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GS20-EIP-8L Series High Protection IO-Link Master Module

User Guide

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

Data code PS00018182A03

Legal Information

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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

GS20-EIP-8L is an IP67 master module that transfers EtherNet/IP communication to IO-Link communication. The module is equipped with eight IO-Link ports and can connect up to eight IO-Link devices (Class A type).

This guide describes the product information, mechanical installation, electrical installation, programming, commissioning, and troubleshooting of the product.

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	-		-
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

More documents

Name	Data code	Description
GR20-16EMNL Digital Input and Output Module User Guide	PS00007355	Presents the product information, mechanical installation, and electrical installation of the product.
GR20-16EMPL Digital Input and Output Module User Guide	PS00007356	Presents the product information, mechanical installation, and electrical installation of the product.
GS20-16EMNL Digital Input and Output Module User Guide	PS00009314	Presents the product information, mechanical installation, and electrical installation of the product.
GS20-16EMPL Digital Input and Output Module User Guide	PS00009714	Presents the product information, mechanical installation, and electrical installation of the product.
GS20-16EMNL-S Digital Input and Output Module User Guide	PS00018165	Presents the product information, mechanical installation, and electrical installation of the product.
GS20-16EMPL-S Series Digital Input and Output Module User Guide	PS00018166	Presents the product information, mechanical installation, and electrical installation of the product.
GS20-EIP-8L High Protection IO-Link Master Module User Guide (This guide)	PS00018182	Introduces the product information, mechanical installation, electrical installation, programming commissioning, and troubleshooting of the product.

Revision history

Date	Version	Description
April 2026	A03	• Updated *"1.1 General Safety Instructions" on page 5*. • Updated *" Web Function" on page 80*. • Updated *" Troubleshooting" on page 82*.
January 2026	A02	Updated *"2.3 Components" on page 14*.
2025-07	A01	Made minor corrections.
January 2025	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.

1 General Safety Rules

1.1 General Safety Instructions

Safety disclaimer

1. Read and comply with the safety instructions during installation, operation, and maintenance of the product.
2. To ensure personal and equipment safety, observe all safety precautions marked on the product and described in this guide during installation, operation, and maintenance.
3. The "CAUTION", "WARNING", and "DANGER" are only supplements to the safety instructions.
4. Use this product 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 death or serious injury.



The "WARNING" sign indicates that failure to comply with the notice could result in death or serious injury.



The "CAUTION" sign indicates that failure to comply with the notice could result in minor or moderate injury, or equipment damage.

Unpacking
 • Do not install the product in case of any damage, rust, or signs of prior use on the product or its accessories upon unpacking. • Do not install the product in case of water seepage into the product or missing or damaged components upon unpacking. • Do not install the product in case of any discrepancy between the product you received and the product name on the packing list.
 • Check whether the packing is intact and whether there is damage, water seepage, dampness, and deformation before unpacking. • Unpack the package by following the unpacking sequence. Do not strike the package violently. • Check for damage, rust, or dents on the surfaces of the product and accessories upon unpacking. • After unpacking, check the contents against the packing list to ensure that the equipment and accessories are in the correct quantities, and that all documentation is complete.

Storage and transportation
WARNING • Large or heavy equipment must be handled by qualified professionals using specialized hoisting equipment. Failure to comply could result in personal injury or equipment damage. • Before hoisting the equipment, ensure that components such as the front cover and terminal blocks are secured firmly with screws. Loosely connected components may fall off and result in personal injury or equipment damage. • Do not stand or stay below the product which is being hoisted. • 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 could result in personal injury or equipment damage.
Caution • Handle the equipment with care and mind your step during transportation to prevent personal injury 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 could result in personal injury. • Store and transport the equipment based on the storage and transportation requirements. Failure to comply could result in equipment damage. • Do not store or transport the equipment in locations where the equipment may be exposed to splashing water or rain, direct sunlight, strong electric field, strong magnetic field, or strong vibration. • Store the equipment for up to three months. Take stricter protective measures and carry out the necessary inspections for a longer storage time. • Pack the equipment securely and properly before transportation. Use a fully enclosed container for long-distance transportation. • Never transport the equipment with other devices or items that could impact or cause harm to the equipment.

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. • If a sustained overcurrent occurs due to overload or load short circuit, the product may smoke or catch fire. An external safety device (such as a fuse or circuit breaker) must be installed.
WARNING • If an output component (such as a relay or transistor) in this product is damaged, the corresponding output may become uncontrolled and remain permanently ON or OFF. • The product design must comply with the overvoltage category requirements specified in the environmental specifications. A system-level lightning protection device must be installed on the power supply to ensure that lightning-induced overvoltages do not reach the product's power input, signal input, or control output terminals, thereby preventing damage to the product. • Ensure that appropriate actions have been taken to prevent product malfunction caused by a communication fault between the product and related devices. Failure to comply could cause personal injury or equipment damage.
Caution Switches that could cause personal injury or equipment damage must not be configured on the touch screen. Use independent switches for performing critical operations. Failure to comply could result in accidents caused by wrong outputs or faults.

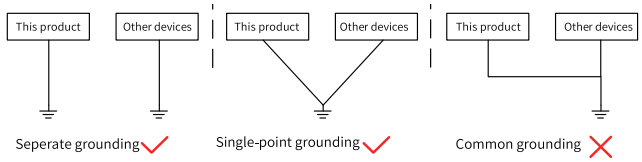
Installation
DANGER This equipment must be operated only by trained and qualified electrical personnel. Non-professionals must not operate this equipment.

Installation
WARNING • Read through the guide and safety instructions before installation. • Do not install this equipment in places with strong electric or magnetic field. • Before installation, check 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 site meets the required environmental conditions. Failure to comply could result in equipment damage. • Do not wear loose clothes or accessories during installation. Failure to comply could result in electric shock. • When installing the equipment in an enclosed environment (such as a cabinet or case), use cooling devices (such as fans or air conditioners) to cool the space and meet the installation environment requirements. Failure to do so could result in equipment overheating or fire. • Do not retrofit the equipment. • Never loosen or turn the fixing bolts on product components, or any bolts marked in red. • This equipment must be installed inside an indoor cabinet or terminal equipment. The cabinet or terminal equipment itself must be provided with the necessary protective enclosures, such as a fireproof enclosure, an electrical protective enclosure, and a mechanical protective enclosure. The IP rating of these enclosures must comply with the relevant IEC standards, and applicable 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 a non-combustible object such as metal. Keep the equipment away from combustible objects. Failure to comply could result in fire. • For products not supporting hot swapping, disconnect all external power supplies of the system before installing/removing the product. Failure to comply could result in electric shock, product failure, 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 product and causing faults. After installation, remove the cloth or paper on the top of the equipment to prevent the ventilation holes from being blocked, which could cause overheating due to poor heat dissipation. • During installation, ensure the equipment is connected to the respective connector securely and hook the equipment firmly. Improper installation may result in malfunction, failure, or detachment.

Wiring

DANGER

- This equipment must be operated only by trained and qualified electrical personnel. Non-professionals must not operate this equipment.
- Before wiring, disconnect all the power supplies of the equipment. Wait for at least the time designated on the 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 could result in electric shock.
- Do not perform wiring, remove the equipment cover, or touch the circuit board with power ON. Failure to comply could result in electric shock.
- Ensure that the equipment is grounded properly. Failure to comply could result in electric shock. Separate grounding or single-point grounding, other than common grounding, is recommended.



- Insulate the cable terminals properly to ensure the insulation distance between cables will not be shortened after cables are connected to the terminal block. Failure to comply could result in electric shock or equipment damage.
- Install the terminal cover attached to the equipment before power-on or operation after wiring is completed. Failure to comply could result in electric shock.

WARNING

- Never connect the power cable to output terminals of the equipment. Failure to comply could cause equipment damage or even fire.
- Cables used for wiring must comply with the requirements for the cross-sectional area and shielding. The shielding layer of the shielded cable must be reliably grounded at one end.
- Tighten the terminal screws with the torque specified in the user guide. Insufficient or excessive torque may cause overheating and damage to the joint, which could result in fire.
- After wiring is done, ensure that all cables are connected properly and no screws, washers or exposed cables are left inside the equipment. Failure to comply could result in electric shock or equipment damage.

Caution

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

Power-on

DANGER

- This equipment must be operated only by trained and qualified electrical personnel. Non-professionals must not operate this equipment.
- Before power-on, ensure that the equipment is installed and wired properly.
- Ensure that the power supply meets equipment requirements before power-on to prevent equipment damage or fire accident.
- Do not open the cabinet door or protective cover of the product, touch any wiring terminal of the product, or remove any components or parts while the product is powered on. Failure to comply could result in personal injury or even death.

WARNING

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

Operation
DANGER • The equipment must be operated only by professionals. Failure to comply can result in injury or death. • Do not touch any connecting terminals or disassemble any unit or component of the equipment during operation. Failure to comply could result in electric shock.
WARNING • Do not touch the enclosure, fan, or resistor with bare hands. Failure to comply could result in burns. • Prevent metal or other objects from falling into the equipment during operation. Failure to comply could result in fire or equipment damage. • During operation, do not bring live parts into contact with the metal enclosure of the product. Failure to comply could result in fire or product damage.
Caution • Operate the equipment within the specified environmental conditions. Failure to comply could result in equipment failure or damage. • Touch the HMI panel with hands only. Failure to comply could cause panel damage, which is out of the warranty range.
Safety recommendations • In positions where the operator directly touches the mechanical parts, for example, where a mechanical device is loaded/unloaded, or where a machine runs automatically, manually-operated devices or other alternative means must be carefully designed so that they are independent of the equipment 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
WARNING • Do not use batteries that do not meet the product requirements. Failure to comply could result in death, personal injury, explosion, or fire. • Do not throw batteries into fire or hot ovens. Do not crush or cut the battery. Failure to comply could result in death, personal injury, explosion, or fire. • Do not expose the battery to extremely high temperatures. Failure to comply could result in death, personal injury, explosion, or fire. • Do not swallow batteries. Failure to comply could result in chemical burns. • Seek for medical treatment immediately if a button battery is swallowed by accident, because this may cause severe internal burns within two hours and even death.
Caution • Keep batteries out of reach of children. • If the battery compartment is not securely closed, stop using the product immediately and keep it out of reach of children.

Maintenance
DANGER • Maintenance must be performed only by trained and qualified electrical personnel. • Do not maintain the equipment with power ON. Failure to comply could result in electric shock. • Before maintenance, disconnect all the power supplies of the equipment and wait for at least the time specified on the warning label. • Disconnect all external power supplies of the system before cleaning the equipment or re-tightening screws on the terminal block or screws for connector installation. Failure to comply could result in electric shock. • Disconnect all external power supplies of the system before removing or installing the product, or connecting or disconnecting cables. Failure to comply could result in electric shock or malfunction.

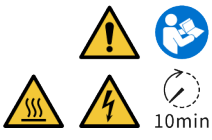
Maintenance
WARNING Perform routine and periodic inspection and maintenance on the equipment according to maintenance requirements and keep a maintenance record.

Repair
DANGER • Repair must be performed only by trained and qualified electrical personnel. • Do not repair the equipment with power ON. Failure to comply could result in electric shock. • Before inspection or repair, disconnect all the power supplies of the equipment and wait for at least the time specified on the warning label.
WARNING • Submit a request for repair based on the warranty agreement. • When the fuse is blown or the circuit breaker or earth leakage circuit breaker (ELCB) trips, wait for at least the time designated on the equipment warning label before power-on or further operations. Failure to comply could result in equipment damage, personal injury, or death. • Troubleshooting and repair of faulty or damaged equipment must be performed by professionals in accordance with the repair instructions, and proper repair records must be kept. • Replace quick-wear parts of the equipment according to the replacement instructions. • Do not use damaged equipment. Failure to comply could result in death, personal injury, or severe equipment damage. • Recheck the wiring and reset the parameters after equipment replacement.

Disposal
WARNING • Dispose of the retired equipment in accordance with applicable national regulations and standards. Failure to comply could result in property damage, personal injury, or death. • Recycle retired equipment in accordance with industry waste disposal standards to avoid environmental pollution. • Treat the scrapped equipment as industrial waste. Dispose of the batteries according to local laws and regulations.

Safety label

To ensure safe operation, comply with safety labels on the equipment and do not damage or remove the labels. The following table describes the meanings of the safety labels.

Safety label	Description
	• Before using the equipment, read the guide and safety precautions carefully. Failure to comply could result in personal injury, death, 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 could result in 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.



Malware (such as viruses, Trojans, and worms) can bring the device into an unsafe operating state, resulting in death, serious injury, and property damage. Observe the following precautions:

- Always use the latest software version. If the product version is no longer supported or the latest version is not used, you will be exposed to increased risk of cyber attacks.
- Develop and maintain appropriate protective measures (including but not limited to antivirus software, firewalls, WAF, IPS/IDS, situational awareness system, identity authentication, and data encryption) to prevent the files in mobile storage devices from being damaged by malware, and to protect the products, networks, systems, and interfaces from unauthorized access, tampering, hacking, data leakage, or information theft.
- Check all safety-related interfaces and settings after commissioning.

2 Product Information

2.1 Functions

Basic functions

- IO-Link communication
  - IO-Link master that can communicate with the IO-Link V1.0 and V1.1 devices
  - Equipped with eight IO-Link ports to connect up to eight IO-Link devices (Class A type)
- Ethernet/IP communication
  Equipped with two EtherNet/IP network ports (M12-D type) to transfer data between IO-Link devices and EtherNet/IP devices
- Parameter configuration
  - Device parameter modification: The system supports modifying the operation parameters of the slave devices through UCMM communication.
  - Port parameter backup: When this function is enabled, the system automatically backs up the configuration parameters of the slave connected to the port for the first time, and the slave connected to the port will run according to this backup parameter.
- Port mode configuration
  - Standard IO-Link master mode
  - Standard digital input mode
  - Standard digital output mode
- Visualized diagnosis
  - Network connection indicator
  - EtherNet/IP communication state indicator
  - US/UA power supply voltage state indicator
  - I/O-LINK port communication state indicator (indicating faults, short circuit, and overcurrent)

Digital input and output function

- Equipped with 16 configurable DI/DOs
- Pin2 and Pin4 of each port can be configured as DI/DO mode.
- The reference potential of all inputs and outputs is Pin3 voltage.

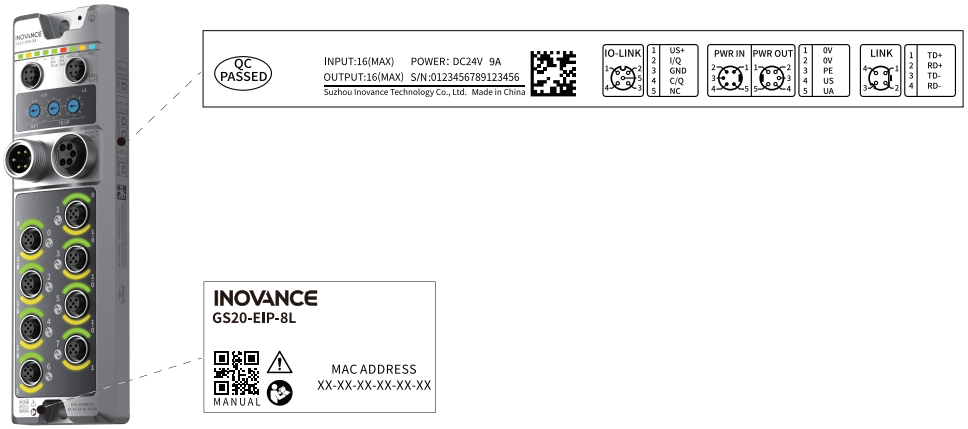
IO-Link port function

- Equipped with eight IO-Link device power supplies
- Class-A IO-Link ports
- Short circuit detection for the power supply of each port
- Short circuit/overcurrent protection for Pin1, Pin2 (DO mode), and Pin4 (DO mode)

2.2 Model and Nameplate

G S 20 - EIP - 8 L
① ② ③ ④ ⑤ ⑥

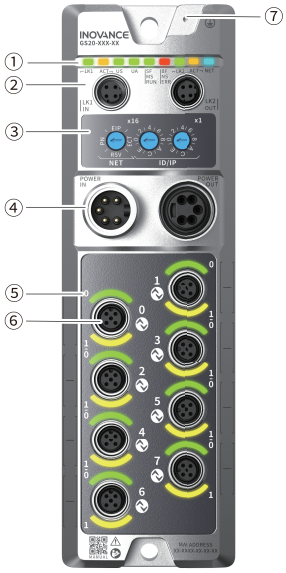
①	**Product family** G: Inovance controller general-purpose module	④	**Communication Protocol** ECT: EtherCAT bus communication EIP: EtherNet/IP communication PN: PROFINET communication
②	**Product type** S: High protection	⑤	**Number of conversion channels** 8: Eight channels
③	**Series** 20: 20 series	⑥	**Module type** L: IO-Link



Based on the above model and nameplate information, relevant ordering information of the product is provided in the following table.

Model	Description	Product code	Applicable model
GS20-EIP-8L	GS20 series high protection EtherNet/IP to 8-channel IO-Link master module	01440656	Class A I/O-Link master

2.3 Components



No.	Name	Description		
①	Status indicator	Link	Network connection indicator	• Solid ON in green: The module is connected to the peer device. • OFF: The module is not connected to the peer device, or the module or the peer device is not powered on.
		ACT	Data transmission indicator	• Flashing in yellow: Data transmission in progress. • OFF: No data is under transmission.
		US	System power supply indicator	• Solid ON in green: The US power supply voltage is normal (18 VDC ≤ US power supply voltage ≤ 30.2 VDC). • Solid ON in red: The US power supply voltage is abnormal (US power supply voltage > 30.2 VDC). • Flashing in red[2]: The US power supply voltage is abnormal (11 VDC < US power supply voltage < 18 VDC). • Flashing in red[1]: The US power supply voltage is abnormal (US power supply voltage < 11 VDC). • OFF: No power supply
		UA	Actuator power supply indicator	• Solid ON in green: The UA power supply voltage is normal (18 VDC ≤ UA power supply voltage ≤ 30.2 VDC). • Solid ON in red: The UA power supply voltage is abnormal (UA power supply voltage > 30.2 VDC). • Flashing in red [2]: The UA power supply voltage is abnormal (11 VDC ≤ UA power supply voltage ≤ 18 VDC). • OFF: The UA power supply voltage is abnormal (UA power supply voltage < 11 VDC).
		MS	Module status	• Solid ON in green: The module is operating normally. • Flashing in green: The module restores factory settings. • Flashing in red: The module hardware is faulty (abnormal US/UA/temperature).
		NS	Network status	• OFF: The communication is not established. • Solid ON in red: IP address conflict occurs. • Solid ON in green: The proprietary owner connection is normal. • Flashing in green: The proprietary owner connection does not exist or is offline. • Flashing in red and green alternatively: The proprietary owner connection and the input-only connection are offline. • Flashing in red: The input-only connection is offline.
		NET	Communication indicator	Solid ON in green: EtherNet/IP communication mode Solid ON in red: Abnormal network startup For details, see the NET indicator state table.

<table>
<tr><th>No.</th><th>Name</th><th colspan="3">Description</th></tr>
<tr><td rowspan="2">②</td><td rowspan="2">EtherNet/IP communication interface</td><td>IN</td><td colspan="2" rowspan="2">Used for EtherNet/IP communication input and output. For pin assignment, see “4.3 Terminal Definition” on page 24</td></tr>
<tr><td>OUT</td></tr>
<tr><td>③</td><td>DIP switch</td><td>ID/IP</td><td colspan="2">Slave address setting switch (value range: 0 to 255)
×16/×1: The slave address is set in hexadecimal.
The value of the x16 DIP switch represents the high 4 bits and the value of the x1 DIP switch represents the low 4 bits. The DIP switch is converted to decimal address as (value corresponding to the x16 DIP switch) * 16 + (value corresponding to the x1 DIP switch) * 1.
Example: Set the x16 DIP switch to A (A = 10 in hexadecimal) and the x1 DIP switch to E (E = 14 in hexadecimal).
The last byte of the IP address is 0×AE, and the slave address in decimal is 10 x 16 + 14 = 174.</td></tr>
<tr><td rowspan="2">④</td><td rowspan="2">Power supply interface</td><td>POWER IN</td><td colspan="2" rowspan="2">Used for power supply input/output. For pin assignment, see “4.3 Terminal Definition” on page 24</td></tr>
<tr><td>POWER OUT</td></tr>
<tr><td rowspan="2">⑤</td><td rowspan="2">IO-link indicator</td><td>0</td><td>0 indicator</td><td>• Solid ON in yellow: The output state of Pin4 is 1.
• Steady green: The IO-Link communication is connected and the output state of Pin4 is 1.
• Flashing in green[2]: The IO-Link communication is not connected.
• Solid ON in red: Pin4 encounters overcurrent.
• Flashing in red and green alternatively: The IO-Link communication is not connected due to invalid verification.
• Flashing in red[2] (together with indicator 1): Pin1 encounters overcurrent.
• OFF: input or output state of Pin4 being 0</td></tr>
<tr><td>1</td><td>Indicator 1</td><td>• Solid ON in yellow: The output state of Pin 2 is 1.
• Solid ON in green: The input state of Pin2 is 1.
• Solid ON in red: Pin 2 encounters overcurrent.
• Flashing in red[2] (together with indicator 0): Pin1 encounters overcurrent.
• OFF: input or output state of Pin4 being 0</td></tr>
<tr><td>⑥</td><td>IO-Link port</td><td>0 to 7</td><td colspan="2">Used for I/O-Link data transmission. For pin assignment, see “4.3 Terminal Definition” on page 24</td></tr>
<tr><td>⑦</td><td>Grounding terminal</td><td></td><td colspan="2">During installation, ensure that the protective grounding terminal of the module is grounded properly, with a recommended grounding impedance of less than 1 Ω.</td></tr>
</table>

Note

- Flashing: The indicator is on for 200ms and off for 200ms, repeating this cycle.
- [1]: US/UA indicator is on for 250ms and off for 250ms, repeating this cycle.
- [2]: The IO-Link indicator and US/UA indicator is on for 500ms and off for 500ms, repeating this cycle.

Caution

: High temperature caution for the module.

The following table introduces the specific states of the NET indicator.

Input Connection/ Proprietary Owner Connection	The proprietary owner connection does not exist	The proprietary owner connection exists and is online	The proprietary owner connection exists but is offline
Input only connection does not exist	Green indicator OFF Red indicator OFF	Steady green Red indicator OFF	Flashing green Red indicator OFF
Input only connection exists and is online	Flashing green Red indicator OFF	Steady green Red indicator OFF	Flashing green Red indicator OFF
Input only connection exists but is offline	Green indicator OFF Flashing red	Steady green Flashing red	Flashing green Flashing red

2.4 Technical Specifications

General specifications

Item	Specification
Dimensions (W x H x D)	69.8 mm x 224.8 mm x 20.5 mm
Weight	Approx. 550 g

Power supply specifications

Item	Specification
Rated voltage of US power supply	24 VDC (18 VDC to 30.2 VDC)
Maximum current of US power supply	The maximum input/output current is 9 A (with the external +24 V power supply disabled for IO-Link port).
US reverse polarity protection	Supported
Rated voltage of UA power supply	24 VDC (18 VDC to 30.2 VDC)
Maximum current of UA power supply	Maximum input 9 A, maximum output 9 A (DO disabled)
UA reverse polarity protection	Supported
US undervoltage detection	The module uses software to perform undervoltage detection (< 18 VDC), voltage-loss detection (< 11 VDC), and overvoltage detection (≥ 30.2 VDC).
UA undervoltage detection	The module uses software to perform undervoltage detection (< 18 VDC), voltage-loss detection (< 11 VDC), and overvoltage detection (≥ 30.2 VDC).

Input specifications

Item	Specification
Input type	Digital input
Input mode	PNP
Number of input channels	Max. 16

Item	Specification
Input voltage class	24 VDC (18 VDC to 30.2 VDC)
Input current (typical)	2.4 mA (typical value @24 V)
ON-state voltage	> 11 VDC
OFF voltage	< 5 VDC
Hardware response time upon ON/OFF	100μs (Max.)/100μs (Max.)
Supported type	Type1/Type3
Isolation	No

Output specifications

Item	Specification
Output type	Digital output; transistor output
Output mode	PNP
Output channel	Max. 16
Output voltage class	24 VDC (18 VDC to 30.2 VDC)
Output load (resistive load)	2 A/point; 9 A/module
Output load (inductive load)	24 W/point
Output load (lamp load)	18 W/point
Hardware response time upon ON/OFF	100μs (Max.)/1.4ms (Max.)
OFF-state leakage current	10 μA (with 24 VDC)
Isolation	No
Protective functions	Short-circuit protection
Output derating	• Outside the cabinet: The module works at full load at 70° C. For example, the output current of the 16-channel resistive output load does not exceed 9 A. • Inside the cabinet: The module works at 75% of full load at 70°C. For example, the output current of the 16-channel resistive output load does not exceed 7 A.

IO-Link specifications

Item	Specification
Number of ports	8
IO-Link version	1.1.3
IO-Link port type	Class A
Communication rate	COM1 (4.8 kbps) COM2 (38.4 kbps) COM3 (230.4 kbps)
Size of process data	Input per port: 32 bytes max. Output per port: 32 bytes max.
Capacity of the memory for saving device parameters	2 kbyte (applicable to each port)
External +24 V "L+" supply current of IO-Link port (Pin1)	Rated current: 1.6 A Overcurrent protection value: 2 A
Isolation method	No
Unshielded drain wire length	Max. 20 m
Cable requirements	5-pin unshielded cable
Protective functions	Overcurrent protection

EtherNet specifications

Item	Specification
Communication port	2
IP setting method	BOOTP/DHCP
Network topology	Linear, star, tree, and DLR (only supported as managed)
Max. data length	Input: 392 bytes Output: 262 bytes
Transmission distance	100 m
RPI	1 ms to 50,000 ms
Max. number of CIP connections	16
Network interface	Two M12 D-code interfaces with switching function
Connection rate	100 M
Factory setting restoration	Supported

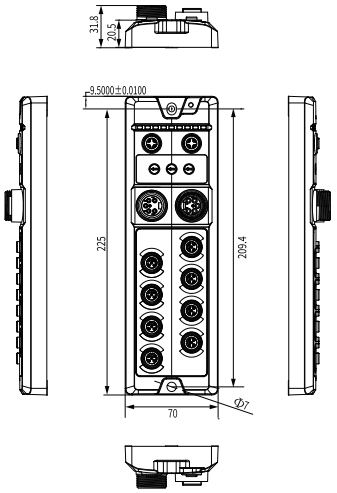
2.5 Environmental Specifications

Item		Operation Specification	Transmission Specification	Storage Specification
IP rating		IP67 (with screws tightened)		
Pollution degree		2		
Immunity		2 kV on power supply line (IEC61000-4-4)		
Overvoltage category		I		
EMC immunity level		Zone B, IEC61131-2		
Anti-static rating		Contact discharge: +/-6 kV; air discharge: +/-8 kV		
Temperature		-30°C to +70°C	-40°C to +85°C	-40°C to +85°C
Humidity		10% RH to 99% RH, without condensation 100% (when all connectors are installed)		
Vi-bra-tion	Frequency	5 Hz to 500 Hz	2M2	1M12
	Displace-ment	1 mm (direct installation) (5 Hz to 61 Hz)		
	Acceleration	15 g (direct installation) (61 Hz to 500 Hz)		
	Direction	3-axial directions		
Shock resistance		Application/Transportation scenario: Tested according to IEC60068-2-27; 15 g peak acceleration, 11 ms pulse width, 18 shocks in total in X, Y and Z axes		
Altitude/air pressure		0 m to 2000 m (> 79.5 kPa)	0 m to 2000 m (> 79.5 kPa)	

3 Mechanical Installation

3.1 Installation Dimensions

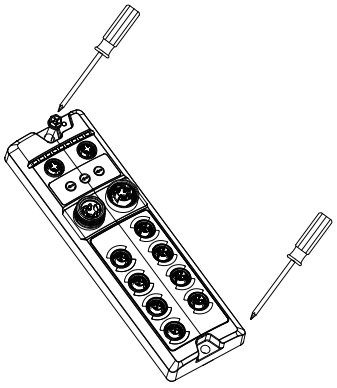
The installation dimensions (in mm) are shown in the figure below.

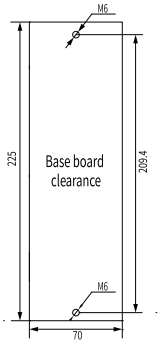


3.2 Installation Method

Installation

Install the module with two cross recessed hexagon SEMS screws (M6 x 25) with the washer diameter of 11 mm. The clearance between the two screws is 209.4 mm. The following figure describes the installation and clearance (in mm).





Uninstallation

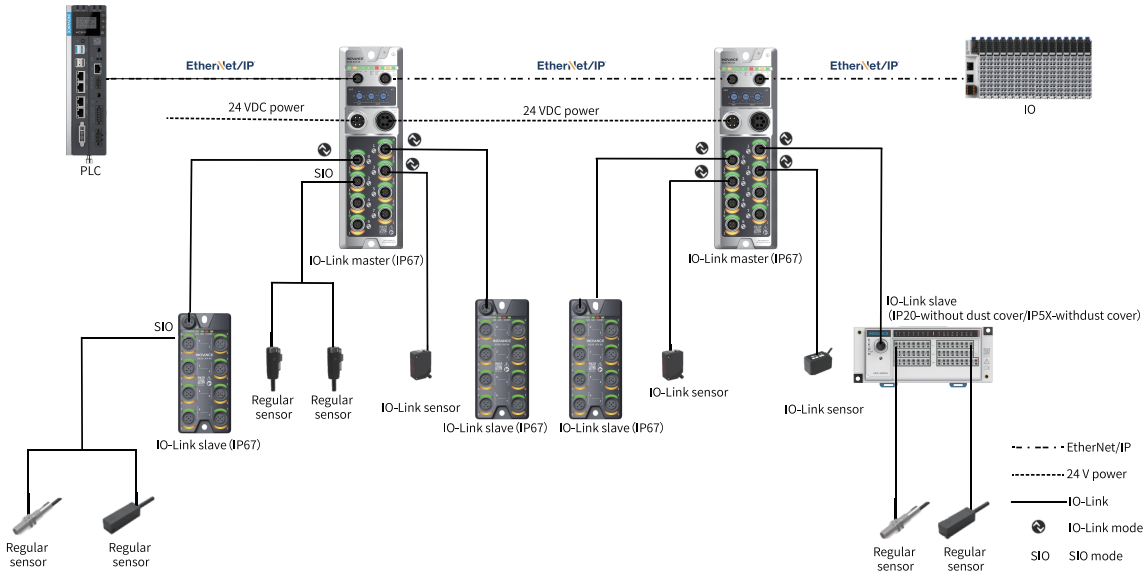
Remove the M6 screws using a Phillips screwdriver, and then detach the module.

4 Electrical Installation

4.1 IO-Link Topology

I/O-Link is a serial digital communication protocol that integrates intelligent sensors and actuators into automation systems. It is the first standardized I/O technology (IEC 61131-9) used for communication of sensors and actuators. It is used for periodic data exchange between the sensor/actuator and the PLC. IO-Link is not a fieldbus, but an open point-to-point communication. This protocol is easy to use, stable, and reliable. With the advancement of Industry 4.0, it is gaining wider adoption.

The IO-Link topology consists of the PLC, IO-Link master (GS20-EIP-8L), IO-Link slave (GR20-16EMNL/GR20-16EMPL/GS20-16EMNL/GS20-16EMPL/GS20-16EMNL-S/GS20-16EMPL-S), sensor/actuator, and IO-Link cables. IO-Link masters communicate with PLCs and other IO-Link masters via EtherNET/IP. IO-Link communication is adopted for connection between IO-Link masters and IO-Link slaves/sensors/actuators, as well as IO-Link slaves and sensors/actuators. IO-Link masters and slaves can directly power sensors and actuators. The IO-Link topology is shown in the figure below.



Note

The IO-Link port supports two operating modes: IO-Link mode and SIO mode (Standard I/O mode), which can be separately configured on any port.

4.2 Cable Selection

Ethernet/IP communication cable

The data for ordering the Ethernet/IP communication cable is as follows.

Model	Description	Length	Material Code
CAB-M12DMS4-M12DMS4-3	Cable assembly - Ethernet/IP cable - Male (straight) - 22AWG - Green - Male (straight) - 80°C (cables for cascading multiple IO-Link masters (Ethernet/IP cascaded))	3 m	15310153
CAB-M12DMS4-M12DMS4-5		5 m	15310178
CAB-M12DMS4-M12DMS4-8		8 m	15310221
CAB-M12DMS4-M12DMS4-10		10 m	15310177
CAB-M12DMS4-M12DMS4-15		15 m	15310176
CAB-RJ45-M12DMS4-3	Cable assembly - Ethernet/IP cable - Male (straight) - 26 AWG - Black - RJ45 - 80°C (used for connecting PLC network ports and IO-Link masters)	3 m	15310154
CAB-RJ45-M12DMS4-5		5 m	15310187
CAB-RJ45-M12DMS4-8		8 m	15310215
CAB-RJ45-M12DMS4-10		10 m	15310186
CAB-RJ45-M12DMS4-15		15 m	15310185

Power supply input cable

The data for ordering the power supply input cable is as follows.

Model	Description	Length	Material Code
CAB-7/8FL5-3	Cable assembly - 7/8" power supply cable - Female (angled) - 16 AWG - Black - NA - 80°C (used for powering IO-Link masters)	3 m	15310155
CAB-7/8FL5-5		5 m	15310175
CAB-7/8FL5-8		8 m	15310216
CAB-7/8FL5-10		10 m	15310174
CAB-7/8FL5-15		15 m	15310173

The following table introduces the functions of power supply cables in different colors.

No.	Color	Function
1	Black	0V
2	Blue	0V
PE	Green/Yellow	Function grounding
4	Brown	Sensor and power supply system (US)
5	White	Power supply of the actuator (UA)

Power supply input cable

The data for ordering the power supply input cable is as follows.

Model	Description	Length	Material Code
CAB-7/8FL5-3	Cable assembly - 7/8 power supply cable - Female (angled) - 16 AWG - Black - NA - 80°C (used for powering IO-Link masters)	3 m	15310155
CAB-7/8FL5-5		5 m	15310175
CAB-7/8FL5-8		8 m	15310216
CAB-7/8FL5-10		10 m	15310174
CAB-7/8FL5-15		15 m	15310173

The following table introduces the functions of power supply cables in different colors.

No.	Color	Function
1	Black	0V
2	Blue	0V
PE	Green/Yellow	Function grounding
4	Brown	Sensor and power supply system (US)
5	White	Power supply of the actuator (UA)

Power supply output cable

The data for ordering the power supply output cable is as follows.

Model	Description	Length	Material Code
CAB-7/8FL5-7/8ML5-3	Cable assembly - 7/8 power supply cable - Female (angled) - 16 AWG - Black - Female (angled) - 80°C (used for cascading multiple IO-Link master power supplies)	3 m	15310156
CAB-7/8FL5-7/8ML5-5		5 m	15310181
CAB-7/8FL5-7/8ML5-8		8 m	15310219
CAB-7/8FL5-7/8ML5-10		10 m	15310180
CAB-7/8FL5-7/8ML5-15		15 m	15310179

IO-Link communication cable

The data for ordering IO-Link communication cable is as follows:

Model	Description	Length	Material Code
CAB-M12AMS4-M12AFL4-3	Cable assembly - IO-Link cable - Male (straight) - 22AWG - Black - Female (angled) - 85°C (used for connecting the IO-Link master to IO-Link slaves)	3 m	15310142
CAB-M12AMS4-M12AFL4-5		5 m	15310184
CAB-M12AMS4-M12AFL4-8		8 m	15310230
CAB-M12AMS4-M12AFL4-10		10 m	15310183
CAB-M12AMS4-M12AFL4-15		15 m	15310182
CAB-M12AMS4-M12AFL4-3-T-taiyo	Cable assembly - IO-Link cable - Male (straight) - 22AWG - Black - Female (angled) - 85°C - Highly flexible cables fit for drag chains, surviving 3 to 5 million continuous tests (used for connecting the IO-Link master to IO-Link slaves)	3 m	15310232
CAB-M12AMS4-M12AFL4-5-T-taiyo		5 m	15310231
CAB-M12AMS4-M12AFL4-8-T-taiyo		8 m	15310229
CAB-M12AMS4-M12AFL4-10-T-taiyo		10 m	15310228
CAB-M12AMS4-M12AFL4-15-T0-taiyo		15 m	15310227

Plug and connector assembly

The data for ordering the plug and connector assembly is as follows:

Model	Description	Material Code
CON-M12AFS4	4-pin female (straight) field-wirable plug	15051155
CON-M12AFL4	4-pin female (angled) field-wirable plug	15051157
CON-M12AMS5	5-pin male (straight) field-wirable plug	15051156
CON-M12AML5	5-pin male (angled) field-wirable plug	15051158
CON-M12AMS5-YF5	Y splitter that converts one 5-pin male M12 connector to two 5-pin female M12 DIO connectors	15051159
CON-M12AFL4-L	4-pin female (angled) field-wirable plug (applicable to GR20-16EMNL/GR20-16EMPL)	15051269
CON-M12AMS4-YM8F3	Y splitter that converts one M12 5-pin A-code male straight connector to two M8 3-pin female connectors	15051420
CON-M12AMS4-YM8F4	Y splitter that converts one M12 5-pin A-code male straight connector to two M8 4-pin female connectors	15051419
CON-M8AMS3	M8 3-pin assembled connector	15051445
CON-M8AMS4	M8 4-pin assembled connector	15051448

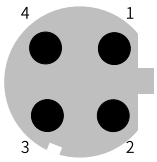
Model	Description	Material Code
CON-M12AFS5-YM5	Y splitter that converts one 5-pin female connector to two 5-pin male straight connectors. It can be used to connect the class A master to class B valve terminal slave.	15051334
IPT210-A-CAB-M12AMS5-M12AFS5-1.5	Connector that converts 5-pin male straight connector to 5-pin female straight connector. It can be used to connect the IO-Link master to valve terminal.	72235829
IPT210-A-CAB-M12AFS5-1.5	Connector that converts 5-pin female straight connector to discrete cable. It can be used to power the valve terminal.	72235870

Note

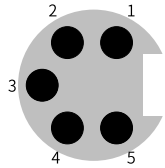
If you have additional requirements for cable selection, contact Inovance for customization.

4.3 Terminal Definition

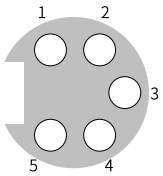
Assignment of EtherNet/IP pins

Diagram	Pin	Description
	1	TD+
	2	RD+
	3	TD-
	4	RD-

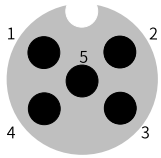
Assignment of power supply input pins

Diagram	Pin	Description
	1	0V
	2	0V
	3	Function grounding (PE)
	4	Sensor and system power supply (US)
	5	Actuator power supply (UA)

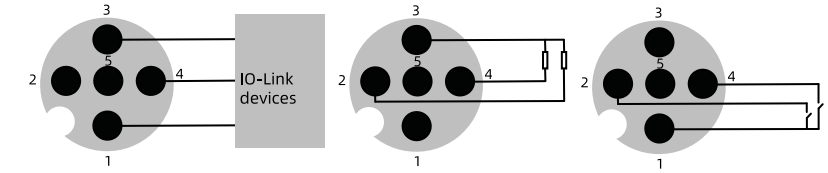
Assignment of power supply output pins

Diagram	Pin	Description
	1	0V
	2	0V
	3	Function grounding (PE)
	4	Sensor and bus power supply (US)
	5	Actuator power supply (UA)

Assignment of IO-Link pins

Diagram	Pin	Function	Description	Color
	1	L+	+24 V power supply (US+)	Brown
	2	I/Q	• Not connected (Class A) • DI: Digital input (Class A) • DO: Digital output (Class A)	White
		2L+	+24 V power supply (UA+)	
	3	L-	+24 V power supply (US-)	Blue
	4	C/Q	• SIO: Standard input/output mode • IO-Link communication mode	Black
	5	NC	Not connected (Class A)	Undefined
		2L-	+24 V power supply (UA-)	

4.4 Terminal wiring



Note

- This product adopts M12 A-coded connectors for EtherCAT communication ports and IO-Link ports. The recommended tightening torque for the connector cable is 0.5 N·m, with a maximum of 0.8 N·m. Exceeding 1.0 N·m may pose a risk of damaging the circuit board.
- This product adopts 7/8 inch terminals for power ports. The recommended tightening torque for terminal cables is 1.5 N·m, with a maximum of 1.8 N·m. Torque exceeding 2.0 N·m may damage the circuit board.

5 Program Commissioning

5.1 IP Address Configuration and Definition

Configure the IP address to establish communication between the PLC and the module. The factory default IP address information is shown below.

- IP address: 192.168.1.66
- Subnet mask: 255.255.255.0
- Gateway address: 192.168.1.1

Configuring the IP address via DIP switch

The GS20-EIP-8L module is equipped with three DIP switches, defined as follows:

- When the ID/IP value of the DIP switch is 0x00, the default IP address (192.168.1.66) is used.
- When the ID/IP value of the DIP switch is within the range of 0x01 to 0xFE, this value represents the last byte of the IP address, which is 192.168.1.(ID/IP value).
- When the ID/IP value of the DIP switch is 0xFF, the device defaults to the DHCP mode.

To reset the DIP switch, power off the module and set the DIP switch to 6FF, as shown below.



Power on the module and set the DIP switch to 400, as shown below. Power off and on the module again, the IP address of the module will be restored to default (192.168.1.66). After modifying the IP address, it is necessary to power off and restart the GS20-EIP-8L module.



5.2 GS20-EIP-8L Module Parameter Configuration

5.2.1 Configuration Data

The following table introduces the parameter configuration of the GS20-EIP-8L module, including the sizes of input, output, and configuration data.

Name	Instance ID	Data Length
Input port	110	392
Output	100	262
Configuration	120	194

The following table introduces the configuration parameter sequence of the GS20-EIP-8L module. Bytes 0 to 9 are for basic module configuration, including port functions and output state upon network disconnection. Bytes 10 to 193 are for IO-Link configuration of the eight ports.

Byte	Configuration Object	Description
0 to 9	Module	Basic configuration of the whole module
10 to 32	IO-Link port 0	Configuration of IO-Link port 0
33 to 55	IO-Link port 1	Configuration of IO-Link port 1
56 to 78	IO-Link port 2	Configuration of IO-Link port 2
79 to 101	IO-Link port 3	Configuration of IO-Link port 3
102 to 124	IO-Link port 4	Configuration of IO-Link port 4
125 to 147	IO-Link port 5	Configuration of IO-Link port 5
148 to 170	IO-Link port 6	Configuration of IO-Link port 6
171 to 193	IO-Link port 7	Configuration of IO-Link port 7

The following table introduces the basic configuration of the entire module. The port function can be configured to use the Pin4 of each port as IO-Link or as standard I/O. If Pin4 is used as standard I/O, the port function can be configured as NO (normally open) input, NC (normally closed) input, or output mode.

- **Configured as standard I/O**
  Output state upon network disconnection of Pin2/Pin4: When the network is disconnected, the module can be configured to output 0 V, 24 V, or the last cycle value.

  The Pin2 port function can be configured as NO input, NC input, output mode, or output enable mode. When it is configured as output enable, Pin2 output can be achieved without modifying the output process data through I/O mapping.

  The Pin4 port function can be configured as NO input, NC input, or output mode.

Byte	Bit								Description
-	7	6	5	4	3	2	1	0	-
0	Port 3		Port 2		Port 1		Port 0		Port function (port_function) • 0x00: Standard I/O • 0x01: IO-Link
1	Port 7		Port 6		Port 5		Port 4		
2	Port 3 to Pin2		Port 2 to Pin2		Port 1 to Pin2		Port 0 to Pin2		Pin2 output function upon network disconnection (Pin2_safe_state) • 0x00: Output 0 V • 0x01: Output 24 V • 0x02: Output the last cycle value
3	Port 7 to Pin2		Port 6 to Pin2		Port 5 to Pin2		Port 4 to Pin2		
4	Port 3 to Pin4		Port 2 to Pin4		Port 1 to Pin4		Port 0 to Pin4		Pin4 output function upon network disconnection (Pin4_safe_state) • 0x00: Output 0 V • 0x01: Output 24 V • 0x02: Output the last cycle value
5	Port 7 to Pin4		Port 6 to Pin4		Port 5 to Pin4		Port 4 to Pin4		

Byte	Bit				Description
6	Port 3 to Pin2	Port 2 to Pin2	Port 1 to Pin2	Port 0 to Pin2	Pin2 port function (Pin2_fun) • 0x00: NO input • 0x01: NC input • 0x02: Output mode • 0x03: Output enable
7	Port 7 to Pin2	Port 6 to Pin2	Port 5 to Pin2	Port 4 to Pin2	
8	Port 3 to Pin4	Port 2 to Pin4	Port 1 to Pin4	Port 0 to Pin4	Pin4 port function (Pin4_fun) • 0x00: NO input • 0x01: NC input • 0x02: Output mode
9	Port 7 to Pin4	Port 6 to Pin4	Port 5 to Pin4	Port 4 to Pin4	

Configured as IO-Link port

The following table introduces the IO-Link port configuration details.

Byte	Bit								Description
-	7	6	5	4	3	2	1	0	-
10	Time base		Scaling factor						Cycle time configuration
11	Port verification mode								• 0: Disable • 1: V1.0 verification for Vendor/Device ID • 2: V1.1 verification for Vendor/Device ID • 3: Enable slave configuration parameter backup and restoration • 4: Enable slave configuration parameter restoration Note: • V1.0 and V1.1 indicate the IO-Link slave protocol stack versions. • When using modes 3 and 4, the port must be configured as configuration mode.
12	Vendor ID0 (VID)								Vendor ID
13	Vendor ID1 (VID)								
14	Device ID0 (DID)								Slave device ID
15	Device ID1 (DID)								
16	Device ID2 (DID)								
17	Serial number 0 (Sernum)								Device serial number
...	...								...
32	Serial number 16 (Sernum)								-
...	The data structure of the other serial numbers is the same.								-

The cycle time configuration can affect the IO-Link communication speed. The calculation is based on multipliers and time bases as described in the following table. When the cycle time is set to "automatic", the IO-Link master automatically the update time of the IO-Link device.

Bit								Description
7	6	5	4	3	2	1	0	-
Time base		Multiplier						• Bits 0 to 5 represent the multiplier, which contains a 6-digit multiplier used to calculate MasterCycleTime or MinCycleTime. The multiplier range is 0 to 63. • Bits 6 to 7 represent the time base, which specifies the time base for MasterCycleTime or MinCycleTime calculations.

The optional values of MasterCycleTime and MiniCycleTimecycle are shown in the following table.

Time Base Code	Time Base Value	Calculation Method	Cycle Time
00	0.1ms	Multiplier x Time base	0.4ms to 6.3ms
01	0.4ms	6.4ms + Multiplier x Time base	6.4ms to 31.6ms
10	1.6ms	32.0ms + Multiplier x Time base	32.0ms to 132.8ms
11	Reserved	Reserved	Reserved

5.2.2 Input Process Data

The size of the input data is 392 bytes. The allocation of the process data input is shown in the following table.

Byte	Configuration Object	Note
0 to 7	Standard I/O port	Process data input for standard input
8 to 55	IO-Link port 0	Process data input for IO-Link port 0
56 to 103	IO-Link port 1	Process data input for IO-Link port 1
104 to 151	IO-Link port 2	Process data input for IO-Link port 2
152 to 199	IO-Link port 3	Process data input for IO-Link port 3
200 to 247	IO-Link port 4	Process data input for IO-Link port 4
248 to 295	IO-Link port 5	Process data input for IO-Link port 5
296 to 343	IO-Link port 6	Process data input for IO-Link port 6
344 to 391	IO-Link port 7	Process data input for IO-Link port 7

- **Input process data for standard I/O input**
  Bytes 0 to 7 represent the input process data when the port is configured as standard input, as shown in the table below.

Byte	Bit								Note
-	7	6	5	4	3	2	1	0	-
0	I32	I34	I22	I24	I12	I14	I02	I04	Input data • I02: Input data of Pin2 of port 0 • I04: Input data on Pin4 of port 0
1	I72	I74	I62	I64	I52	I54	I42	I44	
2	S3		S2		S1		S0		Short circuit state Short circuit between Pin1 and Pin3
3	S7		S6		S5		S4		

Byte	Bit								Note
4	O32	O-34	O22	O24	O12	O14	O02	O04	Overload state • O04: Pin4 of port 0 is overloaded • O02: Pin2 of port 0 is overloaded
5	O72	O-74	O62	O64	O52	O54	O42	O44	
6	-		T		US		UA		System state • UA: UA power supply state • US: US power supply state • T: Temperature state
			• 00: -30°C < Internal temperature < 85°C • 01: Internal temperature < -30°C • 10: Internal temperature > 85°C • 11: Reserved		• 00: 18 VDC < US < 30.2 VDC • 01: 11 VDC < US < 18VDC • 10: US > 30.2 VDC • 11: US < 11 VDC		• 00: 18 VDC < UA < 30.2 VDC • 01: 11 VDC < UA < 18 VDC • 10: UA > 30.2 VDC • 11: UA < 11 VDC		
7	0	0	0	0	0	0	0	0	Reserved

- **Input process data for IO-Link port**

  Bytes 8 to 391 represent the input process data when the port is configured as IO-Link, as shown in the table below.

Byte	Bit								Note
-	7	6	5	4	3	2	1	0	-
8 to 39	-								IO-Link port 0 data (IOL Ports Inputs)
40	0	0	0	0	0	0	DC	IOL	IO-Link state (IOL Status) • IOL: IO-Link mode port • DC: Device connected • 0: Reserved
41	0	0	0	0	0	PDI	DF	VF	IO-Link fault (IOL Error) • VF: Verification failed • DF: Data storage failed • PDI: Invalid process data
42	Vendor ID2								Vendor ID
43	Vendor ID2								
44	Slave device ID1								Slave device ID
45	Slave device ID2								
46	Slave device ID3								
47	Mode		Type		0	-	-	-	Event 1 Mode • 0: Reserved • 1: Event single gap • 2: Event disappeared • 3: Event appeared Type • 0: Reserved • 1: Caution • 2: Alarm • 3: Fault
48	High bytes of event code								
49	Low bytes of event code								

Byte	Bit						Note
50	Mode	Type	0	-	-	-	Event 2 Mode • 0: Reserved • 1: Event single gap • 2: Event disappeared • 3: Event appeared Type • 0: Reserved • 1: Caution • 2: Alarm • 3: Fault
51	High bytes of event code						
52	Low bytes of event code						
53	Mode	Type	0	-	-	-	Event 3 Mode • 0: Reserved • 1: Event single gap • 2: Event disappeared • 3: Event appeared Type • 0: Reserved • 1: Caution • 2: Alarm • 3: Fault
54	High bytes of event code						
55	Low bytes of event code						
...	The data structure of IO-Link port is the same.						-

5.2.3 Output Process Data

The size of the output data is 262 bytes. The allocation of the output process data is shown in the following table.

Byte	Configuration Object	Note
0 to 5	Standard I/O port	Process data output of standard output
6 to 37	IO-Link port 0	Process data output for IO-Link port 0
38 to 69	IO-Link port 1	Process data output for IO-Link port 1
70 to 101	IO-Link port 2	Process data output for IO-Link port 2
102 to 133	IO-Link port 3	Process data output for IO-Link port 3
134 to 165	IO-Link port 4	Process data output for IO-Link port 4
166 to 197	IO-Link port 5	Process data output for IO-Link port 5
198 to 229	IO-Link port 6	Process data output for IO-Link port 6
230 to 261	IO-Link port 7	Process data output for IO-Link port 7

- **Output process data of standard output**

Bytes 0 to 5 represent the output process data when the port is configured as standard output, as shown in the table below.

Byte	Bit								Note
-	7	6	5	4	3	2	1	0	-
0	O32	O34	O22	O24	O12	O14	O02	O04	Output data • O04: Output data on Pin4 of port 0 • O02: Output data on Pin2 of port 0
1	O72	O74	O62	O64	O52	O54	O42	O44	
2	0	0	0	0	0	0	0	0	Reserved
3	0	0	0	0	0	0	0	0	
4	0	0	0	0	0	0	0	0	
5	0	0	0	0	0	0	0	0	

- **Output process data for IO-Link port**

  Bytes 6 to 261 represent the output process data when the port is configured as IO-Link, as shown in the table below.

Byte	Bit (0 to 7)	Note
6 to 37	-	Output data for IO-Link port 0
...	The data structure is the same to that of other IO-Link ports.	Output data for IO-Link port n

5.3 IO-Link Slave Parameter Configuration via UCMM

5.3.1 ODVA EIP-Tools Connection

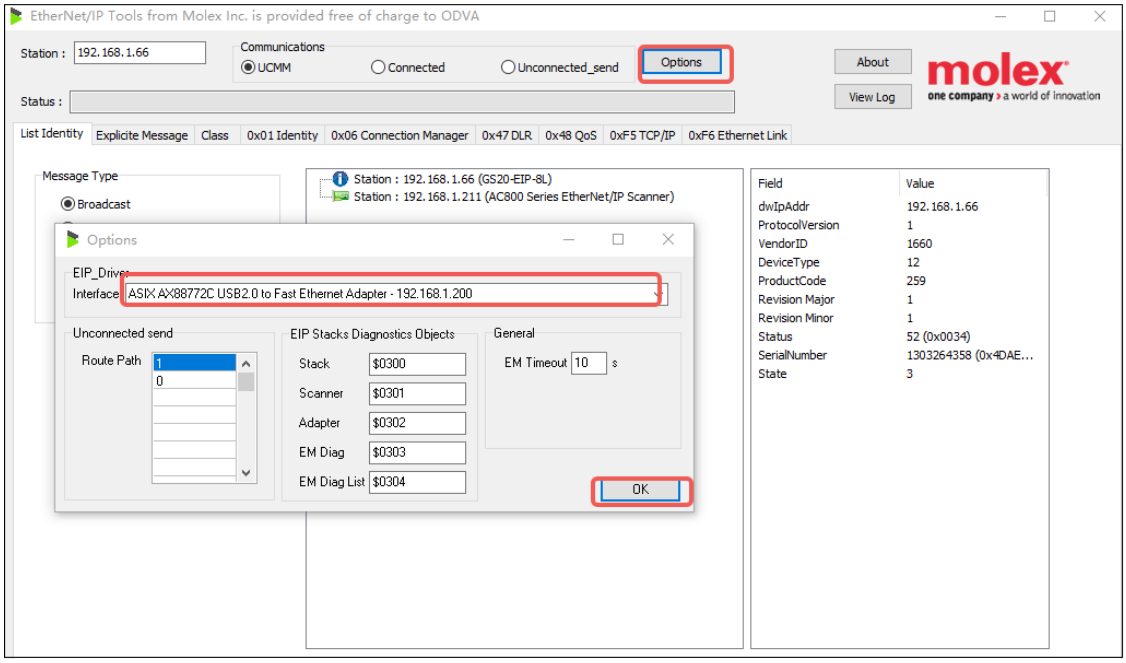
When the GS20-EIP-8L port is configured as IO-Link and connects to an IO-Link slave, the parameters of the slave can be configured through the UCMM communication function.

Prerequisites

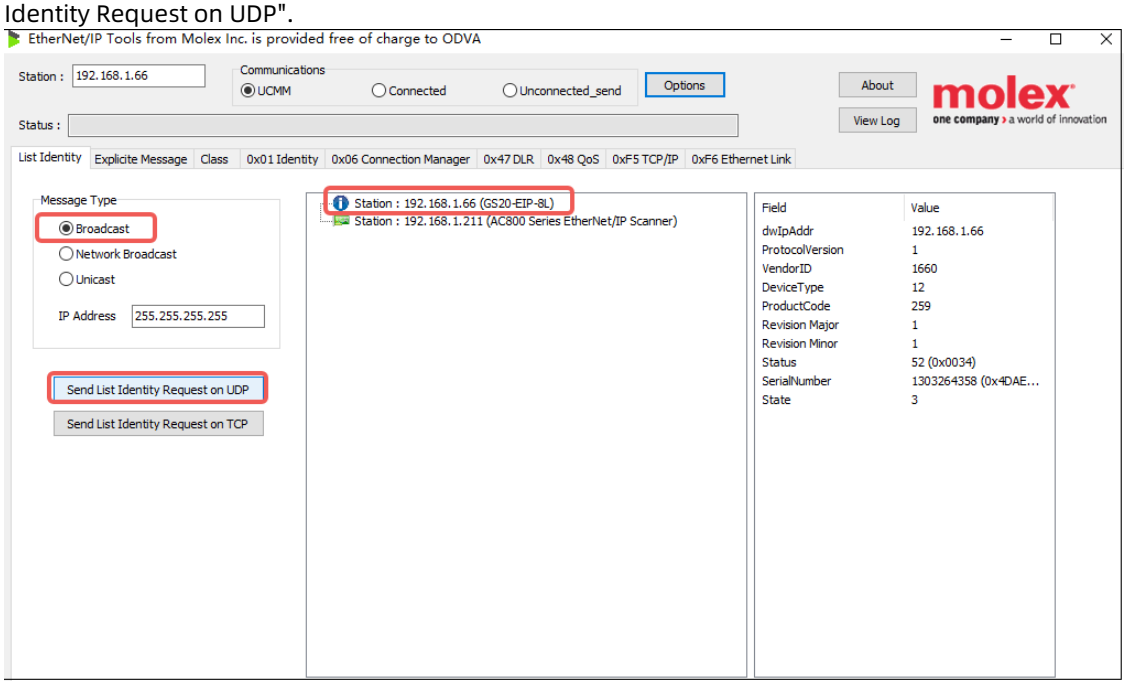
Download and install EIP-Tools from ODVA official.

Procedure

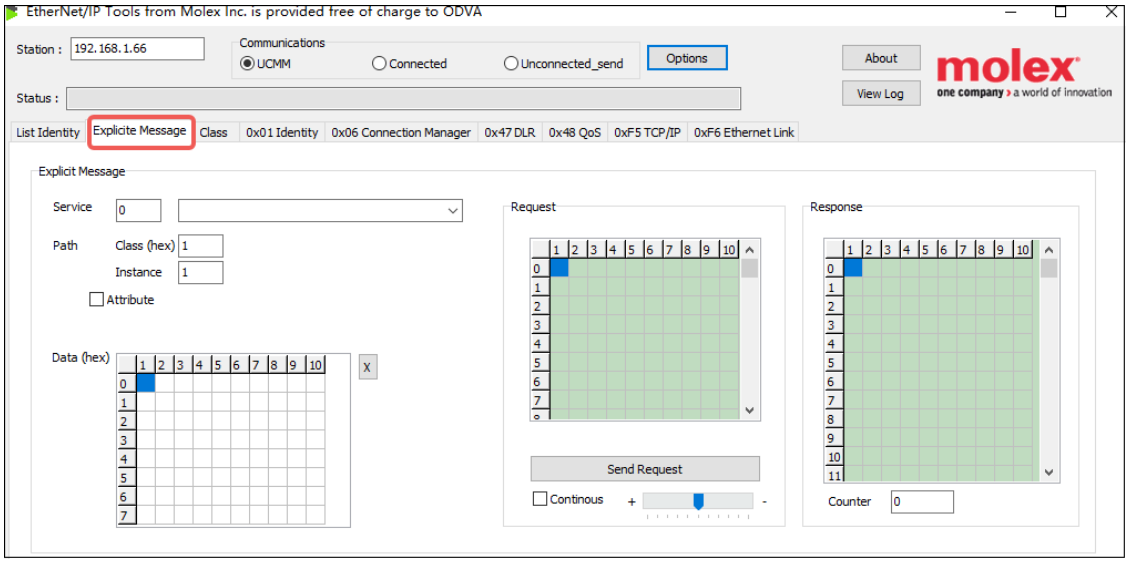
1. Open the ODVA tool and select the same network segment as the module. If they are not in the same network segment, configure the computer's IP address as shown below.



2. Set "Message Type" to "Broadcast" to locate the connected GS20-EIP-8L module. Click "Send List Identity Request on UDP".



3. Click "Explicit Message" and enter related parameters for configuring the UCMM display message issuance.



5.3.2 IO-Link Slave Configuration Parameter Writing

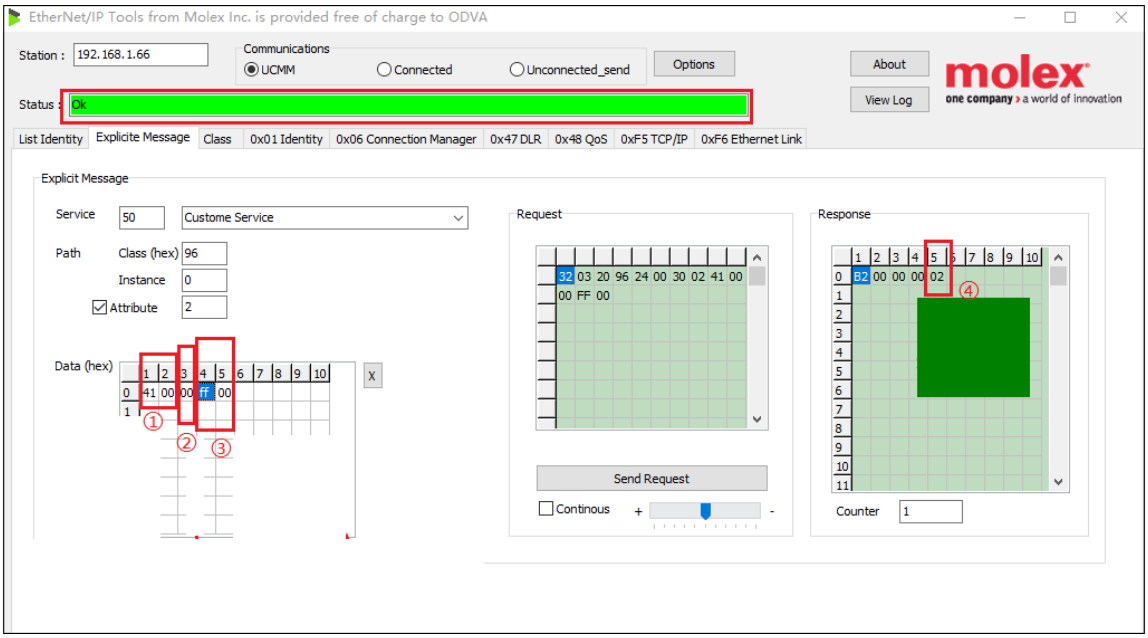
The following parameters need to be configured to write IO-Link slave configuration parameters.

service	class	Instance	Attribute
0x32 (50 in decimal)	0x96	0 to n(7)	0x02 (parameter writing)

Note

"n" refers to port number.

Enter the corresponding values in turn, as shown below.



Caution

When configuring the entire index (with the sub-index value set to 0), the data in Data (hex) must be at least 5 bytes; when configuring the subindex, the data in Data (hex) must be at least 4 bytes.

No.	Description
①	Configure parameter index, with the lower byte preceding the higher bit
②	Configure parameter subindex.
③	Configure parameter data to be issued.
④	Returning “0x02” indicates successful configuration.

5.3.3 IO-Link Slave Configuration Parameter Reading

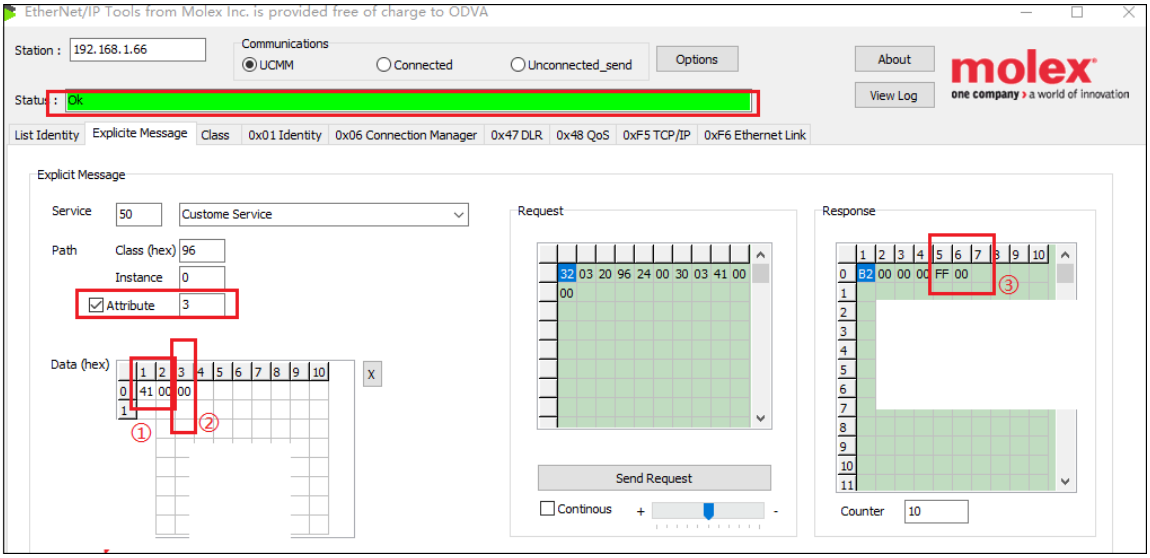
The following parameters need to be configured to read IO-Link slave configuration parameters.

Service	Class	Instance	Attribute
0x32 (50 in decimal)	0x96	0 to n(7)	0x03 (read parameters)

Note

"n" refers to the port number.

Enter the corresponding values in turn, including the parameter index and subindex of the slave to be read, as shown below.



No.	Description
①	Configure parameter index, with the lower byte preceding the higher bit
②	Configure parameter subindex.
③	FF: No fault, read the corresponding configuration parameter 00: A fault occured, read the parameter fault code
④	Returning “0x02” indicates successful configuration.

Caution

Data within Data (hex) must be greater than or equal to 2 bytes.

If there is an issue with the path being read, the "Status" will not return OK; instead, it will return the corresponding fault code, as shown below.

Fault Code	Description	Solution
0x08	Service not supported	Check whether the Service is correct.
0x05	Incorrect Class	Check whether the Class is correct.
0x09	Incorrect Attribute	Check whether the Attribute is correct.
0x20	Incorrect parameter	Check whether the length of "Data" meets the requirements.
0x02	Unavailable data source	Check whether the Instance is correct and whether the IO-Link slave is connected.

5.4 Programming Examples

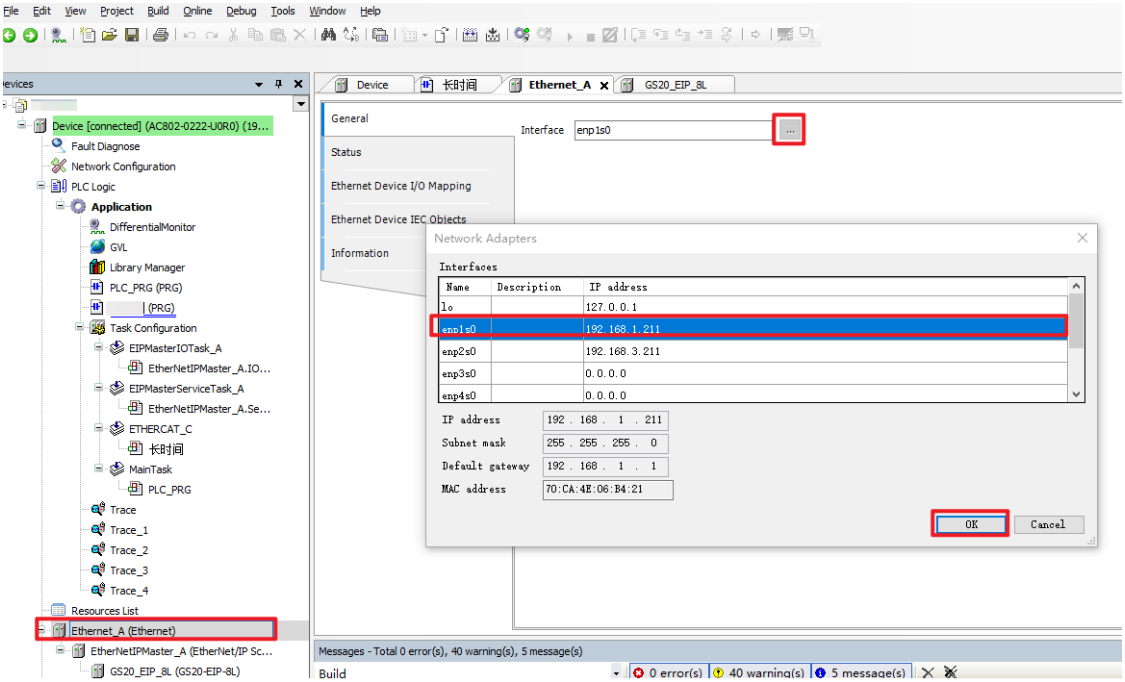
5.4.1 Programming with Inovance InoProShop

Prerequisites

- The cables are connected correctly.
- InoProShop V1.7.3 and above is installed.
- The EDS file of the GS20-EIP-8L module is imported into InoProShop. The EDS file can be obtained under Software and Commissioning Tools on the GS20 series product page at *www.inovance.com*.
- EIP-Tools is downloaded and installed from ODVA official for IO-Link slave parameter configuration.

Procedure

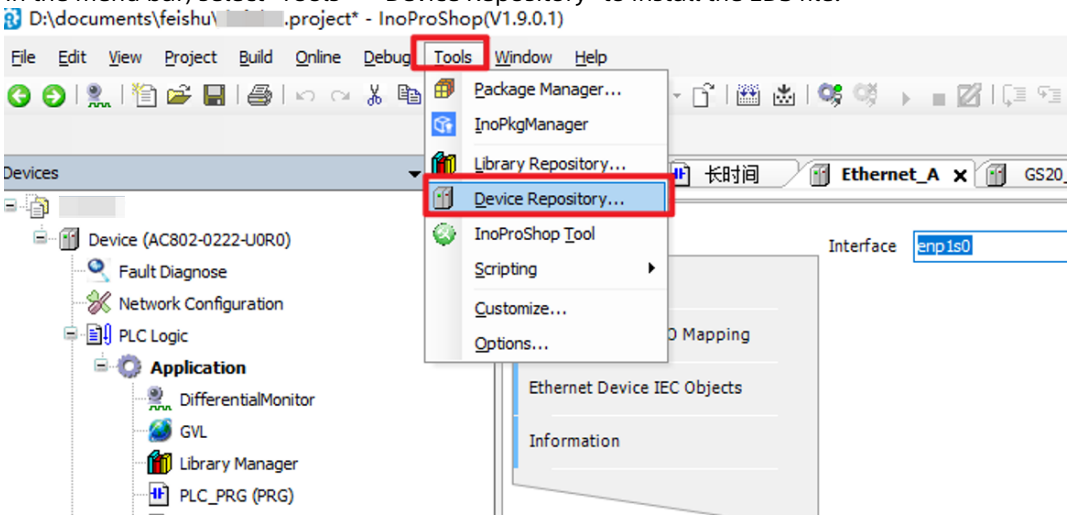
1. Configure the EtherNet/IP network adapter.
   In the "Devices" pane, double-click "EtherNet_A (EtherNet)". In the "General" tab of the pop-up window, set "Interface" to the network adapter with the same IP as the GS20-EIP-8L module.



2. Add the GS20-EIP-8L module.

a. Add the EDS file.

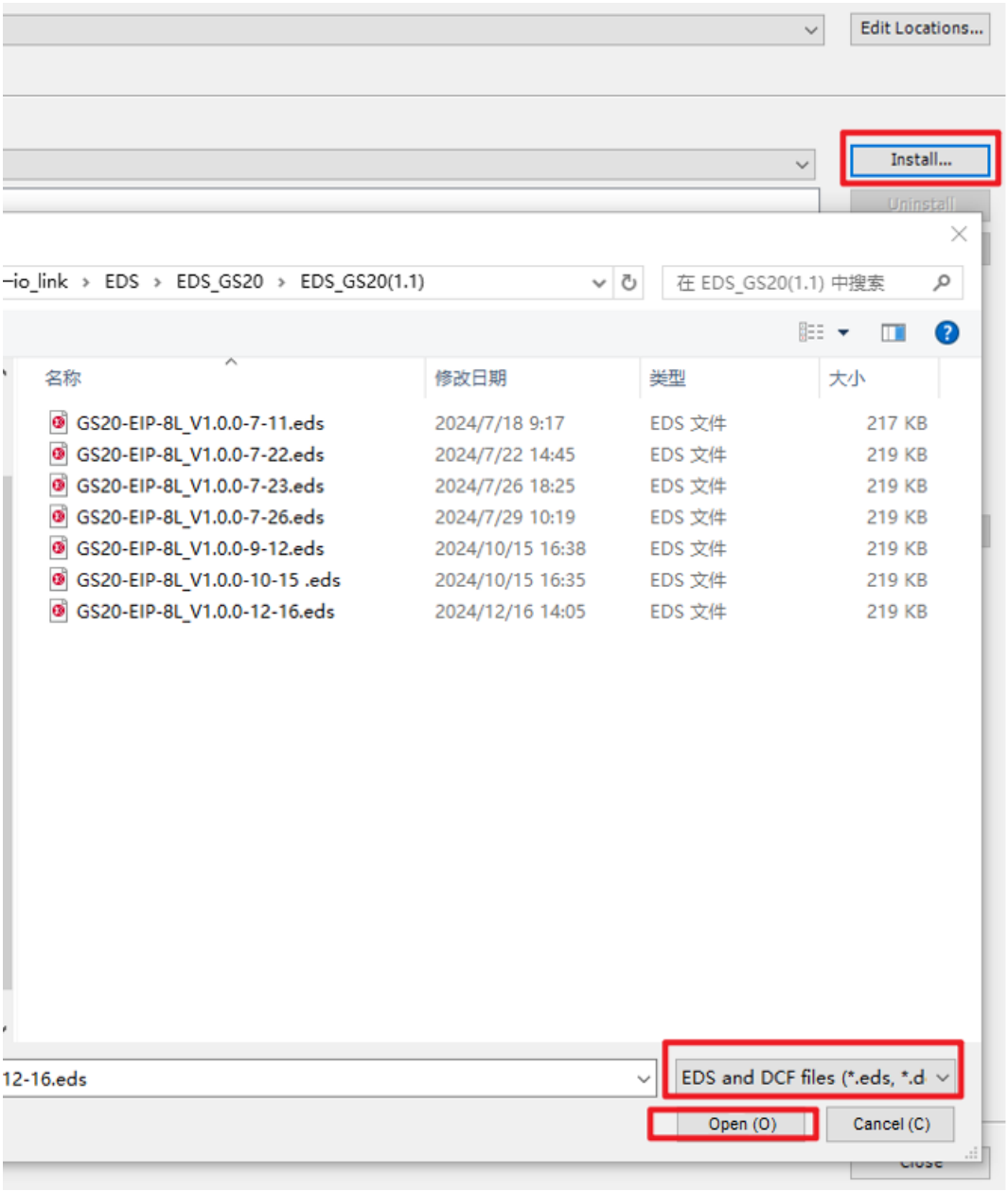
1). In the menu bar, select "Tools" > "Device Repository" to install the EDS file.



Note

Note: If the EDS file is not installed, the GS20-EIP-8L device cannot be scanned.

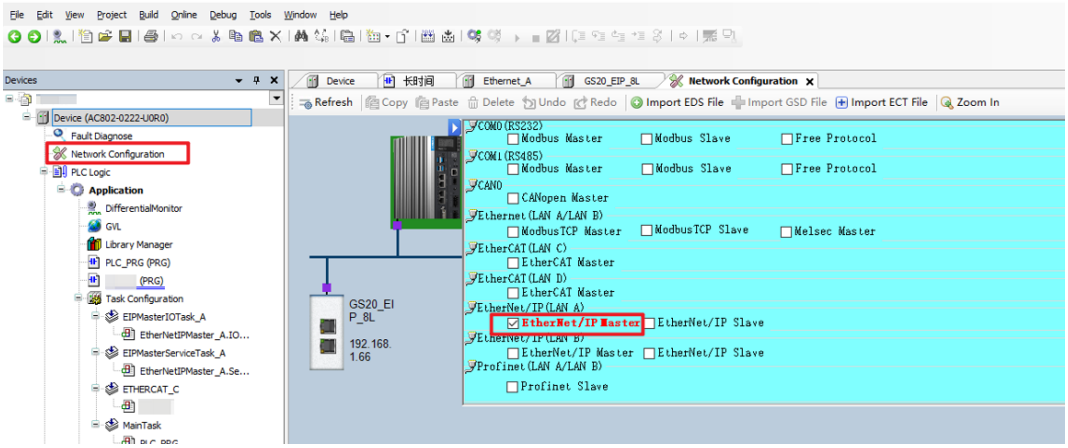
2). Click "Install" and select the EDS file of the GS20-EIP-8L module to be installed.



b. Add the GS20-EIP-8L module.

1). Add the EtherNet/IP master.

Double-click "Network Configuration" and select "EtherNet/IP Master".

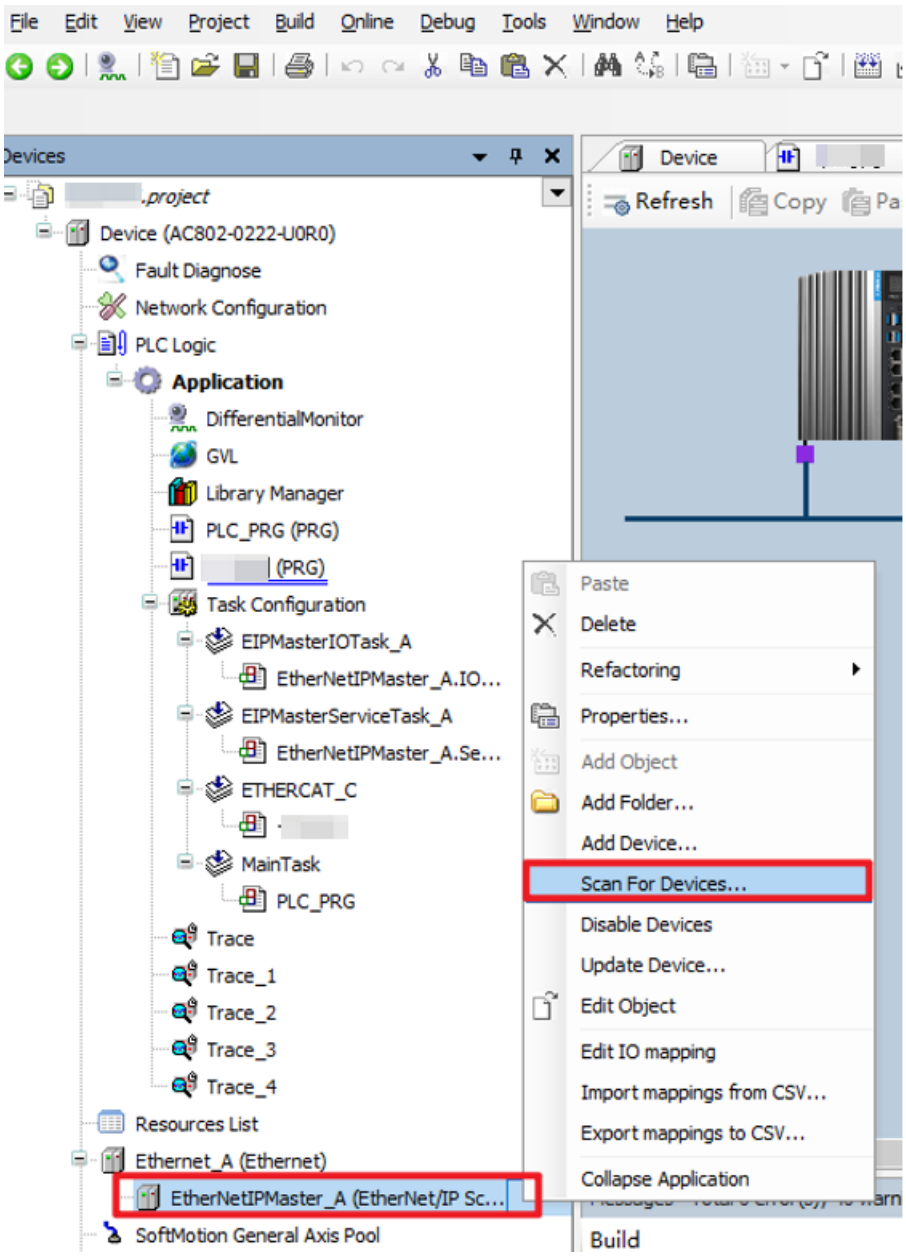


2). Add the GS20-EIP-8L module.

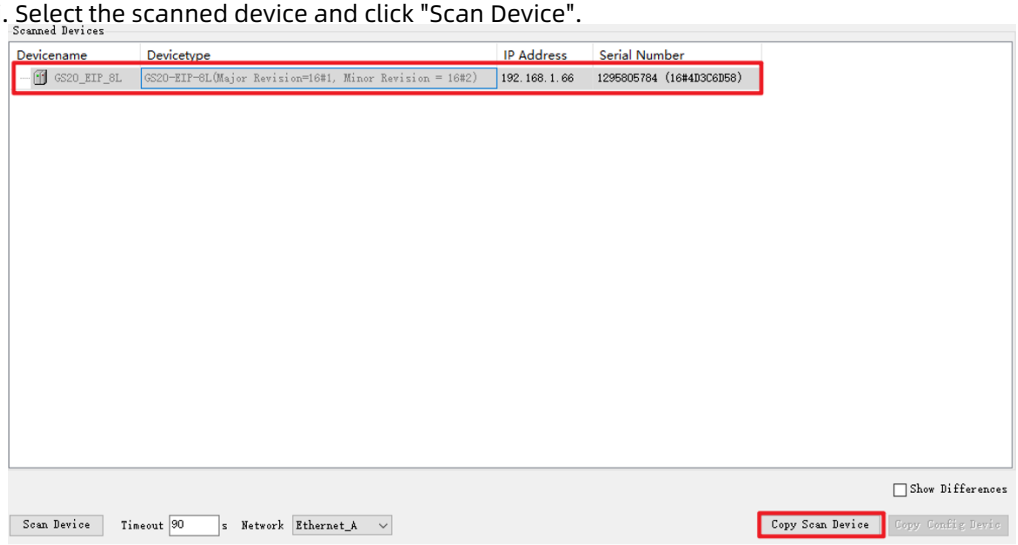
The module can be added through automatic scanning or manual addition.

- Automatic scanning

  i. Right-click "EtherNetIPMaster_A (EtherNet/IP Scanner)" and select "Scan For Devices".

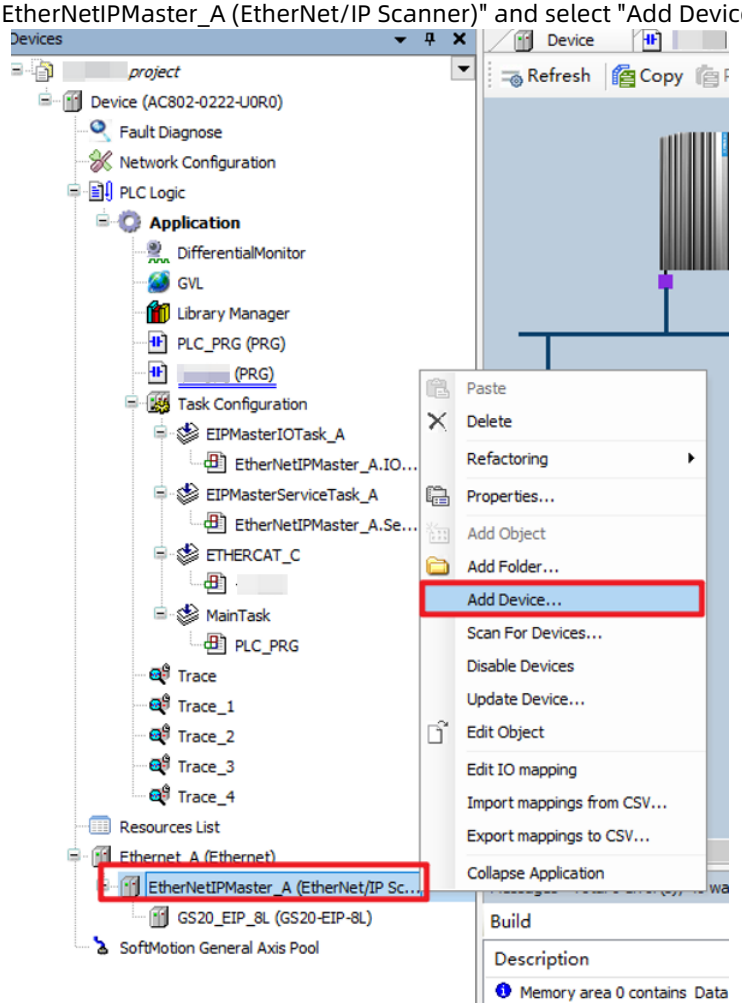


ii. Select the scanned device and click "Scan Device".

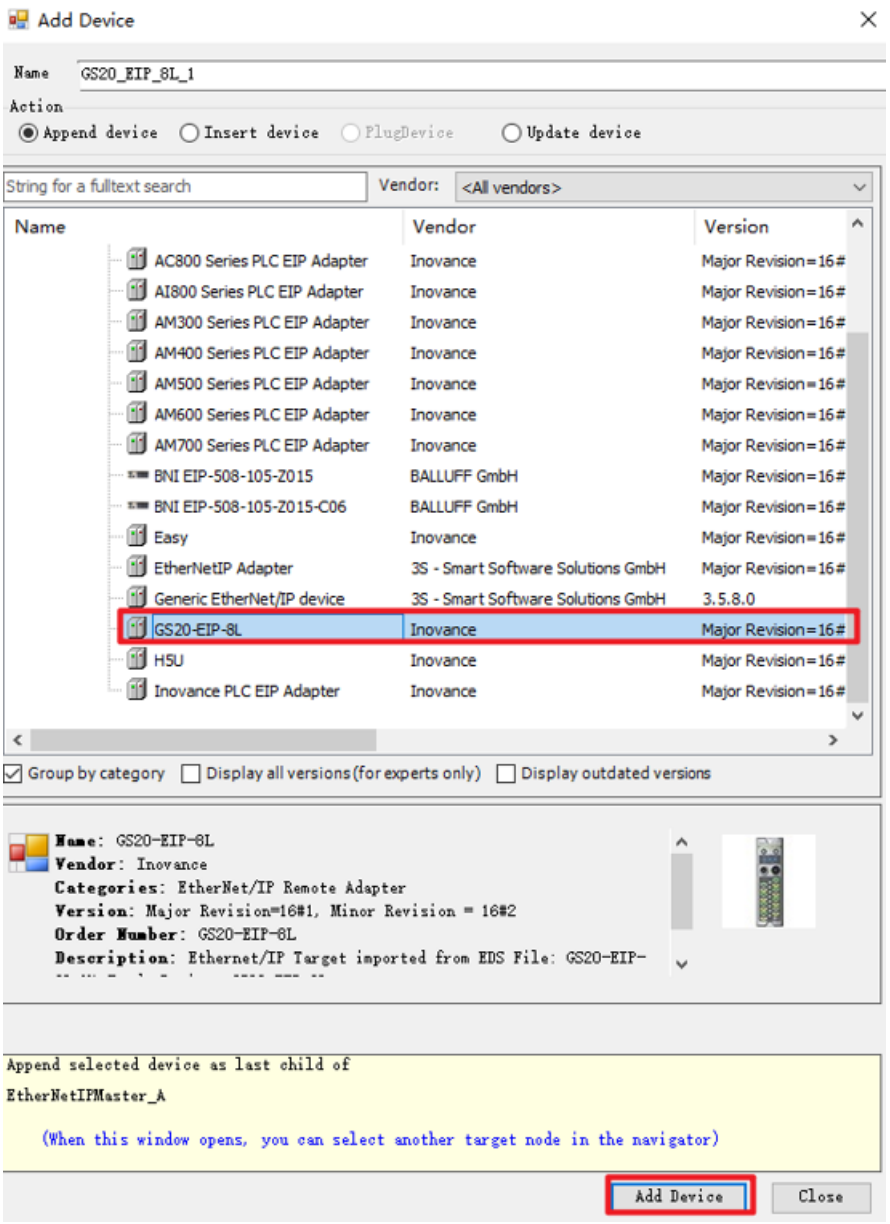


- Manual addition

  i. Right-click "EtherNetIPMaster_A (EtherNet/IP Scanner)" and select "Add Device".



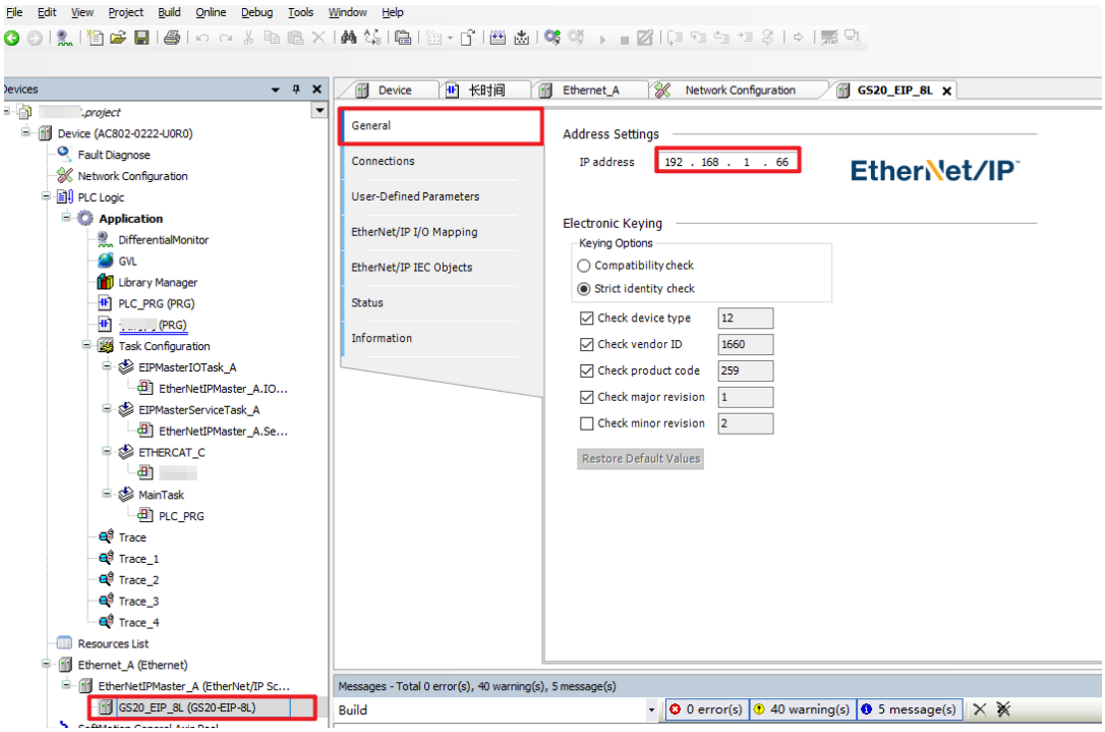
  ii. Select "GS20-EIP-8L" and click "Add Device".



3. Configure the GS20-EIP-8L module.

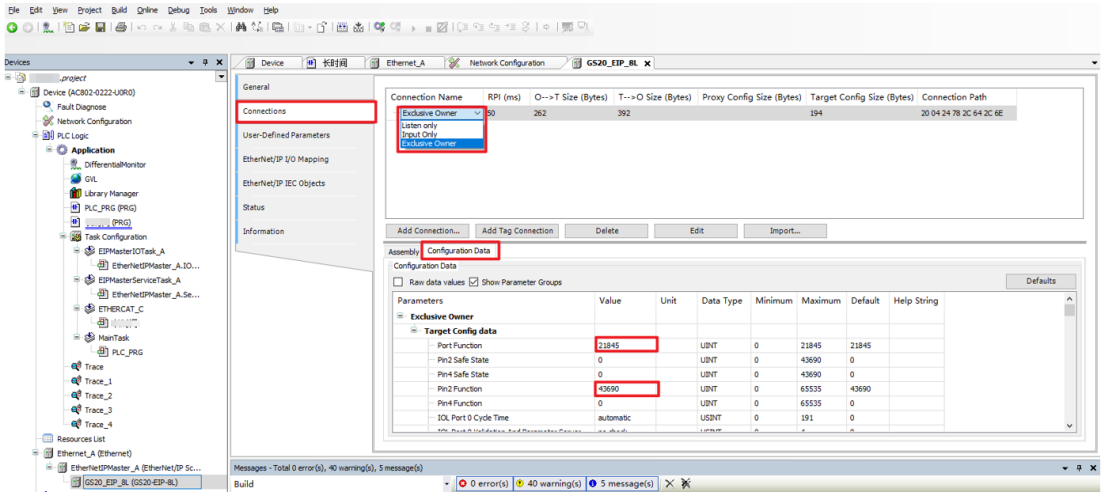
   a. Configure the general data.

   In the "Devices" pane, double-click "GS20-EIP-8L" and click "Generic". Check whether the "IP Address" matches that of the GS20-EIP-8L module. If not, modify the "IP Address".



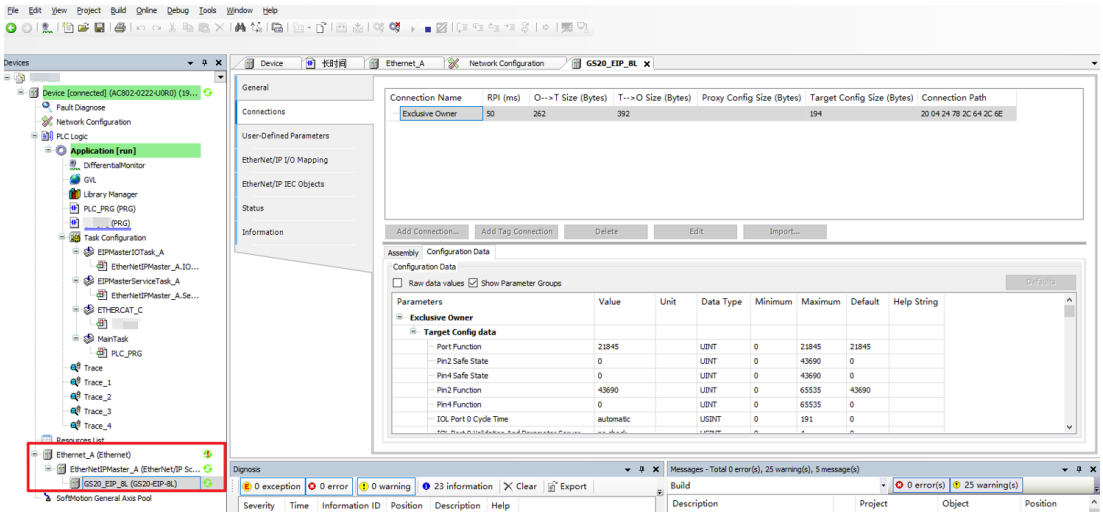
b. Configuration the module data.

Click "Connection" and select the "Connection Name". Click "Configuration Data" to obtain the configuration parameters based on the content represented by the configuration data bits. Enter the configuration module in the corresponding configuration data. In the figure below, all port functions are configured as IO-Link, and all Pin2 functions are configured as output mode.



c. Log in to and operate the GS20-EIP-8L module.

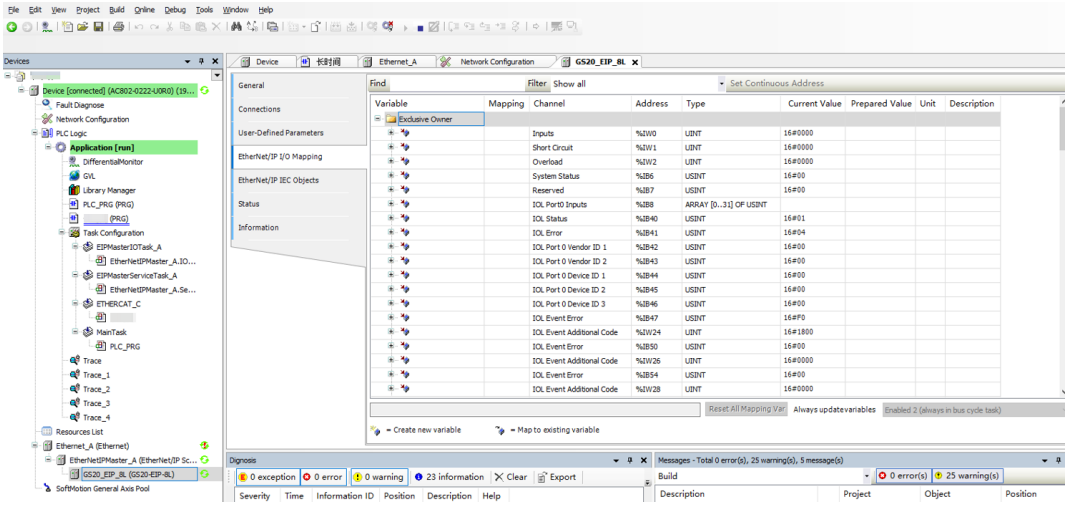
Click  to log in and then click  to operate the module. The result shown below indicates that the operation is successful.



d. Map the process data of GS20-EIP-8L.

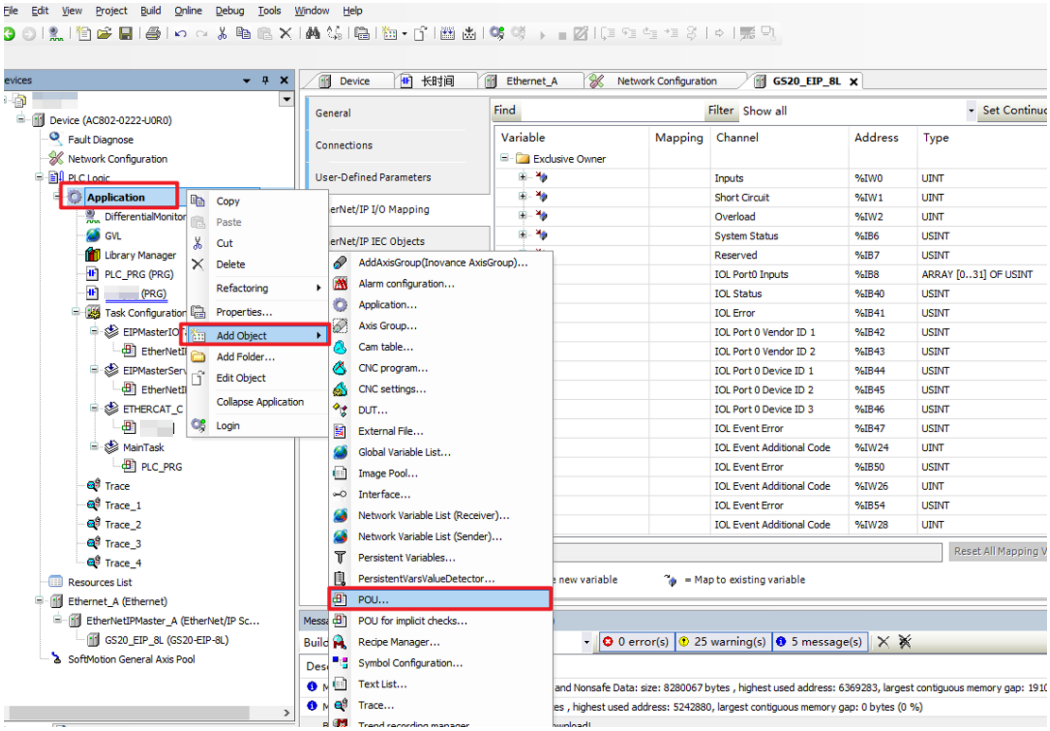
Example: Configure Pin2 of all ports as outputs.

1). After logging in to InoProShop, select "GS20-EIP-8L" > "Ethernet/IP I/O Mapping". Obtain the corresponding input parameter values in the input process data, and map the variables in the output data or directly write output values online, as shown below.

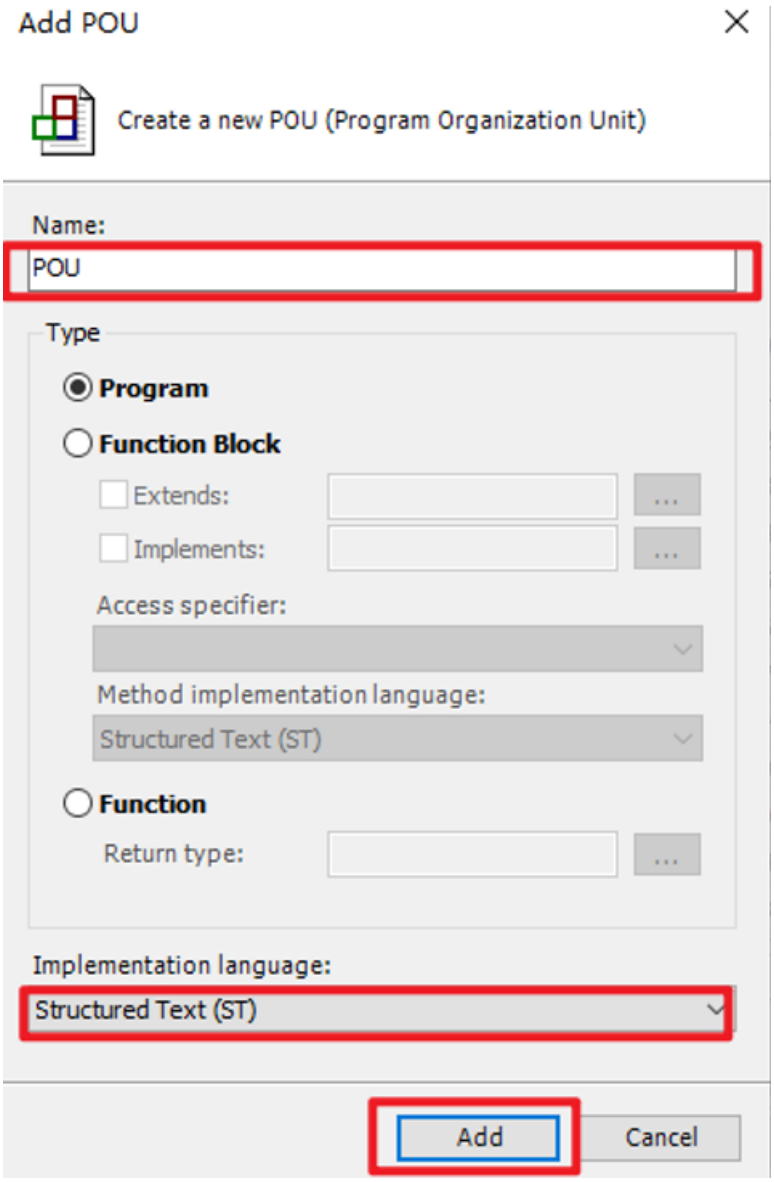


2). Map the variables.

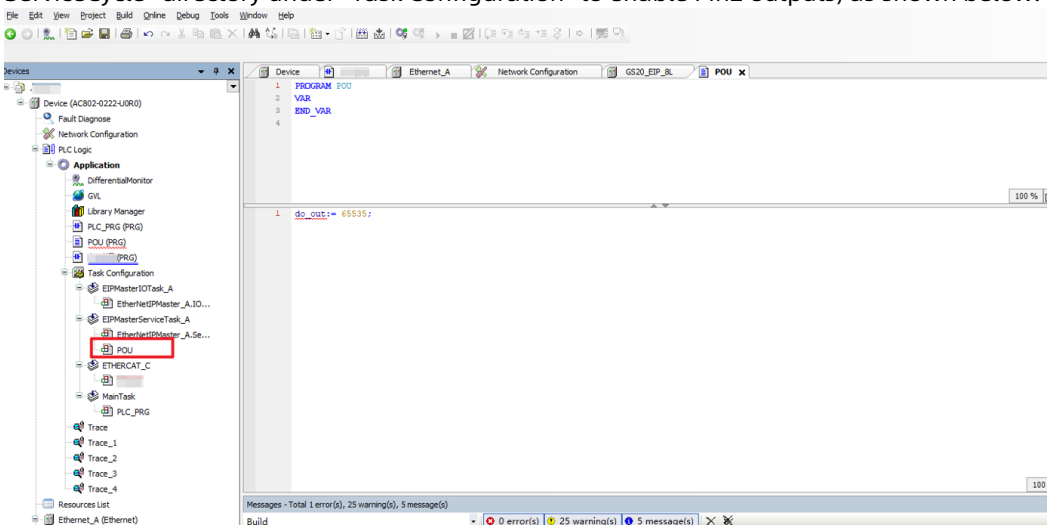
i. Click  to log out. Right-click "Application" and select "Add Object" > "POU".



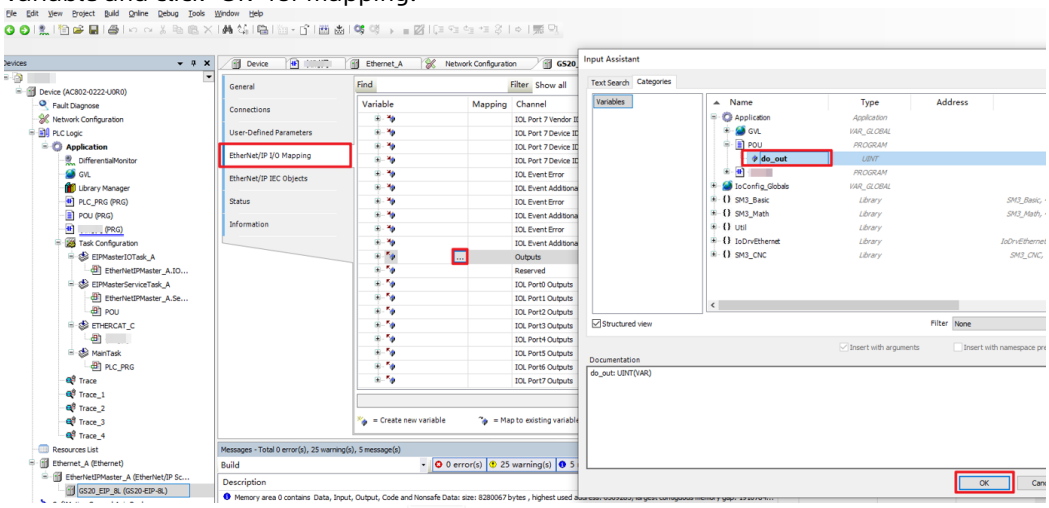
ii. Select the appropriate implementation language and click "Add".



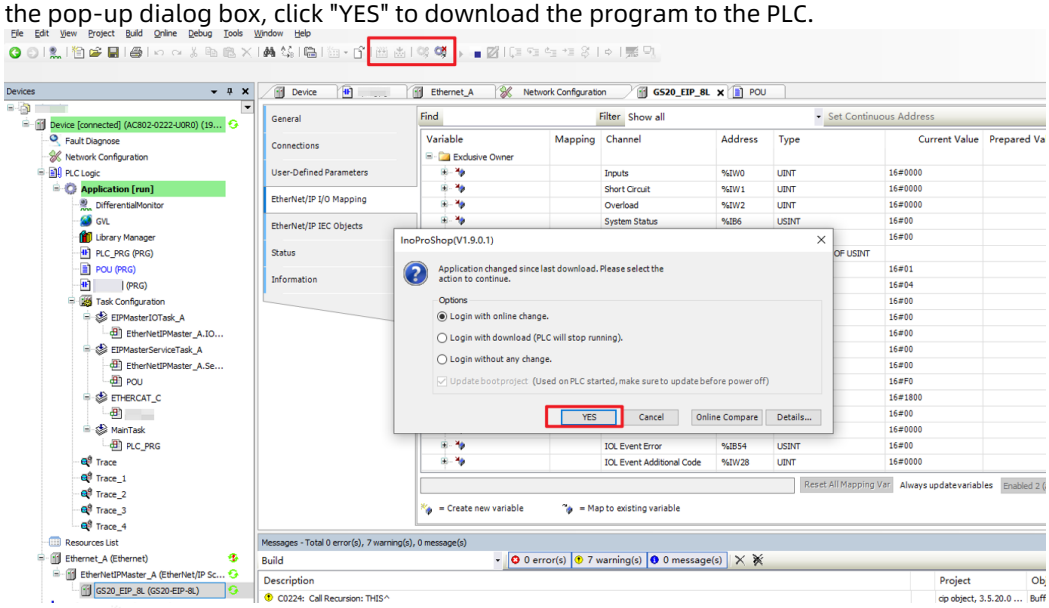
iii. Compile the program. Drag the compiled program file to the "EIPMasterServiceTask_A. ServiceCycle" directory under "Task Configuration" to enable Pin2 outputs, as shown below.



iv. Map the corresponding variables. In the "Ethernet/IP I/O Mapping" interface, click the "..." button of a variable to open the pop-up "Input Assistant" window. Select the corresponding variable and click "OK" for mapping.



v. Click  to compile the program,  to log in, and  to download the program. In the pop-up dialog box, click "YES" to download the program to the PLC.



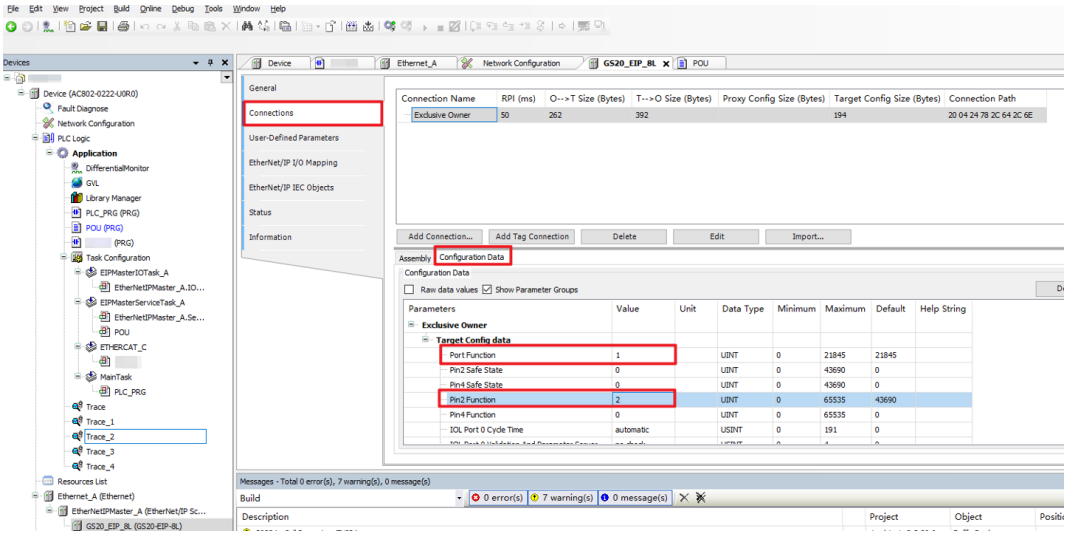
vi. Click  to run the program.

e. Use the GS20-EIP-8L module with an Inovance IO-Link slave.

In the following example, the GS20-EIP-8L module is used as IO-Link and an IO-Link slave is connected.

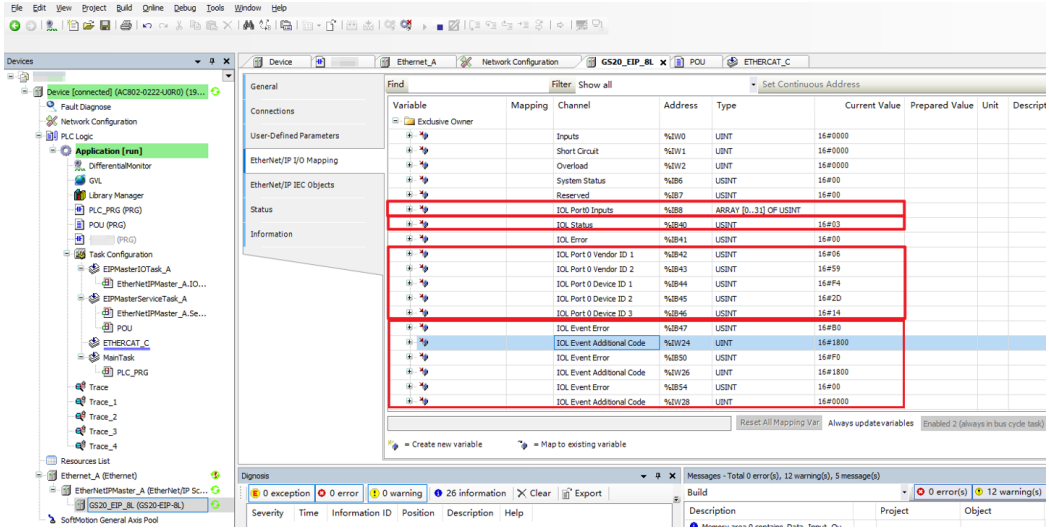
1). Configure the software.

Based on *"5.2.1 Configuration Data" on page 26*, configure port 0 as IO-Link mode and configure Pin2 of port 0 as output mode to provide UA power supply for the IO-Link slave. Log out the PLC, modify the configuration data, and log back in to the PLC.



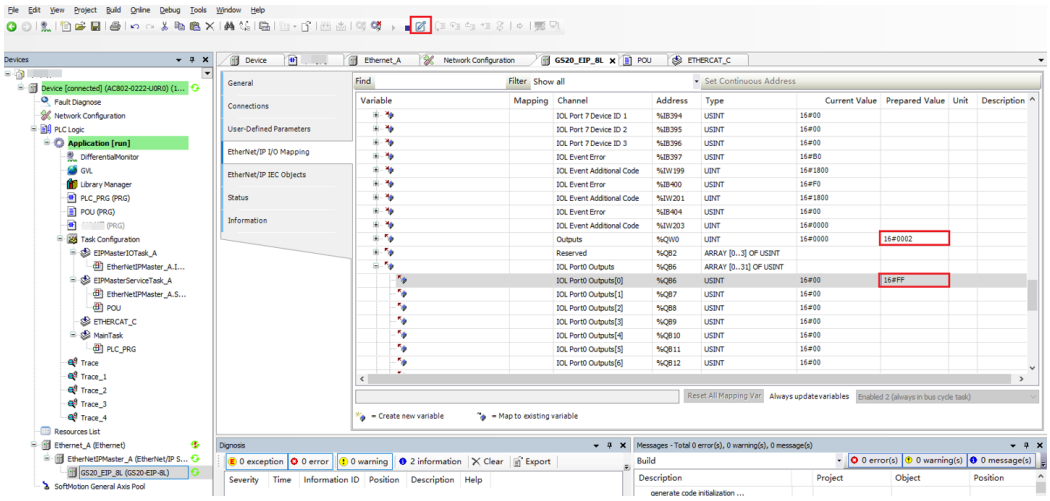
2). Based on *"5.2.2 Input Process Data" on page 29* and *"5.2.3 Output Process Data" on page 31*, obtain the input data from the connected IO-Link slave and issue the output data.

i. Obtain the process data input (PDI) from the connected slave, including IO-Link connection status, slave device information, and diagnostic information.

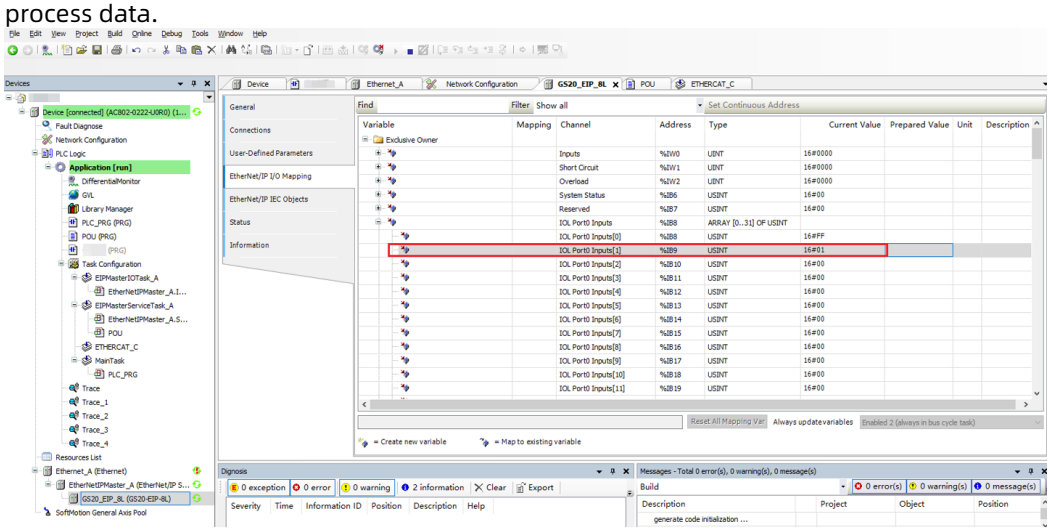


ii. Based on *"5.3.2 IO-Link Slave Configuration Parameter Writing" on page 34* and *"5.3.3 IO-Link Slave Configuration Parameter Reading" on page 35*, configure the parameters related to the slave. In this example, the lower eight bits of the slave (Pin2) is configured as output and the higher eight bits (Pin4) is configured as input.

iii. To issue the output data, refer to *"5.2.3 Output Process Data" on page 31*. In the "EtherNet/IP I/O Mapping" interface, select the output process data of IO-Link "IOL Port0 Outputs[0]" and configure the online output to 255 (16#FF). Click  to enable the lower eight bits of the slave (Pin2) as the output, as shown below.



iv. Short one output and one input of the IO-Link slave to receive valid input data. In the "EtherNet/IP I/O Mapping" interface, click "IOL Port0 Inputs" to obtain valid IO-Link input process data.



5.4.2 Programming with Omron Sysmac Studio

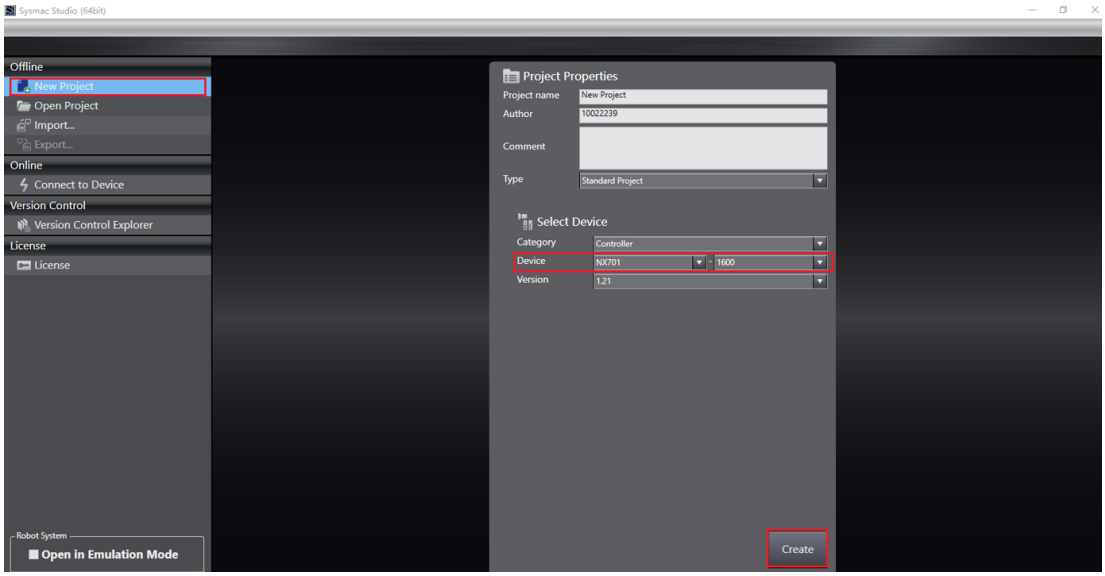
Prerequisites

- The cables are connected correctly.
- Sysmac Studio V1.5.2 and above is installed.
- The EDS file of the GS20-EIP-8L module is imported into InoProShop. The EDS file can be obtained under Software and Commissioning Tools on the GS20 series product page at www.inovance.com.
- EIP-Tools is downloaded and installed from ODVA official for IO-Link slave parameter configuration.

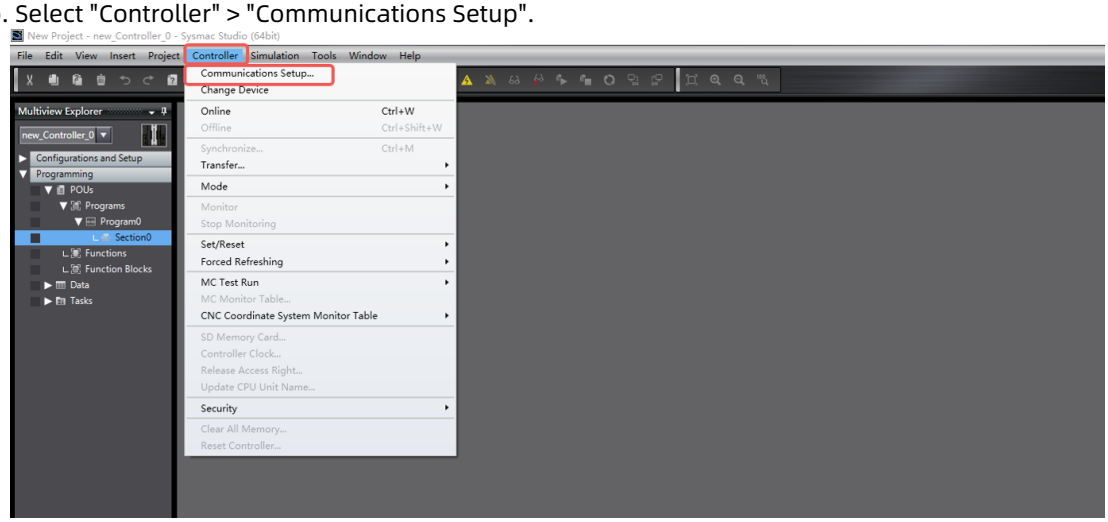
Procedure

1. Create a project.

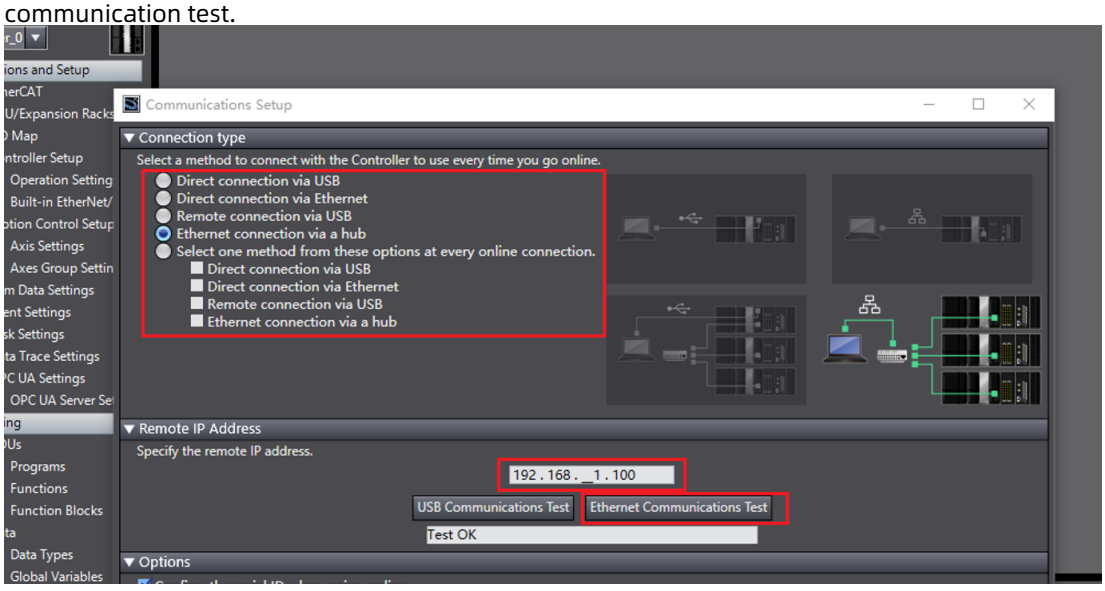
   a. Open the Sysmac Studio software and click "New Project". Select the corresponding Omron PLC model and version, and then click "Create".



b. Select "Controller" > "Communications Setup".

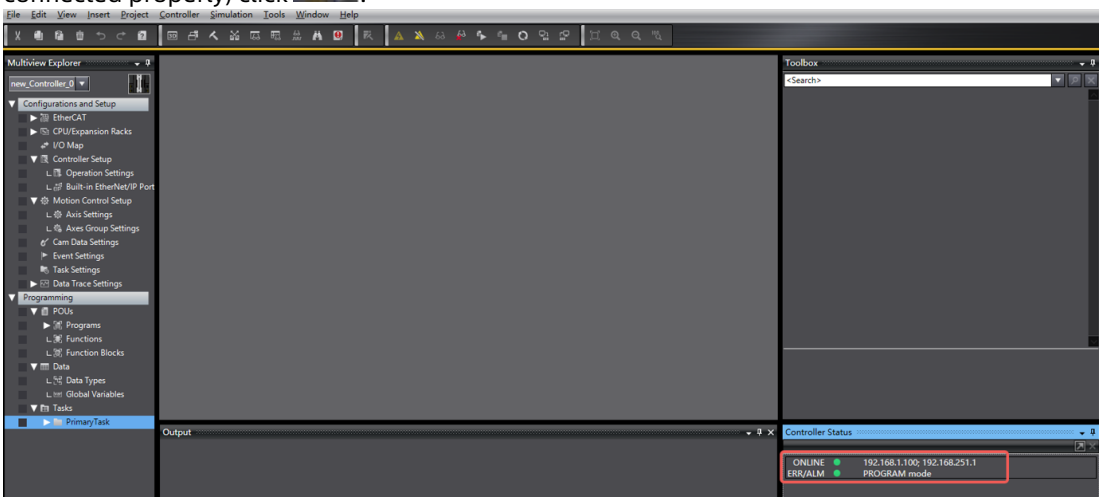


c. Select the corresponding connection type and enter the Omron host IP to perform the communication test.



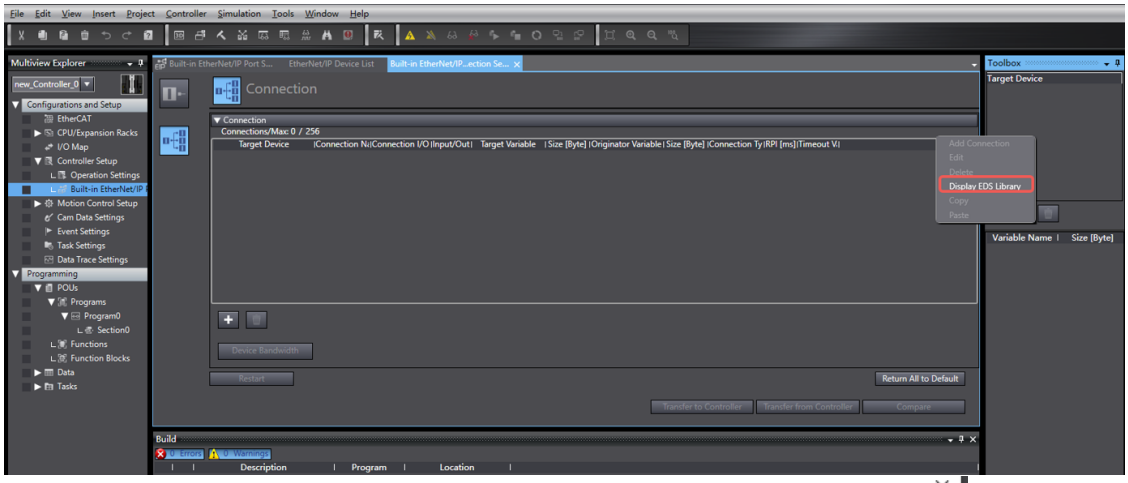
d. Set the computer to be in the same network segment as the Omron host.

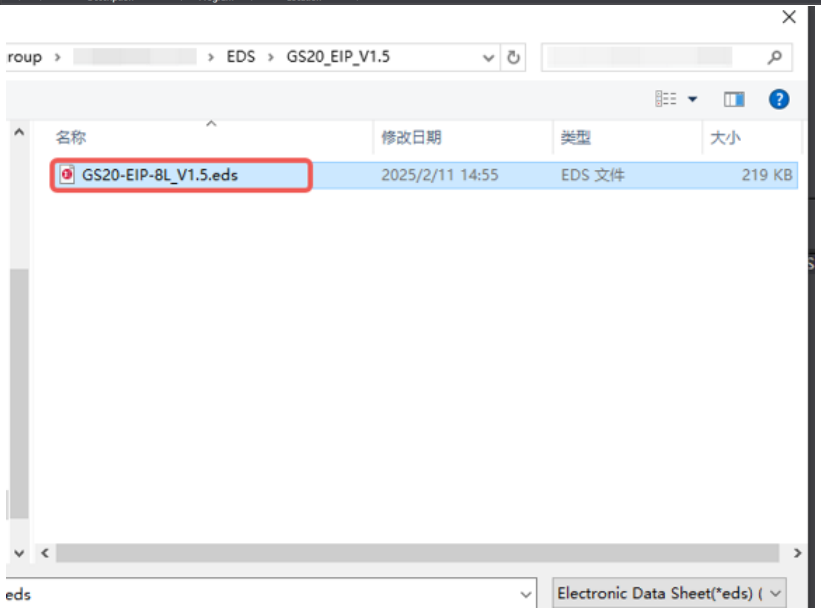
e. Click  to monitor the connection status and operation mode on the right. When the PLC is connected properly, click .



2. Import the EDS file

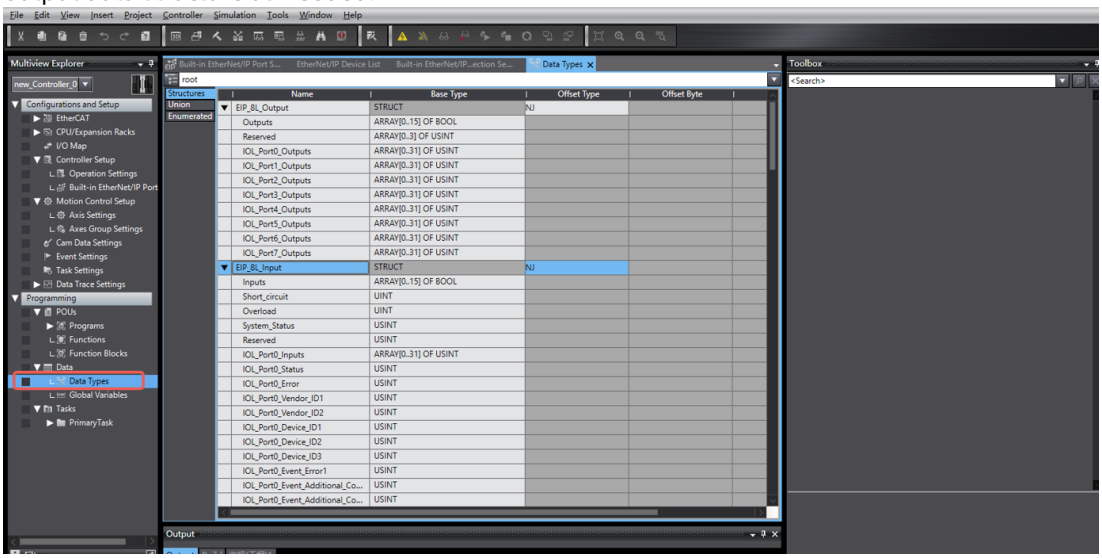
Right-click the right toolbox and select "Display EDS Library". In the pop-up window, click "Install" and select the EDS file to be installed. After installation, "Inovance" is displayed in the EDS library.



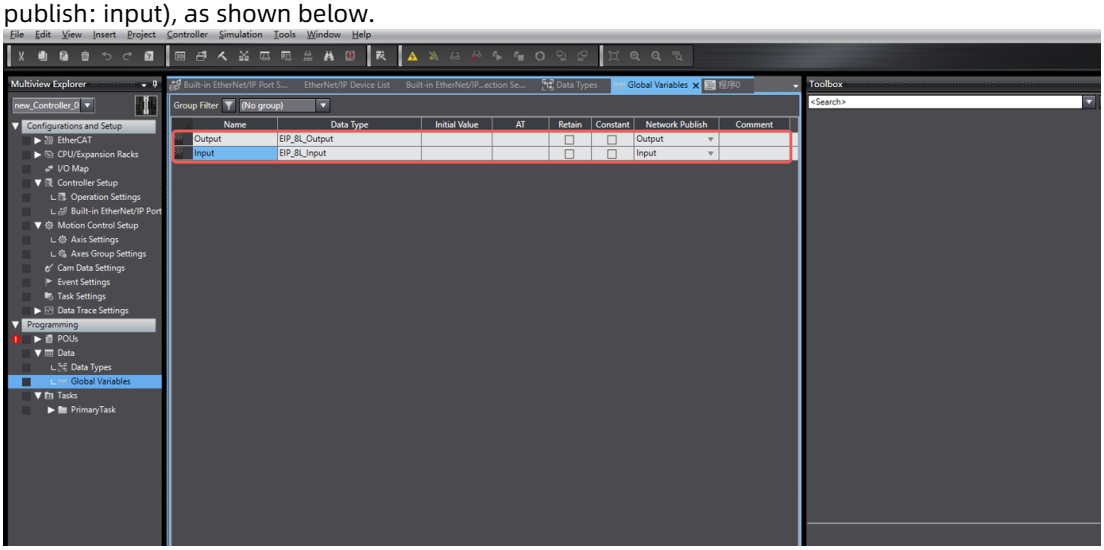


3. Configure the project.

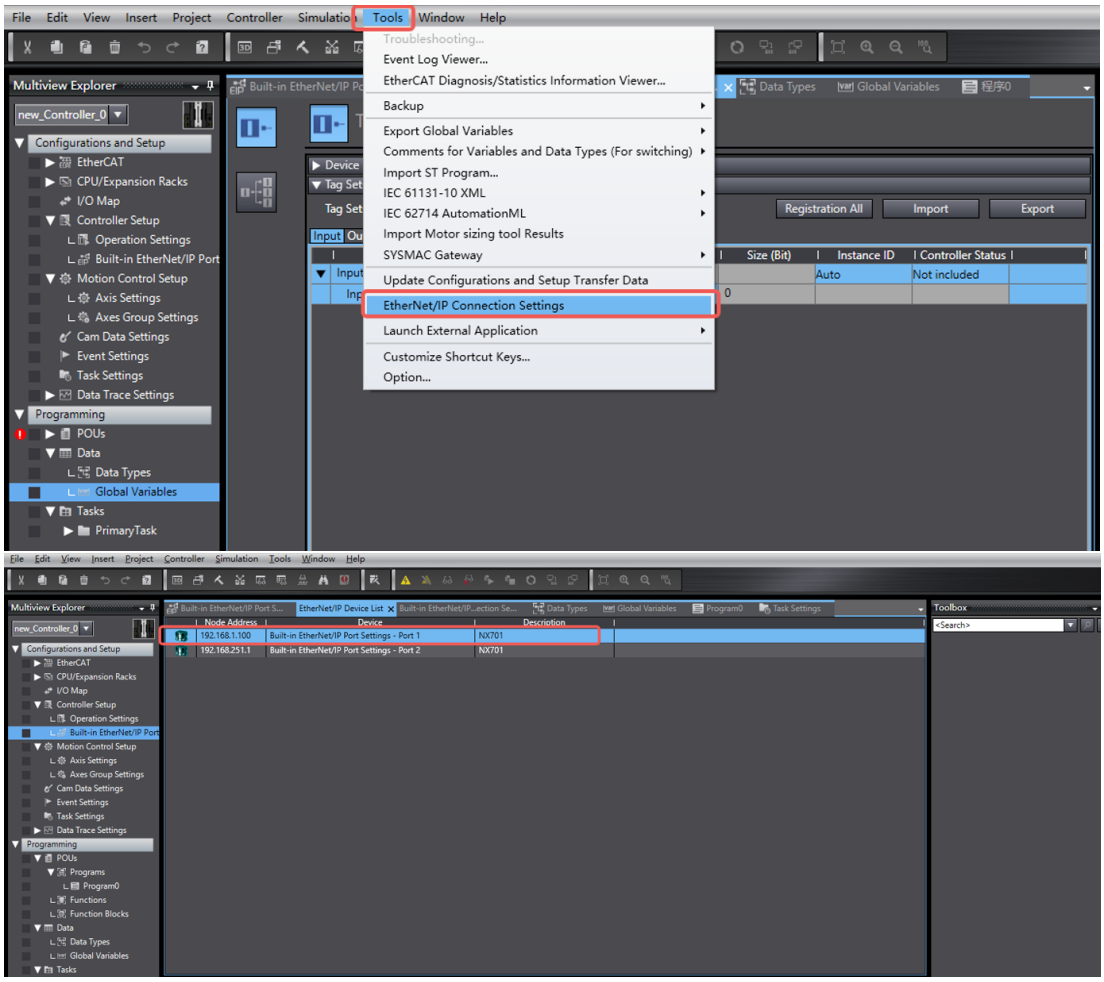
a. Before using Omron for Ethernet/IP communication with GS20-EIP-8L, based on the input/output data area size of GS20-EIP-8L, click "Data Types" and create the corresponding input/output data structure as needed.



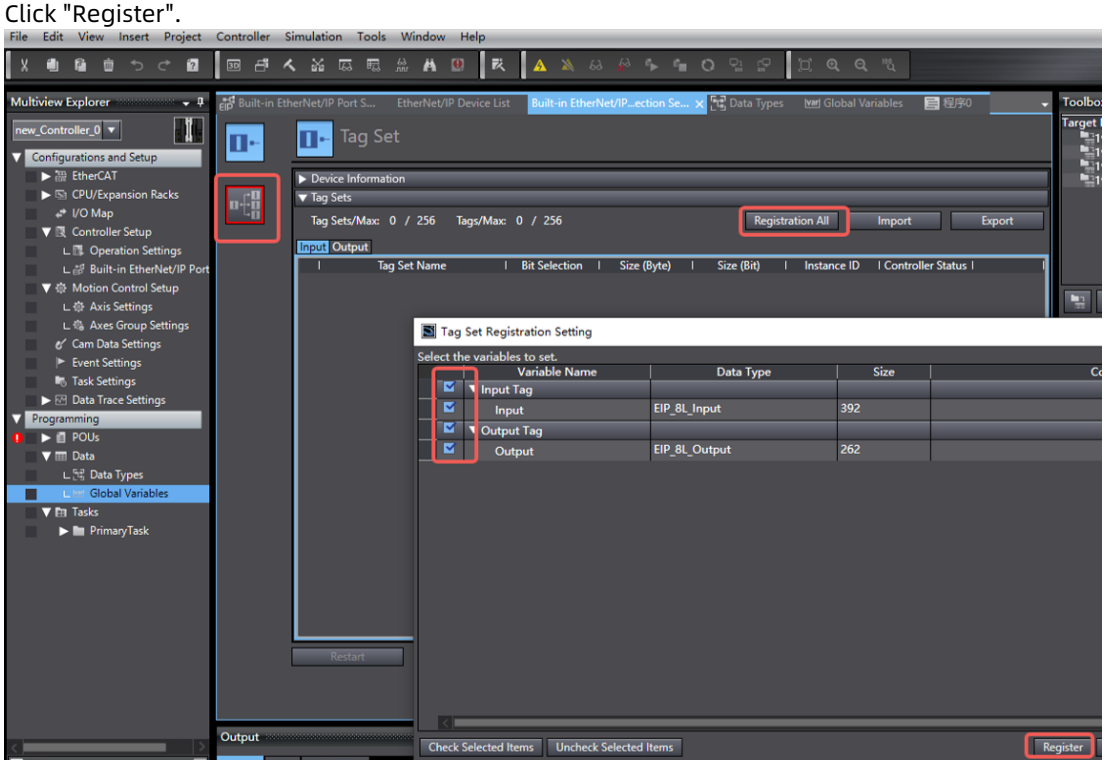
b. Click "Global Variables", and create an output variable "Output" (data type: EIP_8L_Output; network publish: output) and an input variable "Input" (data type: EIP_8L_Input; network publish: input), as shown below.



c. Select "Tools" > "Ethernet/IP Connection Settings". In the pop-up window, double-click the PLC to open the "Built-in EtherNet/IP Port Settings - Connection Settings" interface.

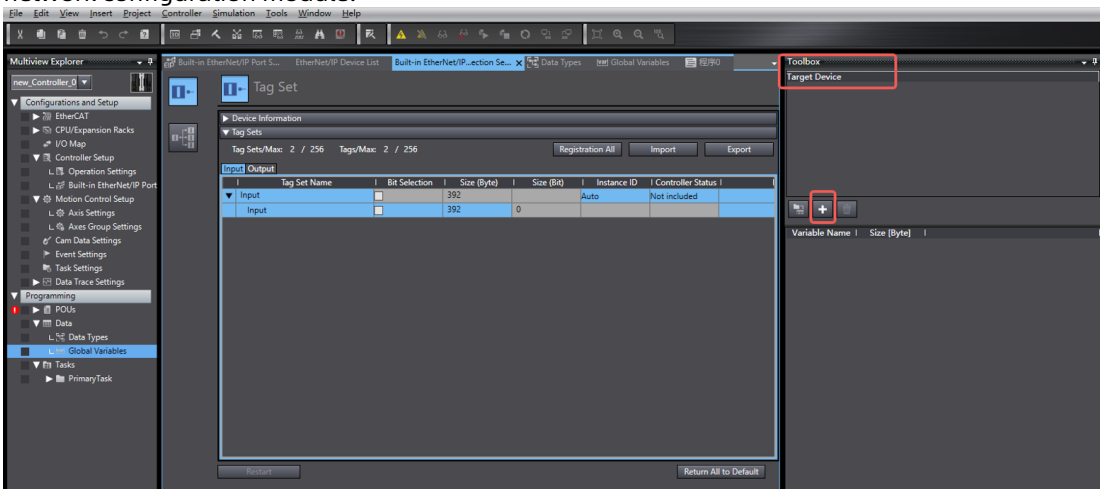


d. Click "Registration All" and select the input/output variables defined by the global variable. Click "Register".

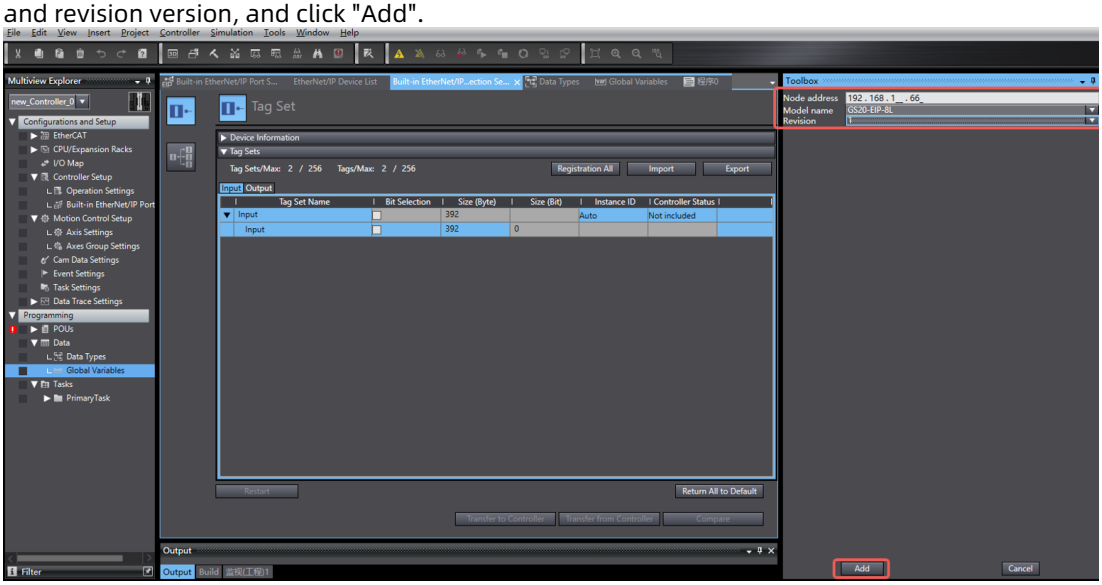


4. Add and configure the GS20-EIP-8L module.

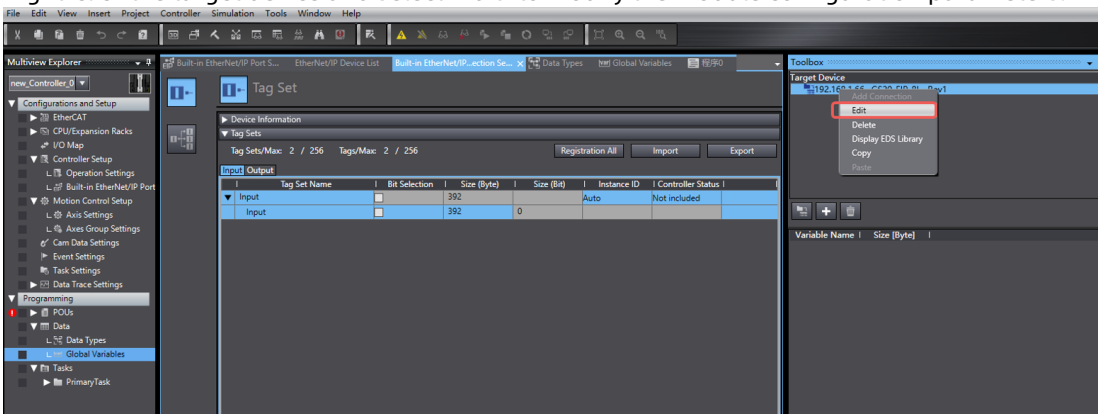
a. In the right "Toolbox" pane, select "Target Device" and then click "+" to add a GS20-EIP-8L network configuration module.



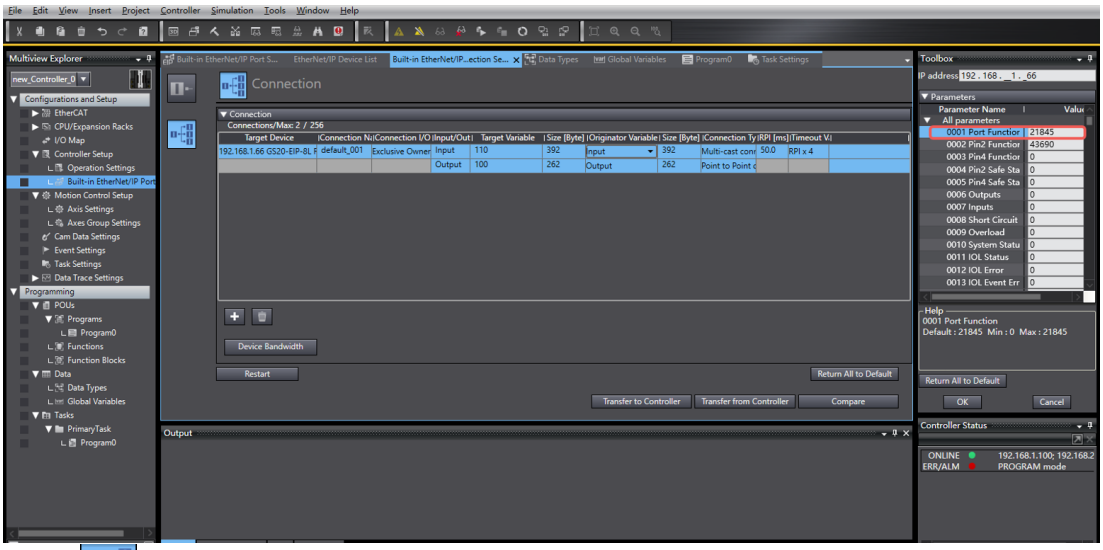
b. Enter the IP address of the GS20-EIP-8L module (ensure the IP of the PLC, the IP of the network card, and the IP of the GS20-EIP-8L are in the same network segment). Select the model name and revision version, and click "Add".



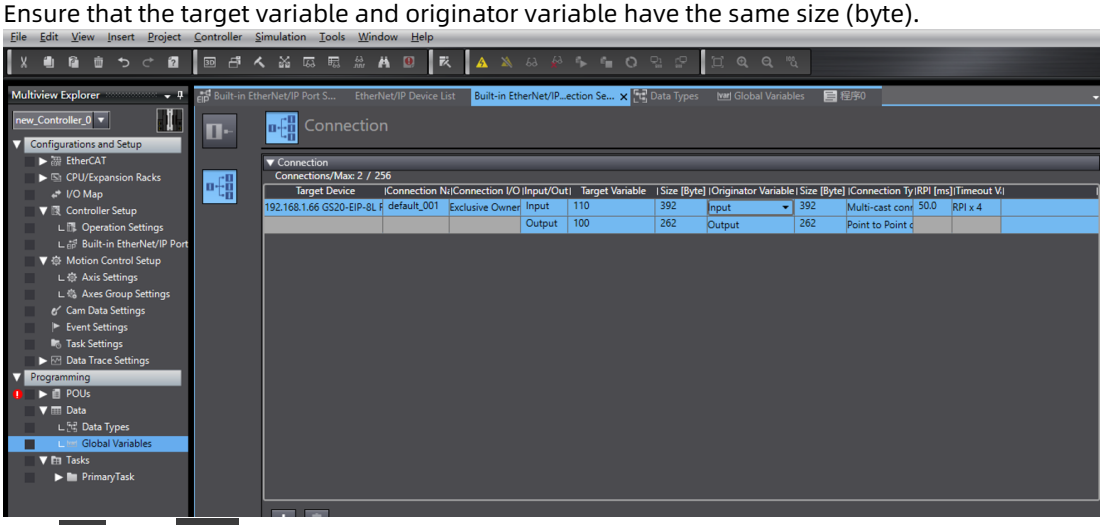
c. Right-click the target device and select "Edit" to modify the module configuration parameters.



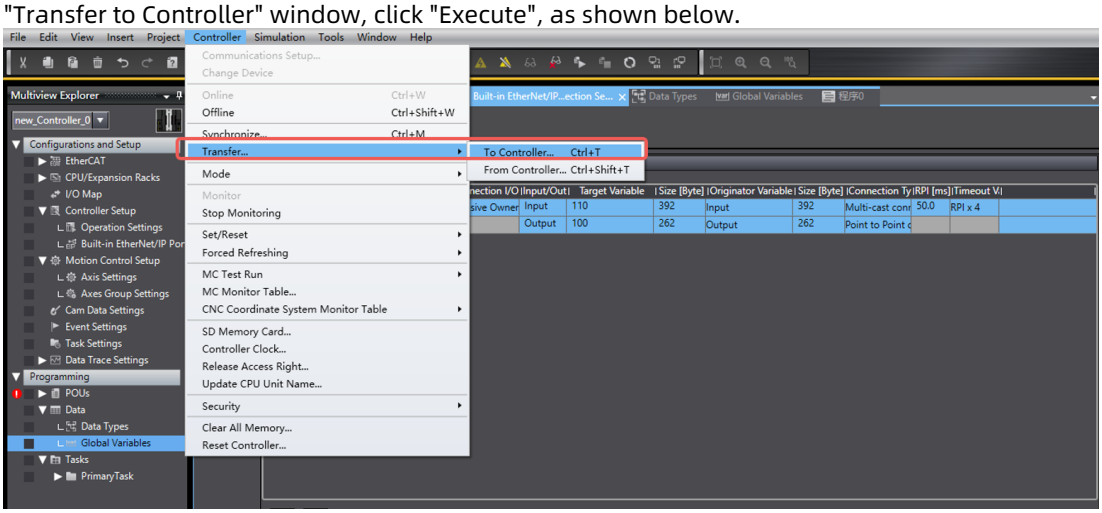
d. Obtain the corresponding configuration input by bit according to the module configuration parameter description. The following example configures all ports as IO-Link.

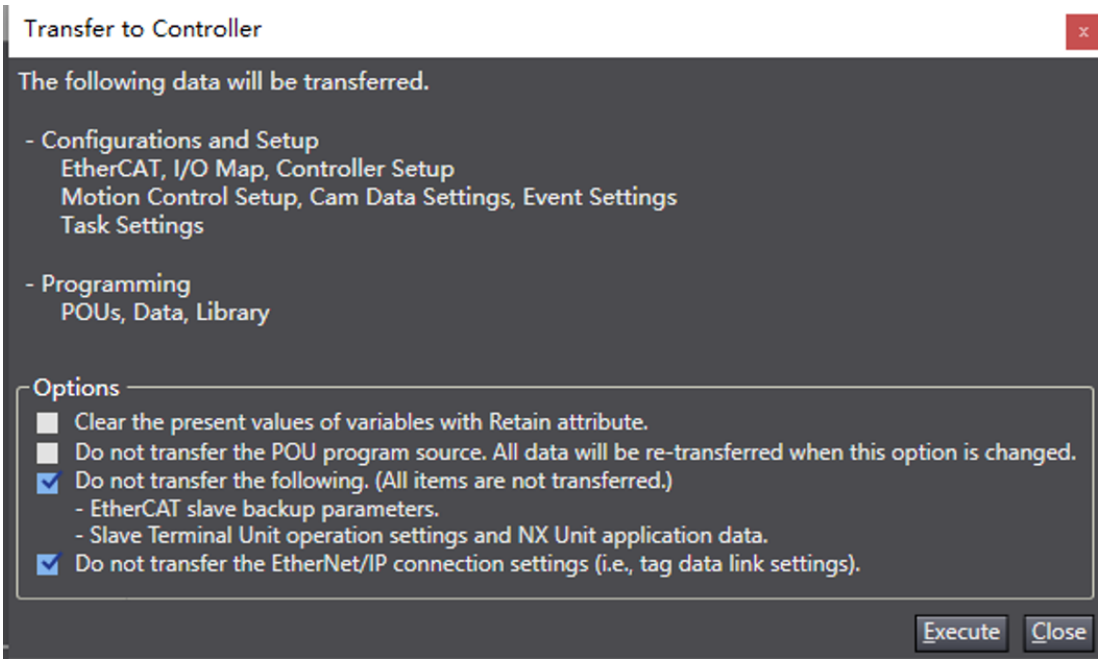


e. Select  > . Set the target device to "192.168.1.66 GS20-EIP-8L". Set the input/output of "Original Variable" to input/output. Set "Target Variable" to "110" for input and "100" for output. Ensure that the target variable and originator variable have the same size (byte).

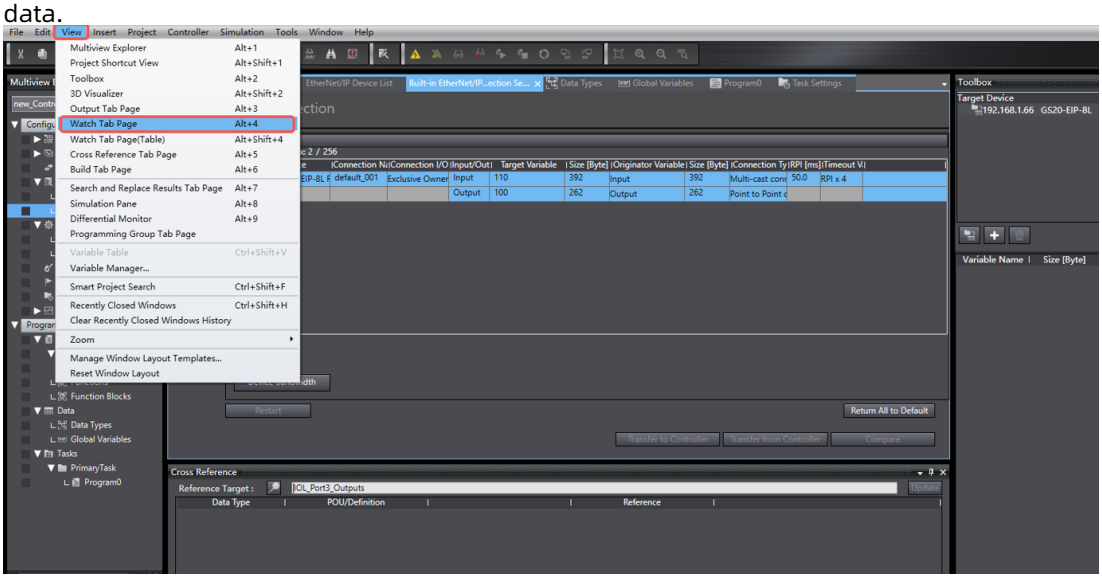


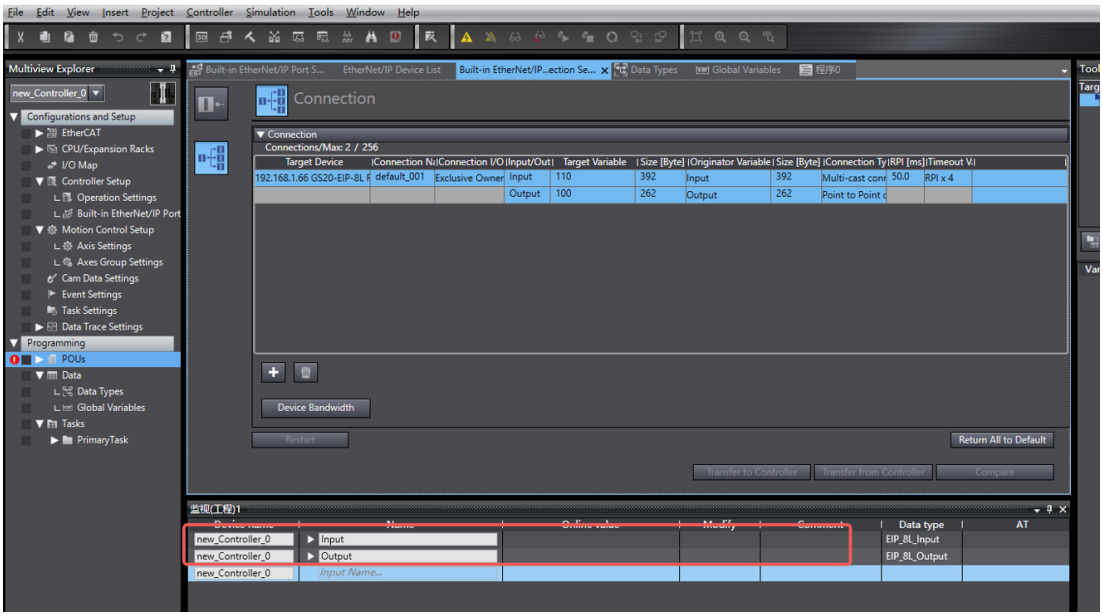
f. Click . Click  or select "Controller" > "Transfer" > "To Controller...". In the pop-up "Transfer to Controller" window, click "Execute", as shown below.





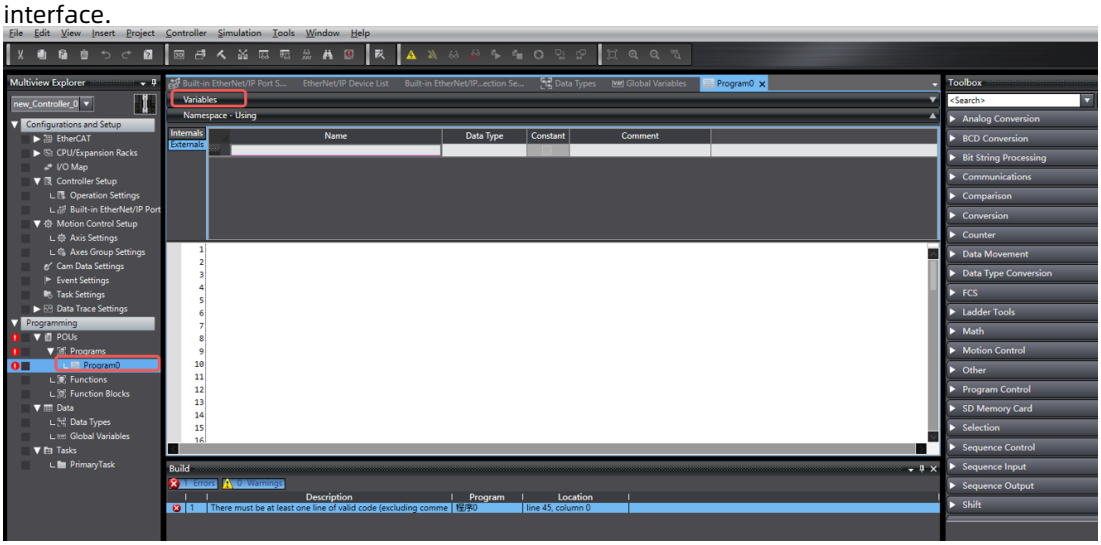
g. Select "View" > "Watch Tab Page". Add input/output variables in the watch window to monitor data.



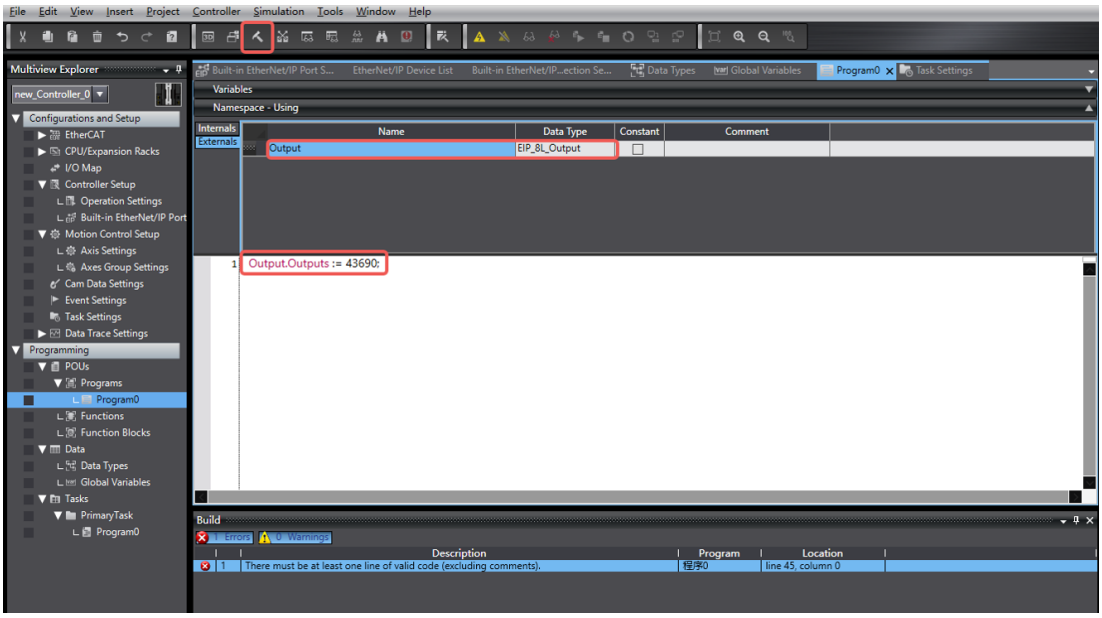


5. Compile a program for code variable mapping.
   Use programs to implement the full output of Pin2.

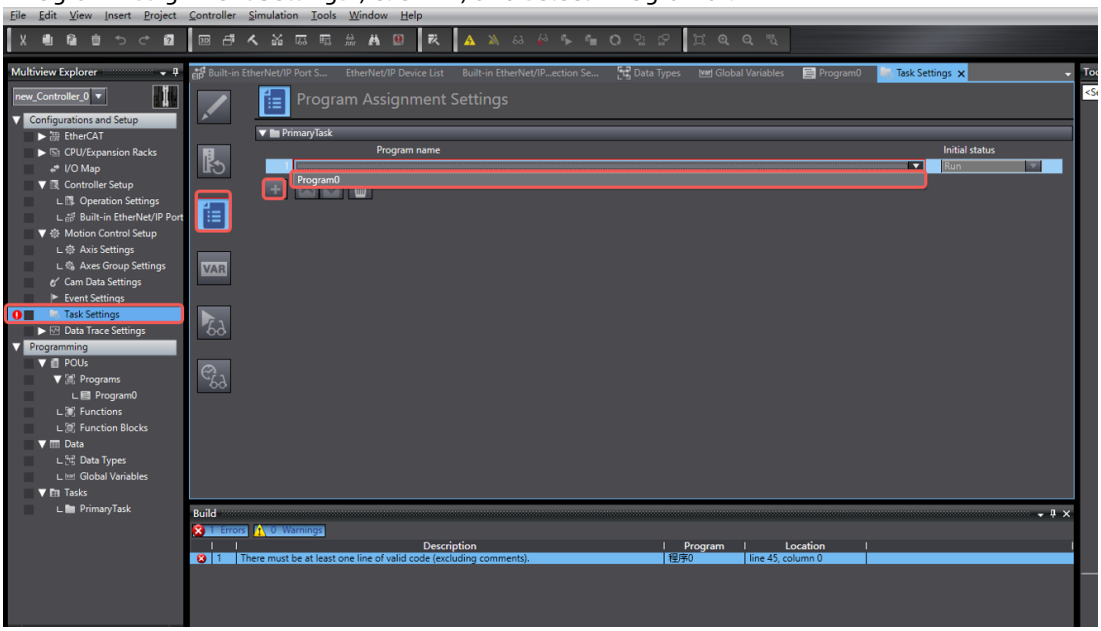
   a. In the left "Multiview Explorer" pane, right-click "Programs" under the "POUs" directory and select "Add" > "Ladder diagram"/"ST". Double-click "Program0" to open the programming interface.



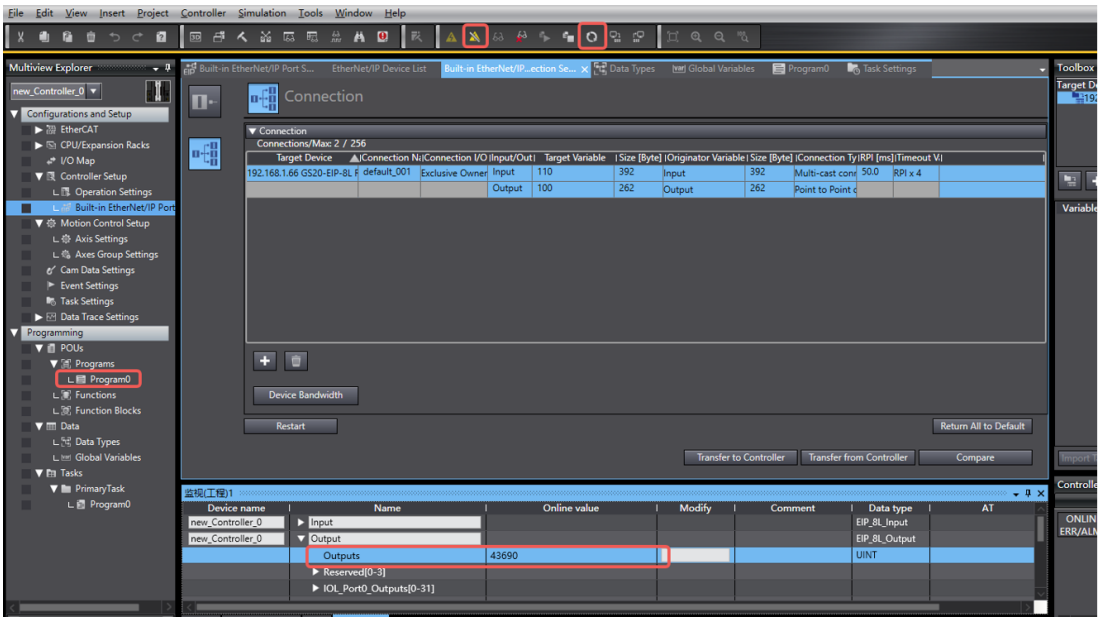
   b. Click "Variables" to open the variable interface. Select "Externals" and enter the created global variable "Output" in the "Name" field. For details, see the corresponding Pin2 output bit in *"5.2.3 Output Process Data" on page 31*. Assign the output value as 43690. After programming, click the compile button.



c. To add the program to tasks, click "Task Settings" in the left "Multiview Explorer" pane. Click "Program Assignment Settings", click "+", and select "Program0".



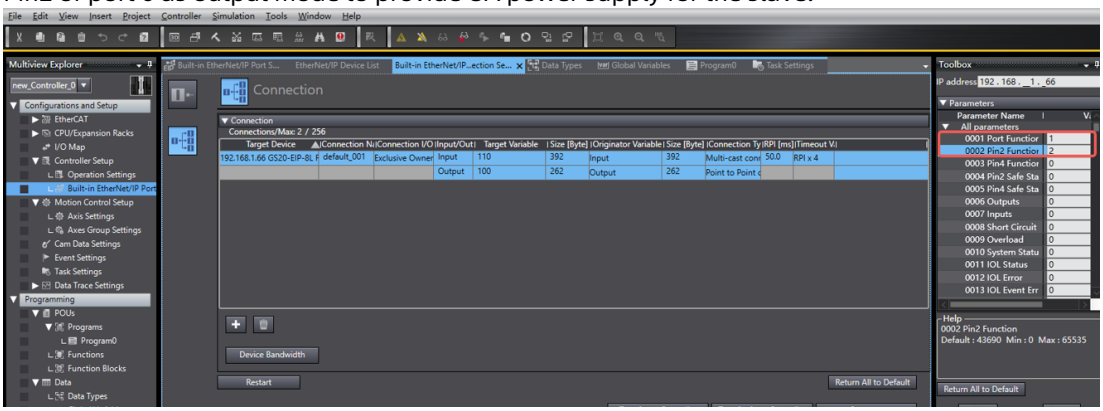
d. Click the online button to log in to the PLC, and then click the sync button. After successful operation, check that Pin2 of all ports of the GS2-EIP-8L module have output.



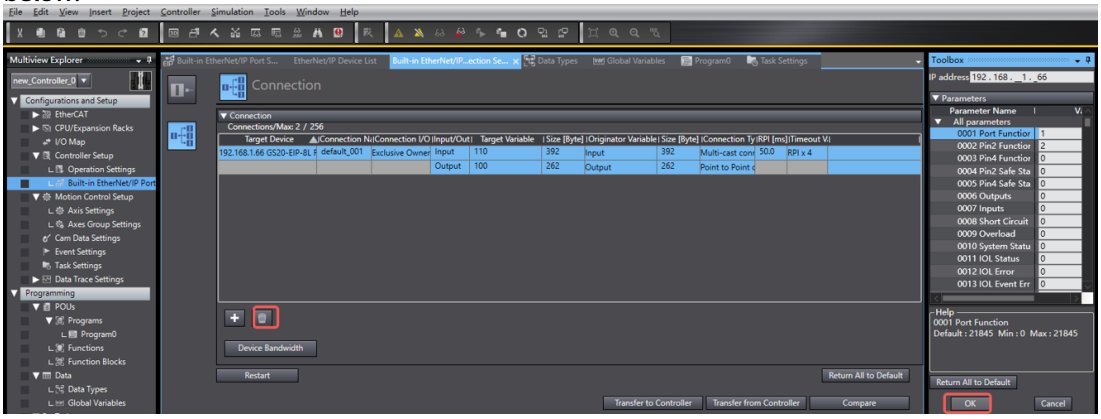
6. Use the GS20-EIP-8L module with an Inovance IO-Link slave.

   In the following example, the port 0 of the GS20-EIP-8L module is configured as IO-Link mode, which connects to an IO-Link slave and provides UA power supply for the slave.

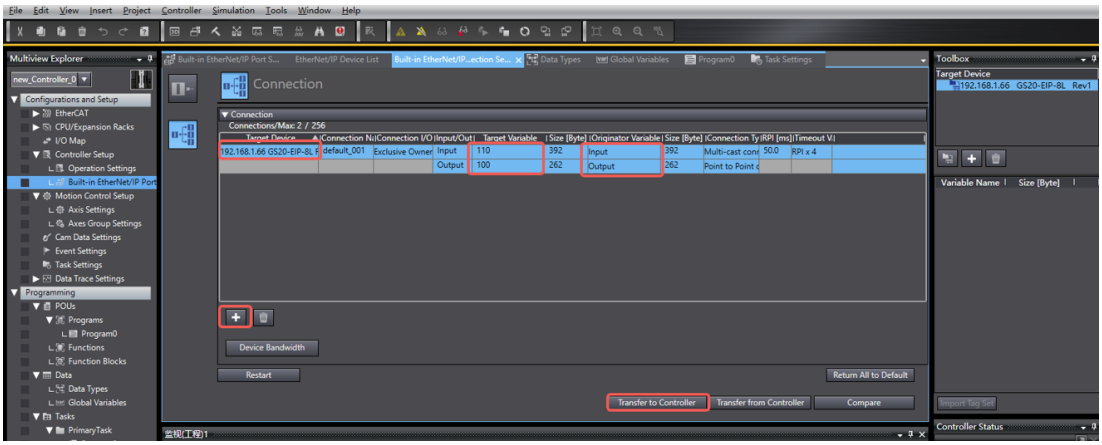
   a. Based on *"5.2.1 Configuration Data" on page 26*, configure port 0 as IO-Link mode and configure Pin2 of port 0 as output mode to provide UA power supply for the slave.



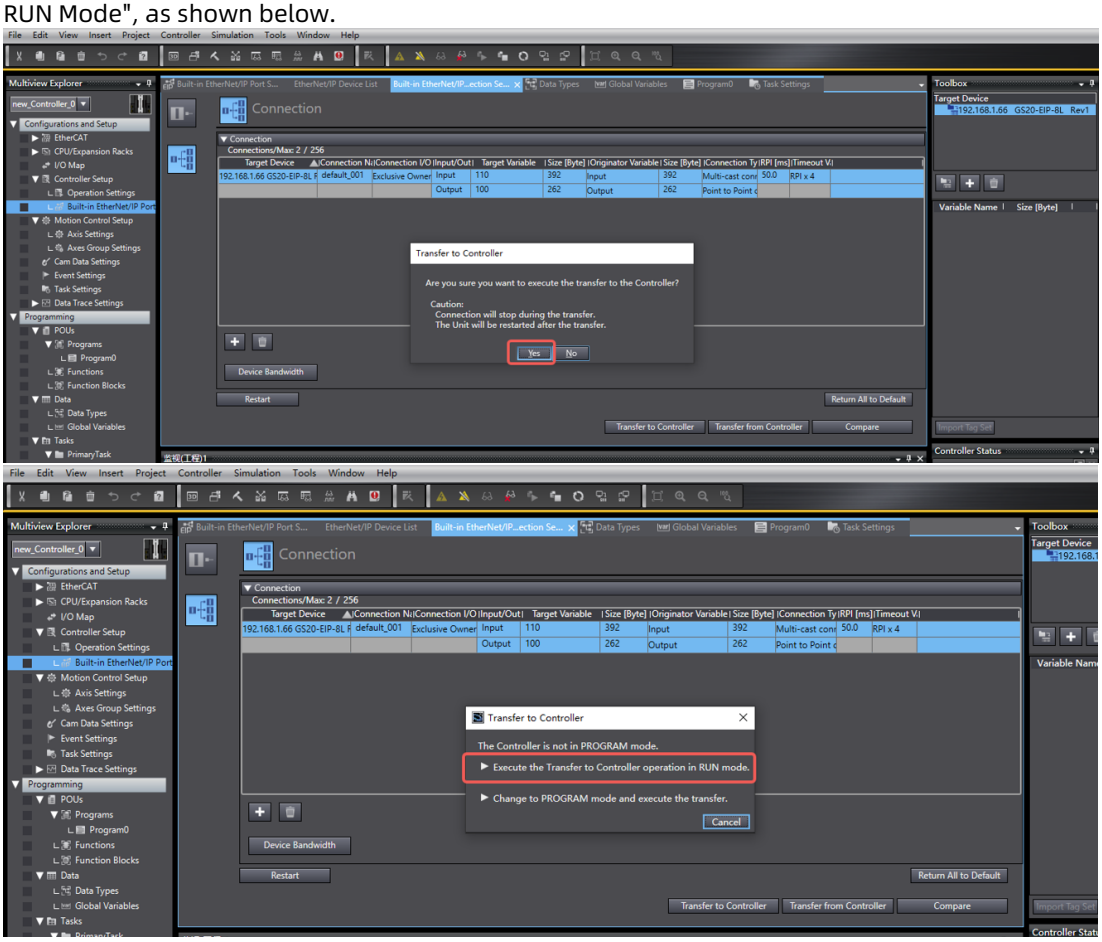
   b. Click "OK". Modify the configuration parameters and delete the original connection, as shown below.



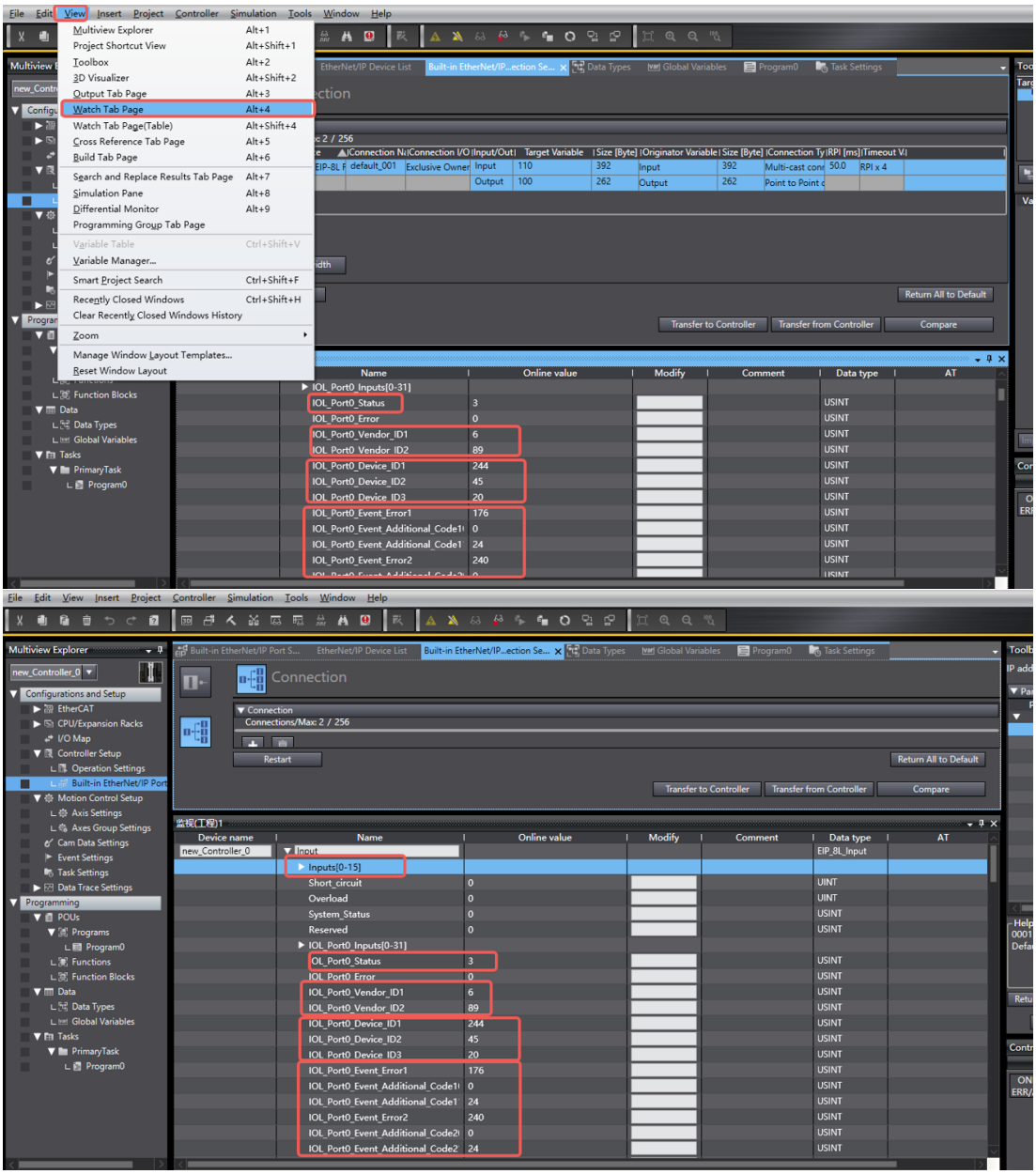
   c. Click "+" to add the target device. Enter the original variable and target variable, and click "Transfer to Controller".



d. In the pop-up window, select "Yes" and select "Execute the Transfer to Controller Operation in RUN Mode", as shown below.

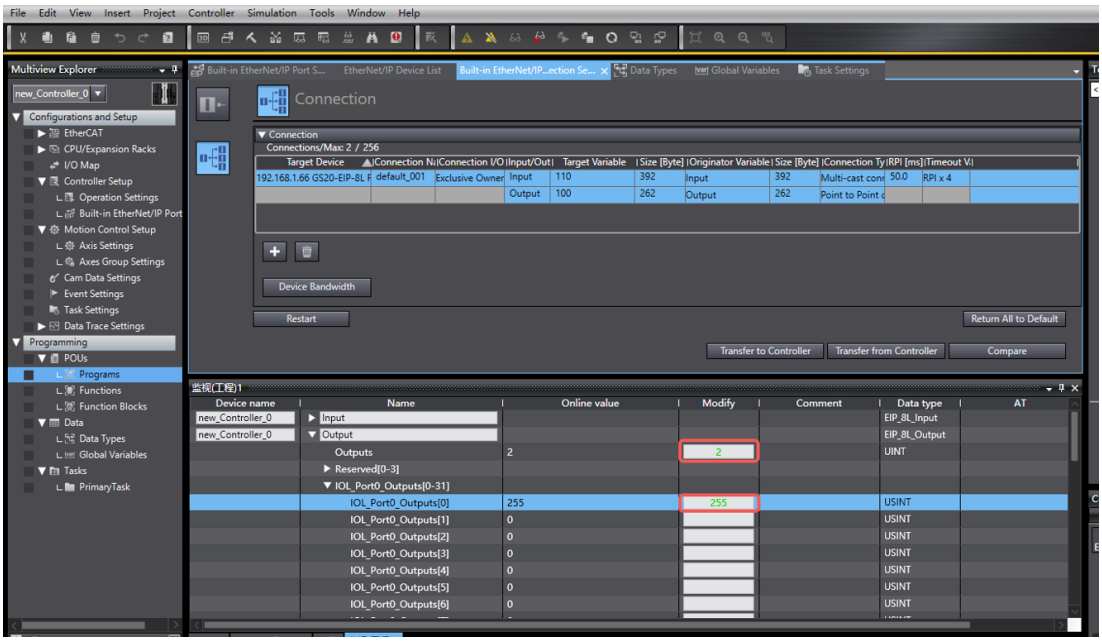


e. Once the configuration parameters are successfully modified and issued, select "View" > "Watch Tab Page". Add the created global variables "Input" and "Output". Expand "Input" to obtain the input data for IO-Link slaves connected on port 0. For details, see *"5.2.2 Input Process Data" on page 29*. Obtain the connection status, device information, and diagnostic information of the slave.

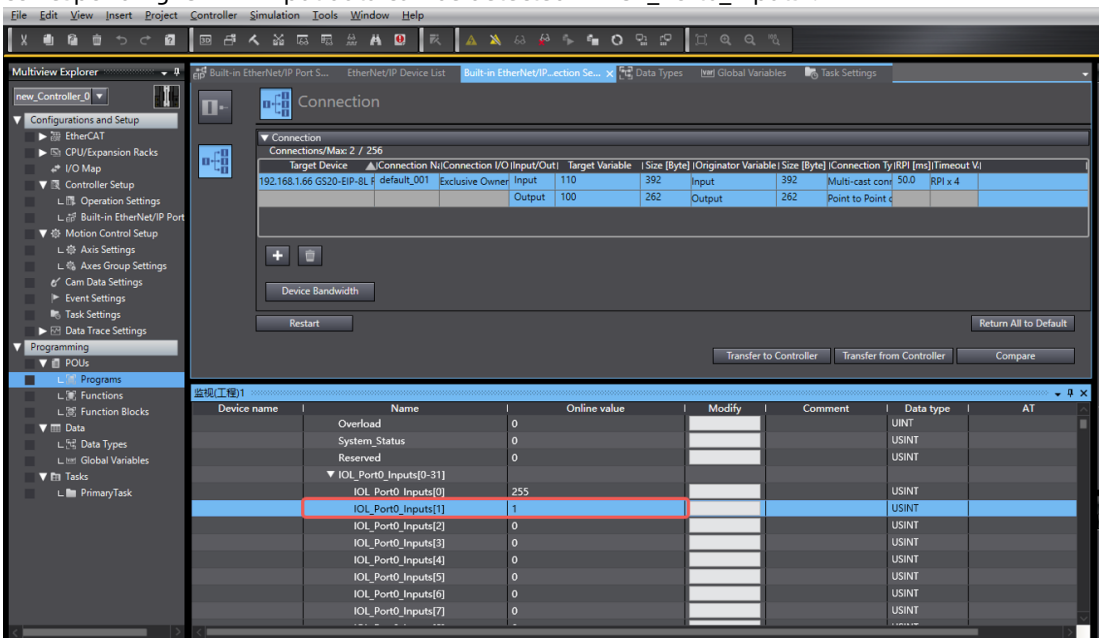


f. Based on *"5.3.1 ODVA EIP-Tools Connection" on page 32*, configure the parameters related to the slave. In this example, the lower eight bits of the IO-Link slave (Pin2) is configured as output and the higher eight bits (Pin4) is configured as input.

g. To issue the output data, expand "Output" data in the "Watch" window. Based on the description of standard output data in *"5.2.3 Output Process Data" on page 31*, enter "2" in the "Modify" field and press Enter to output to Pin2 of port 0 of the GS20-EIP-8L module, providing UA power supply for the IO-Link slave. Based on the description of IO-Link output process data in *"5.2.3 Output Process Data" on page 31*, enter "255" in "Modify" field of "IOL_Port0_Outputs[0]". Press Enter to output a valid lower 8-bit data to the slave via IO-Link.



h. Short-circuit one output pin and one input pin of the IO-Link slave to receive the corresponding IO-Link input process data. Expand the "Input" data in the "Watch" window and the corresponding IO-Link input data can be detected in "IOL_Port0_Inputs".



5.4.3 Programming with Rockwell Studio 5000

Prerequisites

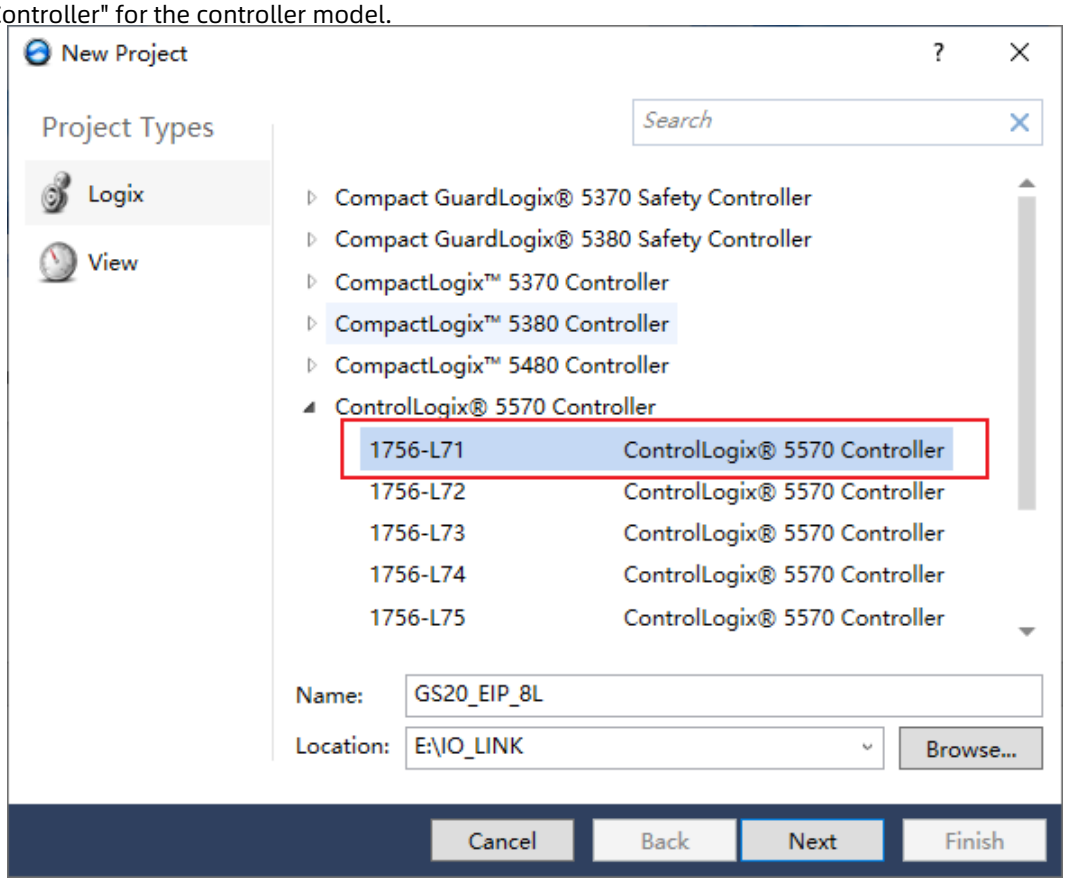
- The cables are connected correctly.
- Rockwell Studio V33.00.00 and above is installed.
- The EDS file of the GS20-EIP-8L module is imported into InoProShop. The EDS file can be obtained under Software and Commissioning Tools on the GS20 series product page at www.inovance.com.

- EIP-Tools is downloaded and installed from ODVA official for IO-Link slave parameter configuration.

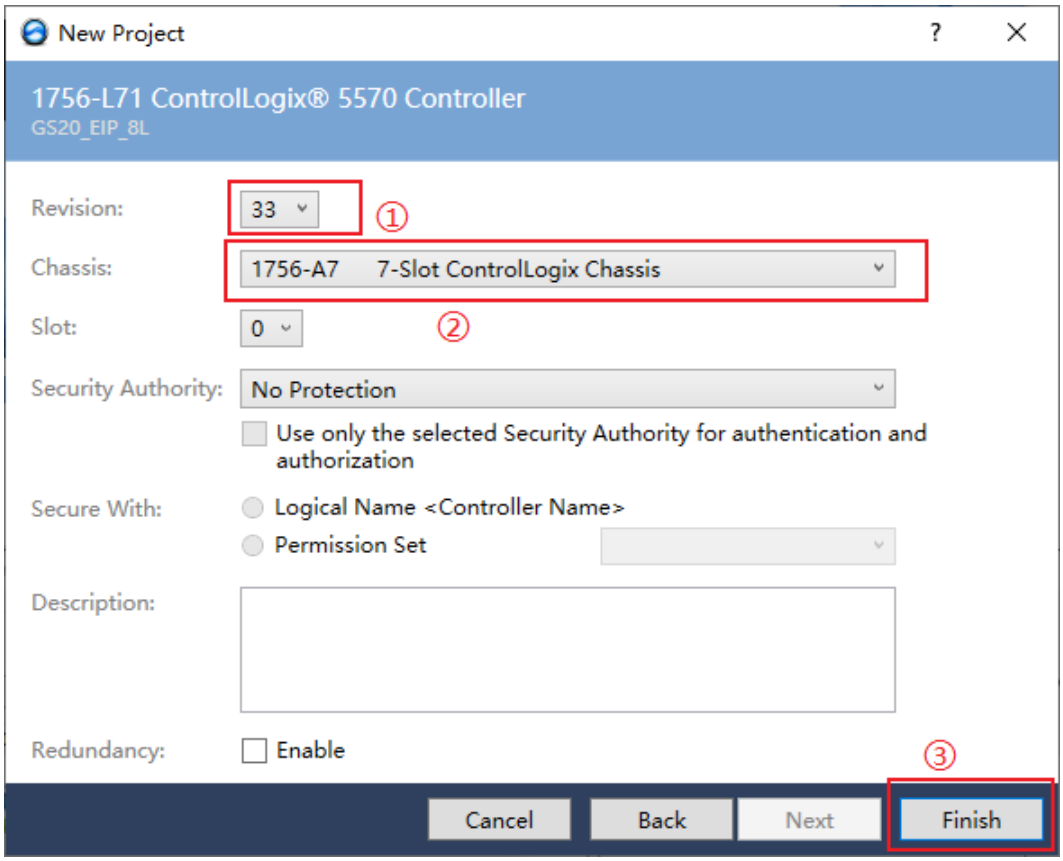
Procedure

1. Create a project.

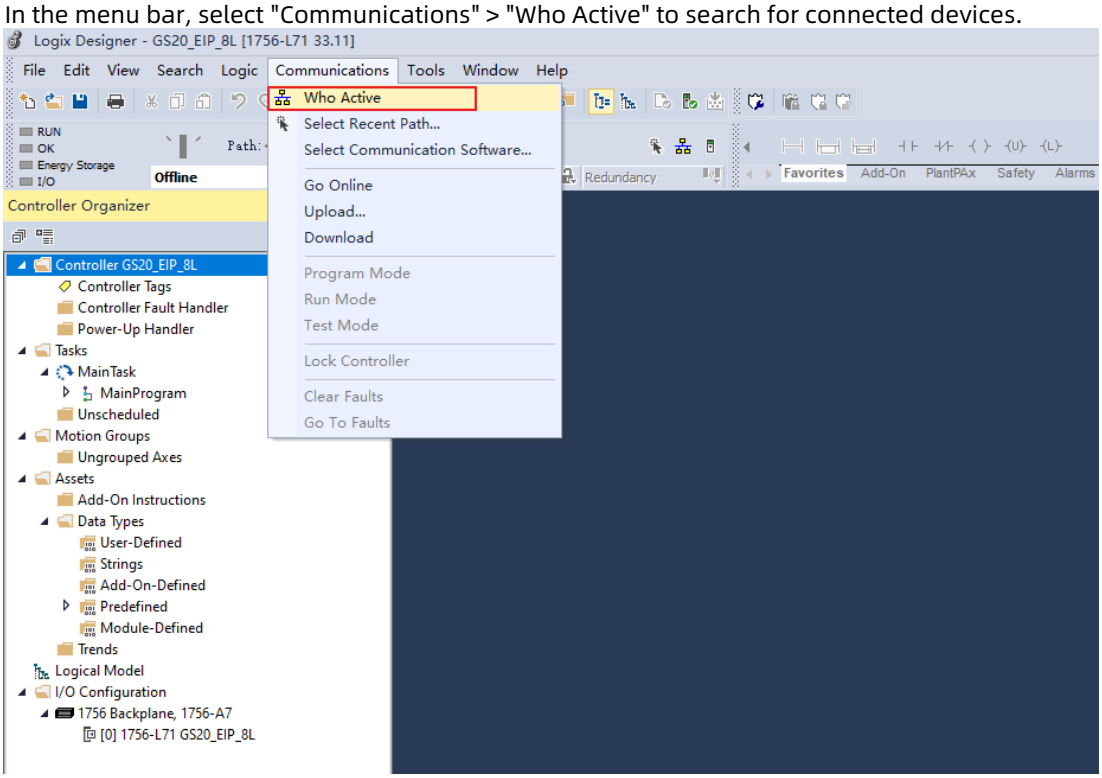
   a. Open the Studio 5000 software, click "New Project", and select "1756-L71 ControlLogix5570 Controller" for the controller model.



   b. Select the corresponding software version (①) and the matching PLC module (②) as needed, and click "Finish" (③).



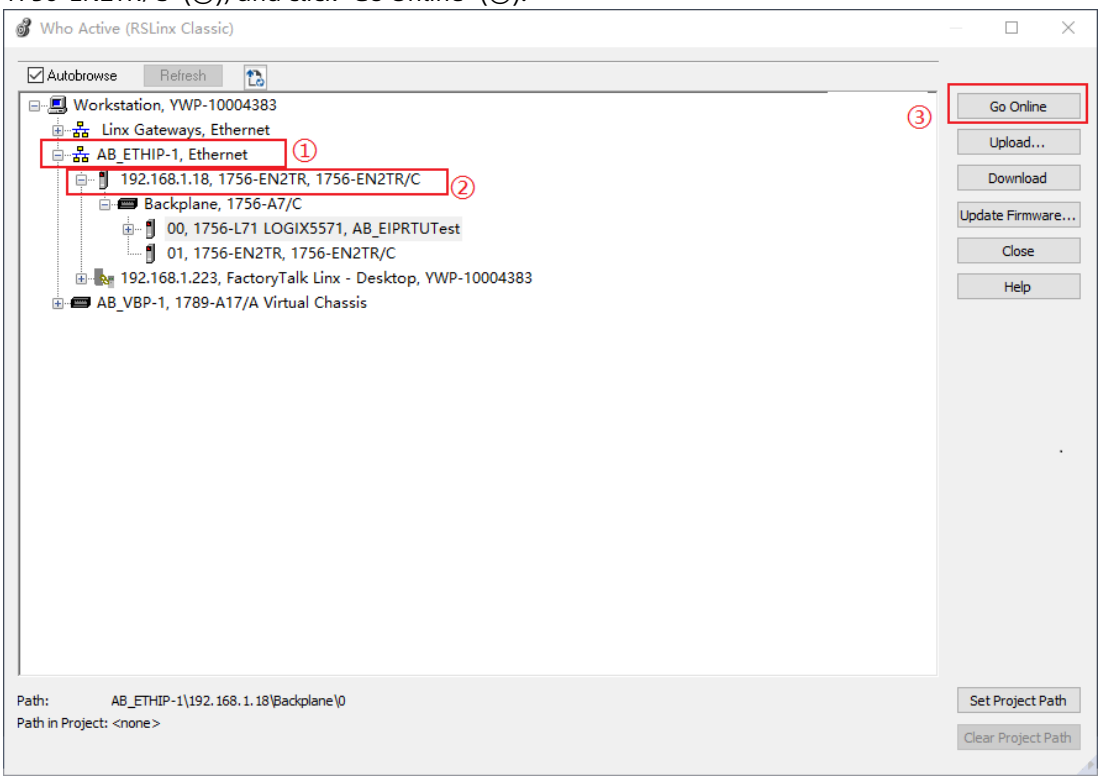
c. In the menu bar, select "Communications" > "Who Active" to search for connected devices.



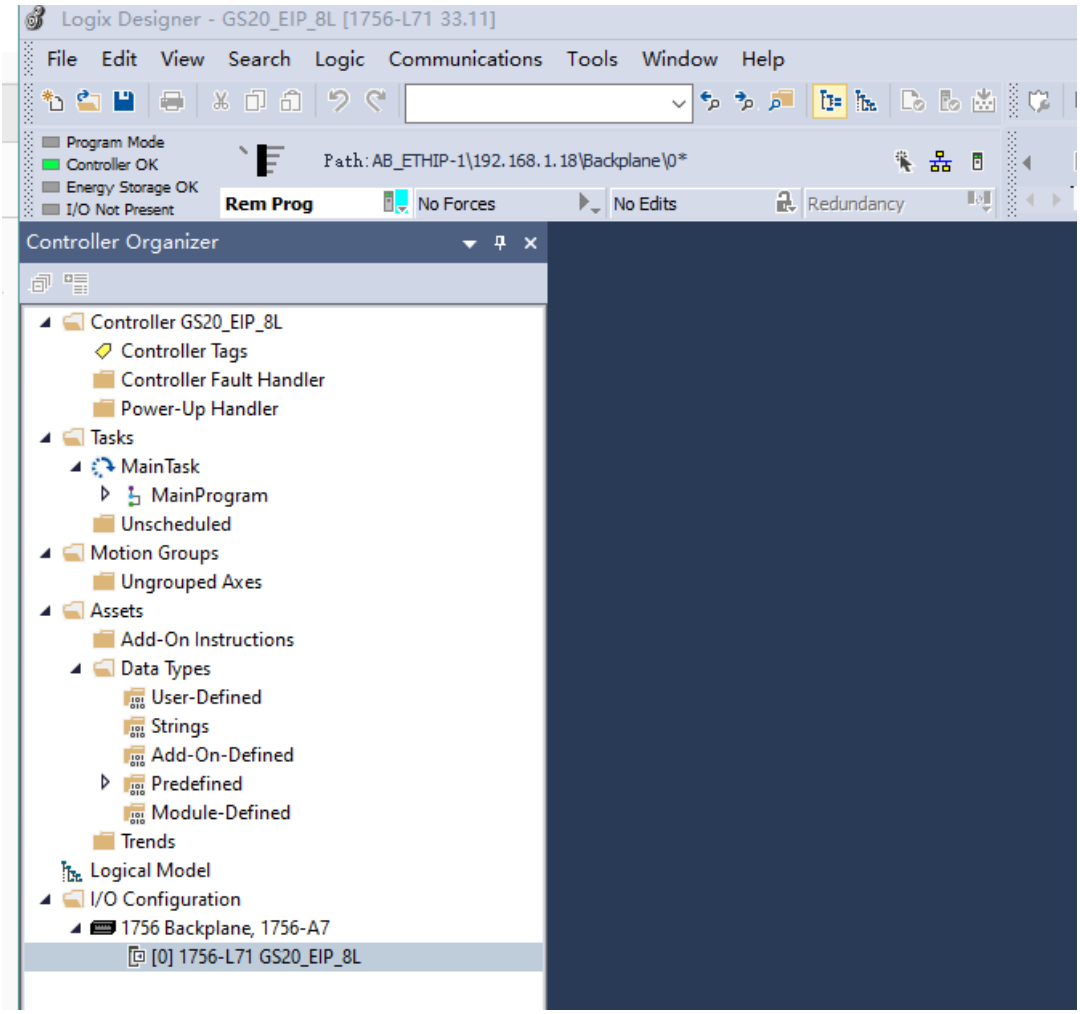
d. Set the local network card to the same network segment as the PLC device.

Select "Control Panel" > "Network and Sharing Center" > "Ethernet". Click "Properties (P)" and select "Internet Protocol version 4 (TCP/IPv4)" in the "Ethernet Properties" dialog box. In the pop-up window, select "Use the following IP address (S)", set the "IP address (I)", and click "OK".

e. Select "AB_ETHIP.1.Ethernet" (①), click the detected PLC model "192.168.1.18, 1756-EN2TR, 1756-EN2TR/C" (②), and click "Go Online" (③).

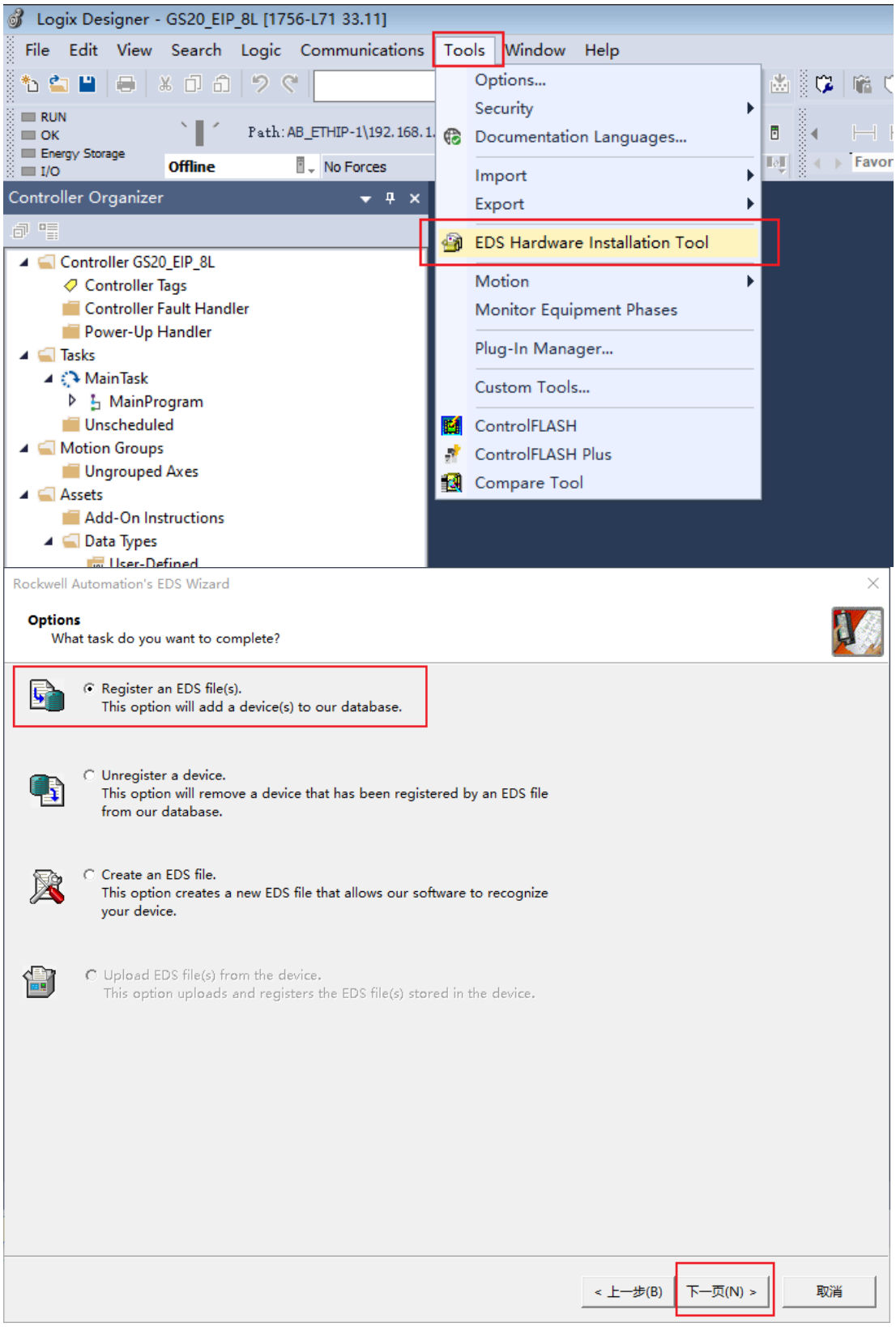


f. The background status is shown below.

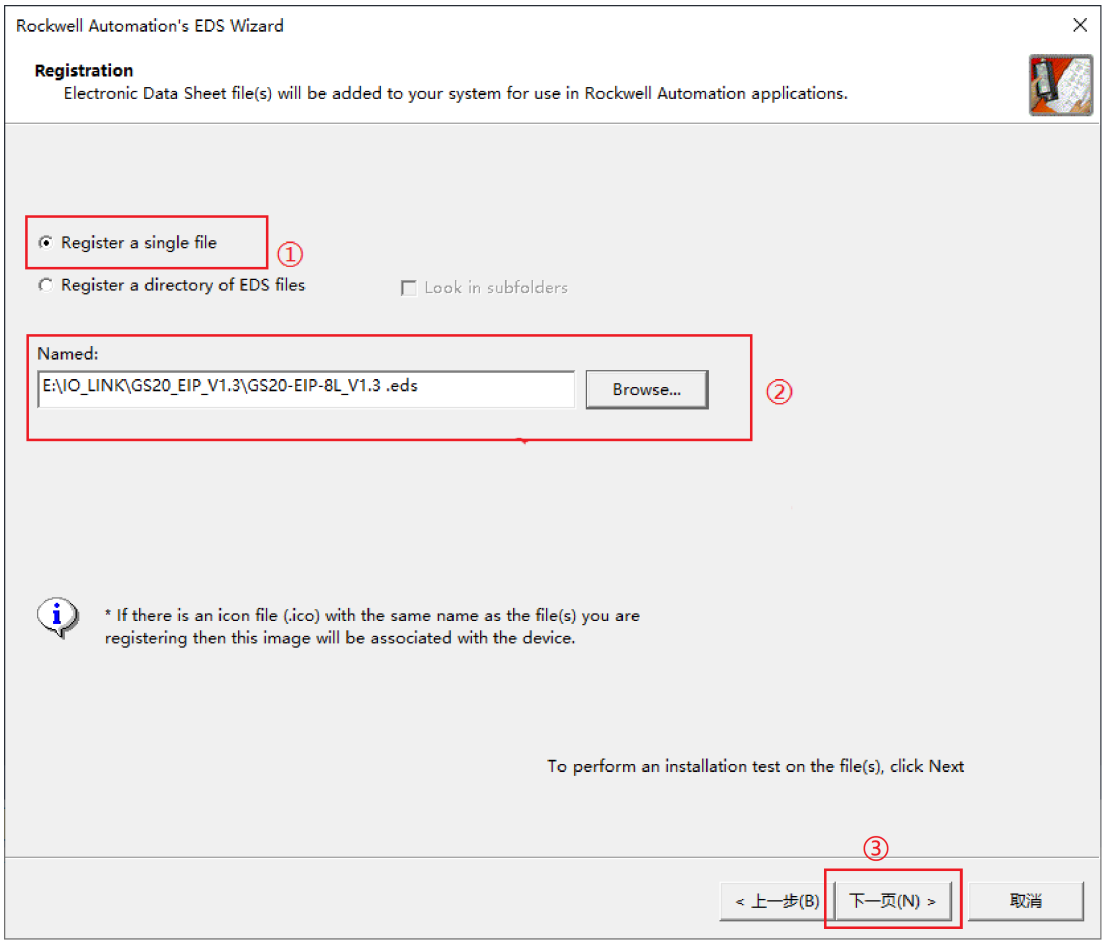


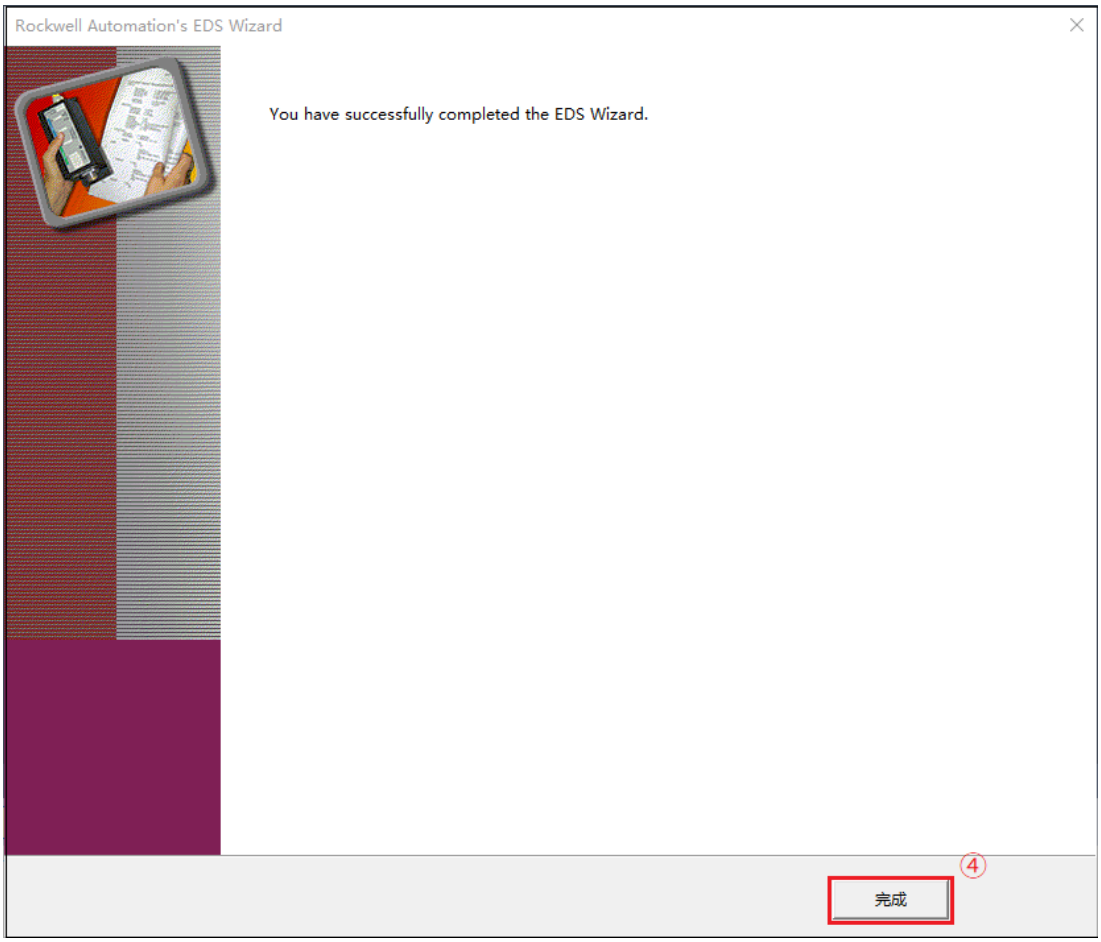
2. Import the EDS file

a. Select "Tools" > "EDS Hardware Installation Tool" (①), select "Register an EDS file(s)" (②), and click "Next (N)" (③).



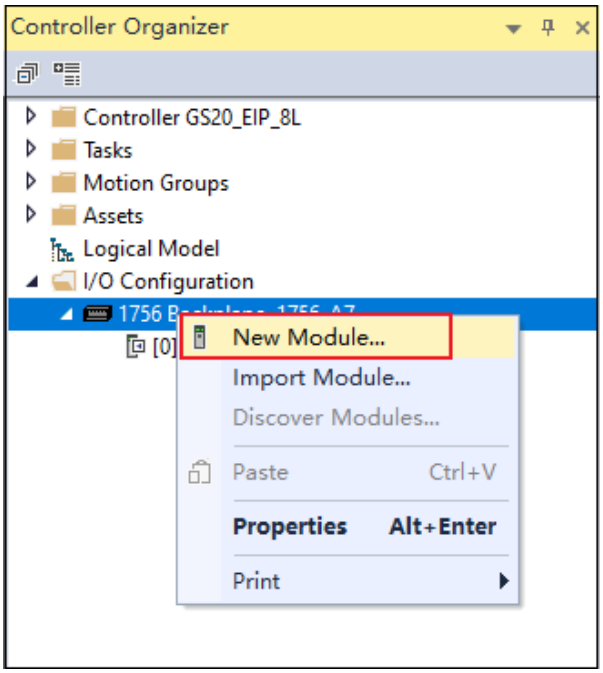
b. Click "Register a single file" (①), click "Browse" to select the EDS file for the device (②) and then click "Next" (③).


Rockwell Automation's EDS Wizard
Registration
Electronic Data Sheet file(s) will be added to your system for use in Rockwell Automation applications.
Register a single file
①
Register a directory of EDS files
Look in subfolders
Named:
E:\IO_LINK\GS20_EIP_V1.3\GS20-EIP-8L_V1.3 .eds
Browse...
②
* If there is an icon file (.ico) with the same name as the file(s) you are registering then this image will be associated with the device.
To perform an installation test on the file(s), click Next
③
< 上一步(B)
下一页(N) >
取消

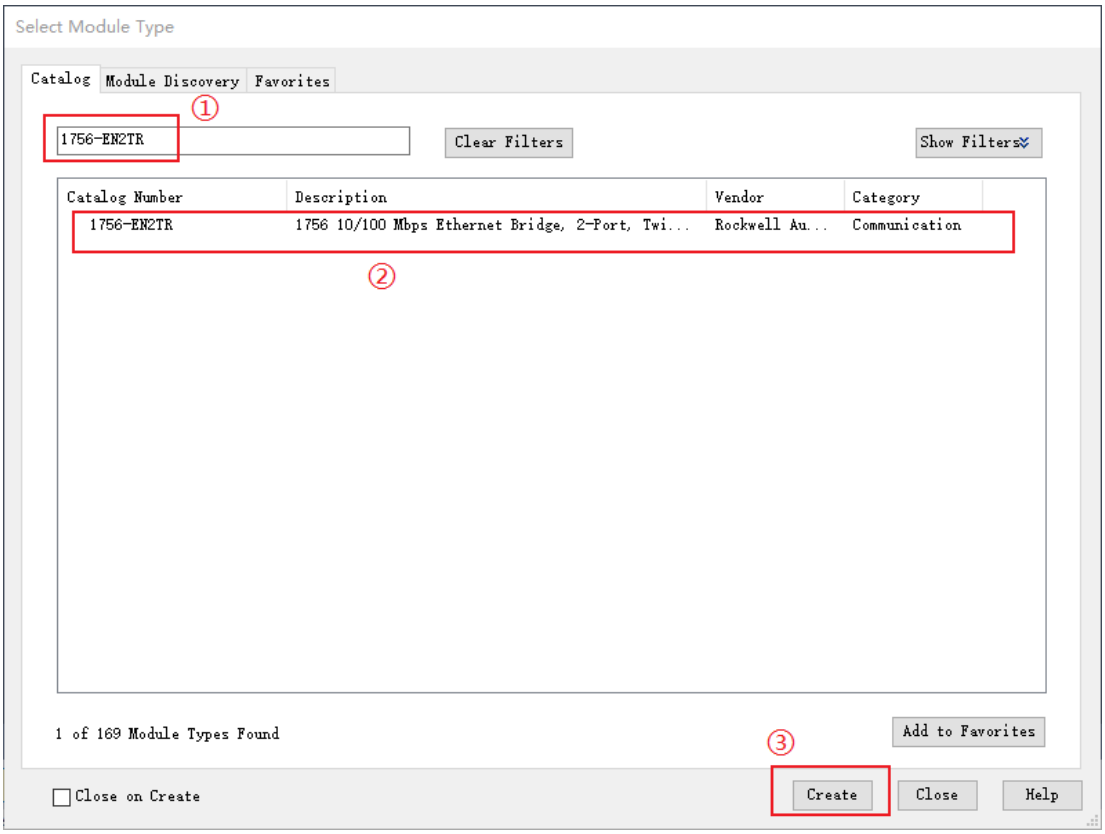


3. Configure the project.

a. Select "I/O Configuration" > "1756 Backplane" on the left of the interface, and click "New Module".



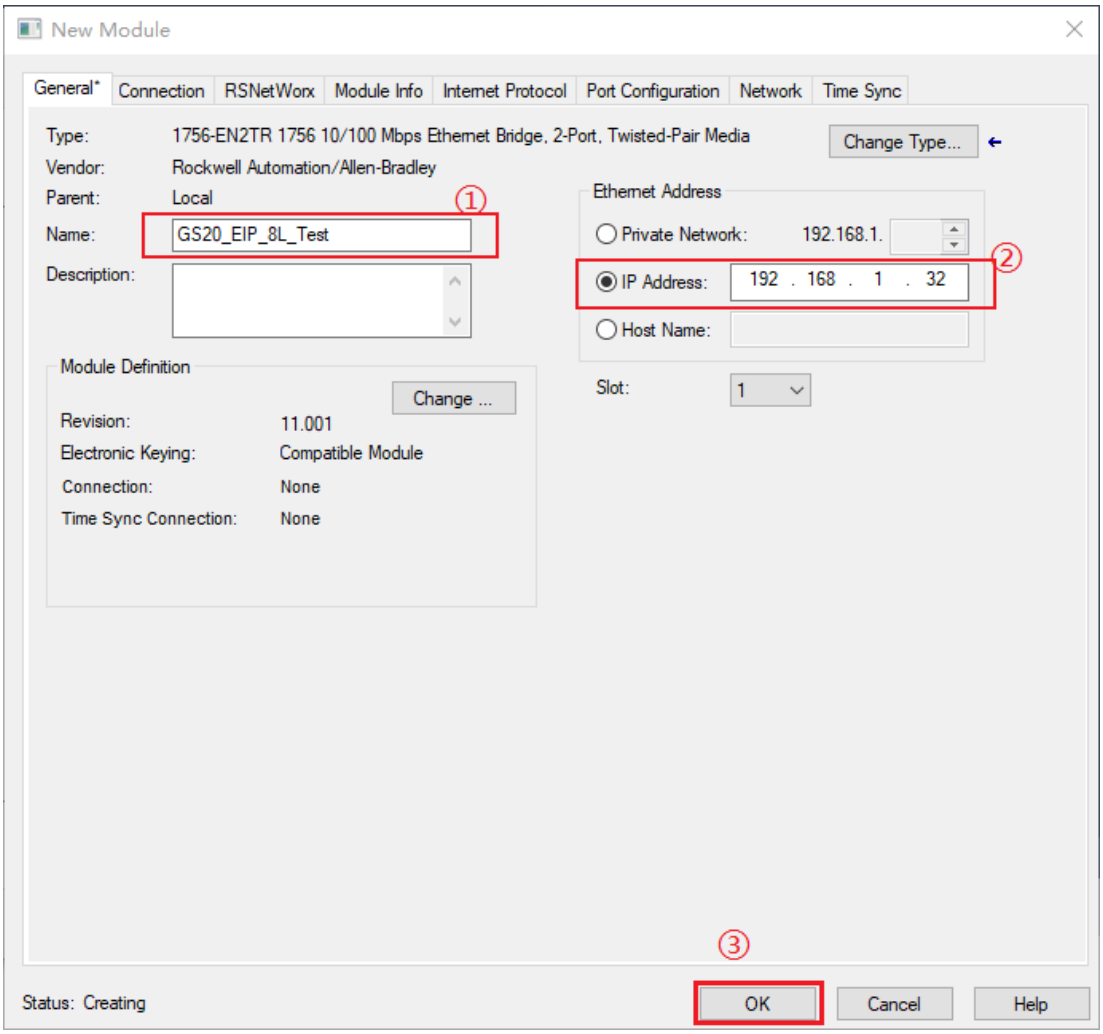
b. In the "Catalog" tab of the "Select Module Type" window, search for "1756-EN2TR" (①), select "1756-EN2TR" (②), and click "Create" (③).



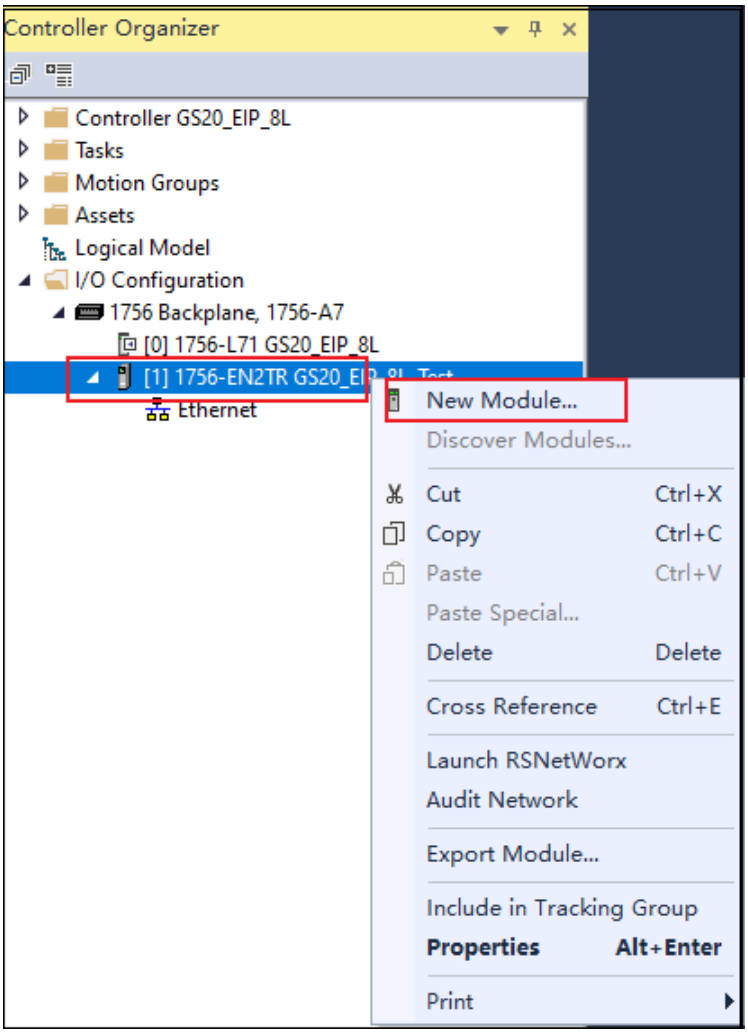
Caution

This device requires the addition of an Ethernet module for use. Some other devices can directly search for the GS20-EIP-8L without adding the module.

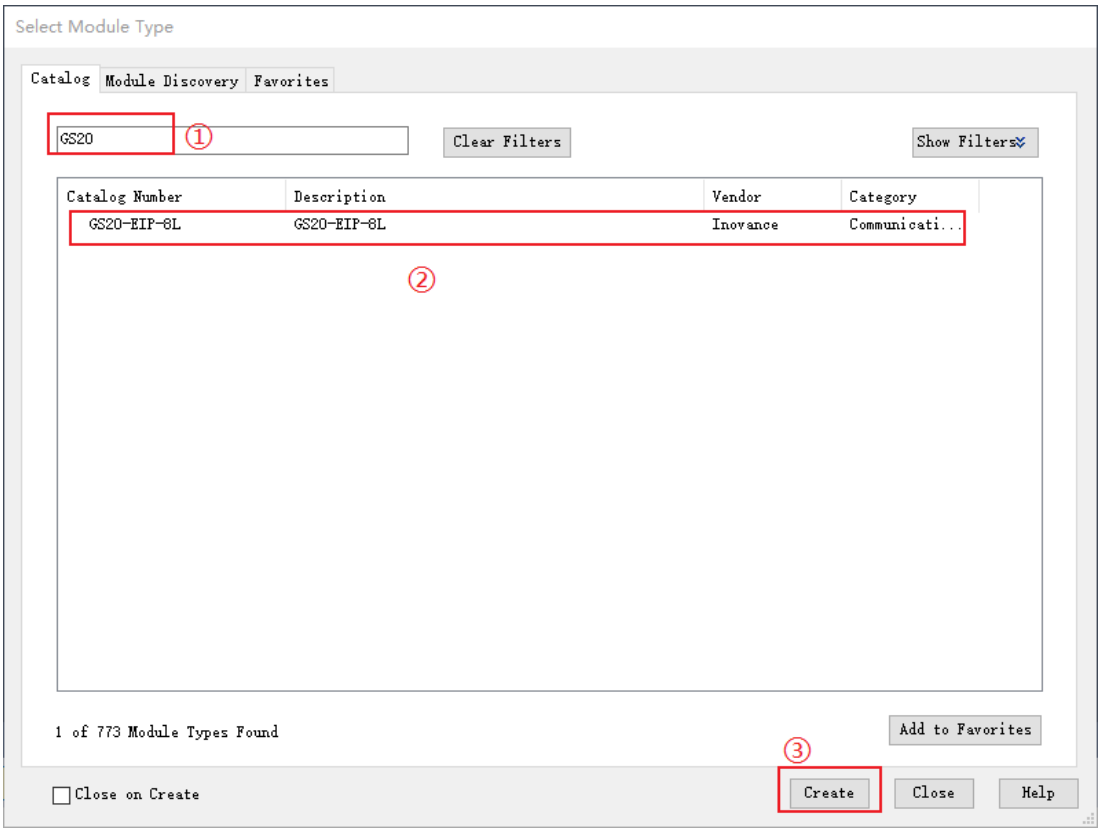
c. In the "General" tab of the "New Module" window, enter the module "Name" (①) and "IP Address" (②) with the same IP as the device, and then click "OK".



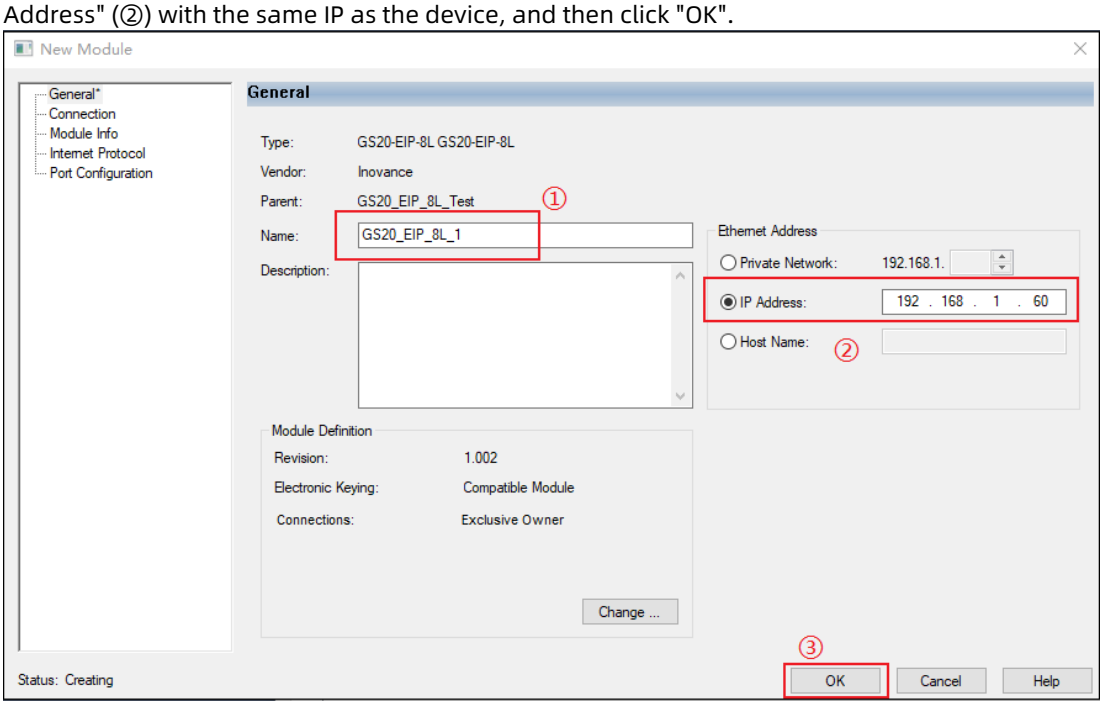
d. Select "I/O Configuration" > "1756 Backplane" on the left of the interface, and click "New Module".



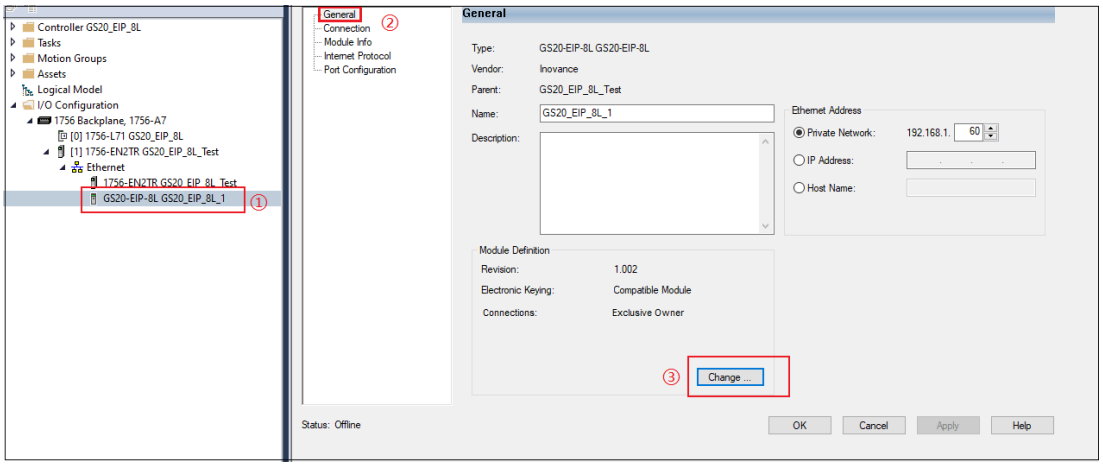
e. In the "Catalog" tab of the "Select Module Type" window, search for "GS20", select "GS20-EIP-8L", and click "Create".



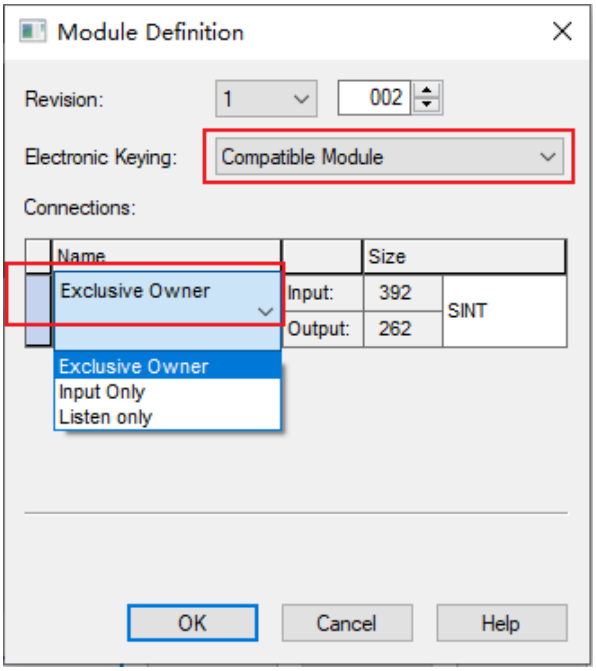
f. In the "General" tab of the "New Module" window, enter the module "Name" (①) and "IP Address" (②) with the same IP as the device, and then click "OK".



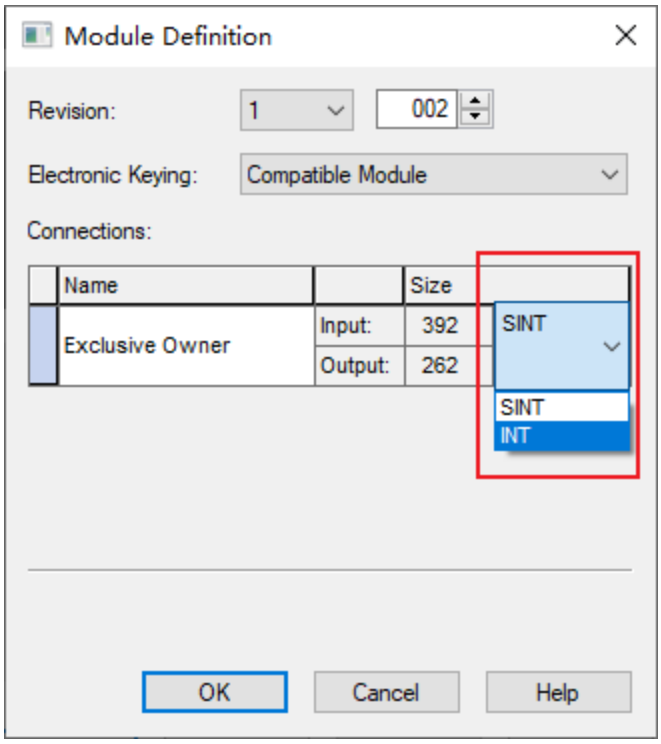
g. To modify the module configuration parameters, double-click the module (①), select "General" (②), and click "Change".



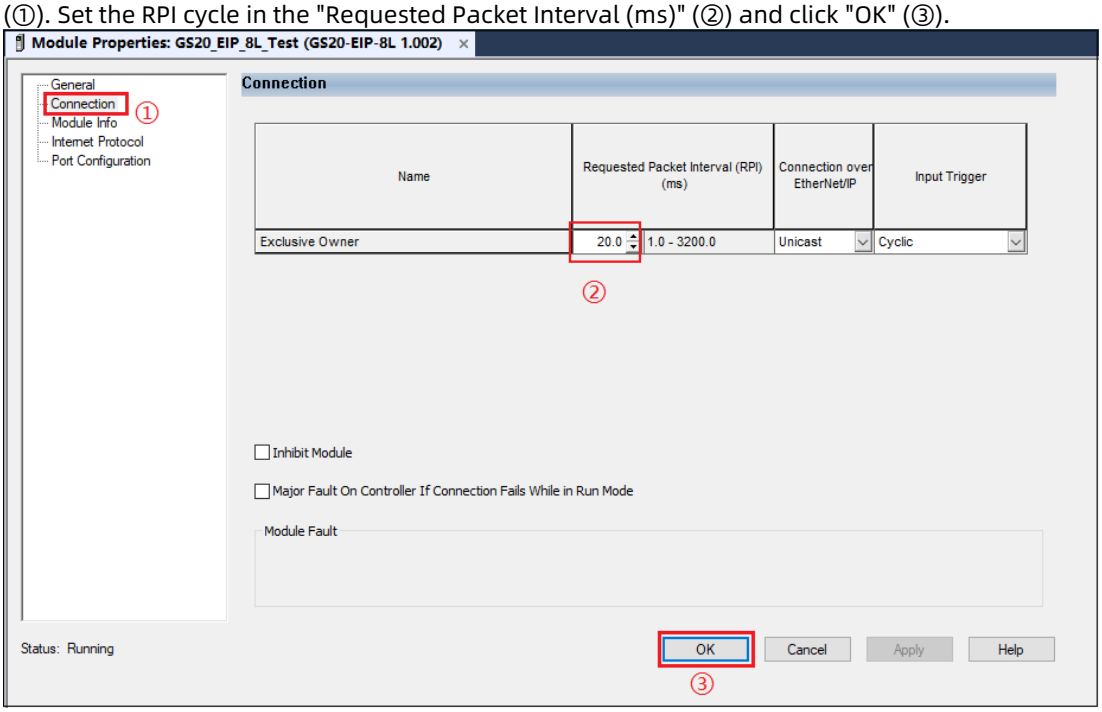
1). In the "Module Definition" dialog box, select the connection method, set the default parameters, and click "OK".



2). To modify the input/output data display length, click the lower triangle to select the data length, and click "OK".

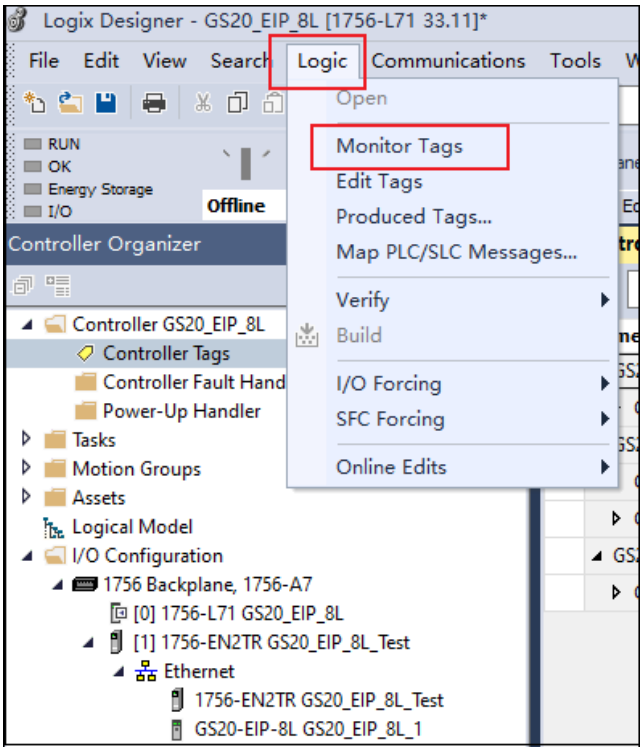


h. To modify the device communication RPI cycle, double-click the device and click "Connection" (①). Set the RPI cycle in the "Requested Packet Interval (ms)" (②) and click "OK" (③).



4. Configure the mapping data.

a. Select "Logic" > "Monitor Tags" from the menu bar.

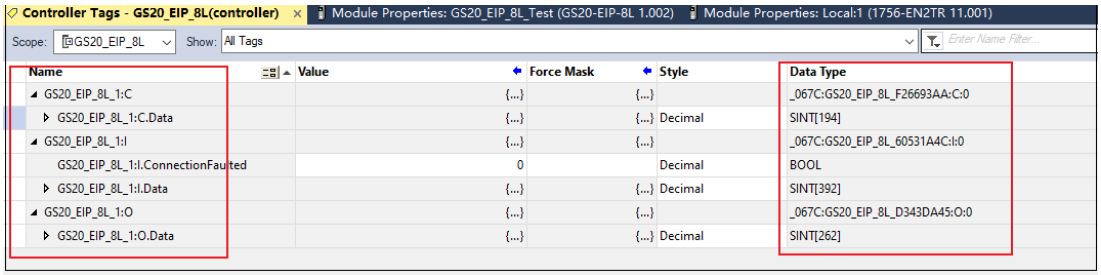


b. The configuration interface includes the module configuration data (C), input channel (I), output channel (O), and the corresponding byte size (Data Type).
All module configuration data in the software is of SINT type. Take module configuration data as an example.

Parameters C.Data[1] and C.Data[0]correspond to the higher and lower eight bits of an INT type data respectively. In the configuration data, the first 10 bytes are of INT type, so two parameters correspond to one set of parameter mapping, while the other SINT types correspond to the module USINT one-by-one.

The "Port Function" of each port of the module is configured as IO-Link mode (binary: 0101010101010101; decimal: 21845; hexadecimal: 5555). The values of the two channels are both 55 and the "Style" value is set to HEL (hexadecimal). So C.Data[0] and C.Data[1] shall both be filled with 55.

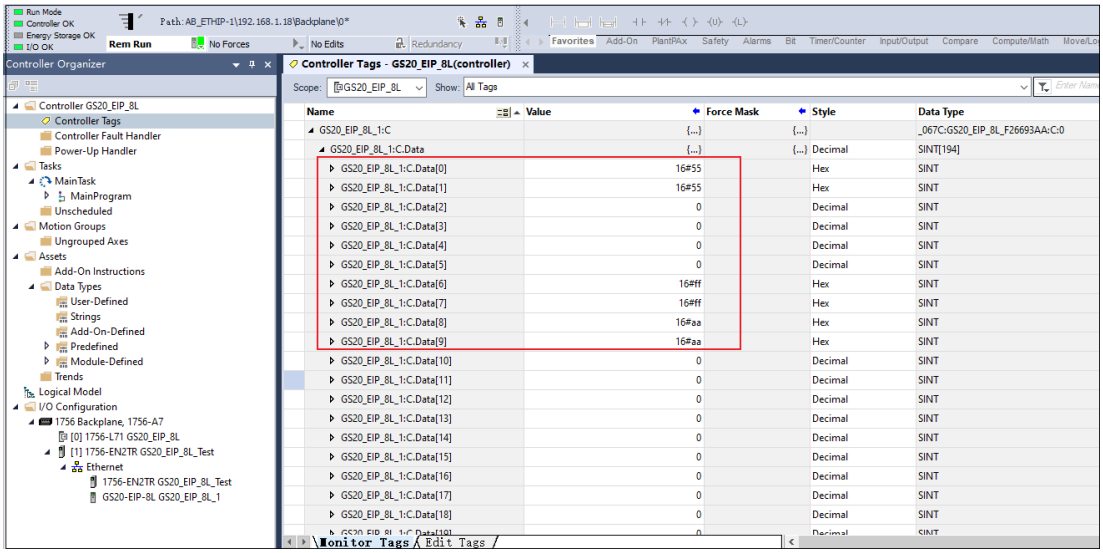
For input and output process channels, synchronous conversion is required for display.



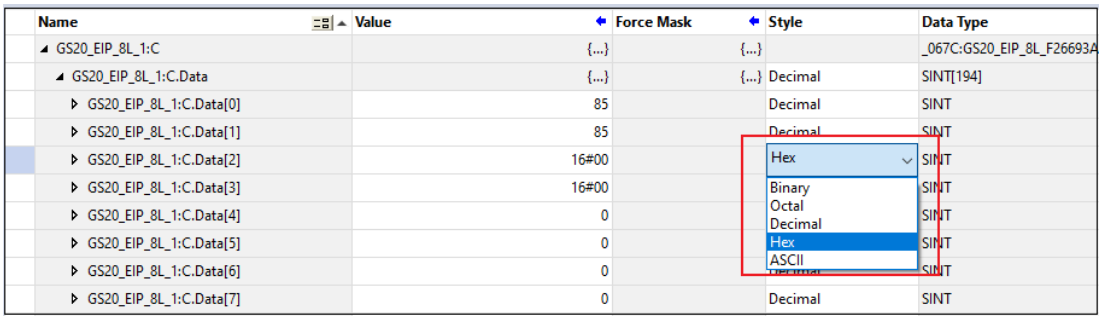
No.	Name
①	Port Function
②	Pin2 Safe Function
③	Pin4 Safe Function
④	Pin2 Function

No.	Name
⑤	Pin4 Function
⑥	IOL Port 0 Cycle Time

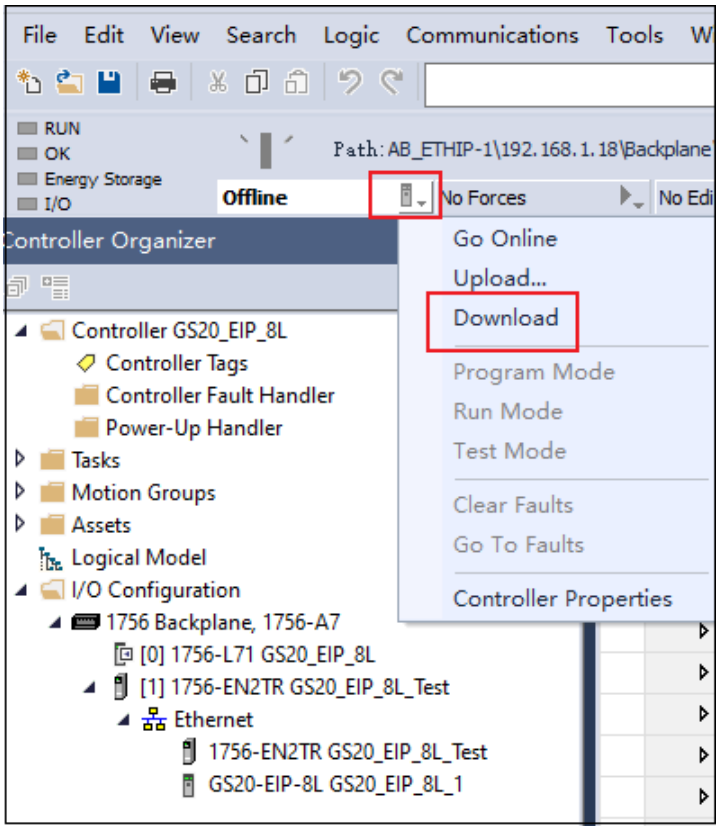
Configure the "Port Function" as IO-Link mode, Pin2/Pin4 output function upon network disconnection as outputting 0 V, Pin2 function as "output enable", and Pin4 function as "output mode", as shown below.



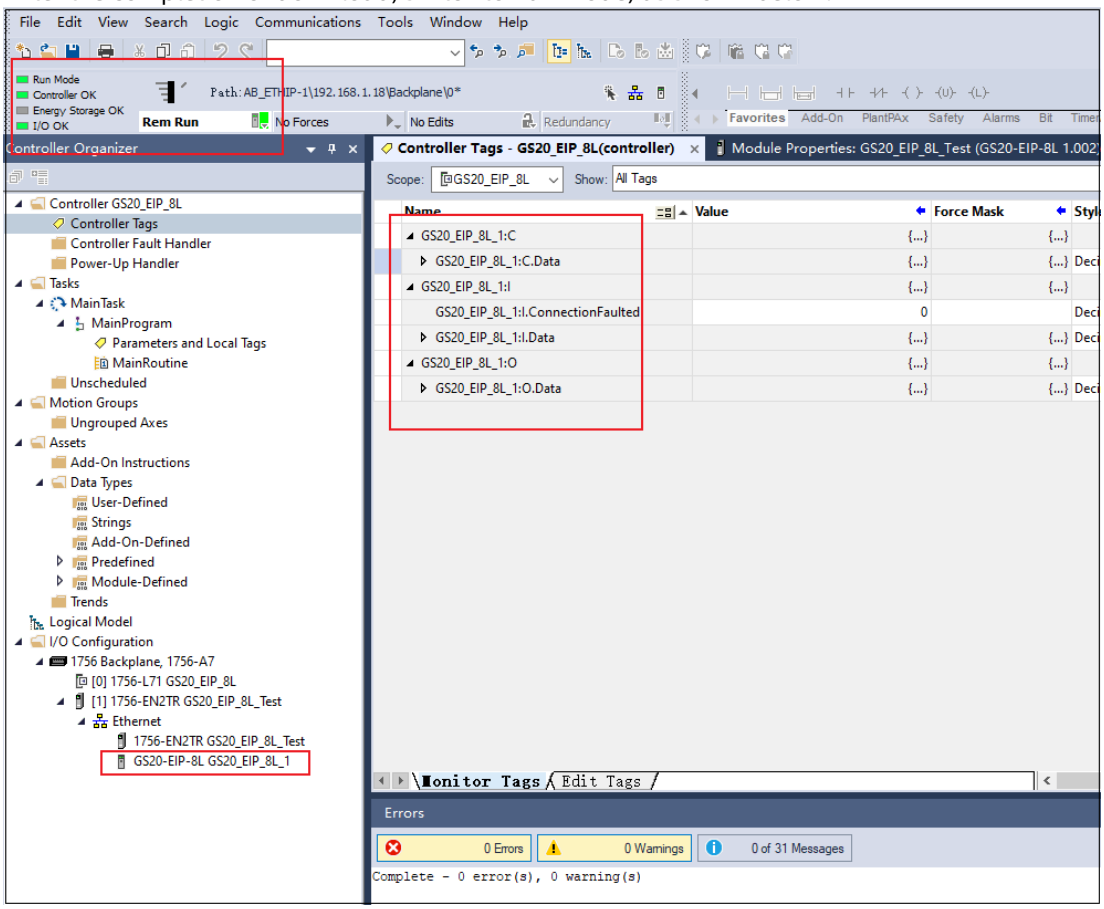
"Style" adjusts the display format to facilitate the calculation of channel mapping values.



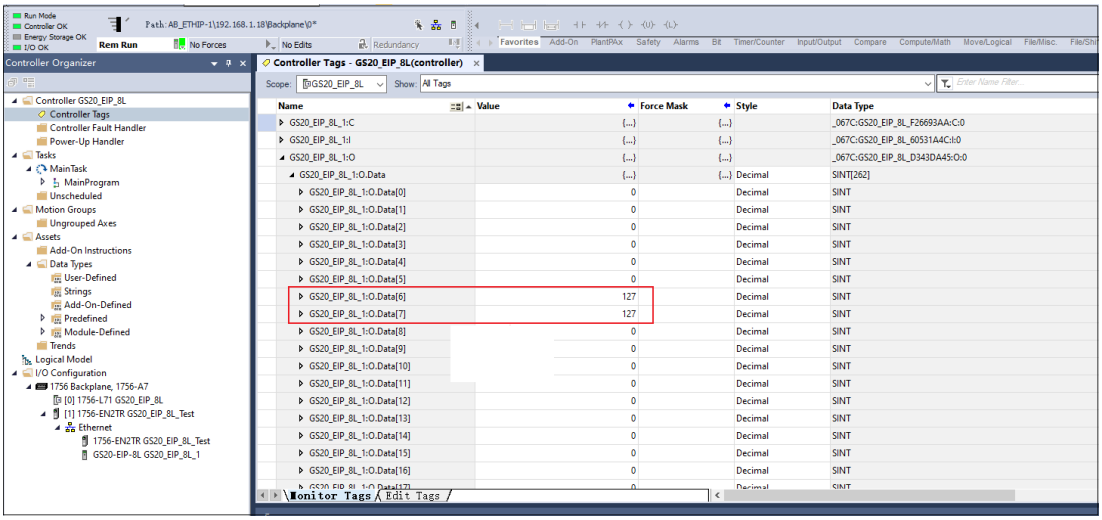
c. Click "Download" to compile and download the program to the PLC device.



d. After the completion of download, switch to Run mode, as shown below.



e. The process data output write values for IO-Link port 0 is shown below.


Controller Organizer
Controller GS20_EIP_8L
Controller Tags
Controller Fault Handler
Power-Up Handler
Tasks
MainTask
MainProgram
Unscheduled
Motion Groups
Ungrouped Axes
Assets
Add-On Instructions
Data Types
User-Defined
Strings
Add-On-Defined
Predefined
Module-Defined
Trends
Logical Model
I/O Configuration
1756 Backplane, 1756-A7
[0] 1756-L71 GS20_EIP_8L
[1] 1756-EN2TR GS20_EIP_8L_Test
Ethernet
1756-EN2TR GS20_EIP_8L_Test
GS20-EIP-8L GS20_EIP_8L_1
Controller Tags - GS20_EIP_8L(controller)
Scope: GS20_EIP_8L
Show: All Tags
Name
Value
Force Mask
Style
Data Type
GS20_EIP_8L_1:C
GS20_EIP_8L_1:I
GS20_EIP_8L_1:O
GS20_EIP_8L_1:O.Data
GS20_EIP_8L_1:O.Data[0]
GS20_EIP_8L_1:O.Data[1]
GS20_EIP_8L_1:O.Data[2]
GS20_EIP_8L_1:O.Data[3]
GS20_EIP_8L_1:O.Data[4]
GS20_EIP_8L_1:O.Data[5]
GS20_EIP_8L_1:O.Data[6]
GS20_EIP_8L_1:O.Data[7]
GS20_EIP_8L_1:O.Data[8]
GS20_EIP_8L_1:O.Data[9]
GS20_EIP_8L_1:O.Data[10]
GS20_EIP_8L_1:O.Data[11]
GS20_EIP_8L_1:O.Data[12]
GS20_EIP_8L_1:O.Data[13]
GS20_EIP_8L_1:O.Data[14]
GS20_EIP_8L_1:O.Data[15]
GS20_EIP_8L_1:O.Data[16]
_067C:GS20_EIP_8L_F26693AA:C:0
_067C:GS20_EIP_8L_60531A4C:I:0
_067C:GS20_EIP_8L_D343DA45:O:0
SINT[262]
SINT
Decimal
Monitor Tags
Edit Tags

6 Web Function

This product provides a web interface for online viewing of product information, port information, device diagnostics, and device maintenance information. The web interface also supports operations such as firmware upgrade, IP address modification, and slave parameter read/write.

User login

The system provides two access permissions: common mode and expert mode.

- Normal mode: The login password is "inogsnormal". Users can only view product information, that is the "Home" and "Product Introduction" tabs on the web interface.
- Expert mode: The login password is "inogsexpert". In this mode, users can not only view product information, port information, device diagnostics, and device maintenance information, but also upgrade device firmware, modify IP addresses, and read/write slave parameters.

1. Enter the IP address in the browser to access the web interface (the default IP address is 192.168.1.66).
2. Click "Login" in the upper right corner.
3. Enter the login password in the pop-up window and click "OK".

Home

Select the home tab in the left navigation tree to view product information, including:

No.	Description
①	Real-time status of the module's status indicators and the IO-Link port indicators. For details, see *"2.3 Components" on page 14*.
②	Information of the slaves connected to each port of the module.
③	Basic data information of the module.

Actual port information

1. In the left navigation tree, select the "Port actual information" tab.
2. Select the port to be viewed from the drop-down box in the upper left corner to view the basic information and process data of the slave connected to the port.
3. The "Process input data (hex)" of the slave is updated in real time. The "Process output data (hex)" can be written.
4. The slave parameters support "Read" and "Write" operations.
   - Read: Enter the index and sub-index of the input parameter and click "Read". The read parameter data will be displayed in "Data (hex)".
   - Write: Enter the index, sub-index, data length, and data of the input parameter, and click "Write" to write the parameter data of the module.

Device diagnosis information

1. In the left navigation tree, select the "Device diagnostic info" tab.
2. The upper list displays all diagnostic information in real time, and the lower list displays filtered diagnostic information. For details about the fault codes, see *" Troubleshooting" on page 82*.

3. Select the master or port 0 to 7 in the drop-down box in the middle of the interface to filter the diagnostic information. The filtered results are displayed in the lower list.
4. Click "Download diagnostic information" to export all current diagnostic information locally in the form of a .csv file. The default file name is diagnosis_data.csv.

Device maintenance information

1. In the left navigation tree, select the "Device maintenance information" tab.
2. On this tab, users can view the master device information. Select a port through the drop-down box to view the device information of the slave connected to the port.
3. To upgrade the firmware version of the master, contact Inovance technical engineers.
4. Users can also modify the IP address, subnet mask, and gateway address of the master. Click "Write" after modification.

- IP address: When the device's DIP switch is not set to 0, only the first three digits of the IP address can be modified. When the DIP switch is set to 0, the entire IP address can be modified, but the fourth segment cannot be set to 0 or 255.
- Subnet mask: It must follow the binary format of continuous "1"s in higher bits + continuous "0"s in lower bits, preventing alternating (e.g. 11100111) or discontinuous (e.g. 11101000) masks.
- Gateway address: It must be in the same subnet as the IP address, meaning it shares the same first three digits with the IP address.

Note

The modified IP address will take effect the next time the module is powered on. The new IP address is required to access the web interface.

Product Introduction

Click the "Product introduction" tab in the left navigation tree to jump to the official website of Inovance, where you can view the product overview, specifications, and related documents of the GS20 series high protection I/O modules.

7 Troubleshooting

There is a set of diagnostic messages for each IO-Link port, which is reported through input process data. Each port can store up to three diagnostic messages. The specific fault codes are shown in the table below.

Source	Fault Code	Name	Solution
IO-Link master station	0x1800	No device on the port (communication interrupted)	Check whether the port device configured as IO-Link is connected.
	0x1801	Startup parameter error	Check parameter configurations.
	0x1802	Invalid vendor ID	Check whether the configured Vendor ID is consistent with the connected port device when I/O-Link validation mode is enabled.
	0x1803	Invalid Device ID	Check whether the configured device ID is consistent with the connected port device when I/O-Link validation mode is enabled.
	0x1804	Pin4 short circuit	Check the wiring.
	0x1805	PHY chip overtemperature	Check the temperature and load.
	0x1806	Pin1 short circuit	Check the wiring.
	0x1807	L+ line overcurrent	Check the power supply (e.g., L1+).
	0x1808	Slave device event overflow	Check slave device events.
	0x1809	Backup inconsistency - memory out of range	Check the 2048-byte range (triggered by DS_Fault).
	0x180A	Backup inconsistency - identification fault	Check the identification configuration (triggered by DS_Fault).
	0x180B	Backup inconsistency - non-specific data storage error	Check data storage.
	0x180C	Backup inconsistency	Check whether the upload fails.
	0x180D	Backup inconsistency	Check the wiring.
	0x180E	P24 (Class B) missing or undervoltage	Check the power supply.
	0x180F	P24 (Class B) short circuit	Check the circuit connection (e.g., L2+).
	0x1810	Pin2 short circuit	Check the wiring.
	0x1811	Pin4 short circuit (DO mode)	Check the wiring.
	0x1812	Pin2 overcurrent	Check the load.
	0x1813	Pin4 overcurrent (DO mode)	Check the load.
	0x1814	Serial number error	Check the serial number.
	0x6000	Invalid cycle time	Check the cycle time configuration.
	0x6001	Version fault - incompatible protocol version	Check protocol version compatibility.
	0x6002	ISDU batch failed - parameter inconsistency	Check parameter configurations.
	0x1F00	Overtemperature	Check the device temperature.
	0x1F10	Low temperature	Check the device temperature.
	0x1F01	Power supply overlimit	Check the power supply system.
	0x1F11	Insufficient power supply	Check the power supply system.
	0x1F02	Active power supply overlimit	Check the active power supply.
	0x1F12	Insufficient active power supply	Check the active power supply.
	0x1F20	Invalid input length	Check the input length.
	0x1F21	Invalid output length	Check the output length.
	0x1FF0	EEPROM access failure	Contact the supplier to replace the device.
	0x1FF1	IO-Link PHY access failed	Contact the supplier to replace the device.
	0x1FF2	Fatal port fault	Contact the supplier to replace the device.
	0xFF26	Port status changed	-
	0xFF27	Data storage and upload completed	-

Source	Fault Code	Name	Solution
IO-Link slave	0x4210	Overtemperature	The ambient temperature is high. Lower down the temperature before using the module.
	0x4220	Low temperature	The ambient environment is low. Increase the temperature before using the module.
	0x5011	Loss of data for which retention upon power-off is configured	Configuration of retention upon power-off fails. Re-configure the parameter for retention upon power-off.
	0x5100	Device power supply error	The UA power supply of the module fails. Enable the power supply to pin 2 on the master or use the external UA power supply.
	0x5110	System power supply overvoltage	The US power supply voltage of the module is higher than the normal operating voltage. Reduce the US power supply voltage.
	0x5111	System power supply undervoltage	The US power supply voltage of the module is lower than the normal operating voltage. Increase the US power supply voltage.
	0x7710	Short circuit	The module encounters short circuit. Check the external wiring.
	0x6320	Incorrect parameter	The module parameters have been configured incorrectly. Configure the parameters correctly according to the product data.
	0x6321	Missing parameter	In expert mode, an input signal is detected for a channel configured as output. Modify the input/output configuration parameter 0x41 according to actual usage.

Note

For all the diagnostic information of the module, see the "Device diagnostic information" page of the *" Web Function" on page 80*.

8 Appendix: Version Matching Information

You can get the module firmware from Inovance technical support engineers. The InoProShop software can be downloaded from the software and commissioning tool interface of any medium-sized PLC series at *https://www.inovance.com*. The following table describes the version matching information.

Module Firmware Version	InoProShop version
2.0.0.0 and later	V1.7.3 SP2 and later

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.

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