Z8 Encore!

Z8 Encore!® Smart Flash Programmer User Manual

User Manual

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ZiLOG Worldwide Headquarters • 532 Race Street • San Jose, CA 95126
Telephone: 408.558.8500 • Fax: 408.558.8300 • www.ZiLOG.com

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ZiLOG Worldwide Headquarters
532 Race Street
San Jose, CA 95126
Telephone: 408.558.8500
Fax: 408.558.8300
www.ZiLOG.com

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Using the Z8 Encore!® Smart Flash Programmer

The Z8 Encore!® Smart Flash Programmer is a software tool used to automate programming of Z8 Encore!, Z8 Encore! MC, and Z8 Encore! XP based Flash devices. In a production environment, a manufacturing engineer uses an advanced Smart Flash Programmer configuration interface in the tool to create Flash project files. These project files store the settings that configure the Smart Flash Programmer in the tool to burn Flash memory on a specific Z8 Encore! target.

Once a project is configured, factory technicians use the simplified Smart Flash Programmer interface to automate Flash memory programming on an assembly line.

This user manual provides instructions that support:

- Smart Flash Programmer configuration by a manufacturing engineer or technician. See "Configuration Instructions" on page 4 for details.
- Smart Flash Programmer operation by a factory worker. See "Programming Flash Memory" on page 22 for operation instructions.

Tool Requirements

Use of the Z8 Encore! Smart Flash Programmer requires a Serial Smart Cable (found in any Z8 Encore! development kit), or a ZiLOG® USB Smart Cable (not available for Windows NT). The Smart Cable is used to connect your manufacturing PC to a target board.

Supported Operating Systems

MS Windows 98SE, Windows NT 4.0 SP6, Windows 2000 SP4, or Windows XP Pro SP1.

Recommended Configuration:

- PC running MS Windows XP Pro SP1
- Pentium III/500-MHz processor or higher
- 128-MB RAM or more
- 10-MB hard disk space (for both application and documentation)
- Super VGA video adapter
- CD-ROM drive for installation

Minimum Configuration:

- PC running MS Windows 98 SE
- Pentium II 233-MHz processor
- 96-MB RAM
- 8-MB hard disk space (application only)
- Super VGA video adapter
- CD-ROM drive for installation

**Supported Smartcable Interfaces by OS:

Table 1 lists the supported ZiLOG Smart Cable interfaces by operating system. USB drivers must be digitally signed with Microsoft hardware compatibility.

Table 1. Supported ZiLOG Smart Cable Interfaces by Operating System

	Windows 98SE	Windows NT	Windows 2000 Pro	Window XP Pro
Serial	yes	yes	yes	yes
USB[1]	no	no	yes	yes

1. USB to serial cable not provided in kit.

Installation

Perform the following steps to install the software tools:

1. Load the Smart Flash Programmer (SFP) for Z8 Encore! from www.zilog.com.
2. Run the executable installation file.

   This displays the Installation Wizard.
3. Click Next> to continue with the installation. The License Agreement appears.
4. Select Yes to accept the agreement and proceed with the installation.
5. After selecting Yes, the Choose Destination Location screen appears. Follow the directions on the screen and choose whether to install ZDS II in the default location or in some other folder. Click Next>.

   Unless you select a different location, the software is installed in:

   `C:\Program Files\ZiLOG\Z8Encore!SFP_<version>\`
6. The Select Program folder screen appears. Follow the directions on the screen and click Next>.

   Unless you select a different location, the program is located in the Start menu under

   Programs > ZiLOG Z8 Encore! Smart Flash Programmer <version>
7. When the installation is complete, you can select to read and/or launch the application.
8. Click Finish.

Configuration Instructions

Smart Flash Programmer settings are stored in project files. To create a project file, the manufacturing engineer specifies a file name and configures the project to support Flash memory programming of a specific Z8 Encore! target.

A Note About Serialization

Serialization is the ability to store customer identifier information – such as a serial number or Internet address – into Flash memory. You can program unique values into Flash, or set an initial value and uniformly increment it. Serialization is a useful tool and is not required to program Flash.

Create a Project File

1. When you start the Z8 Encore! Smart Flash Programmer after installation, the Project File Selection window appears (Figure 1).

   If you have already configured projects in the Smart Flash Programmer, it will open the project file that was last used.

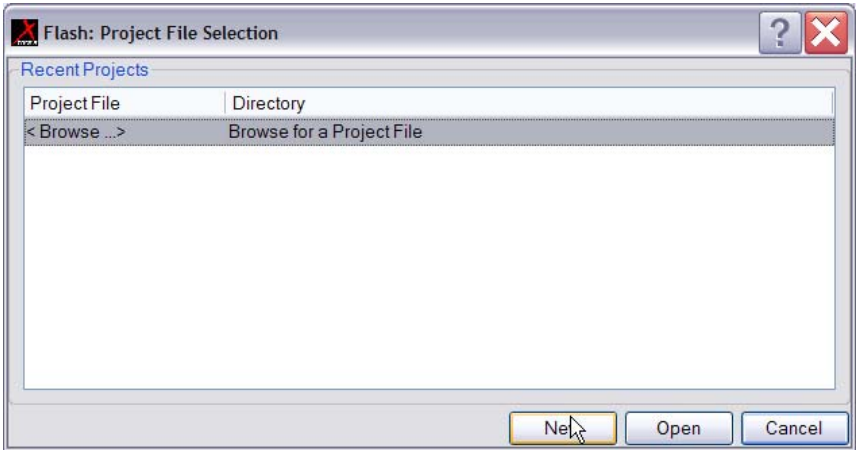


Figure 1. Smart Flash Programmer – Project File Selection Window

2. Click New.

   The Project Creation window appears (Figure 2).

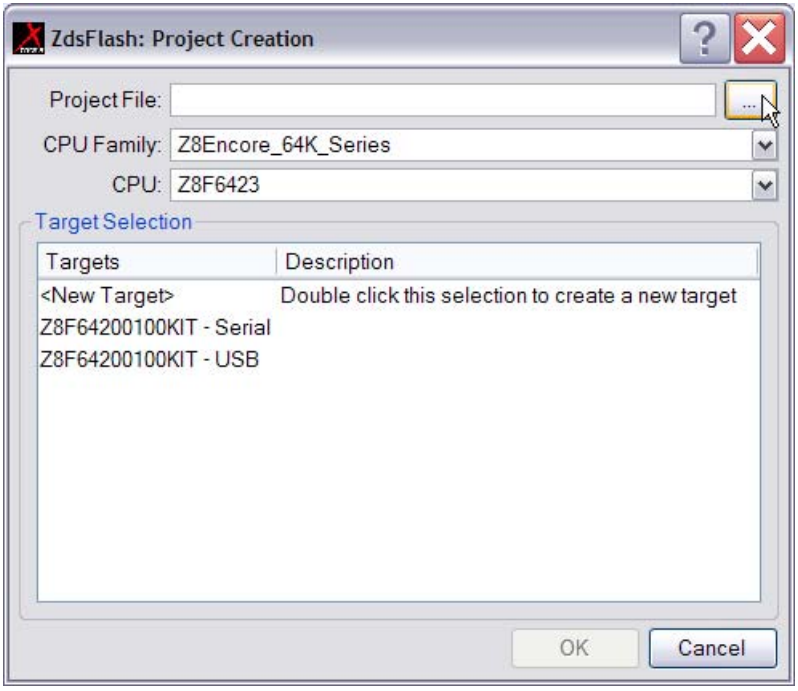


Figure 2. Smart Flash Programmer – Project Creation Window

3. Click the ... button.

   The New Project File Selection window appears (Figure 3).

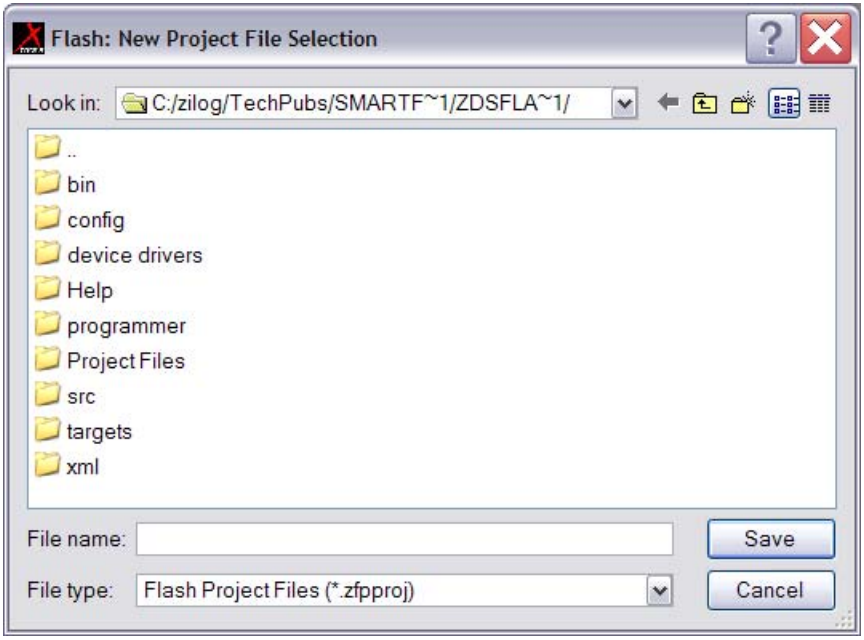


Figure 3. Smart Flash Programmer – New Project File Selection Window

4. Double-click the folder in which to store the new project. (It is a good practice to create a specific folder that holds all projects.)
5. In the File name: field, enter a file name for the new project. Use a legitimate Windows filename. Do not enter an extension.
6. Press Save.

   The New Project File Selection Window closes and the Project File field in the Project Creation window contains the folder and file name specified.

7. Select a Z8 Encore! CPU family from the CPU Family: drop-down menu.
8. Select a Z8 Encore! CPU from the CPU: drop-down menu.
9. You must now create a Target Description for the target device to be programmed.

Create a Target Device

1. In the Target Selection section of the Project Creation window, double-click <New Target>.

   The Target Settings window appears (Figure 4).

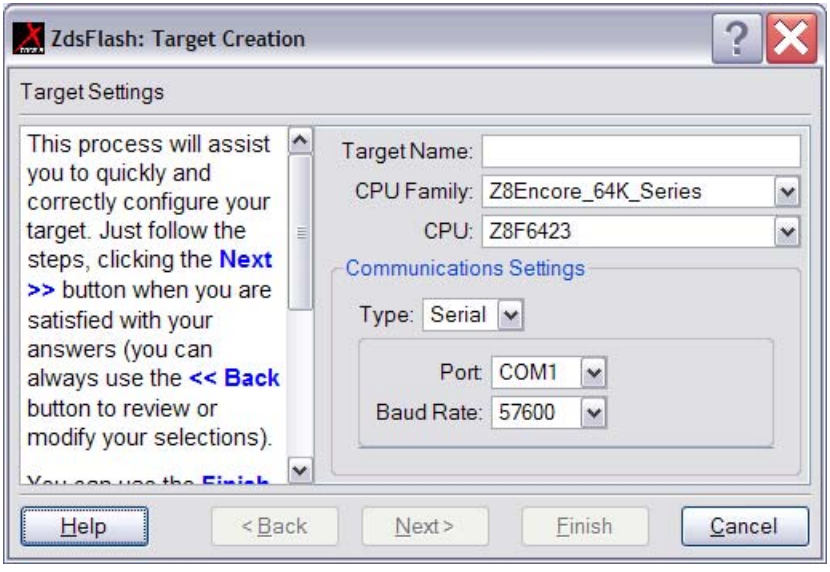


Figure 4. Smart Flash Programmer – Target Settings Window

2. Enter a descriptive name into the Target Name: field. The name must be a legitimate Windows file name. It is a best practice to use file names that uniquely describe the new target. Such a file name can include, for example, CPU and communications setting.
3. Verify that the CPU Family and CPU fields contain the correct entries.
4. In the Communications Settings section, select:
   – Type: Serial or USB

   NOTE: If USB is selected, a serial number option is available. If only one ZiLOG USB device is connected, the serial number for that device appears automatically in the window. If more than one ZiLOG USB device is attached to the manufacturing PC, enter the serial number for the USB device selected.
   – COM Port (if type is Serial)
   – Baud Rate (if type is Serial)
5. Click Next >.

   The Target Clock Settings window appears (Figure 5).

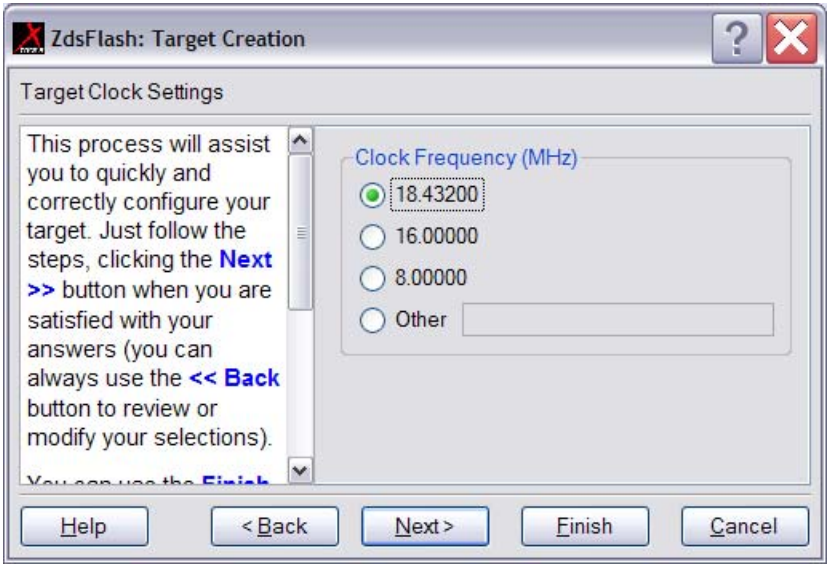


Figure 5. Smart Flash Programmer – Target Clock Settings Window

6. Select the appropriate target clock setting.
7. Click Next >.
8. The Target Creation Summary window appears (Figure 6).

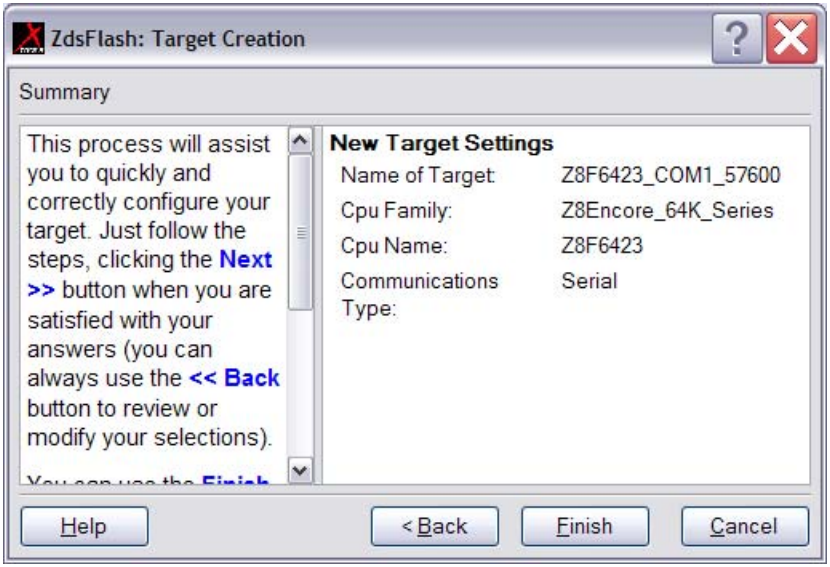


Figure 6. Smart Flash Programmer – Target Creation Summary Window

9. If you need to change a target setting, click < Back until you reach the appropriate target setting window.
10. Click Finish when you have completed setting up the target.

    The Project Creation window reappears. The target you created is highlighted in the Target Selection list.
11. Click the OK button in the Project Creation window.

    The main Smart Flash Programmer window appears (Figure 7). This is the interface the manufacturing engineer or the factory technician will use once you have completed programmer configuration.

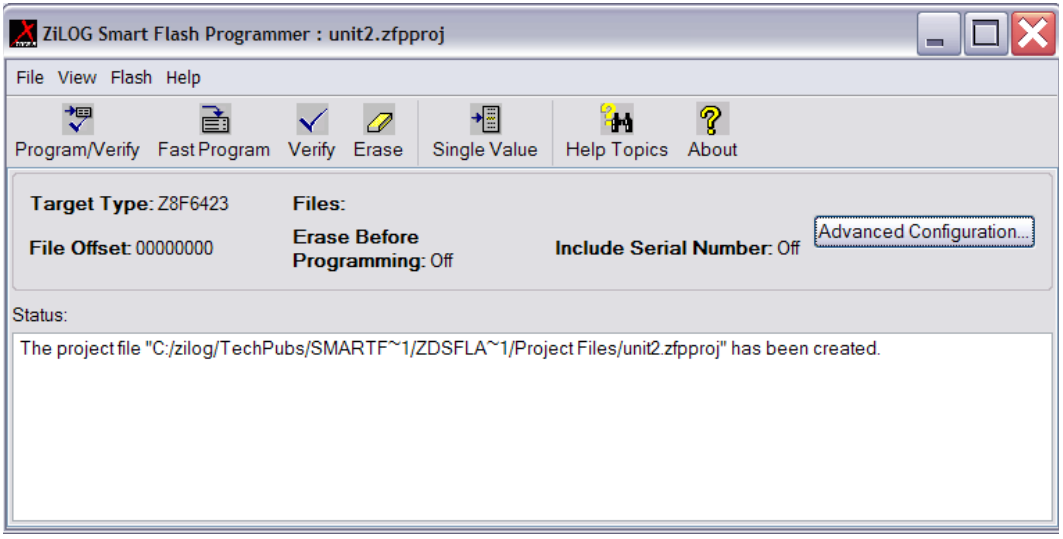


Figure 7. Smart Flash Programmer – Main Window

Set the Advanced Configuration

1. In the Smart Flash Programmer window, click Advanced Configuration... .
   The Advanced Configuration window appears (Figure 8).

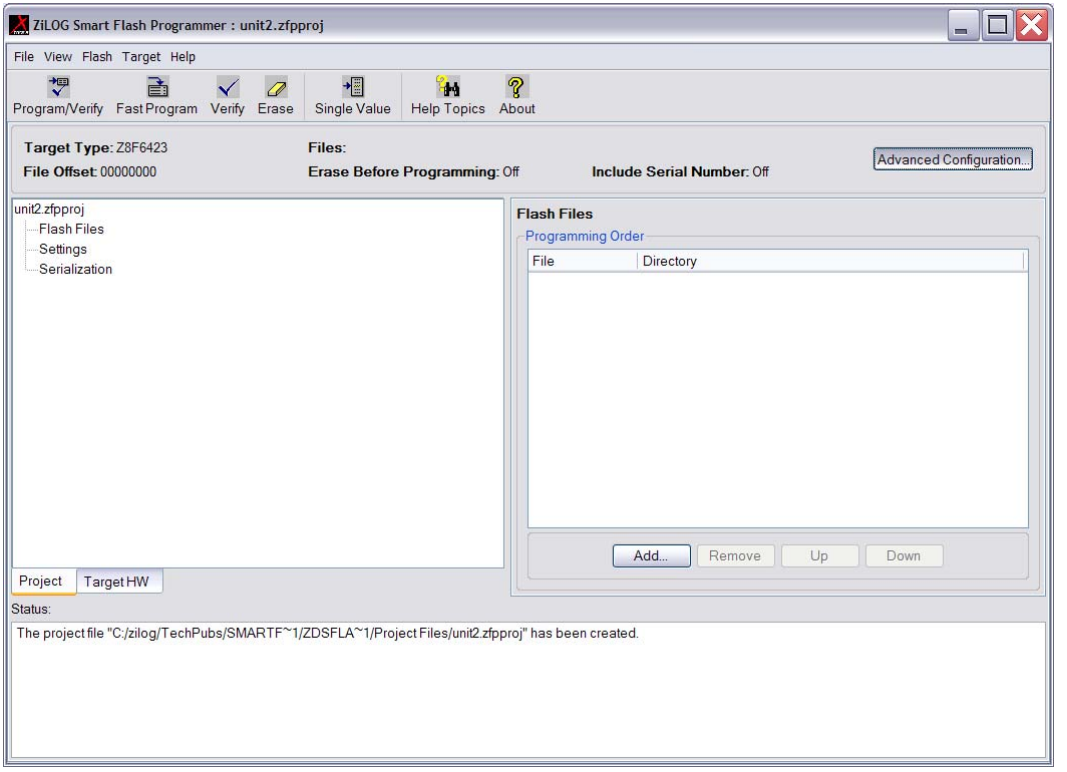


Figure 8. Smart Flash Programmer – Advanced Configuration Window

2. The Advanced Configuration window allows you to:
   - Calculate the checksum for a specific hex file. (Flash menu.)
   - Specify Flash Files to be programmed. (Project tab.)
   - Specify Flash File offsets. (Project tab.)
   - Configure Serialization. (Project tab.)

– Change communication settings. (Target HW tab.)
– Change the target system clock settings. (Target HW tab.)

The left side of the window contains a tabbed interface that allows you to select project settings and target hardware configuration.

NOTE: Flash files are not required for serialization-only operations.

3. If you want to calculate the checksum for a hex file to be loaded into Flash memory:
   a. Select Flash --> Calculate File Checksum.
      The File Checksum Calculator window appears (Figure 9).
   b. Click the ... button and browse to the directory containing the hex file for which you wish to calculate a checksum.
   c. Select a hex file and click OK.
   d. In the File Checksum Calculator window, click the Calculate button.
   e. The checksum for the selected hex file is calculated.
4. To specify the Flash Files to be programmed:
   a. Click the Project tab.
      The current project file name appears in the tab.
   b. Click the Flash Files item beneath the project file name.
      The right side of the window displays the Flash Files Programming Order field.
   c. In the Flash Files Programming Order section, click Add... .
      The Flash File Selection dialog window appears (Figure 10).

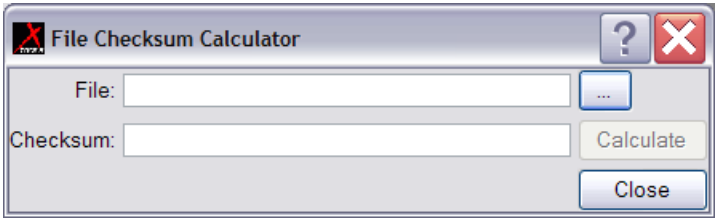


Figure 9. Smart Flash Programmer – File Checksum Calculator

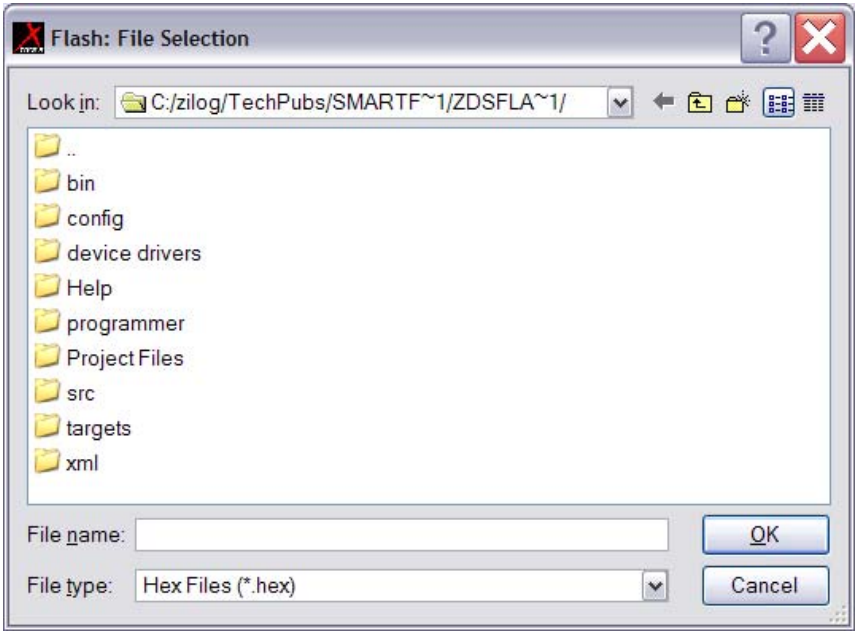


Figure 10. Smart Flash Programmer – Flash File Selection Dialog

d. Browse to the folder containing the flash file(s) you want to program. Select a file, then click the OK button. You can select mul-

tiple files by holding down the Ctrl or Shift key and selecting the files you wish to program.

The Flash file you selected now appears in the Flash Files Programming Order section of the Advanced Configuration window.

e. Repeat steps 3c and 3d for each Flash file to be programmed.

5. After you have selected the Flash files to be programmed, click the Settings item in the Project tab.
   a. The Settings section appears in the right side of the Advanced Configuration window (Figure 11).

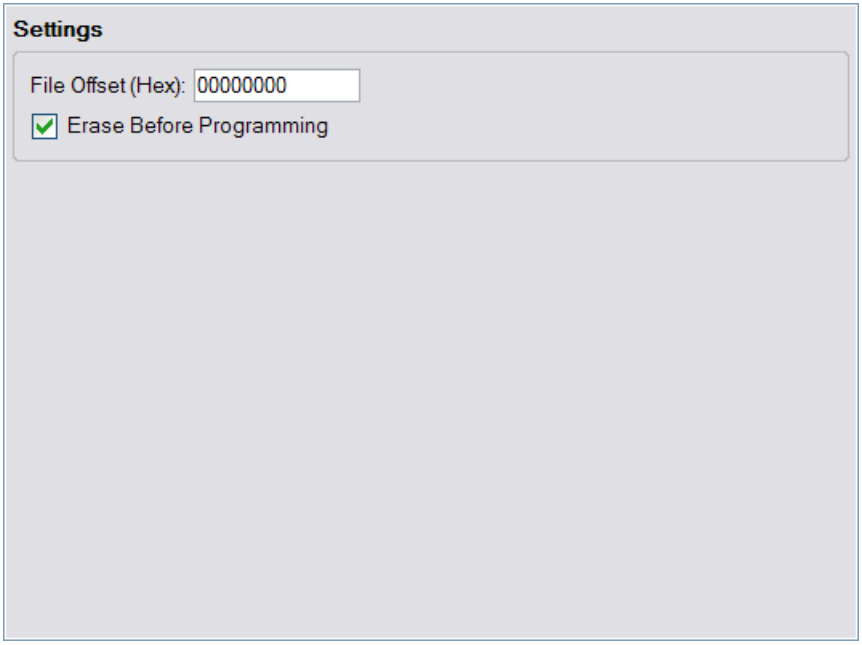


Figure 11. Smart Flash Programmer – Flash File Settings Detail, Advanced Configuration Window

b. In the File Offset (Hex): field, enter a hexadecimal file offset value, if appropriate. This value applies to every file in the project's Flash Files list.

c. If you want to erase the memory ranges defined in your Flash files and/or serialization configuration before programming, check Erase Before Programming.

6. If you are using serialization, select Serialization in the Project tab.
   a. The Serialization section appears in the right side of the Advanced Configuration window ().

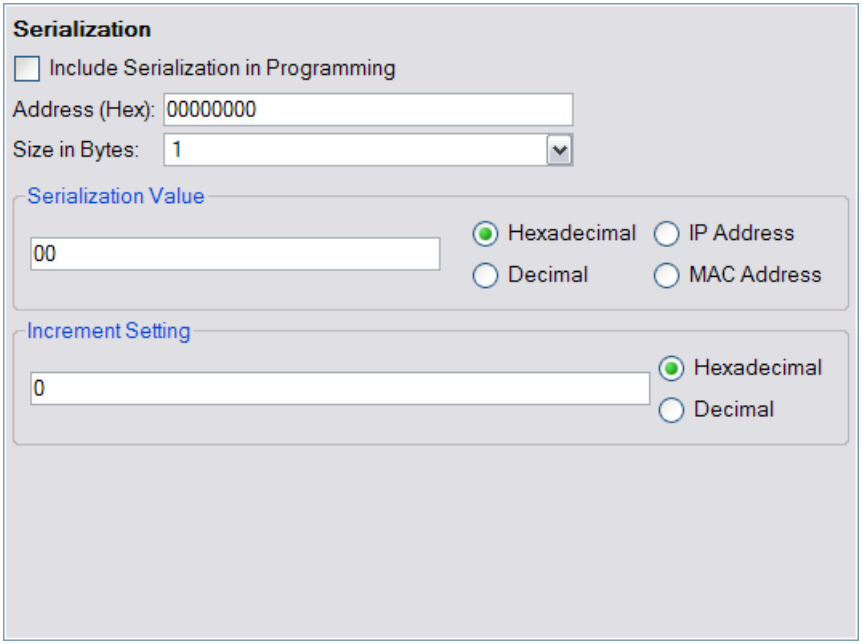


Figure 12. Smart Flash Programmer – Serialization Settings Detail, Advanced Configuration Window

b. If you are using serialization, check Include Serialization in Programming.

c. In the Address (Hex): field, enter the serialization code address.

d. In the Size in Bytes: field, enter the number of bytes required to store the serialized entry.

e. In the Serialization Value section, select the mode of entry for the starting serialization value. For example, to enter the serialization value as an IP address, check the IP Address radio button. Enter the first IP Address in Dotted Decimal notation (192.168.1.30, for example)

   For MAC addresses a format using hexadecimal numbers and colons are used. For example: 00:90:23:1C:45:1B

   The entry mode is used for engineer convenience.

f. In the Increment Setting section, select either Hexadecimal or Decimal, then enter the value by which the serialization value must be incremented.

   To decrement the serialization value, select Decimal and enter a negative number.

7. The Project Flash settings are now configured.

8. Click the Target HW tab in the Advanced Configuration window. The Advanced Configuration window displays target information (Figure 13).

   The Target HW section displays the target you created, and the Target Details provides a summary of the target settings.

   If you wish to change target communication settings, select the Communications item in the Target HW section and change the settings as needed.

   If you wish to change target clock settings, select the Clock item in the Target HW section and change the settings as needed.

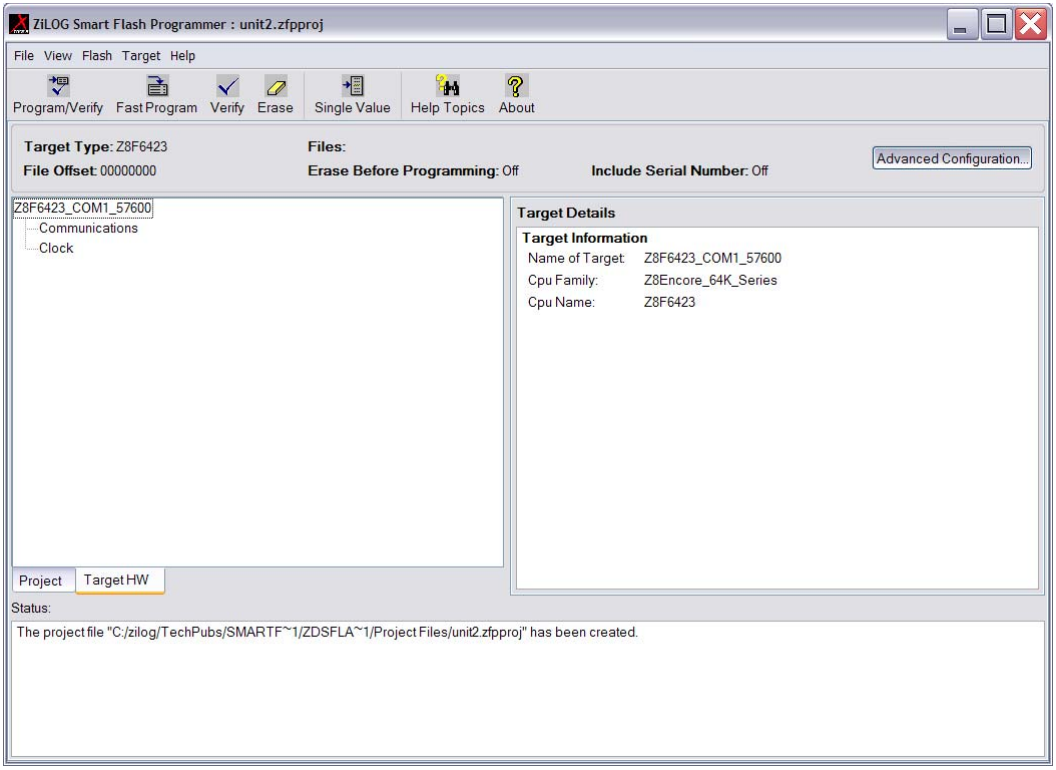


Figure 13. Smart Flash Programmer – Advanced Configuration Window, Target HW Tab

Other Functions Available in the Advanced Configuration Window

There are several other functions available through the Advanced Configuration window: Manage targets, program flash, verify flash, erase flash, and program a single, unique value into flash.

Manage Targets

To manage the available target configurations in the Smart Flash Programmer:

1. In the Advanced Configuration window, open Target → Manage Targets...

   The Target Manager Window appears (Figure 14).

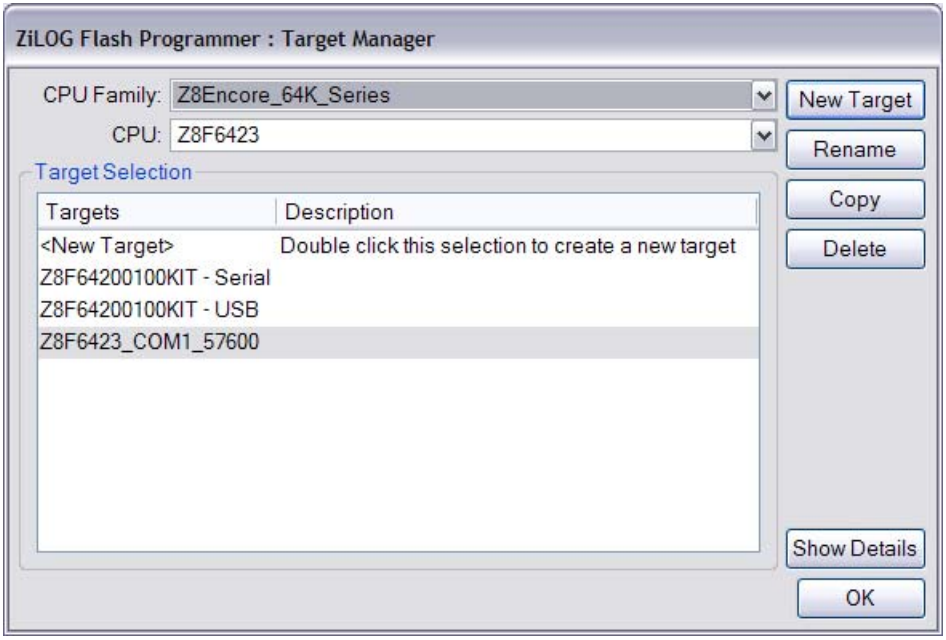


Figure 14. Smart Flash Programmer – Target Manager Window

2. To create a target, click New Target and follow the instructions in "Create a Target Device" on page 7.

3. To rename a target:
   a. Select it and click Rename.
      The Name the New Target window appears (Figure 15).

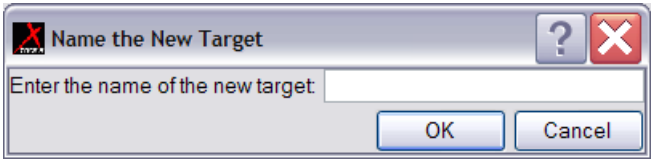


Figure 15. Smart Flash Programmer – Name the New Target Window

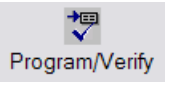
   b. Enter the new name for the target and press the OK button.
      The target name changes.
4. To copy a target configuration to a new target:
   a. Select the target you wish to copy and click Copy.
      The Name the New Target window appears.
   b. Enter the name for the new target and press the OK button.
      The new target appears in the Target Selection list.
5. To delete a target configuration:
   a. Select the target you wish to delete and click Delete.
      The system prompts you to confirm the deletion.
   b. Select Yes to confirm deletion, or No to cancel.

Program Flash on an Attached Target

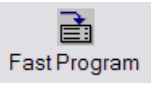
To program Flash on a target device with the currently open project file:

1. Connect your manufacturing PC to the target board containing the Z8 Encore! device to be programmed.

2. Click one of the following buttons:

– 

– Program the attached target and verify.

– 

– Program the attached target, no verification.

Verify Program Stored in Flash on an Attached Target

To verify the program stored in Flash on an attached target, ensure the target is properly connected and click

The status window indicates verification progress. If verification fails, the status window displays the failing file and memory location.

Erase Flash on an Attached Target

To set all bits in Flash on an attached target to 1, ensure the target is properly connected and click

Writing 1s to all memory locations is considered erasing Flash memory.

Program a Single Value in Flash on an Attached Target

The Program Single Value function is a serialization feature that programs a single, unique value into Flash memory on an attached target. Before programming a single value, ensure that serialization values for address and byte size are properly configured.

To program a single, unique value into Flash on an attached target:

1. Ensure the target is properly connected to the manufacturing PC.
2. Click Single Value.

   The Program Single Value window appears.

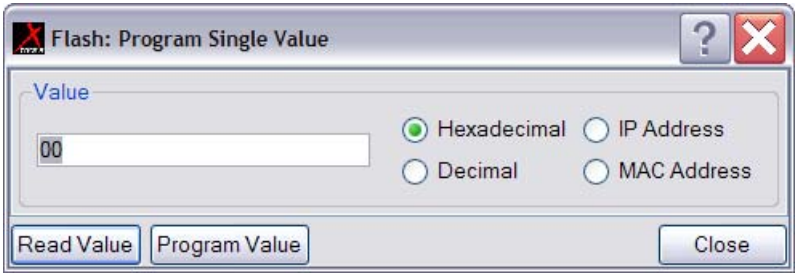


Figure 16. Smart Flash Programmer – Program Single Value Window

3. Select the mode of entry for the value to be programmed (Hexadecimal, Decimal, IP Address, or MAC Address.
4. Enter the value to be programmed.
5. Click Program Value.

   The value you entered is programmed into Flash memory on the attached target.

You can also read the value programmed into the attached target. To do so, ensure the target is attached and click Read Value.

Programming Flash Memory

The instructions in this section describe a suggested Flash programming workflow for manufacturing use. This section is designed to be removed

from the manual and used to assemble a custom set of manufacturing test instructions.

The basic steps for using the Smart Flash Programmer are:

- Connect the manufacturing PC to the target board using a ZiLOG Smart Cable. Refer to your manufacturing test instructions for connection details.
- Start the Smart Flash Programmer and load the correct Flash project file.
- Flash the target board.
- Disconnect the target board and connect another.

Program Flash on an Attached Target

To program Flash on a target device with the currently open project file and automatically verify that Flash was properly programmed:

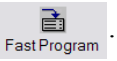
1. Connect your manufacturing PC to the target board containing the Z8 Encore! device to be programmed.
2. Open the File menu and click Open. A file selection window appears. Select the project file to be programmed and click Open.
3. Click 

.

   The status window indicates programming and verification status. If verification fails, the status window indicates the file that failed and the associated memory location.
4. When the status window indicates that verification is complete, disconnect the target board and connect a new target board.
5. Repeat Steps 2 through 4.

Fast Program Flash on an Attached Target

The Fast Program function programs Flash on a target device with the open project file. No verification is performed. To fast program Flash on a target device:

1. Connect your manufacturing PC to the target board containing the Z8 Encore! device to be programmed.
2. Open the File menu and click Open. A file selection window appears. Select the project file to be programmed and click Open.
3. Click 

.

   The status window indicates programming status.
4. When the status window indicates that programming is complete, disconnect the target board and connect a new target board.
5. Repeat Steps 2 through 4.

Verify Program Stored in Flash on an Attached Target

To verify the program stored in Flash on an attached target, ensure the target is properly connected and click 

.

The status window indicates whether the verification was successful. If verification fails, the status window indicates the file that failed and the associated memory location.

Erase Flash on an Attached Target

To set all bits in Flash memory on an attached target to 1, ensure the target is properly connected and click 

.

Writing 1s to all memory locations is considered erasing Flash memory.

Program a Single Value in Flash on an Attached Target

The Program Single Value function is a serialization feature that programs a single, unique value into Flash memory on an attached target. Before programming a single value, ensure that serialization values for address and byte size are properly configured, since they are used to determine the memory location for the single value.

To program a single, unique value into Flash on an attached target:

1. Ensure the target is properly connected to the manufacturing PC.
2. Click 

.

   The Program Single Value window appears.

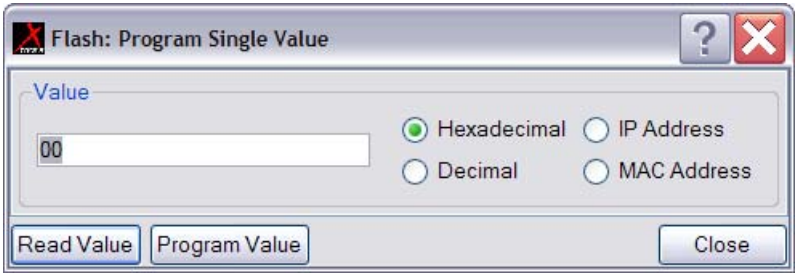
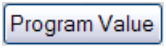


Figure 17. Smart Flash Programmer – Program Single Value Window

3. Select the format of entry for the value to be programmed (Hexadecimal, Decimal, IP Address, or MAC Address.
4. Click 

,

   The value you entered is programmed into Flash memory on the attached target at the memory location specified in Serialization settings.

You can also read the value programmed into the attached target. To do so, ensure the target is attached and click Read Value. The Smart Flash Programmer returns the value of the data stored in the location defined by the Serialization settings.

Starting the Smart Flash Programmer from a Command Line

You can run the Smart Flash Programmer from an Windows command line and use command-line switches to specify what it does on startup.

Command syntax:

```
c:\[installation_path]\bin\zdsflash [<project_file>]|[-s] [-l <log_file>][-h]
```

Switches:

- `<project_file>` – Specify a project file name to load
- `-s` – Cause the Smart Flash Programmer to display the project selection dialog on startup.
- -l <log_file> – Change the name of the default log file created for the new session.
- -h – Display a usage summary for the Smart Flash Programmer command line launch options.

For example, to load the project file c:\flash_files\my_project.zfpproj from the command line, enter:

```
c:\[installation_path]\bin\zdsflash c:\flash_files\my_project.zfpproj
```

Customer Feedback

If you note any inaccuracies while reading this User Manual, please copy and complete this form, then send it to ZiLOG (http://support.zilog.com). We also welcome your suggestions!

Product Information

Z8 Encore!® Smart Flash Programmer
Serial # or Board Fab #/Rev. #
Software Version
Document Number
Host Computer Description/Type

Customer Information

Name	Country
Company	Phone
Address	Fax
City/State/Zip	E-Mail

Problem Description or Suggestion

Provide a complete description of the problem or your suggestion. If you are reporting a specific problem, include all steps leading up to the occurrence of the problem. Attach additional pages as necessary.