

Getting Started with the PHYTRE

WiFi Module(WACIO_GP) & Evaluation Kit

WACIO_GP_XXX

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Introduction

Phytrex WACIO_GP_XXX evaluation kit (here after called "WACIO_GP_XXX EVB") provides a development environment for system designs that demand homekit products. The WACIO_GP_XXX EVB is support Outlet profile reference design and allows scaling to other profiles environments with different SDK. Customer can connect Ethernet cable or through wireless access to update firmware.

Applications

- Homekit Product Development
- Smart Socket
- Smart Thermostat
- Smart Light bulb

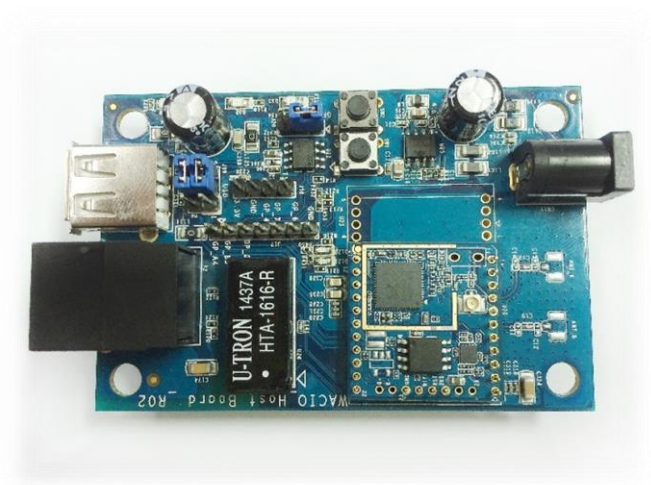


Figure 1: WACIO_GP_XXX & Host Board

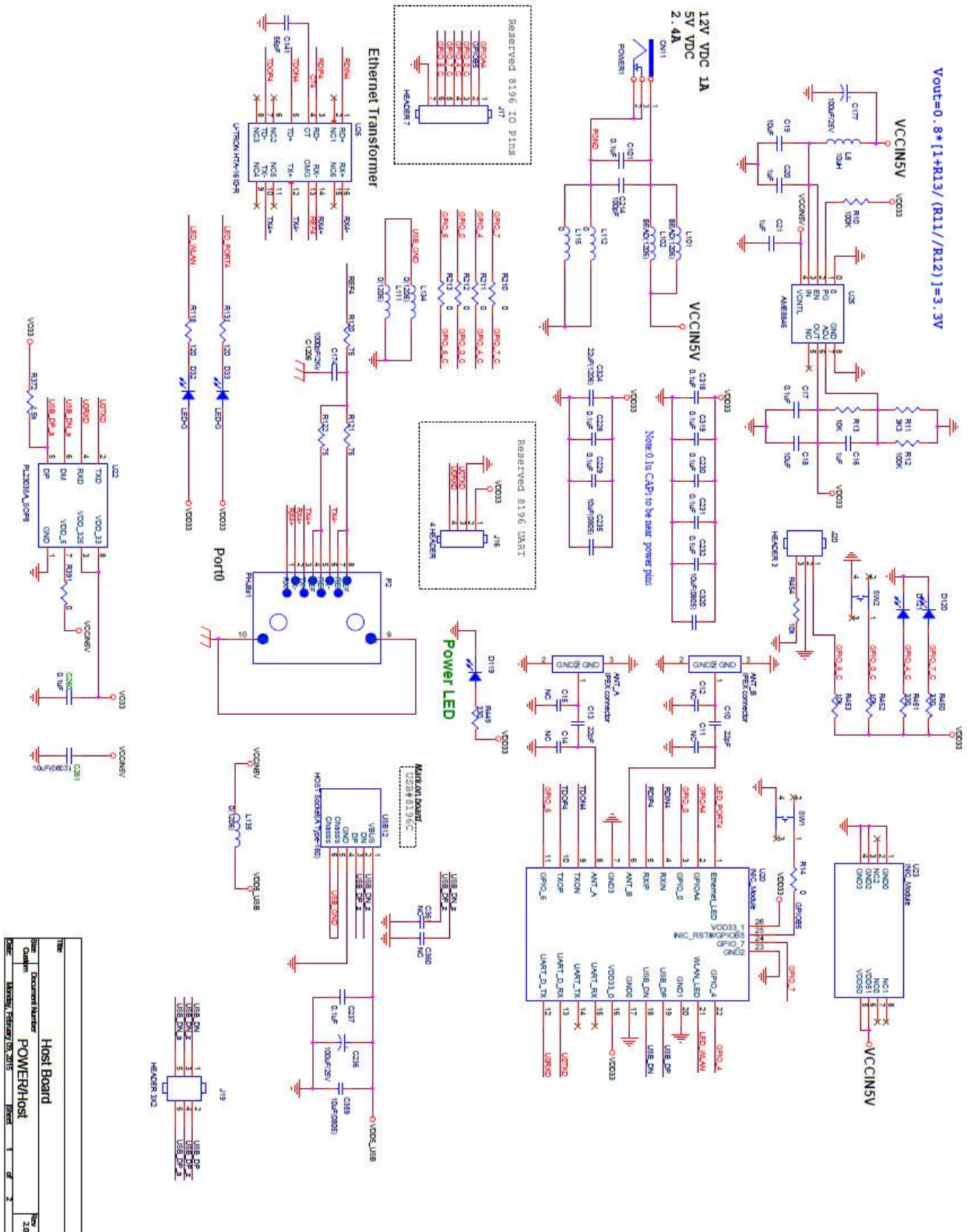
WACIO_GP_XXX Module Support List

WACIO_GP_XXX	USB *1, GPIO*3, RST*1	Option	External antenna
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Table 1. Module support on EVB

Schematic circuit of Evaluation board

Figure 2: WACIO_GP_XXX EVB Circuitry Drawing



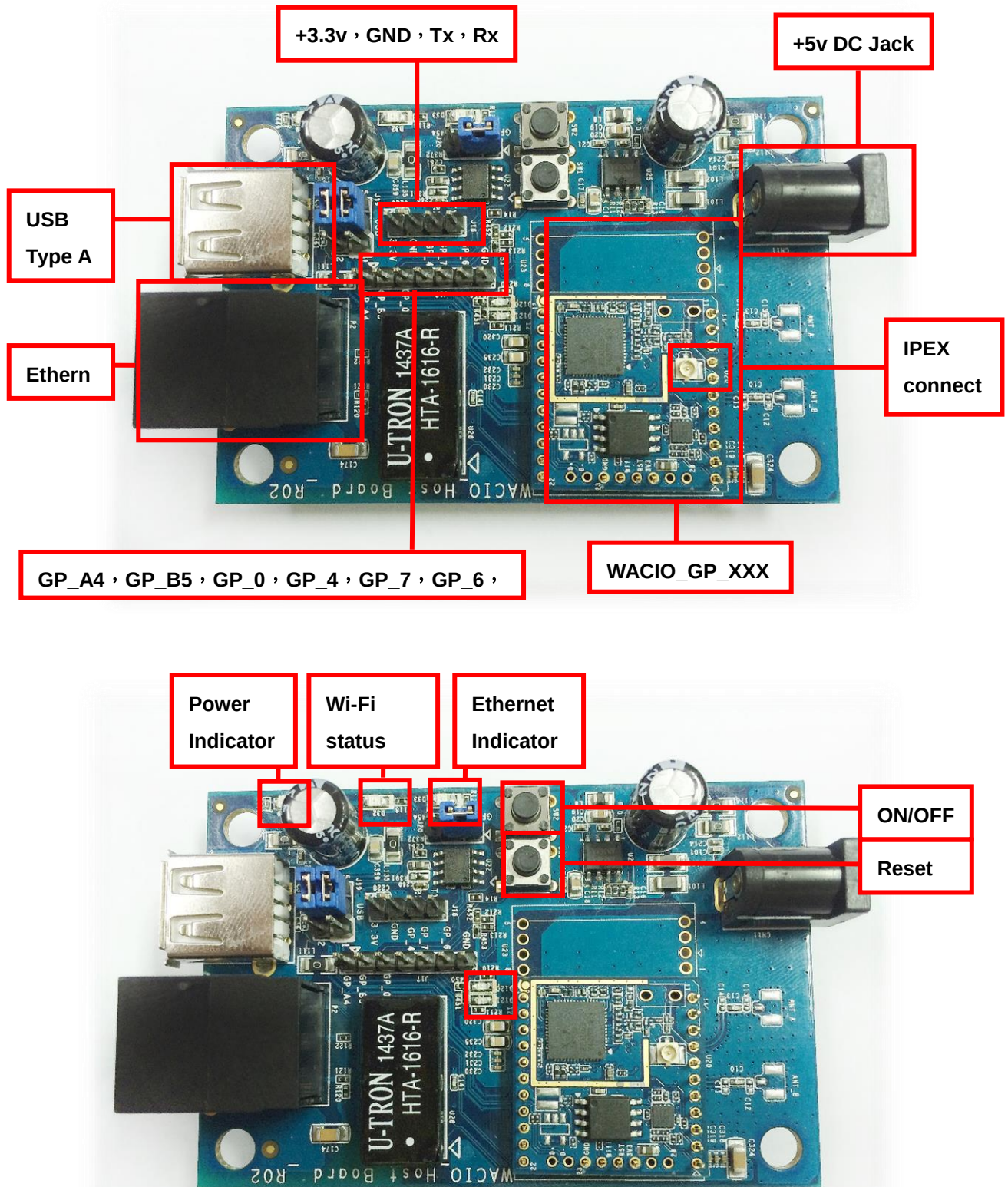


Figure 3: Board PIN Definition

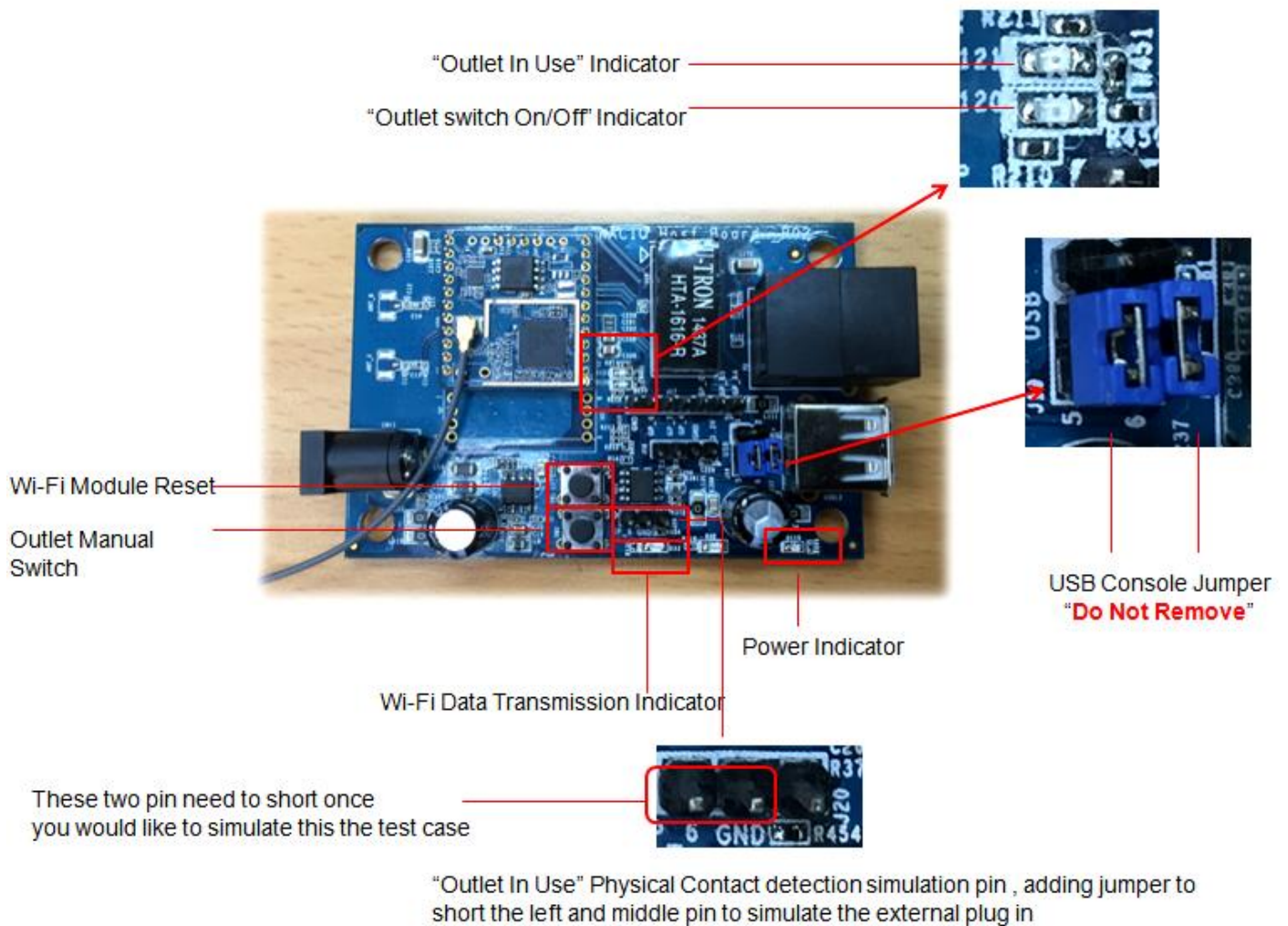


Figure 4: The host board introduction

Note :

1. Power Indicator will "turn on" when USB cable or Power Adaptor plug into DC Jack
2. Outlet Manual Switch button is the power switch of outlet
3. Outlet switch indicator will turn on or off when switch on of off via manual mode or remote mode
4. Outlet in Use indicator will turn on or off when physical contact is active
5. Wi-Fi indicator will be twinkling under specified scenario
6. Ethernet will be twinkling when data is transmitting through this interface

LED Indicator

WACIO_GP_XXX EVB embeds many LED indicators, it provides versatile functional indication under different scenarios. It includes power on/off, Ethernet ,Wi-Fi and Outlet status. Table 2. shows the location of LED indicators and definition.

LED Indicator	Function	Note
D119	Power	
D120	Outlet Power Switch	
D121	Outlet In Use	R367
D32	Wi-Fi Status	R369
D33	Ethernet	R370

Table 2: LED Indicators and Definition

Note. R367,R369 and R370 (red)on WACIO_GP_XXX module should be placed, not allow to open

The Wi-Fi lamp indicator (Figure 5) will display under following status

Status	Wi-Fi Lamp Indicator
System Booting	Turn off
Waiting to Join Network	Fast Flashing
WAC complete	Flashing depends on data transmission (Wi-Fi mode)

Table 3: Wi-Fi status lamp indicator

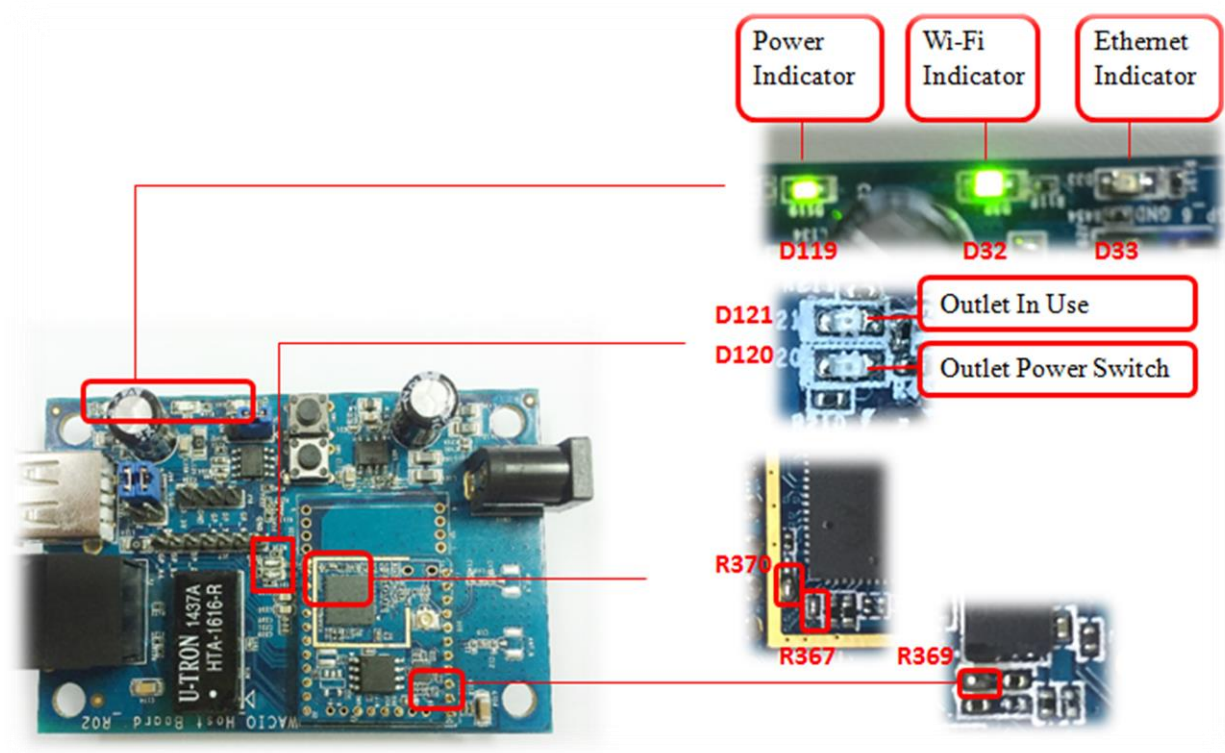


Figure 5: LED Indicator and relative resistors

EVB Board PIN Definition

Port	Description
+5v DC Jack (CN11)	Development board main power +5v
+3.3v*	WACIO_GP_XXX Module external power
GND	Ground
Tx	Console port debug pin Tx
Rx	Console port debug pin Rx
Ethernet interface	Download firmware by TFTP (RJ-45)
Reset button	Clear Wi-Fi Configured status(WACIO_GP_XXX System reboot)
GP_A4	IO port
GP_B5	IO port (Reset)
GP_0	IO port
GP_4	IO port
GP_6	IO port
GP_7	IO port (Hi-Low ON/OFF control)

Table 4: EVB PIN definition

***Note : User can provide the external +3.3V power supply through this pin**

EVB Instructions

- U23 is the block for WACIO_GP_XXX module. Place WACIO_GP_XXX module carefully.
Note: The side with IPEX connector is top side, please check before turn on the power (Figure3)
- Plug the DC +5V Power Adaptor on DC Jack (CN11)
- Operation power of WACIO_GP_XXX module is +3.3V. The host board is already embedded the DC to DC regulator to convert +5V to +3.3V
- Reset button is for clear Wi-Fi WACIO_GP_XXX configured status, it means WACIO_GP_XXX return to unpaired status.
- The firmware update can be implement through TFTP(Ethernet) or Web page (Wi-Fi).

Use "TFTP" to update firmware

Connecting Block diagram

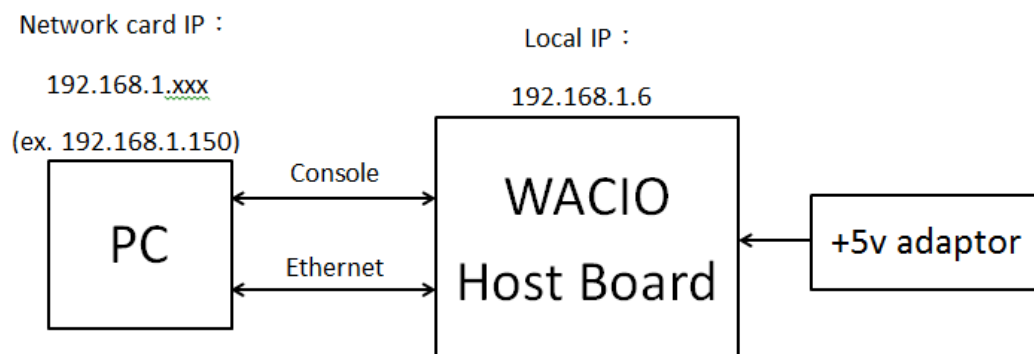
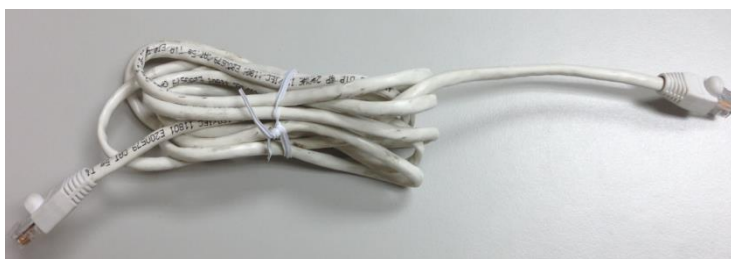


Figure 6: System connecting block diagram

Tools and Shareware

- | | |
|--------------------------------|--------------|
| (1) Power Adaptor(+5v , 1A) | (4) TeraTerm |
| (2) Ethernet cable | (5) TFTPd32 |
| (3) USB Type A to Type A Cable | |



Ethernet Cable



Power Adaptor



Type A to Type A USB Cable

Figure 7: EVB Kit Accessories

Connecting Host Board with PC via Ethernet and USB cable



Figure 8: USB (Type A) and Ethernet cable connection

Step1 : Running Tera Term application program.



Setting Serial port as below :

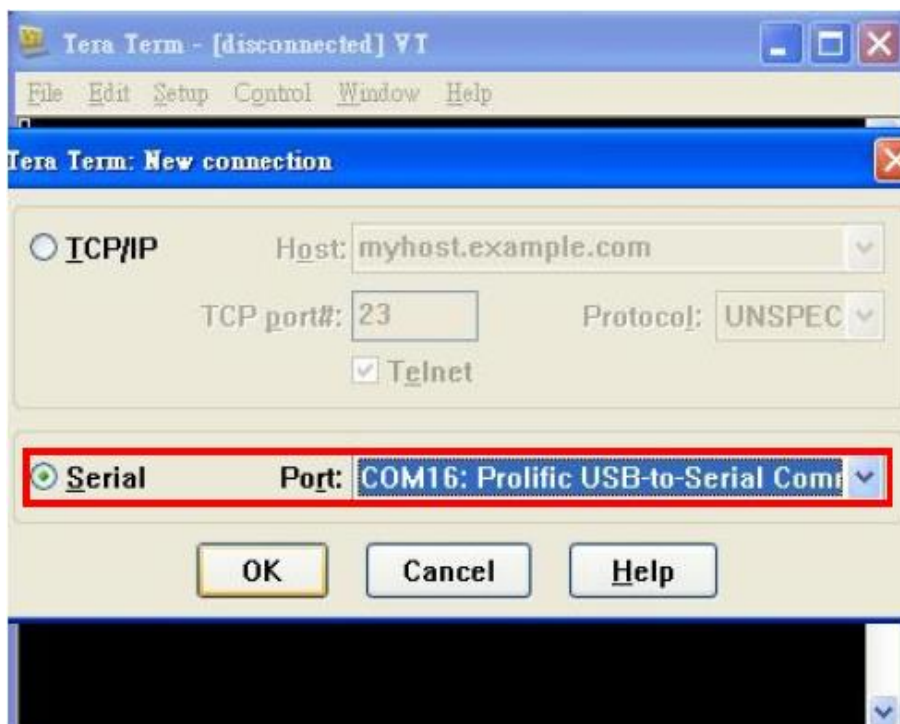


Figure 9: Setting COM Port

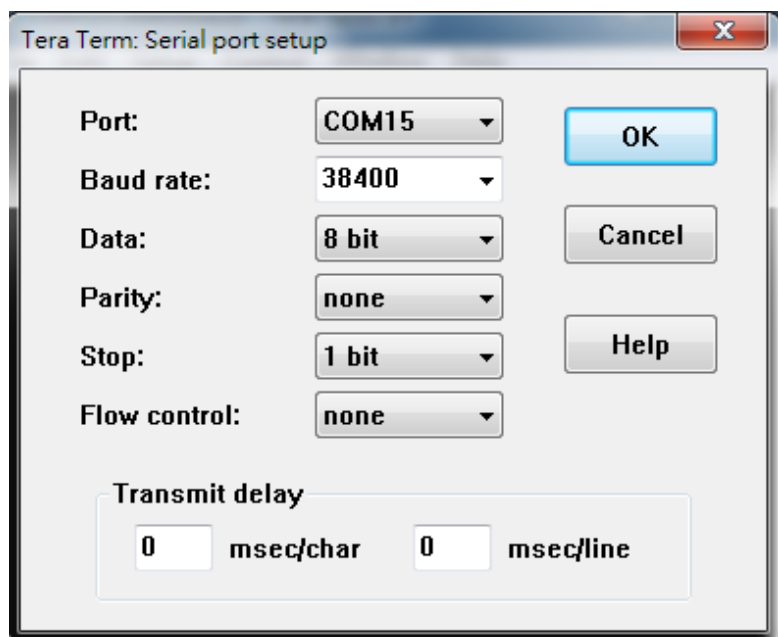


Figure 10: Setting Baud Rate to 38400 bps

Step3 : Connect the Ethernet Cable and Running "Tftpd32" application program



Settings of Tftpd32 are as follows :

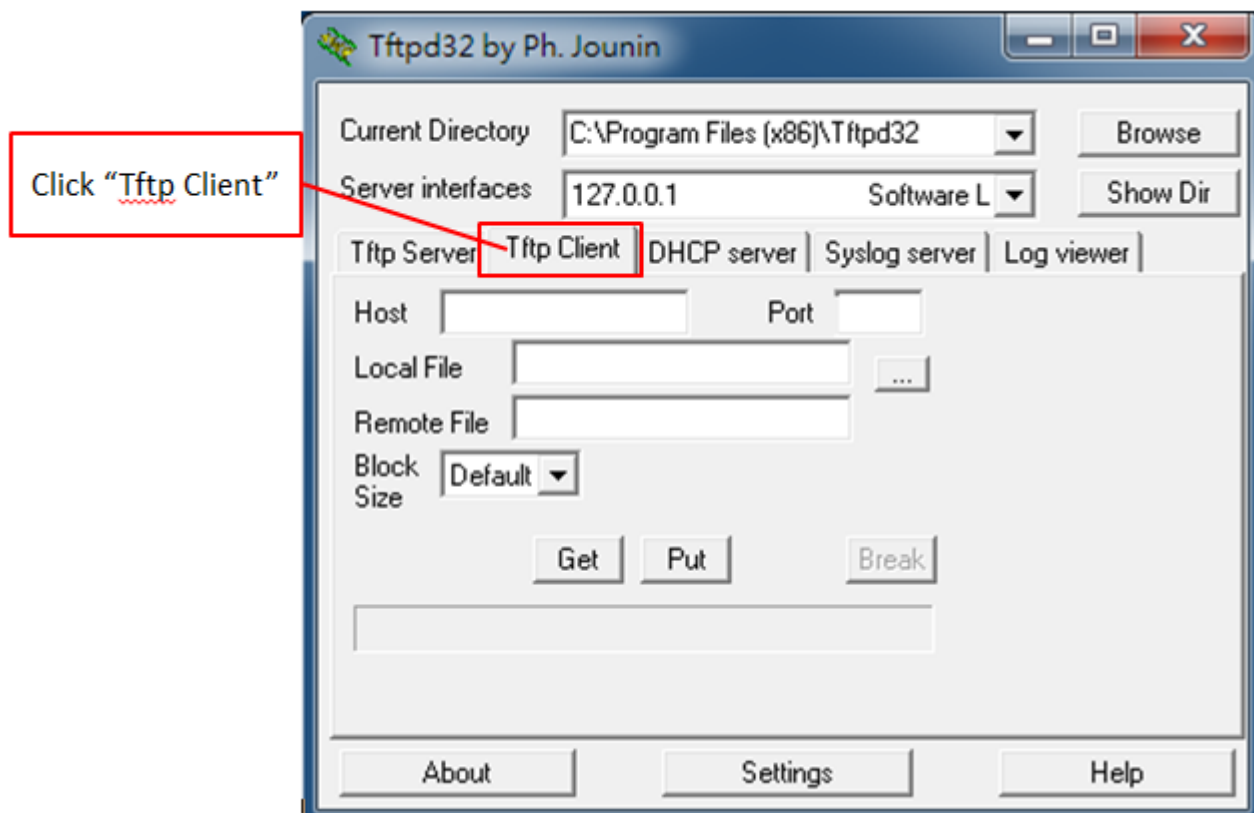


Figure 13: Setting on TFTP Screenshot (1)

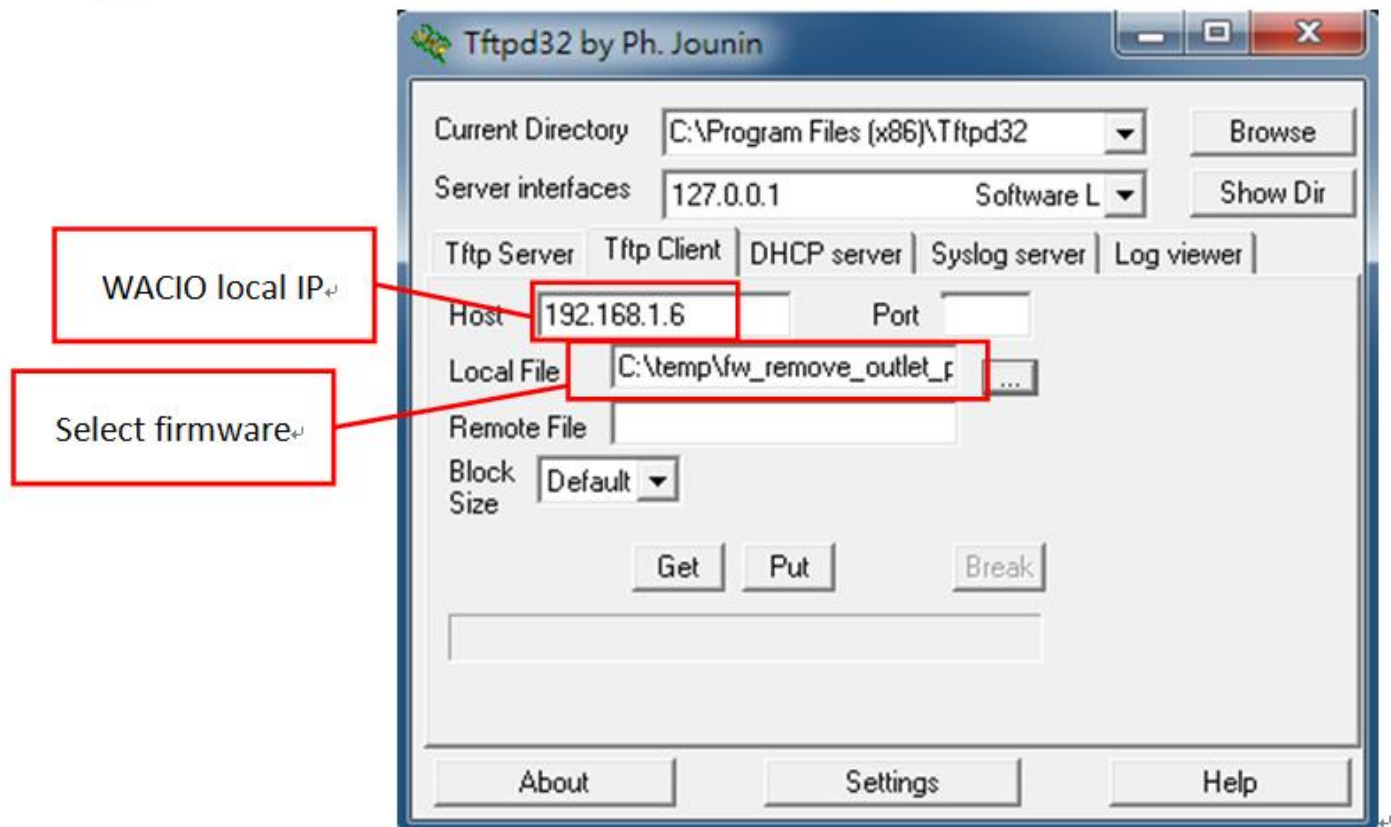


Figure 14: Setting on TFTP Screenshot (2)

Step3 : Click “Put” to update firmware

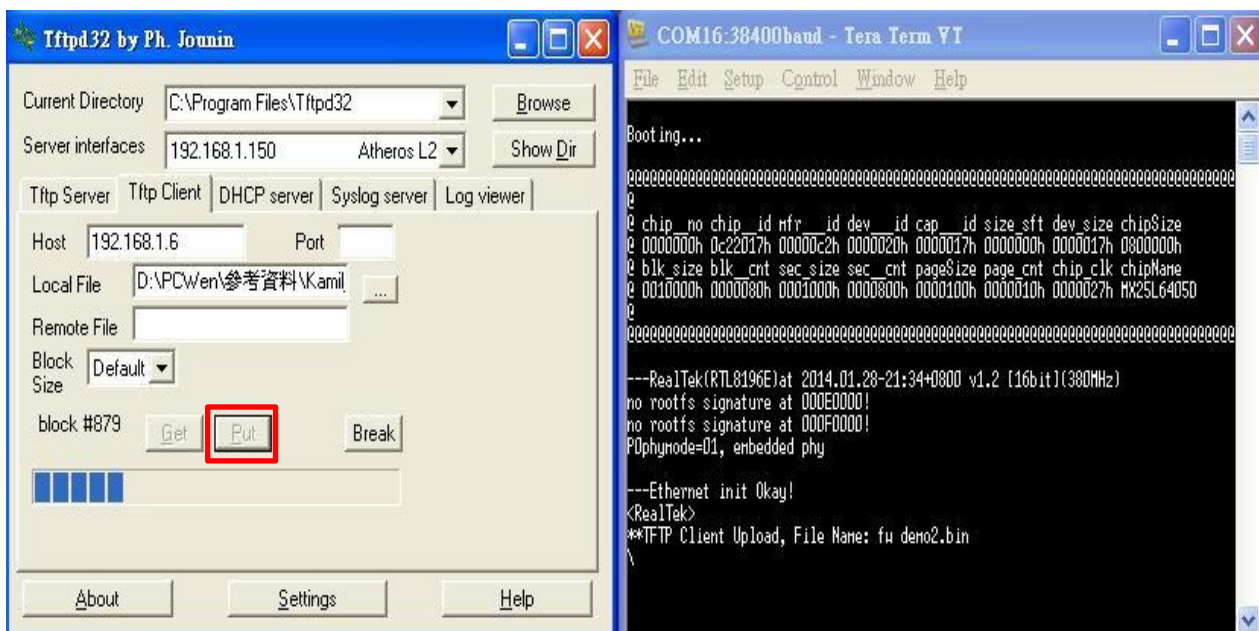


Figure 15: Screenshot of Updating the firmware (1)

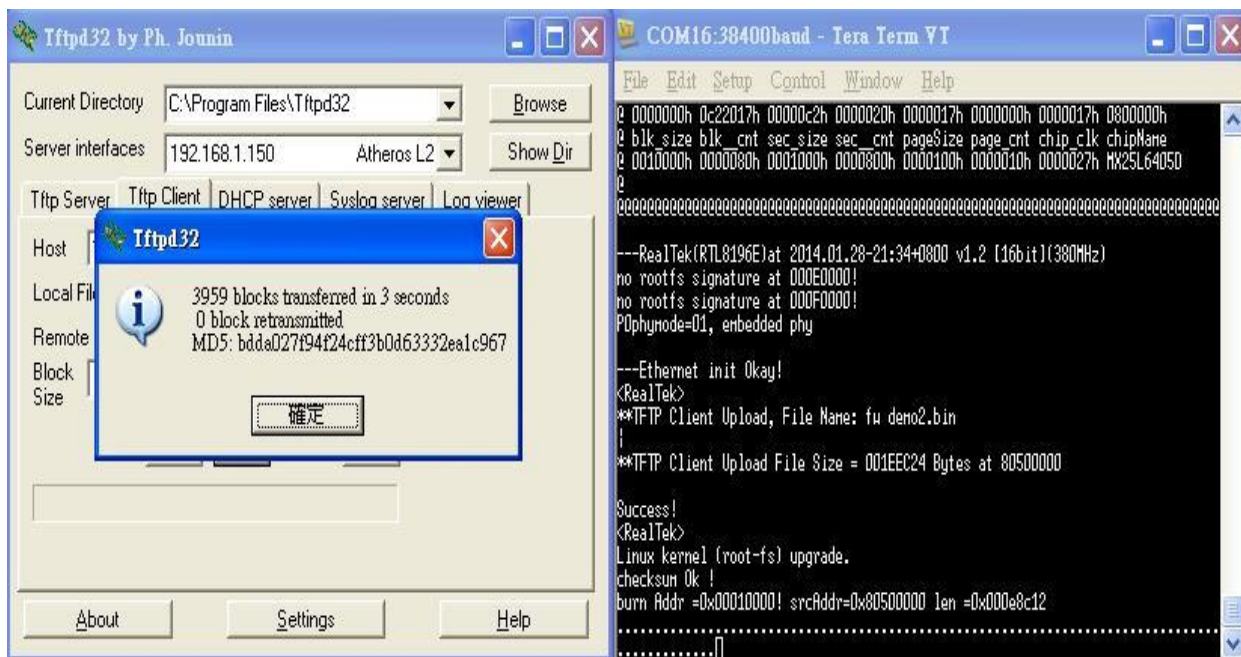


Figure 16: Screenshot of Updating the firmware (2)

System will reboot when update is complete.

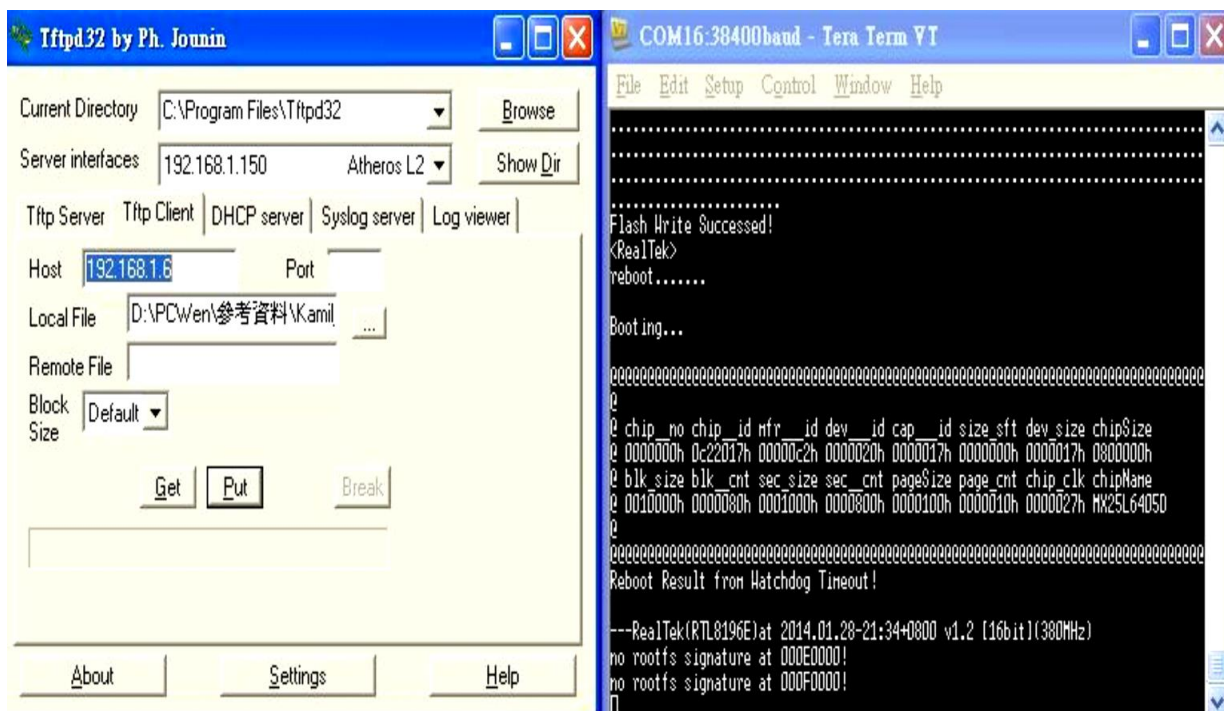


Figure 17: Screenshot of Updating the firmware (3)

Link with Homekit Accessory Tester (HAT)

The following are the requirement gear to link with the HAT, it includes

- MacBook Pro running MacOS10.9 or greater
- Apple Airport Express 802.11n (3rd Gen.) or greater
- iPhone 5 running with iOS8.1 or greater
- HAT version is beta 8.0 or greater

Procedure

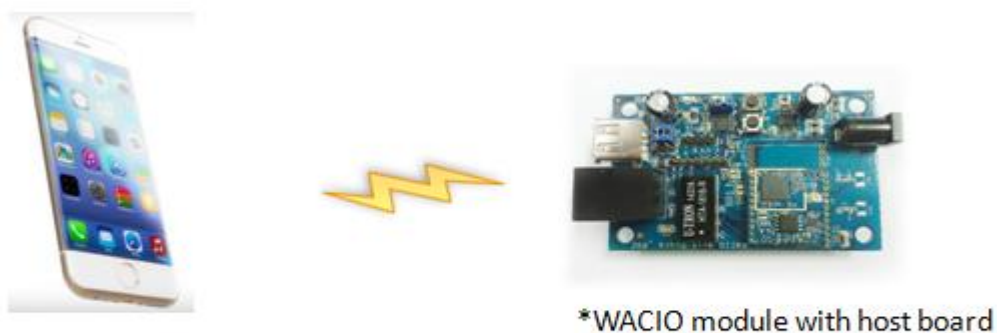
You need to setup your "Airport Express" to your testing environment in advance

- Step 1 : Add your iPhone to local wireless network



Figure 18: iPhone connect to Airport Express

- Step 2 : Add the Wi-Fi module to local wireless network



- *Note 1. WACIO with host board need connect with power adaptor
- 2. WACIO module need connect with 2.4GHz Antenna (IPEX connector)

Figure 19: Add the Wi-Fi module (WACIO_GP_XXX) to wireless network

- Step 2-1 Access to iPhone "Setting"->"Wi-Fi", it will appear "New Wi-Fi Device" under "other Wi-Fi area" and show "PHYTREX-xxxxxx" then press it

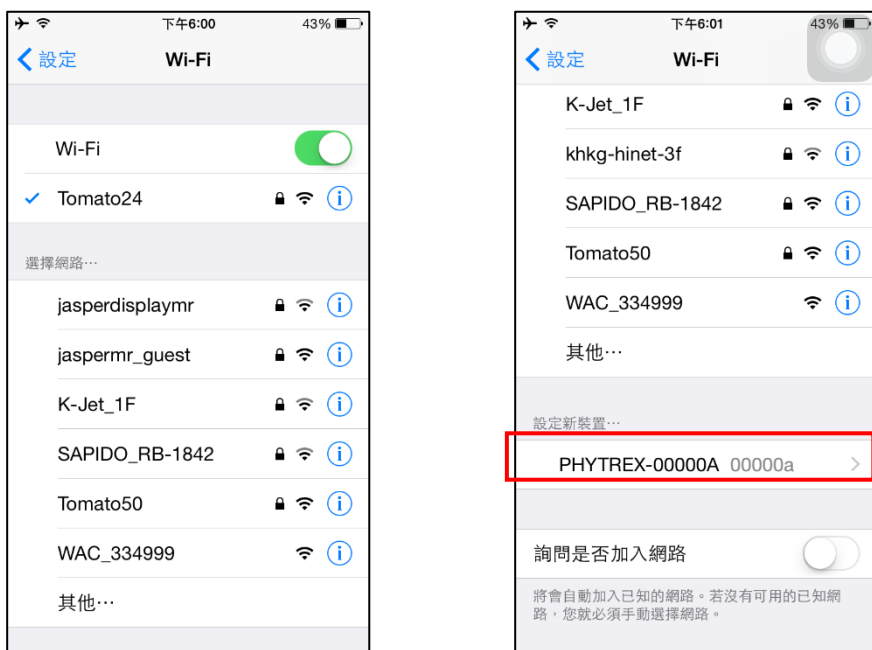


Figure 20 :Setting the Wi-Fi module under Setting category

- Step 2-2 Check the Network Name and Press "Next", waiting the pairing and setting process, then press "OK" when it finishes



Figure 21: Setting Wi-Fi module to local network

- Step 3 Active the OS system on Macbook and launch the HAT from the Dock

(Note: Please make sure the if your system install the HAT beta 8 or greater)

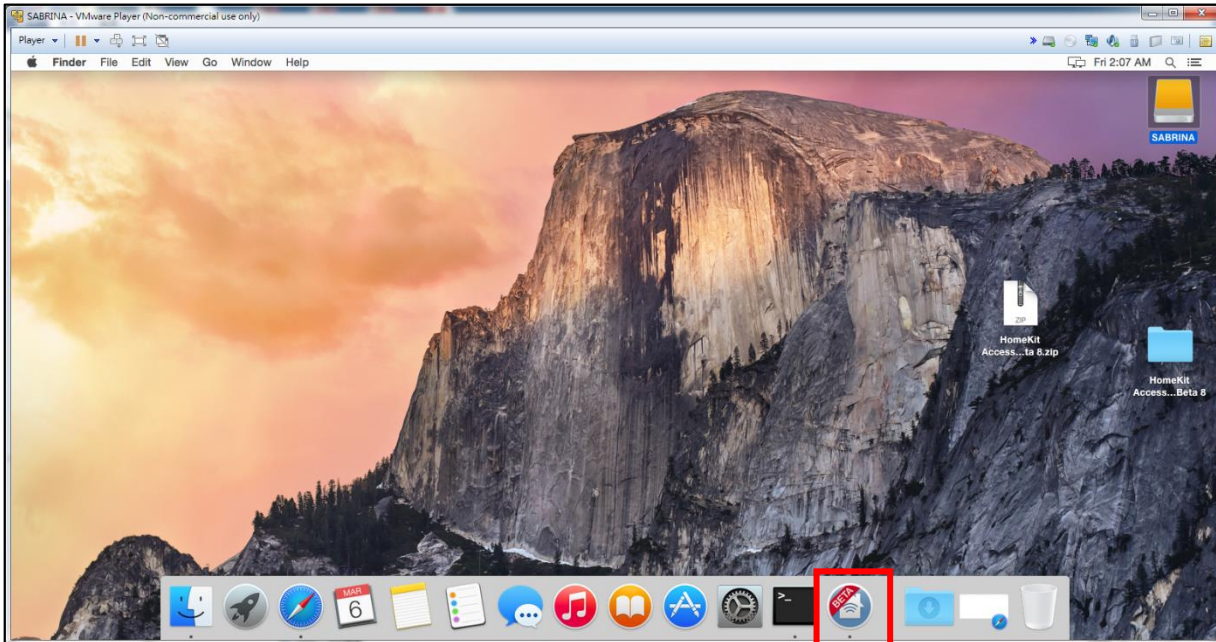


Figure 22 : Launch the Homekit Accessory Tester(HAT) Apps from the Dock

- Step 4 Click "+" at bottom line to add "Create IP Device", then select the device you want to control and press the "start pairing" (Figure 23)

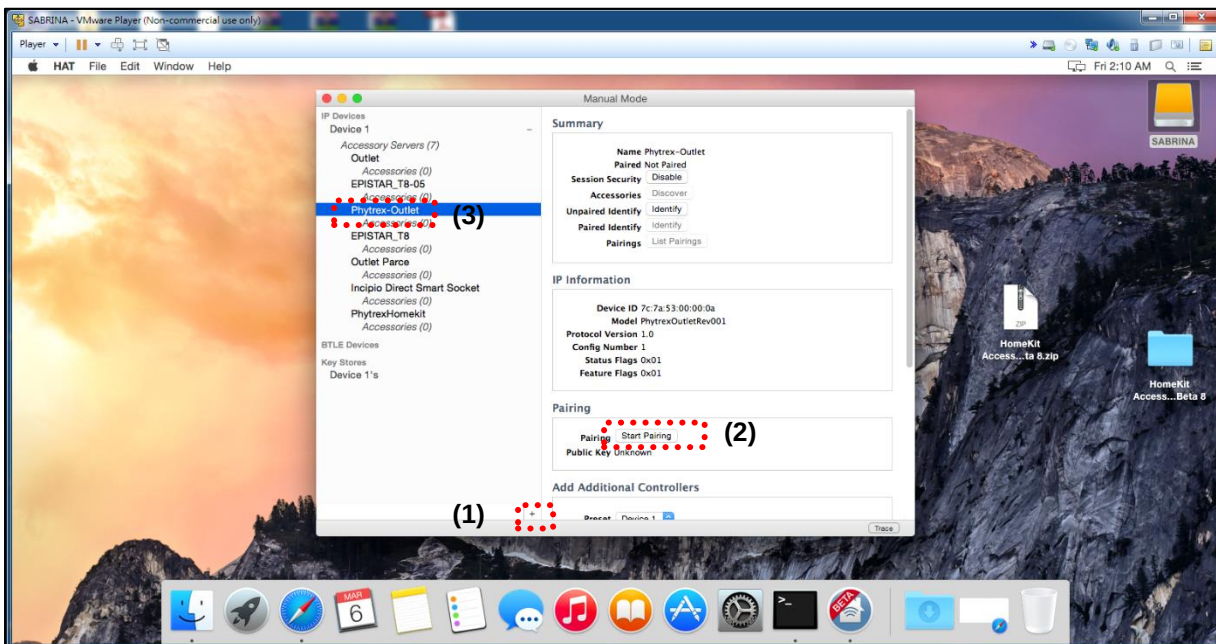


Figure 23 :Add IP Device and Press the "Start Pairing" button

■ Step 5 Insert Pairing PIN (ex:643-29-458)

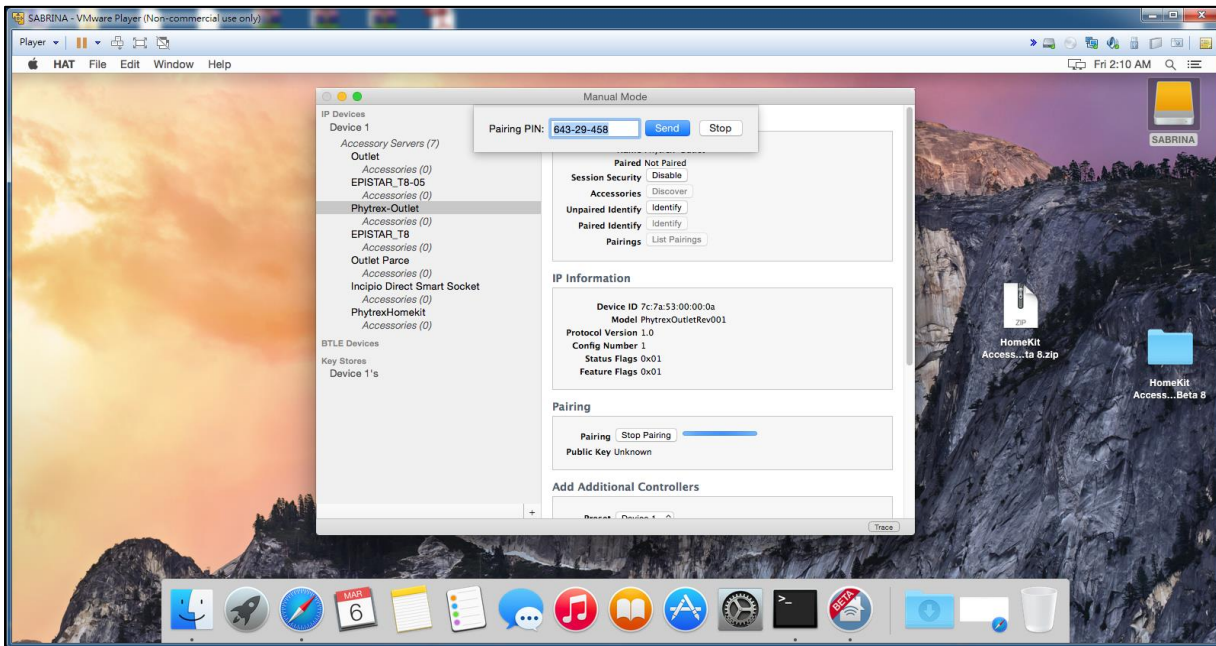


Figure 24 : Insert the Pairing PIN code

■ Step 6 After Pairing Complete Press "Discover" to check the "Profile"

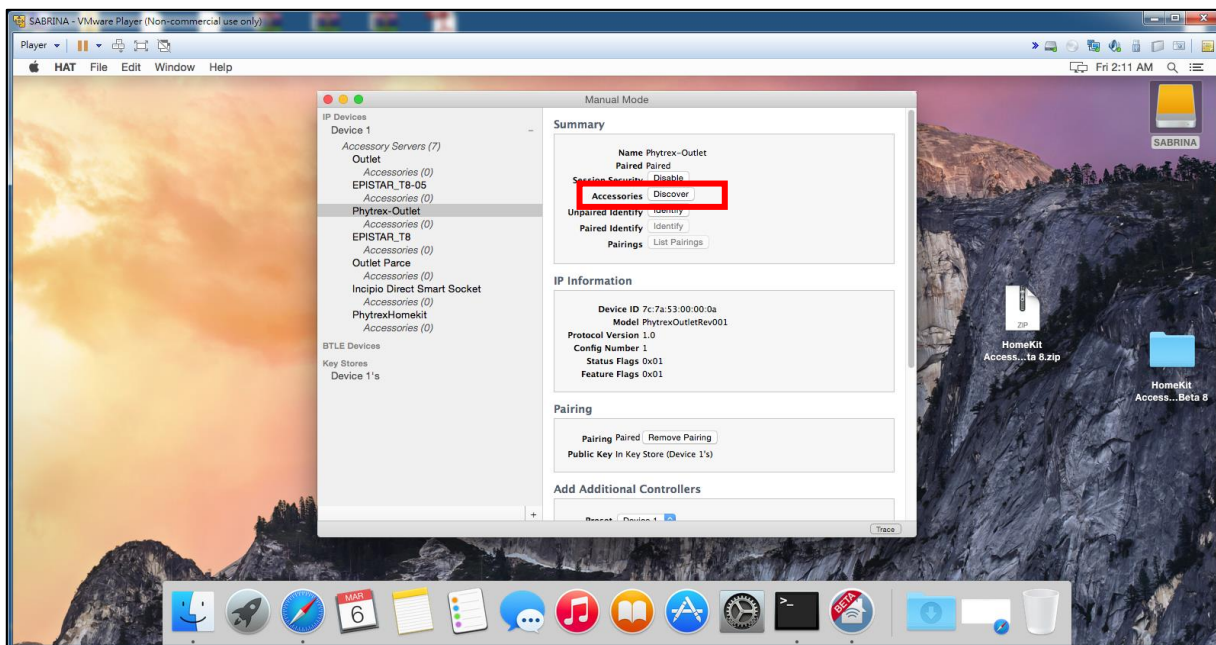


Figure 25 : Press "Discovery" on HAT

- Step 7 Control the Accessory, select the "Outlet Service" and Press the "on" for switch characteristic (Figure 26)

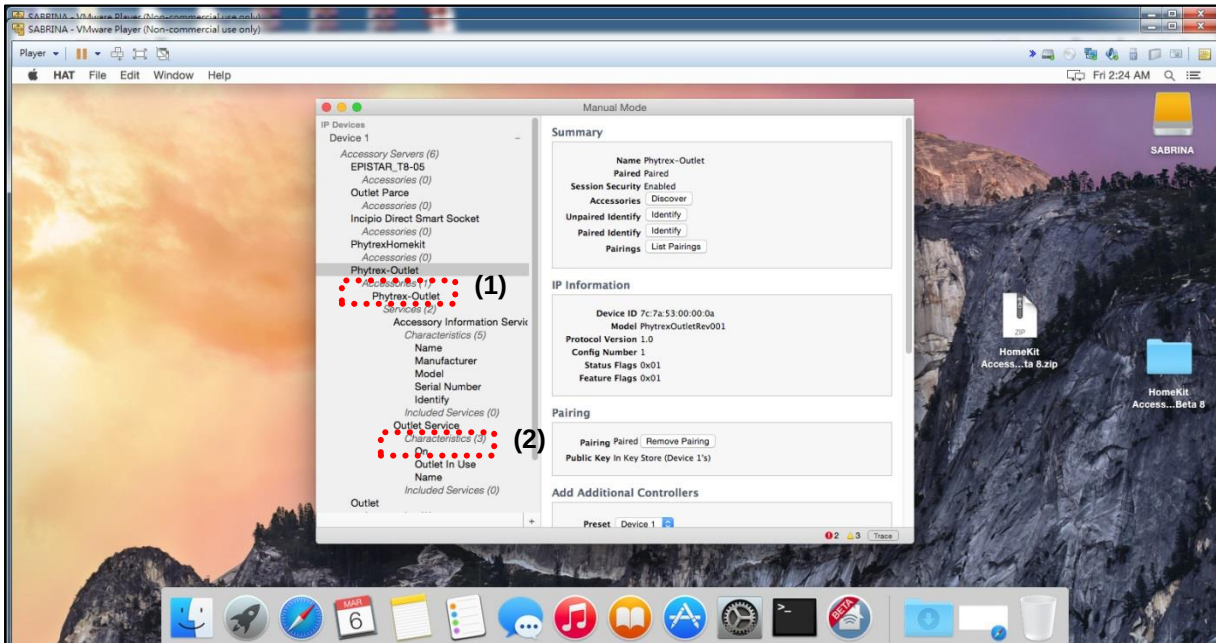


Figure 26 : Select the Accessory you want to control (e.g. Phytrex Outlet)

- Step 8 Enter the bool "1" for true, "0" for false to represent the status of switch "On" and "Off" respectively

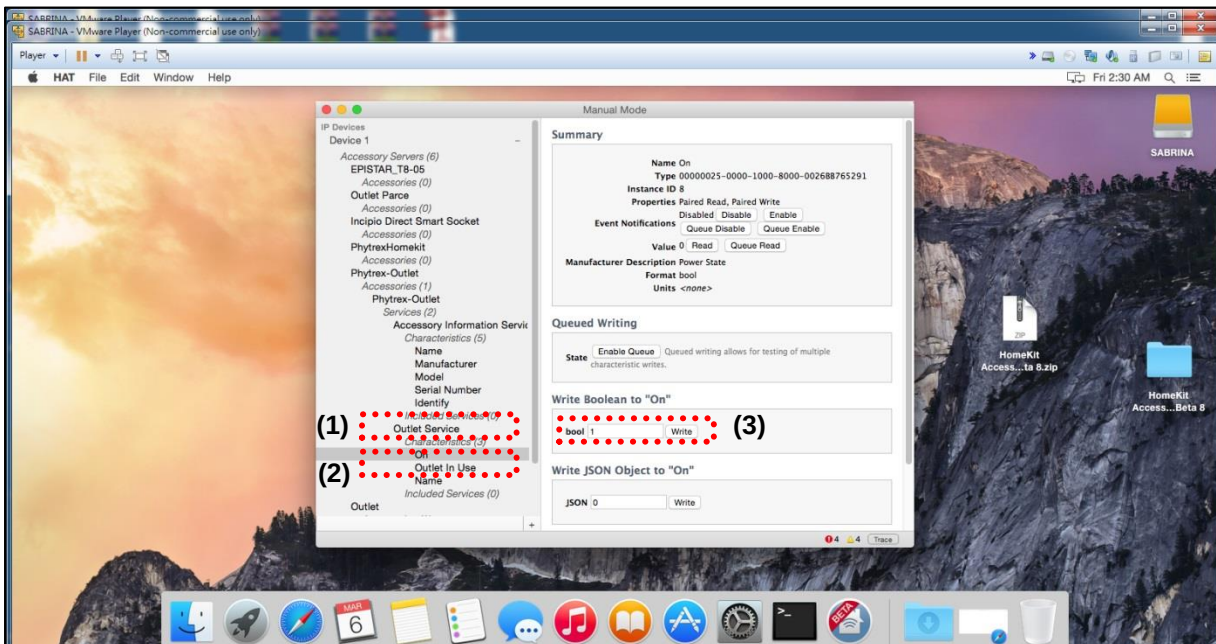


Figure 27: (1)"Outlet Service" (2)" On" Characteristic (3) Write the Boolean "1" or "0"

WACIO_GP_XXX Evaluation Kit Application Note - Outlet Test Case

Note

- Outlet Profile
- 2 Sections
- 14 Steps
- LED Indicators

Section 1 : Making accessory to join the network

Please refer the previous section.

Section 2 : Manual change state and verify with Homekit Accessory Test

- Step 1. Click to open “HAT” test program. (e.g..HAT beta 8.0)

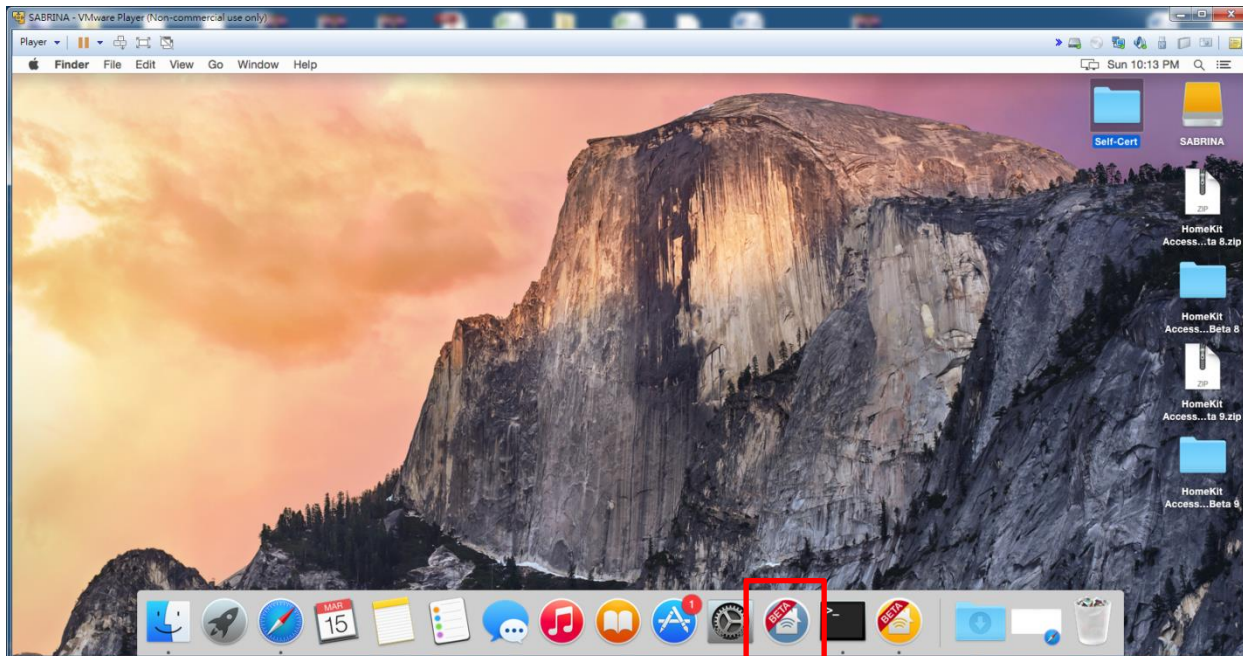


Figure 28: HAT Test Program (1)

- Step 2. Click “Close” under HAT quick note menu

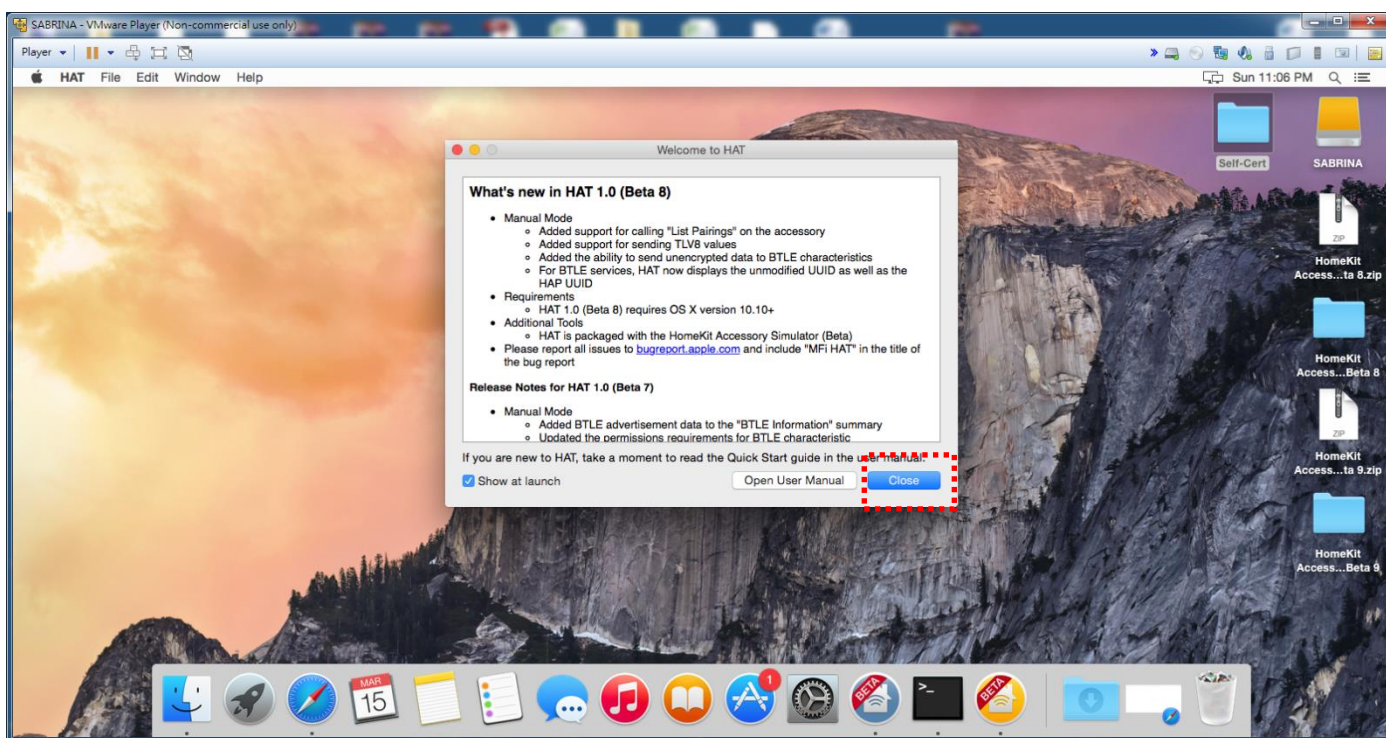


Figure 29: HAT Programming Software Welcome Pop-up and Revision Note

- Step 3. Add IP Device and select "Phytrex-Outlet" accessory, then Click "Start Pairing".

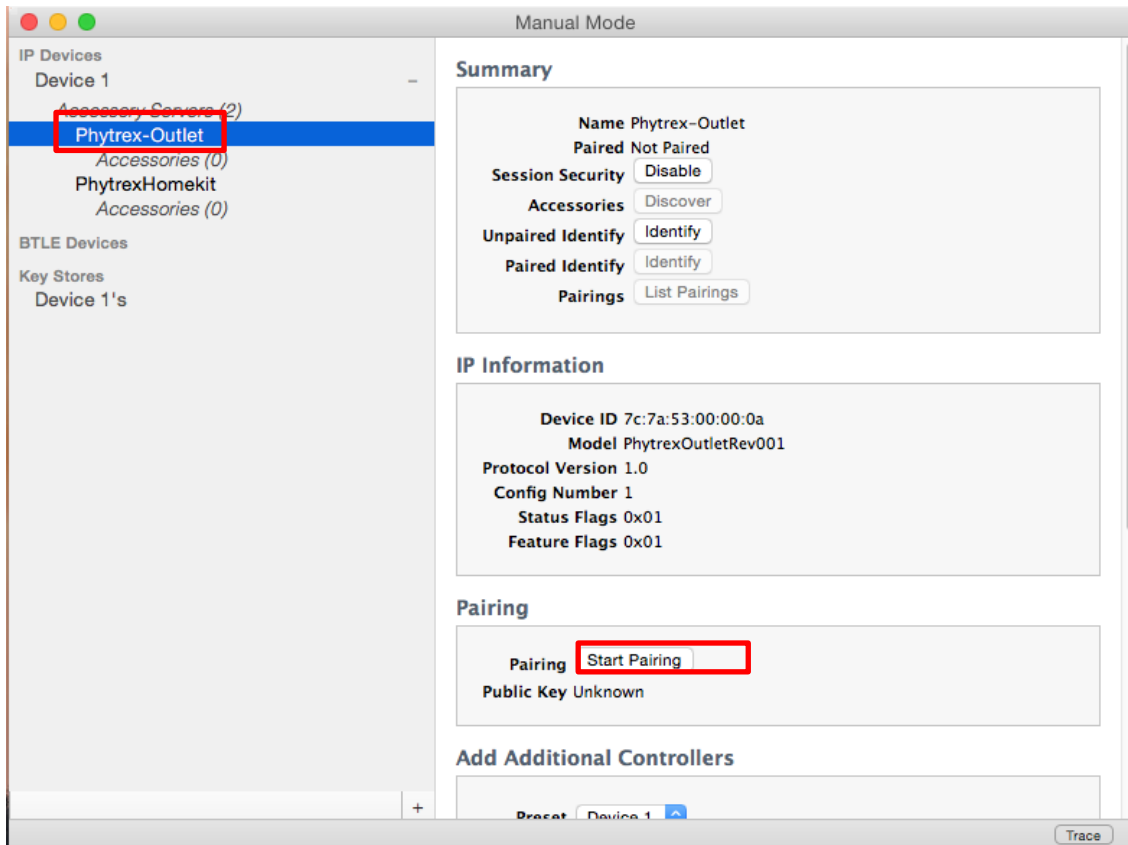


Figure 30: Add New IP Device , and press "start pairing"

- Step 4: key in accessory setup code (e.g. 643-29-458).

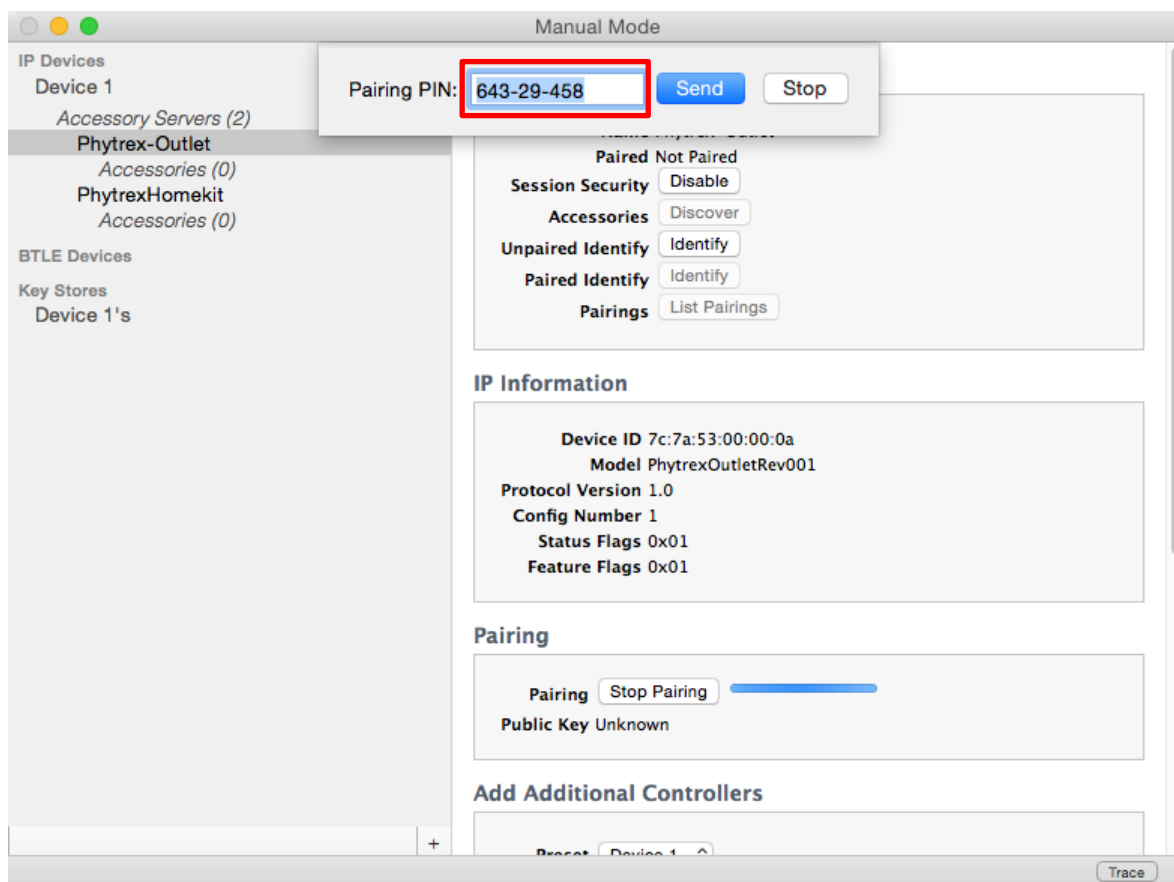


Figure 31: Key in the setup code (PIN code)

- Step 5: click “Send” after enter the setup code (PIN code) and waiting the key verification .

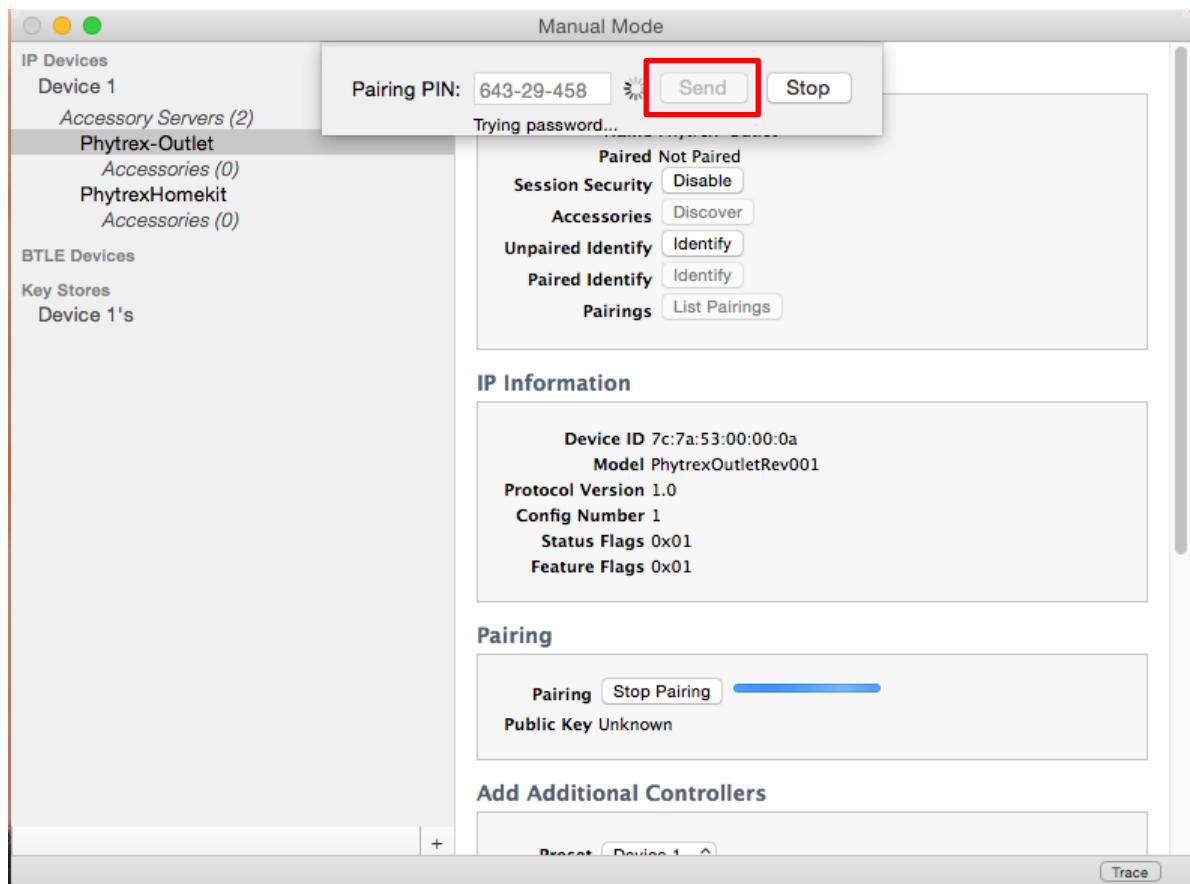


Figure 32: Verifying the Setup code (PIN code)

- Step 6 : Click “Discover” to check the profile under the Accessories category, it will display on the left side for relative service profile and characteristics. (Figure 33 and 34)

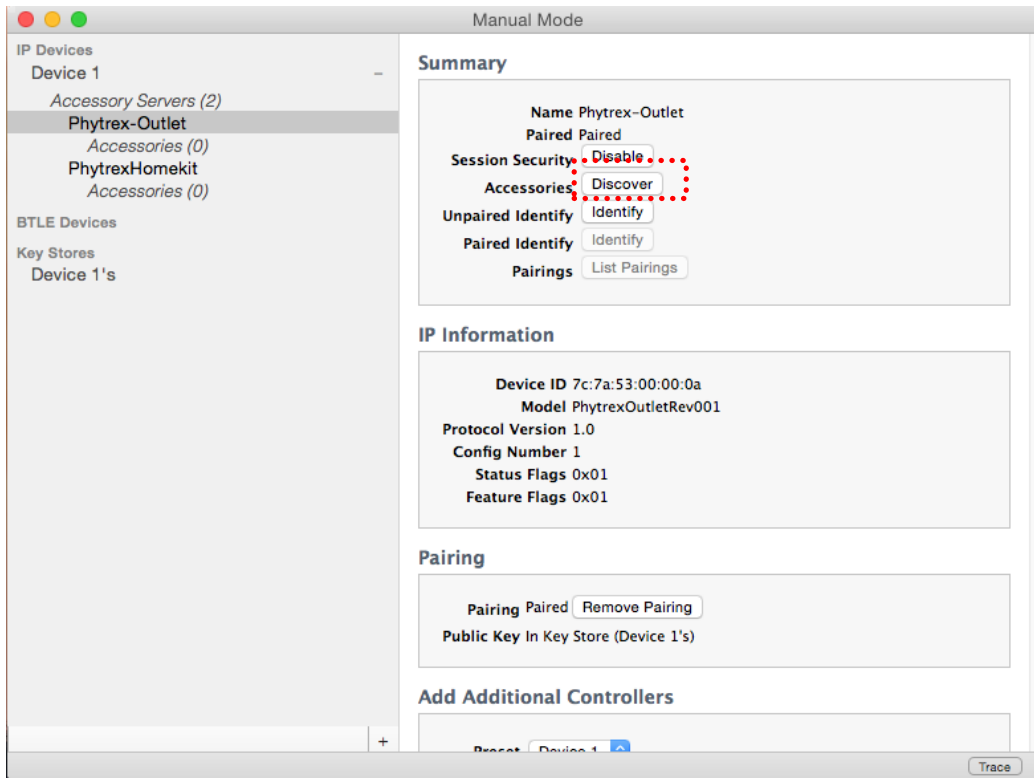


Figure 33: Discover the Accessory

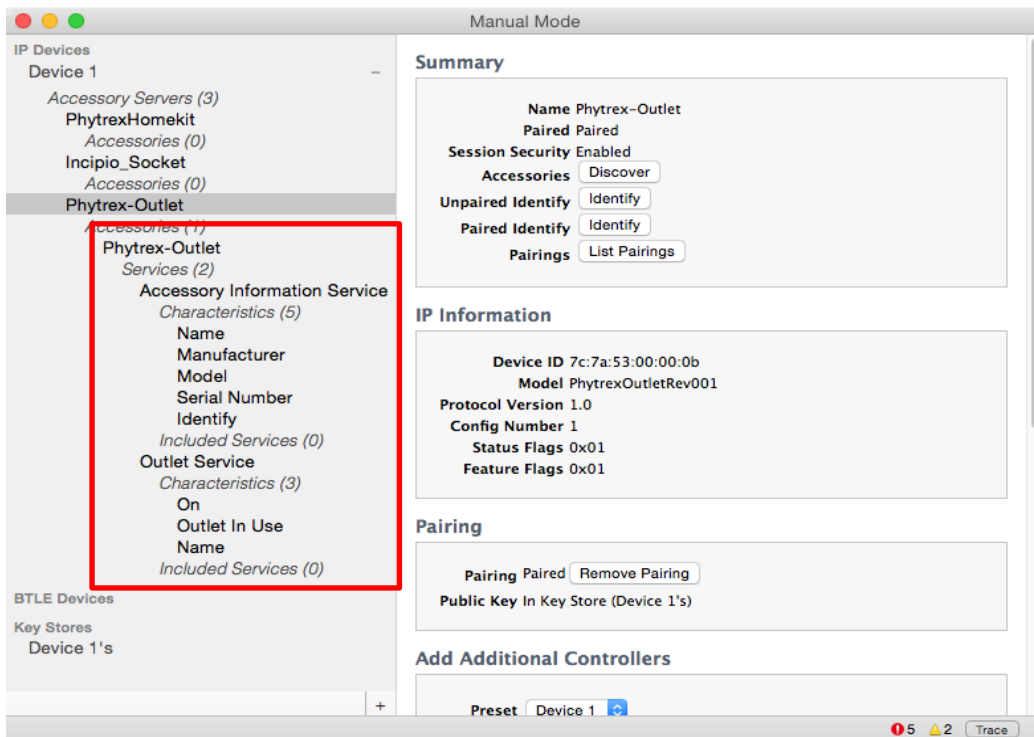


Figure 34: Service Profile and Characteristics

- Step 7. Select the "On" Characteristics from the "Phytrex-Outlet" Service Profile

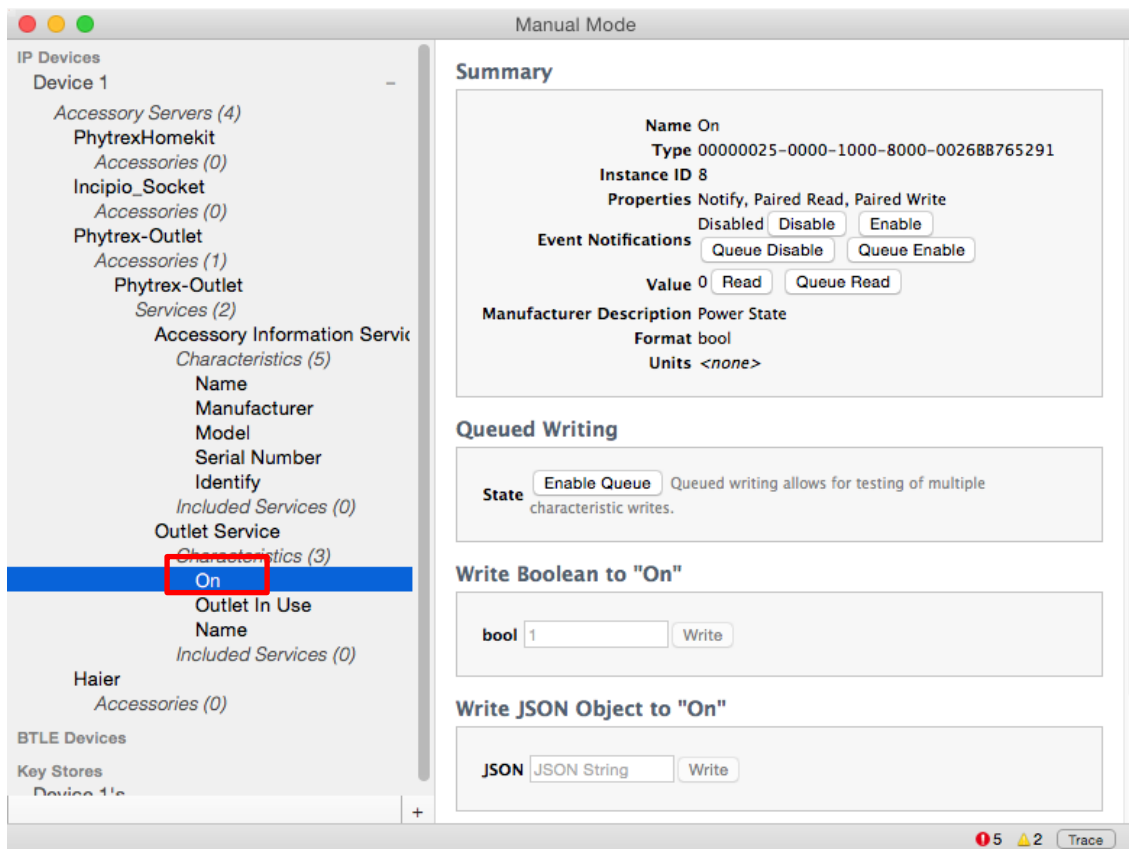


Figure 35: Select the "On" characteristics from the left side Outlet Service Profile

- Step 8 . Click “Enable” to active “Event Notifications”.

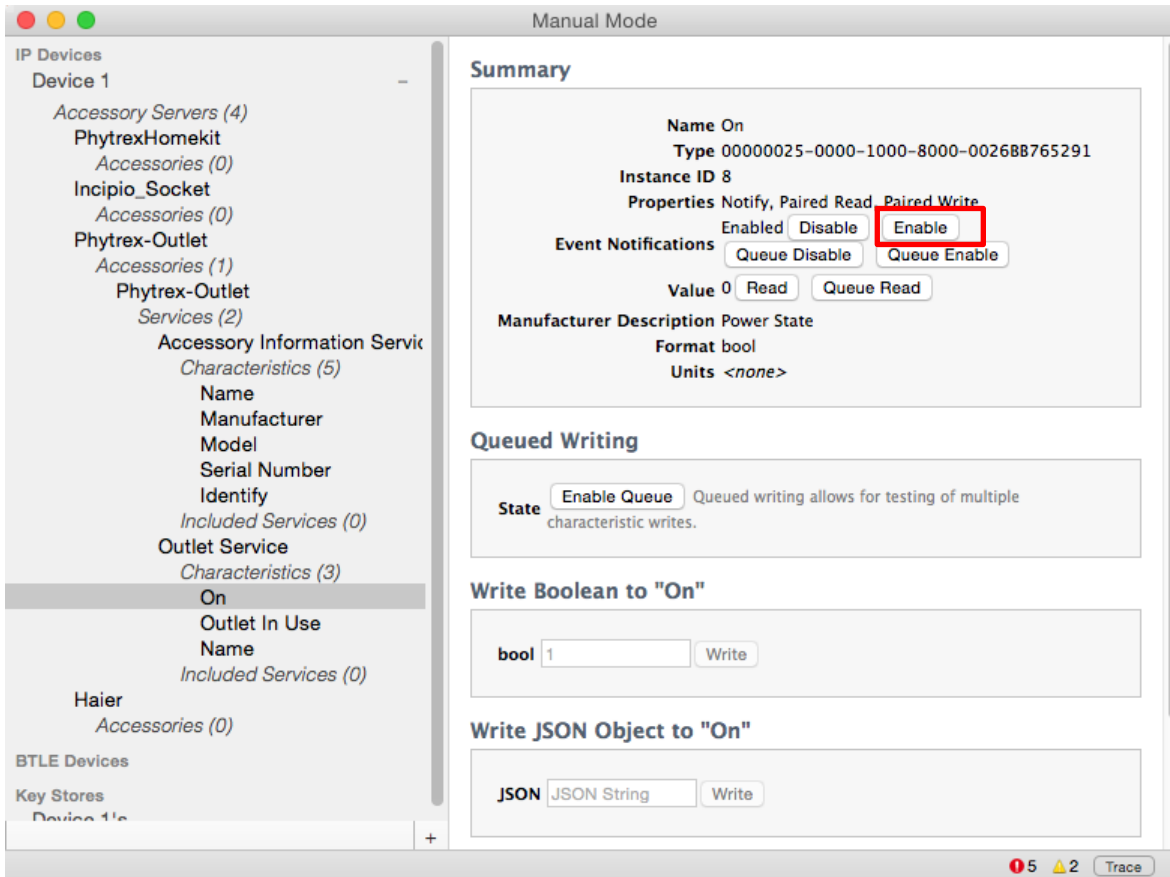


Figure 36: Activate the Event Notification

Outlet Switch "On"

- Step 9. Press "Outlet Manual Switch" around 1~2 seconds on EVB (Figure 4) then release it, The "Outlet Switch On/Off Indicator" will be light on, and "Value" on HAT will update to "1". (Figure 36)

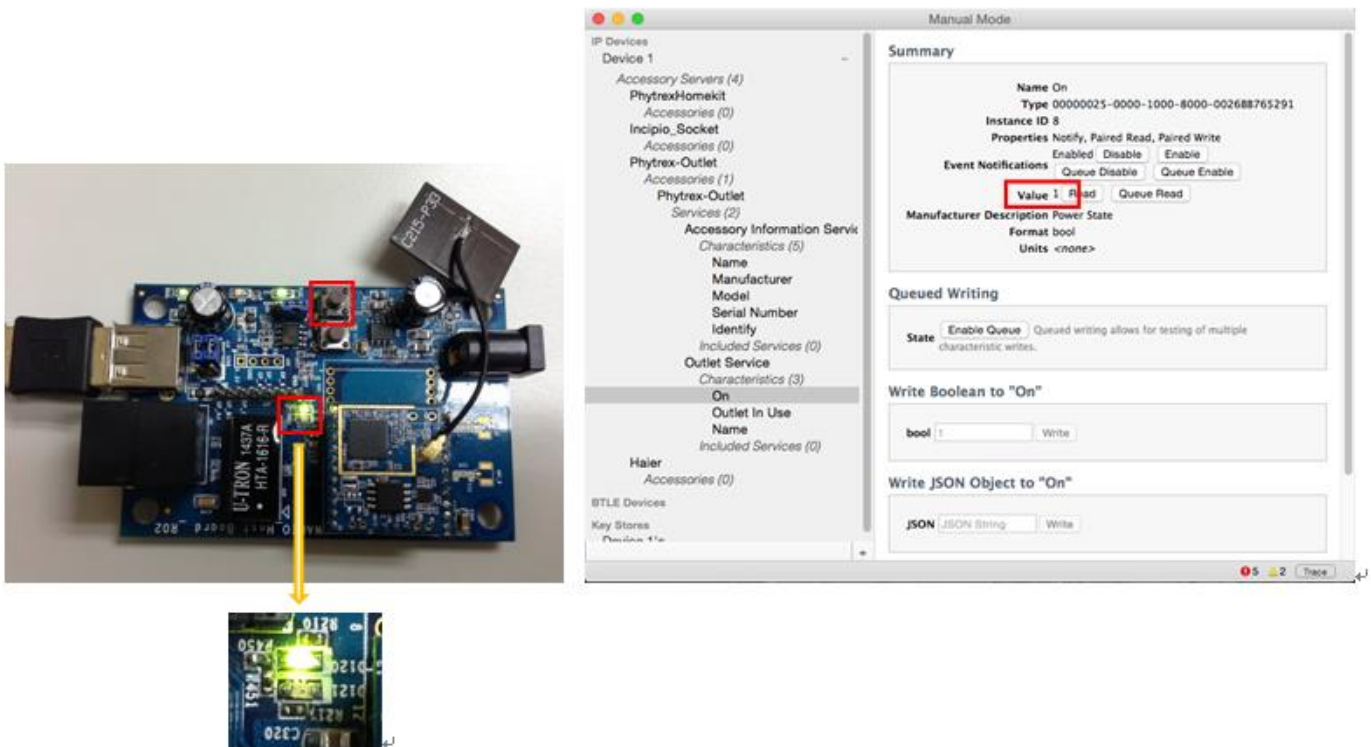


Figure 37: Outlet Switch indicator when switch On/Off and "Value" update on HAT (1)

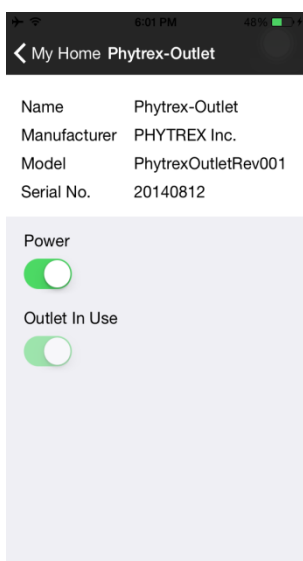


Figure 38: Outlet Switch "On" Screenshot from Homekit Apps

Outlet Switch "Off"

- Step 10: Press "Outlet Manual Switch" about 1-2 seconds on EVB(Figure 4) then release it.

The "Outlet Switch On/Off Indicator" will be light off, and "Value" will update to "0" itself on HAT

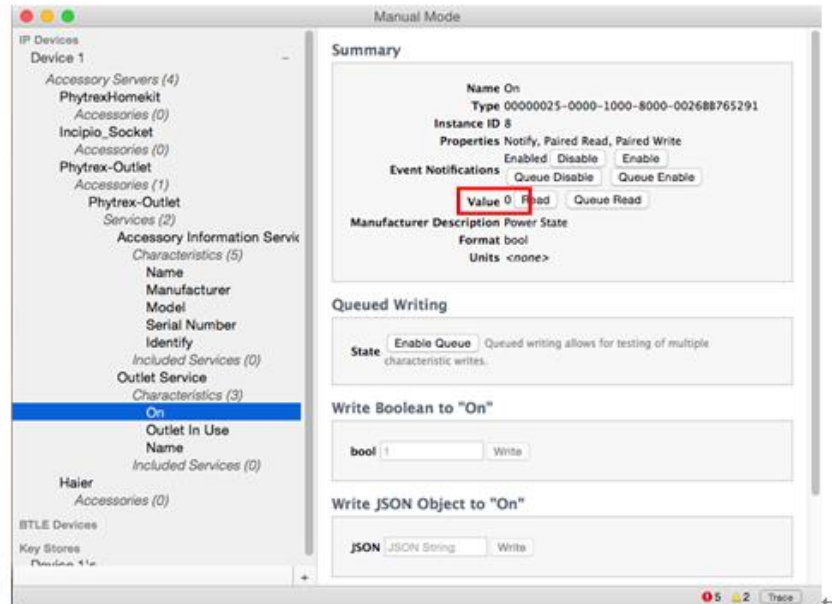


Figure 39 Outlet Switch indicator when switch On/Off and "Value" update on HAT (2)

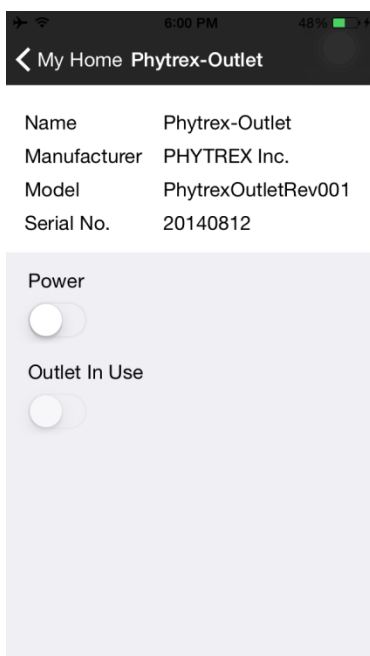


Figure 40: Outlet Switch "Off" Screenshot from Homekit Apps

Outlet In Use

- Step 11: Select the "Outlet In Use" Characteristic from the left side on HAT (Figure 38)

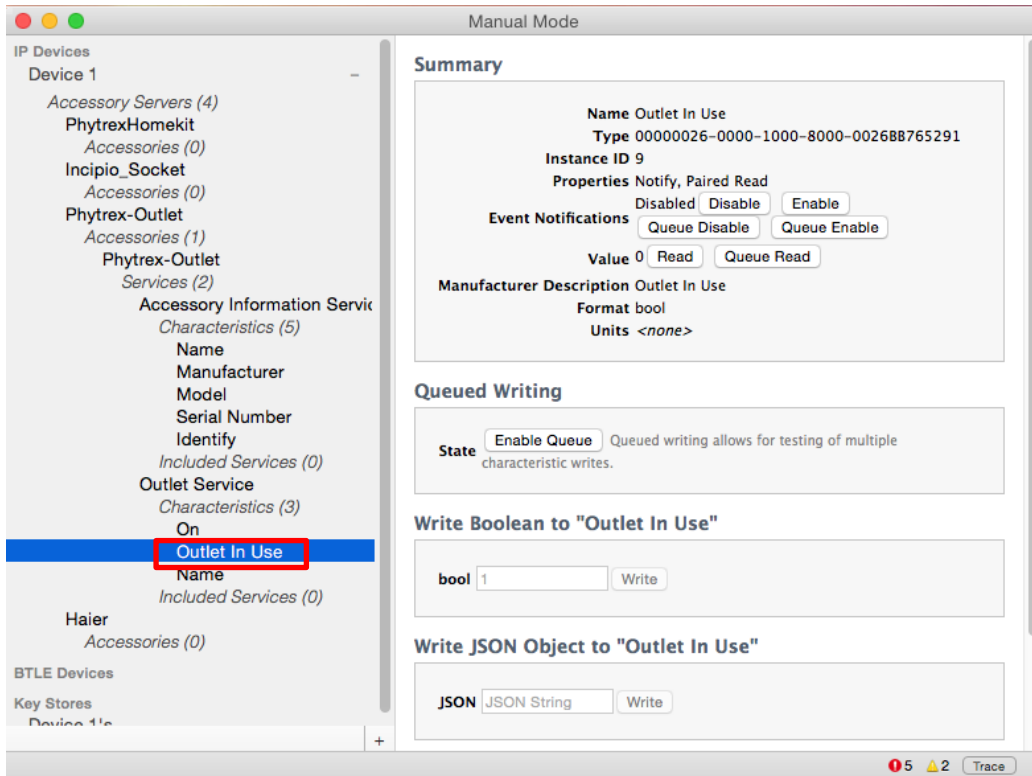


Figure 41: Select "Outlet In Use" Characteristic

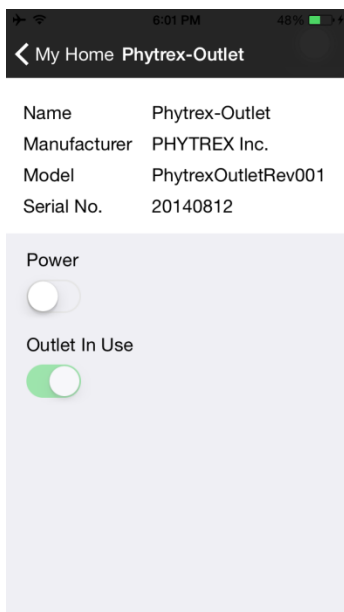


Figure 42: Outlet In Use "On" Screenshot from Homekit Apps

- Step 12: To activate the Event Notification by press the "Enable" button

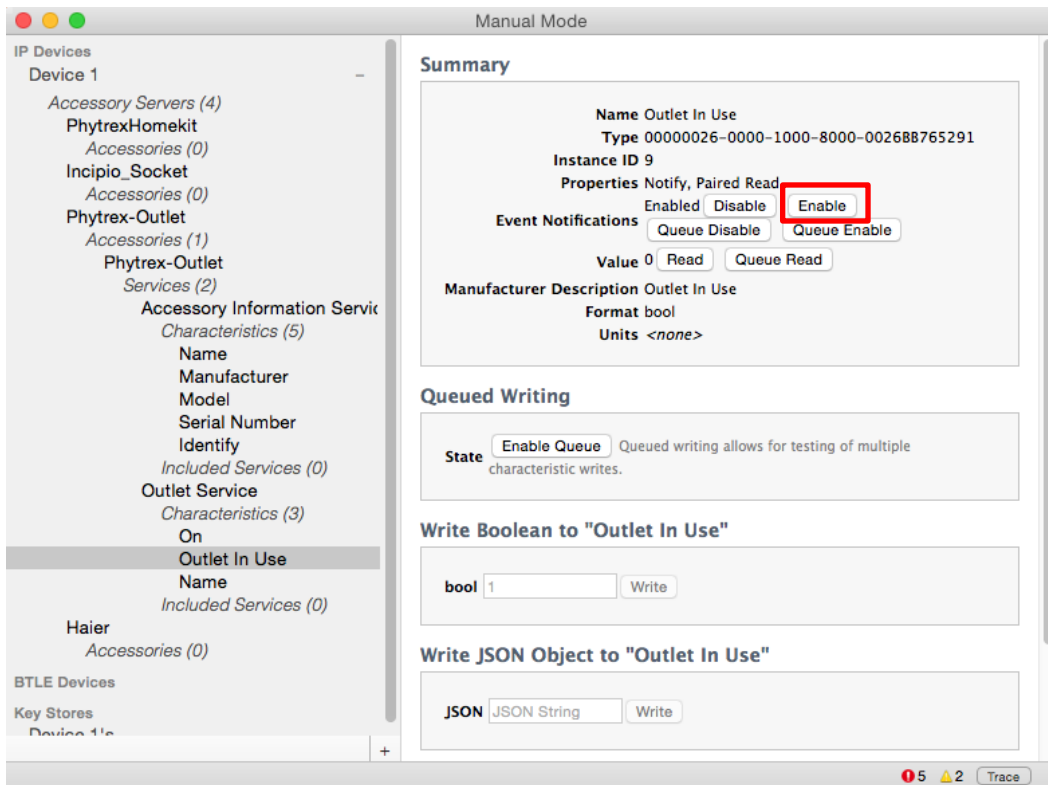


Figure 43: Activate the Event Notification

- Step 13: The implementation of manual change “Outlet In Use” state is removing the jumper from J20 on the EVB, it means the external load is plug in or plug out the outlet physically, and “Outlet In Use Indicator” will lights on, then “Value” on HAT will update to “1”.

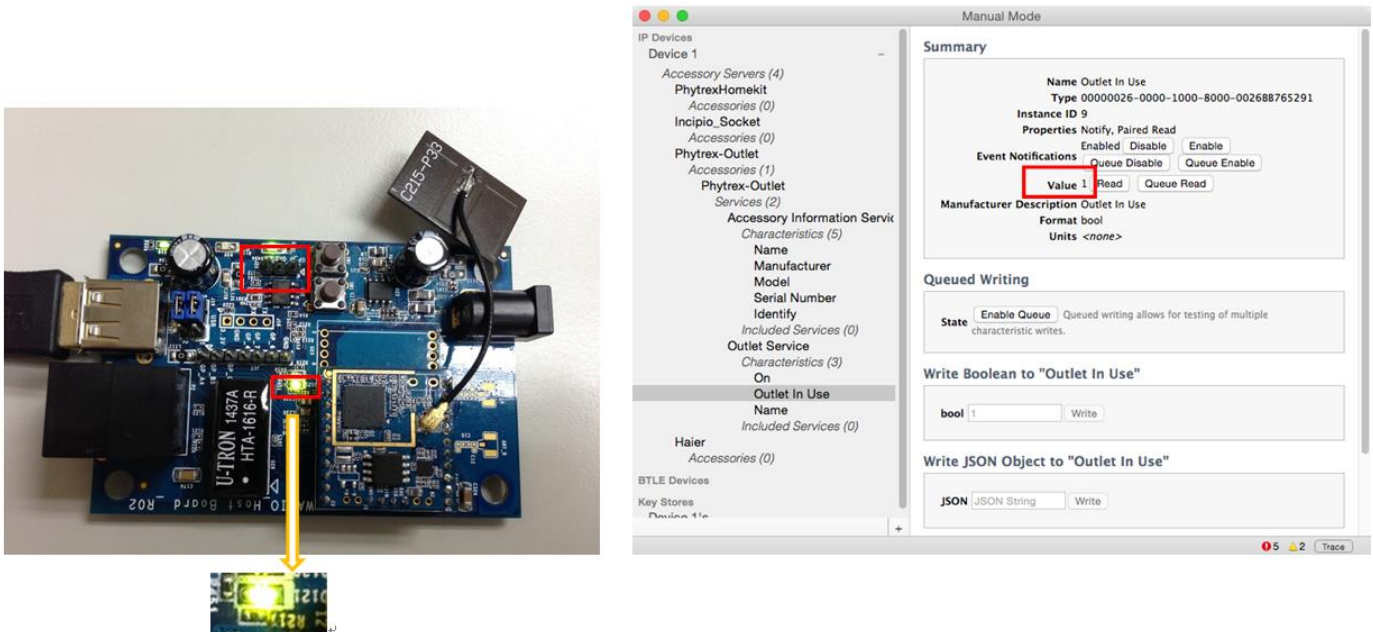


Figure 44: Manual remove the J20 jumper and Check Event Notification Status

- Step 14: Add the Jumper on J20 (Figure 42) then check the LED indicator and the Event Notification Status feedback

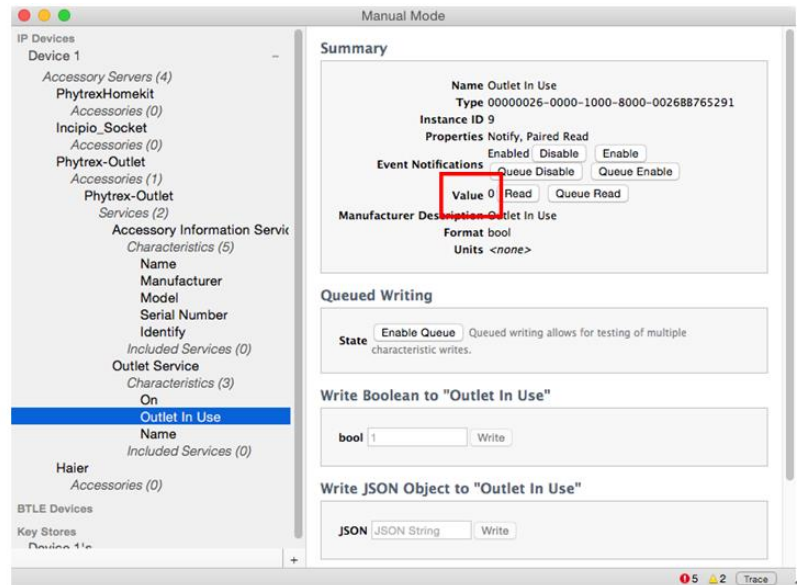
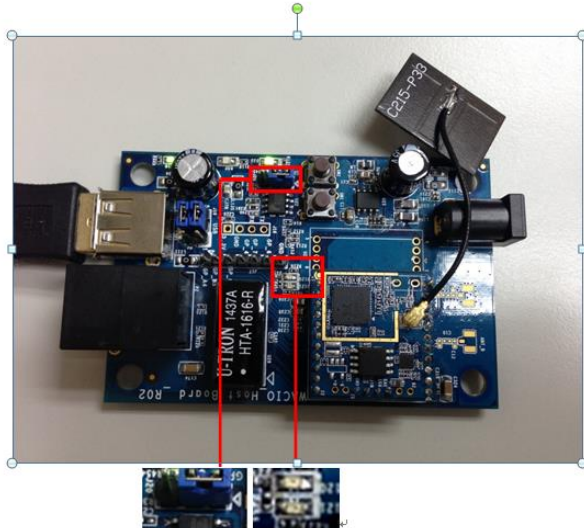


Figure 45: Manual adding the jumper on J20 and check the LED indicator

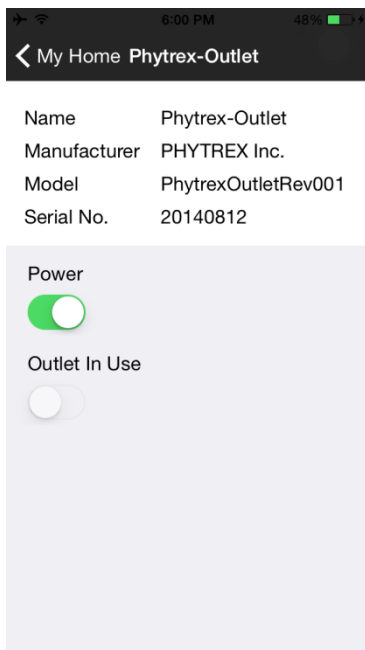


Figure 46: Outlet In Use "Off" Screenshot from Homekit Apps

Reference

- [1] *Homekit Accessory Protocol for IP Accessories R2*
- [2] *Homekit Accessory Tester Beta 9 user manual*
- [3] *Homekit Self-Certification Test case R2.2*

Support and Contact

If you need to purchase our products or have any technical issues, please contact us
(Monday to Friday AM 9:00~12 : 00 ; PM 1:00~6:00). Phytrex Technology Corp.

TEL : +886-3-5169331

Address : 8F-16, No.81, Shuili Rd., Hsinchu, 30059, Taiwan

Email : sales@phytrex.com

FCC Compliance and Advisory Statement

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, according to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try correct the interference by one or more of the following measures:

1. Reorient the receiving antenna.
2. Increase the separation between the equipment and receiver.
3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
4. Consult the dealer or an experienced radio/TV technician for help.

Any special accessories needed for compliance must be specified in the instruction manual.

Warning: A shielded-type power cord is required in order to meet FCC emission limits and also to prevent interference to the nearby radio and television reception. It is essential that only the supplied power cord be used. Use only shielded cables to connect I/O devices to this equipment.

CAUTION: Any changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

OEM Information

OEM : 3D Technologies, CO., LTD.