DAUDIN CO., LTD.

2212TW
V2.0.2

# iO-GRID C Series

# User Manual

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# 1. Module List

| Part No. | Description | Remarks |
|---|---|---|
| GF2-C001T | ModbusTCP Coupler | |
| GF2-C002T | EtherCAT Coupler | |
| GF2-C003T | EtherNet/IP Coupler | |
| GF2-C004T | PROFINET Coupler | |
| GF2-DI01T | 16-channel digital input module, Sink, 24VDC | |
| GF2-DI02T | 16-channel digital input module, Source, 24VDC | |
| GF2-DQ01T | 16-channel digital output module, Sink, 24VDC | |
| GF2-DQ02T | 16-channel digital output module, Source, 24VDC | |
| GF2-AI01T | 4-channel analog input module<br>(-10…10VDC,0…10VDC,0…5VDC,1…5VDC , adjustable) | |
| GF2-AI02T | 4-channel analog input module<br>(0…20mA,4…20mA , adjustable) | |
| GF2-AQ01T | 4-channel analog output module<br>(-10…10VDC,0…10VDC,0…5VDC,1…5VDC , adjustable) | |
| GF2-AQ02T | 4-channel analog output module<br>(0…20mA,4…20mA , adjustable) | |

# 2. Module Specification

## 2.1 GF2-C001T

| Communication Specification | |
|---|---|
| Communication Protocol | Modbus/TCP |
| Communication Interface | RJ-45 |
| Interface Port Number | 2 |
| Transmission Speed | 10/100 Mbps |
| **Technical Specification** | |
| Module Type | Communication Module |
| Max. Expansion Module | 30 slots |
| Max. Input Size | 252 bytes |
| Max. Output Size | 252 bytes |
| Voltage Supply (System) | 24 VDC via DINKLE Bus |
| Current Consumption (System) | Max. 100 mA |
| Isolation Method | Photocoupler Isolation |
| Indicator | 4 LED Lights |
| | Power Status (PWR): Green |
| | System Status (SYS): Green/Red |
| | Communication Status (STATUS): Green/Red |
| | Alarm Status (ALARM): Green/Red |
| **General Specification** | |
| Dimensions (W*D*H) | 20 x 100 x 97mm |
| Weight | 80g |
| Operating Temperature | 0 … +60 °C |
| Storage Temperature | -25˚C…+85˚C |
| Permissible Humidity (Non-condensing) | RH 95%, |
| Altitude Limit | < 2000 m |
| Ingress Protection (IP) | IP 20 |
| Pollution Severity | II |
| Product Certification | CE |
| Wire Range | 0.2 $mm^2$ ~ 1.5 $mm^2$ / AWG 28~16 |
| Suggested Terminals | DN00510D / DN00710D |

## 2.2 GF2-C002T

| Communication Specification | |
|---|---|
| Communication Protocol | EtherCAT |
| Communication Interface | RJ-45 |
| Interface Port Number | 2 |
| Transmission Speed | 100 Mbps |
| **Technical Specification** | |
| Module Type | Communication Module |
| Max. Expansion Module | 30 slots |
| Max. Input Size | 256 bytes |
| Max. Output Size | 256 bytes |
| Voltage Supply (System) | 24VDC via DINKLE Bus |
| Current Consumption (System) | Max. 110 mA |
| Isolation Method | Photocoupler Isolation |
| Indicator | 4 LED Lights |
| | Power Status (PWR): Green |
| | System Status (SYS): Green/Red |
| | Communication Status (STATUS): Green/Red |
| | Alarm Status (ALARM): Green/Red |
| **General Specification** | |
| Dimensions (W*D*H) | 20 x 100 x 97mm |
| Weight | 78g |
| Operating Temperature | 0 … +60 °C |
| Storage Temperature | -25˚C…+85˚C |
| Permissible Humidity (Non-condensing) | RH 95% |
| Altitude Limit | < 2000 m |
| Ingress Protection (IP) | IP 20 |
| Pollution Severity | II |
| Product Certification | CE |
| Wire Range | 0.2 mm² ~ 1.5 mm² / AWG 28~16 |
| Suggested Terminals | DN00510D / DN00710D |

## 2.3 GF2-C003T

| Communication Specification | |
|---|---|
| Communication Protocol | EtherNet/IP |
| Communication Interface | RJ-45 |
| Interface Port Number | 2 |
| Transmission Speed | 10/100 Mbps |
| **Technical Specification** | |
| Module Type | Communication Module |
| Max. Expansion Module | 30 slots |
| Max. Input Size | 252 bytes |
| Max. Output Size | 252 bytes |
| Voltage Supply (System) | 24 VDC via DINKLE Bus |
| Current Consumption (System) | Max. 100 mA |
| Isolation Method | Photocoupler Isolation |
| Indicator | 4 LED Lights |
| | Power Status (PWR): Green |
| | System Status (SYS): Green/Red |
| | Communication Status (STATUS): Green/Red |
| | Alarm Status (ALARM): Green/Red |
| **General Specification** | |
| Dimensions (W*D*H) | 20 x 100 x 97mm |
| Weight | 80g |
| Operating Temperature | 0 … +60 °C |
| Storage Temperature | -25˚C…+85˚C |
| Permissible Humidity (Non-condensing) | RH 95% |
| Altitude Limit | < 2000 m |
| Ingress Protection (IP) | IP 20 |
| Pollution Severity | II |
| Product Certification | CE |
| Wire Range | 0.2mm² ~ 1.5 mm² / AWG 28~16 |
| Suggested Terminals | DN00510D / DN00710D |

## 2.4 GF2-C004T

| Communication Specification | |
|---|---|
| Communication Protocol | PROFINET |
| Communication Interface | RJ-45 |
| Interface Port Number | 2 |
| Transmission Speed | 10/100 Mbps |
| **Technical Specification** | |
| Module Type | Communication Module |
| Max. Expansion Module | 30 slots |
| Max. Input Size | 252 bytes |
| Max. Output Size | 252 bytes |
| Voltage Supply (System) | 24 VDC via DINKLE Bus |
| Current Consumption (System) | Max. 100 mA |
| Isolation Method | Photocoupler Isolation |
| Indicator | 4 LED Lights |
| | Power Status (PWR): Green |
| | System Status (SYS): Green/Red |
| | Communication Status (STATUS): Green/Red |
| | Alarm Status (ALARM): Green/Red |
| **General Specification** | |
| Dimensions (W*D*H) | 20 x 100 x 97mm |
| Weight | 80g |
| Operating Temperature | 0 … +60 °C |
| Storage Temperature | -25˚C…+85˚C |
| Permissible Humidity (Non-condensing) | RH 95% |
| Altitude Limit | < 2000 m |
| Ingress Protection (IP) | IP 20 |
| Pollution Severity | II |
| Product Certification | CE |
| Wire Range | 0.2mm² ~ 1.5 mm² / AWG 28~16 |
| Suggested Terminals | DN00510D / DN00710D |

## 2.5 GF2-DI01T

| Technical Specification | |
|---|---|
| Number of Input Channels | 16 |
| Voltage Supply (Field) | 24 VDC (-15%~+20%) |
| Current Consumption (Field) | Max. 49mA@24VDC |
| Voltage Supply (System) | 24 VDC via DINKLE Bus |
| Current Consumption (System) | Max. 24mA@24VDC |
| Input Current per Channel for Signal | 2.4mA |
| Input Type | Sink |
| Communication Interface | via DINKLE Bus |
| Indicator Description | 16 Green Input States |
| Isolation Method | Photocoupler Isolation |
| Protective Circuit | Overvoltage Protection |
| Connection Method | Push-in |
| Input Voltage range for signal (0) | 15VDC…30 VDC |
| Input Voltage Range for Signal (1) | 0 VDC……10 VDC |
| Input Filter Time | 3ms |
| Common Type | 16 Points / External Common |
| **General Specification** | |
| Dimensions (W*D*H) | 12 x 100 x 97 mm |
| Weight | 62 g |
| Operating Temperature | 0…+60˚C |
| Storage Temperature | -25˚C…+85˚C |
| Permissible Humidity (Non-condensing) | RH 95% |
| Altitude Limit | < 2000 m |
| Ingress Protection (IP) | IP 20 |
| Pollution Severity | II |
| Product Certification | CE |
| Wire Range | 0.2mm² ~ 1.5 mm² / AWG 28~16 |
| Suggested Terminals | DN00510D / DN00710D |

## 2.6 GF2-DI02T

| Technical Specification | |
|---|---|
| Number of Inputs | 16 |
| Number of Input Channels | 24 VDC (-15%~+20%) |
| Voltage Supply (Field) | Max. 51mA@24VDC |
| Current Consumption (Field) | 24 VDC via DINKLE Bus |
| Voltage Supply (System) | Max. 24mA@24VDC |
| Current Consumption (System) | 2.4mA |
| Input Current per Channel for Signal | Source |
| Input Type | via DINKLE Bus |
| Communication Interface | 16 Green Input States |
| Indicator Description | Photocoupler Isolation |
| Isolation Method | Overvoltage Protection |
| "Protective Circuit | Push-in |
| Connection Method | 0 VDC…10 VDC |
| Input Voltage range for signal (0) | 15 VDC…30 VDC |
| Input Voltage Range for Signal (1) | 3ms |
| Input Filter Time | 16 Points / External Common |
| Common Type | |
| Dimensions (W*D*H) | 12 x 100 x 97 mm |
| Weight | 62 g |
| Operating Temperature | 0…+60˚C |
| Storage Temperature | -25˚C…+85˚C |
| Permissible Humidity (Non-condensing) | RH 95% |
| Altitude Limit | < 2000 m |
| Ingress Protection (IP) | IP 20 |
| Pollution Severity | II |
| Product Certification | CE |
| Wire Range | 0.2mm² ~ 1.5 mm² / AWG 28~16 |
| Suggested Terminals | DN00510 / DN00710D |

## 2.7 GF2-DQ01T

| Technical Specification | |
|---|---|
| Number of Output Channels | 16 |
| Voltage Supply(Field) | 24 VDC (-15%~+20%) |
| Current Consumption(Field) | Max. 42mA@24VDC |
| Voltage Supply(System) | 24 VDC via DINKLE Bus |
| Current Consumption(System) | Max. 40mA@24VDC |
| Max. Output Current per Channel for Signal | 0.5A |
| Load Type | Ohmic load, lamp load |
| Output Type | Sink |
| Communication Interface | via DINKLE Bus |
| Indicator Description | 16 Green Outnput States |
| Protective Circuit | Overcurrent Protection / Overvoltage Protection |
| Connection Method | Push-in |
| Common Type | 16 Points / External Common |
| **General Specification** | |
| Dimensions (W*D*H) | 12 x 100 x 97 mm |
| Weight | 65 g |
| Operating Temperature | 0…+60˚C |
| Storage Temperature | -25˚C…+85˚C |
| Permissible Humidity (Non-condensing) | RH 95% |
| Altitude Limit | < 2000 m |
| Ingress Protection (IP) | IP 20 |
| Pollution Severity | II |
| Product Certification | CE |
| Wire Range | 0.2mm² ~ 1.5 mm² / AWG 28~16 |
| Suggested Terminals | DN00510D / DN00710D |

## 2.8 GF2-DQ02T

| Technical Specification | |
|---|---|
| Number of Output Channels | 16 |
| Voltage Supply(Field) | 24 VDC (-15%~+20%) |
| Current Consumption(Field) | Max. 37mA@24VDC |
| Voltage Supply(System) | 24 VDC via DINKLE Bus |
| Current Consumption(System) | Max. 38mA@24VDC |
| Max. Output Current per Channel for Signal | 0.5A |
| Load Type | Ohmic load, lamp load |
| Output Type | Source |
| Communication Interface | via DINKLE Bus |
| Indicator Description | 16 Green Outnput States |
| Protective Circuit | Overcurrent Protection / Overvoltage Protection |
| Connection Method | Push-in |
| Common Type | 16 Points / External Common |
| **General Specification** | |
| Dimensions (W*D*H) | 12 x 100 x 97 mm |
| Weight | 65 g |
| Operating Temperature | 0…+60˚C |
| Storage Temperature | -25˚C…+85˚C |
| Permissible Humidity (Non-condensing) | RH 95% |
| Altitude Limit | < 2000 m |
| Ingress Protection (IP) | IP 20 |
| Pollution Severity | II |
| Product Certification | CE |
| Wire Range | 0.2mm² ~ 1.5 mm² / AWG 28~16 |
| Suggested Terminals | DN00510D / DN00710D |

## 2.9 GF2-AI01T

| Technical Specification | |
|---|---|
| Number of Input Channels | 4 |
| Voltage Supply(Field) | 24 VDC (-15%~+20%) |
| Current Consumption(Field) | Max. 9.5mA@24VDC |
| Voltage Supply(System) | 24 VDC via DINKLE Bus |
| Current Consumption(System) | Max. 22mA@24VDC |
| Resolution | 16 bit |
| Input Type | -10V ~ +10V |
| | 0V ~ +10V |
| | 0V ~ +5V |
| | 1V ~ +5V |
| Input Signal Design | Differential Signal |
| Accuracy | ±0.1% |
| Input Impedance | ≥1 MΩ (Impedance, Typical) |
| Sampling Rate | 10ms |
| Communication Interface | via DINKLE Bus |
| Indicator Description | 4 Green, Input States |
| Isolation Method | Photocoupler Isolation |
| Connection Method | Push-in |
| Common Type | 4 Channels / 4COM |
| **General Specification** | |
| Dimensions (W*D*H) | 12 x 100 x 97 mm |
| Weight | 60 g |
| Operating Temperature | 0…+60˚C |
| Storage Temperature | -25˚C…+85˚C |
| Permissible Humidity (Non-condensing) | RH 95% |
| Altitude Limit | < 2000 m |
| Ingress Protection (IP) | IP 20 |
| Pollution Severity | II |
| Product Certification | CE |
| Wire Range | 0.2mm² ~ 1.5 mm² / AWG 28~16 |
| Suggested Terminals | DN00510D / DN00710D |

## 2.10 GF2-AI02T

| Technical Specification | |
|---|---|
| Number of Input Channels | 4 |
| Voltage Supply(Field) | 24 VDC (-15%~+20%) |
| Current Consumption(Field) | Max. 9.5mA@24VDC |
| Voltage Supply(System) | 24 VDC via DINKLE Bus |
| Current Consumption(System) | Max. 22mA@24VDC |
| Resolution | 16 bit |
| Input Type | 0mA ~ 20mA |
| | 4mA ~20mA |
| | ----- |
| | ----- |
| Input Signal Design | Differential signal |
| Accuracy | ±0.1% |
| Input Impedance | 250Ω, (Max) |
| Sampling Rate | 10ms |
| Communication Interface | via DINKLE Bus |
| Indicator Description | 4 Green ,Input States |
| Isolation Method | Photocoupler Isolation |
| Connection Method | Push-in |
| Common Type | 4 Channels / 4COM |
| **General Specification** | |
| Dimensions (W*D*H) | 12 x 100 x 97 mm |
| Weight | 60 g |
| Operating Temperature | 0…+60˚C |
| Storage Temperature | -25˚C…+85˚C |
| Permissible Humidity (Non-condensing) | RH 95% |
| Altitude Limit | < 2000 m |
| Ingress Protection (IP) | IP 20 |
| Pollution Severity | II |
| Product Certification | CE |
| Wire Range | 0.2mm² ~ 1.5 mm² / AWG 28~16 |
| Suggested Terminals | DN00510D / DN00710D |

## 2.11 GF2-AQ01T

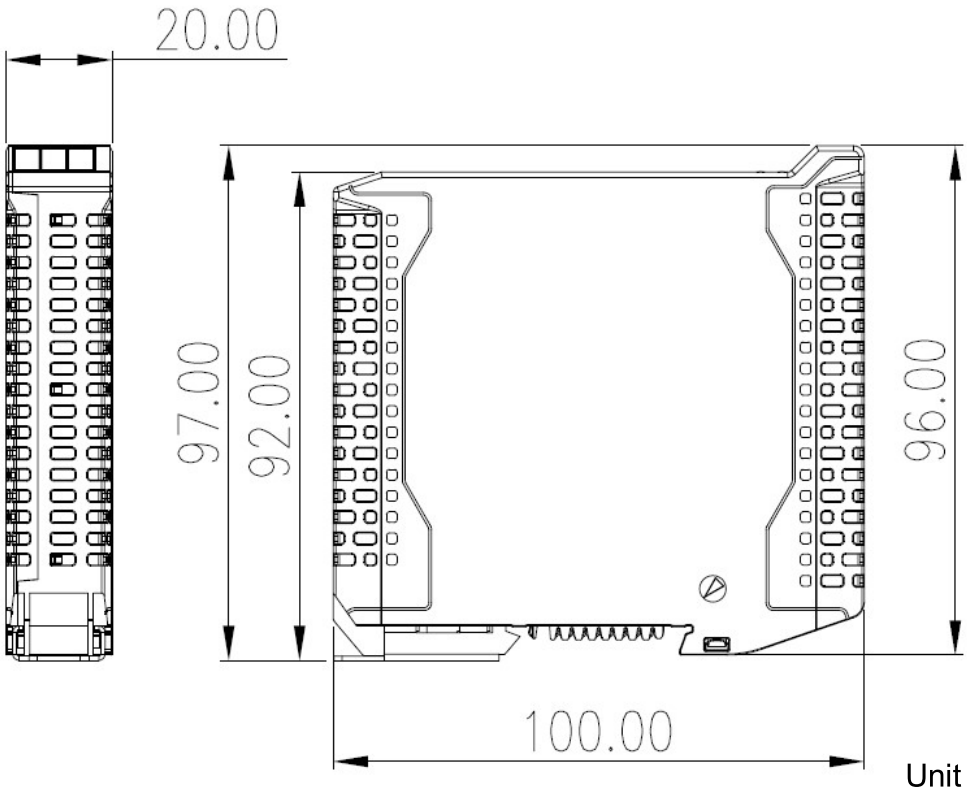
| Technical Specification | |
|---|---|
| Number of Output Channels | 4 |
| Voltage Supply(Field) | 24 VDC (-15%~+20%) |
| Current Consumption(Field) | Max. 76mA@24VDC |
| Voltage Supply(System) | 24 VDC via DINKLE Bus |
| Current Consumption(Field) | Max. 22mA@24VDC |
| Resolution | 16 bit |
| Output Type | -10V ~ +10V |
| | 0V ~ +10V |
| | 0V ~ +5V |
| | 1V ~ +5V |
| Input Signal Design | Differential signal |
| Output Impedance | >2 KΩ |
| Communication Interface | via DINKLE Bus |
| Indicator Description | 4 Green Output States |
| Isolation Method | Photocoupler Isolation |
| Connection Method | Push in |
| Common Type | 4 Channels / 4COM |
| **General Specification** | |
| Dimensions (W*D*H) | 12 x 100 x 97 mm |
| Weight | 64 g |
| Operating Temperature | 0…+60˚C |
| Storage Temperature | -25˚C…+85˚C |
| Permissible Humidity (Non-condensing) | RH 95% |
| Altitude Limit | < 2000 m |
| Ingress Protection (IP) | IP 20 |
| Pollution Severity | II |
| Product Certification | CE |
| Wire Range | 0.2mm² ~ 1.5 mm² / AWG 28~16 |
| Suggested Terminals | DN00510D / DN00710D |

## 2.12 GF2-AQ02T

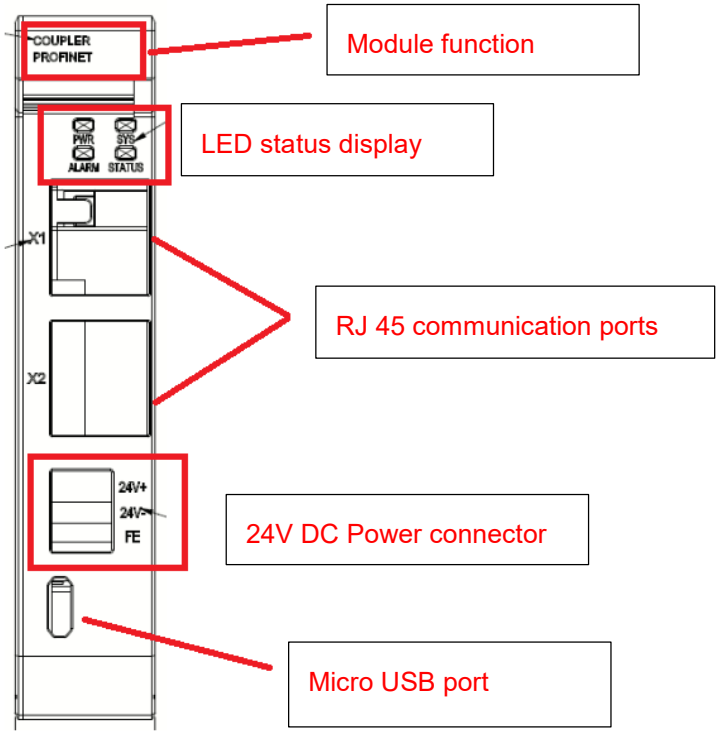
| Technical Specification | |
|---|---|
| Number of Output Channels | 4 |
| Voltage Supply(Field) | 24 VDC (-15%~+20%) |
| Current Consumption(Field) | Max. 112mA@24VDC |
| Voltage Supply(System) | 24 VDC via DINKLE Bus |
| Current Consumption(Field) | Max. 22mA@24VDC |
| Resolution | 16 bit |
| Output Type | 0mA ~ 20mA |
| | 4mA ~20mA |
| | ----- |
| | ----- |
| Input Signal Design | Differential signal |
| Output Impedance | < 500Ω |
| Communication Interface | via DINKLE Bus |
| Indicator Description | 4 Green Output States |
| Isolation Method | Photocoupler Isolation |
| Connection Method | Push in |
| Common Type | 4 Channels / 4COM |
| **General Specification** | |
| Dimensions (W*D*H) | 12 x 100 x 97 mm |
| Weight | 64 g |
| Operating Temperature | 0…+60˚C |
| Storage Temperature | -25˚C…+85˚C |
| Permissible Humidity (Non-condensing) | RH 95% |
| Altitude Limit | < 2000 m |
| Ingress Protection (IP) | IP 20 |
| Pollution Severity | II |
| Product Certification | CE |
| Wire Range | 0.2mm² ~ 1.5 mm² / AWG 28~16 |
| Suggested Terminals | DN00510D,DN00710D |

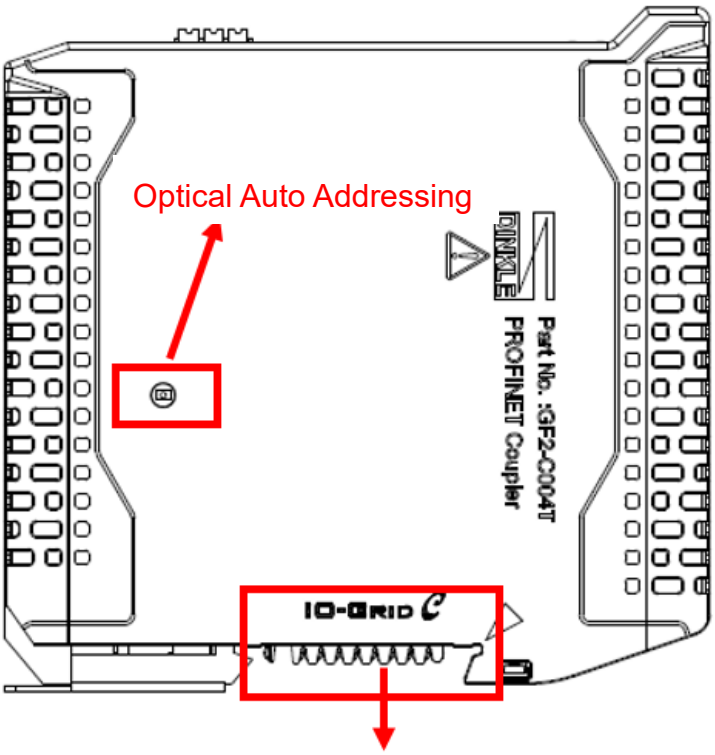
# 3. Module Information

## 3.1 Coupler Module Dimensions



## 3.2 Coupler Module Interface



## I. LED Indicator Light

**GF2-C001T：**

| LED Code | Description |
|---|---|
| PWR | Green; power indicator |
| STATUS | Communication indicator<br>Red: Modbus TCP error<br>Green: Connection normal |
| SYS | System status indicator<br>Green: On - System running<br>Red: On - System booting<br>Orange: Blinking – system initializing and pairing |
| ALARM | System alarm<br>Red: System anomaly,time out,lost slaves…. |

**GF2-C002T：**

| LED Code | Description |
|---|---|
| PWR | Green; power indicator |
| STATUS | Communication indicator<br>Green: EtherCAT RUN<br>Red: EtherCAT Error |
| SYS | System status indicator<br>Green: On - System running<br>Red: On - System booting<br>Orange: Blinking – system initializing and pairing |
| ALARM | System alarm<br>Red: System anomaly,time out,lost slaves…. |

**GF2-C003T：**

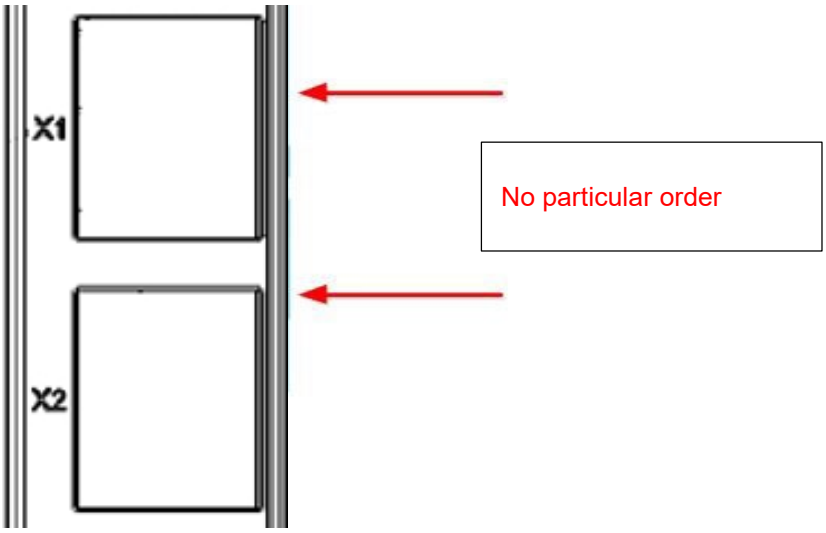
| LED Code | Description |
|---|---|
| PWR | Green; power indicator |
| STATUS | Communication indicator<br>Red: Connection timeout<br>Red (blinking): Waiting for connection<br>Green: Connection normal |
| SYS | System status indicator<br>Green (On): System operating<br>Red (On): System booting<br>Orange (Blinking): System initializing and pairing |
| ALARM | System alarm<br>Red: System anomaly,time out,lost slaves…. |

**GF2-C004T：**

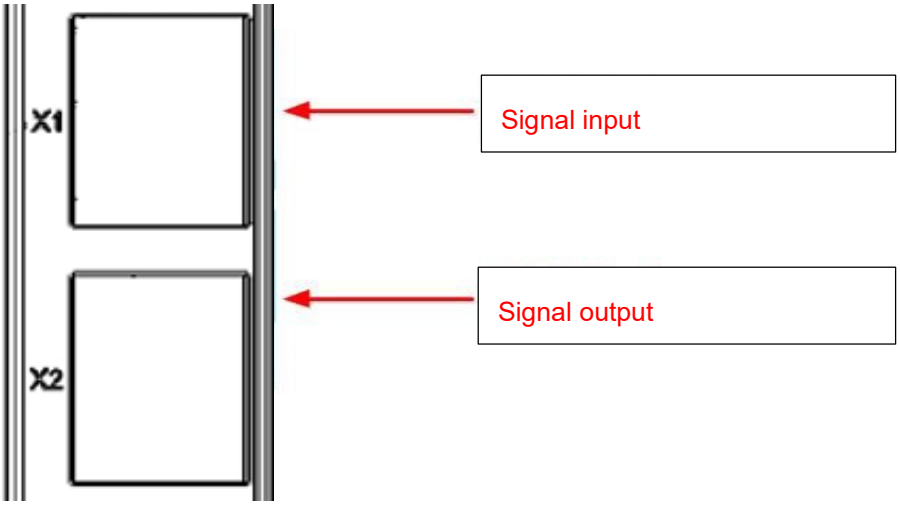
| LED Code | Description |
|---|---|
| PWR | Green; power indicator |
| STATUS | Communication indicator<br>Red: PROFINET error<br>Red (Blinking): Parameter setting error<br>Green: Connection normal |
| SYS | System status indicator<br>Green (On): System operating<br>Red (On): System booting<br>Orange (Blinking): System initializing and pairing |
| ALARM | System alarm<br>Red: System anomaly,time out,lost slaves…. |

## II. RJ45 connector 1 and RJ45 connector 2 definitions:

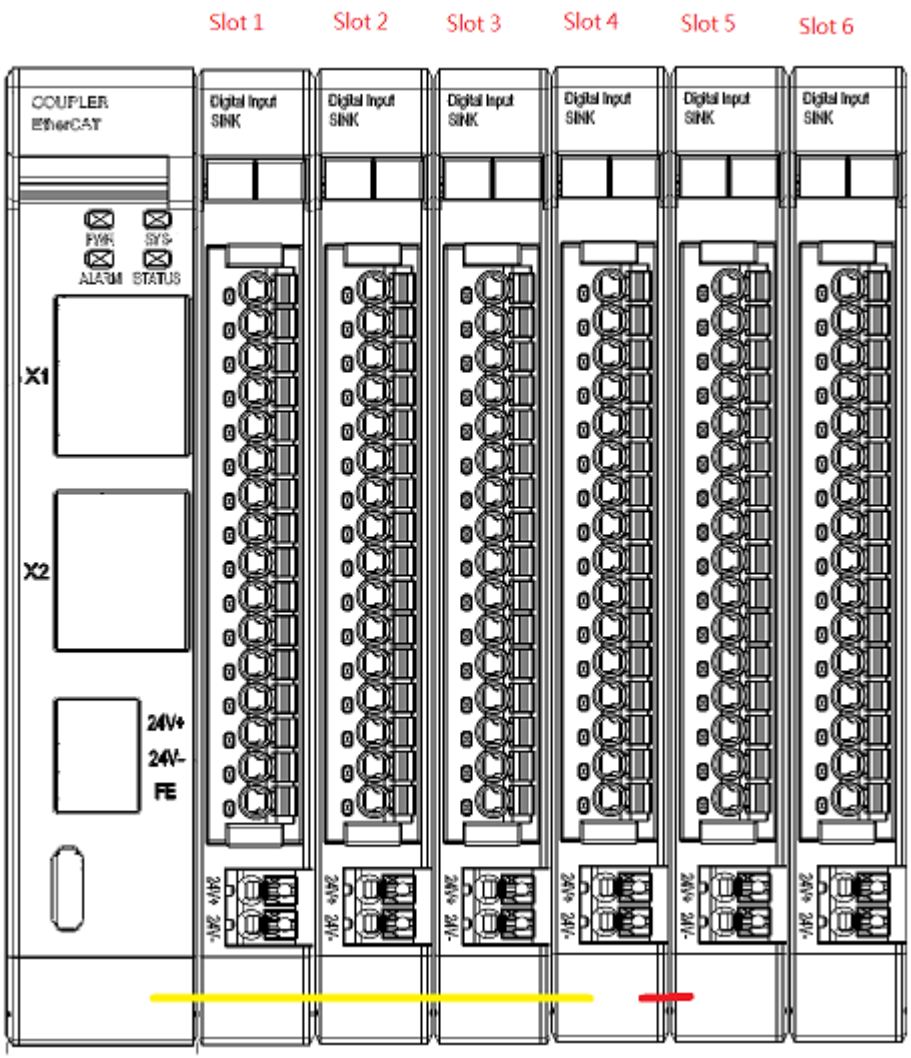
GF2-C001T,GF2-C003T,GF2-C004T




GF2-C002T



## III. Pairing Mechanism




※The position is defined with the slot number. Each slot's slot number is also its ID number.

If slot 4 is not paired normally, the remaining slots will not complete configuration.

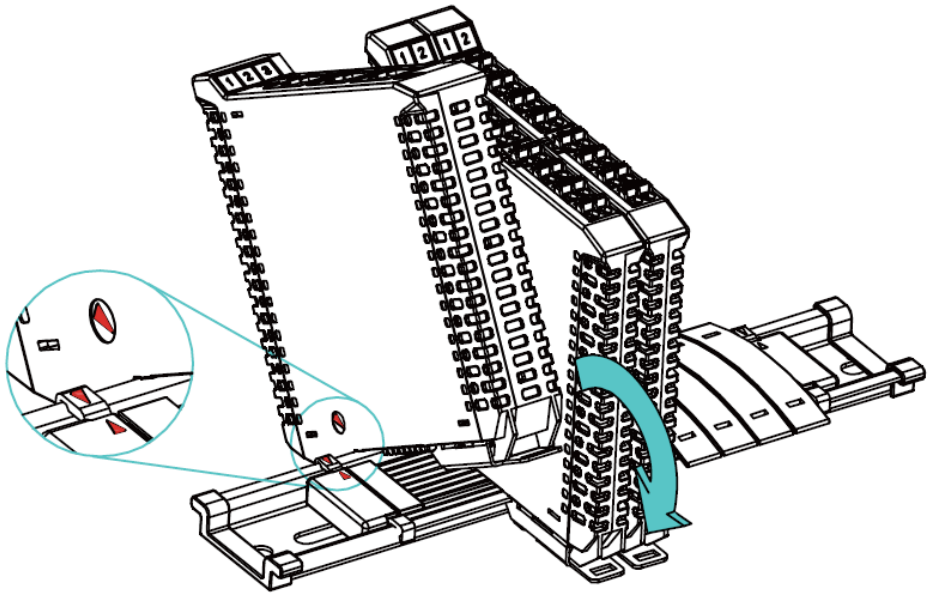
# 4. Module Installation/Disassembly

## 4.1 Installation

I. Align the red arrow on the side of the module to the arrow on the DIN rail.

II. Press the module down and the metal clamp will slide (thanks to its spring mechanism) and grab on the other side of the DIN rail.

Continue to push down until the metal clamp “clicks”.

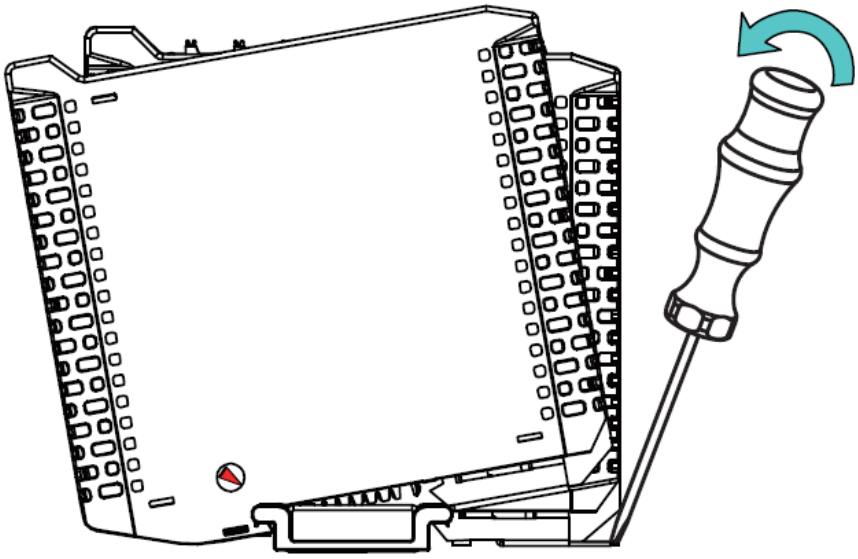


※Note: Make sure the red arrows on the module and the rail are pointing the same direction.

## 4.2 Removal

I. Use a screwdriver to pull the metal hook sideways and detach the module from the DIN rail.

II. Remove all modules from the DIN rail in reverse order of installation.



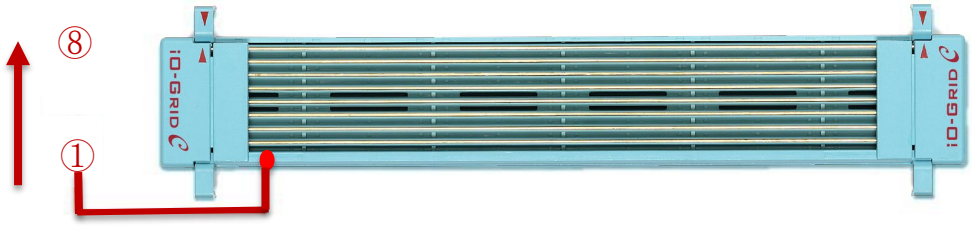
# 5. iO-Grid C Series Introduction

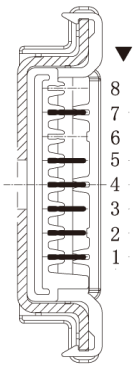
iO-Grid C series provides standard digital I/O modules and analog I/O modules for distributed monitoring. It also provides a wide variety of high-speed industrial network communication interfaces, allowing users to easily and quickly connect to master via Modbus TCP, EtherCAT, EtherNet/IP, PROFINET and other frequently-used industrial communication interfaces.

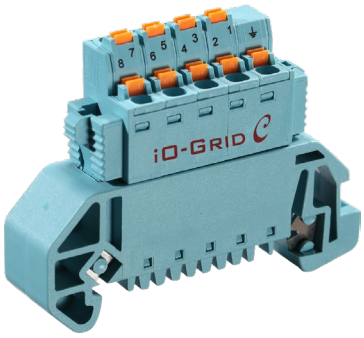
## 5.1 iO-Grid C Components

### I. DINKLE Bus

**Rail 1 to 4 are defined for power supply.**




DINKLE Bus Rail Definitions

| Rail | Definition | Rail | Definition |
|---|---|---|---|
| **8** | System Communication | **4** | — |
| **7** | System Communication | **3** | — |
| **6** | System Communication | **2** | 0V |
| **5** | System Communication | **1** | 24V |

## II. Coupler Module

The coupler is between the master and the bus and controls the I/O module.

Coupler Products:

| Product No. | Description |
|---|---|
| **GF2-C001T** | Modbus TCP Coupler |
| **GF2-C002T** | EtherCAT Coupler |
| **GF2-C003T** | EtherNet/IP Coupler |
| **GF2-C004T** | PROFINET Coupler |

## III. I/O Module

Different types of I/O modules with different functions:

| Product No. | Description |
|---|---|
| **GF2-DI01T** | 16-channel digital input module (sink) |
| **GF2-DI02T** | 16-channel digital input module (source) |
| **GF2-DQ01T** | 16-channel digital output module (sink) |
| **GF2-DQ02T** | 16-channel digital output module (Source) |
| **GF2-AI01T** | 4-channel analog input module<br>(-10…10VDC,0…10VDC,0…5VDC,1…5VDC , adjustable) |
| **GF2-AI02T** | 4-channel analog input module<br>(0…20mA,4…20mA , adjustable) |
| **GF2-AO01T** | 4-channel analog output module<br>(-10…10VDC,0…10VDC,0…5VDC,1…5VDC , adjustable) |
| **GF2-AO02T** | 4-channel analog output module<br>(0…20mA,4…20mA , adjustable) |

# 6. iO-GRID Parameter Settings and Introduction

## 6.1 Coupler Connections

### I. Coupler Configuration List

| Name/Product No. | Description |
|---|---|
| **GF2-C001T** | Modbus TCP Coupler |
| **GF2-C002T** | EtherCAT Coupler |
| **GF2-C003T** | EtherNet/IP Coupler |
| **GF2-C004T** | PRPFINET Coupler |
| **GF2-DI01T** | 16-channel digital input module (sink) |
| **GF2-DI02T** | 16-channel digital input module (source) |
| **GF2-DQ01T** | 16-channel digital output module (sink) |
| **GF2-DQ02T** | 16-channel digital output module (source) |
| **GF2-AI01T** | 4-channel analog input module<br>(-10…10VDC,0…10VDC,0…5VDC,1…5VDC , adjustable) |
| **GF2-AI02T** | 4-channel analog input module<br>(0…20mA,4…20mA , adjustable) |
| **GF2-AO01T** | 4-channel analog output module<br>(-10…10VDC,0…10VDC,0…5VDC,1…5VDC , adjustable) |
| **GF2-AO02T** | 4-channel analog output module<br>(0…20mA,4…20mA , adjustable) |
| **Micro USB cable** | Must have data transfer functionality |
| **Computer** | USB-compatible |

### II. Module Initial Setting List

| Product No. | Description | Factory Default IP |
|---|---|---|
| **GF2-C001T** | Modbus TCP Coupler | 192.168.1.20 |
| **GF2-C002T** | EtherCAT Coupler | N/A |
| **GF2-C003T** | EtherNet/IP Coupler | 192.168.1.20 |
| **GF2-C004T** | PROFINET Coupler | 192.168.1.20 |

## III. Setup Software Functions:

The setup software contains the communication parameters for the couplers and I/O modules

(1) Coupler IP

(2) Module ID number

(3) Module Disconnect Handling Mechanism

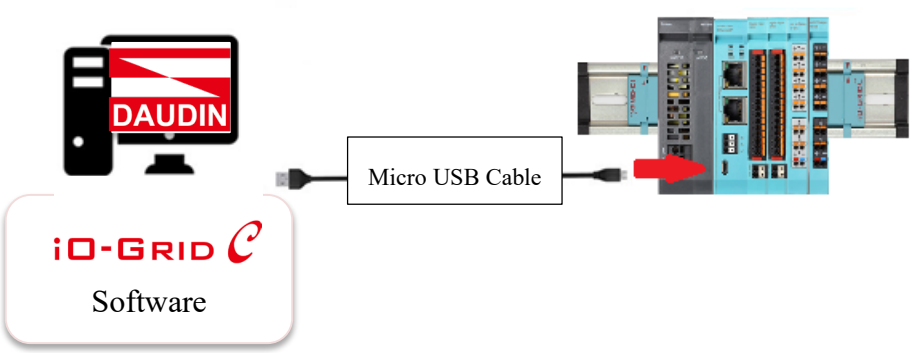
(4) Analog Module Range Adjustment (to be updated)

(5) Firmware update

## IV. Coupler Module Connection Setup

Connect the coupler to a computer via its Micro USB port and open the “i-Designer” program

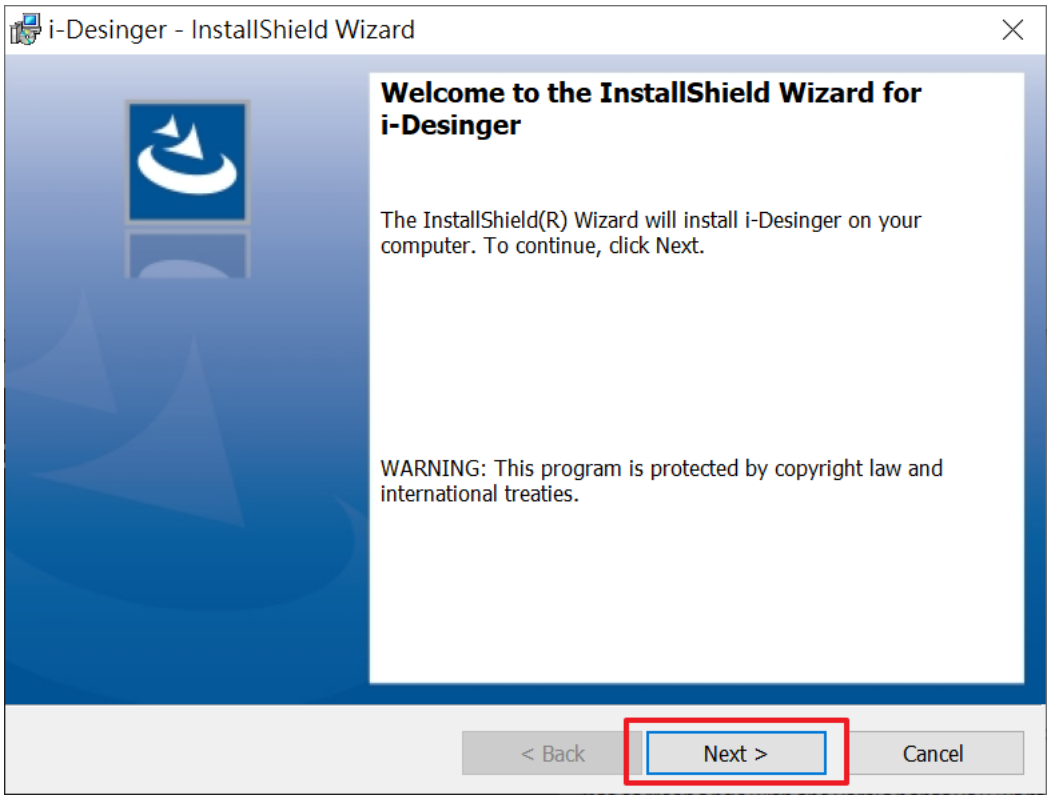
I/O module connection illustration:



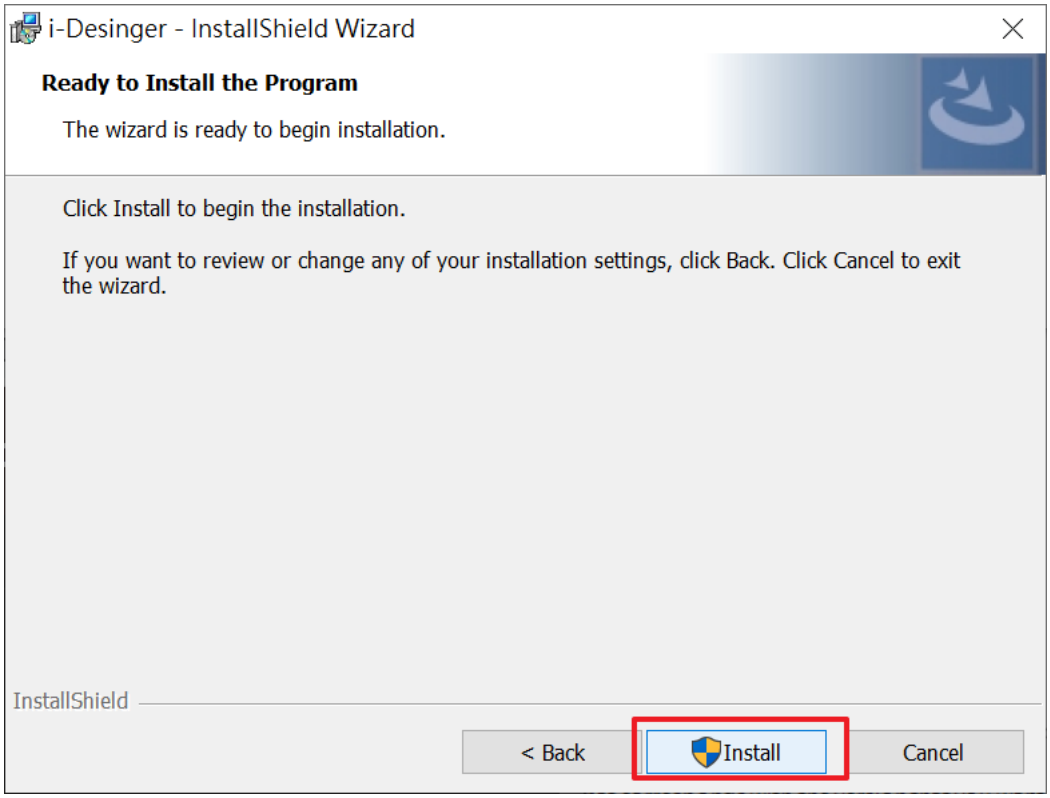
## 6.2 i-Designer Tutorial

### 6.2.1 Click on the installer

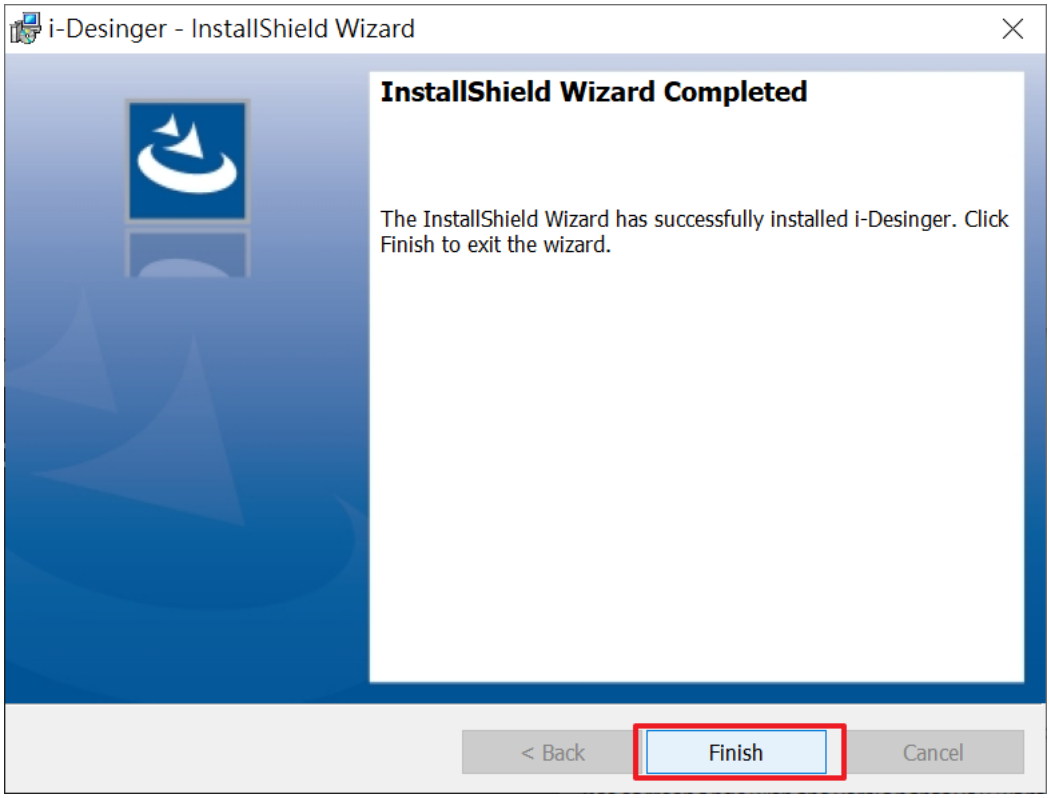

### 6.2.2 Click on “Next”



### 6.2.3 Click on “Install”

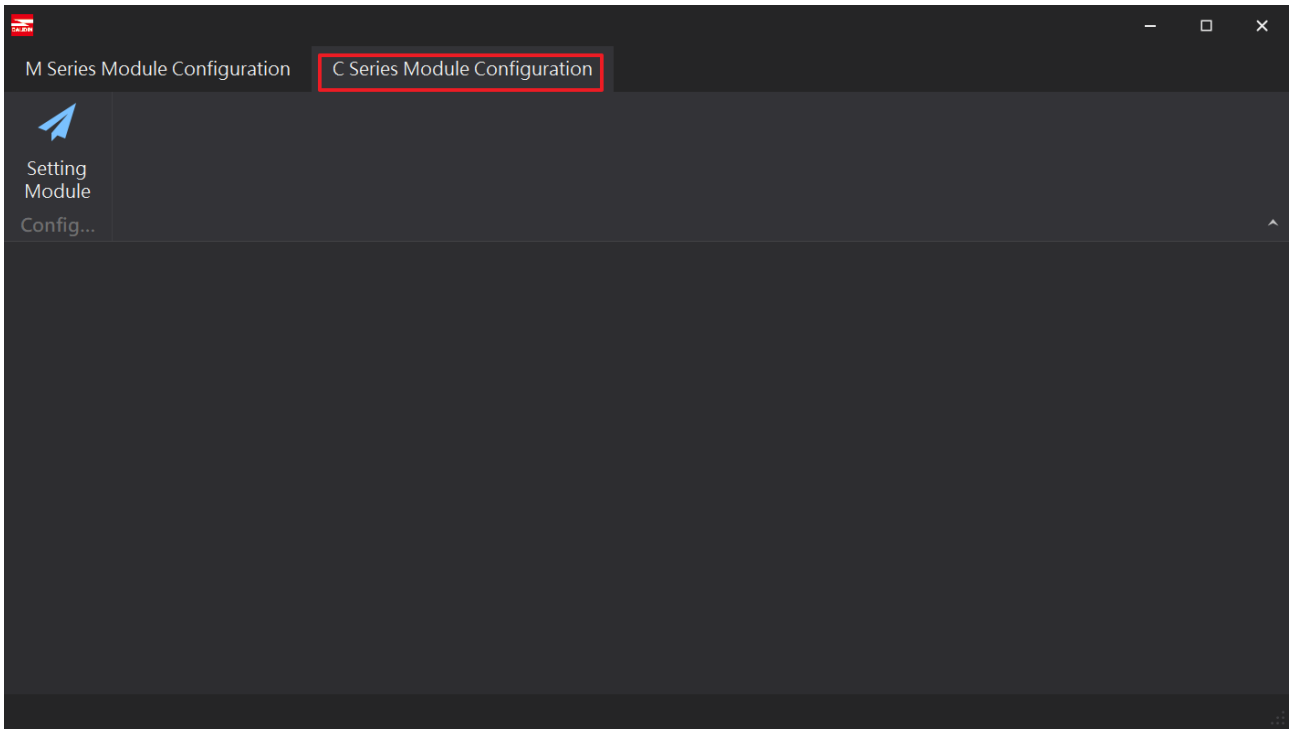



### 6.2.4 Click on “Finish”

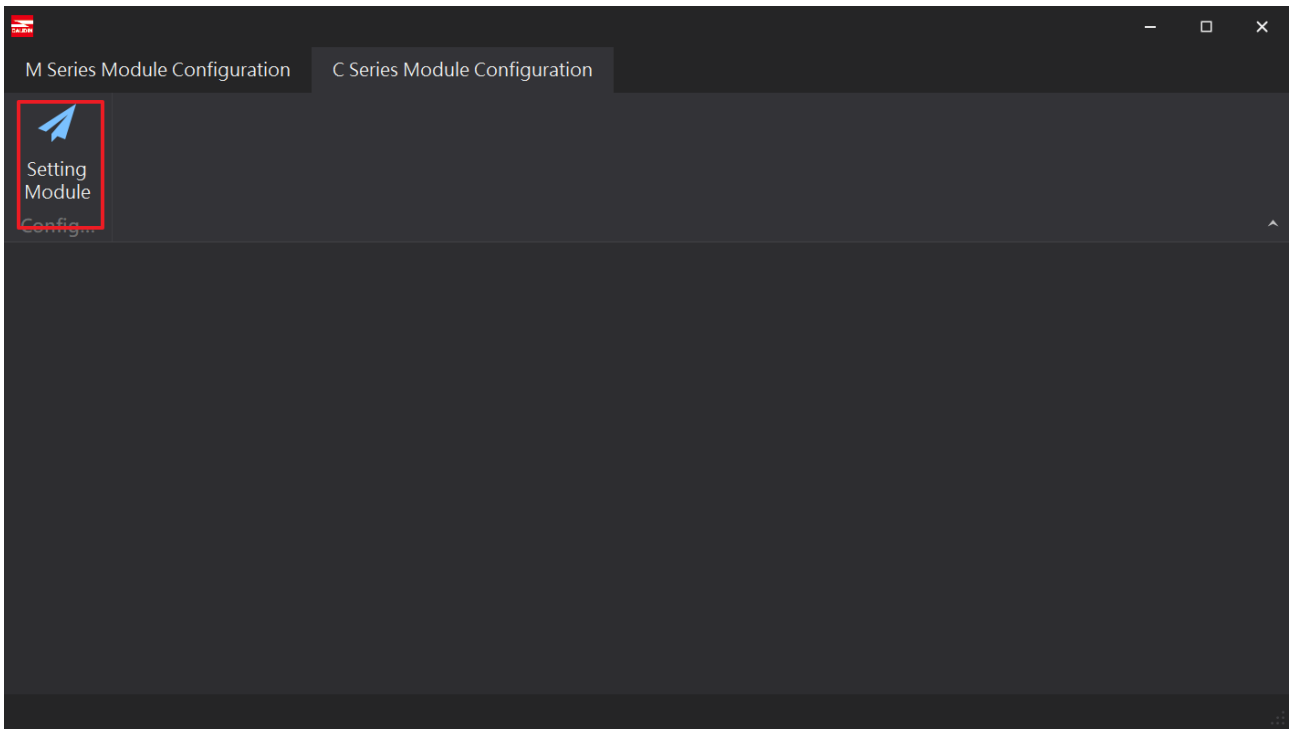


### 6.2.5 Click on the program icon

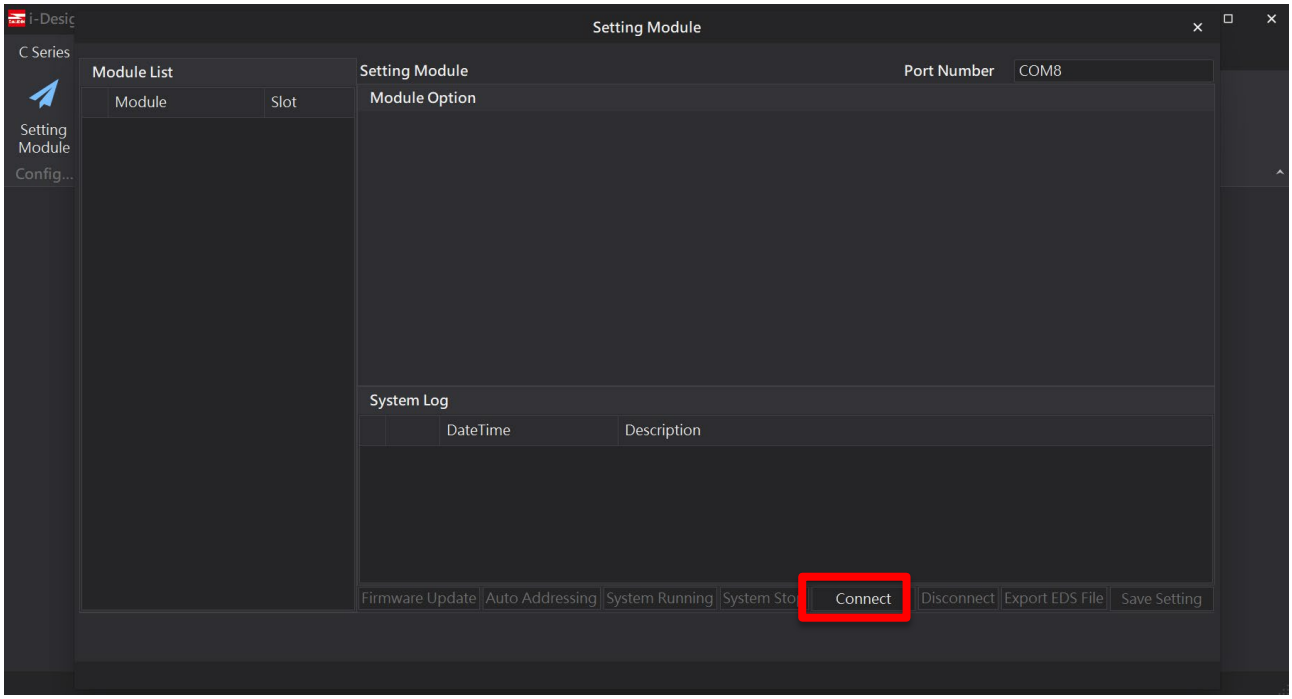

### 6.2.6 Select “C Series Module Configuration”



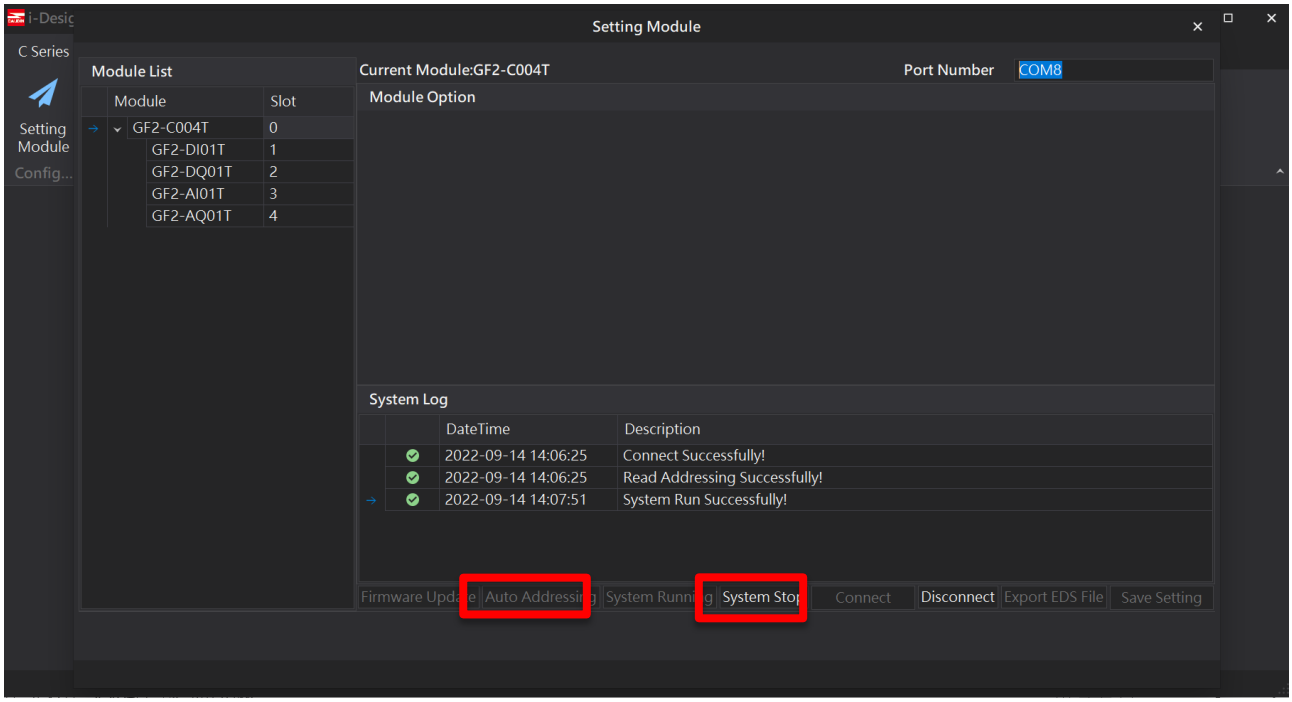
### 6.2.7 Click on the “Setting Module” icon



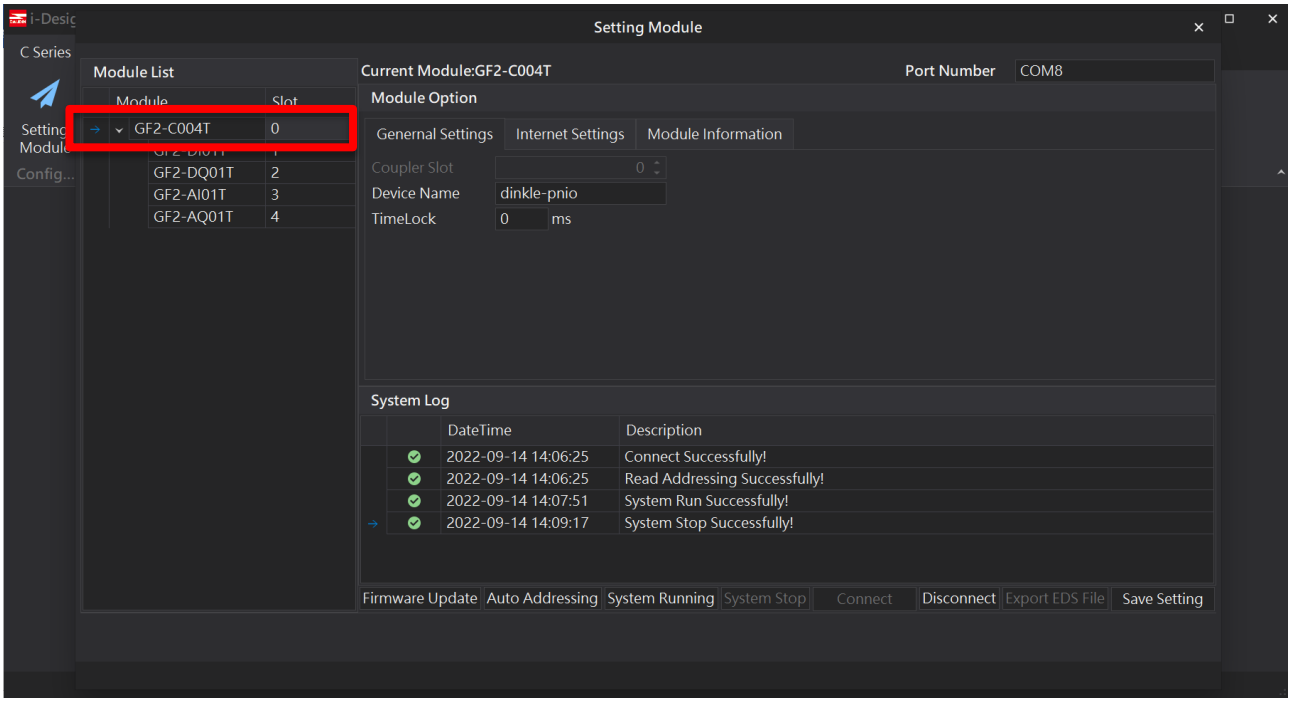

### 6.2.8 Click on “Connect” for the coupler module



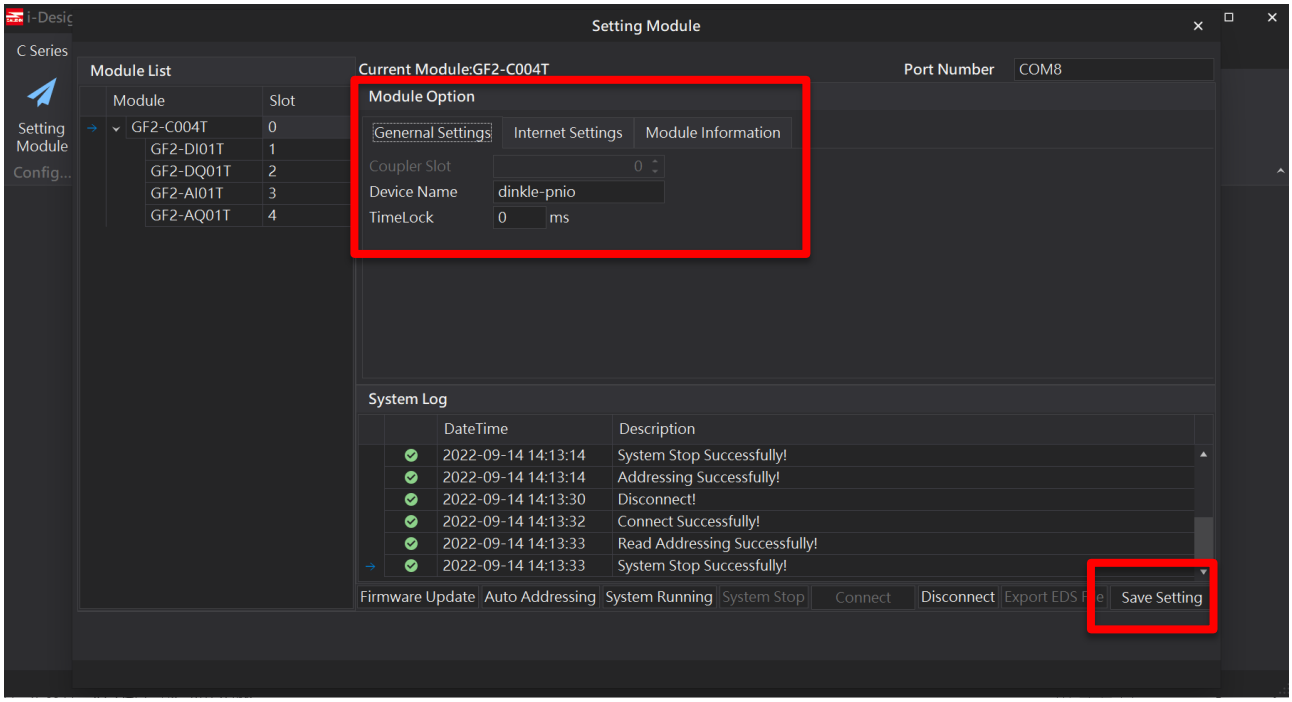
### 6.2.9 Click on “System Stop” before clicking on “Auto Addressing”



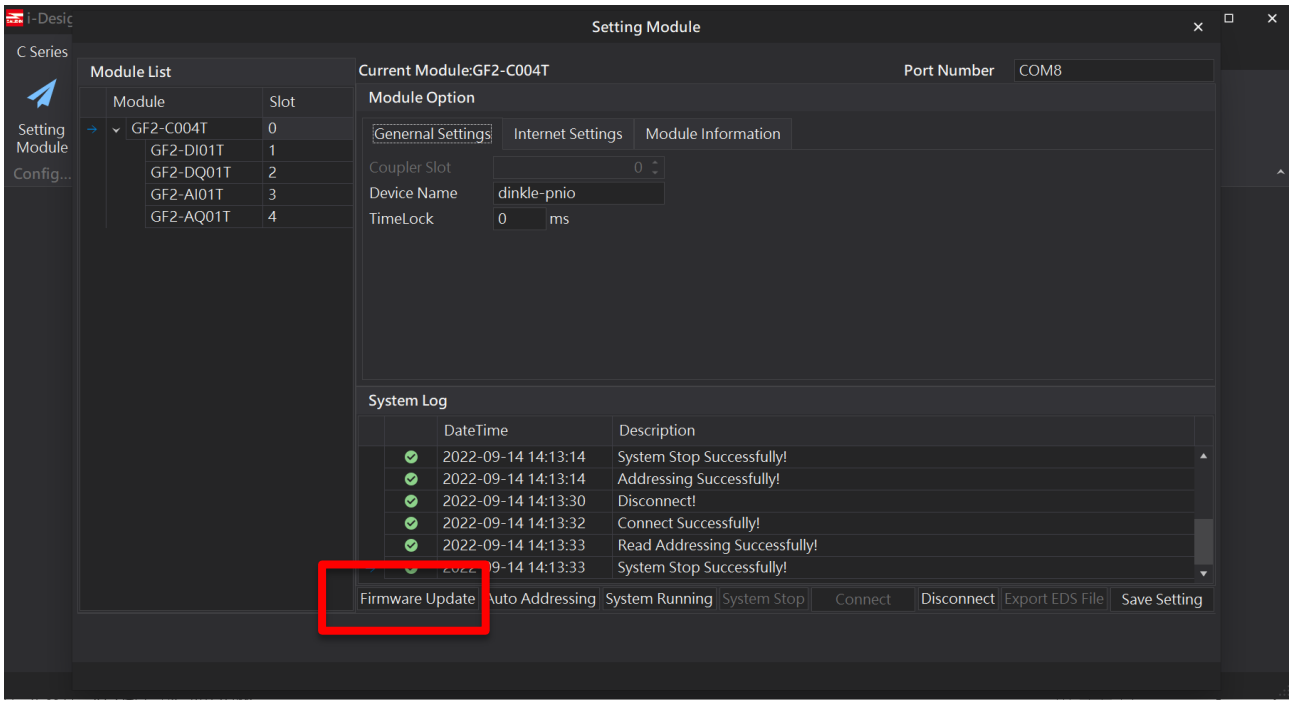

### 6.2.10 To change a module’s parameters, click on the “Module List” and the program will show the “Setting Module” page for “Coupler” and “Slaves”



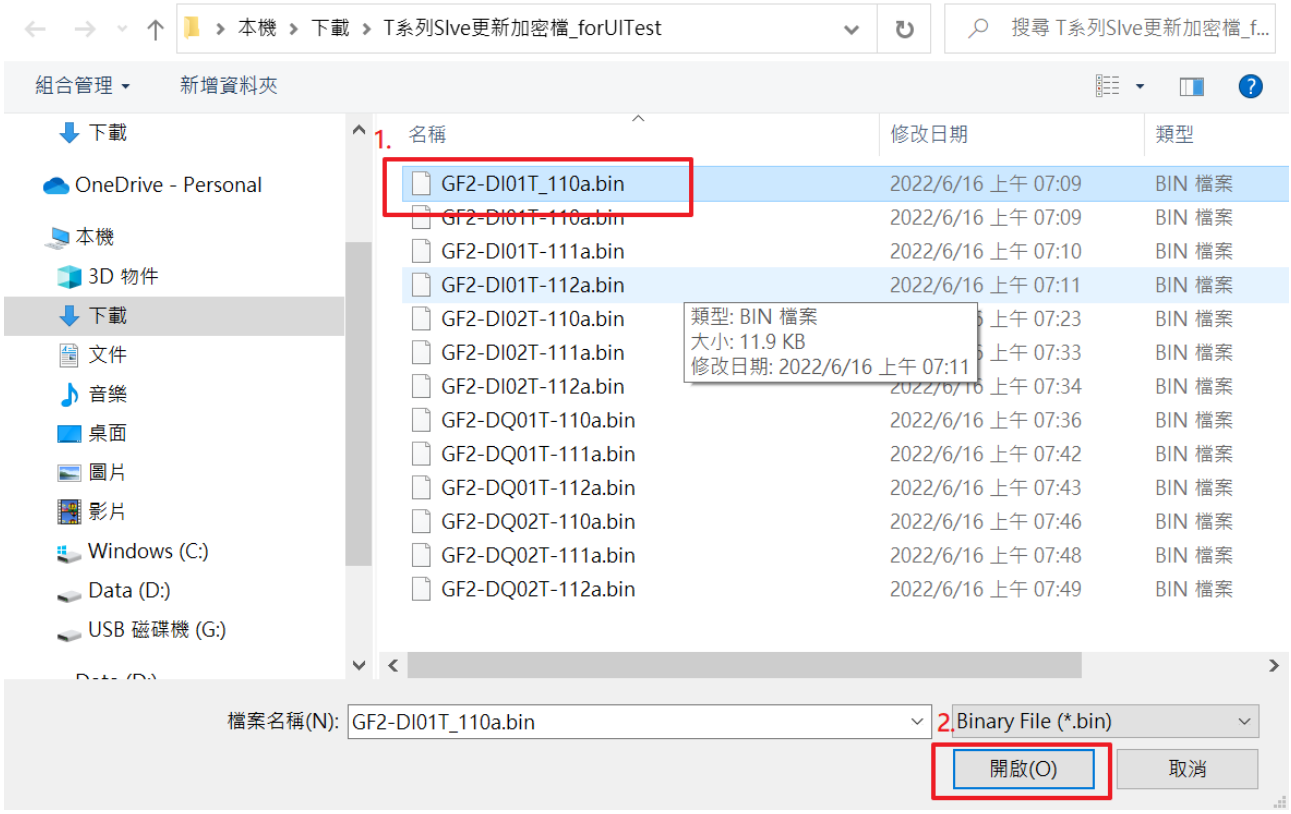
### 6.2.11 Once the parameters have been modified for the Coupler/Slave module, click on “Save Setting”



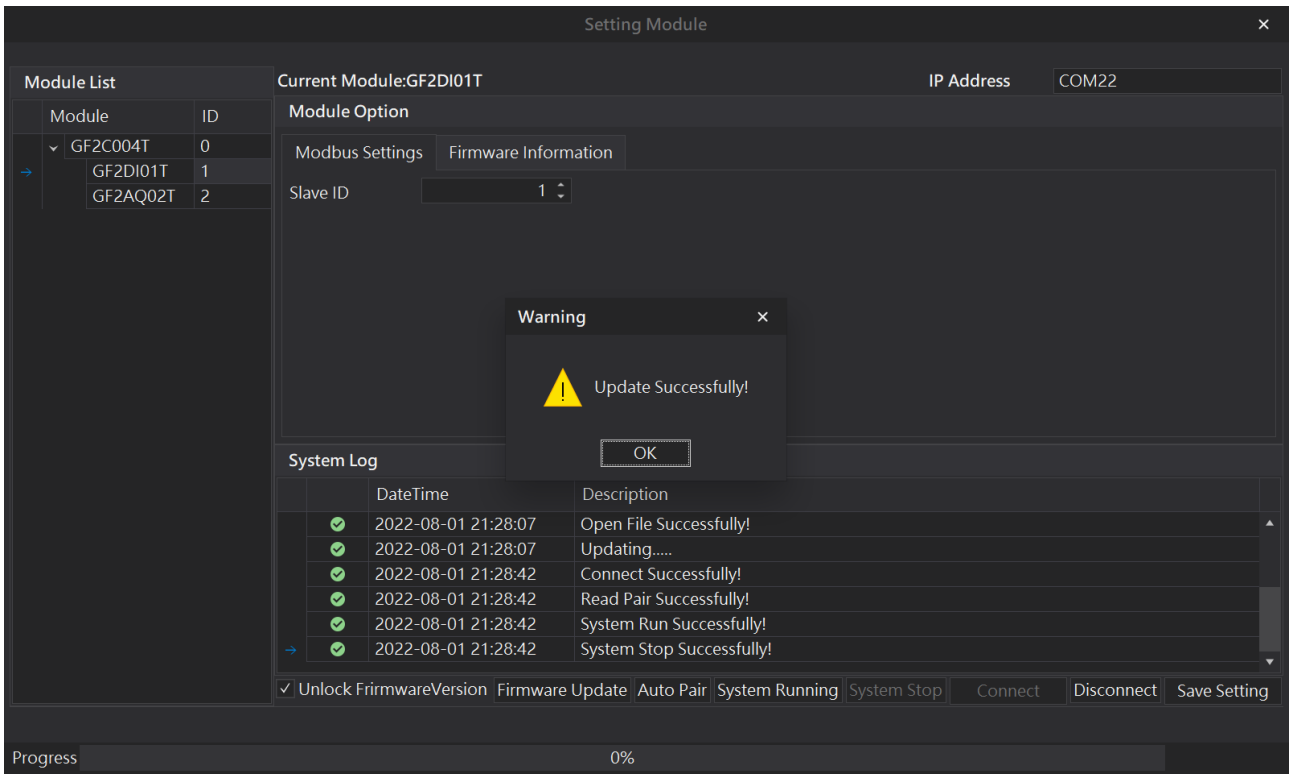

### 6.2.12 For firmware update, please click on “Firmware Update”



### 6.2.13 Select the BIN file and click on “Open”




### 6.2.14 “Update Successfully!” will display once firmware has been updated



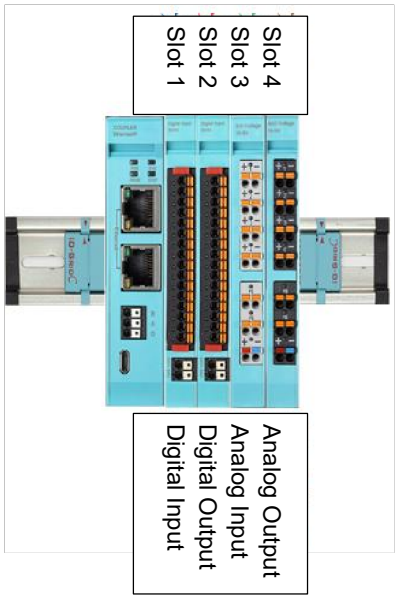
# 7. Coupler Module Register Configuration

## I. Coupler Register Distribution

**The coupler will assign an ID automatically based on the I/O order on the bus. Registers are assigned automatically based on the module type (digital or analog), slot number and total data volume. Registers will be assigned in the following order: digital, analog and then slot number.**

**A single piece of 16-channel digital module will take up 1 WORD／2 BYTE while a single piece of 4-channel analog module will take up 4 WORD／8 BYTE of data.**

Coupler register address distribution:




| | Input register |
|---|---|
| 1st | Slot 1<br>Digital Input |
| 2nd | Slot 3<br>Analog Input<br>(Channel 1) |
| 3rd | Slot 3<br>Analog Input<br>(Channel 2) |
| 4th | Slot 3<br>Digital Input<br>(Channel 3) |
| 5th | Slot 3<br>Analog Input<br>(Channel 4) |

| | Output register |
|---|---|
| 1st | Slot 2<br>Digital Output |
| 2nd | Slot 4<br>Analog Output<br>(Channel 1) |
| 3rd | Slot 4<br>Analog Output<br>(Channel 2) |
| 4th | Slot 4<br>Analog Output<br>(Channel 3) |
| 5th | Slot 4<br>Analog Output<br>(Channel 4) |

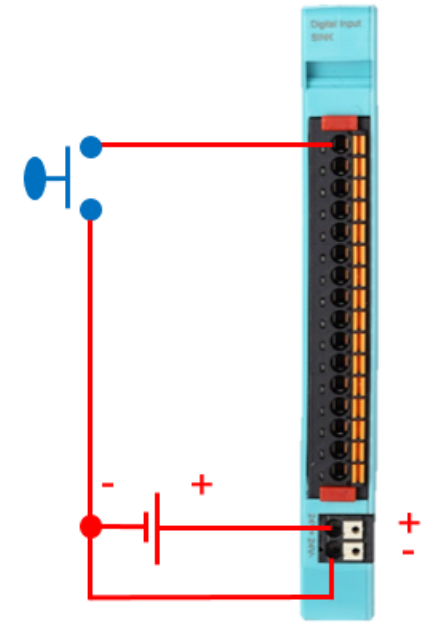
※The register ID differs with different master but the register sequence remains unaffected.

Please refer to the connection manuals for different brands of products.

# 8. Module Connection

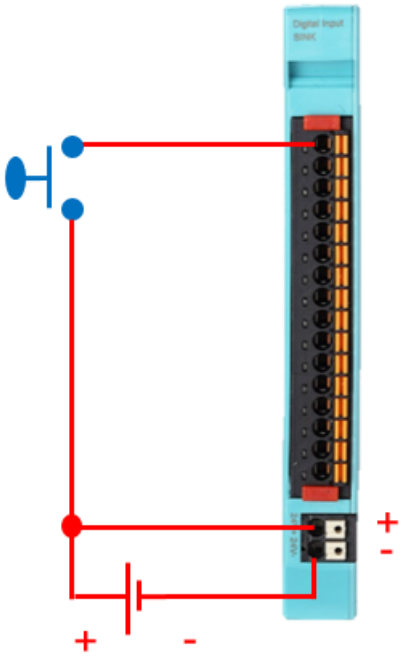
## 8.1 Digital Input Module

GF2-DI01T(Sink)




External power

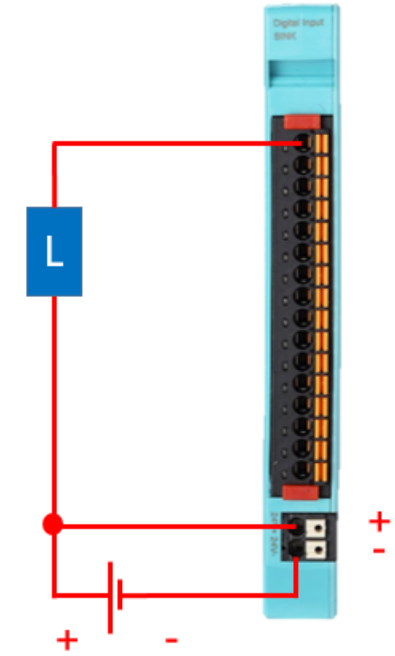
GF2-DI02T(Source)



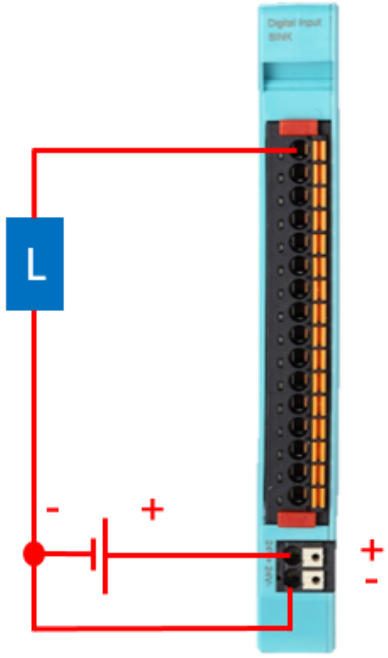

External power

### 8.2 Digital Output Module

## GF2-DQ01T(Sink) GF2-DQ02T(Source)



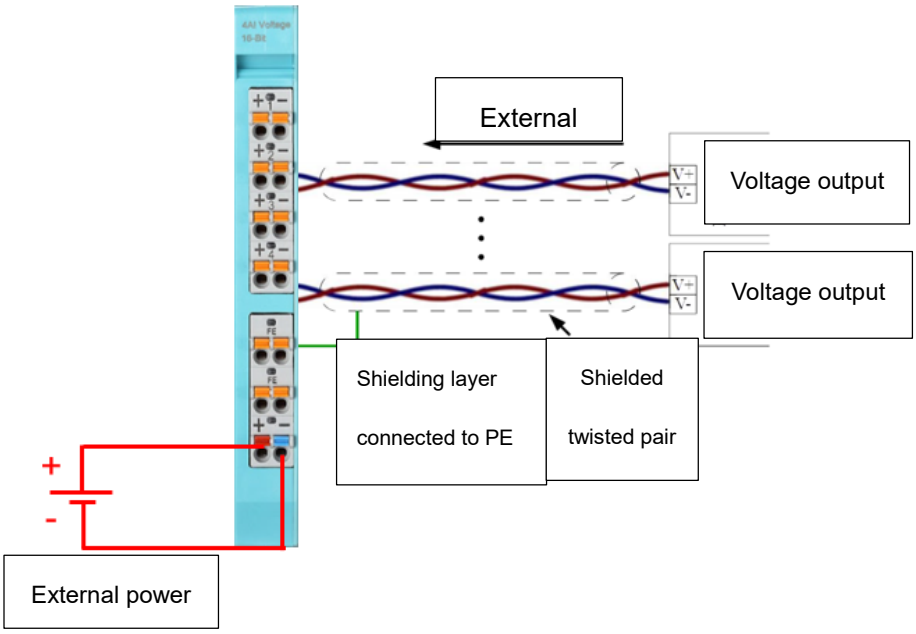

External power



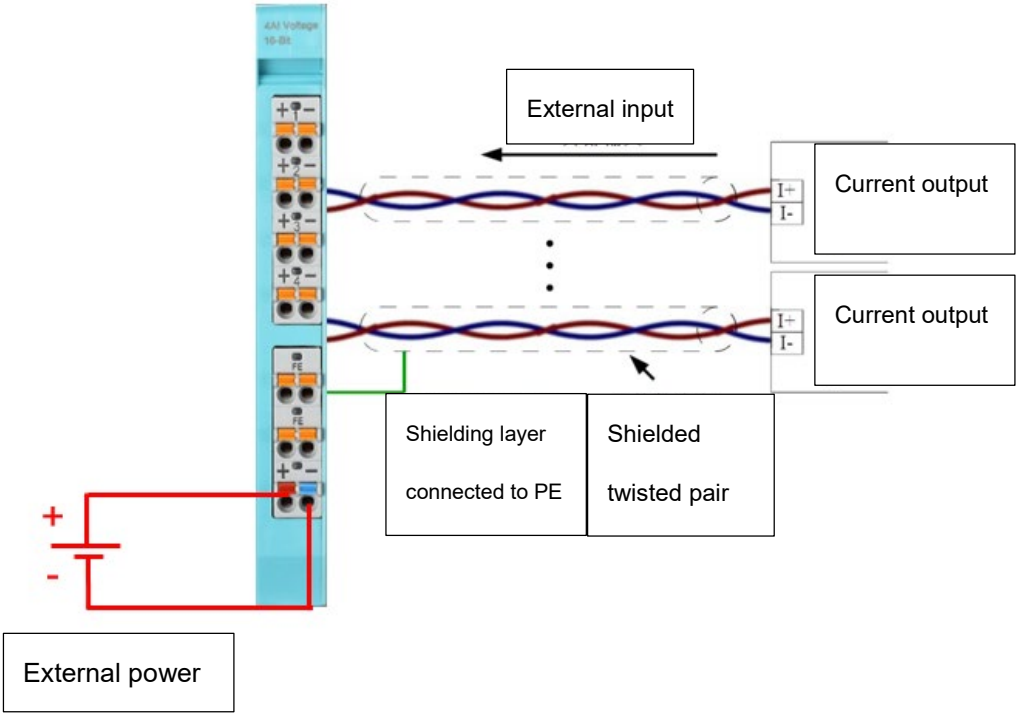

External power

## 8.3 Analog Input Module

GF2-AI01T (Voltage)

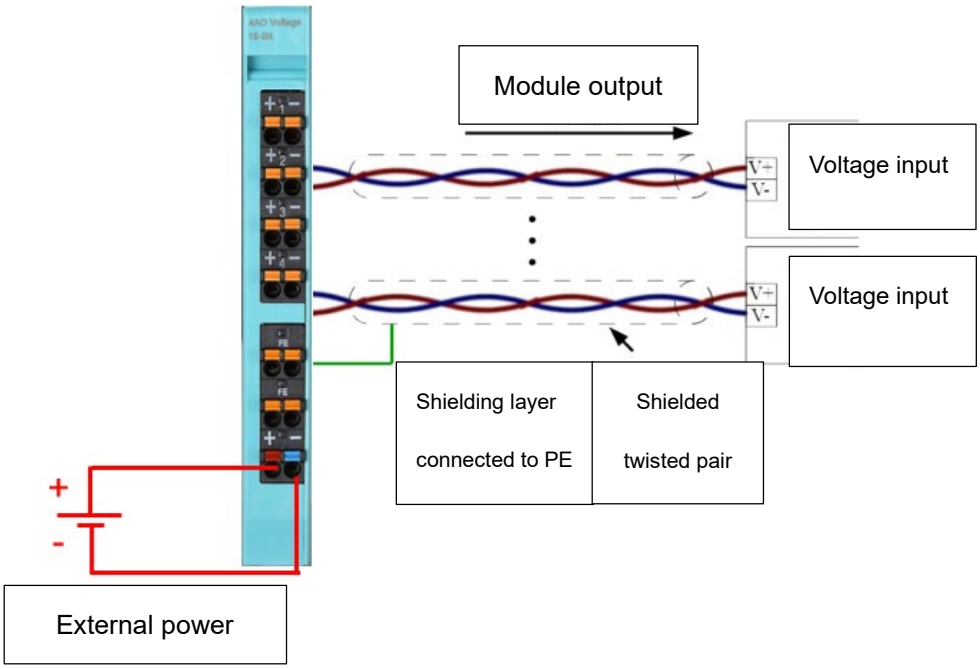



GF2-AI02T (Current)

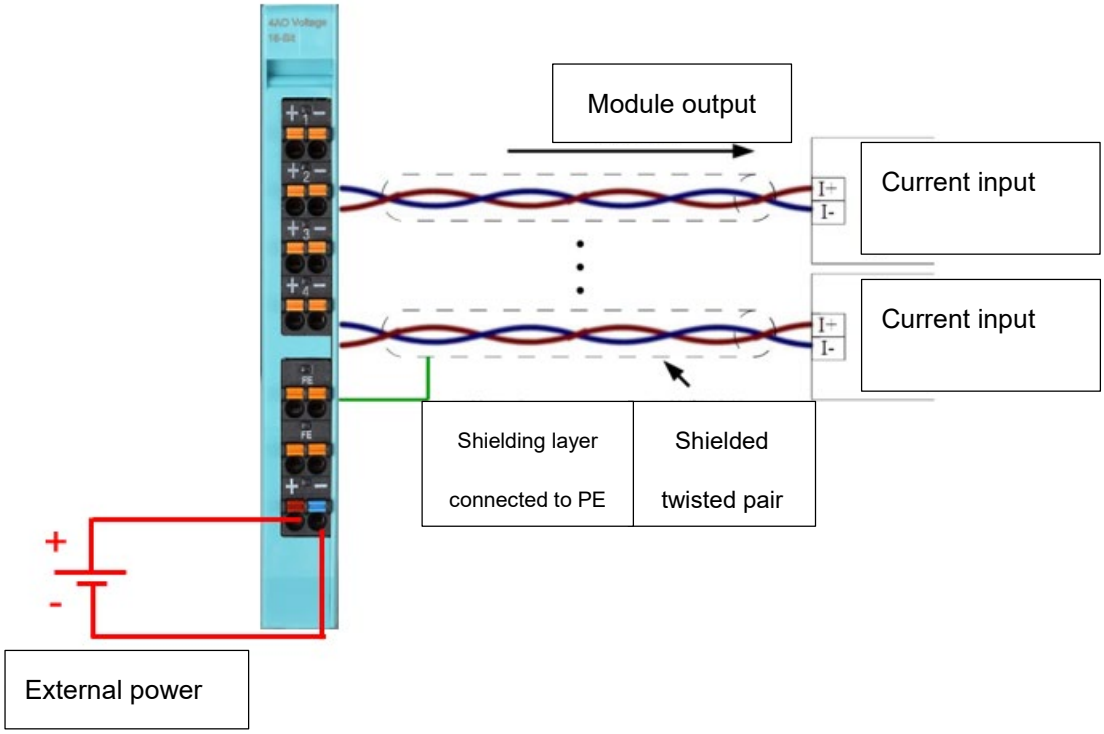


## 8.4 Analog Output Module

GF2-AQ01T (Voltage)



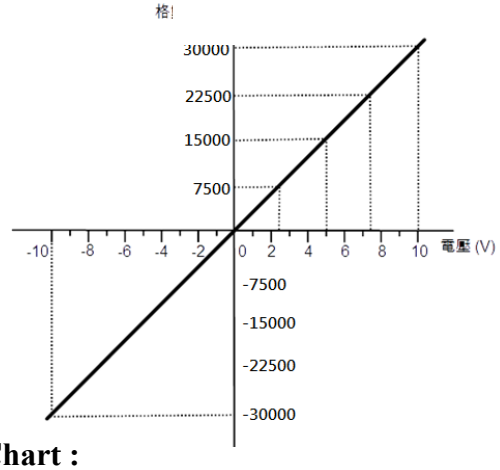

GF2-AQ02T (Current)



# 9. Analog Module A/D and D/A Conversion

## I. Voltage Input/Output Range: -10V-10V

**Conversion Diagram:**




**Voltage Conversion Chart :**

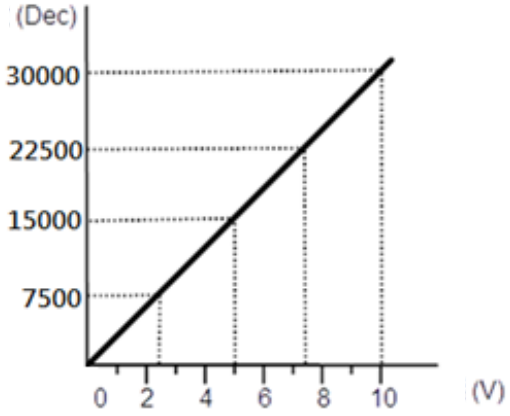
| | 0 | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 |
|---|---|---|---|---|---|---|---|---|---|---|
| **10** | 30000 | 30300 | 30600 | 30900 | 31200 | 31500 | — | — | — | — |
| **9** | 27000 | 27300 | 27600 | 27900 | 28200 | 28500 | 28800 | 29100 | 29400 | 29700 |
| **8** | 24000 | 24300 | 24600 | 24900 | 25200 | 25500 | 25800 | 26100 | 26400 | 26700 |
| **7** | 21000 | 21300 | 21600 | 21900 | 22200 | 22500 | 22800 | 23100 | 23400 | 23700 |
| **6** | 18000 | 18300 | 18600 | 18900 | 19200 | 19500 | 19800 | 20100 | 20400 | 20700 |
| **5** | 15000 | 15300 | 15600 | 15900 | 16200 | 16500 | 16800 | 17100 | 17400 | 17700 |
| **4** | 12000 | 12300 | 12600 | 12900 | 13200 | 13500 | 13800 | 14100 | 14400 | 14700 |
| **3** | 9000 | 9300 | 9600 | 9900 | 10200 | 10500 | 10800 | 11100 | 11400 | 11700 |
| **2** | 6000 | 6300 | 6600 | 6900 | 7200 | 7500 | 7800 | 8100 | 8400 | 8700 |
| **1** | 3000 | 3300 | 3600 | 3900 | 4200 | 4500 | 4800 | 5100 | 5400 | 5400 |
| **0** | 0 | 300 | 600 | 900 | 1200 | 1500 | 1800 | 2100 | 2400 | 2700 |
| **0** | 0 | -300 | -600 | -900 | -1200 | -1500 | -1800 | -2100 | -2400 | -2700 |
| **-1** | -3000 | -3300 | -3600 | -3900 | -4200 | -4500 | -4800 | -5100 | -5400 | -5700 |
| **-2** | -6000 | -6300 | -6600 | -6900 | -7200 | -7500 | -7800 | -8100 | -8400 | -8700 |
| **-3** | -9000 | -9300 | -9600 | -9900 | -10200 | -10500 | -10800 | -11100 | -11400 | -11700 |
| **-4** | -12000 | -12300 | -12600 | -12900 | -13200 | -13500 | -13800 | -14100 | -14400 | -14700 |
| **-5** | -15000 | -15300 | -15600 | -15900 | -16200 | -16500 | -16800 | -17100 | -17400 | -17700 |
| **-6** | -18000 | -18300 | -18600 | -18900 | -19200 | -19500 | -19800 | -20100 | -20400 | -20700 |
| **-7** | -21000 | -21300 | -21600 | -21900 | -22200 | -22500 | -22800 | -23100 | -23400 | -23700 |
| **-8** | -24000 | -24300 | -24600 | -24900 | -25200 | -25500 | -25800 | -26100 | -26400 | -26700 |
| **-9** | -27000 | -27300 | -27600 | -27900 | -28200 | -28500 | -28800 | -29100 | -29400 | -29700 |
| **-10** | -30000 | -30300 | -30600 | -30900 | -31200 | -31500 | — | — | — | — |

※Input/output is limited between -31500(-10.50V) and 31500（+10.50V).

Any input/output exceeding this range will be limited to 31500 (or -31,500)。

## II. Voltage Input/Output Range: 0V-10V

**Conversion Diagram:**




**Voltage Conversion Chart:**

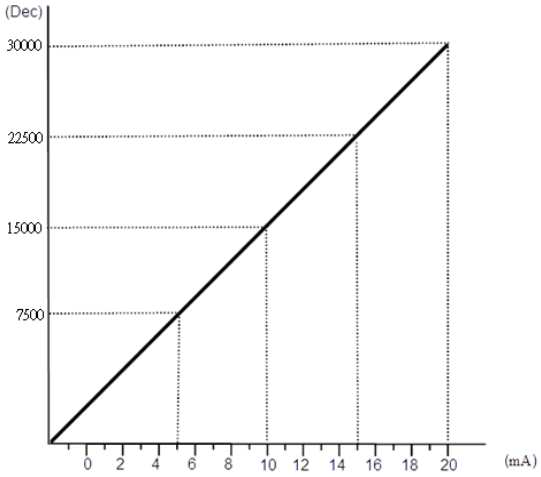
| | 0 | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 |
|---|---|---|---|---|---|---|---|---|---|---|
| **10** | 30000 | 30300 | 30600 | 30900 | 31200 | 31500 | — | — | — | — |
| **9** | 27000 | 27300 | 27600 | 27900 | 28200 | 28500 | 28800 | 29100 | 29400 | 29700 |
| **8** | 24000 | 24300 | 24600 | 24900 | 25200 | 25500 | 25800 | 26100 | 26400 | 26700 |
| **7** | 21000 | 21300 | 21600 | 21900 | 22200 | 22500 | 22800 | 23100 | 23400 | 23700 |
| **6** | 18000 | 18300 | 18600 | 18900 | 19200 | 19500 | 19800 | 20100 | 20400 | 20700 |
| **5** | 15000 | 15300 | 15600 | 15900 | 16200 | 16500 | 16800 | 17100 | 17400 | 17700 |
| **4** | 12000 | 12300 | 12600 | 12900 | 13200 | 13500 | 13800 | 14100 | 14400 | 14700 |
| **3** | 9000 | 9300 | 9600 | 9900 | 10200 | 10500 | 10800 | 11100 | 11400 | 11700 |
| **2** | 6000 | 6300 | 6600 | 6900 | 7200 | 7500 | 7800 | 8100 | 8400 | 8700 |
| **1** | 3000 | 3300 | 3600 | 3900 | 4200 | 4500 | 4800 | 5100 | 5400 | 5400 |
| **0** | 0 | 300 | 600 | 900 | 1200 | 1500 | 1800 | 2100 | 2400 | 2700 |
| **0** | 0 | -300 | -600 | -900 | -1200 | -1500 | - | - | - | - |

※Input/output is limited between -1500(-0.50V) and 31500（+10.50V).

Any input/output exceeding this range will be limited to 31500 (or -1,500).

### III. Current Input/Output Range: 0-20mA

**Conversion Diagram:**




**Current Conversion Chart:**

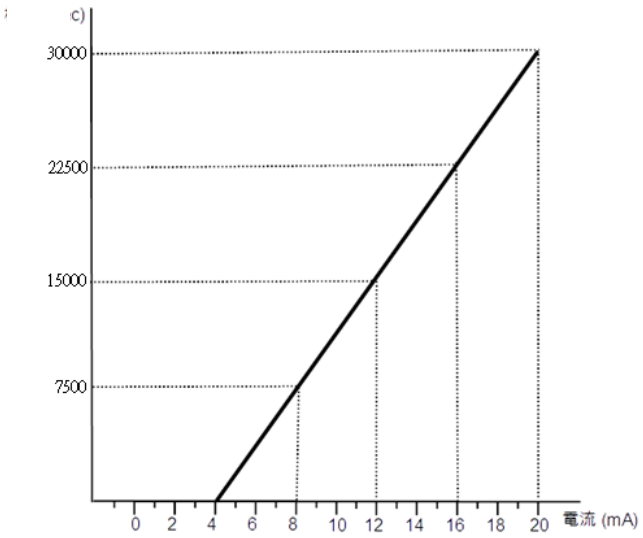
| | 0 | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 |
|---|---|---|---|---|---|---|---|---|---|---|
| **20** | 30000 | 30150 | 30300 | 30450 | 30600 | 30750 | 30900 | 31050 | 31200 | 31350 |
| **19** | 28500 | 28650 | 28800 | 28950 | 29100 | 29250 | 29400 | 29550 | 29700 | 29850 |
| **18** | 27000 | 27150 | 27300 | 27450 | 27600 | 27750 | 27900 | 28050 | 28200 | 28350 |
| **17** | 25500 | 25650 | 25800 | 25950 | 26100 | 26250 | 26400 | 26550 | 26700 | 26850 |
| **16** | 24000 | 24150 | 24300 | 24450 | 24600 | 24750 | 24900 | 25050 | 25200 | 25350 |
| **15** | 22500 | 22650 | 22800 | 22950 | 23100 | 23250 | 23400 | 23550 | 23700 | 23850 |
| **14** | 21000 | 21150 | 21300 | 21450 | 21600 | 21750 | 21900 | 22050 | 22200 | 22350 |
| **13** | 19500 | 19650 | 19800 | 19950 | 20100 | 20250 | 20400 | 20550 | 20700 | 20850 |
| **12** | 18000 | 18150 | 18300 | 18450 | 18600 | 18750 | 18900 | 19050 | 19200 | 19350 |
| **11** | 16500 | 16650 | 16800 | 16950 | 17100 | 17250 | 17400 | 17550 | 17700 | 17850 |
| **10** | 15000 | 15150 | 15300 | 15450 | 15600 | 15750 | 15900 | 16050 | 16200 | 16350 |
| **9** | 13500 | 13650 | 13800 | 13950 | 14100 | 14250 | 14400 | 14550 | 14700 | 14850 |
| **8** | 12000 | 12150 | 12300 | 12450 | 12600 | 12750 | 12900 | 13050 | 13200 | 13350 |
| **7** | 10500 | 10650 | 10800 | 10950 | 11100 | 11250 | 11400 | 11550 | 11700 | 11850 |
| **6** | 9000 | 9150 | 9300 | 9450 | 9600 | 9750 | 9900 | 10050 | 10200 | 10350 |
| **5** | 7500 | 7650 | 7800 | 7950 | 8100 | 8250 | 8400 | 8550 | 8700 | 8850 |
| **4** | 6000 | 6150 | 6300 | 6450 | 6600 | 6750 | 6900 | 7050 | 7200 | 7350 |
| **3** | 4500 | 4650 | 4800 | 4950 | 5100 | 5250 | 5400 | 5550 | 5700 | 5850 |
| **2** | 3000 | 3150 | 3300 | 3450 | 3600 | 3750 | 3900 | 4050 | 4200 | 4350 |
| **1** | 1500 | 1650 | 1800 | 1950 | 2100 | 2250 | 2400 | 2550 | 2700 | 2850 |
| **0** | 0 | 150 | 300 | 450 | 600 | 750 | 900 | 1050 | 1200 | 1350 |
| **0** | 0 | -150 | -300 | -450 | -600 | -750 | -900 | -1050 | -1200 | -1350 |

※Input/output is limited between -1500(-1.0mA) and 31500（+21.0mA).

Any input/output exceeding this range will be limited to 31500 (or -1,500).

## IV. Current Input/Output Range: 4-20mA

**Conversion Diagram:**




**Current Conversion Chart:**

| | 0 | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 |
|---|---|---|---|---|---|---|---|---|---|---|
| 20 | 30000 | 30188 | 30375 | 30563 | 30750 | 30983 | 31125 | 31313 | 31500 | |
| 19 | 28125 | 28313 | 28500 | 28688 | 28875 | 29063 | 29250 | 29438 | 29625 | 29813 |
| 18 | 26250 | 26438 | 26625 | 26813 | 27000 | 27188 | 27375 | 27563 | 27750 | 27938 |
| 17 | 24375 | 24563 | 24750 | 24938 | 25125 | 25313 | 25500 | 25688 | 25875 | 26063 |
| 16 | 22500 | 22688 | 22875 | 23063 | 23250 | 23438 | 23625 | 23813 | 24000 | 24188 |
| 15 | 20625 | 20813 | 21000 | 21188 | 21375 | 21563 | 21750 | 21938 | 22125 | 22313 |
| 14 | 18750 | 18938 | 19125 | 19313 | 19500 | 19688 | 199875 | 20063 | 20250 | 20438 |
| 13 | 16875 | 17063 | 17250 | 17438 | 17625 | 17813 | 18000 | 18188 | 18375 | 18563 |
| 12 | 15000 | 15188 | 15375 | 15563 | 15750 | 15938 | 16125 | 16313 | 16500 | 16688 |
| 11 | 13125 | 13313 | 13500 | 13688 | 13875 | 14063 | 14250 | 14438 | 14625 | 14813 |
| 10 | 11250 | 11438 | 11625 | 11813 | 12000 | 12188 | 12375 | 12563 | 12750 | 12938 |
| 9 | 9375 | 9563 | 9750 | 9938 | 10125 | 10313 | 10500 | 10688 | 10875 | 11063 |
| 8 | 7500 | 7688 | 7875 | 8063 | 8250 | 8438 | 8625 | 8813 | 9000 | 9188 |
| 7 | 5625 | 5813 | 6000 | 6188 | 6375 | 6563 | 6750 | 6938 | 7125 | 7313 |
| 6 | 3750 | 3938 | 4125 | 4313 | 4500 | 4688 | 4875 | 5063 | 5250 | 5438 |
| 5 | 1875 | 2063 | 2250 | 2438 | 2625 | 2813 | 3000 | 3188 | 3375 | 2563 |
| 4 | 0 | 188 | 375 | 563 | 750 | 983 | 1125 | 1313 | 1500 | 1688 |
| 3 | — | | -1500 | -1313 | -1125 | -983 | -750 | -563 | -375 | -188 |

※Input/output is limited between -1500(-3.2mA) and 31500（+20.8mA).

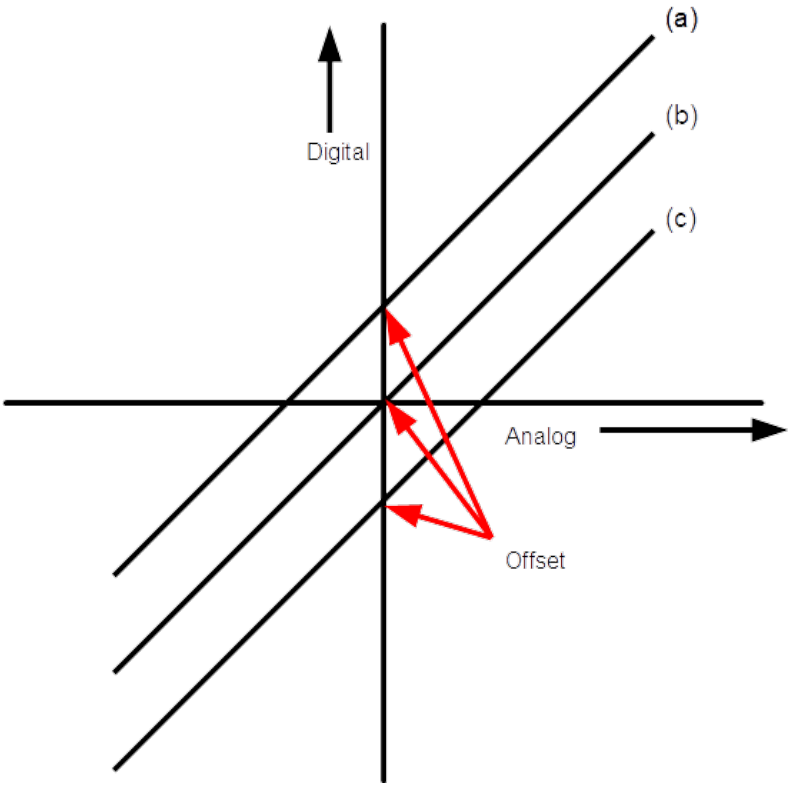
Any input/output exceeding this range will be limited to 31500 (or -1,500).

## 7.1 Function Settings

### I. OFFSET

OFFSET should be adjusted when a module outputs 0v for external devices or external devices have 0 output but external devices or an analog input module has a non-zero reading.

Example: If the module outputs 0V to external equipment but external equipment has the -50 reading (DEC), then the OFFSET should be set at 50.



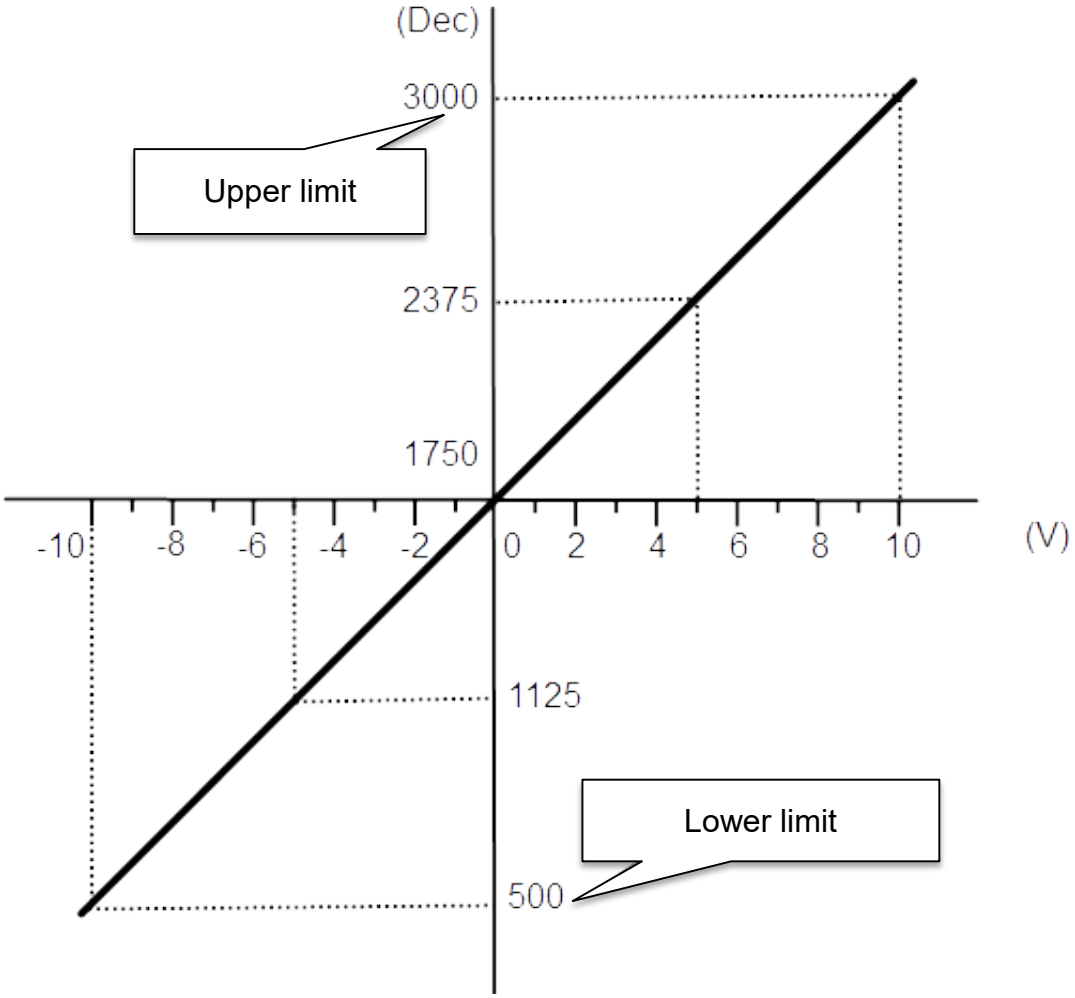

(a): Offset is set at -100 when the reading is 100

(b): 0

(c): Offset is set at 100 when the reading is -100

## II. Upper/Lower Limit Setting Demonstration

With voltage output between -10V and 10V, upper limit of 3000 (DEC) and lower limit of 500 (DEC):




| Internal Register (DEC) | Upper/Lower Limit Register (DEC) | Analog Output Voltage |
|---|---|---|
| 4000 | 3000 | 10 |
| 2000 | 2375 | 5 |
| 0 | 1750 | 0 |
| -2000 | 1125 | -5 |
| -400 | 500 | -10 |

※When using upper/lower limits, upper/lower limits must have been established for all four channels