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PS00004945A08

GL20-4AD/GL20-4AD-DZ
Analog Input Module
User Guide

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Preface

■ Introduction

GL20-4AD (differential input) and GL20-4AD-DZ (single-ended input) are 4-channel analog input modules. The modules support voltage and current input modes, and feature a resolution of up to 16 bits. They are applicable to Easy/AM300/AM500 series PLCs and remotely applicable to AC800 series PLCs through GL20 series communication interface modules (such as GL20-RTU-ECT).

This guide describes the product information, mechanical installation, electrical installation, program commissioning, troubleshooting, and version matching information of the product.

■ Standards Compliance

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

Certification	Directive		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

Certification	Directive		Standard
KCC Certification	-		-
EAC Certification	-		-
UKCA Certification	Safety Regulations	Electrical Equipment (Safety) Regulations 2016	EN 61010-1 EN 61010-2-201
	EMC Regulations	Electromagnetic Compatibility Regulations 2016	**24 VDC products:** EN 61131-2 **220 VAC products:** EN 61131-2 EN 61000-3-2 EN 61000-3-3
	RoHS Regulations	Directive (RoHS) Regulations 2012	EN IEC 63000

■ More Data

Name	Code	Description
GL20-RTU-ECT Series Communication Interface Module User Guide	PS00004985	Introduce the product information, mechanical installation, electrical installation, program commissioning, troubleshooting, and version matching information of the product.
GL20-RTU-ECT32 Series Communication Interface Module User Guide	PS00013434	
GL20-RTU-PN Series Communication Interface Module User Guide	PS00007594	
GL20-RTU-EIP Series Communication Interface Module User Guide	PS00014402	
GL20-4AD/GL20-4AD-DZ Analog Input Module User Guide (This guide)	PS00004945	

■ Revision History

Date	Version	Revision
April 2025	A08	Added information on the GL20-4AD-DZ module.
July 2024	A07	Updated the environmental specifications.
June 2024	A06	• Updated *"1.1 Naming Rules and Nameplate" on page 10*. • Updated the "Output PDO data volume" in *"1.3 Technical Specifications" on page 13*. • Updated *"1.4 Environmental Specifications" on page 17*.

Date	Version	Revision
April 2024	A05	• Updated fault codes in *" Troubleshooting" on page 33*. • Updated *"1.4 Environmental Specifications" on page 17*. • Updated the wiring diagram in *"3.3 Terminal Wiring" on page 26*.
September 2023	A04	Made minor corrections.
August 2023	A03	Added "Fault Diagnosis" and "Version Matching Information" sections.
February 2023	A02	Updated the effect diagram and structure diagram. Added environmental specifications.
June 2022	A01	Made minor corrections.
March 2022	A00	Initial release.

■ Access to the Guide

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

- Do keyword search under Service and Support at *www.inovance.com*.
- 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 user guides.

■ Warranty Disclaimer

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

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

- Damage caused by operations not following the instructions in the user guide
- Damage caused by fire, flood, or unusual voltage

- Damage caused by unintended use of the product
- Damage caused by use beyond the specified scope of application of the product
- Damage or secondary damage caused by force majeure (natural disaster, earthquake, and lightning strike)

The maintenance is 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.

Fundamental Safety Instructions

■ Safety precautions

1. Read and follow the safety instructions when installing, operating, and maintaining the equipment.
2. To ensure your safety and prevent damage to the equipment, follow the marks on the equipment and all the safety instructions in this guide.
3. "CAUTION", "WARNING", and "DANGER" items in this guide do not indicate all safety precautions that need to be followed; instead, they just supplement the safety precautions.
4. Use this equipment according to the designated environment requirements; otherwise, a fault may occur. Malfunction or 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 definition

DANGER "DANGER" indicates that failure to comply with the notice will result in death or severe personal injuries.

WARNING "WARNING" indicates that failure to comply with the notice may result in death or severe personal injuries.

CAUTION "CAUTION" indicates that failure to comply with the notice may result in minor or moderate personal injuries or equipment damage. Keep this user guide properly for future use and deliver it to the end user.

Control System Design
DANGER • Provide a safety circuit outside the PLC so that the control system can still work safely once external power failure or controller fault occurs. • Add an external fuse or circuit breaker to prevent the module from smoking or catching fire due to long-time overcurrent caused by operation above rated current or load short-circuit.

WARNING

- An emergency stop circuit, a protection circuit, a forward/reverse operation interlocked circuit, and an upper position limit and lower position limit interlocked circuit must be set in the external circuits of PLC to prevent damage to the equipment.
- To ensure safe operation, for the output signals that may cause critical accidents, use external protection circuit and safety mechanism.
- Once the CPU of the PLC detects an exception in the system, all outputs may be closed; however, when a fault occurs in the controller circuit, the output may not be under control. Therefore, it is necessary to design an appropriate external control circuit to ensure normal operation.
- If the output units such as relays or transistors are damaged, the output may fail to switch between ON and OFF states according to the commands.
- The PLC is designed to be used in an indoor electrical environment compliant with overvoltage category II. The power supply must have a system-level surge protector to ensure that overvoltage caused by lightning shock cannot be applied to power supply input terminals, signal input terminals, and control output terminals of the PLC, therefore preventing damage to the product.

Installation

WARNING

- Installation must be carried out by skilled personal who have undergone specialized electrical training and possess comprehensive electrical expertise.
- Disconnect all external power supplies of the system before installing/removing the module. Failure to do so may result in electric shock, module fault, or malfunction.
- Do not use the PLC in environments with dust, greasy smoke, conductive dust, corrosive or combustible gases, exposed to high temperature, condensation, wind & rain, or subject to vibration and shock. Electric shock, fire, and malfunction may also result in damage or deterioration to the product.
- The PLC is open-type equipment that must be installed in a control cabinet with lock (cabinet housing protection > IP20). Only the skilled personnel who have undergone specialized electrical training and possess comprehensive electrical expertise can open the cabinet.

CAUTION

- Prevent metal filings and wire ends from dropping into ventilation holes of the PLC during installation. Failure to comply may result in fire, fault, and malfunction.
- Ensure there are no unwanted matters on ventilation surface. Failure to comply may result in poor ventilation, which may cause fire, fault, or malfunction.
- Ensure the module is connected to the respective connector securely and hook the module firmly. Improper installation may result in malfunction, fault, or fall-off.

Wiring

- Wiring must be carried out by skilled personnel who have undergone specialized electrical training and possess comprehensive electrical expertise.
- Disconnect all external power supplies of the system before wiring. Failure to comply may result in electric shock, module fault, or malfunction.
- After wiring, install the terminal cover attached to the product before power-on or operation. Failure to comply may result in electric shock.
- 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 may result in electric shock or damage to the product.

- To avoid electric shock, cut off the power supply before connecting the product to the power supply.
- The input power supply of this product is 24 VDC. Power supplies outside ±20% of 24 VDC can cause severe damage to the product. Therefore, check whether the DC power supply provided by the switching-mode power supply is stable at a regular interval.

Operation and Maintenance

- Operation and maintenance must be carried out by skilled personnel who have undergone specialized electrical training and possess comprehensive electrical expertise.
- Do not touch the terminals while the power is on. Failure to comply may result in electric shock or malfunction.
- Disconnect all external power supplies of the system before cleaning the module or re-tightening screws on the terminal block or the connector. Failure to comply may result in electric shock.
- Disconnect all external power supplies of the system before assembling/disassembling the module or connecting/removing the communication cables. Failure to comply may result in electric shock or malfunction.

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, the on-site manual operating devices and any other alternative means must be carefully arranged and designed so that they are independent of the PLC and can start or terminate the automatic running of the system.
- If modification on the program is needed during system operation, use the lock function or other protective measures. Ensure that only authorized personnel can make the necessary modifications.

Disposal

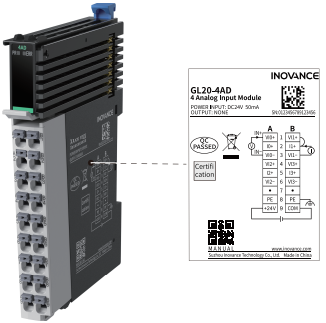
- Treat the scrapped product as industrial waste. Dispose of the battery according to local laws and regulations.
- Recycle retired equipment by observing industry waste disposal standards to avoid environmental pollution.

1 Product Information

1.1 Naming Rules and Nameplate

GL 20 - 4 AD - DZ
① ② ③ ④ ⑤

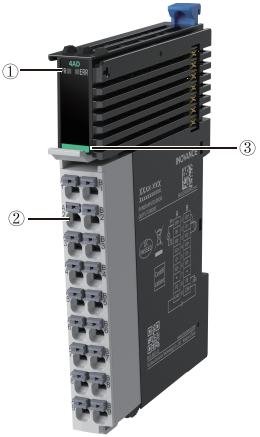
① **Product Information** GL: Inovance general local module	④ **Module Type** AD: Analog input DA: Analog output AM: Hybrid module PT: Thermal resistor temperature detection TC: Thermocouple temperature detection
② **Series Number** 20: 20 series module	⑤ **Board Type** DZ: High speed
③ **Number of I/O Channels** 4: Four channels 8: Eight channels	-



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

Model	Description	Material Code	Applicable Model
GL20-4AD	GL20 series 4-channel analog input module (differential input)	01440288	Applicable to Easy/ AM300/AM500 series PLCs and remotely applicable to AC800 series PLCs through GL20 series communication interface modules (such as GL20-RTU-ECT)
GL20-4AD-DZ	GL20 series 4-channel analog input module (single-ended input)	01440517	

1.2 Components



<table>
<tr><th>No.</th><th>Name</th><th colspan="4">Description</th></tr>
<tr><td rowspan="2">1</td><td rowspan="2">Signal indicator</td><td>PR (POWER +RUN)</td><td>Power/Operation indicator</td><td>Yellow-green</td><td>• Solid ON: The module is operating normally.
• Flashing quickly: The module is addressed successfully.
• Flashing slowly: The module is powered on but not addressed.
• OFF: The module is not powered on or is faulty.</td></tr>
<tr><td>ERR</td><td>State machine fault indicator</td><td>Red</td><td>ON: The state machine is faulty. For troubleshooting, see "Troubleshooting" on page 33</td></tr>
<tr><td>2</td><td>User terminal</td><td colspan="4">For details, see "3.2 Terminal Definition" on page 25</td></tr>
<tr><td rowspan="3">3</td><td rowspan="3">Color identification</td><td colspan="2">Red: Digital output</td><td colspan="2">Orange: Analog output</td></tr>
<tr><td colspan="2">Gray: Digital input</td><td colspan="2">Green: Analog input</td></tr>
<tr><td colspan="2">White: Communication</td><td colspan="2">Blue: Other modules</td></tr>
</table>

1.3 Technical Specifications

■ General specifications

Item	Specification
IP rating	IP20
Dimensions (W x H x D)	12 mm x 100 mm x 75 mm
Weight	About 60 g

■ Power supply specifications

Item	Specification
Rated voltage of bus input power supply	5 VDC (4.75 VDC to 5.25 VDC)
Rated current of bus input power supply	95 mA (typical@ 5 V)
Rated voltage of terminal input power supply	24 VDC (20.4 VDC to 28.8 VDC)
Rated current of terminal input power supply	100 mA (typical@ 24 V)
Rated voltage of terminal output power supply	/
Rated current of terminal output power supply	/
Hot swap	Not supported

■ Input specifications

Item	Specification
Input type	Analog input
Input mode	• GL20-4AD: Voltage/current input, differential input • GL20-4AD-DZ: Voltage/current input, single-ended input
Number of input channels	4
Resolution	16 bits
Voltage input range	±10 V, 0 V to 10 V, ±5 V, 0 V to 5 V, 1 V to 5 V

Item	Specification
Voltage input impedance	1 MΩ
Voltage input accuracy (25°C)	±0.1% (full range)
Voltage input accuracy (full temperature range)	±0.2% (full range)
Voltage input limit	±15 V
Voltage input diagnosis	Wire break detection supported when the voltage input is set to 1 V to 5 V
Current input range	±20 mA, 0 mA to 20 mA, 4 mA to 20 mA
Current sampling impedance	250 Ω
Current input accuracy (25°C)	±0.1% (full range)
Current input accuracy (full temperature range)	±0.2% (full range)
Current input limit	±30 mA (transient), ±24 mA (average)
Current input diagnosis	Wire break detection supported when the current input is set to 4 mA to 20 mA
Isolation	No isolation among interface channels, isolation applied between the power supply and interface, also between the interface and the bus
Input indicator	/
Input derating	/

■ Software specifications

Item	Specification
Input PDO data volume	Max. 8 bytes
Independent channel enable configuration	Supported
Diagnostic report function configuration	Supported
Diagnostic detection enable configuration	Short circuit detection on voltage side and open circuit detection on current side (This function is not available for modes with output range containing 0.)

Item	Specification
Conversion mode configuration	±10 V, 0 V to 10 V, ±5 V, 0 V to 5 V, 1 V to 5 V, ±20 mA, 0 mA to 20 mA, 4 mA to 20 mA
Filter parameter configuration	The configuration range is 1 to 255 with no units. The larger the filter parameter configuration, the better the filtering effect.
Overlimit detection configuration	Supported
Peak hold configuration	Supported
Digital range conversion	+20000 to +20000 -32000 to +32000 -27648 to +27648 For details, see the following table.
Conversion time	• GL20-4AD: 1ms/channel • GL20-4AD-DZ: 62.5μs/channel
Sampling refresh	Refresh asynchronously according to the sampling cycle, with no need to refresh synchronously according to the bus cycle
Stop mode	Output the current value with no further refresh

The following table shows the digital range and limit range corresponding to the analog voltage output range and analog current output range.

Analog	Rated Output Range	Corresponding Rated Digital Range	Limit Output Range	Corresponding Limit Digital Range
Analog voltage input	-10 V to +10 V	-20000 to +20000 -32000 to +32000 -27648 to +27648	-10.20 V to +10.20 V	-20400 to +20400 -32640 to +32640 -28200 to +28200
	0 V to 10 V	0 to 20000 0 to 32000 0 to 27648	-0.5 V to +10.20 V	-1000 to +20400 -1600 to +32640 -1382 to +28200
	-5 V to +5 V	-20000 to +20000 -32000 to +32000 -27648 to +27648	-5.10 V to +5.10 V	-20400 to +20400 -32640 to +32640 -28200 to +28200
	0 V to 5 V	0 to 20000 0 to 32000 0 to 27648	-0.25 V to +5.1 V	-1000 to +20400 -1600 to +32640 -1382 to +28200
	1 V to 5 V	0 to 20000 0 to 32000 0 to 27648	0.8 V to 5.10 V	-1000 to +20400 -1600 to +32640 -1382 to +28200

Analog	Rated Output Range	Corresponding Rated Digital Range	Limit Output Range	Corresponding Limit Digital Range
Analog current input	-20 mA to +20 mA	-20000 to +20000 -32000 to +32000 -27648 to +27648	-20.40 mA to +20.40 mA	-20400 to +20400 -32640 to +32640 -28200 to +28200
	0 mA to 20 mA	0 to 20000 0 to 32000 0 to 27648	-1 mA to +20.40 mA	-1000 to +20400 -1600 to +32640 -1382 to +28200
	4 mA to 20 mA	0 to 20000 0 to 32000 0 to 27648	3.2 mA to 20.4 mA	-1000 to +20400 -1600 to +32640 -1382 to +28200

1.4 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
Max. altitude	⩽ 2000 m
Pollution degree	2
Immunity	2 kV on power supply cable (compliant with IEC 61000-4-4)
Overvoltage category	I
EMC immunity level	Zone B, IEC61131-2
ESD protection level	Contact discharge +/-6 kV, 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/axes • 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; Grms: 1.14 g

Item	Specification
Shock resistance	Application/Transportation scenario: Tested according to IEC60068-2-27; 15 g peak gravitational acceleration; 11ms 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: < 95% RH (30°C), without condensation
Transportation temperature/humidity	• Temperature: -40°C to +70°C • Humidity: < 95% RH (40°C), without condensation

2 Mechanical Installation

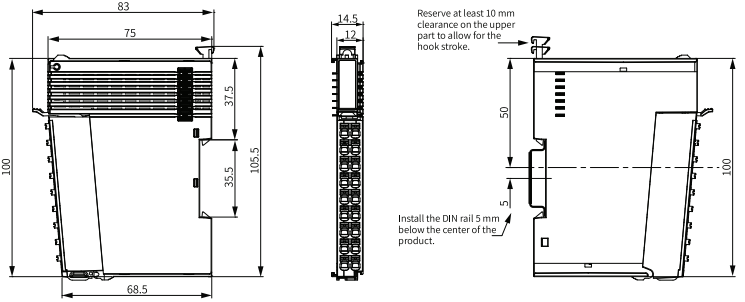
2.1 Installation Precautions

- Make sure the module is powered off before installing or removing.
- Do not hot swap the modules. Otherwise, the modules may be damaged by overcurrent or overvoltage, and the communication interface module or PLC may be subject to restart, user data loss or corruption.
- Do not drop or shock the housing or terminals of the module to avoid damage.

2.2 Mounting Dimensions

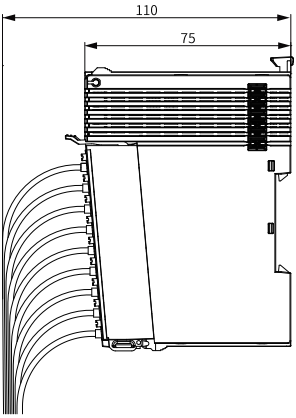
■ Module

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



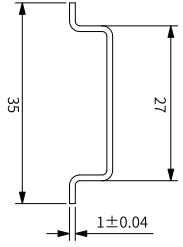
■ Cable connection

Cable dimensions (in mm) are shown in the figure below.



2.3 Installation Method

The module is mounted onto a DIN rail according to IEC 60715 (width: 35 mm, thickness: 1 mm). The dimensions (in mm) are shown below.

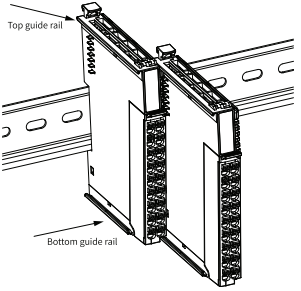


Caution

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

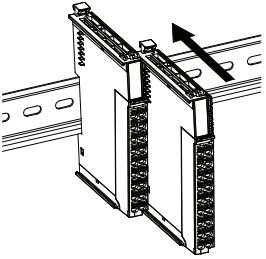
■ Installing modules side by side

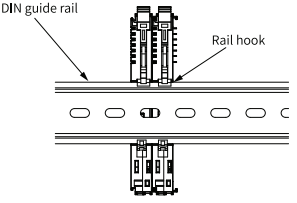
Install modules side by side by sliding them along the top and bottom guide rails of the module, as shown below.



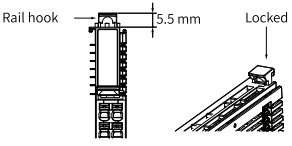
■ Installing modules onto DIN Rail

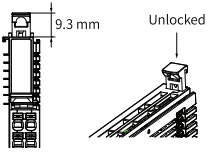
1. Align the module with the DIN rail and push the module in the direction indicated by the arrow until you hear a click, as shown below.





2. Make sure the DIN rail mounting hook of the module is locked. The locked and unlocked states of the mounting hook are shown below.





- If the mounting hook is pressed down, it is locked.

- If the mounting hook is lifted up, it is unlocked.

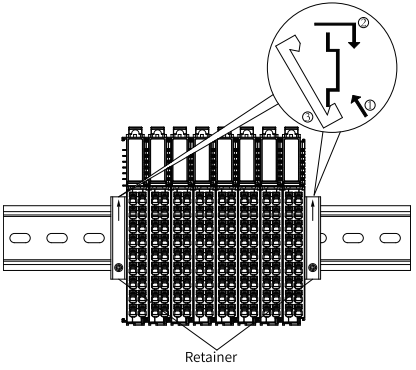
To lock the module to the DIN rail, press down the mounting hook.

Caution

When the module is not installed on the DIN rail, keep the rail hook in locked state. A hook that kept in unlocked state for a long period of time may fail to function properly.

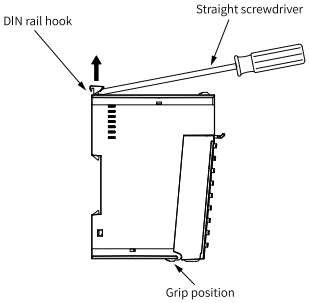
3. Install a DIN rail end plate on both sides of the PLC or the module.

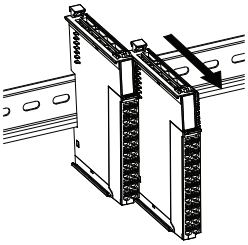
   To install the end plate, hook the bottom of it to the bottom of the DIN rail, rotate the end plate to hook the top of it to the top of the DIN rail, and then tighten the screw to lock the end plate in place.



■ Removing modules

Pry the DIN rail mounting hook upwards with a tool such as a slotted screwdriver, hold the protrusions and pull the module out straight forward. Then, press down the top of the mounting hook.


DIN rail hook
Straight screwdriver
Grip position



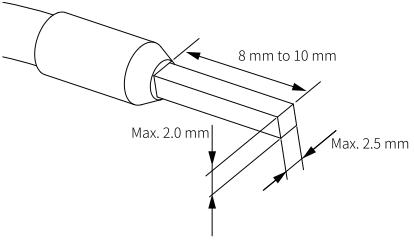
3 Electrical Installation

3.1 Cable Selection

The cable lug and cross sectional area shown in the following table are only for reference.

Material Name	Applicable cross sectional area of the cable		KST		Suzhou Yuanli	
	mm^2	AWG	Model	Crimping pliers	Model	Crimping pliers
Tubular lug	0.3	22	E0308	KST2000L	0308	YAC-5
	0.5	20	E0508		0508	
	0.75	18	E7508		7508	
	1.0	18	E1008		1008	
	1.5	16	E1508		1508	

If you use other types of tubular lug, crimp the lug to the cables according to the shape and dimension requirements shown in the figure below.



3.2 Terminal Definition

Left Signal	Left Terminal	Right Terminal	Right Signal
VI0+	A1	B1	VI1+
I0+	A2	B2	I1+
VI0-	A3	B3	VI1-
VI2+	A4	B4	VI3+
I2+	A5	B5	I3+
VI2-	A6	B6	VI3-
-	A7	B7	-
PE	A8	B8	PE
24V	A9	B9	COM

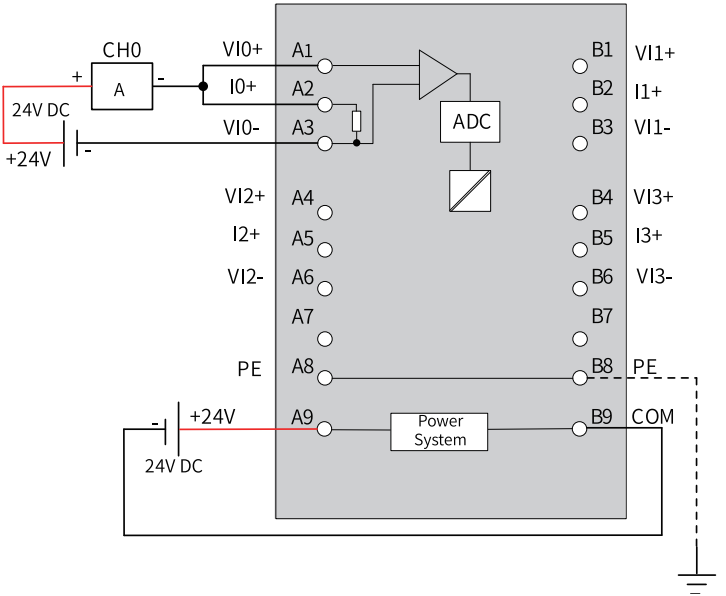
3.3 Terminal Wiring

■ Wiring precautions

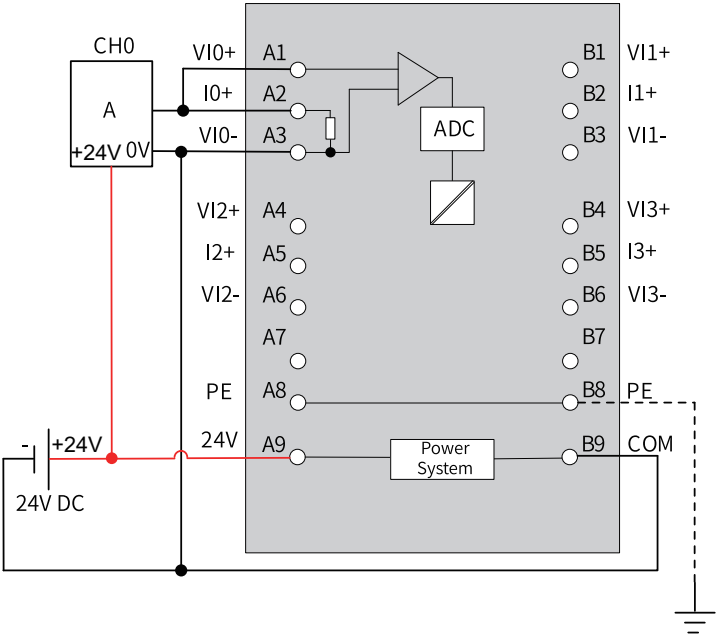
- Do not bundle the expansion cable together with power cables (with high voltage and large current) that produce strong interference signals; otherwise, the expansion cable may be influenced by noise, surge, or induction. Separate it from other cables and avoid cabling in parallel.
- Use recommended 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 shielding of shielded cable and solder sealed cable.

■ Circuit block diagram and wiring diagram

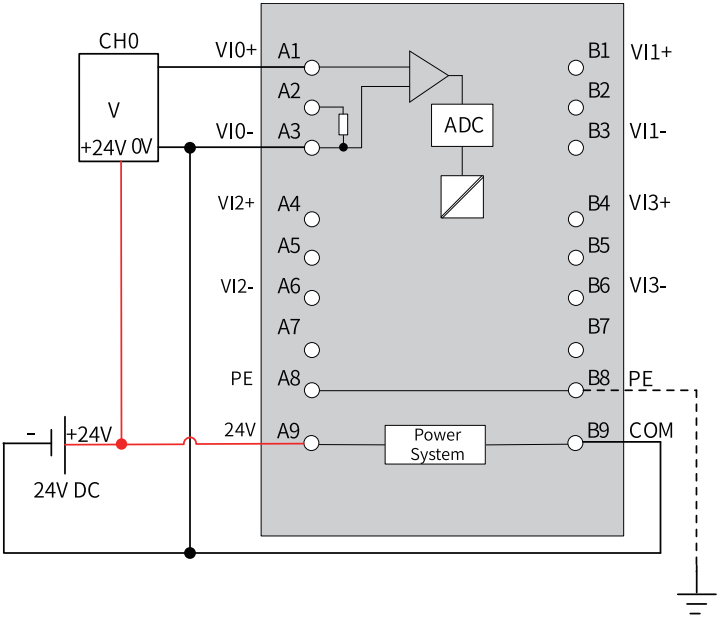
- Two-wire current wiring



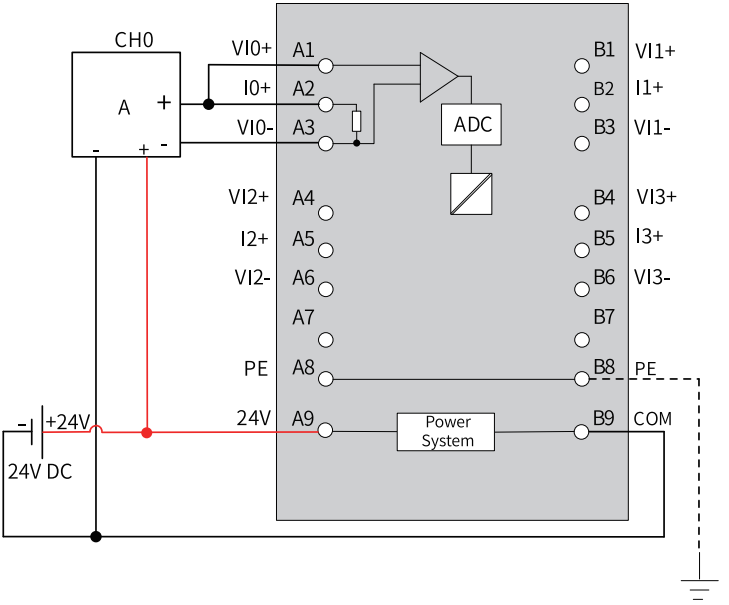
- Three-wire current wiring



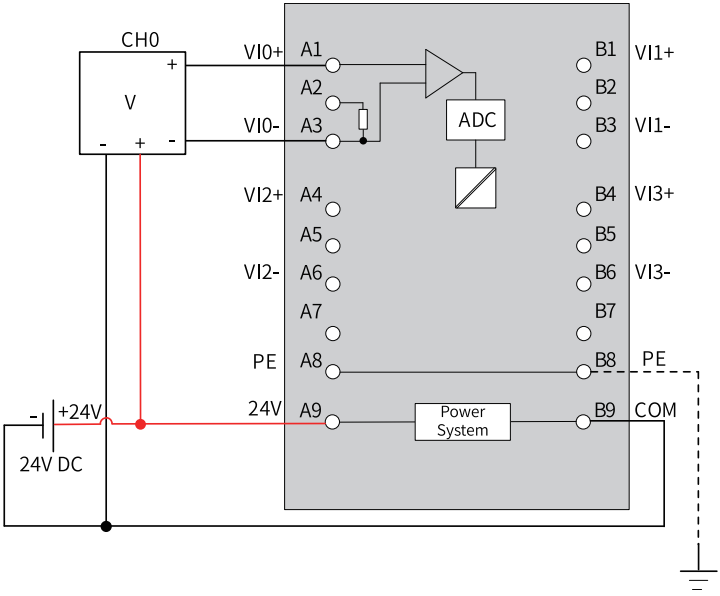
- Three-wire voltage wiring



- Four-wire current wiring



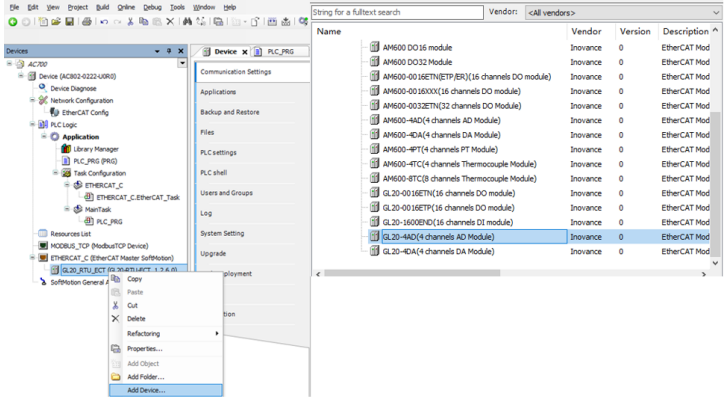
- Four-wire voltage wiring


CH0
+
V
-
+
-
VI0+
VI0-
VI2+
VI2-
PE
24V
A1
A2
A3
A4
A5
A6
A7
A8
A9
ADC
Power
System
B1
B2
B3
B4
B5
B6
B7
B8
B9
VI1+
VI1-
VI3+
VI3-
PE
COM
-
+24V
24V DC

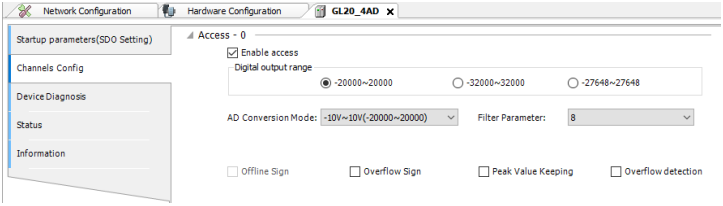
4 Program Commissioning

The following is an example where the input voltage of channel 0 of the GL20-4AD module is assigned to the corresponding variable, and AC802 is used as the main control module.

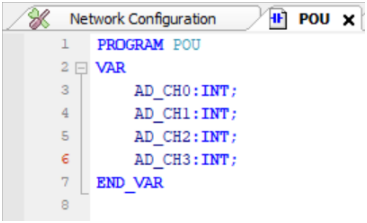
1. In the left "Devices" pane, right-click the GL20-RTU-ECT module and click "Add Device". Select "GL20-4AD" to add the module, as shown below.



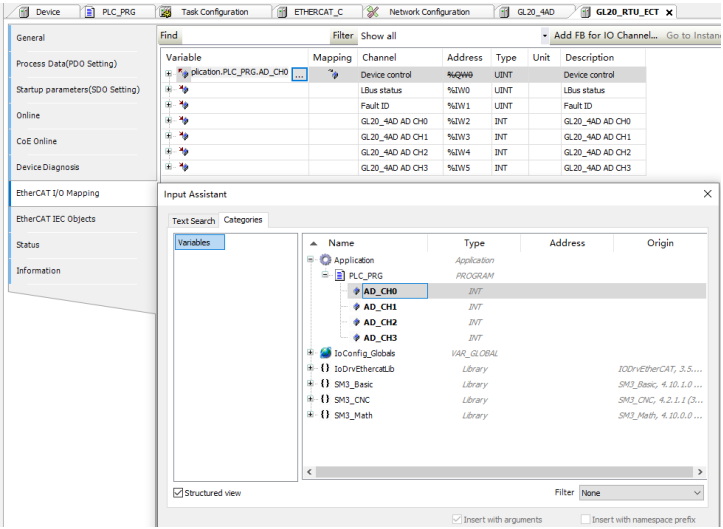
2. Right-click the GL20-4AD module to open the configuration window. In the "Channels Config" tab, enable channel 0, and modify the digital output range and conversion mode of the channel as needed. Each conversion mode corresponds to three optional digital output ranges. Then, set the filter parameter. The larger the filter parameter, the better the filtering effect.



3. Define variables "AD_CH0", "AD_CH1", "AD_CH2", and "AD_CH3" with the ST programming language, as shown below.



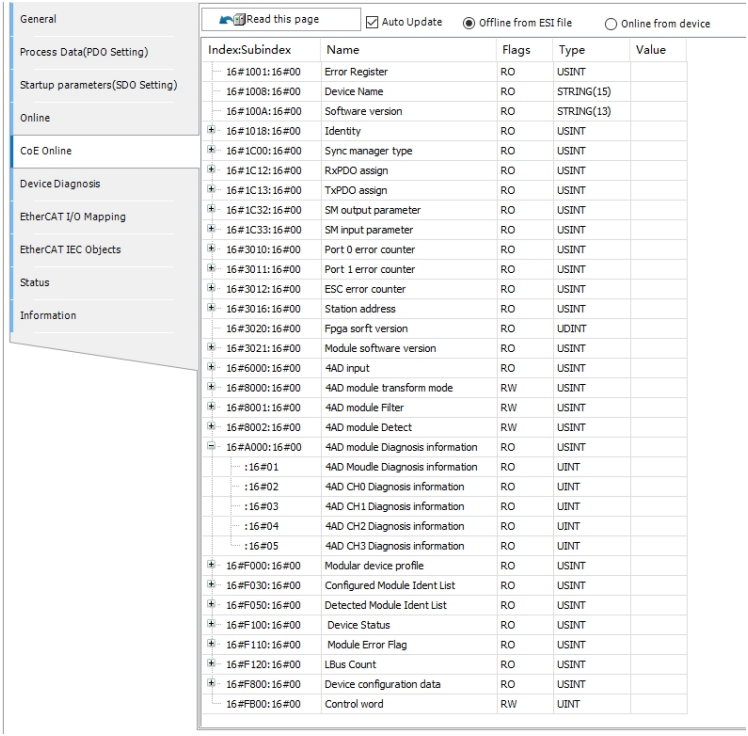
4. Map the variable "AD_CH0" to channel 0 of the configured GL20-4AD module, as shown below.



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

5 Fault Diagnosis

When the ERR indicator is ON, the module is faulty. The module reports a fault code, which can be obtained through the diagnostic data object dictionary value in the "CoE Online" interface, as shown below.



Index:Subindex	Name	Flags	Type	Value
16#1001:16#00	Error Register	RO	USINT	
16#1008:16#00	Device Name	RO	STRING(15)	
16#100A:16#00	Software version	RO	STRING(13)	
16#1018:16#00	Identity	RO	USINT	
16#1C00:16#00	Sync manager type	RO	USINT	
16#1C12:16#00	RxPDO assign	RO	USINT	
16#1C13:16#00	TxPDO assign	RO	USINT	
16#1C32:16#00	SM output parameter	RO	USINT	
16#1C33:16#00	SM input parameter	RO	USINT	
16#3010:16#00	Port 0 error counter	RO	USINT	
16#3011:16#00	Port 1 error counter	RO	USINT	
16#3012:16#00	ESC error counter	RO	USINT	
16#3016:16#00	Station address	RO	USINT	
16#3020:16#00	Fpga sorft version	RO	UDINT	
16#3021:16#00	Module software version	RO	USINT	
16#6000:16#00	4AD input	RO	USINT	
16#8000:16#00	4AD module transform mode	RW	USINT	
16#8001:16#00	4AD module Filter	RW	USINT	
16#8002:16#00	4AD module Detect	RW	USINT	
16#A000:16#00	4AD module Diagnosis information	RO	USINT	
:16#01	4AD Moudle Diagnosis information	RO	UINT	
:16#02	4AD CH0 Diagnosis information	RO	UINT	
:16#03	4AD CH1 Diagnosis information	RO	UINT	
:16#04	4AD CH2 Diagnosis information	RO	UINT	
:16#05	4AD CH3 Diagnosis information	RO	UINT	
16#F000:16#00	Modular device profile	RO	USINT	
16#F030:16#00	Configured Module Ident List	RO	USINT	
16#F050:16#00	Detected Module Ident List	RO	USINT	
16#F100:16#00	Device Status	RO	USINT	
16#F110:16#00	Module Error Flag	RO	USINT	
16#F120:16#00	LBus Count	RO	USINT	
16#F800:16#00	Device configuration data	RO	USINT	
16#FB00:16#00	Control word	RW	UINT	

- Diagnostic data

  For the module in slot n (n = 0 to 31), the object dictionary definition for index 0xA000+0x40*n is shown in the table below.

Index	0xA000+0x40*n: 4AD Fault Code				
Subindex	Name	Data Type	Access Type	Mapping	Default Value
0	4AD fault code count	USINT	RO	NO	5
1	4AD module diagnosis information	UINT	RO	NO	0
2	4AD CH0 diagnosis information	UINT	RO	NO	0
3	4AD CH1 diagnosis information	UINT	RO	NO	0
4	4AD CH2 diagnosis information	UINT	RO	NO	0
5	4AD CH3 diagnosis information	UINT	RO	NO	0

- Module fault code

Fault Code	Description	Solution
0x5003	External 24 V power failure	Check the isolated power supply of the module.
0x5004	ADC device configuration parameter fault	1. Check whether the external 24 V power supply voltage is stable. 2. Restart the module.

- Module channel fault code

Fault Code	Description	Solution
0x6001	Channel open-circuited	When the wire break detection is enabled, ensure the input current or voltage is greater than the minimum value in the current (4 mA to 20 mA) or voltage (1 V to 5 V) mode.
0x6002	Channel short-circuited	/
0x6003	Channel data upper limit exceeded	Check the sensor, wiring, and configuration limit range.

Fault Code	Description	Solution
0x6004	Channel data lower limit exceeded	Check the sensor, wiring, and configuration limit range.
0x6005	Channel data overflow	The sensor measuring range has been exceeded.
0x6006	Channel data underflow	The sensor measuring range is not reached.

6 Appendix: Version Matching Information

Contact Inovance technical support to obtain the firmware of the module and the firmware of communication interface module. XML files and the AutoShop/InoProShop software can be downloaded from the software and debugging tools tab on the GL20 series product page at *https://www.inovance.com*. The following table describes the version matching information.

Module Firmware Version	Communication Interface Module Firmware Version	XML/GSD File Version	AutoShop/InoProShop Version
Board software: 1.1.5.0 and later Logic software: 0.1.3.0 and later	• GL20-RTU-ECT: Board software 2.4.3.0 and later, logic software 0.1.2.1 and later • GL20-RTU-ECT32: Board software 2.5.9.0 and later, logic software 0.1.4.2 and later • GL20-RTU-PN: Board software 2.0.0.5 and later, logic software 0.1.4.0 and later • GL20-RTU-EIP: Board software 1.1.6.0 and later, logic software 0.1.4.2 and later	• GL20-RTU-ECT: 1.2.7.0 and later • GL20-RTU-ECT32: 3.0.2.0 and later • GL20-RTU-PN: 20220930 and later • GL20-RTU-EIP: V00.01 and later	• AutoShop: V4.6.0.0 and later • InoProShop: V1.7.3 SP2 and later