# WF8000-U User Manual

Version of 1.0

Release:2009-11-27

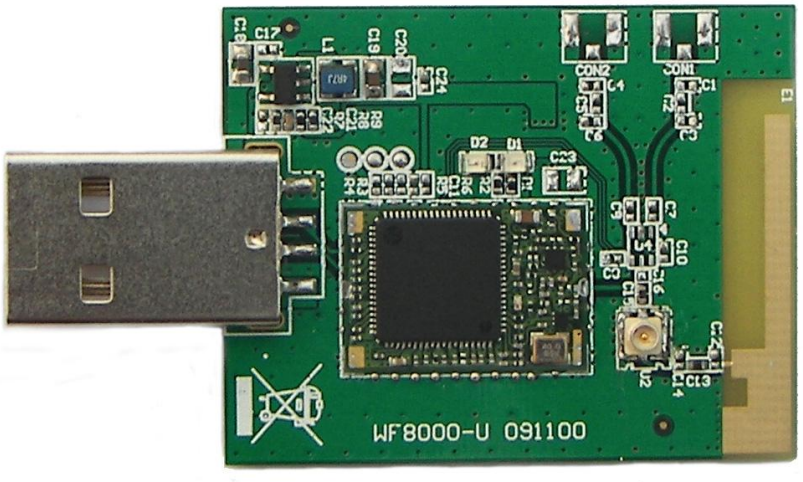
**The note of Version update**

| Version | Date of update | Description |
|---|---|---|
| 1.0 | 2009-11-27 | Init-release |
| | | |
| | | |

# Table Of Contents

# Chapter One: Overview

## I System Overview




### 1.1 Introduction

WF8000-U module is high performance and cost effective 802.11b/g WLAN USB module. WF8000-U is embedded with Ralink chip a highly integrated MAC/BBP and 2.4GHz RF single chip. It fully complies with IEEE 802.11b/g feature rich wireless connectivity at high standards, cost-effective, throughput from extended distance. Optimized RF architecture and baseband algorithms provide superb performance and low power consumption.

# Chapter Two Hardware system

## II Hardware Overview

WF8000-U module is designed to support standard based features in the areas of security, quality of service and international regulation, giving end users the greatest performance anytime in any circumstance.

- Host Interface USB2.0
- Dimension 11.4(W) x 16.7(L) x 1.4(H) mm without shielding case
- Legacy and High Throughput Modes

- Support Antenna Diversity
- Power Consumption
- With Smaller Size Suitable for Compact System Integration
- Low Power Consumption, Extend the Battery Life
- QoS --- WMM, WMM-PS
- WPS-PIN, PBC
- Multiple BSSID Support
- Cisco CCX Support
- Operating Systems Support: Wince,Linux；
- Low Cost

RF Characteristics

- Standards : Fully Compliant with IEEE 802.11 b/g Standard
- Frequency Band:  2400MHz ~ 2500MHz
- Frequency Stability:  < ±5ppm @Room Temperature +25°C
- Modulation: OFDM and CCK
- OFDM Output Power: 15dBm (Typ.) @EVM<3%, all channel
- CCK Spectral Mask@Pout=18dBm
  - ✓ -37dBc (Typ.) @ 11~22MHz
  - ✓ -60dBc (Typ.) @ 22~33MHz
- 2f Harmonics: -55dBm (Typ.)
- LO Leakage Peak Power: -64dBm (Typ.) @Transmit State
- Receive Sensitivity
  - ✓ -65dBm (Typ.) @HT40M, MCS7
  - ✓ -71dBm (Typ.) @54M OFDM
  - ✓ -85dBm (Typ.) @11M CCK
  - ✓ -90dBm (Typ.) @1M CCK
- RF Port Impedance: 50L±10%
- USB Differential Port Impedance: 90L±10%

# III Hardware specification

## 3.1 USB-2.0 connector :

The USB-2.0 connector is connect to ARM board.

| PIN | Signal | Pin out |
|---|---|---|
| 1 | VBUS |  |
| 2 | DN | |
| 3 | DP | |

| | | |
|---|---|---|
| 4 | GND | |

# Chapter Three LINUX System

## IV Application Procedures

### 4.1 System platform

Hardware: DevKit8000 board, WF8000-U module;
Software: DevKit8000 board, WF8000-U complete sets of software

Note:

1. For the customers of buys old Devkit8000 board, please modify kernel configs personally( Add support “Wireless extensions” in kernel configs), you can use the WF8000 module when you changed the uImage.

As the following kernel configs:

```
 [*] Networking support    --->
     [*]     Wireless    --->
          [*]     Wireless extensions
          [*]         Wireless extensions sysfs files
```

2. For the customers of buys new Devkit8000 board, The kernel configs has been modified, you can use image in disk directly.

### 4.2 Preparation

1. Copy all the file in directory of “WF8000” to the sd card, and insert the card to Dekit board, execute the following commands to install the WF8000 module driver:

```
root@DevKit8000:~# cd /media/mmcblk0p1/
root@DevKit8000:/media/mmcblk0p1# cp -R etc/ /
root@DevKit8000:/media/mmcblk0p1# cp -R usr/ /
root@DevKit8000:/media/mmcblk0p1# chmod a+x /usr/bin/*
```

2, Connect the WF8000 module to Devkit board, and execute the following commands:

```
root@DevKit8000:~# insmod /usr/lib/rt3070sta.ko
rtusb init --->



=== pAd = c8a2c000, size = 462696 ===

<-- RTMPAllocAdapterBlock, Status=0
usbcore: registered new interface driver rt2870
```

```
root@DevKit8000:~# ifconfig ra0 up
<-- RTMPAllocTxRxRingMemory, Status=0
-->RTUSBVenderReset
<--RTUSBVenderReset
Key1Str is Invalid key length(0) or Type(0)
Key2Str is Invalid key length(0) or Type(0)
Key3Str is Invalid key length(0) or Type(0)
Key4Str is Invalid key length(0) or Type(0)
1. Phy Mode = 9
2. Phy Mode = 9
NVM is Efuse and its size =2d[2d0-2fc]
3. Phy Mode = 9
RTMPSetPhyMode: channel is out of range, use first channel=1
MCS Set = ff 00 00 00 01
<==== rt28xx_init, Status=0
0x1300 = 00064300
```

## 4.3 Test

1. Search the available wireless router:

```
root@DevKit8000:~# iwlist ra0 scan
ra0       Scan completed :
          Cell 01 - Address: 00:25:86:67:8D:14
                    Protocol:802.11b/g/n
                    ESSID:"888"
                    Mode:Managed
                    Channel:6
                    Quality:73/100  Signal level:-61 dBm  Noise level:-115 dBm
                    Encryption key:on
                    Bit Rates:18 Mb/s
                    IE: WPA Version 1
                        Group Cipher : TKIP
                        Pairwise Ciphers (1) : TKIP
                        Authentication Suites (1) : PSK
          Cell 02 - Address: 00:23:69:3B:CF:5C
                    Protocol:802.11g
                    ESSID:"Jorjin Wireless"
                    Mode:Managed
                    Channel:6
                    Quality:100/100  Signal level:-47 dBm  Noise level:-115 dBm
                    Encryption key:on
                    Bit Rates:118 Mb/s
```

2. Wi-Fi configuration:

```
root@DevKit8000:~# iwpriv ra0 set NetworkType=Infra
root@DevKit8000:~# iwpriv ra0 set AuthMode=WPAPSK
root@DevKit8000:~# iwpriv ra0 set EncrypType=TKIP
root@DevKit8000:~# iwpriv ra0 set SSID="888"
root@DevKit8000:~# iwpriv ra0 set WPAPSK="1234567890"
```

3. Wi-Fi test:

```
root@DevKit8000:~# ifconfig ra0 192.168.1.109
root@DevKit8000:~# ping 192.168.1.1
PING 192.168.1.1 (192.168.1.1) 56(84) bytes of data.
64 bytes from 192.168.1.1: icmp_seq=1 ttl=64 time=3.55 ms
64 bytes from 192.168.1.1: icmp_seq=2 ttl=64 time=0.750 ms
64 bytes from 192.168.1.1: icmp_seq=3 ttl=64 time=0.757 ms
64 bytes from 192.168.1.1: icmp_seq=4 ttl=64 time=0.766 ms
64 bytes from 192.168.1.1: icmp_seq=5 ttl=64 time=1.76 ms
```

*Note: The details of parameter please refer The software of open source third party" wireless_tools", the website is [http://www.hpl.hp.com/personal/Jean_Tourrilhes/Linux/Tools.html], the parameter must modified by corresponding states.*

# Chapter Four WINCE System

## 5.1 System Platform

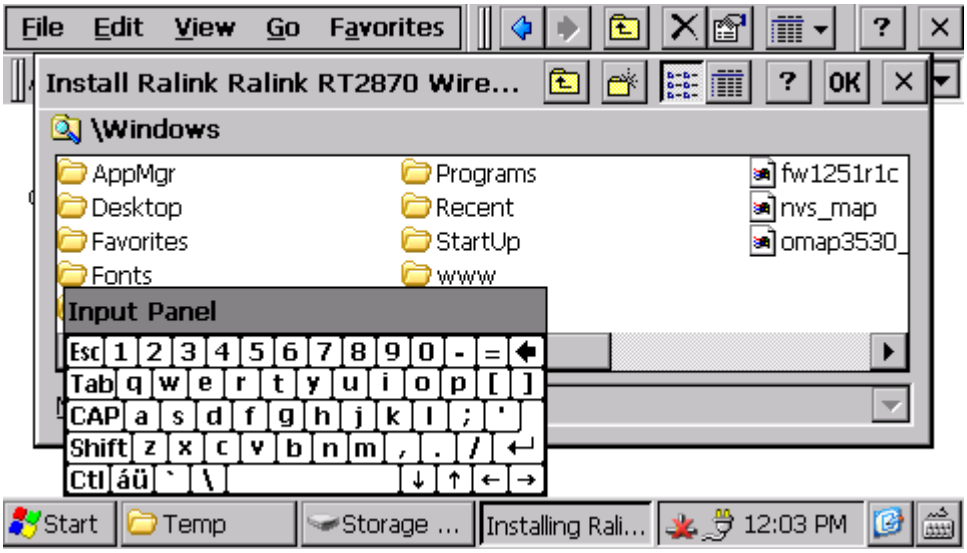
Hardware: DevKit8000（Included usb-host）board，WF8000-U module;
Sofeware: DevKit8000（Included usb-host）board，Software of WF8000-U disk.

## 5.2 Preparation

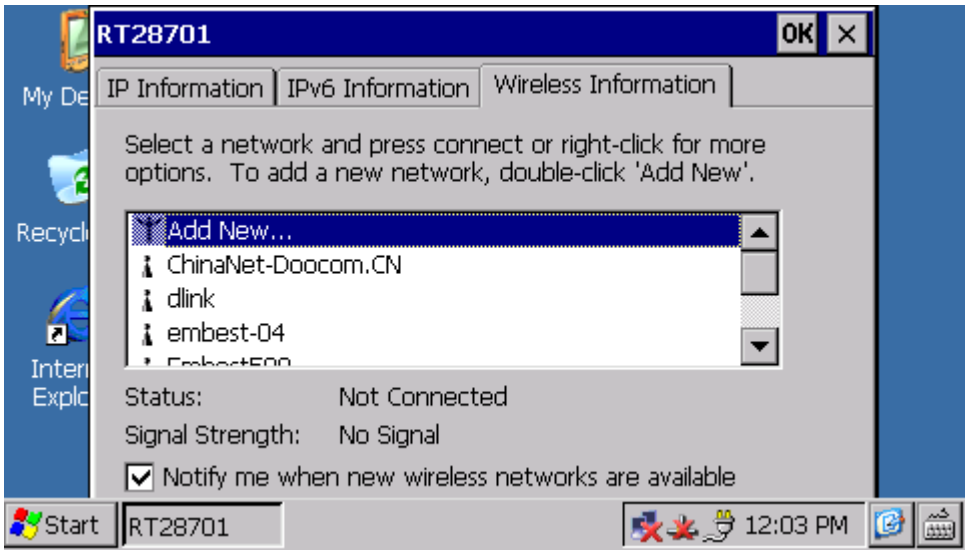
1. Copy the file[RT2870.arm.CAB] in the directory of “disk/wince/” to SD card or U-disk.
2. Power on the board, when enter to wince interface, insert the sd card or U-disk, and copy the file[RT2870.arm.CAB] to board directory of “/temp”, like the following picture:



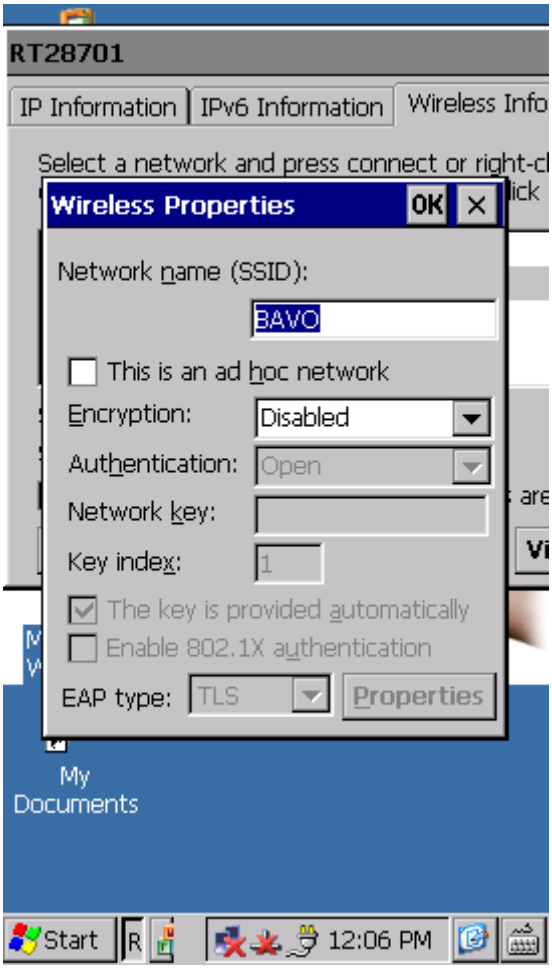
3. Double click the file[RT2870.arm.CAB] ,it will start install, press the [OK],and wait for install finish.




4. Connect the WF8000-U module, if install finish, it will appear the following picture:




Note: For the user of 4.3inch_LCD, it can use the software of Rotation.exe in the disk which it is rotate the LCD:




## 5.3 Compile the WiFi driver to NK.bin

Please reger the file[WINCE60_ARM.rar], there was a PDF[RT2870 Software Release

Note For Windows CE.pdf] to teach you how to Compile the WiFi driver to NK.bin.