

# Mini-Farmbot

## User guide

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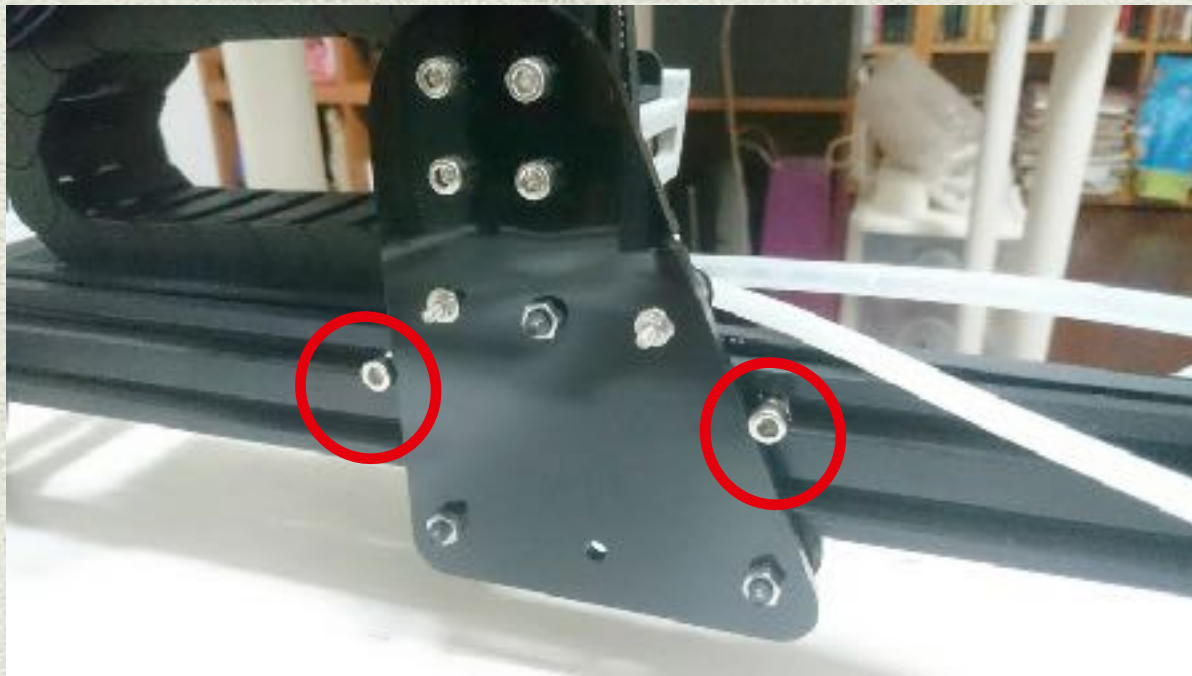
2017/07/22

**FBTUG**



# 開箱注意事項 (一)

- ◆ 避免搬移時XY滑動, 鎖上4顆M5螺絲制動, 如下圖將螺絲取下, 再做Demo.

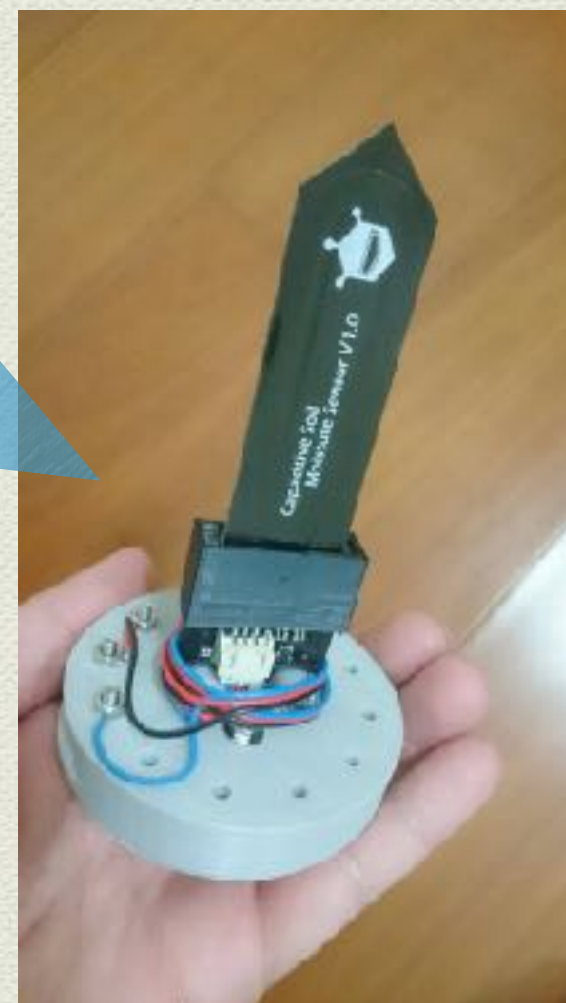




# 開箱注意事項 (二)

\* 土壤偵測器請將塑套如下圖固定

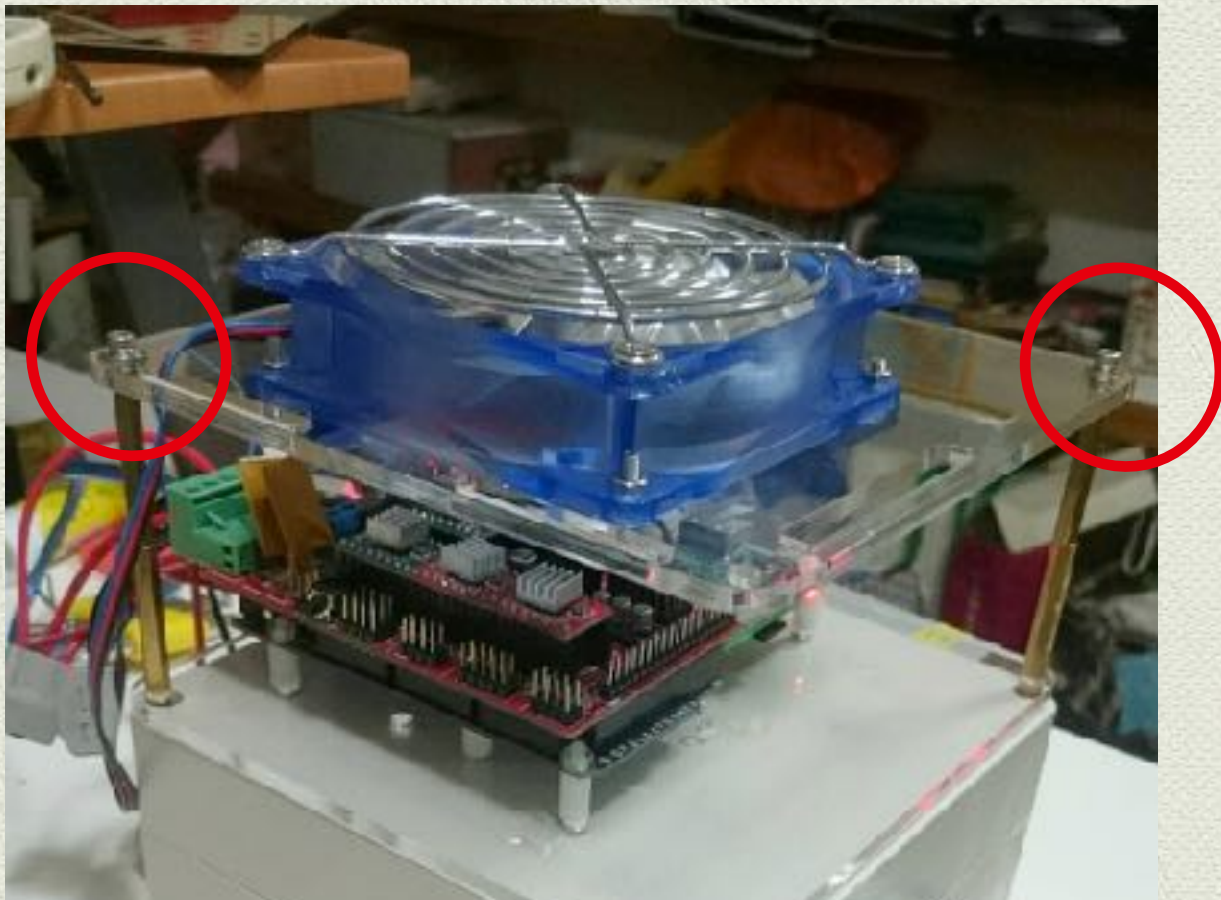
\* 種子吸嘴請反過來轉入卡座(避免受傷,請小心收放)





# 硬體組裝(一)

- ❖ 如下圖將上面板的螺絲取下, 以方便安裝線.





# 硬體組裝 (二)

- ◆ 如下圖將 X(R)/X(L)/Y/Z/USB camera 接到 Arduino RAMPS1.4 主板.

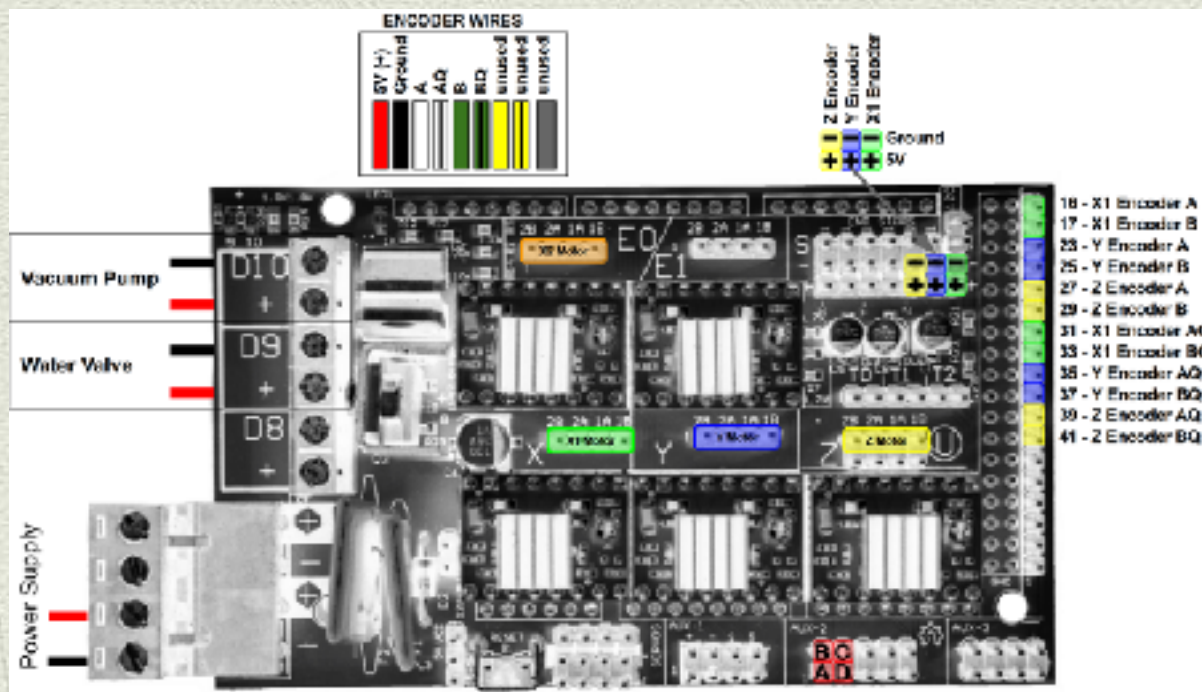
- ◆ Noted:
  - \*\*X(R)/Y紅線靠左
  - \*\*X(L)/Z紅線靠右





# 硬體組裝 (三)

- ❖ 如下圖將 UTM A,B,C,D 接到 Arduino RAMPS1.4 主板.





# 硬體組裝(四)

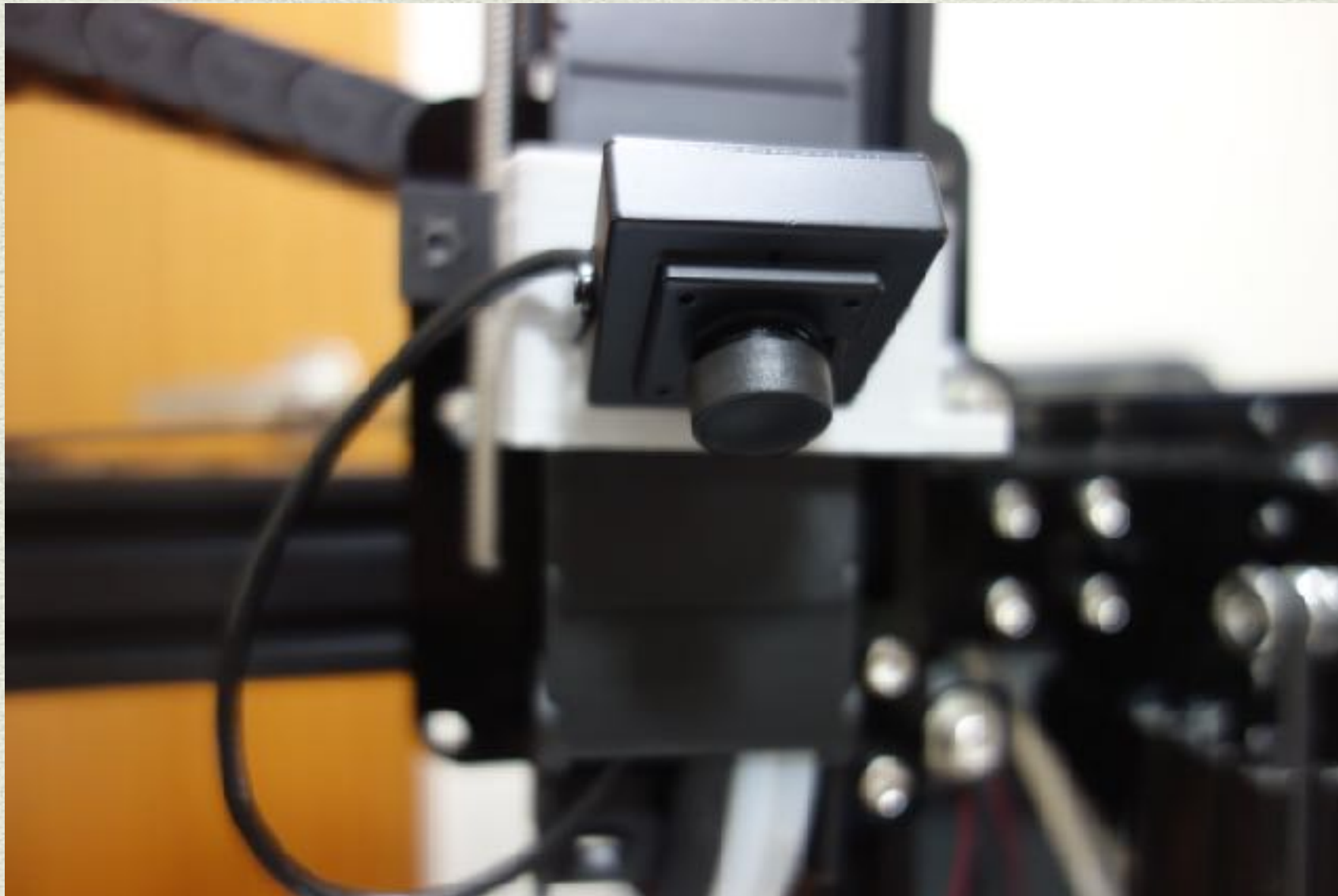
- ❖ 如下圖將 水(out) 及氣(吸)的管子接入快接開關, 水(IN) 請用保特瓶裝水測試, 氣(出)孔暫不使用.





# 硬體組裝(五)

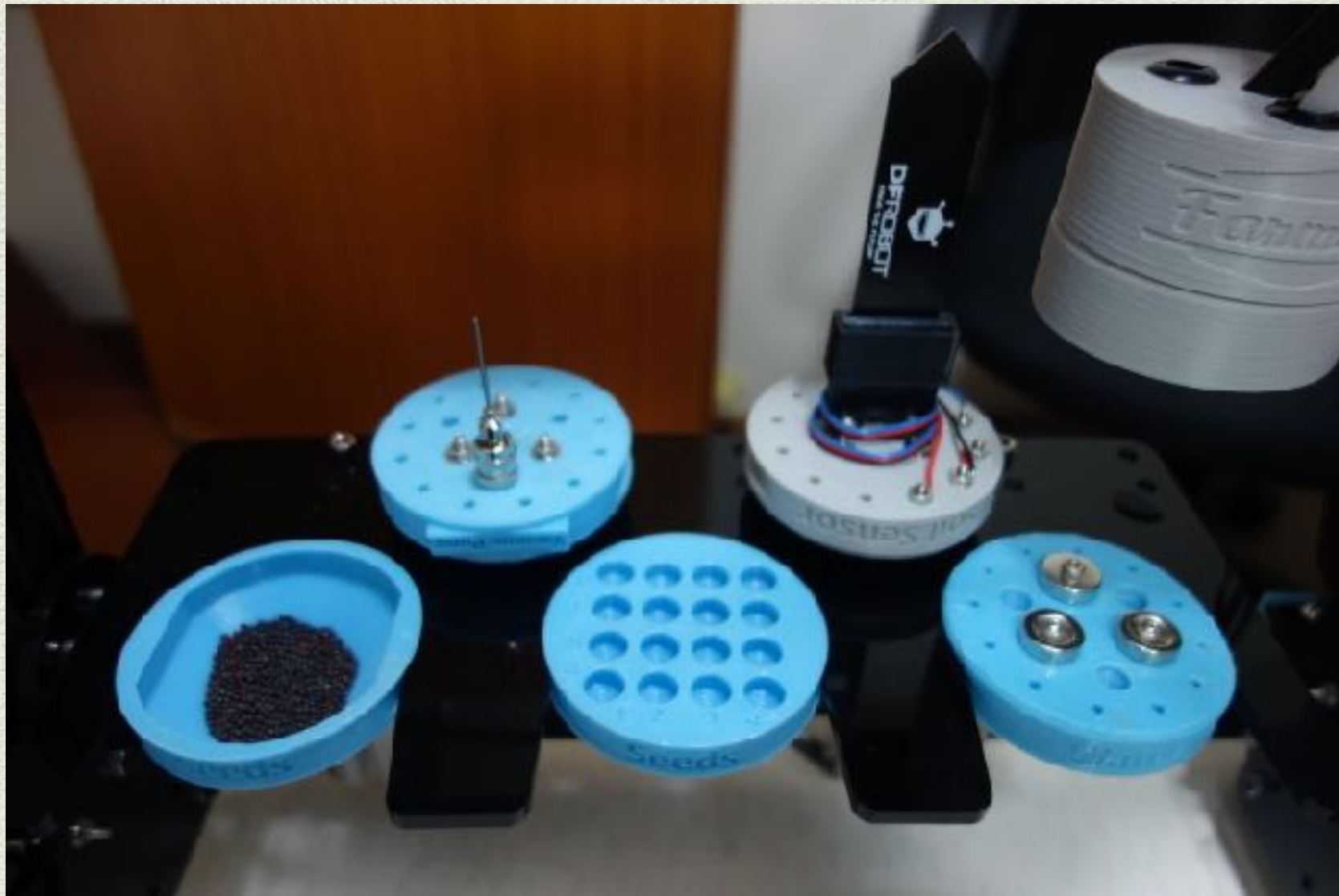
- ◆ USB Camera 請在使用前打開蓋子





# UTM 種類

- ◆ 提供 3種 UTM devices 及 2個種子盒





# UTM 座標

## ToolBay的 XYZ座標

A: 700 / 320 / -1000

B: 700 / 1920 / -1000

C: 700 / 3520 / -1000



Seeder吸C盤種子的座標  
400/3550/-550

Seeder吸B盤種子的座標

A1: 120/1650/-200

A2: 120/1850/-200

A3: 120/2050/-200

A4: 120/2250/-200

B1: 320/1650/-200

B2: 320/1850/-200

B3: 320/2050/-200

B4: 320/2250/-200

C1: 520/1650/-200

C2: 520/1850/-200

C3: 520/2050/-200

C4: 520/2250/-200

D1: 720/1650/-200

D2: 720/1850/-200

D3: 720/2050/-200

D4: 720/2250/-200



# UTM 定義

UTM引腳/ UTM線	連接	使用	系統優先級	目前Cable 線的顏色	目前已知用途	備註
A / 1	在Arduino / RAMPS上為+ 5V	接地	1	棕	6/21 v4.0.0 更新	Farmbot定義
B / 2	在Arduino / RAMPS上接地 (0V)	工具驗證	2	橘	6/21 v4.0.0 更新	Farmbot定義
C / 3	引腳D16在Arduino / RAMPS - 數字輸入A9 (D63)"	工具驗證	3	綠		Farmbot定義
D / 4	Arduino / RAMPS上的引腳A3 - 模擬輸入A5 (D59)"	土壤傳感器等模擬信號工具	4	黃		Farmbot定義
E / 5	Arduino/RAMPS I2C-Clock		6	藍		FBTUG 定義
F / 6	Arduino/RAMPS I2C-Data		6	灰		FBTUG 定義
G / 7	Arduino/RAMPS UART-Tx(Arduino 方向)		7	紫		FBTUG 定義
H / 8	Arduino/RAMPS UART-Rx(Arduino 方向)		7	白		FBTUG 定義
I / 9	Arduino/PWM		8	紅		FBTUG 定義
J / 10	使用者暫時定義			粉		FBTUG 定義
K / 11	使用者暫時定義			黃綠		FBTUG 定義
L / 12	+12V		5	黑		FBTUG 定義
水氣 / 1	氣		1			Farmbot定義
水氣 / 2	保留		2			FBTUG 定義
水氣 / 3	水		3			Farmbot定義



# Mini-Farmbot 歸零校正

- ◆ 請手動將 XYZ 移到圖示位置,再做軟體測試,之後也可自行加限位開關.





# 軟體測試(一)

- ◆ 以 Farmbot 所提供的 my.farmbot.io 來做測試.
  1. 先申請 <https://my.farmbot.io/> 帳號
  2. Farmbot 插入電源後, 電腦即可search 到 farmbot-xxxx 的 wifi.
  3. 請連線到 farmbot-xxxx



# 軟體測試(二)

- ◆ 連線後會自動跳出此configure page.  
如果沒有出現可由<http://192.168.24.1/>進入  
輸入後按 SUBMIT CONFIGURATION



輸入你家裡的Wifi SSID / PW

輸入你剛申請的[my.farmbot.io](http://my.farmbot.io) ID / PW



# 軟體測試(三)

- ◆ 按完 SUBMIT CONFIGURATION後, 只要連線成功, “Farmbot -xxxx”wifi 就會消失, 如果它經過了1分鐘後還是存在, 有可能你輸入的資料 or 你家的Wifi 有問題, 導致Farmbot OS 無法正常連線.



# 軟體測試(四)

◆ 請由<https://my.farmbot.io/> 登入

◆ 先進 Device Page 設定  
請參考右圖設定。

The screenshot displays the 'Motors' and 'Encoders and Endstops' configuration sections of the FarmBot software interface. The 'Motors' section includes settings for MAX RETRIES, MAX SPEED, MINIMUM SPEED, ACCELERATE FOR, STEPS PER MM, and various motor control options like ALWAYS POWER MOTORS, INVERT MOTORS, and ENABLE 2ND X MOTOR. The 'Encoders and Endstops' section includes settings for ENABLE ENCODERS, USE ENCODERS FOR POSITIONING, INVERT ENCODERS, MAX MISSED STEPS, ENCODER MISSED STEP DECAY, ENCODER SCALING, and ENABLE ENDSTOPS. The interface uses a combination of text input fields and toggle switches to configure these parameters.

Setting	Value	Value	Value
MAX RETRIES	5		
MAX SPEED (STEPS/S)	4500	4500	4500
MINIMUM SPEED (STEPS/S)	50	50	50
ACCELERATE FOR (STEPS)	500	500	500
STEPS PER MM	5	5	2.5
ALWAYS POWER MOTORS	NO	NO	NO
INVERT MOTORS	NO	NO	NO
ENABLE 2ND X MOTOR	YES		
INVERT 2ND X MOTOR	NO		
Encoders and Endstops			
ENABLE ENCODERS	NO	NO	NO
USE ENCODERS FOR POSITIONING	NO	NO	NO
INVERT ENCODERS	NO	NO	NO
MAX MISSED STEPS	10	10	10
ENCODER MISSED STEP DECAY	10	10	10
ENCODER SCALING	56	56	56
ENABLE ENDSTOPS	NO	NO	NO
INVERT ENDSTOPS	NO	NO	NO



# 軟體測試(五)

- ◆ 同樣 Device Page 設定 USB Camera  
可根據你的Camera 種類來更改它。

DEVICE ? SAVED ✓

NAME	Joe's FarmBot		
NETWORK	mqtt://mqtt.farmbot.io		
TIME ZONE	Asia/Taipei		
FARMBOT OS	Version 4.0.1	Auto Updates? <input type="checkbox"/> NO	<span>UP TO DATE</span>
RESTART FARMBOT	This will restart FarmBot's Raspberry Pi and controller software.		<span>RESTART</span>
SHUTDOWN FARMBOT	This will shutdown FarmBot's Raspberry Pi. To turn it back on, unplug FarmBot and plug it back in.		<span>SHUTDOWN</span>
FACTORY RESET	Factory resetting your FarmBot will destroy all data on the device, revoking your FarmBot's ability to connect to your web app account and your home wifi. Upon factory resetting, your device will restart into Configurator mode. Factory resetting your FarmBot will not affect any data or settings from your web app account, allowing you to do a complete restore to your device once it is back online and paired with your web app account.		<span>FACTORY RESET</span>
CAMERA	<div>Select a camera...</div> <div><div>None</div><div>USB Camera</div></div>		



# 軟體測試(六)

- ◆ 進 Controls Page 設定:  
參考右上圖, 更改 X-AXIS /  
Y-AXIS / Z-AXIS 測試.  
X-AXIS: 0~ 4500  
Y-AXIS: 0~ 3550  
Z-AXIS: 0~ -1000(待測極限)

The screenshot displays a control interface for a machine. The top section, titled 'MOVE', includes an 'E-STOP' button and a settings icon. Below this, a 'MOVE AMOUNT (MM)' selector shows options: 1, 10, 100 (selected), 1000, and 10000. A set of directional buttons (Home, Left, Down, Right, Up) is provided for movement. Below these are input fields for 'X AXIS' (0), 'Y AXIS' (0), and 'Z AXIS' (0), along with a green 'GO' button. The bottom section, titled 'PERIPHERALS', features a '+' button, a 'SAVED ✓' status, and a 'BACK' button. It lists three peripherals: 'Fan' with a value of 8, 'Water Pump' with a value of 9, and 'Vacuum Pump' with a value of 10. Each peripheral has a red '-' button to its right.

PERIPHERALS	Value	Action
Fan	8	-
Water Pump	9	-
Vacuum Pump	10	-



# 軟體測試(七)

◆ 同樣 Controls Page 設定:  
參考右下圖新增 Pin 8,9,10,  
Save後去開關這3 個device  
，確保Fan / water / Vacuum功  
能正常。

Fan為mini farmbot新增,為  
了讓驅動IC可以有有效的散熱。

The screenshot displays the 'Controls Page' interface, divided into two main sections: 'MOVE' and 'PERIPHERALS'.

**MOVE Section:**

- Top bar: 'MOVE' with a help icon, a red 'E-STOP' button, and a settings gear icon.
- Section header: 'MOVE AMOUNT (MM)'.
- Amount selection: Five buttons labeled '1', '10', '100' (selected), '1000', and '10000'.
- Directional controls: A set of buttons including a home button, left, right, up, and down arrows for each axis.
- Axis labels and values: 'X AXIS' with value '0', 'Y AXIS' with value '0', and 'Z AXIS' with value '0'.
- Action: A green 'GO' button.

**PERIPHERALS Section:**

- Top bar: 'PERIPHERALS' with a help icon, a green '+' button, a 'SAVED ✓' button, and a 'BACK' button.
- Table of peripherals:

Peripheral	Pin	Action
Fan	8	[-]
Water Pump	9	[-]
Vacuum Pump	10	[-]



# 軟體測試(八)

## 進sequences page 設定各種行為

The screenshot displays the 'Sequences' page of a software interface. The top navigation bar includes 'FARM DESIGNER', 'CONTROLS', 'DEVICE', 'SEQUENCES', 'REGIMENS', 'TOOLS', and 'FARMWARE'. On the right, there are buttons for 'SYNC NOW', 'E-STOP', and a user profile 'JOEHOU'.

The main area is divided into three panels:

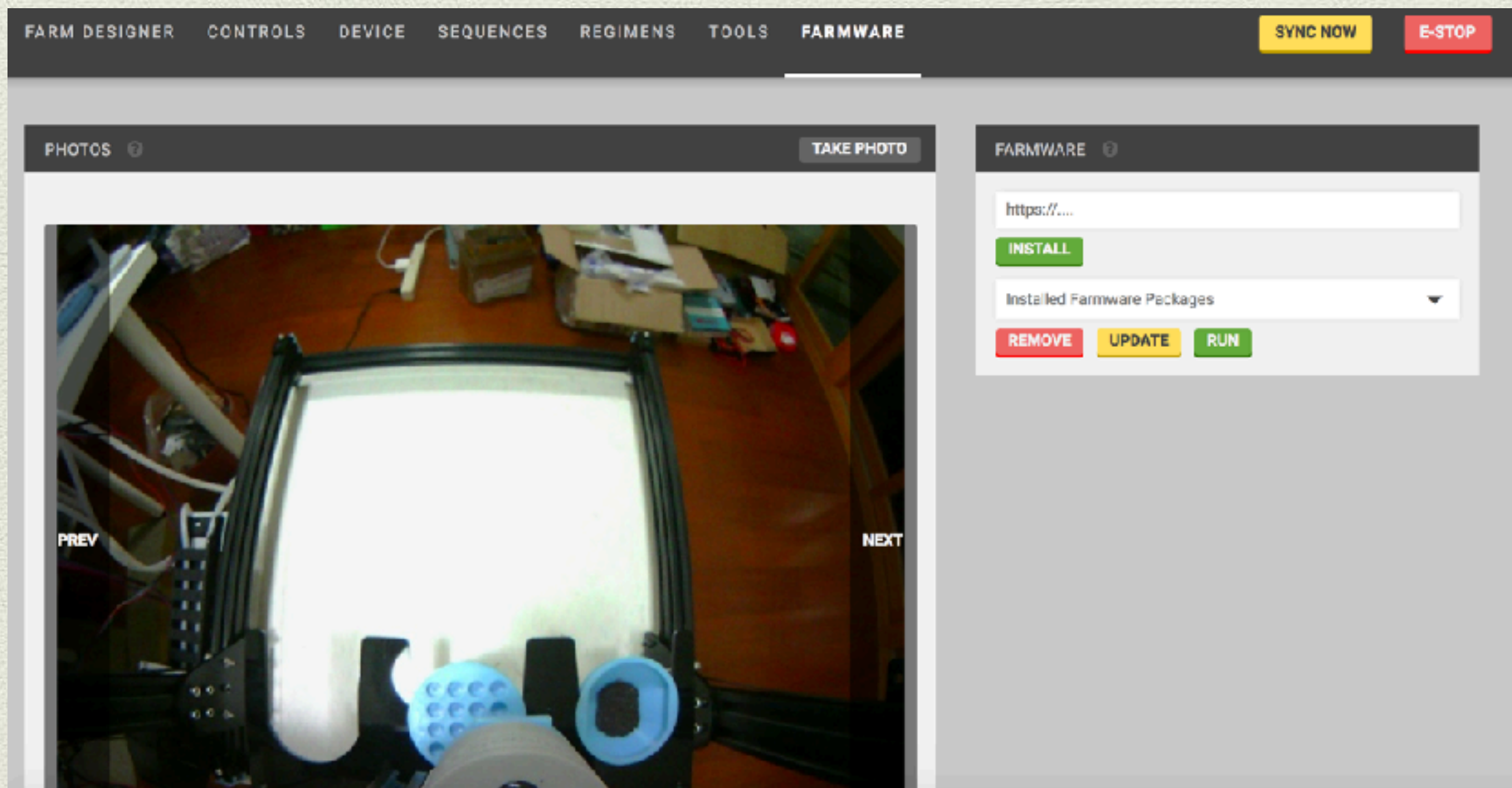
- Commands:** A list of available commands including 'MOVE ABSOLUTE', 'MOVE RELATIVE', 'WRITE PIN', 'READ PIN', 'WAIT', 'SEND MESSAGE', 'FIND HOME', and 'IF STATEMENT'.
- Sequence Editor:** The central panel for editing sequences. It shows a sequence named 'Seeder dispatch' with a 'Seed show' command. Below this, a 'MOVE ABSOLUTE' command is detailed with the following values:

IMPORT COORDINATES FROM		
None		
X (MM)	Y (MM)	Z (MM)
120	1650	0
X-OFFSET	Y-OFFSET	Z-OFFSET
0	0	0
- Sequences:** A list of existing sequences including 'MINIFARMBOT', 'WATERING', 'TEST X', 'NEW SEQUENCE 5', 'WATER SPIN TEST', 'TAKE PHOTO AROUND', 'MESSAGE', and 'DRIVER FAN ENABLE'.



# 軟體測試(九)

進Firmware page 可進行拍照





# 軟體測試(注意事項)

1. 只要重新啟動, XYZ機構都要歸零.  
可到Device page 按 Zero X, Zero Y, Zero Z,來  
做軟體的歸零.
2. 任何的設定都要按"Sync"來同步資料到  
Server.  

3. Farm Designer / Regimens page可自行驗證  
排程.



# Known Issues

1. 連線不穩, 會移動到一半重新啟動.
2. 拍照也會時常有連線異常.
3. 無法用 Camera 來錄製影像.
4. XYZ 速度極限為 4500.



# 參考資料

1. <https://farmbot.io/>
2. <https://farmbot-software.readme.io/docs>
3. <https://genesis.farmbot.io/docs>
4. <https://github.com/FarmBot>
5. <https://forum.farmbot.org/>
7. FBTUS 共筆：<https://hadad.hackpad.com/-FarmBot-a04x9J9qjVf>
8. FBTUG 子專案-Mini FarmBot  
<https://paper.dropbox.com/doc/FBTUG-Mini-FarmBot-LKSuz6QlaHLAzueHkfl1i>
9. FBTUG Public Files  
<https://drive.google.com/drive/folders/0B4jt5C3N9QstbkpraG5zQWZVUzA?usp=sharing>
10. FBTUG GitHub  
<https://github.com/FBTUG>