Actel® Flash Pro v2.0

User's Guide

Windows®

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Introduction

Thank you for selecting the Flash Pro Programming System. This *User's Guide* is designed to help you take full advantage of Flash Pro's capabilities.

Document Organization

This guide provides detailed information about Flash Pro. Step-by-step instructions for using Flash Pro on Windows are included in this guide. This guide is based on Flash Pro version 2.0.

The Flash Pro User's Guide is divided into the following chapters:

Chapter 1 - **Getting Started** with Flash Pro explains how to install the hardware and software. Details about the graphical user interface are also included.

Chapter 2 - **Using Flash Pro** describes how to use the Flash Pro software to program ProASIC and ProASIC ^PLUS devices.

Appendix A - **Error Messages** contains workarounds for error messages and warnings.

Appendix B - **Software Freeze** describes the steps to take if the Flash Pro software crashes.

Appendix C - **Product Support** describes our support services.

Document Assumptions

The information in this manual is based on the following assumptions:

1. You are familiar with the Designer Series software.
2. You are familiar with FPGA architecture and FPGA design software.

Document Conventions

The following conventions are used throughout this manual.

Information that is meant to be input by the user is formatted as follows:

```
keyboard input
```

The contents of a file is formatted as follows:

```
file contents
```

Platform Support

Supported Platforms for the PC include:

- Win95/98
- WinNT
- Win2000
- WinXP

Actel Application Notes

Applications notes are available at our web site, http://www.actel.com/products/tools/prog.html.

Several Application Notes are specifically helpful to programming ProASIC and ProASIC^{PLUS} devices.

- *Programming Actel Devices*
- *Implementation of Security in Actel's ProASIC and ProASIC^{PLUS} Flash Based FPGAs.*
- *In-System Programming ProASIC 500K and ProASIC^{PLUS} Devices with Silicon Sculptor and Flash Pro.*

Actel User Manuals

Other Actel user manuals are available at our web site, under Technical Documentation, http://www.actel.com/techdocs/manuals/index.html.

These manuals provide additional information on designing Actel FPGAs. They include:

Getting Started User's Guide. This manual contains information for using the Designer Series Development System software to create designs for, and program, Actel devices.

Libero IDE User's Guide. This manual contains information about using Libero IDE, Actel's Integrated Design Environment. Details about using ViewDraw for Actel, WaveFormer Lite, Synplicity, and Model*Sim* are provided.

Designer User's Guide. This manual provides an introduction to the Designer series software as well as an explanation of its tools and features.

PinEdit User's Guide. This guide provides a detailed description of the PinEdit tool in Designer. It includes cross-platform explanations of all the PinEdit features.

ChipEdit User's Guide. This guide provides a detailed description of the ChipEdit tool in Designer. It includes a detailed explanation of the ChipEdit functionality.

Timer User's Guide. This guide provides a detailed description of the Timer tool in Designer. It includes a detailed explanation of the Timer functionality.

Netlist Viewr User's Guide. This guide provides a detailed description of how to use the Actel Netlist Viewer tool to view your netlist and how to use it with other Actel tools to analyze your netlist.

SmartPower User's Guide. This guide contains information on how to use the the Actel SmartPower tool to perform power analysis.

Actel HDL Coding Style Guide. This guide provides preferred coding styles for the Actel architecture and information about optimizing your HDL code for Actel devices.

Silicon Expert User's Guide. This guide contains information to assist designers in the use of Actel's Silicon Expert tool.

Flash Pro User's Guide. This guide contains information to assist designer in the use of Actel's Flash Pro programmer.

Mentor Graphics® Interface Guide. This guide contains information to assist designers in the design of Actel devices using Mentor Graphics CAE software and the Designer Series software.

Synopsys®Synthesis Methodology Guide. This guide contains preferred HDL coding styles and information to assist designers in the design of Actel devices using Synopsys CAE software and the Designer Series software.

Innoveda® eProduct Designer Interface Guide (Windows). This guide contains information to assist designers in the design of Actel devices using eProduct Designer CAE software and the Designer Series software.

Innoveda® eProduct Designer Interface Guide (UNIX). This guide contains information to assist designers in the design of Actel devices using eProduct Designer CAE software and the Designer Series software.

VHDL Vital Simulation Guide. This guide contains information to assist designers in simulating Actel designs using a Vital compliant VHDL simulator.

Verilog Simulation Guide. This guide contains information to assist designers in simulating Actel designs using a Verilog simulator.

Silicon Sculptor User's Guide. This guide contains information about how to program Actel devices using the Silicon Sculptor software and device programmer.

Silicon Explorer Quick Start. This guide contains information about connecting the Silicon Explorer diagnostic tool and using it to perform system verification.

Actel FPGA Data Book. This guide contains detailed specifications on Actel device families. Information such as propagation delays, device package pinout, derating factors, and power calculations are found in this guide.

Macro Library Guide. This guide provides descriptions of Actel library elements for Actel device families. Symbols, truth tables, and module count are included for all macros.

A Guide to ACTgen Macros. This Guide provides descriptions of macros that can be generated using the Actel ACTgen Macro Builder software.

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Getting Started

This chapter describes what should be included in the Flash Pro kit and how to install the Flash Pro software and hardware. It also contains an overview of the graphical user interface and commands.

For details of board layout, please refer to the Actel Application Note, *In-System Programming ProASIC 500K and ProASIC^PLUS Devices with Silicon Sculptor and Flash Pro.*

Flash Pro Kit

The Flash Pro kit contains:

- Flash Pro CD
- Flash Pro Actel Programer
- IEEE-1284 25 Pin Cable, Type A-C, 10 ft.
- Flash Pro User's Guide
- Loop Back Test Board
- Power supply brick and cable

Software Installation

After installing the Flash Pro software, you must install the most recent service packs from our website at http://www.actel.com/custsup/updates/flashpro/index.html.

To install the Flash Pro software:

1. **Insert the Flash Pro CD into your drive.** The installation wizard starts, as shown in Figure 1-1.
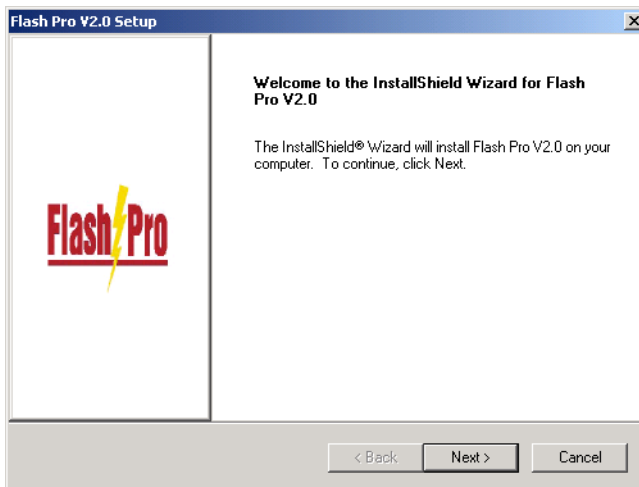
Figure 1-1. Flash Pro Installation Wizard

2. **Click *Next* to see the license agreement.**

3. **Click *Yes* then *Next* to accept the license agreement, as shown in Figure 1-2.**
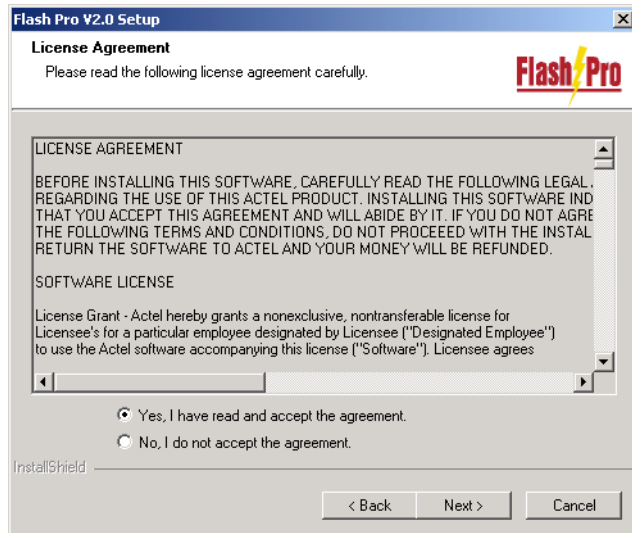
Figure 1-2. License Agreement

4. Click *Next* to install Flash Pro to the destination folder, as shown in Figure 1-3. To install to a different folder, click *Browse* and select another folder. Flash Pro installs to the directory selected.
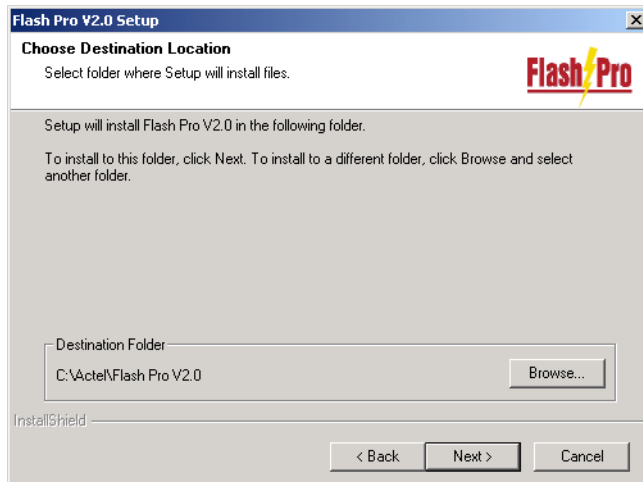
Figure 1-3. Flash Pro Destination

5. **Click *Next* to select the components to install, as shown in Figure 1-4.**
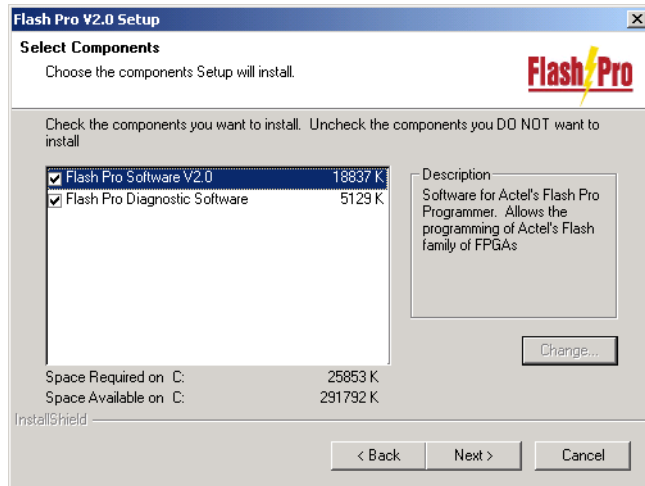
Figure 1-4. Flash Pro Components

Actel strongly recommends that you install both the Flash Pro software and the Flash Pro diagnostic software.

6. **Click *Next* to install.** The Flash Pro software installs. The release notes are displayed.

7. **Click *OK* after reading the release notes.**

8. **Install the most recent service packs from our website:** http://www.actel.com/custsup/updates/flashpro/index.html**.**

9. **Restart your computer.** Actel recommends that you restart your computer before starting Flash Pro**.**

Software Update

You can update your software by installing the most recent service packs from our website at http://www.actel.com/custsup/updates/flashpro/index.html.

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Hardware Installation

To connect the Flash Pro to your PC:

1. **Connect the programmer to a parallel printer port on your PC.** Connect one end of the IEEE-1284 cable to the programmer's connector. Plug the other end of the cable into your parallel printer port and tighten the screws. You should not have any licensing dongles connected between the parallel port and cable.

   Your port settings should be EPP or bidirectional. Actel also supports the ECP mode with Flash Pro version 2.0.

2. **Verify that you have connected to the correct parallel port on your computer.** Actel recommends that you dedicate a port to the programmer. Connecting to a serial port or a third party card may damage the programmer. This type of damage is not covered by the warranty.

3. **Power up the programmer.** Plug the DC adapter into a power socket. Plug the other end of the AC power supply to the DC-IN input at the back of the Flash Pro.

4. **Turn on the programmer.** The POWER LED on the front of the programmer lights up. If it does not, contact Actel technical support at (888) 99-ACTEL.

Hardware Update

After you install or update the Flash Pro software, a Version Mismatch dialog box may appear, as shown in Figure 1-5 so you can download an update to your Flash Pro hardware.

To update your hardware:

1. **Click *OK* to start the update, as shown in Figure 1-5.**
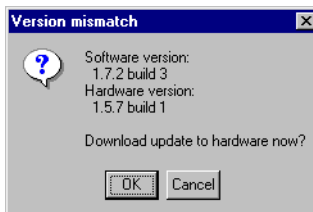
Figure 1-5. Version Mismatch Dialog Box

2. **Click *OK* to complete the update after reading the message in the Hardware Update dialog box, as shown in Figure 1-6.**
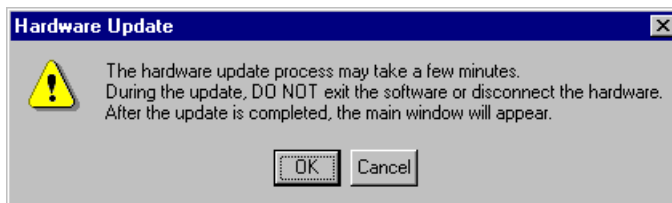
Figure 1-6. Hardware Update Dialog Box

Self-Test

Before you program any devices, please run the self-diagnostic test.

To run the self-diagnositc test:

1. **Connect the loopback test board to the Flash Pro programmer.** (The loopback test board comes with the Flash Pro kit.)

2. **Connect the Flash Pro programmer to your PC's parallel port.**

3. **Turn on the Flash Pro programmer.**

4. **Start the Flash Pro Diagnostic software.** From the *Start* menu, point to *Programs, Flash Pro V2.0,* and click *Diagnostic,* as shown in Figure 1-7..
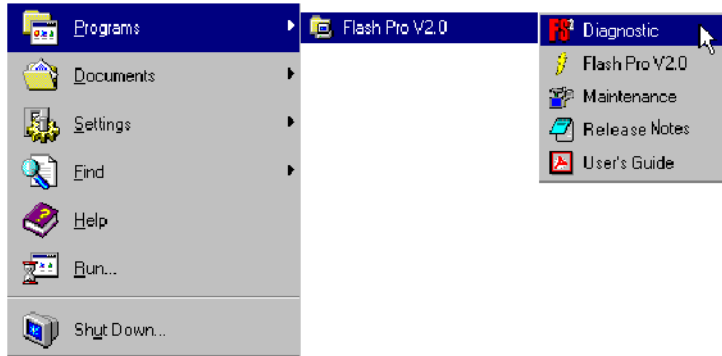
Figure 1-7. Starting Flash Pro Diagnostic

5. **Connect to the Flash Pro programmer by entering**

   openport lpt<port number>

   The port number depends on which parallel port you used to connect to the Flash Pro programmer. If the Flash Pro is connected to port 1, you would enter:

   openport lpt1

   If this fails, check your licensing dongles and make sure the Flash Pro's power is turned on.

6. **Enter**

   test

The unit enters the self-test mode, which lasts approximately less than one minute. Do not interrupt the unit until the self-test mode is completed. If the self-test fails, you might see the following error messages:

• Failed self-test. VDDP setting: Expected 2300...27000. Actual 750 (see page 47).

- Loopback failure TDI->TDO. Expected 1, Actual 0 (see page 48).

- Parallel port device does not support IEEE-1284 negotiation protocol (see page 48).

Please refer to "Error Messages & Trouble Shooting Tips" on page 41 for help with error messages. If you are not successful, please contact technical support at tech@actel.com for credit and replacement.

Starting Flash Pro

To start the Flash Pro software, from the *Start* menu, point to *Programs, Flash Pro V2.0*, and click *Flash Pro V2.0*, as shown in Figure 1-8. (If you installed the program in another folder other than Flash Pro, choose that folder from the Programs menu.
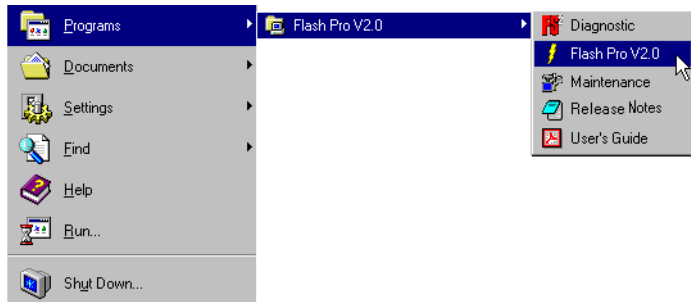
Figure 1-8. Starting Flash Pro

Flash Pro Software Graphical User Interface

The Flash Pro software, as shown in Figure 1-9, consists of a menu bar,
toolbar, log window, and areas to specify your STAPL file, device, and action.
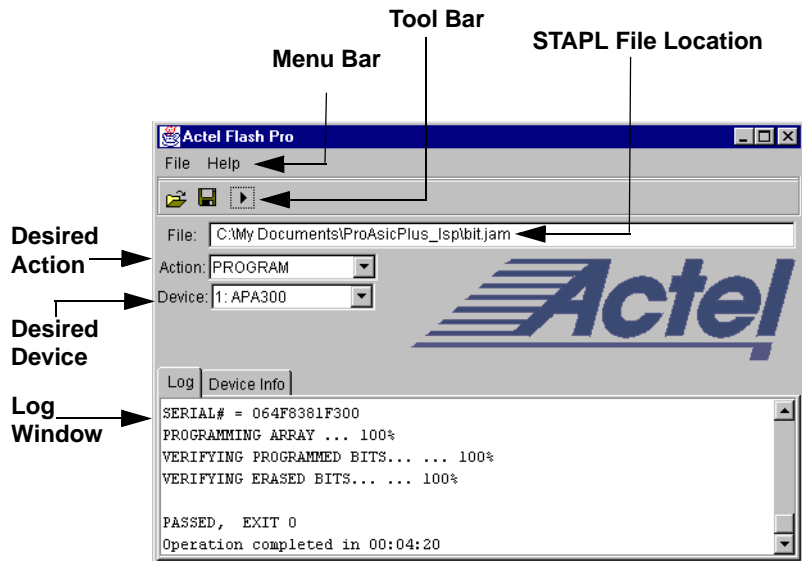
Figure 1-9. Flash Pro Software Graphical User Interface

Menu Bar

Use the menu bar to set up your programmer connection, specify the device,
and to save your log file. From the File menu, you can set up the programmer
connection, specify the device and save or clear the programming log file,
which appears in the log window.

Toolbar

The toolbar buttons in the toolbar, as shown in Figure 1-10, allow you to open a programming file (*.stp) and execute the action selected from the Action window.
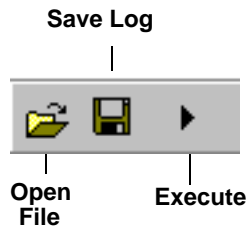
Figure 1-10. Flash Pro Toolbar

Action

Use the Action list menu to specify the action to be performed on the device. Options are available when a STAPL file is loaded. Options appear in Table 1-1:

Table 1-1. Action Options

Option	Action
QUERY_SECURITY	Checks for security feature. If the device is programmed with the security feature, then this command exists with Read inhibit:1 Write inhibit:1. If the security feature is not present, the values are Read inhibit:0 Write inhibit 0.
ERASE	Erases the device.
READ_IDCODE	Reads the device ID code.
VERIFY	Verifies whether the device was programmed with the loaded STAPL file. If the wrong STAPL file is loaded, an Exit 11 result appears in the log window. A successful operation results in Exit 0.
PROGRAM	Programs the device.
DEVICE_INFO	Displays the serial number of the device, the Design Name that is programmed into the device, and the checksum that is programmed into the device.

Device

Options in the Device list specify the device within a chain. The selected action in the Action list is applied to this device. The Device list only appears after selecting *Analyze Chain* from the File menu.

Log Window

The Log Window displays results of the action and any error messages.

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Using Flash Pro

This chapter describes using the Flash Pro programmer to program Actel ProASIC and ProASIC$^{\underline{PLUS}}$ devices. All screen shots shown refer to ProASIC$^{\underline{PLUS}}$ only and options may vary for ProASIC.

Initial Setup

Before any action can be performed with the Flash Pro programmer, it must be properly setup. Please connect Flash Pro ribbon cable with the programming header properly and turn on the switch.

Actel recommends running self test before programming any devices, see "Self-Test" on page 21.

To setup Flash Pro:

1. **From the File menu, click *Connect*.** The Flash Pro Connect to Programmer dialog box is displayed, as shown in Figure 2-1.
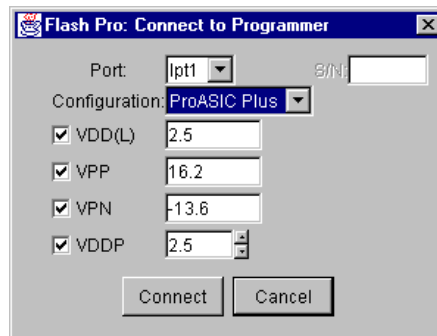
Figure 2-1. Flash Pro: Connect to Programmer Dialog Box

2. **In the Port list, select the port the Flash Pro programmer is connected to.**

3. **In the Configuration list, select the device family (ProASIC or ProASIC $^{\underline{PLUS}}$).**

4. **(Optional) Disable voltages from the programmer, if they are available on the board.**

Note: If you want to power-up the device from the board power supply, please deselect Vddl and Vddp. Vpp and Vpn are required during programming only and are supplied by the Flash Pro programmer. Programming of ProASIC devices requires that Vddl be at 0 volts during programming. The board power supply design must allow for this if it is used to power-up the device during programming. ProASIC$^{\underline{PLUS}}$ devices do not have this requirement.

5. **Click *Connect*.** A successful connect or any errors appears in the Log window, as shown in Figure 2-2. If you encounter failures, please refer to "Error Messages & Trouble Shooting Tips" on page 41.
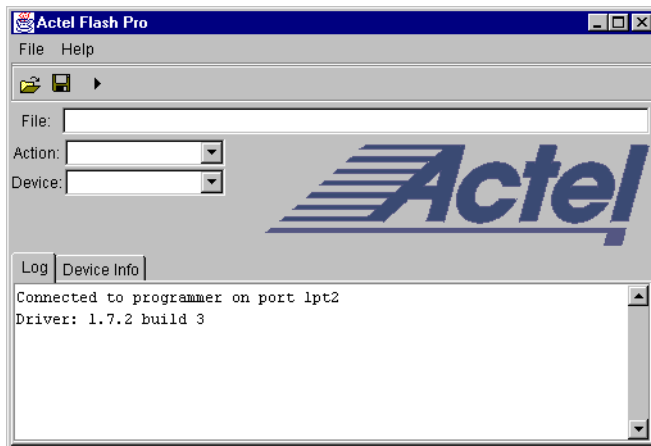
Figure 2-2. Flash Pro: Successful Connection

Analyze Chain and Device Selection

To analyze the chain and select the device:

1. **From the File menu, click *Analyze Chain*.** Chain details appear in the Log window, as shown in Figure 2-3. If you encounter any failures, please refer to "Error Messages & Trouble Shooting Tips" on page 41.
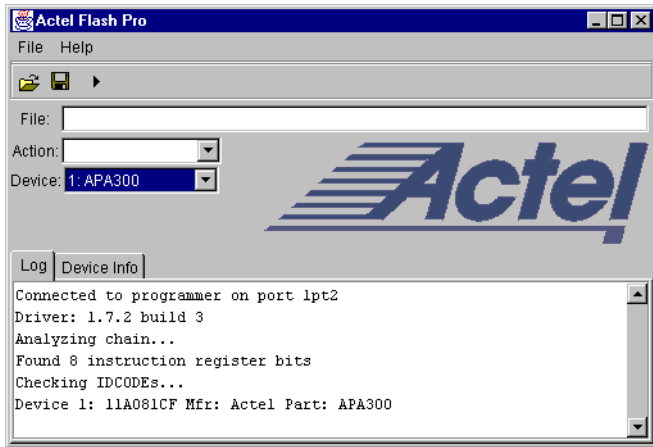
Figure 2-3. Flash Pro: Analyzing Chain

2. **Select your devices.** In the Device list, select your device before you perform any action. If you have only one device in the chain, performing Analyze Chain selects that device automatically from the Device list. If you

have multiple devices in the chain, you must select the devices as shown in Figure 2-4.
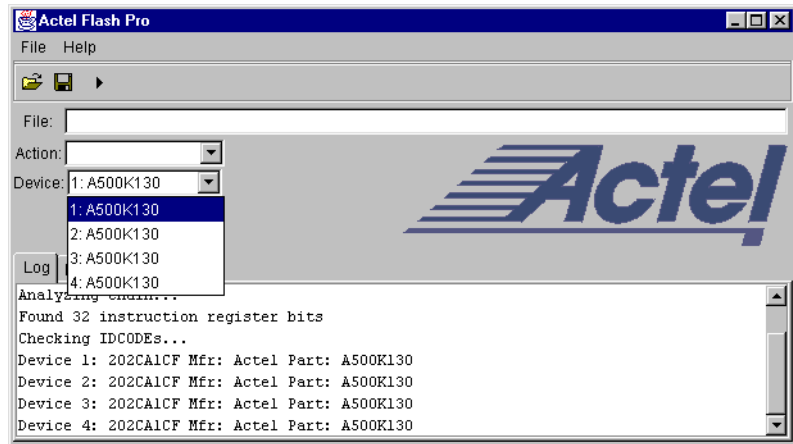
Figure 2-4. Flash Pro: Device Selection

Note: The first device, selected in Figure 2-4 is the device that is nearest to TDO of the programming header.

Loading the STAPL File

The Flash Pro programmer uses a STAPL (*.stp) file to program the device. Export the STAPL file from Designer. For more information, please see the *Designer User's Guide.*

Note: The STAPL file must be generated from Designer R2-2001 or later. Actel strongly recommends using the latest version of Designer software or Libero IDE with the most recent service pack installed. Software service packs can be found at http://www.actel.com/custsup/updates/index.html.

To load the STAPL file:

1. **Click the *Open File* button in the toolbar, as shown in Figure 2-5.**

Figure 2-5. Open File Toolbar Button

The Open dialog box appears, as shown in Figure 2-6.
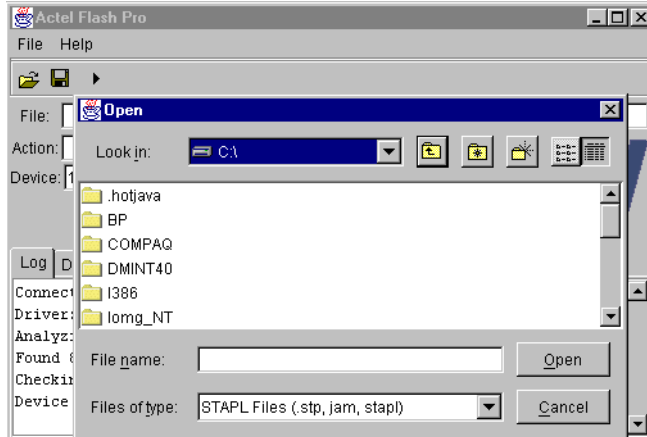
Figure 2-6. Open File

2. **Select your STAPL file and click *Open*.** The file is loaded.

Selecting an Action

After loading the STAPL file, the next step is to select an action to perform. Select an action from the Action list, as shown below:

Table 2-1. Action Options

Option	Action
QUERY_SECURITY	Checks for security feature. If the device is programmed with the security feature, then this command exists with Read inhibit:1 Write inhibit:1. If the security feature is not present, the values are Read inhibit:0 Write inhibit 0.
ERASE	Erases the device.
READ_IDCODE	Reads the device ID code.
VERIFY	Verifies whether the device was programmed with the loaded STPL file. If the wrong STPL file is loaded, an Exit 11 result appears in the log window. A successful operation results in Exit 0. This command resembles the checksum command of anti-fuse product's programming.
PROGRAM	Programs the device.
DEVICE_INFO	Displays the serial number of the device, the Design Name that is programmed into the device, and the checksum that is programmed into the device.

Programming a Device

To program a device:

1. **In the Action list, select *PROGRAM*.**

2. **In the Device list, select the device.**

3. **Click the *Execute* button in the toolbar, as shown in Figure 2-7.**

Figure 2-7. Execute Toolbar Button

The Execute Action dialog box appears, as shown in Figure 2-8.
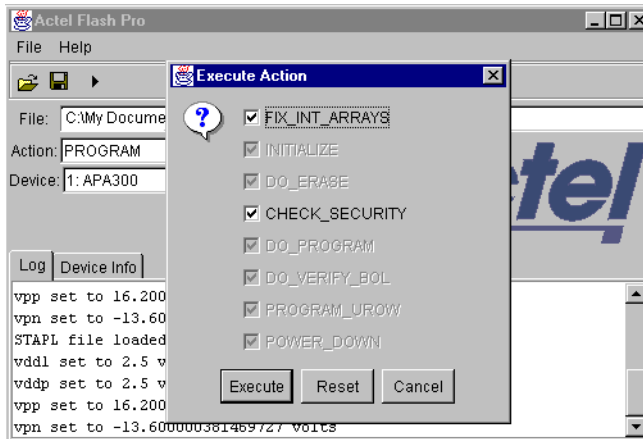
Figure 2-8. Execute Action Dialog Box

All the steps of the programming sequence are listed. Optional steps appear in bold. Grayed out options are required for programming and cannot be changed.

4. **Make your selections and click *Execute* to start programming.** The progress of the programming action is displayed in

the Log window. The message 'Exit 0' indicates that the device has successfully been programed, as shown in Figure 2-9.
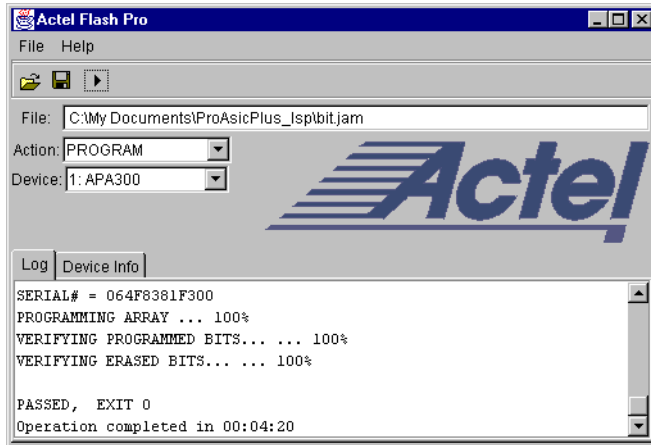
Figure 2-9. Successfully Programmed Device

Note: Do not interrupt the programming sequence, as it may damage the device or programmer.

If you encounter any failures, please refer to "Error Messages & Trouble Shooting Tips" on page 41.

Verifying the Correct Programming

To verify the device is programmed with the correct STAPL file:

1. **Load the STAPL file.**

2. **In the Action list, click *Verify*.**

3. **Click the *Execute* button in the toolbar, as shown in Figure 2-10.**

Figure 2-10. Execute Toolbar Button

The Execute Action dialog box appears, as shown in Figure 2-11.

Figure 2-11. Execute Action Dialog Box

The default settings appear in the Execute Action dialog box.

4. **Click *Execute* to start the verification.** A successful verification will result in Exit 0, as shown in Figure 2-12. If the STPL file is different from the file used for programming, Exit 11 appears in the log window (see "Exit 11" on page 43 for more details).

Note: Do not interrupt the programming sequence, as it may damage the device.
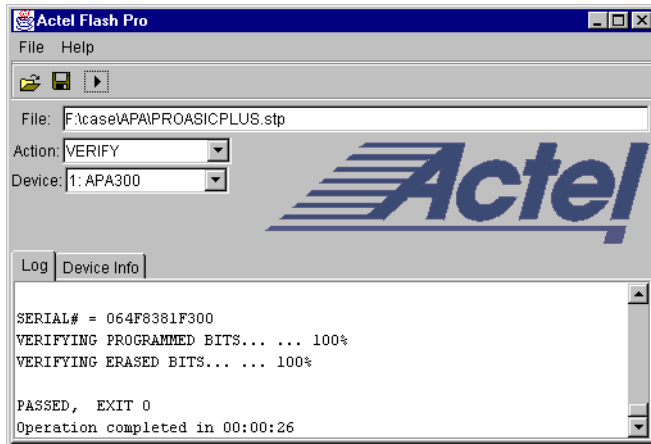
Figure 2-12. Successful Verification

Permanently Lock the Device

The Flash Pro software includes a new feature which enables you to permanently lock your device. The permanent lock feature permanently locks your device and prevents you from reprogramming. This provides the highest level of security to the ProASIC^{PLUS} device family.

Loading the Permanent Lock STAPL File:

Export the permanent lock STAPL file from Designer. See note from Loading the STAPL File in this chapter.

To load the permanent lock STAPL file:

1. **Click the *Open File* button in the tool bar.** The Open dialog box appears.

2. **Select your permanent STAPL file and click *Open*.** The Permanent Lock About dialog box displays, as shown in Figure 2-13.

Figure 2-13. Permanent Lock About Dialog Box

3. **Read the message and click *OK* to load the permanent STAPL file.** The file is loaded.

Programming a Device Using Permanent Lock

To program a device using Permanent Lock:

1. **In the Action list, select PROGRAM.**

2. **In the Device list, select the device.**

3. **Click the *Execute* button in the toolbar, as shown in Figure 2-14.**

*Figure 2-14. Execute Toolbar Button*

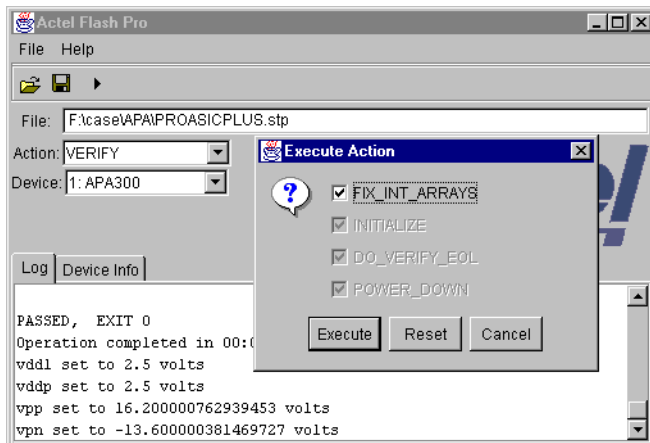The Execute Action dialog box appears, as shown in Figure 2-15.
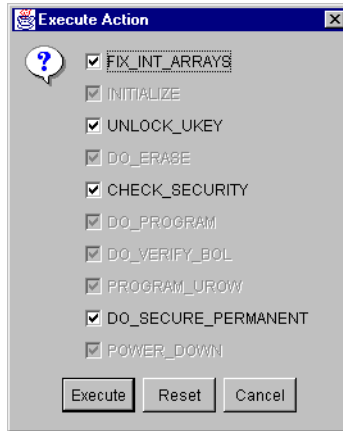
Figure 2-15. Execute Action Dialog Box

Note: The Do_Secure_Permanent checkbox is checked automatically. You have the option of unchecking this box. However, if you do, you will not permanently lock your device.

All the steps in the programming sequence are listed. Optional steps appear in bold. Grayed out options are required for programming and cannot be changed.

4. **Make your selections and click *Execute* to start programming.** The progress of the programming action is displayed in the Log window. The message 'Exit 0' indicates that the device has successfully been programmed as shown in Figure 2-16.
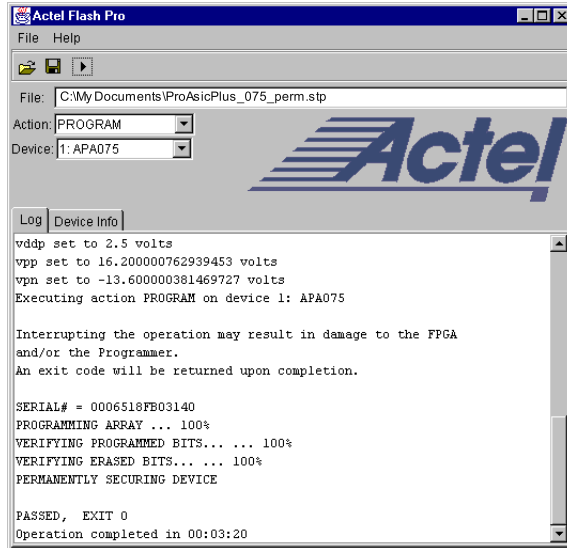
Figure 2-16. Successfully Programmed Device Using Permanent Lock

Note: Do not interrupt the programming sequence, as it may damage the device or programmer.

If you encounter any failures, please refer to "Error Messages & Trouble Shooting Tips" on page 41.

Saving Your Log File

All Flash Pro results are displayed in the Log window. These results can be saved into a file.

To save your log file:

1. **From the File menu, click *Save Log*.** The Save dialog appears, as shown in Figure 2-17.
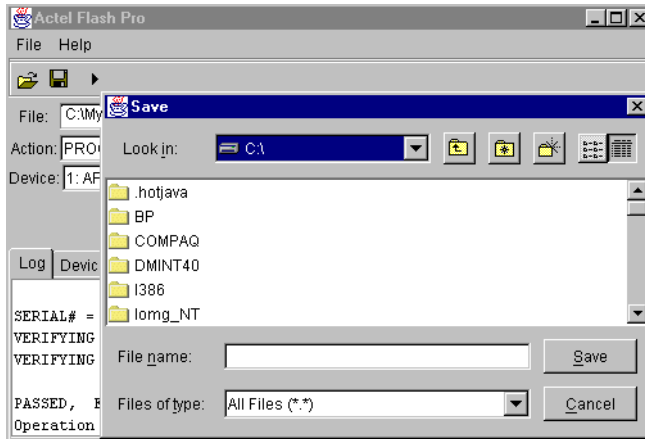
Figure 2-17. Save Dialog Box

2. **Select a directory, type in the file name, and click *Save*.** The file is saved.

A

Error Messages & Trouble Shooting Tips

The information in this chapter may help you solve or identify a problem with the Flash Pro programmer. If you have a problem that you can not solve, please contact Actel Customer Technical Support at tech@actel.com or call our hotline 1-800-262-1060. We are dedicated to making Flash Pro as trouble-free as possible. This chapter contains information on the following error messages:

Exit 0

This message means success. This does not indicate an error.

Exit 3

This occurs when using ProASIC^{PLUS} devices.

Possible Cause: Connect was set up for a ProASIC device and the device is actually a ProASIC^{PLUS}.

Solution: Set it up for a ProASIC^{PLUS} device.

Exit 6

Unrecognized device ID. When the programmer is analyzing the chain, it encountered a device ID that it does not recognize. It can not perform any operations on unrecognized devices, including bypass.

Possible Causes:

- You have chained the ProASIC device with non-Actel devices. This is not supported.

- The FPGA is damaged, and the IDCODE cannot be read back.

- Wrong STAPL file was loaded.

Solution: Please remove all non-Actel devices from the chain. If you still experience the same failure, probably device's ID CODE can not be read and you need to replace the device.

Exit 7

This message occurs only with ProASIC devices. Executing action
DEVICE_INFO on device 1: A500Kxxx
Unknown algorithm: alg=0 prev=1
Either the device is damaged, or your Designer software is out of date.

Possible Cause: In the factory row, the factory writes the algorithm revision
the part is calibrated with. This error occurs with current STAPL files when the
revision written into the factory row is not rev 2. The STAPL files from last
year may "exit 7" with newer devices or the older revision may cause this failure
if the STAPL file used is from latest version. This can occur if you are using
Engineering Sample parts that are no longer supported, such as ProASIC
Engineering Sample parts.

Solution: Recreating the STAPL file with a newer version of Designer or
replacing with newer revision devices will fix this problem.

Exit 8

This message occurs when the FPGA failed during the Erase operation.

Possible Causes: The device is secured, and the corresponding STAPL file is
not loaded. The device has been permanently secured and cannot be unlocked.

Solution: Load the correct STAPL file.

Exit 11

The message occurs when the FPGA failed verify.

Possible Cause: The device is secured, and the corresponding STAPL file is
not loaded.

Solution: Please load the correct STAPL file.

Exit 12

Occurs when security is enabled.

Possible Causes:

- The device is secured and the wrong key/STAPL file was entered.

- The device is damaged.

- The verification was interrupted and therefore fails, causing it to think the device is secure.

Exit 15

This message is a factory Calibration Data CRC Error. During program, erase, or verify, the programmer must read back Calibration Data from the FPGA. The Data contains a CRC and the programmer uses the CRC to ensure the data is not corrupted/wrong.

Possible Causes:

- The device is damaged.

- Noise on the JTAG signals causes the programmer to read back wrong data.

Exit 17

This message means that the device has been secured, write-security enabled.

Possible Causes:

- The device is secured and the wrong key/STAPL file was entered.

- The device is damaged.

Solution: Please load the correct STAPL file.

Exit 90

This message means that an unexpected RCK is detected. The ProASIC devices use either TCK or RCK to shape the programming pulse. The Flash Pro uses TCK, it does not sense RCK directly. Rather, the device senses RCK and Flash Pro reads it from the device.

Possible Causes:

- Noise on the RCK signal.

- You connected a CLK source to the RCK signal.

Solution: Disconnect the RCK and make sure TCK has a clean signal.

Exit 91

This message occurred because of a calibration data parity error. Before the FPGA is programmed, calibration data (stored in the device) are read back for programming purposes. The programmer performs a parity check on the data to ensure the proper data is read back.

Possible Cause: The device is damaged.

Solutions: Please replace the device.

Cable to target is not connected properly

When the *Analyze* command is executed, the Flash Pro will look for target devices. If the cable connection is wrong, Flash Pro senses assumes that nothing is connected at all.

Possible Cause: The cable connector is not connected to the header properly or the connection from header to the device is missing something. Header pin 10 is the GND sensing pin. It senses if Flash Pro is connected to the target's GND. Also, all other GND pins should be connected to the GND plane.

Solution: Please confirm the connection between header to the device. If the board supplies the power to the device, please make sure the voltage level is correct.

Chain Integrity Test Failed: XX

When the analyze chain operation is performed, the Flash Pro programmer expects the first two bits of the data from the device chain to be a "01." When the programmer does not see the 01 pattern, it will return an error and report the bit values that it read. For example, if the bits it read were 11, then it would return "Chain Integrity Test Failed: 3"

Possible Causes:

• The connection between the Flash Pro programmer and the Device is broken.

• The programmer cable might not be securely inserted into the header.

• The header is not connected to the JTAG pins of the FPGA correctly.

Solutions:

• Please secure the connections.

• Check the JTAG pins for signal activity.

• Check for broken TDO, TMS, and TCK pins.

• After checking all type of connections if the failure exists, you may need to replace the first device (the devices closest to the TDO of the programming header) in the chain.

Could not connect to programmer on port lpt1 or Parallel port device does not support IEEE-1284 negotiation protocol

Possible Causes: These errors can occur because the remote device does not respond to the negotiation protocol, or a variety of reasons.

Solutions:

• Make sure the port is connected

• Make sure the connected device is a Flash Pro programmer

• Turn the programmer on

- Check parallel port setting in BIOS)

- Make sure that there are no dongles in between the parallel port and the Flash Pro connection

- Try another parallel cable, the parallel cable might be defective

- Check to see if the programmer is damaged (see step 4 in "Software Freeze" on page 51)

External Voltage Detected on <Supply>

From the CONNECT menu, the Flash Pro programmer has been told to power a supply (one of Vdd, Vddp, Vpp, Vpn) of the FPGA, but it is already driven from another source. The Flash Pro has sense-amps on all the power supplies to make sure that it does not drive a power supply that is already driven by the board.

Possible Cause: The voltage supply for the FPGA is driven by the another source (board, external power-supply), but the user forgot to turn off the supply in the CONNECT menu.

Solution: Set appropriate options in the CONNECT menu.

Failed self-test. VDDP setting: Expected 2300...27000. Actual 750

This failure happens due to low VDDP. A loose cable connector usually causes a low voltage or no voltage.

Possible Cause: The cable may have become loose if the cable was disconnected from the target by pulling up on the cable instead of lifting the connector directly.

Solution: Secure the connection between the cable connector and the programming header.

Loopback Failure TDI -> TDO. Expected 1, Actual 0

Possible Causes: An error message indicating a mismatch between expected signal values of 1 or 0 indicates a hard failure. The signals will be TCK, OUT0, or TDI.

Solution: Send the programmer back for repair.

More than one unidentified device cannot continue

In order to perform an operation to the ProASIC device, the rest of the devices in the chain must be in bypass mode. To put the devices into bypass mode, the programmer must need to know the IDCODE (hence the instruction register length) of these devices. If there is are more than one devices in the chain which does not support IDCODE command, then the programmer cannot put them into bypass mode, therefore cannot reach the desired ProASIC device.

Possible Causes:

- The user has chained the ProASIC device with non-Actel devices. Currently that is not supported in our software.

- One or more of the devices in the chain is damaged, and the IDCODE cannot be read back.

Solution:

Please remove all non-Actel devices from the chain. If you still experience the failure, it is likely that the device's ID CODE can not be read and you need to replace the device.

Self-test

Before you program any devices, you should run the self-diagnostic test (see "Self-Test" on page 21). The diagnostic software can be found on the Actel web site. If the test fails, please contact Actel Customer Technical Support at tech@actel.com for credit and replacement.

VDDP Disconnected

This message occurred because there is no Vddp voltage supply to the FPGA.

Possible Causes:

- You accidentally turned off the Vddp supply in the CONNECT menu.

- The Vddp supply on the board is not functioning.

Solution: Please check the Vddp supply on the board for appropriate voltages and correct the CONEECT menu.

B

Software Freeze

During programming, the device may be damaged due to a voltage/current spike. When the device is damaged (usually in the form of a power-supply shorted to ground), it causes the Flash Pro programmer to lose communication with the PC. This in turn causes the software to hang.

To restart the software after a crash:

1. **Power-down everything.**

- If Vpp and Vpn are provided on the board, power them down first, then power down Vdd and Vddp. Finally, power down the Flash Pro and disconnect it from the board.

- If the Flash Pro is providing all the voltages, power down the Flash Pro and disconnect it from the board.

2. **Close the Flash Pro software.**

3. **On the FPGA, measure resistance between all power supplies to GND. If any power supply is shorted to GND, then the device is damaged. Don't power up the board.**

4. **Power up the Flash Pro, invoke the Flash Pro software, and run self-test (**"Self-Test" on page 21**).**

5. **Assuming that the FPGA does not have any supply to GND short, reconnect the Flash Pro and run an Analyze Chain (**"Analyze Chain and Device Selection" on page 29**).**

Appendix B: Software Freeze

C

Product Support

Actel backs its products with various support services including Customer Service, a Customer Applications Center, a web site, an FTP site, electronic mail, and worldwide sales offices. This appendix contains information about contacting Actel and using these support services.

Actel U.S. Toll-Free Line

Use the Actel toll-free line to contact Actel for sales information, technical support, requests for literature about Actel and Actel products, Customer Service, investor information, and using the Action Facts service.

The Actel toll-free line is (888) 99-ACTEL.

Customer Service

Contact Customer Service for nontechnical product support, such as product pricing, product upgrades, update information, order status, and authorization.

From Northeast and North Central U.S.A., call (408) 522-4480.
From Southeast and Southwest U.S.A., call (408) 522-4480.
From South Central U.S.A., call (408) 522-4434.
From Northwest U.S.A., call (408) 522-4434.
From Canada, call (408) 522-4480.
From Europe, call (408) 522-4252 or +44 (0) 1256 305600.
From Japan, call (408) 522-4743.
From the rest of the world, call (408) 522-4743.
Fax, from anywhere in the world (408) 522-8044.

Customer Applications Center

Actel staffs its Customer Applications Center with highly skilled engineers who can help answer your hardware, software, and design questions. The Applications Center spends a great deal of time creating application notes and answers to FAQs. So, before you contact us, please visit our online resources. It is very likely we have already answered your question(s).

Guru Automated Technical Support

Guru is a web-based automated technical support system accessible through the Actel home page (**http://www.actel.com/guru/**). Guru provides answers to technical questions about Actel products. Many answers include diagrams, illustrations, and links to other resources on the Actel web site. Guru is available 24 hours a day, seven days a week.

Web Site

Actel has a World Wide Web home page where you can browse a variety of technical and nontechnical information. Use a Net browser (Netscape recommended) to access Actel's home page.

The URL is **http://www.actel.com**. You are welcome to share the resources provided on the Internet.

Be sure to visit the Technical Documentation area on our web site, which contains information regarding products, technical services, current manuals, and release notes.

FTP Site

Actel has an anonymous FTP site located at **ftp://ftp.actel.com**. Here you can obtain library updates, software patches, design files, and data sheets.

Contacting the Customer Applications Center

Highly skilled engineers staff the Customer Applications Center from 7:30 A.M. to 5:00 P.M., Pacific Time, Monday through Friday. Several ways of contacting the Center follow:

Electronic Mail

You can communicate your technical questions to our e-mail address and receive answers back by e-mail, fax, or phone. Also, if you have design problems, you can e-mail your design files to receive assistance. We constantly monitor the e-mail account throughout the day. When sending your request to us, please be sure to include your full name, company name, and your contact information for efficient processing of your request.

The technical support e-mail address is **tech@actel.com**.

Telephone

Our Technical Message Center answers all calls. The center retrieves information, such as your name, company name, phone number and your question, and then issues a case number. The Center then forwards the information to a queue where the first available application engineer receives the data and returns your call. The phone hours are from 7:30 A.M. to 5:00 A.M., Pacific Time, Monday through Friday.

The Customer Applications Center number is (800) 262-1060.

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