

NetBurner, Inc.

Development Kit

NBWIFIIN Quick Start Guide

Rev 1.2

Jul 2015



Network Development Kit Quick Start Guide

Table of Contents

Introduction	4
Kit Contents	4
Product Compatibility	4
Hardware	5
Figure 1. Adapter board (inserted on MOD-DEV-70CR)	5
Default Interface Signals	6
Custom Interface Signals	6
Additional Documentation	7
Installation	7
For Development	7
For Production	7
Development Kit Adapter Board JP1 Pinout	8
Figure 2. Adapter board jumper configuration	9
Configuring an IP Address	10
Figure 3. NetBurner IP Setup Application	10
Running the Wifi Example Program	11
Prerequisites	11
Procedure	11
Troubleshooting	12
Additional Services	13
Technical Support	13
Software Licensing	13
Life Support Disclaimer	14
Anti-Piracy Policy	14

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 [NNDK Red Card](#)

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

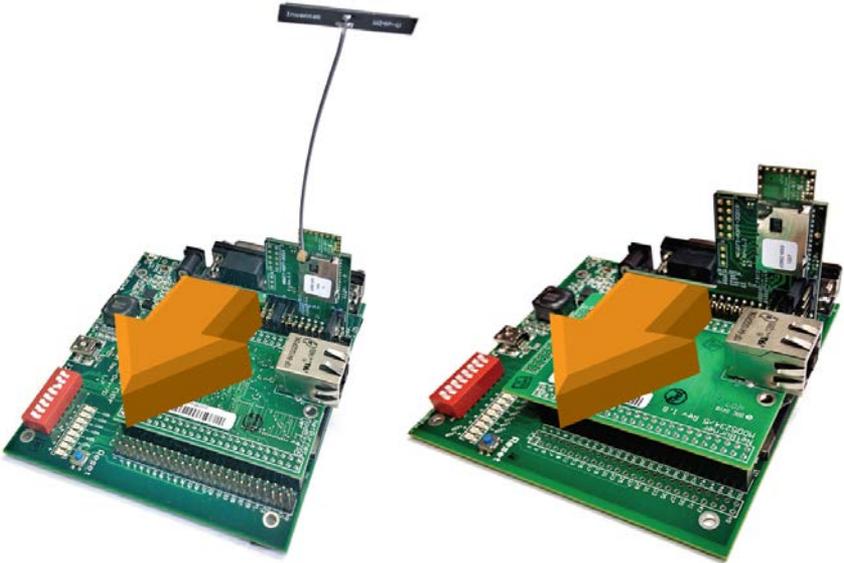
Hardware

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 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. MOD5234, MOD5270, MOD5282

Shorting Jumper Location	Signal Pin on Ethernet Module J2 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. MOD5272

Shorting Jumper Location	Signal Pin on Ethernet Module J2 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



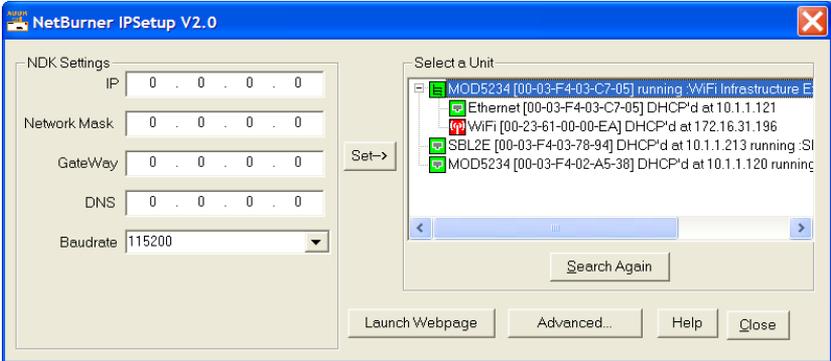
Configuring an IP Address

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 Wifi-enabled application running before the Wifi interface will appear in IPSetup.

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 MTTY 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 MTTY 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

The NetBurner design team has extensive experience in developing network products, and also offers a full line of services from hourly consulting to complete turnkey systems. Please contact sales@netburner.com for more information on any of our services.

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

Technical Support

Your NetBurner Network Evaluation Kit purchase includes 90 days of free email support and software updates. In order to submit technical support requests, you must register your NetBurner Network Evaluation Kit at support.netburner.com. Registration is quick and easy. The registration data stored on NetBurner's server will not be sold, exchanged, or knowingly released to third parties without prior written permission from the individuals affected.

Software Licensing

The Software included in your NetBurner Network Evaluation Kit is licensed to run only on NetBurner provided hardware. Please read the license.txt file located (by default) in your C:\Nburn\docs directory.

If your application involves manufacturing your own hardware, please contact sales@netburner.com for details on a royalty-free software license.

Life Support Disclaimer

NetBurner's products both hardware and software (including tools) are not authorized for use as critical components in life support s or systems, without the express written approval of NetBurner, Inc. prior to use. As used herein: (1) Life support s or systems are s or systems that (a) are intended for surgical implant into the body or (b) support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user. (2) A critical component is any component of a life support or system whose failure to perform can be reasonably expected to cause the failure of the life support or system, or to affect its safety or effectiveness.

Anti-Piracy Policy

NetBurner, Inc. vigorously protects its copyrights, trademarks, patents and other intellectual property rights.

In the United States and many other countries, copyright law provides for severe civil and criminal penalties for the unauthorized reproduction or distribution of copyrighted material. Copyrighted material includes, but is not limited to: computer programs and accompanying sounds, images and text.

Under U.S. law, infringement may result in civil damages of up to \$150,000, and/or criminal penalties of up to five years imprisonment, and/or a \$250,000 fine. In addition, NetBurner, Inc. may seek to recover its attorneys' fees.

NetBurner, Incorporated
5405 Morehouse Drive, Ste 200
San Diego, CA 92121
www.netburner.com

Network Development Kit Quick Start Guide

NetBurner License Agreement

Notice to Developer: This is a contract. By installing the NetBurner Tools, you accept all the terms and conditions of the “NetBurner Tools Software” and “NetBurner Embedded Software” Agreements. If you do not agree with the terms and conditions of these agreements, return this development kit and all components to NetBurner, Inc.

All embedded software and source code provided in this Network development kit is subject to one of four possible licenses: The NetBurner Tools License (most restrictive), The NetBurner Embedded Software License, The GNU Public License, and/or The Newlib License (least restrictive).

The GNU development executables provided in the C:\Nburn\GCC-M68k directory branch are subject to the GNU public license. This license can be found in C:\Nburn\docs\GNULicense.txt file.

The runtime libraries and include files provided in the C:\Nburn\GCC-M68k directory branch are subject to the Newlib license. This license can be found in C:\Nburn\docs\NewlibLicense.txt file.

The compcode application provided in the C:\Nburn\pctools\compcode directory is subject to the GNU public license. This license can be found in the C:\Nburn\docs\GNULicense.txt file.

The other programs in the Nburn\pctools directory are subject to the NetBurner Tools License provided below. A copy of this license can also be found in your C:\Nburn\docs directory.

All other provided source code and libraries are subject to the NetBurner Embedded Software License provided below. A copy of this license can also be found in your C:\Nburn\docs directory.

The NetBurner Tools Software License

Copyright 1998 - 2015 NetBurner, Inc., All Rights Reserved. Permission is hereby granted to purchasers of the NetBurner Network Development Kit to use these programs on one computer, and only to support the development of embedded applications that will run on NetBurner provided hardware. No other rights to use this program or its derivatives, in part or in whole, are granted. It may be possible to license this or other NetBurner software for use on non-NetBurner hardware. Please contact sales@netburner.com for more information. NetBurner makes no representation or warranties with respect to the performance of this computer program, and specifically disclaims any responsibility for any damages, special or consequential, connected with the use of this program.

The NetBurner Embedded Software License

Copyright 1998 – 2015, NetBurner, Inc., All Rights Reserved. Permission is hereby granted to purchasers of NetBurner hardware to use or modify this computer program for any use as long as the resultant program is only executed on NetBurner provided hardware. No other rights to use this program or its derivatives, in part or in whole, are granted. It may be possible to license this or other NetBurner software for use on non-NetBurner hardware. Please contact sales@netburner.com for more information. NetBurner makes no representation or warranties with respect to the performance of this computer program, and specifically disclaims any responsibility for any damages, special or consequential, connected with the use of this program.