

# **iO-GRID NEMO Series**

**GFNH-1A1A 、 GFNH-2A2A**

**GFNH-3A3A 、 GFNH-4A4A**

**GFNH-1A3A 、 GFNH-2A4A**

## **Module User Manual**



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## 1. Introduction

The Nemo series is an integrated IO module composed of a communication board and an IO board. Its design integrates network protocols with digital input and output capabilities into a standalone module. The communication board is responsible for fieldbus communication, enabling connections with the master controller or host computer. It supports four network protocols: ModbusTCP, EtherCAT, EtherNET/IP, and PROFINET. The applications include 32-channel digital input, 32-channel digital output, 16-channel digital input and 16-channel digital output. Users can choose between SINK (NPN) or SOURCE (PNP) models based on their needs. Using an integrated IO module can achieve lower costs when the number of usage points is small.

## 2. Common Module List

Part Number	Description	Remarks
GFNH-1A1A	CC-Link Communication, 32-channel Digital Input Module	SINK(NPN)
GFNH-2A2A		SOURCE(PNP)
GFNH-3A3A	CC-Link Communication, 32-channel Digital Output Module	SINK(NPN)
GFNH-4A4A		SOURCE(PNP)
GFNH-1A3A	CC-Link Communication, 16-channel Digital Input/Output Module	SINK(NPN)
GFNH-2A4A		SOURCE(PNP)

**Caution (ATTENTION):**

1. THIS DEVICE IS FOR INDOOR USE ONLY, DON'T PUT OR USE IT IN HIGH TEMPERATURE AND HIGH MOISTURE ENVIRONMENT.

CET EQUIPEMENT EST DESTINE A UN USAGE INTERIEUR UNIQUEMENT NE PAS STOCKER OU UTILISER DANS UN ENVIRONNEMENT A HAUTE TEMPERATURE ET HAUTE HUMIDITE.

2. AVOID FALLING AND BUMPING OTHERWISE THE ELECTRICAL COMPONENTS WILL BE DAMAGED.

ÉVITEZ DE TOMBER ET DE VOUS ÉCRASER, SINON LES COMPOSANTS ÉLECTRIQUES SERONT ENDOMMAGÉS

3. DON'T TRY TO DISASSEMBLE OR OPEN THE COVER UNDER ANY CIRCUMSTANCE IN ORDER TO AVOID DANGER.

NE TENTEZ JAMAIS DE DEBALLER OU D'OUVRIR LE COUVERCLE POUR EVITER TOUT DANGER.

4. IF THE EQUIPMENT IS USED IN A MANNER NOT SPECIFIED BY THE MANUFACTURER, THE PROTECTION PROVIDED BY THE EQUIPMENT MAY BE IMPAIRED.

SI L'APPAREIL N'EST PAS UTILISE DE LA MANIERE INDIQUEE PAR LE FABRICANT, LA PROTECTION FOURNIE PAR L'APPAREIL PEUT ETRE ALTEREE.

5. THE INSTALLATION THAT THE SAFETY OF ANY SYSTEM INCORPORATING THE EQUIPMENT IS THE RESPONSIBILITY OF THE ASSEMBLER OF THE SYSTEM.

L'INSTALLATION DE TOUT SYSTÈME INTÉGRANT CET ÉQUIPEMENT EST LA RESPONSABILITÉ DU CONSTRUCTEUR DU SYSTÈME.

6. USE WITH COPPER CONDUCTORS ONLY. INPUT WIRING: MINIMUM 28 AWG, 85°C, OUTPUT WIRING: MINIMUM 28 AWG, 85°C

DESTINÉ À ÊTRE UTILISÉ AVEC DES CONDUCTEURS EN CUIVRE SEULEMENT. CABLAGE D'ENTREE: MINIMUM 28 AWG, 85 ° C. CABLAGE DE SORTIE: MINIMUM 28 AWG, 85 ° C.

7. FOR USE IN A CONTROLLED ENVIRONMENT. REFER TO MANUAL FOR ENVIRONMENTAL CONDITIONS.

POUR UN ENVIRONNEMENT CONTROLE. REPORTEZ-VOUS AU MANUEL DES CONDITIONS ENVIRONNEMENTALES.

8. DISCONNECT ALL SOURCES OF SUPPLY BEFORE SERVICING.

COUPER TOUTES LES SOURCES D'ALIMENTATION AVANT DE FAIRE L'ENTRETIEN ET LES



RÉPARATIONS.

9. PROPER VENTILATION IS REQUIRED TO REDUCE THE RISK OF HAZARDOUS OR EXPLOSIVE GAS BUILDUP DURING INDOOR CHARGING. SEE OWNERS MANUAL.

UNE VENTILATION ADÉQUATE EST NÉCESSAIRE AFIN DE RÉDUIRE LES RISQUES D'ACCUMULATION DE GAZ DANGEREUX OU EXPLOSIFS DURANT LA RECHARGE À L'INTÉRIEUR. VOIR LE MANUEL D'ENTRETIEN.

10. PLEASE BE SURE TO USE CERTIFIED POWER SUPPLY WITH SELV OUTPUT OR CERTIFIED POWER SUPPLY PROVIDING DOUBLE INSULATION EVALUATED BY UL60950-1, UL 62368-1, OR UL61010-1 AND UL61010-2-201 STANDARDS.

VEUILLEZ VOUS ASSURER D'UTILISER UNE ALIMENTATION CERTIFIÉE AVEC SORTIE SELV OU UNE ALIMENTATION CERTIFIÉE OFFRANT UNE DOUBLE ISOLATION ÉVALUÉE PAR LES NORMES UL60950-1 OU UL 62368-1 OU UL61010-1 ET UL61010-2-201.



## 2. Module Specifications

### 2.1 Communication Port Specifications

Communication Port Specifications					
Bus Protocol	CC-Link				
Bus Interface	CC-Link Dedicated Cable (Three-core shielded twisted pair)				
Speed	10 Mbps	5 Mbps	2.5 Mbps	625 kbps	156 kbps
Distance	≤100 m	≤160 m	≤400 m	≤900 m	≤1200 m

### 2.2 Electrical Specifications

Electrical Specifications		
Part Number	Working Voltage	Working Current
GFNH-1A1A	24 VDC (-15%~+20%)	MAX,130mA,24VDC
GFNH-2A2A		MAX,130mA,24VDC
GFNH-3A3A		MAX,170mA,24VDC
GFNH-4A4A		MAX,160mA,24VDC
GFNH-1A3A		MAX,150mA,24VDC
GFNH-2A4A		MAX,150mA,24VDC

## 2.3 General Specifications

<b>General Specifications</b>	
Size (W x D x H)	25 x 116 x 85mm
Weight	140g
Operating Temperature	-10 ... +60 °C
Storage Temperature	-25°C...+85°C
Relative Humidity	RH 95% , non-condensing
Altitude Limit	< 2000 m
IP Protection Level	IP 20
Pollution Degree	II
Safety Certifications	CE
Wire Gauge Range (IEC / UL)	0.2 mm <sup>2</sup> ~ 1.5 mm <sup>2</sup> / AWG 24~16

## 2.4 Module IO Board Specifications

<b>Digital Input Specifications</b>		
Signal Type	SINK(NPN)	SOURCE(PNP)
Signal 0 Voltage Range	15VDC...30 VDC	0 VDC...10 VDC
Signal 1 Voltage Range	0 VDC...10 VDC	15 VDC...30 VDC
Number of Channels	32 , 16	
Maximum Input Data Length	4 Bytes	
Rated Voltage	24VDC	
Isolation	Optocoupler Isolation	
Protection Circuit	Overvoltage Protection	
Input Filtering Time	3ms	
System Indicators	2 Green LEDs (PWR, SYS), 2 Red/Green LEDs (ST, ERR)	
Channel Indicators	32 Green LEDs, Input Channel Status	
<b>Digital Output Specifications</b>		
Signal Type	SINK(NPN)	SOURCE(PNP)
Number of Channels	32 , 16	
Maximum Output Data Length	4 Bytes	
Rated Voltage	24VDC	
Load Specifications	Resistive Load, Inductive Load, Lamp Load	
Channel Rated Current	$\leq 0.5$ A	
Isolation	Optocoupler Isolation	
Protection Circuit	Overvoltage Protection	
System Indicators	2 Green LEDs (PWR, SYS), 2 Red/Green LEDs (ST, ERR)	
Channel Indicators	32 Green LEDs, Input Channel Status	



### 3. Module Panel Introduction

#### 3.1 Integrated Module Panel

##### 3.1.1 Product Interface and Function Description

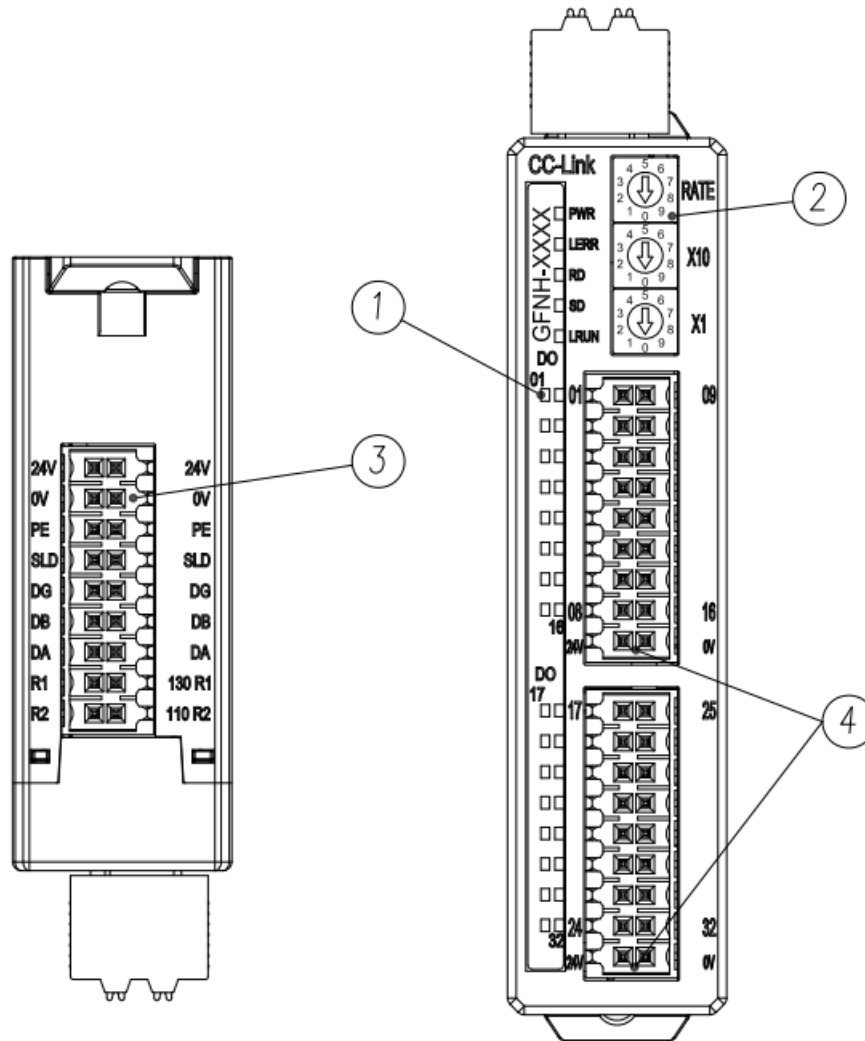


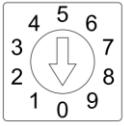
Fig 3. 1 . Front and Side Views

NO.	Name	Description
1	Module Status Indicators	System and Communication Status Indicators
2	Configuration Rotary Dial	System Configuration Setting
3	Network Communication Interface	System Network Protocol Communication Interface
	System Power Interface	Module System Power Interface, 24V DC, Push-in Terminals
4	Fieldbus Power Interface	Fieldbus (Field) Power Interface, 24V DC, Push-in Terminals

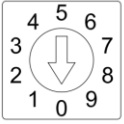
### 3.1.2 Indicator Description

Name	Label	Color	Status	Description
Power Indicator	PWR	Green	On	Normal Power Supply
			Off	Module Not Powered
Operation Status Indicator Light	RUN	Green	On	System Running
			Off	System Stopped
Alarm Indicator	ERR	Red	Off	No Error Alarm
			Flashing	Abnormal conditions (e.g., transmission rate, out of threshold range, communication error, etc.)
Channel Indicators	01~32	Green	On	Channel Input/Output Normal
			Off	No Signal Input or Output

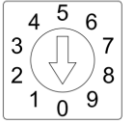
### 3.1.3 Rotary Dial Description



**RATE**



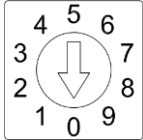
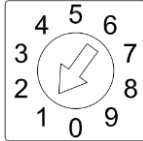
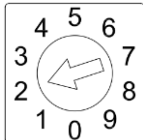
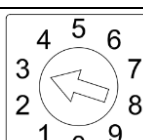
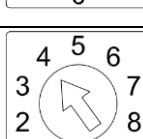
**X10**



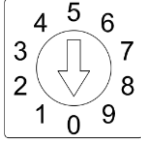
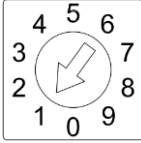
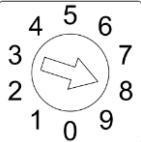
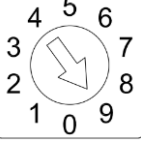
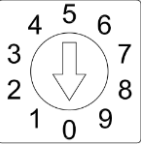
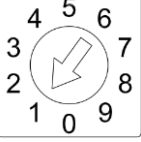
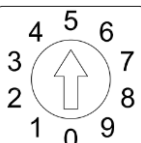

**X1**

Label	Name	Description
RATE	Transmission Rate Setting Dial	Sets different communication rates, with values ranging from 0 to 4.
X10	Station Number Setting (Tens Place)	Sets the tens place of the communication station number, with values ranging from 0 to 9. Used in conjunction with the ones place. For example, Station Number = (Tens Place Value) x 10 + (Ones Place Value)
X1	Station Number Setting (Ones Place)	Values ranging from 0 to 9.

### 3.1.4 Transmission Rate Rotary Dial Setting Diagram

Speed	Dial Setting	Setting Value	Speed
RATE		0	156 kbps
		1	625 kbps
		2	2.5 Mbps
		3	5 Mbps
		4	10 Mbps

**3.1.5 Station Number Rotary Dial Setting Diagram**

Station Number Setting	Dial Setting	Value	Station Number
X1	Ones Place Dial	0~9	X1
		0	0
		1	1
	⋮	⋮	⋮
		8	8
		9	9
X10	Tens Place Dial	0~6	X1
		0	0
		1	10
	⋮	⋮	⋮
		5	50
		6	60



Note:

1. Please use a flathead or Phillips screwdriver with a 2mm tip to adjust the rotary dial.
2. During communication, if you need to change the station number and transmission rate, you must power cycle the module after setting them for the changes to take effect.
3. If the transmission rate and station number settings are out of range, the module will experience communication errors or fail to connect to the master controller.

## 4. Module Installation and Removal Instructions

### 4.1 Installation

Align the module according to the arrow direction on the side and snap it onto the top of the DIN rail.

Once positioned, the latch automatically secures it to the rail.

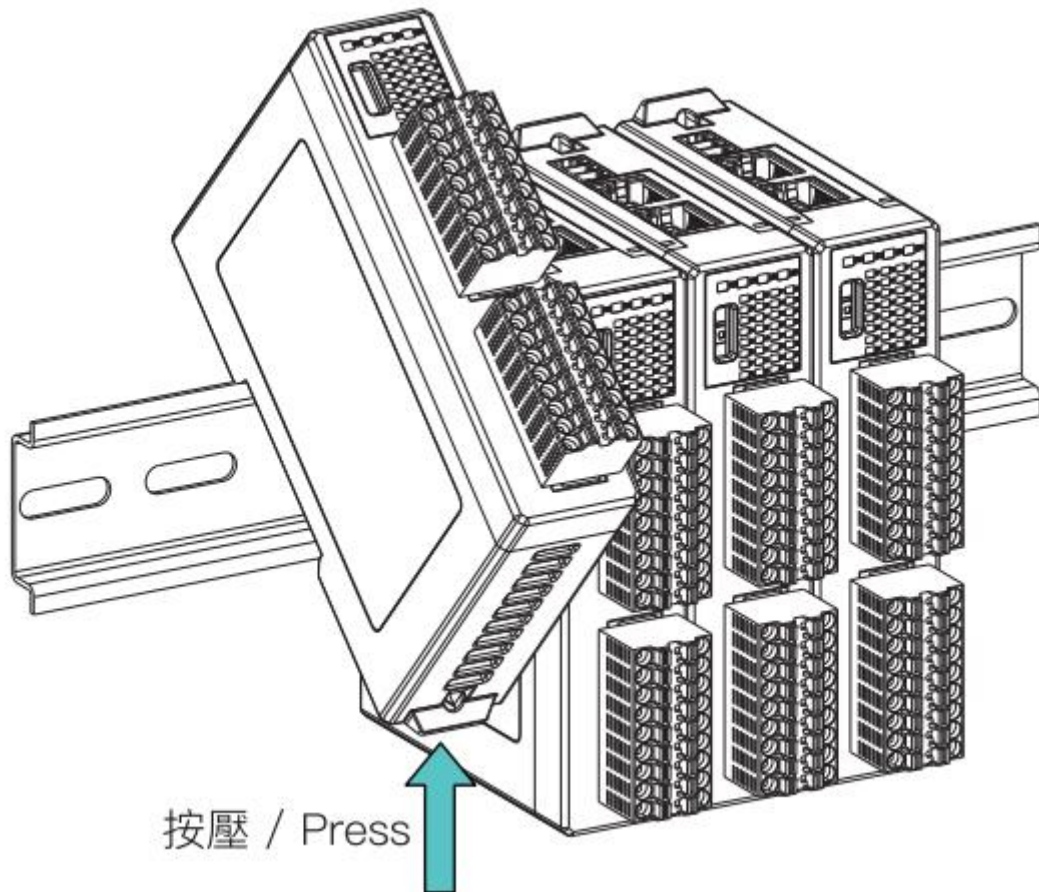


Fig 4. 1 Module Installation Diagram

※ Note: After the module is installed and positioned, the latch automatically secures onto the rail. If it does not secure properly, please press the top of the latch on both sides.

## 4.2 Removal

Pull downward on the plastic hook beneath the module using a screwdriver.

To remove the module from the DIN rail, reverse the steps used for installation.

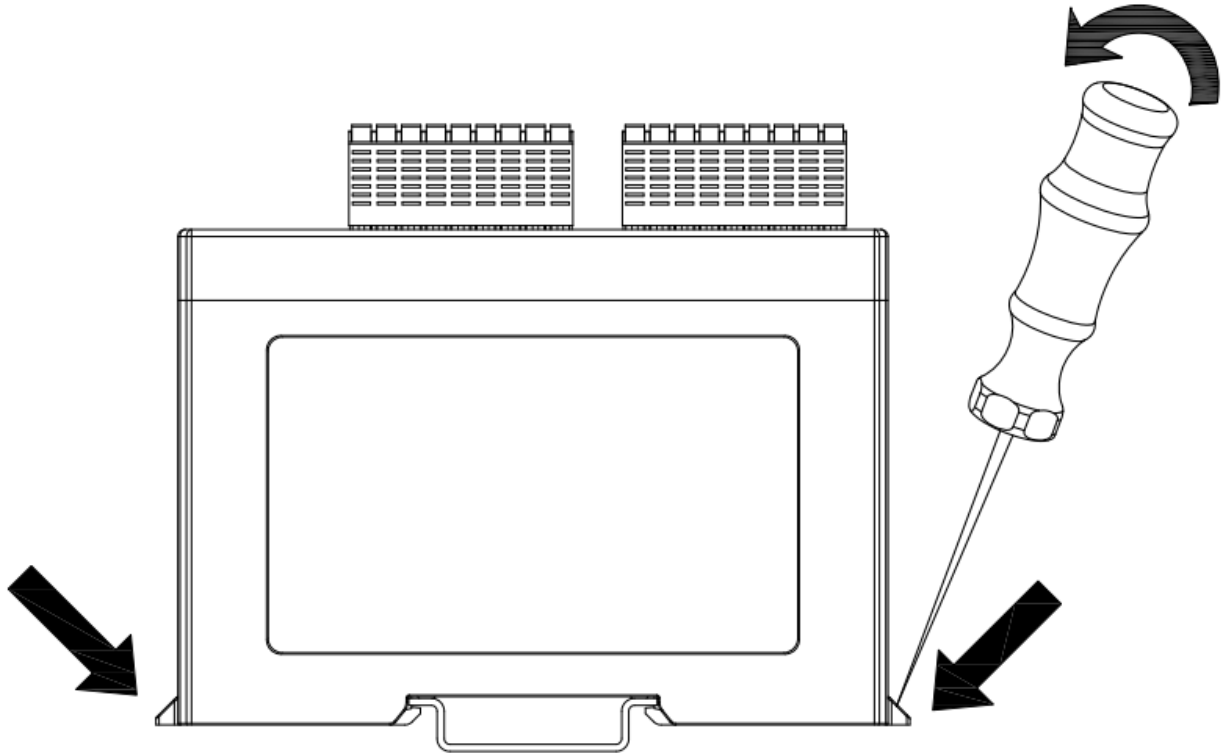


Fig 4. 2 Module Removal Diagram



### 4.3 Module Dimensions

#### 4.3.1 Module Dimensions

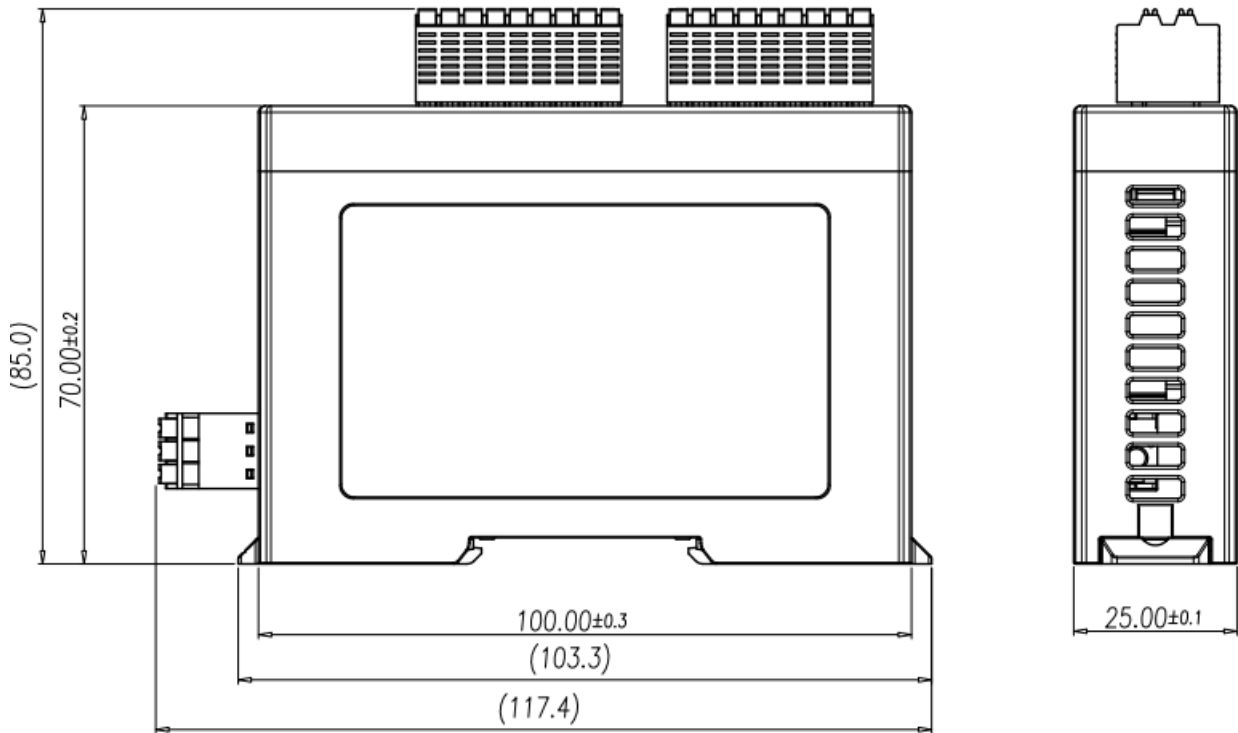


Fig 4. 3 Module Dimensions Diagram

## 5. Module Wiring Instructions

### 5.1 Module Wiring Diagram

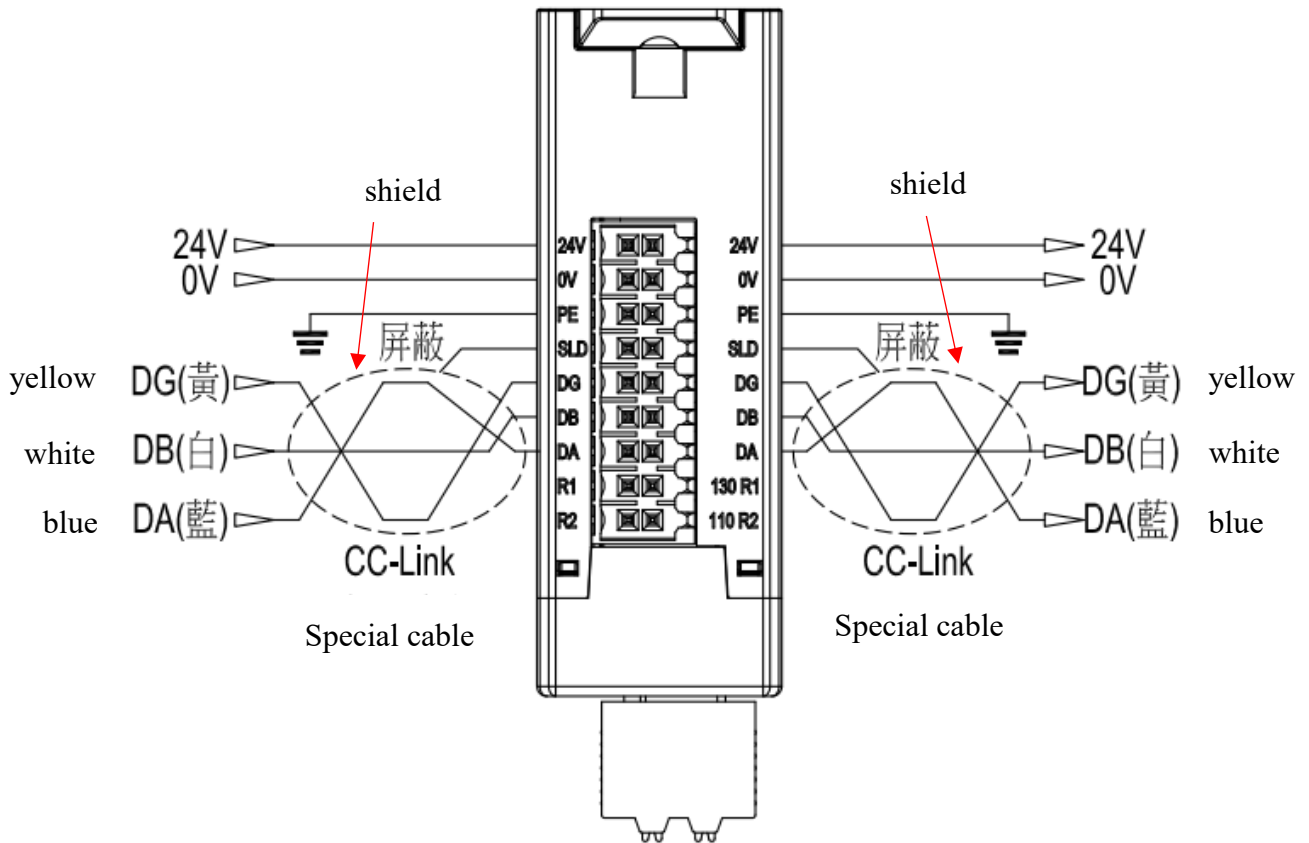


Fig 5. 1 Module Wiring Diagram

## 5.2 IO Board Wiring Diagram

### 5.2.1 GFNH-1A1A

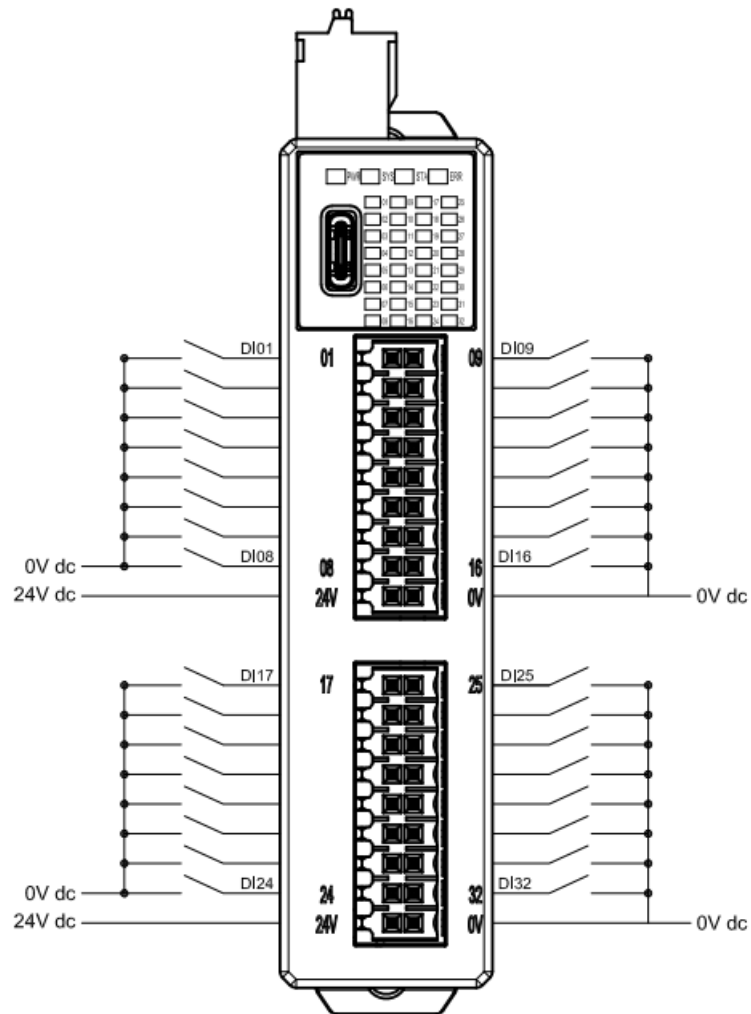


Fig 5. 2 GFNH-1A1A Wiring Diagram

5.2.2 GFNH-2A2A

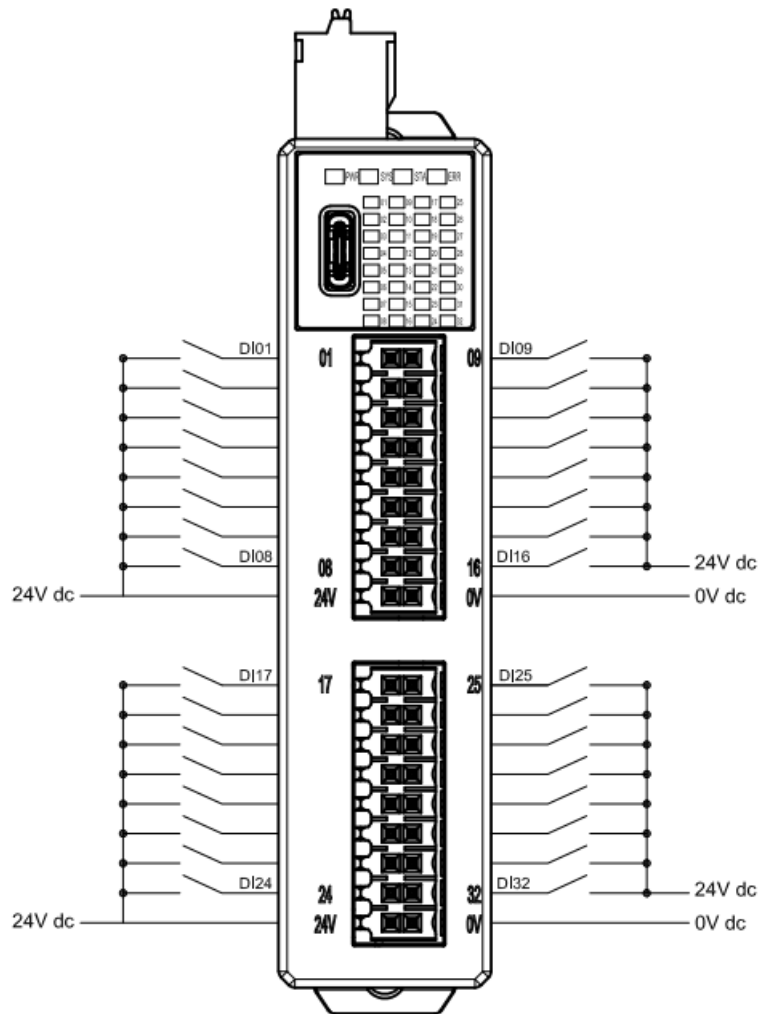


Fig 5. 3 GFNH-2A2A Wiring Diagram

5.2.3 GFNH-3A3A

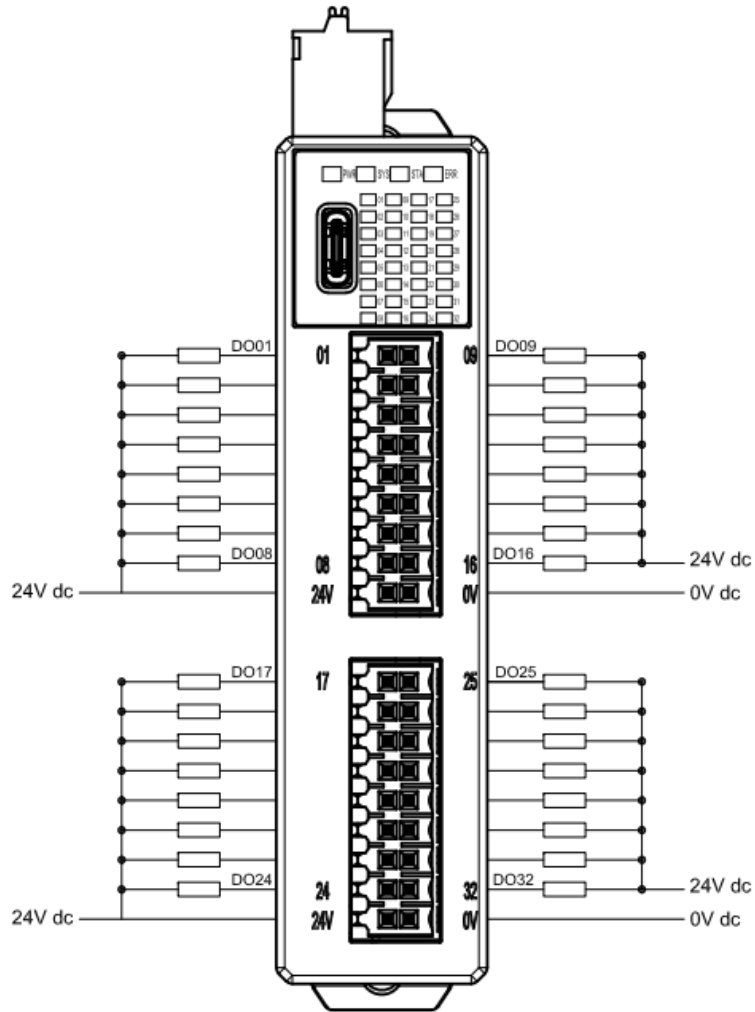


Fig 5. 4 GFNH-3A3A Wiring Diagram

5.2.4 GFNH-4A4A

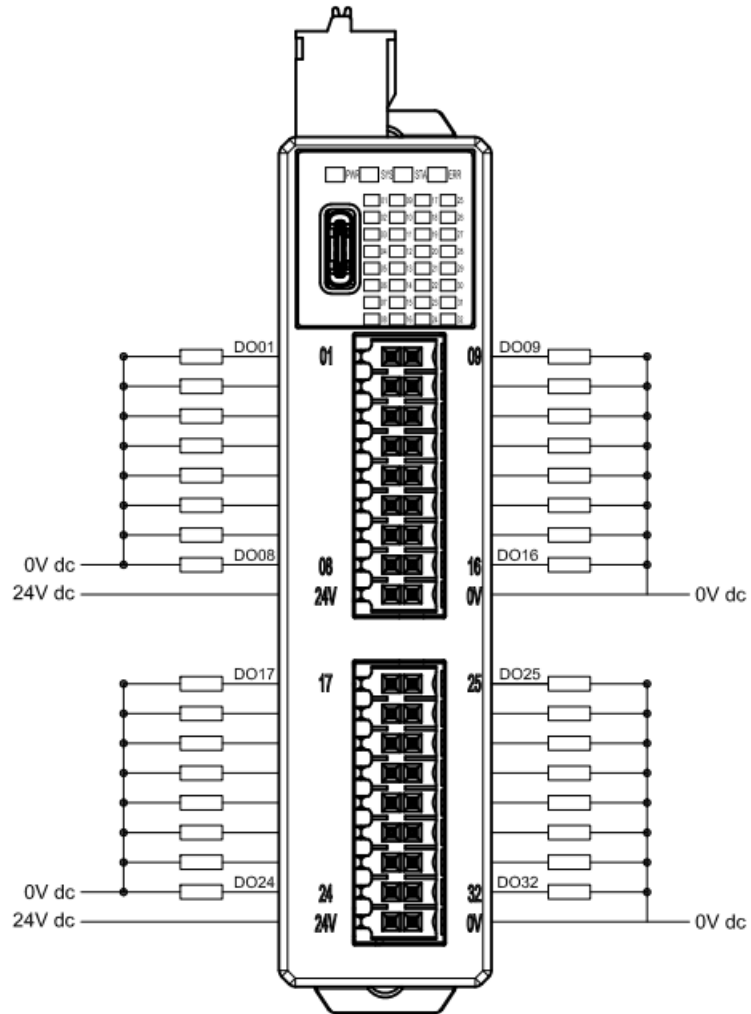


Fig 5. 5 GFNH-4A4A Wiring Diagram

5.2.5 GFNH-1A3A

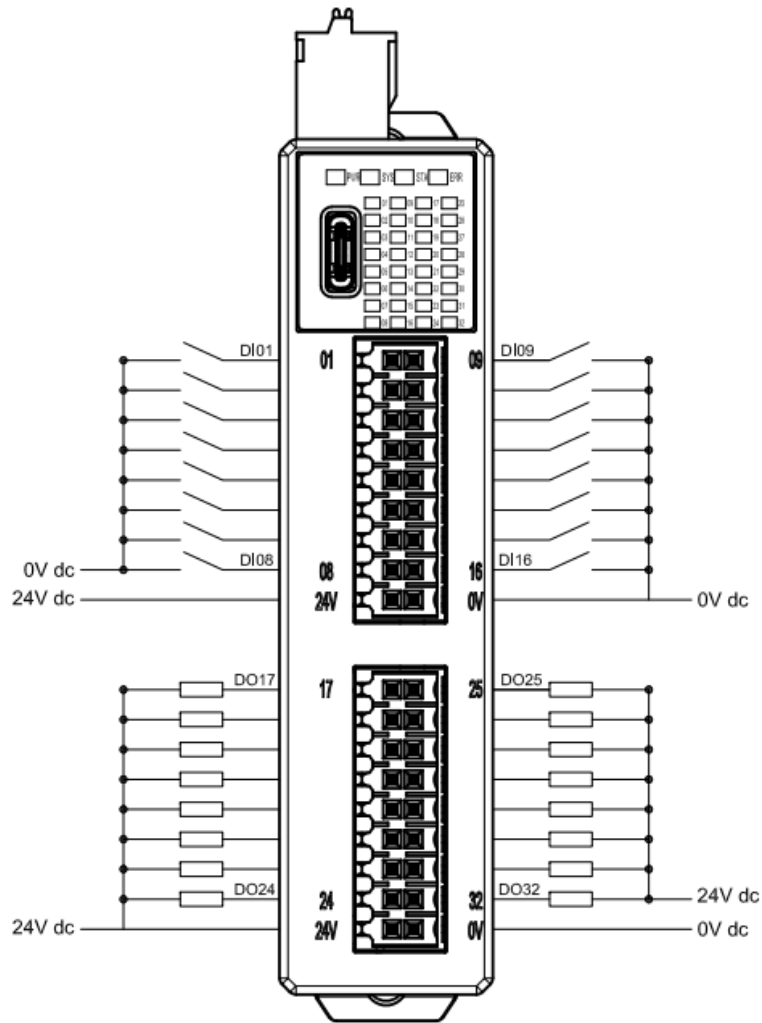


Fig 5. 6 GFNH-1A3A Wiring Diagram

5.2.6 GFNH-2A4A

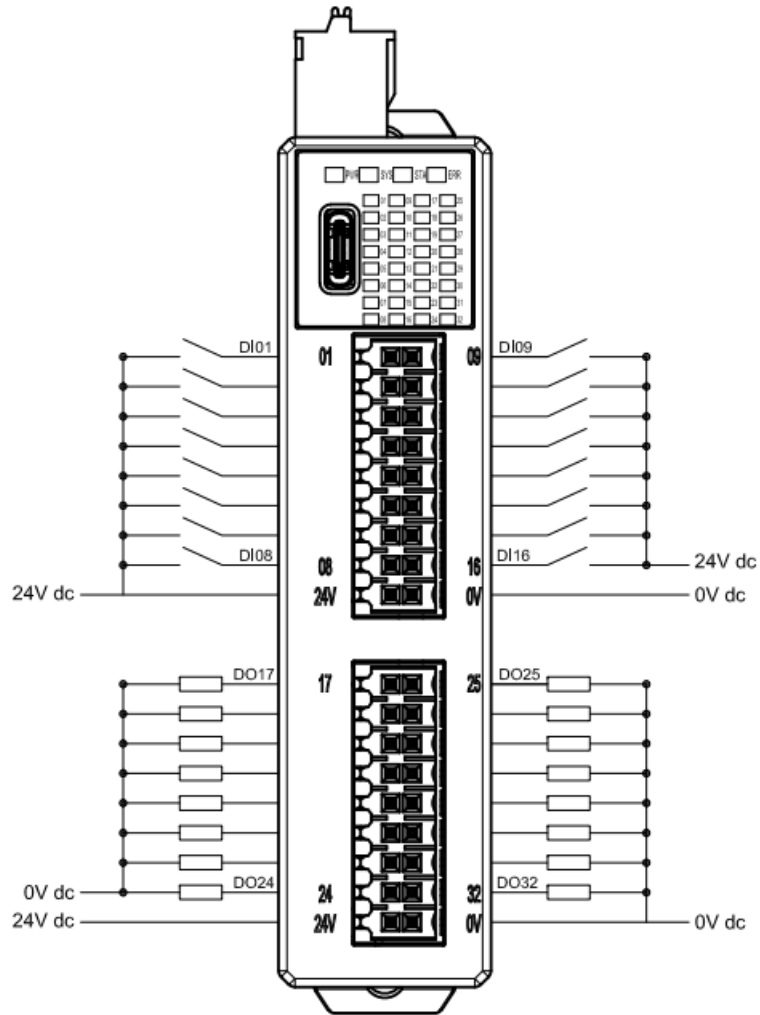


Fig 5. 7 GFNH-2A4A Wiring Diagram



### 5.3 Wiring Precautions

Do not mix CC-Link dedicated cables, high-performance CC-Link cables, and CC-Link cables for Ver.1.10, as this can disrupt normal data transmission.

- The connection order of cables is unrelated to the station number.
- D-type grounding (ground resistance below 100Ω) should be performed.
- The units at both ends of the CC-Link network must be connected to terminal resistors. The terminal resistor should be connected to the [DA]-[DB] terminals.

Terminal resistors must be connected at both ends of the bus, and the terminal resistor used will vary depending on the cable used.

- For CC-Link dedicated cables or CC-Link cables corresponding to Ver.1.10, use 110Ω 1/2W resistors.
- For high-performance CC-Link cables, use 130Ω 1/2W resistors.

#### 5.3.1 Terminal Resistor

The module has a built-in terminal resistor circuit. If a terminal resistor is needed, select one based on the cable used and short-circuit the R1 or R2 terminal resistor directly with the circuit.

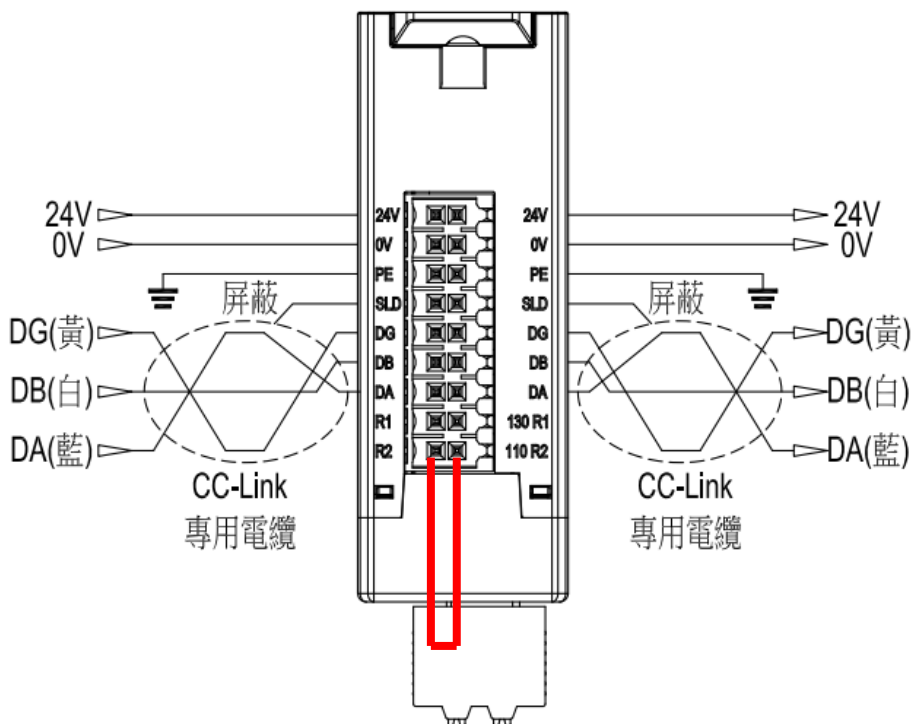


Fig 5.3.1 Communication Port Wiring Diagram

## 6. Parameter Setting and Configuration Instructions

### 6.1 Module Configuration

As shown below, the module is configured primarily utilizing an integrated approach

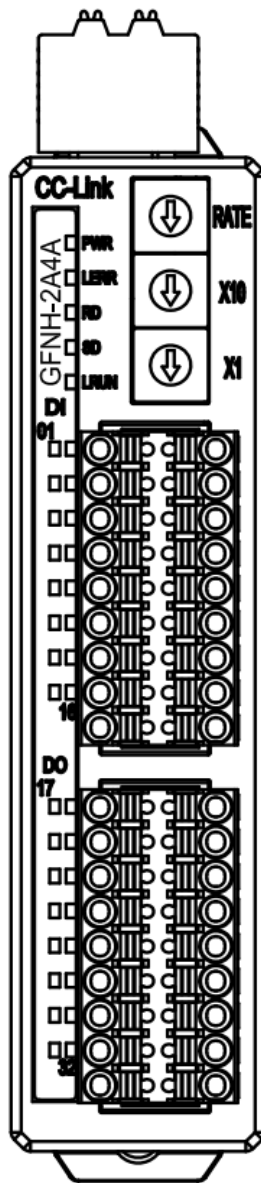


Fig 6. 1

Note: USB data cable configuration is for a single integrated module.