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PS00014054A00

GL20-0004ETP-2A
High Current Digital Output Module
User Guide

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Preface

■ Introduction

The GL20-0004ETP-2A module is a 4-channel high current digital output module applicable to the Easy series products and the GL20 series communication interface modules (such as GL20-RTU-ECT and GL20-RTU-ECT32).

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

■ Compliance

The following table lists the certifications, directives, and standards applicable to this product. For certifications actually acquired for the product you purchased, see the certification marks on the product nameplate.

Certification	Directive		Standard
CE	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	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	-		UL 61010-1 UL 61010-2-201 CAN/CSA-C22.2 No. 61010-1 CSA-C22.2 No. 61010-2-201
KCC	-		-
EAC	-		-

Certification	Directive		Standard
UKCA	Safety Regulations	Electrical Equipment (Safety) Regulations 2016	EN 61010-1 EN 61010-2-201 EN 61131-2
	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

Doc Name	Data Code	Description
GL20-RTU-ECT Communication Interface Module User Guide	PS00004985	Describes the installation and wiring details of the product.
GL20-RTU-ECT32 Communication Interface Module User Guide	PS00013434	Describes the product information, mechanical installation, electrical installation, program commissioning, and troubleshooting.
GL20-0004ETP-2A High Current Digital Output Module User Guide	PS00014054	Describes the mechanical installation, electrical installation, program commissioning, troubleshooting, and version compatibility of the product.

■ Revision History

Date	Version	Description
October 2023	A00	First release

■ Access to the Guide

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

- Visit *www.inovance.com*, go to "Support" > "Download", search by keyword, and then download the PDF file.
- Scan the QR code on the product with your smart phone.
- Scan the QR code below to install the Inovance app, and search for the file in the app.

■ Warranty

For faults and damage incurred during normal use in the warranty period, Inovance provides free repair service. (For details of the warranty period, see the purchase order.) A maintenance fee will be charged out of the warranty period.

Even in the warranty period, a maintenance fee will be charged for repair of the following damage:

- Damage caused by operations not following the instructions in the guide
- Damage caused by fire, flood, or abnormal 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 fee will be charged according to our latest Price List if not otherwise agreed upon.

For details, see the Product Warranty Card.

General Safety Precautions

■ Safety Disclaimer

1. Read the safety precautions before installing, operating, and maintaining this product.
2. To ensure personal and equipment safety, follow all safety precautions marked on the product and described in the user guide when installing, operating, and maintaining this product.
3. "CAUTION", "WARNING", and "DANGER" messages in the guide are only examples and do not cover all safety precautions.
4. Use this product in an environment that complies with the design specifications. Malfunctions or component damage caused by improper use is not covered by warranty.
5. Inovance shall not be liable for any physical injuries or property loss caused by improper use.

■ Safety Categories and Definitions

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

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

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

Control System Design

- Design a safety circuit to ensure that the control system can still work safely upon an external power outage or programmable controller failure.
- The product may catch fire or emit smoke in case of prolonged overcurrent due to overload or short circuit of load. Therefore, configure an external safety device such as a fuse or circuit breaker.

WARNING

- Design an external emergency stop circuit, protective circuit, forward and reverse rotation interlock circuit, as well as up and down limit interlock circuit to be connected to the programmable controller.
- Design an external protective circuit and a safety mechanism for output signals that may cause major incidents.
- When the programmable controller CPU detects a system exception, it may turn off all outputs. When partial circuit of the controller malfunctions, the controller outputs may become uncontrollable. To ensure proper operation, it is necessary to design an appropriate external control circuit.
- If a programmable controller output unit such as the relay or transistor is damaged, its output cannot be controlled to turn ON or OFF.
- The programmable controller is intended for use in an indoor electrical environment with an overvoltage class of II. The power system must contain a lightning arrester to prevent lightening from causing overvoltage on the power supply input, signal input, and control output terminals of the programmable controller and damaging the equipment.

Installation

WARNING

- Only allow trained professionals with electrical expertise to install this product.
- Cut off all external power sources before you install or remove this product. Failure to comply may result in electric shock or faults or malfunctions of this product.
- Do not use the programmable controller in places with dirt, oily fume, conductive dust, corrosive gas, flammable gas, high temperature, condensation, wind and rain, vibration, or shock. Electric shock, fire, and improper operation will lead to damage and deterioration of the product.
- The programmable controller is an open-type device to be installed in a control cabinet with a door lock (housing IP rating higher than IP20). Only allow trained operators with electrical expertise to open the cabinet.

CAUTION

- During installation, prevent metal chippings and cable ends from falling into the vent of the product. Failure to comply may result in fire, faults, or malfunctions.
- After installation, ensure that no unwanted objects exist on the ventilation surface. Failure to comply may result in poor heat dissipation, fire, faults, or malfunctions.
- During installation, tightly connect the product and its connectors and firmly lock its hooks. Improper module installation may lead to malfunctions, faults, and detachment.

Wiring

- Only allow trained professionals with electrical expertise to conduct wiring for this product.
- Cut off all external power sources before wiring. Failure to comply may result in electric shock or equipment faults or malfunctions.
- Properly insulate the cable terminals and ensure a proper insulation distance between the cables connected to the terminal block. Failure to comply will result in electric shock or equipment damage.

- Turn off the main power supply before connecting it to the product. Failure to comply may result in electric shock.
- Select a proper power supply according to the power supply specifications of the product in the "Technical Specifications" section. If the selected power supply is beyond the required range, the product may be damaged. Regularly check whether the DC power provided by the switching-mode power supply unit is stable.

Operation and Maintenance

- Only allow trained professionals with electrical expertise to operate and maintain this product.
- Do not touch terminals when the power is on. Failure to comply may result in electric shock or malfunctions.
- Cut off all external power sources before you clean the product. Failure to comply may result in electric shock.
- Cut off all external power sources before you install or remove the product or communication cables. Failure to comply may result in electric shock or malfunctions.

Safety suggestions

- In places where operators have direct contact with mechanical parts, such as loading and unloading places and areas with automatic machinery operation, carefully configure an on-site manual operating device or alternative means that works independently of the programmable controller and can start or stop the automatic operation.
- If programs need to be modified when the system is running, apply a lock or take other necessary measures to ensure that only authorized personnel can perform such modification.

Disposal

- Dispose of this product as industrial wastes. Dispose of the battery separately in accordance with local laws and regulations.
- Recycle retired equipment in accordance with waste disposal standards of the industry to avoid environmental pollution.

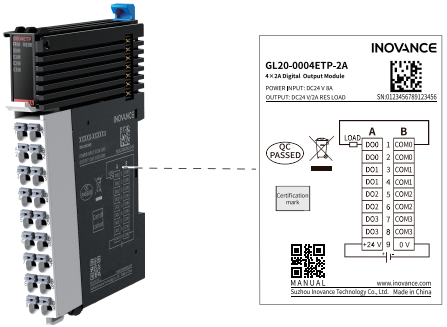
1 Product Information

1.1 Model and Nameplate

GL 20 - 00 04 E TP - 2A

① ② ③ ④ ⑤ ⑥ ⑦

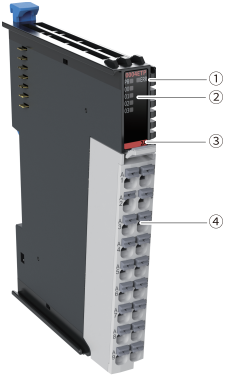
① **Product Information** GL: Inovance general local module	④ **I/O Points** 04: 4-point output	⑦ **Current** 2A: Output current of 2 A per channel (four channels provided)
② **Series** 20: The 20 series module	⑤ **Module Type** E: Logic I/O expansion module	- -
③ **I/O Points** 00: 0-point input	⑥ **Output Type** TP: Transistor output (source type)	- -



Based on the naming rules and nameplate information described above, the ordering data for this product is:

Model	Description	Product Code	Applicable Device
GL20-0004ETP-2A	GL20 series 4-channel high current digital output I/O module	01440512	GL20 series communication interface modules, Easy series, and other series

1.2 Components



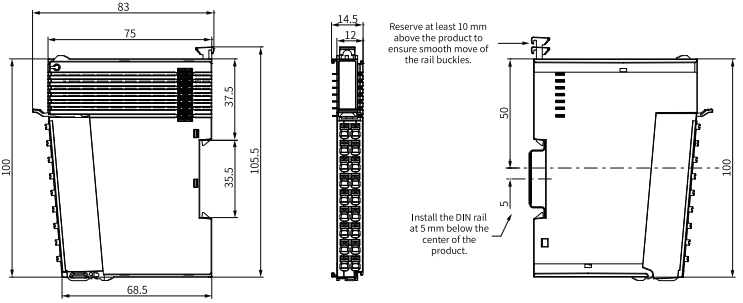
No.	Interface	Function			
①	Signal indicator	PR (POWER +RUN)	Power/Run indicator	Yellow-green	• Steady ON: The module is running properly. • Quick blinking: Module addressing succeeds. • Slow blinking: The module is powered on, but addressing fails. • OFF: The module is not powered on, or a module fault occurs.
		ERR	Error indication	Red	The module is faulty.
②	I/O signal indicator	00 to 03	I/O signal indication	Yellow-green	• Steady ON: The output is active. • Steady OFF: The output is inactive.
③	Color code	Red: Digital output		Orange: Analog output	
		Gray: Digital input		Green: Analog input	
		White: Communication		Blue: Other modules	
④	User terminal	For details, see *"4.2 Terminals" on page 26*.			

Note

- Flashing quickly: on for 200 ms followed by off for 200 ms.
- Flashing slowly: on for 200 ms followed by off for 1000 ms.

1.3 Product Dimensions

Installation dimensions are shown below in millimeters (mm).

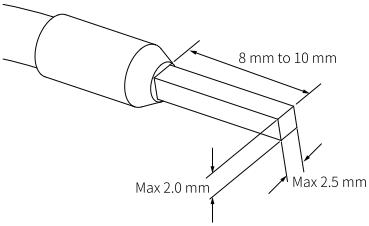


1.4 Spare Parts and Options

The cable lugs and cable sizes in the following table are for reference only. Select proper cables based on actual situations.

Material Name	Applicable Cable Size		KST		Suzhou Yuanli	
	mm^2	AWG	Model	Crimping Tool	Model	Crimping Tool
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 other tubular lugs are used, crimp them to twisted cables. The following figure shows requirements on the shape and size.


8 mm to 10 mm
Max 2.0 mm
Max 2.5 mm

2 Specifications

2.1 Electrical Specifications

■ Power supply specifications

Item	Specifications
Rated voltage of bus input power	5 VDC (4.75 VDC to 5.25 VDC)
Rated current of bus input power	< 100 mA (typical value at 5 V)
Rated voltage of terminal input power	24 VDC (20.4 VDC to 28.8 VDC)
Rated current of terminal input power	8 A (typical value at 24 V)
Protection against terminal power reverse connection	Supported
Rated voltage of terminal output power	None
Rated current of terminal output power	None
Hot swapping	Not supported

■ Output specifications

Item	Specifications
Output type	Digital output; transistor PNP
Output mode	Source type (Current flows from the output terminal to the load.)
Output channels	4
Output voltage class	24 VDC (20.4 VDC to 28.8 VDC)
Load resistance range	12 Ω to 4000 Ω (When the resistance is greater than 4000 Ω, the module will falsely report an open circuit fault. It is recommended to disable the open circuit fault diagnosis.)
Output load (resistive load)	2 A/point; 8 A/module

Item	Specifications
Output load (inductive load)	28.8 W/point; 57.6 W/module
Output load (lamp load)	10 W/point
Hardware response time (ON/OFF)	100 μs/100 μs
Leakage current at OFF	50 μA
Switching frequency	100 Hz for resistive load; 0.5 Hz for inductive load; 10 Hz for lamp load
Isolation	Yes
Output action display	The output indicator lights up (controlled by software) when the output is in drive state.
Output derating	Derated to 62.5% at the ambient temperature of 55°C (total current when all the output channels are ON must not exceed 5 A). Alternatively, when all the output channels are ON, lower the maximum allowed temperature by 10°C.
Protection	• Short circuit protection: Supported • Overcurrent protection: Supported • Typical overcurrent point value: 2.8 A (2.4 A to 3.2 A) • Over-temperature protection: Supported • Overload protection: Supported
Diagnosis	Short circuit diagnosis, open circuit diagnosis (SWITCH OFF/SWITCH ON), and power supply diagnosis

Note

When there is no load and the switch is OFF, each DO interface has an output voltage within the range of 5.7 VDC to 7.8 VDC. This is normal and does not affect the functioning of the module. Such voltage disappears once a load is connected.

2.2 Technical Specifications

■ General specifications

Item	Specifications
IP rating	IP20
Dimensions (W x H x D)	12 mm x 100 mm x 75 mm
Weight	Approx. 60 g

■ Software specifications

Item	Specifications
Output state in case of fault reaction	Zeroing, retaining current value, or output based on preset value
Preset output value in case of fault reaction	0 or 1
Output port exception detection and indication	None
Output channel logic level configuration	Not supported
Independent channel enable configuration	Not supported
Diagnostic reporting configuration	Not supported
Stop mode	Output based on fault reaction and preset value and no longer updated
I/O mapping	Bit-wise access, byte range-wise access, and word-wise access

Note

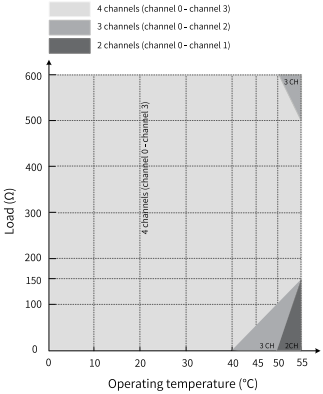
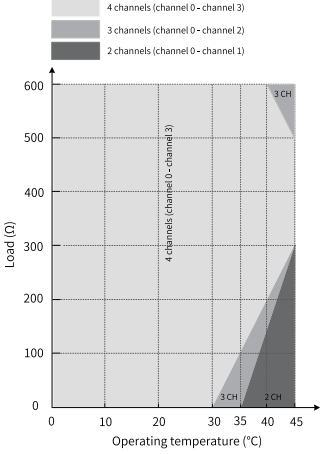
Common fault reaction scenarios include:

- Background start/stop;
- Unplugging the network cable or manually switching states causing the GL20 communication interface module bus to be in a non-operational communication state; and
- Local bus stoppage.

■ Environmental specifications

Item	Specifications
Operating environment	Places without corrosive or inflammable gas or severe conductive dust
Altitude	⩽ 2000 m
Pollution degree	PD2
Noise immunity	2 kV on power supply line (IEC 61000-4-4)
Overvoltage category	I
EMC immunity level	Zone B, IEC 61131-2
Vibration resistance	IEC 60068-2-6 3.5 mm at 5 Hz to 8.4 Hz; 1·g at 8.4 Hz to 150 Hz; 10 sweeps in each X, Y, or Z direction
Shock resistance	IEC 60068-2-27 150 m/s^2, 11 ms; six directions: ±X, ±Y, and ±Z; 3 cycles/direction, totaling 18 cycles
Storage temperature and humidity	• Temperature: –40°C to +70°C • Relative humidity: < 90%, non-condensing

Item		Specifications
Ambient temperature and humidity		Temperature: –20°C to +55°C Relative humidity: 10% to 90%, non-condensing Note: When the ambient temperature exceeds the upper limit, a cooling fan or air conditioner must be installed along the heat dissipation hole direction.
Installation position and limit	Installation position	For details, see *"3.2 Installation Orientation Requirements" on page 19*.

Item		Specifications
Continued	Limit	Horizontal installation: 
Continued	Con-tinu-ed	Non-horizontal installation: 

3 Mechanical Installation

3.1 Installation Precautions

- Before installing or removing the module, ensure that the module is powered off.

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.

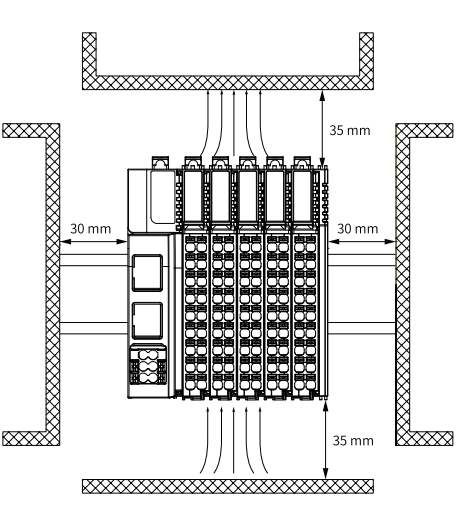
- Do not let the casing or terminals of the module drop or be impacted to prevent module damage.

3.2 Installation Orientation Requirements

This product can be installed in the horizontal orientation (DIN rail placed horizontally) or non-horizontal orientation. Different installation orientations have different ambient temperature requirements. For details, see *"2.2 Technical Specifications" on page 15*.

■ Optimal installation position

The optimal installation position for this product is horizontal. At least the minimal clearance shown in the following figure must be reserved around the module to ensure ventilation, heat dissipation, and wiring space.

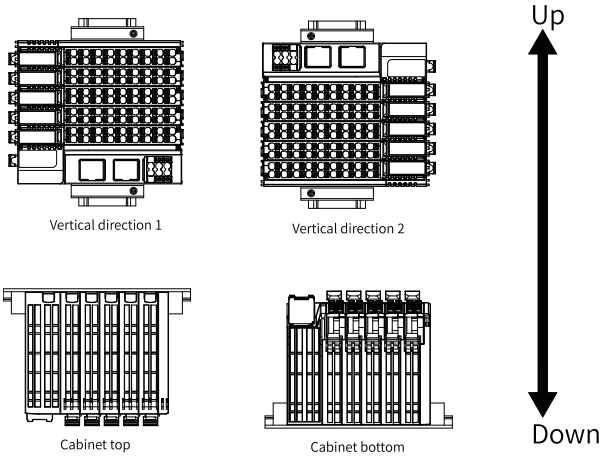


Note

If there is a high-temperature heat source (heater, transformer, large resistor, etc.) in vicinity of the product, keep the product away from the heat source by at least 100 mm.

■ Other installation positions

For other installation positions, the same clearance requirements as the optimal installation position apply. Other installation positions are shown in the following figure.



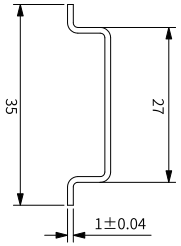
Caution

In case of vertical installation:

- If the module is mounted to the PLC, make sure the PLC is arranged below all I/O modules (see vertical direction 1). The number of modules must not exceed 6, and the type of modules is not limited.
- Hold the cables with a cable duct to prevent the weight of cables being applied to the lower end plate, which may result loose of the product from the DIN rail.

3.3 Installation Method

The module is installed on a DIN rail, which must comply with the IEC 60715 standard (35 mm wide, 1 mm thick). The rail dimensions are shown in the following figure, in millimeters (mm).

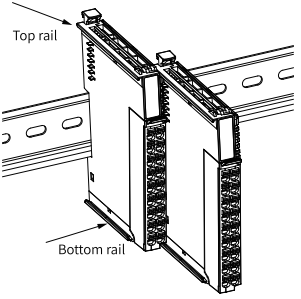


Caution

If the module is not installed on the recommended DIN rail (especially when the DIN rail thickness is not 1.0 mm), DIN rail buckles may not be locked. In this case, the module cannot be installed in place and will fail to work properly.

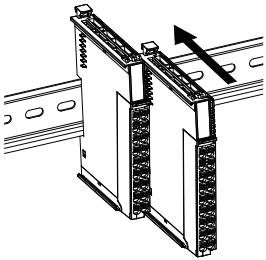
■ Installing the module on another module

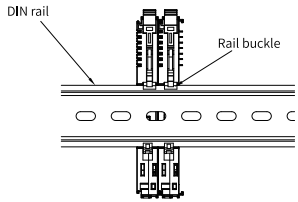
Install the I/O module by sliding it on the top and bottom rails of another module, as shown in the following figure.



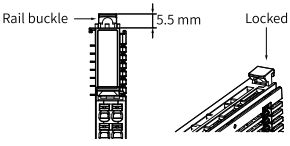
■ Installing the module on the DIN rail

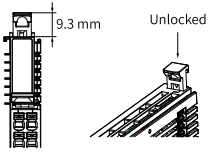
1. Align the module with the DIN rail and push the module in the direction of the arrow until it clicks into place with a distinct locking sound, as shown in the following figure.





2. Ensure that the DIN rail buckles of the module are locked. The following figures show the locked and unlocked states of the buckles.





- The buckles are locked when pressed down.
- The buckles are unlocked when lifted up.

Pressing the buckles locks them.

Caution

When the module is not installed on the DIN rail, keep the rail buckles in locked state. If the rail buckles remain in unlocked state for a long period of time, they will be invalidated.

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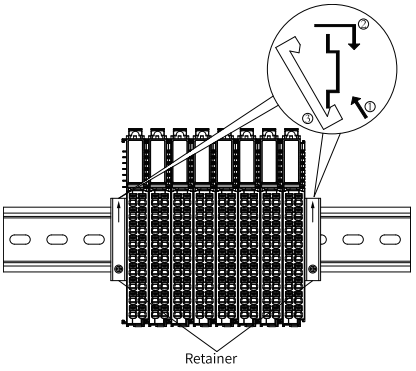
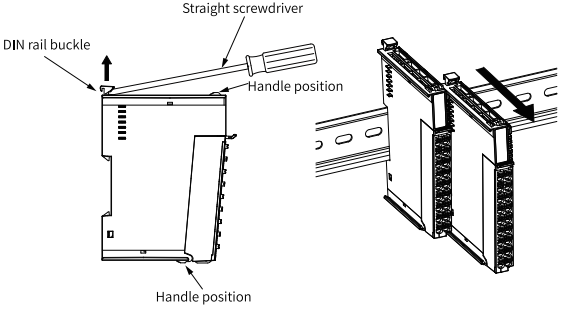
3. Install a DIN rail retainer on each side of the main unit or module, as shown in the following figure.

   When you install a rail retainer, hook the bottom of the retainer to the bottom of the rail, rotate the retainer to make its top hook the top of the rail, and then secure the retainer in place with a screw.



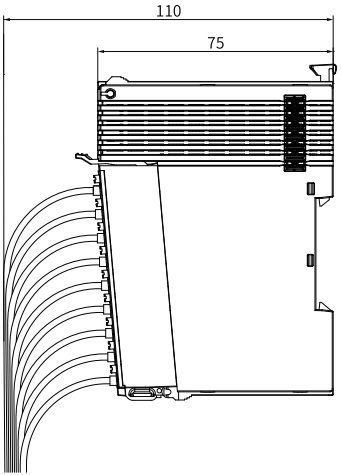
■ Removal

Use a straight screwdriver or similar tool to pry up the rail buckles, pull the module straight out by holding the handle (raised part). After removal, press down the top of the buckles.



4 Electrical Installation

4.1 Connecting Cables



Note

To ensure the reliability of the product, it is recommended to use different power supply modules for the 24 V input of the product and the 24 V input of the coupler.

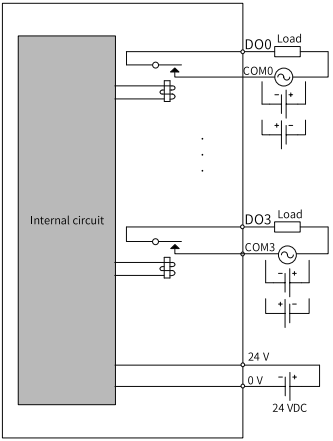
4.2 Terminals

Left Signal	Left Terminal	Right Terminal	Right Signal
DO0	A1	B1	COM0
DO0	A2	B2	COM0
DO1	A3	B3	COM1
DO1	A4	B4	COM1
DO2	A5	B5	COM2
DO2	A6	B6	COM2
DO3	A7	B7	COM3
DO3	A8	B8	COM3
+24 V	A9	B9	0 V

The following table shows the correspondence between terminal signals and signal indicators.

Terminal Signal	Signal Indicator
DO0	00
DO1	01
DO2	02
DO3	03

4.3 Electrical Wiring Diagram

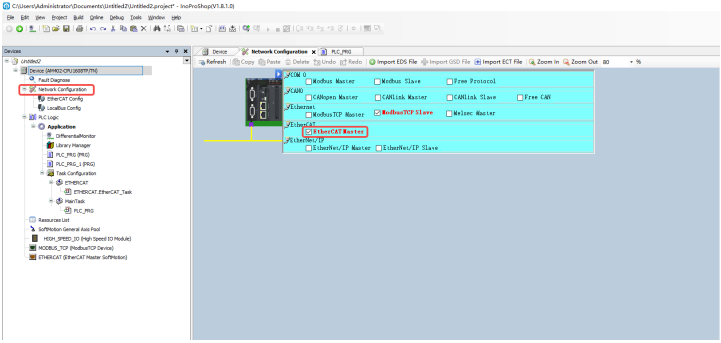


- The inrush current when a lamp load is connected to a channel must be less than the rated current when a resistive load is connected.
- Inductive loads generate a large reverse electromotive force between contacts when stopping, leading to arcing discharge. Under a given current consumption, small power means great arc energy. Therefore, consider using an arc control device.
- For inductive loads:
  - In a DC circuit, add a freewheel diode. The forward current of the freewheel diode must be greater than the load current. The reverse withstand voltage must be 5 to 10 times greater than the load voltage.
  - In an AC circuit, add an RC snubber circuit, where R is around 100 Ω to 200 Ω, and C is approximately 0.1 μF.

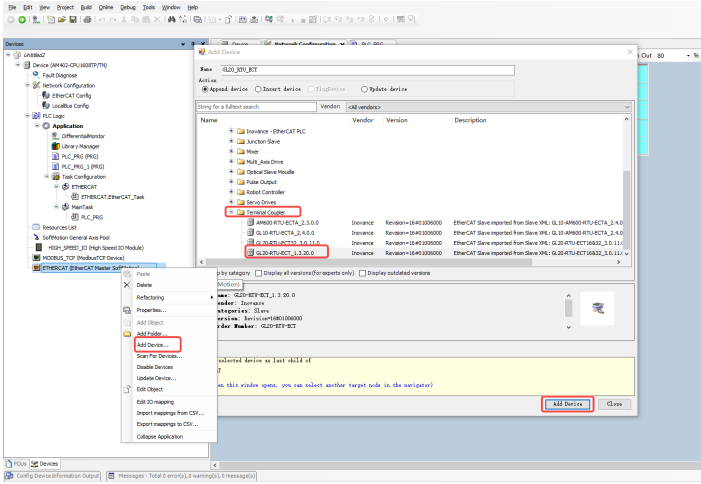
5 Program Commissioning

This section describes how to copy the variable values of the GL20-0004ETP-2A module to output variables to illustrate how to use the module, taking the AM600 series as the control master.

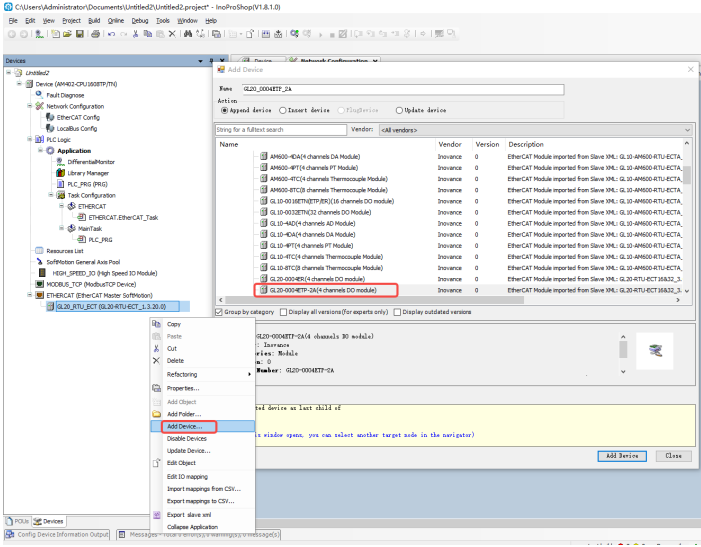
1. In the "Device" navigation tree, double-click "Network Configuration". Under the EtherCAT item, check "EtherCAT Master" to enable the host's EtherCAT master.



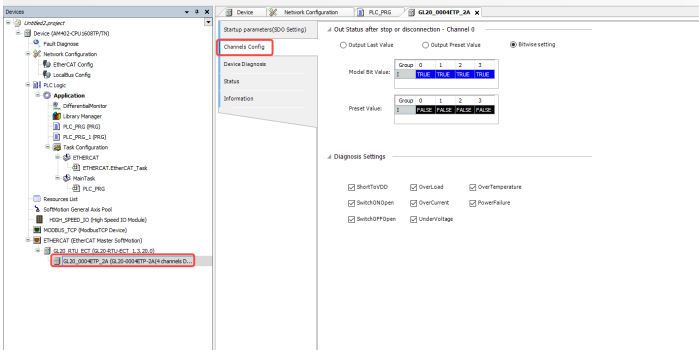
2. Right-click "ETHERCAT" and select "Add Device". In the dialog box that appears, click  to expand "Terminal Coupler". Click "GL20_RTU_ECT" and then click "Add Device" to complete adding GL20_RTU_ECT.



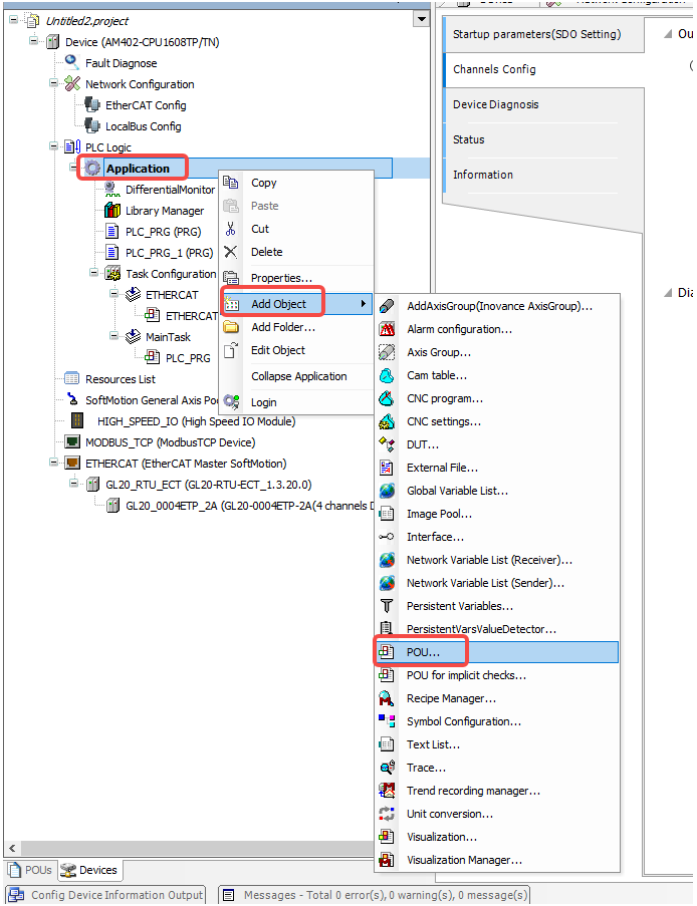
3. Right-click "GL20_RTU_ECT", select "GL20-0004ETP-2A", and click "Add Device" to complete adding GL20-0004ETP-2A.



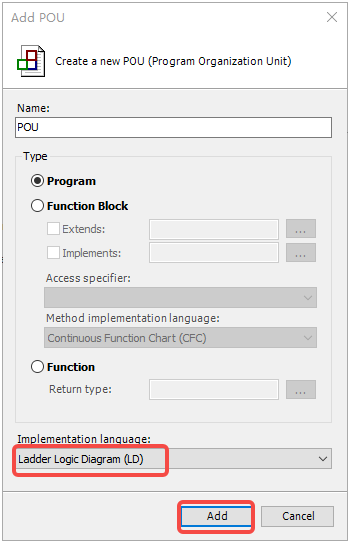
4. Double-click the "GL20-0004ETP-2A" module, click "Channels Config", and set the module output status during stop or network disconnection.



5. In the "Device" navigation tree, right-click "Application" and select "Add Object" > "POU".

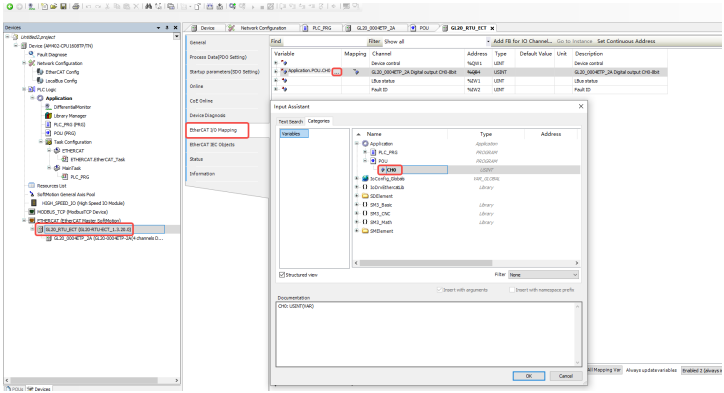


6. In the "Add POU" dialog box, set "Method Implementation Language" to "Ladder Logic Diagram (LD)" and click "Add".

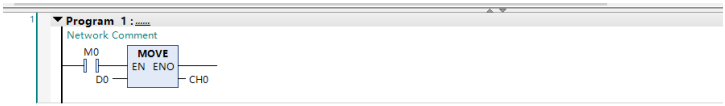


7. Double-click the "Name" column and change the name to "CH0". Double-click the "Data type" column and change the data type to "USINT". The custom variable CH0 is added.

8. In the "Device" navigation tree, double-click "GL20_RTU_ECT". In the dialog box that appears, click "EtherCAT I/O Mapping". Double-click the variable column of "GL20-0004ETP-2A", click  , select the variable CH0 created in step 7, and click "OK" to complete the variable mapping configuration.



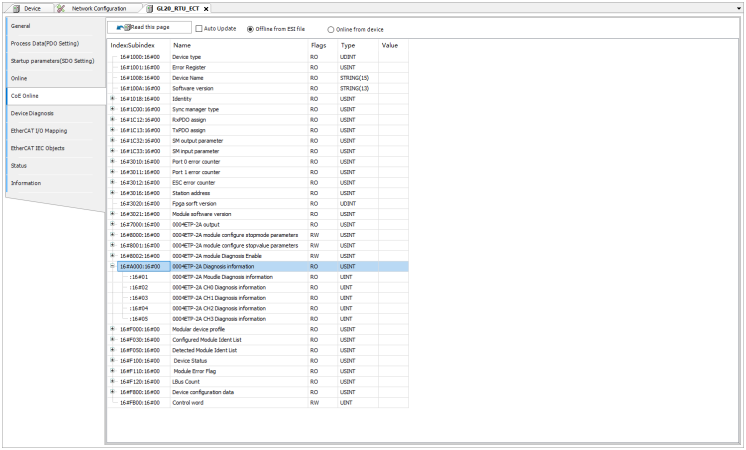
9. In the "Device" navigation tree, click  to expand "Device" > "PLC Logic" > "Application". Double-click "POU" and use the LD programming language to program and define a variable D0.



10. Click  to complete the compilation. Then, click  to download the project and run it.

6 Troubleshooting

When the ERR indicator on the module lights up, it indicates that the module has a fault. At this point, the module reports a fault code, which can be obtained from the diagnosis data object dictionary values in the "CoE Online" interface, as shown in the following figure. The object dictionary definitions are listed in the table below.



- Process data
  - Mapping data

    For a module in slot n (n = 0 to 62), the index is 0x1600+0x08*n.

Index	0x1600+0x08*n: 0004ETP-2A RPDO bit mapping				
Sub-index	Name	Data Type	Access Mode	Mapping	Default
0	Sub-index 000	USINT	RO	No	8
1	Sub-index 001	UDINT	RO	No	0x7xx00101
2	Sub-index 002	UDINT	RO	No	0x7xx00201

Index	0x1600+0x08*n: 0004ETP-2A RPDO bit mapping				
Sub-index	Name	Data Type	Access Mode	Mapping	Default
3	Sub-index 003	UDINT	RO	No	0x7xx00301
8	Sub-index 004	UDINT	RO	No	0x7xx00401

For a module in slot n (n = 0 to 62), the index is 0x1601+0x08*n.

Index	0x1601+0x08*n: 0004ETP-2A RPDO byte mapping				
Sub-index	Name	Data Type	Access Mode	Mapping	Default
0	Sub-index 000	USINT	RO	No	1
1	Sub-index 001	UDINT	RO	No	0x7xx00108

For a module in slot n (n = 0 to 62), the index is 0x1602+0x08*n.

Index	0x1602+0x08*n: 0004ETP-2A RPDO word mapping				
Sub-index	Name	Data Type	Access Mode	Mapping	Default
0	Sub-index 000	USINT	RO	No	1
1	Sub-index 001	UDINT	RO	No	0x7xx00110

- Process data

  For a module in slot n (n = 0 to 62), the index is 0x7000+0x40*n.

Index	0x7000+0x40*n: 0004ETP-2A output				
Sub-index	Name	Data Type	Access Mode	Mapping	Default
0	Sub-index 000	USINT	RO	No	1
1	Digital output of channel bits 0 to 8	USINT	RW	Yes	0

- Configuration data

  For a module in slot n (n = 0 to 62), the index is 0x8000+0x40*n.

Index	0x8000+0x40*n: 0004ETP-2A stop mode				
Sub-index	Name	Data Type	Access Mode	Mapping	Default
0	Sub-index 000	USINT	RO	No	1
1	Channel 0 digital output in stop mode	USINT	RW	No	0x0F

Sub-index 1: Channel 0 digital output in stop mode

Bits 0 to 7	Output mode during stop, with each bit corresponding to one output port 0: Maintain current output state 1: Output according to preset value of object dictionary value 8001

For a module in slot n (n = 0 to 62), the index is 0x8001+0x40*n.

Index	0x8001+0x40*n: 0004ETP-2A stop mode output value				
Sub-index	Name	Data Type	Access Mode	Mapping	Default
0	Sub-index 000	USINT	RO	No	1
1	Channel 0 digital output value in stop mode	USINT	RW	No	0

Sub-index 1: Channel 0 digital output value in stop mode

Bits 0 to 7	Output mode during stop, with each bit corresponding to one output port 0: Output 0 1: Output 1

For a module in slot n (n = 0 to 62), the index is 0x8002+0x40*n.

Index	0x8001+0x40*n: 0004ETP-2A diagnosis enable				
Sub-index	Name	Data Type	Access Mode	Mapping	Default
0	Sub-index 000	USINT	RO	No	1
1	DO module diagnosis enable	UINT	RW	No	0XFF

Sub-index 1: Channel 0 digital output value in stop mode

Bit 0	Disconnected from VDD 0: Disable 1: Enable
Bit 1	Switch-on disconnected 0: Disable 1: Enable
Bit 2	Switch-off disconnected 0: Disable 1: Enable
Bit 3	Overload 0: Disable 1: Enable
Bit 4	Overcurrent 0: Disable 1: Enable
Bit 5	Power undervoltage 0: Disable 1: Enable
Bit 6	Over-temperature 0: Disable 1: Enable

Bit 7	24 V power outage 0: Disable 1: Enable
Bits 8 to 15	Reserved

- Diagnosis data

  For a module in slot n (n = 1 to 32), the index is 0xA000+0x40*n.

Index	0xA000+0x40*n: 0004ETP-2A fault code				
Sub-index	Name	Data Type	Access Mode	Mapping	Default
0	0004ETP-2A fault code	USINT	RW	No	5
1	0004ETP-2A module fault information	UINT	RO	No	0
2	0004ETP-2A module channel 0 fault information	UINT	RO	No	0
3	0004ETP-2A module channel 1 fault information	UINT	RO	No	0
4	0004ETP-2A module channel 2 fault information	UINT	RO	No	0
5	0004ETP-2A module channel 3 fault information	UINT	RO	No	0

Module fault codes

Fault Code	Fault	Solution
0x5002	Power undervoltage	Check the 24 V power supply voltage.
0x5003	24 V power outage	Check the 24 V power supply.
0x5011	Over-temperature	Lower the module temperature. The fault is automatically cleared when the junction temperature (the actual operating temperature of the semiconductor in an electronic device) falls below 140°C.
0x6050	Short-circuited to VDD	Check if the DO interface of the faulty channel, especially the external wiring, is short-circuited to VDD (24 V).
0x6051	Switch-on disconnected	1. Check if the wiring between the DO interface of the faulty channel and the load is normal. 2. Check if the load impedance meets the "load resistance range" requirements in *"2.1 Electrical Specifications" on page 13*.
0x6052	Switch-off disconnected	1. Check if the wiring between the DO interface of the faulty channel and the load is normal. 2. Check if the load impedance meets the "load resistance range" requirements in *"2.1 Electrical Specifications" on page 13*.
0x6053	Overcurrent	1. Check for any short circuit of the load. 2. Check if the load impedance meets the "load resistance range" requirements in *"2.1 Electrical Specifications" on page 13*.
0x6054	Overload	1. Check for any short circuit of the load. 2. Check if the load impedance meets the "load resistance range" requirements in *"2.1 Electrical Specifications" on page 13*.

7 Appendix: Version Compatibility

Explanation

For module firmware and communication interface module firmware, contact Inovance technical personnel to obtain. For XML files and InoProShop software, you can obtain from the "Software and Debugging Tools" section on the GL20 series product page (*https://www.inovance.com*). The version compatibility is shown in the following table.

Module Firmware Version	Communication Interface Module Firmware Version	XML/GSD File Version	InoProShop Version
PCB software: 0.1.13.0 or later	• GL20-RTU-ECT: PCB software 2.4.13.0 or later • GL20-RTU-ECT32: PCB software 2.5.9.0 or later • GL20-RTU-PN: PCB software 2.2.6.4 or later	• GL20-RTU-ECT: 1.3.19.0 or later • GL20-RTU-ECT32: 3.0.4.0 or later • GL20-RTU-PN: GSDML-V2.31-inovance-GL20-20230816 or later	InoProShop: V1.8.0.0 or later