

# F5D8231-4 Operational Principle

## 1. FUNCTION DESCRIPTION

The Belkin F5D8231-4 Wireless-11N Router is a next generation Router with built-in wireless access point (AP), 4-port Fast Ethernet (10/100Base-T) switch for LAN, and 1 Fast Ethernet port for WAN connection. The Router operates on 2.4GHz frequencies, which conforms to the IEEE 802.11b/g wireless standards, and the draft 802.11n specification. The router features Atheros's draft-802.11n-compliant radio in 2x3 (TX/RX) configuration offering breakthrough performance and enhanced coverage to it's WiFi network. The Router is to be used with either a Broadband ADSL or Cable Modem via the WAN port to share broadband connections with up to 4 computers via the LAN ports and 32 computers via the WLAN. Each LAN port supports 10/100 Base-T Networks with auto sensing and switching compatibilities. The Router's Next Gen EZ install software operates on Microsoft's Windows 2000 and XP, and on Mac OS X. The Router can be configured through a web-browser interface. The product is designed for the home and small office and will be available through major retailers and online retailers.

The F5D8231-4 uses the Marvell 88F5180N CPU as the micro-controller and it offers a memory configuration of 4M Bytes Flash and 32MBytes DDR RAM

This device derives its power from a 12V DC power adapter which needs to be converted to 3.3V, 2.5V, 1.5V, 1.4V and 1.2V.

The functional requirements of the system are as follows:

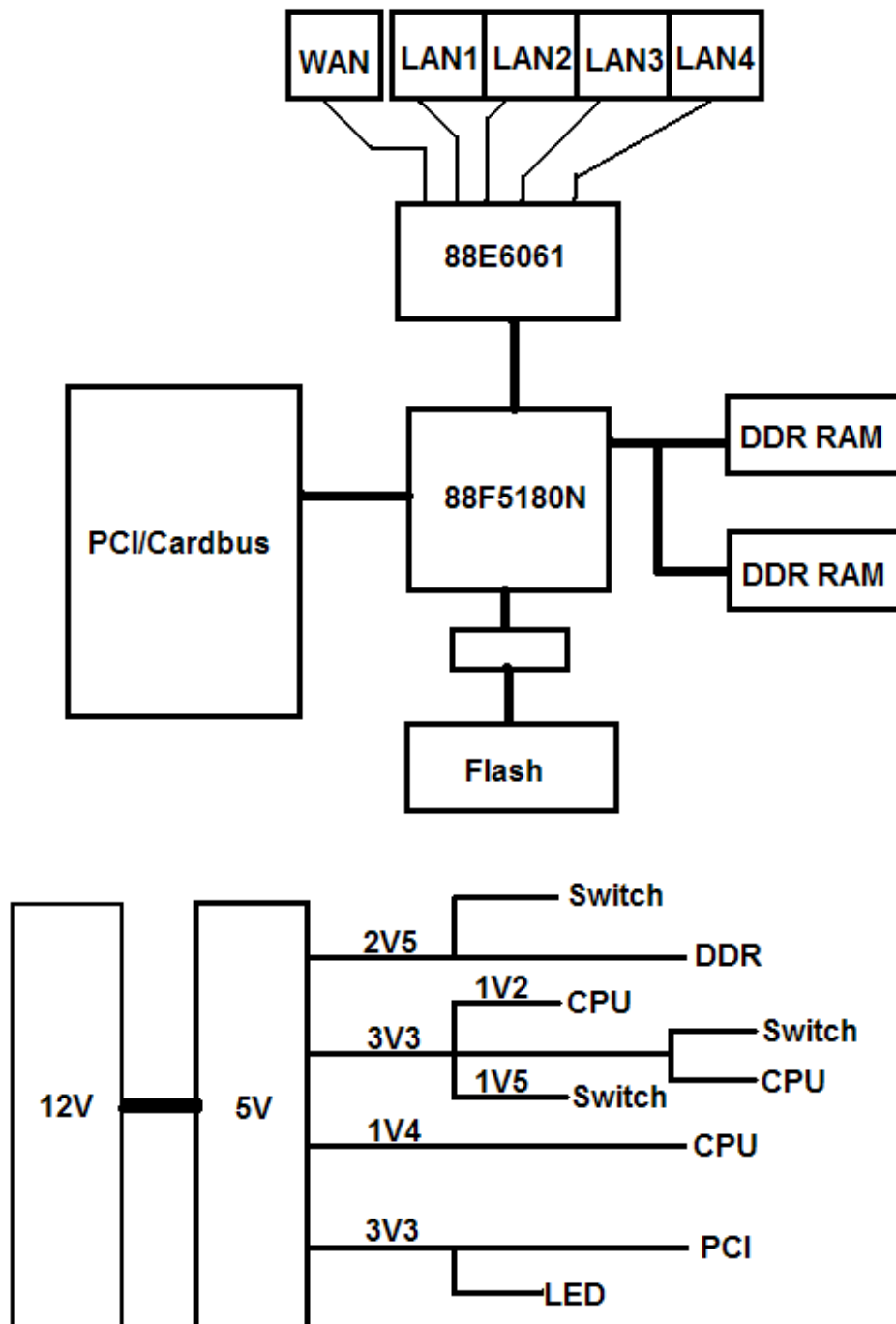
1. CPU	Marvell 88F5180n 333MHz
2. CODE SIZE	4Mbyte
3. SDRAM	32Mbytes
4. Switch	Marvell 88E6061
5. WAN Port	One RJ45 port with auto negotiation
6. LAN Port	Four RJ45 port with LED and auto negotiation
7. Power Adapter	DC 12V/1.2A
8. LEDs	Refer to Table 1
9. Reset button	Reset to factory default by pressing 5 seconds
11. EMC	Class-B
12. PCB Layout	4 layers

**Table 1: LED Table**

Label		Activity	Description
<b>Wireless Security</b>		OFF	Wireless security is OFF
		Solid Blue	Wireless security is ON
<b>Wireless Computer Status</b>		OFF	Wireless computer is not present
		Solid Blue	Wireless computer is connected to the Router
		Blinking Amber	Problem with wireless computer connecting properly to the Router (Pending feasibility confirmation with ODM) <a href="#">Our suggestion now is when there is at least one wireless computer cannot access the router, then blinking amber. Need marvell's support to see if marvell driver can report some of wireless computer is power on, but has problem to associate. This may be not doable.</a>
<b>Wired Computer Status</b>		OFF	Wired computer is not present
		Solid Blue	Wired computer is connected to the Router
		Blinking Amber	Problem with wired computer connecting properly to the Router (Pending feasibility confirmation with ODM) <a href="#">Could have the same problem with the wireless computer.</a>
<b>Router / Power Status</b>		OFF	Router is OFF
		Blinking Blue	Router is booting up
		Solid Blue	Router is ON and ready
<b>Wireless Status</b>		OFF	Wireless is OFF
		Solid Blue	Wireless is ON
<b>Modem/WAN Status</b>		Solid Blue	Router is connected to Modem and functioning properly
		Blinking Amber	Problem with Modem <a href="#">(such as boot failure, etc.)</a>
<b>Internet/Connected</b>		Blinking Blue	Router is attempting to connect to the Internet
		Solid Blue	Router is connected to the Internet
		Blinking Amber	Router is NOT connected to the Internet
<b>LAN</b>	<b>LAN1</b>	Link/Act Green	Indicate that LAN is connected or there is data transaction
		Speed	Indicate that the connect is 10baseT or 100baseT
	<b>LAN2</b>	Link/Act Green	Indicate that LAN is connected or there is data transaction
		Speed	Indicate that the connect is 10baseT or 100baseT
	<b>LAN3</b>	Link/Act Green	Indicate that LAN is connected or there is data transaction
		Speed	Indicate that the connect is 10baseT or 100baseT
	<b>LAN4</b>	Link/Act Green	Indicate that LAN is connected or there is data transaction
		Speed	Indicate that the connect is 10baseT or 100baseT

## 2. Block Diagram

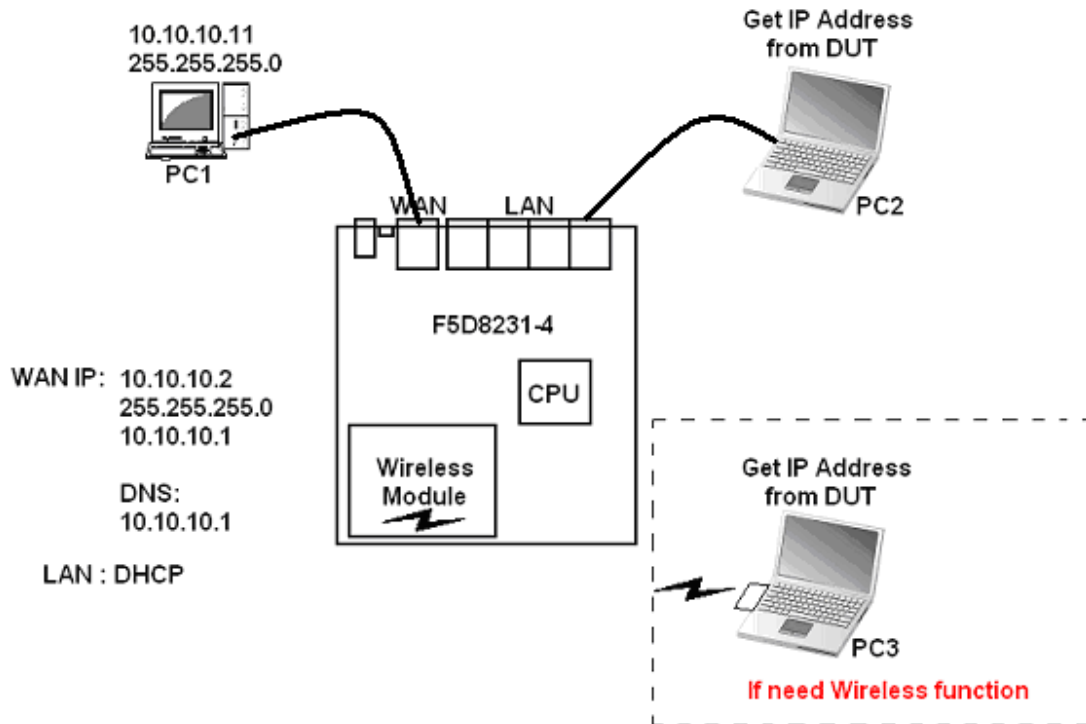
The HW Block Diagram as below:



Operating Frequency in USA: 2412-2462 MHz  
Operating Frequency in Europe: 2412-2472 MHz

### 3. Operational Principle

1). Power on the DUT, then connect WAN port with PC1 and LAN port with PC2.



2). Set PC1(Connected with WAN) IP as:

IP Address:10.10.10.11;  
Subnet Mask:255.255.255.0;  
Gateway:10.10.10.1.

☐ 自动获得 IP 地址 (A)

☒ 使用下面的 IP 地址 (S):

IP 地址 (I):

子网掩码 (U):

默认网关 (D):

3). PC2(Connected with LAN) can get IP address from F5D8231-4 and the default IP subnet is 192.168.2.0. So PC2's IP address may be 192.168.2.x.

Ethernet adapter LAN:

```
Connection-specific DNS Suffix . : Belkin
IP Address. . . . . : 192.168.2.2
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 192.168.2.1
```

4). Open the Internet Explorer and type the Address: 192.168.2.1. Then press "Enter".

**BELKIN Router Setup**

Home | Help | Login | Internet Status: [Connected](#)

**LAN Setup**  
 LAN Settings  
 DHCP Client List

**Internet WAN**  
 Connection Type  
 DNS  
 MAC Address

**Wireless**  
 Channel and SSID  
 Security  
 Use as Access Point

**Firewall**  
 Virtual Servers  
 Client IP Filters  
 MAC Address Filtering  
 DMZ  
 DDNS  
 WAN Ping Blocking  
 Security Log

**Status**

Version Info	
Firmware Version	F5D8231-4_US_5.01.07
Boot Version	v1.00
Hardware	F5D8231-4
Serial No.	BEL7823957

LAN Settings	
LAN/WLAN MAC	00:C0:02:82:31:76
IP address	192.168.2.1
Subnet mask	255.255.255.0
DHCP Server	Enabled

Internet Settings	
WAN MAC address	00:C0:02:82:31:77
Connection Type	Dynamic
Subnet mask	255.255.252.0
Wan IP	172.21.5.14
Default gateway	172.21.5.238
DNS Address	172.26.1.250

Features	
NAT	Enabled
Firewall Settings	Enabled
SSID	Belkin_N1_Wireless_823176
Security	Disabled

## 5)WAN Setting Step1

Internet Settings	
WAN MAC address	00:C0:02:82:31:77
Connection Type	Dynamic
Subnet mask	255.255.252.0
Wan IP	172.21.5.14
Default gateway	172.21.5.238
DNS Address	172.26.1.250

## Step2

## WAN > Connection Type

Select your connection type:



### Dynamic

A Dynamic type of connection is the most common. If you use a cable modem, then most likely you will have a dynamic connection. If you have a cable modem or you are not sure of your connection type, use this.



### Static

A Static IP address connection type is less common than others. Use this selection only if your ISP gave you an IP address that never changes.



### PPPoE

If you use a DSL modem and/or your ISP gave you a User Name and Password, then your connection type is PPPoE. Use this connection type.



### PPTP

[European Countries Only]. This type of connection is most common in European countries. If your ISP has specifically told you that you use PPTP and has supplied you with the proper PPTP information, then use this option.



### Telstra BigPond

[Australia Only] Users of Telstra BigPond Cable or DSL will use this option to configure the connection.



### L2TP

[Israel Only]. This type of connection is most common in Israel. If your ISP has specifically told you that you use L2TP and has supplied you with the proper L2TP information, then use this option.

Next >

## Step3

### WAN > Connection Type > Static IP

To enter your Static IP settings, type in your information below and click "Apply changes". [More Info](#)

IP Address >

10 . 10 . 10 . 2

Subnet Mask >

255 . 255 . 255 . 0

ISP Gateway Address >

10 . 10 . 10 . 1

[Click here to enter your DNS Settings](#)

Clear Changes

Apply Changes

## Step4



#### Step5

#### WAN > DNS

If your ISP provided you with a specific DNS address to use, enter the address in this window and click "Apply Changes".

☐ Automatic from ISP

DNS Address >

10 . 10 . 10 . 1

Secondary DNS Address >

. . . .

DNS = Domain Name Server. A server located on the Internet that translates URL's (Universal Resource Links) like www.belkin.com to IP addresses. [More Info](#)

Clear Changes

Apply Changes

#### Step6

#### Router Setup

Home | H

#### WAN > DNS

If your ISP provided you with a specific DNS address to use, enter the address in this window and click "Apply Changes".

#### Step7→Completed

Internet Settings	
WAN MAC address	00:C0:02:82:31:77
Connection Type	Static
Subnet mask	255.255.255.0
Wan IP	10.10.10.2
Default gateway	10.10.10.1
DNS Address	10.10.10.1

6). Then we can ping PC1 from PC2 (ping 10.10.10.11)

7). LAN subnet setting (If need)

#### Step1

LAN Settings	
LAN/WLAN MAC	00:C0:02:82:31:76
IP address	192.168.2.1
Subnet mask	255.255.255.0
DHCP Server	Enabled

Step2

Login

Before you can change any settings, you need to log in with a password. If you have not yet set a custom password, then leave this field blank and click "Submit."

**Password**

Default = leave blank

Clear

Submit

Step3



## LAN > LAN settings

You can make changes to the Local Area Network (LAN) here. For changes to take effect, you must press the "Apply Changes" button at the bottom of the screen.

IP Address >

192 . 168 . 2 . 1

[More Info](#)

Subnet Mask >

255 . 255 . 255 . 0

[More Info](#)

DHCP server >

☒ On ☐ Off

The DHCP server function makes setting up a network very easy by assigning IP addresses to each computer on the network. It is not necessary to make any changes here. [More Info](#)

IP Pool Starting Address >

192 . 168 . 2 . 2

IP Pool Ending Address >

192 . 168 . 2 . 100

Lease Time >

Forever

The length of time the DHCP server will reserve the IP address for each computer.

Local Domain Name >

(Optional)

Belkin

A feature that lets you assign a name to your network. [More Info](#)

Clear Changes

Apply Changes

## 8). WLAN setting

### Step1

Features	
NAT	Enabled
Firewall Settings	Enabled
SSID	Belkin_N1_Wireless_823176
Security	Disabled

### Step2

## Wireless > Channel and SSID

To make changes to the wireless settings of the router, make the changes here. Click "Apply Changes" to save the settings. [More Info](#)

Wireless Channel >

11

SSID >

Helkin\_N1\_Wireless\_823176

Wireless Mode >

11b+g+n

Broadcast SSID >



[More Info](#)

Protected Mode >

On

[More Info](#)

## QoS Configuration

802.11e QoS >

On

[More Info](#)

Bandwidth >

20MHz+40MHz auto

Clear Changes

Apply Changes

### Step3

Then can use a PC3 with wireless module to connect with the DUT.