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# zilog® Wireless Zdots® Single Board Computer Development Kit

Quick Start Guide

QS007504-0410

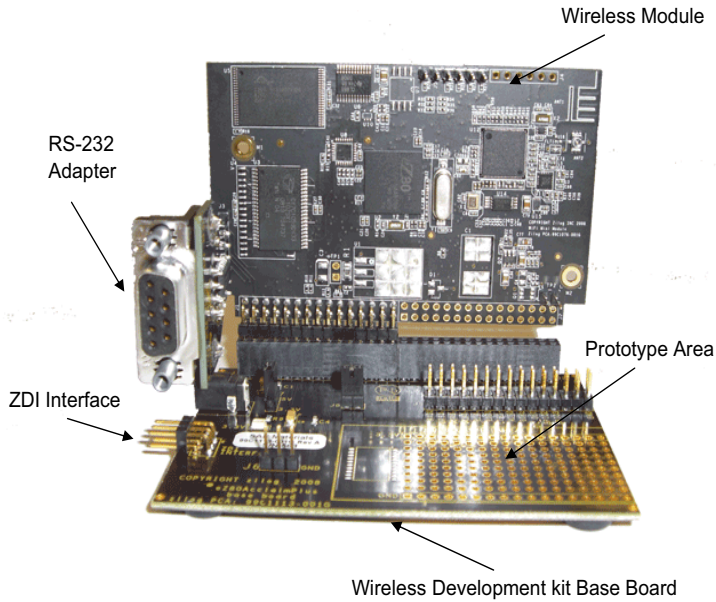
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## Introduction

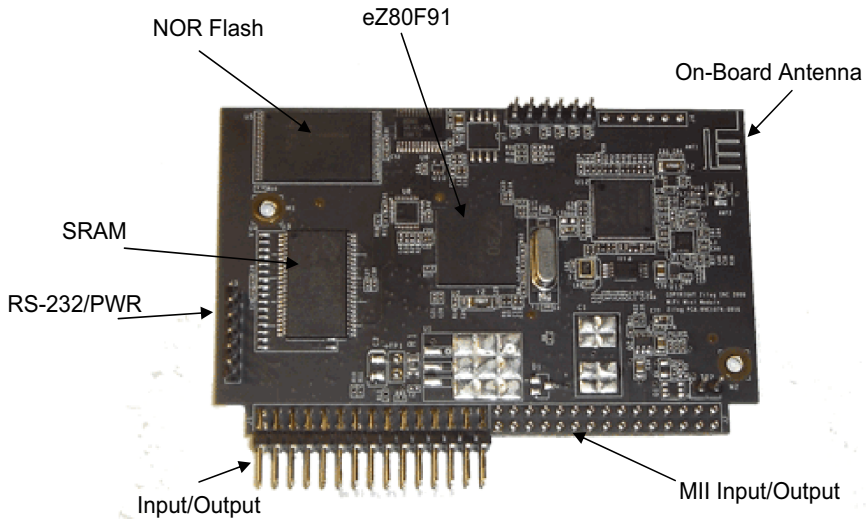
This Quick Start Guide provides instructions to use Zilog's Wireless Zdots® Single Board Computer (SBC) with the Demo project `WLANDemo.zdsproj`. `WLANDemo.zdsproj` is a sample project in which the communication of a PC to a web page is wireless, it is run by Zdots SBC. The `WLANDemo.zdsproj` is used along with standard Zilog TCP/IP (ZTP) software suite. This Demo project can only be used on Wireless Zdots SBC. Do not use this Demo project on Zilog's eZ80Acclaim!® development kit. This project can also be used as the starting point for your application development.



Figure 1. Wireless Zdots® SBC Development Kit



**Figure 2. Wireless Zdots® SBC and Base Board**



**Figure 3. Wireless Zdots® SBC**

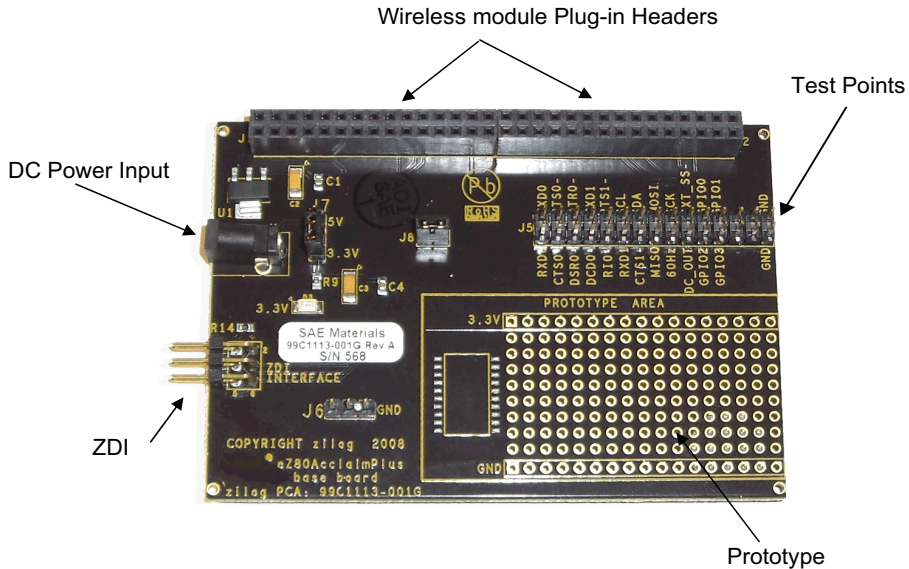


Figure 4. Wireless Base Board

## Kit Contents

This section describes the hardware and software requirements for installing and using Wireless Zdots® Single Board Computer Development Kit.

## Hardware

The hardware included in this kit are:

- eZ80AcclaimPlus! Wireless Zdots SBC
- eZ80AcclaimPlus! Wireless Zdots SBC Development Kit Base Board
- RS-232 Adapter
- USB Smart Cable
- 5 V DC Power Supply
- RS-232 Cable

► **Notes:** *The additional hardware that are required to run the Demo (not included in the kit) are:*

1. *A USB to Serial Adapter for host PC that do not have a serial COM port.*
2. *Wireless LAN router.*

## Software and Documentation (on CD-ROM)

The software included in this kit are:

- Zilog Developer Studio II (ZDS II)-eZ80 Acclaim!®
- Zilog TCP/IP Stack (ZTP) ZDS - Object Code

► **Notes:** 1. For latest revision, visit [www.zilog.com](http://www.zilog.com).

2. For procedure to download the ZTP software, see [Downloading the ZTP Software](#) on page 18.

## System Requirements

[Table 1](#) lists the system requirements for running ZDS II.

**Table 1. ZDS II System Requirements**

Recommended Configuration	Minimum Configuration
PC running Microsoft Windows XP Professional	PC running Microsoft Windows XP Professional/ Windows 2000 SP4/Windows 98 SE
Pentium III/500 MHz or higher processor	Pentium II/233 MHz processor
128 MB RAM	96 MB RAM
110 MB hard disk space	25 MB hard disk space (documentation not installed)
Super VGA video adapter	Super VGA video adapter
CD-ROM drive	CD-ROM drive
One or more RS-232 communications ports	One or more RS-232 communications ports
USB high-speed port	USB high-speed port

## Installing the ZDSII Software and Kit Documentation

Follow the steps below to install the ZDS II and documentation:

1. Insert the ZDS II CD into the CD-ROM drive. **DemoShield** launches automatically. If the **DemoShield** does not launch automatically, open the Windows Explorer, browse to your CD-ROM drive, and double-click `launch.exe` to launch the installer.
2. From the product installer list you can choose to install ZDS II alone, or both ZDS II and associated documentation. You can also copy the documentation directly from your CD-ROM drive to your hard disk using Windows Explorer or read the documentation directly from the CD-ROM itself.

For customer service and technical support, Zilog® recommends you to create an account on <http://support.zilog.com>.

## Installing the USB Smart Cable

Follow the steps below for installing the USB Smart Cable and associated driver software.

### Windows Vista-32

Follow the steps below to install the USB Smart Cable for Windows Vista-32.

1. Connect the USB Smart Cable to the Host PC. The **Found New Hardware** dialog box is displayed.
2. Select **Locate and install the driver software (recommended)**. The **Driver Software Installation** window is displayed, and then the **Found New Hardware-USB Smart Cable** dialog box is displayed.
3. Select **I don't have the disc. Show me other options**.
4. Select **Browse my computer for driver software (advanced)**.
5. Browse to the following driver directory:  
`<ZDS II Installation Directory>\device drivers\USB`  
The **Windows Security** dialog box is displayed.
6. Select **Install this driver software anyway**.
7. When the software is installed, click **Closed**.

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## Windows XP

Follow the steps below to install the USB Smart Cable for Windows XP:

1. Connect the Zilog USB device to the Host PC. The **Found New Hardware** Wizard should activate automatically after connecting the Zilog USB device for the first time; select **No, not at this time** if asked to connect to Windows Update.
2. Select **Install from a list or specific location (Advanced)**; then click **Next**.

► **Note:** *If the Windows Logo testing dialog appears, select **Continue Anyway**.*

3. Select **Search for the best driver in these locations** and **Include this location in search:**.
4. Browse to the following driver directory and click **Next**.  
`<ZDS installation>\device drivers\USB\`
5. Click **Next** after the appropriate driver is found.
6. Click **Finish** to complete the installation.

## Windows 2000

Follow the steps below to install the USB Smart Cable for Windows 2000:

1. Connect the Zilog USB device to the Host PC. The **Found New Hardware** Wizard should activate automatically after connecting the Zilog USB device for the first time.
2. Click **Next** in the **Found New Hardware** Wizard after it has been activated.
3. Select **Search for a suitable driver for my device (Recommended)** and click **Next**.
4. Select **Specify a location** and click **Next**.
5. Browse to the following driver directory and click **OK**.  
`<ZDS installation>\device drivers\USB\`
6. Click **Next** after the appropriate driver is found.
7. Click **Finish** to complete the installation.

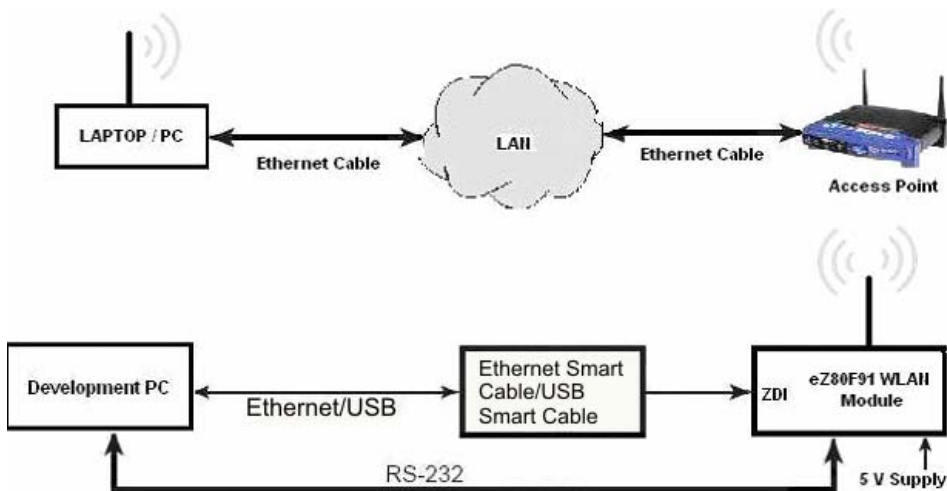
## Windows 98SE

Follow the steps below to install the USB Smart Cable for Windows 98SE:

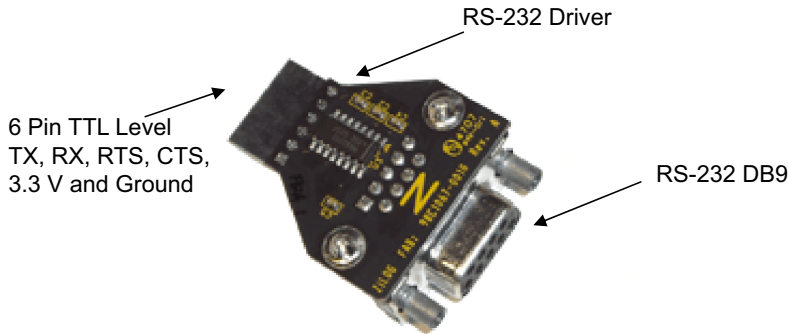
1. Connect the Zilog USB device to the Host PC. The **Add New Hardware** Wizard should activate automatically after connecting the Zilog USB device for the first time.
2. Click **Next** in the **Add New Hardware** Wizard after it has been activated.
3. Select **Search for the best driver for your device (Recommended)** and click **Next**.
4. Select **Specify a location:** and browse to the following driver directory, and click **Next**.  
`<ZDS installation>\device drivers\USB\`
5. Click **Next** after the appropriate driver is found.
6. Click **Finish** to complete the installation.

## Hardware Setup

Figure 5 displays the hardware setup for the ZTP Wireless Local Area Network (WLAN) Demo application that is used to demonstrate wireless data transfer.



**Figure 5. Hardware Setup for the ZTP WLAN Demo Application**



**Figure 6. RS-232 Adapter**

Follow the steps below to set up the hardware:

1. Connect Zdots SBC to J1 of the Wireless base board. See [Figure 2](#) on page 2 for actual image. The SBC must be connected before applying the power.

► **Note:** *Pin 1 of Zdots SBC should match the pin 1 of the base board; this is indicated by square solder around the pin.*

2. Connect the RS-232 adapter (99C1067-001G) to the WLAN Zdots SBC J3 header.

► **Note:** *Pin 1 is indicated by the square solder on the solder side.*

3. Connect the USB Smart cable (or any Zilog Debug tool) to the 6-pins ZDI interface on the Wireless Base Board on your development PC. See [Connecting the USB Smart Cable to the Development Board](#) on page 9.

4. Connect the RS-232 cable to the RS-232 adapter P1 connector and the other end to the communication port (COM1) of the PC.

► **Note:** *This is connected on your PC as displayed in [Figure 5](#) on page 7.*

5. Connect the power supply (5 V DC) cable to the Wireless Base board J4 connector.

6. Set up an access point (AP) in the test area and power it ON. For information on how to set up the wireless router, see [Configuring the Router](#) on page 15.

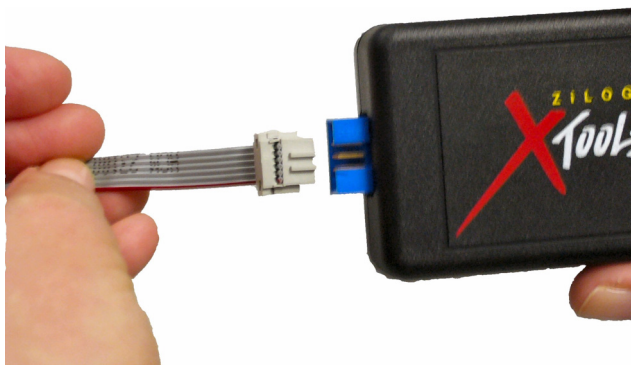


## Connecting the USB Smart Cable to the Development Board



**Caution:** *The power to the development board must be disconnected or turned OFF before connecting or disconnecting the USB Smart Cable.*

Attach one end of the six-conductor ribbon cable (included) to the USB Smart Cable six-pin DBG connector (see [Figure 7](#)). Attach the free end of the ribbon cable to the DBG connector (ZDI Interface) on the development board. Ensure that pin 1 on the ribbon cable (indicated by the dark stripe) is aligned with pin 1 on the target connector (indicated by a square solder on the DBG pin).



**Figure 7. Connecting the Six-Conductor Ribbon Cable to the USB Smart Cable**

## Configuring the HyperTerminal Application

The HyperTerminal program must be configured before starting the Demo application. Follow the steps below to configure the HyperTerminal application:

1. In Windows operating system, launch the HyperTerminal application by navigating to **Start → All Programs → Accessories → Communications → HyperTerminal**. The **Connection Description** dialog box is displayed.
2. Enter the name for a new connection in the **Connection Description** dialog, and click **OK**. The **Connect To** dialog box is displayed.
3. In the **Connect Using** text field, select the port (COM1 or COM2) to which the serial cable is connected. Click **OK** to open the **Port Settings** dialog box for the selected port.

4. In the **Port Settings** tab of dialog box, enter the following values in the respective text fields:

Bits per second	57600 bps
Data bits	8
Parity	None
Stop Bits	1
Flow control	None

5. Click **OK** to establish connection to the eZ80® development platform using the serial port.

## How to Execute WLAN Demo Application

### Running the RAM-Based WLAN Demo Project using the ZDS II Toolset

Follow the steps below to execute the WLAN Demo project in the Zilog Developer Studio II (ZDS II) development environment:

- **Note:** *The following procedures reference the `WLANDemo.zdsproj` located in the CD-ROM. Insert Zilog TCP/IP Stack (ZTP) ZDS - Object Code Version X.Y.Z<sup>1</sup> CD into the CD-ROM drive. **InstallShield** Wizard appears and starts installation. Follow the on-screen procedures. By default, it is installed at `C:\Program Files\ZiLOG\ZTP_X.Y.Z_Lib_ZDS`.*

1. Set up the hardware as displayed in [Figure 5](#) on page 7.
2. To launch ZDS II, navigate to **Start** → **All Programs** → **Zilog ZDS II-eZ80Acclaim!\_<Version>\_ZDS II-eZ80Acclaim!\_<Version>**.
3. Select **Open Project** from the **File** menu in ZDS II to open the sample ZTP Demo project located in the following path:  
For ZDSII - eZ80Acclaim! 5.1.0:  
`C:\Program Files\ZiLOG\ZDSII_eZ80Acclaim!_5.1.0\ZTP\ZTP2.3.1_Lib\ZTP\SamplePrograms\WLANDemo\WLANDemo.zdsproj`

<sup>1</sup> Where X.Y.Z refers to the major, minor, and revision number of the release.

```
<ZTP Installed Dir>\ZTP_X.Y.Z_Lib_ZDS\ZTP\SamplePrograms\WLAN-
Demo\WLANDemo.zdsproj>
```

where <ZTP Installed Dir> is the path to the ZTP folder that you set when you installed the ZTP\_X.Y.Z\_Lib\_ZDS. The default location of <ZTP Installed Dir> is C:\Program Files\ZiLOG.

4. Select **Build** → **Set Active Configuration** to open the **Select Configuration** dialog box, and select the RAM configuration.
  5. From the **Project** menu in ZDS II, select **Settings**. The **Project Settings** dialog box appears.
  6. In the **Project Settings** dialog box, select the **Debugger** tab. In the **Debugger** tab, ensure **eZ80F91\_WiFi\_RAM** option is checked and the correct debug tool is selected. In this Demo, USB Smart Cable is used as the Debug Tool.
  7. Click **OK** to close the **Project Settings** dialog box.
- **Note:** *If the ZDS II prompts to **Rebuild the Project**, click **YES** to enable the configuration on **Project** → **Settings**.*

8. After the successful build, run the Demo application using **Debug** → **Go**.

This is observed on Hyper Terminal window:

```
Initializing SPI
Initializing SDIO card
get SYSCLKR=c0000000
set SYSCLKR=c0000003
get SYSCLKR=c0000003
RTL8711_3rdCUT
SYSCTRL : 68 !
EEPROM ID=8711
EEPROM MAC Address = 0-90-23-0-4e-ab
```

```
Downloading FW# totlen=118300, img sz=118200, hdrsz=100...Done
```

```
Firmware Init OK[ZTP ]>
```

9. Once the shell prompt appears, use the `scan` command on the **Hyper Terminal** window and press **Enter** to search the access points (AP) available in the range.

```

Firmware Init OK[ZTP ]>scan
SSID Scanning
.....Done
Number of Aps 2
SSID                MAC Address          Ch   RSSI   Secure
=====
NETGEAR             00:20:a6:50:f3:65    11   ffa2   WEP
[ZTP ]>

```

Then use the `wep [<SSID> <keyld=0-3> [keyDataHex]]` shell command to specify the hexadecimal WEP key. To display the current WEP key information just issue the ‘wep’ command with no parameters. Use the `join<SSID>` shell command to connect to a specified AP.

```

[ZTP ]>wep NETGEAR 0 378E919303657C6DBCA9B29A5E
Active WEP key for SSID NETGEAR is 0
37 8e 91 93 03 65 7c 6d bc a9 b2 9a 5e
[ZTP ]>wep
Active WEP key for SSID NETGEAR is 0
37 8e 91 93 03 65 7c 6d bc a9 b2 9a 5e
[ZTP ]>join NETGEAR

```

```

Sending Auth....
Joining BSS....SSID NETGEAR

```

```

Querying DHCP Server...DHCP OK

```

```

Initializing network stack...
IF  IP addr      Def Gtway   state  type
0   10.20.2.39    10.20.2.39  UP     Ethernet

```

```

HTTPD ready
TELNET ready[ZTP ]>

```

For more details on shell commands, refer to *Zilog TCP/IP Software Suite Programmer's Guide (RM0041)*.

- ▶ **Note:** *SSID and WEPKEY are provided by the wireless router. In this demo NETGEAR and 378E919303657C6DBCA9B29A5E key are used. See [Figure 9](#) and [Figure 10](#) on page 17.*

10. After successful connection to the BSS (AP) the network stack will be initialized and Zdots® SBC behaves as a complete wireless station.

- **Notes:**
1. *To support FLASH and COPY\_TO\_RAM configuration on Wireless Zdots SBC (due to new external SPANSION Flash) ZDS II Flash driver configuration file must be modified. Replace the `FlashDevice.xml` file in the `...\ZDSII_eZ80Acclaim!_4.x.x\config` folder with the file given in the **WLANDemo** folder. In the **Project** → **Settings** → **Debugger**; `eZ80F91_WiFi_Flash` must be selected for **FLASH** and **COPY\_TO\_RAM** configurations. After replacing the `FlashDevice.xml` file close all ZDS II instances and reopen again.*
  2. *By default the `wlan_conf.c` file contains WLAN parameters set to zero. In this case, you can configure these parameters through shell and connect to a BSS (AP).*
  3. *If the WLAN parameters in `wlan_conf.c` are valid (that is, not initialized to NULL), the Demo connects to the specified BSS (AP) without the user interaction.*
  4. *In FLASH and COPY\_TO\_RAM configurations the SSID and WEP key can be set through the `configwlan` shell command. For more details, refer to Zilog TCP/IP Software Suite Programmer's Guide (RM0041).*
  5. *The Zdots® WLAN solution cannot be configured to work as an Access Point.*

## Web Server Demonstration

Follow the steps below to use the features of WLAN Demo:

1. When you run the WLAN Demo application Zdots SBC accesses the BSS with the specified SSID and displays the network parameters such as IP address and a login prompt on the HyperTerminal. You can type `help` on the prompt to know other command line applications.
2. Use `ping` command from any PC in the same BSS/ESS as Zdots SBC running ZTP. `ping` command can be used from Zdots SBC shell to other PC also.
3. Open an Internet Explorer from a PC/laptop where the router is connected and browse the eZ80® WLAN Zdots SBC with the IP specified on the Hyper Terminal. In this demo the given IP address is 192.168.1.102. See [Figure 8](#).

- **Note:** *IP Address may vary. Please verify this value on IP addr on the hyperterminal.*

Address <http://192.168.1.102/>

The screenshot shows a web browser window displaying the Z80Acclaim! website. The address bar shows 'http://192.168.1.102/'. The website has a blue header with the 'eZ80Acclaim! Flash Microcontrollers' logo and a navigation bar with 'HOME', 'PRODUCT INFO', and 'ABOUT THIS SITE'. A left sidebar contains a menu with categories like 'Home', 'Products', 'Demos', 'Site Info', and 'File System'. The main content area features a welcome message, a product image, and descriptive text about the microcontroller family.

**eZ80Acclaim!**  
Flash Microcontrollers

HOME PRODUCT INFO ABOUT THIS SITE

Home

Products

- eZ80F91
- eZ80F92 / F93
- TCP/IP Suite
- Documentation
- Development Kit

eZ80 F92 / F93

- eZ80F92 / F93
- TCP/IP Suite
- Documentation
- Development Kit

Demos

- Javascripts
- Java Applets
- CGI Calculator

Site Info

- This Site
- Hardware
- Software

File System

- Flashfile

Welcome to ZiLOG's  
**eZ80Acclaim!™ Flash Microcontrollers Demonstration**



ZiLOG, Inc. has introduced the new high-performance **eZ80Acclaim!™** 8-bit microcontroller family, featuring up to 256KB of reprogrammable Flash memory and Ethernet MAC and TCP/IP protocols, and a complete design kit. Designed for cost-sensitive, high-performance applications, the family includes an optimized, power-efficient pipelined architecture with an upgraded **Z80 core** and an enhanced instruction set, and builds on the momentum generated by ZiLOG's **Z80Encore!**

The **eZ80Acclaim!™** family offers a complete hardware, software and design kit solution that allows designers to economically and efficiently perform a number of concurrent tasks at the performance level of 16-bit controllers

The new product family also offers a wide array of peripherals and 256KB of Flash memory. Designed to enable easy, direct connections to Ethernet networks and the Internet, the new device includes an on-chip **eZ80 Ethernet MAC (media access controller)**, embedded TCP/IP, a host of other standard protocols, and a complete design kit.

All three eZ80Acclaim!™ devices offer backward compatibility with the popular Z80 family of MCUs, allowing existing Z80 designers to quickly get up to speed on the new architecture.

## Figure 8. Website Browsing

You can use Telnet client from a PC to browse the eZ80 WLAN Zdots SBC and access its shell prompt through the wireless connection.

## Configuring the Router

The following steps below in configuring the router is set with SSID equal to 'NETGEAR' and the generated keys:

► **Note:** *These steps are based on LINKSYS WRT54G Router.*

1. Disable the wireless connection on your laptop/PC.
2. If you are using Proxy server for your LAN settings, you can disable it by browsing to **Start** → **Settings** → **Control Panel** → **Internet Options** → **Connections** → **LAN Settings**. Uncheck the proxy server on Proxy Server section then select **Automatically detect settings** on Automatic configuration section. Then click **OK** on LAN Settings and Internet Properties.
3. Connect the cable on the Ethernet port of your laptop/PC to the router (AP) using one of its port (not the internet port).
4. Power ON your router.
5. Type 192.168.1.1 in the address bar of Internet Explorer (IE).
6. Enter 'admin' in the Password field. Do not enter any User name. You can now see the Linksys page as displayed in [Figure 9](#).
7. Select **Wireless** → **Basic Wireless Settings**. Change the **Wireless Network Name (SSID)**: field to 'NETGEAR'. See [Figure 9](#).

http://192.168.1.1/wireless.htm

The screenshot displays the Linksys WRT54G wireless settings interface. The main navigation bar includes 'Wireless', 'Setup', 'Wireless', 'Security', 'Access Restrictions', 'Applications & Gaming', 'Administration', and 'Status'. The 'Wireless' section is active, showing 'Basic Wireless Settings'. The 'Wireless Network' configuration area includes:

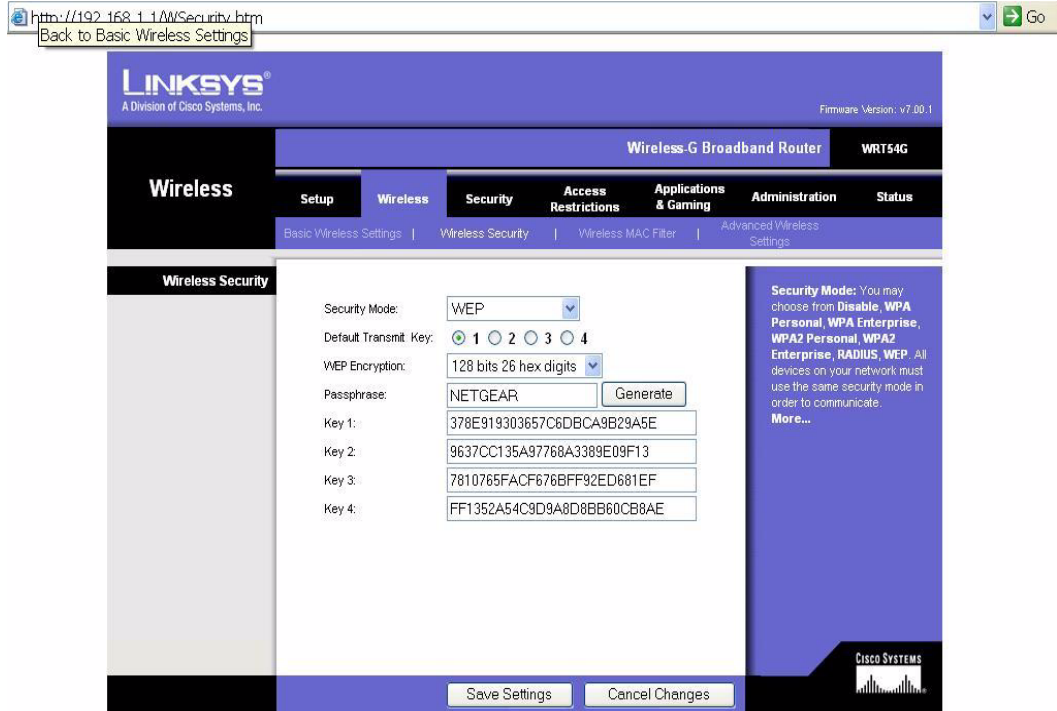
- Wireless Network Mode: Mixed
- Wireless Network Name (SSID): NETGEAR
- Wireless Channel: 11 - 2.462GHz
- Wireless SSID Broadcast:  Enable  Disable

Below these settings is a 'Reset Security' button and a status indicator: 'Status : SES Inactive'. A 'Wireless Network Mode' help text on the right explains that 'Mixed' mode is for including both Wireless-G and Wireless-B clients, while 'B-Only' mode is for disabling wireless access. The page footer contains 'Save Settings' and 'Cancel Changes' buttons, along with the Cisco Systems logo.

Figure 9. Basic Wireless Settings

8. Click **Save Settings**. Then click **Continue** if settings are successful.
  9. Select **Wireless** → **Wireless Security**. Ensure that WEP is selected on the **Security Mode**: field as displayed in Figure 10 (Change the Security Mode to WEP through the drop down button).
- **Note:** Click **Generate** if Key 1 and other Keys do not have a value.





**Figure 10. Wireless Security**

10. Click **Save Settings**. Then click **Continue** if settings are successful.
11. You can now try to connect using the specified SSID and Key 1.
12. You can now run your project. See: “How to Execute WLAN Demo Application”

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## Downloading the ZTP Software

Follow the steps below to download the ZTP software from Zilog website [www.zilog.com](http://www.zilog.com):

1. Visit the link <http://support.zilog.com/support/product/products.asp>.
2. Login with registered username and password. After a successful login you can now register your product. Click on **Register New Products**, and enter the Registration Key Number found on the Registration Card that is included on the kit. Then click on the Register button.
3. Locate and find eZ80F91WF01ZCOG and click on the corresponding **Updates Available** link.
4. Click on **Zilog TCP/IP Stack (ZTP) ZDS - Object Code** to download ZTP X.Y.Z object package; that is, ZTP\_X.Y.Z\_Lib\_ZDS.exe file.
5. After a successful download, locate ZTP\_X.Y.Z\_Lib\_ZDS.exe. Double click **ZTP\_X.Y.Z\_Lib\_ZDS.exe** and follow the on-screen instructions to complete the installation. By default ZTP\_X.Y.Z\_Lib\_ZDS is installed in the following location:  
C:\Program Files\ZiLOG\.

## References

The documents associated with Wireless Zdots® SBC, ZTP, and RZK available on [www.zilog.com](http://www.zilog.com) are listed below:

- eZ80AcclaimPlus!™ Wireless Zdots® Single Board Computer Product Specification (PS0280)
- Wireless Zdots® Single Board Computer Development Kit User Manual (UM0224)
- Zilog TCP/IP Software Suite Programmer's Guide (RM0041)
- Zilog Full-Feature TCP/IP Software Suite Product Brief (PB0154)
- Zilog TCP/IP Software Suite Quick Start Guide (QS0049)
- Zilog TCP/IP Stack API Reference Manual (RM0040)
- Zilog Real-Time Kernel Product Brief (PB0155)
- Zilog Real-Time Kernel Quick Start Guide (QS0048)
- Zilog Real-Time Kernel Reference Manual (RM0006)



**Warning:** DO NOT USE IN LIFE SUPPORT

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