IVDM-10 AC Voltage Detection Module

User Manual

Preface

Thank you for choosing INVT IVDM-10 AC voltage detection module.

IVDM-10 AC voltage detection module is used to detect the AC line voltage detection for GD880 series products such as active rectifier and regenerative rectifier, and needs to be used with GD880 series VFD control box. The module transmits the detection signal to the control box through optical fibers, achieving control and protection of the rectification system.

This manual describes the product overview, installation, wiring, and commissioning instructions. Before installing the VFD, read this manual carefully to ensure the proper installation and running with the excellent performance and powerful functions into full play.

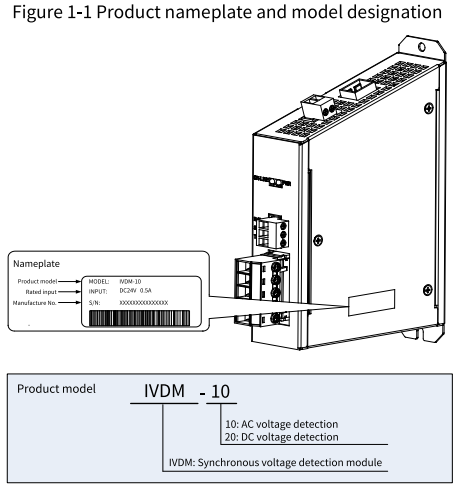
Product features:

- Supports two voltage input detection ranges of 100VAC and 690VAC, with high detection accuracy
- Adopts optical-fiber communication, enabling fast and stable communication rate
- Supports wall mounting method and DIN rail mounting method, easy to mount or dismount

1 Product overview

1.1 Model description

Figure 1-1 Product nameplate and model designation



1.2 Specifications

Table 1-1 Specifications

Parameters	Specification
Working temperature	-10–+50°C
Storage temperature	-10–+60°C
Relative humidity	5%–95% (No condensation)
Running environment	No corrosive gas
Mounting method	Wall mounting and DIN rail mounting
IP rating	IP10
Heat dissipation method	Natural air cooling

1.3 Technical parameters

Table 1-2 Technical parameters

Parameters	Specification
Supply voltage/current	24V±5%/0.5A
Communication connection mode	Optical-fiber communication
Input voltage range of detection channel 1	0–100VAC
Input voltage range of detection channel 2	0–690VAC

1.4 Structure

Figure 1-2 Component diagram

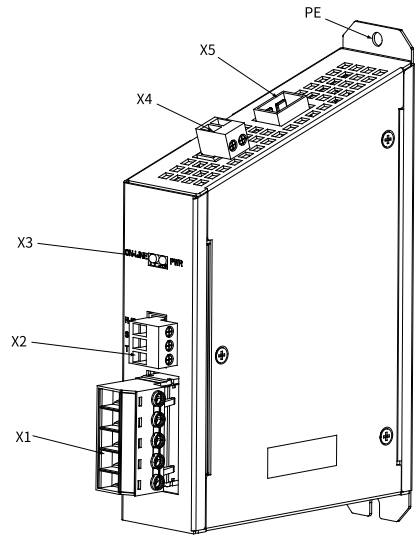


Table 1-3 Component description

No.	Symbol	Name	Description
1	X1	3PH AC line voltage detection terminal (690VAC)	Input voltage range: 0–690VAC Cable cross-sectional area: 0.5–6mm²
2	X2	3PH AC line voltage detection terminal (100VAC)	Input voltage range: 0–100VAC Cable cross-sectional area: 0.5–2.5mm²
3	X3	Status indicator	PWR power supply status indicator ● Red LED ON: Power supply is connected. ● Red LED OFF: The module is not powered on or the power supply is abnormal. ONLINE operation status indicator ● Red LED flashes: Abnormal. ● Red LED OFF: Normal.
4	X4	24VDC power input terminal	Externally powered: 24VDC±5% / 0.5A Two-core twisted-pair cable is recommended. Cable cross-sectional area: 0.5–2.5mm²
5	X5	Optical fiber connection terminal	The expansion module communicates with the control box through optical fiber. Plastic optical fiber

2 Installation and wiring

2.1 Installation precautions

⚠	Make sure the device have been powered off before installation.
Note	● Prevent the module from falling or shock to avoid damage. ● Do not disassemble the module to avoid damage. ● Please tighten the screws according to the required torque to avoid damage or looseness.

- Required tools: Phillips screwdriver PH1, straight screwdriver SL3

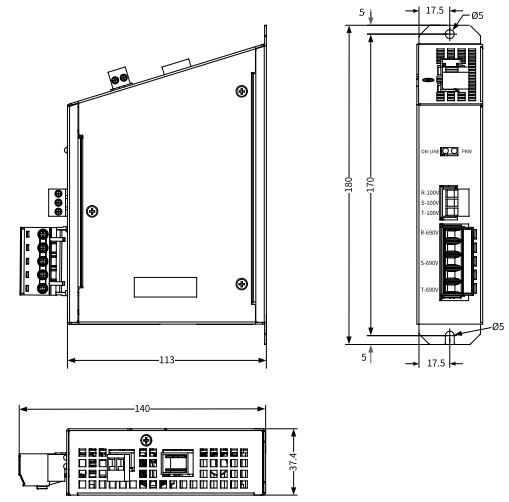
Table 2-1 Screw torque requirements

Screw size	Fastening torque
M3	0.55 N・m
M4	1.2 N・m

2.2 Dimensions

The dimensions of the AC voltage detection module is 37.4×113×180 mm (W*D*H), as shown in Figure 2-1.

Figure 2-1 Product outline and mounting dimensions diagram (unit: mm)



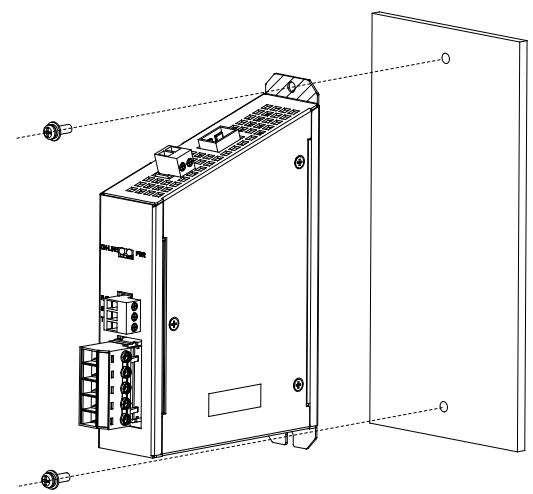
2.3 Mounting and dismounting

The product supports wall mounting and DIN rail mounting.

2.3.1 Wall mounting and dismounting

- **Mounting instructions**

  Align the installation holes and tighten the screws.



Note:

✧ Ensure that all terminals and fiber optic plugs are installed in place for effective electrical connection.

✧ The module is grounded through contact between its exposed metal shell and the assembly board inside the cabinet, so the assembly board must be an exposed metal plate. To ensure the reliable operation of the module and meet the EMC requirements, please tighten the screws to ensure reliable grounding.

- **Dismounting instructions**

Step 1 Disconnect the power supply and disassemble all cables connected to the expansion module.

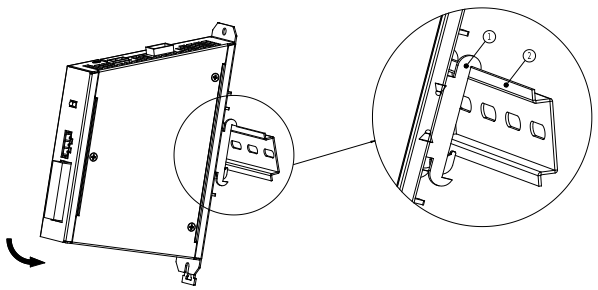
Step 2 Use a Phillips screwdriver to remove the grounding screw of the module.

Step 3 Pull the module out to a suitable position.

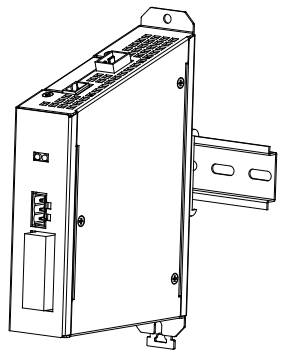
2.3.2 DIN rail mounting and dismounting

- **Mounting instructions**

Hold the IVDM-10 module, place the rail slot upper part of the module on the rail obliquely, and snap the rail slot lower part of the module in the arrow direction to fully secure the rail slot ① to the rail ②.



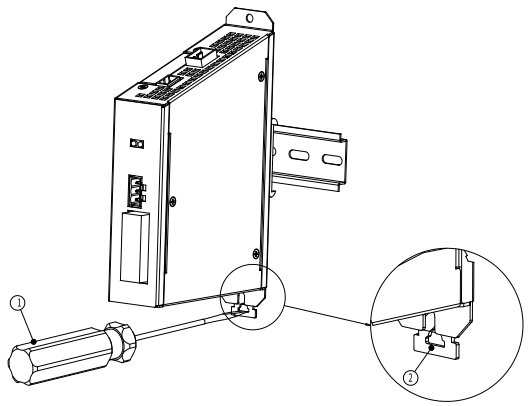
The following figure shows the Installation effect of the DIN rail mounting.



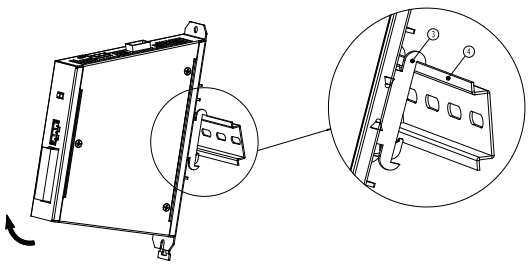
- **Dismounting instructions**

Step 1 Disconnect from the power supply, and remove all cables from this module.

Step 2 Press with a straight screwdriver ① downward to remove the rail ②.



Step 3 Rotate the module in the arrow direction to completely remove the rail slot ③ of the module from the rail ④.



2.4 User's wiring terminal

Figure 2-2 IVDM-10 appearance diagram

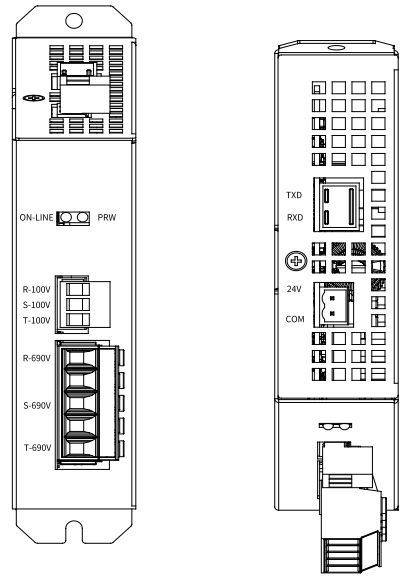


Table 2-2 X1–X2 terminal function definition

X1–X2 terminal definition		Terminal name	Specifications
X1	R-690V	Phase R voltage input	Input voltage range: 0–690VAC
	S-690V	Phase S voltage input	
	T-690V	Phase T voltage input	
X2	R-100V	Phase R voltage input	Input voltage range: 0–100VAC
	S-100V	Phase S voltage input	
	T-100V	Phase T voltage input	

Note:

- Terminal X1 needs to be connected to the AC voltage sampling terminal of the active rectifier filter unit and regenerative rectifier filter unit.
- Terminals X1 and X2 cannot be used at the same time.

Table 2-3 X3 terminal function definition

X3 terminal definition	Terminal name	Specifications
PWR	Power supply status indicator	• Red LED ON: Power supply is connected. • Red LED OFF: The module is not powered on or the power supply is abnormal.
ONLINE	Operation status indicator	• Red LED flashes: Abnormal. • Red LED OFF: Normal.

Table 2-4 X4 terminal function definition

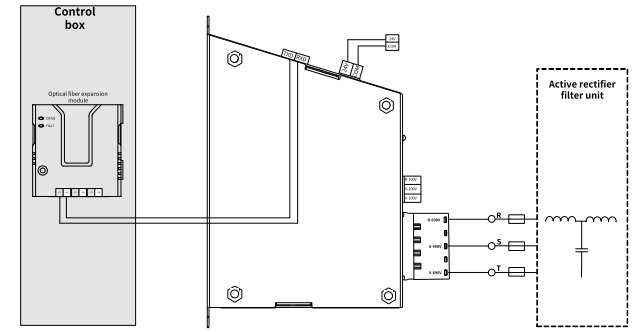
X4 terminal definition	Terminal name	Specifications
24V	24VDC power supply	Externally powered: 24VDC±5%/0.5A
COM	Power ground	

Table 2-5 X5 terminal function definition

X5 terminal definition	Terminal name	Specifications
RXD	Receiving optical fiber	Plastic optical fiber
TXD	Transmitting optical fiber	

The IVDM-10 AC voltage detection module is connected to the fiber optic expansion module EC-TX821/TX823 through optical fibers, transmitting the detection signal to the control box. Figure 2-3 shows the external wiring diagram of the IVDM-10 module, taking the fiber optic expansion module EC-TX823 and active rectifier filter unit as an example.

Figure 2-3 External wiring diagram when using IVDM-10



Note: The 3PH AC voltage line sequence of the IVDM-10 module must be consistent with the phase sequence of the incoming cable of the rectifier filter unit. Otherwise, the overcurrent fault will occur in the rectifier unit.

2.5 Wiring precautions

- It is recommended to place the fiber optic expansion module EC-TX821/TX823 at expansion slot 2 and slot 3 of the control box.
- Handle the optical fibers with care to prevent the fiber optic cable and connector damage, and keep the connector clean.
- Ensure that the direction of the connector is correct when installing. Align and insert the connector into the interface until the "click" sound is heard, indicating it has been installed.
- When disassembling, grip the connector tightly and pull it out. Do not directly pull the optical fiber cable.

3 Commissioning instruction

Figure 3-1 IVDM-10 configuration flowchart

Table 3-1 Function code parameters related to IVDM-10

Function code	Name	Description		Setting range	Default
P54.00	Module type	0: One-expand-three expansion modules 1: DC/AC voltage sampling card		0–1	1
P54.01	Module online status	Bit0–Bit8	Online status of modules in expansion slots (0: Offline 1: Online)	0–1	0

Note: For other parameter settings of the IVDM-10 AC voltage detection module, see software manuals of the GD880 series rectifier unit.

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