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PS00021307A02

GE21-4AD1DA-V

Analog Voltage Input and Output Expansion Card

User Guide

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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.
GE21-4AD1DA-V Analog Voltage Input and Output Expansion Card User Guide (this guide)	PS00021307	Presents the product information, installation, wiring, and configuration and commissioning.

■ Revision history

Date	Version	Description
2026-05	A02	Updated the fundamental safety instructions.
2025-11	A01	Updated *"2.4.5 Digital Limit Specifications" on page 21*.
2025-08	A00	Initial 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 smart phone.
- 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.

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.

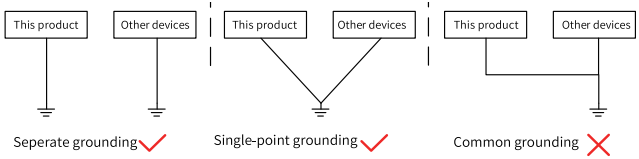


- Cover the top of the equipment with a piece of cloth or paper during installation. This is to prevent unwanted objects such as metal chippings, oil, and water from falling into the product and causing faults. After installation, remove the cloth or paper on the top of the equipment to prevent the ventilation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

GE21-4AD1DA-V expansion card is independently developed by Inovance. It is designed to be used with the Easy321, Easy511, and Easy321S series PLCs, and supports four analog inputs and one analog output (voltage type).

2.2 Model and Nameplate

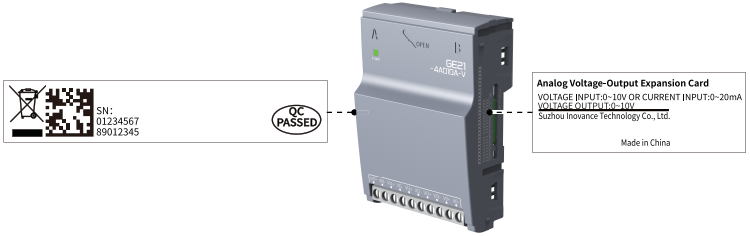
■ Model

GE21- 4AD1DA - V

① ② ③

① **Product series** General-purpose expansion card 21	③ **Product code** Voltage type
② **Product code** Expansion card with four analog inputs and one analog output	-

■ Nameplate

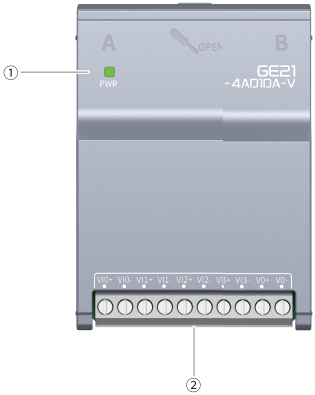


Note

The letters "A" and "B" on the nameplate indicate that the card slots A and B of the PLC are supported.

Model	Description	Code
GE21-4AD1DA-V	GE21 series expansion card with four analog inputs and one analog output (voltage type)	01480071

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 28*

2.4 Product Specifications

2.4.1 General Specifications

Item	Description
IP rating	IP20
Dimensions (W × H × D)	58 mm × 42 mm × 21.4 mm
Weight	Approx. 26 g

2.4.2 Power Supply Specifications

Item	Description
Rated input voltage	5 VDC (4.75 VDC to 5.25 VDC)
Rated input current	65 mA (max@5 V)
Input short-circuit protection	Supported
Hot swap	Not supported

2.4.3 Input Specifications

Item	Description
Number of input channels	4
Voltage input range	0 V to 10 V
Voltage input impedance	> 200 kΩ

Item	Description
Conversion speed	6 ms/channel
Current input range	0 mA to 20 mA
Current sampling impedance	250 Ω
Input accuracy (25°C)	Voltage: ± 1%; current: ± 1% (full range)
Input accuracy (full temperature range)	Voltage: ± 3%; current: ± 3% (full range)
Input signal frequency	< 10 Hz
Resolution	12bit
Digital output	0–20000

2.4.4 Output Specifications

Item	Description
Number of output channels	1
Voltage output range	0 V to 10 V
Voltage output load	> 2 kΩ
Conversion speed	1 ms
Output accuracy (25°C)	± 1% (full range)
Output accuracy (full temperature range)	± 5% (full range)
Resolution	12bit
Digital output	0–20000

2.4.5 Digital Limit Specifications

The following table shows the digital value ranges and limit ranges corresponding to the input and output specifications of analog voltage and analog current.

Analog	Rated range	Corresponding digital value	Limit range	Corresponding digital value
Analog voltage output	0 V to 10 V	0 to 20000	0 V to 10.5 V	0 to 21000
	0 V to 5 V	0 to 20000	0 V to 5.25 V	0 to 21000
	1 V to 5 V	0 to 20000	1 V to 5.2 V	0 to 21000
Analog current output	0 mA to 20 mA	0 to 20000	0 mA to 21 mA	0 to 21000
	4 mA to 20 mA	0 to 20000	4 mA to 20.8 mA	0 to 21000
Analog voltage input	0 V to 10 V	0 to 20000	0 V to 10.5 V	0 to 21000
	0 V to 5 V	0 to 20000	0 V to 5.25 V	0 to 21000
	1 V to 5 V	0 to 20000	1 V to 5.2 V	–1 to 21000
Analog current input	0 mA to 20 mA	0 to 20000	0 mA to 21 mA	0 to 21000
	4 mA to 20 mA	0 to 20000	4 mA to 20.8 mA	–1 to 21000

2.4.6 Other Specifications

Item	Description
Sampling cycle	1 ms
Communication cycle with PLC (AutoShop)	• High-speed mode: ⩽ 6 ms (modification of channel mapping elements is not supported) • Normal mode: ⩽ 20 ms (modification of channel mapping elements is supported)
Isolation mode	Non-isolation
Output short-circuit detection	Not supported
Output open-circuit detection	Not supported

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

Item	Specification
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

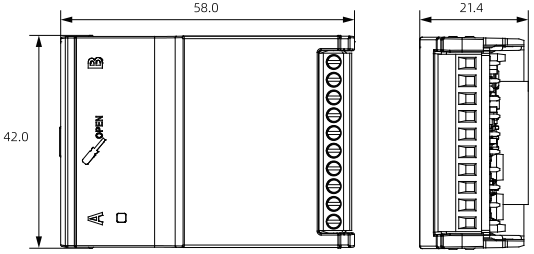
3 Installation

3.1 Precautions

- Make sure the PLC is powered off before installing or removing the expansion card.
- Hot plugging of the expansion card is prohibited, because it may lead to PLC restart and/or user data loss or corruption.
- Do not drop or impact the housing or terminals of the expansion card to prevent damage.

3.2 Mounting Dimensions

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

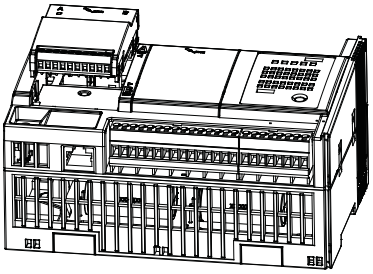


3.3 Procedure

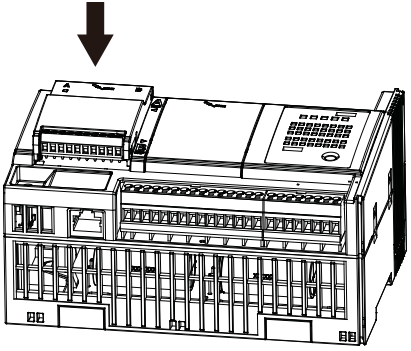
■ Installing the expansion card

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

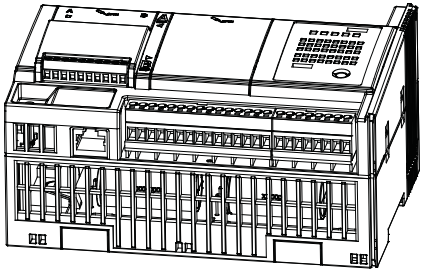
1. Place the PLC horizontally, and align the expansion card module horizontally with it.



2. Insert the expansion card vertically into the card slot A or B (using the slot A as an example) of the PLC along the guide rib.

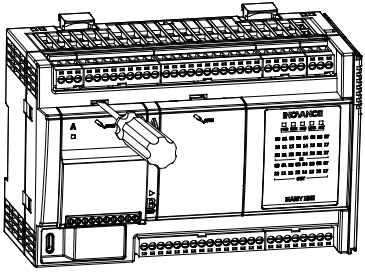


3. Press the expansion card with your hand. When you hear a click and the surface of the expansion card is flush with the surface of the PLC module, the installation is complete, as shown in the figure below.

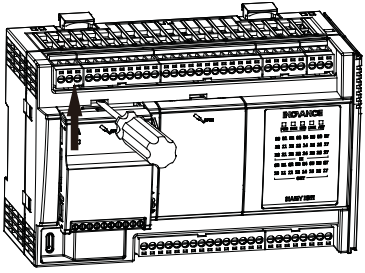


■ Removing the expansion card

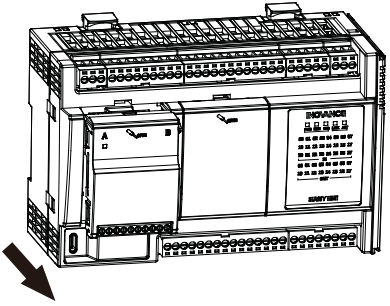
1. Place the PLC module horizontally and insert a straight screwdriver into the snap-fit position.



2. Pry the expansion card module in the direction indicated by the arrow.

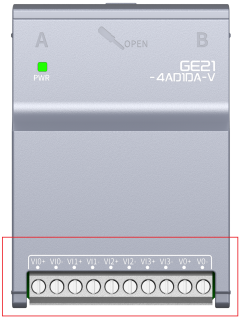


3. Remove the expansion card module vertically when you hear a distinct sound indicating that the expansion card has partially detached from the PLC.



4 Wiring

4.1 Terminal Assignment



Terminal assignment	Description
VI0+	Voltage/Current channel 0 input+
VI0-	Voltage/Current channel 0 input-
VI1+	Voltage/Current channel 1 input+
VI1-	Voltage/Current channel 1 input-
VI2+	Voltage/Current channel 2 input+
VI2-	Voltage/Current channel 2 input-
VI3+	Voltage/Current channel 3 input+
VI3-	Voltage/Current channel 3 input-
V0+	Voltage channel output +
V0-	Voltage channel output-

4.2 Terminal Wiring

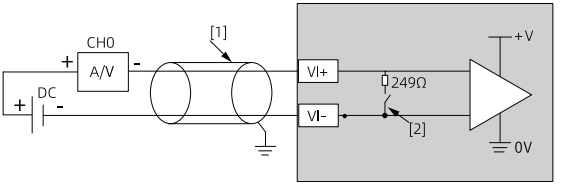
■ Precautions

- Do not bundle the extension 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.

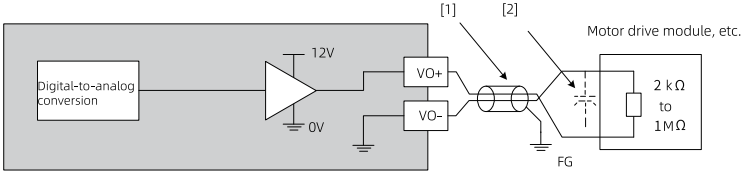
- Select recommended cables for connection. It is recommended that shielded cables be used as extension cables to enhance capacity of resisting interference.
- Apply single-point grounding for the shields of shielded cables and soldered cables.

■ External input wiring



- [1]: Use 2-conductor shielded twisted pair cables for analog signals.
- [2]: Current input is provided when the switch is closed, which is controlled by the software.

■ External output wiring



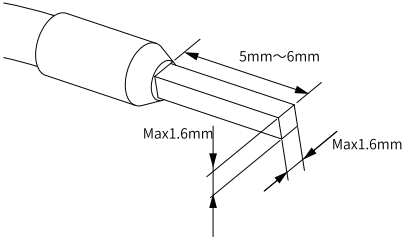
- [1]: Use a 2-conductor shielded twisted pair cable as the power cable.
- [2]: If noises or ripples are generated in external wiring, connect a 0.1–0.47 μF 25 V capacitor between terminals VO+ and VO-.

4.3 Cable Selection

The cable lug and sizes in the following table are provided for reference only.

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, as shown 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 with a straight screwdriver (Radius: 2 mm to 2.5 mm) or equivalent.

Note

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

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5 Configuration and Commissioning

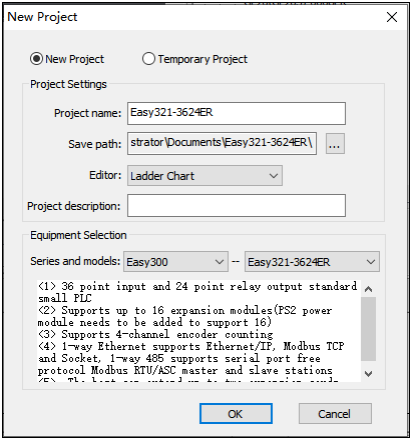
The following is an example of how to configure the Easy321-3624ER PLC and the GE21-4AD1DA-V expansion card in the AutoShop software.

Precautions

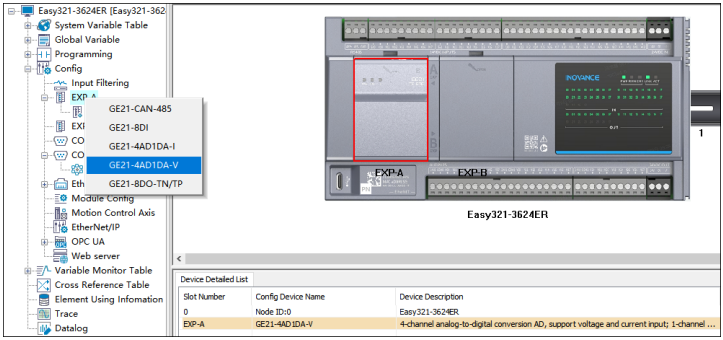
The GE21-4AD1DA-V expansion card type ID is 8. The configured expansion card must have the same type as the actually installed expansion card.

Procedure

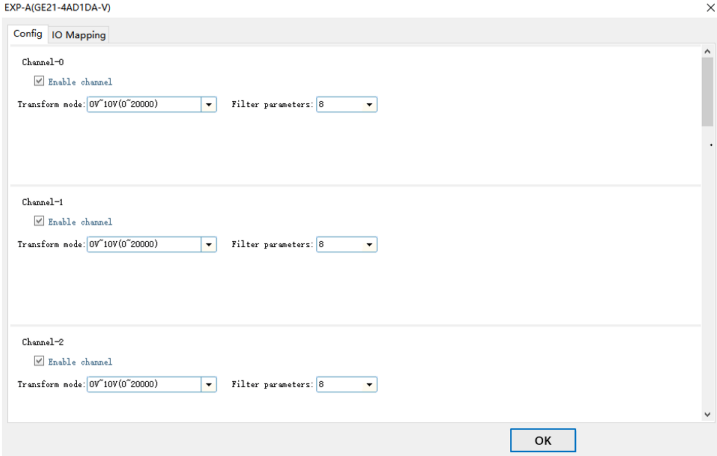
1. Create a new project, define the "Project name" and "Save path", select proper product series and model following the "Series and models", and then click "OK".



2. In the left "Project Manager" pane, right-click "Config > EXP-A" or "Config > EXP-B" (depending on the position of the expansion card) and select "GE21-4AD1DA-V"; or right-click "Config > Module Config" and select "Auto Scan" to add the GE21-4AD1DA-V expansion card, as shown in the figure below.



3. In the left "Project Manager" pane, double-click "Config > EXP-A > GE21-4AD1DA-V". In the opened "EXP-A" dialog box, enable the channel on the "Config" tab, and configure the "Transform mode" and "Filter parameters".



The parameters for channel configuration are shown in the following table.

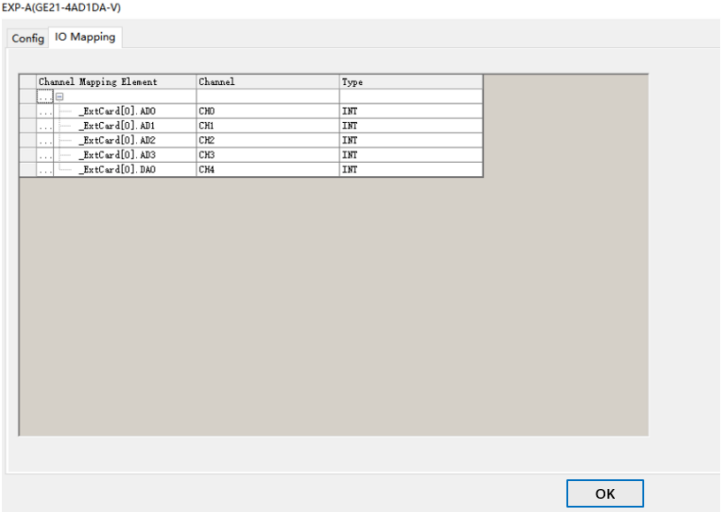
Parameter	Description	Settings
Enable channel	Channel enable status	• Enabled when the option is checked. • Disabled when the option is not checked.
Transform mode	Voltage/Current range	The following ranges are supported for input channels 0 to 3: • 0–10 V (0–20000) • 0–5 V (0–20000) • 1–5 V (0–20000) • 0–20 mA (0–20000) • 4–20 mA (0–20000) The following ranges are supported for output channel 4: • 0–10 V (0–20000) • 0–5 V (0–20000) • 1–5 V (0–20000)
Filter parameters	The larger the parameter value, the stronger the filtering effect.	Range: 0–255
Output status after stop	Output status of the module when the PLC stops running	• Output zeroing: The output value is reset to zero. • Output remains: The output value remains unchanged. • Output preset value: The output value is set to the preset value.

4. Perform IO mapping.

Caution

- GE21 series expansion cards operate in high-speed mode by default.
- High-speed mode: ⩽ 6 ms (modification of channel mapping elements is not supported)
- Normal mode: ⩽ 20 ms (modification of channel mapping elements is supported)

In the left "Project Manager" pane, double-click "Config > EXP-A>GE21-4AD1DA-V". In the opened dialog box, select "IO Mapping" tab, in which the channel IO is mapped to the system variable _ExtCard structure by default.



5. After successful compiling, download the project and run it.

a. Click  in the toolbar to download the program to the PLC.

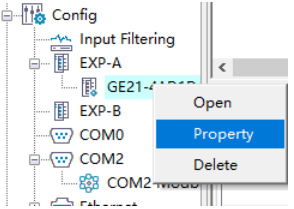
b. After the download is complete, click  in the toolbar to run the program.

Note

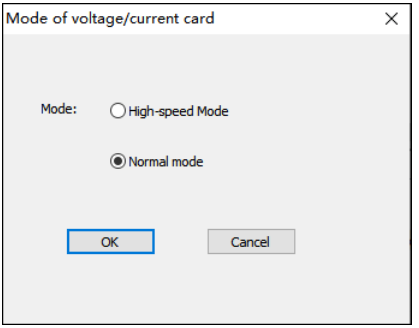
In Step 4, the procedure for IO mapping in normal mode is as follows.

1. Select high-speed mode or normal mode.

   a. In the left "Project Manager" pane, go to "Config", right-click the added expansion card, and select "Property".

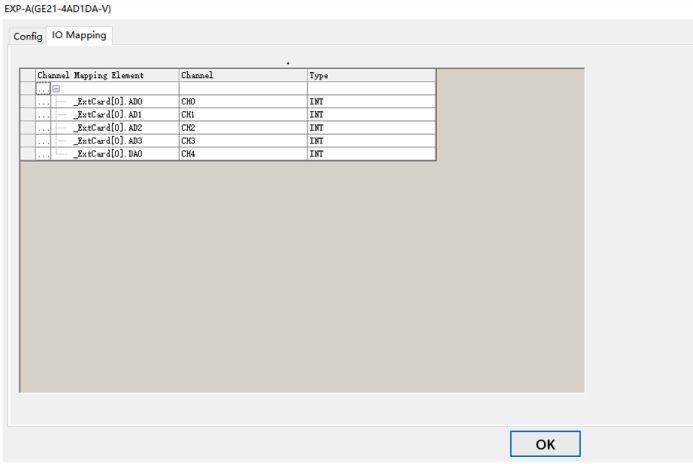


   b. In the opened dialog box, select "Normal mode" and click "OK".

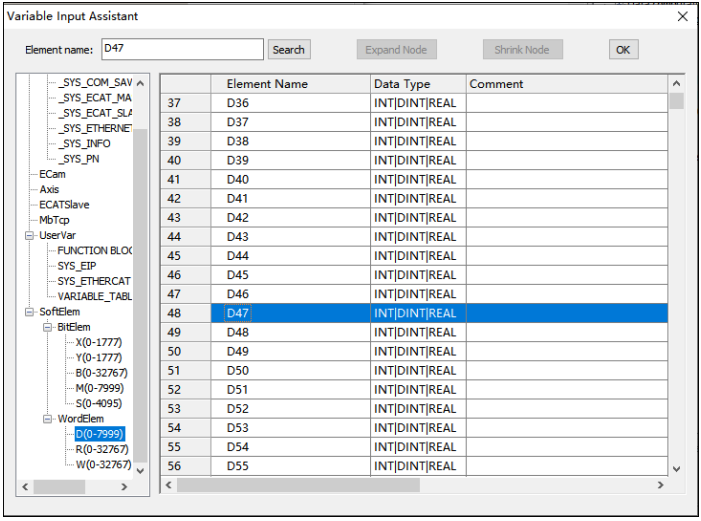


2. Perform IO mapping.

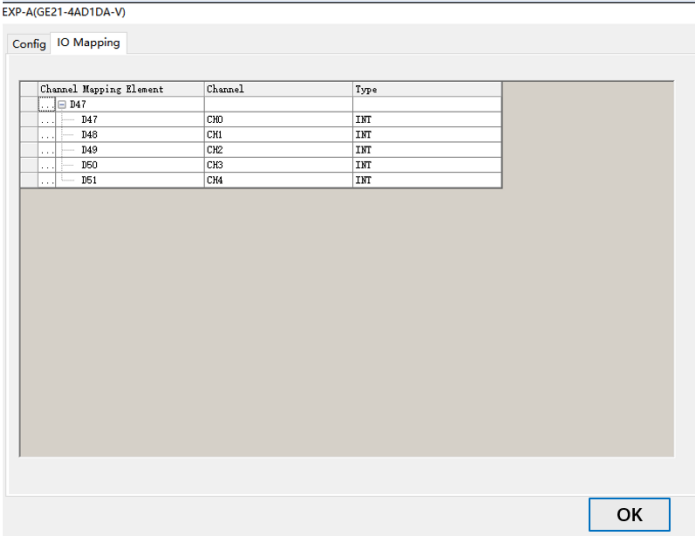
   a. In the left "Project Manager" pane, double-click "Config > EXP-A>GE21-4AD1DA-V". In the opened dialog box, select "IO Mapping" tab and double-click to configure the channel IO mapping for the GE21-4AD1DA-V expansion card (mapping to the system variable _ExtCard structure by default).



b. In the opened dialog box, select the D element.



c. After the configuration is complete, click "OK" to map the channel IO to an unused D element, as shown in the figure below.



Services 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.