INOVANCE

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GL20-RTU-PN Series Communication Interface Module

Function Guide

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

Data code PS00022011A01

Legal Information

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

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

Waste Disposal

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

Qualified Personnel

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

Proper Use of the Product

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

Preface

Introduction

This guide includes the module-specific information, such as model, components, and technical specifications.

Note

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

Documentation guide

The product documentation package is organized into equipment guide and system guide, enabling you to quickly access the information as needed.

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

Standard

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

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

More documents

Document	Code	Description
GL20 Series Module System Guide	PS00022010	Introduces full-scenario tasks for typical users operating the system, providing detailed explanations on system overview, installation, wiring, debugging, and fault diagnosis.
GL20-RTU-ECT Series Communication Interface Module User Guide (This guide)	PS00022011	Introduces module properties, including model, components, technical specifications, and terminal wiring diagrams.

Revision history

Date	Version	Revision
2026-03	A01	Minor corrections.
February 2026	A00	First release.

Access to the guide

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

- **Visit https://www.inovance.com/global, 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

Inovance provides warranty service within the warranty period (as specified in your order) for any fault or damage that is caused by proper operation of the user. Maintenance will be charged after the warranty 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 Product Warranty Card.

1 Fundamental Safety Instructions

1.1 General Safety Instructions

Safety disclaimer

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

Safety levels and definitions

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

Unpacking
 • Do not install the equipment if you find damage, rust, or signs of use on the equipment or accessories upon unpacking. • Do not install the equipment if you find water seepage or missing or damaged components upon unpacking. • Do not install the equipment if you find the packing list does not conform to the equipment you received.
 • Check whether the packing is intact and whether there is damage, water seepage, dampness, and deformation before unpacking. • Unpack the package in accordance with the package sequence. Do not hit the package with force. • Check whether there is damage, rust, or scratches on the surface of the equipment and equipment accessories upon unpacking. • Check whether the package contents are consistent with the packing list after unpacking.

Storage and transportation



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



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

Design



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



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



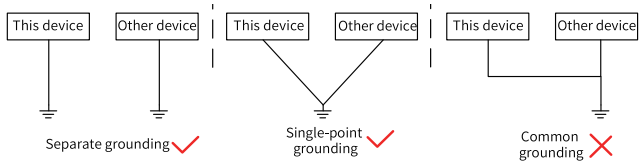
Do not create, on the touch screen of the HMI, switches that may result in personal injury of the operator or equipment damage . Use independent switches for performing critical operations. Failure to comply may result in accidents caused by wrong outputs or faults.

Installation
DANGER The equipment must be operated only by professionals with electrical knowledge. Non-professionals are not allowed.
WARNING • Read through the guide and safety instructions before installation. • Do not install this equipment in places with strong electric or magnetic fields. • Before installation, ensure that the mechanical strength of the installation site can bear the weight of the equipment. Failure to comply will result in mechanical hazards. • Before installation, ensure that the installation environment meets the specifications. Failure to comply will result in product damage. • Do not wear loose clothes or accessories during installation. Failure to comply may result in an electric shock. • When installing the equipment in a closed environment (such as a cabinet or casing), use a cooling device (such as a fan or air conditioner) to cool the environment down to the required temperature. Failure to comply may result in equipment over-temperature or a fire. • Do not retrofit the equipment. • Do not fiddle with the bolts used to fix equipment components or the bolts marked in red. • The equipment shall be installed in a cabinet or terminal device. Protection measures such as a fireproofing shell, electric protection shell, or mechanical protection shell must be provided for the cabinet or terminal device. The IP level must meet IEC standards and local laws and regulations. • Before installing devices with strong electromagnetic interference, such as a transformer, install a shielding device for the equipment to prevent malfunction. • Install the equipment onto an incombustible object such as a metal. Keep the equipment away from combustible objects. Failure to comply will result in a fire. • For products not supporting hot swapping, disconnect all external power supplies of the system before installing/disassembling the product. Failure to comply may result in electric shock, module fault, or malfunction.
CAUTION • Cover the top of the equipment with a piece of cloth or paper during installation. This is to prevent unwanted objects such as metal chippings, oil, and water from falling into the equipment and causing faults. After installation, remove the cloth or paper on the top of the equipment to prevent over-temperature caused by poor ventilation due to blocked ventilation holes. • During installation, ensure the product is connected to the respective connector securely and hook the module firmly. Improper installation may result in malfunction, fault, or fall-off.

Wiring

DANGER

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



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

WARNING

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

CAUTION

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

Power-on

DANGER

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

Power-on

WARNING

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

Operation

DANGER

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

WARNING

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

CAUTION

- Operate the product strictly within the required environmental conditions. Failure to comply may result in equipment fault or damage.
- Touch the HMI panel with hands only during use. Do not use tools to touch the HMI panel. Inovance assumes no responsibility for panel damage caused by excessive external force.

Safety recommendations

- In the position where the operator directly touches the machinery part, for example, where a machinery tool is loaded/unloaded, or where a machine runs automatically, manually-operated devices or similar must be installed independently of the product to start or stop the automatic operation of the system.
- If you need to modify the program while the system is running, use the lock function or other protective measures. Ensure that only authorized personnel can make the necessary modifications.

Battery usage

WARNING

- Do not use batteries that do not meet the product requirements. Failure to comply may result in death, personal injuries, explosion, or fire.
- Do not throw batteries into a fire or heat oven. Do not crush or cut the battery. Failure to comply may result in death, personal injuries, explosion, or fire.
- Do not expose the battery to extremely high temperatures. Failure to comply may result in death, personal injuries, explosion, or fire.
- Do not swallow the battery to prevent the risk of chemical burns.
- If a button battery is swallowed by accident, seek medical treatment immediately. Failure to comply may result in severe internal burns within two hours and could result in death.

CAUTION

- Keep the battery away from children.
- If the battery compartment is not shut tight, stop using the device and keep it away from children.

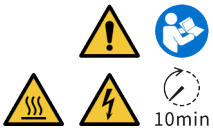
Maintenance
 • Maintenance and inspection must be carried out by personnel who have the necessary electrical training and experience. • Do not maintain the equipment with power ON. Failure to comply will result in an electric shock. • Before maintenance, cut off all the power supplies of the equipment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

Repair
 • Product repair must be carried out by personnel who have the necessary electrical training and experience. • Do not repair the equipment with power ON. Failure to comply can result in an electric shock. • Before inspection and repair, cut off all the power supplies of the equipment and wait for at least the time designated on the equipment warning label.
 • Submit the repair request according to the warranty agreement. • When the fuse is blown or the circuit breaker or earth leakage circuit breaker (ELCB) trips, wait as specified on the product warning sign before power-on or further operations. Failure to comply may result in personal injuries, equipment damage or even death. • When the equipment is faulty or damaged, require professionals to perform troubleshooting and repair by following repair instructions and keep a repair record. • Replace quick-wear parts of the equipment according to the replacement instructions. • Do not use damaged equipment. Failure to comply may result in death, personal injuries, or severe equipment damage. • After the equipment is replaced, check the wiring and set parameters again.

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

Safety label

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

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

1.2 Industrial Information Security

The product provides interfaces for network connection and data transmission. To protect factories, systems, machines, and networks from cyber attacks, 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 products and solutions to enhance safety. It is strongly recommended that you update the product promptly and always use the latest version.

Caution

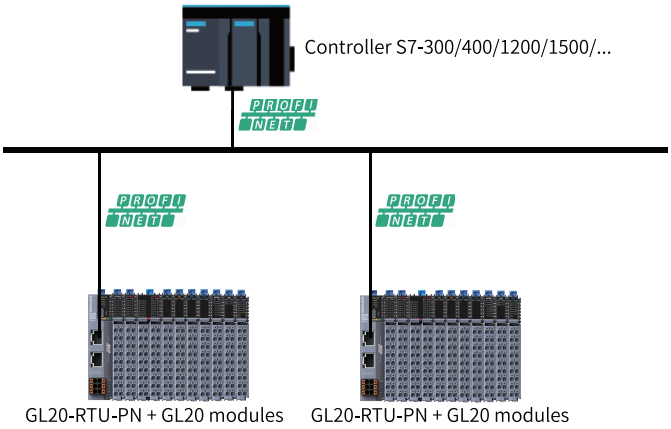
Tampering with software (such as viruses, Trojans, and Worms) can lead to unsafe drivestate, which can put the device in an unsafe operation state. This may result in death,serious injury, and property damage. Observe the following strictly.

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

2 Product Introduction

Product introduction

GL20-RTU-PN communication interface module connects to the PROFINET network as a PROFINET slave. With this module, you can expand the system with Inovance local modules such as GL20 series digital modules, analog modules, and temperature detection modules. It can be used together with the PROFINET master devices, such as S7-200 Smart, S7-300, S7-400, S7-1200, and S7-1500 series. The topology is shown in the figure below.

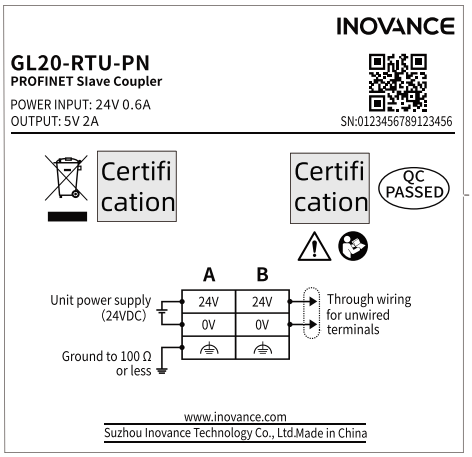


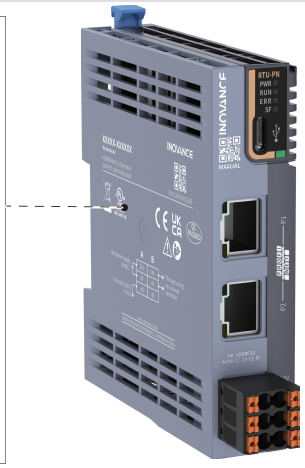
3 Model and Nameplate

GL 20 - RTU - PN

① ② ③ ④

① **Product Information** GL: General local module	③ **I/O Type** RTU: Remote terminal unit
② **Series** 20: 20 series module	④ **Communication Protocol** • PN: PROFINET • ECT: EtherCAT

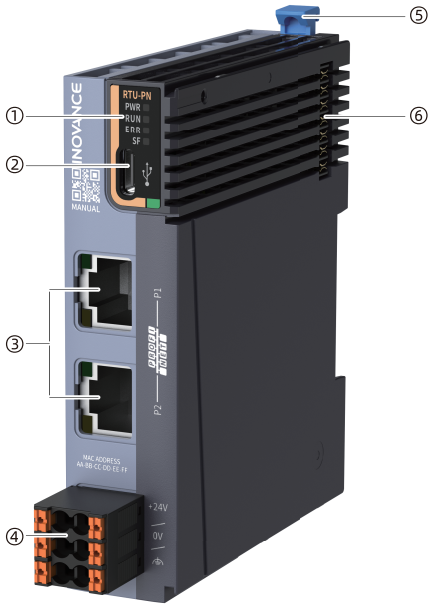




The data for ordering the product is shown in the table below.

Model	Description	Product Code	Applicable Model
GL20-RTU-PN-INT	GL20 series PROFINET (auto-scan) communication module	01441078	PROFINIT master devices such as Siemens S7-1200 and S7-1500

4 Components



No.	Interface	Function			
①	Signal indicator	PWR	Power supply indicator	Solid on (green)	ON when power supply is switched on.
		RUN	Running indicator	Off	The module is initializing.
				Flashing (green)	The module is in parameter configuration mode or waiting to connect to the master device.
				Single flash (green)	The module is in safe operational mode (can read inputs, cannot update outputs).
				Solid on (green)	The module communication is normal.
		ERR	Communica-tion fault indicator	Off	No communication fault
				Solid on (red)	No expansion module
				Flashing (red)	Inconsistent configuration of expansion modules
				Single flash (red)	This product is offline or the expansion module encounters a synchronization fault.
		SF	Module fault indicator	Off	Expansion module is normal.
				Solid on	Local bus fault
				Flashing (red)	Expansion module failure
②	Type-C interface	Used for software upgrade of the board			
③	PROFINET interface	P1: PROFINET interface 1			
		P2: PROFINET interface 2			
④	Power supply interface	+24 V	Power supply +		
		0 V	Power supply -		
		⏚	Grounding		

No.	Interface	Function
⑤	Rail mounting latch	Used to secure module to DIN rail
⑥	Three-position terminal block	Used for backplane bus power supply and communication

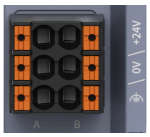
Note

- Flashing: Flashes at an interval of 200 ms.
- Single flash: Flashes at an interval of 1s.
- Double flash: Flashes twice at an interval of 1s.

5 Terminal Wiring

5.1 Terminal Assignment

The signal names and descriptions for the power terminals are listed in the table below.

Mark	Name	Description
	+24 V	Connected to +24 VDC power supply
	0 V	Connected to 0 V power supply
	⏚	Functional grounding terminal

Caution

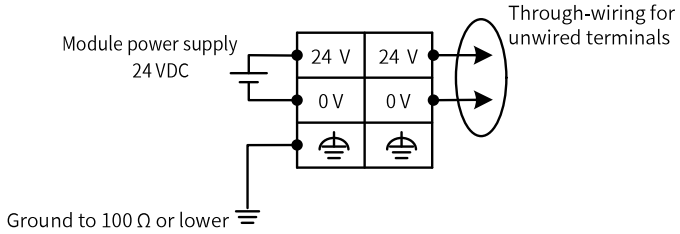
Terminals with the same mark are internally connected. You can connect to any of them as needed. For example, the two +24V terminals are internally connected, so connecting to either one will work.

5.2 Terminal Wiring Diagram

Wiring precautions

- Do not bundle the expansion cables with power cables (high voltage and high current) that produce strong interference signals, as this may increase noise, surges, and induction effects. Separate the extension cables from the power cables and avoid cabling in parallel.
- Use the recommended cables and adapter boards for connection. It is recommended that shielded cables be used as expansion cables to enhance anti-interference capacity.
- Apply single-point grounding for the shield of shielded cables and soldered cables.

Wiring diagram



6 Product Function

6.1 MRP Configuration

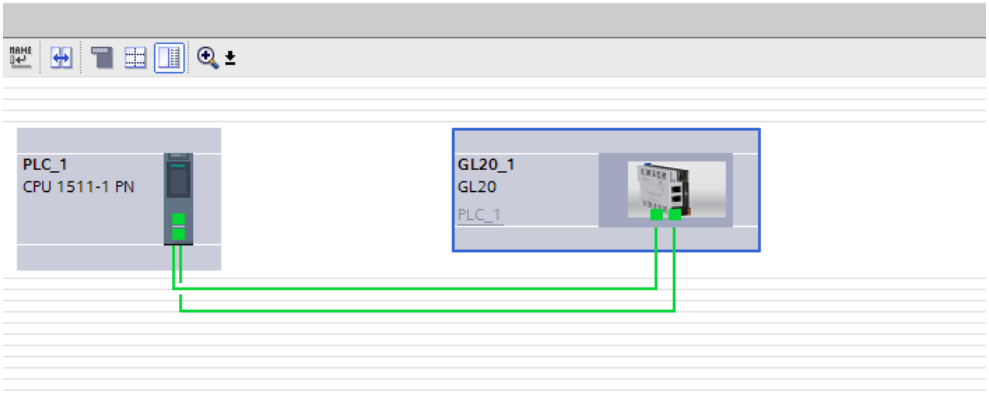
MRP overview

The standard Media Redundancy Protocol (MRP) is used, which meets the IEC 62439-2 standard. The typical reconstruction time is 200 ms and each ring network supports up to 50 devices.

MRP basic rules:

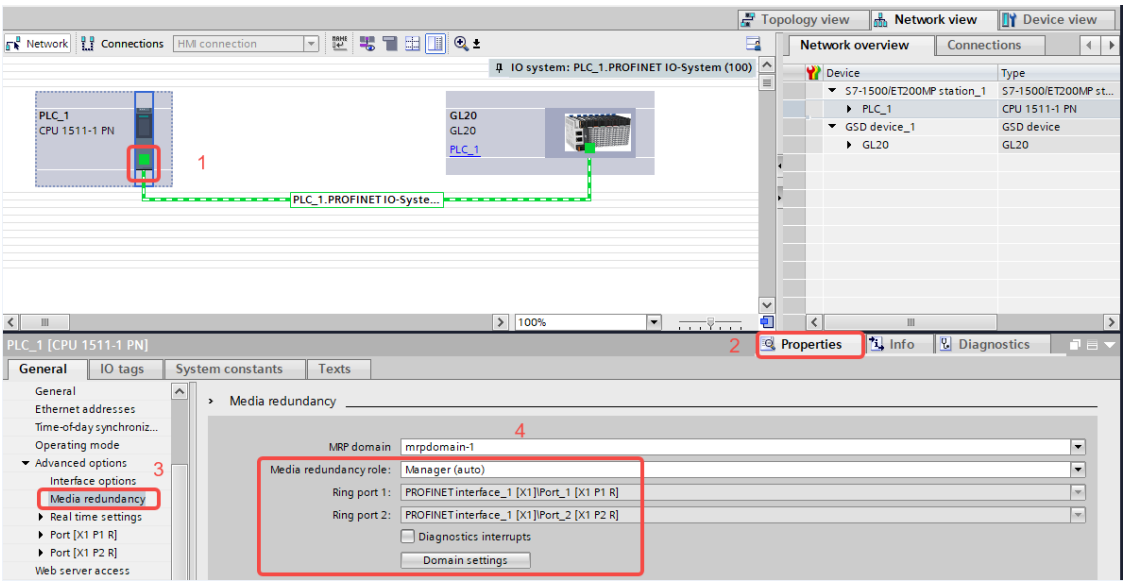
- All nodes on the ring network must support the MRP and have the MRP enabled.
- All devices are interconnected through ports on the ring network.
- All devices in the ring network are in the same redundancy domain.
- A maximum of 50 devices can be connected in a ring network. More devices will prolong the reconstruction time of 200 ms.
- Only one device in the ring network can serve as the ring network manager, and other devices are all ring network clients.

The MRP topology diagram is shown in the figure below.

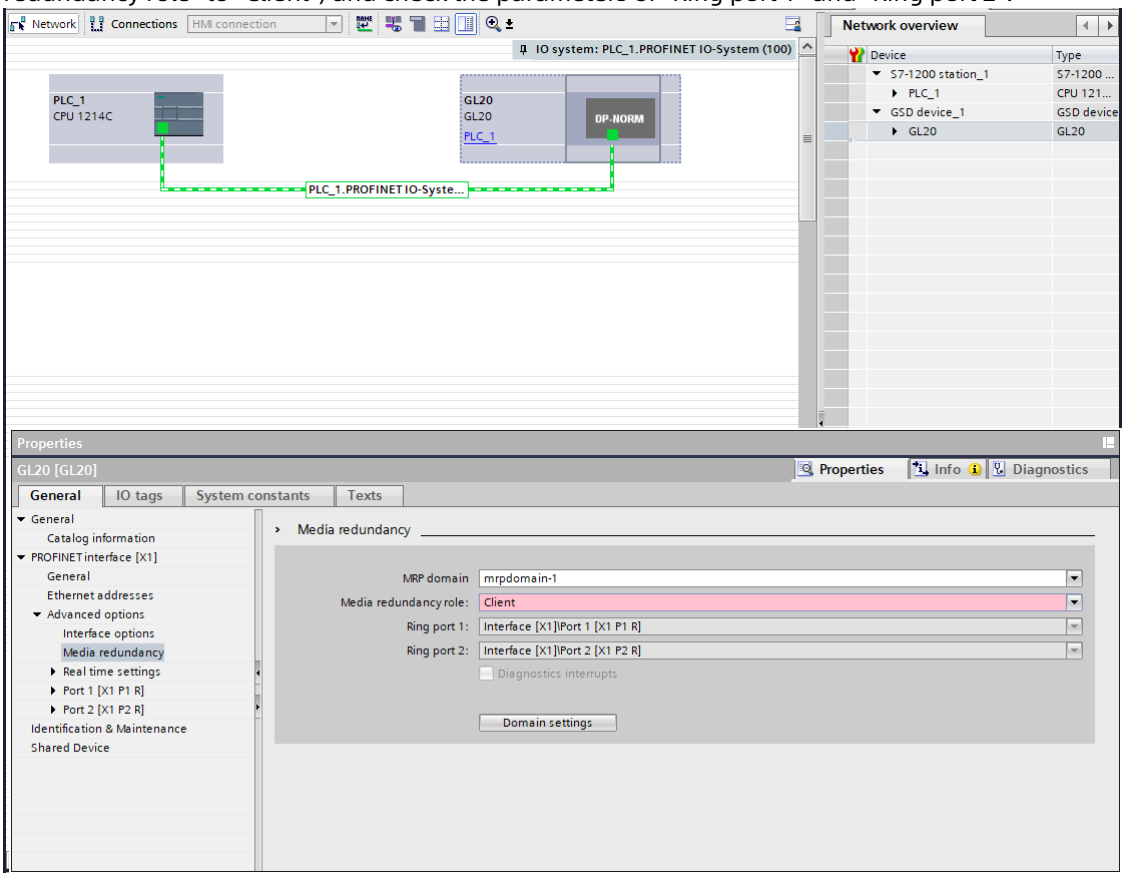


MRP settings

1. Select the PLC port and select "Properties" > "Media redundancy". Set the "Media redundancy role" to "Manager (auto)", and check the parameter values for "Ring port 1" and "Ring port 2."



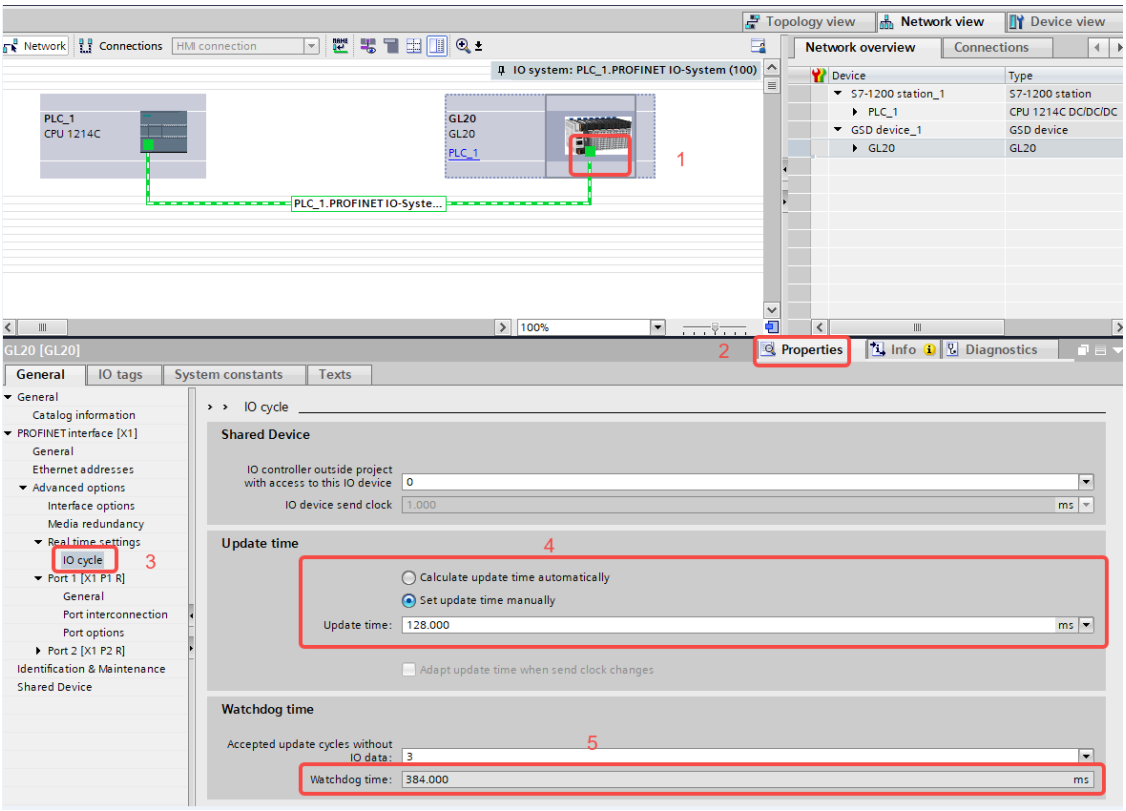
2. Select an I/O device port and select "Properties" > "Media redundancy". Set the "Media redundancy role" to "Client", and check the parameters of "Ring port 1" and "Ring port 2".



3. Select an I/O device port and select "Properties" > "IO cycle". Set the "Update time" to an appropriate value so that the "Watchdog time" is greater than 200 ms.

Note

MRP provides a typical reconstruction time of 200 ms and supports up to 50 devices in each ring network. To avoid interference to PROFINET communication during ring network reconstruction, set the PROFINET watchdog time of the I/O device to be greater than 200 ms.



6.2 Share IN and Share OUT Mapping Modules

Caution

The Share IN and Share OUT are mapping modules, and must be added at the end of all modules; otherwise, the modules will fail to operate.

Byte description

The first two bytes of Share IN will be refreshed in real time, respectively corresponding to the local bus status and PROFINET communication status. The values under normal status, 0x08 (local bus) and 0x02 (PROFINET communication), can be used for program judgment.

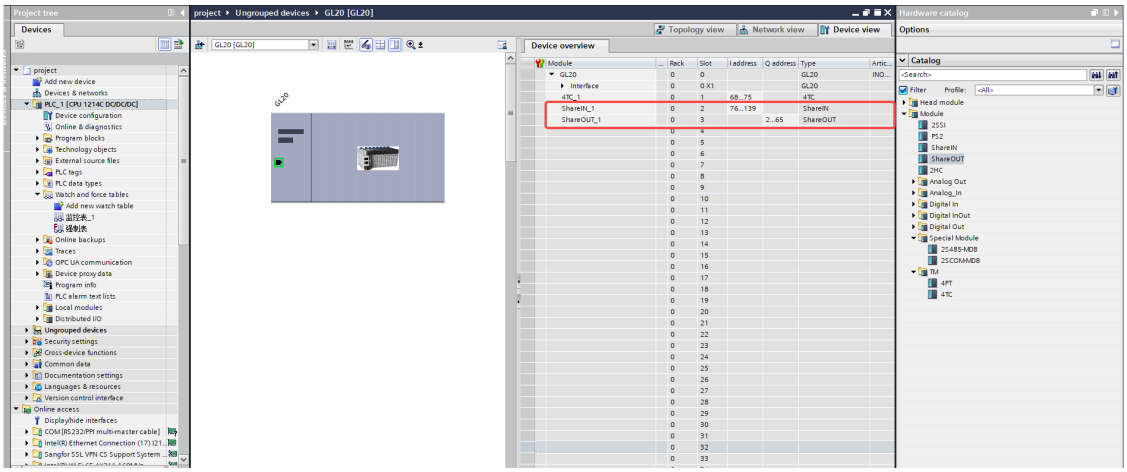
Address	Meaning	Value
First byte of Share IN	Status of local bus	• 0x01: init • 0x02: preop • 0x04: safeop • 0x08: op • 0x10: safeop2op • 0x20: op2safeop • 0x80: error
Second byte of Share IN	Status of PROFINET communication	• 0x01: disconnected • 0x02: connected

Share IN will be displayed according to the value of Share OUT from the 4th byte. This function can only be used when both Share IN and Share OUT modules exist, and corresponding values need to be entered in Share OUT.

Share OUT Input Value	Share IN Feedback Value Meaning	Length
0x01	App version	4 consecutive bytes
0x02	FPGA version	4 consecutive bytes
0x03	PN version	4 consecutive bytes
0x04	GSD version	4 consecutive bytes
0x10	Slot 1 version	8 consecutive bytes
0x11	Slot 2 version	8 consecutive bytes
0x12	Slot 3 version	8 consecutive bytes
0x13	Slot 4 version	8 consecutive bytes
0x14	Slot 5 version	8 consecutive bytes
0x15	Slot 6 version	8 consecutive bytes
0x16	Slot 7 version	8 consecutive bytes
0x17	Slot 8 version	8 consecutive bytes
0x18	Slot 9 version	8 consecutive bytes
0x19	Slot 10 version	8 consecutive bytes
0x1A	Slot 11 version	8 consecutive bytes
0x1B	Slot 12 version	8 consecutive bytes
0x1C	Slot 13 version	8 consecutive bytes
0x1D	Slot 14 version	8 consecutive bytes
0x1E	Slot 15 version	8 consecutive bytes
0x1F	Slot 16 version	8 consecutive bytes
0x20	Slot 17 version	8 consecutive bytes
0x21	Slot 18 version	8 consecutive bytes
0x22	Slot 19 version	8 consecutive bytes
0x23	Slot 20 version	8 consecutive bytes
0x24	Slot 21 version	8 consecutive bytes
0x25	Slot 22 version	8 consecutive bytes
0x26	Slot 23 version	8 consecutive bytes
0x27	Slot 24 version	8 consecutive bytes
0x28	Slot 25 version	8 consecutive bytes
0x29	Slot 26 version	8 consecutive bytes
0x2A	Slot 27 version	8 consecutive bytes
0x2B	Slot 28 version	8 consecutive bytes
0x2C	Slot 29 version	8 consecutive bytes
0x2D	Slot 30 version	8 consecutive bytes
0x2E	Slot 31 version	8 consecutive bytes
0x2F	Slot 32 version	8 consecutive bytes

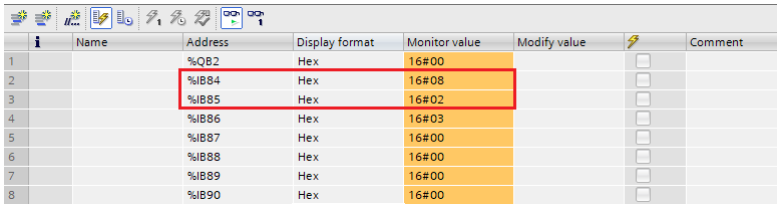
Operation example

1. In the hardware directory tree, double-click "Share IN" and "Share OUT" respectively to add them to the end of the module, as shown in the figure below.



2. Monitor the addresses "%IB84" and "%IB85" on the monitoring table to check the local bus status and PROFINET communication status.

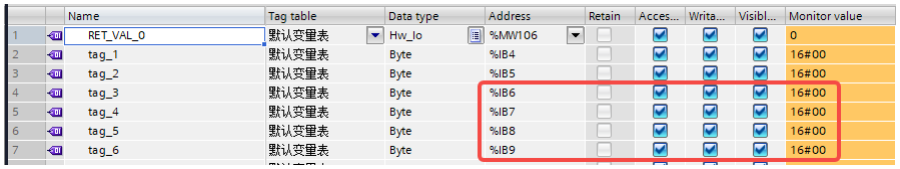
- "16#08" indicates normal local bus operation.
- "16#02" indicates normal PROFINET communication operation.



	Name	Address	Display format	Monitor value	Modify value	Comment
1		%QB2	Hex	16#00		
2		%IB84	Hex	16#08		
3		%IB85	Hex	16#02		
4		%IB86	Hex	16#03		
5		%IB87	Hex	16#00		
6		%IB88	Hex	16#00		
7		%IB89	Hex	16#00		
8		%IB90	Hex	16#00		

3. View the APP version information.

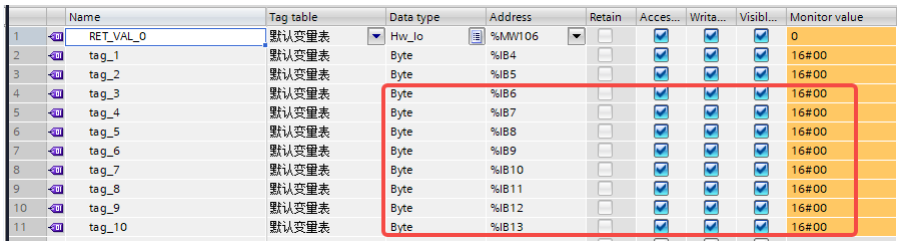
Assign "0x01" to the first byte of the Share OUT mapping module. The Share IN module obtains the feedback values as shown in the following figure, indicating that the APP version is "1.0.1.7".



	Name	Tag table	Data type	Address	Retain	Acces...	Writa...	Visibl...	Monitor value
1	RET_VAL_0	默认变量表	Hw_Io	%MW106		☑	☑	☑	0
2	tag_1	默认变量表	Byte	%IB4		☑	☑	☑	16#00
3	tag_2	默认变量表	Byte	%IB5		☑	☑	☑	16#00
4	tag_3	默认变量表	Byte	%IB6		☑	☑	☑	16#00
5	tag_4	默认变量表	Byte	%IB7		☑	☑	☑	16#00
6	tag_5	默认变量表	Byte	%IB8		☑	☑	☑	16#00
7	tag_6	默认变量表	Byte	%IB9		☑	☑	☑	16#00

4. View the module version information.

Assign "0x14" to the first byte of the Share OUT mapping module. The Share IN module obtains the feedback values as shown in the following figure, indicating that the logic version of the fifth module is "0.1.2.0" and the CPU version is "1.1.0.0".

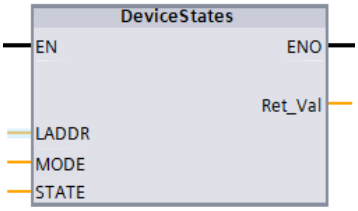


	Name	Tag table	Data type	Address	Retain	Acces...	Writa...	Visibl...	Monitor value
1	RET_VAL_0	默认变量表	Hw_Io	%MW106		☑	☑	☑	0
2	tag_1	默认变量表	Byte	%IB4		☑	☑	☑	16#00
3	tag_2	默认变量表	Byte	%IB5		☑	☑	☑	16#00
4	tag_3	默认变量表	Byte	%IB6		☑	☑	☑	16#00
5	tag_4	默认变量表	Byte	%IB7		☑	☑	☑	16#00
6	tag_5	默认变量表	Byte	%IB8		☑	☑	☑	16#00
7	tag_6	默认变量表	Byte	%IB9		☑	☑	☑	16#00
8	tag_7	默认变量表	Byte	%IB10		☑	☑	☑	16#00
9	tag_8	默认变量表	Byte	%IB11		☑	☑	☑	16#00
10	tag_9	默认变量表	Byte	%IB12		☑	☑	☑	16#00
11	tag_10	默认变量表	Byte	%IB13		☑	☑	☑	16#00

6.3 DeviceStates Command

DeviceStates: Used to read module state information of the I/O system.

Graphic block



See the following table for the command pins and their definitions.

Param.	Declaration Type	Data type	Storage Area	Description
LADDR	Input	HW_IOSYSTEM	I, Q, M, L, or constants	PROFINET I/O hardware identifier
MODE	Input	UINT	I, Q, M, D, L, or constants	1: I/O device/DP slave configured 2: I/O device/DP slave faulty 3: I/O device/DP slave disabled 4: I/O device/DP slave present 5: faulty I/O device/DP slave
STATE	InOut	VARIANT	I, Q, M, D, L	I/O device state buffer
RET_VAL	Return	INT	I, Q, M, D, L	Fault code [1] format: W#16#... 0: No fault 8091: The hardware identifier for the LADDR parameter does not exist. Check if the LADDR value is present in the project (e.g., within the system constants). 8092: LADDR does not address PROFINET I/O or DP master systems. 8093: The data type in the STATE parameter is invalid. 80B1: The CPU does not support the DeviceStates command. 80B2: The CPU in the I/O system specified by the LADDR parameter does not support the selected MODE parameter. 8452: Complete state information, not applicable to variables configured in the STATE parameter. [2]

Note

- [1]: In the program editor, error codes will be displayed as integers or hexadecimal values.
- [2]: To check the field length of variables configured in STATE, the CountOfElements instruction can be invoked. When the data type VARIANT points to an Array of BOOL, this instruction counts the number of padding elements; for example, when using Array [0...120] of BOOL, the field length is 128. Therefore, when the sum of the set field elements and the padding elements created by the CPU is less than the value 1024 or 128, the DeviceStates will only return the error code W#16#8452.

Command description

The STATE parameter indicates the states of the I/O device/DP slave selected by the MODE parameter.

If the state selected by MODE is applicable to the I/O device/DP slave, set the following bits to "1" in the STATE parameter:

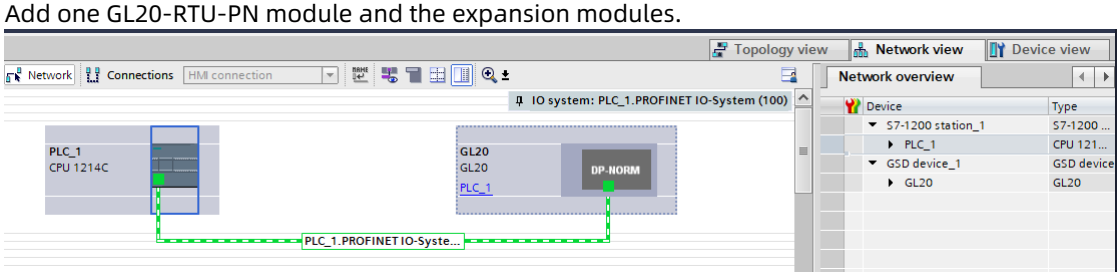
- Bit 0 = 1: Group display, where at least one I/O device/DP slave has the nth bit set to "1".
- Bit n = 1: The state selected by MODE will be applied to the I/O device/DP slave.
  - For the PROFINET I/O system, the nth bit corresponds to the device number of the I/O device (refer to the DP slave properties in the device view and network view).
  - For the PROFINET DP system, the nth bit corresponds to the PROFIBUS address of the DP slave (refer to the DP slave properties in the device view and network view).

Use "BOOL" or "Array of BOOL" as the data type:

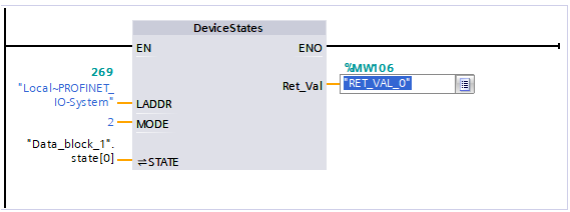
- To display only state information for group bits, use the BOOL data type in the STATE parameter.
- To output the state information of all I/O devices/DP slaves, use an Array of BOOL with the following length:
  - For PROFINET I/O system: 1,024 bits
  - For DP master system: 128 bits

Example

1. Add one GL20-RTU-PN module and the expansion modules.

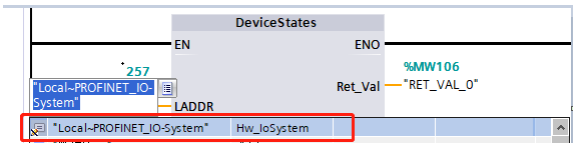


2. Call the DeviceStates diagnostic command.

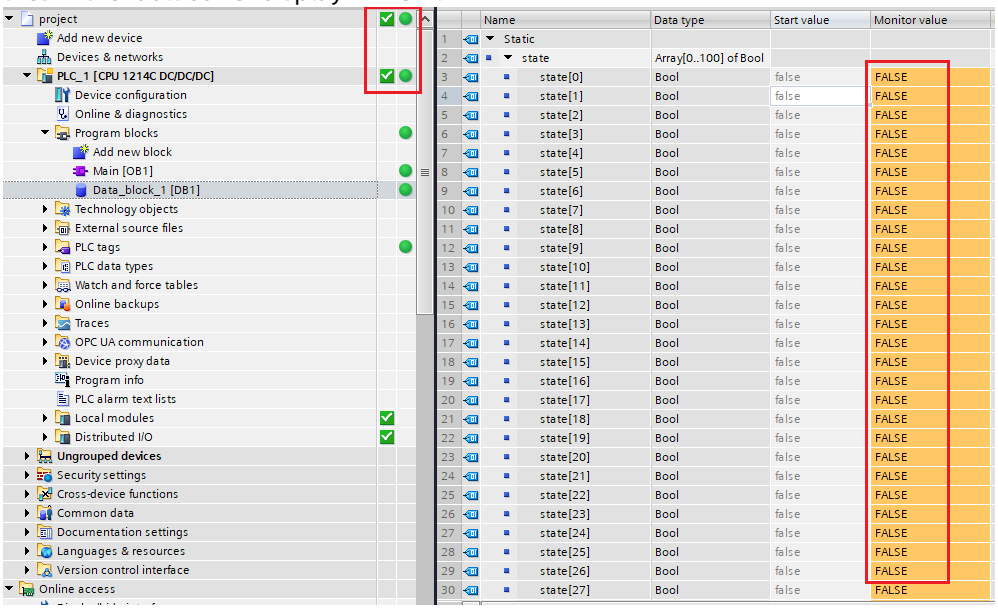


3. Configure command-related parameters.

Name	Description
LADDR	Double-click the input assistant, then select the module added by default in the system.
MODE	Assign a value of 2 (indicating a slave fault).
STATE	Create a BOOL array to store the data.
Ret_VAL	Used for viewing command fault codes.

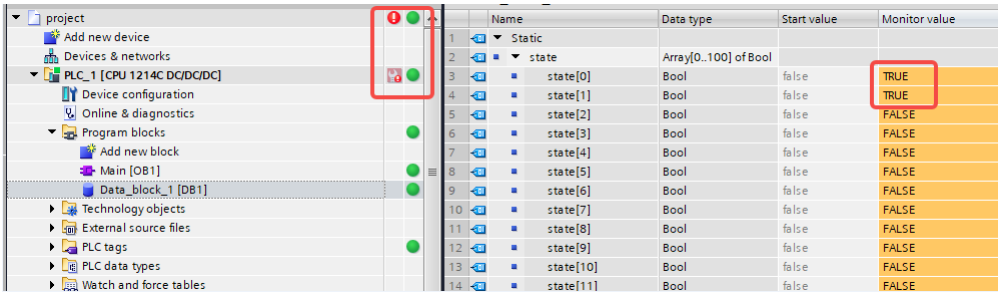


4. Download the program and check the I/O system states and fault buffer. All states are normal if all entries in the fault buffer display "FALSE".



5. Disconnect the I/O system communication line. The interface displays the fault icon, and the first two BOOLs in the fault buffer are set to "TRUE".

- Bit 0=1: At least one I/O device has failed.
- Bit 1=0: I/O device with device number 1 is not faulty.



7 Technical Specifications

General specifications

Item	Specification
IP rating	IP20
Dimensions (W x H x D)	24 mm x 100 mm x 83 mm
Weight	Approx. 100 g

Power supply specifications

Item	Specification
Rated terminal input voltage	24 VDC (20.4 VDC to 28.8 VDC)
Rated terminal input current	0.6 A (typical@24 V)
Rated bus output voltage	5 VDC (4.75 VDC to 5.25 VDC)
Rated bus output current	2 A (typical@5 V)
Power supply protection	Anti-reverse connection, surge absorption

Software specifications

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

Note

Each GL20-RTU-PN communication interface module can be configured with a maximum of 120 modules (the sum of actual expansion modules and sub-modules). Exceeding this limit will cause the GL20-RTU-PN communication interface module to go offline and cease operation. For example, if the configuration includes one GL20-2SCOM-MDB expansion module and one GL20-1600END expansion module, where the GL20-2SCOM-MDB expansion module contains multiple "Master Read Holding Register Modules (referred to as sub-modules)", the total current module count is the sum of GL20-2SCOM-MDB expansion module, GL20-1600END expansion module, and sub-modules. Given that the total number of expansion modules is 2, the number of sub-modules cannot exceed 118.

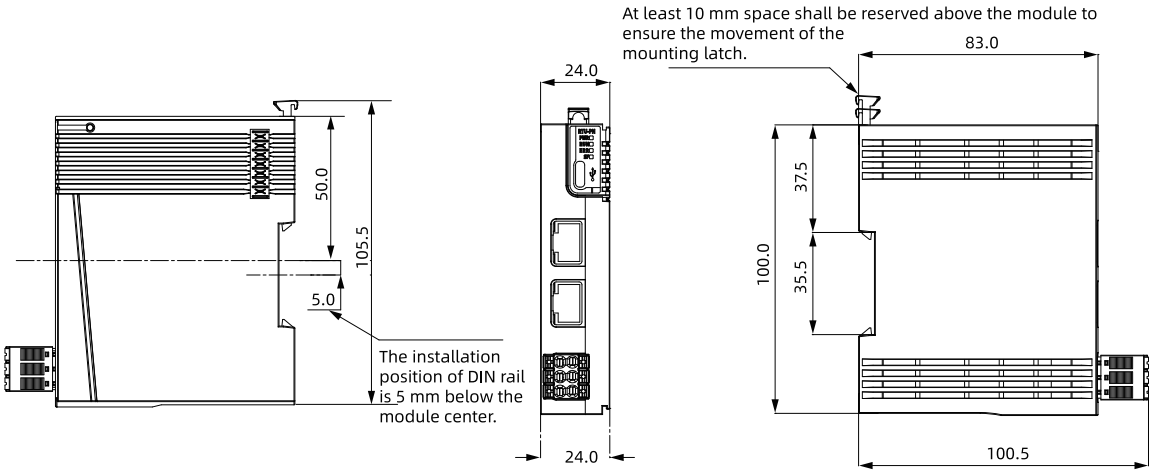
8 Environmental Specifications

Item	Specification
Installation/Operating environment	Free from conductive dust, conductive fibers, explosive dust, flammable gases, water mist/greasy dirt, corrosive dusts/gases, strong vibration, and repetitive shock
Altitude	≤ 2000 m
Pollution degree	Level 2
Immunity	2 kV on power supply line (Conforms to IEC 61000-4-4)
Overvoltage category	I
EMC immunity level	Zone B, IEC61131-2
Anti-static rating	Contact discharge +/-6 kV and air discharge +/-8 kV
Vibration resistance	• Application scenario: Tested according to IEC60068-2-6. 3.5 mm amplitude at 5 Hz to 8.4 Hz; 1 g acceleration at 8.4 Hz to 200 Hz; 10 cycles per axis. • Transportation scenario: Tested according to IEC60068-2-64, 0.01 g^2/Hz power spectral density at 5 Hz to 100 Hz; 0.001 g2/Hz power spectral density at 200Hz; 1.14 g G_{rms}
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
Operating temperature/ humidity	• Temperature: -20°C to +55°C • Humidity: < 95% RH (30°C), without condensation
Storage temperature/ humidity	• Temperature: -20°C to +60°C • Humidity: < 95% RH (30°C), without condensation
Transportation temperature/humidity	• Temperature: -40°C to +70°C • Humidity: < 95% RH (40°C), without condensation

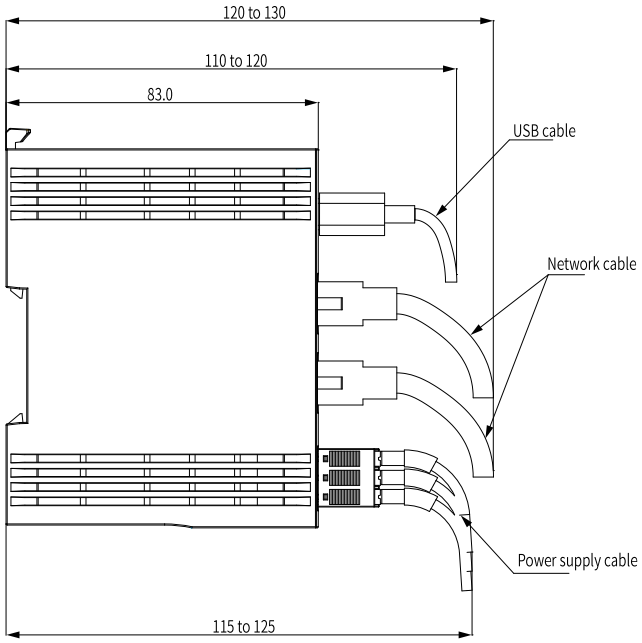
9 Dimension Drawing

Module

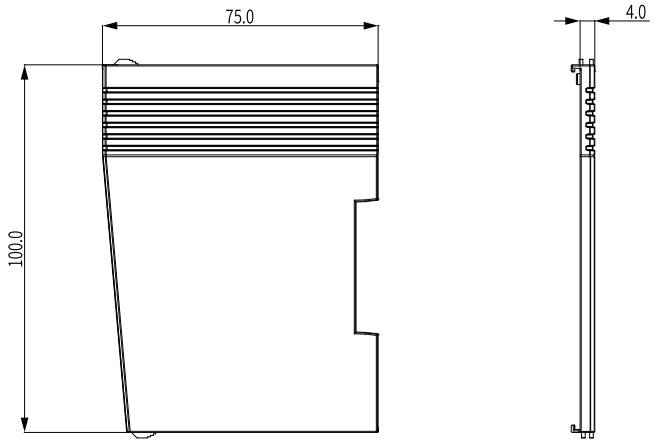
The installation dimensions (in mm) are shown in the figure below.



Cable connection



End cover



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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