



GL20-0008ER Digital Output Module User Guide

Shenzhen Inovance Technology Co., Ltd.

Add.: Inovance Headquarters Tower, High-tech Industrial Park,

Guanlan Street, Longhua New District, Shenzhen

Tel: (0755) 2979 9595

Fax: (0755) 2961 9897

www.inovance.com



Preface

■ About This Guide

GL20-0008ER expansion module is an 8-channel digital relay output module and can be used together with Easy series PLC master and GL20 communication module.

This guide describes the mechanical installation, electrical installation and programming examples of the product.

■ Standard 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 Name		Standard
CE certification	EMC directive	2014/30/EU	24 VDC products EN 61131-2 24 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 UL 61010-2-030 CAN/CSA-C22.2 No. 61010-1 CSA C22.2 NO. 61010-2-201 CSA C22.2 NO. 61010-2-030

Certification	Directive Name	Standard
KCC certification	-	-
EAC certification	-	-

■ More Data

Data Name	Data Code	Description
GL20-RTU-ECT Communication Interface Module User Guide	PS00004985	This guide describes the installation, wiring and more of the product.

■ Revision History

Date	Version	Description
January 2023	A02	Minor corrections
December 2022	A01	Updated the structure drawing and nameplate drawing Added environmental specifications Made some modifications
November 2022	A00	First release.

■ How to Obtain

This guide is not shipped with the product. If you need to obtain the electronic PDF file, you can obtain it in the following ways:

- Log in to Inovance's website (www.inovance.com), choose **Support > Download**, search by keyword, and then download the PDF file.
- Scan the QR code on the product with your mobile phone.

■ Warranty Agreement

The warranty period of the product is 18 months as of the date of manufacture (refer to the barcode on the equipment). If otherwise agreed upon, the agreed terms and

conditions shall prevail. After the warranty period expires, maintenance will be charged.

Within the warranty period, maintenance will be charged for damages caused by the following:

- Operations not following the user instructions
- Fire, flood, or abnormal voltage
- The user uses the product for abnormal functions.
- The user uses the product outside the specified specification range.
- Force majeure such as natural disasters, earthquake, lightning strike

The maintenance fee is charged according to the latest Price List of Inovance. If otherwise agreed upon, the terms and conditions in the agreement shall prevail.


For details, see Product Warranty Card.


Fundamental Safety Instructions


■ Safety Precautions

- Before installing, using, and maintaining this equipment, read the safety information and precautions thoroughly, and comply with them during operations.
- To ensure the safety of humans and equipment, follow the signs on the equipment and all the safety instructions in this user guide.
- "CAUTION", "WARNING", and "DANGER" items in the user guide only indicate some of the precautions that need to be followed; they just supplement the safety precautions.
- Use this equipment according to the designated environment requirements. Damage caused by improper use is not covered by warranty.
- Inovance shall take no responsibility for any personal injuries 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 injuries or damage to the equipment. Please keep this guide well so that it can be read when necessary and forward this guide to the end user.

During 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 PLC 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.



- 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 machine.
- To ensure safe operation, for the output signals that may cause critical accidents, please design an external protection circuit and safety mechanism.
- Once PLC CPU detects abnormality in the system, all outputs may be closed; however, when a fault occurs in the controller circuit, the output may not be under control. Therefore, it is necessary to design an appropriate external control circuit to ensure normal operation.
- If the PLC 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 lightning protection device, assuring that overvoltage due to lightning shock cannot be applied to the PLC power supply input terminals, signal input terminals and output terminals and so forth, so as to avoid damage to the equipment.

Installation



- Installation must be carried out by the specialists who have received the necessary electrical training and understood enough electrical knowledge.
- Disconnect all external power supplies of the system before removing/installing the module. Failure to do so may result in electric shock, module fault or malfunction.
- Do not use the PLC where there is dust, oil smoke, conductive dust, corrosive or combustible gases, or exposed to high temperature, condensation, wind & rain, or subject to vibration and impact. 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 personnel who have received the necessary electrical training and understood enough electrical knowledge can open the cabinet.



- Prevent metal filings and wire ends from dropping into ventilation holes of the PLC during installation. Failure to comply may result in fire, fault and malfunction.
- Ensure there are no foreign matters on ventilation surface. Failure to comply may result in poor ventilation, which may cause 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.

Wiring



- Wiring must be carried out by personnel who have received the necessary electrical training and understood enough electrical knowledge.
- Disconnect all external power supplies of the system before wiring. Failure to comply may result in electric shock, module fault or malfunction.
- Perform good insulation on terminals so that insulation distance between cables will not reduce after cables are connected to terminals. Failure to comply may result in electric shock or damage to the equipment.



- To avoid electric shock, cut off the power supply before connecting the product to the power supply.
- The input power of the product must meet the specifications listed in this guide. If the power input does not meet the specifications, the equipment may be damaged. Thus, check regularly that the DC power provided by the switching-mode power supply unit is stable.

During Operation and Maintenance



- Maintenance & inspection must be carried out by personnel who have the necessary electrical training and experience.
- 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. Failure to comply may result in electric shock.
- Disconnect all external power supplies of the system before removing the module or connecting/removing the communication wirings. Failure to comply may result in electric shock or malfunction.

Safety Recommendations

- On-site manual devices or other backup means must be equipped in the position where the operator directly touches the mechanical parts, such as loading and unloading mechanical tools, or the position where the machine runs automatically. The manual devices and backup means, which can start or interrupt automatic operations of the system, must be independent of the programmable controller.
- If you need to modify the program while the system is running, use the lock function or other protective measures. Ensure that only authorized personnel can make the necessary modifications.

Disposal



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

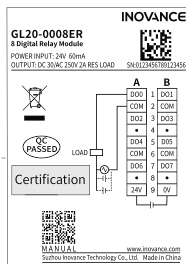
1 Product Information

1.1 Model Number and Nameplate

GL 20 -00 08 E R

① ② ③ ④ ⑤ ⑥

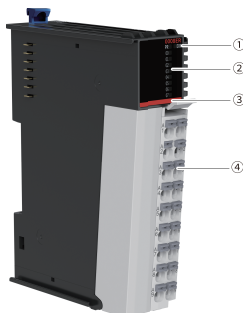
① Product Information GL: General local module	③ I/O Points 0 input	⑤ Module Type Logic I/O expansion module
② Serial Number 20: 20 series module	④ I/O Points 8 outputs	⑥ Output type Relay output









Based on the above description of model number and nameplate, the relevant ordering data of this product is described in the following table.

Model	Description	Product Code	Applicable Model
GL20-0008ER	GL20 series 8-channel relay output general-purpose module	01440334	GL20 communication interface module, Easy series

1.2 Components



No.	Name	Description			
①	Running state indicator	PR (POWER +RUN)	Power / running indicator	Yellow green	<ul style="list-style-type: none"> ● 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.
		ERR	Error indicator	Red	Module fault
②	I/O signal indicator	00 to 07	I/O signal indicator	Yellow green	<ul style="list-style-type: none"> ● ON: Output active ● OFF: Output inactive

No.	Name	Description			
③	Color identification		Red: Digital output		Orange: Analog output
			Gray: Digital input		Green: Analog input
			White: Communication		Blue: Other module
④	Terminals	/	0 inputs and 8 outputs	/	See Terminal Definition for detailed definition <i>"3.2 Terminal Definition" on page 18</i>

Note

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

1.3 Specifications

■ Power supply specifications

Item	Specification
Rated bus input voltage	5 VDC (4.75 VDC to 5.25 VDC)
Rated bus input current	85 mA (typical@5 V)
Rated terminal input voltage	24 VDC (21.6 VDC to 26.4 VDC)
Rated terminal input current	60 mA (typical@24 V)
Rated terminal output voltage	/
Rated terminal output current	/
Hot swap	Not supported

■ Output specifications

Item	Specification
Output type	Digital output, relay output
Output mode	Dry contact

Item	Specification
Output channels	8
Output voltage class	250 VAC/30 VDC
Output load (resistive load)	2 A/point; 8 A/module
Output load (inductive load)	1 A/point; 4 A/module
Output load (lamp load)	30 W/point; 120 W/module
ON/OFF hardware response time	Approx.15ms
Min. load	5 VDC, 5 mA
Minimum number of switching cycles	1×10^5 (exceeding the limit will lead to switch failure or even damage)
Isolation	Yes
Output action display	Output indicators are turned ON (via software control) when the outputs are in the driving state
Output derating	50% derating at 55°C (the output current does not exceed 4 A when all outputs are ON), or 10°C derating when outputs are ON
Protection function	/

■ Software specifications

Item	Specification
Output mode upon stop	Output zero, output last value, output preset value
Preset value	0 or 1
Output port anomaly detection and indication	/
Output channel logic level configuration	Not supported
Independent channel enable configuration	Not supported

Item	Specification
Diagnostic report configuration	Not supported
When in stop mode	Output according to output mode upon stop and present value, no refresh

Note

- Background start/stop;
- The bus of GL20 communication interface module is out of communication due to disconnection of the network cable or manual state switching;
- The local bus stops operation.

1.4 Environmental Specifications

Item	Specification
Ambient operating temperature	-20°C to 55°C
Ambient operating humidity	10% to 90% RH (non-condensing)
Working environment	No corrosive and flammable gas and no excessive conductive dust
Ambient storage temperature	-40°C to 70°C (<90% RH, non-condensing)
Altitude	≤2000 m
Pollution degree	2 or less
Noise immunity	2 kV on power supply line (Conforms to IEC 61000-4-4)
Overvoltage category	I
EMC immunity level	Zone B, IEC61131-2

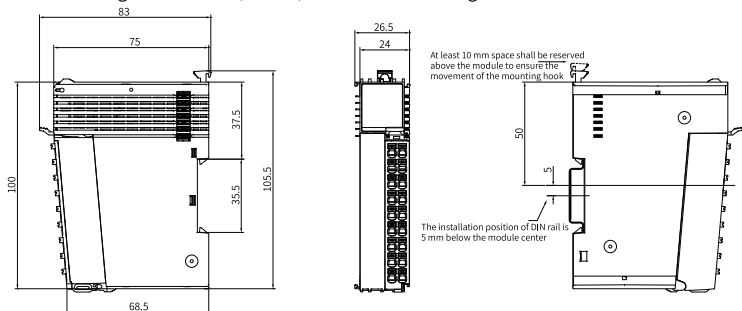
Item	Specification
Vibration resistance	IEC 60068-2-6 5 Hz to 8.4 Hz, 3.5 mm p , 8.4 Hz to 150 Hz, 1g, 10 times each in X, Y and Z directions
Shock resistance	IEC 60068-2-27 150 m/s ² , 11 ms, 3 times each in $\pm X$, $\pm Y$ and $\pm Z$ directions, 18 times in total

2 Mechanical Installation

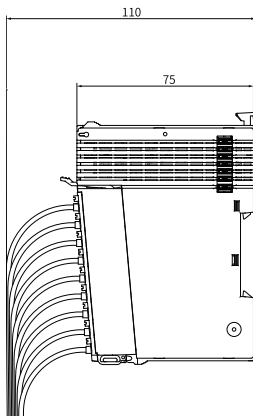
2.1 Mounting Dimensions

■ Module

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



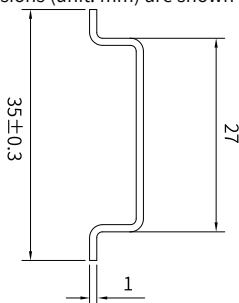
■ Cable Connection



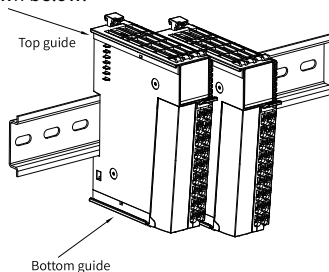
2.2 Installation Method

■ Installing Modules Side-by-Side

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

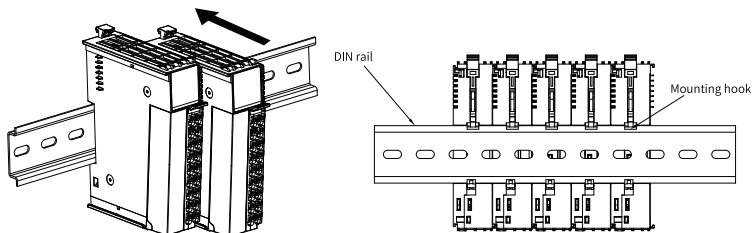


You can install multiple modules side by side with the help of top and bottom guides on the modules, as shown below.



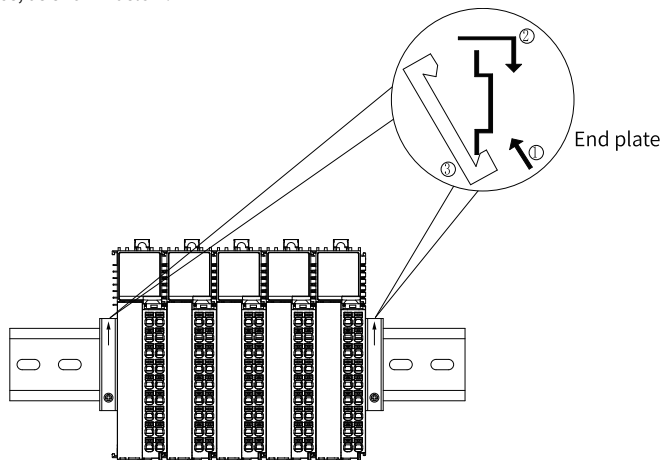
■ Installing Module onto DIN Rail

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



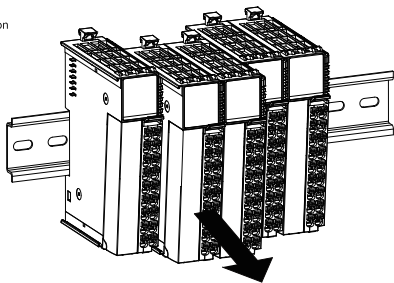
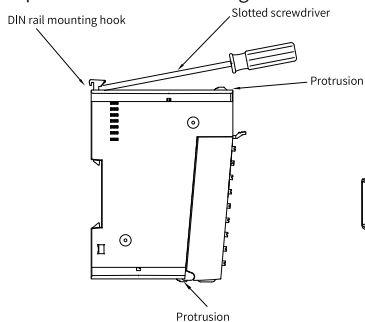
Note: After the module is installed, the DIN rail mounting hook will automatically move downward to lock the module to the rail. If the DIN rail mounting hook does not move downward, press down the top of it to ensure that the module is installed in place.

Mount an end plate on either side of the module assembly. 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 Module

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



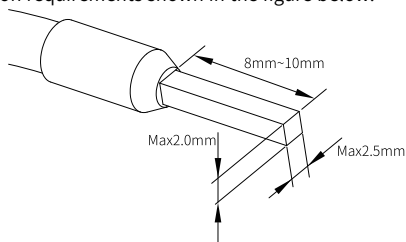
3 Electrical Installation

3.1 Cable Selection

The cable lug and cable diameter included in the following table are only for reference.

Material Name	Applicable Cable Diameter		KST		Suzhou Yuanli	
	mm ²	AWG	Model	Crimping Tool	Model	Crimping Tool
Tubular lug	0.3	22	E0308	KST2000L	0308	YAC-5
	0.5	20	E0508		0508	
	0.75	18	E7508		7508	
	1.0	18	E1008		1008	
	1.5	16	E1508		1508	

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



3.2 Terminal Definition

The terminal arrangement is shown in the following figure and the definition of the terminals is described in the following table.



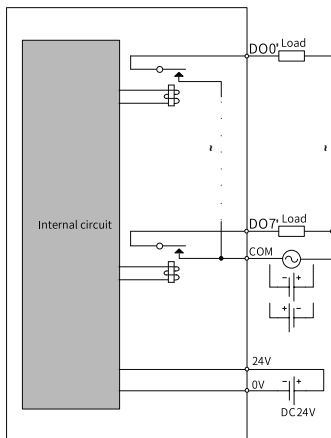
Left Signal	Left Terminal	Right Terminal	Right Signal
DO0	A1	B1	DO1
COM	A2	B2	COM
DO2	A3	B3	DO3
•	A4	B4	•
DO4	A5	B4	DO5
COM	A6	B6	COM
DO6	A7	B7	DO7
•	A8	B8	•
24 V	A9	B9	0 V

Refer to the following table for the correspondence between terminal signals and signal indicators.

Terminal Signal	Signal Indicator
DO0	00
DO1	01
DO2	02
DO3	03
DO4	04

Terminal Signal	Signal Indicator
DO5	05
DO6	06
DO7	07

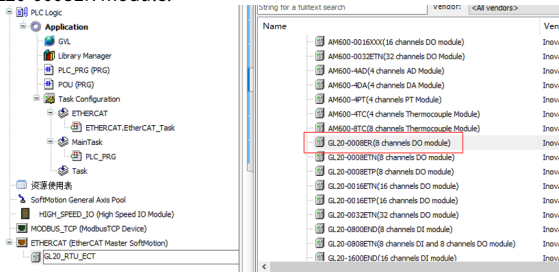
3.3 Terminal Wiring



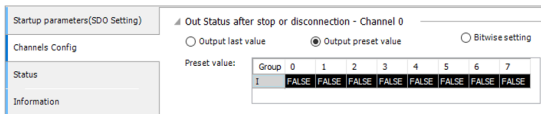
4 Programming Examples

The following is an example where the variable of the GL20-0008ER module is assigned to the corresponding output variable, and AM600 is used as the main control module.

1. Add the GL20-0008ER module.



2. Double click the module and set **Out Status after stop or disconnection**.



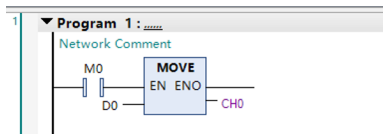
3. Add a custom variable CH0.

	Scope	Name	Address	Data type	Initialization	Persistent	Constant	Comment	Attributes
1	VAR_GLOBAL	CH0		INT		<input type="checkbox"/>	<input type="checkbox"/>		

4. Map CH0 to channel 0 of the configured module.

Find	Filter	Show all							
Variable	Mapping	Channel	Address	Type	Default Value	Unit	Description		
* Application.CH0		Device control	%QW1	UINT			Device control		
* Application.CH0		GL20_0008ER Digital output 8bit	%QW4	USINT			GL20_0008ER Digital output 8bit		
* Application.CH0		LBUS status	%IW1	UINT			LBUS status		
* Application.CH0		Fault ID	%IW2	UINT			Fault ID		

5. Define a variable D0 with the LD programming language as shown in the figure below.



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