REYAX
TECHNOLOGY CORPORATION, LTD

RYWB729x_Raspberry_EVB User Guide



21mm*21mm*2.8mm

Represented by:

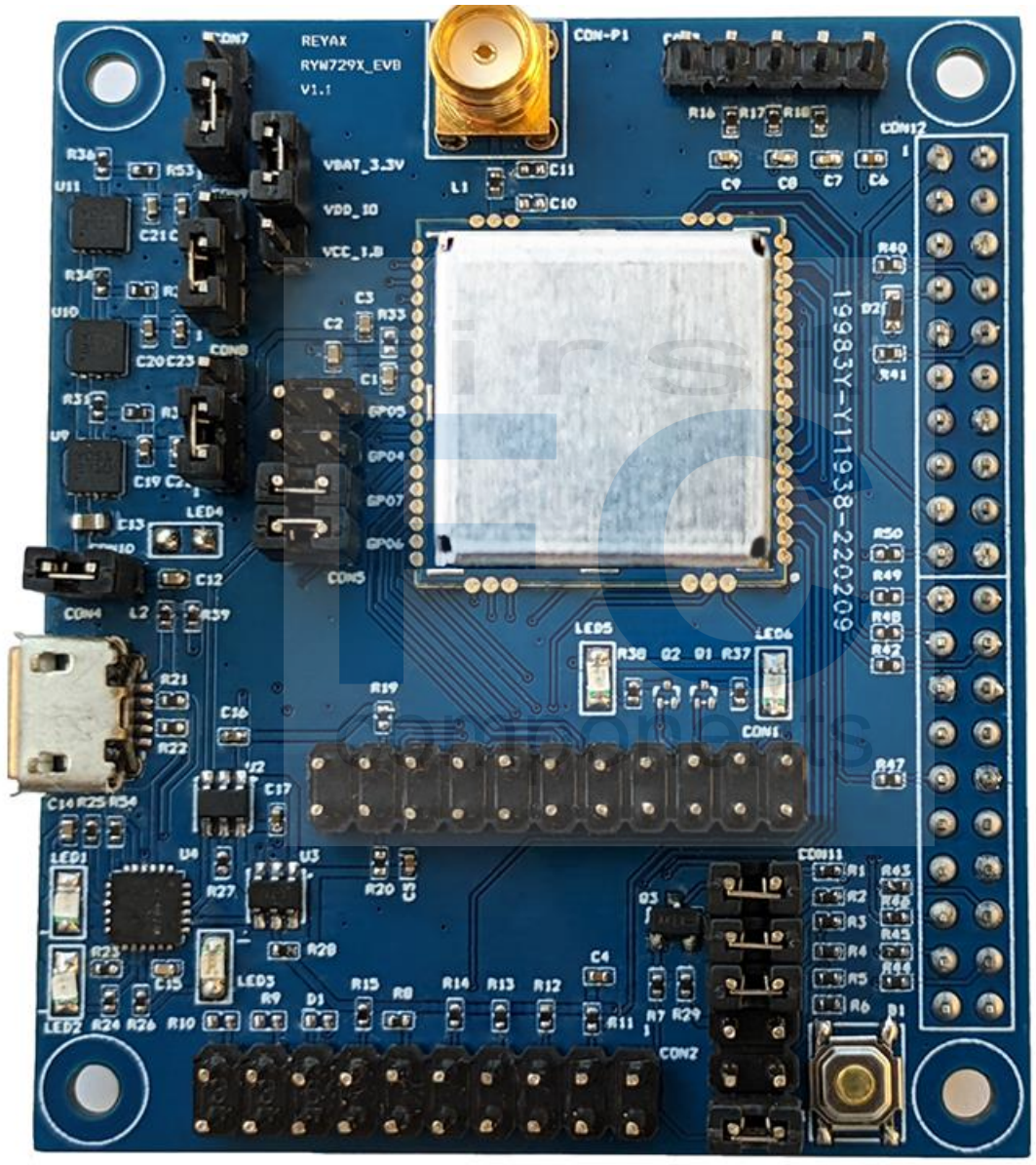
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1. Evaluation Board Introduction

RYWB729x_Raspberry_EVB is a testing kit combined with Raspberry Pi, which allow users can easily test and evaluate REYXA RYW7292/RYW7293.

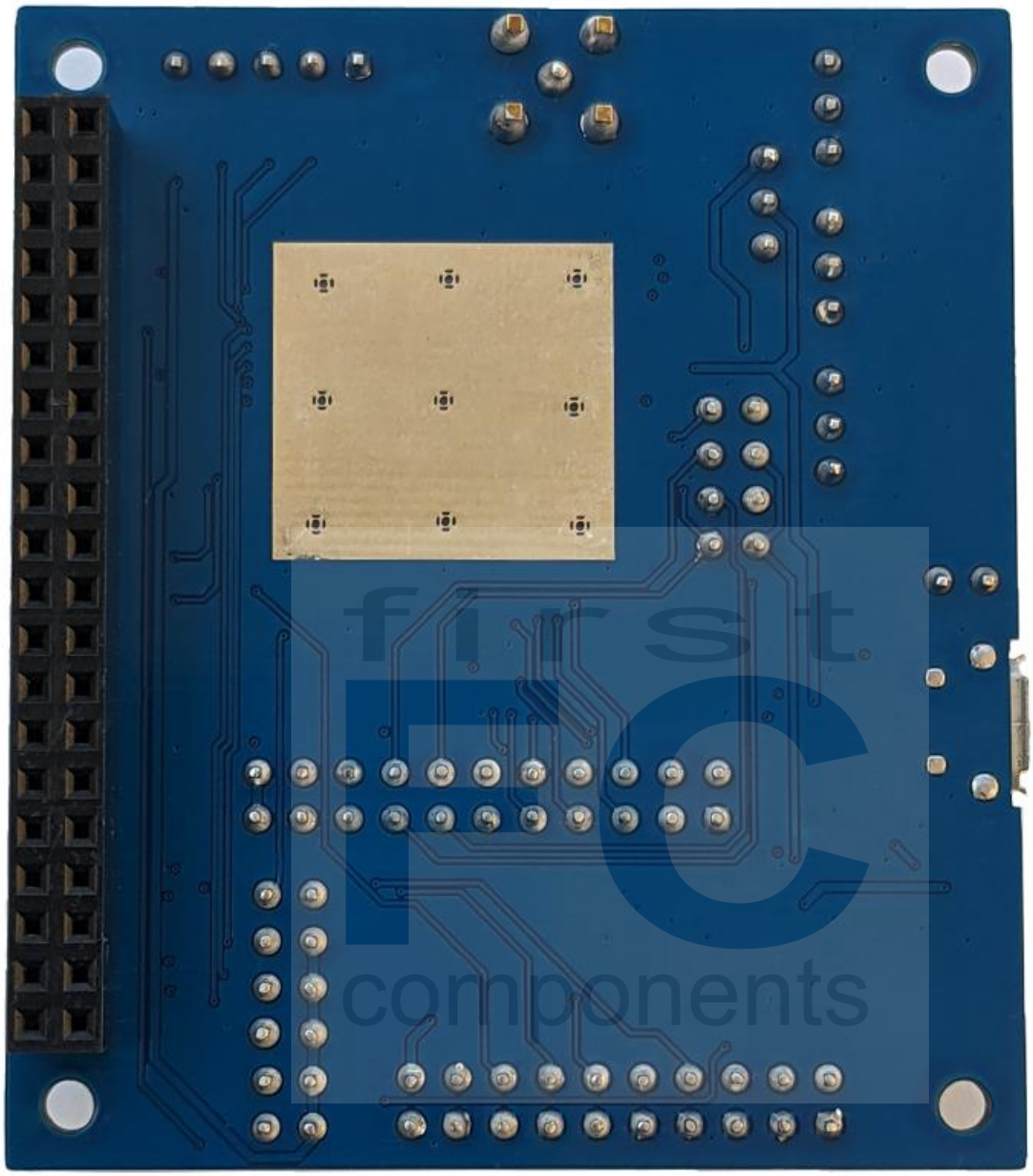
2. Apperance

2.1 Front



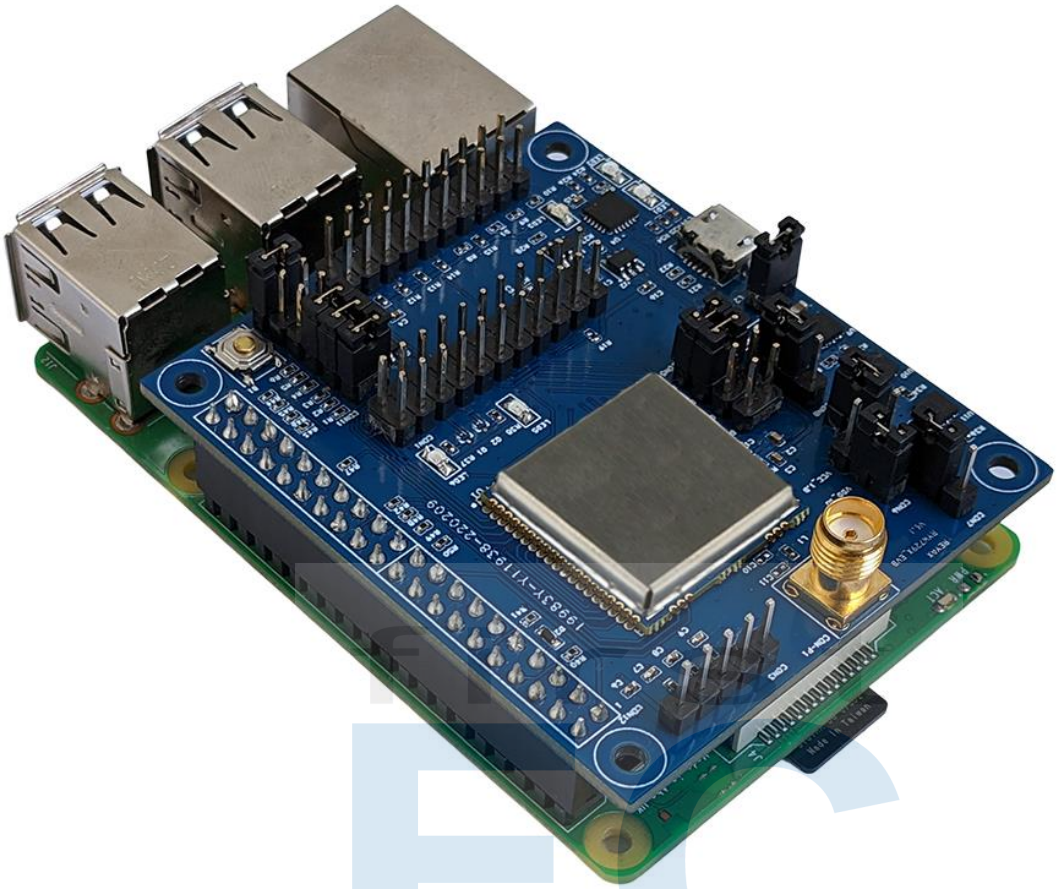
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2.2 Back



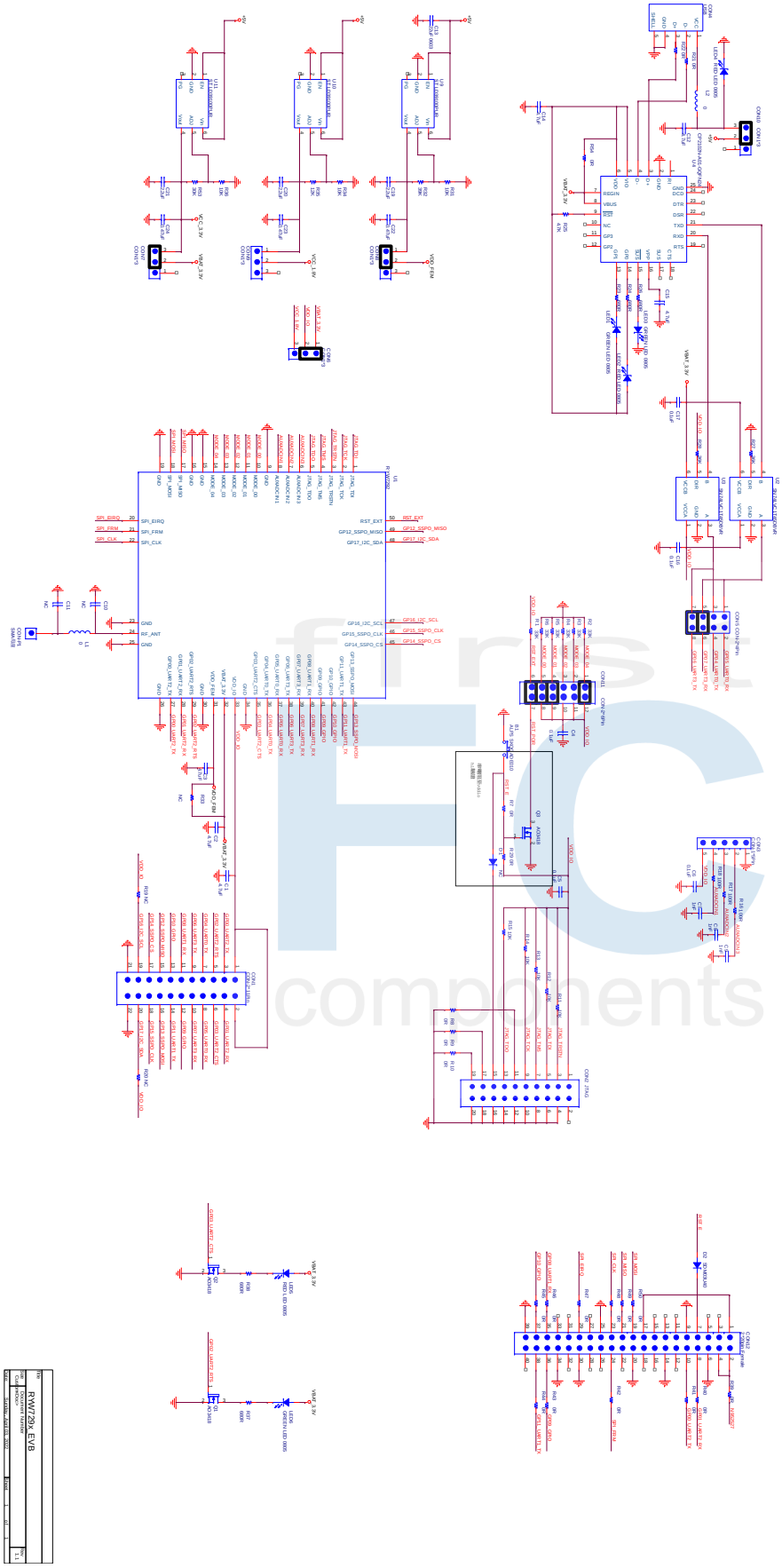
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2.3 Assemble with Raspberry



3. EVB Schematic

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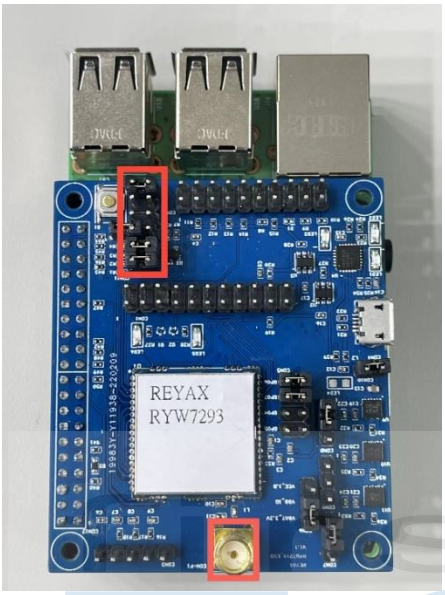
4. EVB test settings

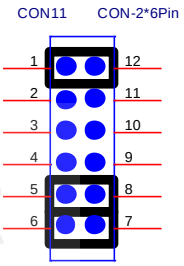
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Two pieces of EVB are required for communication test. The role of EVB1 is AP mode, and the role of EVB2 is STA mode.

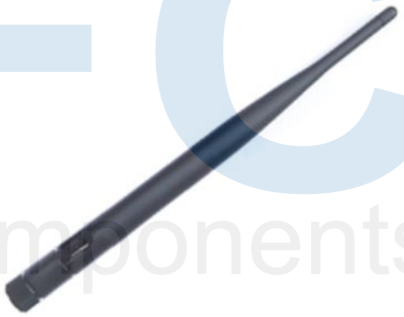
4-1. EVB Jumper setting

[EVB1 & EVB2] Jumper Switch = HLLLHH

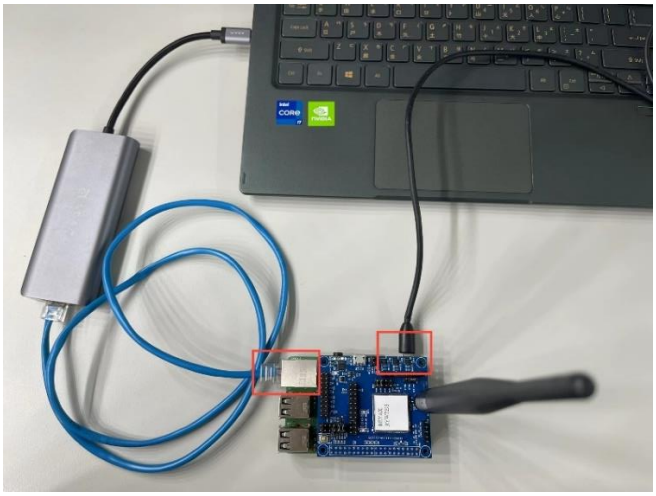




4-2. Install the Antenna



4-3. Connect with ethernet and mirco usb power cable



5 PC Tool Download

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5-1.

Download SSH tool https://mobaxterm.software.informer.com/20.2/

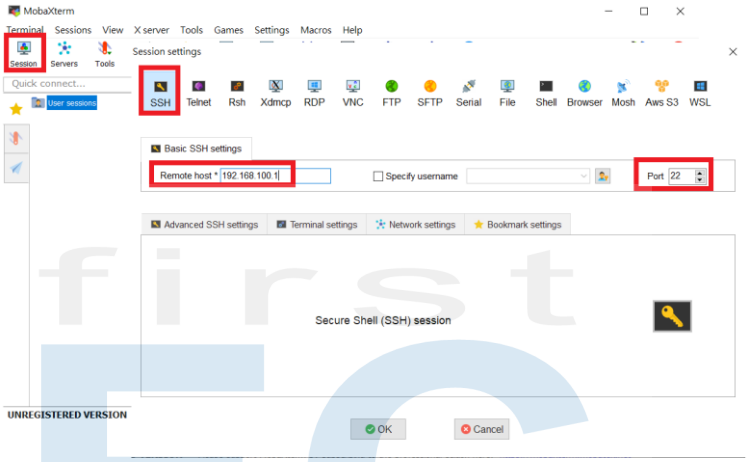
6 Tool Installation

6-1.

Install mobaxterm tool

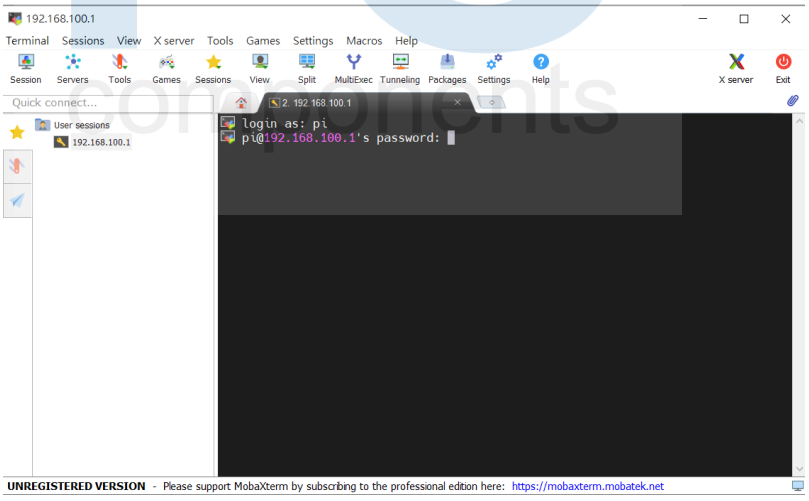
6-2.

Open Mobaxterm and set up SSH，IP 192.168.100.1 ; port 22



6-3.

Account:pi **Password:**raspberry (Based on default settings)



6-4.

Download SDK 1.3.4 https://github.com/newracom/nrc7292_sw_pkg/tags

6-5.

For SDK installation method, please refer the file path

nrc7292_sw_pkg-1.3.4\nrc7292_sw_pkg-1.3.4\README.md

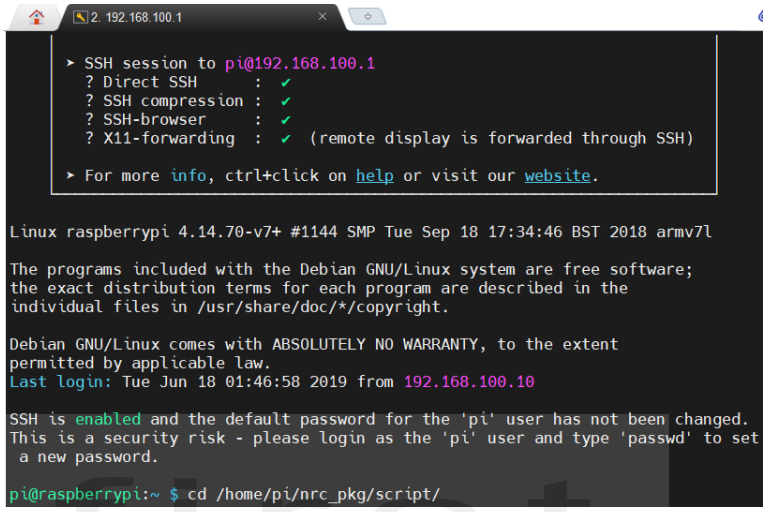
7 Set up AP & STA

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7-1. EVB 1 - AP mode

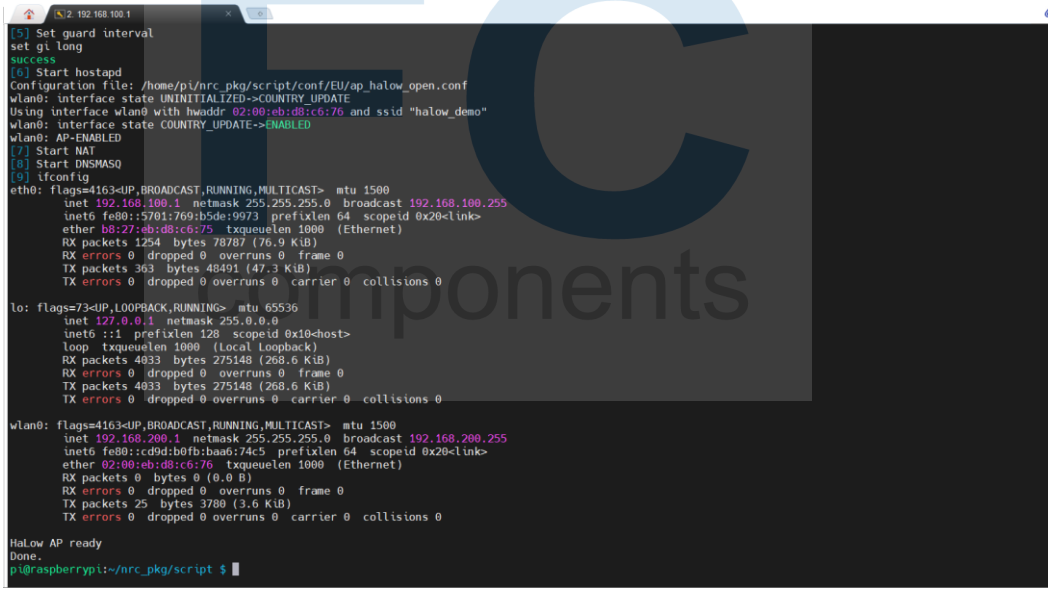
The network connect with NB/PC and EVB1(The file path is based on SDK installation)

[Terminal] pi@raspberrypi:~ $ cd /home/pi/nrc_pkg/script/



[Terminal] pi@raspberrypi:~/nrc_pkg/script $ ./start.py 1 0 EU

(Select the region according to your actual application)



After the AP is established, the interface wlan0 will appear and display:

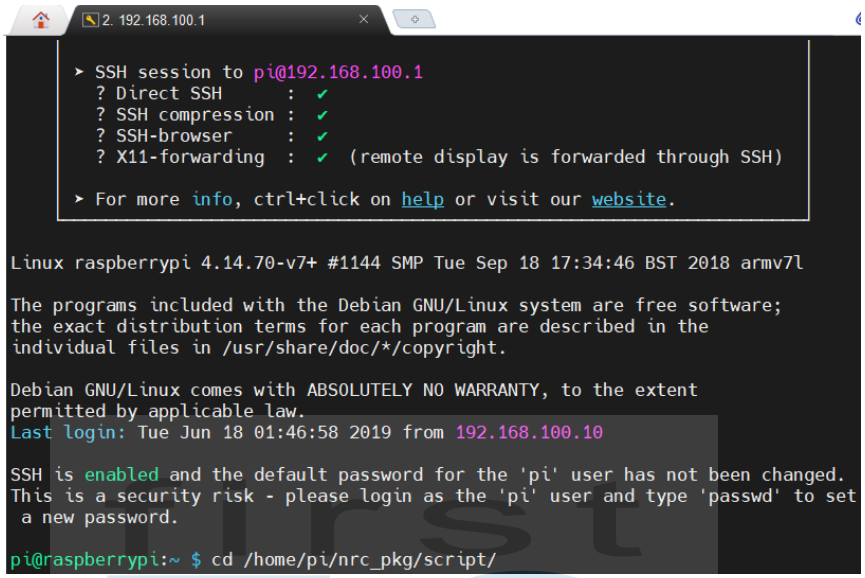
HaLow AP ready
Done.

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7-2. EVB 2 - STA mode

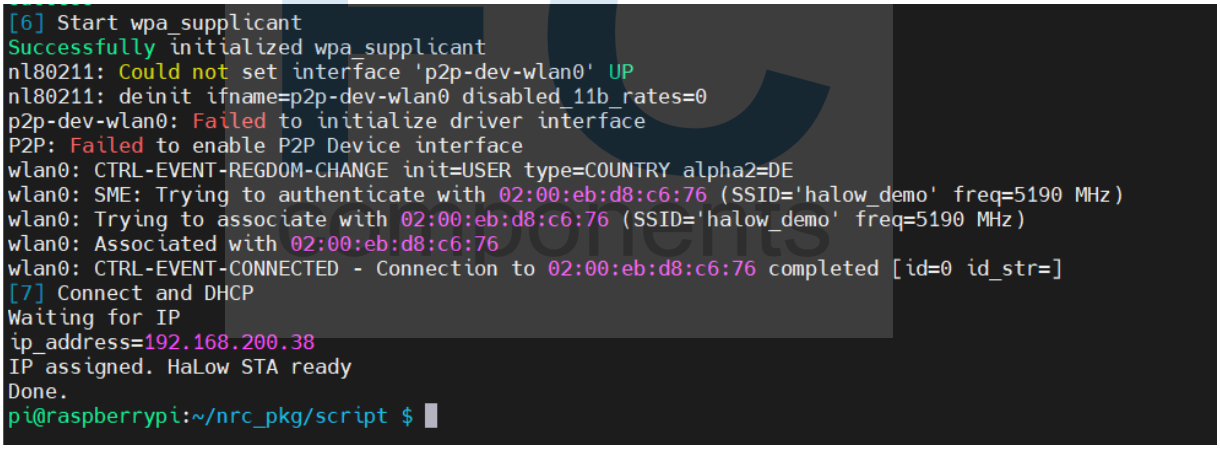
The network connect with NB/PC and EVB2(The file path is based on SDK installation)

[Terminal] pi@raspberrypi:~ $ cd /home/pi/nrc_pkg/script/



[Terminal] pi@raspberrypi:~/nrc_pkg/script $ ./start.py 0 0 EU

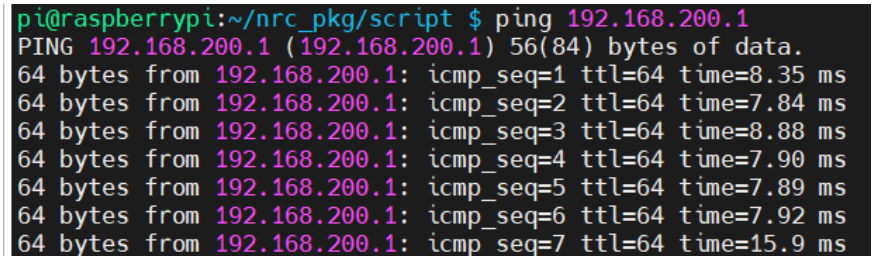
(Select the region according to your actual application)



After establishing the connection, the IP address will appear:

ip_address=192.168.200.38
IP assigned. HaLow STA ready
Done.

[Terminal] pi@raspberrypi:~/nrc_pkg/script $ ping 192.168.200.1

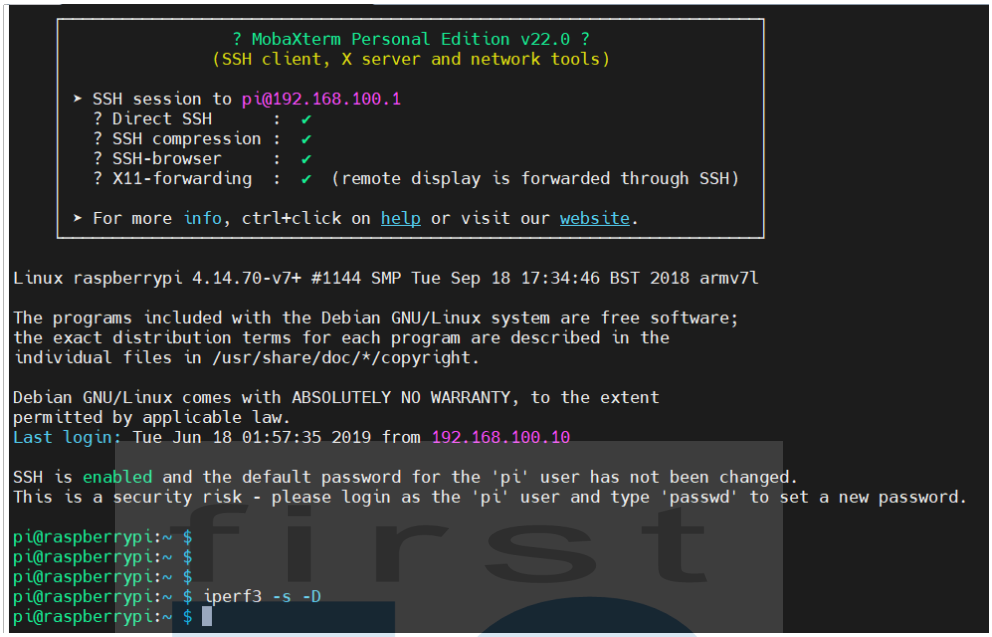


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8 IPERF Testing

8-1. Set up IPERF Server in EVB 1

pi@raspberrypi:~ $ iperf3 -s -D



8-2. Set up Client UDP Connection in EVB 2

pi@raspberrypi:~ $ iperf3 -c 192.168.200.1 -u -b M -i 1 -t 10

```
pi@raspberrypi:~ $ iperf3 -c 192.168.200.1 -u -b M -i 1 -t 10
Connecting to host 192.168.200.1, port 5201
[  4] local 192.168.200.1 port 49557 connected to 192.168.200.1 port 5201
[ ID] Interval           Transfer     Bandwidth       Total Datagrams
[  4]   0.00-1.00   sec   219 MBytes  1.83 Gbits/sec  27980
[  4]   1.00-2.00   sec   203 MBytes  1.71 Gbits/sec  26030
[  4]   2.00-3.00   sec   204 MBytes  1.71 Gbits/sec  26050
[  4]   3.00-4.00   sec   220 MBytes  1.84 Gbits/sec  28130
[  4]   4.00-5.00   sec   204 MBytes  1.71 Gbits/sec  26080
[  4]   5.00-6.00   sec   204 MBytes  1.71 Gbits/sec  26060
[  4]   6.00-7.00   sec   204 MBytes  1.71 Gbits/sec  26050
[  4]   7.00-8.00   sec   203 MBytes  1.71 Gbits/sec  26040
[  4]   8.00-9.00   sec   204 MBytes  1.71 Gbits/sec  26050
[  4]   9.00-10.00  sec   224 MBytes  1.88 Gbits/sec  28670
- - - - - - - - - - - - - - - - - - - - - - - - -
[ ID] Interval           Transfer     Bandwidth       Jitter    Lost/Total Datagrams
[  4]   0.00-10.00  sec  2.04 GBytes  1.75 Gbits/sec  0.015 ms  55/267140 (0.021%)
[  4] Sent 267140 datagrams

iperf Done.
pi@raspberrypi:~ $
```


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8-3. Set up Client TCP Connection in EVB 2

pi@raspberrypi:~ $ iperf3 -c 192.168.200.1 -w 10M -i 1 -t 10

```
pi@raspberrypi:~ $ iperf3 -c 192.168.200.1 -w 10M -i 1 -t 10
Connecting to host 192.168.200.1, port 5201
[  4] local 192.168.200.1 port 46222 connected to 192.168.200.1 port 5201
[ ID] Interval           Transfer     Bandwidth       Retr  Cwnd
[  4]   0.00-1.00   sec   296 MBytes  2.48 Gbits/sec    0    639 KBytes
[  4]   1.00-2.00   sec   296 MBytes  2.48 Gbits/sec    0    639 KBytes
[  4]   2.00-3.00   sec   296 MBytes  2.48 Gbits/sec    0    639 KBytes
[  4]   3.00-4.00   sec   293 MBytes  2.46 Gbits/sec    0    639 KBytes
[  4]   4.00-5.00   sec   308 MBytes  2.58 Gbits/sec    0    639 KBytes
[  4]   5.00-6.00   sec   310 MBytes  2.60 Gbits/sec    0    639 KBytes
[  4]   6.00-7.00   sec   296 MBytes  2.48 Gbits/sec    0    639 KBytes
[  4]   7.00-8.00   sec   298 MBytes  2.50 Gbits/sec    0    639 KBytes
[  4]   8.00-9.00   sec   299 MBytes  2.51 Gbits/sec    0    639 KBytes
[  4]   9.00-10.00  sec   298 MBytes  2.50 Gbits/sec    0    639 KBytes
- - - - - - - - - - - - - - - - - - - - - - - - -
[ ID] Interval           Transfer     Bandwidth       Retr
[  4]   0.00-10.00  sec  2.92 GBytes  2.51 Gbits/sec    0             sender
[  4]   0.00-10.00  sec  2.92 GBytes  2.51 Gbits/sec                  receiver

iperf Done.
```

9 Bandwidth Adjustment on the AP side

9-1.

Go to file path:/script/conf, and choose the country you need

pi@raspberrypi:~ $ cd /home/pi/nrc_pkg/script/conf/

```
pi@raspberrypi:~ $ cd /home/pi/nrc_pkg/script/conf/
CN/  etc/ EU/  JP/  KR/  TW/  US/
pi@raspberrypi:~ $ cd /home/pi/nrc_pkg/script/conf/
pi@raspberrypi:~/nrc_pkg/script/conf $ ls
CN  etc  EU  JP  KR  TW  US
```

9-2.

Select the AP .conf file for use

```
pi@raspberrypi:~/nrc_pkg/script/conf $ cd EU/
pi@raspberrypi:~/nrc_pkg/script/conf/EU $ ls
ap_halow_open.conf  ap_halow_sae.conf   sta_halow_open.conf  sta_halow_sae.conf
ap_halow_owe.conf   ap_halow_wpa2.conf  sta_halow_owe.conf   sta_halow_wpa2.conf
pi@raspberrypi:~/nrc_pkg/script/conf/EU $
```


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9-3.

Select the channel according to your requirements, the larger the bandwidth, the faster the transmission speed.

speed. pi@raspberrypi:~/nrc_pkg/script/conf/EU $ vi ap_halow_open.conf

```
ctrl_interface=/var/run/hostapd
country_code=DE
interface=wlan0
ssid=halow_demo
hw_mode=a

#1MHz
#863.5MHz
#channel=36
#864.5MHz
#channel=37
#865.5MHz
channel=38
#866.5MHz
#channel=39
#867.5MHz
#channel=40
```

10 AMPDU Adjustment

10-1.

Go to the file path: /script

pi@raspberrypi:~ $ cd /home/pi/nrc_pkg/script

```
pi@raspberrypi:~/nrc_pkg/script $ ls
cli_app  conf  sniffer  start.py  stop.py
pi@raspberrypi:~/nrc_pkg/script $
```

10-2.

Open start.py

pi@raspberrypi:~/nrc_pkg/script $ vi start.py

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10-3. Modify maxagg_num

maxagg_num =0 Slower transfer speed

maxagg_num =8 Faster transfer speed

2. 192.168.100.1

```
#!/usr/bin/python

import sys
import os
import time
import commands

################################################################################
# Default Configuration (you can change value you want here)
model       = 7292      # 7292 or 7192
hif_speed   = 16000000 # HSPI Clock
gain_type   = 'phy'     # 'phy' or 'nrf(legacy)'
txpwr_val   = 17        # TX Power (8~18 dBm)
maxagg_num  = 0         # 0(AMPDU off) or  >2(AMPDU on)
cqm_off     = 0         # 0(CQM on) or 1(CQM off)
fw_download = 1         # 0(FW Download off) or 1(FW Download on)
fw_name     = 'uni_s1g.bin'
guard_int   = 'long'    # 'long'(LGI) or 'short'(SGI)
supplicant_debug = 0    # WPA Supplicant debug option : 0(off) or 1(on)
hostapd_debug    = 0    # Hostapd debug option       : 0(off) or 1(on)
max_cpuclock     = 1    # RPi Max CPU Clock : 0(off) or 1(on)
################################################################################
```

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