

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:

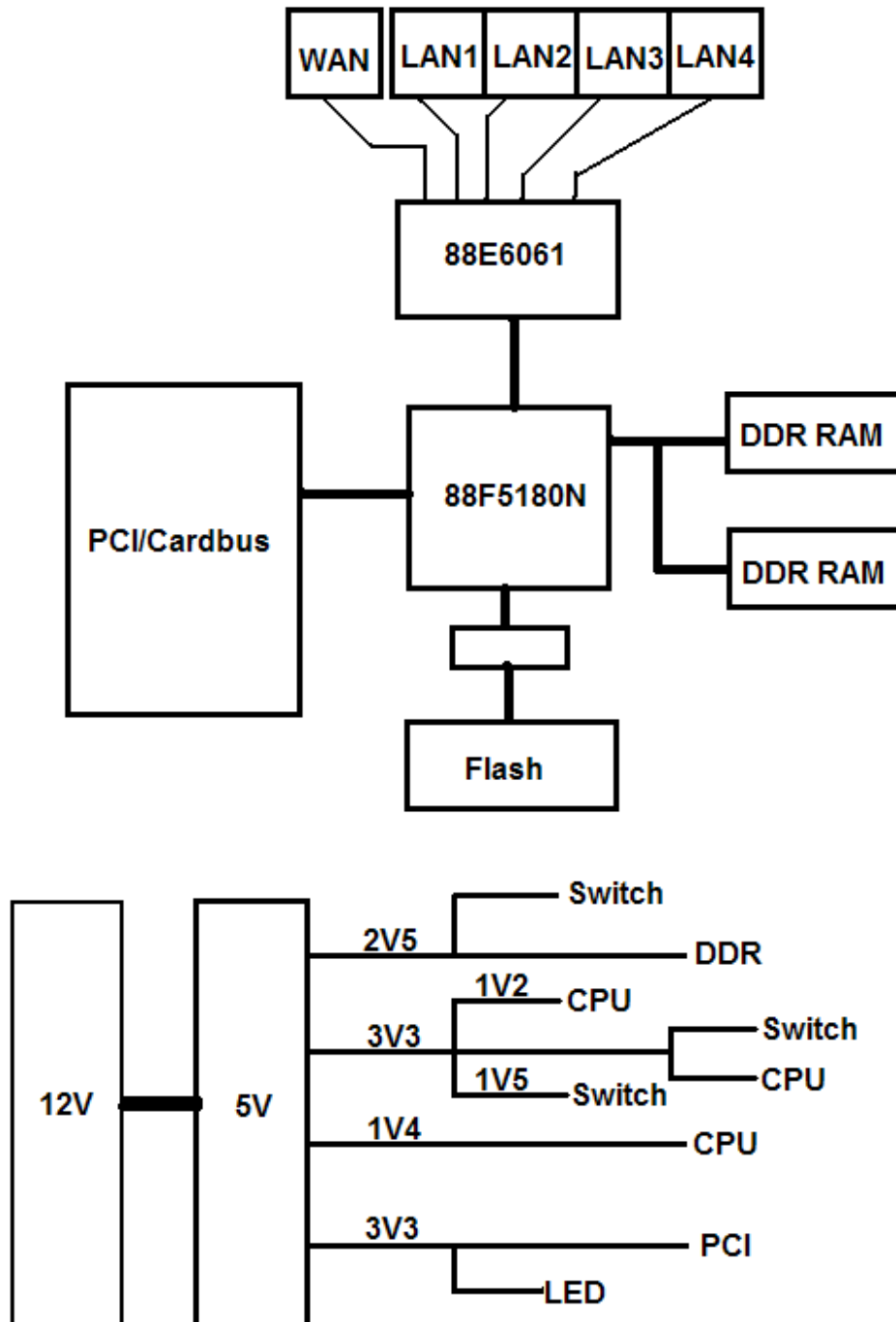
1. CPU	Marvell 88F5180n 333MHz
2. CODE SIZE	4Mbyte
3. SDRAM	32Mbytes
4. Switch	Marvell 88E6061
5. WAN Port	One RJ45 port with auto negotiation
6. LAN Port	Four RJ45 port with LED and auto negotiation
7. Power Adapter	DC 12V/1.2A
8. LEDs	Refer to Table 1
9. Reset button	Reset to factory default by pressing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

Table 1: LED Table

Label	Activity	Description	
Wireless Security	OFF	Wireless security is OFF	
	Solid Blue	Wireless security is ON	
Wireless Computer Status	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) 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.	
Wired Computer Status	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) Could have the same problem with the wireless computer.	
Router / Power Status	OFF	Router is OFF	
	Blinking Blue	Router is booting up	
	Solid Blue	Router is ON and ready	
Wireless Status	OFF	Wireless is OFF	
	Solid Blue	Wireless is ON	
Modem/WAN Status	Solid Blue	Router is connected to Modem and functioning properly	
	Blinking Amber	Problem with Modem (such as boot failure, etc.)	
Internet/Connected	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	
LAN	LAN1	Link/Act Green	Indicate that LAN is connected or there is data transaction
		Speed	Indicate that the connect is 10baseT or 100baseT
	LAN2	Link/Act Green	Indicate that LAN is connected or there is data transaction
		Speed	Indicate that the connect is 10baseT or 100baseT
	LAN3	Link/Act Green	Indicate that LAN is connected or there is data transaction
		Speed	Indicate that the connect is 10baseT or 100baseT
	LAN4	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

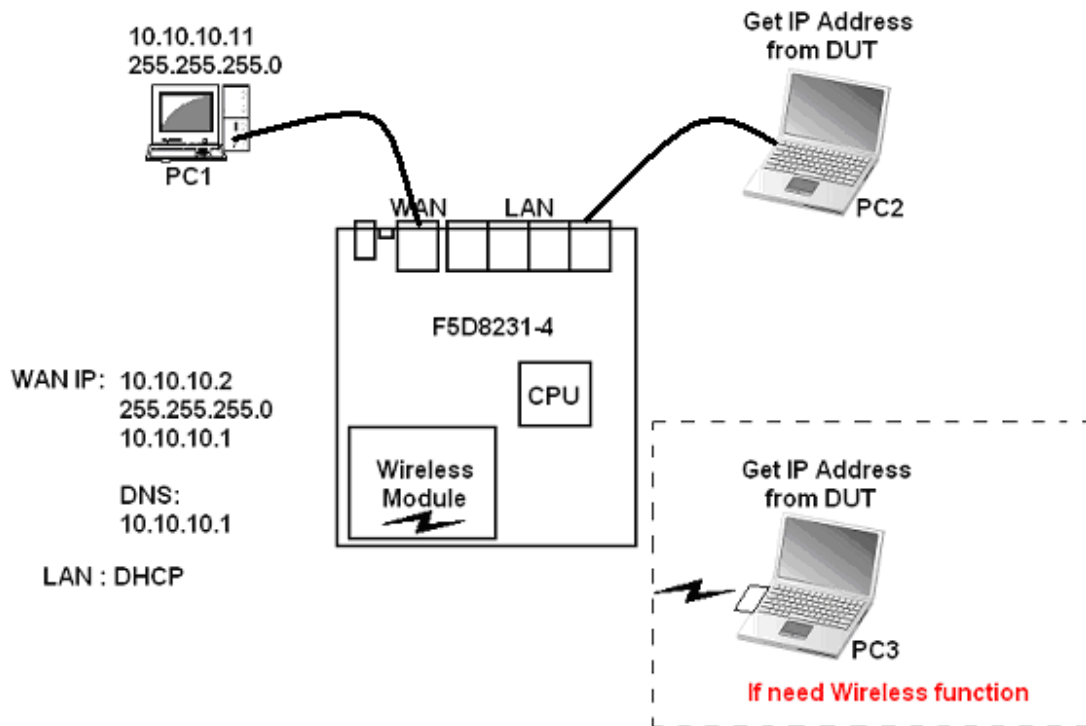
The HW Block Diagram as below:



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 (M):

默认网关 (G):

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".

The screenshot shows the Belkin Router Setup interface. The address bar displays 'http://192.168.2.1/'. The page title is 'BELKIN Router Setup'. The navigation menu includes 'Home | Help | Login | Internet Status: Connected'. The left sidebar contains menu items for LAN Setup, Internet WAN, Wireless, and Firewall. The main content area is titled 'Status' and contains four tables:

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 > . . . [More Info](#)

Subnet Mask > . . . [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 > . . .

IP Pool Ending Address > . . .

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

Local Domain Name >
(Optional)
A feature that lets you assign a name to your network. [More Info](#)

8). WLAN setting

Step1

Features	
NAT	Enabled
Firewall Settings	Enabled
SSID	Belkin_N1_Wireless_823176
Security	Disabled

Step2

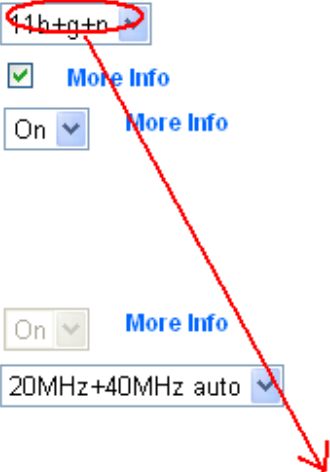
Wireless > Channel and SSID

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 >	<input type="text" value="11"/>
SSID >	<input type="text" value="Belkin_N1_Wireless_823176"/>
Wireless Mode >	<input type="text" value="11b+g+n"/>
Broadcast SSID >	<input checked="" type="checkbox"/> More Info
Protected Mode >	<input type="text" value="On"/> More Info

QoS Configuration

802.11e QoS >	<input type="text" value="On"/> More Info
Bandwidth >	<input type="text" value="20MHz+40MHz auto"/>



Step3

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