RO	No	0xAxxx0110
2	0404ETP Module 5V diagnosis information	UDINT	RO	No	0xAxxx0210
3	0404ETP DO-CH0 diagnosis information	UDINT	RO	No	0xAxxx0310
4	0404ETP DO-CH1 diagnosis information	UDINT	RO	No	0xAxxx0410
5	0404ETP DO-CH2 diagnosis information	UDINT	RO	No	0xAxxx0510
6	0404ETP DO-CH3 diagnosis information	UDINT	RO	No	0xAxxx0610

Process data: For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x6000 +0x40*n is shown in the table below.

Index	0x6000+0x40*n: 0404ETP input				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	1
1	0404ETP digital input CH0-8bit	USINT	RO	Yes	0

Process data: For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x7000 +0x40*n is shown in the table below.

Index	0x7000+0x40*n: 0404ETP output				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	1
1	0404ETP digital output CH0-8bit	USINT	RW	Yes	0

10.4.1.4 GL20-0008ETN/GL20-0008ETP/GL20-0008ER

Introduction

The GL20-0008xxx series modules are 8-channel DO modules, including GL20-0008ETN (0x1041022), GL20-0008ETP (0x10F41025), and GL20-0008ER (0x1041023). They are primarily used for digital output control. GL20-0008ETN/0008ETP/0008ER are referred to as 0008xxx in the table below.

- Name: DO08 module
- Module category: Digital Out

Note

GL20-0008ER is an 8-channel relay DO module and the others are transistor DO modules.

Process data

Mapping data: For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1600 +0x08*n is shown in the table below.

Index	0x1600+0x08*n: 0008xxx output-bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	8
1	Digital output bit0	UDINT	RO	No	0x7xx00101
2	Digital output bit1	UDINT	RO	No	0x7xx00201
3	...	...	...	...	...
8	Digital output bit7	UDINT	RO	No	0x7xx00801

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1601+0x08*n is shown in the table below.

Index	0x1601+0x08*n: 0008xxx output-8bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	1
1	Digital output CH0-8bit	UDINT	RO	No	0x7xx10108

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1602+0x08*n is shown in the table below.

Index	0x1602+0x08*n: 0008xxx output-16bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	1
1	Digital output CH0-16bit	UDINT	RO	No	0x7xx20110

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A04+0x08*n is shown in the table below.

Index	0x1A04+0x08*n: 0008xxx diagnosis information mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	2
1	0008xxx module diagnosis information	UDINT	RO	No	0xAxxx0110
2	0008xxx CH0 diagnosis information	UDINT	RO	No	0xAxxx0210

Process data: For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x7000 +0x40*n is shown in the table below.

Index	0x7000+0x40*n: 0008xxx output				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	1
1	0008xxx digital output CH0-8bit	USINT	RW	Yes	0

10.4.1.5 GL20-0800END

Introduction

GL20-0800END is an 8-channel DI module, primarily used for digital input acquisition.

- Name: GL20-0800END

- Module category: Digital In
- Module identification code: 0x10F41012

Process data

Mapping data: For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A00 +0x08*n is shown in the table below.

Index	0x1A00+0x08*n: 0800END input-bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	8
1	Digital input bit0	UDINT	RO	No	0x6xx00101
2	Digital input bit1	UDINT	RO	No	0x6xx00201
3	...	...	...	...	...
32	Digital input bit7	UDINT	RO	No	0x6xx00801

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A01+0x08*n is shown in the table below.

Index	0x1A01+0x08*n: 0800END input-8bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	1
1	Digital input CH0-8bit	UDINT	RO	No	0x6xx10108

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A02+0x08*n is shown in the table below.

Index	0x1A02+0x08*n: 0800END input-16bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	1
1	Digital input CH0-16bit	UDINT	RO	No	0x6xx20110

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A04+0x08*n is shown in the table below.

Index	0x1A04+0x08*n: 0800END module diagnosis information mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	2
1	0800END module diagnosis information	UDINT	RO	No	0xAxxx0110
2	0800END diagnosis information	UDINT	RO	No	0xAxxx0210

Process data: For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x6000 +0x40*n is shown in the table below.

Index	0x6000+0x40*n: 0800END input				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	1
1	0800END digital input CH0-8bit	USINT	RO	Yes	0x00

Note

The subindex represents the detected digital input values, where each bit corresponds to a digital input, and each byte is a group.

10.4.1.6 GL20-0808ETN

Introduction

The GL20-0808ETN module supports eight digital inputs and eight digital outputs.

- Name: DO08 module
- Module category: Digital In/Out
- Module identification code: 0x10F41060

Process data

Mapping data: For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A00 +0x08*n is shown in the table below.

Index	0x1A00+0x08*n: 0808ETN input-bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	8
1	Digital output bit0	UDINT	RO	No	0x6xx00101
2	Digital output bit1	UDINT	RO	No	0x6xx00201
3	...	...	...	...	...
8	Digital output bit7	UDINT	RO	No	0x6xx00801

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A01+0x08*n is shown in the table below.

Index	0x1A01+0x08*n: 0808ETN input-8bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	1
1	Digital output CH0-8bit	UDINT	RO	No	0x6xx10108

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A02+0x08*n is shown in the table below.

Index	0x1A02+0x08*n: 0808ETN input-16bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	1
1	Digital output CH0-16bit	UDINT	RO	No	0x6xx20110

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1600+0x08*n is shown in the table below.

Index	0x1600+0x08*n: 0808ETN output-bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	8
1	Digital input bit0	UDINT	RO	No	0x7xx00101
2	Digital input bit1	UDINT	RO	No	0x7xx00201
3	...	...	...	...	...
8	Digital input bit7	UDINT	RO	No	0x7xx00801

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1601+0x08*n is shown in the table below.

Index	0x1601+0x08*n: 0808ETN output-8bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	1
1	Digital input CH0-8bit	UDINT	RO	No	0x7xx10108

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1602+0x08*n is shown in the table below.

Index	0x1602+0x08*n: 0808ETN output-16bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	1
1	Digital input CH0-16bit	UDINT	RO	No	0x7xx20110

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A04+0x08*n is shown in the table below.

Index	0x1A04+0x08*n: 0808ETN module diagnosis information mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	3
1	0808ETN module diagnosis information	UDINT	RO	No	0xAxxx0110
2	0808ETN DI-CH0 diagnosis information	UDINT	RO	No	0xAxxx0210
3	0808ETN DO-CH0 diagnosis information	UDINT	RO	No	0xAxxx0310

Process data: For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x6000 +0x40*n is shown in the table below.

Index	0x6000+0x40*n: 0808ETN input				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	1
1	0808ETN digital input CH0-8bit	USINT	RO	Yes	0

10.4.1.7 GL20-1600END

Introduction

GL20-1600END is mainly used for digital input acquisition.

- Name: DI16 module
- Module category: Digital In
- Module identification code: 0x10F41010

Process data

Mapping data: For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A00 +0x08*n is shown in the table below.

Index	0x1A00+0x08*n: 1600END input-bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	16
1	Digital input bit0	UDINT	RO	No	0x6xx00101
2	Digital input bit1	UDINT	RO	No	0x6xx00201
3	...	UDINT	...	...	...
16	Digital input bit15	UDINT	RO	No	0x6xx01001

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A01+0x08*n is shown in the table below.

Index	0x1A01+0x08*n: 1600END input-8bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	2
1	Digital input CH0-8bit	UDINT	RO	No	0x6xx10108
2	Digital input CH1-8bit	UDINT	RO	No	0x6xx10208

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A02+0x08*n is shown in the table below.

Index	0x1A02+0x08*n: 1600END input-16bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	1
1	Digital input CH0-16bit	UDINT	RO	No	0x6xx20110

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A04+0x08*n is shown in the table below.

Index	0x1A04+0x08*n: 1600END diagnosis information mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	3
1	1600END module diagnosis information	UDINT	RO	No	0xAxxx0110

Index	0x1A04+0x08*n: 1600END diagnosis information mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
2	1600END CH0 diagnosis information	UDINT	RO	No	0xAxxx0210
3	1600END CH1 diagnosis information	UDINT	RO	No	0xAxxx0310

Process data: For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x6000 +0x40*n is shown in the table below.

Index	0x6000+0x40*n: 1600END input				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	2
1	1600END digital input CH0-8bit	USINT	RO	Yes	0
2	1600END digital input CH1-8bit	USINT	RO	Yes	0

10.4.1.8 GL20-0016ETP/GL20-0016ETN

Introduction

The GL20-0016XXX series modules are 16-channel DO modules, including GL20-0016ETN (0x1041020) and GL20-0016ETP (0x10F41024). They are used for digital output control and are referred to as 0016XXX in the following tables

- Name: DO16 module
- Module category: Digital Out

Process data

Mapping data: For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1600 +0x08*n is shown in the table below.

Index	0x1600+0x08*n: 0016xxx output-bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	16
1	Digital output bit0	UDINT	RO	No	0x7xx00101
2	Digital output bit1	UDINT	RO	No	0x7xx00201
3	...	...	...	...	...
16	Digital output bit15	UDINT	RO	No	0x7xx01001

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1601+0x08*n is shown in the table below.

Index	0x1601+0x08*n: 0016xxx output-8bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	2
1	Digital output CH0-8bit	UDINT	RO	No	0x7xx10108
2	Digital output CH1-8bit	UDINT	RO	No	0x7xx10208

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1602+0x08*n is shown in the table below.

Index	0x1602+0x08*n: 0016xxx output-16bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	1
1	Digital output CH0-16bit	UDINT	RO	No	0x7xx20110

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A04+0x08*n is shown in the table below.

Index	0x1A04+0x08*n: 0016xxx diagnosis information mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	3
1	0016xxx module diagnosis information	UDINT	RO	No	0xAxxx0110
2	0016xxx CH0 diagnosis information	UDINT	RO	No	0xAxxx0210
3	0016xxx CH1 diagnosis information	UDINT	RO	No	0xAxxx0310

Process data: For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x7000 +0x40*n is shown in the table below.

Index	0x7000+0x40*n: 0016xxx output				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	2
1	0016xxx digital output CH0-8bit	USINT	RW	Yes	0
2	0016xxx digital output CH1-8bit	USINT	RW	Yes	0

10.4.1.9 GL20-0016ETP/GL20-0016ETN

Introduction

The GL20-0016XXX series modules are 16-channel DO modules, including GL20-0016ETN (0x1041020) and GL20-0016ETP (0x10F41024). They are used for digital output control and are referred to as 0016XXX in the following tables

- Name: DO16 module
- Module category: Digital Out

Process data

Mapping data: For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1600 +0x08*n is shown in the table below.

Index	0x1600+0x08*n: 0016xxx output-bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	16
1	Digital output bit0	UDINT	RO	No	0x7xx00101
2	Digital output bit1	UDINT	RO	No	0x7xx00201

Index	0x1600+0x08*n: 0016xxx output-bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
3	...	...	...	...	...
16	Digital output bit15	UDINT	RO	No	0x7xx01001

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1601+0x08*n is shown in the table below.

Index	0x1601+0x08*n: 0016xxx output-8bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	2
1	Digital output CH0-8bit	UDINT	RO	No	0x7xx10108
2	Digital output CH1-8bit	UDINT	RO	No	0x7xx10208

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1602+0x08*n is shown in the table below.

Index	0x1602+0x08*n: 0016xxx output-16bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	1
1	Digital output CH0-16bit	UDINT	RO	No	0x7xx20110

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A04+0x08*n is shown in the table below.

Index	0x1A04+0x08*n: 0016xxx diagnosis information mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	3
1	0016xxx module diagnosis information	UDINT	RO	No	0xAxxx0110
2	0016xxx CH0 diagnosis information	UDINT	RO	No	0xAxxx0210
3	0016xxx CH1 diagnosis information	UDINT	RO	No	0xAxxx0310

Process data: For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x7000 +0x40*n is shown in the table below.

Index	0x7000+0x40*n: 0016xxx output				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	2
1	0016xxx digital output CH0-8bit	USINT	RW	Yes	0
2	0016xxx digital output CH1-8bit	USINT	RW	Yes	0

10.4.1.10 GL20-0032ETN/GL20-0032ETN-M

Introduction

GL20-0032ETN and GL20-0032ETN-M are 32-point DO modules designed for digital output control. The process data of the two modules is the same.

- Name: GL20-0032ETN
- Module category: Digital Out
- Module identification code: 0x10F41021

Process data

Mapping data: (Output) For the module in slot n (n=0 to 31), the object dictionary definition for index 0x1600+0x08*n is shown in the table below:

Index	0x1600+0x08*n: 0032ETN output-bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	32
1	Digital output bit0	UDINT	RO	No	0x7xx00101
2	Digital output bit1	UDINT	RO	No	0x7xx00201
3	...	...	...	...	...
32	Digital output bit31	UDINT	RO	No	0x7xx02001

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1601+0x08*n is shown in the table below.

Index	0x1601+0x08*n: 0032ETN output-8bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	Digital output CH0-8bit	UDINT	RO	No	0x7xx00108
2	Digital output CH1-8bit	UDINT	RO	No	0x7xx00208
3	Digital output CH2-8bit	UDINT	RO	No	0x7xx00308
4	Digital output CH3-8bit	UDINT	RO	No	0x7xx00408

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1602+0x08*n is shown in the table below.

Index	0x1602+0x08*n: 0032ETN output-16bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	2
1	Digital output CH0-16bit	UDINT	RO	No	0x7xx00110
2	Digital output CH1-16bit	UDINT	RO	No	0x7xx00210

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A04+0x08*n is shown in the table below.

Index	0x1A04+0x08*n: 0032ETN diagnosis information mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	5
1	0032ETN module diagnosis information	UDINT	RO	No	0xAxxx0110
2	0032ETN DO-CH0 diagnosis information	UDINT	RO	No	0xAxxx0210
3	0032ETN DO-CH1 diagnosis information	UDINT	RO	No	0xAxxx0310

Index	0x1A04+0x08*n: 0032ETN diagnosis information mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
4	0032ETN DO-CH2 diagnosis information	UDINT	RO	No	0xAxxx0410
5	0032ETN DO-CH3 diagnosis information	UDINT	RO	No	0xAxxx0510

Process data: (Output) For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x7000+0x40*n is shown in the table below.

Index	0x7000+0x40*n: 0032ETN output				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	0032ETN digital output CH0-8bit	USINT	RW	Yes	0x00
2	0032ETN digital output CH1-8bit	USINT	RW	Yes	0x00
3	0032ETN digital output CH2-8bit	USINT	RW	Yes	0x00
4	0032ETN digital output CH3-8bit	USINT	RW	Yes	0x00

Note

The subindex represents the digital output value, where each bit corresponds to a digital output, and each byte is a group.

10.4.1.11 GL20-3200END/GL20-3200END-M

Introduction

GL20-3200END and GL20-3200END-M are 32-point DI modules designed for digital input acquisition. The process data of the two modules is the same.

- Name: GL20-3200END
- Module category: Digital In
- Module identification code: 0x10F41011

Process data

Mapping data: (Input) For the module in slot n (n=0 to 31), the object dictionary definition for index 0x1A00+0x08*n is shown in the table below:

Index	0x1A00+0x08*n: 3200END input-bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	32
1	Digital input bit0	UDINT	RO	No	0x6xx00101
2	Digital input bit1	UDINT	RO	No	0x6xx00201
3	...	...	...	...	...
32	Digital input bit 31	UDINT	RO	No	0x6xx02001

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A01+0x08*n is shown in the table below.

Index	0x1A01+0x08*n: 3200END input-8bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	Digital input CH0-8bit	UDINT	RO	No	0x6xx00108
2	Digital input CH1-8bit	UDINT	RO	No	0x6xx00208
3	Digital input CH2-8bit	UDINT	RO	No	0x6xx00308
4	Digital input CH3-8bit	UDINT	RO	No	0x6xx00408

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A02+0x08*n is shown in the table below.

Index	0x1A02+0x08*n: 3200END input-16bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	2
1	Digital input CH0-16bit	UDINT	RO	No	0x6xx00110
2	Digital input CH1-16bit	UDINT	RO	No	0x6xx00210

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A04+0x08*n is shown in the table below.

Index	0x1A04+0x08*n: 3200END diagnosis information mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	5
1	3200END module diagnosis information	UDINT	RO	No	0xAxxx0110
2	3200END DI-CH0 diagnosis information	UDINT	RO	No	0xAxxx0210
3	3200END DI-CH1 diagnosis information	UDINT	RO	No	0xAxxx0310
4	3200END DI-CH2 diagnosis information	UDINT	RO	No	0xAxxx0410
5	3200END DI-CH3 diagnosis information	UDINT	RO	No	0xAxxx0510

Process data: (Input) For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x6000+0x40*n is shown in the table below.

Index	0x6000+0x40*n: 3200END input				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	3200END digital input CH0-8bit	USINT	RO	Yes	0x00
2	3200END digital input CH1-8bit	USINT	RO	Yes	0x00
3	3200END digital input CH2-8bit	USINT	RO	Yes	0x00
4	3200END digital input CH3-8bit	USINT	RO	Yes	0x00

Note

The subindex represents the detected digital input values, where each bit corresponds to a digital input, and each byte is a group.

10.4.1.12 GL20-3232ETN-M

Introduction

The GL20-3232ETN-M is provided with 32 digital inputs for receiving the digital input, and 32 digital outputs for controlling the digital output.

- Name: GL20-3232ETN
- Module category: Digital In/Out
- Module identification code: 0x10F41061

Process data

Mapping data: (Output) For the module in slot n (n=0 to 31), the object dictionary definition for index 0x1600+0x08*n is shown in the table below:

Index	0x1600+0x08*n: 3232ETN output-bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	32
1	Digital output bit0	UDINT	RO	No	0x7xx00101
2	Digital output bit1	UDINT	RO	No	0x7xx00201
3	...	...	...	...	...
32	Digital output bit31	UDINT	RO	No	0x7xx02001

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1601+0x08*n is shown in the table below.

Index	0x1601+0x08*n: 3232ETN output-8bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	Digital output CH0-8bit	UDINT	RO	No	0x7xx00108
2	Digital output CH1-8bit	UDINT	RO	No	0x7xx00208
3	Digital output CH2-8bit	UDINT	RO	No	0x7xx00308
4	Digital output CH3-8bit	UDINT	RO	No	0x7xx00408

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1602+0x08*n is shown in the table below.

Index	0x1602+0x08*n: 3232ETN output-16bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	2
1	Digital output CH0-16bit	UDINT	RO	No	0x7xx00110
2	Digital output CH1-16bit	UDINT	RO	No	0x7xx00210

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A04+0x08*n is shown in the table below.

Index	0x1A04+0x08*n: 3232ETN diagnosis information mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	9
1	3232ETN module diagnosis information	UDINT	RO	No	0xAxxx0110
2	3232ETN DI-CH0 diagnosis information	UDINT	RO	No	0xAxxx0210
3	3232ETN DI-CH1 diagnosis information	UDINT	RO	No	0xAxxx0310
4	3232ETN DI-CH2 diagnosis information	UDINT	RO	No	0xAxxx0410
5	3232ETN DI-CH3 diagnosis information	UDINT	RO	No	0xAxxx0510
6	3232ETN DO-CH0 diagnosis information	UDINT	RO	No	0xAxxx0610
7	3232ETN DO-CH1 diagnosis information	UDINT	RO	No	0xAxxx0710
8	3232ETN DO-CH2 diagnosis information	UDINT	RO	No	0xAxxx0810
9	3232ETN DO-CH3 diagnosis information	UDINT	RO	No	0xAxxx0910

Mapping data: (Input) For the module in slot n (n=0 to 31), the object dictionary definition for index 0x1A00+0x08*n is shown in the table below:

Index	0x1A00+0x08*n: 3232ETN input-bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	32
1	Digital input bit0	UDINT	RO	No	0x6xx00101
2	Digital input bit1	UDINT	RO	No	0x6xx00201
3	...	UDINT	...	...	...
32	Digital input bit 31	UDINT	RO	No	0x6xx02001

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A01+0x08*n is shown in the table below.

Index	0x1A01+0x08*n: 3232ETN input-8bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	Digital input CH0-8bit	UDINT	RO	No	0x6xx00108
2	Digital input CH1-8bit	UDINT	RO	No	0x6xx00208
3	Digital input CH2-8bit	UDINT	RO	No	0x6xx00308
4	Digital input CH3-8bit	UDINT	RO	No	0x6xx00408

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A02+0x08*n is shown in the table below.

Index	0x1A02+0x08*n: 3232ETN input-16bit mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	2
1	Digital input CH0-16bit	UDINT	RO	No	0x6xx00110
2	Digital input CH1-16bit	UDINT	RO	No	0x6xx00210

Process data: (Input) For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x6000+0x40*n is shown in the table below.

Index	0x6000+0x40*n: 3232ETN input				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	3232ETN digital input CH0-8bit	USINT	RO	Yes	0x00
2	3232ETN digital input CH1-8bit	USINT	RO	Yes	0x00
3	3232ETN digital input CH2-8bit	USINT	RO	Yes	0x00
4	3232ETN digital input CH3-8bit	USINT	RO	Yes	0x00

Note

The subindex represents the detected digital input values, where each bit corresponds to a digital input, and each byte is a group.

Process data: (Output) For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x7000+0x40*n is shown in the table below.

Index	0x7000+0x40*n: 3232ETN output				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	3232ETN digital output CH0-8bit	USINT	RW	Yes	0x00
2	3232ETN digital output CH1-8bit	USINT	RW	Yes	0x00
3	3232ETN digital output CH2-8bit	USINT	RW	Yes	0x00
4	3232ETN digital output CH3-8bit	USINT	RW	Yes	0x00

Note

The subindex represents the digital output value, where each bit corresponds to a digital output, and each byte is a group.

10.4.1.13 GL20-4AD

Introduction

GL20-4AD is a 4-channel analog input remote module. Powered by an external 24 VDC supply, the module supports voltage and current input modes, with a resolution of up to 16 bits, Also, it allows you to choose the input range level.

- Name: 4AD module
- Module category: Analog In

- Module identification code: 0x10F41030

Process data

Mapping data: For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A02 +0x08*n is shown in the table below.

Index	0x1A02+0x08*n: 4AD input mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	4AD CH0	UDINT	RO	No	0x6xx00110
2	4AD CH1	UDINT	RO	No	0x6xx00210
3	4AD CH2	UDINT	RO	No	0x6xx00310
4	4AD CH3	UDINT	RO	No	0x6xx00410

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A04+0x08*n is shown in the table below.

Index	0x1A04+0x08*n: 4AD diagnosis information mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	5
1	4AD module diagnosis information	UDINT	RO	No	0xAxxx0110
2	4AD CH0 diagnosis information	UDINT	RO	No	0xAxxx0210
3	4AD CH1 diagnosis information	UDINT	RO	No	0xAxxx0310
4	4AD CH2 diagnosis information	UDINT	RO	No	0xAxxx0410
5	4AD CH3 diagnosis information	UDINT	RO	No	0xAxxx0510

Process data: For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x6000 +0x40*n is shown in the table below.

Index	0x6000+0x40*n: 4AD input				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	4AD CH0	INT	RO	Yes	0
2	4AD CH1	INT	RO	Yes	0
3	4AD CH2	INT	RO	Yes	0
4	4AD CH3	INT	RO	Yes	0

10.4.1.14 GL20-4DA

Introduction

The GL20-4DA module is a 4-channel analog output remote module. Powered by an external 24 VDC supply, the module supports voltage and current output modes, with a resolution up to 16 bits, and selectable output range levels.

- Name: 4DA module
- Module category: Analog Out
- Module identification code: 0x10F41040

Process data

Mapping data: For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1602 +0x08*n is shown in the table below.

Index	0x1602+0x08*n: 4DA output mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	4DA CH0	UDINT	RO	No	0x7xx00110
2	4DA CH1	UDINT	RO	No	0x7xx00210
3	4DA CH2	UDINT	RO	No	0x7xx00310
4	4DA CH3	UDINT	RO	No	0x7xx00410

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A04+0x08*n is shown in the table below.

Index	0x1A04+0x08*n: 4DA diagnosis information mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	5
1	4DA module diagnosis information	UDINT	RO	No	0xAxxx0110
2	4DA CH0 diagnosis information	UDINT	RO	No	0xAxxx0210
3	4DA CH1 diagnosis information	UDINT	RO	No	0xAxxx0310
4	4DA CH2 diagnosis information	UDINT	RO	No	0xAxxx0410
5	4DA CH3 diagnosis information	UDINT	RO	No	0xAxxx0510

Process data: For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x7000 +0x40*n is shown in the table below.

Index	0x7000+0x40*n: 4DA output				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	4DA CH0	INT	RO	Yes	0
2	4DA CH1	INT	RO	Yes	0
3	4DA CH2	INT	RO	Yes	0
4	4DA CH3	INT	RO	Yes	0

10.4.1.15 GL20-8ADI

Introduction

The GL20-8ADI module is an 8-channel analog input module. Powered by an external 24 VDC supply, the module supports current input mode, with a resolution of up to 16 bits, Also, it allows you to choose the input range level.

- Name: 8ADI module
- Module category: Analog In
- Module identification code: 0x10F41032

Process data

Mapping data: For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A02 +0x08*n is shown in the table below.

Index	0x1A02+0x08*n: 8ADI input mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	8
1	8ADI CH0	UDINT	RO	No	0x6xx00110
2	8ADI CH1	UDINT	RO	No	0x6xx00210
3	8ADI CH2	UDINT	RO	No	0x6xx00310
4	8ADI CH3	UDINT	RO	No	0x6xx00410
5	8ADI CH4	UDINT	RO	No	0x6xx00510
6	8ADI CH5	UDINT	RO	No	0x6xx00610
7	8ADI CH6	UDINT	RO	No	0x6xx00710
8	8ADI CH7	UDINT	RO	No	0x6xx00810

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A04+0x08*n is shown in the table below.

Index	0x1A04+0x08*n: 8ADI diagnosis information mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	9
1	8ADI module diagnosis information	UDINT	RO	No	0xAxxx0110
2	8ADI CH0 diagnosis information	UDINT	RO	No	0xAxxx0210
3	8ADI CH1 diagnosis information	UDINT	RO	No	0xAxxx0310
4	8ADI CH2 diagnosis information	UDINT	RO	No	0xAxxx0410
5	8ADI CH3 diagnosis information	UDINT	RO	No	0xAxxx0510
6	8ADI CH4 diagnosis information	UDINT	RO	No	0xAxxx0610
7	8ADI CH5 diagnosis information	UDINT	RO	No	0xAxxx0710
8	8ADI CH6 diagnosis information	UDINT	RO	No	0xAxxx0810
9	8ADI CH7 diagnosis information	UDINT	RO	No	0xAxxx0910

Process data: For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x6000 +0x40*n is shown in the table below.

Index	0x6000+0x40*n: 8ADI input				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	8
1	8ADI CH0	INT	RO	Yes	0
2	8ADI CH1	INT	RO	Yes	0
3	8ADI CH2	INT	RO	Yes	0
4	8ADI CH3	INT	RO	Yes	0
5	8ADI CH4	INT	RO	Yes	0
6	8ADI CH5	INT	RO	Yes	0
7	8ADI CH6	INT	RO	Yes	0
8	8ADI CH7	INT	RO	Yes	0

10.4.1.16 GL20-8ADV

Introduction

The GL20-8ADV module is an 8-channel analog input remote module. Powered by an external 24 VDC supply, the module supports voltage input mode, with a resolution of up to 16 bits, Also, it allows you to choose the input range level.

- Name: 8ADV module
- Module category: Analog In
- Module identification code: 0x10F41031

Process data

Mapping data: For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A02 +0x08*n is shown in the table below.

Index	0x1A02+0x08*n: 8ADV input mapping				
Subin dex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	8
1	8ADV CH0	UDINT	RO	No	0x6xx00110
2	8ADV CH1	UDINT	RO	No	0x6xx00210
3	8ADV CH2	UDINT	RO	No	0x6xx00310
4	8ADV CH3	UDINT	RO	No	0x6xx00410
5	8ADV CH4	UDINT	RO	No	0x6xx00510
6	8ADV CH5	UDINT	RO	No	0x6xx00610
7	8ADV CH6	UDINT	RO	No	0x6xx00710
8	8ADV CH7	UDINT	RO	No	0x6xx00810

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A04+0x08*n is shown in the table below.

Index	0x1A04+0x08*n: 8ADV diagnosis information mapping				
Subin dex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	9
1	8ADV module diagnosis information	UDINT	RO	No	0xAxxx0110
2	8ADV CH0 diagnosis information	UDINT	RO	No	0xAxxx0210
3	8ADV CH1 diagnosis information	UDINT	RO	No	0xAxxx0310
4	8ADV CH2 diagnosis information	UDINT	RO	No	0xAxxx0410
5	8ADV CH3 diagnosis information	UDINT	RO	No	0xAxxx0510
6	8ADV CH4 diagnosis information	UDINT	RO	No	0xAxxx0610
7	8ADV CH5 diagnosis information	UDINT	RO	No	0xAxxx0710
8	8ADV CH6 diagnosis information	UDINT	RO	No	0xAxxx0810
9	8ADV CH7 diagnosis information	UDINT	RO	No	0xAxxx0910

Process data: For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x6000 +0x40*n is shown in the table below.

Index	0x6000+0x40*n: 8ADV input				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	8
1	8ADV CH0	UINT	RO	Yes	0
2	8ADV CH1	UINT	RO	Yes	0
3	8ADV CH2	UINT	RO	Yes	0
4	8ADV CH3	UINT	RO	Yes	0
5	8ADV CH4	UINT	RO	Yes	0
6	8ADV CH5	UINT	RO	Yes	0
7	8ADV CH6	UINT	RO	Yes	0
8	8ADV CH7	UINT	RO	Yes	0

10.4.1.17 GL20-8DAI

Introduction

The GL20-8DAI module is a 8-channel analog output module. Powered by external 24V DC, it supports current output mode, with a resolution up to 16 bits, and selectable output range levels.

- Name: 8DAI module
- Module category: Analog Out
- Module identification code: 0x10F41042

Process data

Mapping data: For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1602 +0x08*n is shown in the table below.

Index	0x1602+0x08*n: 8DAI input mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	8
1	8DAI CH0	UDINT	RO	No	0x7xx00110
2	8DAI CH1	UDINT	RO	No	0x7xx00210
3	8DAI CH2	UDINT	RO	No	0x7xx00310
4	8DAI CH3	UDINT	RO	No	0x7xx00410
5	8DAI CH4	UDINT	RO	No	0x7xx00510
6	8DAI CH5	UDINT	RO	No	0x7xx00610
7	8DAI CH6	UDINT	RO	No	0x7xx00710
8	8DAI CH7	UDINT	RO	No	0x7xx00810

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A04+0x08*n is shown in the table below.

Index	0x1A04+0x08*n: 8DAI diagnosis information mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	9
1	8DAI module diagnosis information	UDINT	RO	No	0xAxxx0110
2	8DAI CH0 diagnosis information	UDINT	RO	No	0xAxxx0210
3	8DAI CH1 diagnosis information	UDINT	RO	No	0xAxxx0310

Index	0x1A04+0x08*n: 8DAI diagnosis information mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
...	...	...	...	...	...
9	8DAI CH7 diagnosis information	UDINT	RO	No	0xAxxx0910

Process data: For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x6000 +0x40*n is shown in the table below.

Index	0x6000+0x40*n: 8DAI input				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	8
1	8DAI CH0	INT	RO	Yes	0
2	8DAI CH1	INT	RO	Yes	0
3	8DAI CH2	INT	RO	Yes	0
4	8DAI CH3	INT	RO	Yes	0
5	8DAI CH4	INT	RO	Yes	0
6	8DAI CH5	INT	RO	Yes	0
7	8DAI CH6	INT	RO	Yes	0
8	8DAI CH7	INT	RO	Yes	0

10.4.1.18 GL20-8DAV

Introduction

GL20-8DAV module is a 8-channel analog output module. Powered by an external 24 VDC supply, it supports voltage output mode, with a resolution up to 16 bits, and selectable output range levels.

- Name: 8DAV module
- Module category: Analog Out
- Module identification code: 0x10F41042

Process data

Mapping data: For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1602 +0x08*n is shown in the table below.

Index	0x1602+0x08*n: 8DAV input mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	8
1	8DAV CH0	UDINT	RO	No	0x7xx00110
2	8DAV CH1	UDINT	RO	No	0x7xx00210
3	8DAV CH2	UDINT	RO	No	0x7xx00310
4	8DAV CH3	UDINT	RO	No	0x7xx00410
5	8DAV CH4	UDINT	RO	No	0x7xx00510
6	8DAV CH5	UDINT	RO	No	0x7xx00610
7	8DAV CH6	UDINT	RO	No	0x7xx00710
8	8DAV CH7	UDINT	RO	No	0x7xx00810

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A04+0x08*n is shown in the table below.

Index	0x1A04+0x08*n: 8DAV diagnosis information mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	9
1	8DAV module diagnosis information	UDINT	RO	No	0xAxxx0110
2	8DAV CH0 diagnosis information	UDINT	RO	No	0xAxxx0210
3	8DAV CH1 diagnosis information	UDINT	RO	No	0xAxxx0310
...	...	...	...	...	...
9	8DAV CH7 diagnosis information	UDINT	RO	No	0xAxxx0910

Process data: For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x6000 +0x40*n is shown in the table below.

Index	0x6000+0x40*n: 8DAV input				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	8
1	8DAV CH0	INT	RO	Yes	0
2	8DAV CH1	INT	RO	Yes	0
3	8DAV CH2	INT	RO	Yes	0
4	8DAV CH3	INT	RO	Yes	0
5	8DAV CH4	INT	RO	Yes	0
6	8DAV CH5	INT	RO	Yes	0
7	8DAV CH6	INT	RO	Yes	0
8	8DAV CH7	INT	RO	Yes	0

10.4.1.19 GL20-4PT

Introduction

The GL10-4PT module is used for thermoresistance temperature collection. The module is equipped with 4 independent channels, allowing for simultaneous temperature collection through the four channels. Each channel is configured independently and does not interfere with the others.

- Name: 4PT module
- Module category: Temperature Measurement
- Module identification code: 0x10F41050

Process data

Mapping data: For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A03 +0x08*n is shown in the table below.

Index	0x1A03+0x08*n: 4PT input mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	PT CH0	UDINT	RO	No	0x6xx00120
2	PT CH1	UDINT	RO	No	0x6xx00220
3	PT CH2	UDINT	RO	No	0x6xx00320
4	PT CH3	UDINT	RO	No	0x6xx00420

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A04+0x08*n is shown in the table below.

Index	0x1A04+0x08*n: 4PT diagnosis information mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	6
1	4PT diagnosis information mapping	UDINT	RO	No	0xAxxx0110
2	Module Error Code	UDINT	RO	No	0xAxxx0210
3	Channel Error Code CH0	UDINT	RO	No	0xAxxx0310
4	Channel Error Code CH1	UDINT	RO	No	0xAxxx0410
5	Channel Error Code CH2	UDINT	RO	No	0xAxxx0510
6	Channel Error Code CH3	UDINT	RO	No	0xAxxx0610

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x6000+0x40*n is shown in the table below.

Index	0x6000+0x40*n: 4PT input				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	4PT CH0	REAL (32-bit, displays 0.1°C or the corresponding Fahrenheit)	RO	Yes	0x00000000
2	4PT CH1	REAL	RO	Yes	0x00000000
3	4PT CH2	REAL	RO	Yes	0x00000000
4	4PT CH3	REAL	RO	Yes	0x00000000

Note

Each subindex represents the detected PT thermal resistance temperature of a channel.

10.4.1.20 GL20-4TC

Introduction

The GL20-4TC module is used for thermocouple temperature collection. It is equipped with four independent channels for simultaneous temperature collection. The configuration of each channel is independent from each other.

- Name: 4TC module
- Module category: Temperature Measurement
- Module identification code: 0x10F41051

Process data

Mapping data: For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A03 +0x08*n is shown in the table below.

Index	0x1A03+0x08*n: 4TC input mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	TC CH0	UDINT	RO	No	0x6xx00120
2	TC CH1	UDINT	RO	No	0x6xx00220
3	TC CH2	UDINT	RO	No	0x6xx00320
4	TC CH3	UDINT	RO	No	0x6xx00420

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A04+0x08*n is shown in the table below.

Index	0x1A04+0x08*n: 4TC diagnosis information mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	5
1	Module Error Code	UDINT	RO	No	0xAxxx0110
2	Channel Error Code CH0	UDINT	RO	No	0xAxxx0210
3	Channel Error Code CH1	UDINT	RO	No	0xAxxx0310
4	Channel Error Code CH2	UDINT	RO	No	0xAxxx0410
5	Channel Error Code CH3	UDINT	RO	No	0xAxxx0510

Process data: For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x6000 +0x40*n is shown in the table below.

Index	0x6000+0x40*n: 4TC input				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	4
1	4TC CH0	REAL	RO	Yes	0x00000000
2	4TC CH1	REAL	RO	Yes	0x00000000
3	4TC CH2	REAL	RO	Yes	0x00000000
4	4TC CH3	REAL	RO	Yes	0x00000000

Note

Each subindex represents the detected TC thermocouple temperature of a channel.

10.4.1.21 GL20-2HC

Introduction

The GL20-2HC module is a counting module with two high-speed input channels.

- Name: Encoder module
- Module category: Encoder
- Module identification code: 0x10F41082

Process data

Mapping data (Output): For the module in slot n (n=0 to 3), the object dictionary definition for index 0x1700+0x08*n is shown in the table below:

Index	0x1700+0x08*n: 2HC CH0 RxPDO mapping parameter				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	18
1	Subindex 1	UDINT	RO	No	0x7xx00110
2	Subindex 2	UDINT	RO	No	0x7xx00210
3	Subindex 3	UDINT	RO	No	0x7xx00320
...	...	UDINT	RO	No	...
18	Subindex 18	UDINT	RO	No	0x7xx01220

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x1701+0x08*n is shown in the table below.

Index	0x1701+0x08*n: 2HC CH1 RxPDO mapping parameter				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	18
1	Subindex 1	UDINT	RO	No	0x7xx10110
2	Subindex 2	UDINT	RO	No	0x7xx10210
3	Subindex 3	UDINT	RO	No	0x7xx10320
...	...	UDINT	RO	No	...
18	Subindex 18	UDINT	RO	No	0x7xx11220

Mapping data (Input): For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x1B00+0x08*n is shown in the table below:

Index	0x1B00+0x08*n: 2HC CH0 RxPDO mapping parameter				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	17
1	Subindex 1	UDINT	RO	No	0x6xx00110
2	Subindex 2	UDINT	RO	No	0x6xx00210
3	Subindex 3	UDINT	RO	No	0x6xx00320
...	...	UDINT	RO	No	...
17	Subindex 17	UDINT	RO	No	0x6xx01120

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x1B01+0x08*n is shown in the table below.

Index	0x1B01+0x08*n: 2HC CH1 RxPDO mapping parameter				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	17
1	Subindex 1	UDINT	RO	No	0x6xx10110
2	Subindex 2	UDINT	RO	No	0x6xx10210
3	Subindex 3	UDINT	RO	No	0x6xx10320
...	...	UDINT	RO	No	...
17	Subindex 17	UDINT	RO	No	0x6xx11120

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x1A04+0x08*n is shown in the table below.

Index	0x1A04+0x08*n: 2HC module diagnosis information mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	3
1	2HC module diagnosis information	UDINT	RO	No	0xAxxx0110
2	2HC CH0 diagnosis information	UDINT	RO	No	0xAxxx0210
3	2HC CH1 diagnosis information	UDINT	RO	No	0xAxxx0310

Process data: For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x7000 +0x40*n is shown in the table below.

Index	0x7000+0x40*n: 2HC CH0 output				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	18
1	2HC CH0 Encoder command value	UINT	RW	Yes	0
2	2HC CH0 DO function command value	UINT	RW	Yes	0
3	2HC CH0 Encoder preset value	DINT	RW	Yes	0
4	2HC CH0 Probe function command value	UDINT	RW	Yes	0
5	2HC CH0 Compare function command value	UDINT	RW	Yes	0
6	2HC CH0 Compare 0 command size/step	INT	RW	Yes	0
7	2HC CH0 Reserve700	INT	RW	Yes	0
8	2HC CH0 Reserve701	INT	RW	Yes	0
9	2HC CH0 Reserve702	INT	RW	Yes	0
10	2HC CH0 Compare 0 position value 1	DINT	RW	Yes	0
11	2HC CH0 Reserve703	DINT	RW	Yes	0
12	2HC CH0 Reserve704	DINT	RW	Yes	0
13	2HC CH0 Reserve705	DINT	RW	Yes	0
14	2HC CH0 Compare 0 position value 2	DINT	RW	Yes	0
15	2HC CH0 Reserve706	DINT	RW	Yes	0
16	2HC CH0 Reserve707	DINT	RW	Yes	0
17	2HC CH0 Reserve708	DINT	RW	Yes	0
18	2HC CH0 Compare command parameter	UDINT	RW	Yes	0

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x7001+0x40*n is shown in the table below.

Index	0x7001+0x40*n: 2HC CH1 output				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	18
1	2HC CH1 Encoder command value	UINT	RW	Yes	0
2	2HC CH1 DO function command value	UINT	RW	Yes	0
3	2HC CH1 Encoder preset value	DINT	RW	Yes	0
4	2HC CH1 Probe function command value	UDINT	RW	Yes	0
5	2HC CH1 Compare function command value	UDINT	RW	Yes	0
6	2HC CH1 Compare 0 command size/step	INT	RW	Yes	0
7	2HC CH1 Reserve710	INT	RW	Yes	0
8	2HC CH1 Reserve711	INT	RW	Yes	0
9	2HC CH1 Reserve712	INT	RW	Yes	0
10	2HC CH1 Compare 0 position value 1	DINT	RW	Yes	0

Index	0x7001+0x40*n: 2HC CH1 output				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
11	2HC CH1 Reserve713	DINT	RW	Yes	0
12	2HC CH1 Reserve714	DINT	RW	Yes	0
13	2HC CH1 Reserve715	DINT	RW	Yes	0
14	2HC CH1 Compare 0 position value 2	DINT	RW	Yes	0
15	2HC CH1 Reserve716	DINT	RW	Yes	0
16	2HC CH1 Reserve717	DINT	RW	Yes	0
17	2HC CH1 Reserve718	DINT	RW	Yes	0
18	2HC CH1 Compare command parameter	UDINT	RW	Yes	0

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x6000+0x40*n is shown in the table below.

Index	0x6000+0x40*n: 2HC CH0 input				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	17
1	2HC CH0 Encoder status	USINT	RW	Yes	0
2	2HC CH0 DI status	USINT	RW	Yes	0
3	2HC CH0 DO status	USINT	RW	Yes	0
4	2HC CH0 Compare status	USINT	RW	Yes	0
5	2HC CH0 Probe status	UDINT	RW	Yes	0
6	2HC CH0 Encoder present position	DINT	RW	Yes	0
7	2HC CH0 Measure value 1	UDINT	RW	Yes	0
8	2HC CH0 Measure value 2	UDINT	RW	Yes	0
9	2HC CH0 Probe 0 positive value	DINT	RW	Yes	0
10	2HC CH0 Probe 1 positive value	DINT	RW	Yes	0
11	2HC CH0 Reserve600	DINT	RW	Yes	0
12	2HC CH0 Reserve601	DINT	RW	Yes	0
13	2HC CH0 Probe 0 negative value	DINT	RW	Yes	0
14	2HC CH0 Probe 1 negative value	DINT	RW	Yes	0
15	2HC CH0 Reserve602	DINT	RW	Yes	0
16	2HC CH0 Reserve603	DINT	RW	Yes	0
17	2HC CH0 Error code	UDINT	RW	Yes	0

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x6001+0x40*n is shown in the table below.

Index	0x6001+0x40*n: 2HC CH1 input				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	17
1	2HC CH1 Encoder status	USINT	RW	Yes	0
2	2HC CH1 DI status	USINT	RW	Yes	0
3	2HC CH1 DO status	USINT	RW	Yes	0
4	2HC CH1 Compare status	USINT	RW	Yes	0
5	2HC CH1 Probe status	UDINT	RW	Yes	0
6	2HC CH1 Encoder present position	DINT	RW	Yes	0
7	2HC CH1 Measure value 1	UDINT	RW	Yes	0
8	2HC CH1 Measure value 2	UDINT	RW	Yes	0
9	2HC CH1 Probe 0 positive value	DINT	RW	Yes	0

Index	0x6001+0x40*n: 2HC CH1 input				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
10	2HC CH1 Probe 1 positive value	DINT	RW	Yes	0
11	2HC CH1 Reserve610	DINT	RW	Yes	0
12	2HC CH1 Reserve611	DINT	RW	Yes	0
13	2HC CH1 Probe 0 negative value	DINT	RW	Yes	0
14	2HC CH1 Probe 1 negative value	DINT	RW	Yes	0
15	2HC CH1 Reserve612	DINT	RW	Yes	0
16	2HC CH1 Reserve613	DINT	RW	Yes	0
17	2HC CH1 Errorcode	UDINT	RW	Yes	0

10.4.1.22 GL20-2SSI

Introduction

The GL20-2SSI module serves as an interface between absolute (SSI) type encoders and controllers, enabling the processing of periodically sampled encoder values within the controller.

- Name: 2SSI module
- Module category: Communication
- Module identification code: 0x10F41093

Process data

Mapping data: For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A03 +0x08*n is shown in the table below.

Index	0x1A03: Channel Para Input				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	12
1	Ch0 Para Input	UDINT	RO	No	0x60000120
2 to 6	Ch0 Reserved data0	UDINT	RO	No	...
7	Ch1 Para Input	UDINT	RO	No	0x60000720
9 to 12	Ch1 Reserved data0	UDINT	RO	No	...

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A04+0x08*n is shown in the table below.

Index	0x1A04: 2SSI diagnosis information mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	12
1	2SSI module diagnosis information	UDINT	RO	No	0xAxxx0110
2	2SSI-CH0 diagnosis information	UDINT	RO	No	0xAxxx0210
3	2SSI-CH1 diagnosis information	UDINT	RO	No	0xAxxx0310
4	reserve0	UDINT	RO	No	0xAxxx0410
5 to 11	...	...	...	...	...
12	reserve8	UDINT	RO	No	0xAxxx0C10

Process data: For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x6000 +0x08*n is shown in the table below.

Index	0x6000: 2SSI RX_data				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	12
1	Chn_0 Para Input	UDINT	RO	Yes	0
2	Chn_0 Reserve_0	UDINT	RO	Yes	0
3 to 6	...	...	...	...	...
7	Chn_1 Para Input	UDINT	RO	Yes	0
8	Chn_1 Reserve_0	UDINT	RO	Yes	0
9 to 12	...	...	...	...	...

10.4.1.23 GL20-2SCOM

Introduction

GL20-2SCOM is a 2-channel communication module that supports RS232, RS485, and RS422 communication protocols.

- Name: GL20-2SCOM
- Module category: Communication
- Module identification code: 0x10F41094

Process data

Mapping data: (Input) For the module in slot n (n=0 to 31), the object dictionary definition for index 0x1A03+0x08*n is shown in the table below:

Index	0x1A03+0x08*n: 2SCOM input mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	15
1	2SCOM-1 RXCOUNTER and length	UDINT	RO	No	0x6xx00110
2	2SCOM-1 RX_DATA1	UDINT	RO	No	0x6xx00210
3	2SCOM-1 RX_DATA2	UDINT	RO	No	0x6xx00310
4	2SCOM-1 RX_DATA3	UDINT	RO	No	0x6xx00410
5	2SCOM-1 RX_DATA4	UDINT	RO	No	0x6xx00510
6	2SCOM-1 RX_DATA5	UDINT	RO	No	0x6xx00610
7	2SCOM-1 RX_DATA6	UDINT	RO	No	0x6xx00710
8	2SCOM-2 RXCOUNTER and length	UDINT	RO	No	0x6xx00810
9	2SCOM-2 RX_DATA1	UDINT	RO	No	0x6xx00910
10	2SCOM-2 RX_DATA2	UDINT	RO	No	0x6xx00A10
11	2SCOM-2 RX_DATA3	UDINT	RO	No	0x6xx00B10
12	2SCOM-2 RX_DATA4	UDINT	RO	No	0x6xx00C10
13	2SCOM-2 RX_DATA5	UDINT	RO	No	0x6xx00D10
14	2SCOM-2 RX_DATA6	UDINT	RO	No	0x6xx00E10
15	RX_status	UDINT	RO	No	0x6xx00F10

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A04+0x08*n is shown in the table below.

Index	0x1A04+0x08*n: 2SCOM module diagnosis information mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	15
1	2SCOM module diagnosis information	UDINT	RO	No	0xAxxx0110
2	2SCOM-1 diagnosis information	UDINT	RO	No	0xAxxx0210
3	2SCOM-2 diagnosis information	UDINT	RO	No	0xAxxx0310
4	2SCOM-1 Miss Frame count	UDINT	RO	No	0xAxxx0410
5	2SCOM-2 Miss Frame count	UDINT	RO	No	0xAxxx0510
6	Reserve diagnosis information0	UDINT	RO	No	0xAxxx0610
7	...	...	...	...	...
15	Reserve diagnosis information9	UDINT	RO	No	0xAxxx0E10

Process data: (Input) For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x6000+0x40*n is shown in the table below.

Index	0x6000+0x40*n: 2SCOM RX_data				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	15
1	2SCOM-1 RXCOUNTER and length	UDINT	RW	Yes	0
2	2SCOM-1 RX_DATA1	UDINT	RW	Yes	0
3	2SCOM-1 RX_DATA2	UDINT	RW	Yes	0
4	2SCOM-1 RX_DATA3	UDINT	RW	Yes	0
5	2SCOM-1 RX_DATA4	UDINT	RW	Yes	0
6	2SCOM-1 RX_DATA5	UDINT	RW	Yes	0
7	2SCOM-1 RX_DATA6	UDINT	RW	Yes	0
8	2SCOM-2 RXCOUNTER and length	UDINT	RW	Yes	0
9	2SCOM-2 RX_DATA1	UDINT	RW	Yes	0
10	2SCOM-2 RX_DATA2	UDINT	RW	Yes	0
11	2SCOM-2 RX_DATA3	UDINT	RW	Yes	0
12	2SCOM-2 RX_DATA4	UDINT	RW	Yes	0
13	2SCOM-2 RX_DATA5	UDINT	RW	Yes	0
14	2SCOM-2 RX_DATA6	UDINT	RW	Yes	0
15	RX_status	UDINT	RW	Yes	0

Subindex 1: 2SCOM RX_length and counter

Bit	Description	Remarks
bit0 to bit15	Frame count. It loops from 0 to 65535.	-
bit16 to bit23	Segment number. When the count is the same but the segment numbers are different, it indicates that the frames are consecutive.	-
bit24 to bit31	Frame length. It indicates the length of the frame data.	-

Mapping data: (Output) For the module in slot n (n=0 to 31), the object dictionary definition for index 0x1603+0x08*n is shown in the table below:

Index	0x1603+0x08*n: 2SCOM output mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	15
1	2SCOM-1 TXCOUNTER and length	UDINT	RO	No	0x7xx00110
2	2SCOM-1 TX_DATA1	UDINT	RO	No	0x7xx00210
3	2SCOM-1 TX_DATA2	UDINT	RO	No	0x7xx00310
4	2SCOM-1 TX_DATA3	UDINT	RO	No	0x7xx00410
5	2SCOM-1 TX_DATA4	UDINT	RO	No	0x7xx00510
6	2SCOM-1 TX_DATA5	UDINT	RO	No	0x7xx00610
7	2SCOM-1 TX_DATA6	UDINT	RO	No	0x7xx00710
8	2SCOM-2 TXCOUNTER and length	UDINT	RO	No	0x7xx00810
9	2SCOM-2 TX_DATA1	UDINT	RO	No	0x7xx00910
10	2SCOM-2 TX_DATA2	UDINT	RO	No	0x7xx00A10
11	2SCOM-2 TX_DATA3	UDINT	RO	No	0x7xx00B10
12	2SCOM-2 TX_DATA4	UDINT	RO	No	0x7xx00C10
13	2SCOM-2 TX_DATA5	UDINT	RO	No	0x7xx00D10
14	2SCOM-2 TX_DATA6	UDINT	RO	No	0x7xx00E10
15	TX_status	UDINT	RO	No	0x7xx00F10

Process data: (Output) For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x7000+0x40*n is shown in the table below.

Index	0x7000+0x40*n: 2SCOM TX_data				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	15
1	2SCOM-1 TXCOUNTER and length	UDINT	RW	Yes	0
2	2SCOM-1 TX_DATA1	UDINT	RW	Yes	0
3	2SCOM-1 TX_DATA2	UDINT	RW	Yes	0
4	2SCOM-1 TX_DATA3	UDINT	RW	Yes	0
5	2SCOM-1 TX_DATA4	UDINT	RW	Yes	0
6	2SCOM-1 TX_DATA5	UDINT	RW	Yes	0
7	2SCOM-1 TX_DATA6	UDINT	RW	Yes	0
8	2SCOM-2 TXCOUNTER and length	UDINT	RW	Yes	0
9	2SCOM-2 TX_DATA1	UDINT	RW	Yes	0
10	2SCOM-2 TX_DATA2	UDINT	RW	Yes	0
11	2SCOM-2 TX_DATA3	UDINT	RW	Yes	0
12	2SCOM-2 TX_DATA4	UDINT	RW	Yes	0
13	2SCOM-2 TX_DATA5	UDINT	RW	Yes	0
14	2SCOM-2 TX_DATA6	UDINT	RW	Yes	0
15	TX_status	UDINT	RW	Yes	0

Subindex 1: 2SCOM TX_length and counter

Bit	Description
bit0 to bit15	Frame count. It loops from 0 to 65535.
bit16 to bit23	Segment number. When the count is the same but the segment numbers are different, it indicates that the frames are consecutive.
bit24 to bit31	Frame length. It indicates the length of the frame data.

10.4.1.24 GL20-2SCOM-MDB

Introduction

GL20-2SCOM-MDB is a dual-channel communication module that supports RS232, RS485, and RS422 communication protocols.

- Name: GL20-2SCOM-MDB
- Module category: Serial
- Module identification code: 0x10F41098

Process data

Mapping data (Output): For the module in slot n (n=0 to 3), the object dictionary definition for index 0x1700+0x08*n is shown in the table below:

Index	0x1700+0x08*n: 2SCOM-MDB RPDO output0 mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	120
1	Subindex 001	UDINT	RO	No	0x7xx00108
2	Subindex 002	UDINT	RO	No	0x7xx00208
⋮	⋮	UDINT	RO	No	⋮
119	Subindex 119	UDINT	RO	No	0x7xx07708
120	Subindex 120	UDINT	RO	No	0x7xx07808

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x1701+0x08*n is shown in the table below.

Index	0x1701+0x08*n: 2SCOM-MDB RPDO output1 mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	120
1	Subindex 001	UDINT	RO	No	0x7xx10108
2	Subindex 002	UDINT	RO	No	0x7xx10208
⋮	⋮	UDINT	RO	No	⋮
119	Subindex 119	UDINT	RO	No	0x7xx17708
120	Subindex 120	UDINT	RO	No	0x7xx17808

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x1702+0x08*n is shown in the table below.

Index	0x1702+0x08*n: 2SCOM-MDB RPDO output2 mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	120
1	Subindex 001	UDINT	RO	No	0x7xx20108
2	Subindex 002	UDINT	RO	No	0x7xx20208
⋮	⋮	UDINT	RO	No	⋮
119	Subindex 119	UDINT	RO	No	0x7xx27708
120	Subindex 120	UDINT	RO	No	0x7xx27808

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x1703+0x08*n is shown in the table below.

Index	0x1703+0x08*n: 2SCOM-MDB RPDO output3 mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	120
1	Subindex 001	UDINT	RO	No	0x7xx30108
2	Subindex 002	UDINT	RO	No	0x7xx30208
⋮	⋮	UDINT	RO	No	⋮
119	Subindex 119	UDINT	RO	No	0x7xx37708
120	Subindex 120	UDINT	RO	No	0x7xx37808

Mapping data (Input): For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x1B00+0x08*n is shown in the table below:

Index	0x1B00+0x08*n: 2SCOM-MDB TPDO input0 mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	120
1	Subindex 001	UDINT	RO	No	0x6xx00108
2	Subindex 002	UDINT	RO	No	0x6xx00208
⋮	⋮	UDINT	RO	No	⋮
119	Subindex 119	UDINT	RO	No	0x6xx07708
120	Subindex 120	UDINT	RO	No	0x6xx07808

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x1B01+0x08*n is shown in the table below.

Index	0x1B01+0x08*n: 2SCOM-MDB TPDO input1 mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	120
1	Subindex 001	UDINT	RO	No	0x6xx10108
2	Subindex 002	UDINT	RO	No	0x6xx10208
...	...	UDINT	RO	No	...
119	Subindex 119	UDINT	RO	No	0x6xx17708
120	Subindex 120	UDINT	RO	No	0x6xx17808

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x1B02+0x08*n is shown in the table below.

Index	0x1B02+0x08*n: 2SCOM-MDB TPDO input2 mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	120
1	Subindex 001	UDINT	RO	No	0x6xx20108
2	Subindex 002	UDINT	RO	No	0x6xx20208
...	...	UDINT	RO	No	...
119	Subindex 119	UDINT	RO	No	0x6xx27708
120	Subindex 120	UDINT	RO	No	0x6xx27808

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x1B03+0x08*n is shown in the table below.

Index	0x1B03+0x08*n: 2SCOM-MDB TPDO input3 mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	120
1	Subindex 001	UDINT	RO	No	0x6xx30108
2	Subindex 002	UDINT	RO	No	0x6xx30208
...	...	UDINT	RO	No	...
119	Subindex 119	UDINT	RO	No	0x6xx37708
120	Subindex 120	UDINT	RO	No	0x6xx37808

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x1A04+0x08*n is shown in the table below.

Index	0x1A04+0x08*n: 2SCOM-MDB diagnosis information mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	63
1	2SCOM-MDB module diagnosis information	UINT	RO	No	0x00
2	2SCOM-0 diagnosis information1	UINT	RO	No	0x00
...	...	...	...	...	...
32	2SCOM-0 diagnosis information31	UINT	RO	No	0x00
33	2SCOM-1 diagnosis information1	UINT	RO	No	0x00
...	...	...	...	...	...
63	2SCOM-1 diagnosis information31	UINT	RO	No	0x00

Process data: For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x7000 +0x40*n is shown in the table below.

Index	0x7000+0x40*n: 2SCOM-MDB frame0 TX_data				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	120
1	2SCOM-MDB_Frame0_TX_0	USINT	RW	Yes	0
2	2SCOM-MDB_Frame0_TX_1	USINT	RW	Yes	0
...	...	USINT	RW	Yes	...
119	2SCOM-MDB_Frame0_TX_118	USINT	RW	Yes	0
120	2SCOM-MDB_Frame0_TX_119	USINT	RW	Yes	0

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x7001+0x40*n is shown in the table below.

Index	0x7001+0x40*n: 2SCOM-MDB frame1 TX_data				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	120
1	2SCOM-MDB_Frame1_TX_0	USINT	RW	Yes	0
2	2SCOM-MDB_Frame1_TX_1	USINT	RW	Yes	0
...	...	USINT	RW	Yes	...
119	2SCOM-MDB_Frame1_TX_118	USINT	RW	Yes	0
120	2SCOM-MDB_Frame1_TX_119	USINT	RW	Yes	0

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x7002+0x40*n is shown in the table below.

Index	0x7002+0x40*n: 2SCOM-MDB frame2 TX_data				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	120
1	2SCOM-MDB_Frame2_TX_0	USINT	RW	Yes	0
2	2SCOM-MDB_Frame2_TX_1	USINT	RW	Yes	0
...	...	USINT	RW	Yes	...
119	2SCOM-MDB_Frame2_TX_118	USINT	RW	Yes	0
120	2SCOM-MDB_Frame2_TX_119	USINT	RW	Yes	0

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x7003+0x40*n is shown in the table below.

Index	0x7003+0x40*n: 2SCOM-MDB frame3 TX_data				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	120
1	2SCOM-MDB_Frame3_TX_0	USINT	RW	Yes	0
2	2SCOM-MDB_Frame3_TX_1	USINT	RW	Yes	0
...	...	USINT	RW	Yes	...
119	2SCOM-MDB_Frame3_TX_118	USINT	RW	Yes	0
120	2SCOM-MDB_Frame3_TX_119	USINT	RW	Yes	0

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x6000+0x40*n is shown in the table below.

Index	0x6000+0x40*n: 2SCOM-MDB frame0 RX_data				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	120
1	2SCOM-MDB_Frame0_RX_0	USINT	RW	Yes	0
2	2SCOM-MDB_Frame0_RX_1	USINT	RW	Yes	0
...	...	USINT	RW	Yes	...
119	2SCOM-MDB_Frame0_RX_118	USINT	RW	Yes	0
120	2SCOM-MDB_Frame0_RX_119	USINT	RW	Yes	0

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x6001+0x40*n is shown in the table below.

Index	0x6001+0x40*n: 2SCOM-MDB frame1 RX_data				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	120
1	2SCOM-MDB_Frame1_RX_0	USINT	RW	Yes	0
2	2SCOM-MDB_Frame1_RX_1	USINT	RW	Yes	0
...	...	USINT	RW	Yes	...
119	2SCOM-MDB_Frame1_RX_118	USINT	RW	Yes	0
120	2SCOM-MDB_Frame1_RX_119	USINT	RW	Yes	0

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x6002+0x40*n is shown in the table below.

Index	0x6002+0x40*n: 2SCOM-MDB frame2 RX_data				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	120
1	2SCOM-MDB_Frame2_RX_0	USINT	RW	Yes	0
2	2SCOM-MDB_Frame2_RX_1	USINT	RW	Yes	0
...	...	USINT	RW	Yes	...
119	2SCOM-MDB_Frame2_RX_118	USINT	RW	Yes	0
120	2SCOM-MDB_Frame2_RX_119	USINT	RW	Yes	0

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x6003+0x40*n is shown in the table below.

Index	0x6003+0x40*n: 2SCOM-MDB frame3 RX_data				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	120
1	2SCOM-MDB_Frame3_RX_0	USINT	RW	Yes	0
2	2SCOM-MDB_Frame3_RX_1	USINT	RW	Yes	0
...	...	USINT	RW	Yes	...
119	2SCOM-MDB_Frame3_RX_118	USINT	RW	Yes	0
120	2SCOM-MDB_Frame3_RX_119	USINT	RW	Yes	0

10.4.1.25 GL20-2S485

Introduction

GL20-2S485 is a dual-channel RS485 communication module.

- Name: GL20-2S485
- Module category: Communication
- Module identification code: 0x10F41091

Process data

Mapping data: (Input) For the module in slot n (n=0 to 31), the object dictionary definition for index 0x1A03+0x08*n is shown in the table below:

Index	0x1A03+0x08*n: RS485 input mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	15
1	RS485-0 RXCOUNTER and length	UDINT	RO	No	0x6xx00110
2	RS485-0 RX_DATA1	UDINT	RO	No	0x6xx00210
3	RS485-0 RX_DATA2	UDINT	RO	No	0x6xx00310
4	RS485-0 RX_DATA3	UDINT	RO	No	0x6xx00410
5	RS485-0 RX_DATA4	UDINT	RO	No	0x6xx00510
6	RS485-0 RX_DATA5	UDINT	RO	No	0x6xx00610
7	RS485-0 RX_DATA6	UDINT	RO	No	0x6xx00710

Index	0x1A03+0x08*n: RS485 input mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
8	RS485-1 RXCOUNTER and length	UDINT	RO	No	0x6xx00810
9	RS485-1 RX_DATA1	UDINT	RO	No	0x6xx00910
10	RS485-1 RX_DATA2	UDINT	RO	No	0x6xx00A10
11	RS485-1 RX_DATA3	UDINT	RO	No	0x6xx00B10
12	RS485-1 RX_DATA4	UDINT	RO	No	0x6xx00C10
13	RS485-1 RX_DATA5	UDINT	RO	No	0x6xx00D10
14	RS485-1 RX_DATA6	UDINT	RO	No	0x6xx00E10
15	RX STATUS	UDINT	RO	No	0x6xx00F10

For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A04+0x08*n is shown in the table below.

Index	0x1A04+0x08*n: 2S485 module diagnosis information mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	15
1	RS485 module diagnosis information	UDINT	RO	No	0xAxxx0110
2	RS485-0 diagnosis information	UDINT	RO	No	0xAxxx0210
3	RS485-1 diagnosis information	UDINT	RO	No	0xAxxx0310
4	RS485-0 ERROR FRAME COUNTER	UDINT	RO	No	0xAxxx0410
5	RS485-1 ERROR FRAME COUNTER	UDINT	RO	No	0xAxxx0510
6	RS485-0 REEOR FRAME SEGNUB	UDINT	RO	No	0xAxxx0610
7	RS485-1 REEOR FRAME SEGNUB	UDINT	RO	No	0xAxxx0710
8	Reserve diagnosis information0	UDINT	RO	No	0xAxxx0810
9 to 14	...	...	...	...	...
15	Reserve diagnosis information7	UDINT	RO	No	0xAxxx0E10

Process data: (Input) For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x6000+0x40*n is shown in the table below.

Index	0x6000+0x40*n: RS485 RX_data				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	15
1	RS485-0 RXCOUNTER and length	UDINT	RW	Yes	0
2	RS485-0 RX_DATA1	UDINT	RW	Yes	0
3	RS485-0 RX_DATA2	UDINT	RW	Yes	0
4	RS485-0 RX_DATA3	UDINT	RW	Yes	0
5	RS485-0 RX_DATA4	UDINT	RW	Yes	0
6	RS485-0 RX_DATA5	UDINT	RW	Yes	0
7	RS485-0 RX_DATA6	UDINT	RW	Yes	0
8	RS485-1 RXCOUNTER and length	UDINT	RW	Yes	0
9	RS485-1 RX_DATA1	UDINT	RW	Yes	0
10	RS485-1 RX_DATA2	UDINT	RW	Yes	0
11	RS485-1 RX_DATA3	UDINT	RW	Yes	0
12	RS485-1 RX_DATA4	UDINT	RW	Yes	0
13	RS485-1 RX_DATA5	UDINT	RW	Yes	0
14	RS485-1 RX_DATA6	UDINT	RW	Yes	0
15	RX STATUS	UDINT	RW	Yes	0

Subindex 1: RS485-0 RXCOUNTER and length

Bit	Description
bit0 to bit15	Channel-0 frame count: Loops from 0 to 65535.
bit16 to bit23	Channel-0 segment number: When the count is the same but the segment numbers are different, it indicates that the frames are consecutive.
bit24 to bit31	Channel-0 data length.

Subindex 2 to 7: Communication data received on channel 0.

Subindex 8 to 14: Channel-1 data, the definition of which is the same as channel-0.

Subindex 15: Reserved.

Mapping data: (Output) For the module in slot n (n=0 to 31), the object dictionary definition for index 0x1603+0x08*n is shown in the table below:

Index	0x1603+0x08*n: RS485 output mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	15
1	RS485-0 TXCOUNTER and length	UDINT	RO	No	0x7xx00110
2	RS485-0 TX_DATA1	UDINT	RO	No	0x7xx00210
3	RS485-0 TX_DATA2	UDINT	RO	No	0x7xx00310
4	RS485-0 TX_DATA3	UDINT	RO	No	0x7xx00410
5	RS485-0 TX_DATA4	UDINT	RO	No	0x7xx00510
6	RS485-0 TX_DATA5	UDINT	RO	No	0x7xx00610
7	RS485-0 TX_DATA6	UDINT	RO	No	0x7xx00710
8	RS485-1 TXCOUNTER and length	UDINT	RO	No	0x7xx00810
9	RS485-1 TX_DATA1	UDINT	RO	No	0x7xx00910
10	RS485-1 TX_DATA2	UDINT	RO	No	0x7xx00A10
11	RS485-1 TX_DATA3	UDINT	RO	No	0x7xx00B10
12	RS485-1 TX_DATA4	UDINT	RO	No	0x7xx00C10
13	RS485-1 TX_DATA5	UDINT	RO	No	0x7xx00D10
14	RS485-1 TX_DATA6	UDINT	RO	No	0x7xx00E10
15	TX STATUS	UDINT	RO	No	0x7xx00F10

Process data: (Output) For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x7000+0x40*n is shown in the table below.

Index	0x7000+0x40*n: RS485 TX_data				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	15
1	RS485-0 TXCOUNTER and length	UDINT	RW	Yes	0
2	RS485-0 TX_DATA1	UDINT	RW	Yes	0
3	RS485-0 TX_DATA2	UDINT	RW	Yes	0
4	RS485-0 TX_DATA3	UDINT	RW	Yes	0
5	RS485-0 TX_DATA4	UDINT	RW	Yes	0
6	RS485-0 TX_DATA5	UDINT	RW	Yes	0
7	RS485-0 TX_DATA6	UDINT	RW	Yes	0
8	RS485-1 TXCOUNTER and length	UDINT	RW	Yes	0
9	RS485-1 TX_DATA1	UDSINT	RW	Yes	0

Index	0x7000+0x40*n: RS485 TX_data				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
10	RS485-1 TX_DATA2	UDSINT	RW	Yes	0
11	RS485-1 TX_DATA3	UDSINT	RW	Yes	0
12	RS485-1 TX_DATA4	UDSINT	RW	Yes	0
13	RS485-1 TX_DATA5	UDSINT	RW	Yes	0
14	RS485-1 TX_DATA6	UDSINT	RW	Yes	0
15	TX STATUS	UDSINT	RW	Yes	0

Subindex 1: RS485-0 TXCOUNTER and length

Bit	Description	Remarks
bit0 to bit15	Channel-0 frame count: Loops from 0 to 65535.	-
bit16 to bit23	Channel-0 segment number: When the frame length exceeds 24, you can set multiple frames with the same counter but different segment numbers. The module will combine them into one frame and send it.	-
bit24 to bit31	Data length to be sent on channel 0.	-

Subindex 2 to 7: Communication data to be sent on channel 0.

Subindex 8 to 14: Channel-1 data, the definition of which is the same as channel-0.

Subindex 15: Reserved.

10.4.1.26 GL20-2S485-MDB

Introduction

GL20-2S485-MDB is a dual-channel RS485 communication module.

- Name: GL20-2S485-MDB
- Module category: Serial
- Module identification code: 0x10F41099

Process data

Mapping data (Output): For the module in slot n (n=0 to 3), the object dictionary definition for index 0x1700+0x08*n is shown in the table below:

Index	0x1700+0x08*n: 2S485-MDB RPDO output0 mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	120
1	Subindex 001	UDINT	RO	No	0x7xx00108
2	Subindex 002	UDINT	RO	No	0x7xx00208
...	...	UDINT	RO	No	...
119	Subindex 119	UDINT	RO	No	0x7xx07708
120	Subindex 120	UDINT	RO	No	0x7xx07808

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x1700+0x08*n is shown in the table below.

Index	0x1701+0x08*n: 2S485-MDB RPDO output1 mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	120
1	Subindex 001	UDINT	RO	No	0x7xx10108
2	Subindex 002	UDINT	RO	No	0x7xx10208
...	...	UDINT	RO	No	...
119	Subindex 119	UDINT	RO	No	0x7xx17708
120	Subindex 120	UDINT	RO	No	0x7xx17808

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x1702+0x08*n is shown in the table below.

Index	0x1702+0x08*n: 2S485-MDB RPDO output2 mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	120
1	Subindex 001	UDINT	RO	No	0x7xx20108
2	Subindex 002	UDINT	RO	No	0x7xx20208
...	...	UDINT	RO	No	...
119	Subindex 119	UDINT	RO	No	0x7xx27708
120	Subindex 120	UDINT	RO	No	0x7xx27808

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x1703+0x08*n is shown in the table below.

Index	0x1703+0x08*n: 2S485-MDB RPDO output3 mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	120
1	Subindex 001	UDINT	RO	No	0x7xx30108
2	Subindex 002	UDINT	RO	No	0x7xx30208
...	...	UDINT	RO	No	...
119	Subindex 119	UDINT	RO	No	0x7xx37708
120	Subindex 120	UDINT	RO	No	0x7xx37808

Mapping data (Input): For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x1B00+0x08*n is shown in the table below:

Index	0x1B00+0x08*n: 2S485-MDB TPDO input0 mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	120
1	Subindex 001	UDINT	RO	No	0x6xx00108
2	Subindex 002	UDINT	RO	No	0x6xx00208
...	...	UDINT	RO	No	...
119	Subindex 119	UDINT	RO	No	0x6xx07708
120	Subindex 120	UDINT	RO	No	0x6xx07808

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x1B01+0x08*n is shown in the table below.

Index	0x1B01+0x08*n: 2S485-MDB TPDO input1 mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	120
1	Subindex 001	UDINT	RO	No	0x6xx10108
2	Subindex 002	UDINT	RO	No	0x6xx10208
...	...	UDINT	RO	No	...
119	Subindex 119	UDINT	RO	No	0x6xx17708
120	Subindex 120	UDINT	RO	No	0x6xx17808

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x1B02+0x08*n is shown in the table below.

Index	0x1B02+0x08*n: 2S485-MDB TPDO input2 mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	120
1	Subindex 001	UDINT	RO	No	0x6xx20108
2	Subindex 002	UDINT	RO	No	0x6xx20208
...	...	UDINT	RO	No	...
119	Subindex 119	UDINT	RO	No	0x6xx27708
120	Subindex 120	UDINT	RO	No	0x6xx27808

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x1B03+0x08*n is shown in the table below.

Index	0x1B03+0x08*n: 2S485-MDB TPDO input3 mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	120
1	Subindex 001	UDINT	RO	No	0x6xx30108
2	Subindex 002	UDINT	RO	No	0x6xx30208
...	...	UDINT	RO	No	...
119	Subindex 119	UDINT	RO	No	0x6xx37708
120	Subindex 120	UDINT	RO	No	0x6xx37808

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x1A04+0x08*n is shown in the table below.

Index	0x1A04+0x08*n: 2S485-MDB diagnosis information mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	63
1	2S485-MDB module diagnosis information	UINT	RO	No	0x00
2	2S485-0 diagnosis information1	UINT	RO	No	0x00
...	...	...	...	...	...
32	2S485-0 diagnosis information31	UINT	RO	No	0x00
33	2S485-1 diagnosis information1	UINT	RO	No	0x00
...	...	...	...	...	...
63	2S485-1 diagnosis information31	UINT	RO	No	0x00

Process data: For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x7000 +0x40*n is shown in the table below.

Index	0x7000+0x40*n: 2S485-MDB frame0 TX_data				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	120
1	2SCOM-MDB_Frame0_TX_0	USINT	RW	Yes	0
2	2SCOM-MDB_Frame0_TX_1	USINT	RW	Yes	0
...	...	USINT	RW	Yes	...
119	2SCOM-MDB_Frame0_TX_118	USINT	RW	Yes	0
120	2SCOM-MDB_Frame0_TX_119	USINT	RW	Yes	0

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x7001+0x40*n is shown in the table below.

Index	0x7001+0x40*n: 2S485-MDB frame1 TX_data				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	120
1	2SCOM-MDB_Frame1_TX_0	USINT	RW	Yes	0
2	2SCOM-MDB_Frame1_TX_1	USINT	RW	Yes	0
...	...	USINT	RW	Yes	...
119	2SCOM-MDB_Frame1_TX_118	USINT	RW	Yes	0
120	2SCOM-MDB_Frame1_TX_119	USINT	RW	Yes	0

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x7002+0x40*n is shown in the table below.

Index	0x7002+0x40*n: 2S485-MDB frame2 TX_data				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	120
1	2SCOM-MDB_Frame2_TX_0	USINT	RW	Yes	0
2	2SCOM-MDB_Frame2_TX_1	USINT	RW	Yes	0
...	...	USINT	RW	Yes	...
119	2SCOM-MDB_Frame2_TX_118	USINT	RW	Yes	0
120	2SCOM-MDB_Frame2_TX_119	USINT	RW	Yes	0

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x7003+0x40*n is shown in the table below.

Index	0x7003+0x40*n: 2S485-MDB frame3 TX_data				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	120
1	2SCOM-MDB_Frame3_TX_0	USINT	RW	Yes	0
2	2SCOM-MDB_Frame3_TX_1	USINT	RW	Yes	0
...	...	USINT	RW	Yes	...
119	2SCOM-MDB_Frame3_TX_118	USINT	RW	Yes	0
120	2SCOM-MDB_Frame3_TX_119	USINT	RW	Yes	0

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x6000+0x40*n is shown in the table below.

Index	0x6000+0x40*n: 2S485-MDB frame0 RX_data				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	120
1	2SCOM-MDB_Frame0_RX_0	USINT	RW	Yes	0
2	2SCOM-MDB_Frame0_RX_1	USINT	RW	Yes	0
...	...	USINT	RW	Yes	...
119	2SCOM-MDB_Frame0_RX_118	USINT	RW	Yes	0
120	2SCOM-MDB_Frame0_RX_119	USINT	RW	Yes	0

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x6001+0x40*n is shown in the table below.

Index	0x6001+0x40*n: 2S485-MDB frame1 RX_data				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	120
1	2SCOM-MDB_Frame1_RX_0	USINT	RW	Yes	0
2	2SCOM-MDB_Frame1_RX_1	USINT	RW	Yes	0
...	...	USINT	RW	Yes	...
119	2SCOM-MDB_Frame1_RX_118	USINT	RW	Yes	0
120	2SCOM-MDB_Frame1_RX_119	USINT	RW	Yes	0

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x6002+0x40*n is shown in the table below.

Index	0x6002+0x40*n: 2S485-MDB frame2 RX_data				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	120
1	2SCOM-MDB_Frame2_RX_0	USINT	RW	Yes	0
2	2SCOM-MDB_Frame2_RX_1	USINT	RW	Yes	0
...	...	USINT	RW	Yes	...
119	2SCOM-MDB_Frame2_RX_118	USINT	RW	Yes	0
120	2SCOM-MDB_Frame2_RX_119	USINT	RW	Yes	0

For the module in slot n (n = 0 to 3), the object dictionary definition for index 0x6003+0x40*n is shown in the table below.

Index	0x6003+0x40*n: 2S485-MDB frame3 RX_data				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	120
1	2SCOM-MDB_Frame3_RX_0	USINT	RW	Yes	0
2	2SCOM-MDB_Frame3_RX_1	USINT	RW	Yes	0
...	...	USINT	RW	Yes	...
119	2SCOM-MDB_Frame3_RX_118	USINT	RW	Yes	0
120	2SCOM-MDB_Frame3_RX_119	USINT	RW	Yes	0

10.4.1.27 GL20-1DNM

Introduction

The GL20-1DNM module is a DeviceNet Master (DNM) module.

- Name: GL20-1DNM
- Module category: Communication
- Module identification code: 0x10F41095

Process data

The process data for the DNM module is provided in the I/O mapping under the virtual station, not in the that of the EtherCAT bus. Therefore, the process data is not described in this section.

10.4.1.28 GL20-PS2

Introduction

GL20-PS2 is a power supply module that provides power to subsequent modules.

- Name: Power supply module
- Module category: Digital Out
- Module identification code: 0x10F41080

Process data

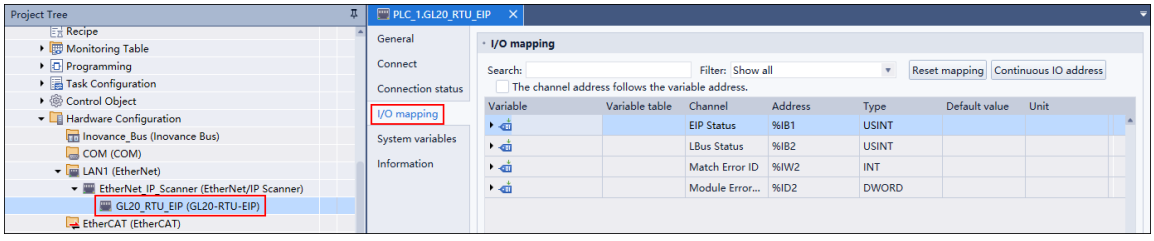
For the module in slot n (n = 0 to 31), the object dictionary definition for index 0x1A04+0x08*n is shown in the table below.

Index	0x1A04+0x08*n: PS2 module diagnosis information mapping				
Subindex	Name	Data Type	Access Mode	Mapping	Default Value
0	Number of entries	USINT	RO	No	1
1	PS2 module diagnosis information	UDINT	RO	No	0xAxxx0110

10.4.2 GL20-RTU-EIP

10.4.2.1 GL20-RTU-EIP

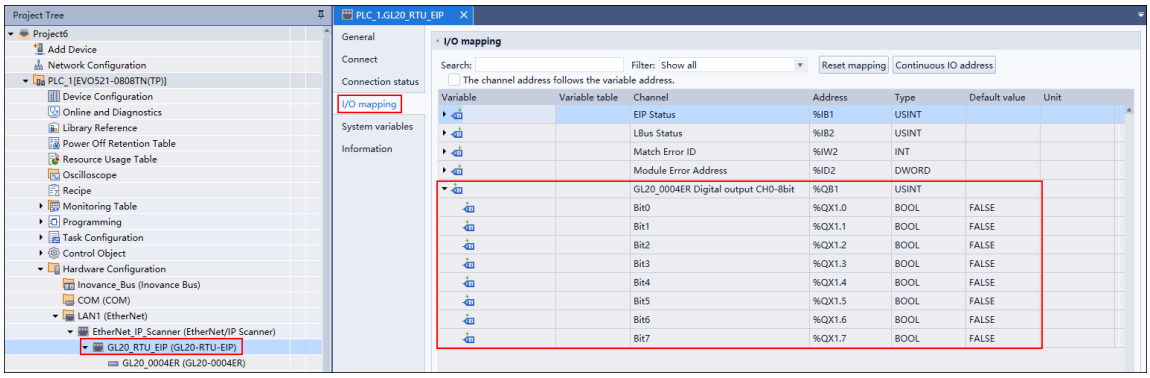
Double-click the "GL20-RTU-EIP" module, select the "I/O mapping" tab, and configure the I/O mapping variables of the module, as shown below.



Channel Name	Description
EIP Status	EIP connection status • 0: Reserved • 1: All connections are normal • 2: Partial connections are disconnected • 3: Connection status is changed
LBus Status	Local bus status • 0x01: Initialization • 0x02: Pre-operational • 0x04: Safe-operational • 0x08: Operational • 0x80: Local bus error
Match Error ID	Configuration match diagnostics • 0x1000: Expansion module not scanned. • 0x1003: Configuration module does not match the scanned module type.
Module Error Address	Faulty module address Each bit represents a slot, with bit0 corresponding to slot1, and so on. • 0: No diagnostic information • 1: Diagnostic information present

10.4.2.2 GL20-0004ER

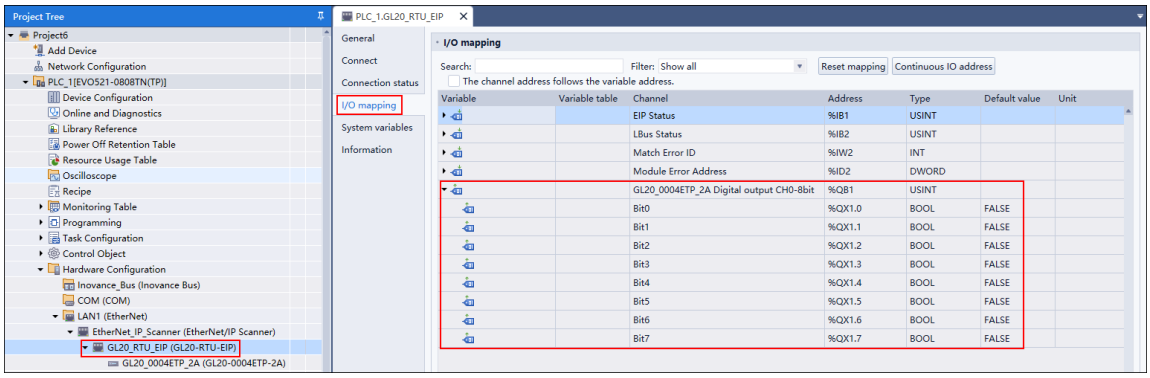
Double-click the "GL20-RTU-EIP" module, select the "I/O mapping" tab, and configure the I/O mapping variables, as shown below.



Channel Name	Description
GL20_0004ER digital output CH0-8bit	Indicates the output data of each channel in channel group 0. • FALSE: No output • TRUE: Normal output

10.4.2.3 GL20-0004ETP-2A

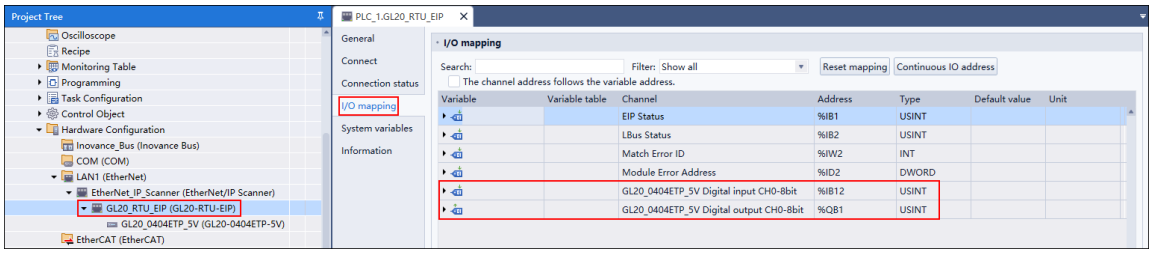
Double-click the "GL20-RTU-EIP" module, select the "I/O mapping" tab, and configure the I/O mapping variables, as shown below.



Channel Name	Description
GL20_0004ETP-2A digital output CH0-8bit	Indicates the output data of each channel in channel group 0. • FALSE: No output • TRUE: Normal output

10.4.2.4 GL20-0404ETP-5V

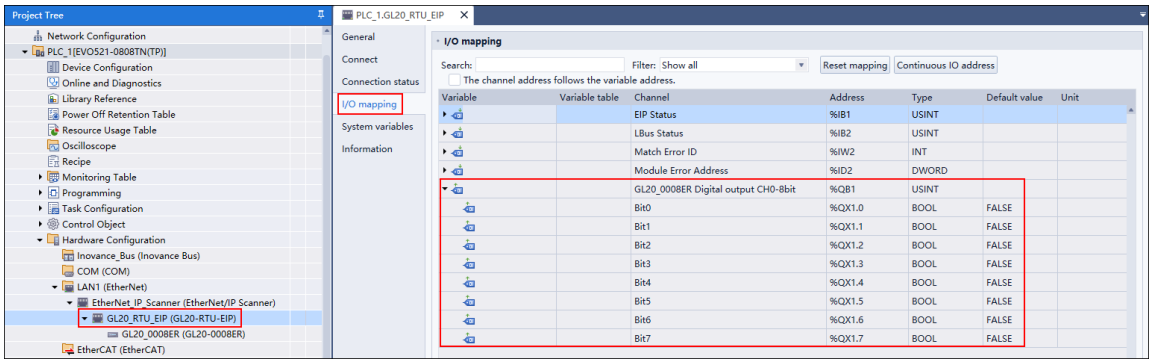
Double-click the "GL20-RTU-EIP" module, select the "I/O mapping" tab, and configure the I/O mapping variables, as shown below.



Channel Name	Description
GL20_0404ETP_5V digital input CH0-8bit	Indicates the input data of each channel in channel group 0. • FALSE: No input • TRUE: Normal input
GL20_0404ETP_5V digital output CH0-8bit	Indicates the output data of each channel in channel group 0. • FALSE: No output • TRUE: Normal output

10.4.2.5 GL20-0008ER

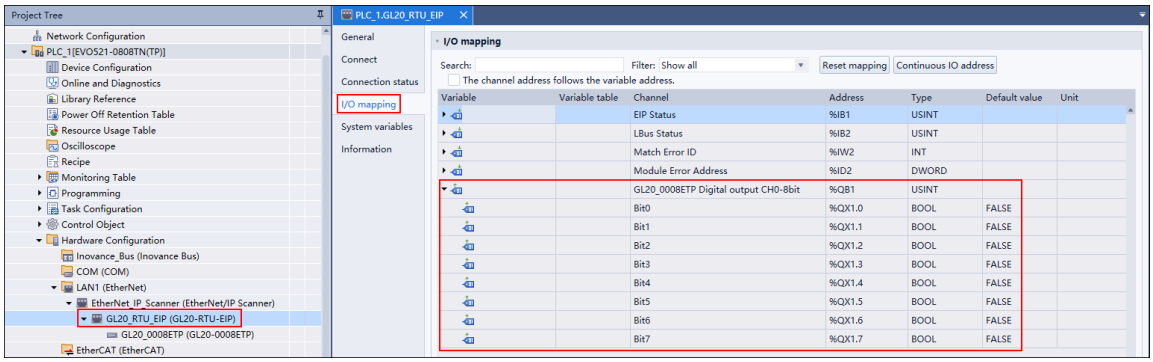
Double-click the "GL20-RTU-EIP" module, select the "I/O mapping" tab, and configure the I/O mapping variables, as shown below.



Channel Name	Description
GL20_0008ER digital output CH0-8bit	Indicates the output data of each channel in channel group 0. • FALSE: No output • TRUE: Normal output

10.4.2.6 GL20-0008ETP

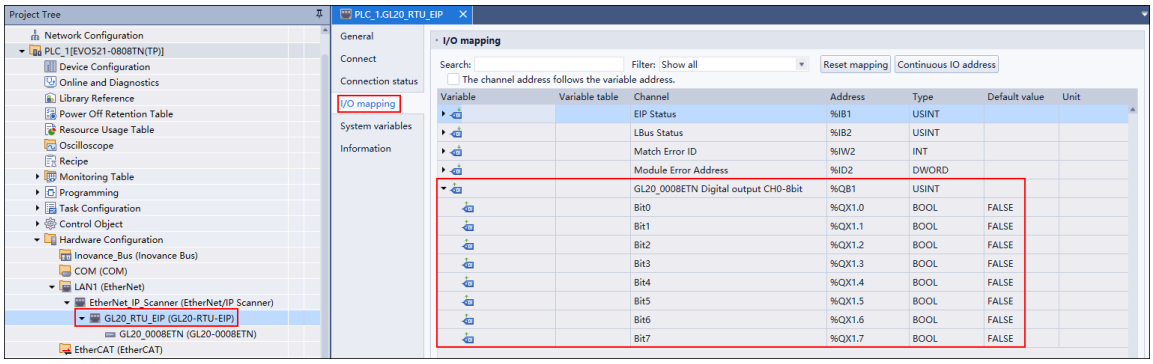
Double-click the "GL20-RTU-EIP" module, select the "I/O mapping" tab, and configure the I/O mapping variables, as shown below.



Channel Name	Description
GL20_0008ETP digital output CH0-8bit	Indicates the output data of each channel in channel group 0. • FALSE: No output • TRUE: Normal output

10.4.2.7 GL20-0008ETN

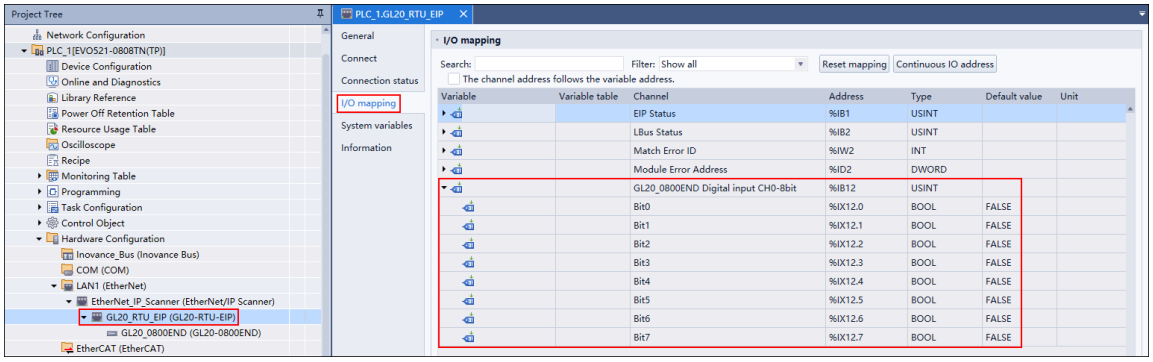
Double-click the "GL20-RTU-EIP" module, select the "I/O mapping" tab, and configure the I/O mapping variables, as shown below.



Channel Name	Description
GL20_0008ETN digital output CH0-8bit	Indicates the output data of each channel in channel group 0. • FALSE: No output • TRUE: Normal output

10.4.2.8 GL20-0800END

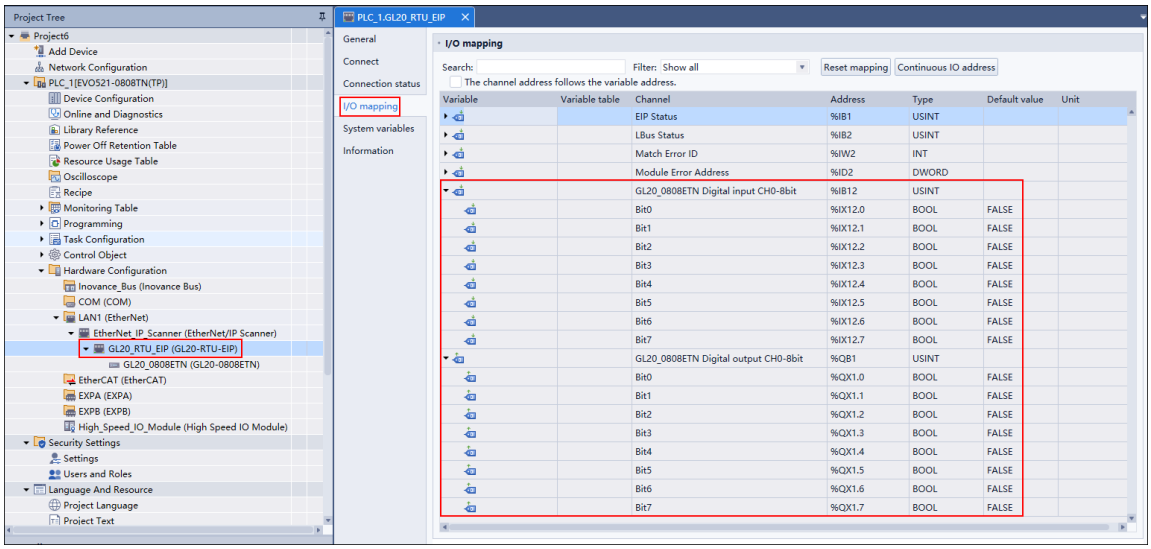
Double-click the "GL20-RTU-EIP" module, select the "I/O mapping" tab, and configure the I/O mapping variables, as shown below.



Channel Name	Description
GL20_0800END digital input CH0-8bit	Indicates the input data of each channel in channel group 0. • FALSE: No input • TRUE: Normal input

10.4.2.9 GL20-0808ETN

Double-click the "GL20-RTU-EIP" module, select the "I/O mapping" tab, and configure the I/O mapping variables, as shown below.



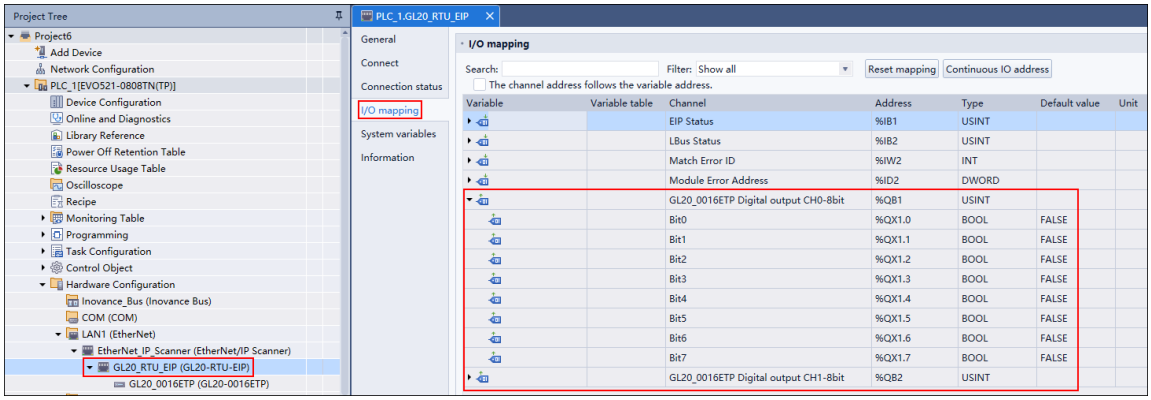
Channel Name	Description
GL20_0808ETN digital input CH0-8bit	Indicates the input data of each channel in channel group 0. • FALSE: No input • TRUE: Normal input
GL20_0808ETN digital output CH0-8bit	Indicates the output data of each channel in channel group 0. • FALSE: No output • TRUE: Normal output

Note

GL20-0808ETN module is a module featuring 8-channel digital input and 8-channel NPN transistor output, with channels grouped into two groups of eight channels each.

10.4.2.10 GL20-0016ETP

Double-click the "GL20-RTU-EIP" module, select the "I/O mapping" tab, and configure the I/O mapping variables, as shown below.



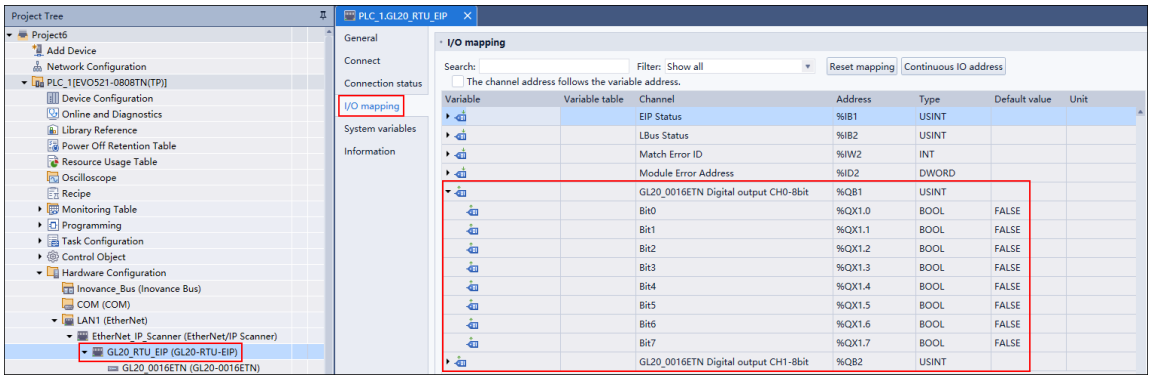
Channel Name	Description
GL20_0016ETP digital output CH0-8bit	Indicates the output data of each channel in channel group 0. • FALSE: No output • TRUE: Normal output
GL20_0016ETP digital output CH1-8bit	Indicates the output data of each channel in channel group 1. • FALSE: No output • TRUE: Normal output

Note

GL20-0016ETP is a 16-channel digital output module, with channels grouped into two groups of eight channels each.

10.4.2.11 GL20-0016ETN

Double-click the "GL20-RTU-EIP" module, select the "I/O mapping" tab, and configure the I/O mapping variables, as shown below.



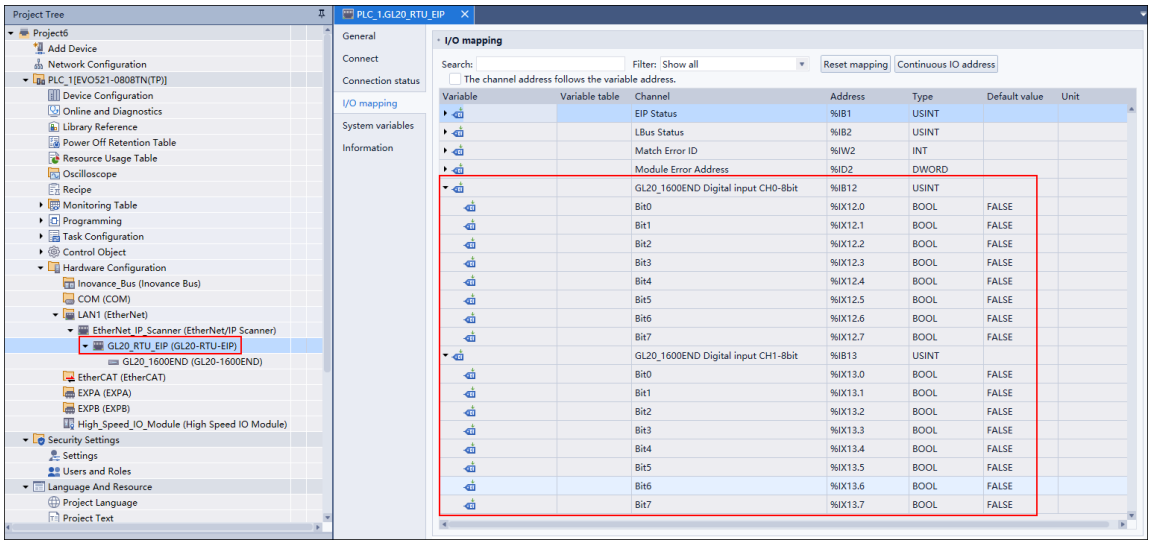
Channel Name	Description
GL20_0016ETN digital output CH0-8bit	Indicates the output data of each channel in channel group 0. • FALSE: No output • TRUE: Normal output
GL20_0016ETN digital output CH1-8bit	Indicates the output data of each channel in channel group 1. • FALSE: No output • TRUE: Normal output

Note

GL20-0016ETN is a 16-channel digital output module, with channels grouped into two groups of eight channels each.

10.4.2.12 GL20-1600END

Double-click the "GL20-RTU-EIP" module, select the "I/O mapping" tab, and configure the I/O mapping variables, as shown below.



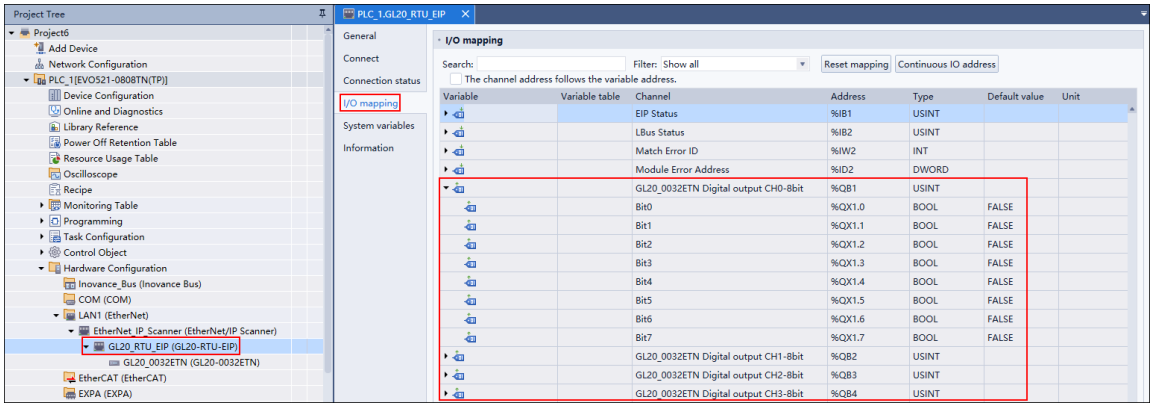
Channel Name	Description
GL20_1600END digital input CH0-8bit	Indicates the input data of each channel in channel group 0. • FALSE: No input • TRUE: Normal input
GL20_1600END digital input CH1-8bit	Indicates the input data of each channel in channel group 1. • FALSE: No input • TRUE: Normal input

Note

GL20-1600END is a 16-channel digital input module, with channels grouped into two groups of eight channels each.

10.4.2.13 GL20-0032ETN/GL20-0032ETN-M

Double-click the "GL20-RTU-EIP" module, select the "I/O mapping" tab, and configure the I/O mapping variables, as shown below.



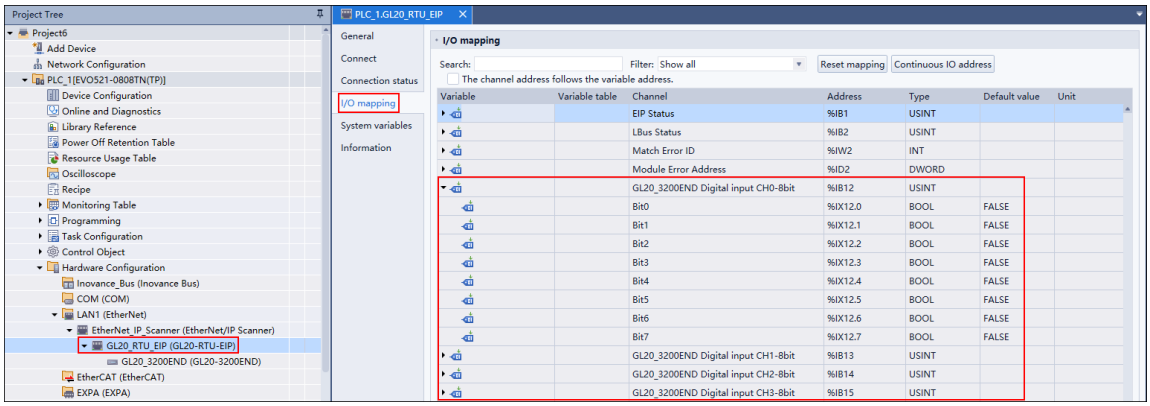
Channel Name	Description
GL20_0032ETN digital output CH0-8bit	Indicates the output data of each channel in channel group 0. • FALSE: No output • TRUE: Normal output
GL20_0032ETN digital output CH1-8bit	Indicates the output data of each channel in channel group 1. • FALSE: No output • TRUE: Normal output
GL20_0032ETN digital output CH2-8bit	Indicates the output data of each channel in channel group 2. • FALSE: No output • TRUE: Normal output
GL20_0032ETN digital output CH3-8bit	Indicates the output data of each channel in channel group 3. • FALSE: No output • TRUE: Normal output

Note

GL20-0032ETN and GL20-0032ETN-M are 32-channel digital output modules, with channels grouped into four groups of eight channels each.

10.4.2.14 GL20-3200END/GL20-3200END-M

Double-click the "GL20-RTU-EIP" module, select the "I/O mapping" tab, and configure the I/O mapping variables, as shown below.



Channel Name	Description
GL20_3200END digital input CH0-8bit	Indicates the input data of each channel in channel group 0. • FALSE: No input • TRUE: Normal input
GL20_3200END digital input CH1-8bit	Indicates the input data of each channel in channel group 1. • FALSE: No input • TRUE: Normal input

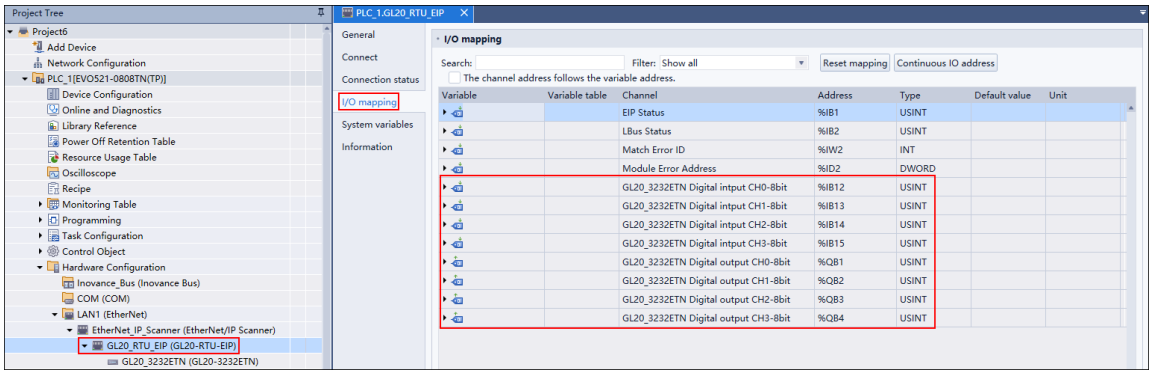
Channel Name	Description
GL20_3200END digital input CH2-8bit	Indicates the input data of each channel in channel group 2. • FALSE: No input • TRUE: Normal input
GL20_3200END digital input CH3-8bit	Indicates the input data of each channel in channel group 3. • FALSE: No input • TRUE: Normal input

Note

GL20-3200END and GL20-3200END-M are 32-channel digital input modules, with channels grouped into four groups of eight channels each.

10.4.2.15 GL20-3232ETN-M

Double-click the "GL20-RTU-EIP" module, select the "I/O mapping" tab, and configure the I/O mapping variables, as shown below.



Channel Name	Description
GL20_3232ETN digital input CH0-8bit	Indicates the input data of each channel in channel group 0. • FALSE: No input • TRUE: Normal input
GL20_3232ETN digital input CH1-8bit	Indicates the input data of each channel in channel group 1. • FALSE: No input • TRUE: Normal input
GL20_3232ETN digital input CH2-8bit	Indicates the input data of each channel in channel group 2. • FALSE: No input • TRUE: Normal input
GL20_3232ETN digital input CH3-8bit	Indicates the input data of each channel in channel group 3. • FALSE: No input • TRUE: Normal input

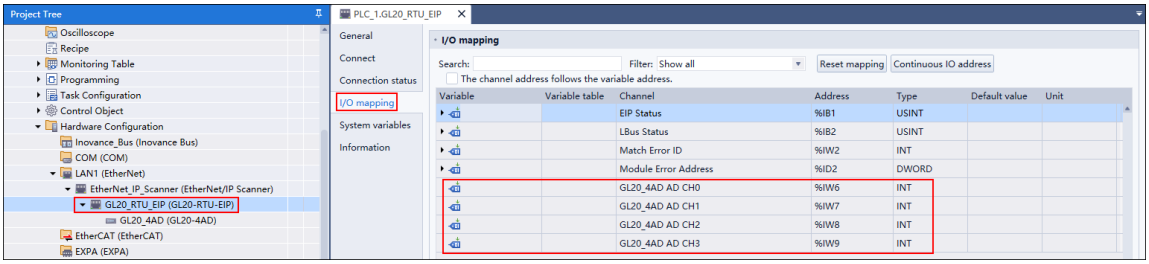
Channel Name	Description
GL20_3232ETN digital output CH0-8bit	Indicates the output data of each channel in channel group 0. • FALSE: No output • TRUE: Normal output
GL20_3232ETN digital output CH1-8bit	Indicates the output data of each channel in channel group 1. • FALSE: No output • TRUE: Normal output
GL20_3232ETN digital output CH2 -8bit	Indicates the output data of each channel in channel group 2. • FALSE: No output • TRUE: Normal output
GL20_3232ETN digital output CH3-8bit	Indicates the output data of each channel in channel group 3. • FALSE: No output • TRUE: Normal output

Note

GL20-3232ETN-M is a module featuring 32-channel digital input and 32-channel digital output, with channels grouped into eight groups of eight channels each.

10.4.2.16 GL20-4AD

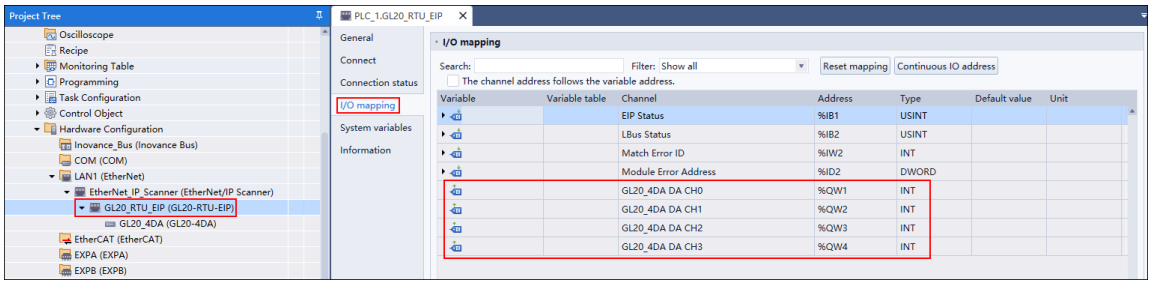
Double-click the "GL20-RTU-EIP" module, select the "I/O mapping" tab, and configure the I/O mapping variables, as shown below.



Channel Name	Description
GL20_4AD AD CH0 to CH3	Indicates the sampling data of channels 0 to 3.

10.4.2.17 GL20-4DA

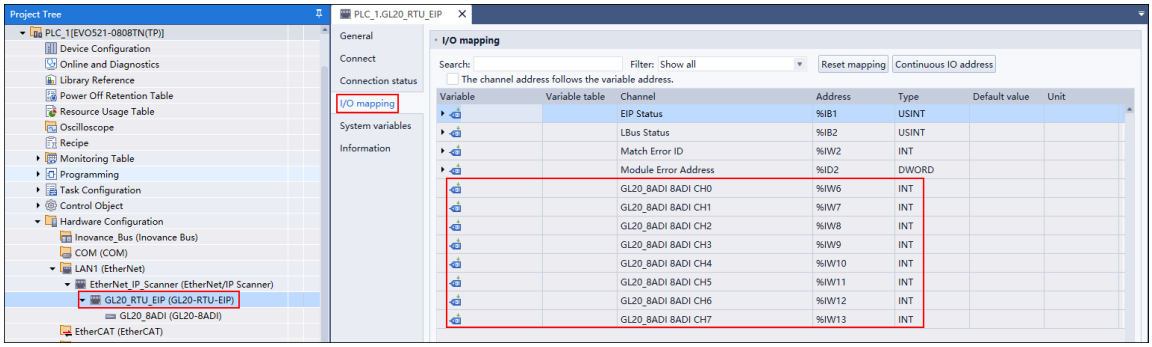
Double-click the "GL20-RTU-EIP" module, select the "I/O mapping" tab, and configure the I/O mapping variables, as shown below.



Channel Name	Description
GL20_4DA DA CH0 to CH3	Indicates the sampling data of channels 0 to 3.

10.4.2.18 GL20-8ADI

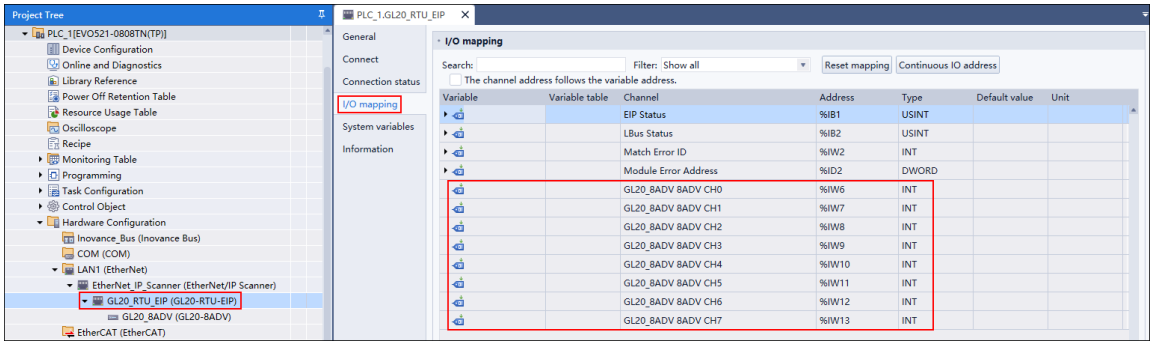
Double-click the "GL20-RTU-EIP" module, select the "I/O mapping" tab, and configure the I/O mapping variables, as shown below.



Channel Name	Description
GL20_8ADI 8ADI CH0 to CH7	Indicates the sampling data of channels 0 to 7.

10.4.2.19 GL20-8ADV

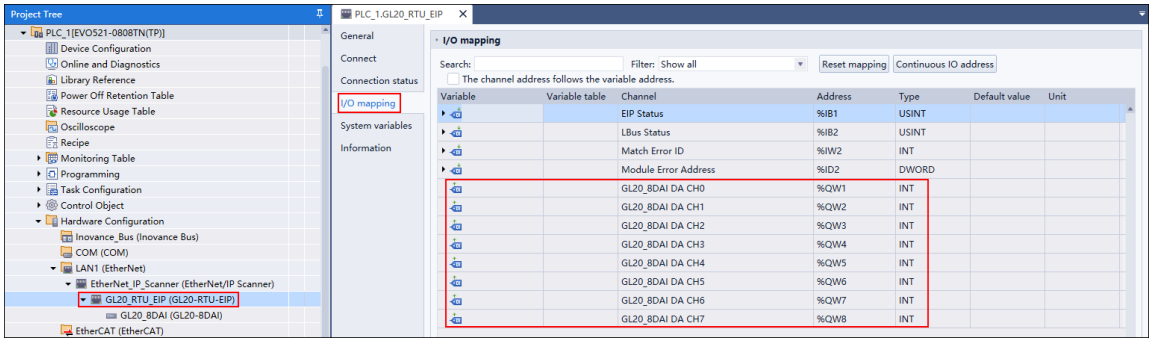
Double-click the "GL20-RTU-EIP" module, select the "I/O mapping" tab, and configure the I/O mapping variables, as shown below.



Channel Name	Description
GL20_8ADV 8ADV CH0 to CH7	Indicates the sampling data of channels 0 to 7.

10.4.2.20 GL20-8DAI

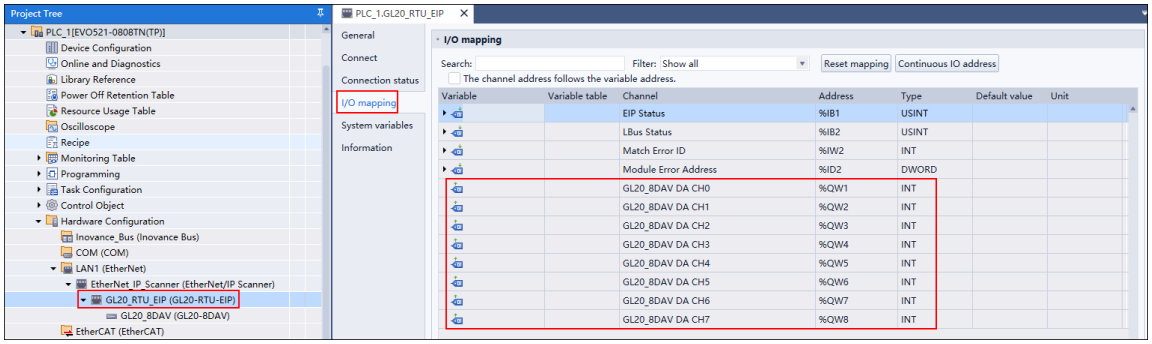
Double-click the "GL20-RTU-EIP" module, select the "I/O mapping" tab, and configure the I/O mapping variables, as shown below.



Channel Name	Description
GL20_8DAI 8DAI CH0 to CH7	Indicates the sampling data of channels 0 to 7.

10.4.2.21 GL20-8DAV

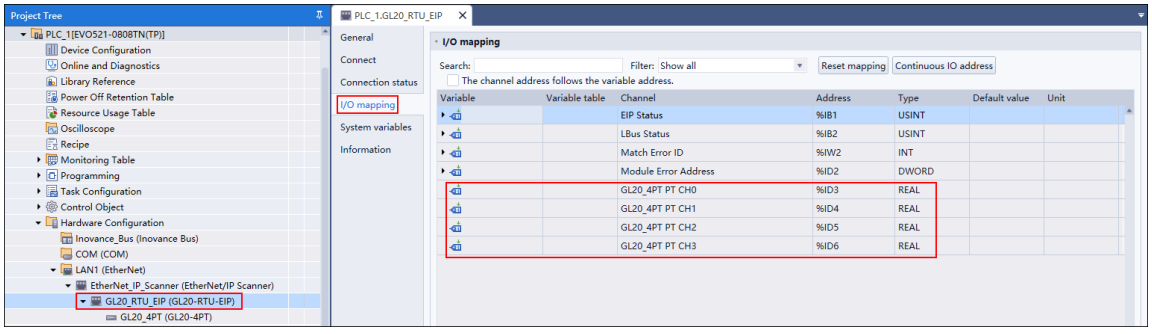
Double-click the "GL20-RTU-EIP" module, select the "I/O mapping" tab, and configure the I/O mapping variables, as shown below.



Channel Name	Description
GL20_8DAV 8DAV CH0 to CH7	Indicates the sampling data of channels 0 to 7.

10.4.2.22 GL20-4PT

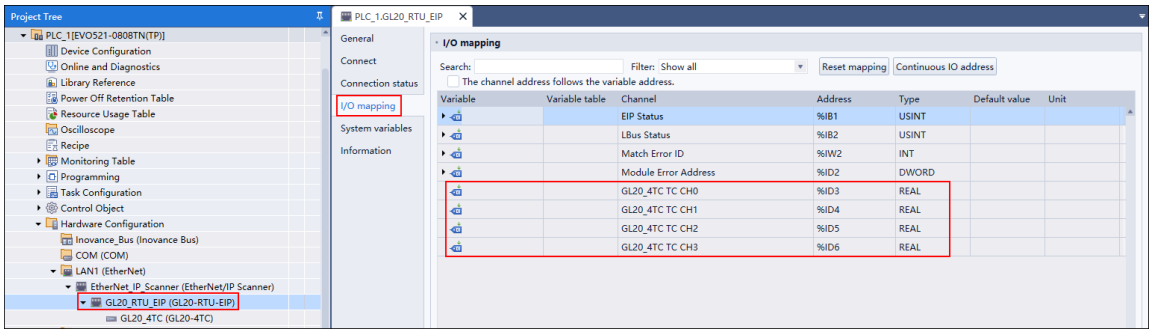
Double-click the "GL20-RTU-EIP" module, select the "I/O mapping" tab, and configure the I/O mapping variables, as shown below.



Channel Name	Description
GL20_4PT PT CH0 to CH3	Indicates the sampling data of channels 0 to 3.

10.4.2.23 GL20-4TC

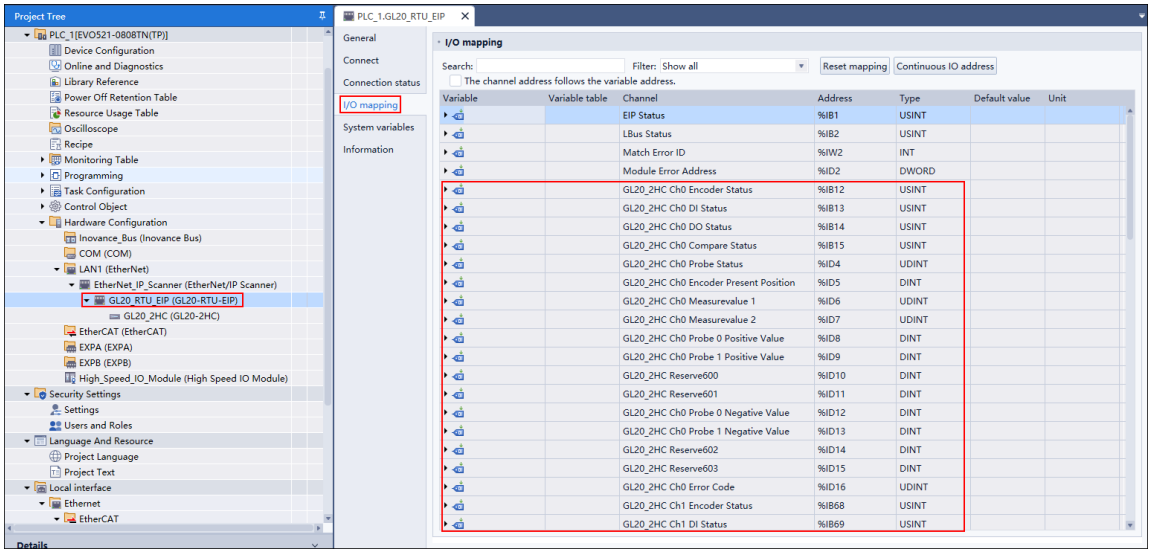
Double-click the "GL20-RTU-EIP" module, select the "I/O mapping" tab, and configure the I/O mapping variables, as shown below.



Channel Name	Description
GL20_4TC TC CH0 to CH3	Indicates the sampling data of channels 0 to 3.

10.4.2.24 GL20-2HC

Double-click the "GL20-RTU-EIP" module, select the "I/O mapping" tab, and configure the I/O mapping variables, as shown below.

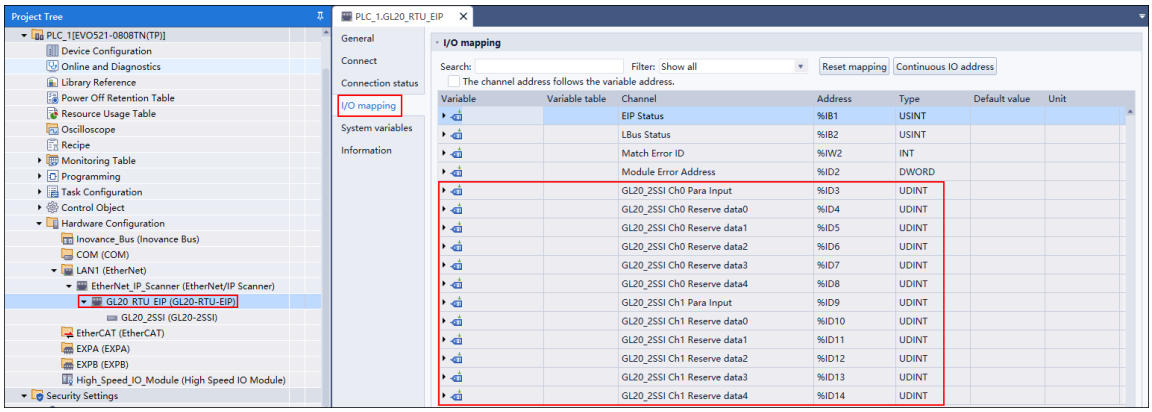


Channel Name	Description
GL20_2HC Ch0/Ch1 Encoder Status	Indicates the counter status of channel 0/1.
GL20_2HC Ch0/Ch1 DI Status	Indicates the digital input status of channel 0/1.
GL20_2HC Ch0/Ch1 DO Status	Indicates the digital output status of channel 0/1.
GL20_2HC Ch0/Ch1 Compare Status	Indicates the comparison function status of channel 0/1.

Channel Name	Description
GL20_2HC Ch0/Ch1 Probe Status	Indicates the touch probe status of channel 0/1.
GL20_2HC Ch0/Ch1 Encoder Present Position	Indicates the counter position value of channel 0/1.
GL20_2HC Ch0/Ch1 Measure value 1	Indicates the measured value 1 of channel 0/1.
GL20_2HC Ch0/Ch1 Measure value 2	Indicates the measured value 2 of channel 0/1.
GL20_2HC Ch0/Ch1 Probe 0 Positive Value	Indicates the latched value at rising edge for probe 0 of channel 0/1.
GL20_2HC Ch0/Ch1 Probe 1 Positive Value	Indicates the latched value at rising edge for probe 1 of channel 0/1.
GL20_2HC Reserved 600 to 603/610 to 613	Reserved
GL20_2HC Ch0/Ch1 Reserved 700 to 708	Reserved
GL20_2HC Ch0/Ch1 Probe 0 Negative Value	Indicates the latched value at falling edge for probe 0 of channel 0/1.
GL20_2HC Ch0/Ch1 Probe 1 Negative Value	Indicates the latched value at falling edge for probe 1 of channel 0/1.
GL20_2HC Ch0/Ch1 Error Code	Indicates the error code of channel 0/1.
GL20_2HC Ch0/Ch1 Encoder command value	Indicates the counter control command value of channel 0/1.
GL20_2HC Ch0/Ch1 DO Function command value	Indicates the digital output function command value of channel 0/1.
GL20_2HC Ch0/Ch1 Encoder preset value	Indicates the counter preset value for channel 0/1.
GL20_2HC Ch0/Ch1 Probe function command value	Indicates the touch probe command value of channel 0/1.
GL20_2HC Ch0/Ch1 Compare function command value	Indicates the comparison function command value of channel 0/1.
GL20_2HC Ch0/Ch1 Compare 0 command size/step	Indicates the comparison function 0 command count/step of channel 0/1.
GL20_2HC Ch0/Ch1 Compare 0 position value 1	Indicates the comparison function 0 position value 1 of channel 0/1.
GL20_2HC Ch0/Ch1 Compare 0 position value 2	Indicates the comparison function 0 position value 2 of channel 0/1.
GL20_2HC Ch0/Ch1 Compare Function command parameter	Indicates the comparison function control parameter of channel 0/1.

10.4.2.25 GL20-2SSI

Double-click the "GL20-RTU-EIP" module, select the "I/O mapping" tab, and configure the I/O mapping variables, as shown below.

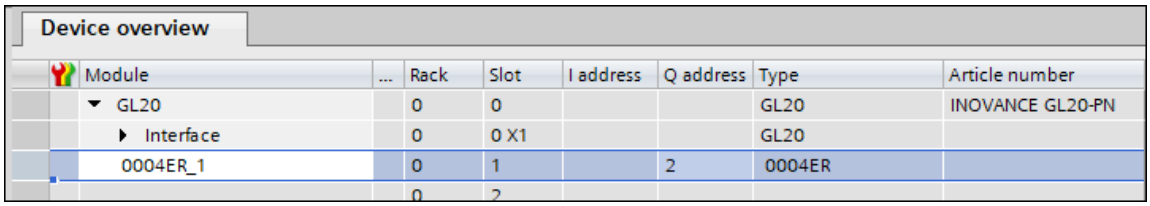


Channel Name	Description
GL20_2SSI Ch0 Para Input	Input value of channel 0
GL20_2SSI Ch0 Reserved data 0 to 4	Reserved
GL20_2SSI Ch1 Para Input	Input value of channel 1
GL20_2SSI Ch1 Reserved data 0 to 4	Reserved

10.4.3 GL20-RTU-PN

10.4.3.1 GL20-0004ER

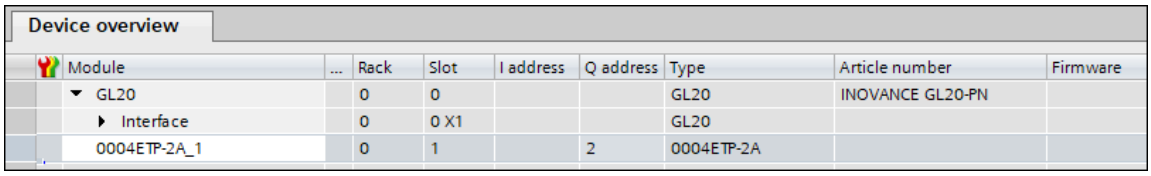
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Double-click the GL20-RTU-PN module in the network view to open the device view and assign the I address or Q address for the expansion module, as shown in the following figure.



Output PDO					
Address offset	bit0	bit1	bit2	bit3	bit4 to bit7
0	Channel 0	Channel 1	Channel 2	Channel 3	Invalid

10.4.3.2 GL20-0004ETP-2A

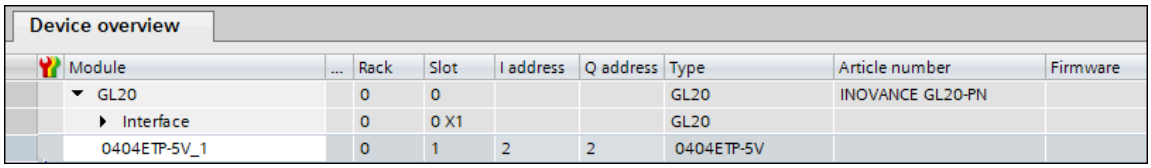
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Double-click the GL20-RTU-PN module in the network view to open the device view and assign the I address or Q address for the expansion module, as shown in the following figure.



Input PDO data volume								
Address offset	bit0	bit1	bit2	bit3	bit4	bit5	bit6	bit7
0	Channel 0	Channel 1	Channel 2	Channel 3	Reserved	Reserved	Reserved	Reserved

10.4.3.3 GL20-0404ETP-5V

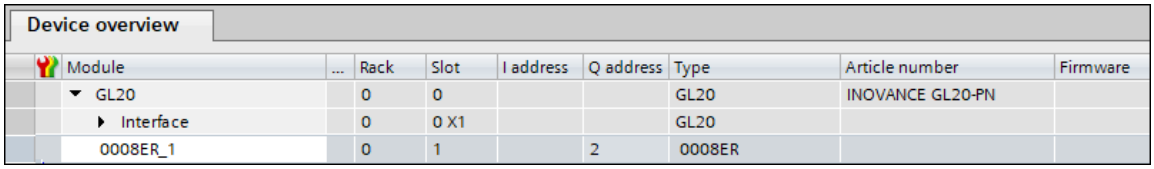
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Double-click the GL20-RTU-PN module in the network view to open the device view and assign the I address or Q address for the expansion module, as shown in the following figure.



Input PDO data volume					
Address offset	bit0	bit1	bit2	bit3	bit4 to bit7
0	Channel 0	Channel 1	Channel 2	Channel 3	Invalid
Output PDO					
Address offset	bit0	bit1	bit2	bit3	bit4 to bit7
0	Channel 0	Channel 1	Channel 2	Channel 3	Invalid

10.4.3.4 GL20-0008ER

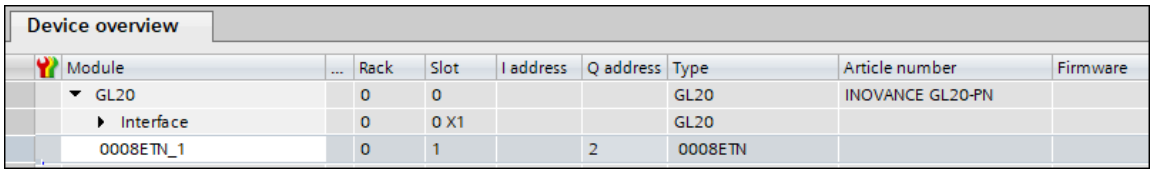
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Double-click the GL20-RTU-PN module in the network view to open the device view and assign the I address or Q address for the expansion module, as shown in the following figure.



Input PDO data volume								
Address offset	bit0	bit1	bit2	bit3	bit4	bit5	bit6	bit7
0	Channel 0	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6	Channel 7

10.4.3.5 GL20-0008ETN

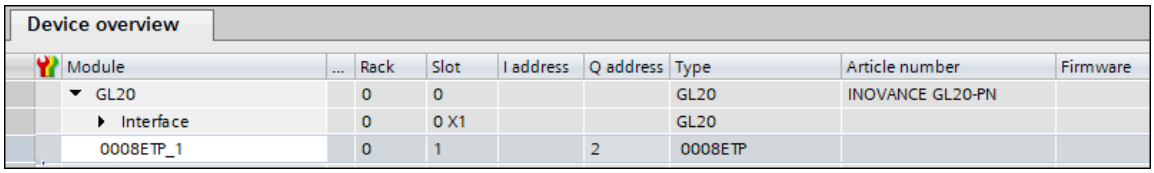
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Double-click the GL20-RTU-PN module in the network view to open the device view and assign the I address or Q address for the expansion module, as shown in the following figure.



Output PDO								
Address offset	bit0	bit1	bit2	bit3	bit4	bit5	bit6	bit7
0	Channel 0	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6	Channel 7

10.4.3.6 GL20-0008ETP

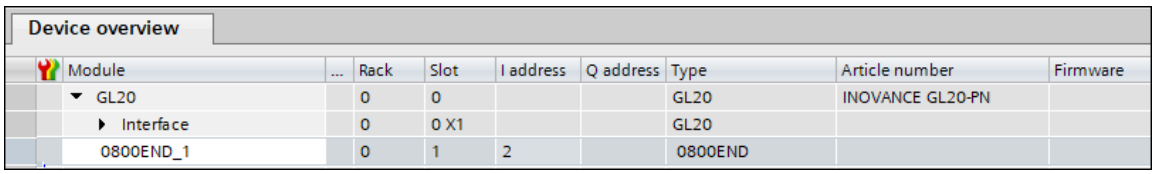
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Double-click the GL20-RTU-PN module in the network view to open the device view and assign the I address or Q address for the expansion module, as shown in the following figure.



Output PDO								
Address offset	bit0	bit1	bit2	bit3	bit4	bit5	bit6	bit7
0	Channel 0	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6	Channel 7

10.4.3.7 GL20-0800END

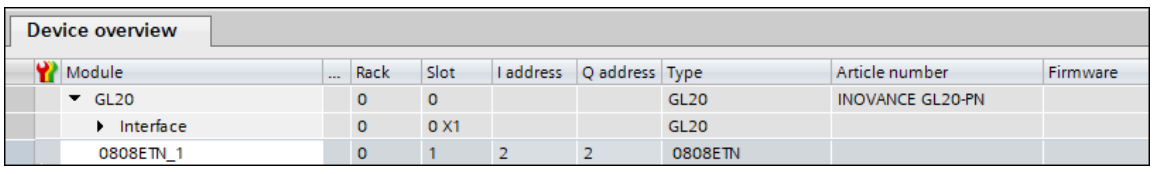
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Double-click the GL20-RTU-PN module in the network view to open the device view and assign the I address or Q address for the expansion module, as shown in the following figure.



Input PDO data volume								
Address offset	bit0	bit1	bit2	bit3	bit4	bit5	bit6	bit7
0	Channel 0	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6	Channel 7

10.4.3.8 GL20-0808ETN

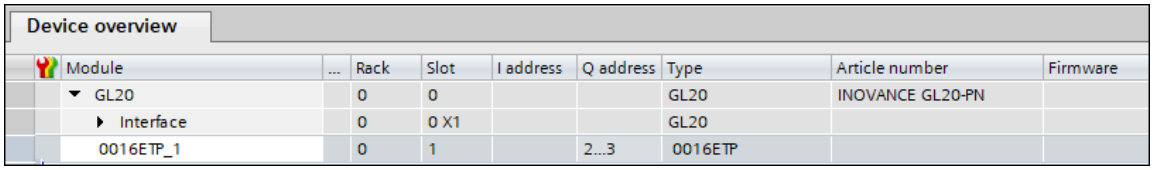
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Double-click the GL20-RTU-PN module in the network view to open the device view and assign the I address or Q address for the expansion module, as shown in the following figure.



Input PDO data volume								
Address offset	bit0	bit1	bit2	bit3	bit4	bit5	bit6	bit7
0	Channel 0	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6	Channel 7
Output PDO								
Address offset	bit0	bit1	bit2	bit3	bit4	bit5	bit6	bit7
0	Channel 0	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6	Channel 7

10.4.3.9 GL20-0016ETP

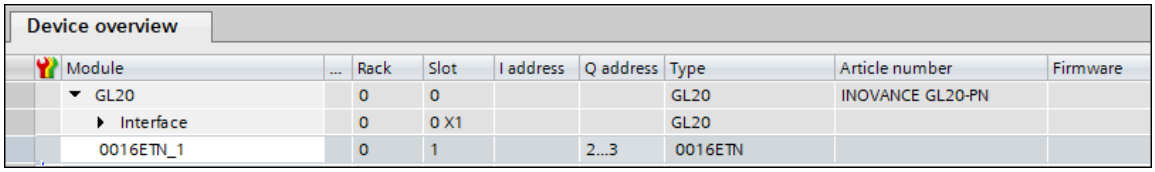
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Double-click the GL20-RTU-PN module in the network view to open the device view and assign the I address or Q address for the expansion module, as shown in the following figure.



Input PDO data volume								
Address offset	bit0	bit1	bit2	bit3	bit4	bit5	bit6	bit7
0	Channel 0	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6	Channel 7
1	Channel 8	Channel 9	Channel 10	Channel 11	Channel 12	Channel 13	Channel 14	Channel 15

10.4.3.10 GL20-0016ETN

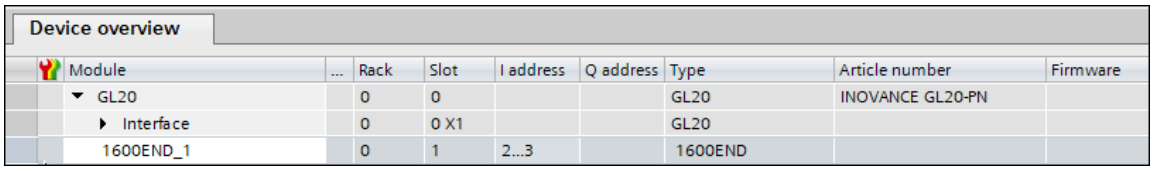
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Double-click the GL20-RTU-PN module in the network view to open the device view and assign the I address or Q address for the expansion module, as shown in the following figure.



Input PDO data volume								
Address offset	bit0	bit1	bit2	bit3	bit4	bit5	bit6	bit7
0	Channel 0	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6	Channel 7
1	Channel 8	Channel 9	Channel 10	Channel 11	Channel 12	Channel 13	Channel 14	Channel 15

10.4.3.11 GL20-1600END

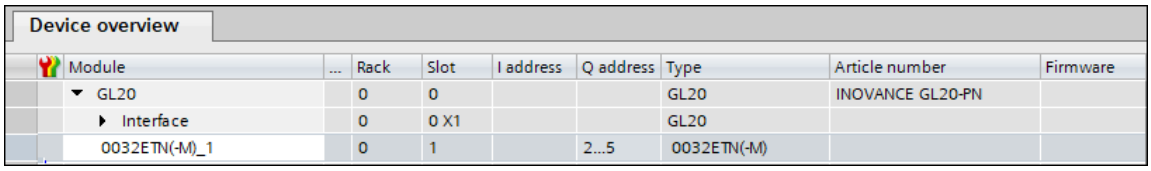
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Double-click the GL20-RTU-PN module in the network view to open the device view and assign the I address or Q address for the expansion module, as shown in the following figure.



Input PDO data volume								
Address offset	bit0	bit1	bit2	bit3	bit4	bit5	bit6	bit7
0	Channel 0	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6	Channel 7
1	Channel 8	Channel 9	Channel 10	Channel 11	Channel 12	Channel 13	Channel 14	Channel 15

10.4.3.12 GL20-0032ETN/GL20-0032ETN-M

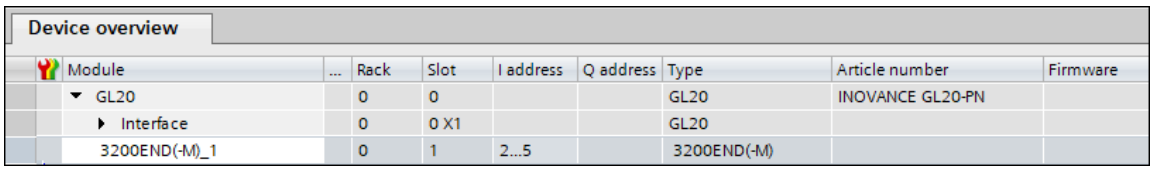
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Double-click the GL20-RTU-PN module in the network view to open the device view and assign the I address or Q address for the expansion module, as shown in the following figure.



Input PDO data volume								
Address offset	bit0	bit1	bit2	bit3	bit4	bit5	bit6	bit7
0	Channel 0	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6	Channel 7
1	Channel 8	Channel 9	Channel 10	Channel 11	Channel 12	Channel 13	Channel 14	Channel 15
2	Channel 16	Channel 17	Channel 18	Channel 19	Channel 20	Channel 21	Channel 22	Channel 23
3	Channel 24	Channel 25	Channel 26	Channel 27	Channel 28	Channel 29	Channel 30	Channel 31

10.4.3.13 GL20-3200END/GL20-3200END-M

In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Double-click the GL20-RTU-PN module in the network view to open the device view and assign the I address or Q address for the expansion module, as shown in the following figure.

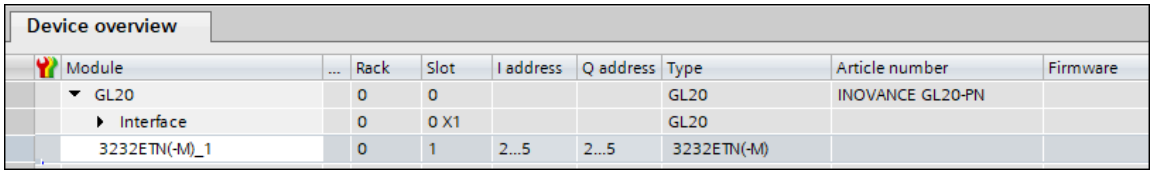


Input PDO data volume								
Address offset	bit0	bit1	bit2	bit3	bit4	bit5	bit6	bit7
0	Channel 0	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6	Channel 7
1	Channel 8	Channel 9	Channel 10	Channel 11	Channel 12	Channel 13	Channel 14	Channel 15

Input PDO data volume								
2	Channel 16	Channel 17	Channel 18	Channel 19	Channel 20	Channel 21	Channel 22	Channel 23
3	Channel 24	Channel 25	Channel 26	Channel 27	Channel 28	Channel 29	Channel 30	Channel 31

10.4.3.14 GL20-3232ETN-M

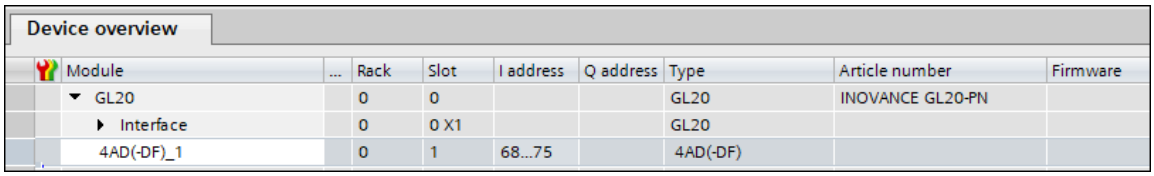
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Double-click the GL20-RTU-PN module in the network view to open the device view and assign the I address or Q address for the expansion module, as shown in the following figure.



Input PDO data volume								
Address offset	bit0	bit1	bit2	bit3	bit4	bit5	bit6	bit7
0	Channel 0	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6	Channel 7
1	Channel 8	Channel 9	Channel 10	Channel 11	Channel 12	Channel 13	Channel 14	Channel 15
2	Channel 16	Channel 17	Channel 18	Channel 19	Channel 20	Channel 21	Channel 22	Channel 23
3	Channel 24	Channel 25	Channel 26	Channel 27	Channel 28	Channel 29	Channel 30	Channel 31
Output PDO								
Address offset	bit0	bit1	bit2	bit3	bit4	bit5	bit6	bit7
0	Channel 0	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6	Channel 7
1	Channel 8	Channel 9	Channel 10	Channel 11	Channel 12	Channel 13	Channel 14	Channel 15
2	Channel 16	Channel 17	Channel 18	Channel 19	Channel 20	Channel 21	Channel 22	Channel 23
3	Channel 24	Channel 25	Channel 26	Channel 27	Channel 28	Channel 29	Channel 30	Channel 31

10.4.3.15 GL20-4AD

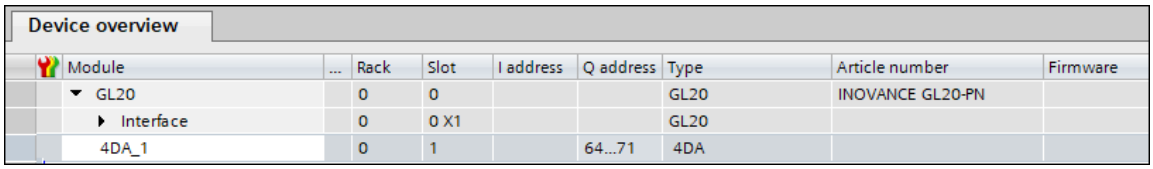
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Double-click the GL20-RTU-PN module in the network view to open the device view and assign the I address or Q address for the expansion module, as shown in the following figure.



Input PDO data volume			
Address offset	Channel	Data Type	Remarks
0 to 1	Channel 0	INT	Retains one decimal place.
2 to 3	Channel 1	INT	Retains one decimal place.
4 to 5	Channel 2	INT	Retains one decimal place.
6 to 7	Channel 3	INT	Retains one decimal place.

10.4.3.16 GL20-4DA

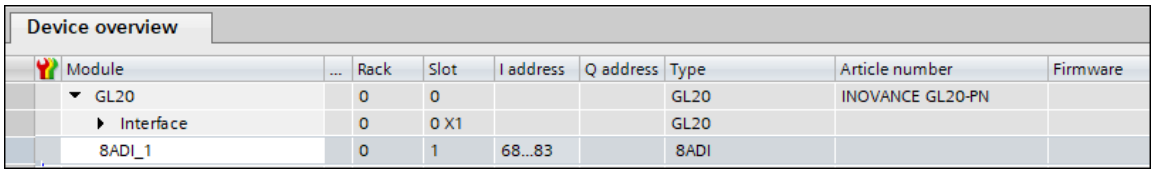
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Double-click the GL20-RTU-PN module in the network view to open the device view and assign the I address or Q address for the expansion module, as shown in the following figure.



Input PDO data volume			
Address offset	Channel	Data Type	Remarks
0 to 1	Channel 0	INT	Retains one decimal place.
2 to 3	Channel 1	INT	Retains one decimal place.
4 to 5	Channel 2	INT	Retains one decimal place.
6 to 7	Channel 3	INT	Retains one decimal place.

10.4.3.17 GL20-8ADI

In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Double-click the GL20-RTU-PN module in the network view to open the device view and assign the I address or Q address for the expansion module, as shown in the following figure.

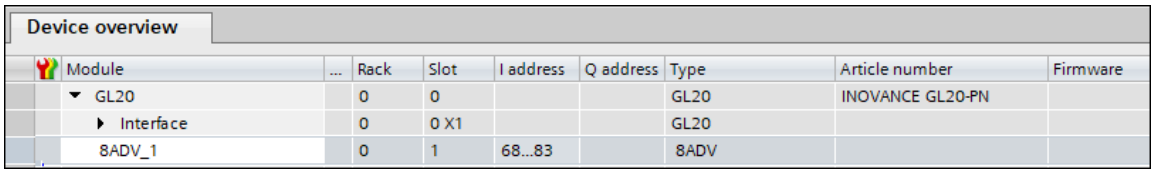


Input PDO data volume			
Address offset	Channel	Data Type	Remarks
0 to 1	Channel 0	INT	Retains one decimal place.
2 to 3	Channel 1	INT	Retains one decimal place.

Input PDO data volume			
Address offset	Channel	Data Type	Remarks
4 to 5	Channel 2	INT	Retains one decimal place.
6 to 7	Channel 3	INT	Retains one decimal place.
8 to 9	Channel 4	INT	Retains one decimal place.
10 to 11	Channel 5	INT	Retains one decimal place.
12 to 13	Channel 6	INT	Retains one decimal place.
14 to 15	Channel 7	INT	Retains one decimal place.

10.4.3.18 GL20-8ADV

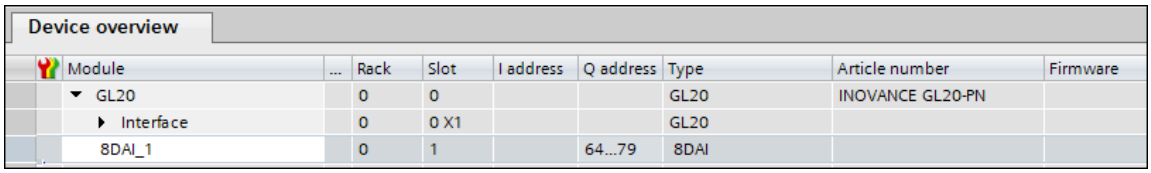
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Double-click the GL20-RTU-PN module in the network view to open the device view and assign the I address or Q address for the expansion module, as shown in the following figure.



Input PDO data volume			
Address offset	Channel	Data Type	Remarks
0 to 1	Channel 0	INT	Retains one decimal place.
2 to 3	Channel 1	INT	Retains one decimal place.
4 to 5	Channel 2	INT	Retains one decimal place.
6 to 7	Channel 3	INT	Retains one decimal place.
8 to 9	Channel 4	INT	Retains one decimal place.
10 to 11	Channel 5	INT	Retains one decimal place.
12 to 13	Channel 6	INT	Retains one decimal place.
14 to 15	Channel 7	INT	Retains one decimal place.

10.4.3.19 GL20-8DAI

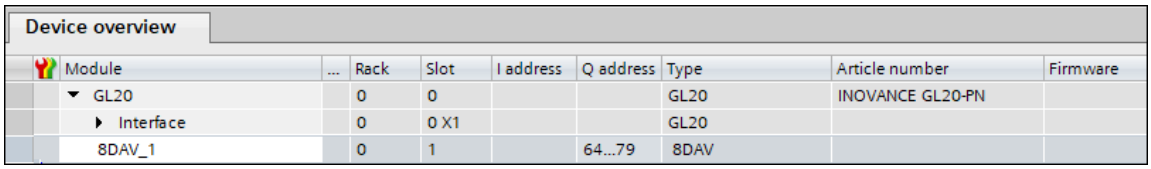
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Double-click the GL20-RTU-PN module in the network view to open the device view and assign the I address or Q address for the expansion module, as shown in the following figure.



Input PDO data volume			
Address offset	Channel	Data Type	Remarks
0 to 1	Channel 0	INT	Retains one decimal place.
2 to 3	Channel 1	INT	Retains one decimal place.
4 to 5	Channel 2	INT	Retains one decimal place.
6 to 7	Channel 3	INT	Retains one decimal place.
8 to 9	Channel 4	INT	Retains one decimal place.
10 to 11	Channel 5	INT	Retains one decimal place.
12 to 13	Channel 6	INT	Retains one decimal place.
14 to 15	Channel 7	INT	Retains one decimal place.

10.4.3.20 GL20-8DAV

In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Double-click the GL20-RTU-PN module in the network view to open the device view and assign the I address or Q address for the expansion module, as shown in the following figure.

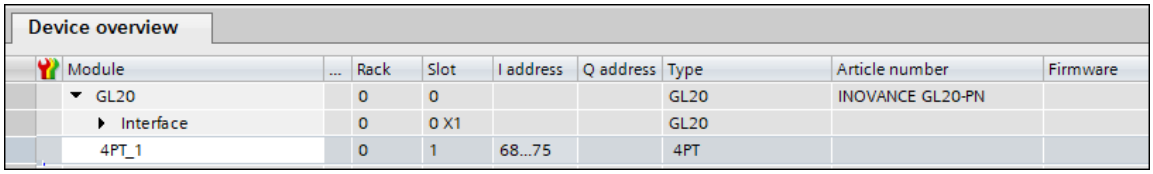


Input PDO data volume			
Address offset	Channel	Data Type	Remarks
0 to 1	Channel 0	INT	Retains one decimal place.
2 to 3	Channel 1	INT	Retains one decimal place.
4 to 5	Channel 2	INT	Retains one decimal place.
6 to 7	Channel 3	INT	Retains one decimal place.
8 to 9	Channel 4	INT	Retains one decimal place.
10 to 11	Channel 5	INT	Retains one decimal place.

Input PDO data volume			
Address offset	Channel	Data Type	Remarks
12 to 13	Channel 6	INT	Retains one decimal place.
14 to 15	Channel 7	INT	Retains one decimal place.

10.4.3.21 GL20-4PT

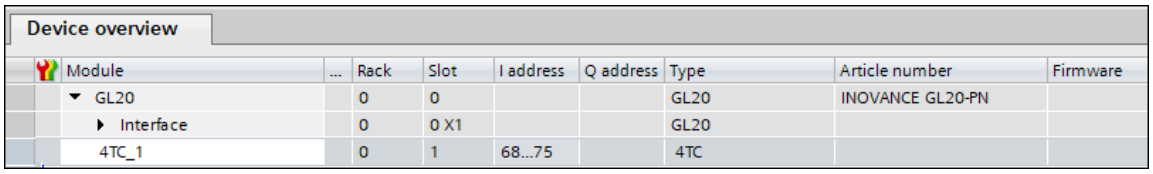
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Double-click the GL20-RTU-PN module in the network view to open the device view and assign the I address or Q address for the expansion module, as shown in the following figure.



Input PDO data volume			
Address offset	Channel	Data Type	Remarks
0 to 1	Channel 0	INT	Retains one decimal place.
2 to 3	Channel 1	INT	Retains one decimal place.
4 to 5	Channel 2	INT	Retains one decimal place.
6 to 7	Channel 3	INT	Retains one decimal place.

10.4.3.22 GL20-4TC

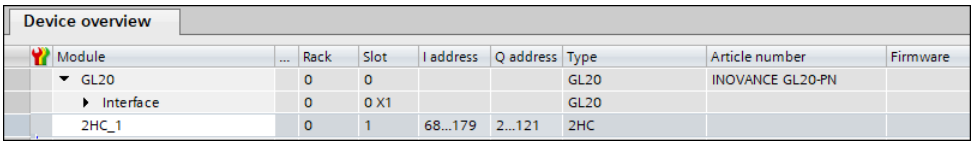
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Double-click the GL20-RTU-PN module in the network view to open the device view and assign the I address or Q address for the expansion module, as shown in the following figure.



Input PDO data volume			
Address offset	Channel	Data Type	Remarks
0 to 1	Channel 0	INT	Retains one decimal place.
2 to 3	Channel 1	INT	Retains one decimal place.
4 to 5	Channel 2	INT	Retains one decimal place.
6 to 7	Channel 3	INT	Retains one decimal place.

10.4.3.23 GL20-2HC

In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Double-click the GL20-RTU-PN module in the network view to open the device view and assign the I address or Q address for the expansion module, as shown in the following figure.



When the GL20-2HC module is used with the GL20-RTU-PN coupler, the process data of the module is accessed in the form of the first address plus the offset address. The offset address of the process data for different slots is the same. The first address is assigned automatically or manually in the TIA Portal software. For offset addresses, see the following table.

Input PDO Parameters				
Offset address	Data type	Description	Access type	Definition
0	USINT	CH0 Encoder status	RO	600nh.1
1	USINT	CH0 DI status	RO	600nh.2
2	USINT	CH0 DO status	RO	600nh.3
3	USINT	CH0 Compare status	RO	600nh.4
4 to 7	UDINT	CH0 Probe status	RO	600nh.5
8 to 11	DINT	CH0 Encoder present position	RO	600nh.6
12 to 15	UDINT	CH0 Measure value 1	RO	600nh.7
16 to 19	UDINT	CH0 Measure value 2	RO	600nh.8
20 to 23	DINT	CH0 Probe 0 positive value	RO	600nh.9
24 to 27	DINT	CH0 Probe 1 positive value	RO	600nh.10
28 to 35	DINT	Reserve	-	-
36 to 39	DINT	CH0 Probe 0 negative value	RO	600nh.13
40 to 43	DINT	CH0 Probe 1 negative value	RO	600nh.14
44 to 51	DINT	Reserve	-	-
52 to 55	UDINT	CH0 Error code	RO	600nh.17
56	USINT	CH1 Encoder status	RO	600nh.1
57	USINT	CH1 DI status	RO	600nh.2
58	USINT	CH1 DO status	RO	600nh.3
59	USINT	CH1 Compare status	RO	600nh.4
60 to 63	UDINT	CH1 Probe status	RO	600nh.5
64 to 67	DINT	CH1 Encoder present position	RO	600nh.6
68 to 71	UDINT	CH1 Measure value 1	RO	600nh.7
72 to 75	UDINT	CH1 Measure value 2	RO	600nh.8
76 to 79	DINT	CH1 Probe 0 positive value	RO	600nh.9
80 to 83	DINT	CH1 Probe 1 positive value	RO	600nh.10
84 to 91	DINT	Reserve	-	-
92 to 95	DINT	CH1 Probe 0 negative value	RO	600nh.13
96 to 99	DINT	CH1 Probe 1 negative value	RO	600nh.14
100 to 107	DINT	Reserve	-	-
108 to 111	UDINT	CH1 Error code	RO	600nh.17

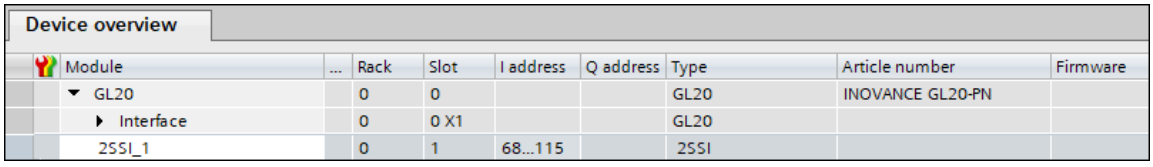
Output PDO Parameters				
Offset address	Data type	Description	Access type	Definition
0 to 1	UINT	CH0 Encoder command value	RW	700nh.1
2 to 3	UINT	CH0 DO function command value	RW	700nh.2
4 to 7	DINT	CH0 Encoder preset value	RW	700nh.3
8 to 11	UDINT	CH0 Probe function command value	RW	700nh.4
12 to 15	UDINT	CH0 Compare function command value	RW	700nh.5
16 to 17	INT	CH0 Compare 0 command size/step	RW	700nh.6
18 to 23	INT	Reserve	-	-
24 to 27	DINT	CH0 Compare 0 position value 1	RW	700nh.10
28 to 39	DINT	Reserve	-	-
40 to 43	DINT	CH0 Compare 0 position value 2	RW	700nh.14
44 to 55	DINT	Reserve	-	-
56 to 59	UDINT	CH0 Compare command parameter	RW	700nh.18
60 to 61	UINT	CH1 Encoder command value	RW	700nh.1
62 to 63	UINT	CH1 DO function command value	RW	700nh.2
64 to 67	DINT	CH1 Encoder preset value	RW	700nh.3
68 to 71	UDINT	CH1 Probe function command value	RW	700nh.4
72 to 75	UDINT	CH1 Compare function command value	RW	700nh.5
76 to 77	INT	CH1 Compare 0 command size/step	RW	700nh.6
78 to 83	INT	Reserve	-	-
84 to 87	DINT	CH1 Compare 0 position value 1	RW	700nh.10
88 to 99	DINT	Reserve	-	-
100 to 103	DINT	CH1 Compare 0 position value 2	RW	700nh.14
104 to 115	DINT	Reserve	-	-
116 to 119	UDINT	CH1 Compare command parameter	RW	700nh.18

Note

For details about input/output PDO parameters, see "Appendix 1: Parameter Description" in the GL20-2HC Two-Channel High-Speed Counter Module User Guide.

10.4.3.24 GL20-2SSI

In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Double-click the GL20-RTU-PN module in the network view to open the device view and assign the I address or Q address for the expansion module, as shown in the following figure.

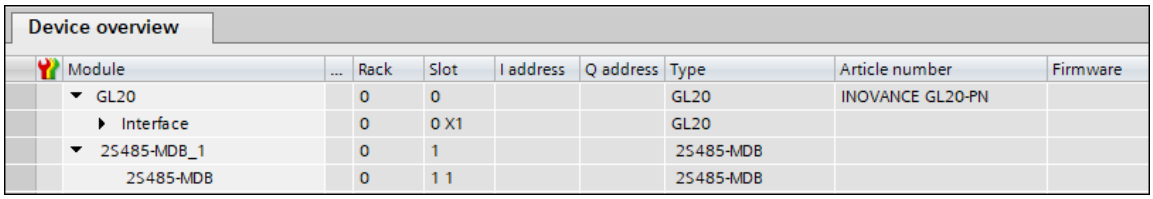


Input PDO data volume		
Address offset	Channel	Data type
0 to 3	Channel 0	DINT
4 to 7	Reserved	DINT
8 to 11	Reserved	DINT
12 to 15	Reserved	DINT
16 to 19	Reserved	DINT

Input PDO data volume		
Address offset	Channel	Data type
20 to 23	Reserved	DINT
24 to 27	Channel 1	DINT
28 to 31	Reserved	DINT
32 to 35	Reserved	DINT
36 to 39	Reserved	DINT
40 to 43	Reserved	DINT
44 to 47	Reserved	DINT

10.4.3.25 GL20-2S485-MDB

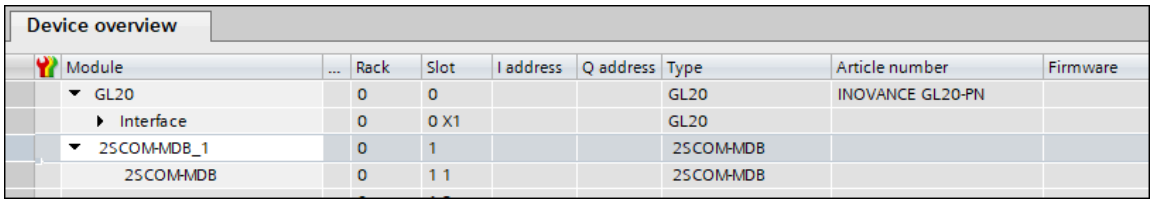
In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Double-click the GL20-RTU-PN module in the network view to open the device view and assign the I address or Q address for the expansion module, as shown in the following figure.



The data type of the module process data is related to the type of the added virtual submodule. For details, see the process data of the related submodule.

10.4.3.26 GL20-2SCOM-MDB

In the TIA Portal, configure the GL20-RTU-PN module and the expansion module. Double-click the GL20-RTU-PN module in the network view to open the device view and assign the I address or Q address for the expansion module, as shown in the following figure.



The data type of the module process data is related to the type of the added virtual submodule. For details, see the process data of the related submodule.

10.5 List of Fault Codes

10.5.1 Expansion Module Fault Codes

The fault codes of the GL20 series expansion modules are listed in the table below.

Fault Code	Description	Solution
Communication Protocol Conversion Module Fault		
0x1000	The number of scanned expansion modules is 0.	1 .Check that the module is installed properly and supplied with power. 2 .Check the contact of the communication interface of the expansion module or restart the rack.
0x1001	The number of I/O modules configured is more than the number of I/O modules actually scanned.	1 .Check the number and installation sequence of expansion modules. 2 .Check the contact of the communication interface of the expansion module or restart the rack.
0x1002	The number of I/O modules configured is less than the number of I/O modules actually scanned.	
0x1003	The type of I/O modules configured is inconsistent with that of the I/O modules actually scanned.	
0x1004	The I/O module is not configured successfully.	Check the contact of the communication interface of the expansion module or restart the rack.
0x1005	Switching I/O module status failed	
0x1006	The I/O module is offline.	1 .Check whether the module in the corresponding slot is powered off or removed. 2 .Check the contact of the communication interface of the expansion module or restart the rack.
Module Application Parameter Configuration Fault		
0x2003	The 2SCOM-MDB/2S485-MDB module is placed in a wrong slot.	Place the module in the first four slots.
0x2004	The number of submodules for serial port 0/1 of the 2SCOM-MDB/2S485-MDB module exceeds 31.	Reduce the number of submodules for serial port 0/1.
0x2005	The process data of the 2SCOM-MDB/2S485-MDB module exceeds 480 bytes.	Reduce module process data.
...	...	...
0x2010	The baud rate of the RS485 module channel is configured incorrectly.	The configuration parameters sent to the module are out of the specified range or do not meet the requirements. Check the configuration parameters.
0x2011	The communication method of the RS485 module channel is configured incorrectly.	
0x2012	The data bit-related parameters of the RS485 module channel is configured incorrectly.	
0x2013	The data packet size of the RS485 module channel is configured incorrectly.	
0x2014	The message interval of the RS485 module channel is configured incorrectly.	
0x2015	The transmit buffer of the RS485 module channel is configured incorrectly.	
0x2016	The receive buffer of the RS485 module channel is configured incorrectly.	
...	...	...

Fault Code	Description	Solution
Communication Protocol Conversion Module Fault		
0x2030	The serial port parameters of the 2SCOM/ 2SCOM-MDB module channel are configured incorrectly.	The configuration parameters sent to the module are out of the specified range or do not meet the requirements. Check the configuration parameters.
0x2031	The data packet size is incorrectly configured for the channels of the 2SCOM module.	
0x2032	The timeout parameter is incorrectly configured for the channels of the 2SCOM module.	
0x2033	The port protocol of the 2SCOM/2SCOM-MDB module channel is configured incorrectly.	
...	...	...
0x2040	The Modbus slave address of the 2SCOM-MDB/2S485-MDB module channel is configured incorrectly.	The configuration parameters sent to the module are out of the specified range or do not meet the requirements. Check the configuration parameters.
0x2041	The serial parameters of the 2S485-MDB module channel are configured incorrectly.	
...	...	...
0x2100	The CH0 preset value is out of range.	Set the preset value within the required range.
0x2101	The CH0 counter is configured incorrectly.	Check and correct the following settings: • The single-ended counting function is enabled but the DI is not configured in counting mode. • The single-ended interface enabled by the command is inconsistent with the counting interface configured for DI. • The counter is configured as a differential interface, but DI0 and DI1 are both configured in counting mode.
0x2102	The CH0 signal type is not supported.	Check whether the signal type is within the allowed range. Allowed values: A/B phase single frequency, A/B phase 2x frequency, A/B phase 4x frequency, pulse + direction, CW/CCW, single-phase counting (A), single-phase counting (B).
0x2103	The CH0 counter limit is configured incorrectly.	Ensure the minimum value of the CH0 counter is smaller than the maximum value.
0x2104	The CH0 unit pulse increment is configured incorrectly.	Ensure the unit pulse increment is not smaller than 1.
0x2105	The CH0 time base of the speed measurement is configured incorrectly.	Check whether the time base is within the allowed range.
0x2106	The CH0 input filter parameter is configured incorrectly.	Check whether the filter parameter is within the allowed range.
0x2107	The CH0 frequency sampling time is configured incorrectly.	Check whether the frequency sampling time is within the allowed range.
0x2108	CH0 reset function not configured properly	The reset function is enabled by the command, but the DI is not configured for the reset function. Configure the DI for the reset function.
0x2109	The CH0 preset function is configured incorrectly.	The preset function is enabled by the command, but the DI is not configured for the preset function. Configure the DI for the preset function.

Fault Code	Description	Solution
Communication Protocol Conversion Module Fault		
0x210A	The CH0 comparison 0 function is configured incorrectly.	The comparison function is enabled by the command, but the DO is not configured for the comparison function. Configure the DO for the comparison function.
0x210B	CH0 comparison 1 function not configured properly	The comparison function is enabled by the command, but the DO is not configured for the comparison function. Configure the DO for the comparison function.
0x210C	The CH0 comparison 2 function is not configured properly.	The comparison function is enabled by the command, but the DO is not configured for the comparison function. Configure the DO for the comparison function.
0x210D	The CH0 comparison 3 function is not configured properly.	The comparison function is enabled by the command, but the DO is not configured for the comparison function. Configure the DO for the comparison function.
0x210E	The CH0 probe 0 function is configured incorrectly.	The probe function is enabled by the command, but the DI is not configured for the probe function. Configure the DI for the probe function.
0x210F	The CH0 probe 1 function is not configured properly.	The probe function is enabled by the command, but the DI is not configured for the probe function. Configure the DI for the probe function.
0x2110	The CH0 probe 2 function is not configured properly.	The probe function is enabled by the command, but the DI is not configured for the probe function. Configure the DI for the probe function.
0x2111	The CH0 probe 3 function is not configured properly.	The probe function is enabled by the command, but the DI is not configured for the probe function. Configure the DI for the probe function.
0x2112	The CH0 DO0 parameter is configured incorrectly.	Check if the configuration parameter is within the allowed range. Allowed values: Normal output, comparison output.
0x2113	The CH0 DO1 parameter is not configured properly.	Check if the configuration parameter is within the allowed range. Allowed values: Normal output, comparison output.
0x2114	The CH0 DO2 parameter is not configured properly.	Check if the configuration parameter is within the allowed range. Allowed values: Normal output, comparison output.
0x2115	The CH0 DO3 parameter is not configured properly.	Check if the configuration parameter is within the allowed range. Allowed values: Normal output, comparison output.
0x2116	The CH0 DI0 parameter is not configured properly.	Check if the configuration parameter is within the allowed range. Allowed values: Normal input, probe function, counting, reset, preset, gating.

Fault Code	Description	Solution
Communication Protocol Conversion Module Fault		
0x2117	The CH0 DI1 parameter is not configured properly.	Check if the configuration parameter is within the allowed range. Allowed values: Normal input, probe function, counting, reset, preset, gating.
0x2118	CH0 DI2 parameter not configured properly	Check if the configuration parameter is within the allowed range. Allowed values: Normal input, probe function, counting, reset, preset, gating.
0x2119	The CH0 DI3 parameter is not configured properly.	Check if the configuration parameter is within the allowed range. Allowed values: Normal input, probe function, counting, reset, preset, gating.
0x2200 to 0x2219	CH1	Same as CH0
0x2300 to 0x2319	CH2	Same as CH0
0x2400 to 0x2419	CH3	Same as CH0
IO module fault		
0x5001	The power supply voltage is too high.	Check whether the module power supply voltage is within the normal range.
0x5002	The power supply voltage is too low.	
0x5003	The external 24 V power supply fails.	Check whether the 24 V power supply is normal.
0x5004	ADC device configuration parameter fault	1 .Check whether the external 24 V power supply voltage is stable. 2 .Restart the module.
0x5011	The chip is overheating.	1 .Check whether the module hardware is faulty. 2 .Replace the module.
0x5021	The ADC of the module malfunctions.	
0x5022	The DAC of the module malfunctions.	
0x5023	ADC reference fault	
0x5031	TC module cold end sampling channel failure	1 .Check whether the cold end channel circuit of the TC module is faulty. 2 .Replace the module.
I/O channel failure		
0x6001	Channel disconnected	1 .Check whether the external wiring of the module channels is normal. 2 .Check whether the module hardware is faulty. 3 .Replace the module.
0x6002	Channel short-circuit	
0x6003	The channel data exceeds the upper limit.	1 .Check whether the input module hardware is faulty. 2 .Check whether the external signals are abnormal.
0x6004	The channel data is below the lower limit.	
0x6005	The channel data overflows.	
0x6006	The channel data underflows.	
0x6007	Channel overcurrent	1 .Check whether the external wiring is short-circuited. 2 .Check whether the load is causing overcurrent. 3 .Check whether the module channel circuit is faulty.

Fault Code	Description	Solution
Communication Protocol Conversion Module Fault		
0x6009	Channel configuration data fault	Check whether the configuration parameters are properly transmitted.
...	...	...
0x6010	The transmit buffer of the RS485 module channel is full.	Decrease the length of data sent from the module, or increase the sending interval or baud rate.
0x6011	The receive buffer of the RS485 module channel is full.	Decrease the length of data sent to the module or increase the sending interval.
0x6012	The receiving frame counter value of the RS485 module channel is faulty.	Check whether the frame counter value is correct.
0x6013	The receiving frame segnum value of the RS485 module channel is faulty.	Check whether the frame segnum value is correct.
0x6014	Noise detected on the RS485 module channel	Check the channel wiring for interference.
0x6015	Parity bit fault detected on the RS485 module channel	Check whether the configuration parameter and calculation of the parity bit is correct.
...	...	...
0x6030	24 V output fault of SSI module channel	Check for short circuit in module or encoder wiring.
0x6031	Communication fault of SSI module channel	1 .Check whether the positive and negative terminals of the DATA signal line and the Clock signal line are reversed, and correct the wiring. 2 .Refer to solution for 0x6032.
0x6032	Abnormal SSI module channel data	1 .Check the encoder surroundings for interference. 2 .Check whether the configured frame interval time matches the encoder. 3 .Replace the sensor.
...	...	...
0x6040	The transmit buffer of the 2SCOM module channel is full.	Decrease the length of data sent from the module, or increase the sending interval or baud rate.
0x6041	The receive buffer of the 2SCOM module channel is full.	Decrease the length of data sent to the module or increase the sending interval.
0x6042	The receiving frame counter value of the 2SCOM module channel is faulty.	Check whether the frame counter value is correct.
0x6043	The receiving frame segnum value of the 2SCOM module channel is faulty.	Check whether the frame segnum value is correct.
0x6044	Noise detected on the 2SCOM/2SCOM-MDB module channel	Check the channel wiring for interference.
0x6045	Parity bit fault detected on the 2SCOM/ 2SCOM-MDB module channel	Check whether the configuration parameter and calculation of the parity bit is correct.
0x6046	Channel submodules of the 2SCOM-MDB module are configured incorrectly.	Check whether the submodule configuration matches the working mode of serial port 0/1.
...	...	...
0x6070	Noise detected on 2S485-MDB module channel	Check the channel wiring for interference.
0x6071	2S485-MDB module channel parity bit error	Check whether the configuration parameter and calculation of the parity bit is correct.
0x6072	Submodules of the 2S485-MDB module channel are configured incorrectly.	Check whether the submodule configuration matches the working mode of serial port 0/1.
...	...	...

Fault Code	Description	Solution
Communication Protocol Conversion Module Fault		
0x6060	M: Modbus response parameter mismatch	1. Check whether a communication fault occurs. 2. Check whether the parameter is supported by the master.
0x6061	M: Modbus slave ID mismatch	Check for communication faults.
0x6062	M: Modbus response address mismatch	
0x6063	M: Modbus response data length mismatch	
0x6064	M: Modbus communication timeout	
0x6065	M: Modbus CRC check fault	
0x6066	Illegal function code	Set the parameters correctly.
0x6067	Illegal data address	Set the data address correctly.
0x6068	The data value is illegal.	Set the data value correctly.
0x6069	Slave device fault	1. Check whether the connection between the module and the slave is normal. 2. Check whether the module channel configuration is correct.
...	...	...
0x6800	CH0 phase A open-circuited	Check whether the terminal wiring is properly connected.
0x6801	CH0 phase B open-circuited	
0x6802	CH0 frequency limit exceeded	Check whether the frequency of the external devices is abnormal. • Differential interface: Frequency > 4 M • Single-ended interface: Frequency > 500 K
0x6803	CH0 count value overflow	Count value > maximum value
0x6804	CH0 count value underflow	Count value < minimum value
0x6805	Number/stepsize limit of CH0 comparison 0 function exceeded	Number > 1024 or number < 1 or stepsize < 1
0x6806	Number/stepsize limit of CH0 comparison 1 function exceeded	
0x6807	Number/stepsize limit of CH0 comparison 2 function exceeded	
0x6808	Number/stepsize limit of CH0 comparison 3 function exceeded	
0x6809	Hold time/pulse number of CH0 comparison 0 output function is configured incorrectly.	Hold time < 1 or pulse number < 1.
0x680A	Hold time/pulse number of CH0 comparison 1 output function is configured incorrectly.	
0x680B	Hold time/pulse number of CH0 comparison 2 output function is configured incorrectly.	
0x680C	Hold time/pulse number of CH0 comparison 3 output function is configured incorrectly.	

Fault Code	Description	Solution
Communication Protocol Conversion Module Fault		
0x680D	Start/stop position and stepsize direction of CH0 comparison 0 output function is configured incorrectly.	Start and end positions are equal; start position < end position, stepsize < 0; start position > end position, stepsize > 0.
0x680E	Start/stop position and stepsize direction of CH0 comparison 1 output function is configured incorrectly.	
0x680F	Start/stop position and stepsize direction of CH0 comparison 2 output function is configured incorrectly.	
0x6810	Start/stop position and stepsize direction of CH0 comparison 3 output function is configured incorrectly.	
0x6811	CH0 comparison 0 limit exceeded	Comparison value > maximum value or comparison value < minimum value.
0x6812	Comparison value of CH0 comparison 1 function is exceeded.	
0x6813	CH0 comparison 2 limit exceeded	
0x6814	CH0 comparison 3 limit exceeded	
0x6815	CH0 comparison 0 type fault	Check whether the compasiron type is within the allowed range. Allowed values: multi-point comparison, equally-spaced comparison.
0x6816	CH0 comparison 1 type fault	
0x6817	CH0 comparison 2 type fault	
0x6818	CH0 comparison 3 type fault	
0x6819	Control mode fault of CH0 comparison 0 output function	Check whether the control mode is within the allowed range. Allowed values: time control, pulse control, level control.
0x681A	Control mode fault of CH0 comparison 1 output function	
0x681B	Control mode fault of CH0 comparison 2 output function	
0x681C	Control mode fault of CH0 comparison 3 output function	
0x681D	CH0 DO0 short-circuit fault	1. Check whether the terminal wiring is short-circuited. 2. Replace the module for cross-validation.
0x681E	CH0 DO1 short-circuit fault	1. Check whether the terminal wiring is short-circuited. 2. Replace the module for cross-validation.
0x681F	CH0 DO2 short-circuit fault	1. Check whether the terminal wiring is short-circuited. 2. Replace the module for cross-validation.
0x6820	CH0 DO3 short-circuit fault	1. Check whether the terminal wiring is short-circuited. 2. Replace the module for cross-validation.
0x6900-0x6920	CH1	Same as CH0
0x6A00-0x6A20	CH2	
0x6B00-0x6B20	CH3	

10.5.2 ECT32 Module Fault Codes

10.5.2.1 EtherCAT Application Layer Status Codes

The status codes of the EtherCAT application layer are described in the table below.

Status Code	Definition	Current State (or State Change)	Resulting State
0x0000	No error	Any	Current state + E
0x0001	Unspecified error	Any	Any + E
0x0002	No memory	Any	Any + E
0x0011	Invalid requested state change	I->S, I->O, P->O O->B, S->B, P->B	Current state + E
0x0012	Unknown requested state	Any	Current state + E
0x0013	Bootstrap not supported	I->B	I + E
0x0014	No valid firmware	I->P	I + E
0x0015	Invalid mailbox configuration	I->B	I + E
0x0016	Invalid mailbox configuration	I->P	I + E
0x0017	Invalid sync manager configuration	P->S, S->O	Current state + E
0x0018	No valid inputs available	O, S->O	S + E
0x0019	No valid outputs available	O, S->O	S + E
0x001A	Synchronization fault	O, S->O	S + E
0x001B	Sync manager watchdog	O, S	S + E
0x001C	Invalid sync manager type	O, S, P->S	S + E
0x001D	Invalid output configuration	O, S, P->S	S + E
0x001E	Invalid input configuration	O, S, P->S	S + E
0x001F	Invalid watchdog configuration	O, S, P->S	S + E
0x0020	Starting the slave in cold mode	Any	Current state + E
0x0021	Slave needs INIT	B, P, S, O	Current state + E
0x0022	Slave needs PREOP	S, O	S + E, O + E
0x0023	Slave needs SAFEOP	O	O + E
0x0024	Invalid input mapping	P->S	P + E
0x0025	Invalid output mapping	P->S	P + E
0x0026	Inconsistent settings	P->S	P + E
0x0027	FreeRun not supported	P->S	P + E
0x0028	Synchronization not supported	P->S	P + E
0x0029	Freerun needs 3 buffer modes	P->S	P + E
0x002A	Background watchdog	S, O	P + E
0x002B	No valid inputs and outputs	O, S->O	S + E
0x002C	Fatal sync error	O	S + E
0x002D	No sync error	S->O	S + E
0x0030	Invalid DC SYNC configuration	O, S->O, P->S	P + E, S + E

Status Code	Definition	Current State (or State Change)	Resulting State
0x0031	Invalid DC latch configuration	O, S->O, P->S	P + E, S + E
0x0032	PLL error	O, S->0	S + E
0x0033	DC sync I/O error	O, S->0	S + E
0x0034	DC sync timeout fault	O, S->0	S + E
0x0035	DC invalid sync period	P->S	P + E
0x0036	DC sync0 period	P->S	P + E
0x0037	DC sync1 period	P->S	P + E
0x0041	MBX_AOE	B, P, S, O	Current state + E
0x0042	MBX_EOE	B, P, S, O	Current state + E
0x0043	MBX_COE	B, P, S, O	Current state + E
0x0044	MBX_FOE	B, P, S, O	Current state + E
0x0045	MBX_SOE	B, P, S, O	Current state + E
0x004F	MBX_VOE	B, P, S, O	Current state + E
0x0050	EEPROM no access	Any	Any + E
0x0051	EEPROM error	Any	Any + E
0x0060	Local restart of the slave	Any	I
0x0052	External hardware not ready	I	I
0x0070	Configuration error	P, S	P
0x0071	Local bus error	P, S	Current status + E
0x0072	Local module's data configuration error	S, O	Current status + E
Other codes<0x8000	Reserved	-	-
0x8000 to 0xFFFF	Specific vendor	-	-

10.5.2.2 SDO Communication Fault Codes

The SDO communication error fault codes are listed in the table below.

Value	Definition
0x05 03 00 00	Toggle bit not alternated
0x05 04 00 00	SDO protocol timeout
0x05 04 00 01	Client/server command specifier not valid or unknown
0x05 04 00 05	Out of memory
0x06 01 00 00	Unsupported access to an object
0x06 01 00 01	Attempt to read a write-only object
0x06 01 00 02	Attempt to write to a read-only object
0x06 02 00 00	No such object in the object directory
0x06 04 00 41	The object cannot be mapped to the PDO.
0x06 04 00 42	The number and length of the objects to be mapped would exceed PDO length.
0x06 04 00 43	General parameter incompatibility
0x06 04 00 47	General internal incompatibility in the device
0x06 06 00 00	Access failed due to a hardware error.
0x06 07 00 10	Data type mismatch: service parameter length mismatch
0x06 07 00 12	Data type mismatch: service parameter too long
0x06 07 00 13	Data type mismatch: service parameter too short
0x06 09 00 11	Subindex does not exist.

Value	Definition
0x06 09 00 30	Parameter value out of range (write access)
0x06 09 00 31	Written parameter value too large
0x06 09 00 32	Written parameter value too small
0x06 09 00 36	Maximum value is less than minimum value.
0x08 00 00 00	General error
0x08 00 00 20	Data cannot be transmitted or stored to the application.
0x08 00 00 21	Data cannot be transmitted or stored to the application due to local control.
0x08 00 00 22	Data cannot be transmitted or stored to the application due to the current device state.
0x08 00 00 23	Failed to generate the object dictionary dynamically to there is currently no object dictionary.

10.6 FAQ

10.6.1 How to Check if a Module is Online

The steps to check if the GL20-RTU-EIP and GL20-RTU-ECT32 modules and their expansion modules are online through Inovance InoProShop software are the same. The following takes GL20-RTU-ECT32 as an example.

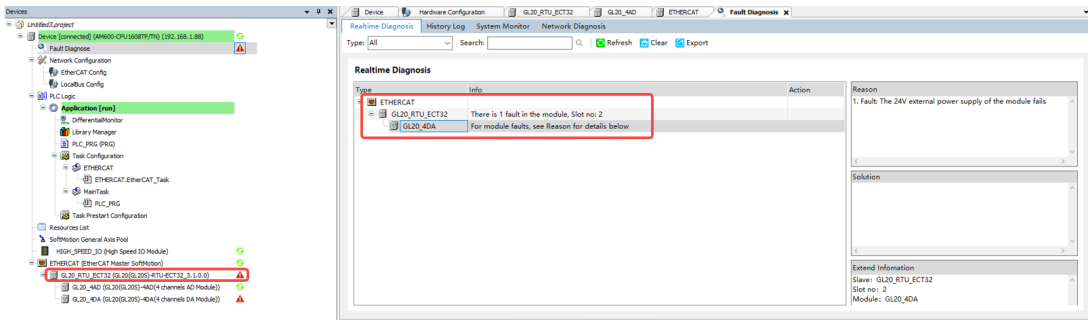
Prerequisites

- This product is connected to a PC equipped with InoProShop programming software via a network cable.
- The device is powered on and started.

Procedure

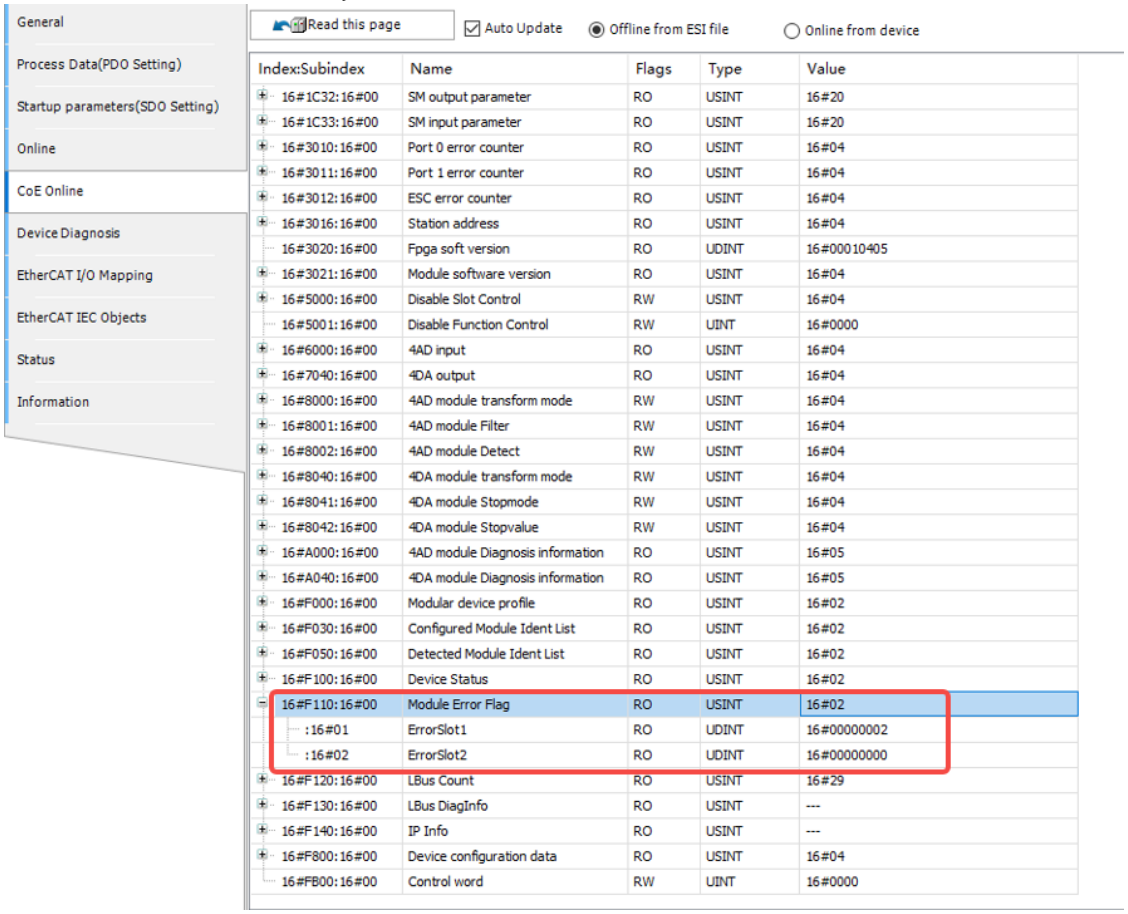
1. Check the PR indicator of the module.

   - Solid on: The module is online.
   - Flashing quickly or slowly: If the SF indicator of the EtherCAT communication interface module is flashing, it indicates that the module is offline.
     When the module is offline, a fault will be displayed in the InoProShop programming software interface, as shown below.



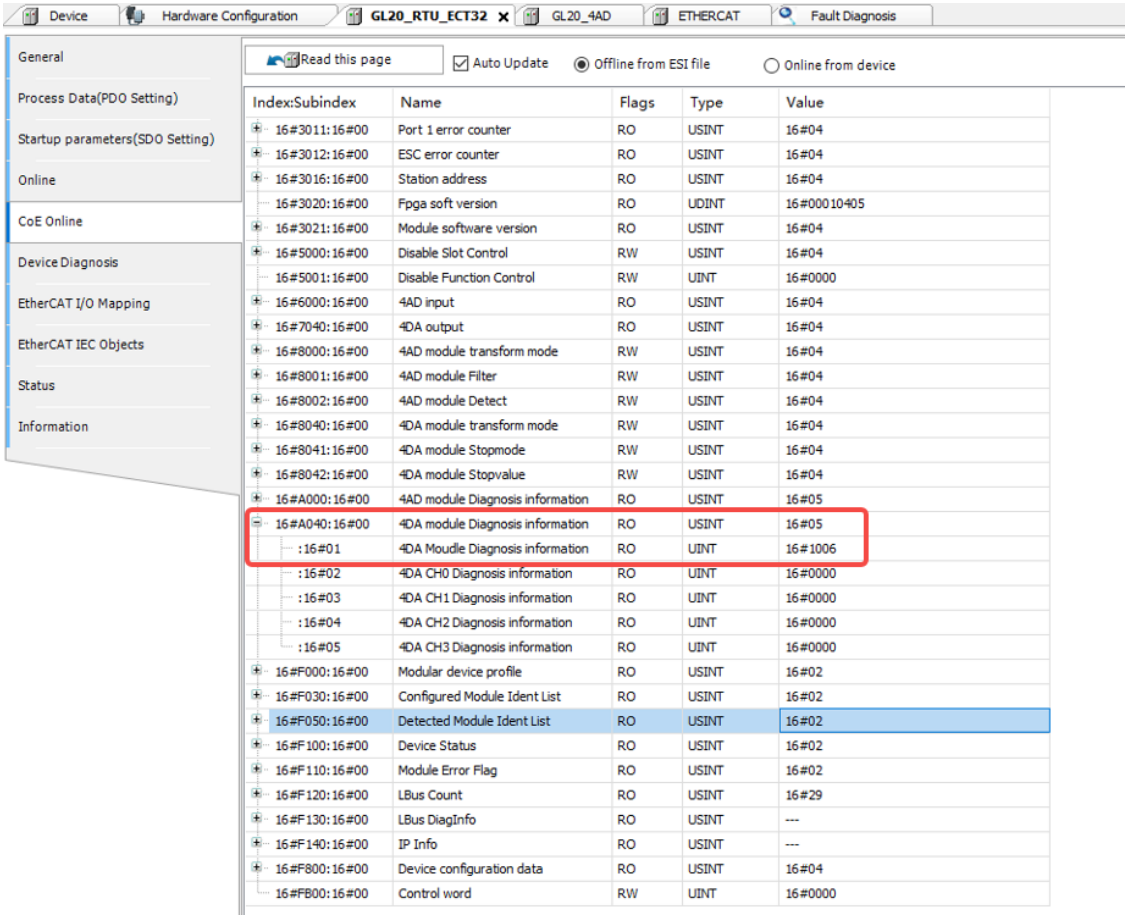
2. In the "Devices" navigation tree on the left, double-click "GL20_RTU_ECT32". In "CoE Online" interface, check the value of subindex "F110: 16#01" to locate the faulty module. Take the

following figure as an example, the value of subindex "F110: 16#01" is "0x180", indicating that the 8th and 9th modules are faulty.



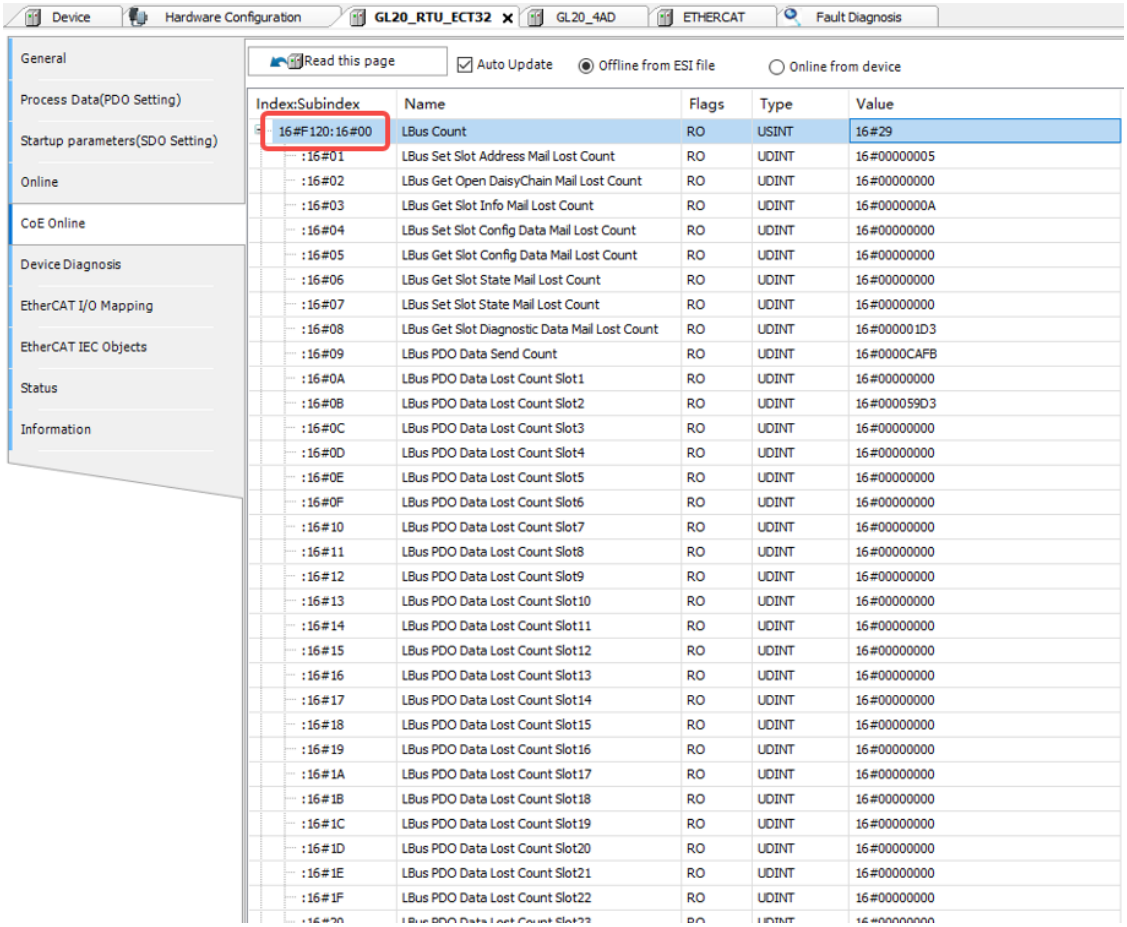
Index:Subindex	Name	Flags	Type	Value
16#1C32:16#00	SM output parameter	RO	USINT	16#20
16#1C33:16#00	SM input parameter	RO	USINT	16#20
16#3010:16#00	Port 0 error counter	RO	USINT	16#04
16#3011:16#00	Port 1 error counter	RO	USINT	16#04
16#3012:16#00	ESC error counter	RO	USINT	16#04
16#3016:16#00	Station address	RO	USINT	16#04
16#3020:16#00	Fpga soft version	RO	UDINT	16#00010405
16#3021:16#00	Module software version	RO	USINT	16#04
16#5000:16#00	Disable Slot Control	RW	USINT	16#04
16#5001:16#00	Disable Function Control	RW	UINT	16#0000
16#6000:16#00	4AD input	RO	USINT	16#04
16#7040:16#00	4DA output	RO	USINT	16#04
16#8000:16#00	4AD module transform mode	RW	USINT	16#04
16#8001:16#00	4AD module Filter	RW	USINT	16#04
16#8002:16#00	4AD module Detect	RW	USINT	16#04
16#8040:16#00	4DA module transform mode	RW	USINT	16#04
16#8041:16#00	4DA module Stopmode	RW	USINT	16#04
16#8042:16#00	4DA module Stopvalue	RW	USINT	16#04
16#A000:16#00	4AD module Diagnosis information	RO	USINT	16#05
16#A040:16#00	4DA module Diagnosis information	RO	USINT	16#05
16#F000:16#00	Modular device profile	RO	USINT	16#02
16#F030:16#00	Configured Module Ident List	RO	USINT	16#02
16#F050:16#00	Detected Module Ident List	RO	USINT	16#02
16#F100:16#00	Device Status	RO	USINT	16#02
16#F110:16#00	Module Error Flag	RO	USINT	16#02
:16#01	ErrorSlot1	RO	UDINT	16#00000002
:16#02	ErrorSlot2	RO	UDINT	16#00000000
16#F120:16#00	LBus Count	RO	USINT	16#29
16#F130:16#00	LBus DiagInfo	RO	USINT	---
16#F140:16#00	IP Info	RO	USINT	---
16#F800:16#00	Device configuration data	RO	USINT	16#04
16#FB00:16#00	Control word	RW	UINT	16#0000

3. The fault codes of the 8th and 9th modules are "0x1006", indicating that they are offline, as shown below.



Index:Subindex	Name	Flags	Type	Value
16#3011:16#00	Port 1 error counter	RO	USINT	16#04
16#3012:16#00	ESC error counter	RO	USINT	16#04
16#3016:16#00	Station address	RO	USINT	16#04
16#3020:16#00	Fpga soft version	RO	UDINT	16#00010405
16#3021:16#00	Module software version	RO	USINT	16#04
16#5000:16#00	Disable Slot Control	RW	USINT	16#04
16#5001:16#00	Disable Function Control	RW	UINT	16#0000
16#6000:16#00	4AD input	RO	USINT	16#04
16#7040:16#00	4DA output	RO	USINT	16#04
16#8000:16#00	4AD module transform mode	RW	USINT	16#04
16#8001:16#00	4AD module Filter	RW	USINT	16#04
16#8002:16#00	4AD module Detect	RW	USINT	16#04
16#8040:16#00	4DA module transform mode	RW	USINT	16#04
16#8041:16#00	4DA module Stopmode	RW	USINT	16#04
16#8042:16#00	4DA module Stopvalue	RW	USINT	16#04
16#A000:16#00	4AD module Diagnosis information	RO	USINT	16#05
16#A040:16#00	4DA module Diagnosis information	RO	USINT	16#05
:16#01	4DA Moudle Diagnosis information	RO	UINT	16#1006
:16#02	4DA CH0 Diagnosis information	RO	UINT	16#0000
:16#03	4DA CH1 Diagnosis information	RO	UINT	16#0000
:16#04	4DA CH2 Diagnosis information	RO	UINT	16#0000
:16#05	4DA CH3 Diagnosis information	RO	UINT	16#0000
16#F000:16#00	Modular device profile	RO	USINT	16#02
16#F030:16#00	Configured Module Ident List	RO	USINT	16#02
16#F050:16#00	Detected Module Ident List	RO	USINT	16#02
16#F100:16#00	Device Status	RO	USINT	16#02
16#F110:16#00	Module Error Flag	RO	USINT	16#02
16#F120:16#00	LBus Count	RO	USINT	16#29
16#F130:16#00	LBus DiagInfo	RO	USINT	---
16#F140:16#00	IP Info	RO	USINT	---
16#F800:16#00	Device configuration data	RO	USINT	16#04
16#FB00:16#00	Control word	RW	UINT	16#0000

4. (Optional) Check the frame loss object dictionary F120, the frame loss counts for the 8th and 9th modules have increased.



10.6.2 How to Check if the Channel is Normal

The steps to check if the GL20-RTU-EIP and GL20-RTU-ECT32 modules and their expansion modules are normal through Inovance InoProShop software are the same. The following takes GL20-RTU-ECT32 as an example.

Prerequisites

- This product is connected to a PC equipped with InoProShop programming software via a network cable.
- The device is powered on and started.

Procedure

Digital module

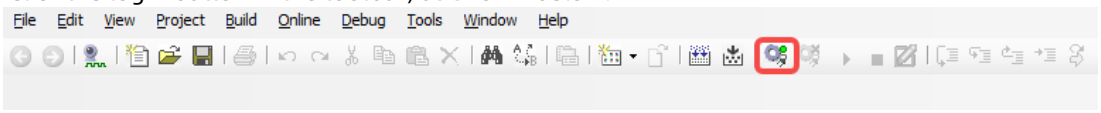
For example, connect the 3rd point of channel 0 of the GL20-0016ETN module to the 3rd point of channel 0 of the GL20-1600END module. During actual use, this method can be used to verify whether the input and output points are functioning properly.



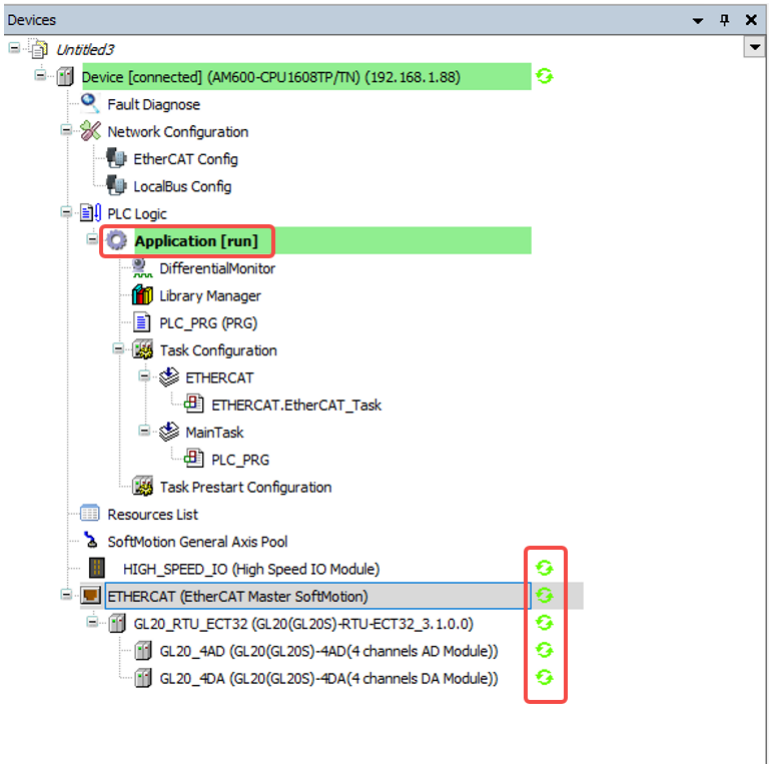
1. Check whether the output indicators on the GL20-0016ETN module and the input indicators on the GL20-1600END module are solid on. If so, it indicates that the module output and input points are functioning properly.
2. Confirm the result through the InoProShop programming software interface.

   a. Open the InoProShop programming software on the PC desktop and open the project.

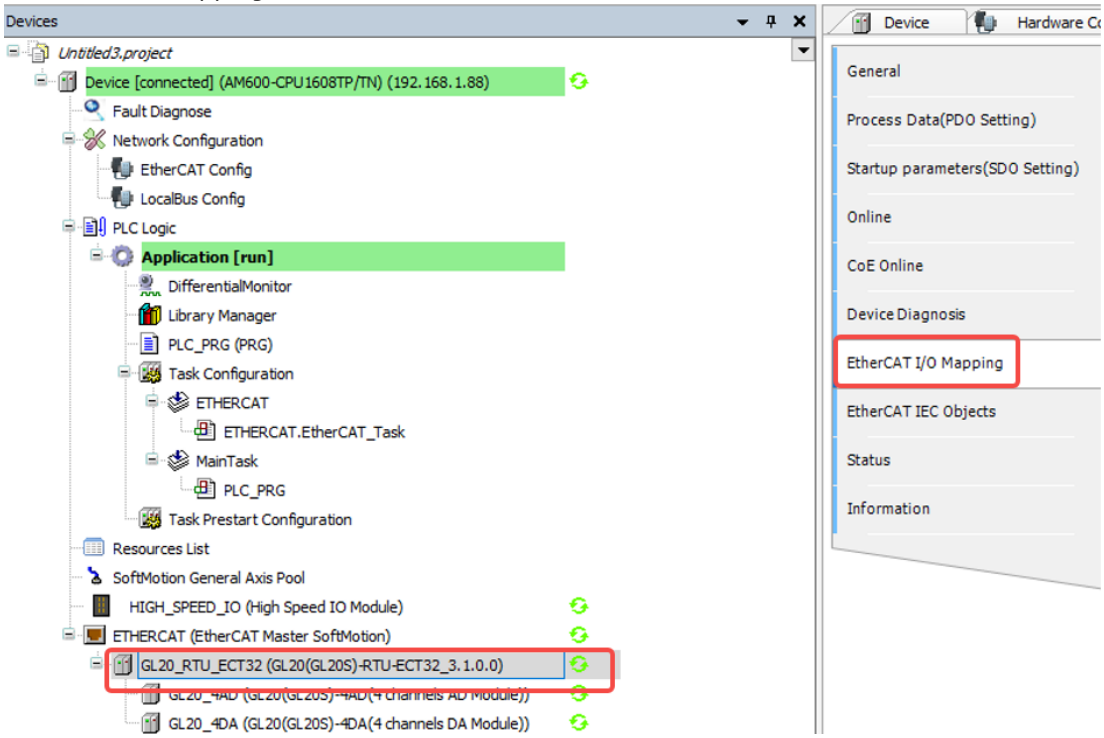
   b. Click the login button in the toolbar, as shown below.



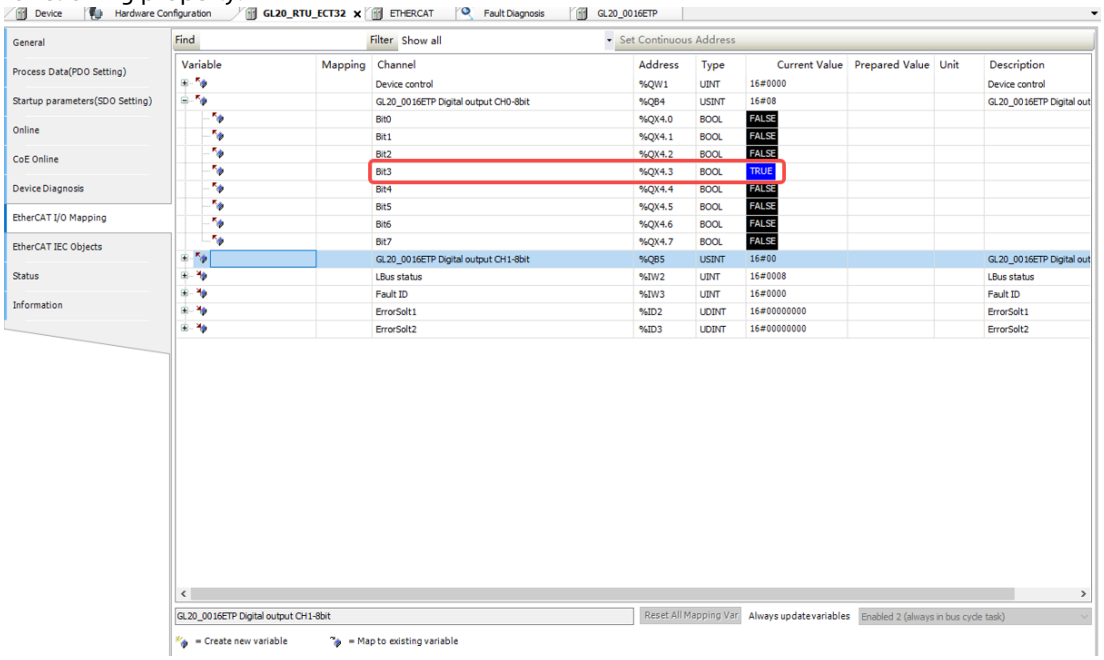
   After a successful login, the "Application" node displays "run", as shown below.

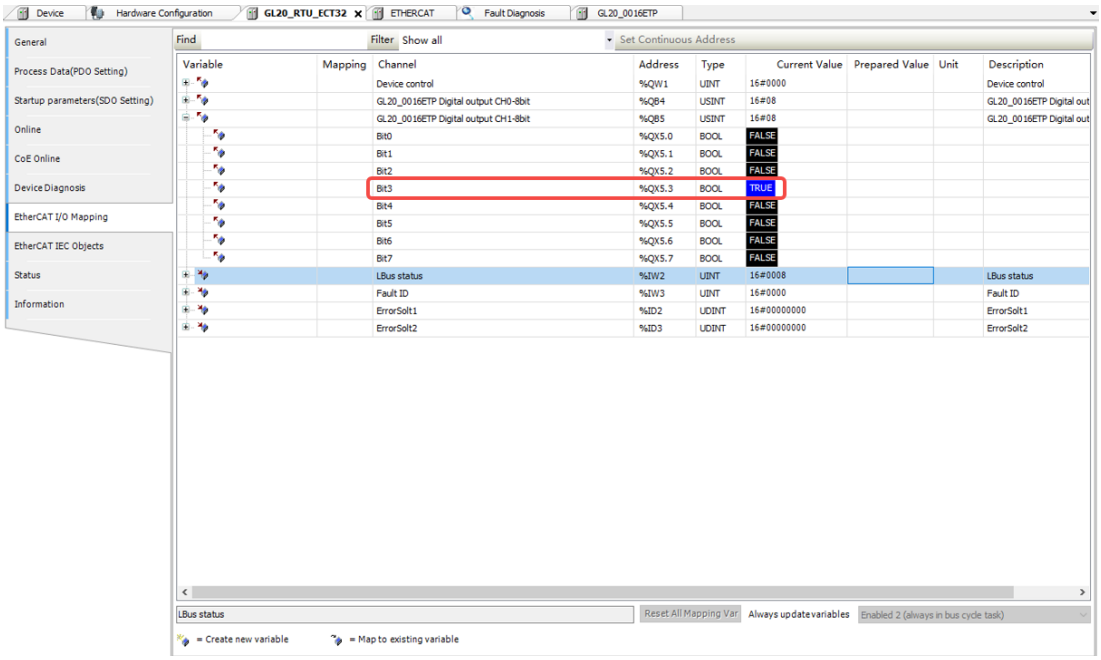


c. In the "Devices" navigation tree on the left, double-click the "GL20_RTU_ECT32" node to open the "EtherCAT I/O Mapping" interface.



d. Check the values corresponding to the mapping addresses of the GL20-0016ETN module and the GL20-1600END module. If "Bit3" is "TRUE", it indicates that the output and input points are functioning properly.





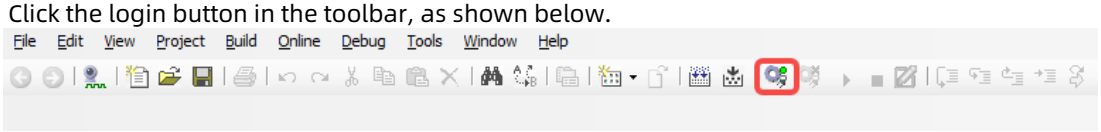
Analog module

For example, connect the four output channels of the GL20-4DA module to the four input channels of the GL20-4AD module. During actual use, this method can be used to verify whether the input and output channels are functioning properly.

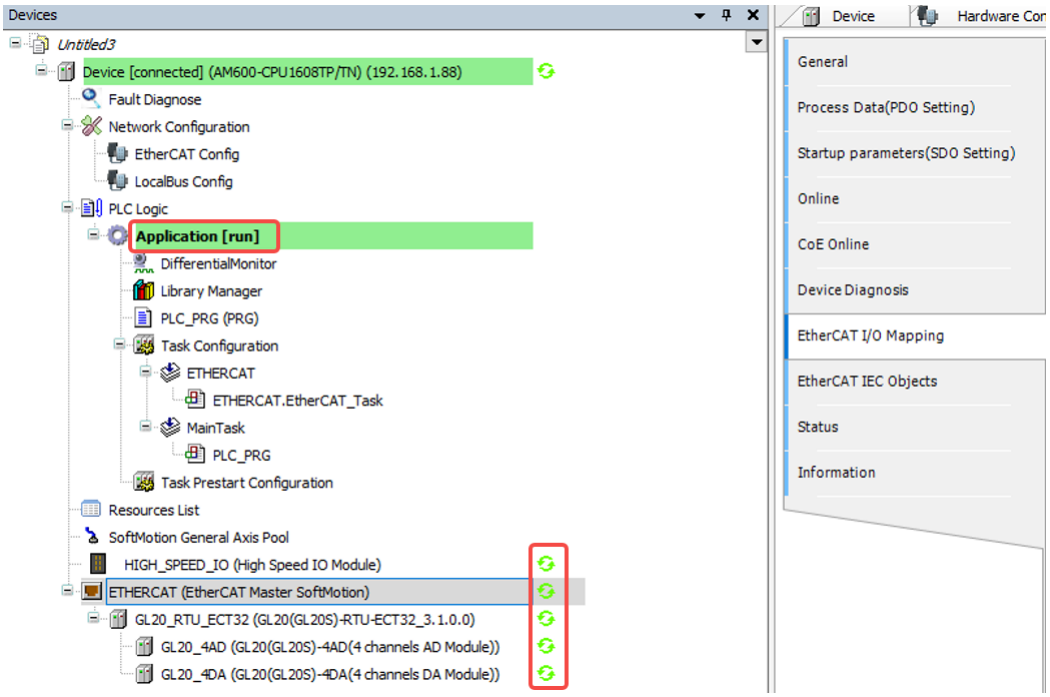
1. Check whether the output indicators on the GL20-4DA module and the input indicators on the GL20-4AD module are solid on. If so, it indicates that the module output and input channels are functioning properly.
2. Confirm the result through the InoProShop programming software interface.

   a. Open the InoProShop programming software on the PC desktop and open the project.

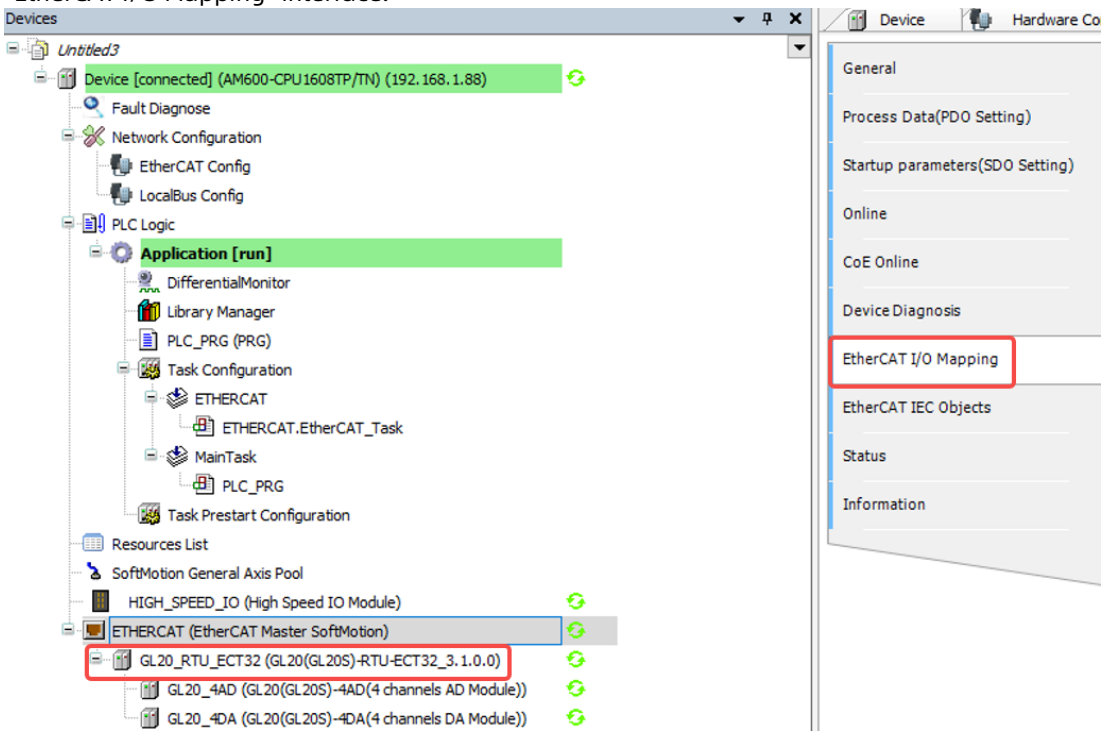
   b. Click the login button in the toolbar, as shown below.



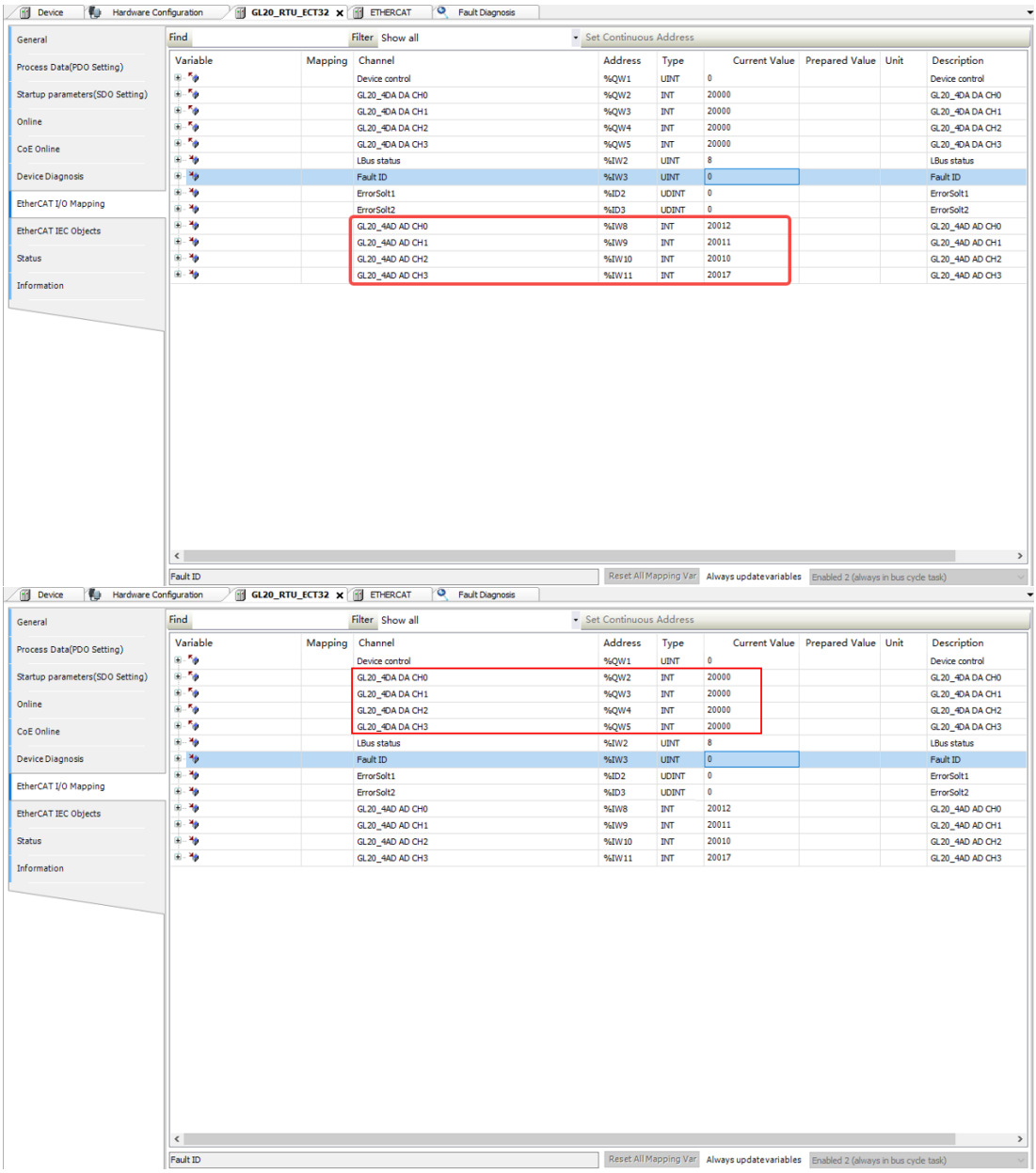
After a successful login, the "Application" node displays "run", as shown below.



c. In the "Devices" navigation tree on the left, double-click the "GL20_RTU_ECT32" node to open the "EtherCAT I/O Mapping" interface.



d. Check the values corresponding to the mapping addresses of the GL20-4AD module and the GL20-4DA module. If all four channels of the GL20-4DA module output a code value of 20000, and all four channels of the GL20-4AD module receive a code value of 20000, it indicates that the output and input channels are functioning properly.



10.6.3 How to View Module Firmware Version

10.6.3.1 View via InoProShop

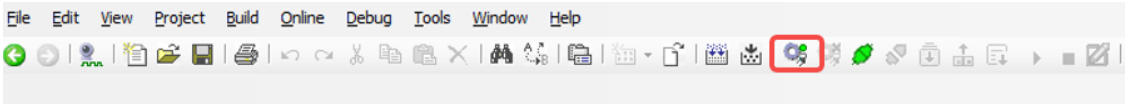
The steps to view the firmware versions of the GL20-RTU-EIP and GL20-RTU-ECT32 modules and their expansion modules through Inovance InoProShop software are the same. The following takes GL20-RTU-ECT32 as an example.

Prerequisites

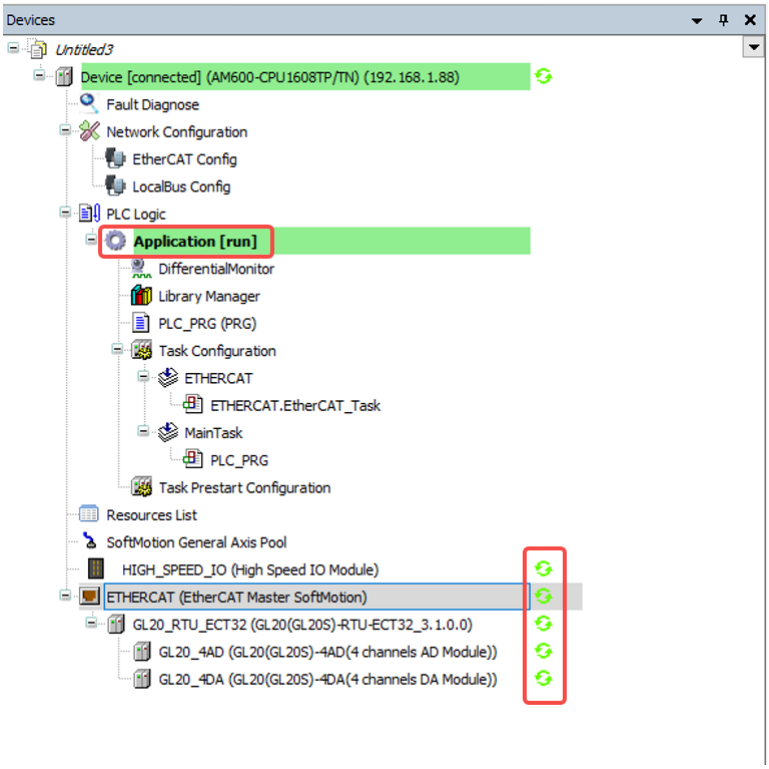
- This product is connected to a PC equipped with InoProShop programming software via a network cable.
- The device is powered on and started.

Procedure

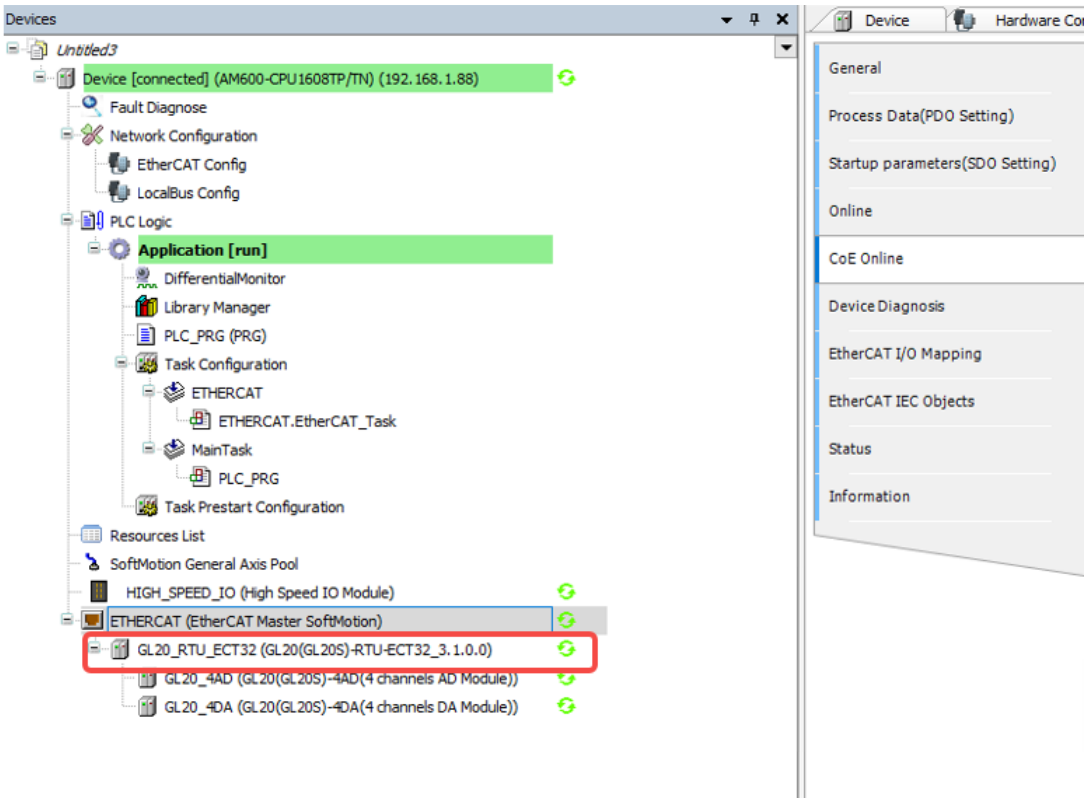
1. Open the InoProShop programming software on the PC desktop and open the project.
2. Click the login button in the toolbar, as shown below.



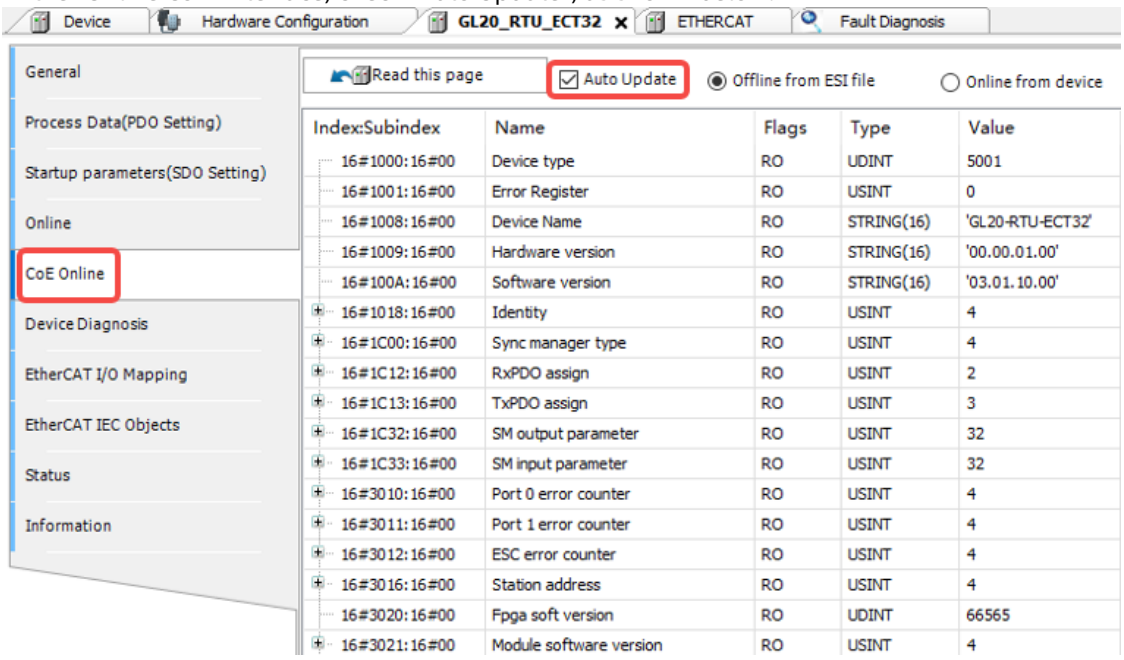
After a successful login, the "Application" node displays "run", as shown below.



3. In the "Devices" navigation tree on the left, double-click the EtherCAT communication interface module under the "ETHERCAT" node to open the configuration interface.

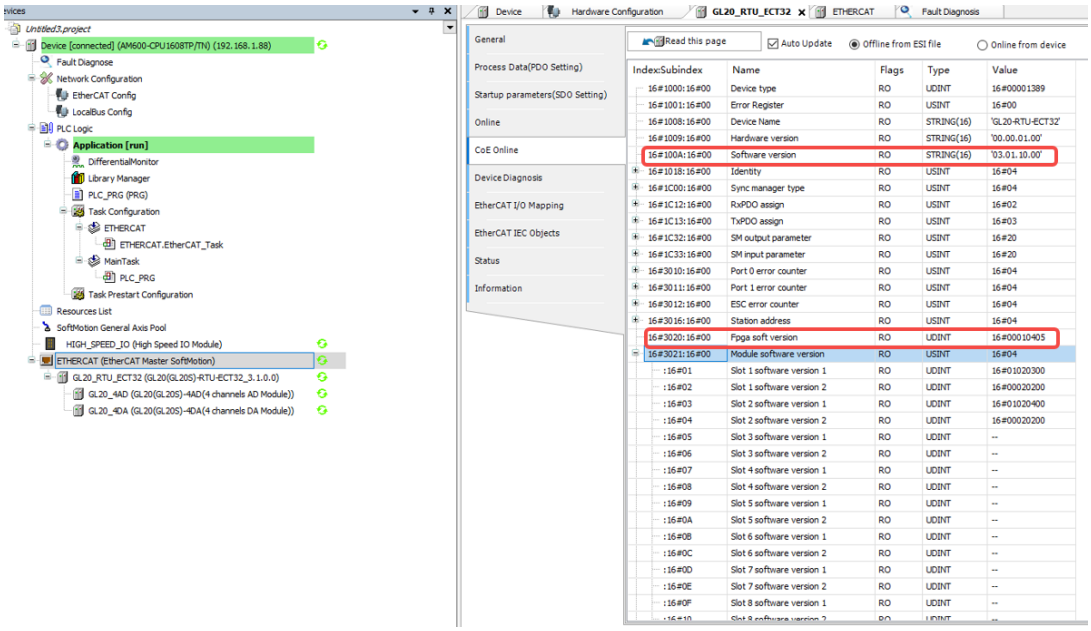


4. In the "Online CoE" interface, check "Auto Update", as shown below.

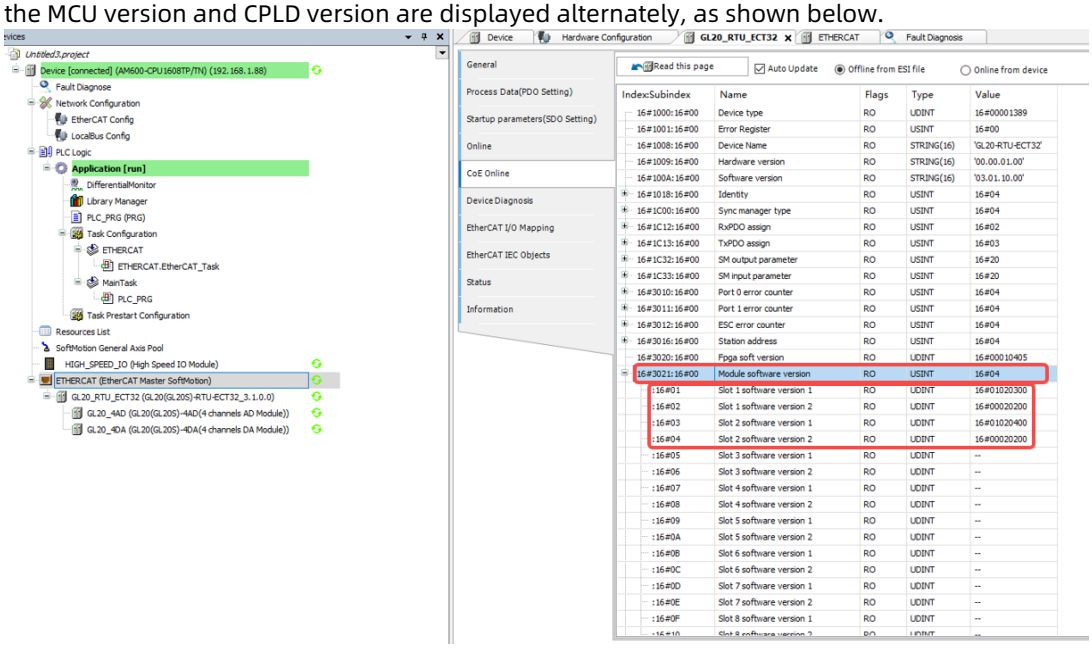


5. Check the firmware version information for the EtherCAT communication interface module and expansion module.

- For the firmware version of the EtherCAT communication interface module: Check the object dictionary 0x100A for the MCU version, and check the object dictionary 0x3020 for the FPGA version, as shown below.



- For the firmware version of the expansion module: Check the object dictionary 0x3021, where the MCU version and CPLD version are displayed alternately, as shown below.



10.6.3.2 View via IOManager

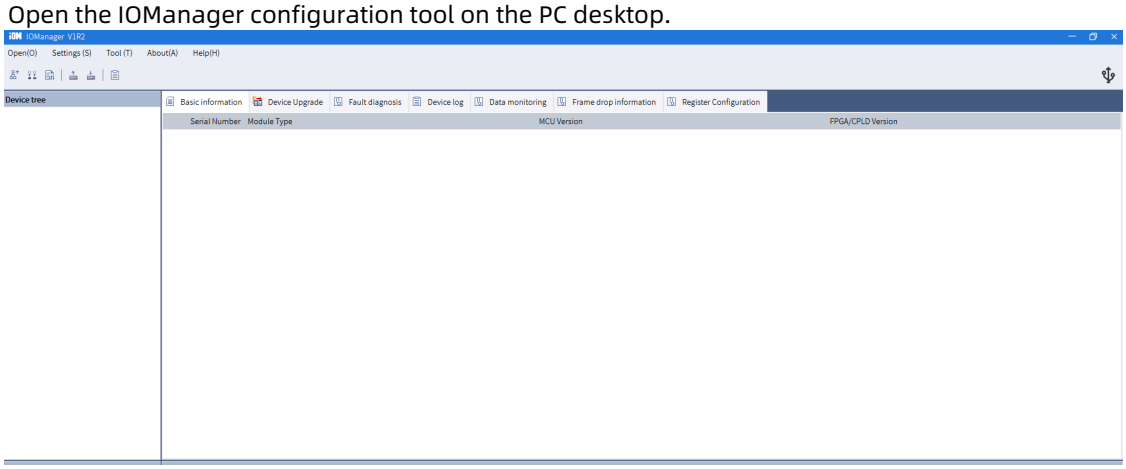
The steps to view the firmware versions of the GL20-RTU-EIP, GL20-RTU-ECT32, and GL20-RTU-PN modules and their expansion modules through Inovance IOManager software are the same. The following takes GL20-RTU-ECT32 as an example.

Prerequisites

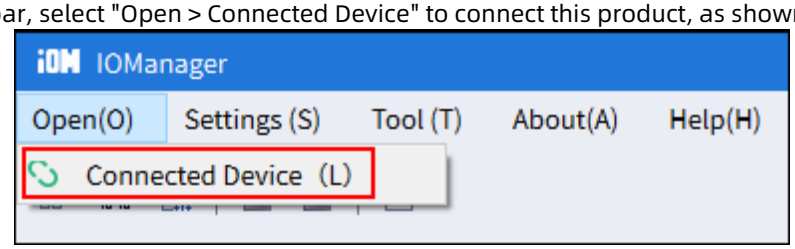
- This product is connected to a PC equipped with the IOManager configuration tool via a USB cable.
- The device is powered on and started.

Procedure

1. Open the IOManager configuration tool on the PC desktop.

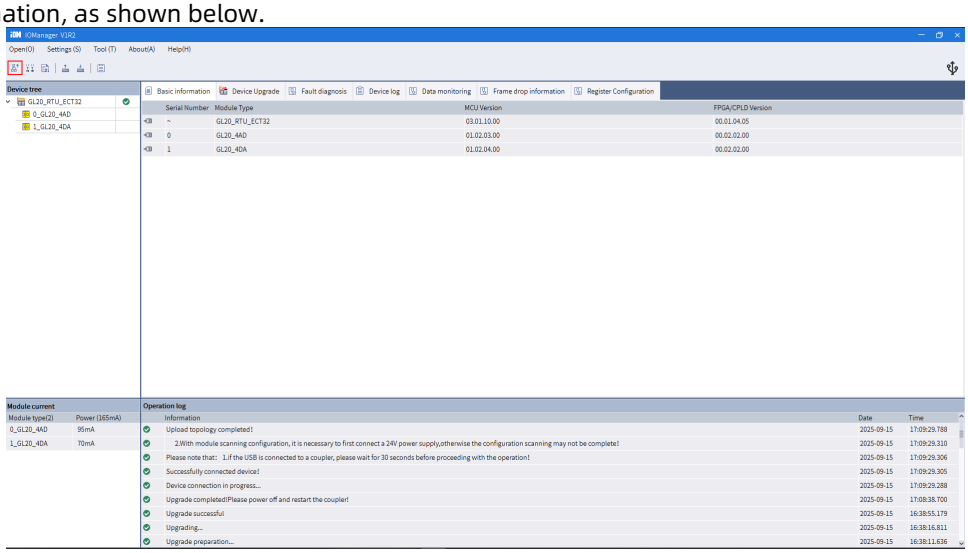


2. In the menu bar, select "Open > Connected Device" to connect this product, as shown below.



If the connection is successful, "Connected" is displayed in the upper right corner of the interface. If the connection fails, check whether the driver is correctly installed.

3. Click "Configuration topology upload" in the toolbar to view the module firmware version information, as shown below.



10.6.4 How to Set the Filter Time

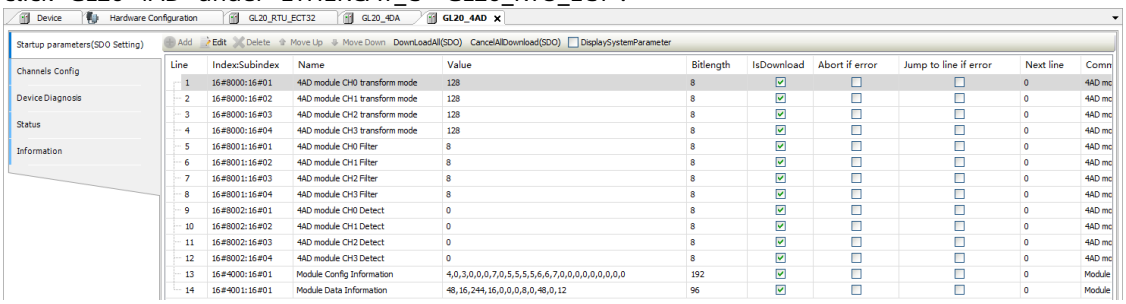
When data jitter occurs on the analog module, increase the filter time. The following takes the GL20-4AD module as an example.

Prerequisites

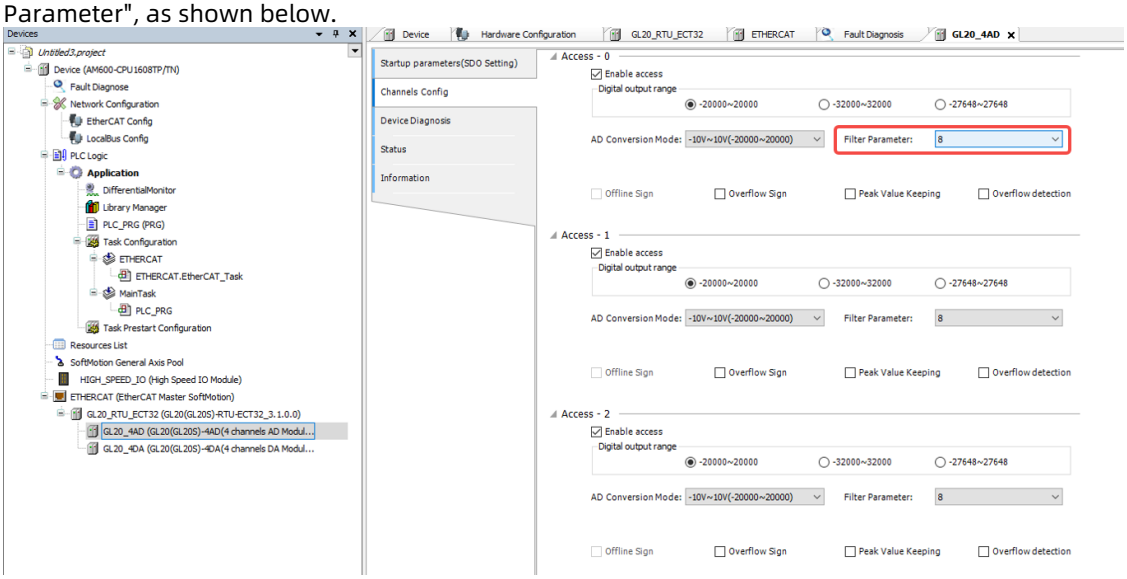
- This product is connected to a PC equipped with InoProShop programming software via a network cable.
- The device is powered on and started.

Procedure

1. Open the InoProShop programming software on the PC desktop and open the project.
2. Take the GL20-4AD module as an example. In the "Devices" navigation tree on the left, double-click "GL20-4AD" under "ETHERCAT_C > GL20_RTU_ECT".



3. Take channel 0 as an example. In the "Channels Config" interface, increase the value of "Filter Parameter", as shown below.



Service and Support

Should you encounter a safety accident during the use or operation of the product, or face challenges in operating and maintaining the equipment, which remain unresolved after the relevant documentation is consulted, we provide multiple channels to ensure prompt resolution:

- Channel #1: Contact service@inovance.com.
- Channel #2: Visit https://www.inovance.com/global to access document downloads, after-sales support, spare parts ordering, repair applications, and authenticity verification services.
- Channel #3: Download My Inovance app (https://zshc-eu.inovance.com/download-pc/) where you can access products info and documentation, and query product parameters.

We are committed to providing you with quick and professional technical support, and we look forward to your satisfaction and trust.

Copyright © Shenzhen Inovance Technology Co., Ltd.

PS00022193A00

Shenzhen Inovance Technology Co., Ltd.

www.inovance.com

Add.: Inovance Headquarters Tower, High-tech Industrial Park,
Guanlan Street, Longhua New District,
Shenzhen 518000, P.R. China

Tel: (0755) 2979 9595 Fax: (0755) 2961 9897

Suzhou Inovance Technology Co., Ltd.

www.inovance.com

Add.: No. 52, Tian E Dang Road, Wuzhong District, 215104,
Suzhou City, Jiangsu Province, P.R. China

Tel: (0512) 6637 6666 Fax: (0512) 6285 6720