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PS00021289A01

GE21-232/485-RTC

Communication Expansion Card

User Guide

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Legal Information

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■ Disclaimer of Liability

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

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

■ Waste Disposal

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

■ Qualified Personnel

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

■ Proper Use of the Product

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

Preface

■ Introduction

This guide presents the product information, installation, wiring, and configuration and commissioning. Read this guide carefully before operating the product to ensure safe and proper operation.

■ 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		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

■ More documents

Document	Code	Description
Easy321 and Easy511 Programmable Logic Controller User Guide	PS00017976	Presents the information about all application scenarios of Easy321 and Easy511 series products, including product information, installation, wiring, configuration and commissioning, product features, fault diagnosis, maintenance, and appendix.
Easy321S Programmable Logic Controller User Guide	PS00021275	Presents the information about all application scenarios of Easy321S series products, including product information, installation, wiring, configuration and commissioning, product features, fault diagnosis, maintenance, and appendix.
H5U and Easy Series Programmable Logic Controller Programming Guide	19012249	Presents the basics of PLC programming, quick start guidance, communication, motion control, and high-speed counter usage.

Document	Code	Description
H5U and Easy Series Programmable Logic Controller Instruction Guide	19012250	Presents the basic and advanced instructions used in PLC programming, along with corresponding examples.
GE21-232/485-RTC Communication Expansion Card User Guide (this guide)	PS00011289	Presents the product information, installation, wiring, and configuration and commissioning.

■ Revision history

Date	Version	Description
2025-05	A01	Updated the battery service life.
2025-08	A00	Initial release.

■ 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 fees will be charged after the warranty period expires.

Even within the warranty period, maintenance can be charged for the following product damage:

- Damage caused by operations not following the instructions in the 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)

When applicable, relevant maintenance fee will be charged according to the latest Price List of Inovance. If otherwise agreed upon, the agreed terms and conditions 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

WARNING

- Do not install the product in the case of any damage, rust, or signs of use on the product or accessories upon unpacking.
- Do not install the product in the case of water seepage into the product or missing or damaged components upon unpacking.
- Do not install the product in the case of any discrepancy between the product you received and the product name on the packing list.

Caution

- 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.

Storage and transportation

Caution

- Handle the equipment with care and mind your steps 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

- Provide a safety circuit and include an error handling program in the software to ensure that the product remains in a safe state in case of an external power failure or an internal fault.
- 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

Design

- 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.



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



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



Installation

- 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 may 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.

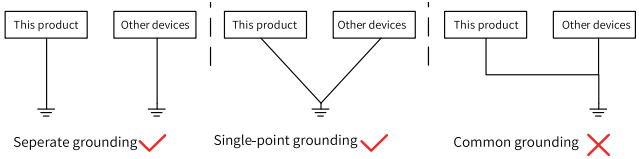


- Cover the top of the equipment with a piece of cloth or paper during installation. This is to prevent unwanted objects such as metal chippings, oil, and water from falling into the product and causing faults. After installation, remove the cloth or paper on the top of the equipment to prevent the ventilation 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

Wiring

- 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.



- 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



- 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.



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 shut tight, stop using the product and keep it away from 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.

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 a faulty or damaged equipment must be performed by professionals based on the repair instructions, with the repair records kept properly.
- 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 equipment 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 Product Overview

The GE21-232/485-RTC card is independently developed by Inovance. It can be used with Easy321, Easy511 and Easy321S series PLCs, supporting one channel of RS485 communication with RTC or one channel of RS232 communication with RTC.

2.2 Model and Nameplate

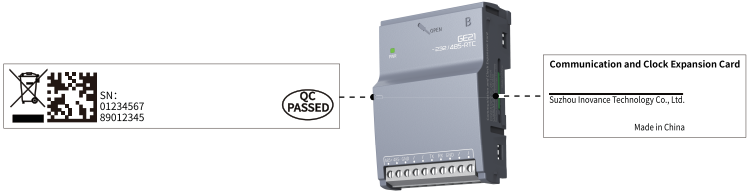
■ Model

GE21- 232/485 - RTC

① ② ③ ④

① **Product series** Inovance 21 series general-purpose expansion card	③ **Product code** RS485 communication card
② **Product code** RS232 communication card	④ **Product code** RTC clock card

■ Nameplate

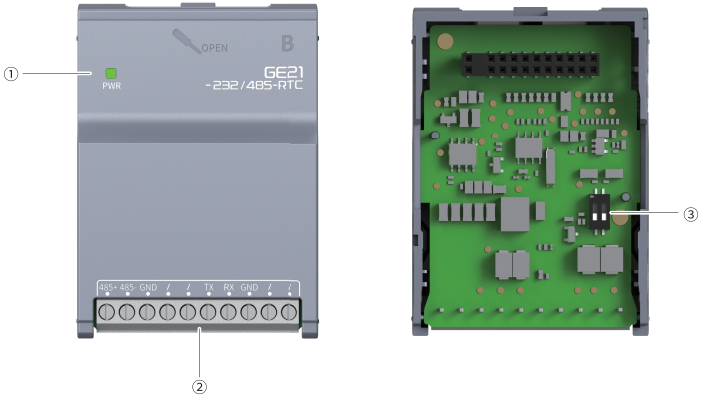


Note

The letter "B" on the nameplate indicates that only the card slot B of the PLC is supported.

Model	Description	Code
GE21-232/485-RTC	GE21 series RS232 or RS485 communication card (integrated RTC)	01480072

2.3 Components



No.	Terminal type	Identification	Definition	Indicator color	Description
①	Power supply indicator	PWR	Normal power supply	Yellow-green	ON when the expansion card is powered on.
②	User terminal	-	-	-	For details, see *"4.1 Terminal Assignment" on page 26*.
③	RS485 DIP switch	1, 2	Used to control the termination resistor	-	The RS485 DIP switch is set to OFF by default. To turn on the switch, toggle switches 1 and 2 using a tool such as tweezers.

2.4 Product Specifications

2.4.1 General Specifications

Item	Description
IP rating	IP20
Dimensions (W x H x D)	58 mm x 42 mm x 21.4 mm
Weight	Approx. 28 g

2.4.2 Power Supply Specifications

Item	Specification
Rated input voltage	5 VDC (4.75 VDC to 5.25 VDC)
Rated input current	60 mA (typical@5 V)
Input short-circuit protection	Supported
Hot swap	Not supported

2.4.3 Communication Specifications

Item		Description
RS485	Number of channels	One channel
	Termination resistor	Built-in termination resistor, controlled by DIP switch. The switch is set to OFF by default, indicating that the resistor is disconnected.
	Number of slaves	Up to 31 slaves (Each slave stub length must be less than 3 m.)
	Communication rate	9.6 kbit/s, 19.2 kbit/s, 38.4 kbit/s, 57.6 kbit/s, 115.2 kbit/s
	Communication distance	• Transmission distance < 100 m at a rate of 115.2 kbit/s • Transmission distance < 1000 m at a rate of 19.2 kbit/s
RS232	Number of channels	One channel
	Isolation mode	Non-isolation
	Communication rate	9.6 kbit/s, 19.2 kbit/s, 38.4 kbit/s, 57.6 kbit/s, 115.2 kbit/s
	Communication distance	Max. 15 m
RTC	Communication interface	I^2C
	Clock accuracy	120 seconds/month
	Time format	YYYY-MM-DD hh:mm:ss
	Built-in battery specification	CR2032 coin cell battery (3-year service life, replaceable)
	Battery replacement time	⩽ 60s (battery power-off time ⩽ 15s) Note: If the battery power-off time exceeds 15s, the RTC clock must be reset after battery replacement.

Note

When all four RS485 expansion cards are used as slaves on the same bus, avoid connecting any other devices to the bus.

2.5 Environmental Specifications

Item	Specification
Working environment	Free from conductive dust, conductive fibers, explosive dust, flammable gases, water mist/greasy dirt, corrosive dust/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; in ten cycles/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 g^2/Hz power spectral density at 200 Hz; 1.14 g Grms
Shock resistance	Application/Transportation scenario: Tested according to IEC60068-2-27; 15 g peak gravitational acceleration; 11 ms pulse width; 18 times in X/Y/Z-axis directions
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: < 90% RH (30°C), without condensation
Transportation temperature/humidity	• Temperature: –40 °C to +70 °C • Humidity: < 95% RH (40°C), without condensation

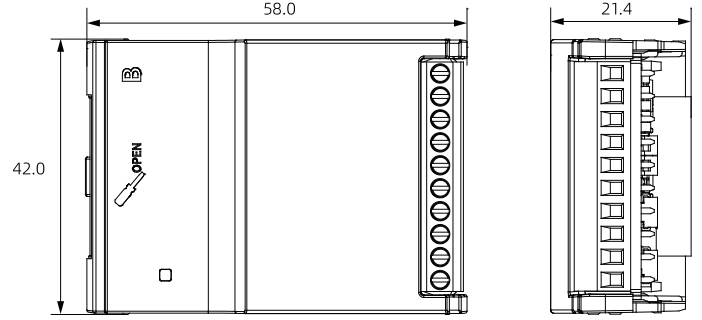
3 Installation

3.1 Installation Precautions

- Make sure the PLC is powered off before installing or removing the expansion card.
- Do not hot-swap the expansion card. Otherwise, this action may cause the main unit (PLC) to restart, or result in data loss/corruption.
- Do not drop or impact the housing or terminals of the expansion card to prevent damage.

3.2 Installation Dimensions

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

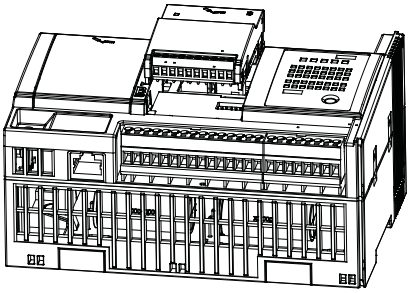


3.3 Installation Procedure

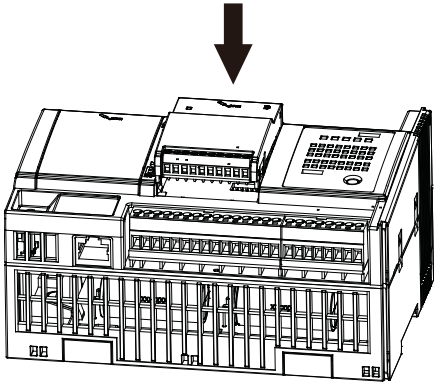
■ Installing the expansion card

The expansion card is snap-fitted with the PLC module.

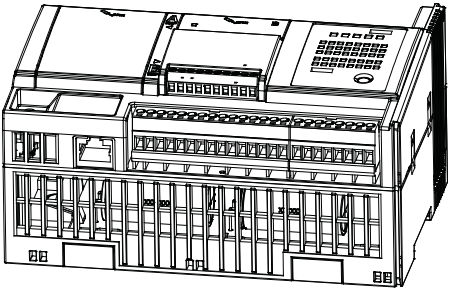
1. Place the PLC horizontally, and align the expansion card module horizontally with it.



2. Insert the expansion card vertically into the card slot B of the PLC along the guide ribs.

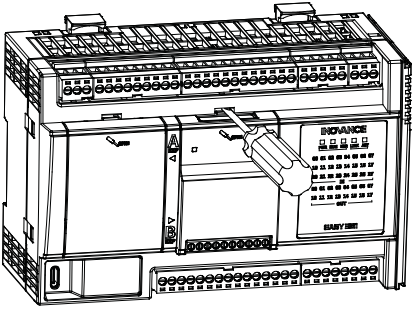


3. Press down the expansion card. When you hear a click and the surface of the expansion card is flush with the surface of the PLC module, the installation is complete, as shown in the figure below.

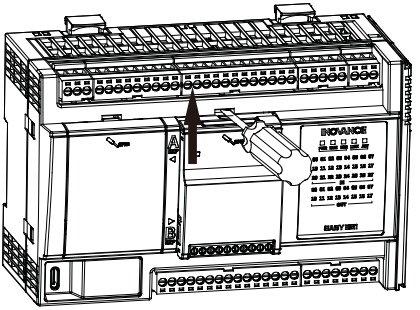


■ Removing the expansion card

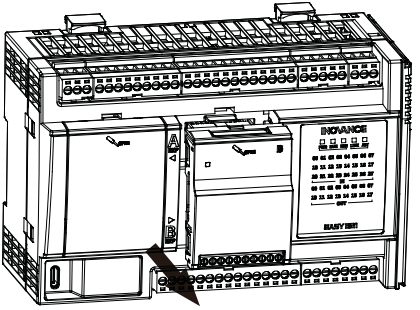
1. Place the PLC module horizontally and insert a slotted screwdriver into the snap-fit position.



2. Pry the expansion card module upward in the direction of the arrow.



3. Remove the expansion card module vertically when you hear a distinct sound indicating that the expansion card has partially detached from the PLC.



4 Wiring

4.1 Terminal Assignment



Terminal name	Signal description
485+	RS485 communication signal (+)
485-	RS485 communication signal (-)
GND	RS485 communication signal ground
-	-
-	-
TX	RS232 communication TX signal
RX	RS232 communication RX signal
GND	RS232 communication signal ground
-	-
-	-

4.2 RS485 Communication

Caution

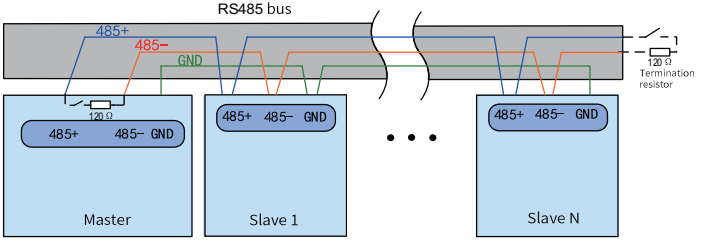
- Do not bundle the extension cable together with power cables (high voltage, large current) which produce strong interference signals. Separate it from other cables and avoid cabling in parallel.
- Select recommended cables and pinboards for connection. It is recommended that shielded cables be used as extension cables to enhance capacity of resisting interference.

■ Wiring requirement

When using RS485 communication, observe the following requirements:

- For the RS485 bus, a shielded twisted-pair cable is recommended. The 485+ and 485- lines must be wired as a twisted pair within this cable.
- Connect 120 Ω termination resistors at both ends of the bus to prevent signal reflection.
- Tie the RS485 signal reference grounds of all nodes together.
- A maximum of 31 nodes are supported. The stub length from each node to the main bus must be less than 3 m.

The RS485 bus topology is shown in the figure below.

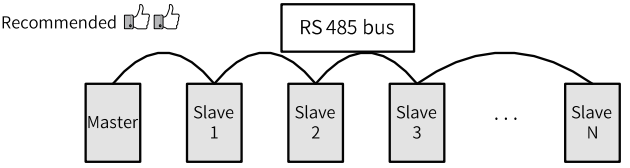


■ Multi-node connection

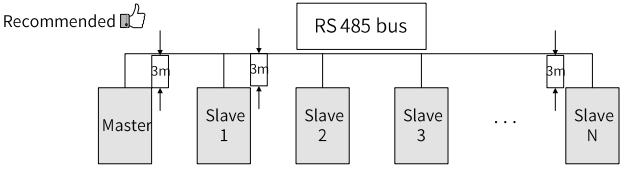
To connect a large number of nodes, the daisy chain topology must be used for the RS485 bus. If a branch line connection is required, keep the stub (from the node to

the main bus) as short as possible, ideally under 3 m. Star connections are prohibited. Common bus structures are shown in the following figures.

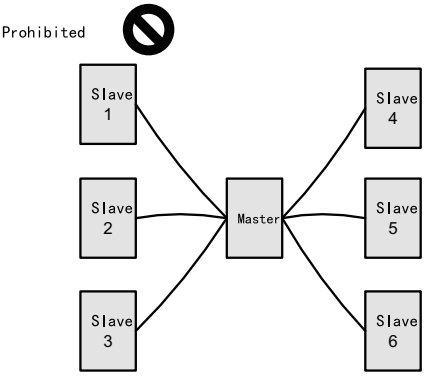
- Daisy chain connection



- Branch line connection



- Star connection (prohibited)

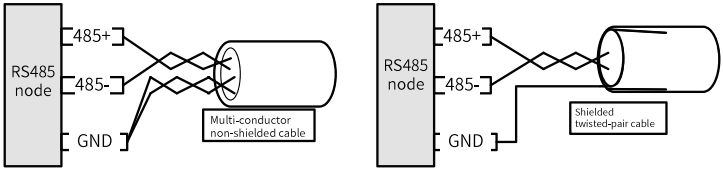


■ Terminal wiring

Check if the on-site RS485 bus contains three cables and that the terminals are not reversed or miswired. Particularly note that if a shielded cable is used, connect the

shield layer to the GND terminal. Never connect the shield layer to any terminal except GND, including the drive housing and grounding terminal of the device.

Due to cable attenuation, it is recommended to use AWG26 or thicker cables if the connection length is longer than 3 m. The 485+ and 485- lines must always be a twisted pair.



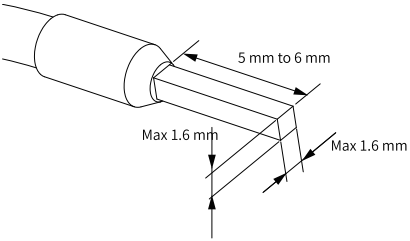
1. Recommended cable 1: Use multi-conductor twisted pair cables, with one twisted pair connected to 485+ and 485-, and others twisted together to connect GND.
2. Recommended cable 2: Use shielded twisted pair cables, with the twisted pair connected 485+ and 485-, and the shield connected to CGND. In applications where shielded cables are used, the shield can be connected to GND only. Never connect the shield to the ground.

4.3 Cable Selection

The cable lug and sizes in the following table are provided for reference only. Adjustments can be made based on actual usage after proper calculation.

Supporting material	Applicable cable size		Suzhou Yuanli	
	mm^2	AWG	Model	Crimping tool
Tubular lug	0.5	20	0508	YAC-5
	0.75	18	7508	

If another type of tubular lug is used, crimp the lug onto the stranded wire. The lug must meet the shape and dimensional requirements shown in the figure below.



4.4 Cable Connection

For selection of the cable with a tubular lug, see *"4.3 Cable Selection" on page 29*. To secure the cable, insert it into an input/output terminal and tighten the screw using a slotted screwdriver (Radius: 2 mm to 2.5 mm) or an equivalent tool.

Note

Use a slotted screwdriver to loosen the terminal screw, and then pull out the cable during the removal.

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5 Configuration and Commissioning

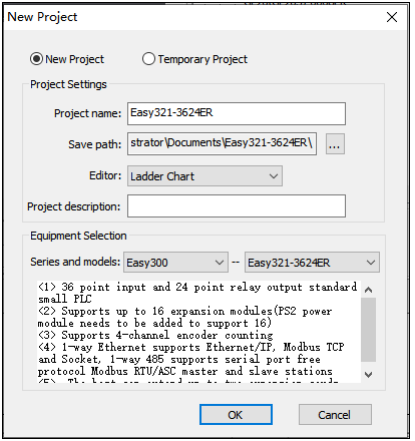
This chapter introduces how to configure the Easy321-3624ER and GE21-232/485-RTC expansion card in the AutoShop.

Notes

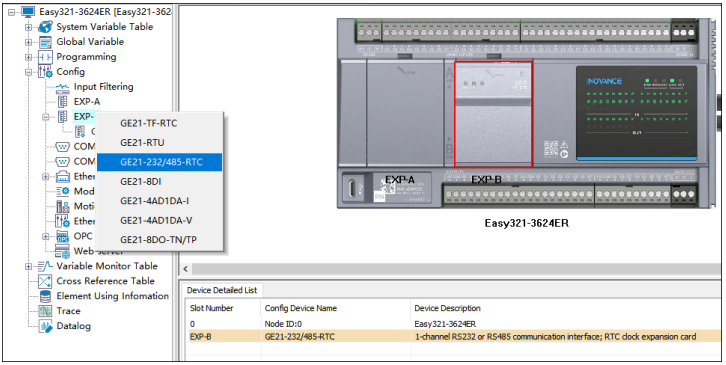
- The GE21-232/485-RTC expansion card only supports EXP-B.
- The type ID of the GE21-232/485-RTC expansion card is 14. The configured type of expansion card must be consistent with the type of expansion card actually installed.

Steps:

1. Create a new project. Define "Project name" and "Save path", select proper product series and model in "Series and models", and then click "OK".



2. In the left "Project Manager" pane, right-click "Config > EXP-B" and select "GE21-232/485-RTC"; or right-click "Config > Module Config" and select "Auto Scan" to add the GE21-232/485-RTC expansion card, as shown in the figure below.



3. Modify the serial port configuration as required. For specific methods, see the "Serial Communication" chapter in the "H5U and Easy Series Programmable Logic Controller Programming and Application Guide".
4. After successful compiling, download the project and run it.
   a. Click the download button in the toolbar to download the program to the PLC.

   After the download is complete,

   b. click the button in the toolbar to run the program.

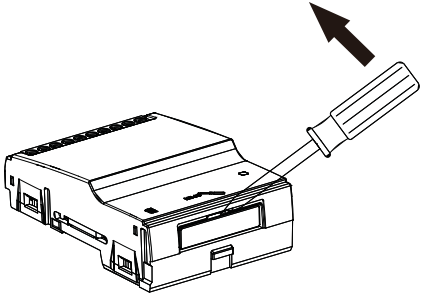
Appendix: Backup Battery Maintenance

The backup battery provides power to the product when the PLC is powered off. It has a service life of up to 3 years, which may vary depending on the operating environment. When the backup battery is depleted, replace it promptly.

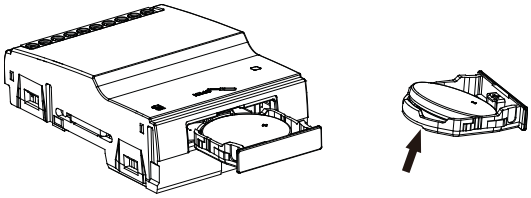
Caution

The replacement of the backup battery must be completed within 15 seconds (excluding the time taken to remove the expansion card), otherwise the RTC clock will be lost.

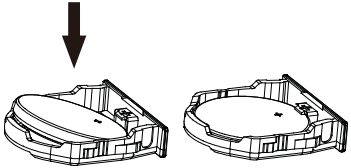
1. Remove the expansion card as described in "Removing the expansion card" in *"3.3 Installation Procedure" on page 22*.
2. Insert a pointed tool such as a screwdriver into the notch on the housing, and then apply upward force diagonally to remove the battery compartment from the expansion card.



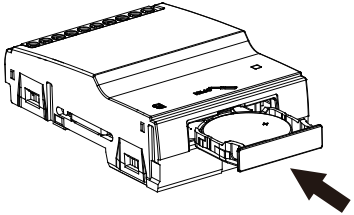
3. Lift the old battery out by pushing it upward at an angle from the bottom of the battery compartment.



4. Install a new battery into the battery compartment according to the polarity markings, and make sure that the battery is securely held in place.



5. Slide the battery compartment into the expansion card (make sure the positive side of the battery is aligned with the housing notch). A "click" sound indicates that the battery compartment is installed properly.



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.