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PS00006874A03

GL20-PS2 Series

Relay Power Supply Module

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

The GL20-PS2 relay power supply module outputs 2 A current to power at most 16 modules. It can be used with Easy series products and GL20 series communication interface module such as GL20-RTU-ECT.

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

■ Standards Compliance

The following table lists the certifications, directives, and standards that the product may comply with. For details about the acquired certificates, see the certification marks on the product nameplate.

Certification	Directive		Standard
CE Certification	EMC Directive	2014/30/EU	**24 VDC products:** EN 61131-2 **220 VAC products:** EN 61131-2 EN 61000-3-2 EN 61000-3-3
	LVD Directive	2014/35/EU	EN 61010-1 EN 61010-2-201
	RoHS Directive	2011/65/EU amended by (EU) 2015/863	EN IEC 63000
UL/cUL Certification	-		UL 61010-1 UL 61010-2-201 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	Standard
KCC Certification	-	-
EAC Certification	-	-

■ More Data

Name	Code	Description
GL20-RTU-ECT Series Communication Interface Module User Guide	PS00004985	This guide introduces the installation, wiring, and other information of the product.
GL20-PS2 Series Relay Power Supply Module User Guide (This guide)	PS00006874	This guide introduces the installation, wiring, and other information of the product.

■ Revision History

Date	Version	Revision
March 2025	A03	• Added *" Troubleshooting" on page 21*. • Added *" Version Matching Information" on page 23*.
July 2024	A02	Updated *"1.4 Environmental Specifications" on page 11*.
June 2024	A01	• Updated *"1.4 Environmental Specifications" on page 11* • Added *"2.1 Installation Precautions" on page 13*.
February 2023	A00	Initial release

■ Access to the Guide

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

- Do keyword search under Service and Support at *www.inovance.com*.

- Scan the QR code on the product with your smart phone.
- Scan the QR code below to install My Inovance app, where you can search for and download user guides.

■ Warranty Disclaimer

Inovance provides warranty service within the warranty period (as specified in your order) for any fault or damage that is not caused by improper operation of the user. Maintenance will be charged after the warranty period expires.

Within the warranty period, maintenance fee will be charged for the following damage:

- Damage caused by operations not following the instructions in the user guide
- Damage caused by fire, flood, or unusual voltage
- Damage caused by unintended use of the product
- Damage caused by use beyond the specified scope of application of the product
- Damage or secondary damage caused by force majeure (natural disaster, earthquake, and lightning strike)

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

For details, see the Product Warranty Card.

Safety Precautions

■ Safety Disclaimer

1. Read and follow the safety instructions when installing, operating, and maintaining the equipment.
2. To ensure your safety and prevent damage to the equipment, follow the marks on the equipment and all the safety instructions in this guide.
3. "CAUTION", "WARNING", and "DANGER" items in the guide do not indicate all safety precautions that need to be followed; instead, they just supplement the safety precautions.
4. Use this equipment according to the designated environment requirements; otherwise, a fault may occur. Malfunction or damage caused by improper use is not covered by warranty.
5. Inovance shall take no responsibility for any personal injury or property damage caused by improper use.

■ Safety Levels and Definitions

DANGER: "DANGER" indicates that failure to comply with the notice can result in severe personal injury or even death.

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

CAUTION: "CAUTION" indicates that failure to comply with the notice may result in minor or moderate personal injury or equipment damage. Keep this guide properly for future use and deliver it to the end user.

Control System Design
DANGER • Provide a safety circuit outside the PLC so that the control system can still work safely once external power failure or controller fault occurs. • Add a fuse or circuit breaker because the module may smoke or catch fire due to long-time overcurrent caused by operation above rated current or load short-circuit.

WARNING

- An emergency stop circuit, a protection circuit, a forward/reverse operation interlocked circuit, and an upper position limit and lower position limit interlocked circuit must be set in the external circuits of PLC to prevent damage to the equipment.
- To ensure safe operation, for the output signals that may cause critical accidents, use external protection circuits and safety mechanism.
- Once the CPU of the PLC detects an exception 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 output units such as relays or transistors are damaged, the output may fail to switch between ON and OFF states according to the commands.
- The PLC is designed to be used in an indoor electrical environment (overvoltage category II). The power supply must have a system-level surge protector, assuring that overvoltage due to lightning shock cannot be applied to the PLC's power supply input terminals, signal input terminals, and output terminals, to prevent damage to the equipment.

Installation

WARNING

- Installation must be carried out by skilled personal who have undergone specialized electrical training and possess comprehensive electrical expertise.
- Disconnect all external power supplies of the system before disassembling the module. Failure to do so may result in electric shock, module fault, or malfunction.
- Do not use the PLC in environments with dust, greasy smoke, conductive dust, corrosive or combustible gases, exposed to high temperature, condensation, wind & rain, or subject to vibration and shock. Electric shock, fire, and malfunction may also result in damage or deterioration to the product.
- The PLC is open-type equipment that must be installed in a control cabinet with lock (cabinet housing protection > IP20). Only the skilled personnel who have undergone specialized electrical training and possess comprehensive electrical expertise can open the cabinet.

- 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 unwanted 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 skilled personnel who have undergone specialized electrical training and possess comprehensive electrical expertise.
- Disconnect all external power supplies of the system before wiring. Failure to comply may result in electric shock, module fault, or malfunction.
- Insulate the cable terminals properly to ensure the insulation distance between cables will not be shortened after cables are connected to the terminal block. Failure to comply may result in electric shock or damage to the equipment.

- 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.

Operation and Maintenance

- Operation and maintenance must be carried out by skilled personnel who have undergone specialized electrical training and possess comprehensive electrical expertise.
- Do not touch the terminals while the power is on. Failure to comply may result in electric shock or malfunction.
- Disconnect all external power supplies of the system before cleaning the module. Failure to comply may result in electric shock.
- Disconnect all external power supplies of the system before assembling/disassembling the module or connecting/removing the communication cables. Failure to comply may result in electric shock or malfunction.

Safety Recommendations

- In the position where the operator directly touches the machinery part, for example, where a machinery tool is loaded/unloaded, or where a machine runs automatically, the on-site manual operating devices and any other alternative means must be carefully arranged and designed so that they are independent of the PLC and can start or terminate the automatic running of the system.
- If modification on the program is needed during system operation, use the lock function or other protective measures. Ensure that only authorized personnel can make the necessary modifications.

Disposal

- Treat the scrapped equipment 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.

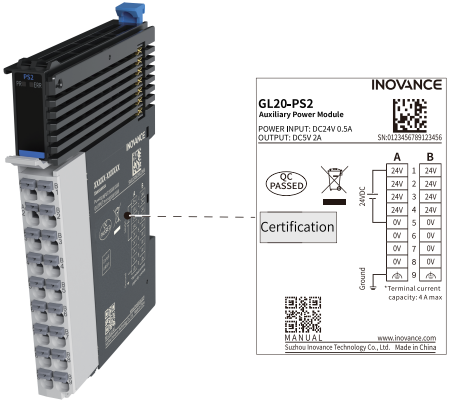
1 Product Information

1.1 Naming Rules and Nameplate

GL 20 - PS 2

① ② ③ ④

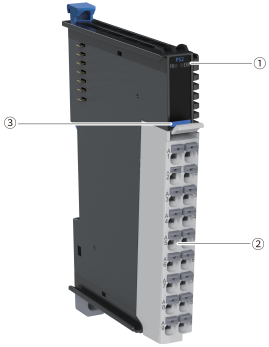
① **Product Information** GL: Inovance general local module	③ **Module Type** PS: Power supply module
② **Series Number** 20: 20 series module	④ **Output Current** 2: 2 A



The data for ordering the product is shown in the following table.

Model	Description	Code	Applicable Model
GL20-PS2	GL20 series programmable logic controller power supply module	01440351	It is applicable to Easy series products and GL20 series communication interface modules, such as GL20-RTU-ECT.

1.2 Components



No.	Name	Description			
①	Signal indicator	RUN	Running state indicator	Green	• ON: The module is in normal operation. • Flashing slowly (at an interval of 1 s): The module is being addressed. • Flashing quickly (at an interval of 200 ms): The module is preparing or stopped. • OFF: The module is not powered on or is faulty.
		ERR	Fault indicator	Red	ON when the module is faulty or software fault occurs.
②	User terminals	24 V input. For detailed definition, see *"3.2 Terminal Definition" on page 18*			
③	Color identification	Red: Digital output		Orange: Analog output	
		Gray: Digital input		Green: Analog input	
		White: Communication		Blue: Other module	

1.3 Technical Specifications

■ Power supply specifications

Item	Specification
Rated voltage of terminal input power supply	24 VDC (20.4 VDC to 28.8 VDC)
Rated current of terminal input power supply	0.5 A (typical value @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	2 A (typical value @5 V)
Rated voltage of bus input power supply	5 VDC (4.75 VDC to 5.25 VDC)
Rated current of bus input power supply	55 mA (typical value @5 V)
Terminal current capacity	< 4 A
Ripple of bus output power supply	3%
Derating of bus output power supply	The power supply operates at full load (output current ⩽ 2A) at 50°C, and operates at 85% of full load (output current ⩽ 1.7A) at 60°C.
Short circuit protection of bus output power supply	3 A, hiccup mode protection
Power conversion efficiency	70%, more than 85% @2 A
Power isolation	Not supported
Retentive at power failure	Not supported

■ Software specifications

Item	Specification
Module type and basic information reading	Supported
Module addressing	Supported

Item	Specification
Read and write of module configuration	Supported
Module state machine control	Supported. The host or gateway can switch the module state through commands, including initialization state, configuration state, operation state, and stop state.
Module state acquisition	Supported. The host or gateway can obtain the state information of the module for the master to control timing.
Periodic data access	Supported. After entering the operation state, the host or gateway can perform scheduled periodic data access with the module.
Index data access	Not supported
Register data access	Supported
Memory block data access	Not supported
Read exception code	Supported
Stop module operation	Supported
Diagnostic report	Not supported
Firmware update	Not supported

1.4 Environmental Specifications

Item	Specification
Installation/ application environment	Free from conductive dust, conductive fibers, explosive dust, flammable gases, water mist/greasy dirt, corrosive dusts/gases, strong vibration, and repetitive shock
Altitude	⩽ 2,000 m
Pollution degree	2
Immunity	2 kV on power supply cable (compliant with IEC 61000-4-4)
Overvoltage category	I
EMC immunity level	Zone B, IEC61131-2
Anti-static rating	Contact discharge +/-6 kV and air discharge +/-8 kV

Item	Specification
Vibration resistance	• Application scenario: Tested according to IEC60068-2-6, 3.5 mm amplitude from 5 Hz to 8.4 Hz; 1 g acceleration from 8.4 Hz to 200 Hz; 10 cycles per axial direction • Transportation scenario: Tested according to IEC60068-2-64, 0.01 g^2/Hz power spectral density from 5 Hz to 100 Hz; 0.001 g^2/Hz power spectral density at 200 Hz; 1.14 g Grms
Shock resistance	Application/Transportation scenario: Tested according to IEC60068-2-27; 15 g peak acceleration, 11 ms pulse width, 18 cycles in total in X, Y and Z axial directions
Operating temperature/humidity	• Temperature: -20°C to +55°C • Humidity: < 95% RH (30°C), without condensation
Storage temperature/ humidity	• Temperature: -20°C to +60°C • Humidity: < 95% RH (30°C), without condensation
Transportation temperature/humidity	• Temperature: -40°C to +70°C • Humidity: < 95% RH (40°C), without condensation

2 Mechanical Installation

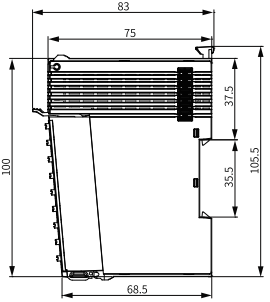
2.1 Installation Precautions

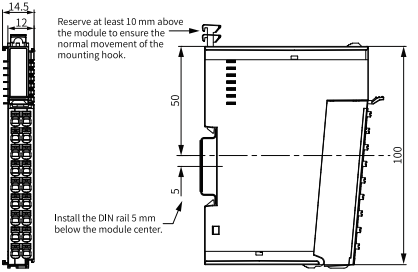
- Make sure the module is powered off before installing or removing.
- Do not hot swap the modules. Otherwise, the modules may be damaged by overcurrent or overvoltage, and the communication interface module or PLC may be subject to restart, user data loss or corruption.
- Do not drop or shock the housing or terminals of the module to avoid damage.

2.2 Installation Dimensions

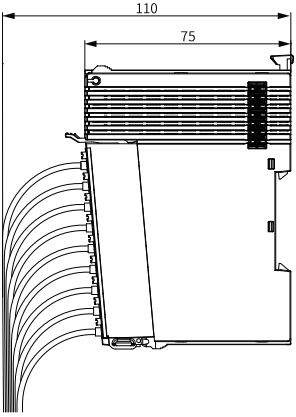
■ Module

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



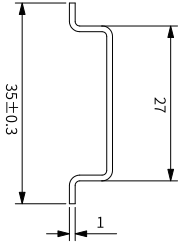


■ Cable connection



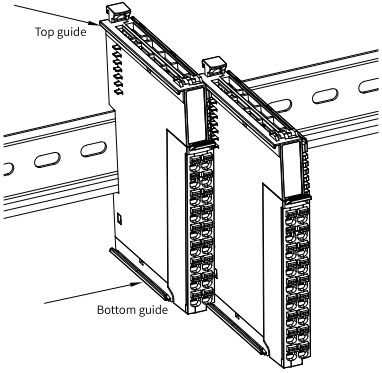
2.3 Installation Method

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



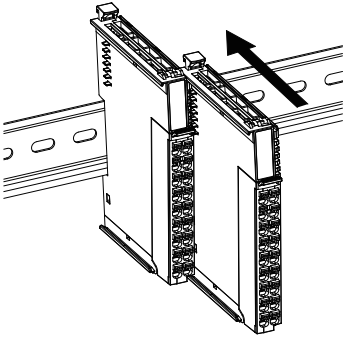
■ Installing modules side by side

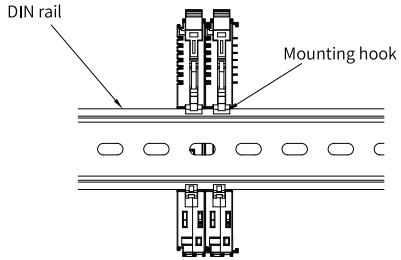
Install modules side by side by sliding them along the top and bottom guide rails of adjacent modules.



■ Installing modules onto DIN Rail

You can install the module onto a 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 in the following figure.

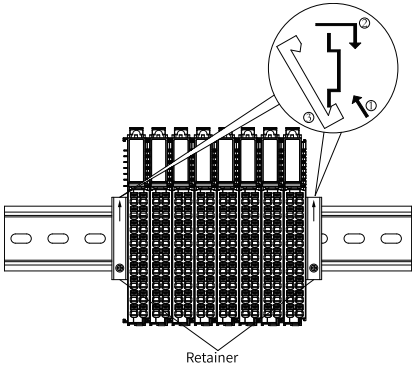




Note: After the module is installed, the DIN rail mounting hook will automatically move downward to lock the module to the rail. If the hook does not move downward, press down the top of the hook to ensure that the module is installed in place.

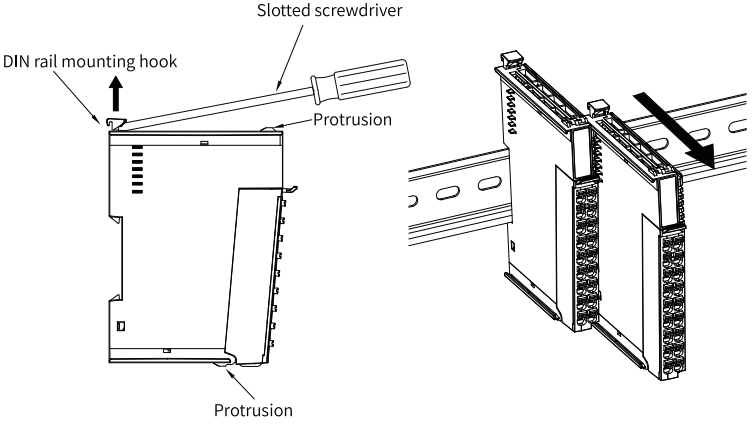
Install a DIN rail end plate on both sides of the PLC or expansion module. To install the end plate, hook the bottom of it to the bottom of the DIN rail, rotate the end plate

to hook the top of it to the top of the DIN rail, and then tighten the screw to lock the end plate in place, as shown in the following figure.



■ Removing modules

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.



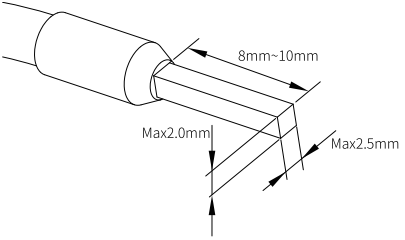
3 Electrical Installation

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	

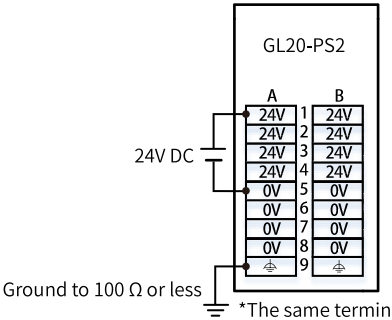
To use other types of tubular lugs, crimp the lug to the cables according to the shape and dimension requirements shown below.



3.2 Terminal Definition

Left Signal	Left Terminal	Right Terminal	Right Signal
24 V	A1	B1	24 V
24 V	A2	B2	24 V
24 V	A3	B3	24 V
24 V	A4	B4	24 V
0 V	A5	B5	0 V
0 V	A6	B6	0 V
0 V	A7	B7	0 V
0 V	A8	B8	0 V
PE	A9	B9	PE

3.3 Terminal Wiring

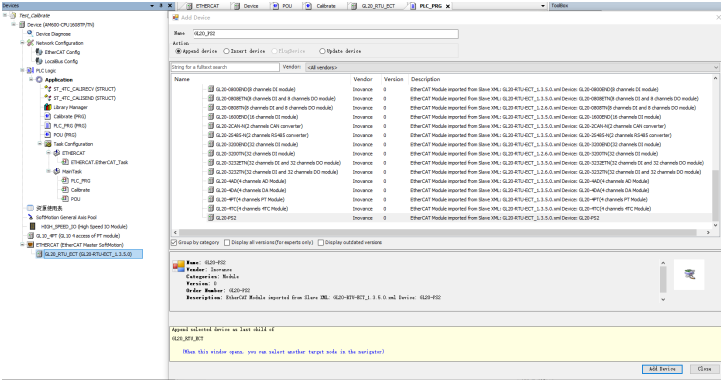


*The same terminals are connected.
Terminal current capacity: 4 A max.

4 Program Commissioning

The following is an example where AM600 is used as the master control module along with the GL20-PS2 module.

1. Add the GL20-PS2 module.



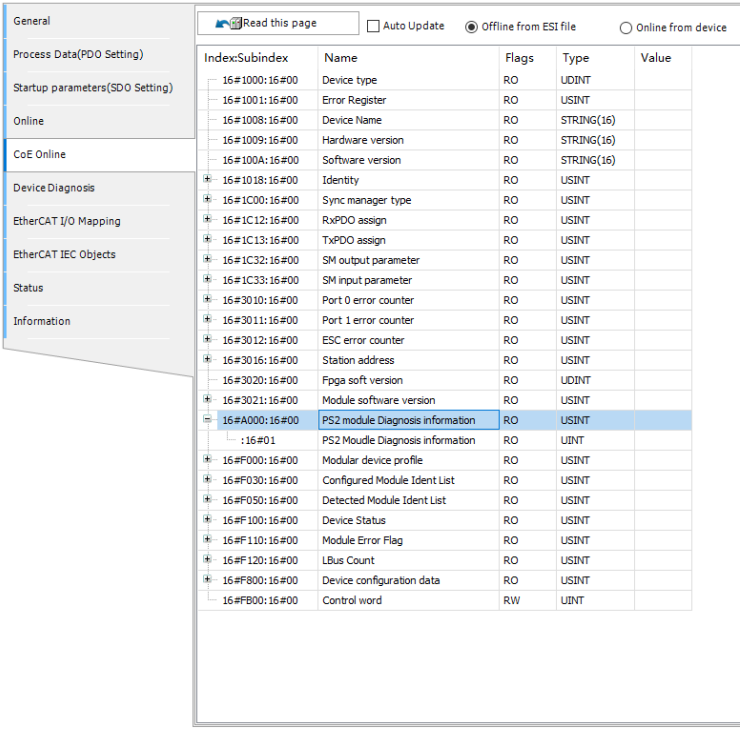
2. After successful compiling, download the project and run it.

Note

GL20-PS2 just serves to supply power to the additional modules and therefore does not need SDO and PDO configuration.

5 Troubleshooting

When the ERR indicator is ON, it indicates that the module is faulty. The module reports a fault code, which can be obtained through the diagnostic data object dictionary value in the "CoE Online" interface, as shown below. For the module installed in slot n (n = 0 to 31), the object dictionary definition for index 0xA000 +0x40*n is shown in the table below.



Index:Subindex	Name	Flags	Type	Value
16#1000:16#00	Device type	RO	UDINT	
16#1001:16#00	Error Register	RO	USINT	
16#1008:16#00	Device Name	RO	STRING(16)	
16#1009:16#00	Hardware version	RO	STRING(16)	
16#100A:16#00	Software version	RO	STRING(16)	
16#1018:16#00	Identity	RO	USINT	
16#1C00:16#00	Sync manager type	RO	USINT	
16#1C12:16#00	RxPDO assign	RO	USINT	
16#1C13:16#00	TxPDO assign	RO	USINT	
16#1C32:16#00	SM output parameter	RO	USINT	
16#1C33:16#00	SM input parameter	RO	USINT	
16#3010:16#00	Port 0 error counter	RO	USINT	
16#3011:16#00	Port 1 error counter	RO	USINT	
16#3012:16#00	ESC error counter	RO	USINT	
16#3016:16#00	Station address	RO	USINT	
16#3020:16#00	Fpga soft version	RO	UDINT	
16#3021:16#00	Module software version	RO	USINT	
16#A000:16#00	PS2 module Diagnosis information	RO	USINT	
:16#01	PS2 Moudle Diagnosis information	RO	UINT	
16#F000:16#00	Modular device profile	RO	USINT	
16#F030:16#00	Configured Module Ident List	RO	USINT	
16#F050:16#00	Detected Module Ident List	RO	USINT	
16#F100:16#00	Device Status	RO	USINT	
16#F110:16#00	Module Error Flag	RO	USINT	
16#F120:16#00	LBus Count	RO	USINT	
16#F800:16#00	Device configuration data	RO	USINT	
16#FB00:16#00	Control word	RW	UINT	

- Diagnostic Data

  For the module in slot n (n = 0 to 31), the object dictionary definition for index 0xA000+0x40*n is shown in the table below.

Index	0xA000+0x40*n: PS2 Diag data				
Subindex	Name	Data Type	Access Mode	Mapping	Default value
0	Subindex 000	USINT	RO	Not supported	3
1	Fault information	UINT	RO	Not supported	0x0000

- Module fault code

Fault Code	Description	Solution
0x5003	External 24 V power supply failure	Check the isolated power supply of the module.

Note

Fault detection is only supported for the output power supply. When the output power supply is faulty (undervoltage), the diagnostic code is 0x5003.

6 Version Matching Information

This product supports local adaptation to PLCs and remote adaption through communication interface modules. The version matching information is shown in the following tables.

■ Locally adapted PLCs

Name	Board Software	Logic Software/ Programming Software
This module	-	Logic software: 0.1.1.0 and later
AM300 series	2.1.0.0 and later	Programming software: V1.9.0 and later
AM500 series	2.1.0.0 and later	Programming software: V1.9.0 and later
AM760 series	2.1.0.0 and later	Programming software: V1.8.1 and later
AM780 series	2.1.0.0 and later	Programming software: V1.9.0 and later

■ Remotely adapted PLCs

Name	Board Software	Logic Software/ Programming Software/XML file
This module	-	Logic software: 0.1.1.0 and later
GL20-RTU-ECT32 communication interface module	3.0.6.0 and later	Logic software: 0.1.4.2 and later InoProShop programming software: V1.9.0 and later AutoShop programming software: V4.10.2.0 and later XML file: 3.0.14.0 and later
AM300 series	2.1.0.0 and later	Programming software: V1.9.0 and later

Name	Board Software	Logic Software/ Programming Software/XML file
AM500 series	2.1.0.0 and later	Programming software: V1.9.0 and later
AM760 series	2.1.0.0 and later	Programming software: V1.8.1 and later
AM780 series	2.1.0.0 and later	Programming software: V1.9.0 and later

Note

Contact Inovance technical support to obtain the PLC firmware, product firmware, and communication interface module firmware. XML files and the InoProShop software can be downloaded from the software and debugging tool tab on the GL20 series product page at *https://www.inovance.com*.