# **Development Kit**

## NBWIFIIN Quick Start Guide

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### Introduction

The NBWIFIIN is an IEEE 802.11 b/g/n wireless network interface controller that is based on the Broadcom 43362 chipset and a firmware built on Broadcom's WICED SDK. It has the following features:

- 1. Compliant to IEEE 802.11 b/g/n standards.
- 2. Operates in the 2.4 GHz ISM band.
- 3. Supports WPA2, WPA, and WEP security suites with AES/TKIP.
- 4. Communicates with NetBurner module via SPI or Serial.

#### **Kit Contents**

- NBWIFIIN-SOM-PCBIR or NBWIFIIN-SOM-UFLIR
- Adapter/Interface Board
- Software and documentation via <u>NNDK Red Card</u>

#### **Product Compatibility**

All versions of the NBWIFIIN are compatible with the modules listed below:

MOD5272 MOD5282 MOD5441X NANO54415 SB70LC

The external antenna version (UFL) is compatible with all the above modules, plus these additional modules:

MOD5234 MOD5270

#### Hardware

The NBWIFIIN-SOM-PCBIR and NBWIFIIN-SOM-UFLIR are in an LGA-44 SOM format, with the NBWIFIIN-SOM-UFLIR having a UFL connector for connecting to an external antenna.

Additional app notes, schematics, and pinouts can be found on the Wifi product webpage:

http://www.netburner.com/products/wireless/nbwifiin-802-11b-g-n

Figure 1. Adapter board (inserted on MOD-DEV-70CR)



**Note**: Plug in WiFi Adapter Board with component side towards the Ethernet Core Module!

### **Default Interface Signals**

The default hardware and software configuration uses the following NetBurner processor module signals:

- MOD5234, MOD5270, MOD5282
  - QSPI MOSI, QSPI MISO, QSPI CLK, QSPI CS0, IRQ 3

OR

- UART\_2 TX, UART\_2 RX
- MOD5441X, NANO54415
  - DSPI\_1 MOSI, DSPI\_1 MISO, DSPI\_1 CLK, DSPI\_1 CS0, IRQ 3

OR

- UART\_9 TX, UART\_9 RX
- MOD5272
  - QSPI MOSI, QSPI MISO, QSPI CLK, QSPI CS1, IRQ 3
  - OR
  - UART\_2 TX, UART\_2 RX
- SB70LC
  - QSPI MOSI, QSPI MISO, QSPI CLK, QSPI CS0, IRQ 5 (uses timer input 3 (TIN3) pin.
  - OR
  - UART\_1 TX, UART\_1 RX

#### **Custom Interface Signals**

You may use different chip select or IRQ input signals. To use different signals, you must populate the arguments of the Wifilnit calls where appropriate. You must also ensure that the signal is connected to the Wifi module.

### Additional Documentation

This document covers the wireless product only. If you need assistance in using the NetBurner development tools, TCP/IP stack or Real-Time Operating system, please refer to the following documents located in c:\nburn\docs:

- NNDK Programmer's Guide: a textbook style document on programming NetBurner devices.
- NBEclipse Getting Started Guide: a tutorial on using the NBEclipse Integrated Development Environment.
- NetBurner Runtime Libraries: API function reference documents for the TCP/IP Stack and RTOS.

### Installation

#### For Development

The NNDK-NBWIFIIN-PCB-KIT development kit includes an adapter board that enables it to be installed on the J2 header of the MOD-DEV-70CR development boards, which are included with the NetBurner MODxxxx development kits.

If you have a MOD-DEV-70CR, which does not already have it, you will need to install a 50-pin 0.1" dual row header in the location J2\_C.

The Wifi software libraries are automatically installed with your development kit.

#### **For Production**

The NBWIFIIN-100IR and NBWIFIIN-200IR are a solderable System on Module (SoM) in a LGA-44 format.

#### **Development Kit Adapter Board JP1 Pinout** The JP1 header on the development board enables you to select the

The JP1 header on the development board enables you to select the desired mode of operation for the Wifi module (SPI or UART), as well as which IRQ to use in SPI mode.

Table 1.	Mode Jumpers: J5 and J6

J5	J6	Mode
OFF	OFF	SPI
ON	OFF	UART
ON	ON	RESERVED
OFF	ON	RESERVED

Table 2. MOD5441X IRQ Jumpers (Note: only select one)	
Shorting Jumper Location	Signal Pin on Ethernet Module J2 Connector
1-2	J2-26 (IRQ 3)
3-4	J2-43 (IRQ 2)
5-6	J2-45 (IRQ 1)
7-8	J2-47 (IRQ 6)
9-10	J2-48 (IRQ 7)

Table 3. MOD523	MOD5234, MOD5270, MOD5282	
Shorting Jumper	Signal Pin on Ethernet Module J2	
Location	Connector	
1-2	J2-26 (N/A)	
3-4	J2-43 (IRQ 1)	
5-6	J2-45 (IRQ 3)	
7-8	J2-47 (IRQ 5)	
9-10	J2-48 (IRQ 7)	

Table 4. MOD527	2
Shorting Jumper	Signal Pin on Ethernet Module J2
Location	Connector
1-2	J2-26 (N/A)
3-4	J2-43 (IRQ 1)
5-6	J2-45 (IRQ 3)
7-8	J2-47 (IRQ 5)
9-10	J2-48 (IRQ 6)

#### Figure 2. Adapter board jumper configuration



**IRQ Jumpers** 

### **Configuring an IP Address**

The IPSetup utility will recognize that there are both Ethernet and Wifi network interfaces available to your NetBurner module. You can configure either interface from the other. The IPSetup device selection box will display a tree structure with a '+' character. If you click on the '+' it will enable you to view/edit each interface. In this way you can configure the Wifi interface through a network connection, which may be easier the first time you use the WDK.

In the screen capture below you can see both interfaces for the MOD5234. The Wifi icon is red because IPSetup was run on a PC on the Ethernet network and the 172.x.x.x address range is not visible to it. However, both interfaces are completely functional and configured correctly.

IMPORTANT: Your NetBurner Ethernet module must have a Wifienabled application running before the Wifi interface will appear in IPSetup.

NetBurner IPSetup V2.0	×
NDK Settings  IP  0  0  0  0  0  0    Network Mask  0  0  0  0  0  0  0    GateWay  0  0  0  0  0  0  0    DNS  0  0  0  0  0  0  0    Baudrate  115200	Select a Unit    ■  MOD5234 [00-03-F4-03-C7-05] running. WiFi Infrastructure E    ■  Ethermet [00-03-F4-03-C7-05] DHCP'd at 10.1.1.121    ●  WiFi [00-23-64-03-C7-05] DHCP'd at 12.1.6.31.196    ●  Set→    ●  MOD5234 [00-03-F4-03-78-94] DHCP'd at 10.1.1.213 running. SI    ●  MOD5234 [00-03-F4-03-78-94] DHCP'd at 10.1.1.120 running.    ●  MOD5234 [00-03-F4-02-A5-38] DHCP'd at 10.1.1.120 running.    ●  MOD5234 [00-03-F4-02-A5-38] DHCP'd at 10.1.1.120 running.    ●  Set→
	Launch Webpage Advanced Help Close

#### Figure 3. NetBurner IP Setup Application

### Running the Wifi Example Program

#### Prerequisites

- The NBEclipse development tools have been installed and are running properly.
- The Wifi hardware has been installed on your NNDK development board.
- The Wifi module is in a location with access to a 802.11 b/g/n access point.

#### Procedure

- In NBEclipse, create an empty project. Then, import the source code files located in examples/StandardStack/Wifi of your NNDK install:
  - WifiClient Configuring a Wifi interface and connecting to an Access Point
  - WifiScan Performing Scans and reporting results
  - WifiAP Running the Wifi interface in Access Point mode, with the onboard DHCP server

This procedure is described in the NBEclipse Getting Started Guide.

- Build the project and download it to your Ethernet module.
- Optional: You can view application status messages with MTTTY connected to the debug serial port.
- Run IPSetup and verify you can see both the Ethernet and Wifi interfaces.
- Use IPSetup to select the Wifi interface. Then, specify the SSID and key/passphrase if needed. After you click on the Set button, the display will take a few seconds to update, and if the Wifi connection was successful the IP address information should appear.
- Use a web browser and type the Ethernet IP address in the URL field. The web page should display the configuration information for both interfaces, and identify that the request came from the Ethernet interface.
- Use a web browser and type the Wifi IP address in the URL field. The web page should display the configuration information for both interfaces, and identify that the request came from the Wifi interface.

#### Troubleshooting

- Run MTTTY and connect to the debug serial port, either through USB or the DB9 connector. Press the reset button on the development board and look for status information and error messages.
- Try pinging the IP address of each interface.

### **Additional Services**

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Our services include: Hardware Design Firmware Design Software Applications in C, C++, and JAVA Turnkey add-on boards to your specifications Consulting on product design definition

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