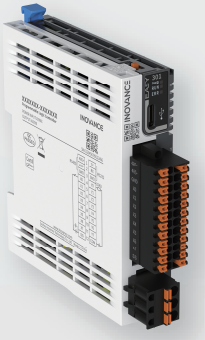
INOVANCE

FORWARD, ALWAYS PROGRESSING



PS00006239A05

Easy301 Series Programmable Controller

User Guide

Suzhou Inovance Technology Co., Ltd.

Add.:No.52, Tian'e Dang Road, Wuzhong District,
Suzhou 215104, P.R. China
Tel: (0512) 6637 6666 Fax: (0512) 6285 6720
www.inovance.com

Preface

■ Introduction

This product is a new generation of small-sized, ultra-thin programmable logic controller (PLC) independently developed by Inovance. It supports RS485 and RS232 communication features and implements multi-layer network communication through the RS485 and RS232 ports. It allows process encapsulation and reuse through the Function Block (FB) and Function (FC) features. This product can accommodate a maximum of eight expansion modules. For module types supported, see the section of "Local Expansion Modules" in the "H5U and Easy Series Programmable Logic Controller Programming and Application Guide".

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 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

Certification	Directive		Standard
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 Documents

Doc 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 and Application 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	19011939	Describes the basic instructions and complex instructions used for programming applications, as well as examples of these instructions
Easy301 Programmable Logic Controller User Guide (this guide)	PS00006239	Describes the installation and wiring of the product, including product information, mechanical installation, and electrical installation

■ Revision History

Date	Version	Description
July 2024	A05	**Addition** • Added the I/O terminal wiring in *"3.2 Terminal Wiring" on page 28* **Change** • Updated the note for power-off and restart in *"1.2 Components" on page 11* • Updated the program data capacity in *"1.3.1 General Specifications" on page 13* • Updated the number of axes supported in *"1.3.1 General Specifications" on page 13* • Updated the rated current of bus input power for the GL20-3232ETN-M expansion module in *"1.3.2 Power Supply Specifications" on page 14*
March 2024	A04	**Addition** Added the Easy301 series programmable controller models and the GL20 series expansion module models in *" Appendix" on page 35* **Change** • Updated the descriptions of status indicators in *"1.2 Components" on page 11* • Updated the power supply specifications in *"1.3.2 Power Supply Specifications" on page 14* • Updated the overcurrent protection device specifications in *"2.1 Installation Environment Requirements" on page 18*

Date	Version	Description
February 2024	A03	Corrected minor errors
March 2023	A02	Updated the diagram of DIN rail buckles; added some product specification data
October 2022	A01	Corrected minor errors
August 2022	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:

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

■ Warranty

Inovance provides an 18-month free warranty (subject to information indicated by the barcode on the product if not otherwise specified in the contract) from the date of manufacturing for product failure or damage under normal use conditions. A maintenance fee will be charged out of the 18-month warranty period.

Even in the 18-month 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 when the external power supply is cut off or the programmable controller fails. • 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

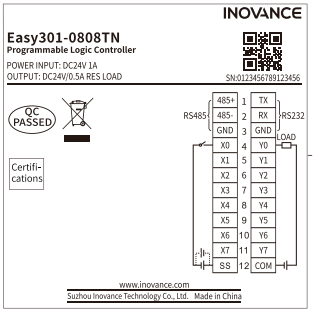
1.1 Model Number and Nameplate

■ Model number

Easy 301 – 0808 TN
① ② ③ ④

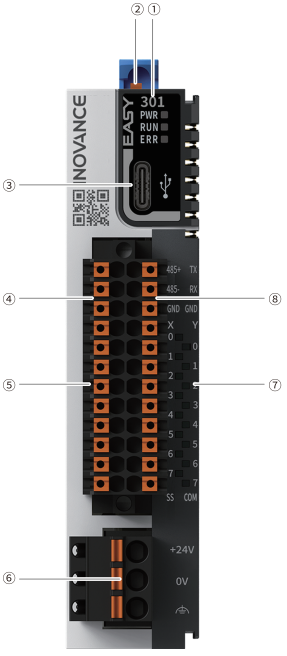
① **Product series** Easy: Easy series programmable logic controller	③ **Input and output channels** 08: 8-channel input 08: 8-channel output
② **Series** 3: 300 series platform 0: No Ethernet 1: Model serial number	④ **Output type** TN: Sink transistor

■ Nameplate



Model	Description	Code
Easy301-0808TN	Easy300 series 8-input 8-output programmable controller	01440323

1.2 Components



No.	Port Type	Mark	Meaning	Indicator Color	Description
①	Operation status indicator	PWR	Power supply normal	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
②	DIP switch	RUN/ STOP	Run/Stop control	-	-
③	Type-C port		Communication with PC	-	-
④	RS485	RS485+	RS485 communication signal+	-	-
		RS485–	RS485 communication signal–	-	-
		GND	RS485 communication ground	-	-
⑤	I/O terminal	-	8-channel input and 8-channel output	-	For details, see *"3.1 Terminal Arrangement" on page 27*.
⑥	Power terminal	+24V	24 VDC power supply+	-	-
		0V	24 VDC power supply–	-	-
			PE	-	-

No.	Port Type	Mark	Meaning	Indicator Color	Description
⑦	I/O indicator	X/Y	I/O status	Yellow-green	• Steady ON: Input or output active • OFF: Input or output inactive
⑧	RS232	TX	RS232 transmit signal	-	-
		RX	RS232 receive signal	-	-
		GND	RS232 communica-tion ground	-	-

[1]: If the product malfunctions and needs to be powered off and restarted, be sure to turn off the power and unplug the USB power cable, and wait for at least 10 seconds after the power indicator is off before proceeding with the power-on and startup operation.

1.3 Product Specifications

1.3.1 General Specifications

Item	Specifications
Program data capacity	• User program: 128 kB steps • Customized variables: 1 MB (including 128 kB retentive at power failure) • Soft elements: approx. 150 kB (retentive at power failure after No. 1000; non-retentive at power failure when only powered by USB)
Instruction processing speed	20,000 steps executed in 2 ms

Item	Specifications
Bit operation	0.144 μs/instruction
Word transmission	0.338 μs/instruction
Floating point operation	0.779 μs/instruction
Ethernet	-
EtherCAT communication	-
Number of axes supported	Maximum 4 axes (maximum 4 local pulse axes and 16 virtual axes)
Serial communication	One RS485 port and one RS232 port
CAN communication	-
High-speed input	Single-phase: 8 channels at 200 kHz
High-speed output	4 axes at 200 kHz; PWM supported
Expansion module	Maximum 8 local expansion modules
Expansion card	-
Programming language	LD, SFC; FB/FC supported (LD)
Type-C	Support for program upload/download and firmware upgrade
IP rating	IP20
Dimensions (W x H x D)	24 mm x 100 mm x 83 mm
Weight	Approx. 135 g

1.3.2 Power Supply Specifications

Item	Specifications
Rated voltage of terminal input power	24 VDC±10% (21.6 VDC to 26.4 VDC)
Rated current of terminal input power	1 A (maximum value at 24 V)
Rated voltage of bus output power	5 VDC (4.75 VDC to 5.25 VDC)
Rated current of bus output power[1]	1 A (typical value at 5 V)

Item	Specifications
24 V input power protection	Protection against short circuit and reverse connection
Hot swapping	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 (⩽ 1 A). For example, the rated current of the bus input power for the GL20-3232ETN-M expansion module is 250 mA, so at most four such modules can be connected to the Easy series programmable logic controller (1 A/250 mA = 4).

1.3.3 Input Specifications

Item		Specifications
Input type		Digital input
Number of input channels		8
Input mode		Sink/Source
Input voltage class		24 VDC±10% (21.6 VDC to 26.4 VDC)
High-speed input (X0 to X7)	Input current when input is ON	> 4 mA
	Input current when input is OFF	< 2.5 mA
	Hardware response time	2 μs (RC time)
	Maximum input frequency	200 kHz
	Input impedance	2.7 kΩ
ON voltage		⩾ 15 VDC
OFF voltage		⩽ 5 VDC
Software filter time		• Low-speed: 2 ms to 1,000 ms • High-speed: 2 μs to 1,000 μs
Isolation mode		Capacitive isolation for integrated chip

Item	Specifications
Common terminal mode	8-point/common terminal (positive/ negative polarity of input power being changeable)
Input action display	The input indicator lights up (controlled by software) when the input is in drive state.

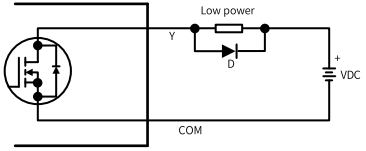
1.3.4 Output Specifications

Item		Specifications
Output type		Transistor NPN output
Number of output channels		8
Output voltage class		24 VDC±10% (21.6 VDC to 26.4 VDC)
High-speed output (Y0 to Y3)	Output load (resistive load)	0.5 A/point; 2 A/8-point
	Output load (inductive load)	7.2 W/point; 24 W/8-point
	Output load (lamp load)	5 W/point; 18 W/8-point
	Hardware response time (ON/ OFF)	< 1 μs (OFF→ON); < 2 μs (ON→OFF)
	Load current requirements	Load current ⩾ 12 mA when the output is greater than 10 kHz
	Maximum output frequency	200 kHz for resistive load; 0.5 Hz for inductive load; 10 Hz for lamp load
Normal output (Y4 to Y7)	Output load (resistive load)	0.5 A/point; 1 A/common terminal
	Output load (inductive load)	6 W/24 VDC (total)
	Output load (lamp load)	1 W/24 VDC (total)
	Hardware response time (ON/ OFF)	< 100 μs (OFF→ON, ON→OFF)
	Load current requirements	⩾ 5 mA
	Maximum output frequency	100 Hz for resistive load; 0.5 Hz for inductive load; 10 Hz for lamp load
PWM output (Y0 to Y3)		Maximum frequency 200 kHz; minimum pulse width 2.5 μs; minimum resolution 2.5 μs; adjustable duty cycle[1] 0.01% to 99.99%

Item	Specifications
Leakage current during OFF	< 30 μA at rated 24 V
Maximum residual voltage during ON	< 0.5 VDC
Isolation mode	Photocoupler isolation
Common terminal mode	8-point/common terminal (polarity of output power supply being negative)
Short circuit protection	Protection against short circuit of each channel, recovered after power-off
External inductive load protection	A flywheel diode[2] is required when an external inductive load is connected.
Output action display	The output indicator lights up (controlled by software) when the output is in drive state.

[1]: The duty cycle setting is frequency dependent, and the pulse width corresponding to the duty cycle must not be less than the minimum pulse width.

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

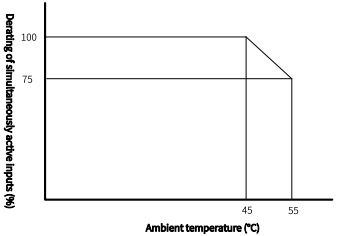


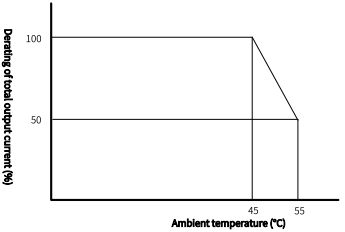
2 Mechanical Installation

2.1 Installation Environment Requirements

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

Item	Specifications
Operating environment	Places without corrosive or inflammable gas or severe conductive dust
Altitude	Maximum 2,000 m (80 kPa)
Pollution degree	PD2
Interference 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; 5 Hz to 8.4 Hz: 3.5 mm; 8.4 Hz to 150 Hz: 1·g; three axes: X, Y, and Z; 10 sweeps/axis
Shock resistance	IEC 60068-2-27; 150 m/s^2; 11 ms; six directions: ±X, ±Y, and ±Z; 3 cycles/direction, totaling 18 cycles
Overcurrent protection device	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
Ambient 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 forced draft fan or air conditioner must be installed in the heat dissipation hole direction.**

Item	Specifications
Installation position and limit	Installation position: The PLC can be installed in four directions. For details, see *"2.2 Installation Position Requirements" on page 20*. 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 simultaneously active inputs shall be reduced to 75% (that is, no more than six inputs), at a derating rate of 2.5% per 1°C of temperature rise.  (To be continued)

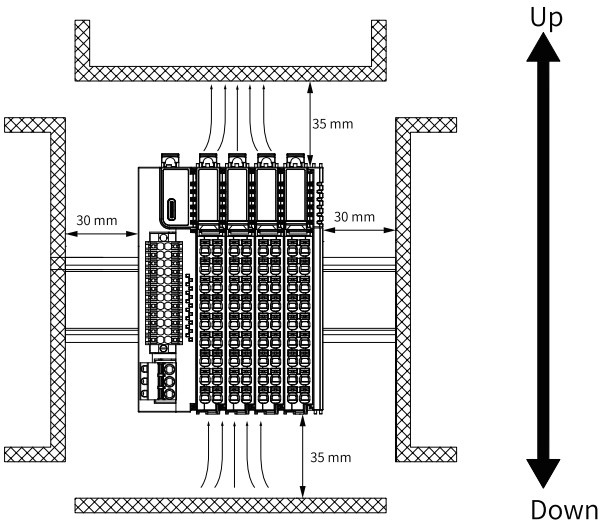
Item	Specifications
Continued	(Continued) • Output derating: When the ambient temperature is 45°C, the PLC can work at full load (that is, the total current of the eight outputs not higher than 2 A). When the ambient temperature is 55°C, the total current of simultaneously active outputs shall be reduced to 50% (that is, the total current of the eight outputs not higher than 1 A), at a derating rate of 5% per 1°C of temperature rise.  Non-horizontal installation: A maximum of six inputs can be in active state simultaneously, and the maximum allowed output current is 1 A.

2.2 Installation Position Requirements

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 *"2.1 Installation Environment Requirements" on page 18*.

■ 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 product, as shown in the following figure.

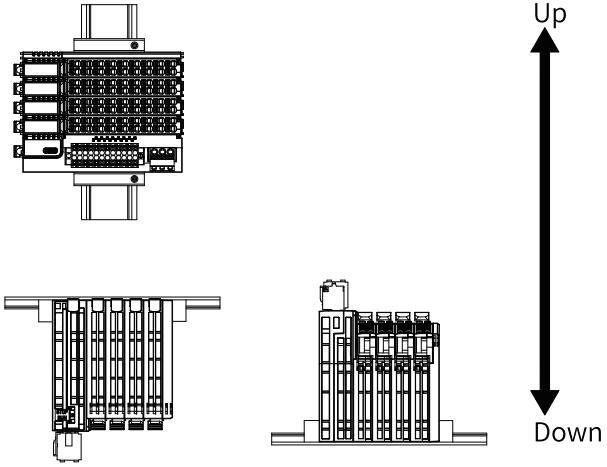


Note

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:

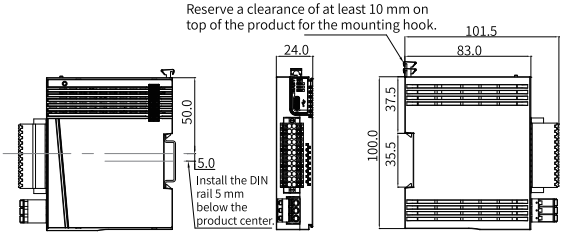
- Install the PLC below all I/O modules.
- Hold the cables with a cable duct to prevent the weight of cables being applied to the lower end plate. Failure to comply may cause displacement of the PLC from the DIN rail, leading to maloperation of the PLC.

2.3 Installation Precautions

- Before installing or removing the PLC and modules, ensure that they are powered off.
- Do not hot-swap the modules, as hot-swapping may cause reboot of the PLC and loss or damage of user data.
- To avoid damage to the PLC and modules, prevent their enclosures and terminals from falling off or being impacted.

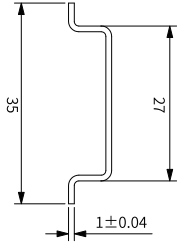
2.4 Installation Dimensions

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



2.5 Installation Methods

The controller is mounted onto a DIN rail that complies with IEC 60715 (width: 35 mm, thickness: 1 mm). The dimensions (unit: mm) are shown below.

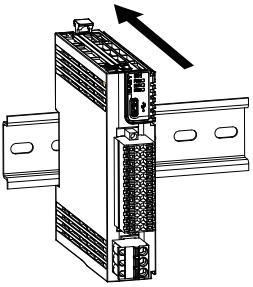


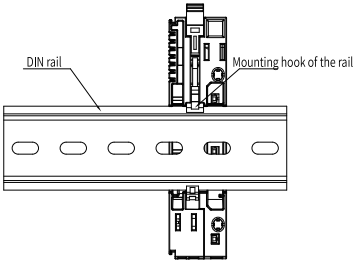
Caution

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.

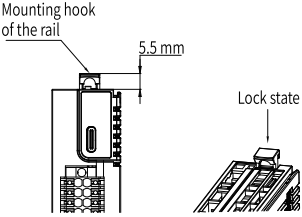
■ Installing the master

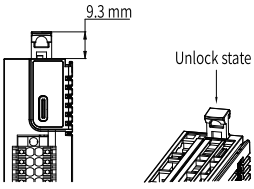
1. Align the controller with the DIN rail and push the controller in the direction indicated by the arrow until you hear a clicking sound, as shown below.





2. Make sure the DIN rail mounting hook of the controller 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.

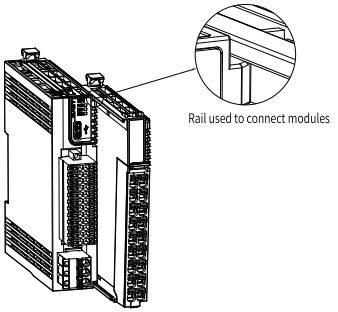
Press down the mounting hook to lock the controller to the DIN rail.

Caution

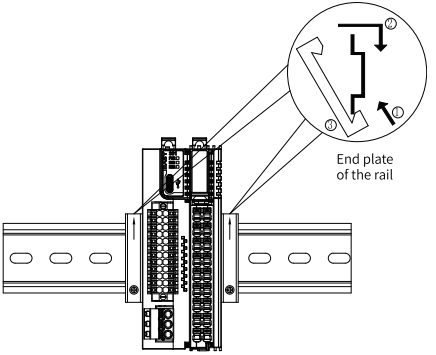
Keep the mounting hook locked when the controller is not mounted on the rail. If the mounting hook is kept unlocked for an extended period of time, it may malfunction.

■ Installing the module to the master

Install the extension module to the master through top and bottom rails, as shown below.

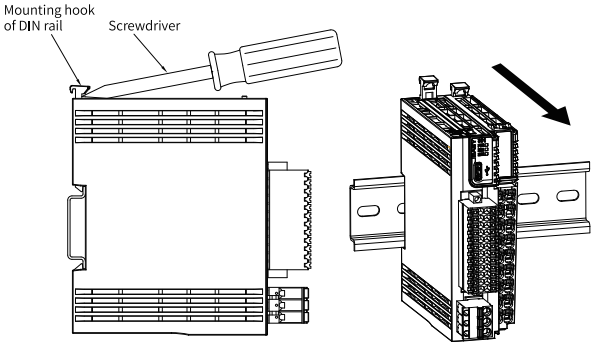


Install an DIN rail end plate to both sides of the master or module. To mount the end plate, hook the bottom of it to the bottom of the DIN rail, rotate the end plate to hook the top of it to the top of the DIN rail, and then tighten the screw to lock the end plate in place, as shown below.



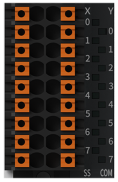
■ Removing the module

Pry the mounting hook upwards with a tool such as a straight screwdriver or similar, and pull out the module forwardly. Then press down the top of the mounting hook.


Mounting hook
of DIN rail
Screwdriver

3 Electrical Installation

3.1 Terminal Arrangement



Left Signal	Left Terminal	Right Terminal	Right Signal
X0 input	X0	Y0	Y0 output
X1 input	X1	Y1	Y1 output
X2 input	X2	Y2	Y2 output
X3 input	X3	Y3	Y3 output
X4 input	X4	Y4	Y4 output
X5 input	X5	Y5	Y5 output
X6 input	X6	Y6	Y6 output
X7 input	X7	Y7	Y7 output
Input common terminal	SS	COM	Output common terminal

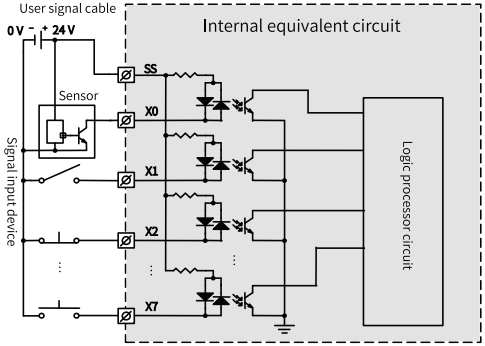
Caution

- Check the silk print on both sides of the terminals to prevent wrong connection. Failure to comply may result in short circuit and damage to the device.
- The length of a high-speed I/O interface extension cable must be within 3.0 m.
- To prevent interference, route the I/O interface extension cable and the power cable (high-voltage/high-current cables) through different and non-parallel routes.

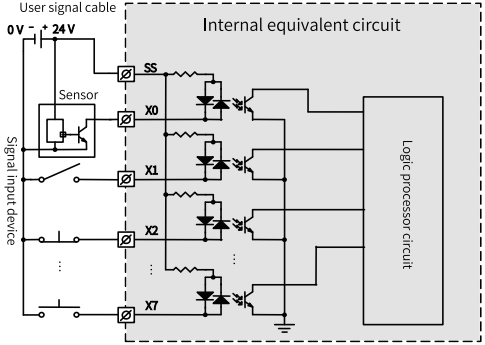
3.2 Terminal Wiring

■ Input terminal circuit diagram

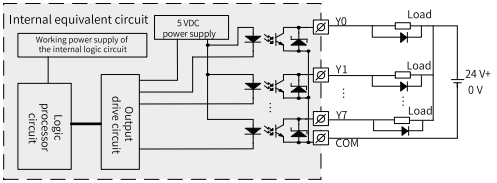
- **Input terminal circuit diagram for sink wiring**



- **Input terminal circuit diagram for source wiring**



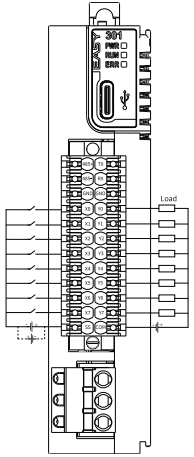
■ Output terminal circuit diagram



Note

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

■ Input and output terminal wiring diagram



4 Communication Connection

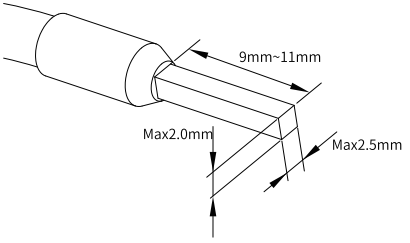
4.1 Cable Selection

- Power cable

  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	17
	1.5	16

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

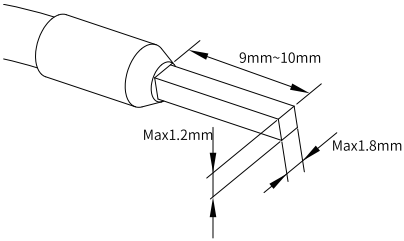


- Communication cable

  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

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



4.2 Cable Connection

■ RS485&RS232 communication

The RS485 communication port and the RS232 communication port share the same terminal block, with RS485 communication port on the left and RS232 communication port on the right.

■ RS485&RS232 terminal assignment

Description	Left terminal	Right terminal	Description
RS485 differential pair (+)	485+	TX	RS232 signal transmission
RS485 differential pair (-)	485-	RX	RS232 signal reception
RS485 ground	GND	GND	RS232 ground

Caution

Check the silk print on both sides of the terminal to prevent wrong connection. Do not connect the GND cable to the lower I/O terminal. Failure to comply can result in short circuit and damage to the device.

■ RS485 communication specifications

Item	Description
Number of channel supported	1
Hardware interface	2 x 12-pin terminal (shared with DI/DO)
Isolation mode	Non-isolation
Termination resistor	Without termination resistor
Number of slaves connected	Up to 31 slaves (The length of each slave branch must be shorter than 3 m.)
Communication baud rate	9600 bit/s, 19200 bit/s, 38400 bit/s, 57600 bit/s, and 115200 bit/s
Short circuit protection	Providing protection against improper connection of 24 V power supply

■ RS232 communication specifications

Item	Description
Number of channel supported	1
Hardware interface	2 x 12-pin terminal (shared with DI/DO)
Isolation mode	Non-isolation
Communication baud rate	9600 bit/s, 19200 bit/s, 38400 bit/s, 57600 bit/s, and 115200 bit/s

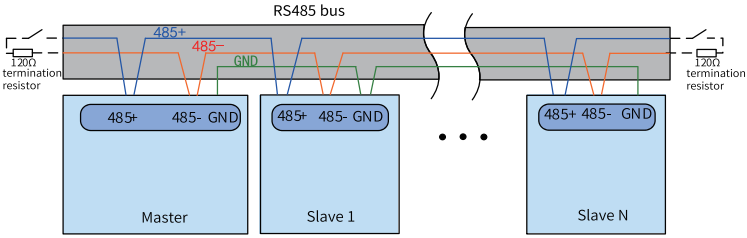
■ Wiring

Select the communication cable according to *"4.1 Cable Selection" on page 30*. Insert the communication cable to the communication port.

4.3 Instructions on RS485 Communication

It is recommended to use a shielded twisted pair cable as the RS485 bus. Connect a 120 Ω termination resistor to both ends of the bus respectively to prevent signal reflection. Connect the signal reference grounds of all nodes together. Up to 31 nodes can be connected and the distance between nodes must be less than 3 m.

The RS485 bus topology is shown in the figure below.


RS485 bus
485+
485−
GND
120Ω
termination
resistor
120Ω
termination
resistor
485+ 485- GND
Master
485+ 485- GND
Slave 1
485+ 485- GND
Slave N

5 Operation and Maintenance

5.1 Program Run and Stop

After writing a program while the PLC is in the "STOP" state, execute the shutdown operation as described in the following table.

Status	Operation
To run the system	1. Set the system to the "RUN" state. 2. Confirm that the RUN indicator is yellow-green and steady on.
To stop running	Set the system to the "STOP" state, or stop the PLC in the background by using the host controller.

6 Appendix

■ Easy301 series programmable controllers

Model	Description	Code
Easy301-0808TN	Easy300 series 8-input 8-output programmable controller	01440323

■ GE20 series expansion cards

Type	Model	Description	Code	Slot	ID
Digital input/ output	GE20-4DI	4-channel input 24 VDC input Source/Sink	01480032	A/B	13
	GE20-4DO-TN	4-channel sink transistor output 24 VDC output	01480033	A/B	5
Analog input/ output	GE20-2AD1DA-I	2-channel analog input and 1-channel analog output (current type)	01480027	A/B	11
	GE20-2AD1DA-V	2-channel analog input and 1-channel analog output (voltage type)	01480028	A/B	3
Commu-nication	GE20-CAN-485	CAN and RS485 communication (RJ45)	01480034	A	15
	GE20-232/ 485	RS232 or RS485 communication	01480029	A/B	7
	GE20-232/ 485-RTC	RS232 or RS485 communication (with RTC)	01480035	B	14
Storage	GE20-TF	TF expansion card	01480030	B	1
	GE20-TF-RTC	Memory expansion card (with integrated RTC)	01480050	B	6
Clock	GE20-RTC	Clock expansion card	01480031	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 series expansion modules

Module	Model	Description	Code
Digital	GL20-0016ETP	16-channel digital output (PNP)	01440292
	GL20-1600END	16-channel digital input	01440291
	GL20-0016ETN	16-channel digital output (NPN)	01440293
	GL20-0800END	8-channel digital input	01440381
	GL20-0008ETP	8-channel digital output (PNP)	01440380
	GL20-0008ETN	8-channel digital output (NPN)	01440379
	GL20-0808ETN	8-channel digital input and 8-channel digital output (NPN)	01440339
	GL20-0008ER	8-channel relay output module	01440334
	GL20-3200END	32-channel digital input	01440378
	GL20-0032ETN	32-channel digital output (NPN)	01440377
	GL20-0404ETP-5V	5 VDC; 4-channel digital input and 4-channel digital output (available soon)	01440506
	GL20-3232ETN-M	32-channel digital input and 32-channel digital output (NPN), with external terminal block wiring	01440290
Analog	GL20-4AD	4-channel analog input	01440288
	GL20-4DA	4-channel analog output	01440287
	GL20-8ADV	8-channel analog input	01440482
	GL20-8ADI	8-channel analog input	01440489

Module	Model	Description	Code
Temperature measurement	GL20-4PT	4-channel thermistor input type	01440337
	GL20-4TC	4-channel thermocouple input type	01440338
Communication	GL20-2SCOM	2-channel serial module (third-party products not supported)	01440463
	GL20-2S485	2-channel RS485 expansion module, currently only supporting EtherCAT couplers (third-party products not supported)	01440398
Process module	GL20-2SSI	2-channel SSI communication	01440445