ZGP32300100ZPR

Z8 GP™ ZGP323 Programming System

User Manual

UM017403-0707

Revision History

Each instance in Revision History reflects a change to this document from its previous revision. For more details, refer to the corresponding pages and appropriate links in the table below.

Date	Revision Level	Description	Page No
July 2007	03	Updated document with latest company address and implemented Zilog Style Guide.	All

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Introduction

Zilog's Z8 GP™ ZGP323 Programming System provides an inexpensive development environment for Zilog's Z8 GP family of microcontrollers. A windowed 28-CDIP chip is included for use in prototyping.

This User Manual guides in connecting the programming system components to your PC, and a target board, install the Zilog Developer Studio II (ZDS II) and use ZDS II to burn demonstration code into a Z8 GP family OTP microcontroller.

System Requirements

Table 1 lists the system requirements for running ZDS II.

Table 1. ZDS II System Requirements

Recommended Configuration	Minimum Configuration
PC running MS Windows XP, SP1	PC running MS Windows 98SE/WinNT 4.0–SP6/Win2000–SP3/WinXP–SP1
Pentium III/500 MHz processor	Pentium II/233 MHz processor
128 MB RAM	96 MB RAM
35 MB hard disk space	12 MB hard disk space (documentation not included)
Super VGA video adapter	Super VGA video adapter
CD-ROM drive	CD-ROM drive
Ethernet port	Ethernet port
Internet browser (Internet Explorer or Netscape)	Internet browser (Internet Explorer or Netscape)
One or more RS-232 communications ports	One or more RS-232 communications ports

Table 1. ZDS II System Requirements (Continued)

Recommended Configuration	Minimum Configuration
One or more RS-232 communications ports	One or more RS-232 communications ports
Internet browser (Internet Explorer or Netscape)	Internet browser (Internet Explorer or Netscape)

ZDS II Software Installation

Follow the steps below to install ZDS II:

1. DemoShield program available in the ZDS II installation CD launches automatically. If it does not automatically launch, go to the root of the CD-ROM and double-click the file `launch.exe`.
2. DemoShield provides several installation options to install ZDS II, select **Install ZDS II**. You can install other software and accompanying documentation later.
3. Follow the instructions on the screen to complete the installation.

Note: *Software versions illustrated in the following figures are for reference only. You may have an updated version.*

4. The following directory is installed on the host PC, assuming all installation settings remain at their defaults:

`C:\Program Files\ZiLOG\ZDSII_<product>_<version number>`

Hardware Installation

The Z8 GP features an Ethernet interface and an RS-232 console port. You may have to configure the network settings.

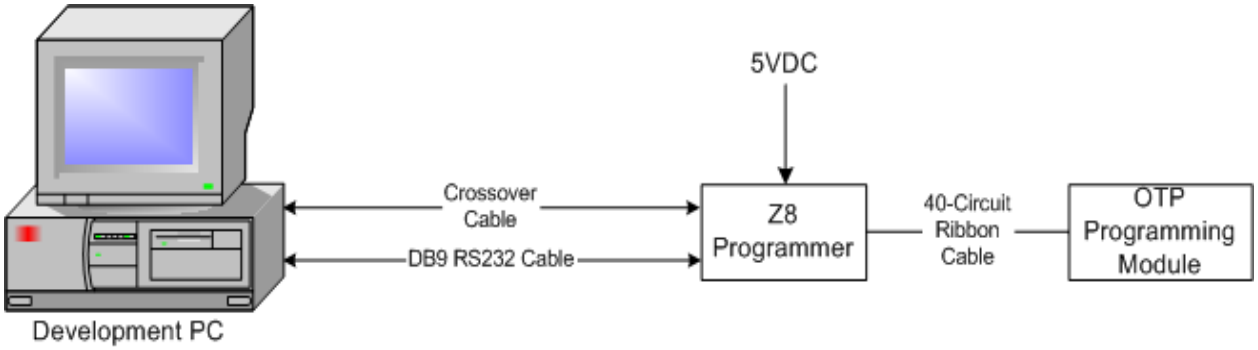

Figure 1. Hardware Setup Using the Supplied Crossover Cable

Follow the steps in this section to install the Z8 GP ZGP323 Programming System and to configure the Z8 Programmer, see Figure 1 for reference.

1. Use the 40-circuit ribbon cable to connect the Z8 Programmer to the OTP Programming Module.
2. Connect the Ethernet crossover cable from the Ethernet port on the Z8 Programmer to the Ethernet port on the development PC.

Note: *You can also use an external network hub (not included) to connect the Z8 Programmer to the development PC. Use a standard Ethernet cable to connect the Z8 Programmer to the hub.*

If you need to reconfigure the IP address of the Z8 Programmer, connect the serial COM port on the PC to the console port on the Z8 Programmer unit via the supplied 10-pin ID10-to-DB9 adapter cable. The serial connection allows you to reconfigure the Z8 Programmer Ethernet configuration if necessary.

Connect the 5 V DC power supply to the Z8 Programmer.

Hardware Configuration

The default IP address and subnet mask of the Z8 Programmer module are 192.168.1.50 and 255.255.255.0, respectively. To enable communication between the PC running ZDS II and the Z8 Programmer, you must either change the PC's Ethernet settings to match those of the Z8 Programmer or vice versa.

If using the PC in a non-networked configuration, set the PC's IP address to 192.168.1.21 and its subnet mask to 255.255.255.0. For more information, see Changing the PC's Settings to Match Z8 Programmer.

In a networked environment, set the Z8 Programmer IP address and subnet mask to match the existing network setup. For more information, see Changing Z8 Programmer Settings to Match the PC on page 9.

Changing the PC's Settings to Match Z8 Programmer

After changing the PC's Ethernet settings, see Using ZDS II to Burn a Hex File into a ZGP323 OTP Chip on page 11.

Note: *The following instructions are for the MS Windows XP platform. If your Windows operating system is different, please refer to your MS Windows OS online help for details. Screen shots are shown for reference purposes only.*

Follow the steps below to change the PC's settings:

1. Open the **Windows Control Panel a**nd double-click the **Network and Internet Connections** icon, see Figure 2.

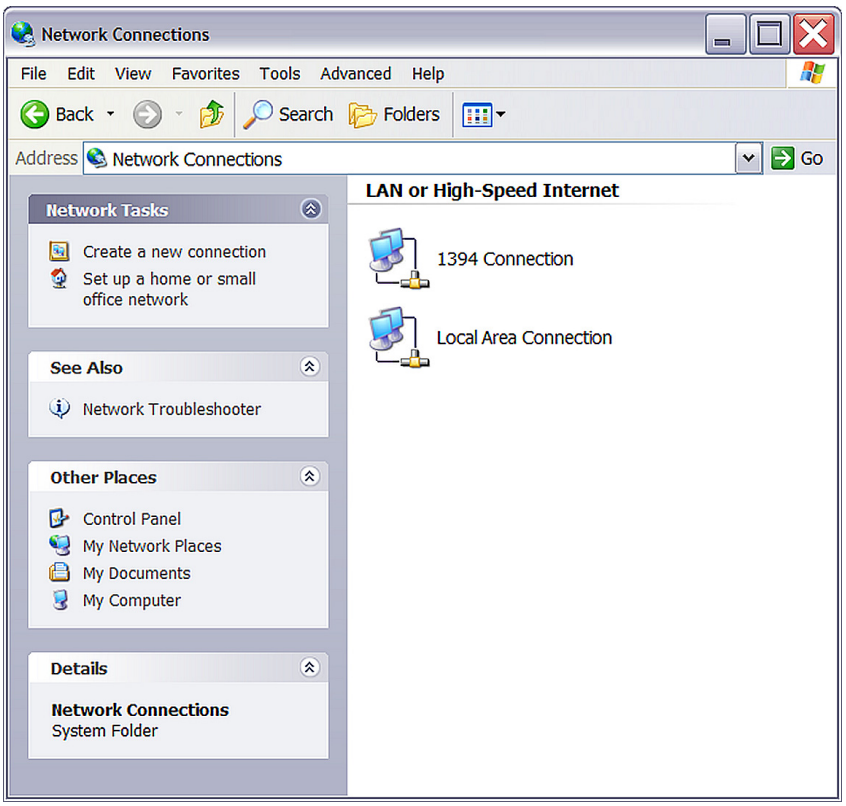

Figure 2. Network Connections

2. In the panel labeled **LAN or High-Speed Internet**, double-click the **Local Area Connection** icon. The **Local Area Connection Status** window appears, see Figure 3.

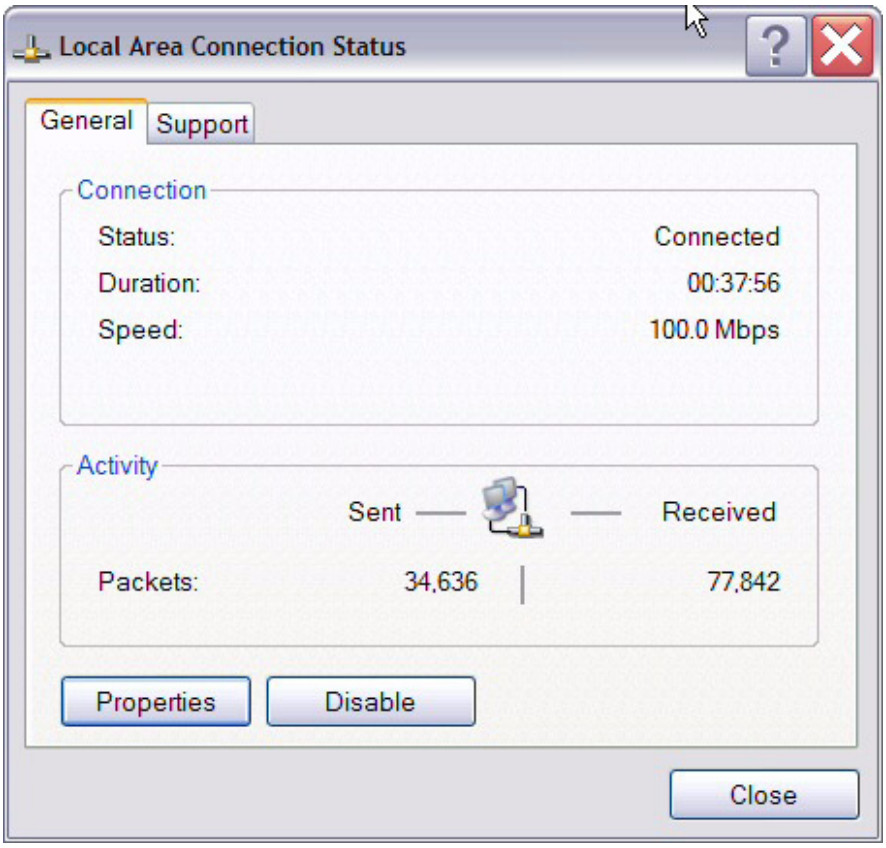

Figure 3. Local Area Connection Status Window

3. In the **Local Area Connection Status** window, click **Properties** button. The **Local Area Connection Properties** dialog box appears, see Figure 4.

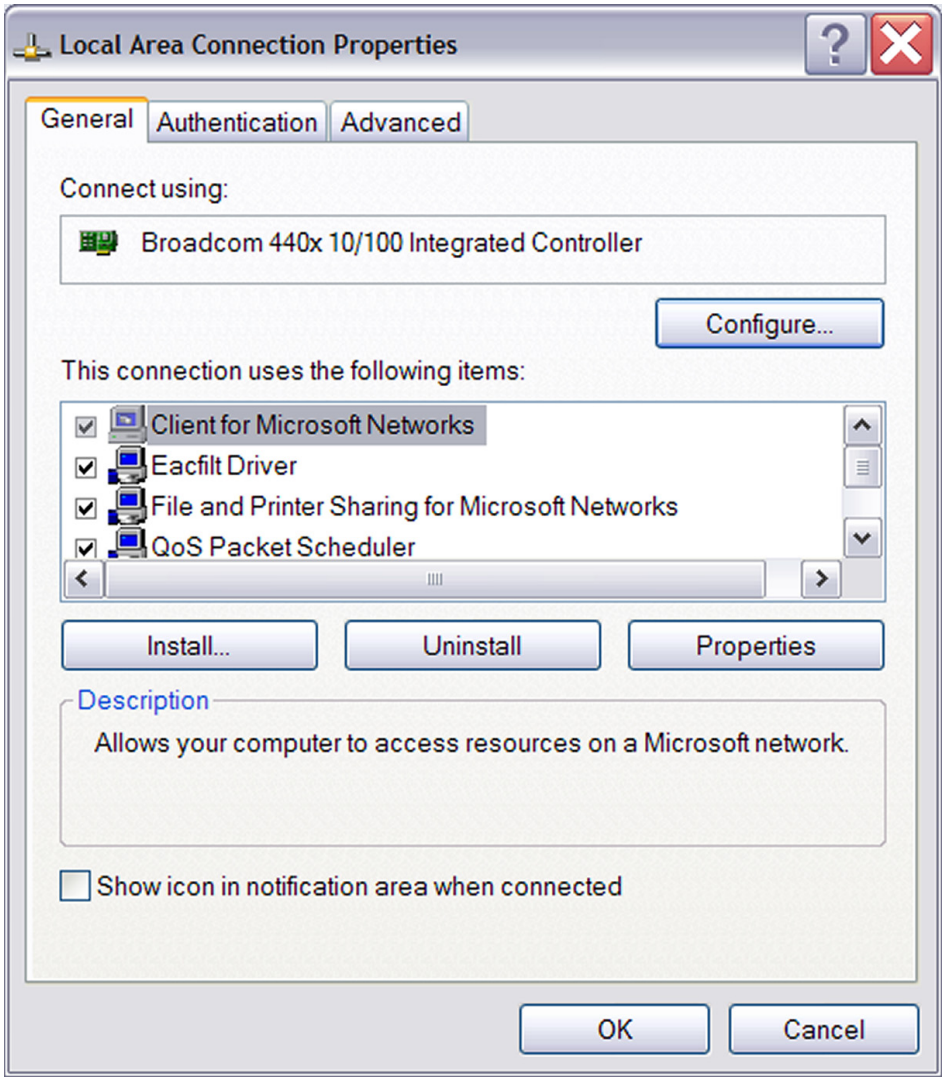

Figure 4. Local Area Connection Properties Dialog Box

4. Select **Internet Protocol (TCP/IP)** from the scroll down list, and click **Properties** button. The **Internet Protocol (TCP/IP) Properties** dialog box appears, see Figure 5.

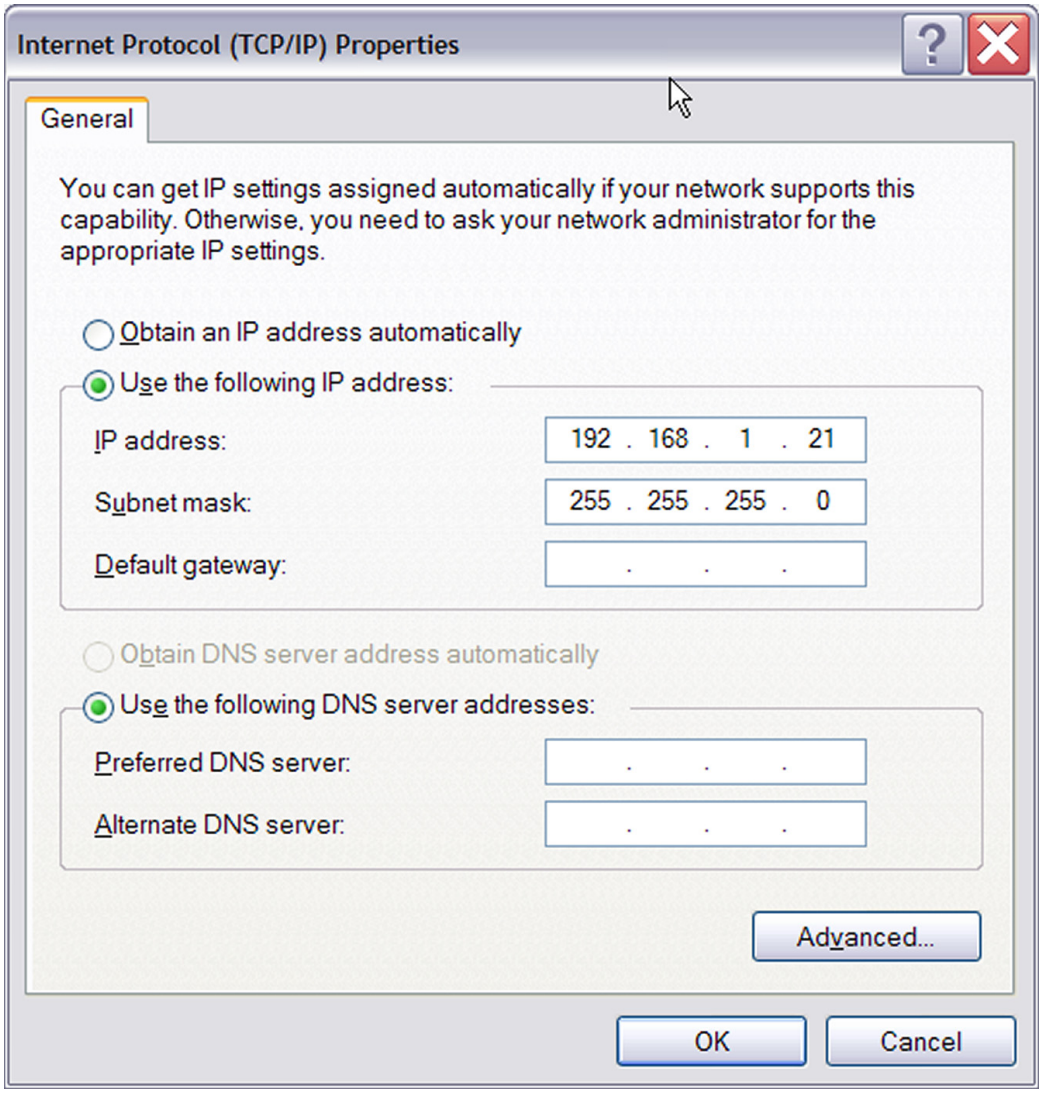

Figure 5. Internet Protocol Properties Dialog

5. Enter an IP address of 192.168.1.21 and a subnet mask of 255.255.255.0. These values connect the PC on to the same network as the Z8 Programmer unit, and do not conflict with the IP address of Z8 Programmer.
6. Click **OK** and restart the PC.

The PC is now ready to communicate with Z8 Programmer via the ZDS II software. The default IP address of the Z8 Programmer unit is 192.168.1.50. If this address conflicts with another address on the LAN, or if another address is more compatible, see Changing Z8 Programmer Settings to Match the PC. Otherwise, see Using ZDS II to Burn a Hex File into a ZGP323 OTP Chip on page 11.

Changing Z8 Programmer Settings to Match the PC

Follow the steps below to change the Z8 Programmer settings:

1. Connect the serial port of the PC to the Z8 Programmer serial port.
2. Launch HyperTerminal on the PC by selecting **Start** —> **Programs** —> **Accessories** —> **Communications** —> **HyperTerminal**. The **Connection Description** dialog box appears.
3. Enter the name for a new connection in the **Connection Description** dialog box, and click **OK** to open the **Connect To** dialog box.
4. In the **Connect To** dialog, set the **Connect Using** drop-down menu to match the COM port to which the Crimzon ICE is connected. Click **OK**.
5. If you select **COM1**, the **COM1 Properties** dialog appears. Enter the following port settings and click **OK**. HyperTerminal should automatically attempt a connection. Otherwise, select **Call** —> **Connect**.

Bits per second	57600
Data bits	8

Parity	None
Stop bits	2
Flow control	None

6. While holding down the z key (lowercase) on the PC's keyboard, press the RESET button on the side of the Z8 Programmer. (The RESET button is recessed within the side of the Z8 Programmer.) Releasing the z key displays a Z8 Programmer console boot-up message in HyperTerminal, followed by the ZPAK prompt. A typical bootup message is shown below.

```
ZiLOG TCP/IP Software Suite v1.1
Copyright (C) 2004 ZiLOG Inc.
All Rights Reserved

clock enabled
IP Address: 192.168.1.50
IP Subnet: 192.168.1.0/255.255.255.0
IP Gateway: 192.168.1.254

Z8 Programmer Firmware x.x
Copyright (C) 2001-2004 ZiLOG, Inc.
All Rights Reserved.

Press 'Ctl-Z' to enter configuration mode
```

7. Press `ctrl-z`. The Z8 Programmer command prompt displays:

```
eth1%
```

Note: *The Z8 Programmer console prompt is not case-sensitive.*

Type help or ? at the Z8 Programmer command prompt to see a list of available commands. For information on Z8 GP ZGP323 Programmer

Interface Commands, see Appendix A–Z8 GP ZGP323 Programmer Interface Commands on page 16.

8. When you have finished configuring the Z8 Programmer, type `exit` to exit the command shell.
9. Press **Alt+F4** to exit HyperTerminal.
10. Cycle the power on the Z8 Programmer or type reboot at the `eth1%` prompt for the new settings to take effect.

The hardware is now configured and ready for use.

Using ZDS II to Burn a Hex File into a ZGP323 OTP Chip

Follow the steps below to open the sample project `ledblink_c.pro`, build a hex file from the program, and burn that hex file into the supplied ZGP323 28-CDIP chip via the OTP programming module.

The sample project `ledblink_c.pro` is included in the ZDS II sample directory, located in:

```
c:\Program Files\ZiLOG\ZDSII_<product>_<version>
  \samples\<processor type>_<demo name>
  \<demo name>_<language>\src
```

1. Start ZDS II for the Z8 GP ZGP323 programming system by selecting **Start —>File—> Open Project** to open `projectledblink_c.pro`, the sample project available at:

```
c:\Program Files\ZDSII_Z8GP_<version>
\samples\ZGP323_ledBlink\ledblink_c\src\ledblink_c.pro
```

2. In ZDS II open the **Build** menu and select **Set Active Configuration**.
3. In the **Select Configuration** dialog, select **Debug** and click **OK**.
4. Select **Project** –> **Settings**.
5. In the **General** tab, set the **CPU Family field** to `ZGP323` and the **CPU field type** to `ZGP323XXX2832`.

6. Set the **Output Files Directory**: to a specific directory where the output files will be stored. By default, ZDS II stores the files in the same directory as the project files.
7. In the **Debugger** tab, set the **Driver:** field to **Simulator**.
8. Click **OK**.
9. Click **OK** in the **Project Settings** window.
10. When prompted to rebuild affected files, click **Yes** to rebuild the project. (You can also rebuild later by pressing F7.)

The **Build Output** window at the bottom of ZDS II provides status messages about the rebuild's progress.

11. To debug the program using the simulator, open the **Build** menu and select **Debug** and then **Reset** to load the simulator with the program code. The simulator is used to completely debug the program before downloading on to the chip.

Now that the program is complete, we're going to create a hex file you can download into a ZGP323 chip installed on the programing system's OTP programming module.

12. In ZDS II, open the **Build** menu and select **Set Active Configuration**.
13. In the **Select Configuration** dialog, select **Release** and click **OK**.
14. Open the **Build** menu and select **Rebuild All** to rebuild the project.
15. Browse to:

`c:\Program Files\ZDSII_Z8GP_<version>\samples\ZGP323_ledBlink\ledblink_c\src` directory.

The hex file `ledblink_c.hex`, created when you rebuilt the project in Release configuration is available in the above directory.

16. Connect the Z8 GP ZGP323 programming system to your development PC as described in Hardware Installation on page 2.
17. Select **Project** –> **Settings** to open the **Project Settings** window.
18. In the **Debugger** tab of the **Project Settings** window, select **Ethernet Driver** from the **Driver** drop-down menu and then click **Configure** button.
19. The **Ethernet Driver** dialog box appears. The **IP Address** field displays the default IP address as 192.168.1.50. Enter the Z8 Programmer IP address if it has been modified. Leave the Port setting at 4040.
20. Click **OK**.
21. Select the appropriate package converter for your OTP chip.
22. Install the package converter into the ZIF socket on the OTP programming module
23. Install the OTP chip to be burnt into the package converter installed in the OTP programming module ZIF socket. Match pin 1 of the chip with pin 1 of the package converter ZIF socket.

Note: *Stop any debugging process by selecting **Build**—>**Debug**—>**Stop Debugging**.*

24. Select **Tools** —> **OTP Programming** to open the **OTP** window, see Figure 6 on page 14.

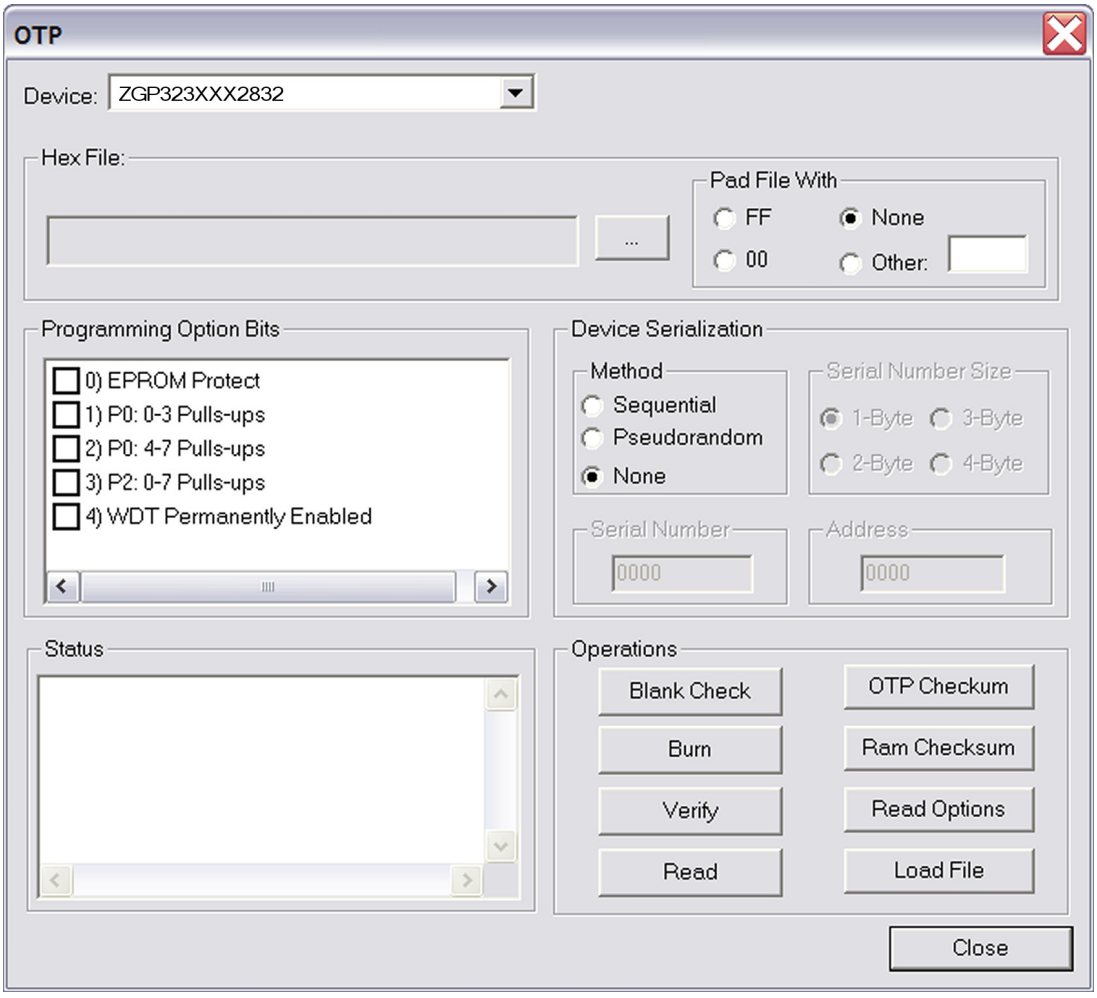

Figure 6. OTP Programming Window (Hex File Example)

25. Select the appropriate target device from the **Device** drop-down menu.
26. In the **Hex File:** section, click ... button and select the hex file to be programmed on to the OTP chip.

27. If you do not want to pad the hex file, select the **None** button in the **Pad File With** panel. Otherwise, select **FF**, **00**, or **Other** button. If you select the **Other** button, type the hex value to pad the file with in the text field provided with **Other**.
28. Click **Load File** to load the hex file.
29. Click **Ram Checksum** to calculate the checksum of the data in emulator RAM. Use this to compare with the OTP checksum after burning.
30. Select the option bits to program in the **Programming Option Bits** area.
31. Select **None** button in the **Method** panel of **Device Serialization** to leave the serial number blank.
32. To load a serial number:

- Select **Sequential** or **Pseudorandom** button. This determines how the serial number is incremented on subsequent burns.
- Select the size of the serial number (1, 2, 3, or 4 bytes) in the **Serial Number Size** area.
- Enter the starting serial number in the **Serial Number** field.
- In the **Address** field, enter the address of the serial number.

33. Click **Blank Check** to verify that the OTP chip is actually blank.
34. Click **Burn** to program the OTP chip with the contents of emulator RAM. The OTP chip contents is also verified.
35. When the burn is complete, click **OTP Checksum** to calculate the checksum of data on the OTP chip and compare it to the RAM checksum calculated earlier.
36. Click **Close** to close the OTP Programming window.

Appendix A–Z8 GP ZGP323 Programmer Interface Commands

Table 2 describes the Z8 GP ZGP323 Programmer Interface Commands.

Table 2. Z8 GP ZGP323 Programmer Interface Commands

Command	Description and Options
`?`	Displays available Z8 Programmer command shell options.
`debugport`	Configures the TCP port.Usage: `debugport`–displays current setting `debugport tcp_port`–sets debugport to specified TCP port. Example: `debugport` 4040–sets debugport to TCP port 4040.
`devs`	not used
`exit`	Exits the command shell.
`help`	Displays available Z8 Programmer command options.

Table 2. Z8 GP ZGP323 Programmer Interface Commands (Continued)

Command	Description and Options
`ifconfig`	Configures the Z8 Programmer network interface. Entering ipconfig with no options lists current configuration. The following command options are available: `i` – specifies an IP address `s` – specifies a subnet mask `g` – specifies a network gateway address `dhcp` – configures the Z8 Programmer network interface to look for a dhcp host to obtain network settings Example: `ifconfig i` 192.168.1.1 `s` 255.255.255.0 `g` 192.165.1.254 configures the Z8 Programmer to use IP address 192.168.1.1 on subnet 255.255.255.0 with gateway address 192.168.1.254.
`kbuf`	unused
`kill`	unused
`mem`	unused
`password`	unused
`ps`	unused
`reboot`	Reboots the Z8 Programmer.
`restore`	Restores factory default network interface settings.

Customer Support

For answers to technical questions about the product, documentation, or any other issues with Zilog's offerings, please visit Zilog's Knowledge Base at http://www.zilog.com/kb.

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