

威綸科技股份有限公司

人機和 CODESYS 連接 iR-ETN40R 範例

Weintek Built-in CODESYS

Weintek Remote IO (MODBUS TCP/IP)

工程檔案範例

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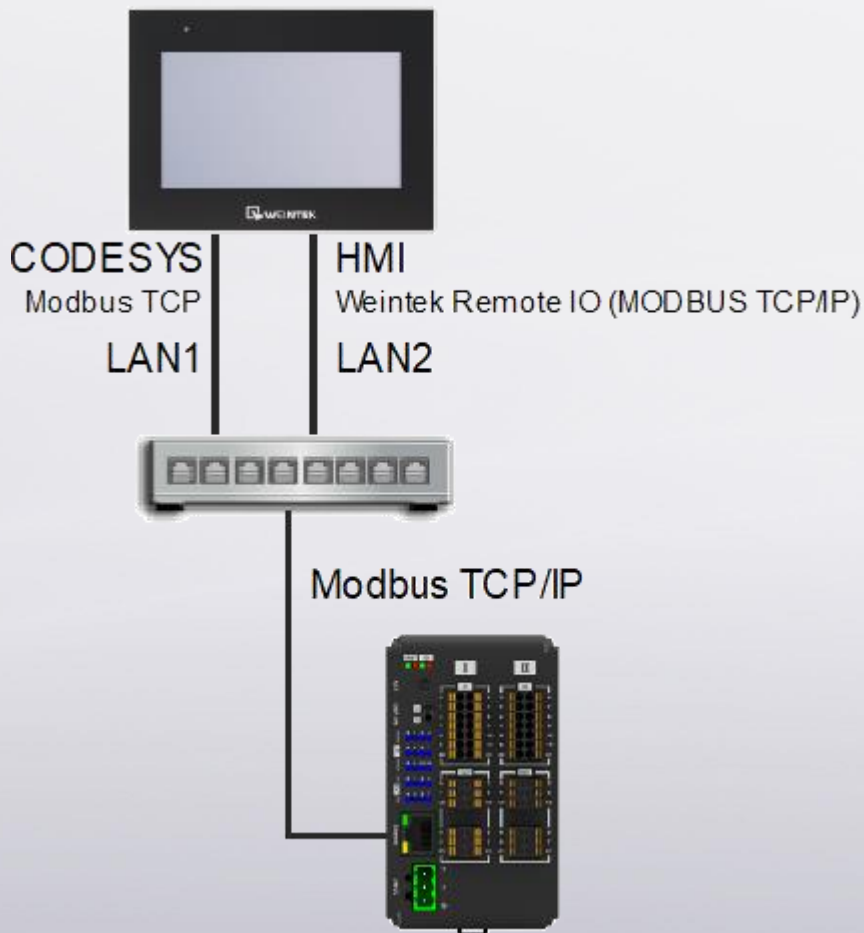
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1. 簡介與操作

簡介

以下範例介紹人機如何透過 Weintek Built-in CODESYS 和 iR-ETN40R 連線，顯示和控制數位輸入和輸出點位。Weintek Remote IO (MODBUS TCP/IP)則是用於高速計數器的使用和參數的設定，可以參考：

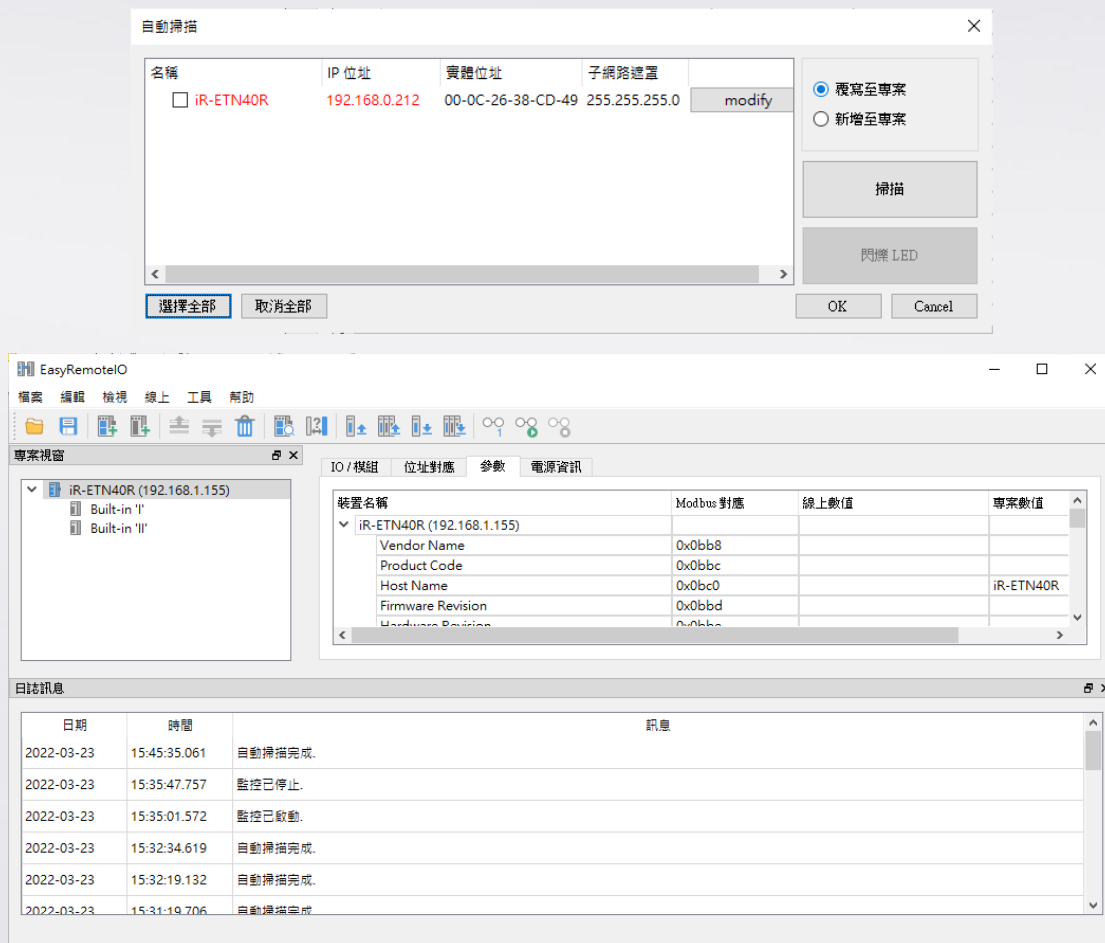
DEM22003_HMI_Modbus_iR-ETN40R_Demo



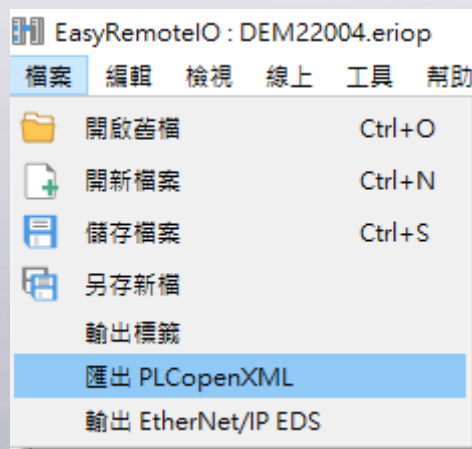
操作

步驟 1. 先安裝 EasyRemoteIO 軟體。將 iR-ETN40R 接上網路並上電，開啟 EasyRemoteIO 點選[自動掃描]會顯示 iR-ETN40R 的 IP 設定，按下

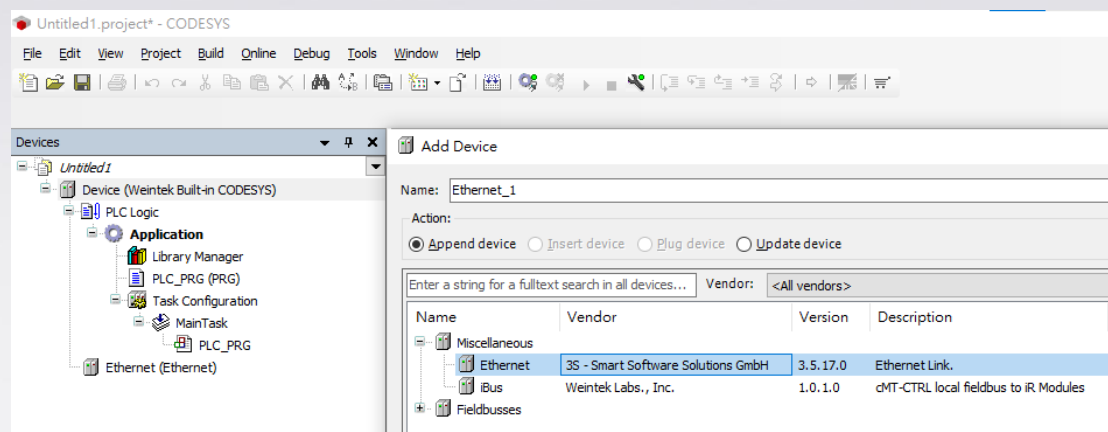
[modify]可以修改 IP 設定。修改成本地的網域，按下[OK]就可以進入到 EasyRemoteIO 的主畫面。



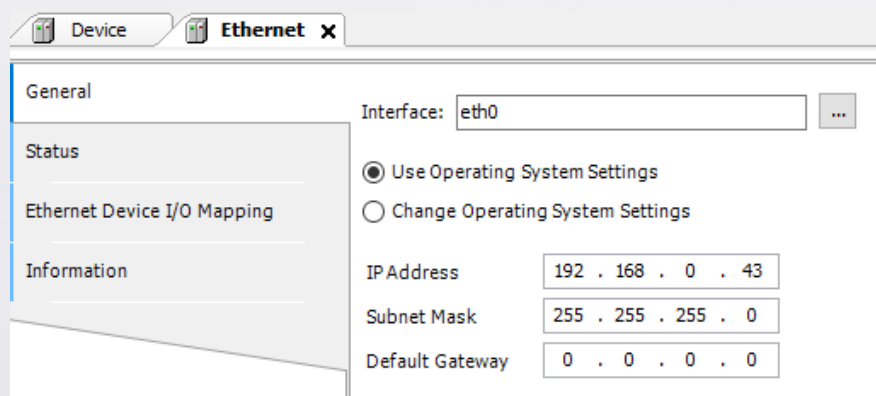
步驟 2. 在[檔案]»[匯出 PLCopenXML]可以匯出給 CODESYS 用的 xml 檔案。



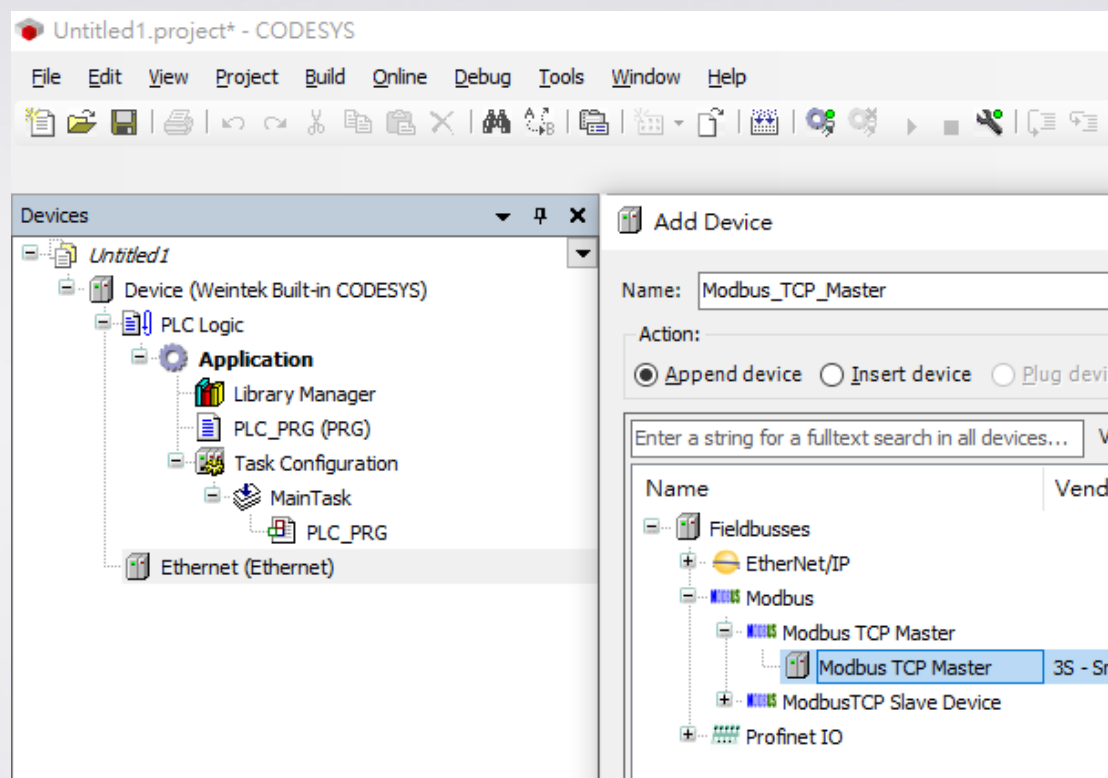
步驟 3. 開啟 CODESYS，新增 Device，新增 Ethernet。



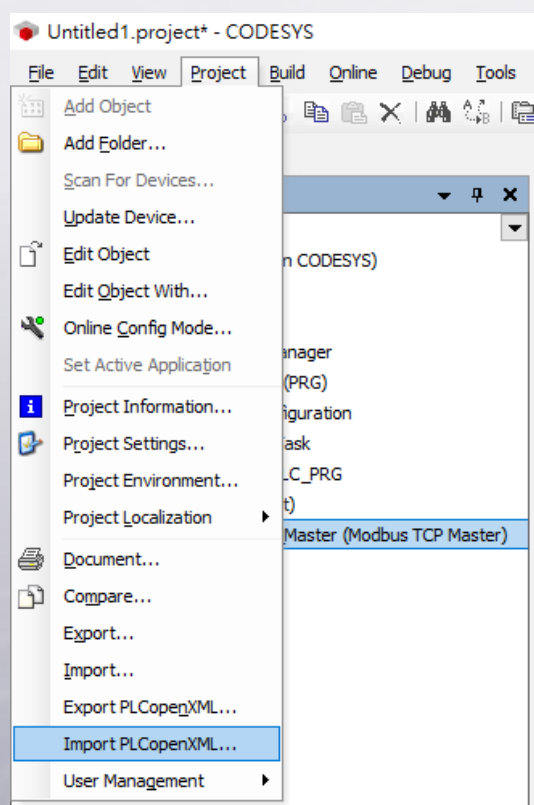
必須連接 Device(Weintek Built-in CODESYS)然後去設定 Ethernet 的介面或是設定 HMI 上 CODESYS LAN1 的 IP。



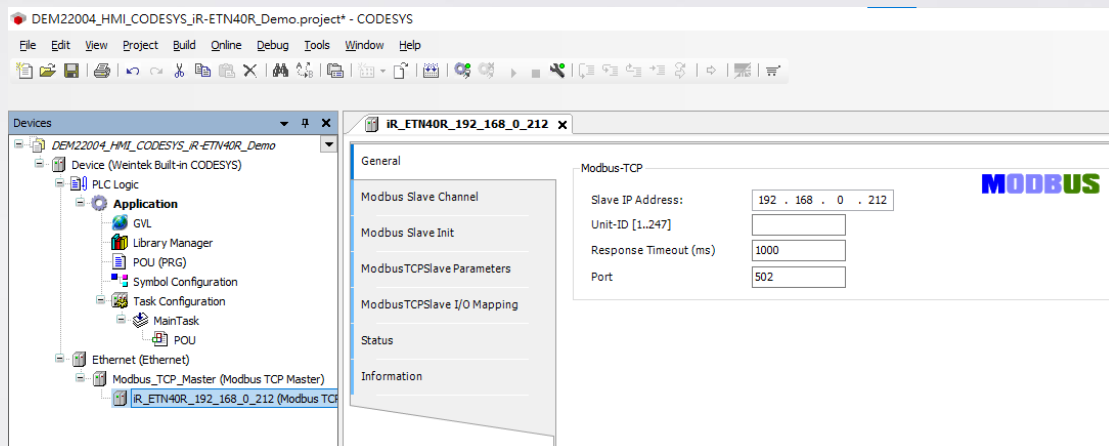
步驟 4. 點選 Ethernet 再新增 Modbus TCP Master。



步驟 5. 點選剛剛新增的 Modbus TCP Master 再點選 [Project] » [Import PLCopenXML...]



就會新增 iR-ETN40R 的 Modbus TCP Slave，輸入或確認 iR-ETN40R 的 IP 地址。



步驟 6. 如果數位輸出要由計數器控制，要修改一下 built-in 'I' / 'II' Digital Output(W)寫的長度，這樣計數器的輸出才不會被 CODESYS 覆蓋。

General	Name	Access Type	Trigger	READ Offset	Length	Error Handling	WRITE Offset	Length	Comment
Modbus Slave Channel	0 built-in I.Digital Input	Read Discrete Inputs (Function Code 02)	Cyclic, t#100ms	16#0000	16	Keep last Value			
	1 built-in I.Digital Output(R)	Read Coils (Function Code 01)	Cyclic, t#100ms	16#0000	8	Keep last Value			
Modbus Slave Init	2 built-in I.Digital Output(W)	Write Multiple Coils (Function Code 15)	Cyclic, t#100ms				16#0004	4	
	3 built-in II.Digital Input	Read Discrete Inputs (Function Code 02)	Cyclic, t#100ms	16#0010	16	Keep last Value			
ModbusTCPSlave Parameters	4 built-in II.Digital Output(R)	Read Coils (Function Code 01)	Cyclic, t#100ms	16#0008	8	Keep last Value			
	5 built-in II.Digital Output(W)	Write Multiple Coils (Function Code 15)	Cyclic, t#100ms				16#000C	4	

步驟 7. 在開機時會設定初始值，只有前 10 個會被設定，每一項只能設定一個 word 的數值。

General	Line	Access Type	WRITE Offset	Default Value	Length	Comment
Modbus Slave Channel	1	Write Single Register (Function Code 06)	16#17D4 (=6100)	0	1	Life Guarding Time, unit: ms
	2	Write Single Register (Function Code 06)	16#273D (=10045)	0	1	iBus continues run
Modbus Slave Init	3	Write Single Register (Function Code 06)	16#0FCC (=4044)	1	1	Terminal I Input Setting
	4	Write Single Register (Function Code 06)	16#0FCD (=4045)	1	1	Terminal II Input Setting
ModbusTCPSlave Parameters	5	Write Single Register (Function Code 06)	16#0FBC (=4028)	1000	1	TimeWindows
	6	Write Single Register (Function Code 06)	16#0FBD (=4029)	0	1	WindowsChannel
ModbusTCPSlave I/O Mapping	7	Write Single Register (Function Code 06)	SimpleCounter0DigitalOutputPoint (=4080)	0	1	
	8	Write Single Register (Function Code 06)	16#0FF1 (=4081)	1	1	Simple Counter 1 DO point
Status	9	Write Single Register (Function Code 06)	16#0FF2 (=4082)	2	1	Simple Counter 2 DO point
	10	Write Single Register (Function Code 06)	16#0FF3 (=4083)	3	1	Simple Counter 3 DO point

步驟 8. 依 ModbusTCPSlave I/O Mapping 的 IO 地址建立 GLOBAL VAR。

IR_ETN40R_192_168_0_212 x

Find	Filter	Show all
Variable	Mapping	Channel
		built-in 'I'.Digital Input
		built-in 'I'.Digital Input[0]
		Bit0
		Bit1
		Bit2
		Bit3
		Bit4
		Bit5
		Bit6

Address	Type	Unit	Description
%IB0	ARRAY [0..1] OF BYTE		built-in 'I'.Digital Input
%IB0	BYTE		built-in 'I'.Digital Input
%IX0.0	BOOL		built-in 'I'.Digital Input
%IX0.1	BOOL		built-in 'I'.Digital Input
%IX0.2	BOOL		built-in 'I'.Digital Input
%IX0.3	BOOL		built-in 'I'.Digital Input
%IX0.4	BOOL		built-in 'I'.Digital Input
%IX0.5	BOOL		built-in 'I'.Digital Input
%IX0.6	BOOL		built-in 'I'.Digital Input

GVL x

```



1  VAR_GLOBAL
2      DI_I_00 AT %IX0.0:BOOL;
3      DI_I_01 AT %IX0.1:BOOL;
4      DI_I_02 AT %IX0.2:BOOL;
5      DI_I_03 AT %IX0.3:BOOL;
6      DI_I_04 AT %IX0.4:BOOL;
7      DI_I_05 AT %IX0.5:BOOL;
8      DI_I_06 AT %IX0.6:BOOL;
9      DI_I_07 AT %IX0.7:BOOL;
10     DI_I_08 AT %IX1.0:BOOL;
11     DI_I_09 AT %IX1.1:BOOL;
12     DI_I_10 AT %IX1.2:BOOL;
13     DI_I_11 AT %IX1.3:BOOL;
14
15     DI_II_00 AT %IX3.0:BOOL;
16     DI_II_01 AT %IX3.1:BOOL;
17     DI_II_02 AT %IX3.2:BOOL;
    
```

步驟 9. POU 裡建立的變數和程式只是為了可以產生 Symbol 給 HMI 讀寫。


```

POU x
1  PROGRAM POU
2  VAR
3      HMI_DI_I_00 : BOOL;
4      HMI_DI_I_01 : BOOL;
5      HMI_DI_I_02 : BOOL;
6      HMI_DI_I_03 : BOOL;
7      HMI_DI_I_04 : BOOL;
8      HMI_DI_I_05 : BOOL;
9      HMI_DI_I_06 : BOOL;
10     HMI_DI_I_07 : BOOL;
11     HMI_DI_I_08 : BOOL;
12     HMI_DI_I_09 : BOOL;
13     HMI_DI_I_10 : BOOL;

1  HMI_DI_I_00 := GVL_DI_I_00;
2  HMI_DI_I_01 := GVL_DI_I_01;
3  HMI_DI_I_02 := GVL_DI_I_02;
4  HMI_DI_I_03 := GVL_DI_I_03;
5  HMI_DI_I_04 := GVL_DI_I_04;
6  HMI_DI_I_05 := GVL_DI_I_05;
7  HMI_DI_I_06 := GVL_DI_I_06;
8  HMI_DI_I_07 := GVL_DI_I_07;
9  HMI_DI_I_08 := GVL_DI_I_08;
10 HMI_DI_I_09 := GVL_DI_I_09;
11 HMI_DI_I_10 := GVL_DI_I_10;
12 HMI_DI_I_11 := GVL_DI_I_11;
13
14 HMI_DI_II_00 := GVL_DI_II_00;
    
```

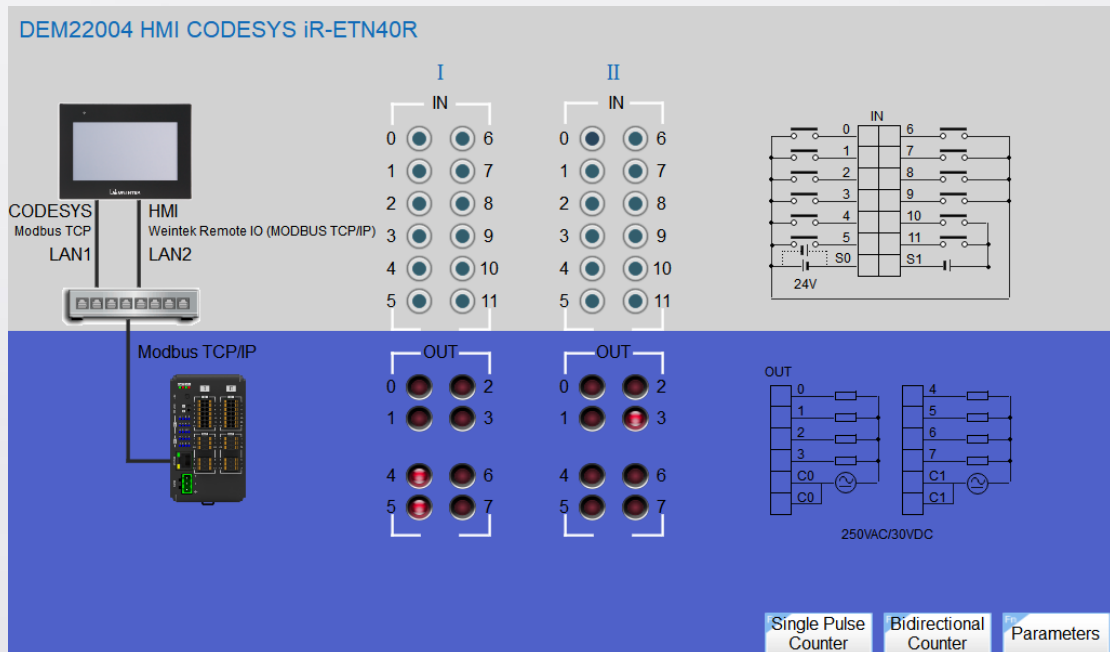
Symbol Configuration x						
View ▾ Build Settings ▾ Tools ▾						
Changed symbol configuration will be transferred with the next download or online change						
Symbols	Access Rights	Maximal	Attribute	Type	Members	Comment
 GVL	<input checked="" type="checkbox"/>					
 POU	<input checked="" type="checkbox"/>					

2. 畫面解說

主畫面

顯示 iR-ETN40R 數位輸入和輸出的狀態。

人機、CODESYS 經 Ethernet Switch 和 iR-ETN40R 連接。



Parameters 參數設定

顯示韌體版本、硬體版本和裝置功耗等資訊。

iBus 資訊暫存器顯示各插槽的模組代碼。

Disable Reset Button 在地址 4x1014 輸入 5AA5h 的數值可以防止 Reset Button 被誤按而後將網路參數回復出廠設定值。

Power Consumption 2.630 W	Product Code 0A73 h	Number of TCP/IP connections 0001	Device Error Code 00000000
Power Consumption 3.280 W	Firmware Revision 1001	MAC address 000C 2638 CD49	Bit Number Description Bit0 Low power alarm Bit1 iBus initialization fault Bit2 Hardware error Bit3 Module lost connection Bit4 Module alarm Bit5 Number of iBus exceeds 16 Bit6 Power consumption exceeded at iBus system Bit7~15 Reserved
Power Supply 10.000 W	Hardware Revision 1000	Disable Reset Button 5AA5h : Reset Button is ineffective.	
Life Guard Time 0 ms	RUN/STOP Disable	0000	
	RUN/STOP Input Point 0	Disable Enable	

Slot	0	1	2	3	4	5	6	7	8	9	10	11	12	~16
Product code	0A73	0351	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	

iBus Continue Run
☒

0: iBus stops when one of the modules is disconnected.
1: iBus continues running when one of the modules is disconnected.

Mode Indicator
☒

0: Modbus
1: EtherNet/IP

Item Product Code
1 iR-DI16-K 0154h
2 iR-DM16-P 0351h
3 iR-DQ16-P 0251h
4 iR-DM16-N 0352h
5 iR-DQ16-N 0252h
6 iR-DQ08-R 0243h
7 iR-AQ04-VI 0525h
8 iR-AI04-VI 0425h
9 iR-AM06-VI 0635h
10 iR-AI04-TR 0426h
11 iR-ETN 0702h
12 iR-ETN40R 0A73h

Single Pulse Counter 單脈波計數器

進入這一頁時會將高速輸入點設成四個單脈波計數器，高速輸入點 DI 10 和 11。設定 ON-trigger 和 OFF-trigger 的數值就會在計數到達時去 ON/OFF 輸出點。下方 Rate Measurement 速率量測，依選擇的計數器在時間間隔內，所接受到的計數值總數。如果 Time Windows 設成 1000ms，Rate Value 就等於 Hz。

Counter	Terminal I Input Setting	1: Single pulse only	Out	Out
	0: Counting 1: Stops Counting	0: Keep Counting 1: Stop Counting 2: Clear Count Value	0 1	2 3
Counter value	State	Command	Upper limit	DO Point
Counter 0	0	0	4294901760	0
Counter 1	0	0	4294901760	1
Counter 2	0	0	4294901760	2
Counter 3	0	0	10	3
ON trigger value	OFF trigger value	INPUT	10	11
10	0	10	11	11

Terminal II Input Setting	1: Up & down pulse
0: Up pulse 1: Down pulse	

Rate Measurement	Time-Windows	Windows Channel	Rate Value
1000 ms	5	Bidirectional Counter 0	0

Frequency [Hz] = Rate Value / Time-Window [sec.]

Bidirectional Counter 雙脈波計數器

進入這一頁時會設成雙脈波計數器模式，高速輸入點 DI 10 和 11 是做為正數和倒數的功能。設定 ON-trigger 和 OFF-trigger 的數值就會在計數到達時去 ON/OFF 輸出點。下方同樣有 Rate Measurement 速率量測。

Counter

Terminal I Input Setting

5

5:Up & down pulse

DO Point

ON trigger value

OFF trigger value

0

0

2

0

0

10

1

1

5

3

1

11

2

2

8

6

2

2

3

3

12

10

3

3

Bidirectional Counter 0

Counter value

0

Upper limit

2147483647

Lower limit

-2147483648

Upper limit Reload

0

Lower limit Reload

0

Terminal II Input Setting

5

5:Up & down pulse

DO Point

ON trigger value

OFF trigger value

0

4

2

2

4

10

1

5

5

3

5

11

2

6

8

6

6

6

3

7

12

10

7

7

Bidirectional Counter 1

Counter value

0

Upper limit

2147483647

Lower limit

-2147483648

Upper limit Reload

0

Lower limit Reload

0

Rate Measurement

Time-Windows

1000

ms

Windows Channel

5

Bidirectional Counter 0

Rate Value

0

Main

3. 參考文件

手冊	連結
iR-ETN40R 使用手冊	UM021002T_iR-ETN40R_UserManual_cht.pdf
EasyRemoteIO 使用手冊	UM018004T_EasyRemoteIO_UserManual_cht.pdf
Weintek Built-in CODESYS	Weintek_Built_in_CODESYS.pdf
Weintek Remote IO (MODBUS TCP/IP) 連接手冊	Weintek_Remote_IO_MODBUS_TCP_IP.pdf