Hub Quick Start Guide

Version	With	Editor	Date
V1.0	Draft	Alice	September 6, 2019
V2.0	Supplement the power supply connection	Alice	September 9, 2019
V2.1	Change to finish good photo	Robust	Dec. 25th, 2019
V2.2	Add wiring instruction	Robust	Feb. 10th ,2020
V2.3	Add wiring diagram and Safety statement	Robust	Feb. 12th ,2020

Technical Specification

1. Power :

   Rate : 24VAC (common wire requirement)

   Frequency : 50/60Hz

2. Weight of Unit: 0.5 Kg

3. Environment

   Operating Temperature : 0^0C~40^0C

   Storage Temperature : -10^0C~45^0C

   Humidity : 0 to 90% RH (non-condensing)

CAUTION!

1. Risk of explosion if the battery is replaced by an incorrect type
2. Use the battery only under the following environmental conditions. Failure to do so can result in reduced performance or a shorten service life. Recharging the battery outside of these temperatures can cause the battery to overheat, explode or catch fire.

   Operating environment:

   When charging the battery: 0^0C~45^0C

   When discharging the battery: -10^0C~60^0C

   When stored up to 30 days: -10^0C~45^0C

   When stored up to 90 days: -10^0C~35^0C
3. In cases where children use the battery, instruct them on the contents of the user's guide and keep an eye on them to ensure that the battery is being used correctly.

   If the battery leaks and electrolyte gets your skin or clothing, immediately rinse the affected area with clean running water. If left as is, skin inflammation can occur.
4. For directions on battery installation and removal, read the instruction manual that accompanies the equipment in which the battery will be used.
5. If the terminals of the battery are dirty, wipe them clean with dry cloth before use. Otherwise, solid electrical contact may not be charged with the equipment, and this can cause power outages or charging to fail.

Warning!

1. Do not use the battery if it gives off an door, generates heat, becomes discolored or deformed, or appears abnormal in any way. If the battery is in use or being recharged, remove it from the device or charger immediately and discontinue use.
2. Replace a BATTERY with incorrect type that can defeat a SAFEGUARD (for example, in the case of some lithium BATTERY types);
3. Disposal of a BATTERY into fire or a hot oven, or mechanically crushing or cutting of a BATTERY, that can result in an explosion;
4. Leaving a BATTERY in an extremely high temperature surrounding environment that can result in an explosion of the leakage of flammable liquid or gas;
5. A Battery subjected to extremely low air pressure that may result in an explosion or the leakage of flammable liquid or gas;
6. Keep the batteries out of the reach of children. If a child somehow swallows a battery, seek medical attention immediately.

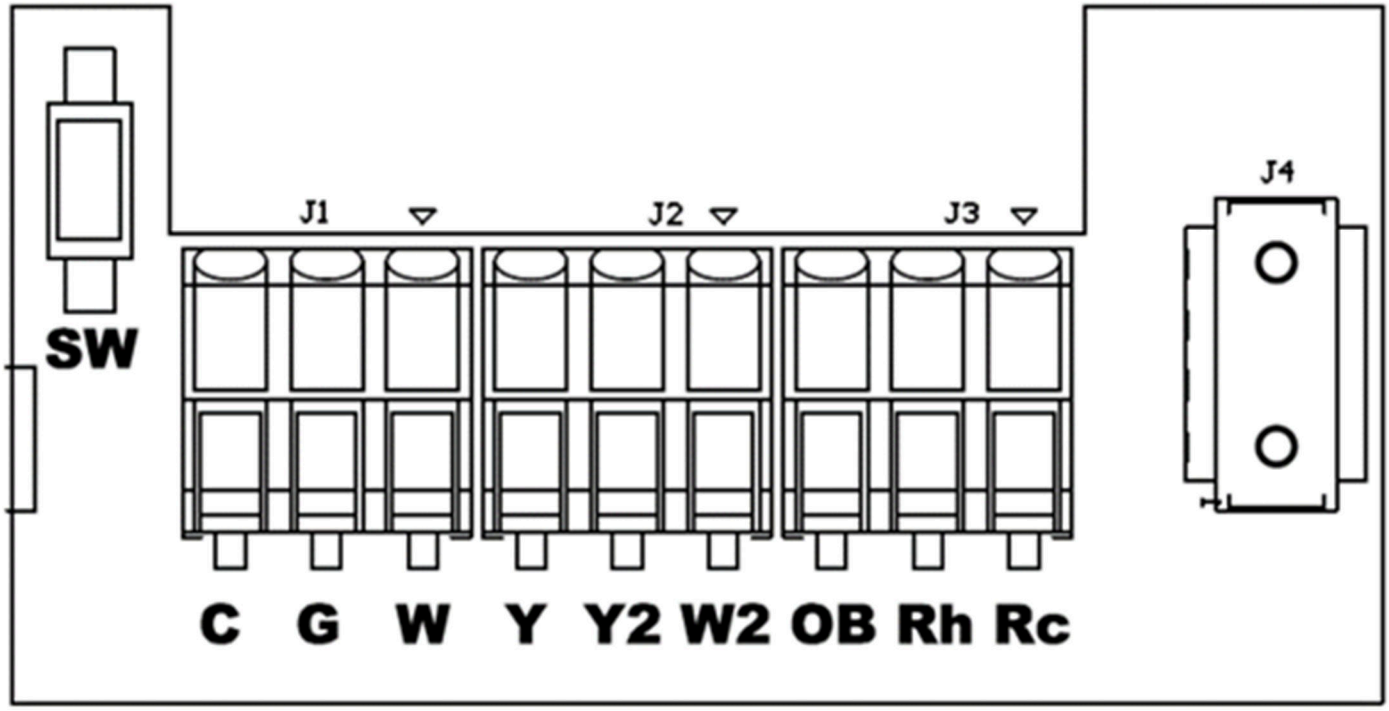
Danger!

Failure to observe the following precautions may result in battery leakage, overheating, explosion and/or fire.

1. Do not immerse the battery in water or allow it to get wet.
2. Do not use or store the battery near sources of heat such as a fire or heater.
3. Do not connect the battery directly to wall outlets or car cigarette-lighter sockets.
4. Do not put the battery into a fire or apply direct heat to it.
5. Do not short-circuit the battery by connecting wires or other metal objects to the positive (+) and negative (-) terminals.
6. Do not carry or put the battery together with necklaces, hairpins or other metal objects.
7. Do not strike, throw or subject the battery to sever physical shock.
8. Do not pierce the battery casing with a nail or other sharp object, break it open with a hammer, or step on it.
9. Do not directly solder the battery terminals.
10. Do not attempt to disassemble or modify the battery in any way.
11. Do not recharge the battery near a fire or in extremely hot conditions.

- 24VAC Power Connection

Terminal	Color	Description
Rh or Rc	RED	24VAC power wire
C	BLUE	Common wire

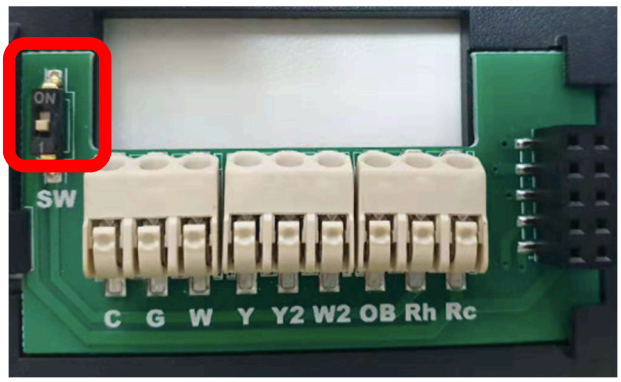


- Terminal Description

Terminal	Color	Function
G	Green	Fan
Rc	RED	Cooling transformer
Rh	RED	Heating transformer
O/B	ORANGE	Heat Pump O or Heat Pump B (reverse valve)
Y/Y2	YELLOW	Y, Y2: Use for 1-2 stages of conventional A/C or 1-2 stages of heat pump compressor
W/W2 (AUX)	White Brown	W, W2: Use for 1-2 stages of conventional heat or 1-2 stages of auxiliary heat with heat pump
C	BLUE	24VAC common wire

Note:

1. Thermostat hub is designed for 24VAC with a 1A max. current.
2. Do not connect to line (high) voltage or millivolt systems
3. Switch enable: Rh=Rc (One transformer)
4. Switch disable: Rc≠Rh (Two transformer)
5. Y/Y2 will switch together, W/W2 will switch together

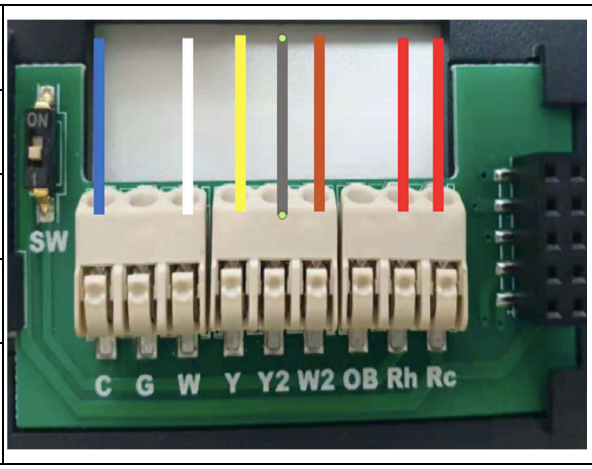


- Thermostat Wire Connection

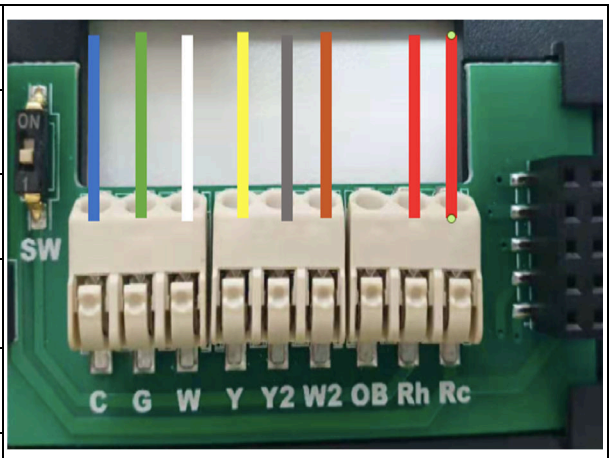
  Please Note: if there exists two independent transformers (Rc≠Rh), switch can be disable, vice versa

(1) Gas/Oil/Geothermal/Propane: Force Air, Radiators

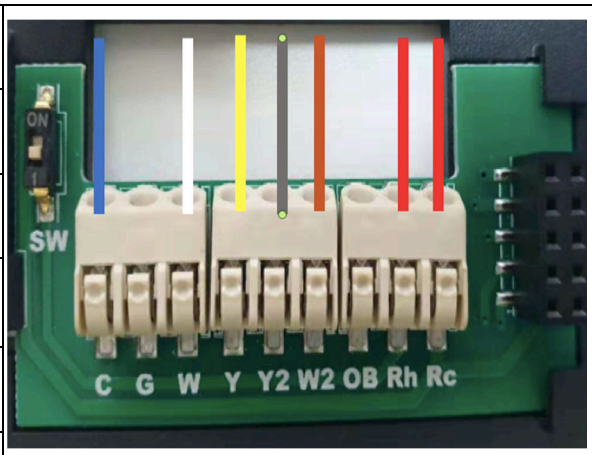
(Rh-W,Rh-W2 switch together)

Label	
G	
W	
C	
Rc/Rh	

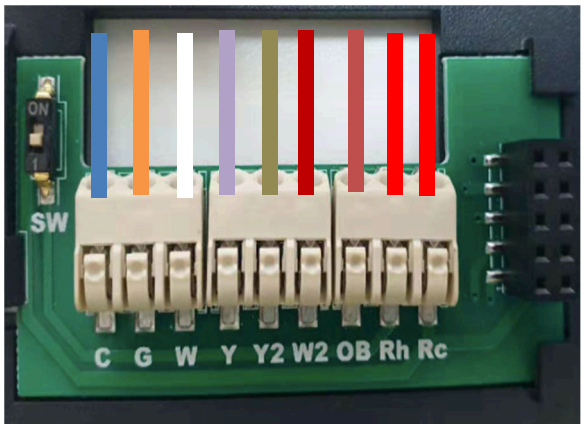
(2) Electric: Force Air (Rh-W,Rh-W2 switch together)

Label	
G	
W	
W2	
C	
Rc/Rh	

(3) Electric: Radiator (Rh-W,Rh-W2 switch together)

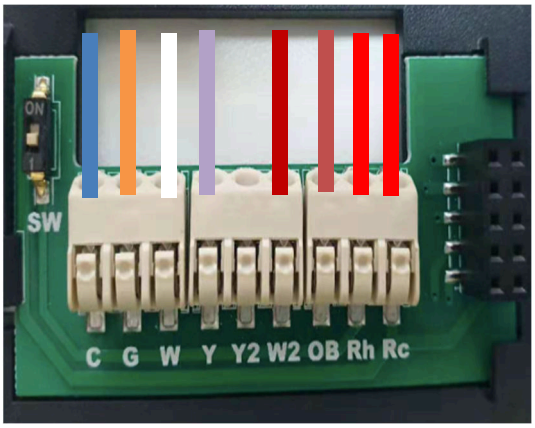
Label	
G	
W	
Y	
C	
Rc/Rh	

(4) Heat Pump O/B: Force Air

Label	
G	
W	
Y	
Y2	
C	
O/B	
Rc/Rh	

(5) Heat Pump O/B: Radiator

Label	
W	
W2	
Y	
C	
O/B	
Rc/Rh	



- Wire Connection Procedure

Please refer the following procedure to install your thermostat

1. Turn Off power

Turn off the power to your heating and air conditioning system at your fuse box or flip the switch next to your furnace. In order to confirm the power is off, try to turn on heating or cooling by setting temperature on your old thermostat.

2. Remove old thermostat

Remove face plate with screwdriver or by pushing the pressure latch.

3. Take a photo of your wiring

Take a photo of your existing wiring before remove your thermostat from the wall. It is very important step and can help and reduce a lot time if you need to troubleshooting later.

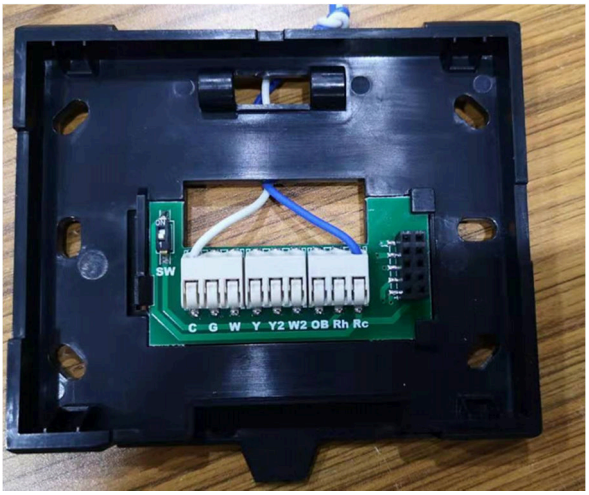
4. Label your wires

Use the wire labels before remove the wire cable from your old thermostat. Label one wire at a time and doing the terminal cross-reference table .

5. Attach back terminal plate to wall

   Secure the back plate to your wall with the screws

6. Connect wire to the back terminal plate
7. Attach the main frame on it
8. Power on HVAC system



Back Terminal Plate

Thermostat Mainframe

Fuel Source	Heating Type	Heating	Cooling	Common wire	*Mode switch duration
Gas,Oil, Geothermal, Propane	Forced Air, Radiators, In-floor Radiant	Rh-W， Rh-W2	Rc-Y， Rc-G	C	180s
Electric	Forced Air	Rh-W， Rh-W2， Rc-G	Rc-Y， Rc-G	C	180s
	Radiators, In-floor Radiant	Rh-W， Rh-W2	Rc-Y， Rc-G	C	180s
*Heat-Pump O	Forced Air	Rc-Y， Rh-W， Rh-W2， Rc-G	Rc-Y， Rc- O/B， Rc-G	C	180s
	Radiators, In-floor Radiant	Rc-Y， Rh-W， Rh-W2， Rc-G	Rc-Y， Rc-O/B	C	180s
*Heat-Pump B	Forced Air	Rc-Y， Rc-O/B， Rh-W， Rh-W2， Rc-G	Rc-Y， Rc-G	C	180s
	Radiators, In-floor Radiant	Rc-Y， Rc-O/B， Rh-W， Rh-W2， Rc-G	Rc-Y	C	180s

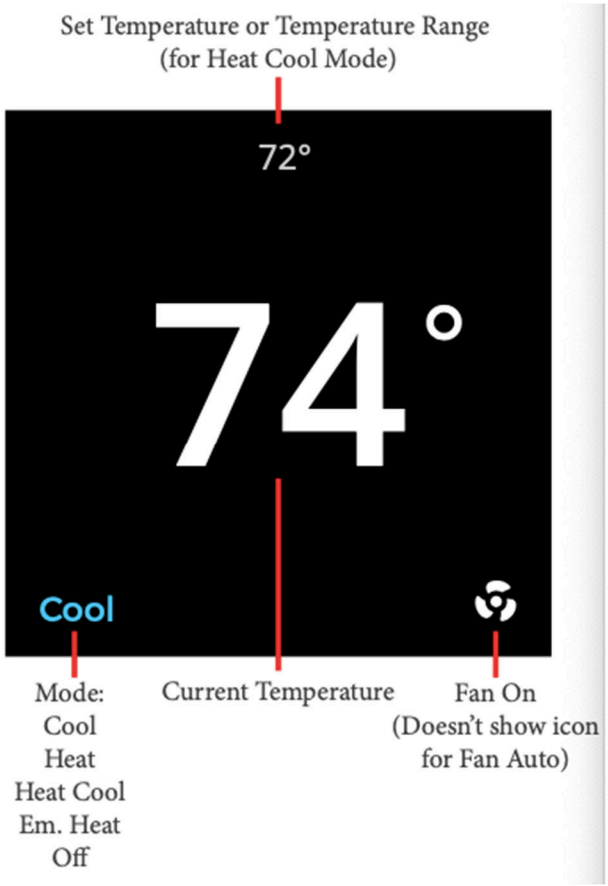
*Heat Pump mode : W, W2 wiring belong to Aux. heating, it needs work with G wire

*Mode switch duration : Mode switching from Y (cooling) to W (heating) needs waiting 180 sec. ,vice versa.

1. Operation

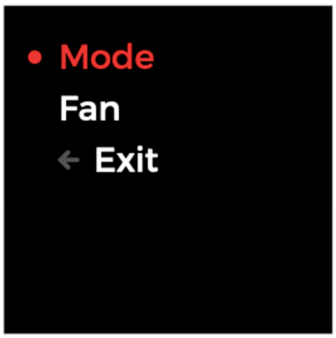
1.1 Hub Outlook

1.2 Home Screen



1.3 Main Menu

Main Menu

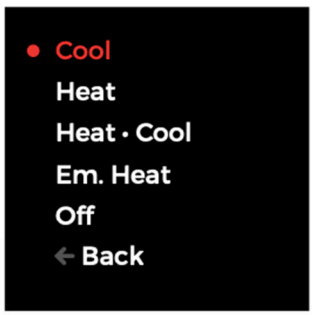


Mode Highlighted
Mode is highlighted when visiting this Menu. Pressing the Center button here will go to the Mode Menu.

Fan Highlighted
Pressing the Center button here will go to the Fan Menu.

Exit Highlighted
Pressing the Center button here will go to the Home Screen.

1.4 Mode Menu



Cool Mode Highlighted
Cool Mode is highlighted when visiting this Menu. Pressing the Center button here will turn the A/C to Cool Mode and go back to the Home Screen.

Heat Mode Highlighted
Pressing the Center button here will turn the A/C to Heat Mode and go back to the Home Screen.

Heat Mode Highlighted
Pressing the Center button here will go to the Heat Cool Menu.

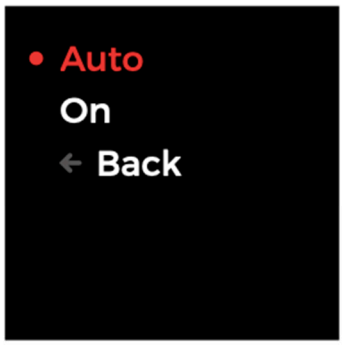
Em. Heat Mode Highlighted
Pressing the Center button here will turn the A/C to Em. Heat Mode and go back to the Home Screen.

Off Highlighted
Pressing the Center button here will turn the A/C Off and go back to the Home Screen.

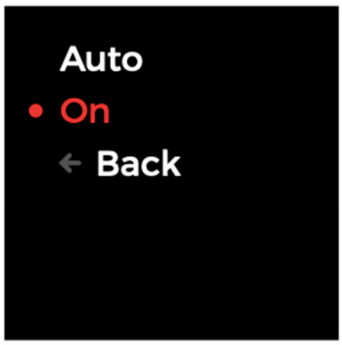
Back Highlighted
Pressing the Center button here will turn go back to the previous screen (Main Menu).

1.5 Fan Menu

Fan Menu



Fan Auto Mode Highlighted
Auto is highlighted when visiting this Menu. Pressing the Center button here will turn the Fan to Auto Mode and go back to the Home Screen.

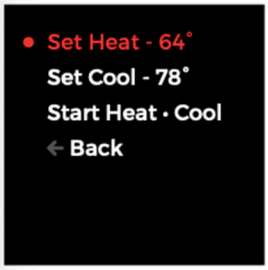


Fan On Mode Highlighted
Pressing the Center button here will go to the Fan Time Select Screen below.

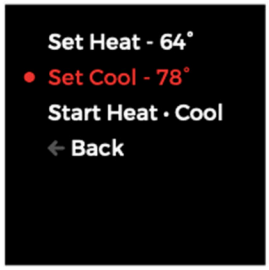
Back Highlighted
Pressing the Center button here will turn go back to the previous screen (Main Menu).

1.6 Heat Cool Menu

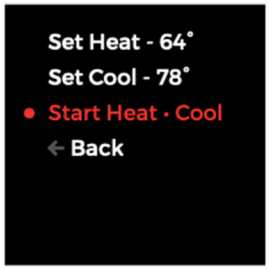
Heat Cool Menu



Set Heat Highlighted
Set Heat is highlighted when visiting this Menu, this option also shows the current Heat Target stored in the system. Pressing the Center button here will go to the Set Heat Target Screen shown below.



Set Cool Highlighted
This option also shows the current Heat Target stored in the system. Pressing the Center button here will go to the Set Cool Target Screen shown below.



Start Heat Cool Highlighted
Pressing the Center button here will go to the turn the A/C to Heat Cool Mode and go back to the Home Screen.

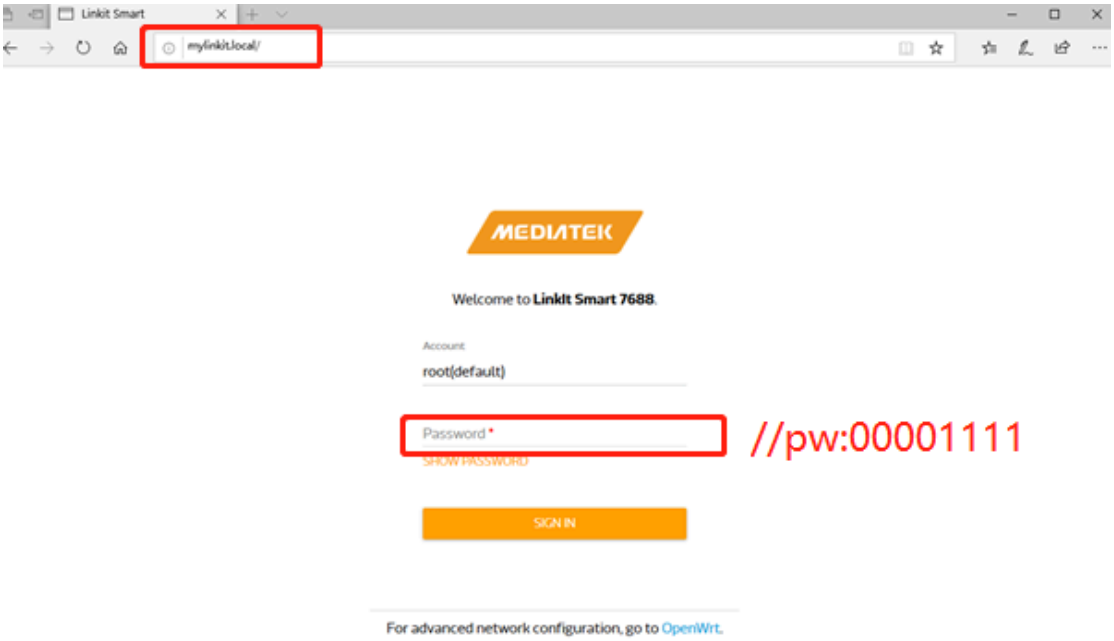
Back Highlighted
Pressing the Center button here will turn go back to the previous screen (Mode Menu).

2. Wi-Fi Configuration

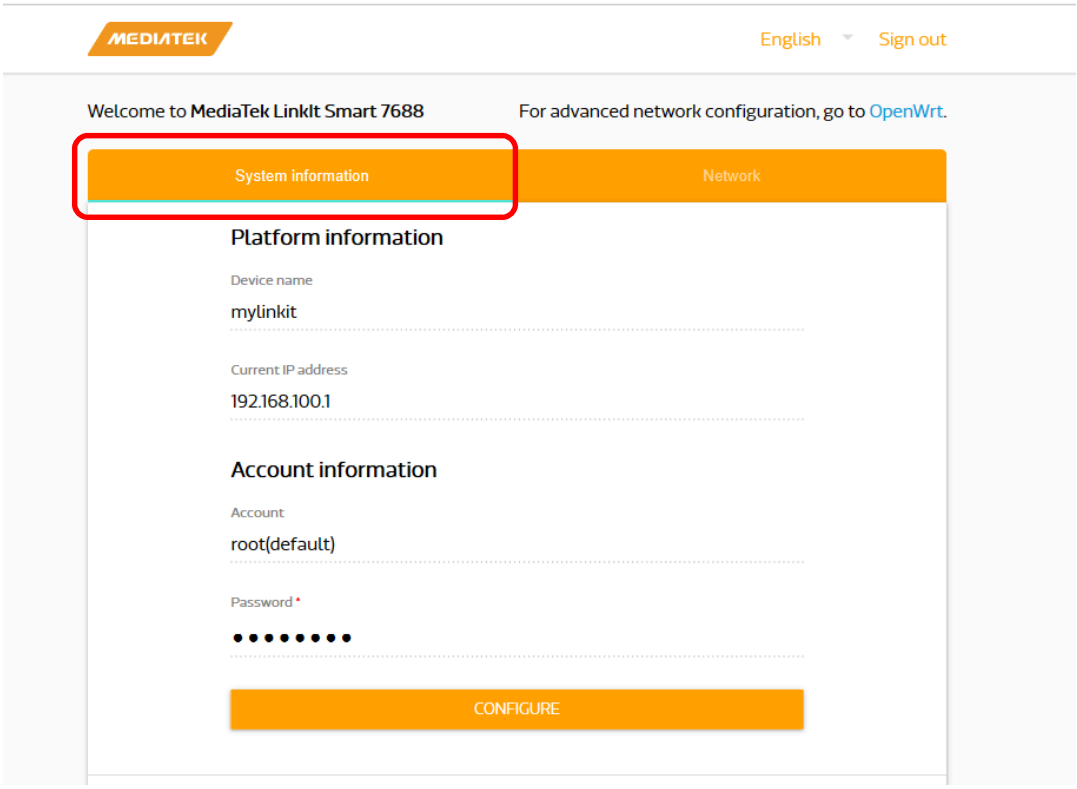
2.1 Connect the Web UI and Join local network

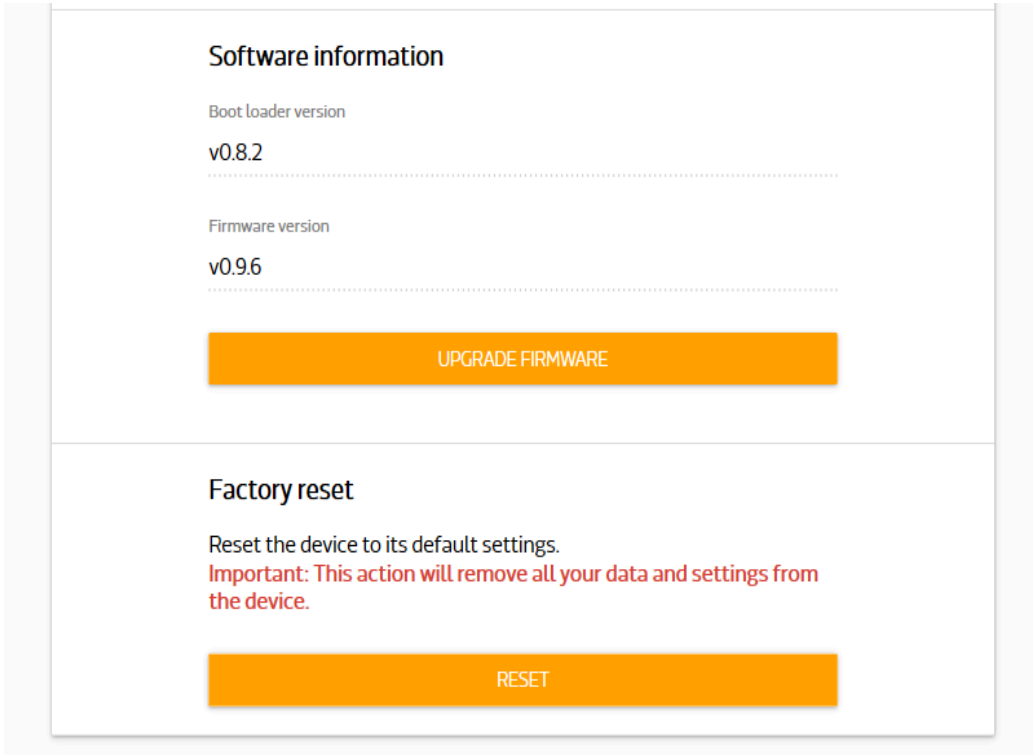
2.1.1 Power on the module and waiting for 1-3 minutes, then discover the network under network setting. The device default name will be Linkit_Smart_7688_xxxxxx , Here xx means the last 6 characters of Mac address on Wi-Fi module

2.1.2 The connection was successful, open the browser, enter the URL:mylinkit. local/ (or 192.168.100.1); Default account root, password: 00001111 ,

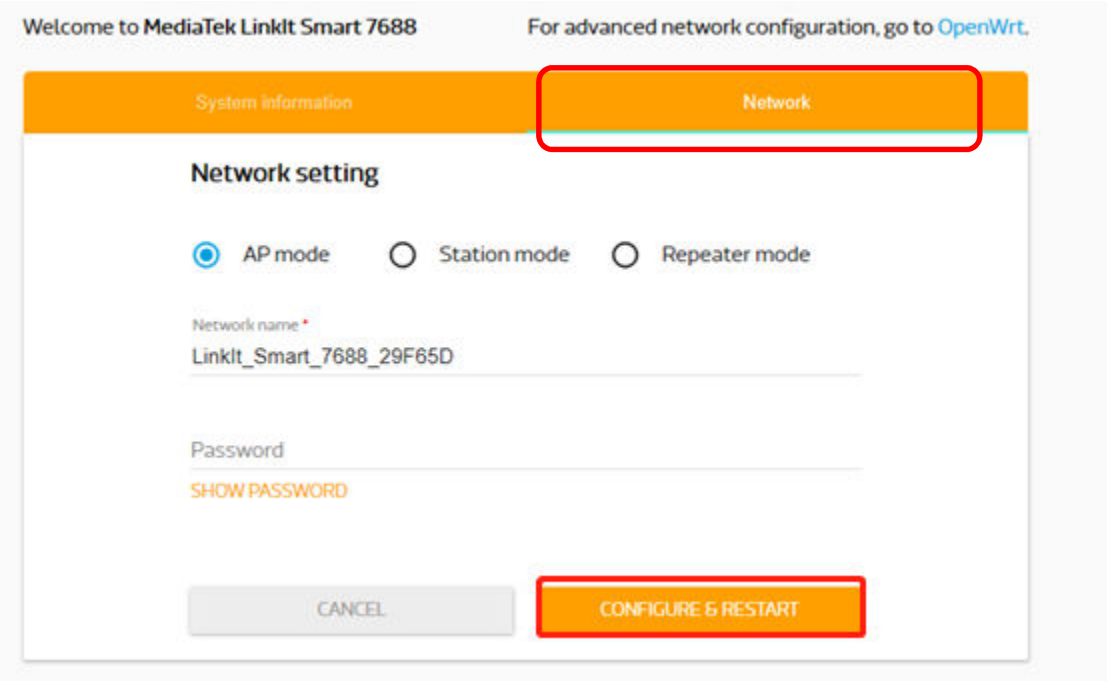


2.1.3 The following shows the system information on Wi-Fi module.

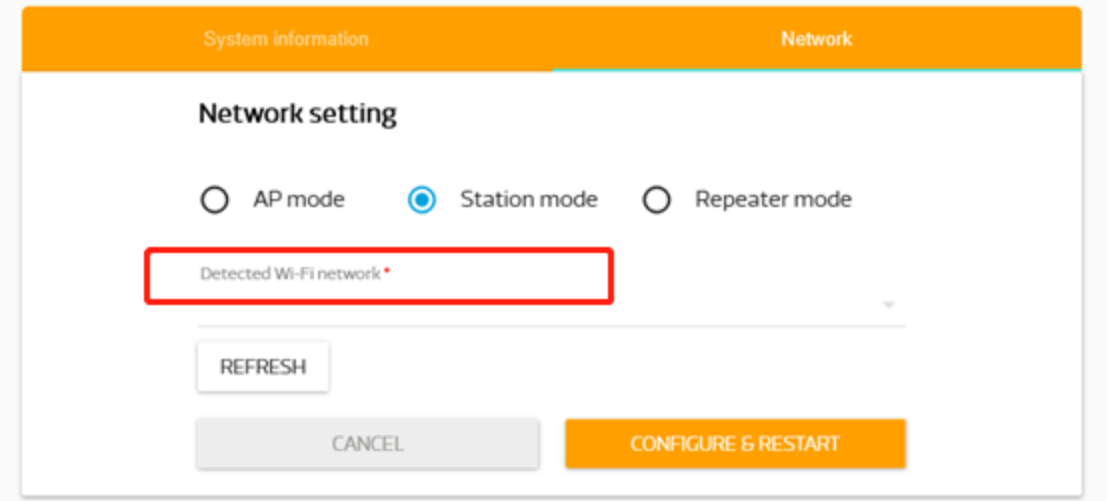

MEDIATEK
English
Sign out
Welcome to MediaTek LinkIt Smart 7688
For advanced network configuration, go to OpenWrt.
System information
Network
Platform information
Device name
mylinkit
Current IP address
192.168.100.1
Account information
Account
root(default)
Password *
CONFIGURE


Software information
Boot loader version
v0.8.2
Firmware version
v0.9.6
UPGRADE FIRMWARE
Factory reset
Reset the device to its default settings.
Important: This action will remove all your data and settings from the device.
RESET

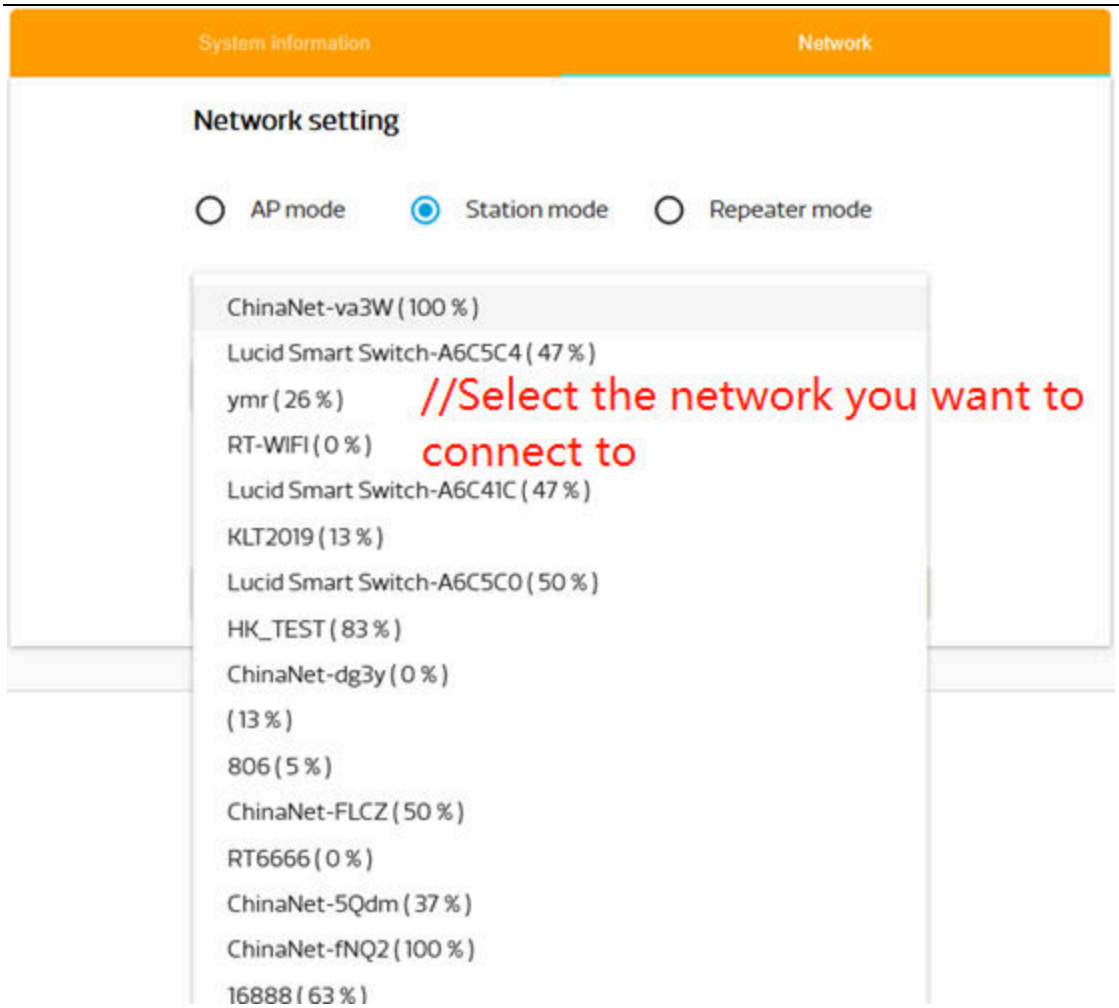
2.1.4 Click the “Network setting” to enter the Network setting interface, the default selection is AP mode and Do not need to enter any password, direct login and wait around 90 sec.



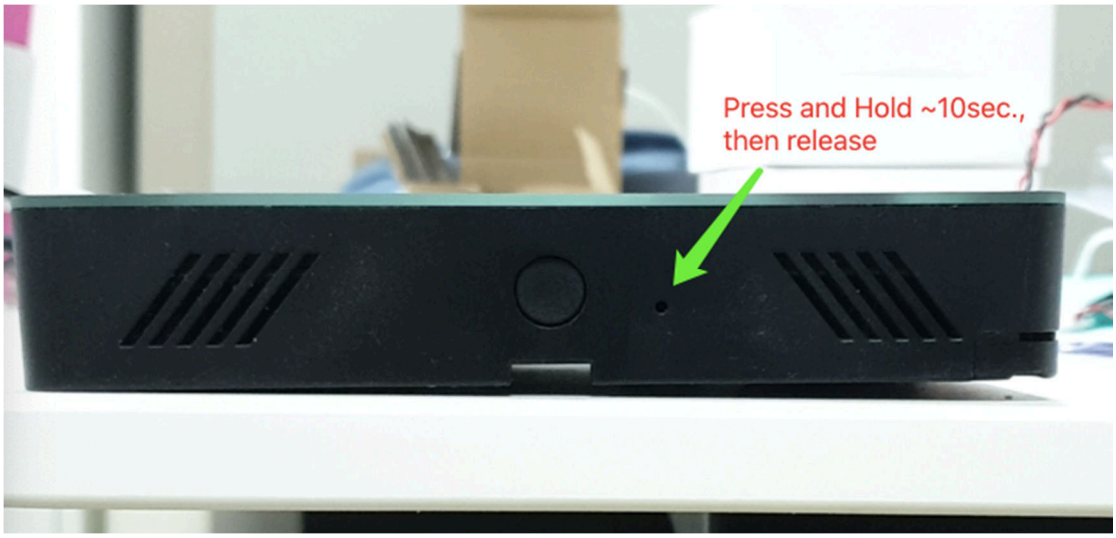
2.1.5 The station mode can be selected using station login, as follows interface



- Click Add Network, select the network you need to connect to, enter the correct password for the network in the password box below, click Login



- If you want to reset the Wi-Fi configuration , just press and hold the button around 10 sec. (as shown on following photo), then release, it will be back to system default setting

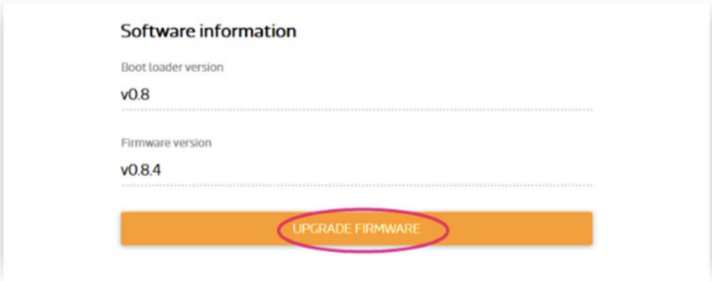


2.2 Firmware Upgrade

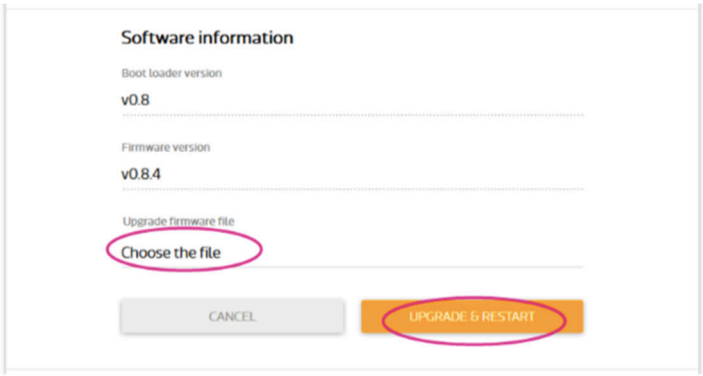
• Using Web UI: (For Kernel Upgrade)

2.2.1 Sign in the Hub Web UI. Please see section 2.1 , "Connecting to the Web UI"

2.2.2 After you've signed in, click on the **UPGRADE FIRMWARE** .



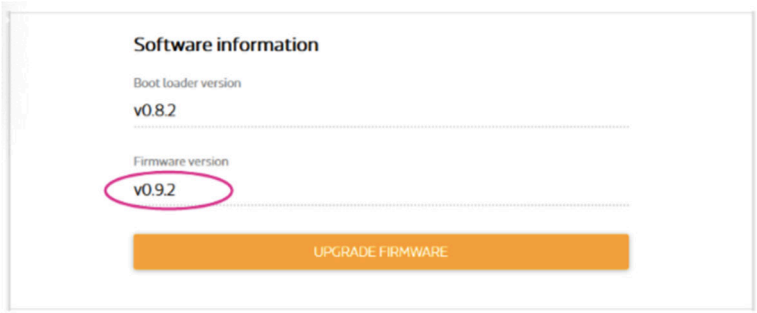
2.2.3 Click **Choose the file** and select the file. Click **UPGRADE & RESTART**



Selecting firmware file

2.2.4 The firmware will upload to Hub, please make sure the device stays connected to its power source until the firmware upgrade is completed.

2.2.5 Wait for 3minutes, once the firmware upgrade has completed and the Hub will reboot.



Firmware version

• Using Console: (For HSWAPP)

2.2.6 Copy the latest hswapp file to the following location
root/hsw/hswapp

2.2.7 Open the SSH (Check section 2.1 for detail)

2.2.8 Type the following command
scp ./hswapp root@mylinkit.local:/root/hsw/hswapp

3. Connect the system console with “putty” or “Terminal”

■ 3.1 Using SSH (Secure Socket Shell)

(1) Install PuTTY

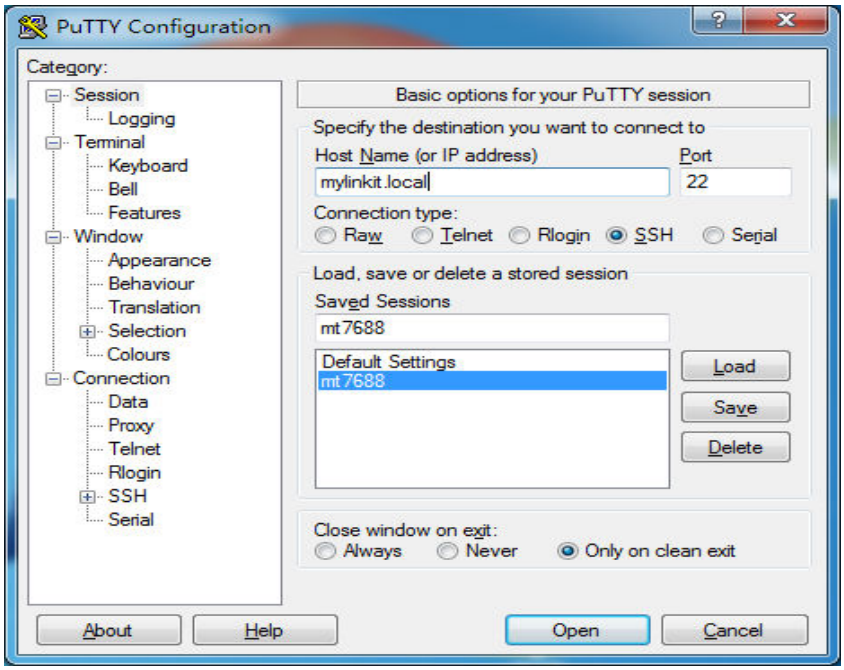
(2) Type mylinkit.local in Hst Name box, select SSH connection type

Host name: mylinkit.local or IP address

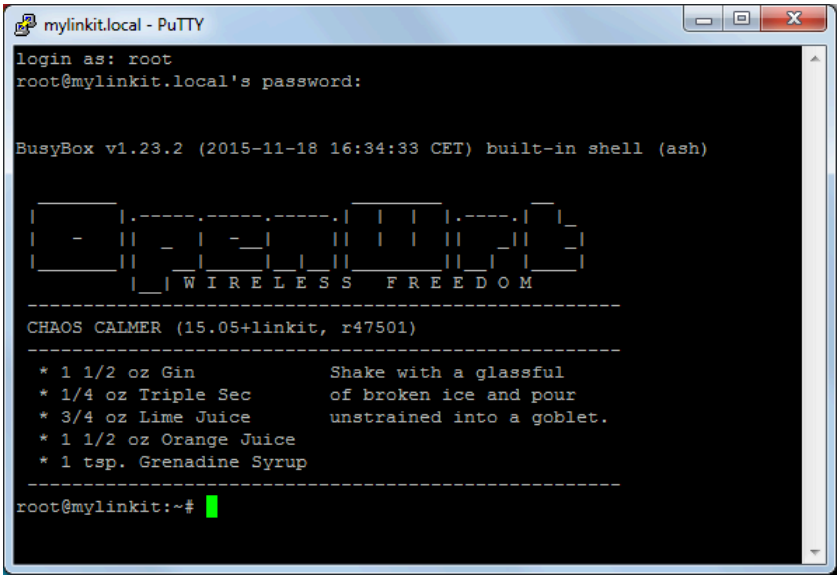
(3) Default account: root, password:00001111

(4) Open /root

(5) Run ./start_all.sh



3.2 In the PuTTY terminal window that opens, log in with username root and enter the password you set previously in the Web UI, after log in you should see a screen similar to following screenshot



■ 4.2 UART Tool in Openwrt*

1.Open two shell to connect wi-fi module.

2.shell A: stty -F /dev/ttyUSB1 speed 115200 cs8 -parenb -cstopb -echo
3.shell A:cat /dev/ttyUSB1
4.shell B:echo -e "AT\r\n" > /dev/ttyUSB1
5.you shall see the "OK" response of LTE module at shell A, then you can send your command on shell B.

*Note UART tools is available with kernel 0.98 and hswapp #1.1.6 or later version

MQTT Testing

- ✧ Connect to AWS using mqtt.fx, broker Settings

Topics related to mqtt.fx Subscription and publication are available

FCC Statement

15.19

1. 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.

(2) This device must accept any interference received, including interference that may cause undesired operation.

15.21

Note: The grantee is not responsible for any changes or modifications not expressly approved by the party responsible for compliance. Such modifications could void the user's authority to operate the equipment.

15.105(b)

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant 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 to correct the interference by one or more of the following measures:

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

RF Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body.