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PS00007634A05

GL20-3232ETN-M Series

Digital Input and Output Module

User Guide

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Preface

■ Introduction

The GL20-3232ETN-M digital input and output expansion module includes 32 input channels and 32 output channels. The module can be used with Easy series PLCs and GL20 series communication interface modules such as GL20-RTU-ECT. A coupler can expand up to eight GL20-3232ETN-M modules. For configurations with more than eight modules, a GL20-PS2 power supply module is required.

This guide introduces the product information, mechanical installation, electrical installation, commissioning, and troubleshooting 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
KCC Certification	-		-

Certification	Directive		Standard
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	Introduces the installation, wiring, and other information of the product.
GL20-RTU-PN Series Communication Interface Module User Guide	PS00007594	Introduces the installation, wiring, and other information of the product.
GL20-RTU-ECT32 Series Communication Interface Module User Guide	PS00013434	Introduces the product information, mechanical installation, electrical installation, commissioning, and troubleshooting of the product.
GL20-3232ETN-M Series Digital Input and Output Module User Guide (This guide)	PS00007634	Introduces the product information, mechanical installation, electrical installation, commissioning, and troubleshooting of the product.

■ Revision History

Date	Version	Revision
March 2025	A05	Modified the input/output wiring diagrams in *"3.3 Terminal Wiring" on page 28*.
January 2024	A04	**Added:** Added *"2.1 Installation Precautions" on page 18*. **Modified:** • Modified the component descriptions in *"1.2 Components" on page 12*. • Modified *"2.3 Installation Method" on page 19*. • Modified the operation steps in *" Program Commissioning" on page 33*. • Modified *" Troubleshooting" on page 42*. • Modified the matching version in *" Appendix: Version Matching Information" on page 45*.
August 2023	A03	• Added *" Troubleshooting" on page 42*. • Added *" Appendix: Version Matching Information" on page 45*.
July 2023	A02	Modified *"3.1 External Terminal Block and Cable Selection" on page 23*.
April 2023	A01	**Added:** Added general specifications in *"1.3 Technical Specifications" on page 14*. **Modified:** • Modified *"2.3 Installation Method" on page 19*. • Modified *"3.1 External Terminal Block and Cable Selection" on page 23*.
February 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

- 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. You will be charged for any repair work 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 the Product Warranty Card.

Safety Precautions

■ Safety Disclaimer

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 the 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 Definitions

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

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

"CAUTION" indicates that failure to comply with the notice may result in minor or moderate personal injury 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 a fuse or circuit breaker because the module may smoke or catch fire due to long-time overcurrent caused by operation above rated current or load short-circuit.

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 circuits and safety mechanism.
- Once the CPU of the controller detects an exception in the system, all outputs may be closed. When a fault occurs in the controller circuit, the output may not be under control. Therefore, it is necessary to set up an 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 (overvoltage category II). The power supply must have a system-level surge protector, assuring that overvoltage due to lightning shock cannot be applied to the PLC's power supply input terminals, signal input terminals, and output terminals, to prevent damage to the equipment.

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 disassembling 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.
- 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 the module is connected to the respective connector securely and hook the module firmly. Improper installation may result in malfunction, fault or fall-off.
- Ensure natural ventilation for the equipment.

Wiring

DANGER

- 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.
- Install the terminal cover attached to the product before power-on or operation after wiring is done. 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 equipment.

Wiring

- To avoid electric shock, cut off the power supply before connecting the equipment to the power supply.
- The input power supply of this product must be 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 screws of 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 in accordance with industry waste disposal standards to avoid environmental pollution.

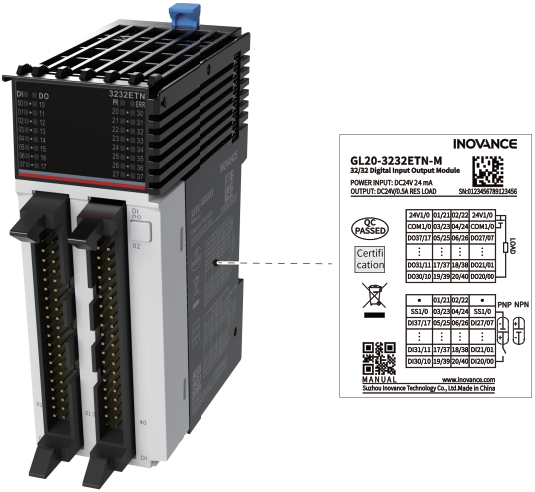
1 Product Information

1.1 Naming Rules and Nameplate

GL 20 - 32 32 E TN - M

① ② ③ ④ ⑤ ⑥ ⑦

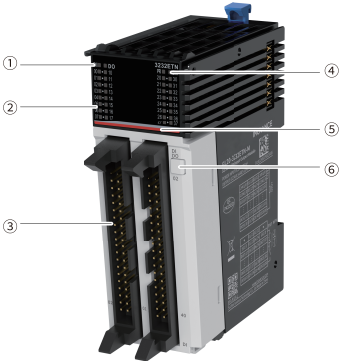
① **Product Information** GL: Inovance general local module	③ **Number of I/O Channels** 32 input channels	⑤ **Module Type** Logic I/O expansion module	⑦ **Terminal Type** M: Ejector header (For the PUSHIN terminal, this item is empty by default)
② **Series Number** 20: 20 series module	④ **Number of I/O Channels** 32 output channels	⑥ **Output type** Transistor output (sink type)	-



The data for ordering the product is shown below.

Model	Description	Code	Applicable Model
GL20-3232ETN-M	GL20 series module with 32 digital input channels and 32 NPN transistor output channels	01440290	Easy series products and GL20 series communication interface modules such as GL20-RTU-ECT

1.2 Components



No.	Name	Description			
①	DI/DO indicator	DI indicator is ON: The module is in the input state. DO indicator is ON: The module is in the output state.			
②	I/O signal indicator	Corresponding to various input/output signals: • ON: input/output active • OFF: input/output inactive			
③	I/O terminals	/	32 inputs and 32 outputs	/	For details, see *"3.2 Terminal Definition" on page 25*.

<table>
<tr><th>No.</th><th>Name</th><th colspan="4">Description</th></tr>
<tr><td rowspan="2">④</td><td rowspan="2">Signal indicator</td><td>PR (POWER +RUN)</td><td>Power/Run indicator</td><td>Yellow-green</td><td>• Steady ON: The module is in normal operation.
• 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>Error indicator</td><td>Red</td><td>ON when the module is faulty. For details, see "Troubleshooting" on page 42.</td></tr>
<tr><td rowspan="3">⑤</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>
<tr><td>⑥</td><td>DI/DO switch button</td><td colspan="4">Switches the input/output state of the module. By default, the module is in the input state (DI indicator ON). When the button is pressed down, the DO indicator is ON and the DI indicator is OFF, indicating the module is switched to the output state.</td></tr>
</table>

Note

- Quick flashing: The indicator is on for 200 ms and off for 50 ms, repeating this cycle.
- Slow flashing: The indicator is on for 200 ms and off for 1 s, repeating this cycle.

1.3 Technical Specifications

■ General specifications

Item	Specification
IP rating	IP20
Dimensions (W x H x D)	36 mm x 100 mm x 76.1 mm
Weight	About 164 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	250 mA (typical value @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 value @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	Digital input
Input mode	Sink/source mode
Number of input channels	32
Input voltage class	24 VDC±10% (21.6 VDC to 26.4 VDC)
Input current (typical)	4 mA (typical value@24 V)

Item	Specification
ON voltage	15 VDC
OFF voltage	< 5 VDC
ON/OFF hardware response time	100 μs/100 μs
Software filter time	Supported
Input impedance	Reference: 5.3 kΩ to 5.6 kΩ
Isolation	Isolated
Input indicator	The input indicator turns on (controlled by software) when the input is in drive state.
Input derating	The module works at full load at 45°C (with the number of simultaneously ON input channels not exceeding 32) and works at 50% of full load at 55°C (with the number of simultaneously ON input channels not exceeding 16).

■ Output specifications

Item	Specification
Output type	Digital output/transistor output
Output mode	Sink mode
Number of output channels	32
Output voltage class	24 VDC±10% (21.6 VDC to 26.4 VDC)
Output load (resistive load)	0.5 A/channel; 8 A/module
Output load (inductive load)	7.2 W/channel; 48 W/module
Output load (lamp load)	5 W/channel; 36 W/module
ON/OFF hardware response time	100 μs/100 μs
Leakage current upon OFF	10 μA
Switching frequency	Resistive load: 100 Hz; inductive load: 0.5 Hz; lamp load: 10 Hz
Isolation	Isolated

Item	Specification
Output indicator	The output indicator turns on (controlled by software) when the output is in drive state.
Output derating	The module works at full load at 45°C (with a maximum total current of 8 A for 32 output channels) and works at 50% of full load at 55°C (with a maximum total current of 4 A).

■ Software specifications

Item	Specification
Input PDO data volume	4 bytes
Output PDO data volume	4 bytes
Output state mode during fault stop	Output zero, output last value, output preset value
Preset value output during fault stop	0 or 1
Output terminal fault detection and indication	/
Output channel logic level configuration	Not supported
Independent channel enable configuration	Not supported
Diagnostic report configuration	Not supported
Output in the stop mode	Output zero, last value, or preset value according to the output state mode during fault stop, without further refreshing.

1.4 Environmental Specifications

Item	Specification
Installation/ application environment	Free from conductive dust, conductive fibers, explosive dust, flammable gases, water mist/greasy dirt, corrosive dusts/gases, strong vibration, and repetitive shock
Altitude	⩽ 2,000 m
Pollution degree	2
Immunity	2 kV on power supply cable (compliant with IEC 61000-4-4)

Item	Specification
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 from 5 Hz to 8.4 Hz; 1 g acceleration from 8.4 Hz to 200 Hz; 10 cycles per axial direction • Transportation scenario: Tested according to IEC60068-2-64, 0.01 g^2/Hz power spectral density from 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 acceleration, 11 ms pulse width, 18 cycles in total in X, Y and Z axial 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

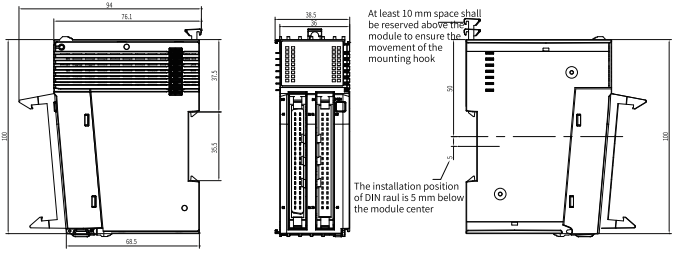
2.1 Installation Precautions

- 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.
- Prevent the enclosure or terminals of the module from dropping or being impacted to avoid damage to the module.

2.2 Installation Dimensions

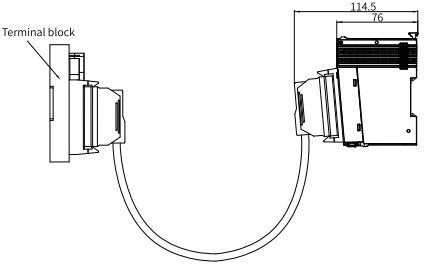
The installation dimensions (in mm) are shown in the figure below.

■ Module



■ Cable connection

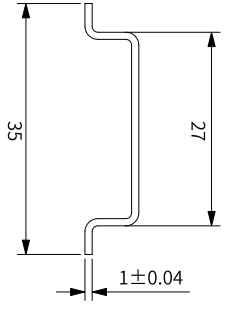
Cable dimensions (in mm) are shown in the figure below.



2.3 Installation Method

■ Installing modules side by side

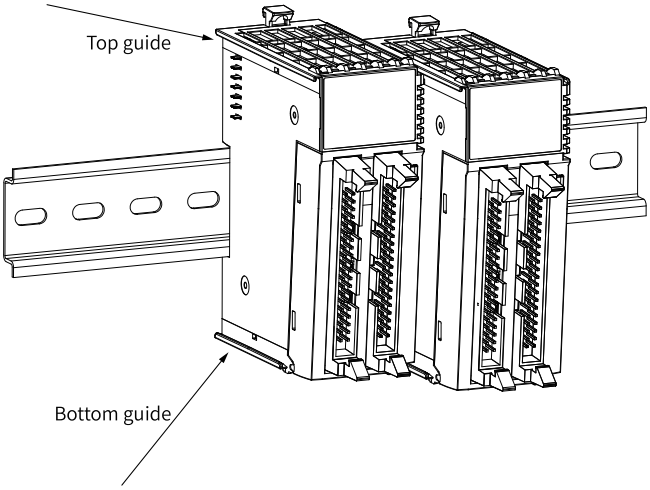
The module is mounted onto a DIN rail according to IEC 60715 (width: 35 mm, thickness: 1 mm). The dimensions (in mm) are shown below.



Caution

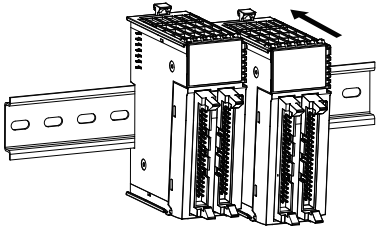
When installed on a DIN rail other than the recommended one (especially the one whose thickness is not 1.0 mm), the product will not fit in place as the mounting hook does not work.

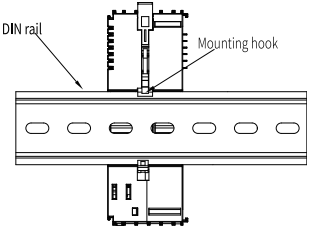
Install modules side by side by sliding them along the top and bottom guide rails of adjacent modules.



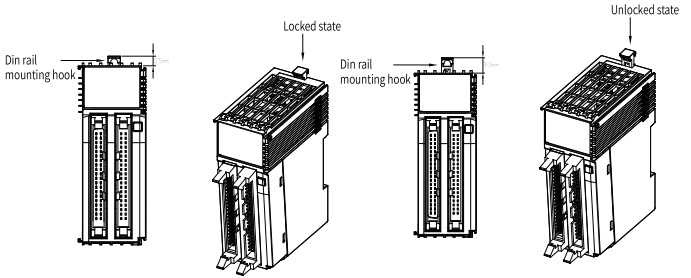
■ Installing modules onto DIN Rail

1. Align the module with the DIN rail and push it 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.



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

Caution

When the module is not installed on the rail, keep the mounting hook in the locked state. Keeping the mounting hook unlocked for a prolonged time may cause the hook to fail.

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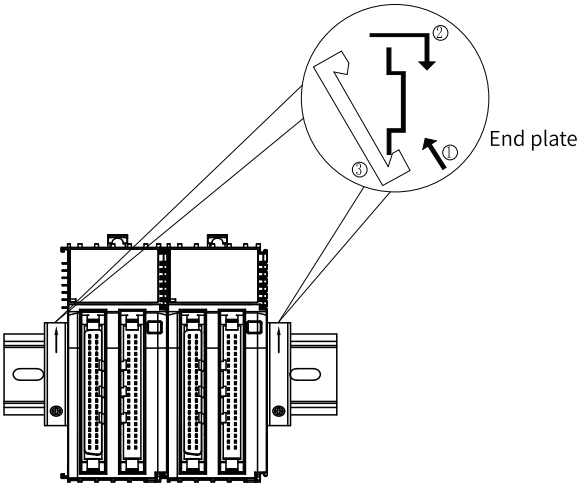
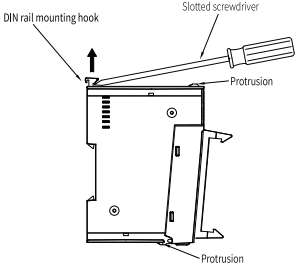
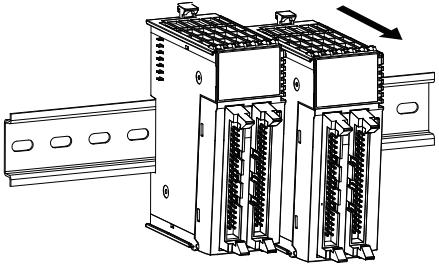
3. Install a DIN rail end plate on both sides of the PLC or expansion module. To install the end plate, hook the bottom of it to the bottom of the DIN rail, rotate the end plate to hook the top of it to the top of the DIN rail, and then tighten the screw to lock the end plate in place, as shown below.



■ 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.





3 Electrical Installation

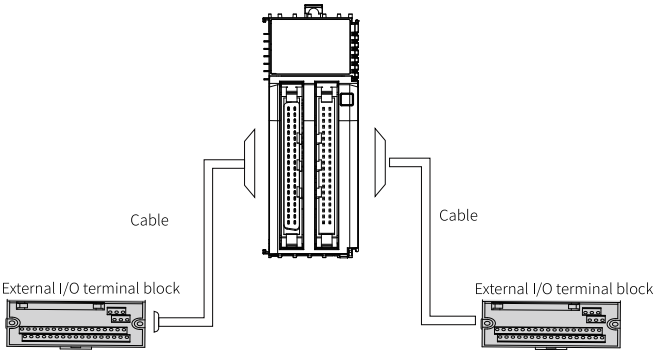
3.1 External Terminal Block and Cable Selection

The following table describes the order data of the terminal block and the cable.

Name	Material Code	Model	Description	Remark
Cable (connector not provided)	15310167	XA3210A-40-L0.5M-01	40PIN MIL cable (500 mm)	High density adapter cable, including two 40PIN MIL connectors (500 mm)
	15310166	XA3210A-40-L2M-01	40PIN MIL cable (2000 mm)	High density adapter cable, including two 40PIN MIL connectors (2000 mm)
Terminal block	15020452	T024-K	40PIN MIL-to-screw terminal block	T024-K

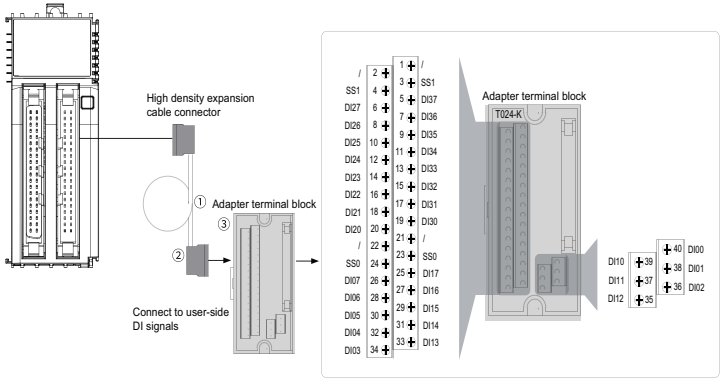
■ Terminal Block Connection

After installation, connect the module to the external I/O terminal blocks through connecting cables. This module can be connected to two external terminal blocks.

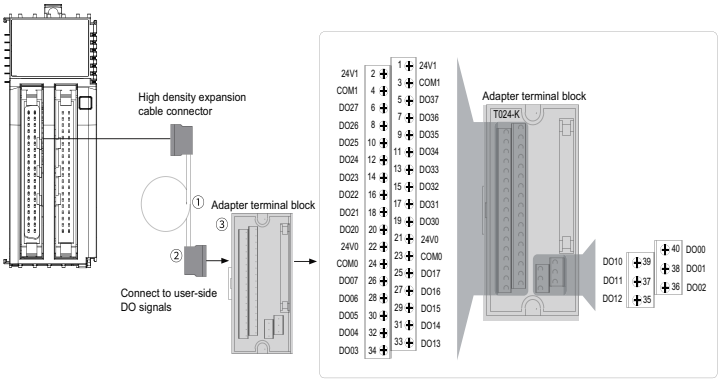


When the T024-K adapter terminal block is used for connection, the correspondence between the terminals of the block and the terminals of the module is shown in the figures below. (When other types of adapter terminal blocks are used, check the terminal correspondence.)

- DI signals:



- DO signals:



3.2 Terminal Definition

The GL20-3232ETN-M module supports digital inputs and outputs. Its display panel features a DI indicator and a DO indicator. By default, the DI indicator is ON, indicating the module is in the input state. When the DI/DO switch button is pressed down, the DO indicator is ON and the DI indicator is OFF, indicating the module is switched to the output state.

■ Input state

Left Indicator	Left Signal	Right Terminal		Right Signal	Right Indicator
/	/	1	2	/	/
/	SS1	3	4	SS1	/
37	DI37	5	6	DI27	27
36	DI36	7	8	DI26	26
35	DI35	9	10	DI25	25
34	DI34	11	12	DI24	24
33	DI33	13	14	DI23	23
32	DI32	15	16	DI22	22
31	DI31	17	18	DI21	21
30	DI30	19	20	DI20	20
/	/	21	22	/	/
/	SS0	23	24	SS0	/

Left Indicator	Left Signal	Right Terminal		Right Signal	Right Indicator
17	DI17	25	26	DI07	07
16	DI16	27	28	DI06	06
15	DI15	29	30	DI05	05
14	DI14	31	32	DI04	04
13	DI13	33	34	DI03	03
12	DI12	35	36	DI02	02
11	DI11	37	38	DI01	01
10	DI10	39	40	DI00	00

■ Output state

Left Indicator	Left Signal	Left Terminal		Right Signal	Right Indicator
/	24V1	1	2	24V1	/
/	COM1	3	4	COM1	/
37	DO37	5	6	DO27	27
36	DO36	7	8	DO26	26
35	DO35	9	10	DO25	25
34	DO34	11	12	DO24	24
33	DO33	13	14	DO23	23
32	DO32	15	16	DO22	22
31	DO31	17	18	DO21	21
30	DO30	19	20	DO20	20
/	24V0	21	22	24V0	/
/	COM0	23	24	COM0	/
17	DO17	25	26	DO07	07
16	DO16	27	28	DO06	06
15	DO15	29	30	D005	05
14	DO14	31	32	D004	04
13	DO13	33	34	DO03	03
12	DO12	35	36	DO02	02

Left Indicator	Left Signal	Left Terminal		Right Signal	Right Indicator
11	DO11	37	38	DO01	01
10	DO10	39	40	DO00	00

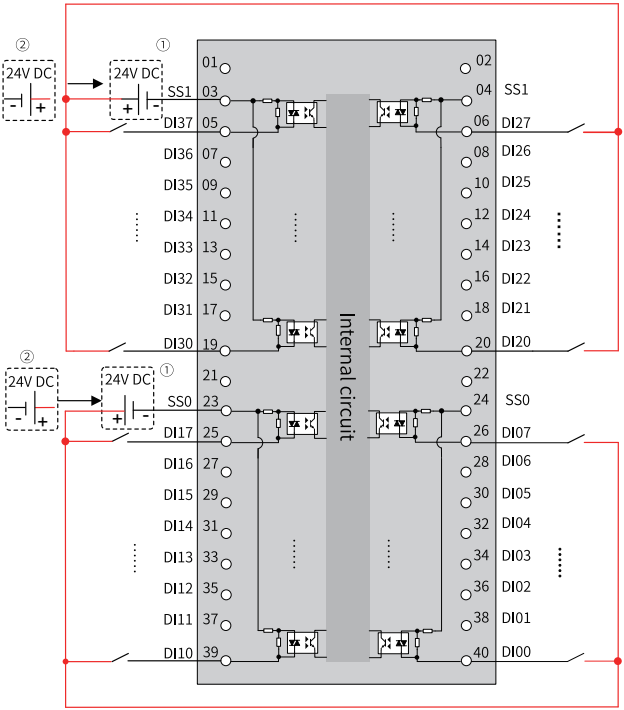
3.3 Terminal Wiring

■ Wiring precautions

- Do not bundle the expansion cable together with power cables (with high voltage, large current) that produce strong interference signals; otherwise, the expansion cable may be influenced by noise, surge, and 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

- Input

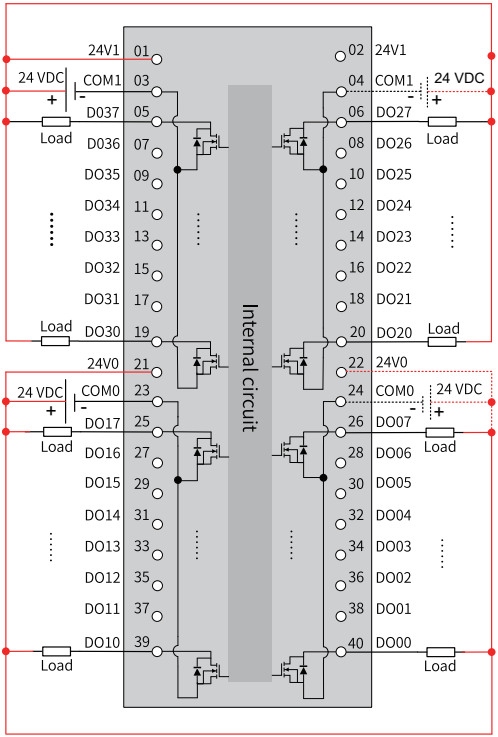


No.	Remark
①	Source type signal input mode
②	Sink type signal input mode

- Terminals No. 05–20 and No. 25–40 are input terminals.
- Terminals No. 01, 02, 21, and 22 are unused terminals.
- Terminals No. 03 and 04 are common terminals SS1, which are internally connected. The common terminals can be connected to one or two 24 VDC power supplies.
- Terminals No. 23 and 24 are common terminals SS0, which are internally connected. The common terminals can be connected to one or two 24 VDC power supplies.

- Output

Sink type signal output mode



Caution

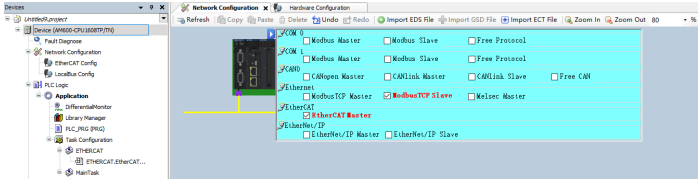
- Terminals No. 05–20 and No. 25–40 are output terminals.
- Terminals No. 01 and 03. 02 and 04, 21 and 23, 22 and 24 are power supply terminals.
- Terminals No. 03 and 04 are common terminals SS1, which are internally connected. The common terminals can be connected to one or two 24 VDC power supplies.
- Terminals No. 23 and 24 are common terminals SS0, which are internally connected. The common terminals can be connected to one or two 24 VDC power supplies.

4 Program Commissioning

In the programming software interface, the GL20-3232ETN-M module is displayed as "GL20-3232ETN". The following is an example where AM600 is used as the master control module along with the GL20-3232ETN-M module.

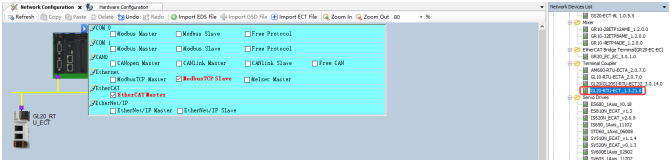
1. Enable the AM600 PLC as the EtherCAT master and add the GL20-RTU-ECT communication interface module.

   a. In the left **Devices** pane, double-click **Network Configuration** and click the AM600 PLC figure in the upper left corner of the interface. Check the "EtherCAT Master" to enable the PLC as an EtherCAT master.

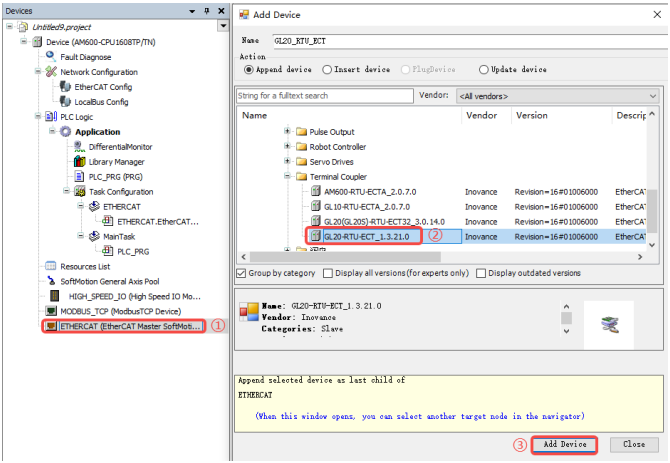


   b. Add the GL20-RTU-ECT communication interface module.

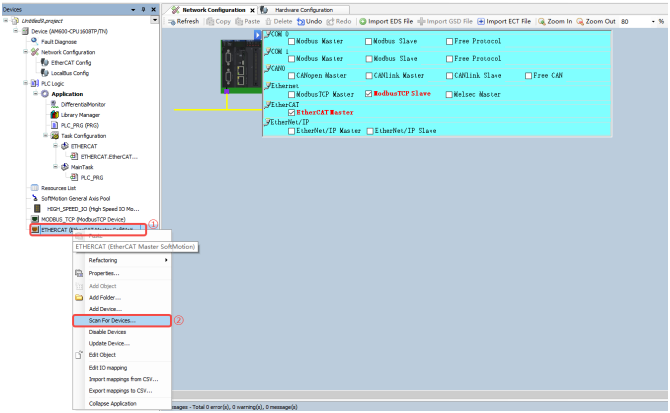
   - Method 1: In the right **Network Devices List**, double-click "GL20-RTU-ECT" to add the module.

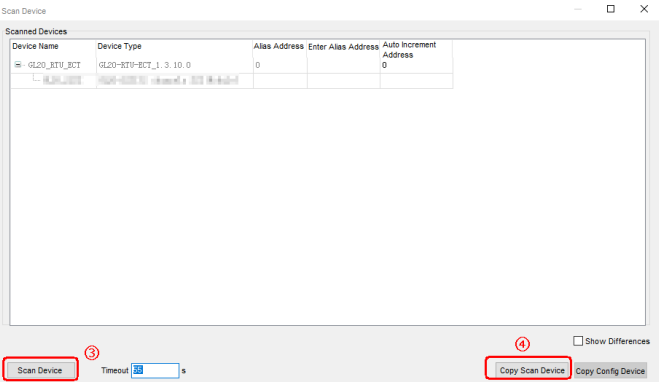


   - Method 2: In the left **Devices** pane, right click **ETHERCAT(EtherCAT Master SoftMotion)** ① and select **Add Device**. Select "GL20_RTU_ECT *_x.x.x.x* " ② in the pop-up dialog box and click **Add Device** ③.



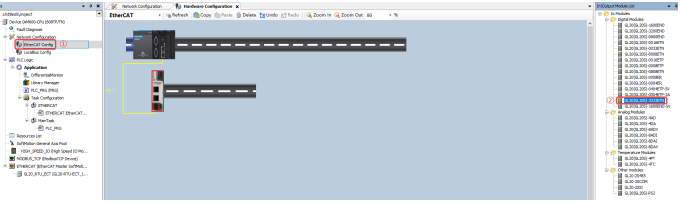
- Method 3: In the left **Devices** pane, right click **ETHERCAT(EtherCAT Master SoftMotion)** ① and select **Scan For Devices** ②. Click **Scan Devices** ③, select the GL20-RTU-ECT module, and click **Copy Scan Device** ④.



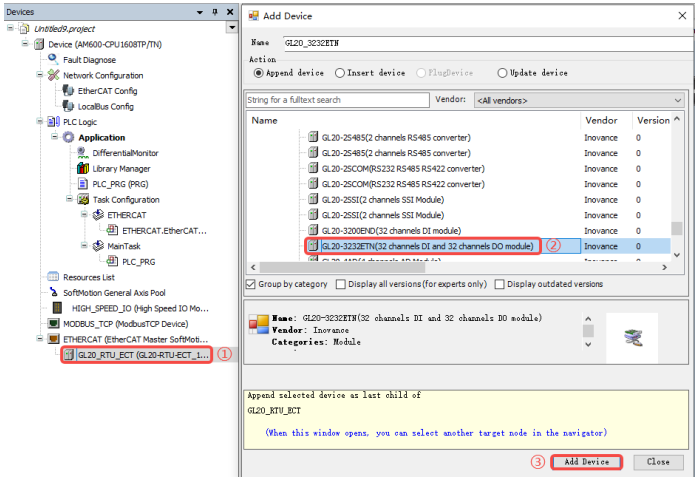


2. Add the GL20-3232ETN-M module.

- Method 1: Open the **Hardware Configuration** pane by double-clicking **EtherCAT Config** ① in the left **Devices** pane, or double-clicking the GL20-RTU-ECT figure in the **Network Configuration** pane. In the right **In\Output Module List**, double-click "GL20-3232ETN" ② or drag the GL20-3232ETN module and place it after the GL20-RTU-ECT module.

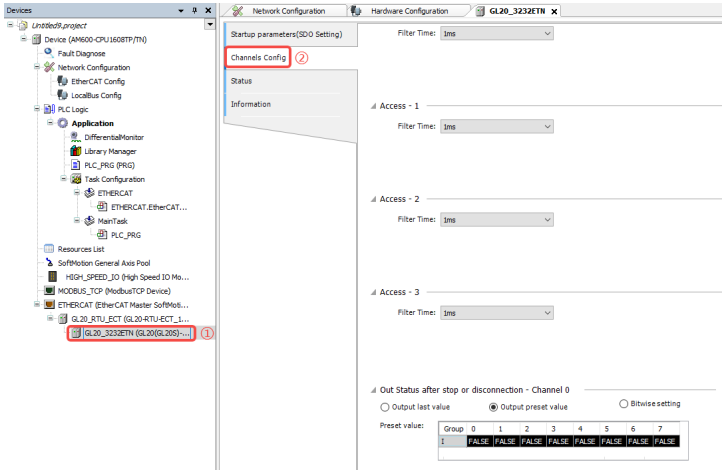


- Method 2: In the left **Devices** pane, right click "GL20_RTU_ECT" ① and select **Add Device**. Select "GL20-3232ETN" ② in the pop-up dialog box and click **Add Device** ③.



- Method 3: In the left **Devices** pane, right click **ETHERCAT(EtherCAT Master SoftMotion)** and select **Scan For Devices**. Click **Scan Devices**, select the GL20-3232ETN-M module, and click **Copy Scan Device**.

3. Double-click the GL20-3232ETN module ① to set **Channels Config** ②.

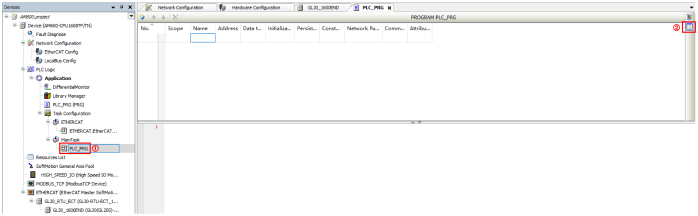


The parameters for channel configuration are shown in the following table.

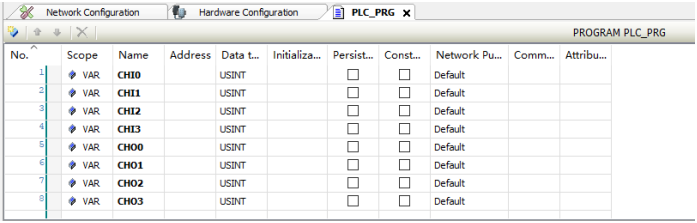
Name	Description	Configuration
Filter time	Debounce filter time of the digital input channel	The following parameter values are supported: • No filter • 0.25 ms • 0.5 ms • 1 ms (default value) • 2 ms • 4 ms • 8 ms • 16 ms • 32 ms
Out status after stop or disconnection	The output mode of the output channel of the module in non-OP state (when the module is stopped or the coupler is disconnected)	The following options are supported: • Output last value: All channels in the corresponding group retain the output state before module stop or network disconnection. • Output preset value: The output mode of each channel in the corresponding group matches the preset values. The preset value is matched by bit, with one bit representing one channel.For example, if bit0 is set to FALSE, the output state of channel 0 is 0; if bit0 is set to TRUE, the output state of channel 0 is 1. • Bitwise setting: The output mode of each channel in the corresponding group is matched by bit, with one bit representing one channel. For example, bit0 represents channel 0.If bit0 is set to TRUE, channel 0 outputs according to its preset value. If bit0 is set to FALSE, channel 0 retains the last output state.

4. Create input/output variables.

a. In the left **Devices** pane, double-click **PLC_PRG** ① and click  ② in the upper right corner to switch to table mode.



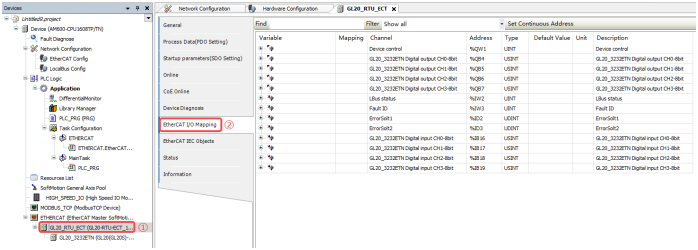
b. Add custom input variables "CHI0", "CHI1", "CHI2", and "CHI3", and output variables "CHO0", "CHO1", "CHO2", and "CHO3". Set the scope of these variables to "VAR" and data type to "USINT", as shown below.



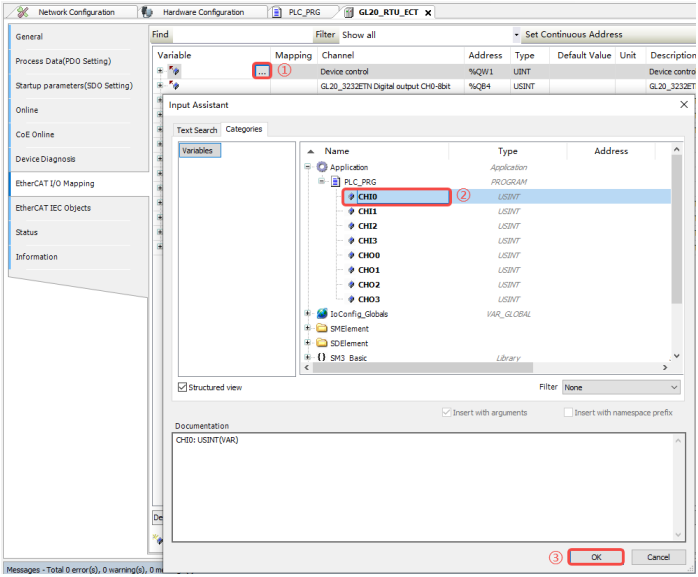
No.	Scope	Name	Address	Data t...	Initializa...	Persist...	Const...	Network Pu...	Comm...	Attribu...
1	VAR	CHI0		USINT		☐	☐	Default		
2	VAR	CHI1		USINT		☐	☐	Default		
3	VAR	CHI2		USINT		☐	☐	Default		
4	VAR	CHI3		USINT		☐	☐	Default		
5	VAR	CHO0		USINT		☐	☐	Default		
6	VAR	CHO1		USINT		☐	☐	Default		
7	VAR	CHO2		USINT		☐	☐	Default		
8	VAR	CHO3		USINT		☐	☐	Default		

5. Map the input/output variable to the corresponding input/output channel.

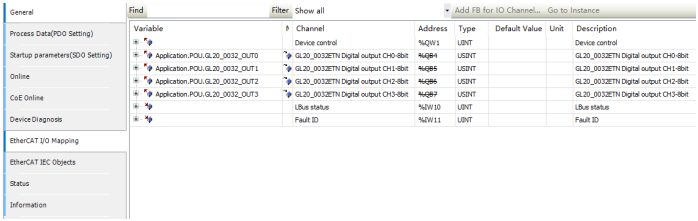
a. In the left **Devices** pane, double-click **GL20_RTU_ECT** ① and click the **EtherCAT I/O Mapping** tab ②.



b. On the **EtherCAT I/O Mapping** tab, double-click a variable entry and click ... ① to open the **Input Assistant** dialog box. Choose **Application** > **PLC_PRG** > specific variables ② and click **OK** ③.



c. Map the input variables "CHI0", "CHI1", "CHI2", and "CHI3" to the input channels of the configuration module, and map the output variables "CHO0", "CHO1", "CHO2", and "CHO3" to the output channels of the configuration module, as shown below.



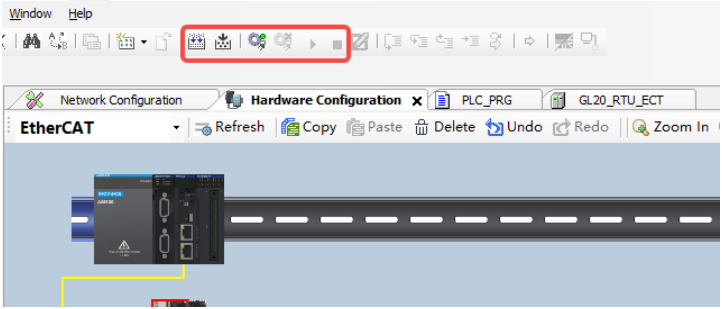
6. Double-click **PLC_PRG** in the left **Devices** pane and complete programming on the **PLC_PRG** page.
7. Check, compile, log in, download, and run the program.

   a. Click  on the toolbar at the top of the interface to check whether the program is correct.

   b. Click  on the toolbar to compile all the code into PLC executable code.

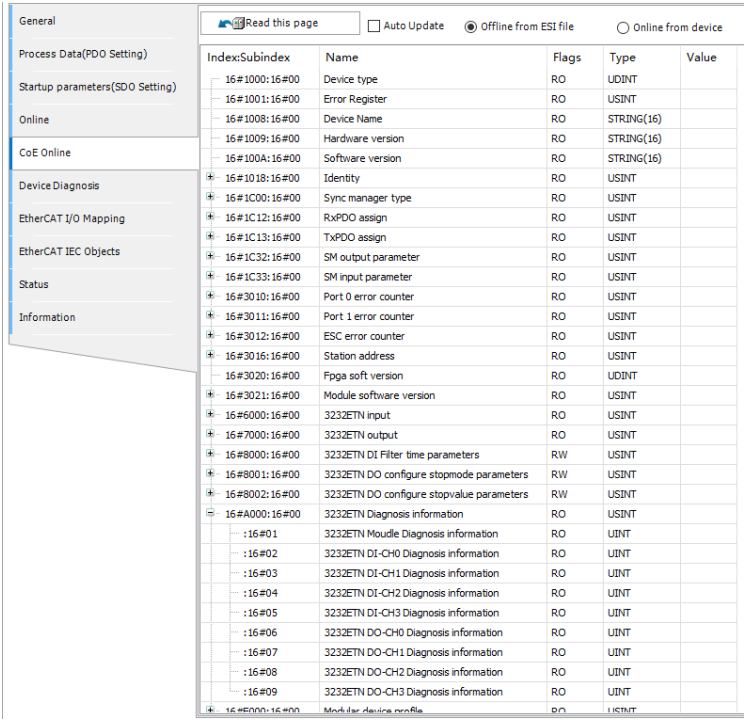
   c. Click  on the toolbar, and follow the interface prompts to log in to the PLC and download the program.

   d. Click  on the toolbar to execute the program.



5 Troubleshooting

When the ERR indicator is ON, it indicates that 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. For the module installed in slot n (n = 0 to 31), the object dictionary definition for index 0xA000 +0x40*n is shown in the table below.



Index:Subindex	Name	Flags	Type	Value
16#1000:16#00	Device type	RO	UDINT	
16#1001:16#00	Error Register	RO	USINT	
16#1008:16#00	Device Name	RO	STRING(16)	
16#1009:16#00	Hardware version	RO	STRING(16)	
16#100A:16#00	Software version	RO	STRING(16)	
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 soft version	RO	UDINT	
16#3021:16#00	Module software version	RO	USINT	
16#6000:16#00	3232ETN input	RO	USINT	
16#7000:16#00	3232ETN output	RO	USINT	
16#8000:16#00	3232ETN DI Filter time parameters	RW	USINT	
16#8001:16#00	3232ETN DO configure stopmode parameters	RW	USINT	
16#8002:16#00	3232ETN DO configure stopvalue parameters	RW	USINT	
16#A000:16#00	3232ETN Diagnosis information	RO	USINT	
:16#01	3232ETN Moudle Diagnosis information	RO	UINT	
:16#02	3232ETN DI-CH0 Diagnosis information	RO	UINT	
:16#03	3232ETN DI-CH1 Diagnosis information	RO	UINT	
:16#04	3232ETN DI-CH2 Diagnosis information	RO	UINT	
:16#05	3232ETN DI-CH3 Diagnosis information	RO	UINT	
:16#06	3232ETN DO-CH0 Diagnosis information	RO	UINT	
:16#07	3232ETN DO-CH1 Diagnosis information	RO	UINT	
:16#08	3232ETN DO-CH2 Diagnosis information	RO	UINT	
:16#09	3232ETN DO-CH3 Diagnosis information	RO	UINT	
16#F000:16#00	Modular device profile	RO	USINT	

- 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: 3232ETN Diag data				
Subindex	Name	Data Type	Access Mode	Mapping	Default value
0	Subindex 000	USINT	RO	Not supported	9
1	Fault code	UINT	RO	Not supported	0x0000
2	DI Channel CH0 error code	UINT	RO	Not supported	0x0000
3	DI Channel CH1 error code	UINT	RO	Not supported	0x0000
4	DI Channel CH2 error code	UINT	RO	Not supported	0x0000
5	DI Channel CH3 error code	UINT	RO	Not supported	0x0000
6	DO Channel CH0 error code	UINT	RO	Not supported	0x0000
7	DO Channel CH1 error code	UINT	RO	Not supported	0x0000
8	DO Channel CH2 error code	UINT	RO	Not supported	0x0000
9	DO Channel CH3 error code	UINT	RO	Not supported	0x0000

- Fault code

Fault Code	Description	Solution
0x5003	Module 24 V power supply failure	Check the external power supply wiring and the power supply voltage.

Note

Fault detection is not supported for digital inputs. For digital outputs, fault detection is only supported for the output power supply. When the output power supply is faulty (undervoltage), the fault code is 0x5003. No faults are reported for other channels.

6 Appendix: Version Matching Information

Contact Inovance technical support to obtain the firmware of GL20-3232ETN-M module and the firmware of communication interface module. XML files and the AutoShop/InoProShop software can be downloaded from the software and debugging tool tab on the GL20 series product page at *https://www.inovance.com*. The following table describes the version matching information.

GL20-3232ETN-M Module Firmware Version	Communication Interface Module Firmware Version	XML/GSD File Version	AutoShop/InoProShop Version
Logic software: 0.1.2.0 and later	• GL20-RTU-ECT: Board software 2.4.13.0 and later • GL20-RTU-ECT32: board software 2.5.9.0 and later • GL20-RTU-PN: board software 2.1.1.0 and later	• GL20-RTU-ECT: 1.3.9.0 and later • GL20-RTU-ECT32: 3.0.2.0 and later • GL20-RTU-PN: 20230323 and later	• AutoShop (ECT): V4.8.2.4 and later • InoProShop (ECT): V1.7.3 and later • InoProShop (ECT32): V1.7.3 SP6 and later