INOVANCE

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Easy320 Series
Programmable Logic Controller

User Guide

Industrial Automation | New Energy Vehicle | Intelligent Elevator | Intelligent Robot | Digital Energy | Rail Transit

Data code PS00005850A10

Legal Information

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

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

■ Waste Disposal

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

■ Qualified Personnel

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

■ Proper Use of the Product

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

Preface

■ Introduction

This product is a new generation of small-sized programmable logic controller (PLC) independently developed by Inovance. It supports network switching over dual network ports. It allows process encapsulation and reuse through the Function Block (FB) and Function (FC) features, and supports multi-layer network communication through the RS485 and Ethernet ports. This product can accommodate a maximum of 16 expansion modules. For module types supported, see the section "Local Expansion Modules" in the "H5U and Easy Series Programmable Logic Controller Programming Guide". This product can also provide the RS485, RS232, CAN, digital input (DI), digital output (DO), analog input (AI), analog output (AO), real-time clock (RTC), and trans-flash (TF) card features through expansion cards.

This guide describes the installation and wiring of the product, including product information, mechanical installation, and electrical installation.

■ 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	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	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	-		-
UKCA	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

Data Name	Data Code	Description
GE20 Series Expansion Card User Guide	PS00006443	Describes the product information, installation and wiring, and programming examples of the GE20 series expansion card.
H5U and Easy Series Programmable Logic Controller Programming Guide	19012249	Describes the basics of PLC programming, quick start guide, communication, motion control, and high-speed counter usage.
H5U and Easy Series Programmable Logic Controller Instruction Guide	19012250	Describes the basic instructions and complex instructions used for programming applications, as well as examples of these instructions.
Easy320 Programmable Logic Controller User Guide (this guide)	PS00005850	Describes the installation and wiring of the product, including product information, mechanical installation, and electrical installation.

■ Revision History

Date	Version	Description
January 2026	A10	• Added the transmission speed of network cables in *"5.3 Cable Connection" on page 40* • Updated effect diagrams and the product code.
September 2025	A09	Corrected minor errors.
June 2025	A08	Corrected minor errors.
March 2025	A07	Modified input and output terminal wiring diagrams in *"4.2 Terminal Wiring" on page 32*
January 2025	A06	Corrected minor errors.

Date	Version	Description
July 2024	A05	**New** • Added the I/O terminal wiring in *"4.2 Terminal Wiring" on page 32*
		Modify • Updated the note for power-off and restart in *"2.2 Components" on page 13* • Updated the program data capacity in *"2.3.1 General Specifications" on page 17* • Updated the number of axes supported in *"2.3.1 General Specifications" on page 17*
March 2024	A04	Corrected minor errors.
February 2024	A03	• *"2.1 Model and Nameplate" on page 12*Added the PNP model in • *"2.2 Components" on page 13*Updated the descriptions of status indicators in • *"2.3.1 General Specifications" on page 17*Added the PNP specifications in the high-speed input item in • *"2.3.2 Power Supply Specifications" on page 18*Updated the power supply specifications in • *"2.3.3 Input Specifications" on page 19*Added the PNP specifications in the high-speed input (X0 to X7) item in • *"2.3.4 Output Specifications" on page 20*Added the PNP specifications in the output type item in • *"4.2 Terminal Wiring" on page 32*Added the PNP output terminal wiring in • *" Appendix" on page 46*Added the Easy320 programmable controller models and the GL20 expansion module models in
March 2023	A02	Updated the diagram of DIN rail buckles and added some product specification data.
October 2022	A01	• Added support for CAN communication. • Corrected minor errors.
August 2022	A00	Initial release.

■ Access to the Guide

This guide is not in the scope of delivery. If necessary, you can download the PDF file in the following ways:

- Visit https://www.inovance.com/global and choose Service&Support > Support > Documentation Download.
- Scan the QR code on the product with your smart phone to obtain the corresponding guide.
- Scan the QR code below to install My Inovance app, where you can search for and download user guides.

■ Warranty Disclaimer

If your product becomes defective under normal use conditions, we will offer guaranteed repair services within the warranty period. Maintenance will be charged after the warranty period expires.

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 (such as 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.

1 Fundamental Safety Instructions

1.1 Fundamental Safety Instructions

■ 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. Malfunction 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 Levels 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.



- 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



- 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 controller is open-type equipment that must be installed in a control cabinet with lock (IP rating of the control cabinet enclosure > IP20). Only qualified professionals can open the cabinet.



- 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 and remove modules and 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 by observing industry waste disposal standards to avoid environmental pollution.

1.2 Industrial Information Security

This product provides an interface to connect to the network and transmit data through the network interface. To protect factories, systems, machines, and networks from cyber attacks, appropriate industrial information security protection mechanisms need to be implemented to ensure the safe operation of factories, systems, machines, and networks.

The customer is responsible for providing and continuously ensuring a secure connection between the product and the customer's network or any other network, to prevent unauthorized access to their factory, systems, machines, and networks. The system or machine may only be connected to the corporate network or the Internet when a secure connection is established and proper security measures are in place (for example, using antivirus software and installing firewalls).

INOVANCE continuously develops and improves its products and solutions to enhance safety. It is strongly recommended that you update your products promptly and always use the latest product versions.



Malware (such as viruses, Trojans, and worms) can bring the device into an unsafe operating state, resulting in death, serious injury, and property damage. Observe the following precautions strictly:

- Always use the latest software version. If the product version is no longer supported or the latest program version is not applied, customers are at increased risk of cyberattacks.
- Implement and maintain appropriate security measures (including but not limited to deploying anti-virus software, firewall, WAF, IPS/IDS, situational awareness system, ID verification, and data encryption) to prevent files in the removable storage device from being damaged by malware and to protect products, networks, systems, and interfaces from unauthorized access, disruption, intrusion, data leakage, or information theft.
- Check all safety-related interfaces and settings after commissioning.

2 Product Information

2.1 Model and Nameplate

■ Model description

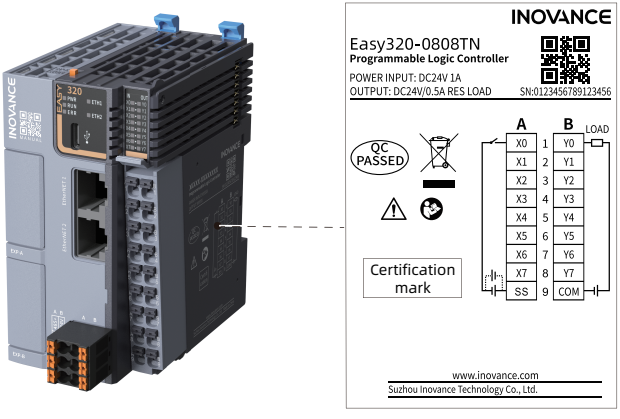
Easy 320 – 0808 TX

① ② ③ ④

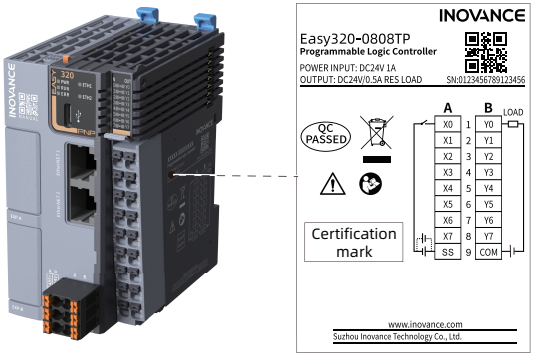
① **Product series** • Easy: Easy series programmable logic controller	③ **Number of inputs/outputs** • 08: 8 inputs • 08: 8 outputs
② **Series** • 3: 300 series platform • 2: Two Ethernet ports • 0: Model serial number	④ **Output type** • TN: Sink-type transistor • TP: Source-type transistor

■ Nameplate description

Easy320-0808TN



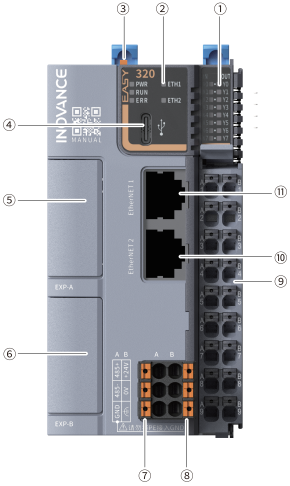
Easy320-0808TP



Model	Description	Code
Easy320-0808TN-INT	Easy300 series 8-input 8-output programmable controller	01441216
Easy320-0808TP-INT	Easy300 series 8-input 8-output programmable controller	01441186

2.2 Components

The Easy320-0808TN and Easy320-0808TP models share the same components. The following section takes the Easy320-0808TN model as an example to describe the components.


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⑥
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⑩
⑨
⑦
⑧
INOVANCE
EASY 320
PWR
RUN
ERR
ETH1
ETH2
MANUAL
EtherNET 1
EtherNET 2
EXP-A
EXP-B
A B
A B
EXIO1
EXIO2
485+
485-
CAN+
CAN-
GND
24V
ALM
PWR
RUN
ACT

No.	Type	Mark	Definition	Indicator Color	Description
①	I/O indicator	IN/OUT	I/O status	Yellow-green	• Steady ON: Input or output active • OFF: Input or output inactive
②	Operation status indicator	PWR	Power supply	Yellow-green	• Steady ON: Power supply normal • OFF: Power supply off or abnormal
		RUN	Normal running	Yellow-green	• Steady ON: User program running • OFF: User program stopped
		ERR	Running error	Red	• OFF: No major error • Blinking[1]: Major error occurred
		ETH1	Ethernet link 1	Yellow-green	• Steady ON: Connected • Blinking: Communication in progress • OFF: Disconnected
		ETH2	Ethernet link 2	Yellow-green	• Steady ON: Connected • Blinking: Communication in progress • OFF: Disconnected
③	DIP switch	RUN/STOP	Run/Stop control	-	-
④	Type-C port		Communica-tion with PC	-	-
⑤/-⑥	Expansion card slot	EXP-A/EXP-B	Expansion card slots, used to expand features	-	Expansion card options are available in *"Appendix" on page 46*

No.	Type	Mark	Definition	Indicator Color	Description
⑦	RS485	485+	Positive of RS485 communication signal	-	-
		485–	Negative of RS485 communication signal	-	-
		GND[2]	RS485 communication ground	-	-
⑧	Power supply port	+24V	24 VDC power supply positive	-	-
		0V	24 VDC power supply negative	-	-
			Function grounding[1]	-	-
⑨	I/O terminal	-	8-channel input and 8-channel output	-	For details, see *"4.1 Terminal Layout" on page 31*
⑩/-⑪	Ethernet port	EtherNET1/ EtherNET2	RJ45 ports used for Ethernet communication	-	PoE power supply not supported

Caution

- [1]: To restart the product in case of a fault, turn off the power and disconnect the USB cable. Ensure the power indicator is off for at least 10 seconds before powering it on again.
- [2]: Do not connect the PE cable to the GND terminal.

2.3 Product Specifications

2.3.1 General Specifications

Item	Specification
Program data capacity	• User program: 256 kB • User-defined variables: 1 MB, 128 kB of which is retentive at power failure • Soft elements: Approx. 150 kB (retentive at power failure after No. 1000; non-retentive at power failure when the PLC is only powered by USB)
Instruction execution speed	20 k-step in 2 ms
Bit operation	0.144 μs/instruction
Word transmission	0.338 μs/instruction
Floating point operation	0.779 μs/instruction
Ethernet	Support Ethernet/IP, ModbusTCP (up to 32 slaves), Socket, PROFINET slaves, FINS TCP/FINS UDP slaves, program download/ upload, and firmware upgrade.
EtherCAT communication	-
Number of axes	Up to 5 (local pulse axis: 5; virtual axis: 16)

Item	Specification
Serial communication	Up to 3 channels (1 for the main unit and 2 for the expansion card) **Note**: Serial communication is provided by GL20-2S485 and GL20-2SCOM expansion modules with serial ports.
CAN communication	One master (requiring firmware version 5.65.2.0 or later and AutoShop version 4.6.5.0 or later) • CANlink: Up to 62 slaves • CANopen: Up to 30 slaves with 16 axes
High-speed input	• Easy320-0808TN: 8-channel at 200 kHz (single-phase) • Easy320-0808TP: 8-channel at 100 kHz (single-phase)
High-speed output	5 axes at 200 kHz; PWM supported
Expansion module	Up to 16 local expansion modules
Expansion card	Up to 2 expansion cards
Programming language	LD (FB/FC supported), ST, and SFC
Type-C	• Program upload and download and firmware upgrade through Type-C or GE20-TF storage expansion card • Communication distance of 3 m by using a USB cable
IP rating	IP20
Dimensions (W x H x D)	53 mm x 100 mm x 80 mm
Weight	Approx. 184 g

2.3.2 Power Supply Specifications

Item	Specification
Rated voltage of terminal input power supply	24 VDC±10% (21.6 VDC to 26.4 VDC)
Rated current of terminal input power supply	1 A (max@24 V)
Rated voltage of bus output power supply	5 VDC (4.75 VDC to 5.25 VDC)
Rated current of bus output power supply [1]	2 A (typical value@5 V)

Item	Specification
24 V input power supply protection	Protection against short circuit and reversed polarity connection
Hot swap	Not supported

Note

[1]: Expansion modules are powered by the Easy programmable logic controller. Therefore, the sum of the rated current values of the bus input power for expansion modules must not be greater than the current value specified in the table (⩽ 2 A). For example, the rated current of the bus input power for the GL20-3232ETN-M expansion module is 250 mA, so at most eight such modules can be connected to the Easy series programmable logic controller (2 A/250 mA = 8).

2.3.3 Input Specifications

Item		Specification
Input type		Digital input
Number of input channels		8
Input mode		Sink/source mode
Input voltage class		24 VDC±10% (21.6 VDC to 26.4 VDC)
High-speed input (X0-X7)	Input current at input ON	• Easy320-0808TN: > 4mA • Easy320-0808TP: > 2.5mA
	Input current at input OFF	• Easy320-0808TN: < 2.5mA • Easy320-0808TP: < 1.5mA
	Hardware response time	2 μs (RC time)
	Maximum input frequency	200 kHz
	Input resistance	3.4 kΩ
ON voltage		⩾ 15 VDC
OFF voltage		⩽ 5 VDC
Software filter time		• Low speed: 2 ms to 1000 ms • High speed: 2 μs to 1000 μs

Item	Specification
Isolation method	Capacitive isolation with integrated chips
Common terminal mode	Eight input ports share a common terminal (positive/negative polarity of input power being changeable).
Input indicator	The input indicator turns on (controlled by software) when the input is in drive state.

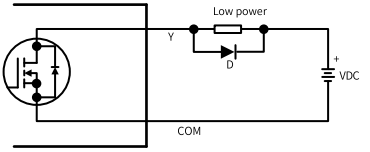
2.3.4 Output Specifications

Item		Specification
Output type		• TN: NPN transistor output • TP: PNP transistor output
Number of output channels		8
Output voltage class		24 VDC±10% (21.6 VDC to 26.4 VDC)
High-speed output (Y0 to Y7)	Output load (resistive load)	0.5 A/point; 2 A/8 points
	Output load (inductive load)	7.2 W/point; 24 W/8 points
	Output load (lamp load)	5 W/point; 18 W/8 points
	Hardware response time ON/OFF	< 1 μs (OFF→ON); < 2 μs (ON→OFF)
	Load current requirements	Load current ⩾ 12 mA when used with outputs greater than 10 kHz
	Maximum output frequency	Resistive load: 200 kHz; inductive load: 0.5 Hz; lamp load: 10 Hz
Leakage current upon OFF		< 30 μA at 24 V
Maximum residual voltage upon ON		< 0.5 VDC
Isolation method		Digital isolator
Common terminal mode		Eight input ports share a common terminal (polarity of output power supply being negative)
Short circuit protection		Protection against short circuit of each channel, recovered after power-off

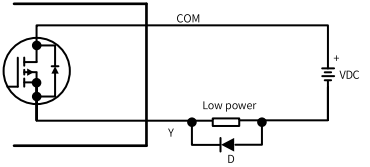
Item	Specification
External inductive load protection	A flywheel diode [1] is required when an external inductive load is connected.
Output indicator	The output indicator turns on (controlled by software) when the output is in drive state.

[1]: Use a 1N4001 (50 V/1 A) or similar diode, as marked by "D" in the following figure.

- **Easy320-0808TN**



- **Easy320-0808TP**



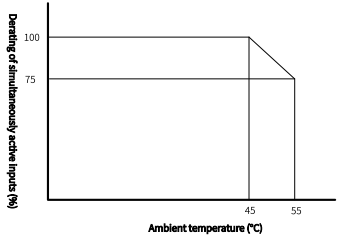
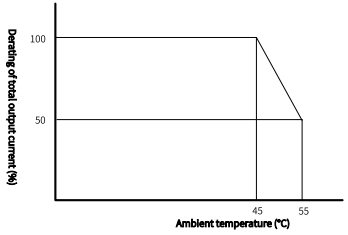
3 Mechanical Installation

3.1 Installation Environment

When installing the PLC on the guide rail, take the operability, maintainability, and environment adaptation into account.

Item	Specification
Operating environment	Free from conductive dust, conductive fibers, explosive dust, flammable gases, water mist/greasy dirt, corrosive dusts/gases, strong vibration, and repetitive shock
Altitude	⩽ 2000 m (80 kPa)
Pollution degree	PD2
Noise immunity	2 kV on power cable (IEC 61000-4-4)
Overvoltage category	I
EMC immunity level	Zone B, IEC 61131-2
Anti-static rating	Contact discharge +/-6 kV and air discharge +/-8 kV
Vibration resistance	• Application scenario: Tested according to IEC 60068-2-6; 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. • Transport scenario: Tested according to IEC 60068-2-64. Test conditions: 5 Hz to 100 Hz, 0.01 g^2/Hz; 200 Hz, 0.001 g^2/Hz, G_{rms} of 1.14 g, 30 min each in X, Y and Z directions.
Shock resistance	Application scenario: Tested according to IEC 60068-2-27. Test conditions: 15 g peak acceleration, 11 ms pulse width, total 18 shocks in X, Y and Z directions.
Overcurrent protection device	• Easy301: 1.1 A fuse • Easy302/Easy501/Easy502/Easy52X: 1.5 A fuse
Storage temperature and humidity	• Temperature: –20°C to +60°C • Relative humidity: < 90%, non-condensing
Transportation temperature and humidity	• Temperature: –40°C to +70°C • Relative humidity: < 95%, non-condensing

Item	Specification
Operating temperature and humidity	• Temperature: –20°C to +55°C (for horizontal installation), –20°C to +45°C (for non-horizontal installation) • Relative humidity: < 95%, 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.**

Item	Specification
Installation position and limit	Installation position: The PLC can be installed horizontally, vertically, on the top of the cabinet, or at the bottom of the cabinet. Installation limit: • Horizontal installation: ■ Input derating: When the ambient temperature is 45°C, the PLC can work at full load. When the ambient temperature is 55°C, the number of active inputs shall be reduced to 75% (that is, no more than six channels), with a derating rate of 2.5% for temperature rise of every 1°C.  ■ Output derating: When the ambient temperature is 45°C, the PLC can work at full load (that is, total current of eight channels not higher than 2 A). When the ambient temperature is 55°C, the total current of active outputs shall be reduced to 50% (that is, total current of eight channels not higher than 1 A), with a derating rate of 5% for temperature rise of every 1°C. 

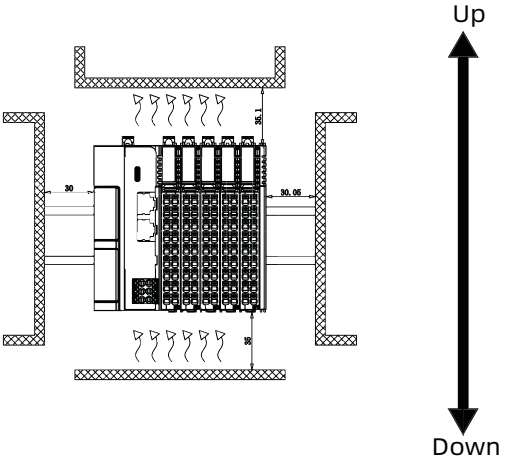
Item	Specification
Installation position and limit	• When installed non-horizontally: The maximum number of inputs should not exceed 6 and the maximum output current should not exceed 1 A.

3.2 Installation Position

This product can be installed in four positions (modes): horizontal (recommended), vertical, cabinet top, and cabinet bottom. Different modes have different ambient temperature requirements. For details, see *"3.1 Installation Environment" on page 22*.

■ Optimal installation position

The optimal installation mode is horizontal, adopting natural convection for heat dissipation. To ensure normal ventilation and heat dissipation and sufficient wiring space, sufficient clearance must be reserved around the module, as shown in the following figure.

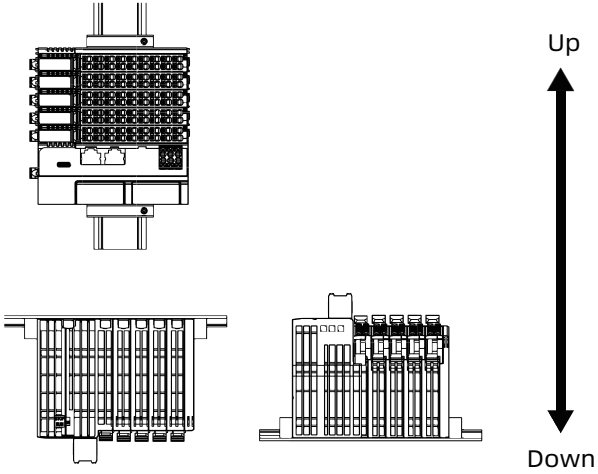


Note

Keep the PLC away from high-temperature heating sources (heater, transformer, large resistor, etc.) 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:

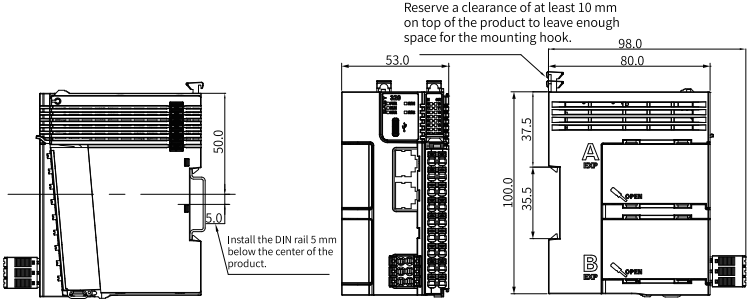
- Install the PLC below all I/O modules.
- Hold the cables with a cable duct to prevent the weight of cables being applied to the lower end plate. Failure to comply may cause displacement of the PLC from the DIN rail, leading to maloperation of the PLC.

3.3 Installation Precautions

- Before you install and uninstall the PLC and modules, ensure that they are powered off.
- Do not hot swap the modules. This may lead to restart or damage of the PLC or user data loss.
- To avoid damage to the PLC and modules, prevent the enclosure and terminals of them from falling-off or being impacted.

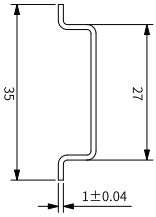
3.4 Installation Dimensions

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



3.5 Installation Method

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

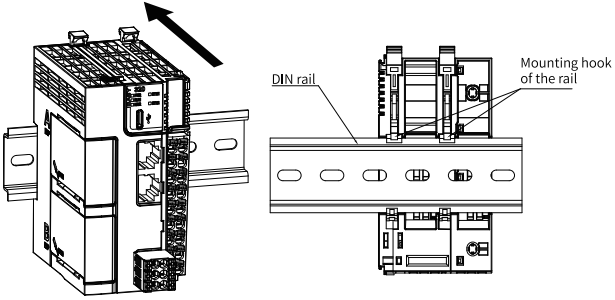


Caution

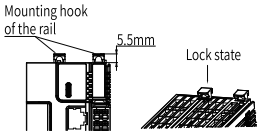
When installed on a DIN rail other than the recommended one (especially the one whose thickness is not 1.0 mm), the module will not fit in place as the mounting hook does not work.

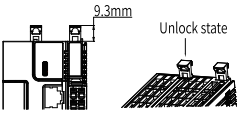
■ Installing the PLC

1. Align the PLC 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 PLC 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.

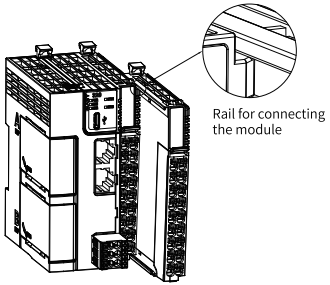
To lock the PLC to the DIN rail, press down the mounting hook.

Caution

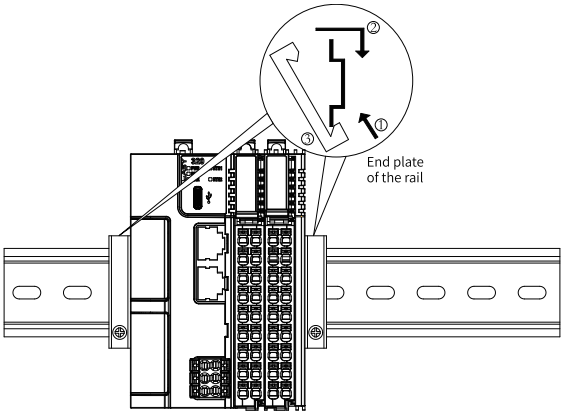
Keep the mounting hook locked when the controller is not mounted on the rail. If the mounting hook is kept unlocked for an extended period of time, it may malfunction.

■ Installing the module to the PLC

Install the expansion module to the PLC through top and bottom rails, as shown below.

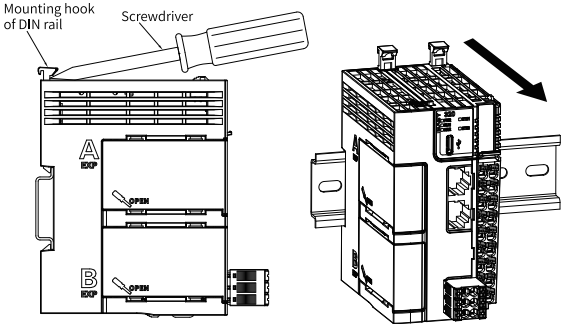


Mount a DIN rail end plate on both sides of the PLC or expansion module. To mount the end plate, hook the bottom of it to the bottom of the DIN rail, rotate the end plate to hook the top of it to the top of the DIN rail, and then tighten the screw to lock the end plate in place, as shown below.



■ Removing the module

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



4 Electrical Installation

4.1 Terminal Layout



Left Signal	Left Terminal	Right Terminal	Right Signal
X0 input	A1	B1	Y0 output
X1 input	A2	B2	Y1 output
X2 input	A3	B3	Y2 output
X3 input	A4	B4	Y3 output
X4 input	A5	B5	Y4 output
X5 input	A6	B6	Y5 output
X6 input	A7	B7	Y6 output
X7 input	A8	B8	Y7 output
Input common terminal SS	A9	B9	Output common terminal COM

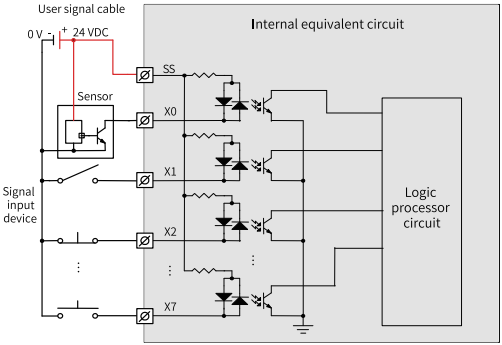
Caution

- Check the silk prints on both sides of the terminal to prevent wrong cable connection. Failure to comply may lead to short circuit and damage the components.
- The length of a high-speed I/O interface extension cable must be within 3 m.
- Route extension cables separately from high-voltage and high-current power cables that produce strong interference signals, and avoid parallel routing.

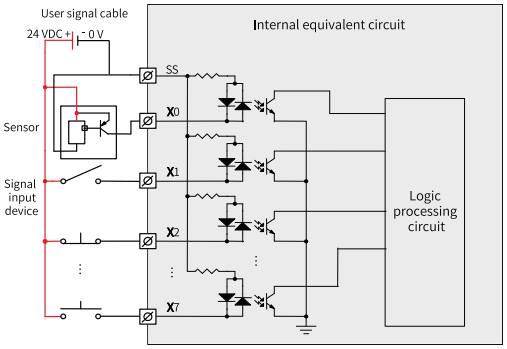
4.2 Terminal Wiring

■ Input terminal circuit diagram

- **Sink wiring**

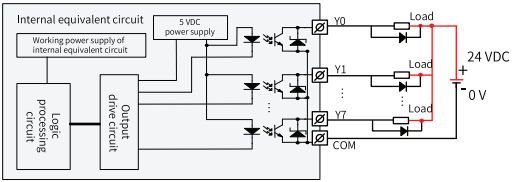


- **Source wiring**



■ Output terminal circuit diagram

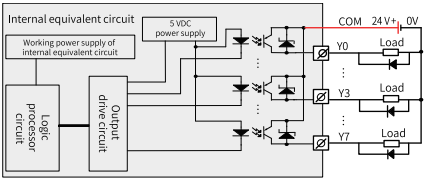
- **Easy320-0808TN**



Note

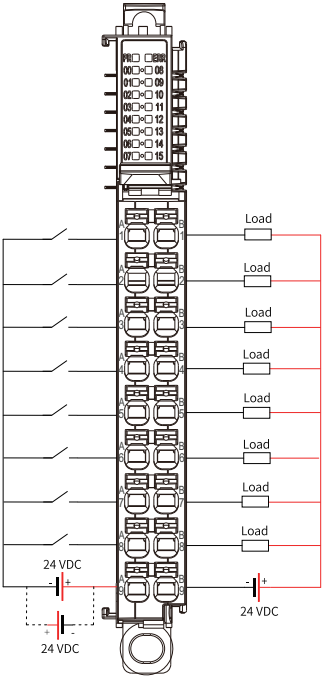
An external flywheel diode is required when an inductive load is connected. In this case, use a 1N4001 or similar diode.

- **Easy320-0808TP**

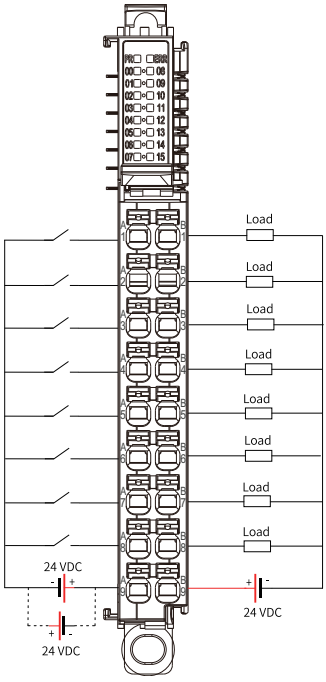


■ Input and output terminal wiring

- **Easy320-0808TN**

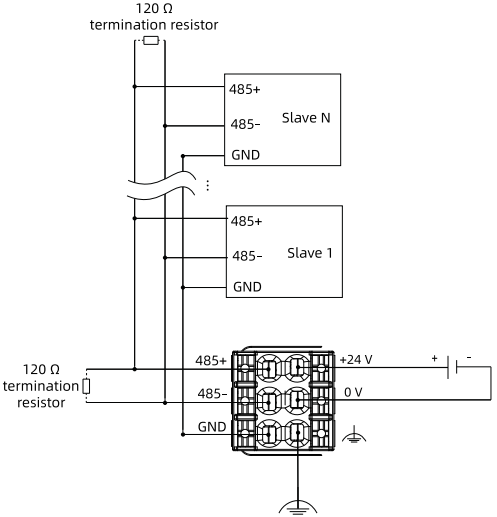


- **Easy320-0808TP**



■ Power terminal wiring

The power terminal wiring diagram is the same for Easy320-0808TN and Easy320-0808TP.



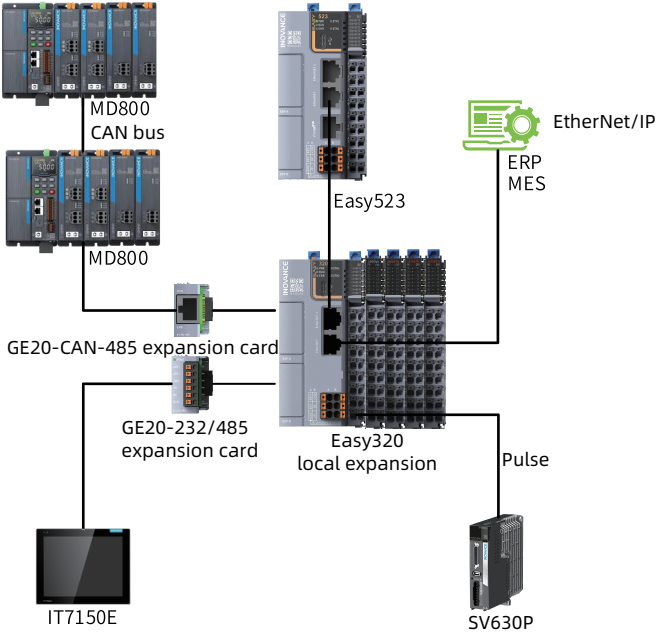
■ RS485 terminal wiring

For details about RS485 terminal wiring, see *"5.4 RS485 Communication" on page 42*.

5 Communication Connection

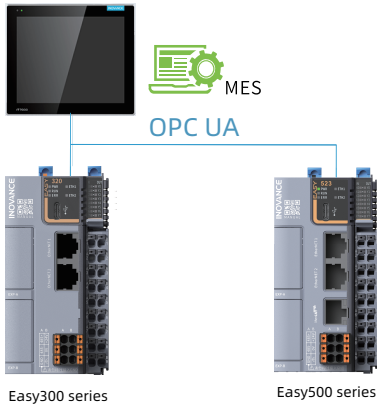
5.1 Communication Networking

This product uses the Ethernet port to connect to other stations or ERP or MES systems. It uses the GE20-232/485 expansion card for communication with a computer or HMI. It uses the GE20-CAN-485 expansion card and CAN bus communication to connect to the MD800 AC drives, as shown in the following figure.



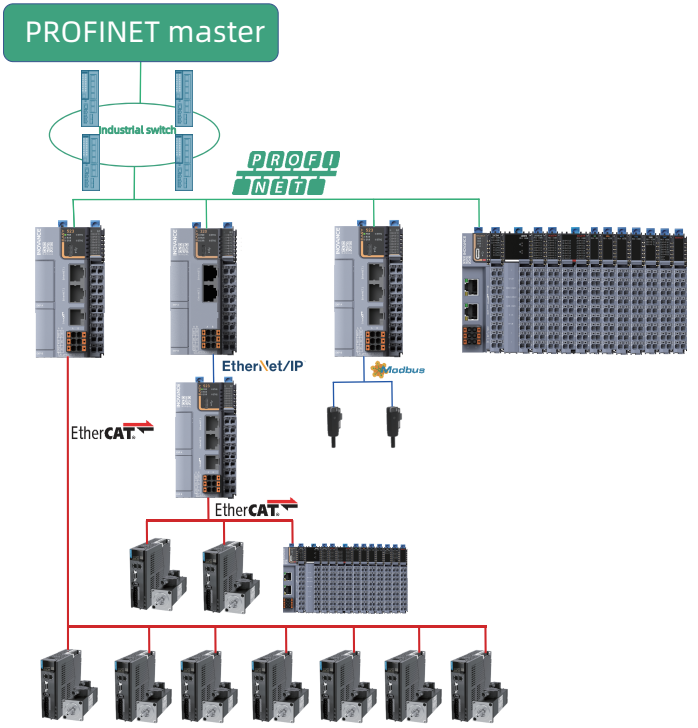
■ OPC UA topology

The MES system connects to the Easy320 and Easy52X PLCs through the OPC UA server, as shown in the following figure.



■ PROFINET topology

The PROFINET master connects to the Easy523 and Easy320 PLCs and the GL20 modules through PROFINER. It connects to other slaves, such as SV630N, SV660N, and other servos, as well as other EtherCAT-enabled modules through the EtherCAT port, as shown in the following figure.

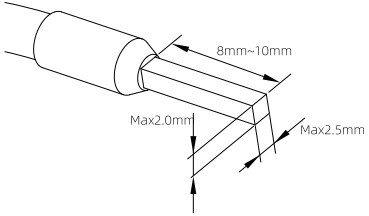


5.2 Cable Selection

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	
	mm^2	AWG
Tubular lug	0.3	22
	0.5	20
	0.75	18
	1.0	18
	1.5	16

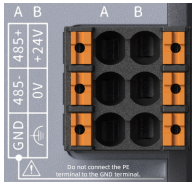
If other tubular lugs are used, crimp them to twisted cables. The following figure shows requirements on the shape and size.



5.3 Cable Connection

■ RS485 communication

The RS485 communication port and the 24 V power supply port are located on the left and right of the same terminal block, respectively.



- Terminal definition

Signal	Left Terminal	Right Terminal	Signal
RS485 differential pair positive signal	485+	+24V	24 VDC power supply positive
RS485 differential pair negative signal	485–	0V	24 VDC power supply negative
RS485 communication ground	GND		PE



- Check the silk prints on both sides of the terminal to prevent wrong cable connection. Do not connect the GND cable to the I/O terminals on the lower side. Failure to comply can lead to short circuit and damage the components.
- Do not connect the PE cable to the GND terminal.

- Communication specifications

Item	Specification
Number of channels	3 (The PLC itself supports one channel and can support two more channels including RS232 through expansion cards.)
Hardware port	2 x 3-pin terminal (shared with the power supply)
Isolation mode	No isolation
Termination resistor	No (The PLC can be used as the master or slave.)
Number of slaves	31 (The cable length for each slave branch must be less than 3 m.)
Baud rate	9600 bps, 19,200 bps, 38,400 bps, 57,600 bps, or 115,200 bps
Transmission speed	• 10 Mbps: 10BASE-T • 100 Mbps: 100BASE-TX • 10 Mbps/100 Mbps self-adaptive
Short circuit protection	Protection against incorrect connection to the 24 V terminal

- Wiring

  Select proper communication cables according to *"5.2 Cable Selection" on page 39* and insert the cables to the corresponding communication ports.

■ Ethernet communication

For reliable communication, use Cat 5 shielded twisted pair cables with injection molded, iron-shelled connectors as Ethernet cables.

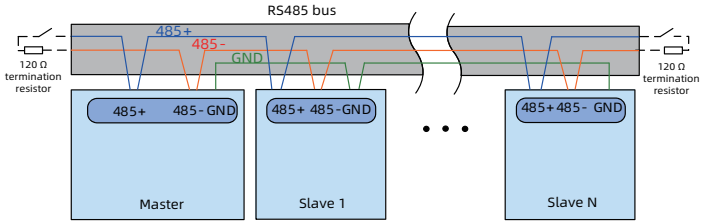
- Insert the registered jack on the cable into the Ethernet port (RJ45 port) until a click is heard.
- To remove the RJ45 network cable, press and hold the tail of the registered jack, and then pull it out along the direction parallel with the PLC.

5.4 RS485 Communication

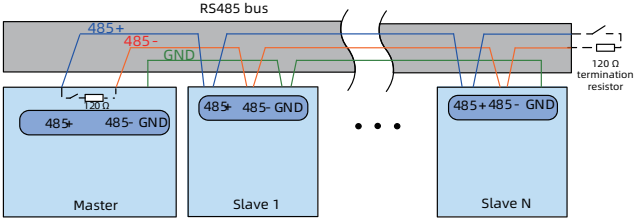
- It is recommended to use a shielded twisted pair cable to connect the 485+ and 485– ports of the RS485 bus.
- Connect a 120 Ω termination resistor at each end of the bus to prevent signal reflection.
- Connect the reference grounds of RS485 signals of all the nodes together.
- Up to 31 nodes can be connected to the RS485 bus and the cable length of any node branch must be less than 3 m.

The following figures show the RS485 bus topology.

Local RS485 communication of Easy series hosts



RS485 communication of GE20 series extension cards



6 Operation and Maintenance

6.1 RUN and STOP States

After writing a program to the STOP-state PLC, execute the following operations to run or stop the system:

State	Operation
To run the system	1. Set the system to RUN state. 2. Ensure the RUN indicator is solid on in yellow green.
To stop the system	Set the system to STOP state or stop the PLC through the host controller.

6.2 User Program Download with a TF Card

Prerequisite

- Prepare a TF card (Micro SD) with a capacity of 32 GB or less and a FAT32 file system.
- Power off the PLC.

Steps

1. Generate a Down/Updown file using AutoShop. For details, see "Applying the Function of Download File Generation" in the *H5U and Easy Series Programmable Logic Controllers Programming and Application Guide*.
2. Create a "PLCProgram" directory in the root directory of the TF card and copy the Down/Updown file to the "PLCProgram" directory.
3. Load the TF card into the TF expansion card and install the TF expansion card to the PLC.
4. Power on the PLC and download the user program in the TF card into the PLC. The RUN indicator flashes quickly at a frequency of 4 Hz during downloading.
5. After successful download, the RUN indicator flashes slowly at a frequency of 1 Hz and the PLC enters the STOP state. You can remove the TF card now.
   If the ERR indicator flashes slowly, the download fails. Check whether the downloaded file is applicable to the PLC model and whether the login password of

the downloaded file is the same as that of the PLC. If the model and password are both correct but the download still fails, contact Inovance for technical support.

6. Re-power on the PLC.

6.3 Firmware Programming with a TF Card

Prerequisite

- Prepare a TF card (Micro SD) with a capacity of 32 GB or less and a FAT32 file system.
- Power off the PLC.

Note

Perform filmware programming carefully because the original application will be deleted and user data will be lost after firmware programming (in .img format).

Steps

1. Load the TF card into the TF expansion card and mount the TF expansion card to the PLC.
2. Power on the PLC again.

   The state of firmware programming is indicated by the RUN and ERR indicators: Flashing quickly for three seconds indicates the start of firmware programming. Remaining solid on indicates firmware programming is in progress. Flashing slowly indicates firmware programming is completed.

3. After firmware programming is completed, power off the PLC and remove the TF card.
4. Power on the PLC again.

7 Appendix

■ Easy320 programmable controllers

Model	Description	Code
Easy320-0808TN-INT	Easy300 series 8-input 8-output programmable controller	01441216
Easy320-0808TP-INT	Easy300 series 8-input 8-output programmable controller	01441186

■ GE20 expansion cards

Type	Model	Description	Code	Slot	ID
Digital input/ output	GE20-4DI-INT	4-channel input 24 VDC input Source/Sink	01480130	A/B	13
	GE20-4DO-TN-INT	4-channel sink transistor output 24 VDC output	01480115	A/B	5
Analog input/ output	GE20-2AD1DA-I-INT	2-channel analog input and 1-channel analog output (current type)	01480138	A/B	11
	GE20-2AD1DA-V-INT	2-channel analog input and 1-channel analog output (voltage type)	01480107	A/B	3
Communication	GE20-CAN-485-INT	CAN and RS485 communication (RJ45)	01480114	A	15
	GE20-232/485-INT	RS232 or RS485 communication	01480119	A/B	7
	GE20-232/485-RTC-INT	RS232 or RS485 communication (with RTC)	01480122	B	14
Storage	GE20-TF-INT	TF expansion card	01480109	B	1
	GE20-TF-RTC-INT	Memory expansion card (with integrated RTC)	01480132	B	6

Type	Model	Description	Code	Slot	ID
Clock	GE20-RTC-INT	Clock expansion card	01480099	B	9

Note

The ID is "0" when there is no expansion card. For expansion card IDs, see the relevant expansion card user guides.

■ GL20 extension module

Module	Model	Description	Code
Digital	GL20-0016ETP-INT	16-channel digital output (PNP)	01441069
	GL20-1600END-INT	16-channel digital input	01441085
	GL20-0016ETN-INT	16-channel digital output (NPN)	01441063
	GL20-0800END-INT	8-channel digital input	01441054
	GL20-0008ETP-INT	8-channel digital output (PNP)	01441062
	GL20-0008ETN-INT	8-channel digital output (NPN)	01441058
	GL20-0808ETN-INT	8-channel digital input and 8-channel digital output (NPN)	01441072
	GL20-0008ER-INT	8-channel relay output module	01441064
	GL20-3200END-INT	32-channel digital input	01441067
	GL20-0032ETN-INT	32-channel digital output (NPN)	01441079
	GL20-0404ETP-5V-INT	5 VDC, 4-channel digital input and 4-channel digital output (about to release)	01441070
	GL20-3232ETN-M-INT	32-channel digital input and 32-channel digital output (NPN), with external terminal block wiring	01441080
Analog	GL20-4AD-INT	4-channel analog input	01441075
	GL20-4DA-INT	4-channel analog output	01441089
	GL20-8ADV-INT	8-channel analog input	01441086
	GL20-8ADI-INT	8-channel analog input	01441092
Temper-ature measure-ment	GL20-4PT-INT	4-channel thermistor input type	01441074
	GL20-4TC-INT	4-channel thermocouple input type	01441066

Module	Model	Description	Code
Communication	GL20-2SCOM-INT	2-channel serial module (third-party products not supported)	01441084
	GL20-2S485-INT	2-channel RS485 expansion module, currently only supporting EtherCAT couplers (third-party products not supported)	01441071
Process module	GL20-2SSI-INT	2-channel SSI communication	01441056

Service and Support

Should you encounter a safety accident during the use or operation of the product, or face challenges in operating and maintaining the equipment, which remain unresolved after the relevant documentation is consulted, we provide multiple channels to ensure prompt resolution:

- Channel #1: Contact service@inovance.com.
- Channel #2: Visit https://www.inovance.com/global to access document downloads, after-sales support, spare parts ordering, repair applications, and authenticity verification services.
- Channel #3: Download My Inovance app (https://zshc-eu.inovance.com/download-pc/) where you can access products info and documentation, and query product parameters.

We are committed to providing you with quick and professional technical support, and we look forward to your satisfaction and trust.