



# EtherCAT 快速上手

## FLEX-6 NANO



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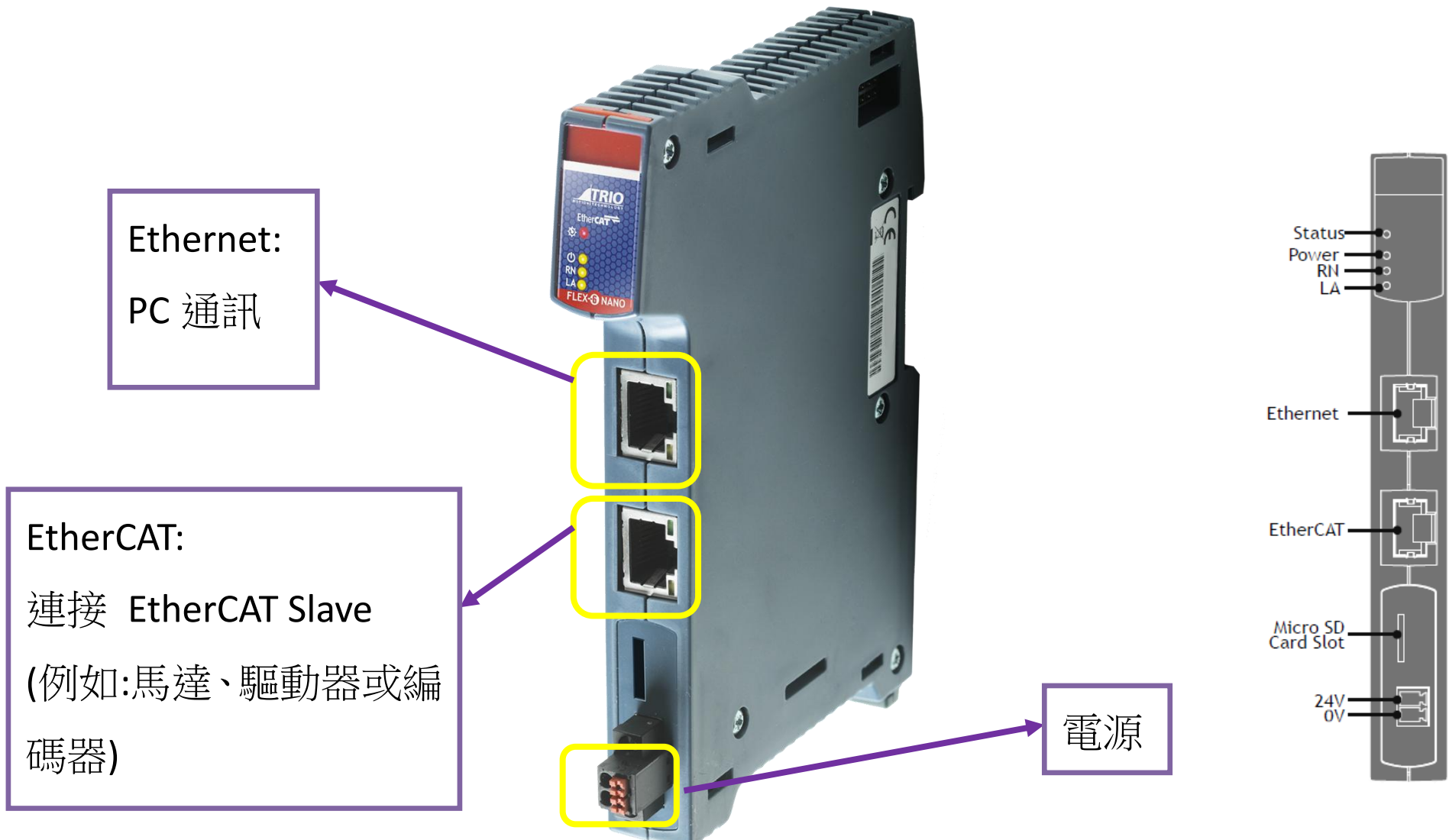
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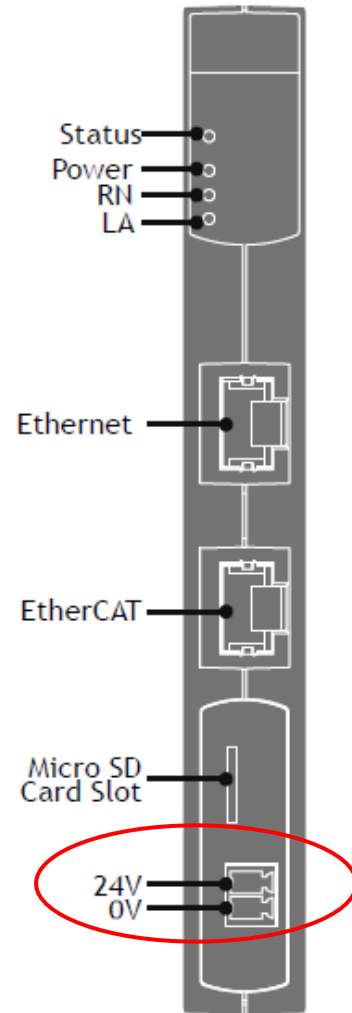
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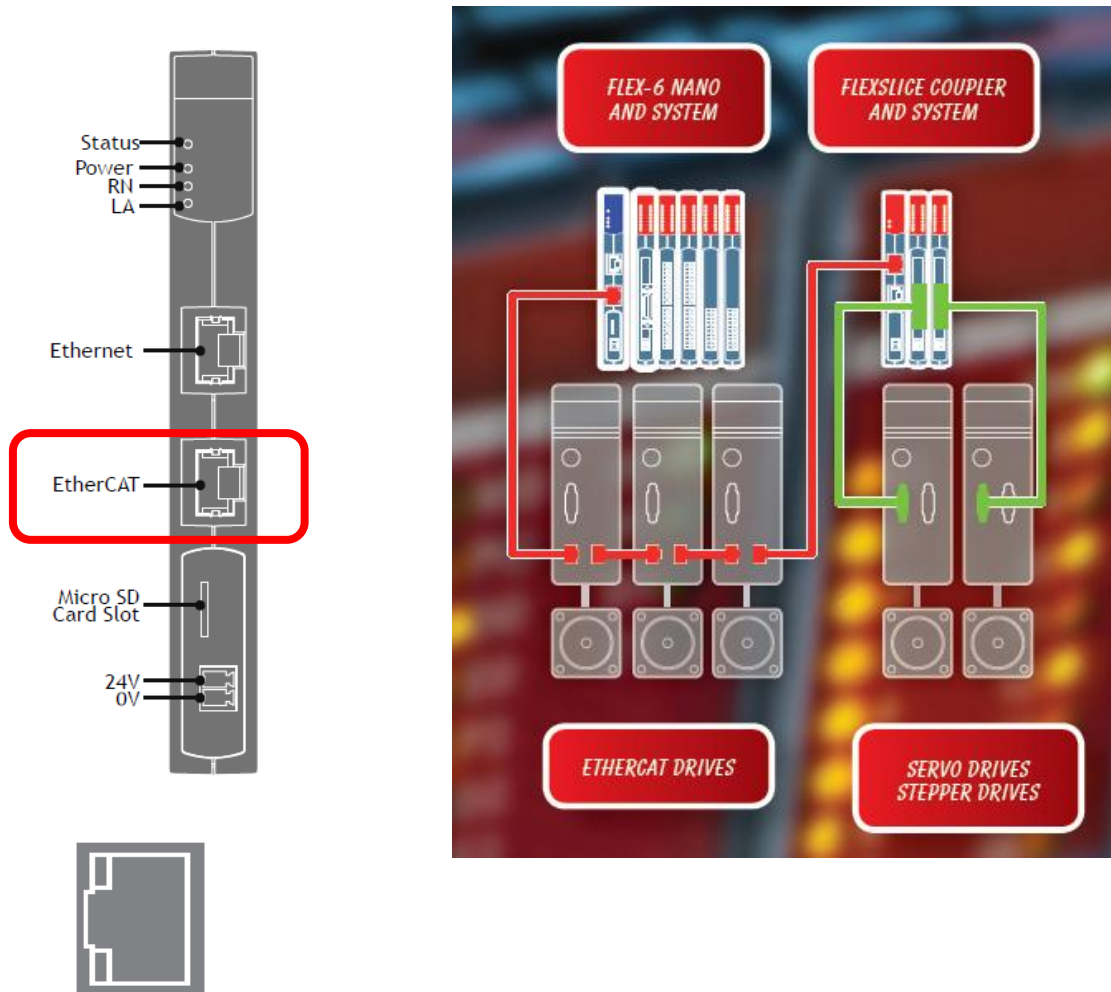


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## ETHERCAT NETWORK DETECTION

Intelligent drives

Slot 0 - EtherCAT

Diagram

Master state: Operational

Address: 2000 1 1000 1001

Axis: 0 1 2

Drives

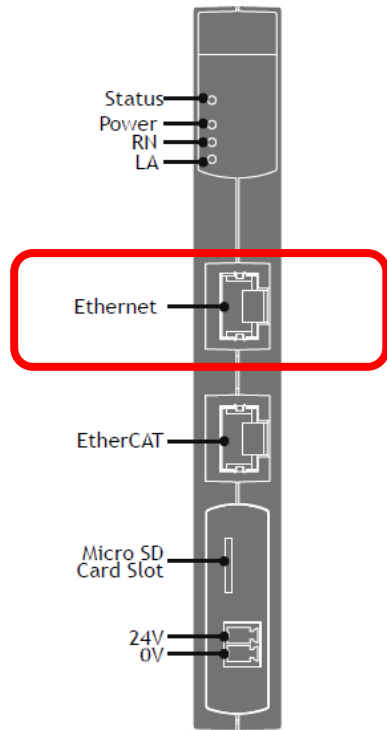
Axis	Ctrl Mode	Model	Pos	Alias	Configured
0	71	P375 3 Axes Stepper Output	1	0	1
1	71	P375 3 Axes Stepper Output	1	0	1
2	71	P375 3 Axes Stepper Output	1	0	1

Other devices

Model	Pos	Alias	Configured
P600	0	0	2000
P376 DOUT 16 NPN	2	0	1000
P376 DOUT 16 NPN	3	0	1001

Modify STARTUP Program Browse database...

*EtherCAT Intelligent drives Window in Motion Perfect.*



建議： Ethernet 網路線請使用 CAT5 以上等級

1. 開啟 **網路和共用中心**，找尋 **區域連線**，點擊。



## 2. 點擊內容。

The screenshot shows the Windows 7 Network and Sharing Center. A dialog box titled "區域連線 狀態" (Network Status) is open, displaying the following information:

連線	
IPv4 連線能力:	無網際網路存取
IPv6 連線能力:	無網路存取
媒體狀態:	已啟用
連線時間:	02:09:32
速度:	100.0 Mbps

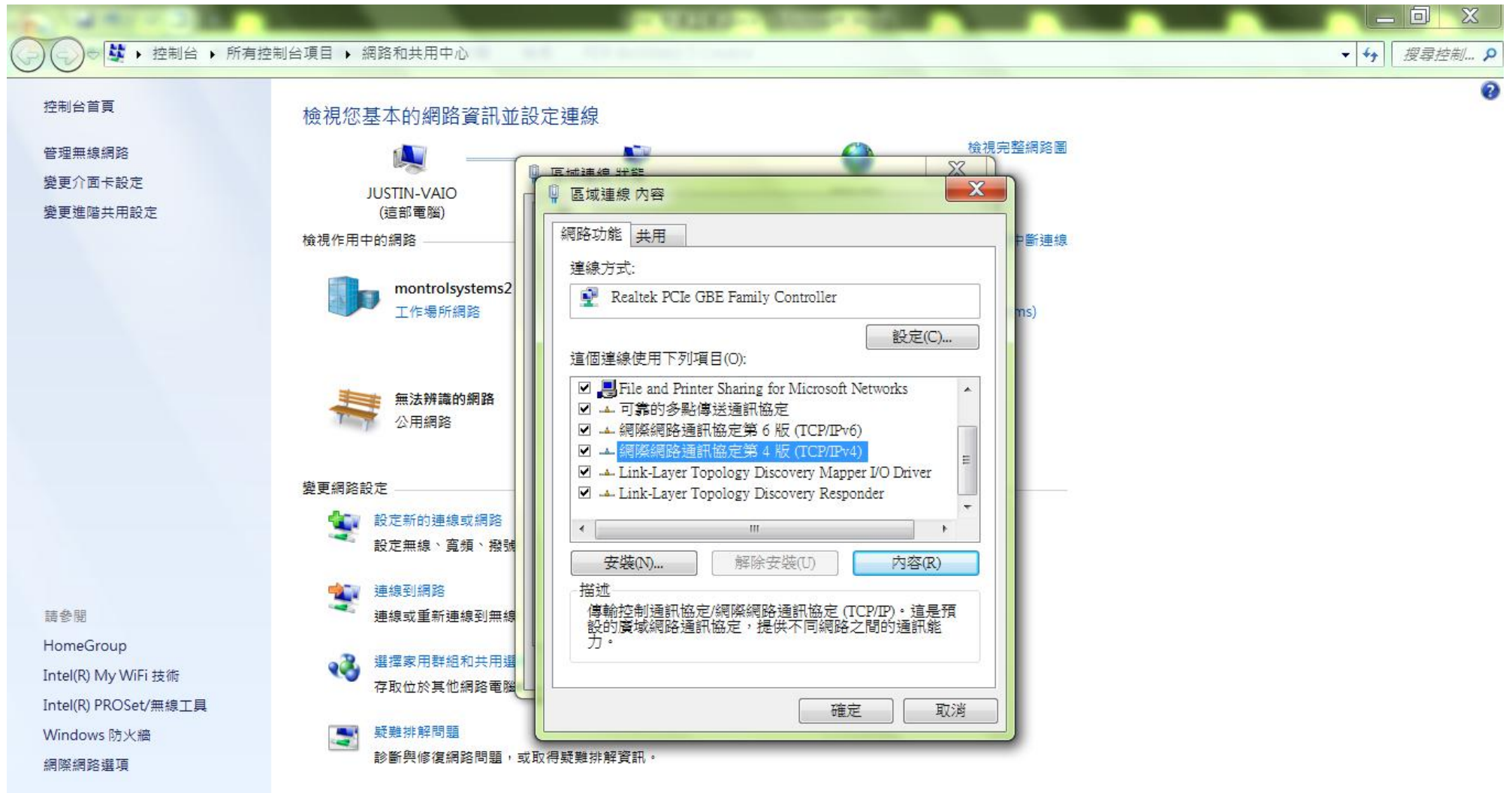
Below the connection information, there is a section for "活動" (Activity) showing data transfer statistics:

	已傳送	已收到
位元組:	816,566	1,062,042

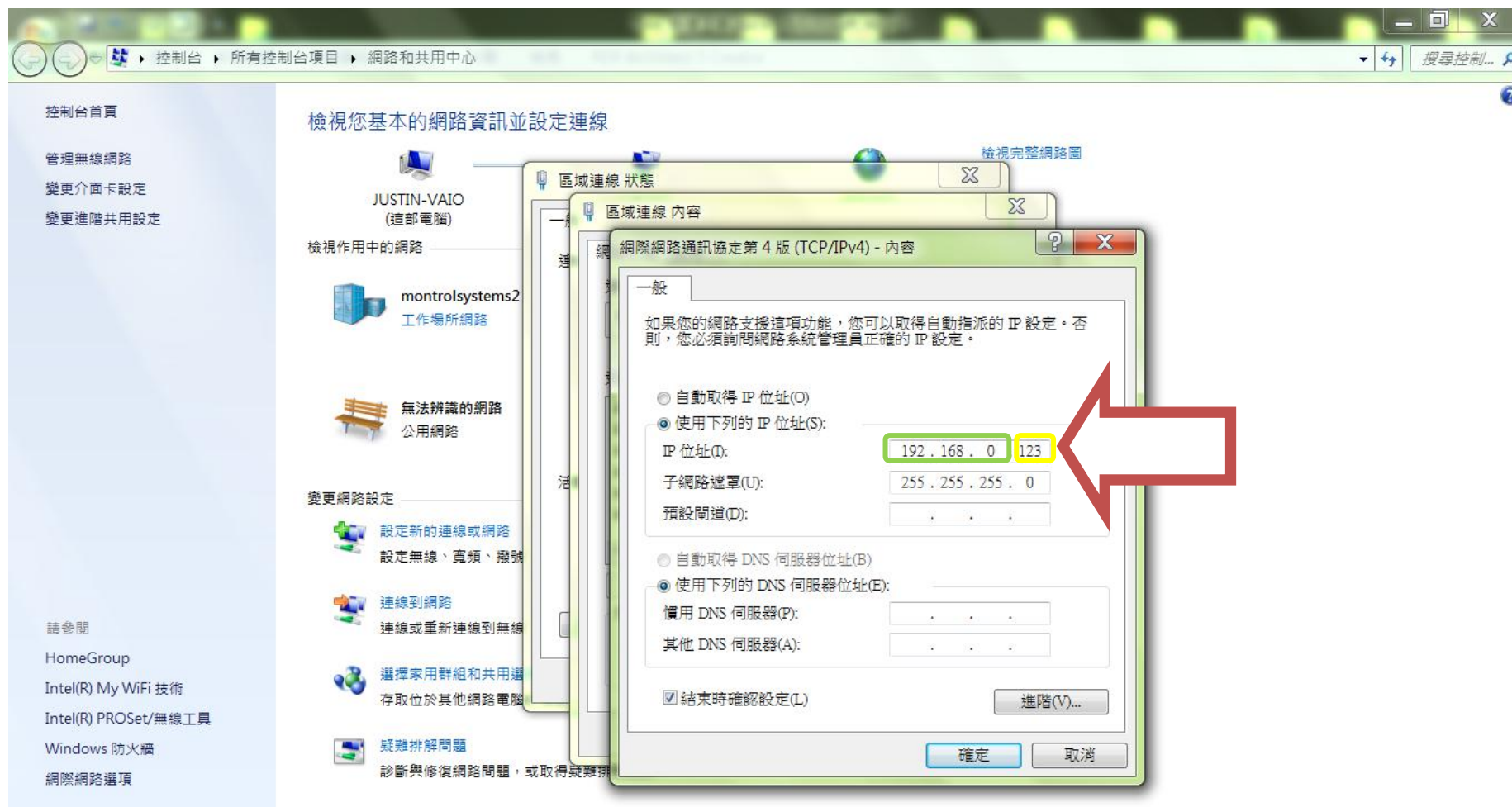
At the bottom of the dialog box, there are three buttons: "內容(P)" (Content Advisor), "停用(D)" (Disable), and "診斷(G)" (Diagnose). A red arrow points to the "內容(P)" button.





3. 找尋網際網路通訊協定第 4 版(TCP/IPv4) -> 按內容。

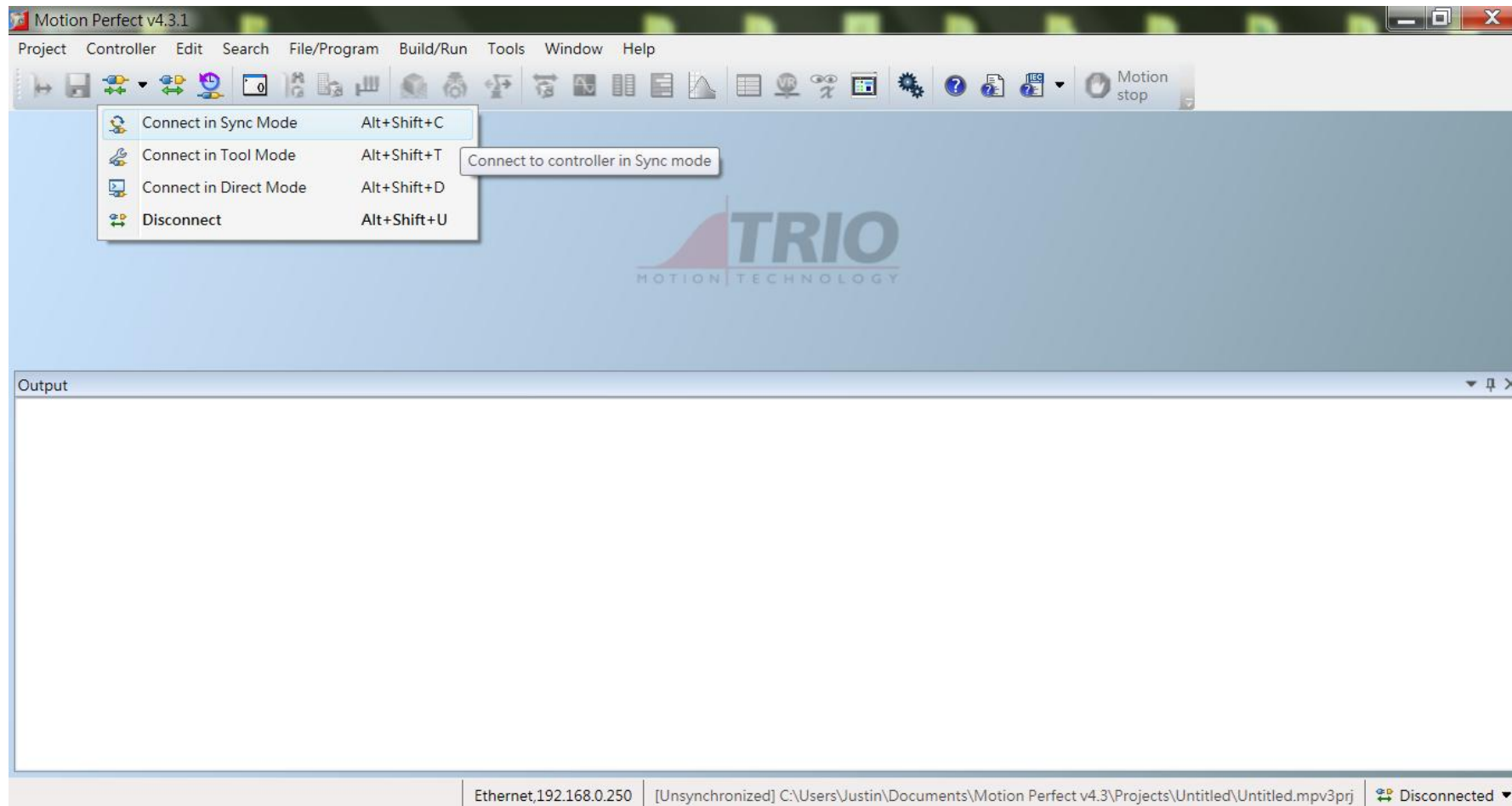


4. 選項修改為**使用下列的 IP 位址**，設定電腦部份 IP 位址，前三碼 **192.168.0** 與軟體上 Controller IP Address 相同(詳見第 6 點)，末一碼 **123** 不可相同(軟體預設 250)，並按確定。

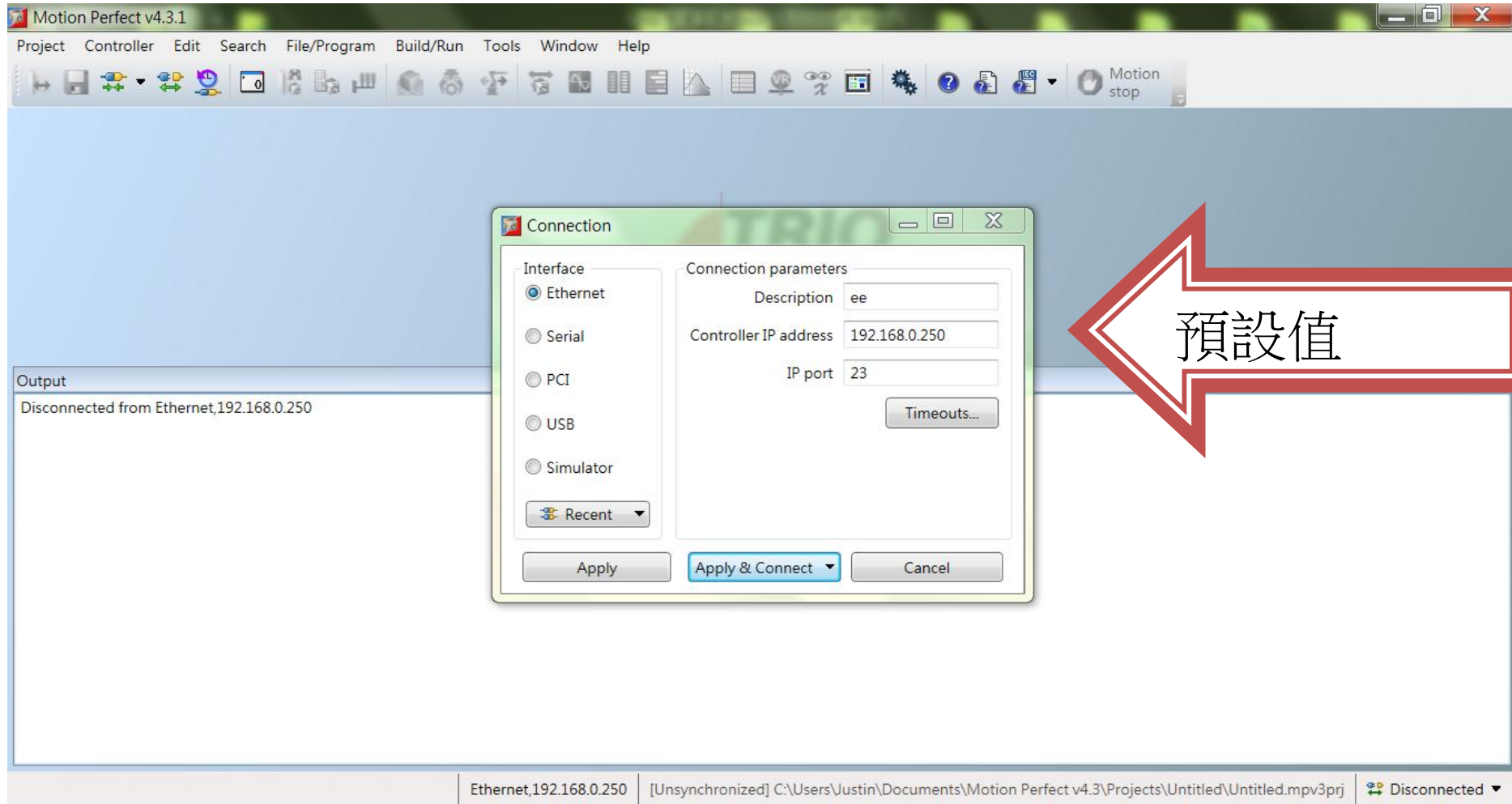





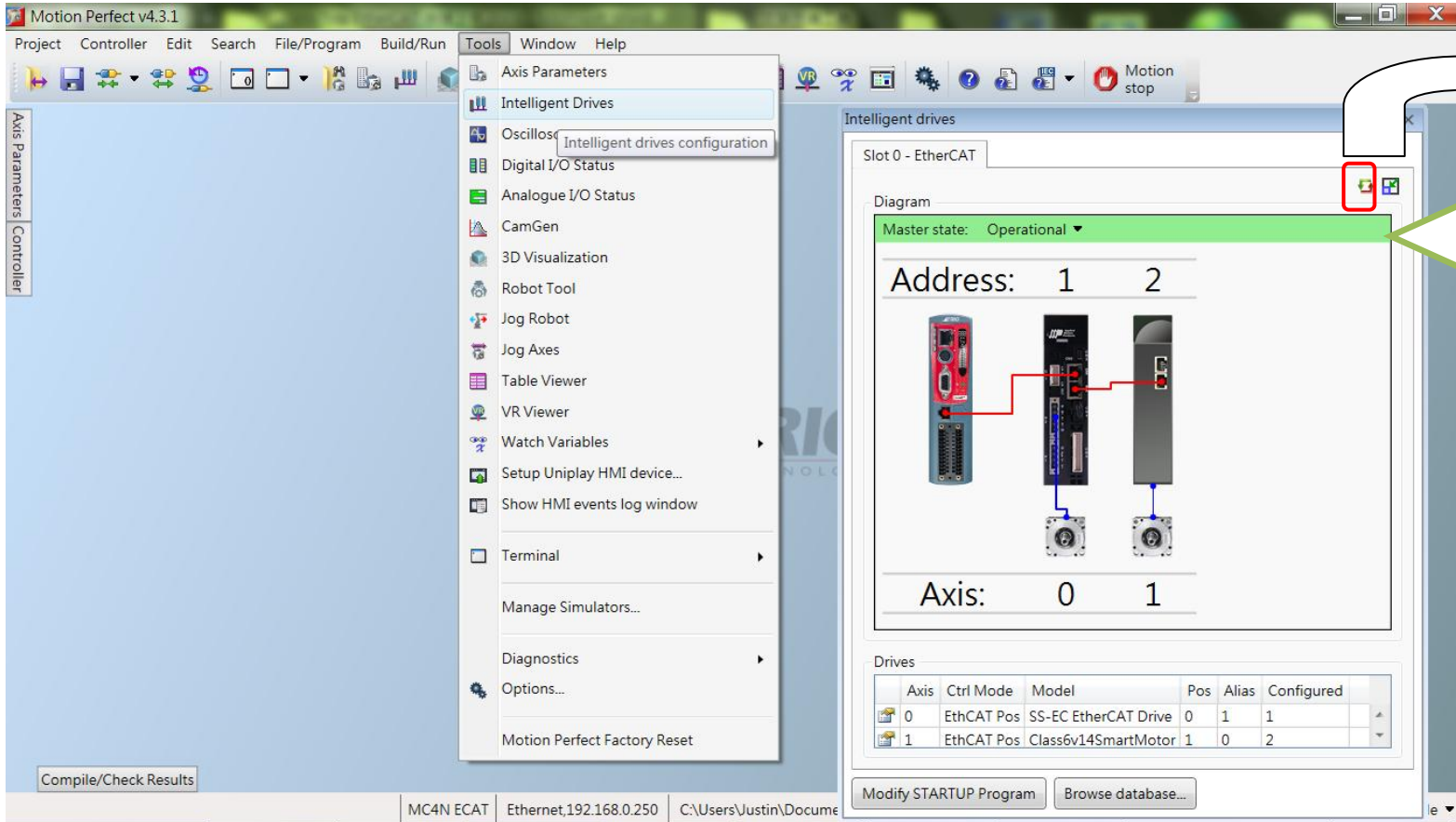
5. 滑鼠雙擊圖示 ，開啟 Motion Perfect 軟體，點選工具選單 Controller 或圖示  -> Connect in Sync Mode，與機台連線。



6. 選擇連線方式(以 Ethernet 為例)，第一次連線須做設定(之後軟體會自動記憶先前的連線方式)，並點選 **Apply & Connect** 完成連線。



Intelligent Drives 視窗：點擊圖示  或點選功能選單 Tools -> 開啟 Intelligent Drives，可查看 EtherCAT 連線狀態。



The screenshot shows the 'Intelligent drives' window for 'Slot 0 - EtherCAT'. The 'Master state' is 'Operational', which is highlighted in green. Below this, a diagram shows two drives connected to two axes. The first drive is connected to Axis 0, and the second drive is connected to Axis 1. A table below the diagram lists the drive details:

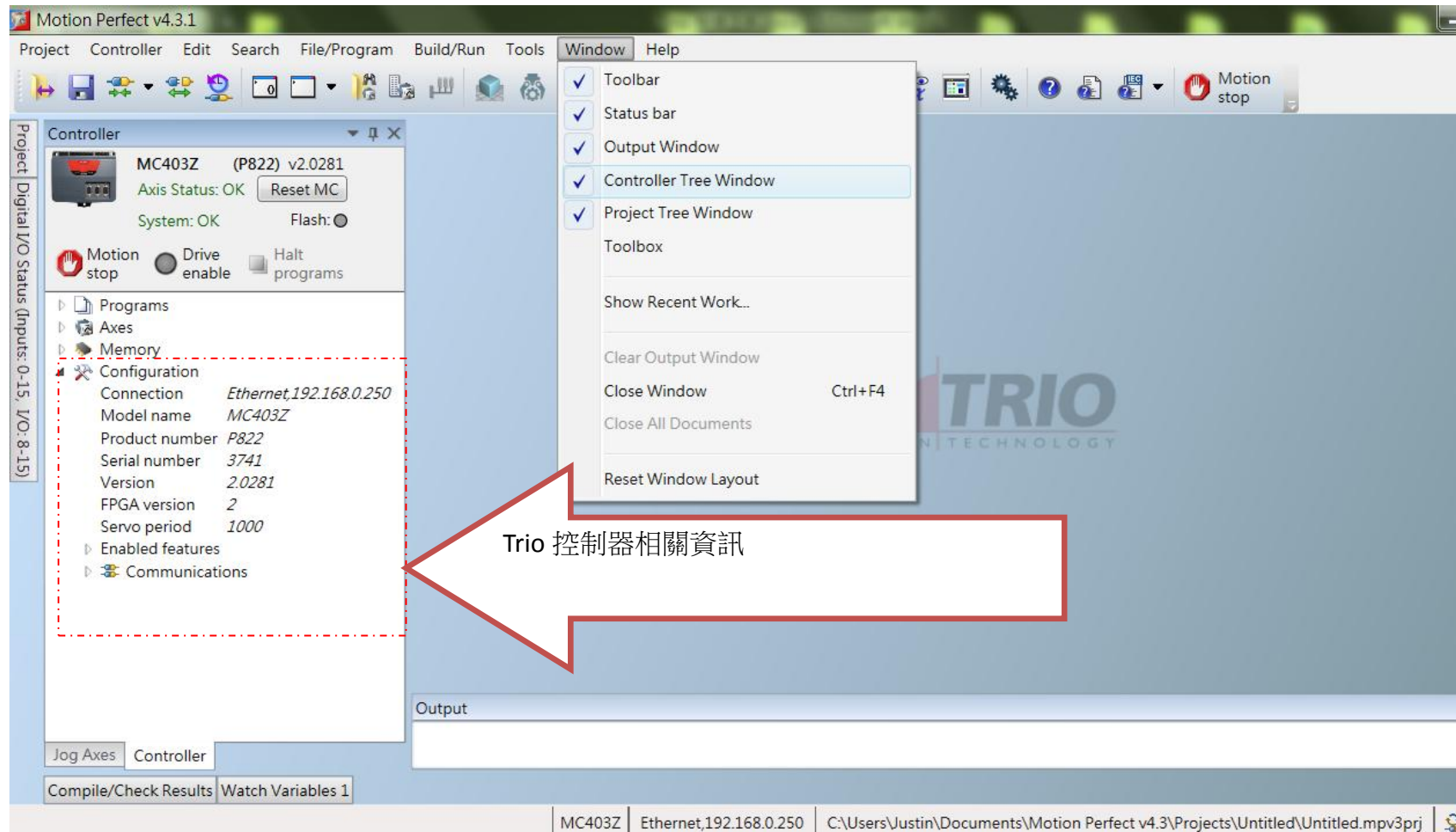
Axis	Ctrl Mode	Model	Pos	Alias	Configured
0	EthCAT Pos	SS-EC EtherCAT Drive	0	1	1
1	EthCAT Pos	Class6v14SmartMotor	1	0	2

At the bottom of the window, there are buttons for 'Modify STARTUP Program' and 'Browse database...'. The status bar at the bottom shows 'MC4N ECAT', 'Ethernet,192.168.0.250', and 'C:\Users\Justin\Docume'.

若連線不正常時可按此鍵重新整理。

顯示綠色時為正常連線

1. Controller 視窗：點選功能選單 Window -> 勾選 Controller Tree Window。





2. Axis Parameters 視窗：點擊圖示 或點選功能選單 Tools ->開啟 Axis Parameters，可查看運動軸的參數設定及回傳值。

Motion Perfect v4.3.1

Project Controller Edit Search File/Program Build/Run Tools Window Help

Axis Parameters

Select axes 1.0 (Type text to search for)

Parameter	Axis (0)	Axis (1)	Axis (2)
ATYPE	Step+Dir	Step+Dir	Step+Dir
UNITS	1.0	1.0	1.0
▲ Gains			
P_GAIN	1.0	1.0	1.0
I_GAIN	0.0	0.0	0.0
D_GAIN	0.0	0.0	0.0
OV_GAIN	0.0	0.0	0.0
VFF_GAIN	0.0	0.0	0.0
▲ Velocity profile			
ACCEL	10000.0	10000.0	10000.0
DECEL	10000.0	10000.0	10000.0
SPEED	1000.0	1000.0	1000.0
CREEP	100.0	100.0	100.0
MERGE	0	0	0
SRAMP	0	0	0
MSPEED	0.0	0.0	0.0
VP_SPEED	0.0	0.0	0.0
▲ Limits			
DATUM_IN	-1	-1	-1
FE_LIMIT	20000.0	20000.0	20000.0
FE_RANGE	10000.0	10000.0	10000.0
FHOLD_IN	-1	-1	-1
FWD_IN	-1	-1	-1
REP_DIST	200000000000.0	200000000000.0	200000000000.0

Axis Parameters Jog Axes Controller

Compile/Check Results Watch Variables 1

MC403Z Ethernet,192.168.0.250 C:\Users\Justin\Documents\Motion Perfect v4.3\Projects\Untitled\Untitled.mpv3prj Sync mode



3. I/O 視窗：點擊圖示 或點選功能選單 Tools ->開啟 Digital I/O Status，可查看數位 I/O 狀態。

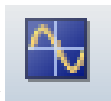
The screenshot shows the Motion Perfect v4.3.1 software interface. The main window displays the Digital I/O Status window, which is divided into two sections: Built-In Inputs and Built-In I/Os. The Built-In Inputs section shows a table with columns 'In' and 'Description', and rows 0 through 7. The Built-In I/Os section shows a table with columns 'I/O' and 'Description', and rows 8 through 15. The status bar at the bottom indicates MC403Z, Ethernet, 192.168.0.250, C:\Users\Justin\Documents\Motion Perfect v4.3\Projects\Untitled\Untitled.mpv3prj, and Sync mode.

Built-In Inputs	
In	Description
0	
1	
2	
3	
4	
5	
6	
7	


Built-In I/Os	
I/O	Description
8	
9	
10	
11	
12	
13	
14	
15	

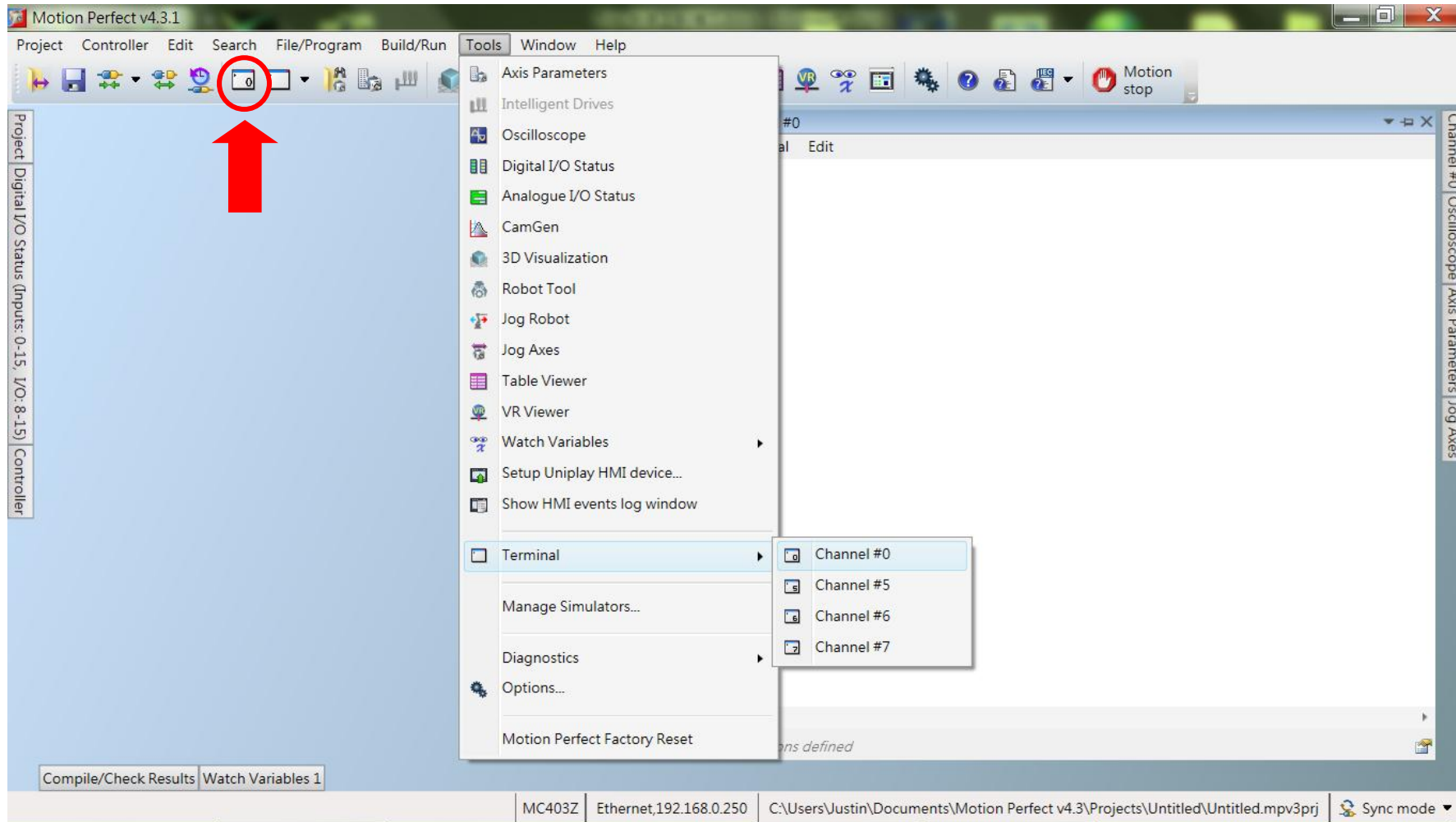




4. Oscilloscope 視窗：點擊圖示 或點選功能選單 Tools -> 開啟 Oscilloscope，可查看運動軌跡或波形。

The screenshot displays the Motion Perfect v4.3.1 software interface. The main window is titled "Motion Perfect v4.3.1" and features a menu bar (Project, Controller, Edit, Search, File/Program, Build/Run, Tools, Window, Help) and a toolbar. The "Tools" menu is open, highlighting the "Oscilloscope" option. The Oscilloscope window is active, showing a configuration panel on the left and a grid on the right. The configuration panel includes settings for multiple channels (Axis 0 and Axis 2) with variables like DPOS and DEMAND\_SPEED. The grid shows "Ch.0 No data" and "Ch.1 No data". The status bar at the bottom indicates "MC403Z Ethernet, 192.168.0.250" and "C:\Users\Justin\Documents\Motion Perfect v4.3\Projects\Untitled\Untitled.mpv3prj".

點擊圖示  或點選功能選單 Tools -> Terminal 開啟



軸參數預設值 UNITS=1; ACCEL=10000; DECEL=10000; SPEED=1000

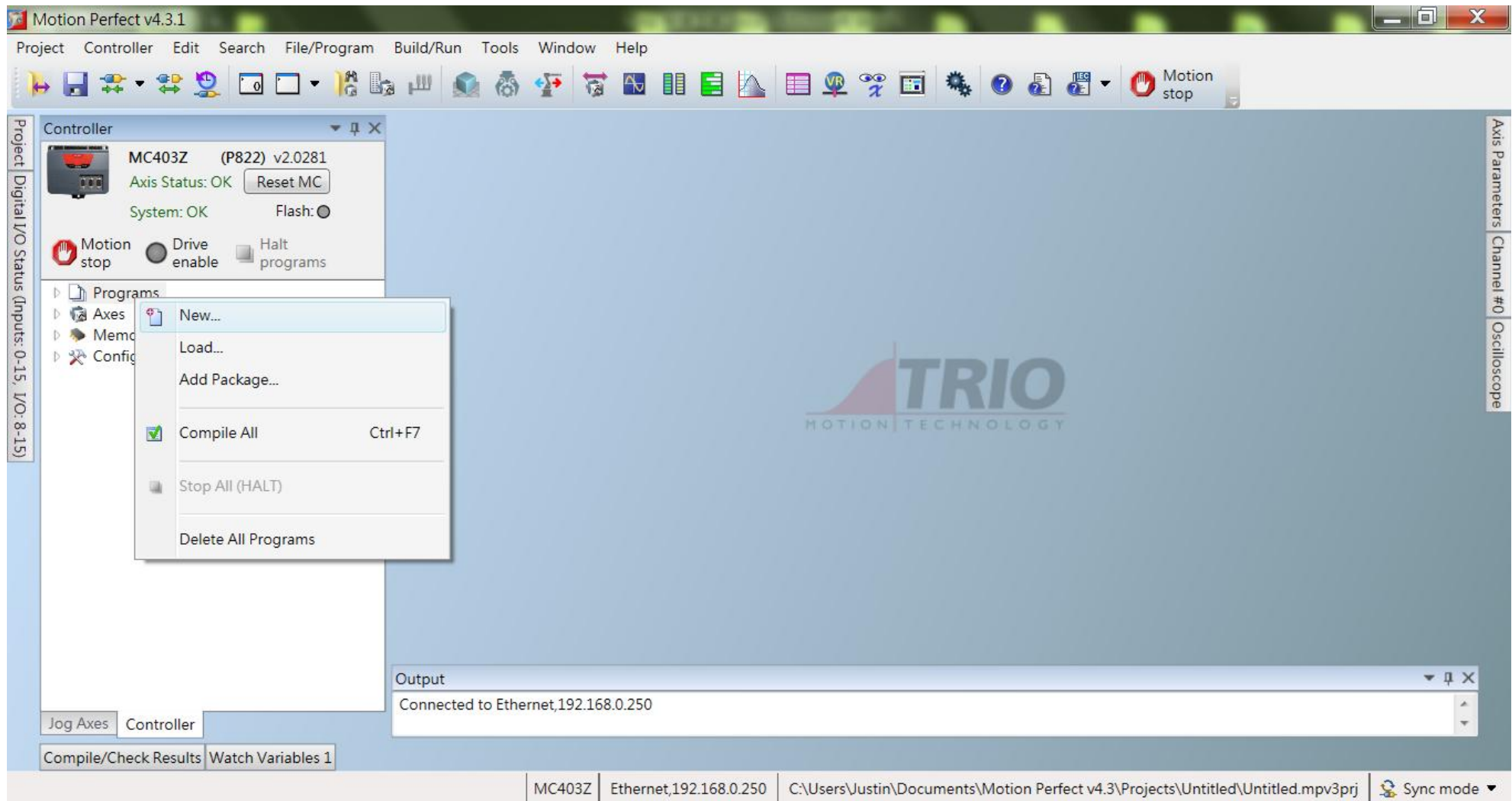
以步進馬達解析度 25000 為例，UNITS=25000\*16(EtherCAT 無需乘 16 倍數); ACCEL=10; DECEL=10; SPEED=1，下指令 MOVE(1)可使馬達 1 秒內轉 1 圈 (EtherCAT 需加入 SERVO=ON)

The screenshot displays the Motion Perfect v4.3.1 software interface. The 'Axis Parameters' window is open, showing a table of parameters for two axes. The 'UNITS' parameter for Axis (0) is highlighted with a yellow box and set to 400000.0. The 'Velocity profile' section also has a yellow highlight around the ACCEL, DECEL, and SPEED parameters, which are set to 10.0, 10.0, and 1.0 respectively. The 'Terminal' window on the right shows the following commands being executed:

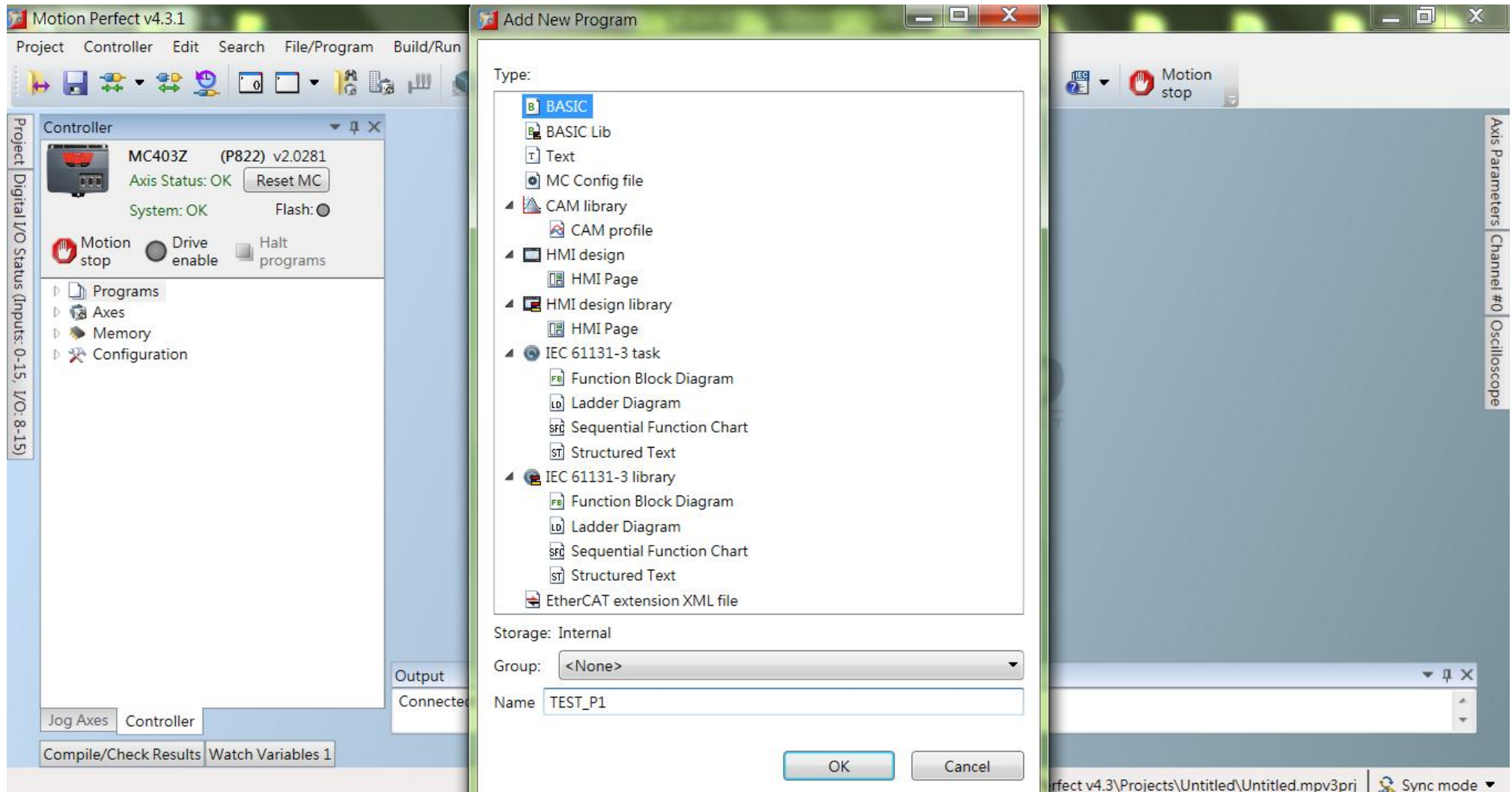
```
WDOG=ON
>>BASE (0)
>>UNITS=25000*16
>>ACCEL=10
>>DECEL=10
>>SPEED=1
>>MOVE (1)
>>
```

The status bar at the bottom indicates the controller is MC403Z, connected via Ethernet at 192.168.0.250, and the project path is C:\Users\Justin\Documents\Motion Perfect v4.3\Projects\Untitled\Untitled.mpv3prj. The sync mode is set to Sync mode.

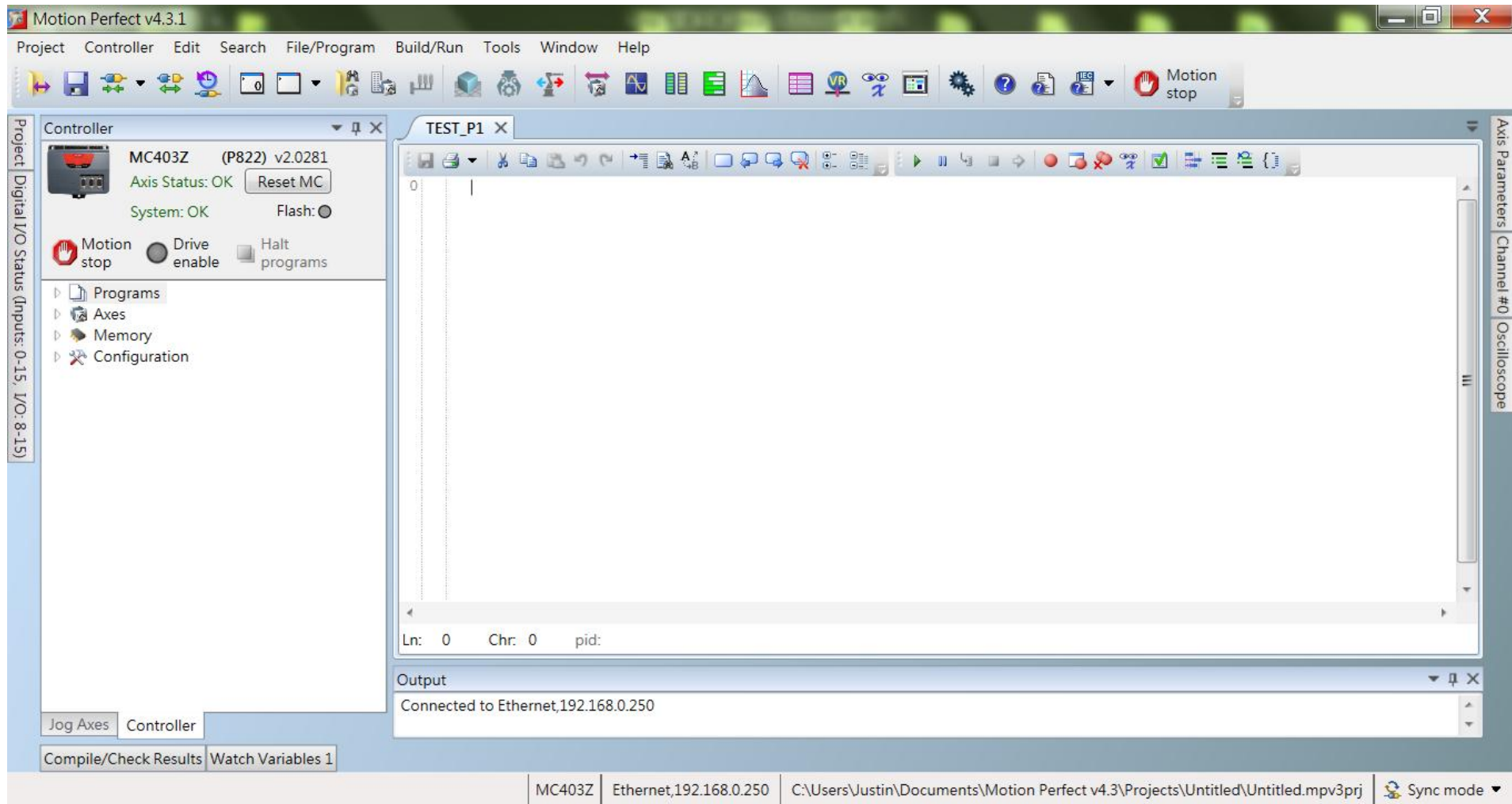
於 Controller 視窗的 Programs 點擊右鍵，點選 New...後會出現 Add New Program 視窗。



選擇 BASIC 並在 Name 欄位打上名字後，點擊 OK。

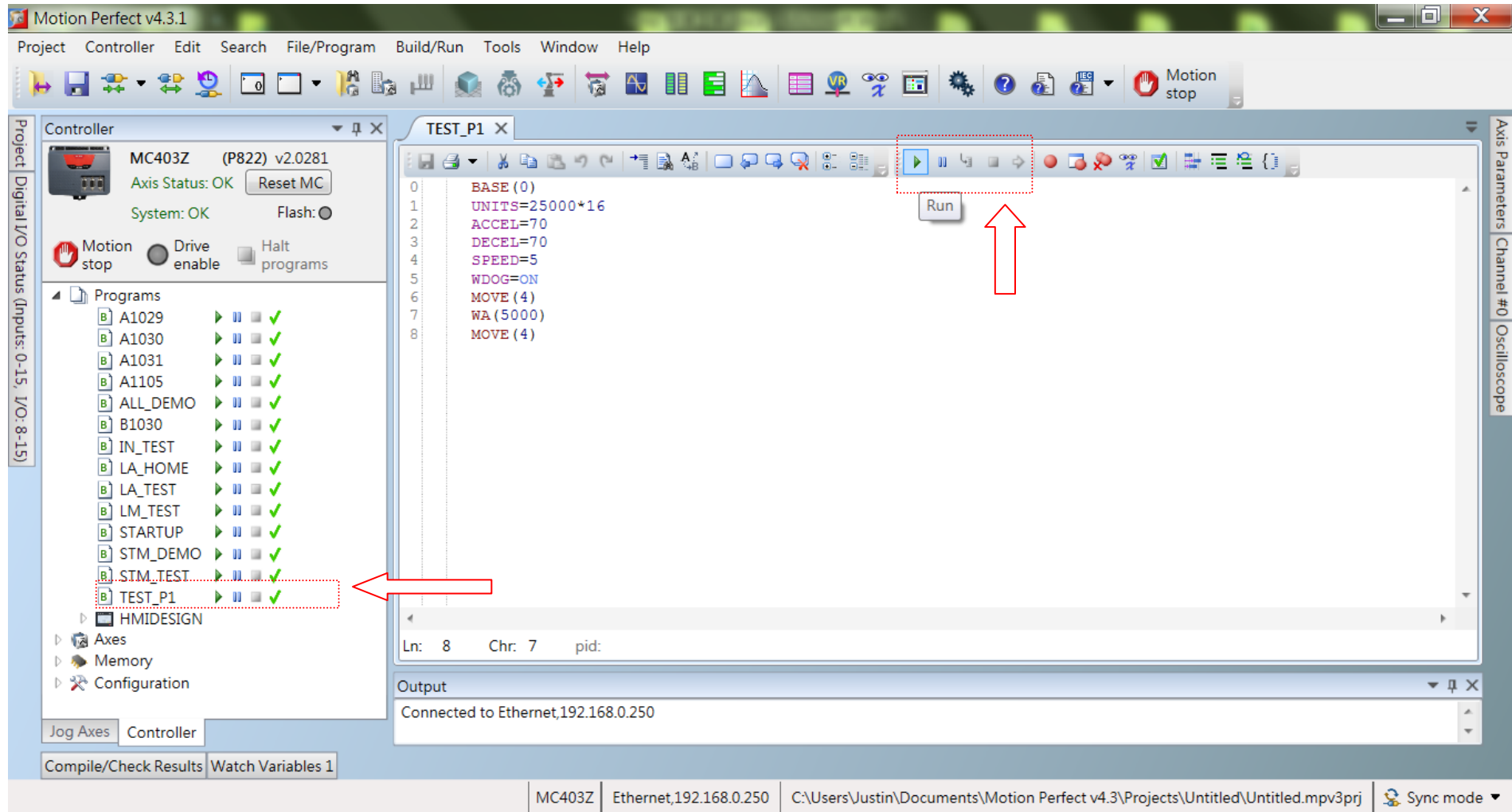


出現程式編輯介面，可開始編輯程式碼。

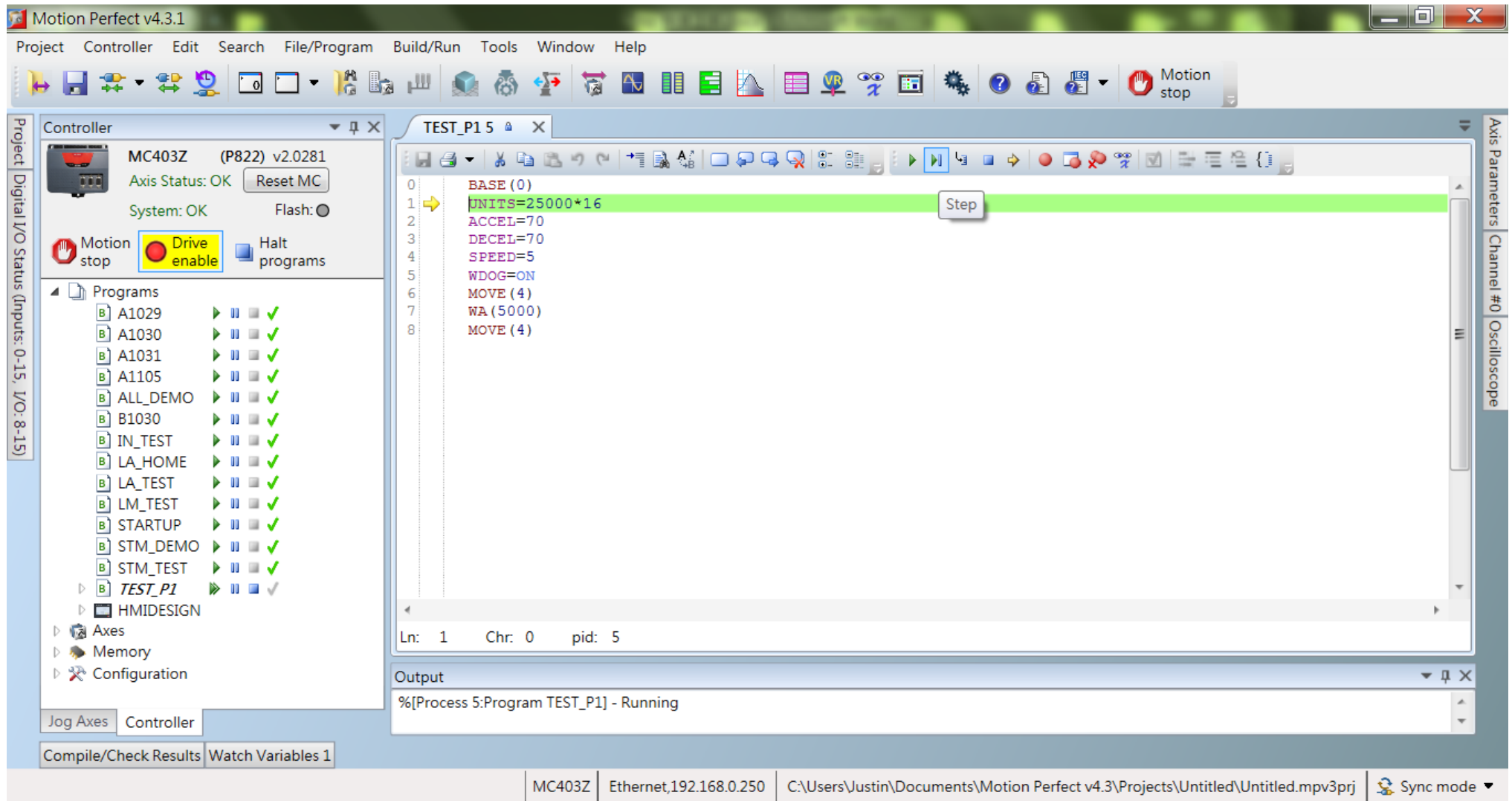


程式編輯完成後，按下 Run 鍵 ▶ 執行程式，程式由第一行開始執行至最後一行結束程式。  
倘若程式尚未執行至最後一行，但需強制終止程式時，按下 Stop 鍵 ◻ 可結束程式。

(EtherCAT 通訊時 UNITS 值無需乘 16 倍數，EtherCAT 需加入 SERVO=ON)



按下 Pause/Step 鍵 ，一次只執行一行程式碼。(EtherCAT 通訊時 UNITS 值無需乘 16 倍數，EtherCAT 需加入 SERVO=ON)





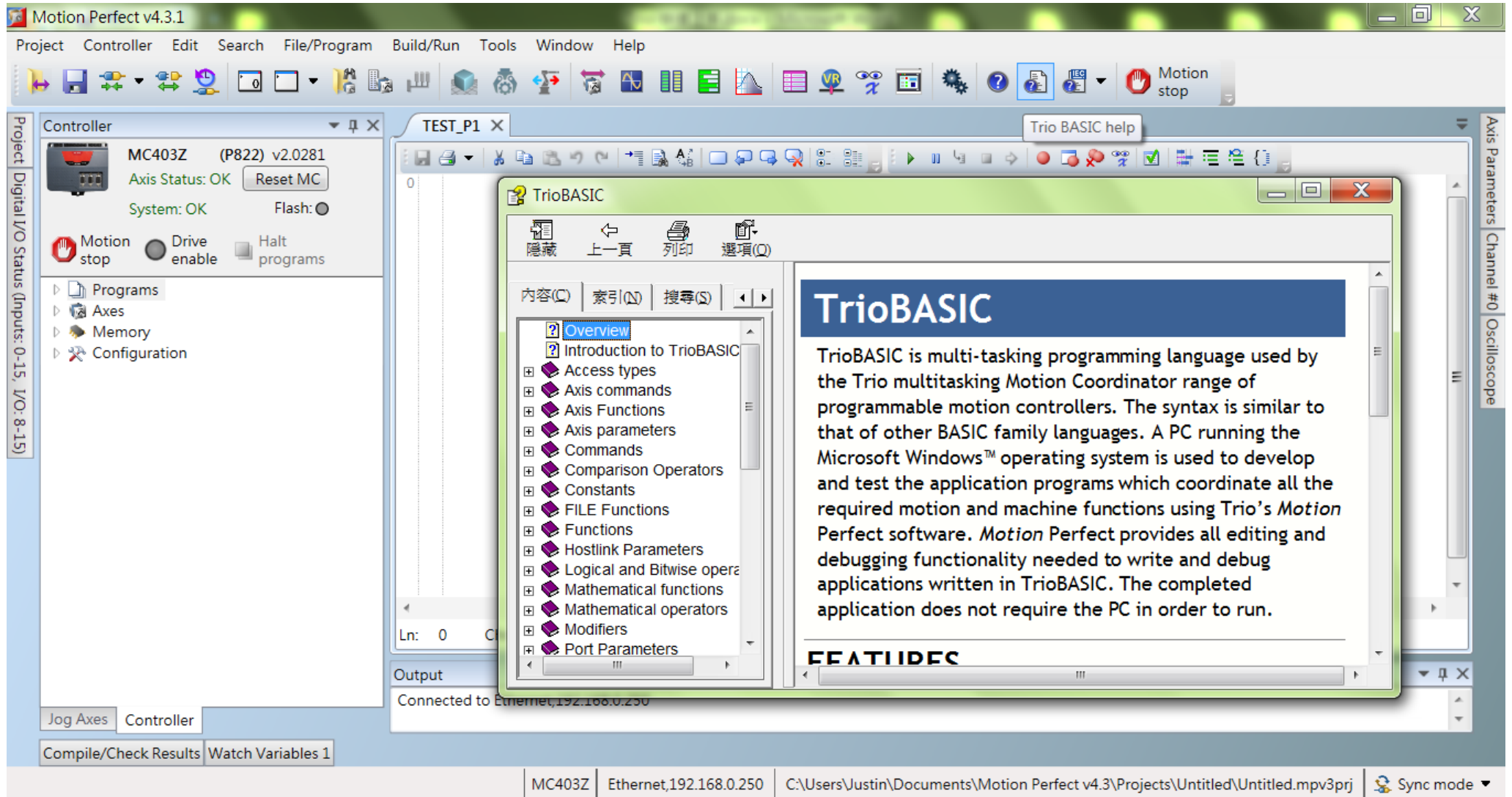
The screenshot displays the Motion Perfect v4.3.1 software interface. The main window shows a G-code program named TEST\_P1 5. The program code is as follows:

```
0 BASE (0)
1 UNITS=25000*16
2 ACCEL=70
3 DECEL=70
4 SPEED=5
5 WDOG=ON
6 MOVE (4)
7 WA (5000)
8 MOVE (4)
```

The line `UNITS=25000*16` is highlighted in green, and a 'Step' button is visible over it. The left sidebar shows the Controller status for MC403Z (P822) v2.0281, with 'Axis Status: OK' and 'System: OK'. The 'Motion stop' button is red, and 'Drive enable' is yellow. The 'Programs' list includes TEST\_P1, which is currently running. The bottom status bar shows 'MC403Z | Ethernet,192.168.0.250 | C:\Users\Justin\Documents\Motion Perfect v4.3\Projects\Untitled\Untitled.mpv3prj | Sync mode'.



點擊圖示  程式指令幫助，可查詢指令。 點擊圖示 ，軟體操作說明。



The screenshot displays the Motion Perfect v4.3.1 software interface. The main window is titled "TEST\_P1" and contains a code editor. A "TrioBASIC help" window is open, showing the "Overview" section. The help window has a table of contents on the left and a main text area on the right. The table of contents includes:

- Overview
- Introduction to TrioBASIC
- Access types
- Axis commands
- Axis Functions
- Axis parameters
- Commands
- Comparison Operators
- Constants
- FILE Functions
- Functions
- Hostlink Parameters
- Logical and Bitwise operations
- Mathematical functions
- Mathematical operators
- Modifiers
- Port Parameters

The main text area of the help window contains the following text:

**TrioBASIC**

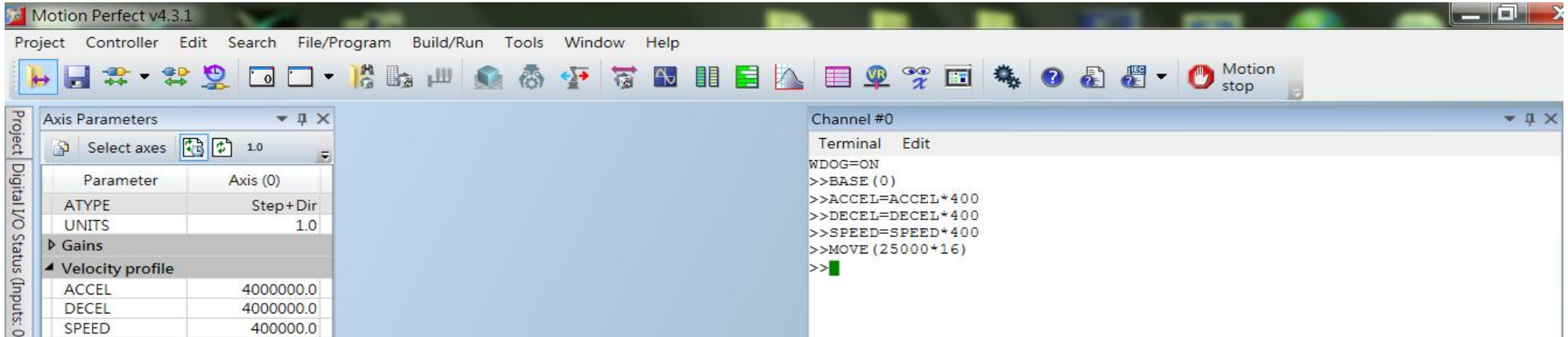
TrioBASIC is multi-tasking programming language used by the Trio multitasking Motion Coordinator range of programmable motion controllers. The syntax is similar to that of other BASIC family languages. A PC running the Microsoft Windows™ operating system is used to develop and test the application programs which coordinate all the required motion and machine functions using Trio's *Motion Perfect* software. *Motion Perfect* provides all editing and debugging functionality needed to write and debug applications written in TrioBASIC. The completed application does not require the PC in order to run.

**FEATURES**

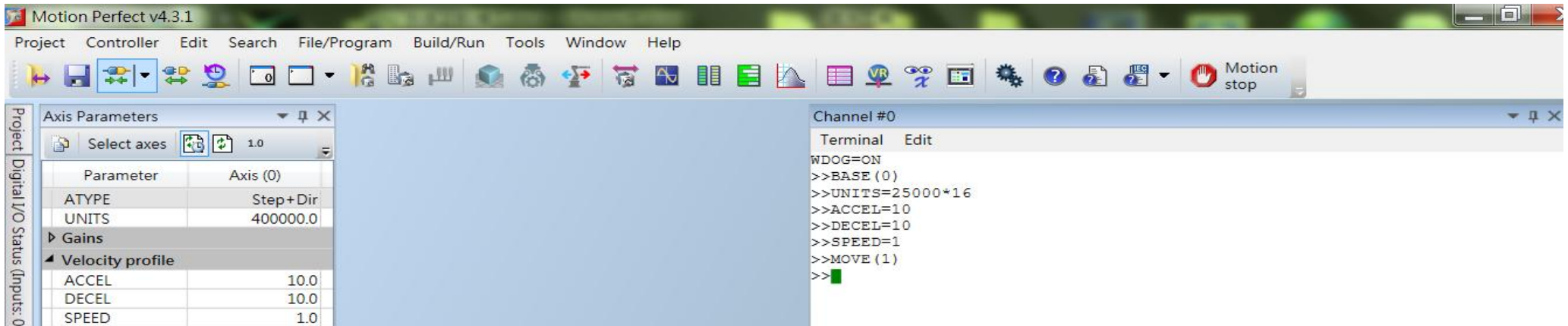
The interface also shows a "Controller" panel on the left with "MC403Z (P822) v2.0281" and "Axis Status: OK". The status bar at the bottom indicates "MC403Z | Ethernet,192.168.0.250 | C:\Users\Justin\Documents\Motion Perfect v4.3\Projects\Untitled\Untitled.mpv3prj | Sync mode".

(EtherCAT 通訊時 UNITS 值無需乘 16 倍數，EtherCAT 需加入 SERVO=ON)

以步進馬達解析度 25000 為例，若 UNITS=1，其餘值乘上  $1/0.0025=400$  倍，下指令 MOVE(25000\*16)可使馬達 1 秒內轉 1 圈



以步進馬達解析度 25000 為例，UNITS=25000\*16; ACCEL=10; DECEL=10; SPEED=1，下指令 MOVE(1)可使馬達 1 秒內轉 1 圈



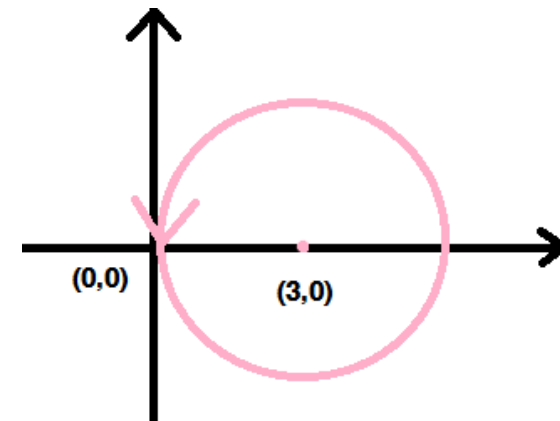
---

BASE(0)	'指定單運動軸位址為 0(可隨意指定)
UNITS=25000	'設定軸 0 馬達轉一圈步數(編碼器解析度 25000)
ACCEL=90	'設定軸 0 加速度(UNITS/SEC/SEC)為 90 rev/s <sup>2</sup>
DECEL=90	'設定軸 0 減速度(UNITS/SEC/SEC)為 90 rev/s <sup>2</sup>
SPEED=1	'設定軸 0 速度(UNITS/SEC)為 1 rps
SERVO=ON	'啟動伺服控制
BASE(2)	'指定單運動軸位址為 2(可隨意指定)
UNITS=25000	'設定軸 2 馬達轉一圈步數(編碼器解析度 25000)
ACCEL=100	'設定軸 2 加速度(UNITS/SEC/SEC)為 100 rev/s <sup>2</sup>
DECEL=100	'設定軸 2 減速度(UNITS/SEC/SEC)為 100 rev/s <sup>2</sup>
SPEED=4	'設定軸 2 速度(UNITS/SEC)為 4 rps
SERVO=ON	'啟動伺服控制
WDOG=ON	'啟動運動
MOVE (5) AXIS(0)	'軸 0 前進五圈(軸 0 速度)
MOVE (5) AXIS(2)	'軸 2 前進五圈(軸 2 速度)
WAIT IDLE AXIS(0)	'等待軸 0 運動完成
WAIT IDLE AXIS(2)	'等待軸 2 運動完成

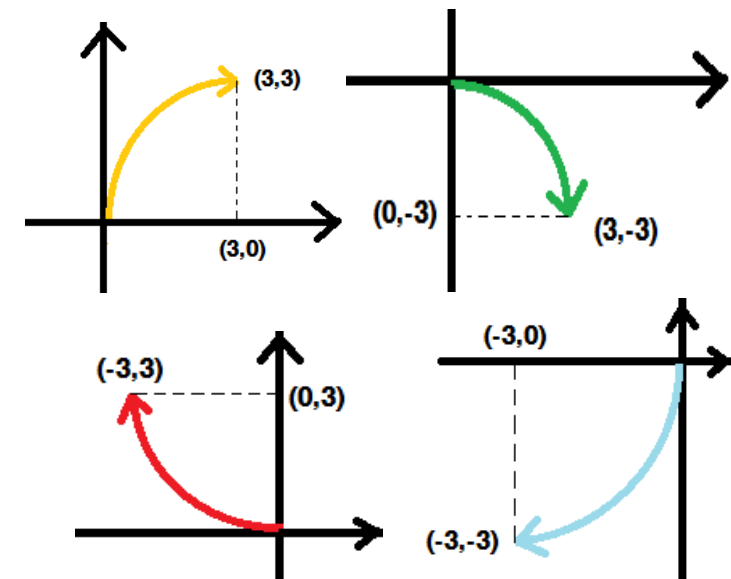
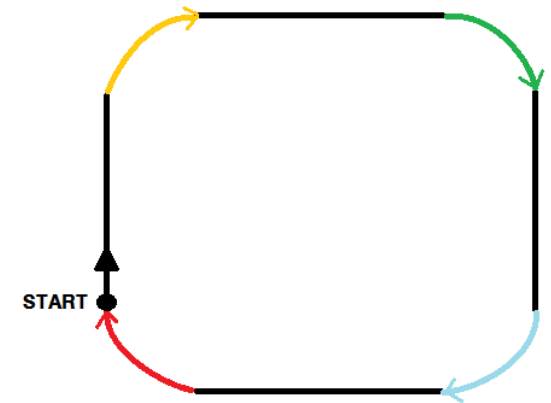
---

BASE(0)	'指定單運動軸位址為 0
UNITS=25000	'設定軸 0 馬達轉一圈步數(編碼器解析度 25000)
ACCEL=90	'設定軸 0 加速度(UNITS/SEC/SEC)為 90 rev/s <sup>2</sup>
DECEL=90	'設定軸 0 減速度(UNITS/SEC/SEC) 為 90 rev/s <sup>2</sup>
SPEED=1	'設定速度(UNITS/SEC)為 1 rps (多軸補間運動之主速度)
SERVO=ON	'啟動伺服控制
BASE(2)	'指定單運動軸位址為 2
UNITS=25000	'設定軸 2 馬達轉一圈步數(編碼器解析度 25000)
ACCEL=100	'設定軸 2 加速度(UNITS/SEC/SEC)為 100 rev/s <sup>2</sup>
DECEL=100	'設定軸 2 減速度(UNITS/SEC/SEC)為 100 rev/s <sup>2</sup>
SPEED=4	'設定軸 2 速度(UNITS/SEC)為 4 rps
SERVO=ON	'啟動伺服控制
WDOG=ON	'啟動運動
BASE(0,2)	'指定多運動軸位址為 0 與 2
MOVE(1,5)	'軸 0(配合主速度自動調整)前進一圈;軸 2(圈數多的行主速度)前進五圈
WAIT IDLE	'等待多軸運動完成

BASE(0)	'指定單運動軸位址為 0
UNITS=25000	'設定軸 0 馬達轉一圈步數(編碼器解析度 25000)
ACCEL=100	'設定軸 0 加速度(UNITS/SEC/SEC)為 100 rev/s <sup>2</sup>
DECEL=100	'設定軸 0 減速度(UNITS/SEC/SEC)為 100 rev/s <sup>2</sup>
SPEED=1	'設定軸 0 速度(UNITS/SEC)為 1 rps(主速度)
SERVO=ON	'啟動伺服控制
BASE(2)	'指定單運動軸位址為 2
UNITS=25000	'設定軸 2 馬達轉一圈步數(編碼器解析度 25000)
ACCEL=100	'設定軸 2 加速度(UNITS/SEC/SEC)為 100 rev/s <sup>2</sup>
DECEL=100	'設定軸 2 減速度(UNITS/SEC/SEC)為 100 rev/s <sup>2</sup>
SPEED=5	'設定軸 2 速度(UNITS/SEC)為 5 rps
SERVO=ON	'啟動伺服控制
'draw a circle	
WDOG=ON	'啟動運動
BASE(0,2)	'指定多運動軸位址為 0 與 2
MOVECIRC(0,0,3,0,0)	'圓弧以主速度相對移動(終點(0,0);圓心(3,0);方向:逆時針)
WAIT IDLE	'等待多軸運動完成



BASE(0)	'指定單運動軸位址為 0
UNITS=25000	'設定軸 0 馬達轉一圈步數(編碼器解析度 25000)
ACCEL=100	'設定軸 0 加速度(UNITS/SEC/SEC)為 100 rev/s <sup>2</sup>
DECEL=100	'設定軸 0 減速度(UNITS/SEC/SEC)為 100 rev/s <sup>2</sup>
SPEED=1	'設定軸 0 速度(UNITS/SEC)為 1 rps(主速度)
SERVO=ON	'啟動伺服控制
BASE(2)	'指定單運動軸位址為 2
UNITS=25000	'設定軸 2 馬達轉一圈步數(編碼器解析度 25000)
ACCEL=100	'設定軸 2 加速度(UNITS/SEC/SEC)為 100 rev/s <sup>2</sup>
DECEL=100	'設定軸 2 減速度(UNITS/SEC/SEC)為 100 rev/s <sup>2</sup>
SPEED=5	'設定軸 2 速度(UNITS/SEC)為 5 rps
SERVO=ON	'啟動伺服控制
WDOG=ON	'啟動運動
BASE(0,2)	'指定多運動軸位址為 0 與 2
MERGE=ON	'啟動融合
MOVE(0,6)	'軸 0(配合主速度自動調整)前進 0 圈;軸 2(圈數多的行主速度)前進 6 圈
MOVECIRC(3,3,3,0,1)	'圓弧以主速度相對移動(終點(3,3);圓心(3,0);方向:順時針) (橙色)
MOVE(6,0)	'軸 0(圈數多的行主速度)前進 6 圈;軸 2(配合主速度自動調整)前進 0 圈
MOVECIRC(3,-3,0,-3,1)	'圓弧以主速度相對移動(終點(3,-3);圓心(0,-3);方向:順時針) (綠色)
MOVE(0,-6)	'軸 0(配合主速度自動調整)前進 0 圈;軸 2(圈數多的行主速度)後退 6 圈
MOVECIRC(-3,-3,-3,0,1)	'圓弧以主速度相對移動(終點(-3,-3);圓心(-3,0);方向:順時針) (藍色)
MOVE(-6,0)	'軸 0(圈數多的行主速度)後退 6 圈;軸 2(配合主速度自動調整)前進 0 圈
MOVECIRC(-3,3,0,3,1)	'圓弧以主速度相對移動(終點(-3,3);圓心(0,3);方向:順時針) (紅色)
WAIT IDLE	'等待運動完成
MERGE=OFF	'關閉融合



---

BASE(0)	'指定單運動軸位址為 0
UNITS=25000	'設定軸 0 馬達轉一圈步數(編碼器解析度 25000)
ACCEL=70	'設定軸 0 加速度(UNITS/SEC/SEC)為 70 rev/s^2
DECEL=70	'設定軸 0 減速度(UNITS/SEC/SEC)為 70 rev/s^2
SPEED=5	'設定軸 0 速度(UNITS/SEC)為 5 rps
SERVO=ON	'啟動伺服控制
WDOG=ON	'啟動運動
DEFPOS(0)	'設定當前位置為 0
WHILE TRUE	'迴圈開始(無窮迴圈)
c=0	'設定參數 c 為 0
WHILE c<5	'迴圈開始(當 c 小於 5 條件成立時)
MOVE (1) AXIS(0)	'軸 0 前進 1 圈
WAIT IDLE AXIS(0)	'軸 0 等待運動完成
WA(500)	'等待 0.5 sec
c=c+1	'參數 c 加 1
WEND	'迴圈結束
MOVEABS(0)	'移動到位置 0
WEND	'迴圈結束

---

BASE(0)	'指定單運動軸位址為 0
UNITS=25000	'設定軸 0 馬達轉一圈步數(編碼器解析度 25000)
ACCEL=70	'設定軸 0 加速度(UNITS/SEC/SEC)為 70 rev/s^2
DECEL=70	'設定軸 0 減速度(UNITS/SEC/SEC)為 70 rev/s^2
SPEED=5	'設定軸 0 速度(UNITS/SEC)為 5 rps
SERVO=ON	'啟動伺服控制
WDOG=ON	'啟動運動
c=0	'設定參數 c 為 0
REPEAT	'迴圈開始
MOVE (1) AXIS(0)	'軸 0 前進 1 圈
WA(500)	'等待 0.5 sec
c=c+1	'參數 c 加 1
UNTIL c>5	'迴圈結束(當 c 大於 5 條件成立時)



BASE(0)	'指定單運動軸位址為 0
UNITS=25000	'設定軸 0 馬達轉一圈步數(編碼器解析度 25000)
ACCEL=10	'設定軸 0 加速度(UNITS/SEC/SEC)為 10 rev/s <sup>2</sup>
DECEL=10	'設定軸 0 減速度(UNITS/SEC/SEC)為 10 rev/s <sup>2</sup>
SPEED=1	'設定軸 0 速度(UNITS/SEC)為 1 rps
SERVO=ON	'啟動伺服控制
WDOG=ON	'啟動運動
FORWARD	'以 SPEED 速度持續前進運動(正轉)
WA(5000)	'等待 5 sec
CANCEL	'取消運動
WAIT IDLE	'等待運動完成

BASE(0)	'指定單運動軸位址為 0
UNITS=25000	'設定軸 0 馬達轉一圈步數(編碼器解析度 25000)
ACCEL=10	'設定軸 0 加速度(UNITS/SEC/SEC)為 10 rev/s <sup>2</sup>
DECEL=10	'設定軸 0 減速度(UNITS/SEC/SEC)為 10 rev/s <sup>2</sup>
SPEED=1	'設定軸 0 速度(UNITS/SEC)為 1 rps
SERVO=ON	'啟動伺服控制
WDOG=ON	'啟動運動
REVERSE	'以 SPEED 速度持續後退運動(反轉)
WA(5000)	'等待 5 sec
CANCEL	'取消運動
WAIT IDLE	'等待運動完成

'Program "IN\_TEST"

```

WHILE TRUE                                '迴圈開始(無窮迴圈)
  IF (PROC_STATUS PROC(1)=0) THEN          '假如程式序列(1)為未執行狀態，則
    RUN "TEST_P1",1                        '執行程式"TEST_P1"，標註序列(1)
  ENDIF                                    '結束假設句
  IF (PROC_STATUS PROC(3)=0) THEN          '假如程式序列(3)為未執行狀態，則
    RUN "TEST_P2",3                        '執行程式"TEST_P2"，標註序列(3)
  ENDIF                                    '結束假設句
WEND                                        '迴圈結束
    
```

'Program "TEST\_P1"

```

BASE(0)      '指定單運動軸位址為 0
UNITS=25000  '設定軸 0 馬達轉一圈步數(編碼器解析度 25000)
ACCEL=200    '設定軸 0 加速度(UNITS/SEC/SEC)為 200 rev/s^2
DECEL=200    '設定軸 0 減速度(UNITS/SEC/SEC)為 200 rev/s^2
SPEED=20     '設定軸 0 速度(UNITS/SEC)為 20 rps
SERVO=ON     '啟動伺服控制
WDOG=ON      '啟動運動
MOVE(10)     '軸 0 前進 10 圈
WAIT IDLE    '等待運動完成
WA(1000)     '等待 1 sec
    
```

'Program "TEST\_P2"

```

BASE(2)      '指定單運動軸位址為 2
UNITS=25000  '設定軸 2 馬達轉一圈步數(編碼器解析度 25000)
ACCEL=50     '設定軸 2 加速度(UNITS/SEC/SEC)為 50 rev/s^2
DECEL=50     '設定軸 2 減速度(UNITS/SEC/SEC)為 50 rev/s^2
SPEED=5      '設定軸 2 速度(UNITS/SEC)為 5 rps
SERVO=ON     '啟動伺服控制
WDOG=ON      '啟動運動
MOVE(5)      '軸 2 前進 5 圈
WAIT IDLE    '等待運動完成
WA(500)      '等待 0.5 sec
    
```

BASE(0)	'指定單運動軸位址為 0
UNITS=25000	'設定軸 0 馬達轉一圈步數(編碼器解析度 25000)
SERVO=ON	'啟動伺服控制
WDOG=ON	'啟動運動
WHILE 1	'迴圈開始(無窮迴圈)
GOSUB aaa	'前往附程式 aaa
GOSUB bbb	'前往附程式 bbb
WEND	'迴圈結束
aaa:	'附程式 aaa 開始
ACCEL=10	'設定軸 0 加速度(UNITS/SEC/SEC)為 10 rev/s <sup>2</sup>
DECEL=10	'設定軸 0 減速度(UNITS/SEC/SEC)為 10 rev/s <sup>2</sup>
SPEED=1	'設定軸 0 速度(UNITS/SEC)為 1 rps
MOVE(3)	'軸 0 前進 3 圈
WAIT IDLE	'等待運動完成
WA(2000)	'等待 2 sec
RETURN	'附程式 aaa 結束
bbb:	'附程式 bbb 開始
ACCEL=50	'設定軸 0 加速度(UNITS/SEC/SEC)為 50 rev/s <sup>2</sup>
DECEL=50	'設定軸 0 減速度(UNITS/SEC/SEC)為 50 rev/s <sup>2</sup>
SPEED=5	'設定軸 0 速度(UNITS/SEC)為 5 rps
MOVE(10)	'軸 0 前進 10 圈
WAIT IDLE	'等待運動完成
WA(2000)	'等待 2 sec
RETURN	'附程式 bbb 結束

## ■ 指令說明 (此處只列出練習程式中所用到指令，其餘指令需查閱手冊)

[目錄](#)

**AXIS(expression)** Assigns ONE command, function or axis parameter operation to a particular axis.

**ACCEL** The ACCEL axis parameter may be used to set or read back the acceleration rate of each axis fitted. The acceleration rate is in UNITS/sec/sec.

**ACC(rate)** Sets both the acceleration and deceleration rate simultaneously.

**BASE(axis no<,>second axis<,>third axis>...)** The BASE command is used to direct all subsequent motion commands and axis parameter read/writes to a particular axis, or group of axes.

**CANCEL([mode])** Used to cancel current or buffered axis commands on an axis or an interpolating axis group.

**DECEL** The DECEL axis parameter may be used to set or read back the deceleration rate of each axis fitted.

**DEFPOS(pos1 [,pos2[, pos3[, pos4...]]])** Defines the current position(s) as a new absolute value.

**FORWARD** Sets continuous forward movement.

**GOSUB..RETURN** Stores the position of the line after the GOSUB command and then branches to the label specified. Upon reaching the RETURN statement, control is returned to the stored line.

**IF..THEN..ELSEIF..ELSE..ENDIF** An IF program structure is used to execute a block of code after a valid expression. If no expressions are valid and an ELSE is present the commands under the ELSE will be executed.

**MOVE(distance1 [,distance2 [,distance3 [,distance4...]]])** Incremental move.

**MOVEABS(position1[, position2[, position3[, position4...]]])** Absolute position move.

**MOVECIRC(end1, end2, centre1, centre2, direction [,ta [,output]])** Moves 2 orthogonal axes in such a way as to produce a circular arc at the tool point.

**MERGE** Velocity profiled moves can be MERGED together so that the speed will not ramp down to zero between the current move and the buffered move.

**PROC** Allows a particular process to be specified when using a Process Parameter, Function or Command.

**PROC\_STATUS** Returns the status of another process, referenced with the PROC (x) modifier.

**REVERSE** Sets continuous reverse movement.

**RUN "program" [, process]** Runs a named program on the controller.

**RAPIDSTOP [(mode)]** The RAPIDSTOP command cancels the currently executing move on ALL axes.

**SERVO** On a servo axis this parameter determines whether the axis runs under servo control or open loop. When SERVO=OFF the axis hardware will output demand value dependent on the DAC parameter. When SERVO=ON the axis hardware will output a demand value dependant on the gain settings and the

following error.

**STOP "progname",[process\_number]** Stops one program at its current line.

**SPEED** The SPEED axis parameter can be used to set/read back the demand speed axis parameter. The speed is in UNITS/sec.

**UNITS** The motion commands to set speeds, acceleration and moves use the UNITS scalar to allow values to be entered in more convenient units.

**WA(time)** Wait time(milliseconds)

**WDOG** Controls the WDOG relay contact used for enabling external drives. The WDOG=ON command MUST be issued in a program prior to executing moves.

**WAIT UNTIL expression** Suspends program execution until the expression is TRUE.

**WAIT IDLE** Suspend program execution until the move has finished.

**WHILE .. WEND** The commands contained in the WHILE..WEND loop are continuously executed until the condition becomes FALSE .