



DAUDIN CO., LTD.

2301EN
V1.0.0



iD-GRID 

EtherNet/IP Connection Operating Manual



Table of Contents

1.	Example Remote I/O Module System Configuration List	3
1.1	Product Description	3
2.	Coupler Parameter Settings	4
2.1	Preceding Operation of Software Setup.....	4
2.2	Coupler Software Setup.....	5
3.	Beginner's Guide to Different Brands' Software.....	12
3.1	Beginner's guide to <i>iD-GRID</i>  using Codesys program	12
3.2	Beginner's guide to <i>iD-GRID</i>  using Sysmac Studio program	25
3.3	Beginner's guide to <i>iD-GRID</i>  using KV Studio	40



1. Example Remote I/O Module System Configuration List

Part No.	Specification	Remarks
GF2-C003T	EtherNet/IP Coupler	
GF2-DI01T	16-channel digital input module, Sink, 24VDC	
GF2-DQ01T	16-channel digital output module, Sink, 24VDC	
GF2-AI01T	4-channel analog input module (-10... 10VDC, 0...10VDC · 0...5VDC)	
GF2-AQ01T	4-channel analog output module (-10... 10VDC, 0...10VDC · 0...5VDC)	
GFPS-0202	Power 24V / 48W	

1.1 Product Description

- I. The coupler is used externally to connect with the EtherNet/IP's communication port.**
- II. The coupler is in charge of the management and dynamic configuration of I/O parameters and so on.**
- III. The power module is standard for remote I/Os and users can choose the model or brand of power module they prefer.**

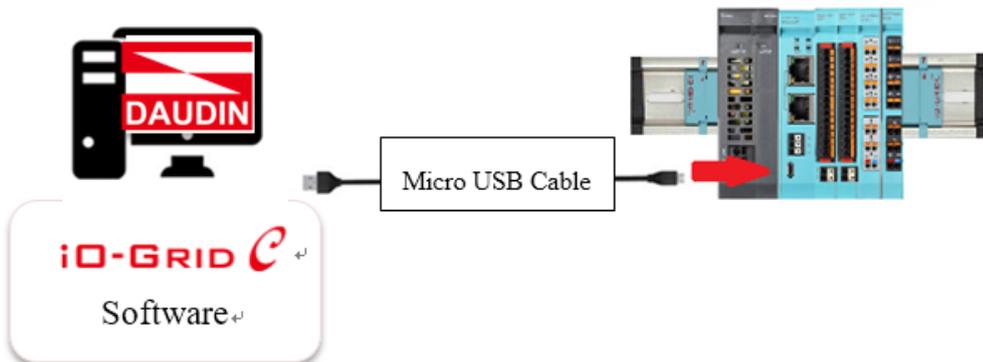
2. Coupler Parameter Settings

This chapter explains how a coupler connects to EtherNet/IP. For detailed information on **iO-GRID C**, please refer to the *i-Designer User's Manual*

2.1 Preceding Operation of Software Setup

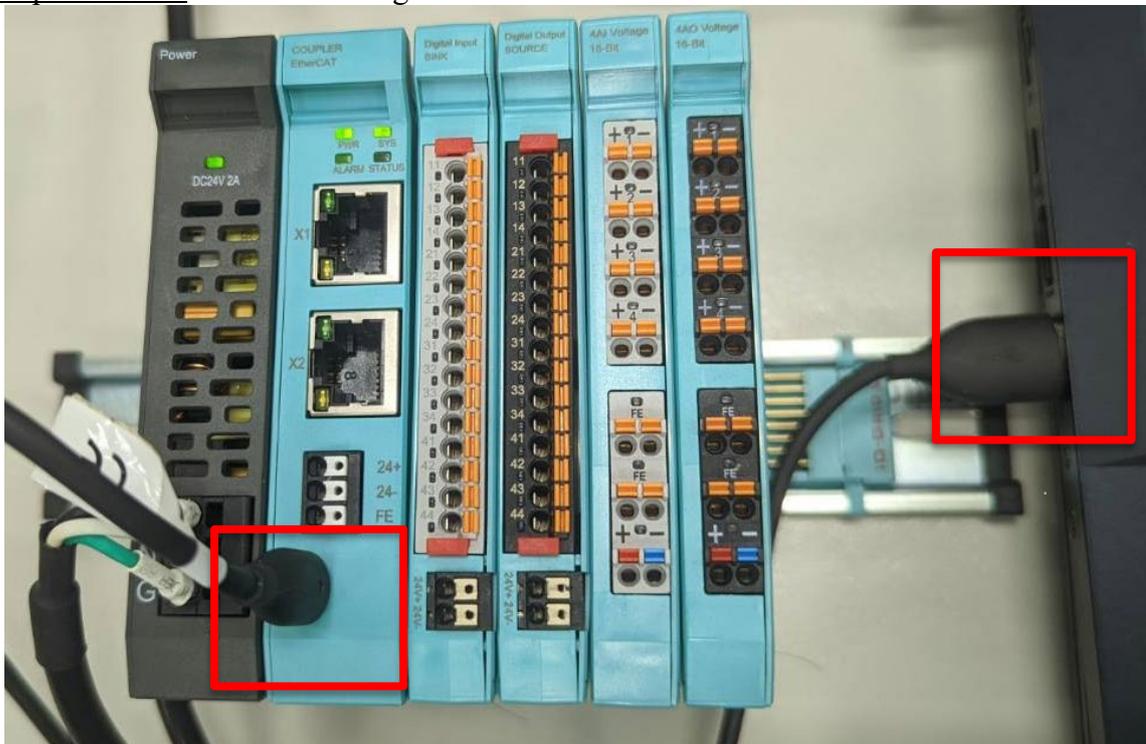
Connect with the coupler module using a Micro-USB cable
Plug your Micro-USB cable to the Micro-USB port on your coupler module.
Make sure the fieldbus is powered and then open the i-Designer setup program
Coupler Module Parameters Setup

Coupler module connection illustration:



※ Before setting up the coupler module, please confirm that the I/O modules are **lined up closely** on the fieldbus

Coupler module connection image:



2.2 Coupler Software Setup

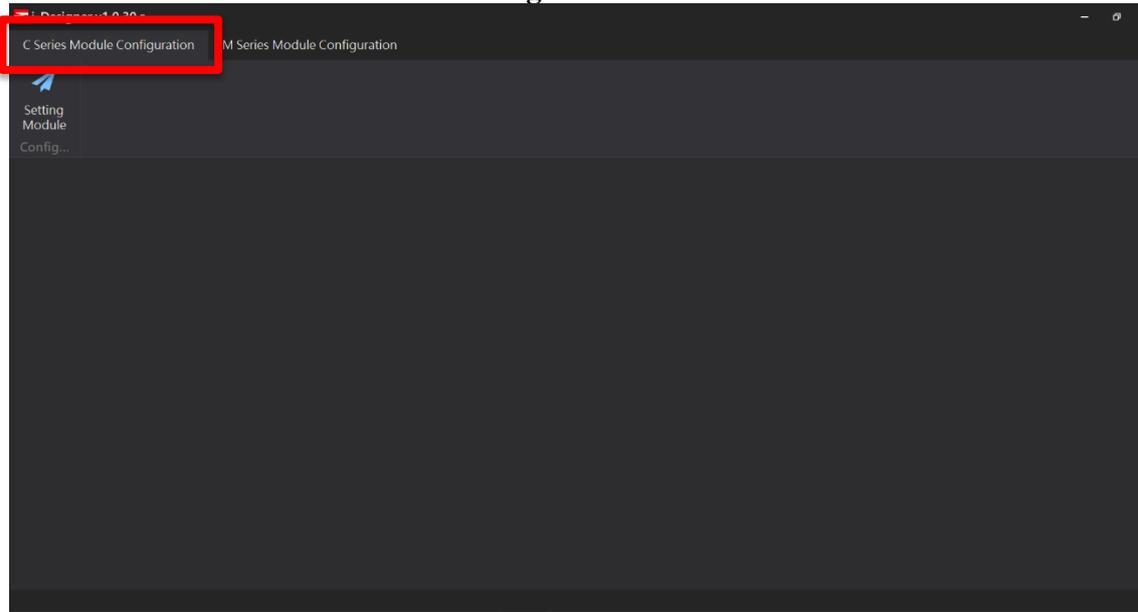
I. Make sure that the module is powered and connected to the USB port



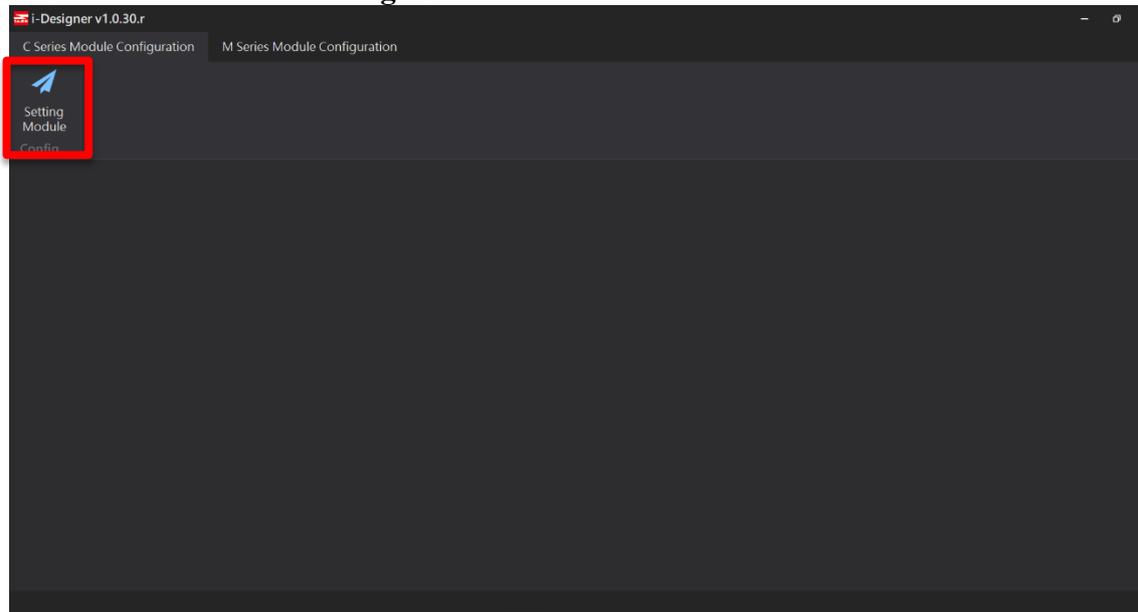
II. Click to launch the software



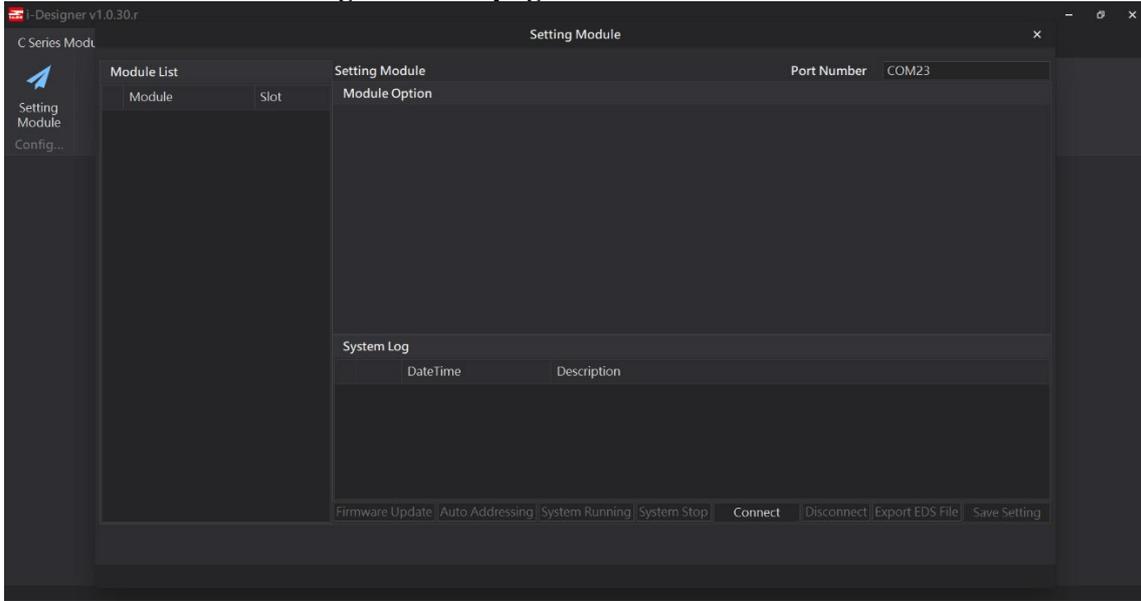
III. Select “C Series Module Configuration”



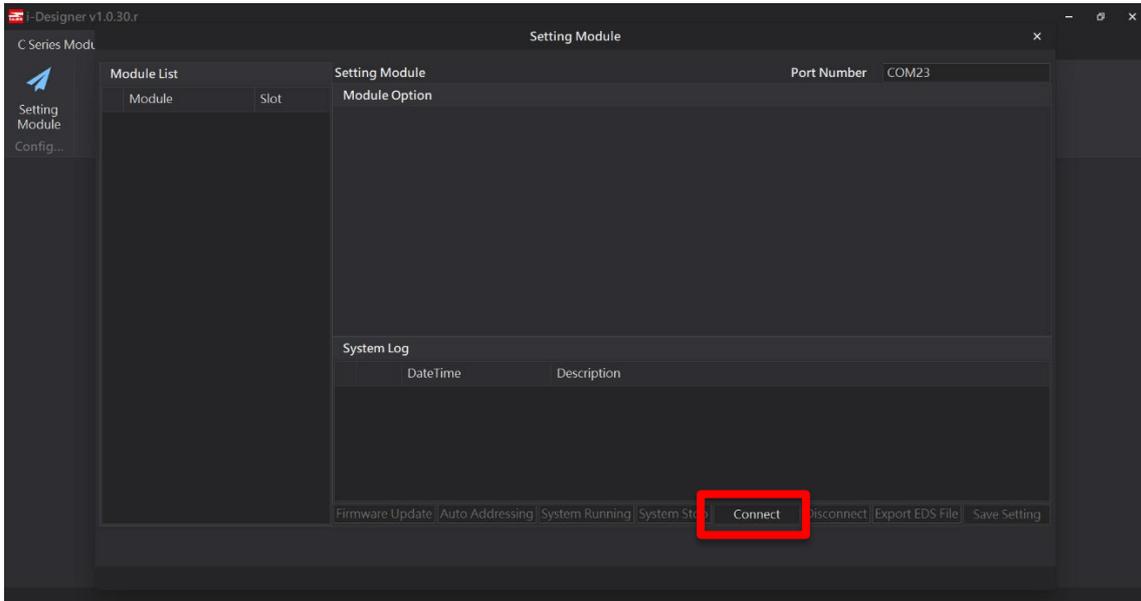
IV. Click on the “Setting Module” icon



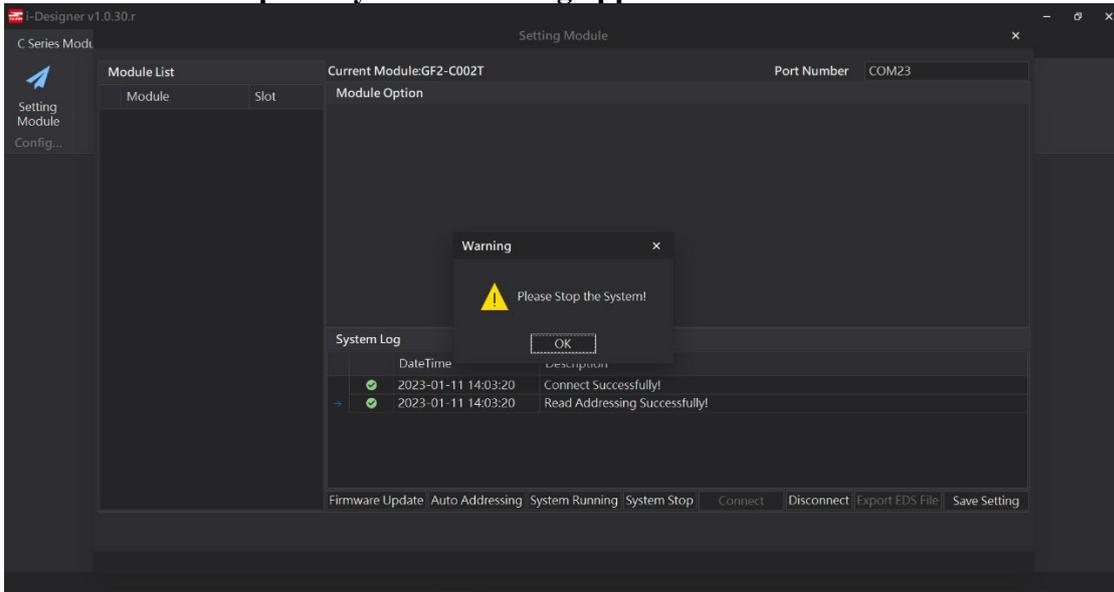
V. Enter the “Setting Module” page for C-series



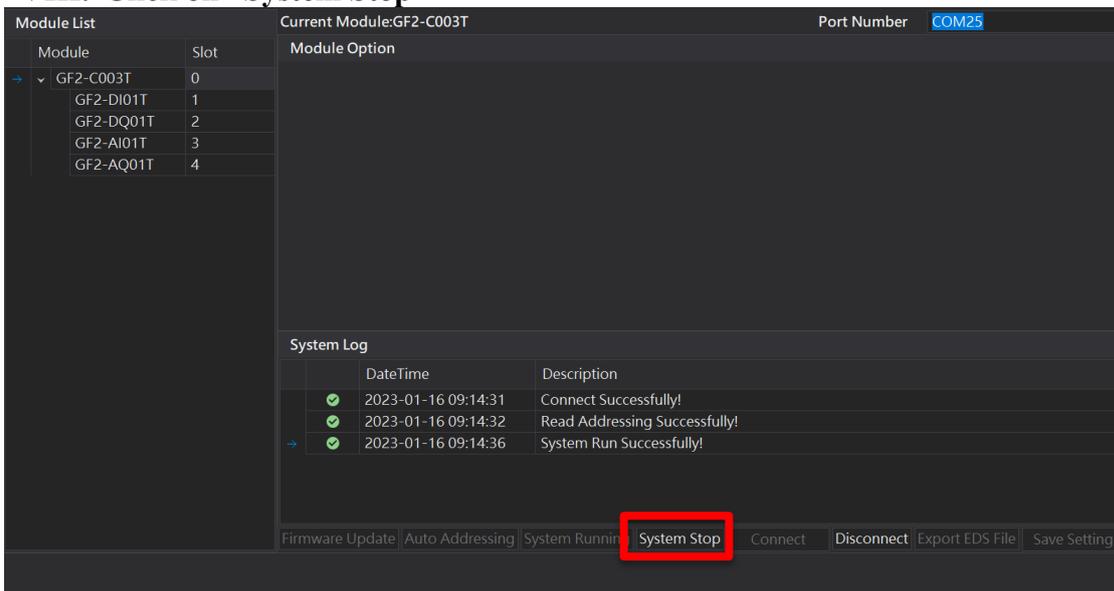
VI. Click on “Connect”



VII. “Please Stop the System” warning appears



VIII. Click on “System Stop”



IX. Select the coupler module and click on “Auto Addressing”

Module List

Module	Slot
GF2-C003T	0
GF2-DI01T	1
GF2-DQ01T	2
GF2-AI01T	3
GF2-AQ01T	4

Current Module:GF2-C003T Port Number COM25

Module Option

General Settings Internet Settings Module Information

Firmware Version 1.2.0.r

Product SN GF2-C003T222800029

System Log

	DateTime	Description
✓	2023-01-16 09:14:31	Connect Successfully!
✓	2023-01-16 09:14:32	Read Addressing Successfully!
✓	2023-01-16 09:14:36	System Run Successfully!
→	2023-01-16 09:15:37	System Stop Successfully!

Firmware Update **Auto Addressing** System Running System Stop Connect Disconnect Export EDS File Save Setting

X. Once addressing is completed, modules will appear on the “Module List” on the left

Module List

Module	Slot
GF2-C003T	0
GF2-DI01T	1
GF2-DQ01T	2
GF2-AI01T	3
GF2-AQ01T	4

Current Module:GF2-C003T Port Number COM25

Module Option

General Settings Internet Settings Module Information

Firmware Version 1.2.0.r

Product SN GF2-C003T222800029

System Log

	DateTime	Description
✓	2023-01-16 09:15:37	System Stop Successfully!
✓	2023-01-16 09:17:17	System Stop Successfully!
✓	2023-01-16 09:17:17	Connect Successfully!
✓	2023-01-16 09:17:17	Read Addressing Successfully!
✓	2023-01-16 09:17:17	System Stop Successfully!
→	2023-01-16 09:17:17	Addressing Successfully!

Firmware Update Auto Addressing System Running System Stop Connect Disconnect Export EDS File Save Setting

XI. Click on the coupler module to open the “Setting Module” page

Module List

Module	Slot
GF2-C003T	0
GF2-DI01T	1
GF2-DQ01T	2
GF2-AI01T	3
GF2-AQ01T	4

Current Module:GF2-C003T Port Number COM25

Module Option

General Settings Internet Settings Module Information

Coupler Slot 0

TimeLock 0 ms

System Log

	DateTime	Description
✓	2023-01-16 09:15:37	System Stop Successfully!
✓	2023-01-16 09:17:17	System Stop Successfully!
✓	2023-01-16 09:17:17	Connect Successfully!
✓	2023-01-16 09:17:17	Read Addressing Successfully!
✓	2023-01-16 09:17:17	System Stop Successfully!
→	2023-01-16 09:17:17	Addressing Successfully!

Firmware Update Auto Addressing System Running System Stop Connect Disconnect Export EDS File Save Setting

XII. Type in the device name and if transmission should continue once connection is interrupted (TimeLock at 0)

Module List

Module	Slot
GF2-C003T	0
GF2-DI01T	1
GF2-DQ01T	2
GF2-AI01T	3
GF2-AQ01T	4

Current Module:GF2-C003T Port Number COM25

Module Option

General Settings Internet Settings Module Information

Coupler Slot 0

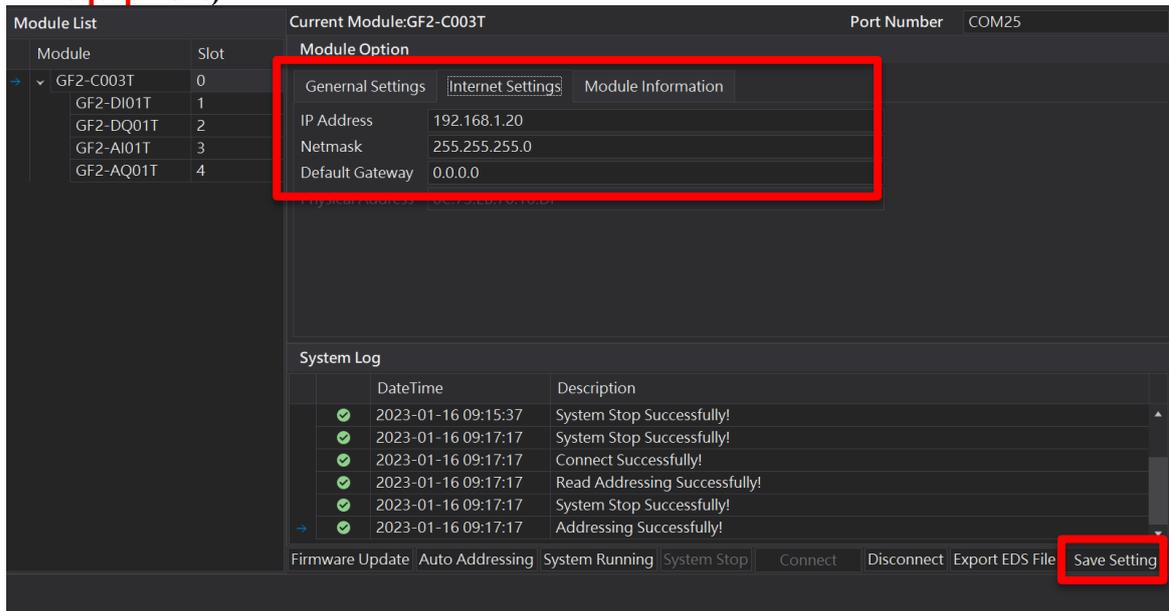
TimeLock 0 ms

System Log

	DateTime	Description
✓	2023-01-16 09:15:37	System Stop Successfully!
✓	2023-01-16 09:17:17	System Stop Successfully!
✓	2023-01-16 09:17:17	Connect Successfully!
✓	2023-01-16 09:17:17	Read Addressing Successfully!
✓	2023-01-16 09:17:17	System Stop Successfully!
→	2023-01-16 09:17:17	Addressing Successfully!

Firmware Update Auto Addressing System Running System Stop Connect Disconnect Export EDS File Save Setting

XIII. Set the equipment's IP address (must be in the same domain as the controller equipment)



The screenshot displays the configuration interface for the GF2-C003T module. The 'Module List' on the left shows the selected module and its slots. The 'Module Option' section is divided into 'General Settings', 'Internet Settings', and 'Module Information'. The 'Internet Settings' tab is active, showing the following configuration:

Parameter	Value
IP Address	192.168.1.20
Netmask	255.255.255.0
Default Gateway	0.0.0.0

The 'System Log' section at the bottom shows a series of successful operations:

DateTime	Description
2023-01-16 09:15:37	System Stop Successfully!
2023-01-16 09:17:17	System Stop Successfully!
2023-01-16 09:17:17	Connect Successfully!
2023-01-16 09:17:17	Read Addressing Successfully!
2023-01-16 09:17:17	System Stop Successfully!
2023-01-16 09:17:17	Addressing Successfully!

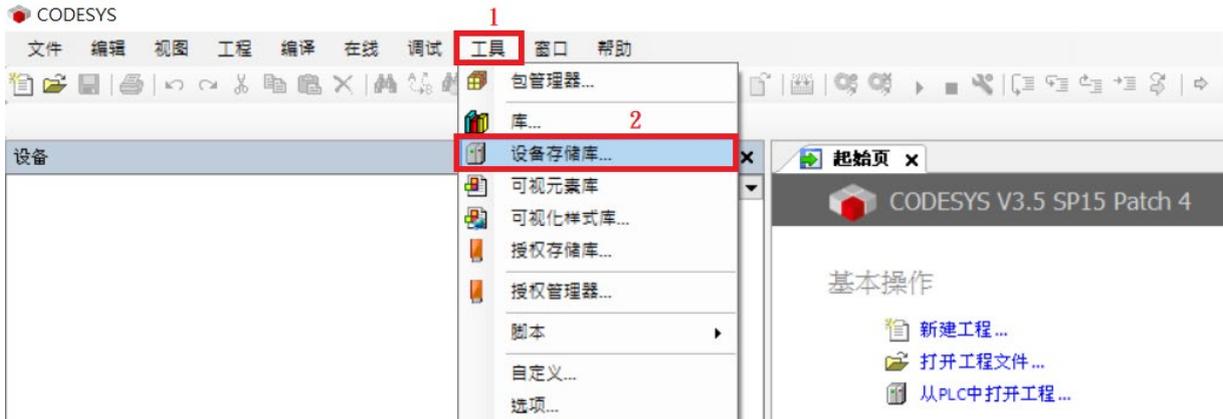
At the bottom of the interface, there are several control buttons: 'Firmware Update', 'Auto Addressing', 'System Running', 'System Stop', 'Connect', 'Disconnect', 'Export EDS File', and 'Save Setting'. The 'Save Setting' button is highlighted with a red box.

3. Beginner’s Guide to Different Brands’ Software

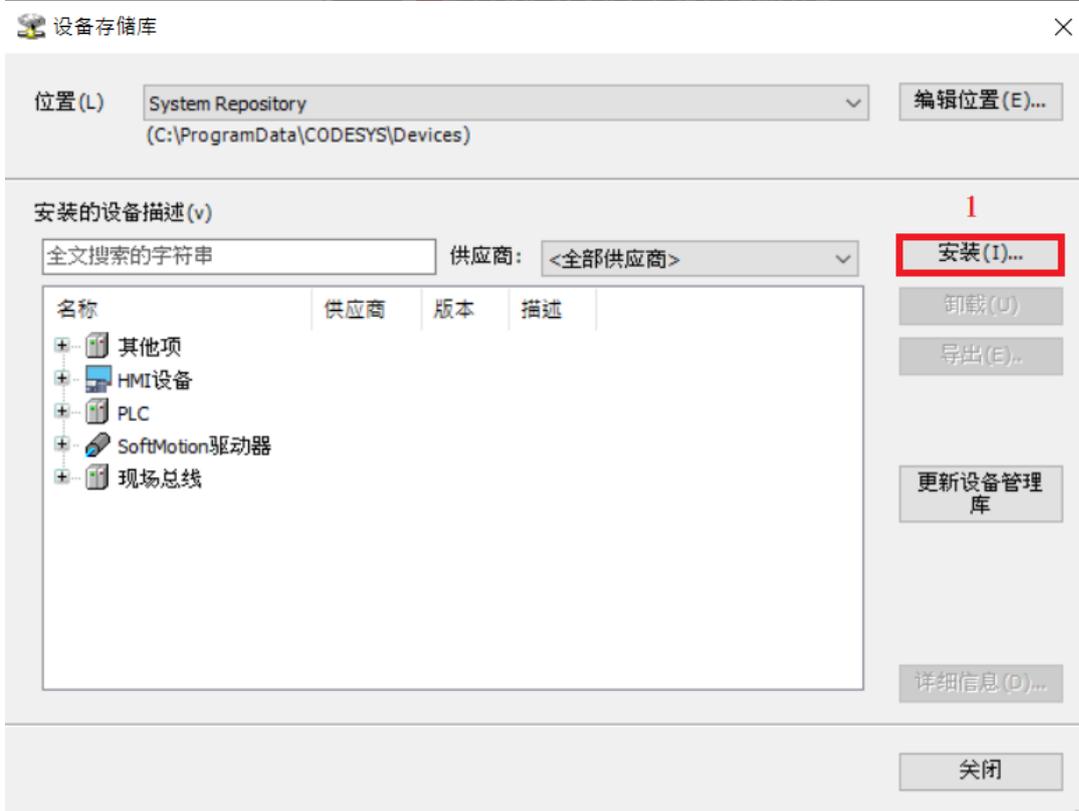
3.1 Beginner’s guide to iQ-GRID using Codesys program

I. Install eds

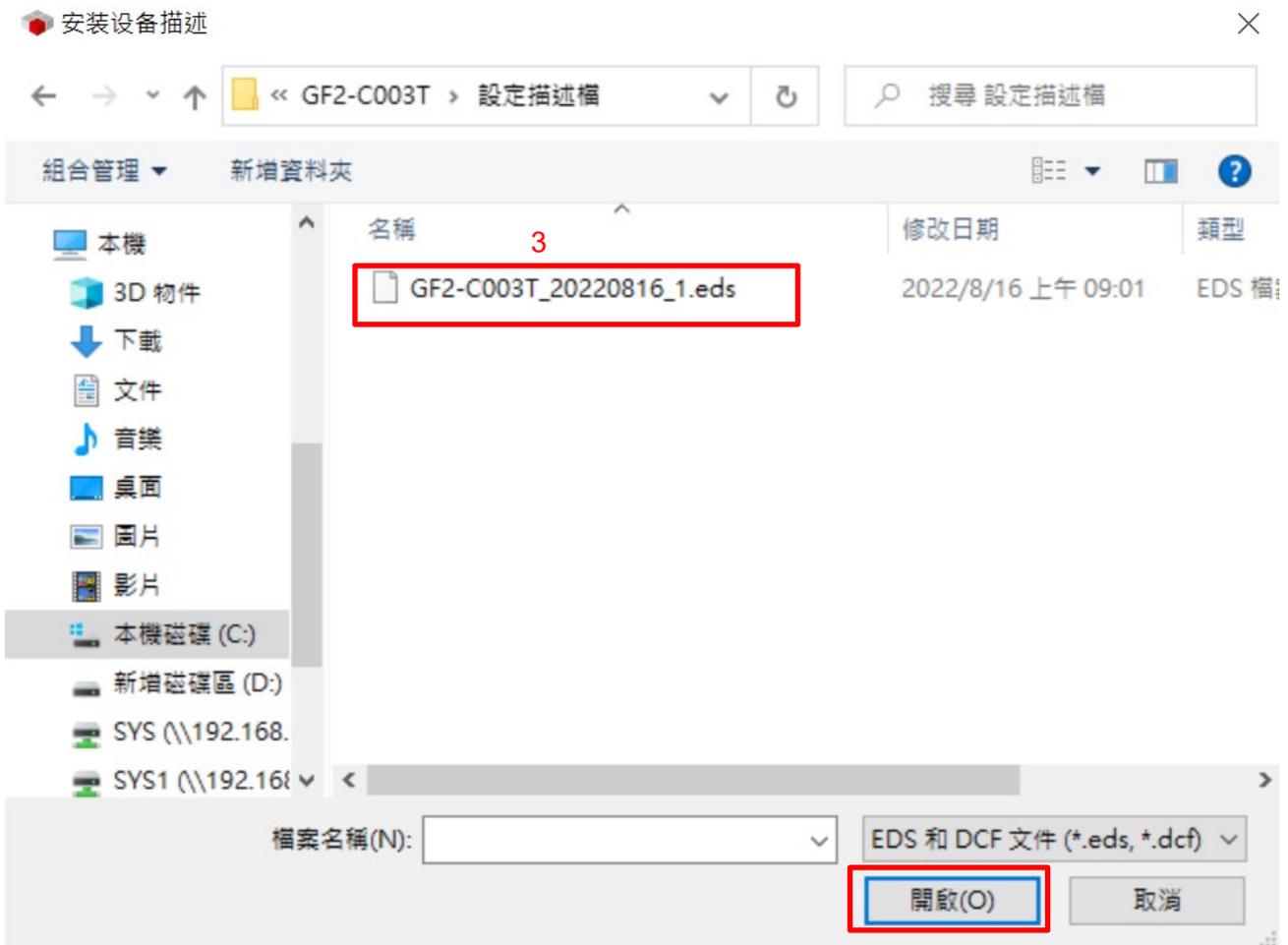
Launch Codesys and select the device library under “Tools”



Click on “Install” and choose the path for the XML file. For document type, please select “EtherCAT XML Device Configuration” and click on “Open”



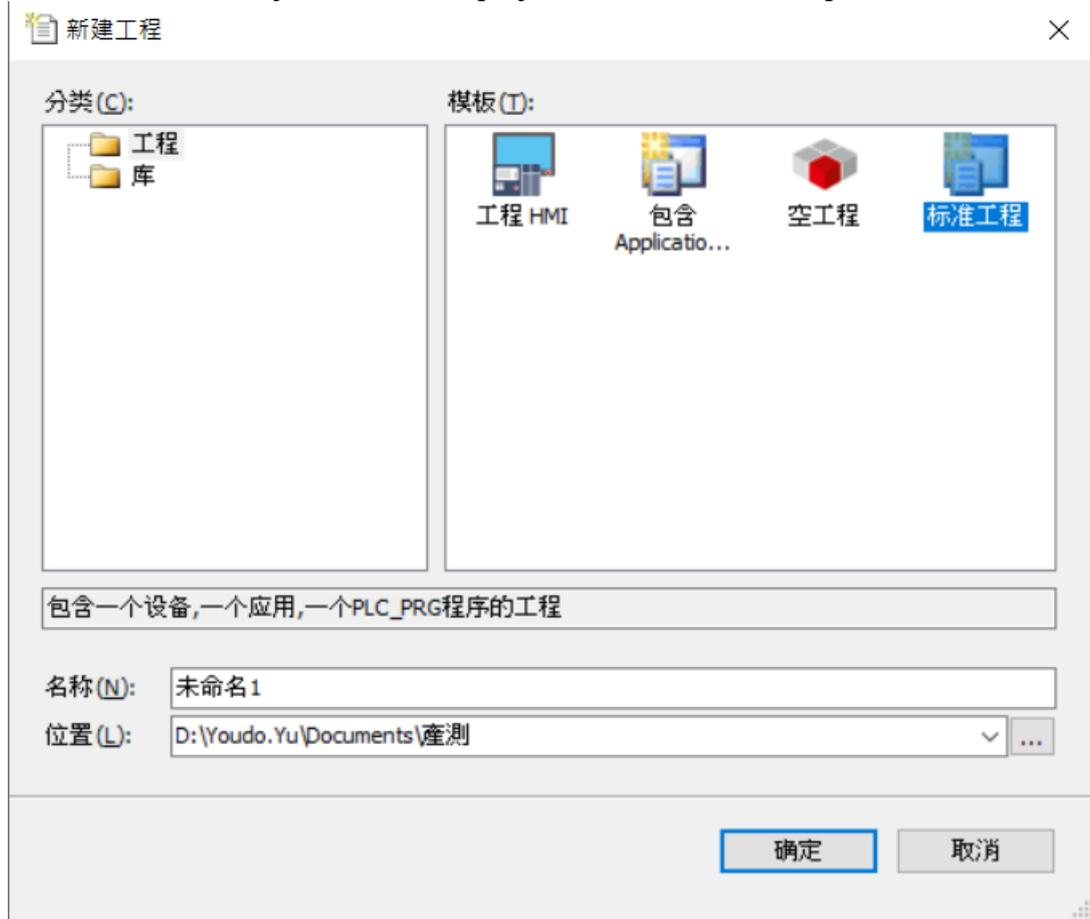
If a message appears indicating that the device has been installed successfully, this means the XML has been installed successfully



II. Create a New Project Click on “New Project”



Select “Standard Project”, name the project and choose the file path



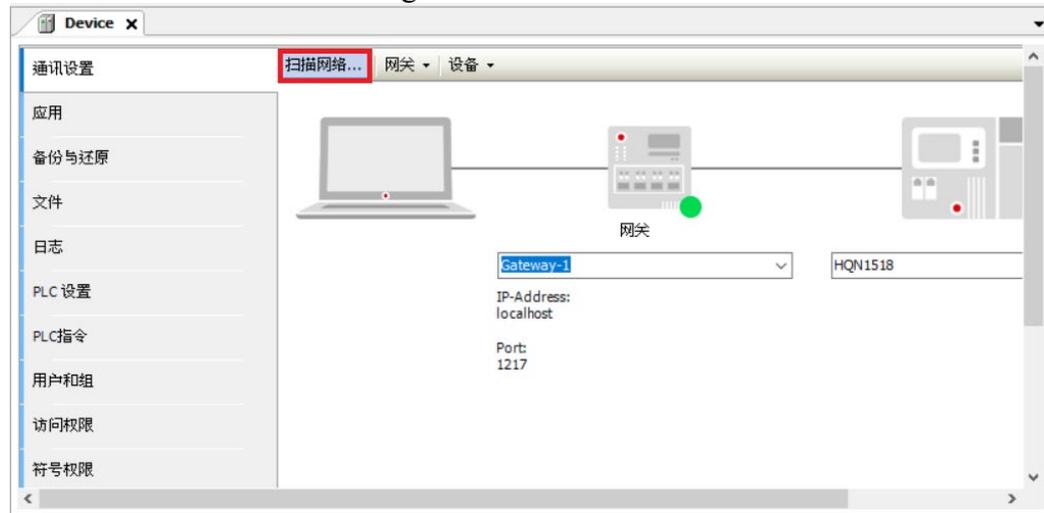
Choose the client’s device and programming language



Double-click on the device



Select “Communication Settings” and then “Scan Networks”

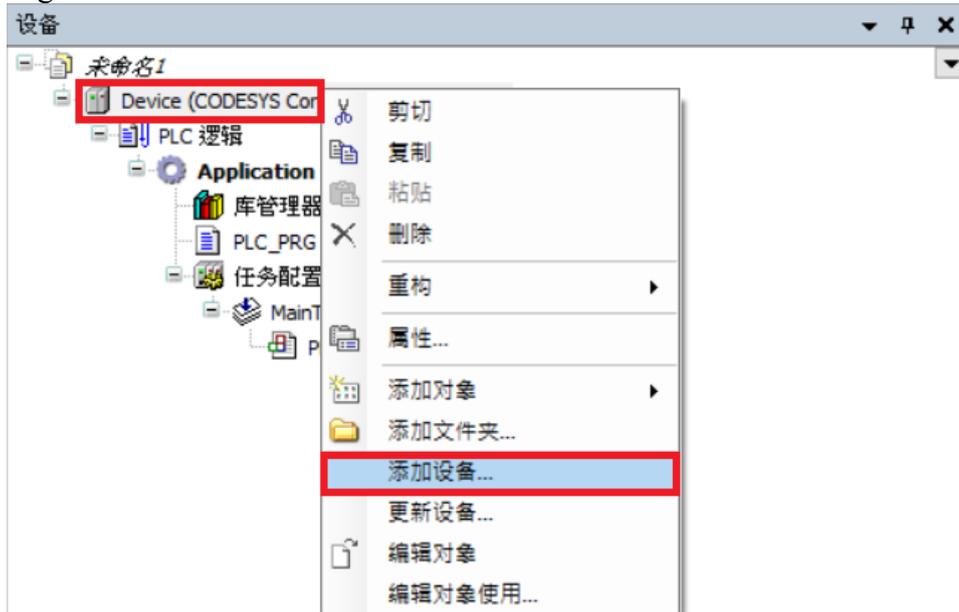


Select the device and then click on “YES”

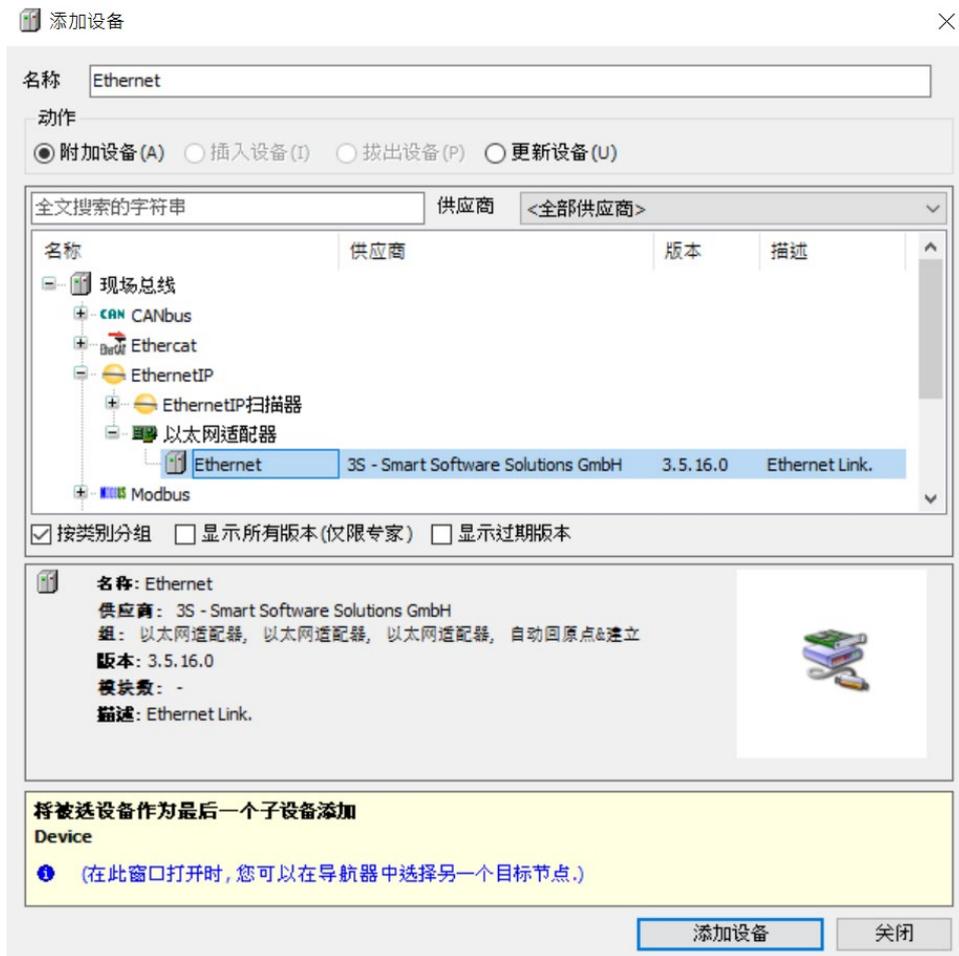


III. Add EtherNet/IP equipment

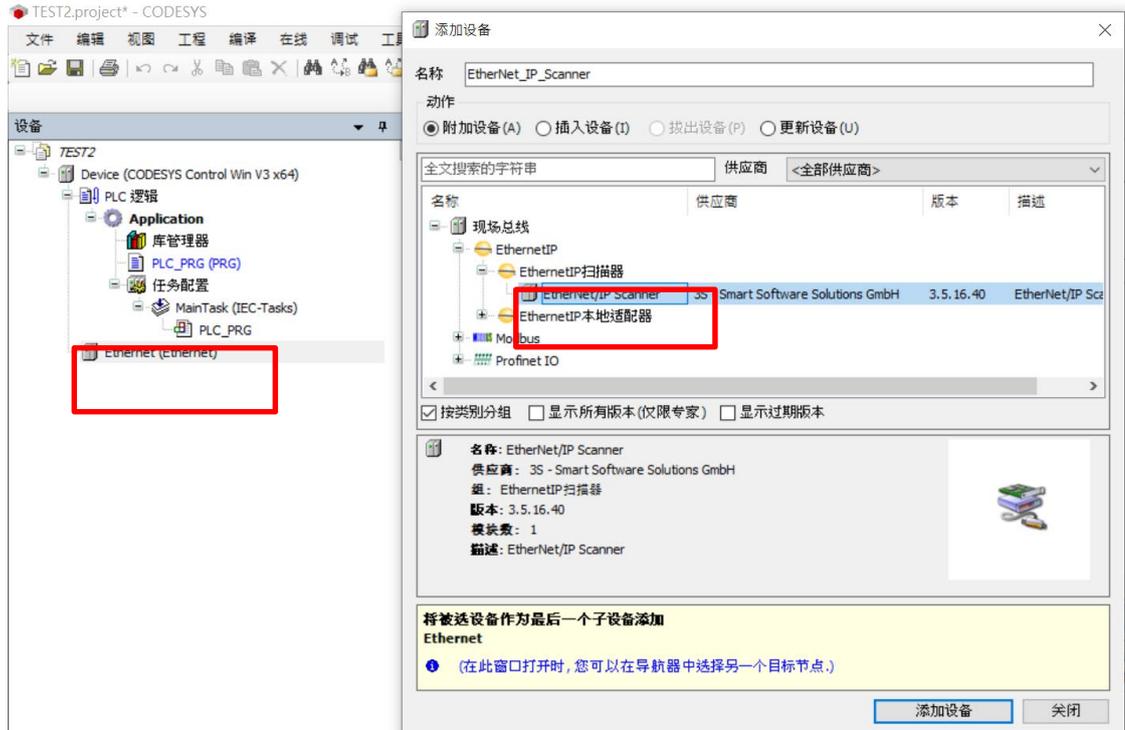
Right-click on “Device” and select “Add Device”



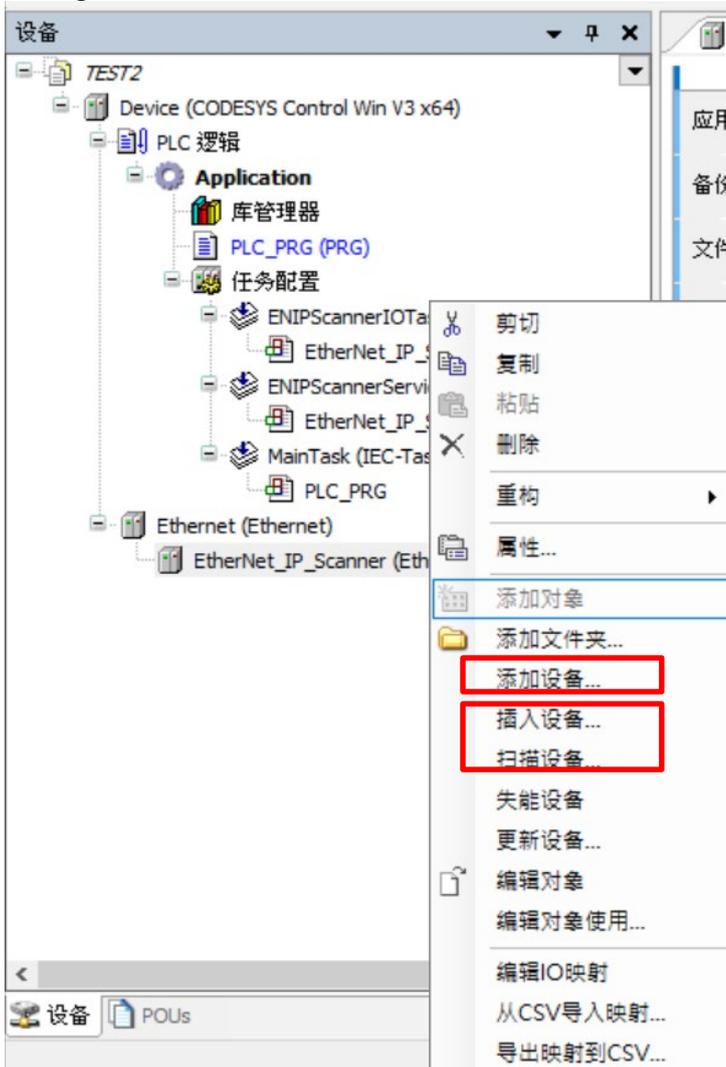
From the “Add Device” window, select “Ethernet/IP”, then “Ethernet Interface”, and then “Ethernet” before clicking on it to add ad device



Right-click on Ethernet, select “Add Device” to add EtherNet/IP Scanner

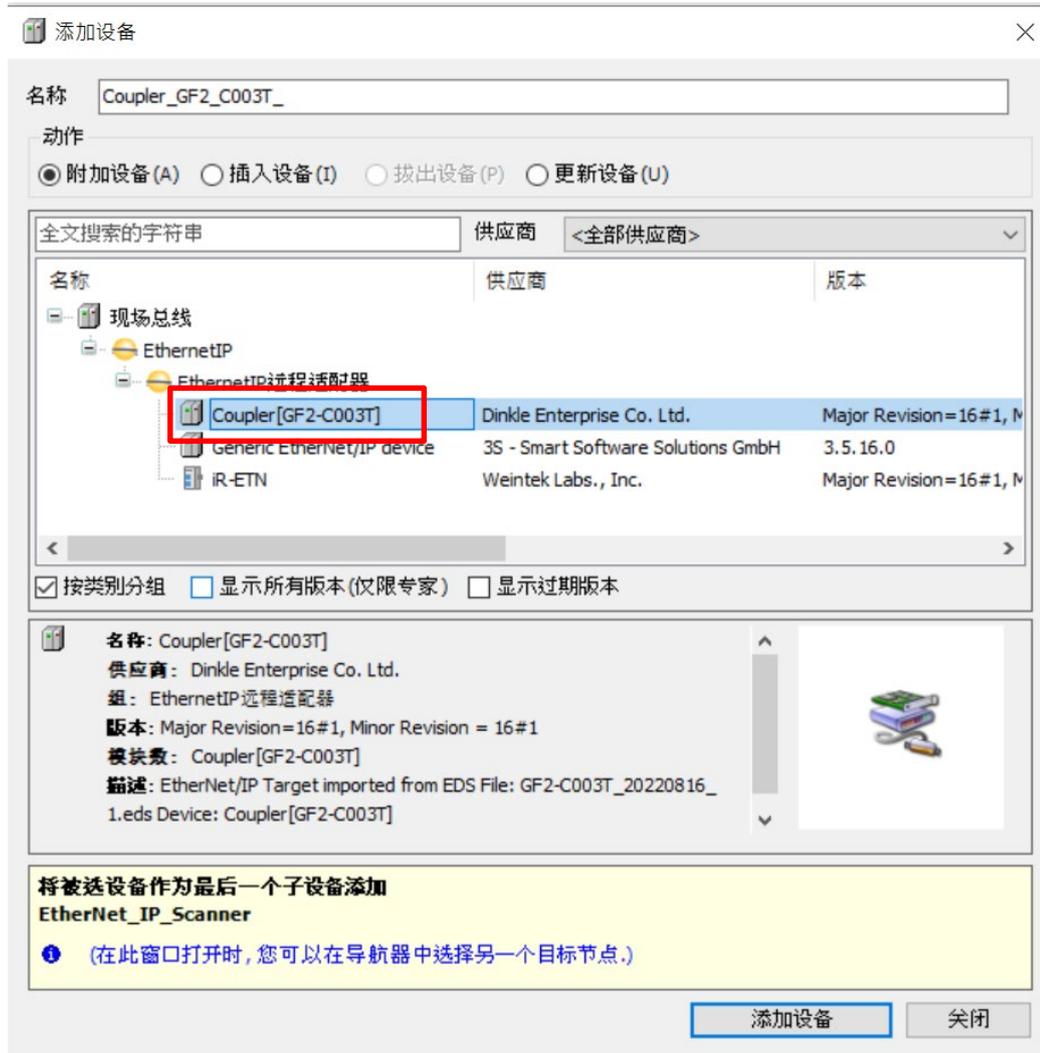


Right-click on “EtherNet_IP_Scanner”, select “Add Device” or “Scan Device” for device configuration



IV. How to Add a Module Manually

After clicking on “Add Device”, select the needed **IO-GRID** module in the window and then click on “Add Device”



添加设备

名称: Coupler_GF2_C003T_

动作: 附加设备(A) 插入设备(I) 拔出设备(P) 更新设备(U)

全文搜索的字符串: 供应商: <全部供应商>

名称	供应商	版本
现场总线		
EthernetIP		
EthernetIP远程适配器		
Coupler[GF2-C003T]	Dinkle Enterprise Co. Ltd.	Major Revision=16#1, M
Generic Ethernet/IP device	3S - Smart Software Solutions GmbH	3.5.16.0
iR-ETN	Weintek Labs., Inc.	Major Revision=16#1, M

按类别分组 显示所有版本(仅限专家) 显示过期版本

名称: Coupler[GF2-C003T]
 供应商: Dinkle Enterprise Co. Ltd.
 组: EthernetIP远程适配器
 版本: Major Revision=16#1, Minor Revision = 16#1
 模块数: Coupler[GF2-C003T]
 描述: EtherNet/IP Target imported from EDS File: GF2-C003T_20220816_1.ed5 Device: Coupler[GF2-C003T]

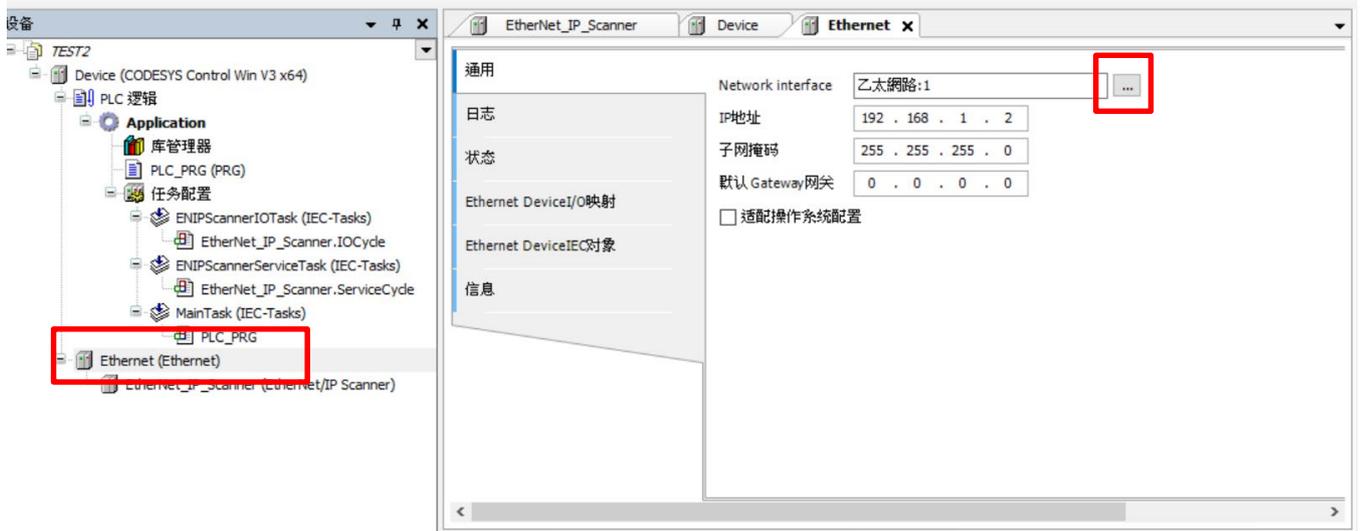
将被选设备作为最后一个子设备添加
EtherNet_IP_Scanner

i (在此窗口打开时,您可以在导航器中选择另一个目标节点.)

添加设备 关闭

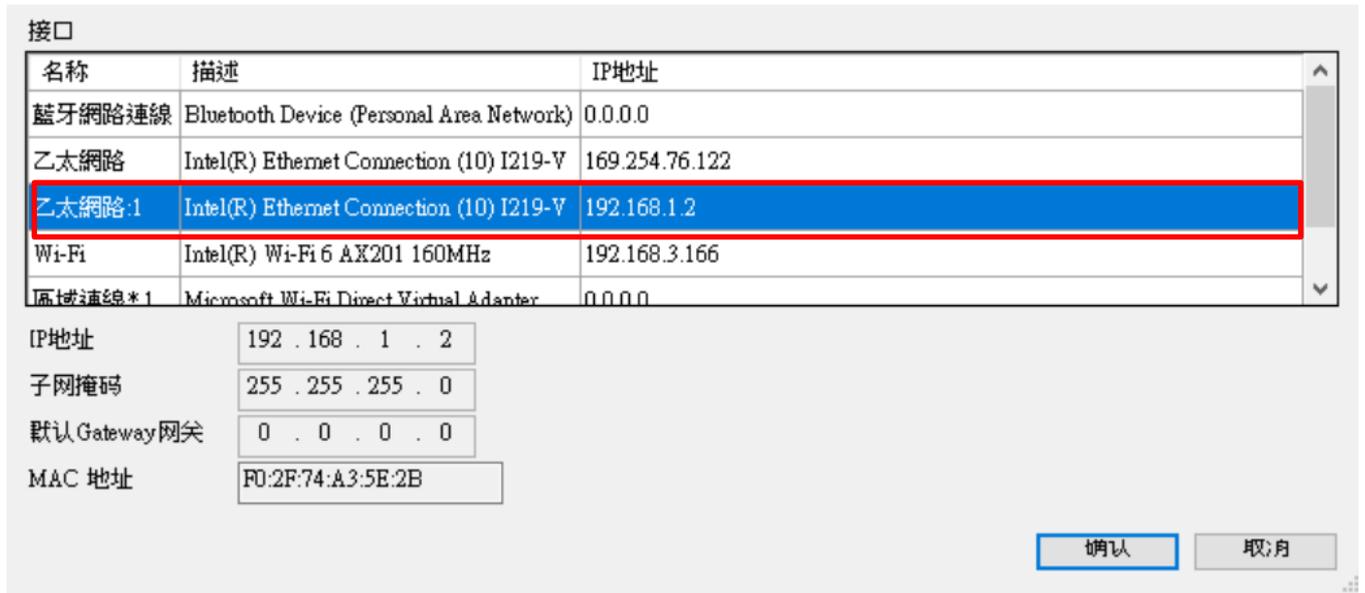
V. How to Scan and Add a Module

Double-click on Ethernet and click on “Browse” on the right

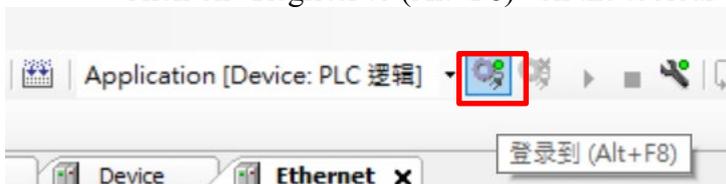


Select the network interface card to connect

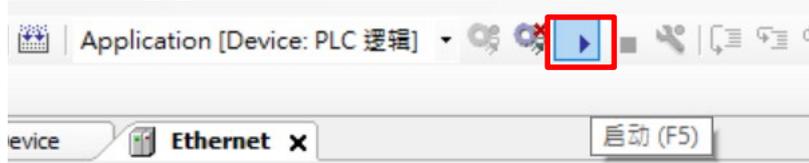
网络适配器



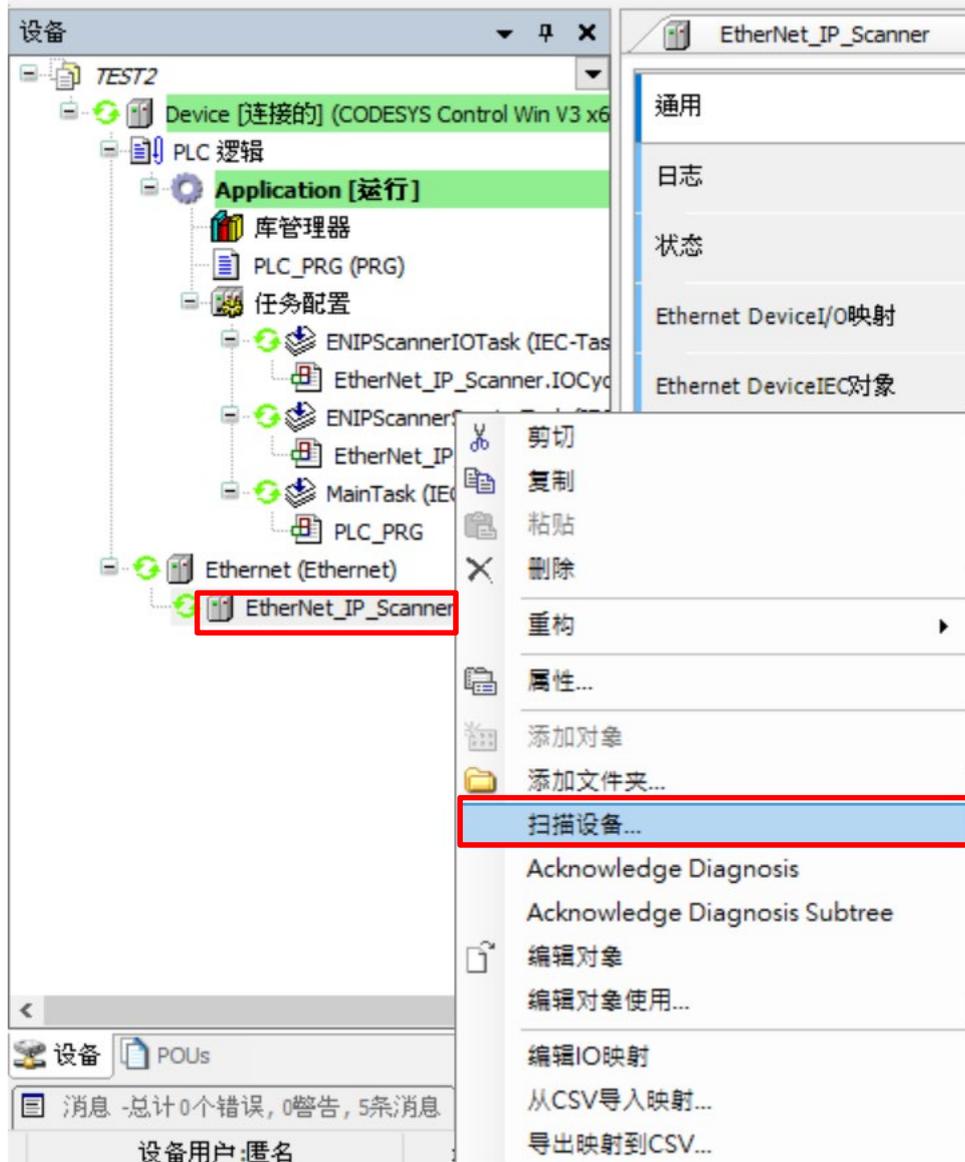
Click on “Register to (Alt+F8)” on the toolbar above



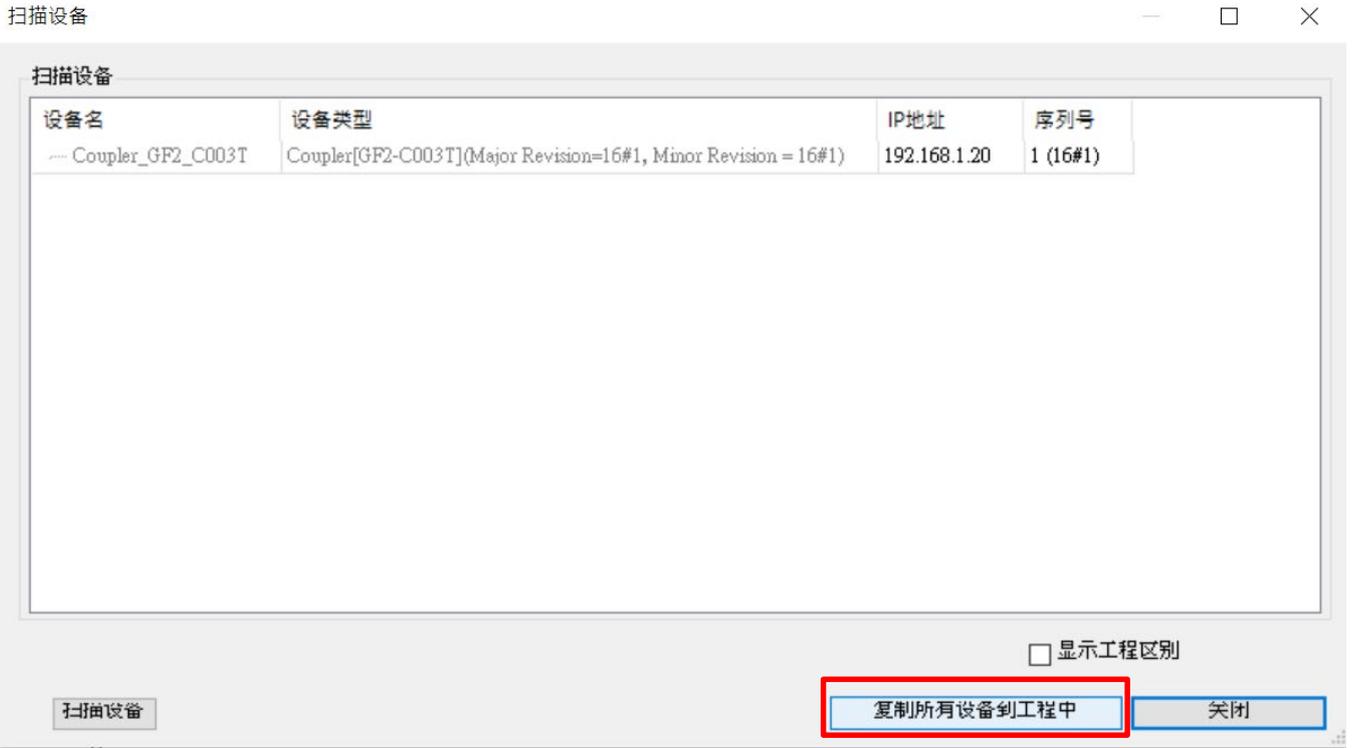
Activate equipment



Right-click on “EtherNet_IP_Scanner” and then click on “Scan Device”

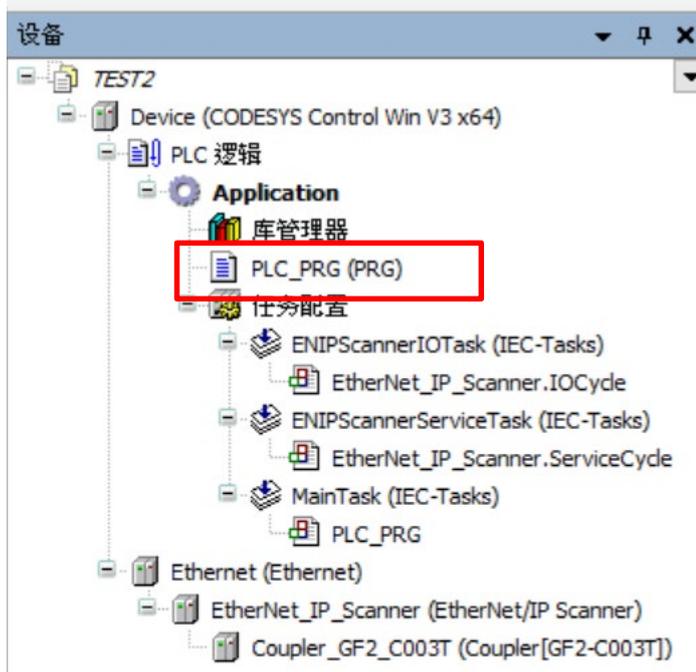


Confirm all the scanned devices and then click on “Copy All Devices to Project”



V. Simple I/O Mapping

Click on “PLC_PRG” to open the program editing page



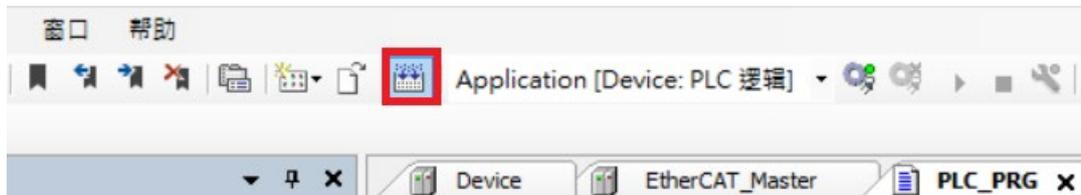
Create variables and simple codes

```

1  PROGRAM PLC_PRG
2  VAR
3      Input1 : BOOL;
4      Output1 : BOOL;
5  END_VAR

1  Output1 := Input1;
    
```

Click on “編譯程序” on the toolbar above



Double-click on the corresponding I/O module on the left and select “EtherCAT I/O Mapping” page

变量	映射	通道	地址	类型
Exclusive Owner				
Input Assembly_Param0		Input Assembly_Param0	%IB0	BYTE
Input Assembly_Param1		Input Assembly_Param1	%IB1	BYTE
Input Assembly_Param2		Input Assembly_Param2	%IB2	BYTE
Input Assembly_Param3		Input Assembly_Param3	%IB3	BYTE
Input Assembly_Param4		Input Assembly_Param4	%IB4	BYTE
Input Assembly_Param5		Input Assembly_Param5	%IB5	BYTE
Input Assembly_Param6		Input Assembly_Param6	%IB6	BYTE
Input Assembly_Param7		Input Assembly_Param7	%IB7	BYTE
Input Assembly_Param8		Input Assembly_Param8	%IB8	BYTE
Input Assembly_Param9		Input Assembly_Param9	%IB9	BYTE
Input Assembly_Param10		Input Assembly_Param10	%IB10	BYTE

Click on the channel you want to map...

变量	映射	通道	地址	类型
Exclusive Owner				
		Input Assembly_Param0	%IB0	BYTE
	...	Bit0	%IX0.0	BOOL
		Bit1	%IX0.1	BOOL
		Bit2	%IX0.2	BOOL
		Bit3	%IX0.3	BOOL
		Bit4	%IX0.4	BOOL
		Bit5	%IX0.5	BOOL
		Bit6	%IX0.6	BOOL
		Bit7	%IX0.7	BOOL
		Input Assembly_Param1	%IB 1	BYTE
		Input Assembly_Param2	%IB2	BYTE

Select corresponding variables

输入助手 ×

文本搜索 类别

变量	名称	类型	地址	初始
	Application	应用		
	PLC_PRG	PROGRAM		
	Input1	BOOL		
	Output1	BOOL		
	Io Config_Globals	VAR_GLOBAL		
	IoDrvEthercatLib	库		IODrvEtherCAT, 3.5...

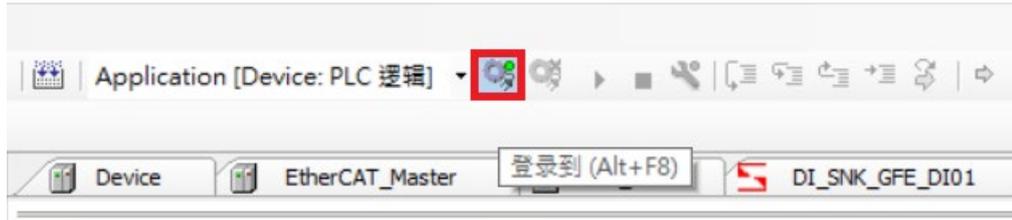
结构视图(s) 过滤器(F) 无

插入变量(w) 以命名空间前缀插入(n)

文档(D)

```
Input1: BOOL;
(VAR)
```

Once mapping is complete, click on the toolbar above to register the PLC

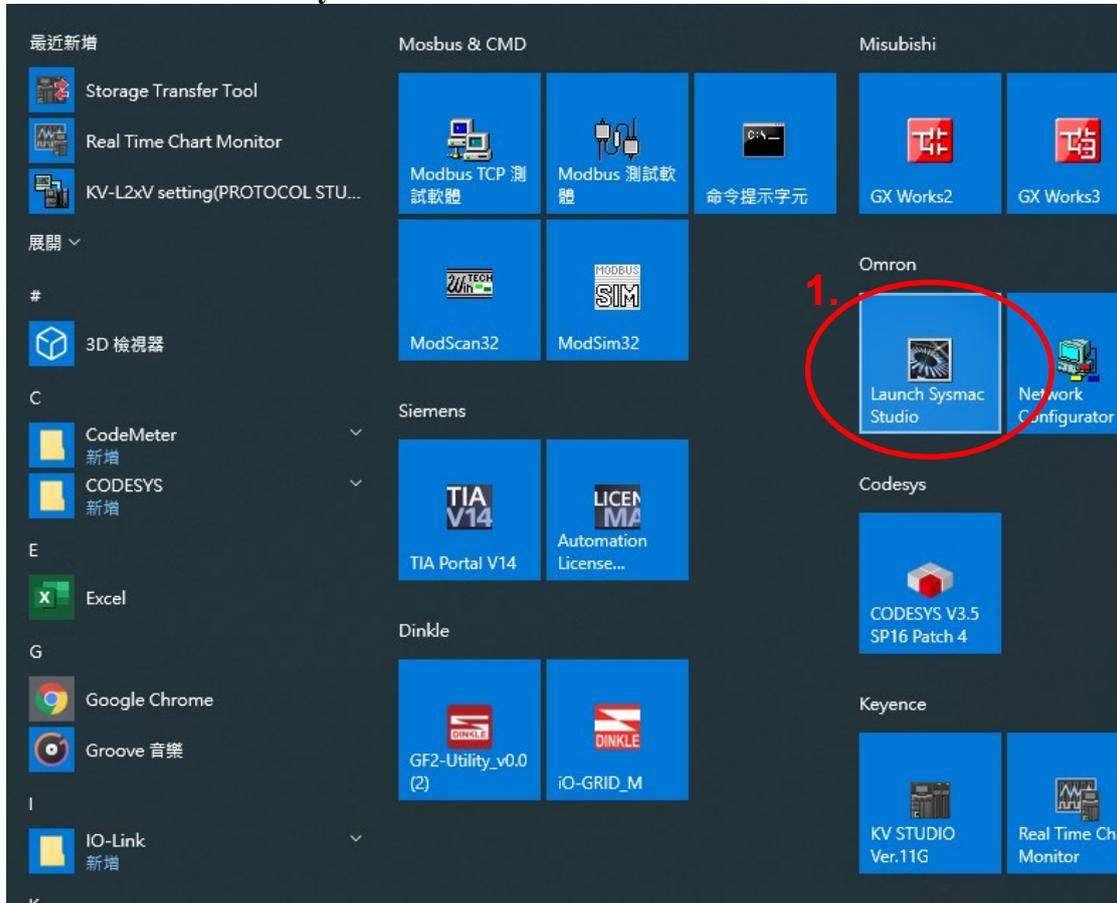


Now you can view all the I/O mappings when online

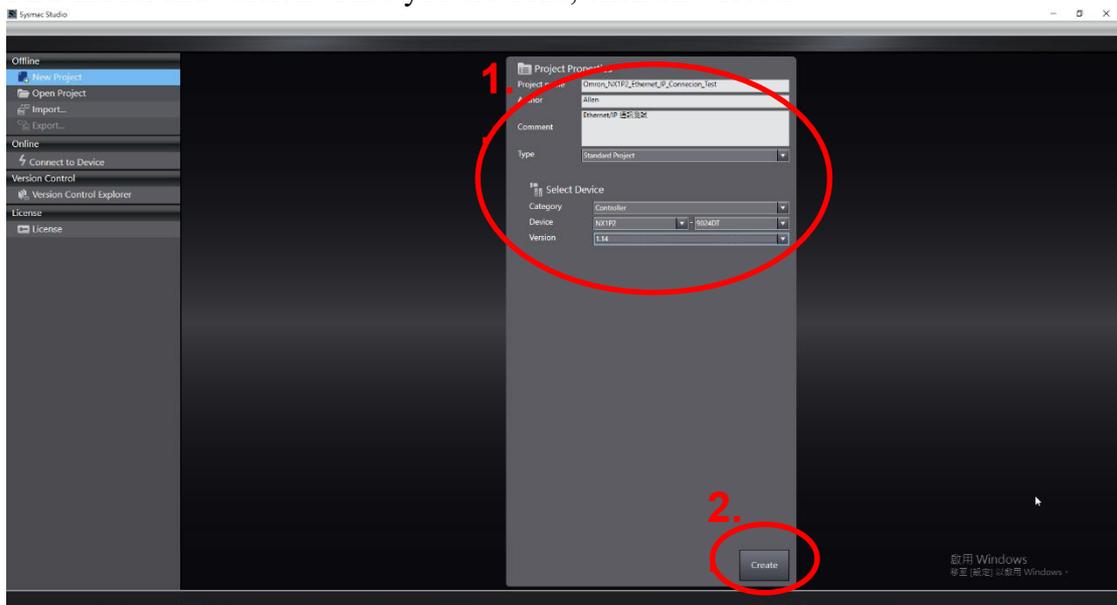
3.2 Beginner's guide to iO-GRID C using Sysmac Studio program

I. Launch Sysmac Studio and set up the Ethernet/IP ports:

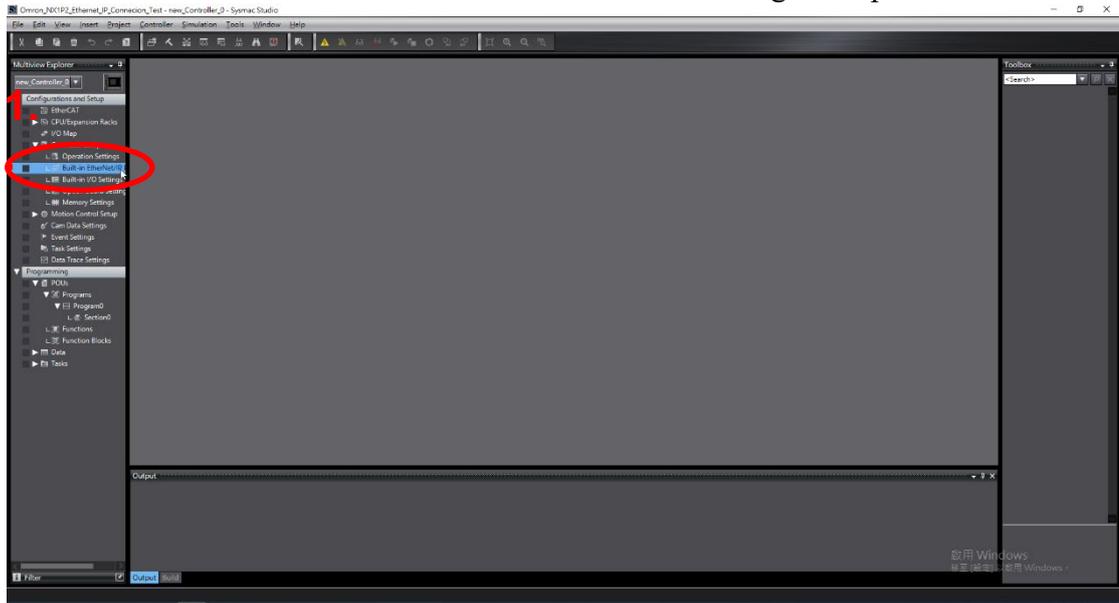
Left-click to launch Sysmac Studio:



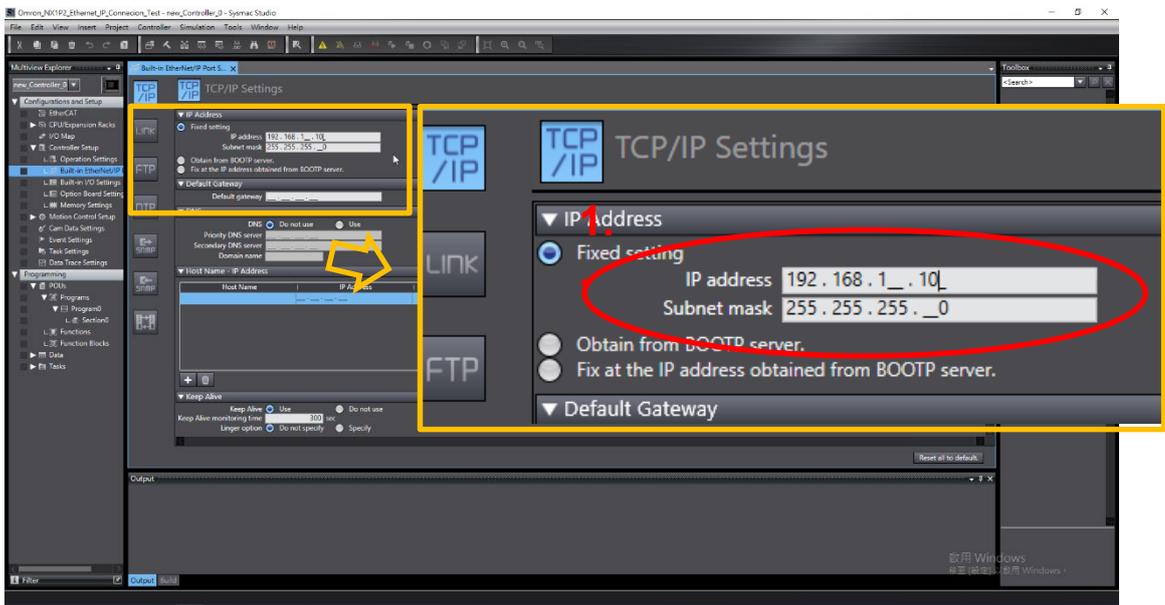
Left-click on “New Project” to create a new project and enter the project name, information, PLC model and version. Once you are done, click on “Create”:



Select and double-click on “Built-in Ethernet/IP Port Settings” to open the editor:



Enter PLC’s IP address in the “IP Address” field and enter Class C (255.255.255.0) in the “Mask” field:

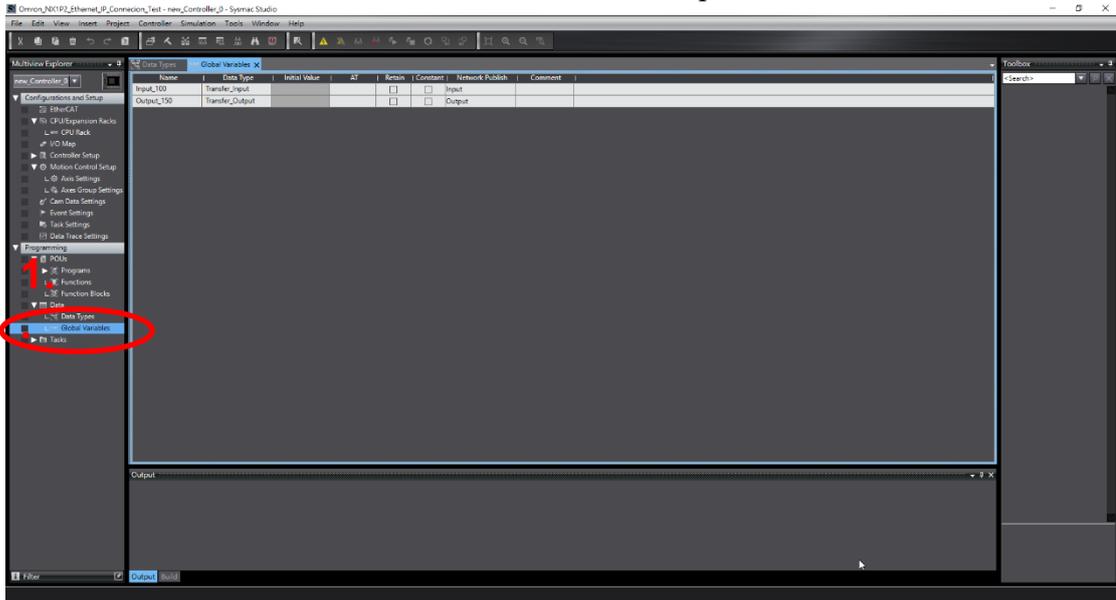


Create two data types: Transfer_Input and Transfer_Output in the fields:

Name	Base Type	Name	Base Type
Transfer_Input	Union	Transfer_Output	Union
Data_To_Byte	ARRAY[0...259] of Byte	Data_To_Byte	ARRAY[0...252] of Byte
Data_To_Word	ARRAY[0...129] of Word	Data_To_Word	ARRAY[0...125] of Word
Data_To_Bit	ARRAY[0...2079] of BOOL	Data_To_Bit	ARRAY[0...2015] of BOOL

▼ Transfer_Input	UNION
Data_To_Byte	ARRAY[0..259] OF Byte
Data_To_Word	ARRAY[0..129] OF Word
Data_To_Bit	ARRAY[0..2079] OF BOOL
▼ Transfer_Output	UNION
Data_To_Byte	ARRAY[0..251] OF Byte
Data_To_Word	ARRAY[0..125] OF Word
Data_To_Bit	ARRAY[0..2015] OF BOOL

Select and double-click on “Global Variables” to open the editor:

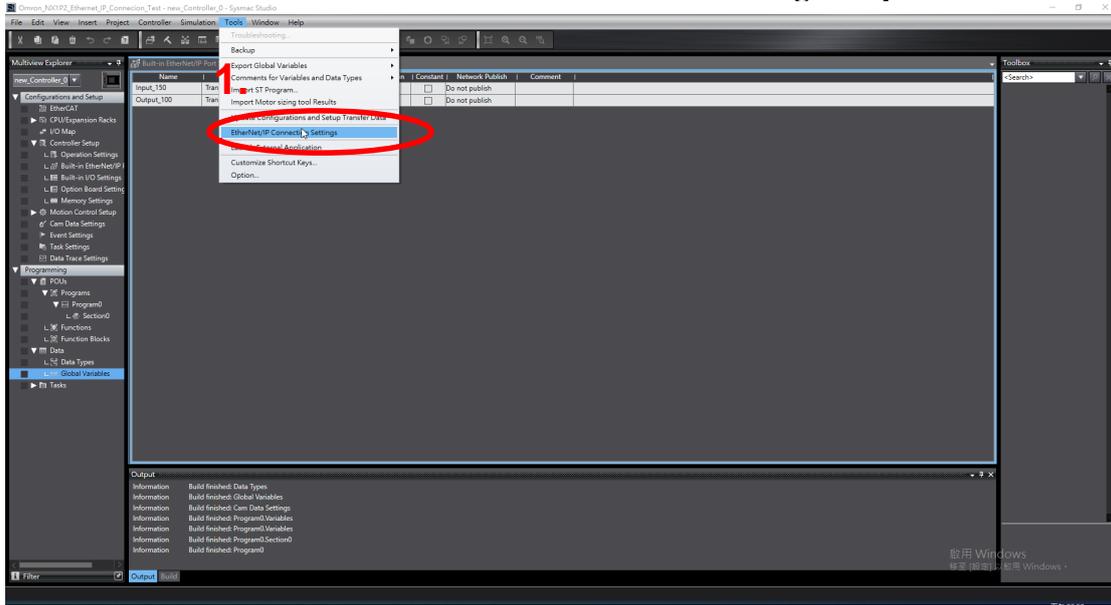


Create two global variables in the fields:

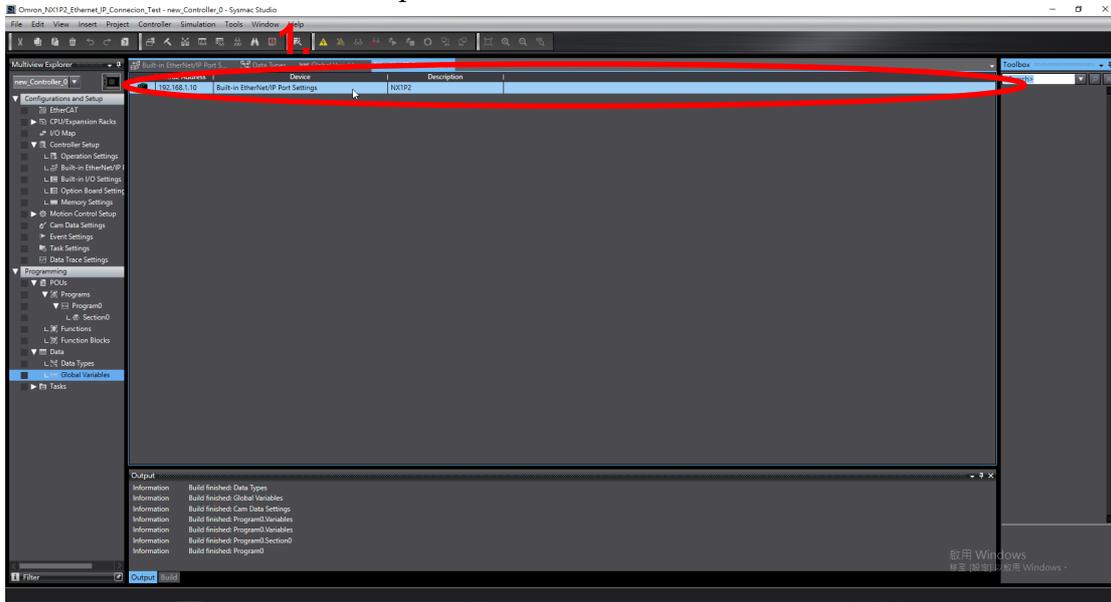
Name	Data Type	Network Publish
Input_100	Transfer_Input	Input
Output_150	Transfer_Output	Output

Name	Data Type	Initial Value	AT	Retain	Constant	Network Publish	Comment
Input_100	Transfer_Input			<input type="checkbox"/>	<input type="checkbox"/>	Input	
Output_150	Transfer_Output			<input type="checkbox"/>	<input type="checkbox"/>	Output	

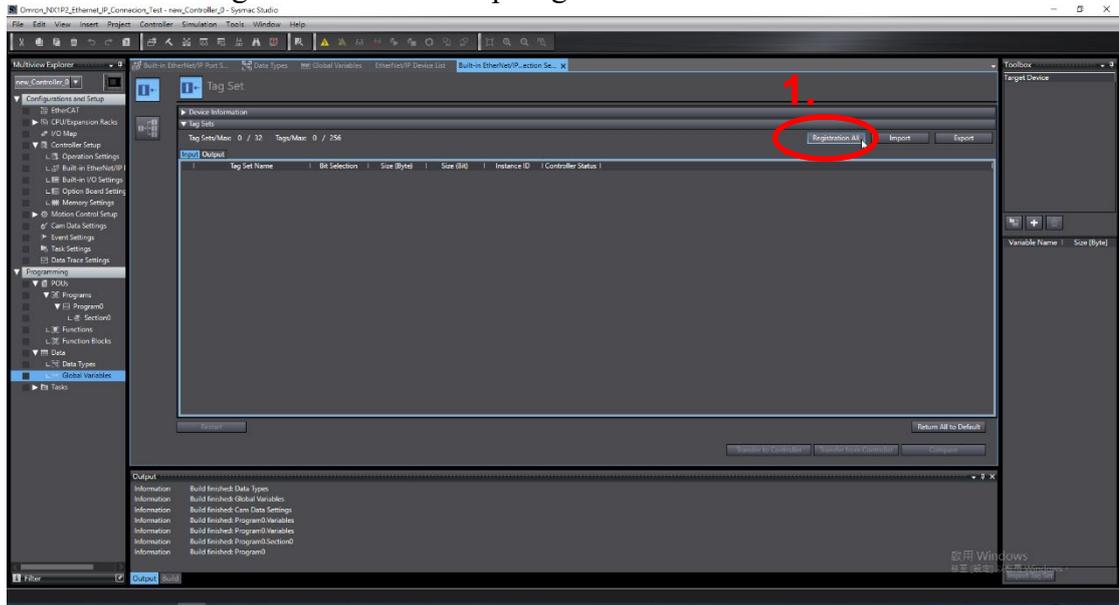
III. Ethernet/IP Connection Setup: Left-click on Tool → Ethernet/IP Connection Settings to open the editor:



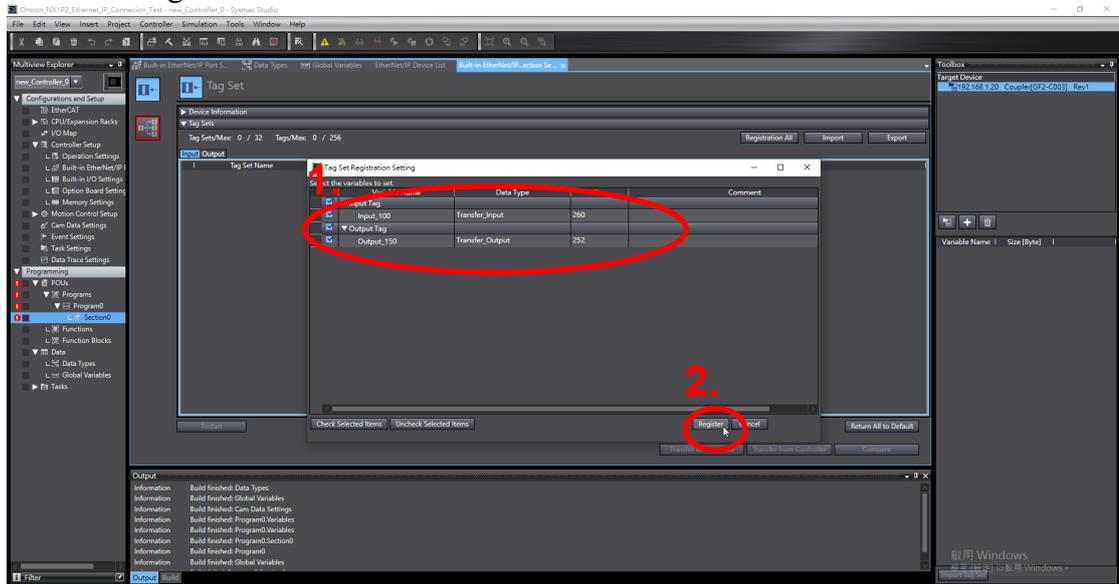
Double-click on “Device” to open the editor:



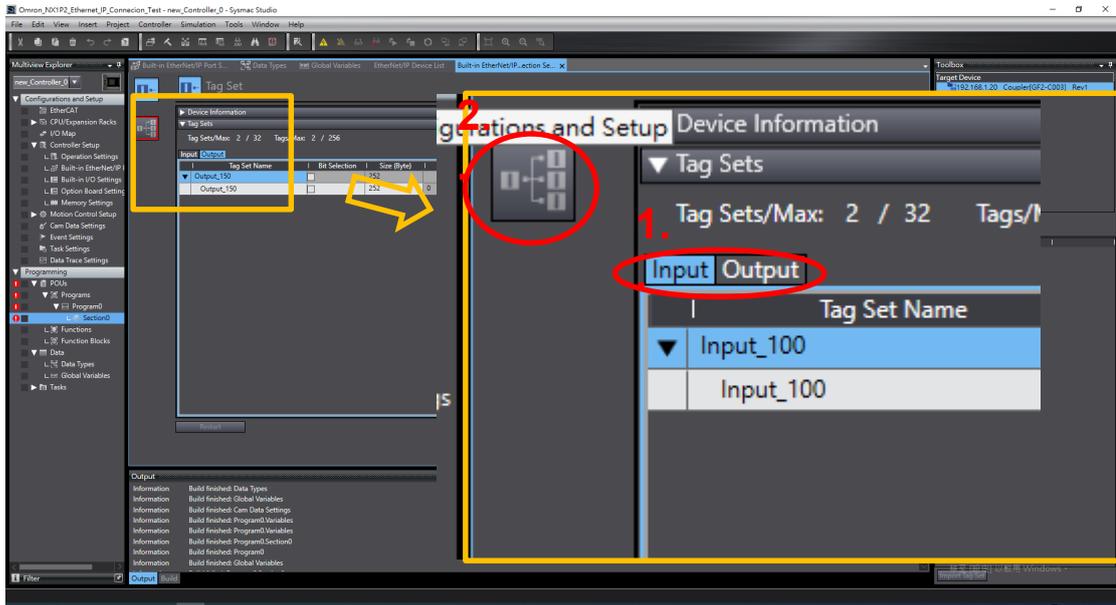
Left-click on “Registration All” to import global variables:



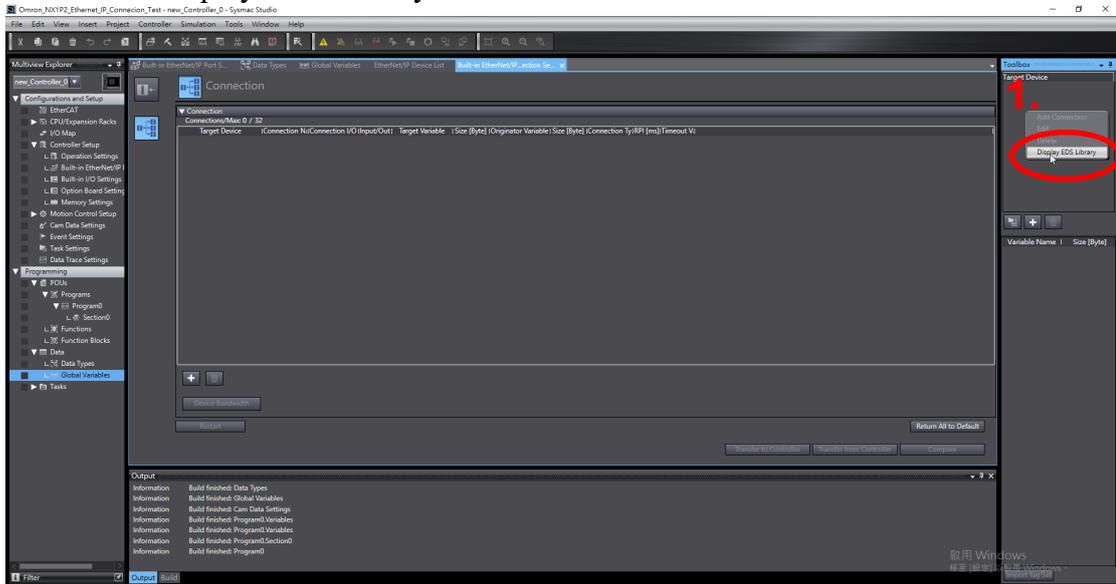
The import window appears. Confirm that the tags to be imported are correct and then click on “Register”:



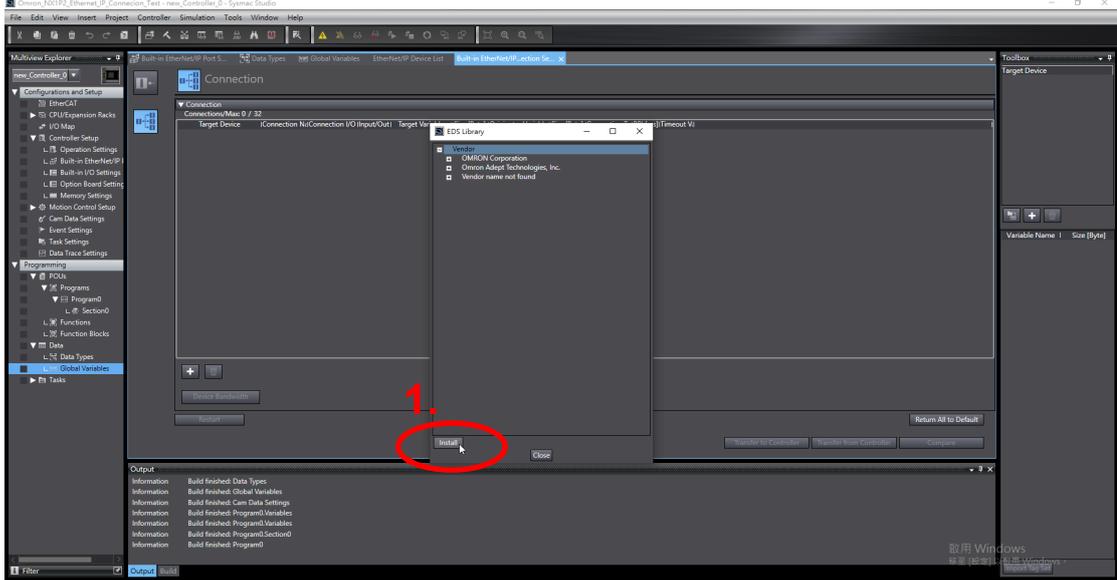
Confirm tag import under both “Input” and “Output” tabs. Once confirmed, left-click on the “Connection” icon:



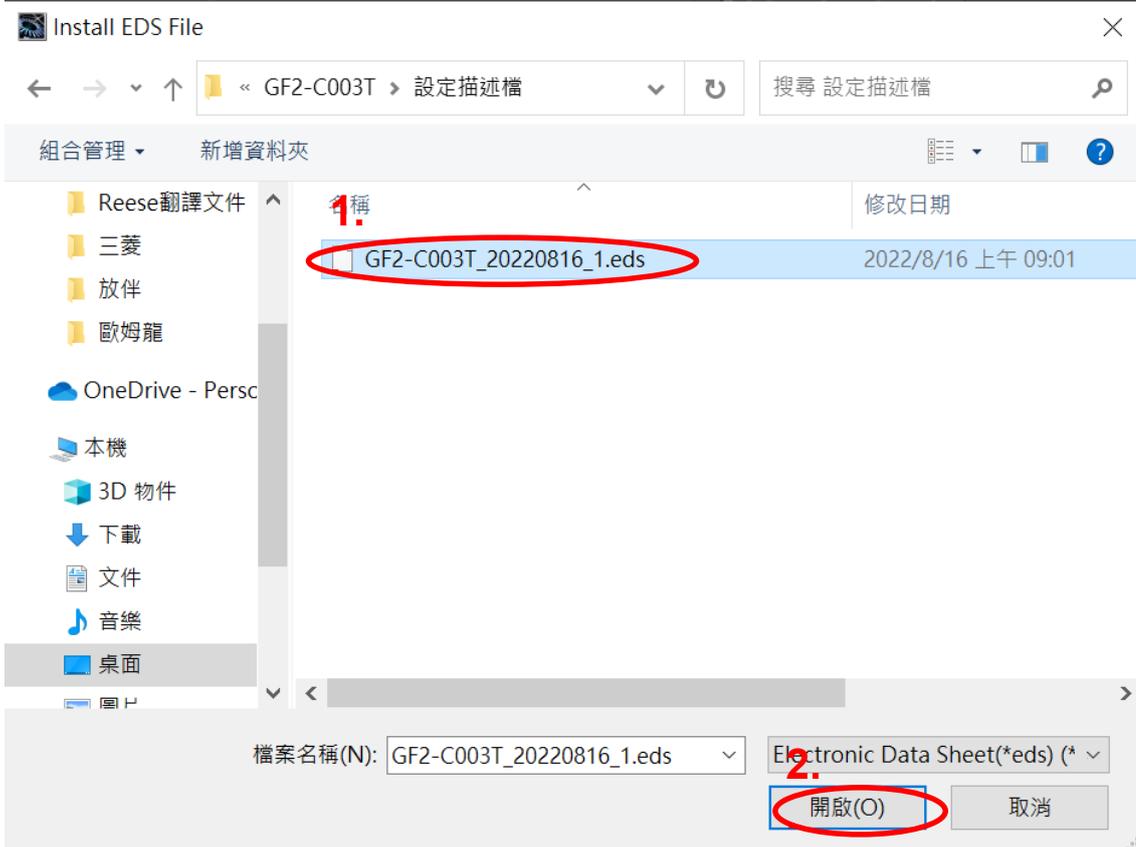
Open the “Connection” window and right-click on “Target Device” on the top-right corner and select “Display EDS Library” from the menu:



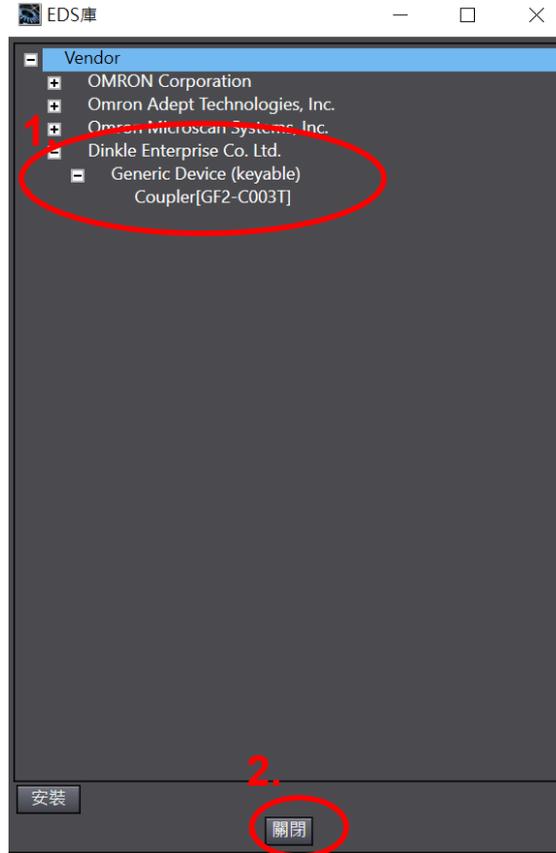
When the EDS Library window appears, click on “Install”:



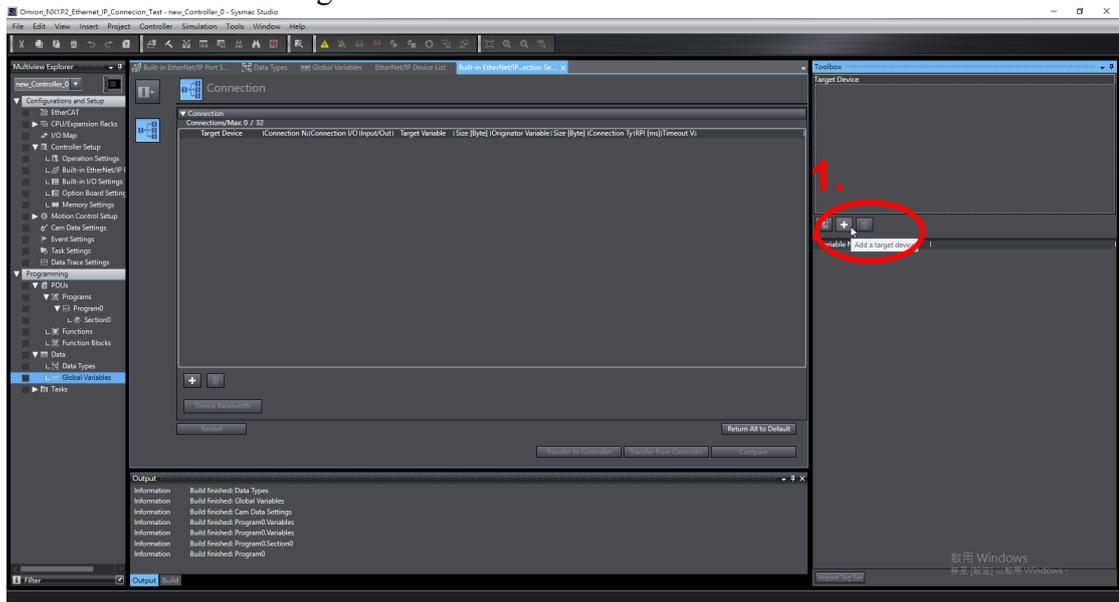
Select the EDS file (with “.eds” in filename extension) we have provided in the file path and click on “Open”:



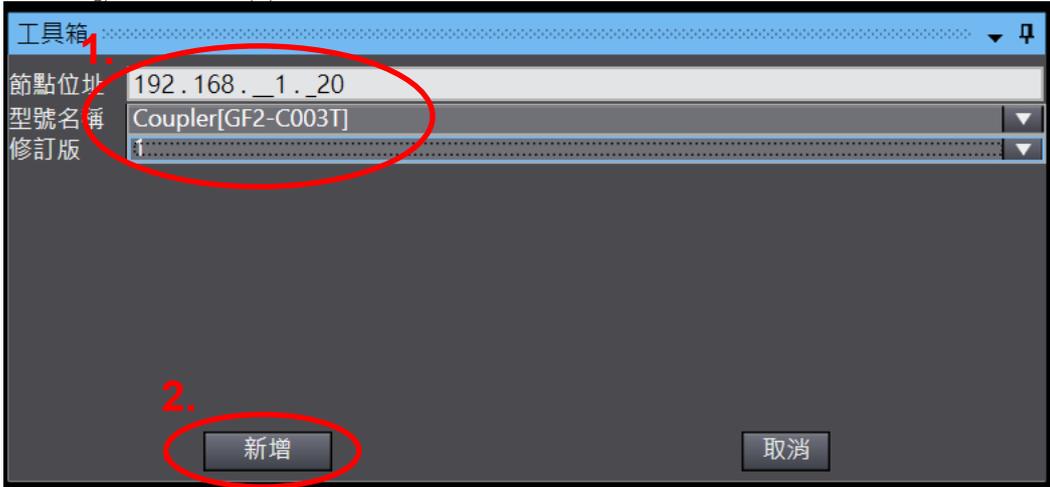
From the EDS Library menu, you will see the newly-added Coupler [GF2-C003T], which means that the file has been added successfully. Click on “Close” to close the window:



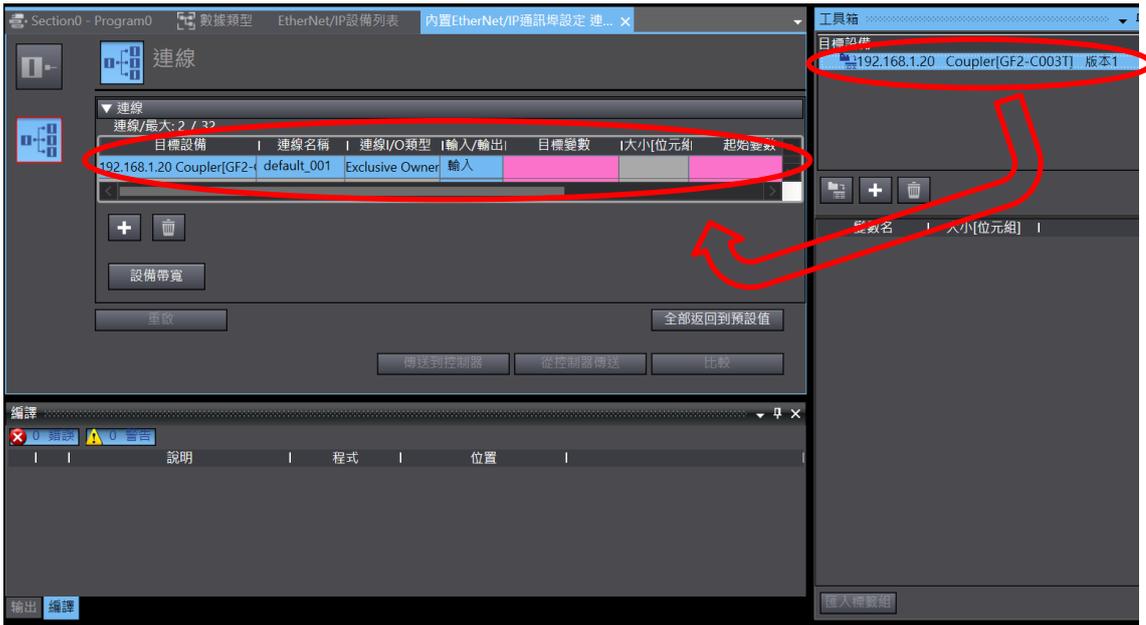
Left-click on “Add a target device”:



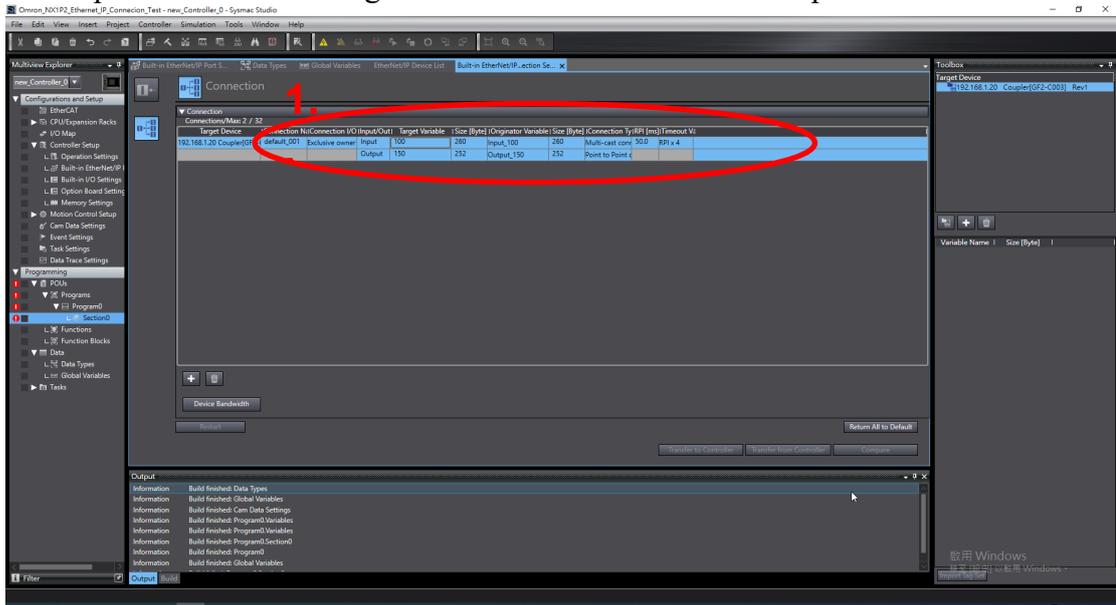
In the toolbox, enter the coupler IP (192.168.1.20 by default), model name (Coupler [GF2-C003T]), revision (1) and then left-click on “Add”:



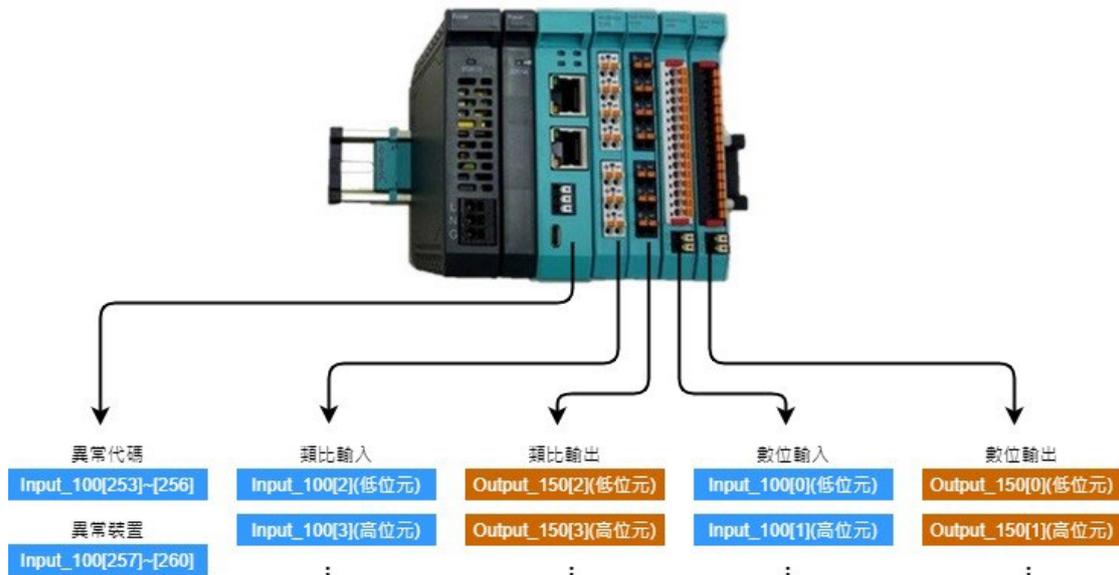
Select the equipment in the toolbox and drag them to the “Connection” window by holding down the left-hand button on the mouse:



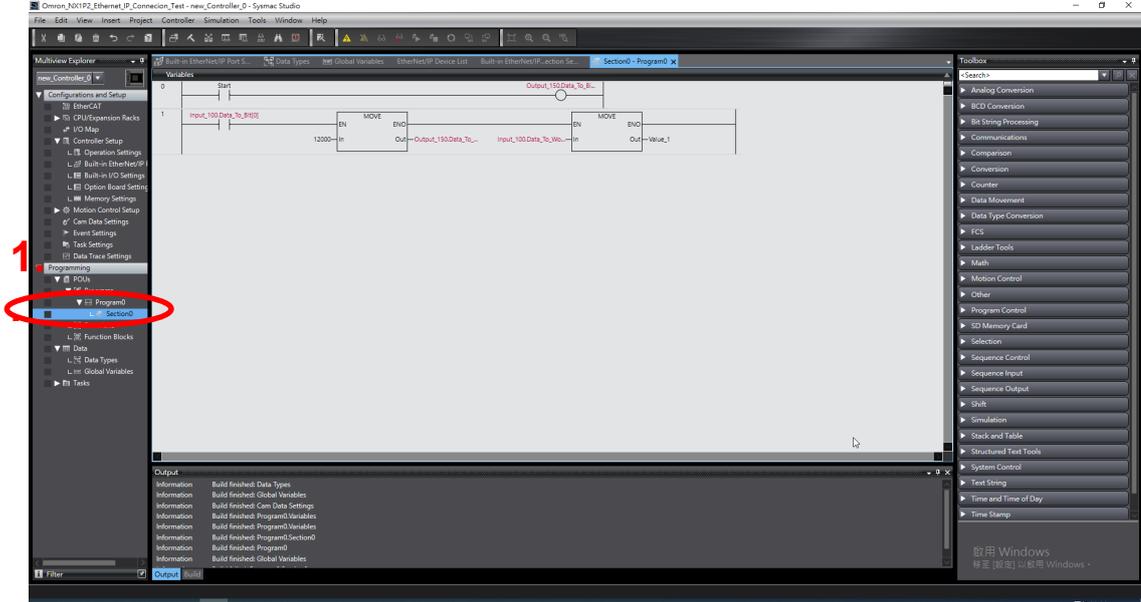
Add all the global variables to the Originator Variables' drop-down menu and enter 100 in the "Input" field under "Target Variables" and 150 in the "Output" field:



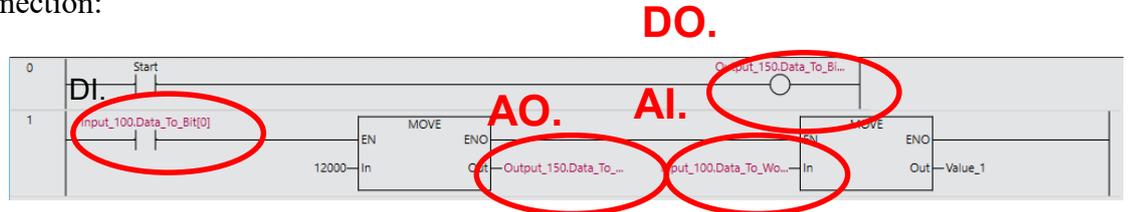
IV. Set up the IO address and establish a simple testing program: Regarding iO-GRID Coupler register address:



Expand “Programming” and double-click to select Section0 to open the editor for the ladder diagram (LD)



Enter the testing program in the image below, which verifies Remote I/O’s proper connection:



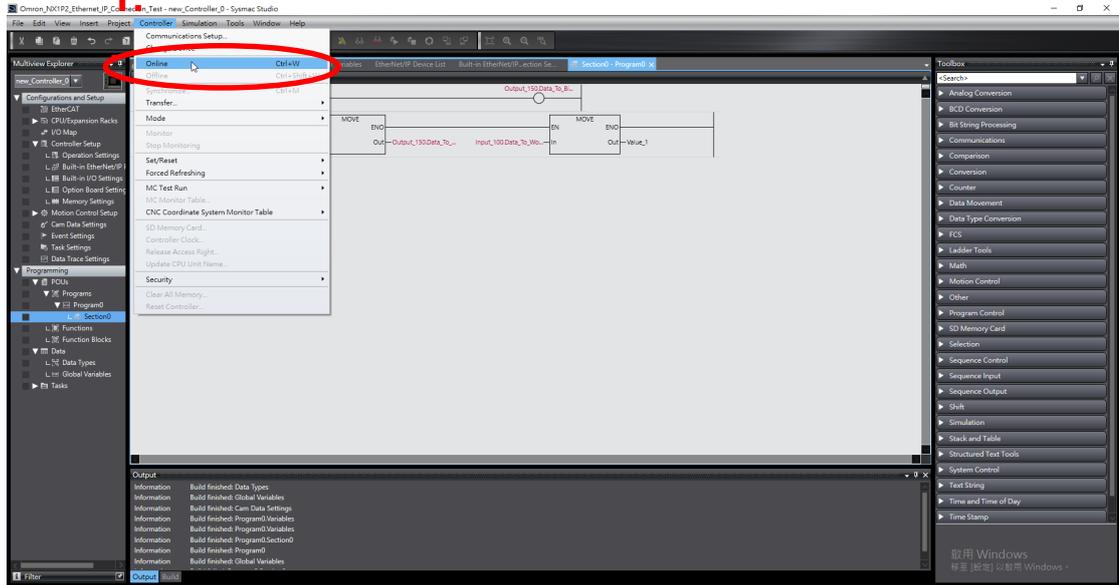
DO: Use the “Start” register to trigger.

DI: DI is placed on connector a. When a signal is transmitted back from the cables, it will trigger the “MOVE” command.

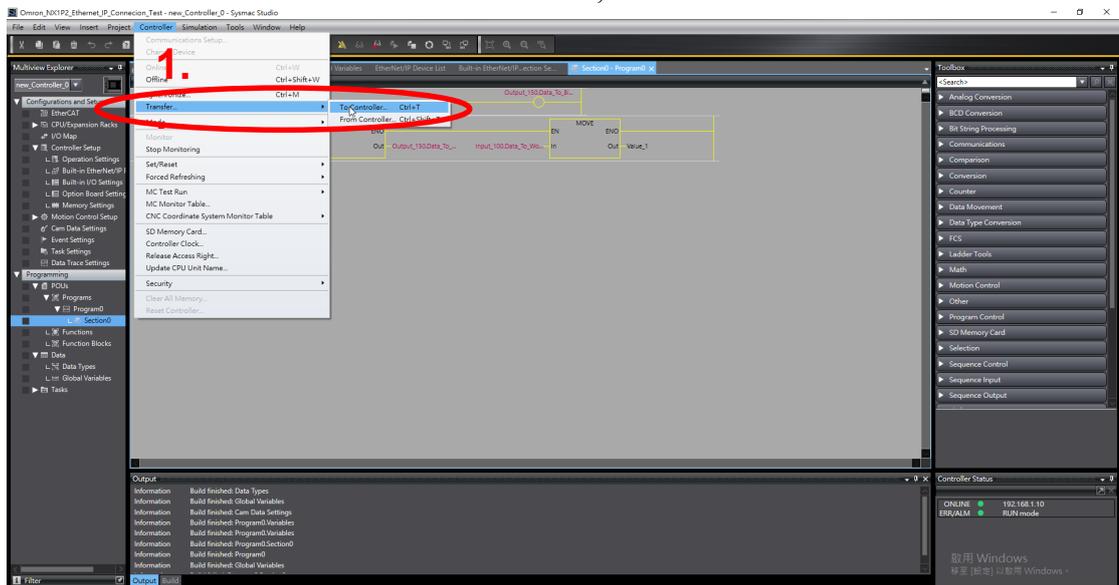
AO: Use the “MOVE” command to move the 12,000 value to AO.

AI: Use the “MOVE” command to move the AI value to the Valeu_1 register. The AI value can come from the signal producer or AO.

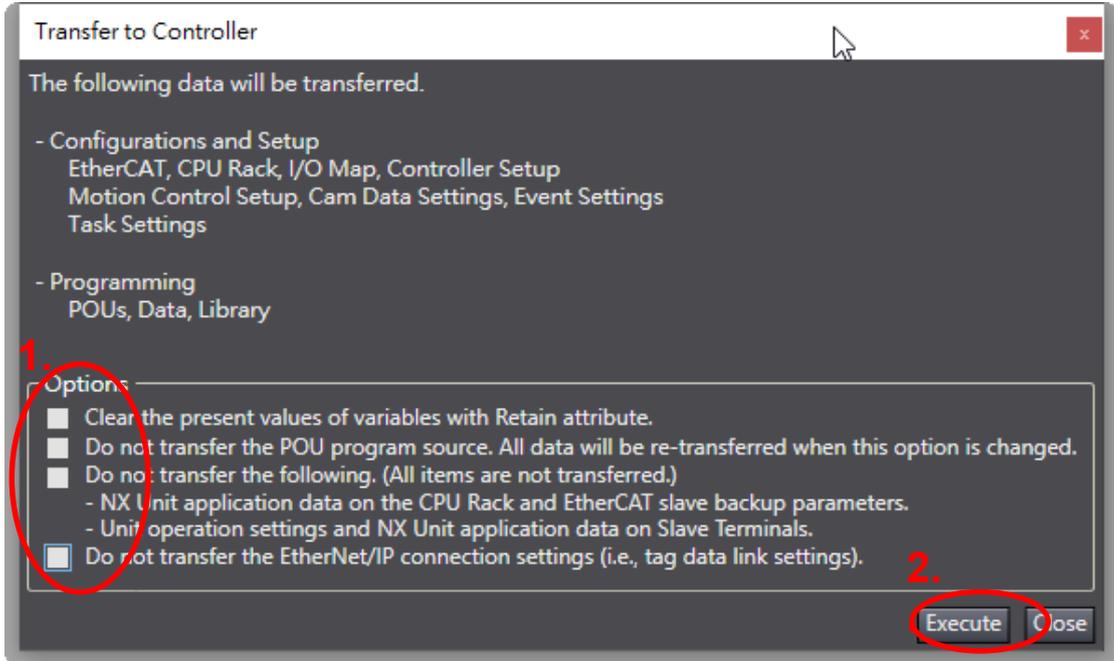
V. Download the program to PLC and test it online: Use the mouse's left button to select “Controller” then “Online” to confirm connection to PLC:



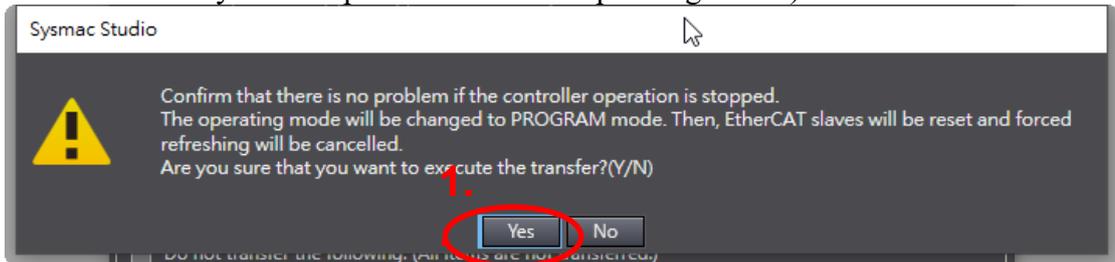
Use mouse's left button to select “Controller”, then “Transfer” and then “To Controller”:



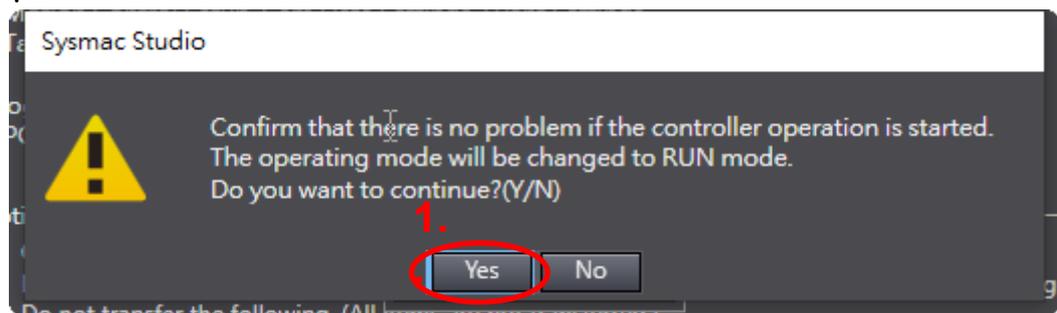
The “Transfer To Controller” window appears. Uncheck all boxes under “Options” and then click on “Execute”:



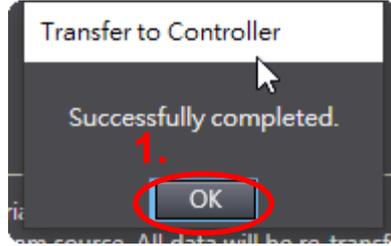
A warning window appears to remind you that the transfer will put PLC on the Program Mode. Please click on “Yes” (Note: At this time, PLC will stop the program’s operation. Please do not carry out this procedure to PLC operating online):



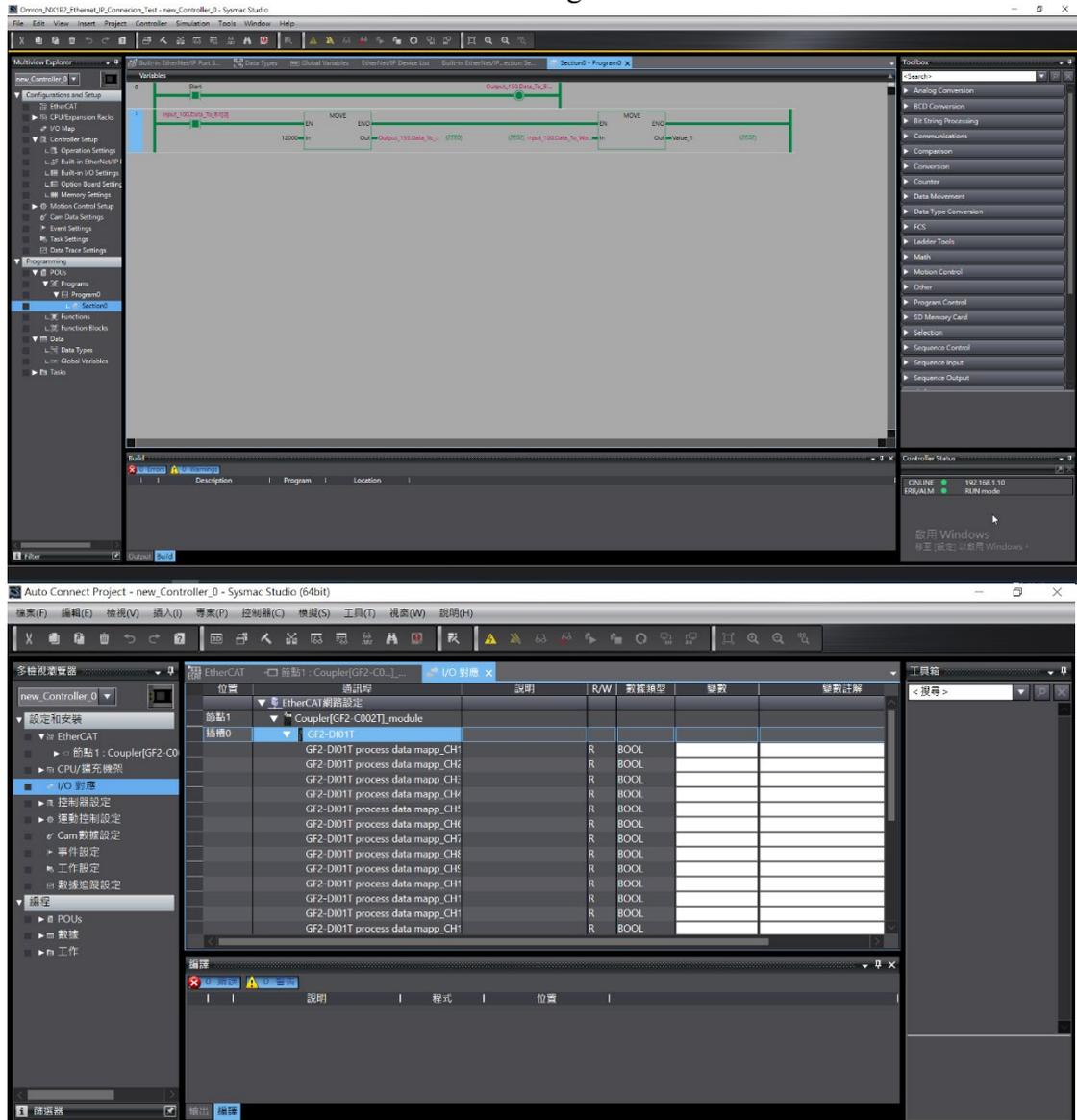
A warning window appears asking if you want to switch to the Run Mode. Please click “Yes”:



Once the setup is complete, click on “OK” in the “Successfully Completed” window:



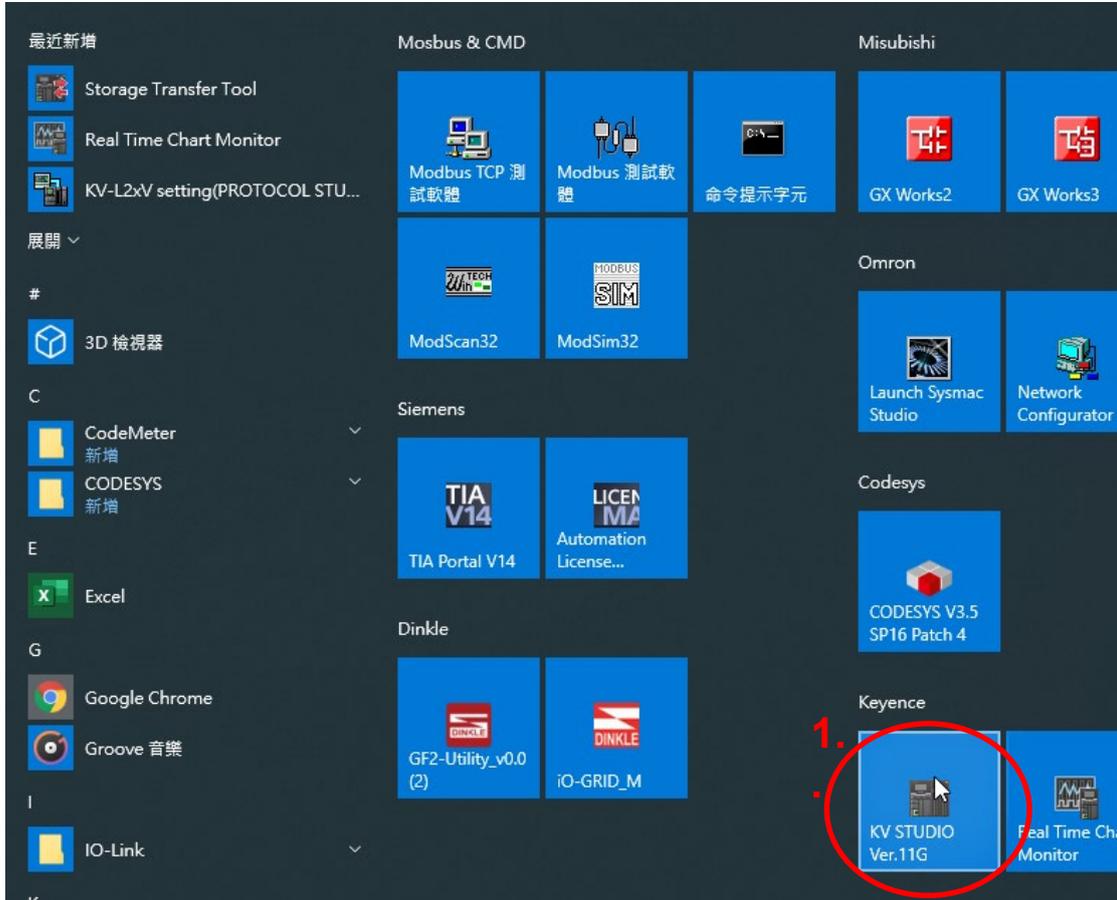
Please use the online monitor mode for testing:



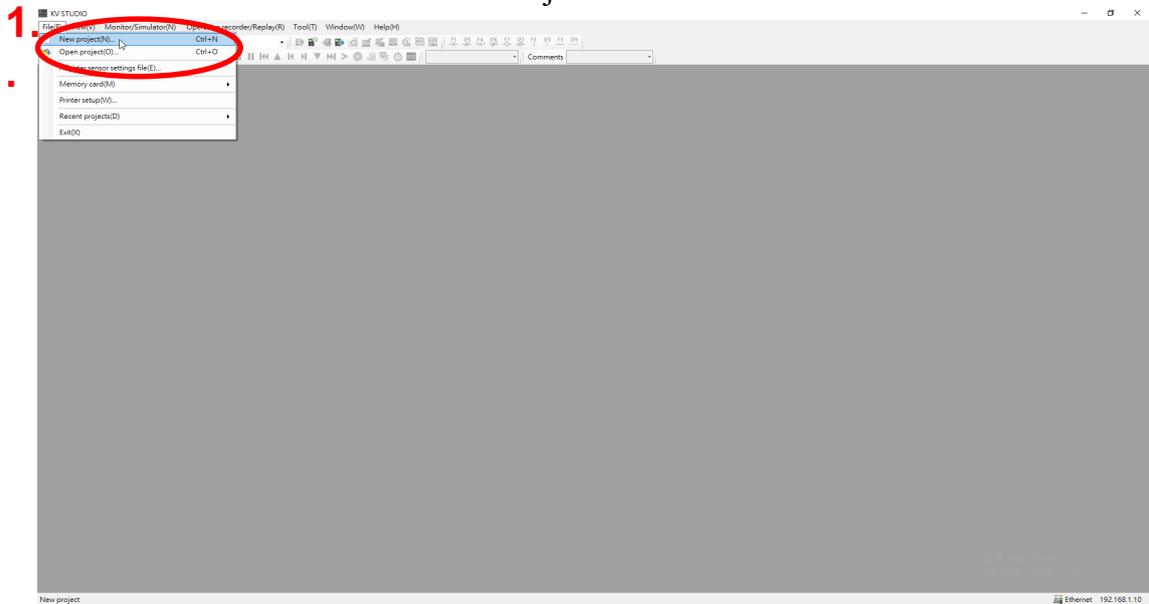
3.3 Beginner's guide to iO-GRID using KV Studio

I. Launch KV Studio and set up the Ethernet/IP ports:

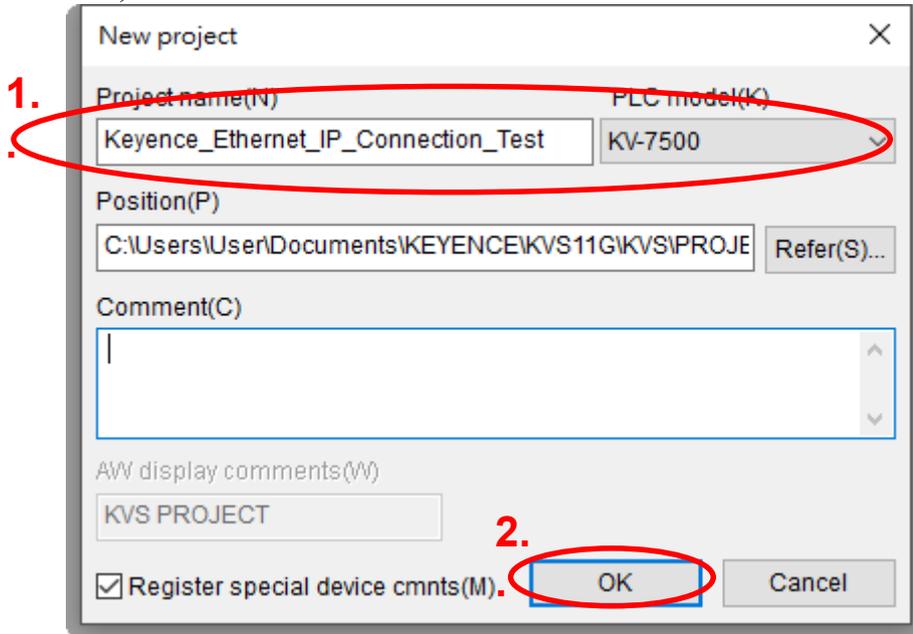
Left-click to launch KV Studio:



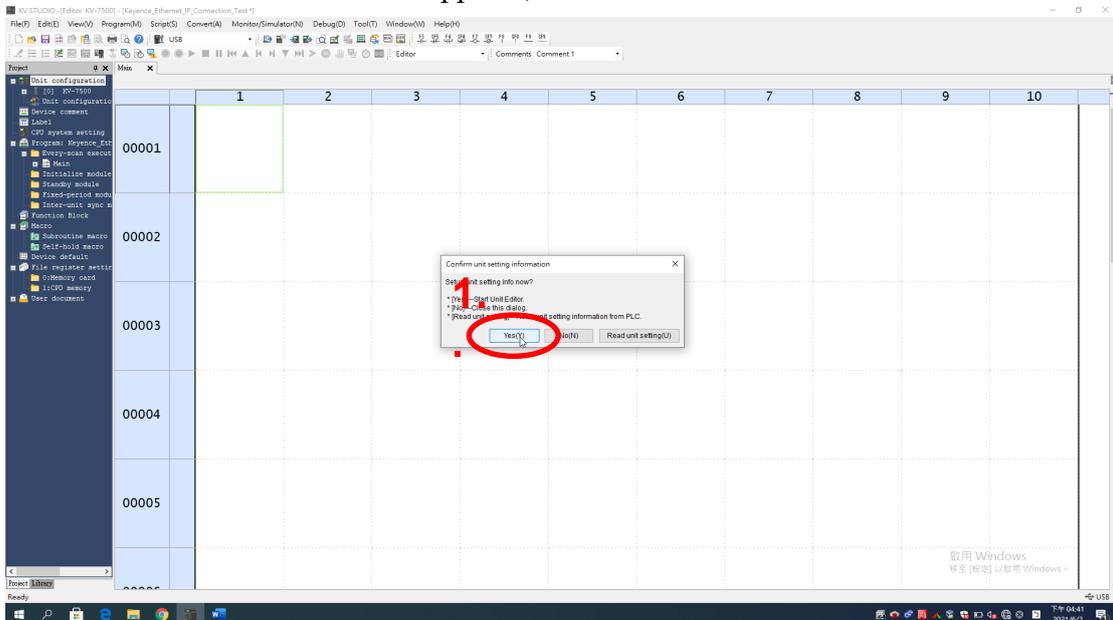
Left-click on “File” and then “New Project”.



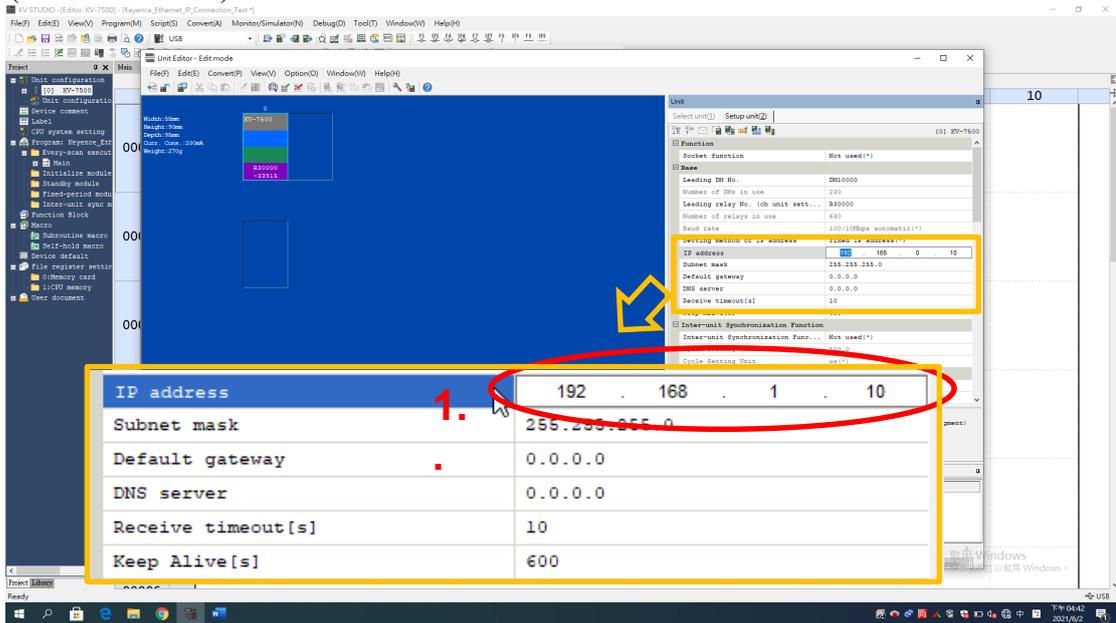
Create a new project and enter the project name, information, PLC model and version. Once you are done, click on “OK”:



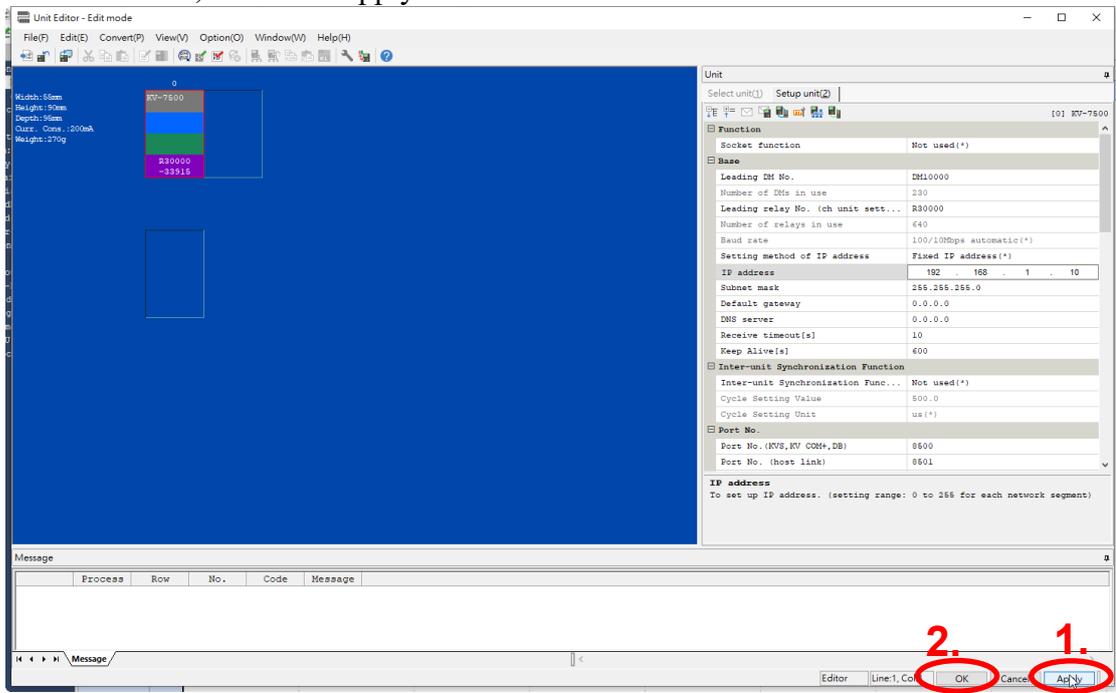
When the Unit Editor’s window appears, click on “YES”:



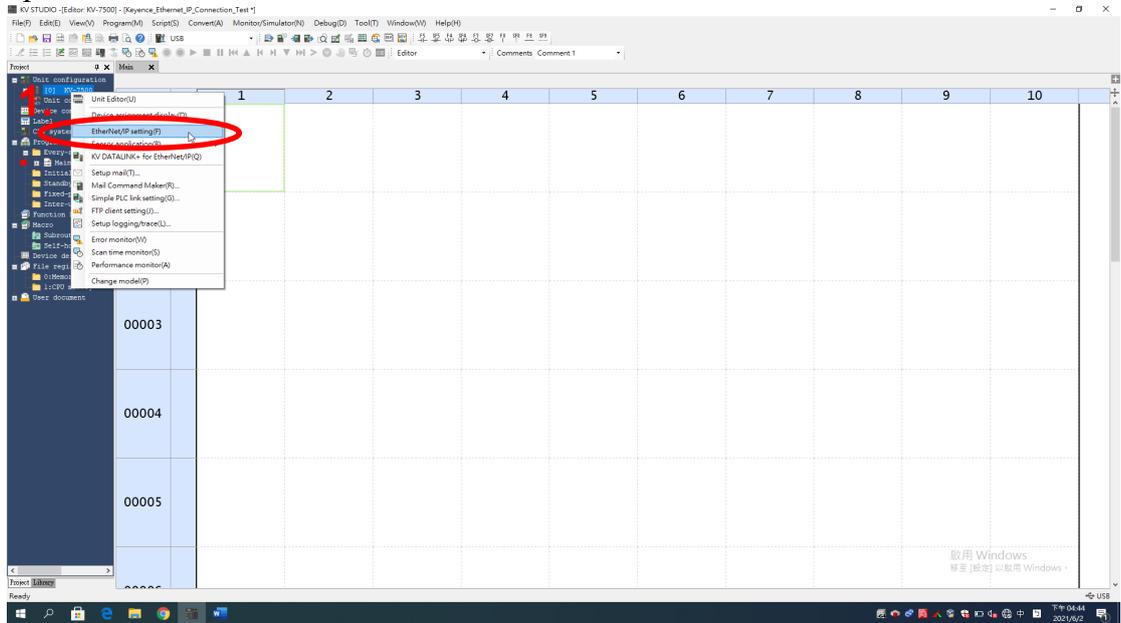
Enter PLC's IP address in the "IP Address" field (192.168.1.10) and enter Class C (255.255.255.0) in the "Mask" field:



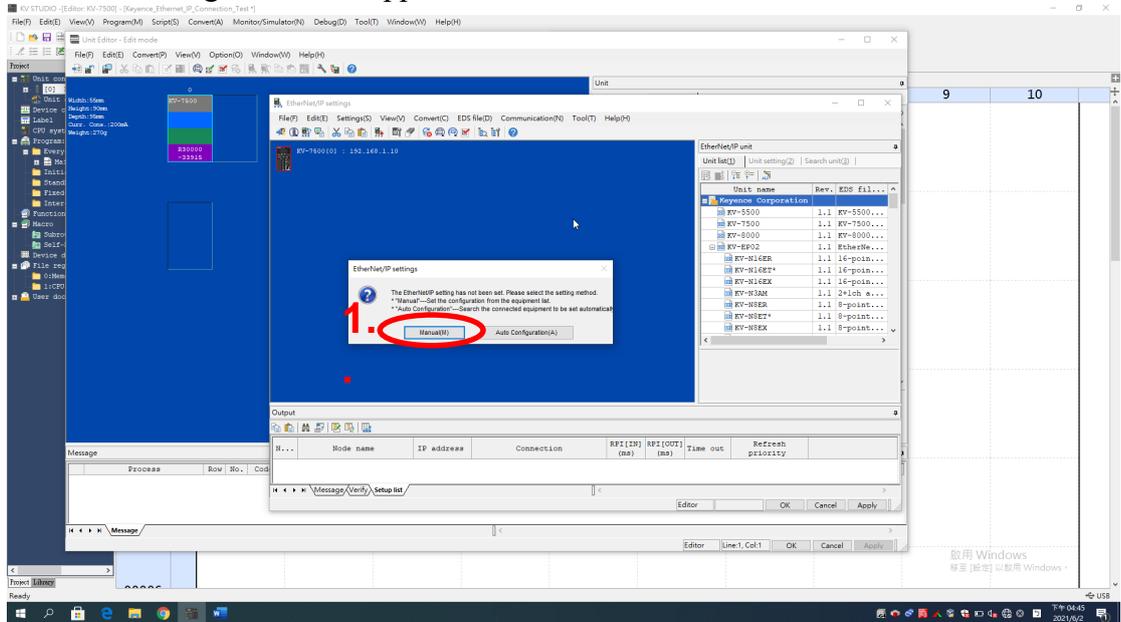
When finished, click on "Apply" and then "OK" to close the window:



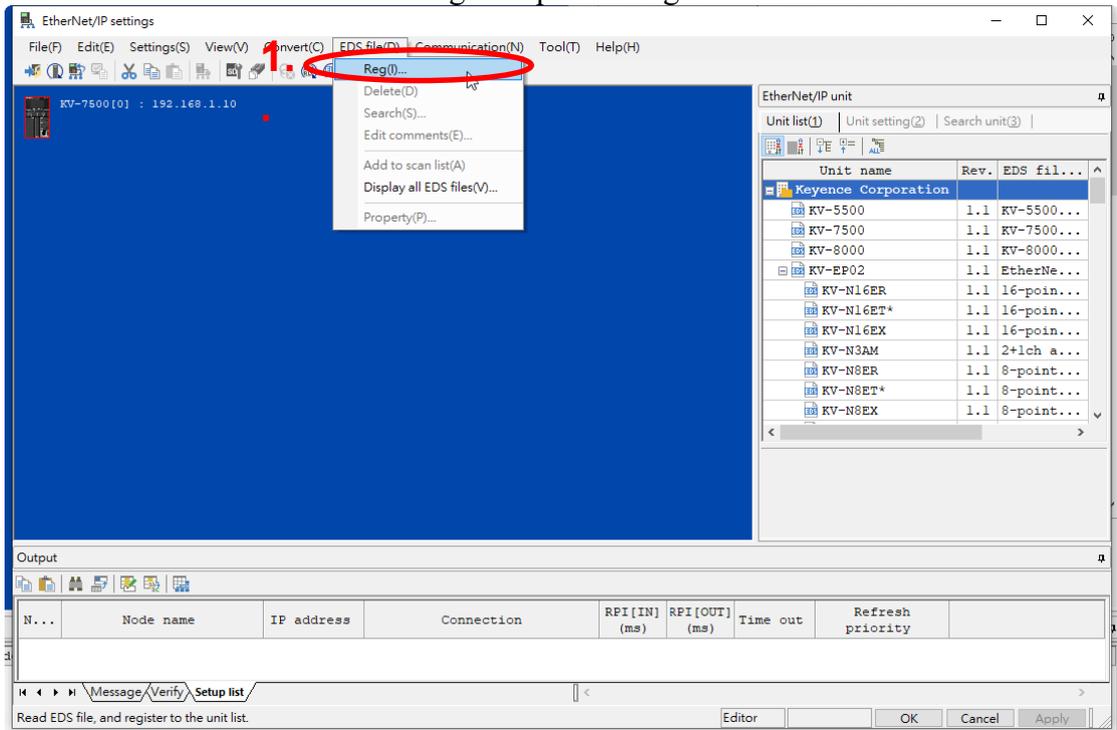
II. Ethernet/IP Connection Setup (Slave) and EDS file Registration:
 Right-click on “[0] KV7500” and left-click on Ethernet/IP Setting on the menu to open the editor:



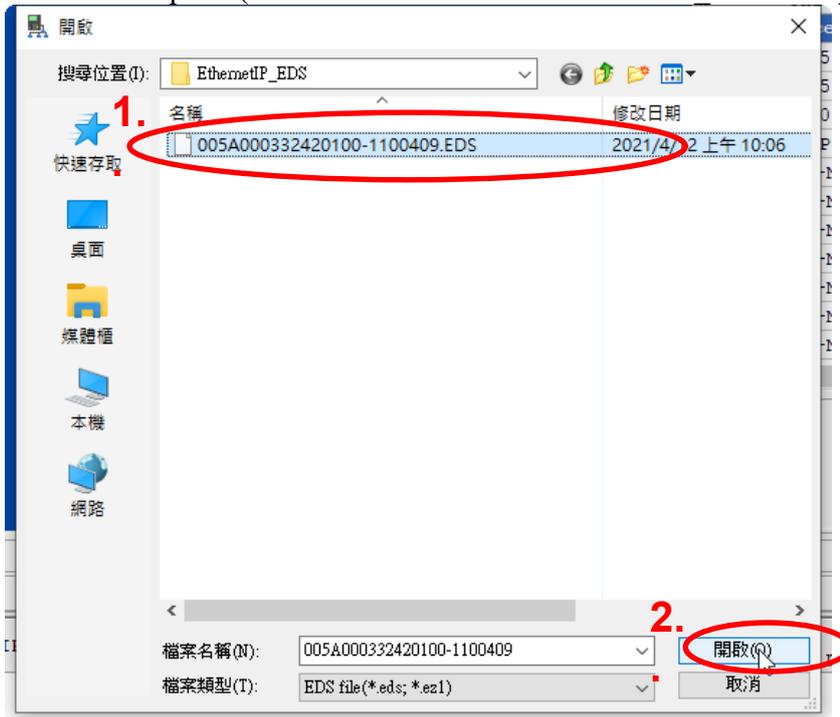
When the dialogue window appears, left-click on “Manual”:



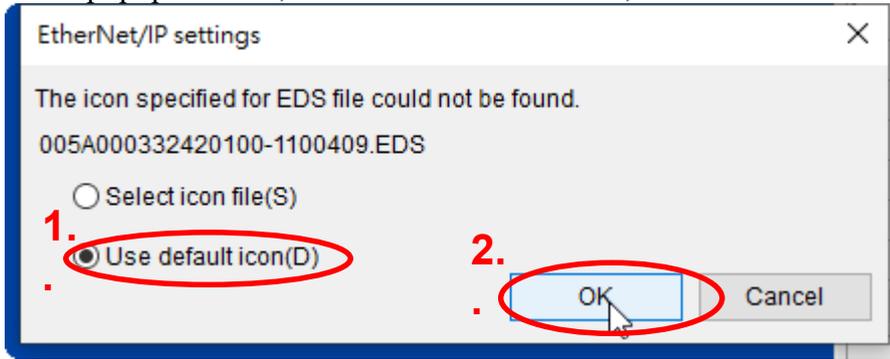
Left-click on “EDS File” then “Reg” to open the registration window:



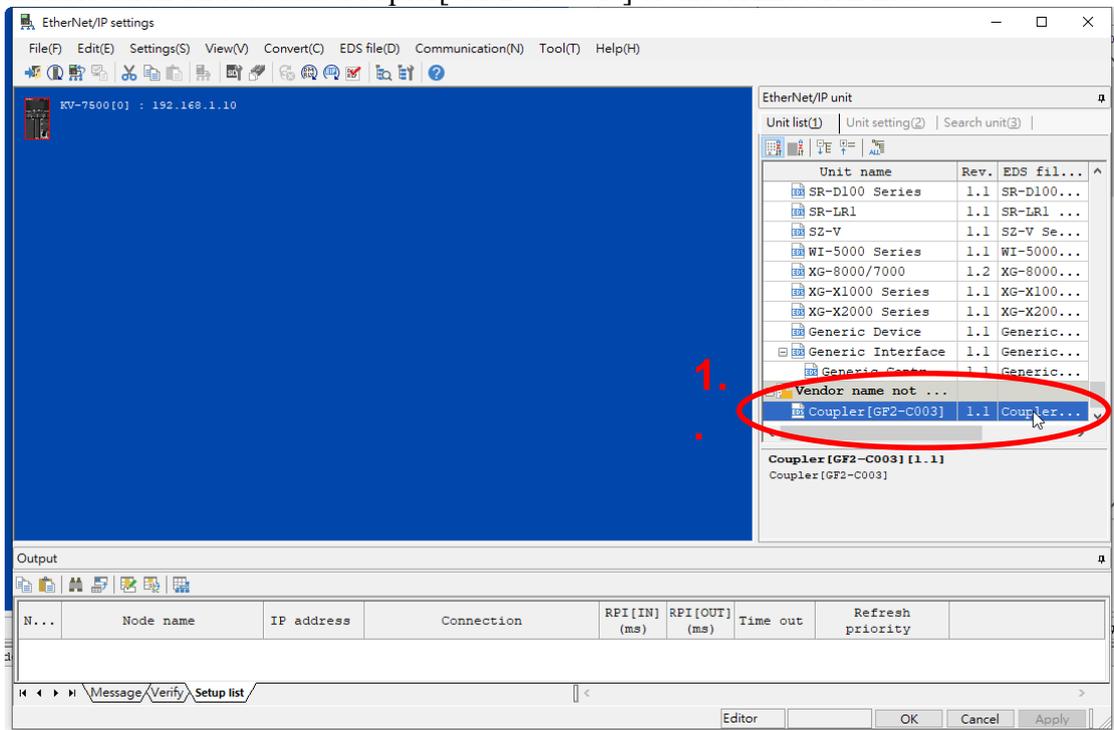
Select the EDS file (with “.eds” in filename extension) we have provided in the file path and click on “Open” (the current version is: GF2-C003T_20220816_1):



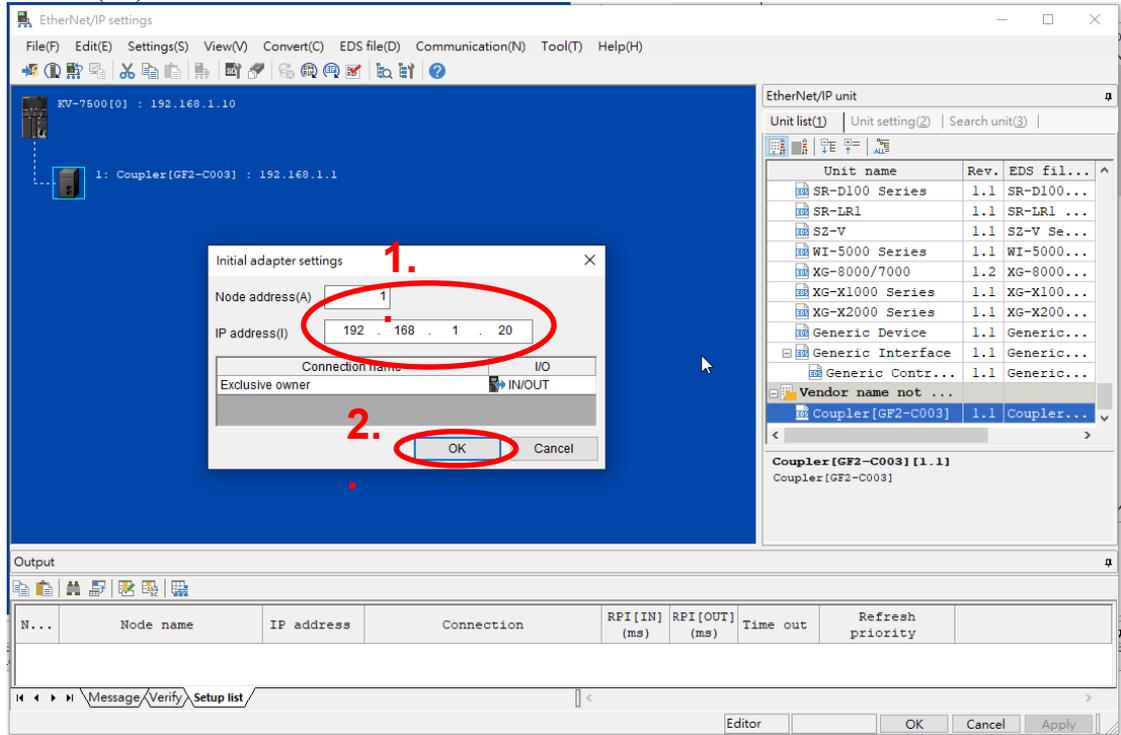
In the popup window, select “Use Default Icon”, then left-click on “OK”:



From the EDS Library menu, we will see the newly-added Coupler[GF2-C003T]. Double-click on it to add Coupler[GF2-C003T] to the connection list:

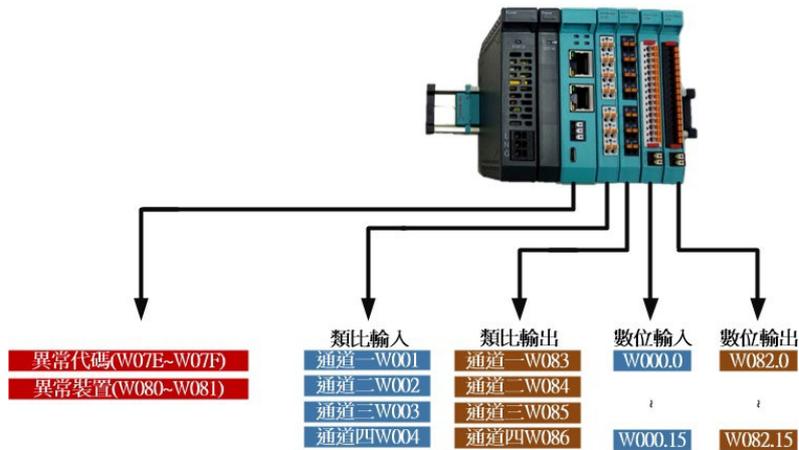


In the popup window, enter the coupler's IP address (192.168.1.20 by default), Node Address(1) and then click on "OK":

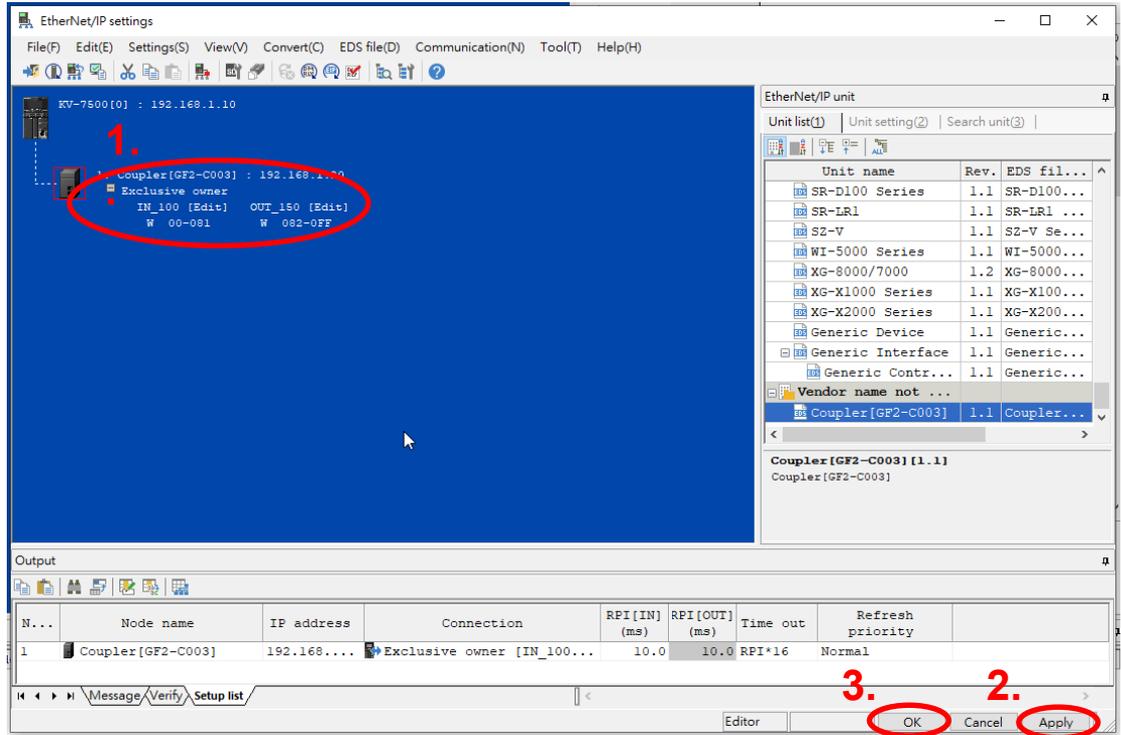


III. Confirm the IO address and establish a simple testing program:

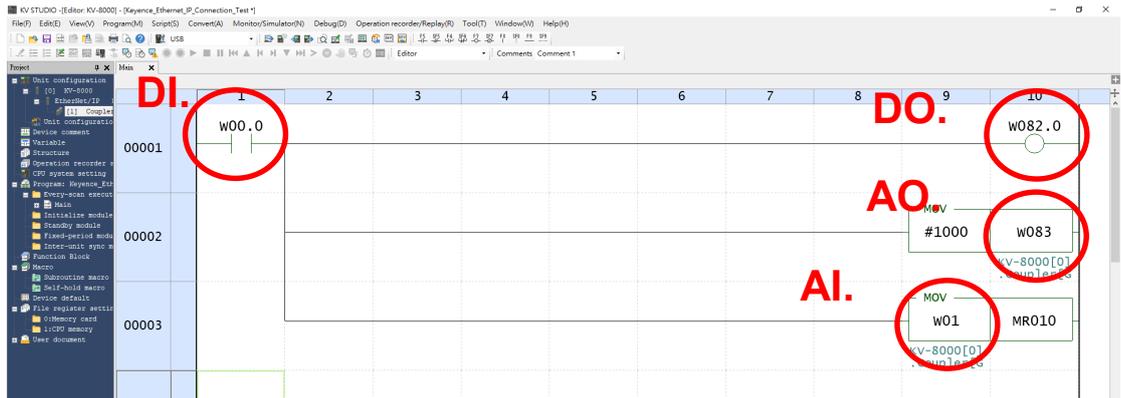
Regarding **IO-GRID** Coupler register address:



Once equipment addresses have been confirmed, click on “Apply” and then “OK” to close the window:



Enter the testing program in the image below, which verifies Remote I/O's proper connection:



DO: Use DI to trigger.

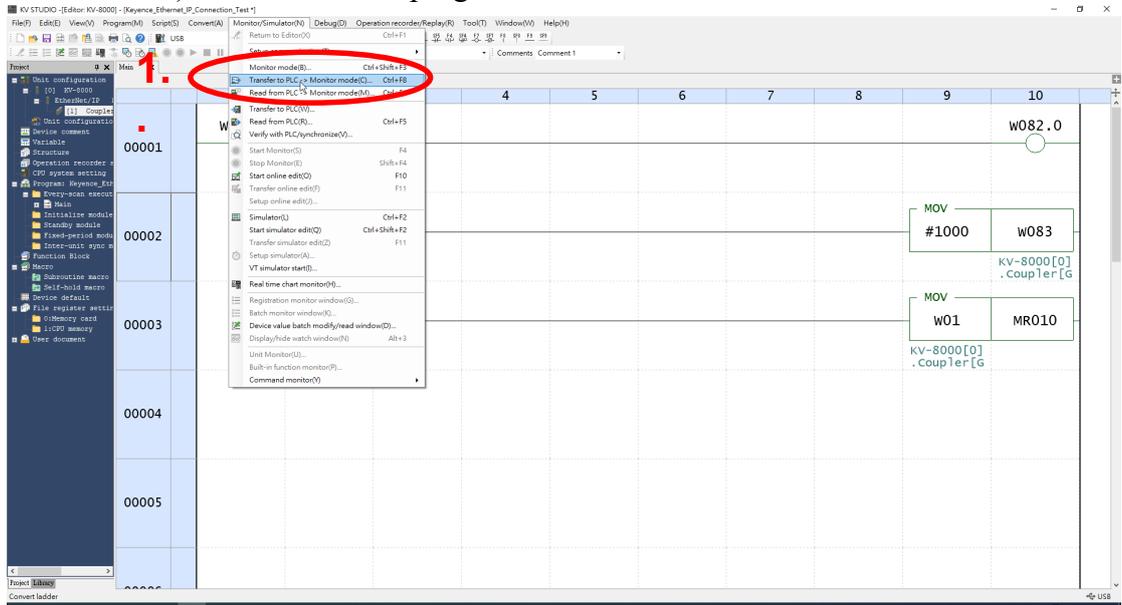
DI: DI is placed on connector a. When a signal is transmitted back from the cables, it will trigger the “MOVE” command and DO.

AO: Use the “MOVE” command to move the 1000 value to AO.

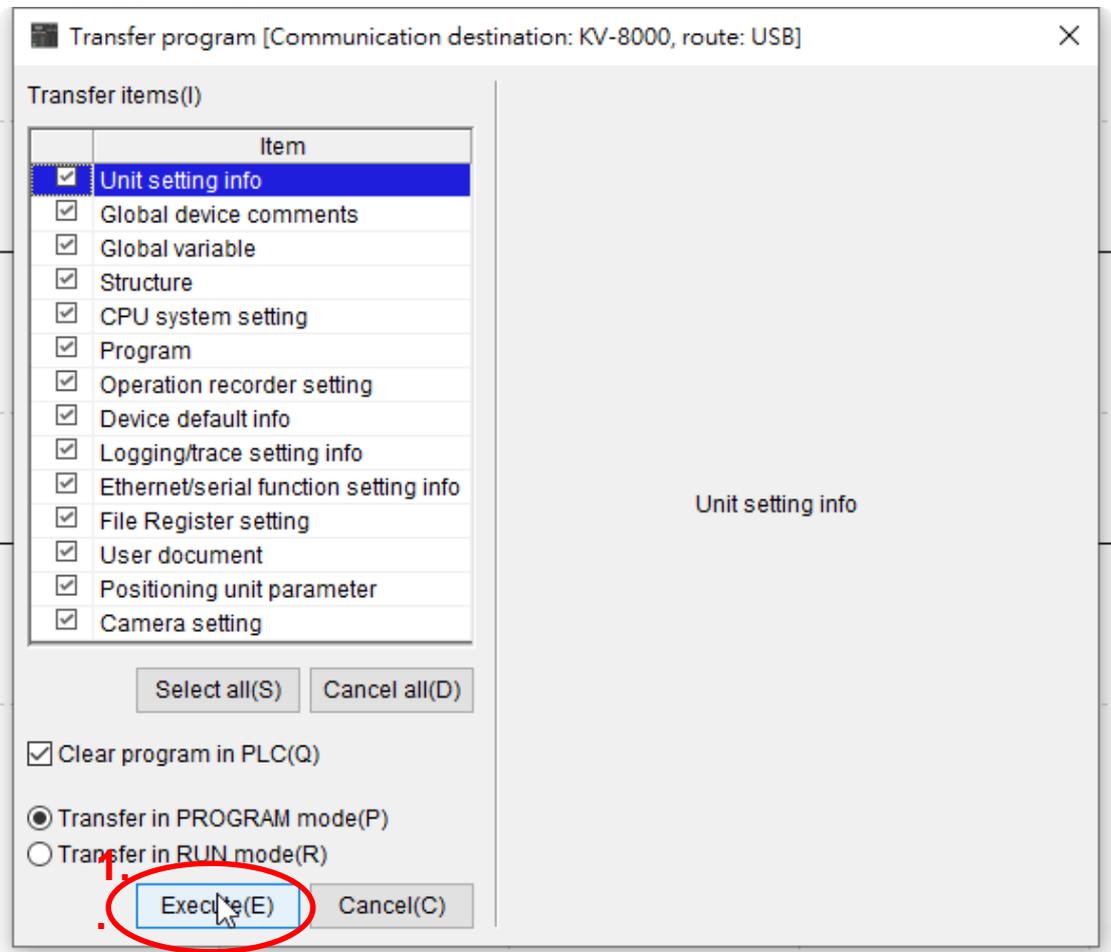
AI: Use the “MOVE” command to move the AI value to the MR010 register. The AI value can come from the signal producer or AO.

IV. Download the program to PLC and test it online:

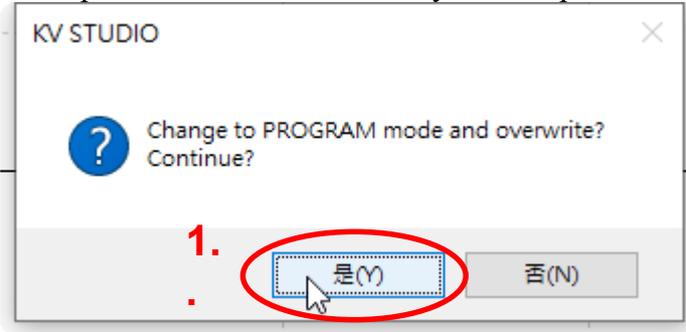
Use mouse's left button to select "Monitor/Simulator", then "(Transfer TO PLC → Monitor Mode)" to download the program to PLC:



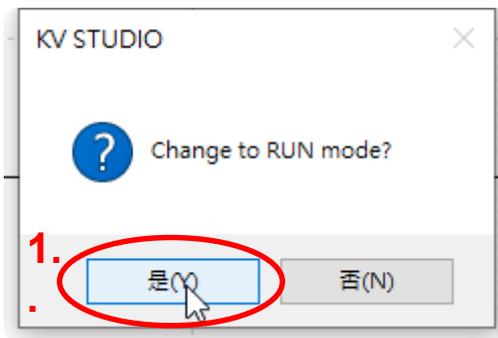
Click on "Execute":



A warning window appears to remind you that the transfer will put PLC on the Program Mode. Please click on “Yes” (Note: At this time, PLC will stop the program’s operation. Please do not carry out this procedure to PLC operating online):



A warning window appears asking if you want to switch to the Run Mode. Please click “Yes”



Please use the online monitor mode for testing:

