

JTAG-BLAZER

User's Manual

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Atmark Techno, Inc.
<http://www.atmark-techno.com>

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1. Introduction

Thank you for your purchase of the JTAG-Blazer

This product is designed as a FPGA configuration and CPLD / PROM programming tool. (In this document these functions are collectively called configuration).

■

This manual describes the necessary preparation to get started and then information on how to use the JTAG-Blazer. Please read the manual in its entirety before using this product.

If you have any questions relating to this product, you can obtain more detailed information from our web site (<http://www.atmark-techno.com>).

■

The software used in this product consists of Free Software and Open Source Software. Free Software and Open Source Software are the achievements of many developers from around the world. We would like to take this opportunity to thank all of these developers.

uClinux is supported by the achievements of D. Jeff Dionne, Greg Ungere, David McCulloughu and all people participating in the uClinux development list.

uClibc has been developed and is maintained by Eric Andersen.

The original uClinux port that runs on the MicroBlaze processor architecture is the achievement of John Williams (Embedded Systems Research Group, University of Queensland, Brisbane, Australia).

■

The source code used in this product is available for download from our web site (<http://www.atmark-techno.com>).

2. Precautions

The following conventions are used to indicate precautions in this manual. Failure to observe precautions could result in injury or damage to property.

**Warning**

Failure to observe these instructions could result in death or bodily injury of the operator.

**Caution**

Failure to observe these instructions could result in physical damage to equipment.

2.1. Safety Precautions

Please read carefully the following safety precautions to assure correct use of the JTAG-Blazer.

**Warning**

This product uses semiconductor components designed for generic electronics equipment such as office automation equipment, communications equipment, measurement equipment and machine tools. Do not incorporate the product into devices such as medical equipment, traffic control systems, combustion control systems, safety equipment and so on which can directly threaten human life or pose a hazard to the human body or property due to a malfunction or failure. Moreover, products incorporating semiconductor components can be caused to malfunction or fail due to foreign noise or a surge. To avoid injury, death or loss of property in the case of malfunction or failure, be sure to take all possible safety measures.

2.2. Handling Precautions

To avoid degradation, damage, malfunction, fire or electric shock, the following precautions must be observed when handling this product.

Handling the main unit

**Warning**

- Guard against excessive shock to the unit caused by stepping, dropping or tapping the product. Failure to do so could result in damage, fire or electric shock.
- Do not operate the unit with wet hands. Failure to observe this could result in malfunction, fire or electric shock.
- Do not spill liquids such as water on the unit. Failure to observe this could result in malfunction, fire or electric shock.
- Should water be spilled on the unit, turn off the power switch, remove the AC adapter from the outlet and then contact a local distributor.
- Do not disassemble or modify the unit.
- Do not operate the unit in a manner other than specified in this document. Failure to observe this could result in an accident or malfunction.
- Be sure to use the supplied AC adapter to power the unit.
- Turn on the unit's power switch before turning on the target board.
- Store and operate the unit in a stable place.
- Operate the unit at a room temperature of 0 to 40 degrees C.
- Do not operate the unit in excessively moist or dusty environments or where there is a possibility of water leaks. Failure to observe this could result in malfunction, fire or electric shock.

Handling the AC adapter



Warning

- Use the AC adapter set to AC100V.
- Do not use or plug in the AC adapter with wet hands. Failure to observe this could result in malfunction, fire or electric shock.
- Do not damage, forcefully remove or bend the power cable. Failure to observe this could result in malfunction.
- Do not use the unit in excessively moist or dusty environments or where there is a possibility of water leaks. Failure to observe this could result in malfunction, fire or electric shock.

Using the JTAG cable



Warning



Caution

- Do not apply more than +5.5V VCC voltage to the JTAG connector.
- Do not connect or disconnect the cable from the unit or target board with the power switch of the target board kept on.
- When connecting a 6-pin parallel cable to a terminal on a target board, first connect the GND pin for over-voltage protection.
- When connecting a 6-pin parallel cable to a target board, carefully check that the cable is properly connected before turning on the power switch of the target board.
- A 14-pin flat cable is less noise-susceptible and can suppress cross-talk better compared to a 6-pin parallel cable. Therefore, we recommend using the 14-pin flat cable to enable high-speed configuration and the use of a low-voltage target device, in addition to avoiding malfunction due to environment effects.
- Due to connection conditions with a target device (i.e. chain connection or wiring length on the target board), in some circumstances high-speed writing may not be possible. If this occurs, decrease the speed setting and try it again.
- Do not extend the JTAG cable.
- Do not connect a 14-pin flat cable and a 6-pin parallel cable simultaneously. Failure to observe this could result in damage to the target board.

Network security



Caution

- Take all possible network security measures required by the system in use and its environment.
- The ports used on this product are **TCP 39293 and 39793**.

3. Features

The JTAG-Blazer enables FPGA/CPLD configuration via network. It incorporates internal memory to store configuration data and also provides the ability to configure a target device using a single switch.

The main features of this product are as follows:

- **Networking**

A network interface is used for data transmission between the PC and the JTAG-Blazer. Configuration data to be written to a target board and data to be stored in the internal memory can be transferred to the JTAG-Blazer via network.

- **Standalone Writing**

This feature enables configuration data stored in the internal memory of the JTAG-Blazer to be written to a target board by the use of a switch. This does not require the JTAG-Blazer to be connected to a PC. The internal memory capacity is approximately 16Mbit. However, with the support for data compression, the JTAG-Blazer can store more configuration data than its physical memory capacity would normally allow.

- **High Speed Downloading**

JTAG operates at a maximum 12.9MHz clock frequency. This enables configuration data to be transferred at approximately 6Mbps between the JTAG-Blazer and target board.

- **Parallel Cable IV JTAG Pin Compatibility**

The supplied 14-pin flat cable is compatible with the Xilinx Parallel Cable IV pin layout. It allows for a direct connection by attaching a Xilinx Parallel Cable IV compatible connector to the target board.

- **Easy-to-Operate**

Windows-based software makes operation possible using only a mouse. Once configured, all settings such as the IP address are stored for future use and will be effective from the subsequent system boot-up.

4. Before Getting Started

Read carefully the following sections before using the product.

4.1. Part Names of the JTAG-Blazer

Part names and functions of the JTAG-Blazer are shown in **Figure 4-1** and **Table 4-2**.

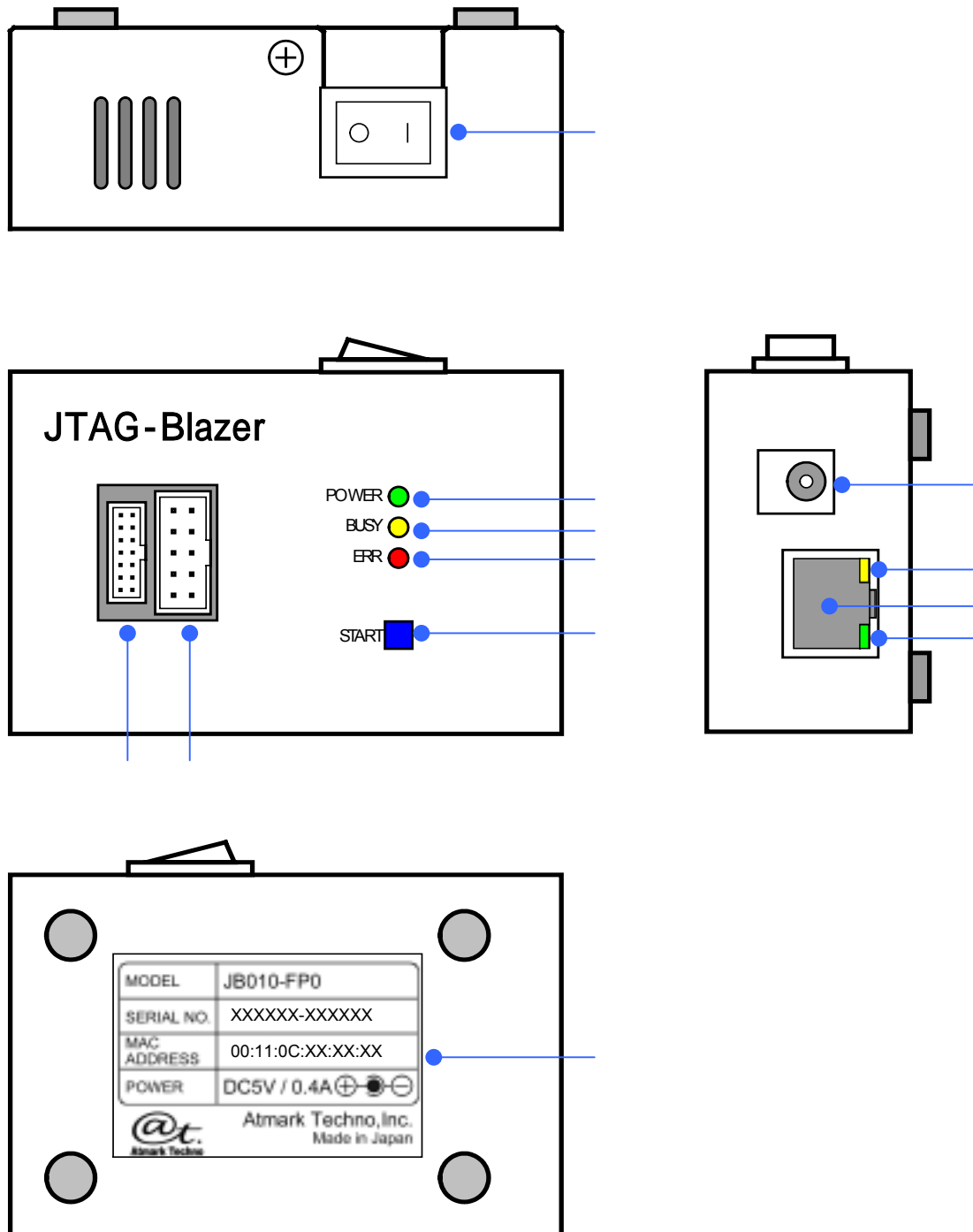


Figure 4-1 External View of the JTAG-Blazer

Table 4-2 Part Names and Functions of the JTAG-Blazer

Item No.	Name	Function
1	Power switch	Position "1": Turns power ON. Position "0": Turns power OFF.
2	14-pin flat cable terminal	Used to connect a 14-pin flat cable.
3	6-pin parallel cable terminal	Used to connect a 6-pin parallel cable.
4	POWER lamp	Shows status of the board. Flashes at power-on and lights during while idle.
5	BUSY lamp	Shows status of the board. Lights during network access or when writing to a target board.
6	ERR lamp	Shows status of the board. Lights or flashes when a failure occurs while, for example, writing to a target board or accessing the network.
7	START button	This button is used to write configuration data stored in the JTAG-Blazer to a target device. For more information, refer to 5.4. Standalone Writing .
8	AC adapter terminal	Used to connect the AC adapter.
9	Link lamp	Lights when LAN port is available.
10	LAN cable terminal	Used to connect a LAN cable.
11	Access lamp	Shows status of LAN port. Flashes when data transmission is in progress.
12	Product label	Provides individual product information.

4.2. Part Names of JB Manager

JB Manager is a program that can control a JTAG-Blazer remotely via network. All operations except for standalone writing are accomplished through this program.

Part names and functions of JB Manager are shown in **Figure 4-3** and **Table 4-4**.

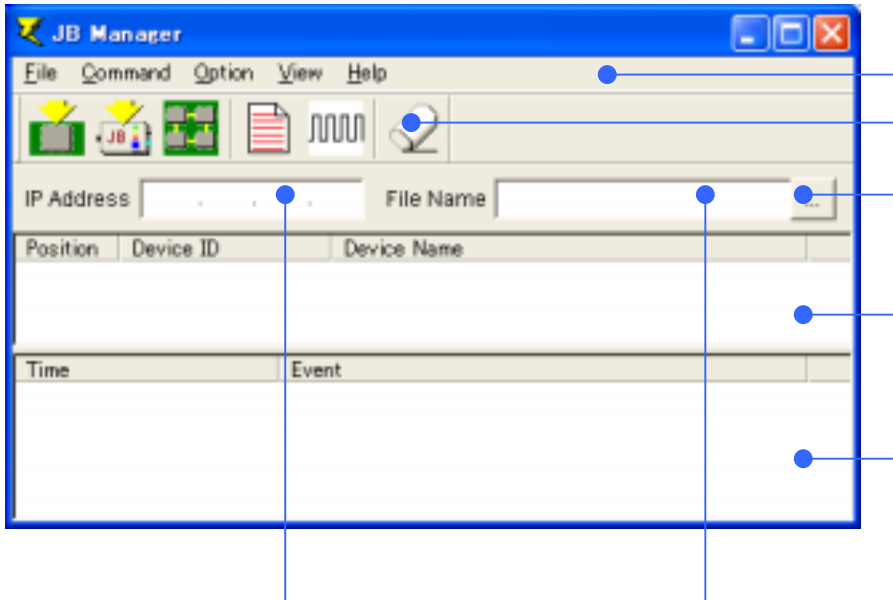


Figure 4-3 JB Manager Main Screen

Table 4-4 Part Names and Functions of JB Manager

Item No.	Name	Function
1	Menu bar	Used to select functions to be executed and set options.
2	Tool bar	Used to operate main functions.
3	IP address area	Used to enter an IP address of JTAG-Blazer.
4	File name area	Used to enter the file name to be written to a target board or internal memory. When directly entering a file name, enter its absolute path.
5	File selection button	Used to select a specific file name from the file dialog when writing into a target board or an internal memory.
6	Device ID display area	Displays the device ID obtained in the configuration information acquisition process.
7	History display area	Displays command history. When an error occurs, its associated error code is displayed here.

4.3. Installing JB Manager

The following describes the installation of JB Manager.

1. Insert the supplied CD-ROM into the PC on which JB Manager is to be installed.
2. Open the DRIVE:¥Application¥ folder.
3. Copy JBManager.exe and jb_device_list.dat to the local drive.

Note: DRIVE is represented by a capital letter like "E".

This completes the installation of JB Manager. To launch it, double-click JBManager.exe.

4.4. JTAG-Blazer Connection Diagram

The following is a connection diagram of a client PC, a JATG-Blazer and a target board.

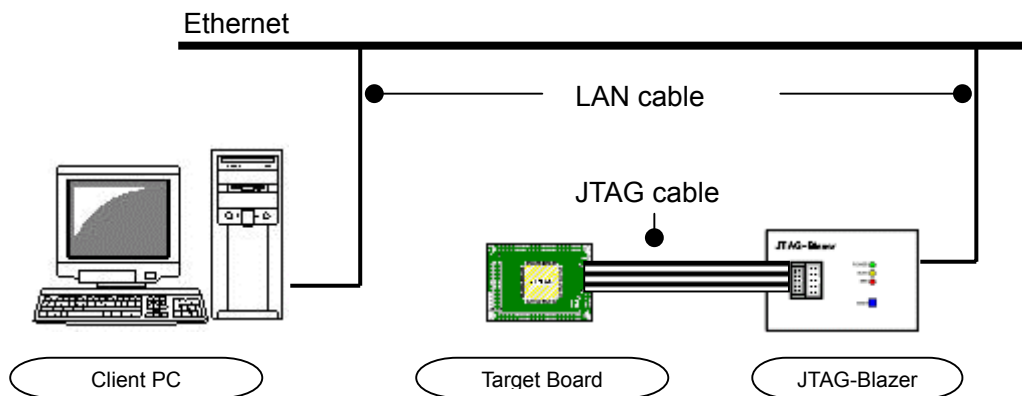


Figure 4-5 Connection Diagram

4.5. Connecting a JTAG Cable

The following are connection diagrams for 6-pin parallel and 14-pin flat cables.

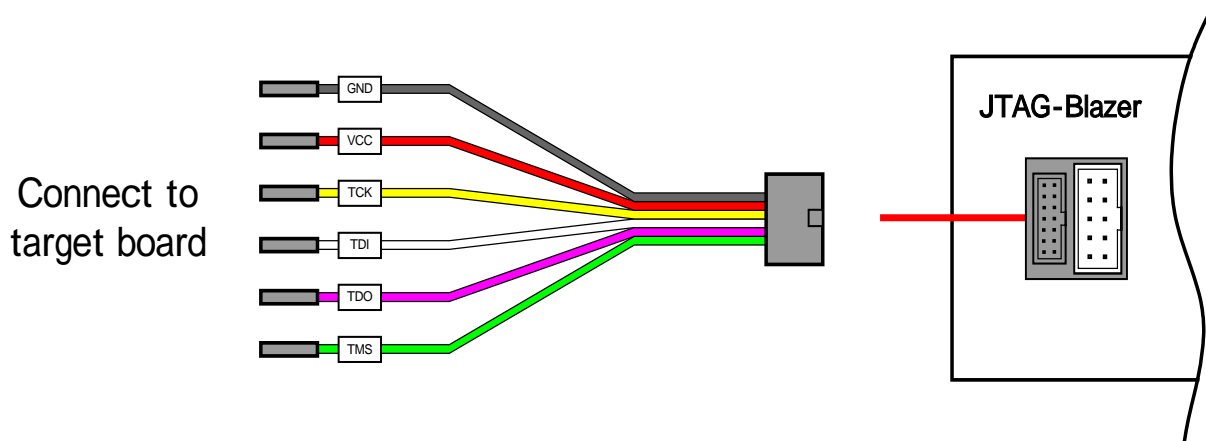


Figure 4-6 6-pin Parallel Cable Connection Diagram

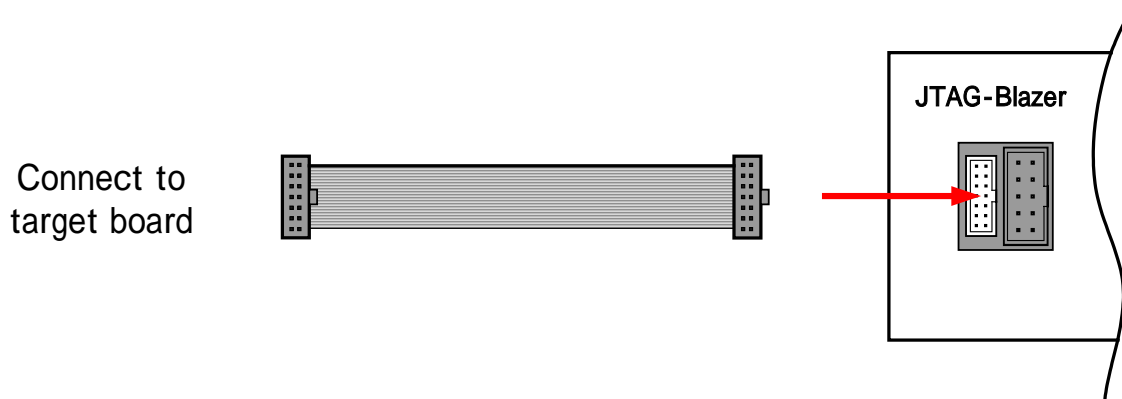


Figure 4-7 14-pin Flat Cable Connection Diagram



Caution

- Do not apply more than +5.5V VCC voltage to the JTAG connector.
- Do not connect or disconnect cables from the unit or target board with the power switch on the target board kept ON.
- When connecting a 6-pin parallel cable to the terminal of a target board, first connect the GND pin for over-voltage protection.
- When connecting a 6-pin parallel cable to a target board, carefully check that the cable is properly connected before turning on the power switch of the target board.
- A 14-pin flat cable is less noise-susceptible and can suppress cross-talk better compared to a 6-pin parallel cable. Therefore, we recommend using the 14-pin flat cable to enable the use of low-voltage target devices and high-speed configuration, in addition to avoiding malfunction due to effects from the environment.
- Due to connection conditions with a target device (i.e. chain connection or wiring length on the target board), in some circumstances high-speed writing may not be possible. If this occurs, decrease the speed setting and try it again.
- Do not extend the JTAG cable.
- Do not connect the 14-pin flat cable and the 6-pin parallel cable simultaneously. Failure to observe this could result in damage to the target board.

4.6. Networking

This product can be used in a local area network (LAN) environment.

◆ Using DHCP

Make sure that a DHCP server is available within the LAN.

Make sure that there are enough free IP addresses under the DHCP server within the LAN.

Note: If you have any questions related to connecting to the network, consult with your network administrator.

◆ Using a Fixed IP Address

Make sure that the IP address you want to use is available.

Note: If you have any questions related to connecting to the network, consult with your network administrator.

◆ Security

This product does not provide any special security protection against access from the network. We recommend that all possible security measures be taken against external access.

Port numbers used by this product are TCP: **39293** and **39793**.

5. How to Use the JTAG-Blazer

This chapter explains how to use the JTAG-Blazer.

The following provides a brief description of the JTAG-Blazer's functions. For more information on each function, refer to the specified page.

If you have not completed assigning the JTAG-Blazer's IP address yet, be sure to do this address by referring to **5.1. Search/Set IP Address**.

5.1. Searching/Setting IP Address (P.11)

Searching for the JTAG-Blazer and setting an IP address for it.

5.2. Writing to Target (P.15)

Writing to a target board via network.

5.3. Writing to Internal Memory (P.18)

Writing a file to the JTAG-Blazer's internal memory for standalone writing.

5.4. Writing in Standalone (P..21)

Writing data stored in the JTAG-Blazer internal memory to a target board.
This enables high-speed data transfer.

5.5. Displaying Configuration Information (P.22)

Displaying device information on a target board connected to the JTAG-Blazer.

5.6. Displaying Internal Memory Information (P.25)

Displaying information on files stored in the JTAG-Blazer's internal memory.

5.7. Setting JTAG Clock (P.27)

Setting JTAG clock used when writing into a target board.

5.8. Displaying Firmware Information (P.29)

Displaying the JTAG-Blazer firmware information.

5.9. Upgrading Firmware (P.30)

Updating the JTAG-Blazer firmware.

5.10. Clearing History (P.32)

Clearing the JB Manager's operational history.

5.11. TE7720 Device Mode (P.33)

Setting options for when a device on the target board is a TE7720 device.

5.1. Searching/Setting IP Address

This function searches for a JTAG-Blazer and sets an IP address for it. It refers to a MAC address specified on the reverse side of the main unit that identifies each JTAG-Blazer. The JTAG-Blazer is set to DHCP mode by factory default.



Caution

Since this function uses broadcast packets to search for the JTAG-Blazer, it cannot function over a router. Use this function within a network area where broadcast packets can reach.
If you have any questions regarding networking, consult with your network administrator.

5.1.1. Making a Connection

Connect a PC to the JTAG-Blazer using a LAN cable. If you want to connect them directly without using a network, use a cross-type LAN cable.

5.1.2. Search/Set Sequence

1. Check the MAC address specified on the reverse side of the JTAG-Blazer.

MODEL	JB010-FP0
SERIAL NO.	XXXXXX-XXX
MAC ADDRESS	00:11:0C:xx:xx:xx
POWER	DC5V / 0.4A ⊕ ⊙ ⊖



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Figure5-1 MAC address on the reverse side of the JTAG-Blazer

2. Select Menu, Option, IP Search/Setting.

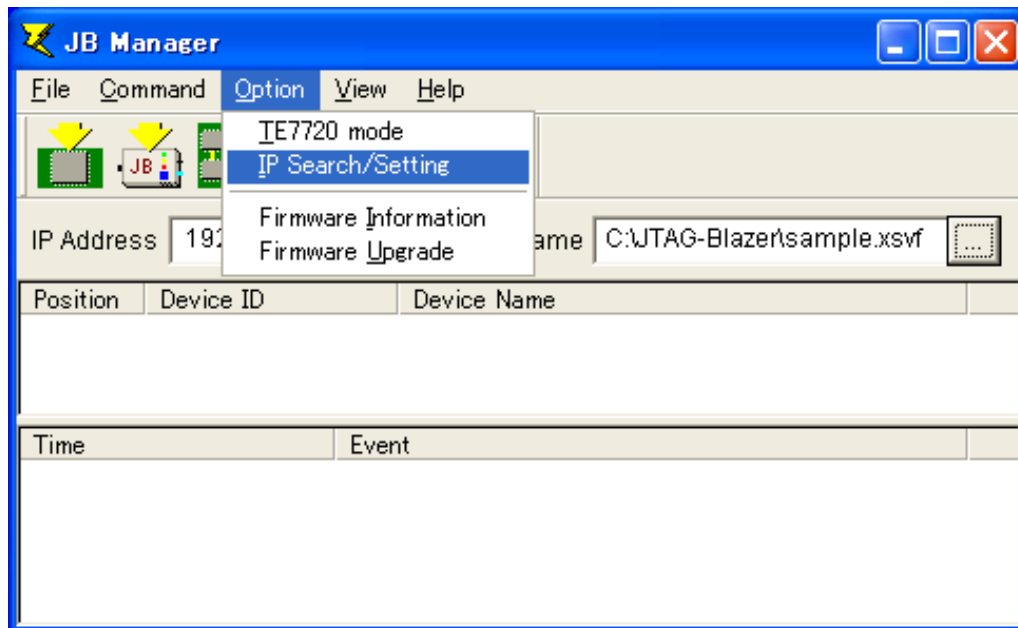


Figure5-2 Setting IP Address

3. An IP configuration dialog will appear.
4. The search function automatically displays various devices such as the JTAG-Blazer within the network. If you want to refresh the list, click the "Find" button.

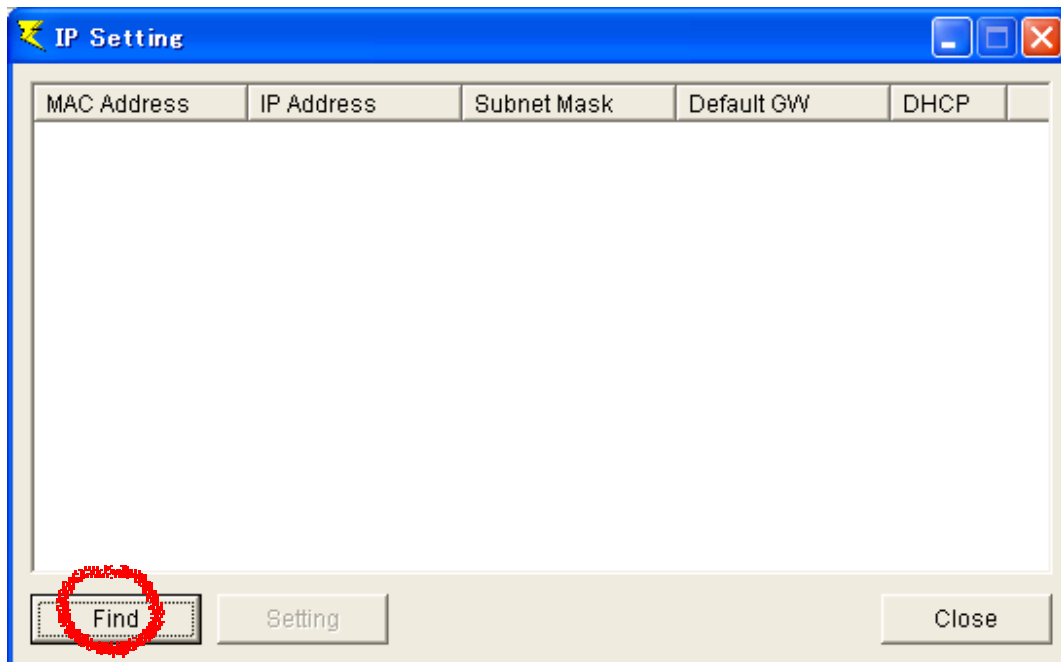


Figure 5-3 S IP Setting Dialog

5. The verified MAC address will be displayed, so select it and then click the “Setting” button. The address shown in the “IP Address” field indicates the **current IP address setting**.
Note: If the target MAC address is not displayed, make sure that the devices are properly connected.

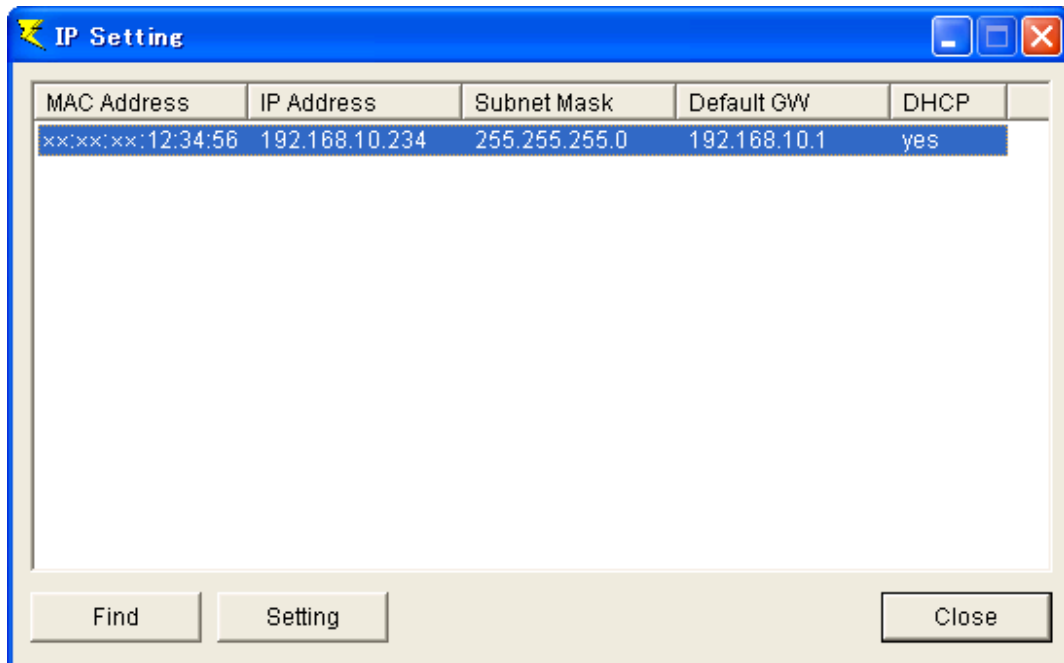


Figure 5-4 S IP Setting Dialog after Search

6. A configuration dialog will open.
If using DHCP, select the **DHCP** box and then click the **OK** button.
If DHCP is not being used, uncheck the **DHCP** box. Enter the appropriate values in each field and click the **OK** button.

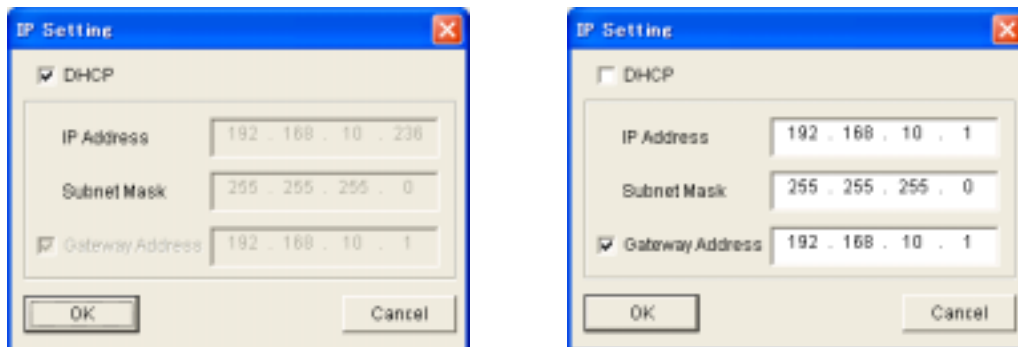


Figure 5-5 IP Setting Dialog

7. A "Waiting for Response" dialog will appear.

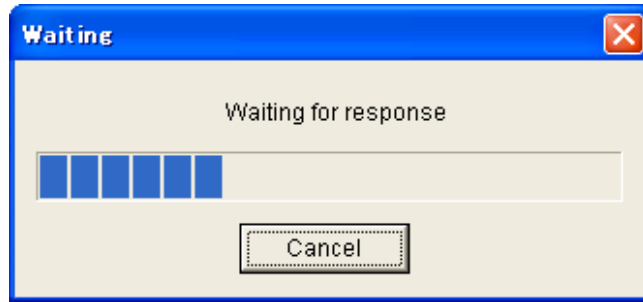


Figure 5-6 Waiting for Response Dialog

8. When the changes have been completed, **Figure 5-7** appears.

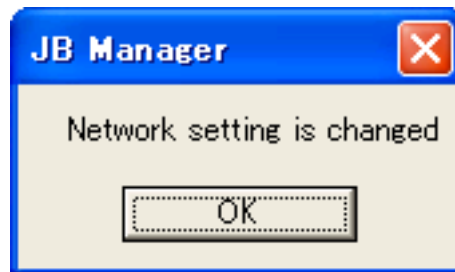


Figure 5-7 Message Indicating Completion of Configuration



Caution

Be careful not to power off the JTAG-Blazer while the "Waiting for Response" dialog is displayed.

About Setting the IP Address

Please take note that this IP Address configuration tool prohibits the setting of the following addresses.

- 0.0.0.0
- 255.255.255.255
- Broadcast Addresses
- Multicast Addresses
- Class E Addresses

5.2. Writing to Target

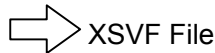
This function remotely configures devices on a target board connected to the JTAG-Blazer via network. There are no restrictions in data size and it allows for multiple devices to be configured in a single operation.

5.2.1. Preparing the XSVF File

Prepare the XSVF file to be used to configure the target device. For information on creating a XSVF file, refer to **Appendix B. Creating a XSVF File with B.iMPACT**.

Note that the design file specified when creating a XSVF file differs dependent on type of device.

CPLD: *.jed
FPGA: *.bit
PROM: *.mcs



5.2.2. Making a Connection

Connect a PC to the JTAG-Blazer using a LAN cable. If you want to connect them directly, use a cross-type LAN cable. For information on connecting the JTAG-Blazer to a target board, refer to **4.5. Connecting a JTAG Cable**.

After completing the connection, run "Display Configuration Information" (refer to **5.5. Displaying Configuration Information**). If an error occurs, make sure that the devices are properly connected.

5.2.3. Writing Sequence

1. Here, specify the IP address of the JTAG-Blazer by entering it into the IP Address field.
2. Click the File Selection button to select the configuration data file or enter the absolute path of the file in the File Name field.
3. Click the Write to Target button.

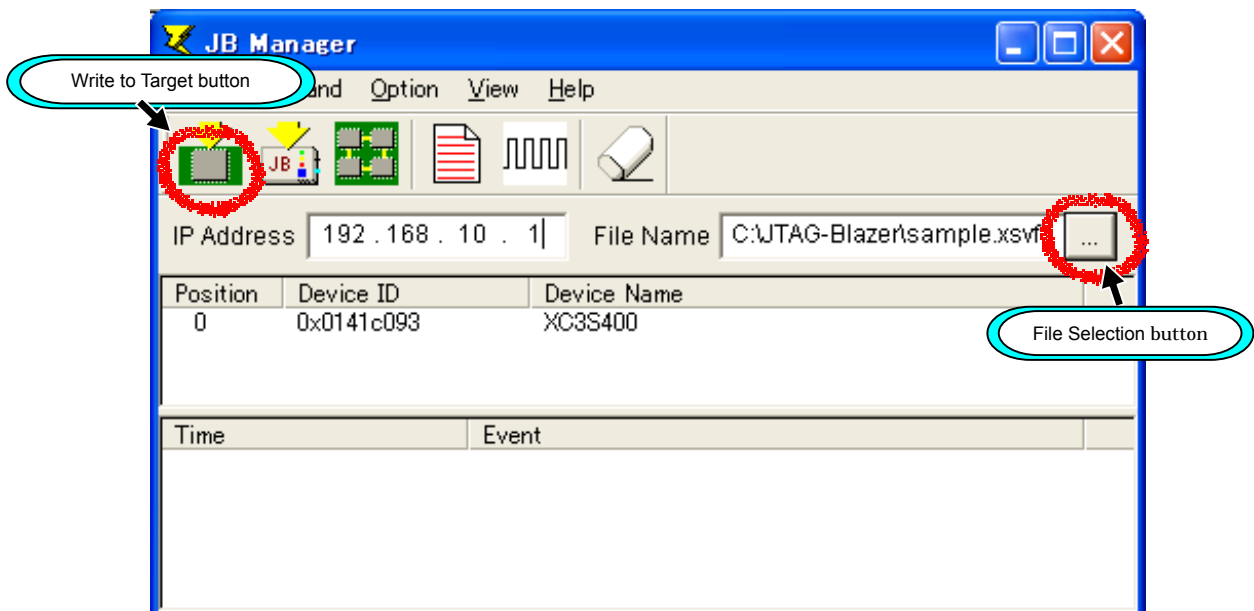


Figure 5-8 Write to Target Window

4. A Download Confirmation window will appear. Make sure that the download parameters are correct and then click the OK button.

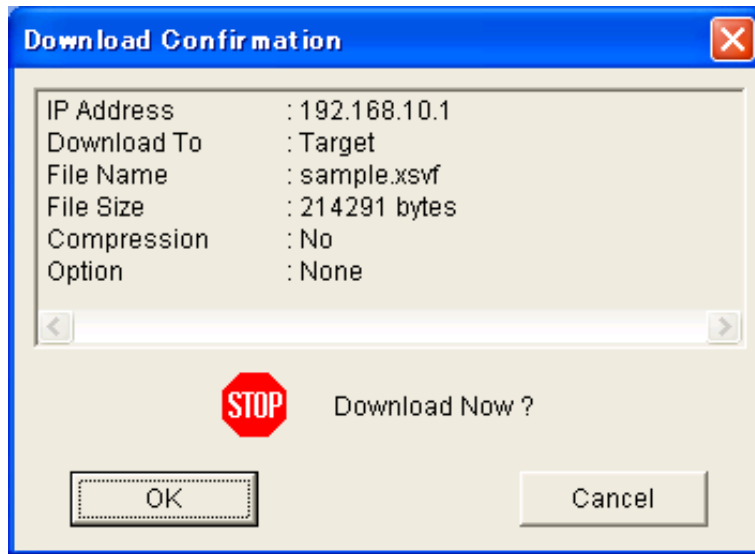


Figure 5-9 Download Confirmation Window

5. A Downloading dialog will appear. The downloading dialog indicates the progress of writing.
6. After the writing has completed, the downloading dialog automatically closes.

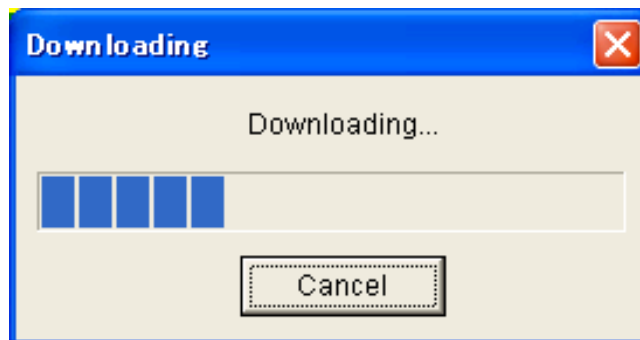


Figure 5-10 Downloading Dialog

Note: If an error occurs, an error message appears and its associated error code is displayed in the Display History field.

For more information on this error code, refer to **Appendix C. Error List**.

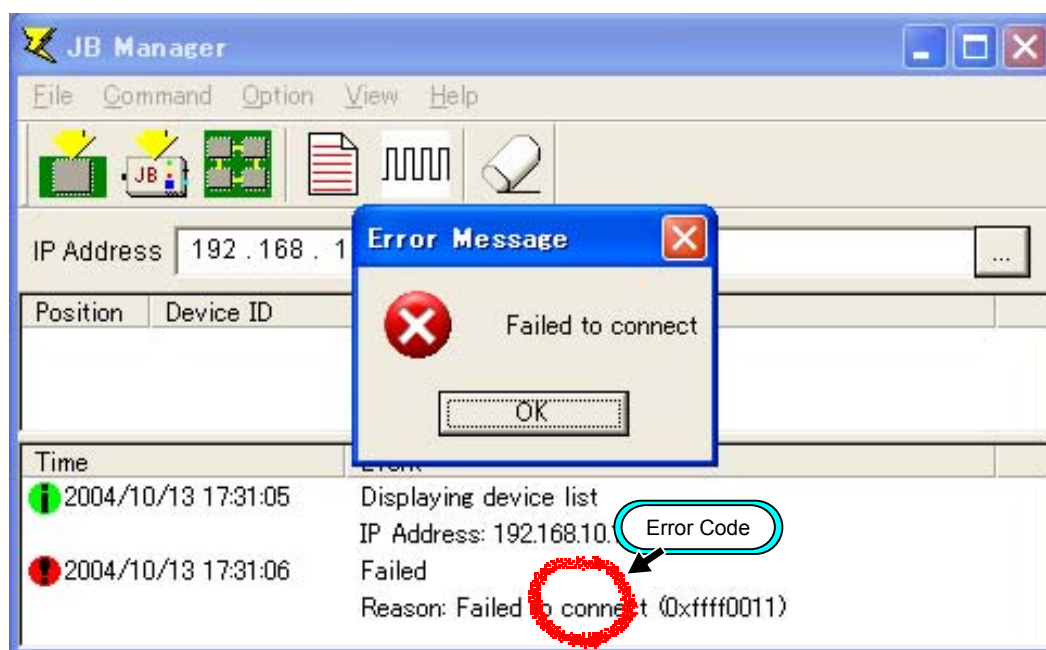


Figure 5-11 Error Message

5.3. Writing to Internal Memory

This function stores the file that is to be used in a standalone write in the non-volatile internal memory of the JTAG-Blazer. The internal memory capacity is approximately 16Mbit. However, with the support for configuration data compression, files that exceed the memory capacity will be automatically compressed.

5.3.1. Preparing the XSVF File

Prepare the XSVF file that is to be written to the internal memory. For information on creating a XSVF file, refer to **Appendix B. Creating a XSVF File with iMPACT**.

Note that the design file specified when creating a XSVF file differs dependent on type of device.

CPLD: *.jed
FPGA: *.bit
PROM: *.mcs

➔ XSVF File

5.3.2. Making a Connection

Connect a PC to the JTAG-Blazer using a LAN cable. If you want to connect them directly, use a cross-type LAN cable.

After completion of a connection, execute a Display Firmware Information command (refer to **5.8. Display Firmware Information**). If an error is generated, make sure that they are properly connected.

5.3.3. Writing Sequence

1. Specify the IP address of the JTAG-Blazer by entering it into the IP Address field.
2. Click the File Selection button to select the configuration data file or enter the absolute path of the file in the File Name field.
3. Click the Write to Internal Memory button.

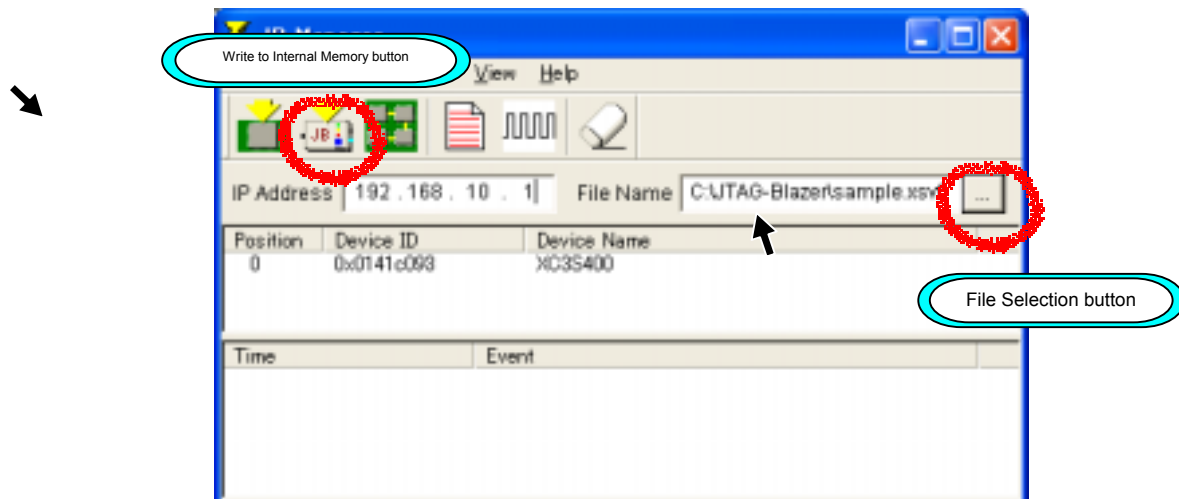


Figure 5-12 Write into Internal Memory Window

4. A Download Confirmation window will appear. Make sure that the write parameters are correct and then click the OK button.

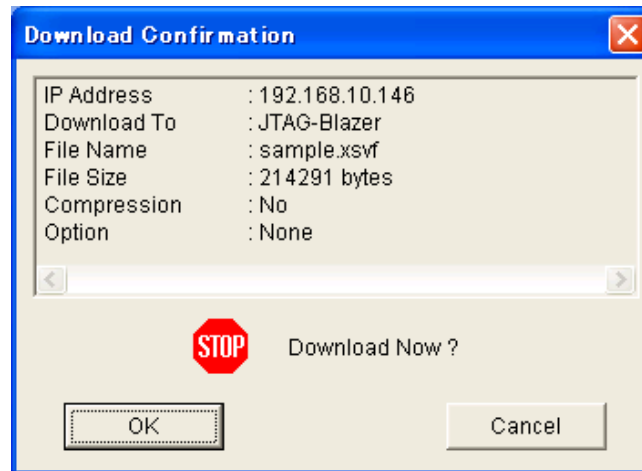


Figure 5-13 Download Confirmation Window

5. A Downloading dialog will appear. The downloading dialog indicates write progress.
6. After the writing has completed, the downloading dialog automatically closes.

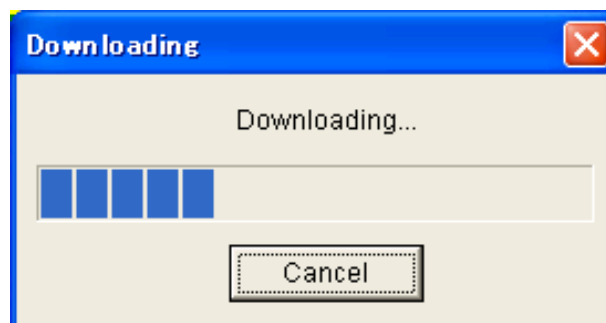


Figure 5-14 Downloading Dialog

Note: If an error occurs, an error message appears and its associated error code is displayed in the Display History field.

For more information on this error code, refer to **Appendix C. Error List**.

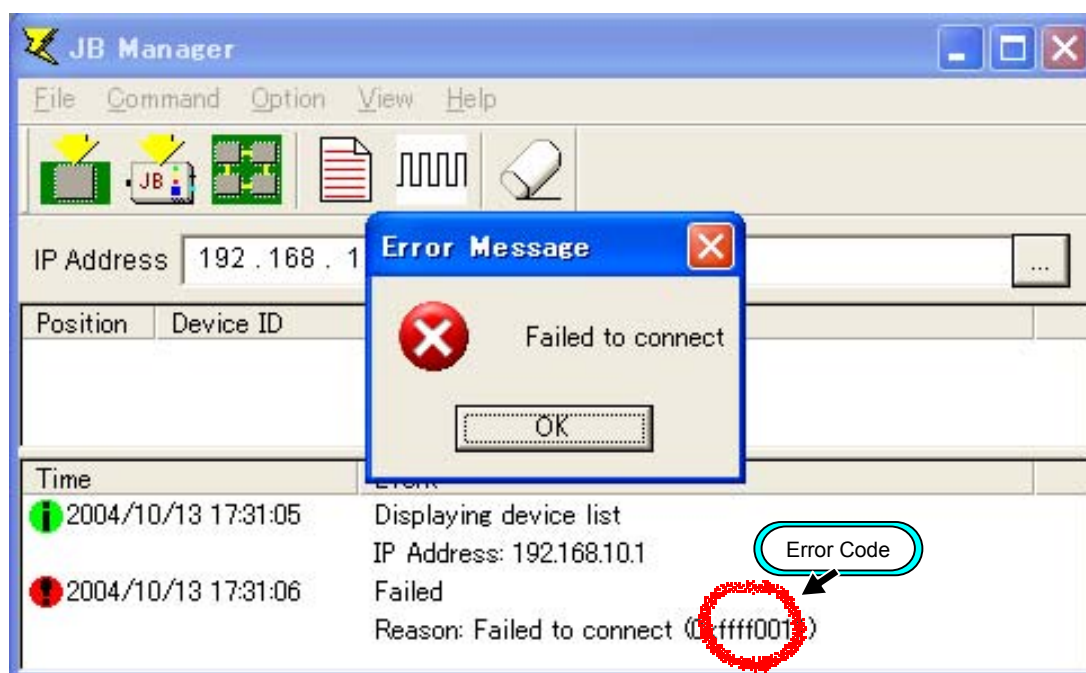


Figure 5-15 Error Message

5.4. Writing in Standalone

This function is used to write a file that has been stored in the internal memory of the JTAG-Blazer to a connected target board. It is the fastest method of writing.

5.4.1. Making a Connection

Connect the JTAG-Blazer to a target board. For information on this connection, refer to **4.5. Connecting a JTAG Cable**.

5.4.2. Writing Sequence

1. Store the configuration data file intended for the target board in the internal memory of the JTAG-Blazer (refer to **5.3. Writing to Internal Memory**).
2. Hold down the START button for **more than one second**.
3. The BUSY lamp will light as writing is initiated.
4. The BUSY lamp will turn off after the writing has completed.

Note: If an error occurs, the ERR lamp will illuminate.

For more information on this error, refer to **Appendix D. ERR Lamp Illumination Pattern**.

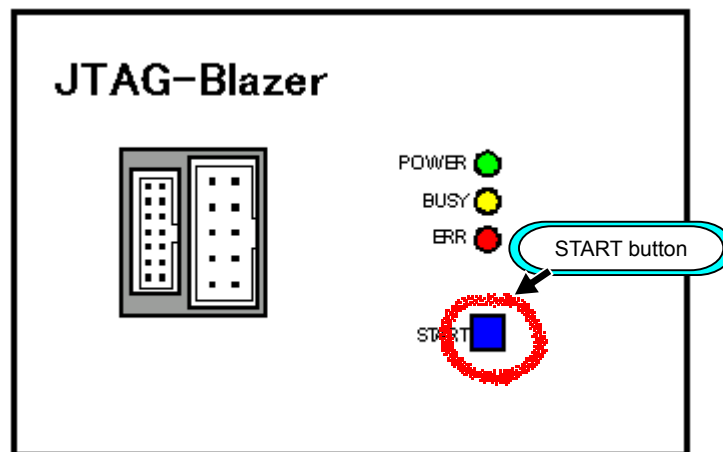


Figure 5-16 START Button

5.5. Displaying Configuration Information

This function is used to display information on devices on a target board connected to the JTAG-Blazer. If multiple devices are installed on a target board, information on all these devices will be displayed.

5.5.1. Making a Connection

Connect a PC to the JTAG-Blazer using a LAN cable. If you want to connect them directly, use a cross-type LAN cable. For information on connecting the JTAG-Blazer to a target board, refer to 4.5. **Connecting a JTAG Cable.**

5.5.2. Acquisition and Display Sequence

1. Specify the IP address of the JTAG-Blazer by entering it into the IP Address field.
2. Click the Display Configuration Information button.

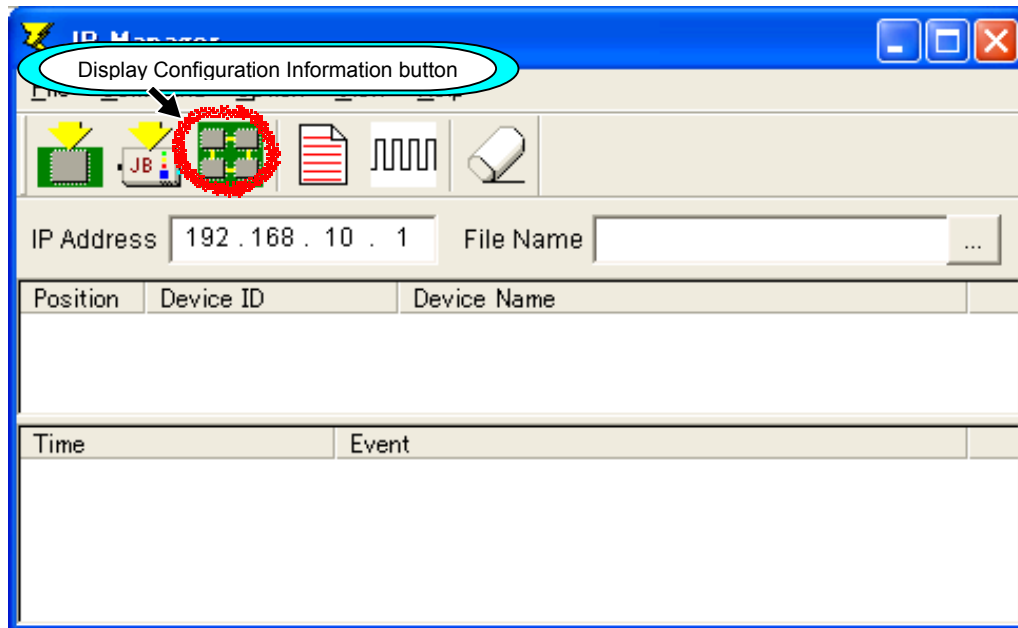


Figure 5-17 Display Configuration Information Window

- If the acquisition is successful, the device ID is displayed as shown in **Figure 5-18**.

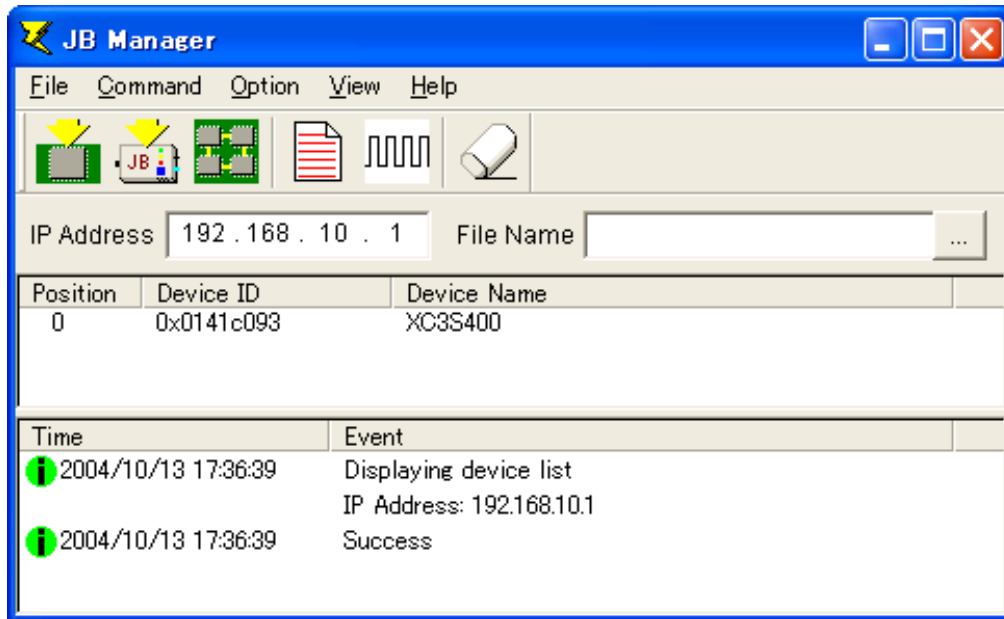


Figure 5-18 Display Device Information Window after Acquisition

Note: If an error occurs, an error message appears and its associated error code is displayed in the History field.

For more information on this error message, refer to **Appendix C. Error List**.

5.5.3. Registering Undefined Device ID

This function is used to register the name of a device displayed as undefined in JB Manager so that the name will be displayed at acquisition.

- Using a text editor, open the `jb_device_list.dat` file copied when JB Manager was installed. (**4.3. Installing JB Manager**).

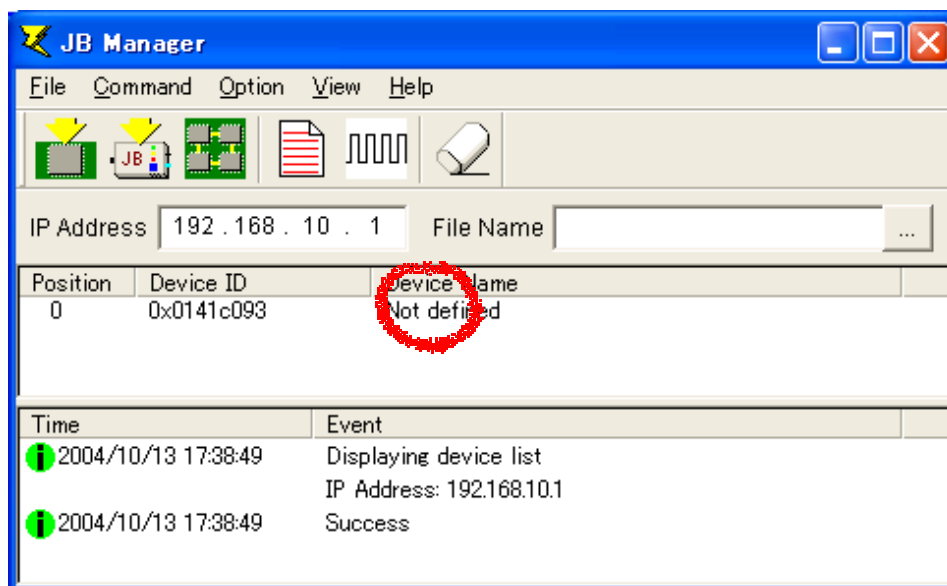


Figure 5-19 Display Device ID Window with Undefined Device Name

2. Enter "Device ID", comma (,), "Device Name" and then a Return in order.

Figure 5-20 shows Device ID: 0x0141c093 with Device Name: XC3S400 being registered.

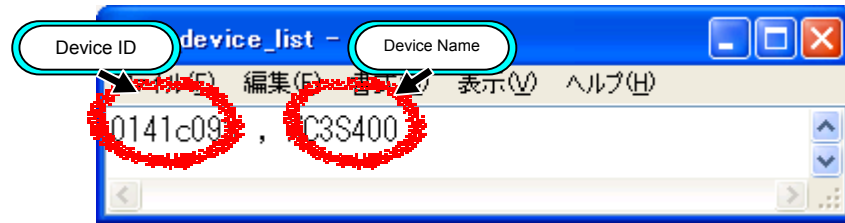


Figure 5-20 jb_device_list.dat Editing Window

3. Save the edited file and then restart JB Manager to display the registered device name.

5.6. Displaying Internal Memory Information

This function is used to display file information stored in the internal memory of the JTAG-Blazer, such as file name, file size, date & time of data transfer, file compression and options. **Table 5-21** provides a brief description of this information.

Table 5-21 List of Items on Display Internal Memory Information

Item	Description
File Name	Name of stored file
File Size	Size of stored file
Date & Time	Date and time at which file was stored
File Compression	Compression state of stored file
Options	Options set on stored file

5.6.1. Making a Connection

Connect a PC to the JTAG-Blazer using a LAN cable. If you want to connect them directly, use a cross-type LAN cable.

After making the connection, choose Firmware Information from the Option menu (refer to **5.8. Displaying Firmware Information**). If an error occurs, make sure they are properly connected.

5.6.2. Acquisition and Display Sequence

1. Specify the IP address of the JTAG-Blazer by entering it into the IP Address field.
2. Click the Display Internal Memory Information button.

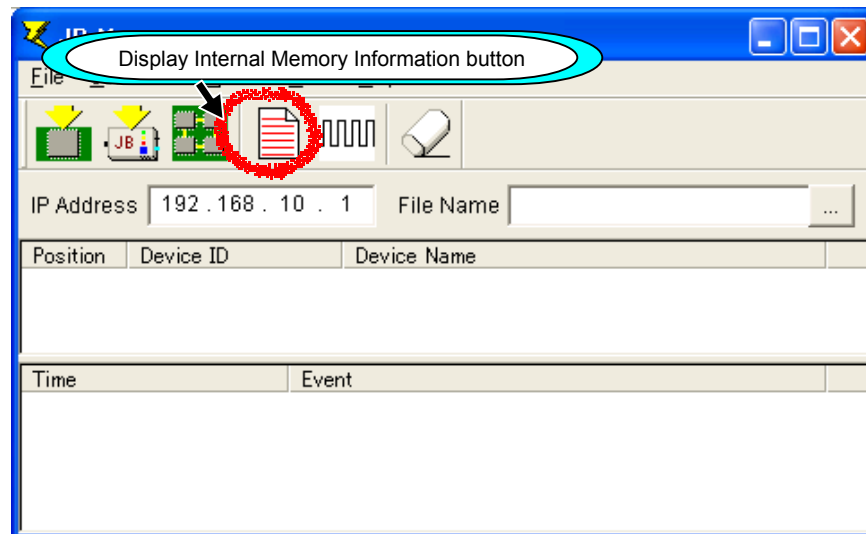


Figure 5-22 Display Internal Memory Information Window

3. If the acquisition is successful, a File Information window as shown in **Figure 5-23** appears.

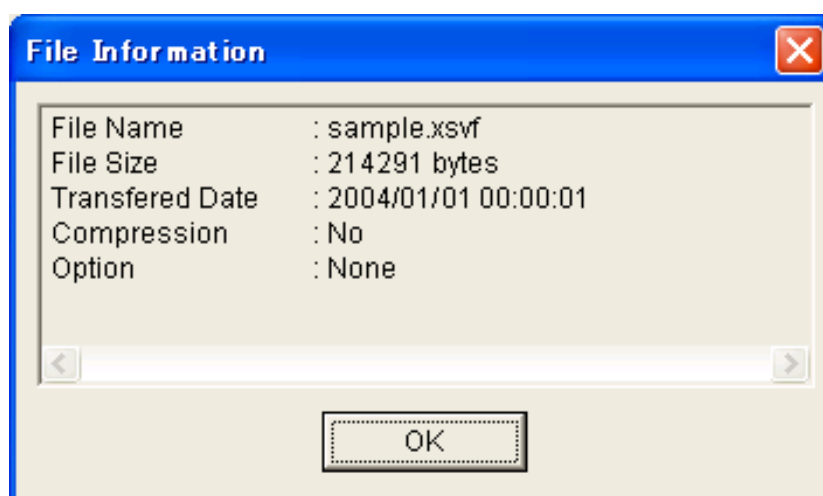


Figure 5-23 File Information Window

Note: If an error occurs, an error message appears and its associated error code is displayed in the History field.

For more information on this error, refer to **Appendix C. Error List**.

5.7. Setting the JTAG Clock

This function is used to set the JTAG clock on which data is transferred to devices on the target board. It is specifically used for carrying out high-speed configuration or when configuration fails. Be sure to select a JTAG clock setting compatible with the connected target board.

5.7.1. Making a Connection

Connect a PC to the JTAG-Blazer using a LAN cable. If you want to connect them directly, use a cross-type LAN cable.

After making the connection, choose Firmware Information from the Option menu (refer to **5.8. Displaying Firmware Information**). If an error occurs, make sure they are properly connected.

5.7.2. Acquisition and Setting Sequence

1. Specify the IP address of the JTAG-Blazer by entering it in the IP Address field.
2. Click the Set JTAG Clock button.

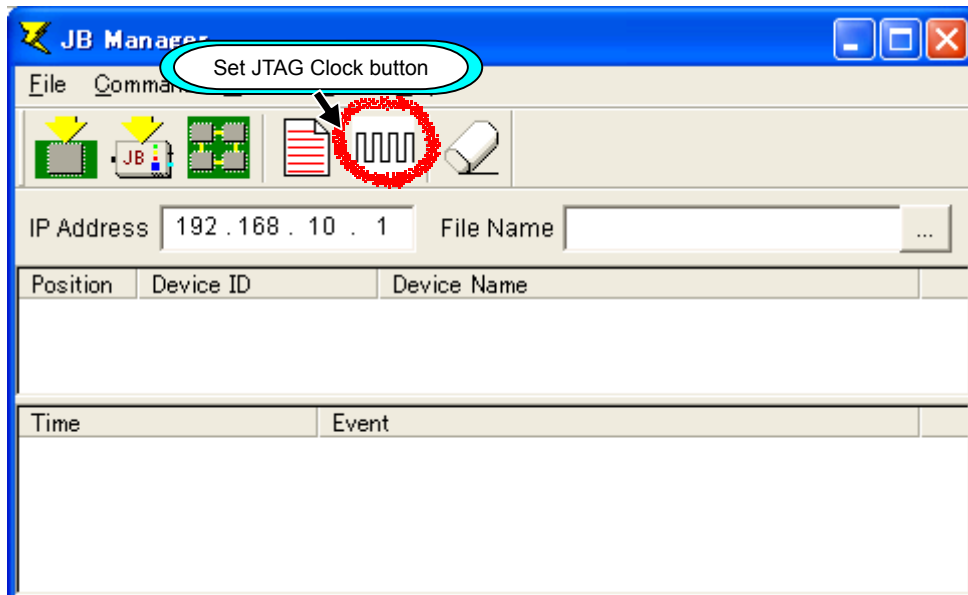


Figure 5-24 Selecting Set JTAG Clock Window

3. A JTAG Clock Setting window will open. The value shown is the current JTAG Clock setting.

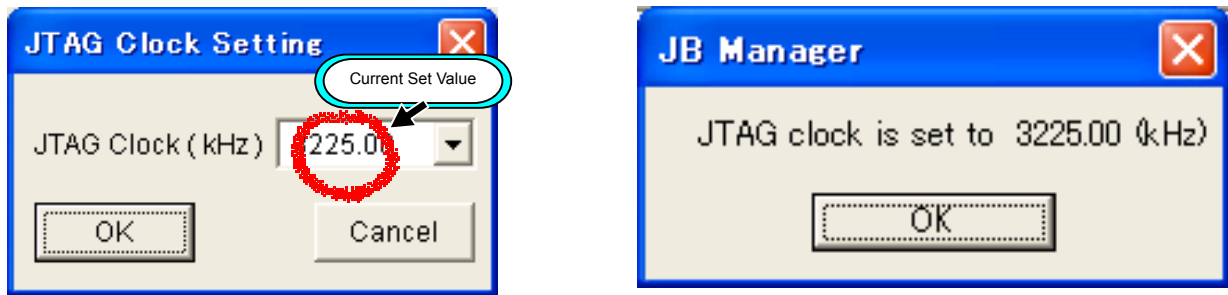


Figure 5-25 Set JTAG Clock Window

4. From the combo box select the value to be set and then click on the OK button.

**Caution**

Once the OK button is clicked, the JTAG-Blazer will go into a BUSY state for two seconds while storing the selected value. Be careful not to turn the unit off during this time. If the power is cut the stored data may be lost.

5.8. Displaying Firmware Information

This function displays the JTAG-Blazer's firmware information. It is mainly used when upgrading the firmware.

5.8.1. Making a Connection

Connect a PC to the JTAG-Blazer using a LAN cable. To connect them directly, use a cross-type LAN cable.

5.8.2. Acquisition and Display Sequence

1. Select Menu, Option, and then Firmware Information.

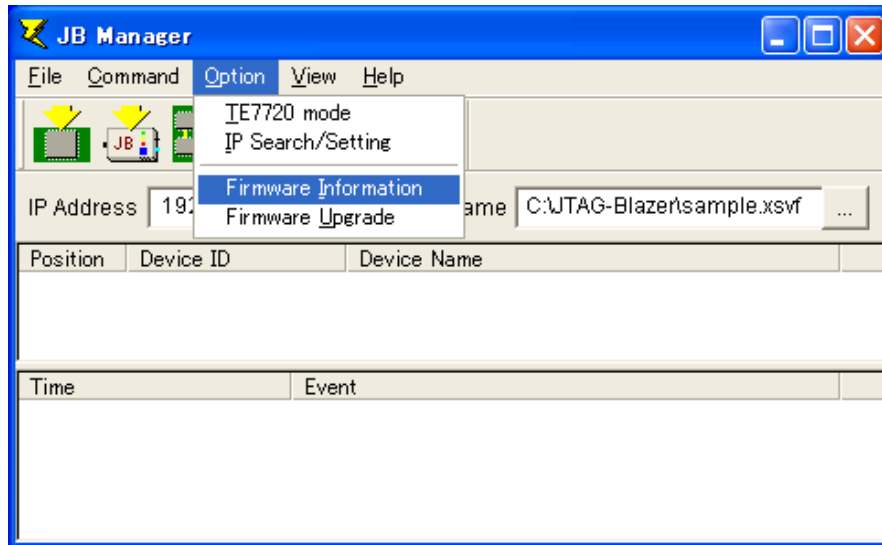


Figure 5-26 Displaying Firmware Information Window

2. A Version Information window will open.
3. After verifying the firmware information, click OK.

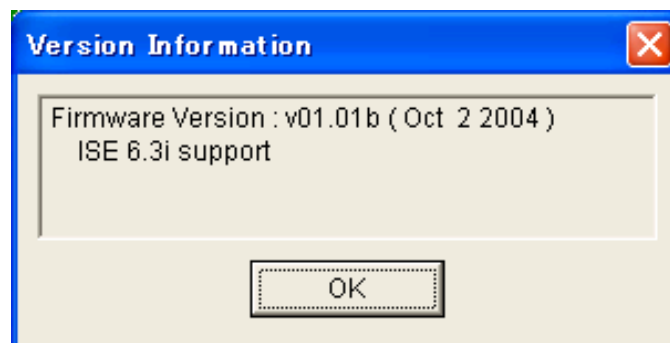


Figure 5-27 Version Information Window

5.9. Upgrading Firmware

This function is used to upgrade the JTAG-Blazer's firmware. For information on upgrades, please refer to our web site.

5.9.1. Making a Connection

Connect a PC to the JTAG-Blazer using a LAN cable. To connect them directly, use a cross-type LAN cable.

5.9.2. Update Sequence

1. Select Menu, Option, and then Firmware Upgrade.

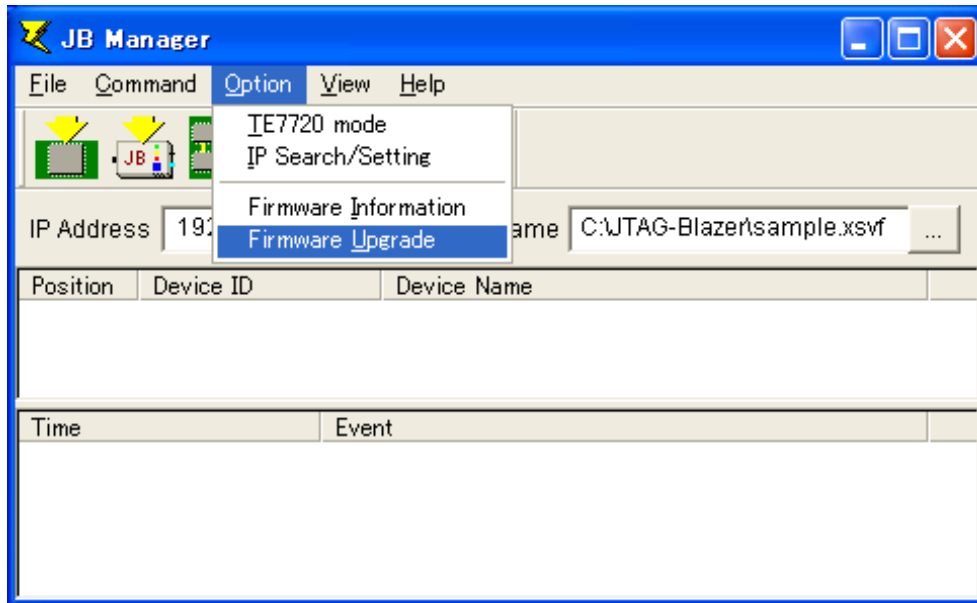


Figure 5-28 Firmware Upgrade Window

2. A file selection dialog will open. Select the appropriate file and then click the Open button.
3. A Firmware Upgrade confirmation window will open. Verify that the upgrade parameters are correct and then click OK.

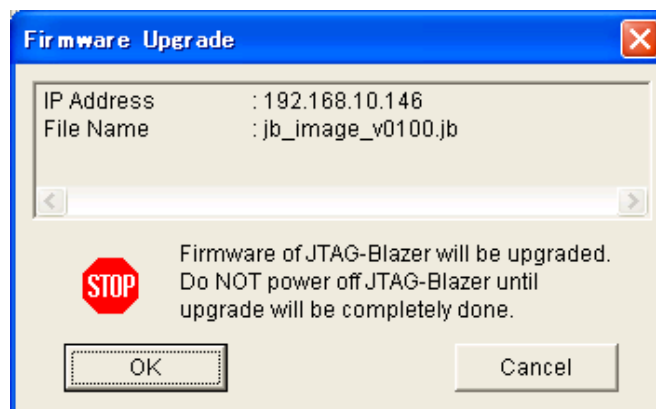


Figure 5-29 Firmware Upgrade confirmation Window

4. A Downloading dialog appears. The downloading dialog shows write progress.

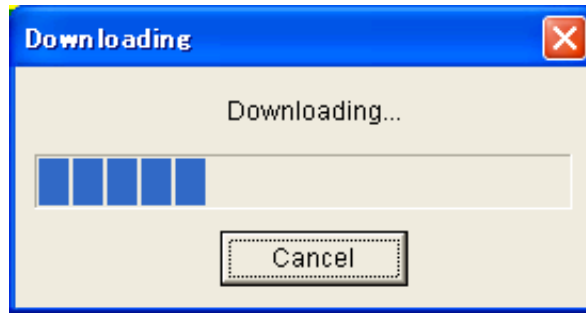


Figure 5-30 Downloading Dialog

5. When the downloading has completed, the downloading dialog closes automatically.
6. The JTAG-Blazer will automatically reboot.

**Caution**

Be careful not to power off the JTAG-Blazer while the downloading dialog is displayed. If power is cut, an irregularity in the firmware can occur, disabling writing and other functions. In this situation, upgrade the firmware again.

5.10. Clearing History

This function is used to delete the information in the JB Manager's History field.

5.10.1. Delete Sequence

1. Click the Delete History button.
2. The history information will be deleted.

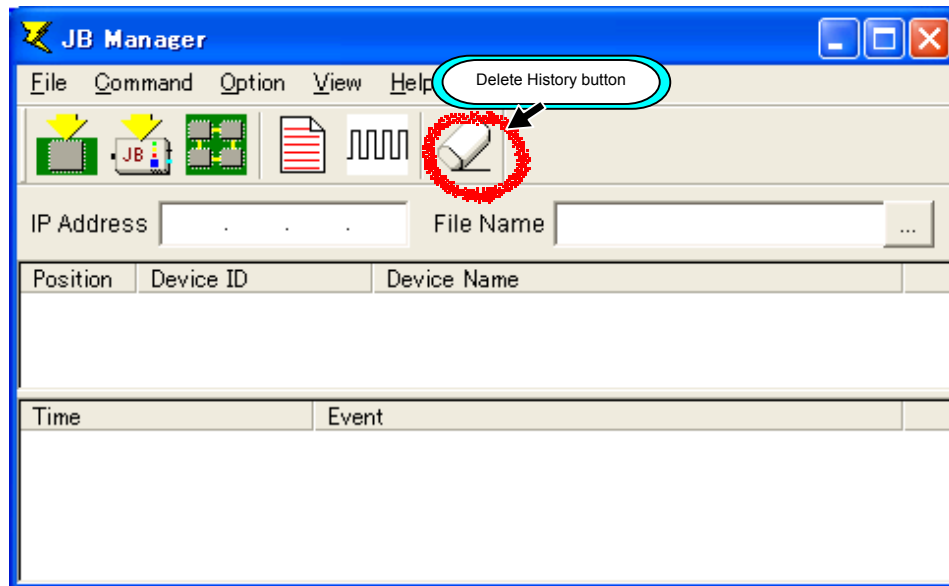


Figure 5-31 Delete History Window

5.11. TE7720 Device Mode

This is the procedure used to select the option required when configuring a TE7720 device. Be careful not to choose this option for devices other than TE7720.

The TE7720 (manufactured by Tokyo Electron Device) is a control LSI for configuring Xilinx FPGAs using general-purpose Flash memory.

The TE7720 device option is required when using the following functions.

- Writing to a target board (refer to **5.2. Write into Target**)
- Writing to Internal Memory (refer to **5.3. Write into Internal Memory**)

5.11.1. Set Sequence

1. Select Menu, Option, and then TE7720 Mode.

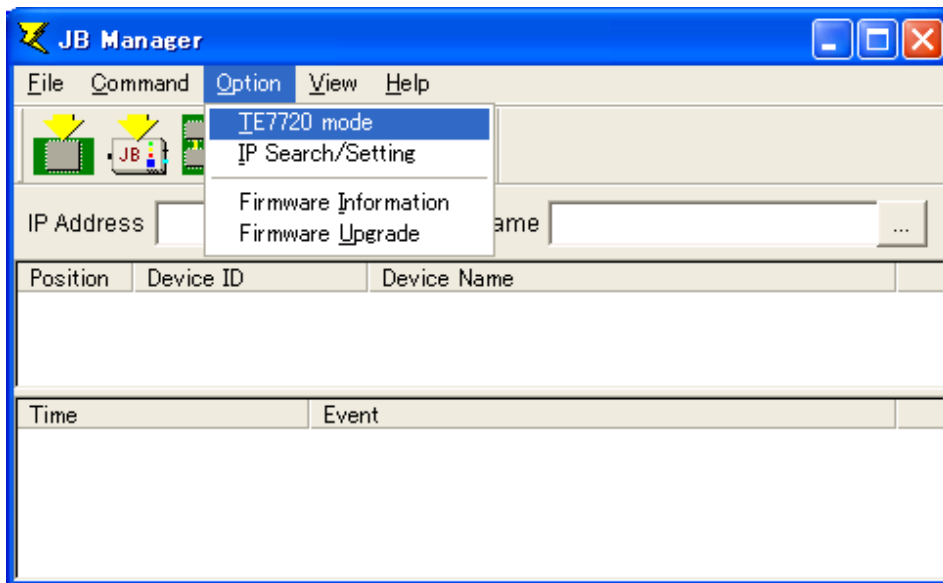


Figure 5-32 Set TE7720 Option Window

This completes the option setting.

This option can be checked in the Download Confirmation dialog (refer to **Figure 5-33**).

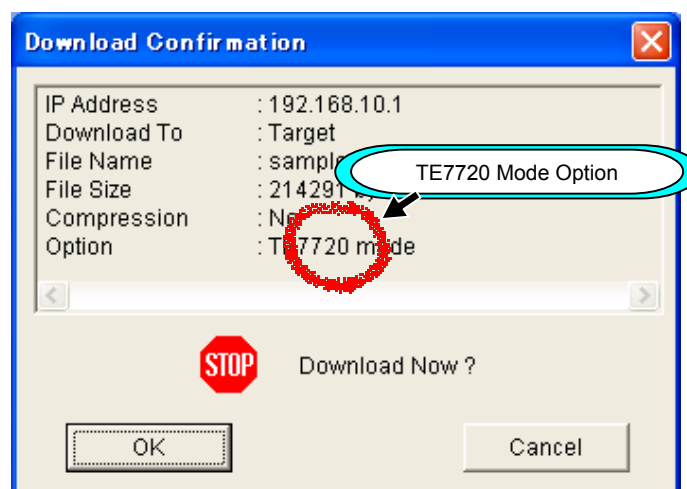


Figure 5-33 Download Confirmation Window in TE7720 Mode

6. Troubleshooting

This chapter describes points to be checked if the JTAG-Blazer does not operate properly or an error message appears. Please read appropriate items as needed.

◆ Network

Q. Cannot access the JTAG-Blazer.

- A. Make sure that the power switch of the JTAG-Blazer is turned on.
Make sure that the Link lamp lights up.
Make sure that there are no routers between the JTAG-Blazer and the PC.

Q. Cannot operate the JTAG-Blazer.

- A. Make sure that the power switch of the JTAG-Blazer is turned on.
Make sure that the Link lamp lights up.
Make sure that the IP address of the JTAG-Blazer is set correctly.

◆ JTAG

Q. Cannot write successfully.

- A. Make sure that the power switch of the JTAG-Blazer is turned on.
Make sure that the JTAG cable is properly connected.
Make sure that the XSVF file has been created correctly.

Q. Writing completes, but the target board does not operate properly.

- A. Make sure that the XSVF file was created correctly.
Make sure that all options have been set correctly when writing.

◆ JB Manager

Q. Device name is displayed as “undefined”.

- A. The device may not have been registered yet. Refer to **5.5.3. Registering Undefined Device ID** to register it.
Make sure that a `jb_device_list.dat` file is present in the same directory as `JBManager.exe`.

Q. Immediately after boot-up, the message “Device list file (jb_device_list.dat) is not present” appears.

- A. Install a device list file (refer to **4.3. Installing JB Manager**).

Appendix A. Product Specifications

JTAG-Blazer Specifications

Dimension	Approx. 91 W × 60 D × 33H (mm) (excluding projections)
Weight	Approx.250g
Operational environment	0 to 40 degrees (non-condensing)
Power supply	DC5V 0.4A
Ethernet	10Base-T / 100Base-Tx
LED indicator	POWER, BUSY, ERR
Switches	Power switch, START button
JTAG clock	Max. 12.9MHz (changeable)
Type of Internal Memory	Flash memory
Max. storage capacity	Approx. 16Mbit
Supported file formats	XSVF (Xilinx Serial Vector Format)
Port numbers to be used	TCP: 39293, 39793
Device voltage	1.8V ~ 5V
Supported devices	Spartan II/IIE Series Spartan3 Series Virtex-II Series Virtex-II Pro Series XC9500 Series CoolRunner XPLA3 Series CoolRunner-II Series XC18V Series XCF Series TE7720 (Tokyo Electron Device)

Electrical Specifications of JTAG Signals

Symbol	Parameter	Min	Max	Unit	Conditions
VCC	Target Voltage	1.8	5	V	
ICC	Internal Use Current		6	mA	All Output pin = 4.7kΩ External Pullup All VO=VOL
VIH	High-level input voltage	1.17		V	VCC=1.8V
		1.7		V	VCC=2.5V
		2		V	VCC=3.3V
		3.5		V	VCC=5V
VIL	Low-level input voltage		0.63	V	VCC=1.8V
			0.7	V	VCC=2.5V
			0.8	V	VCC=3.3V
			1.5	V	VCC=5V
VOH	High-level output voltage	VCC-0.1		V	IOH=-100uA, VI=VIH, VCC=1.8V to 4.5V
		1.25		V	IOH=-2mA, VI=VIH, VCC=1.8V
		1.75		V	IOH=-4mA, VI=VIH, VCC=2.3V
		2.15		V	IOH=-12mA, VI=VIH, VCC=3V
		3.3		V	IOH=-16mA, VI=VIH, VCC=4.5V
VOL	Low-level output voltage		0.1	V	IOH=-100uA, VI=VIL, VCC=1.8V to 4.5V
			0.5	V	IOH=-2mA, VI=VIL, VCC=1.8V
			0.45	V	IOH=-4mA, VI=VIL, VCC=2.3V
			0.8	V	IOH=-8mA, VI=VIL, VCC=3V
			1.05	V	IOH=-16mA, VI=VIL, VCC=4.5V

Appendix B. Creating a XSVF File with iMPACT

The JTAG-Blazer uses XSVF (Xilinx Serial Vector Format) for its configuration files. This chapter provides information on how to create a XSVF file with Xilinx iMPACT.

In this document all BIT files, MCS files and JED files are referred to as the design file.

Creating a Configuration File

1. Start iMPACT.
2. Select "Prepare Configuration Files" and then click "Next".

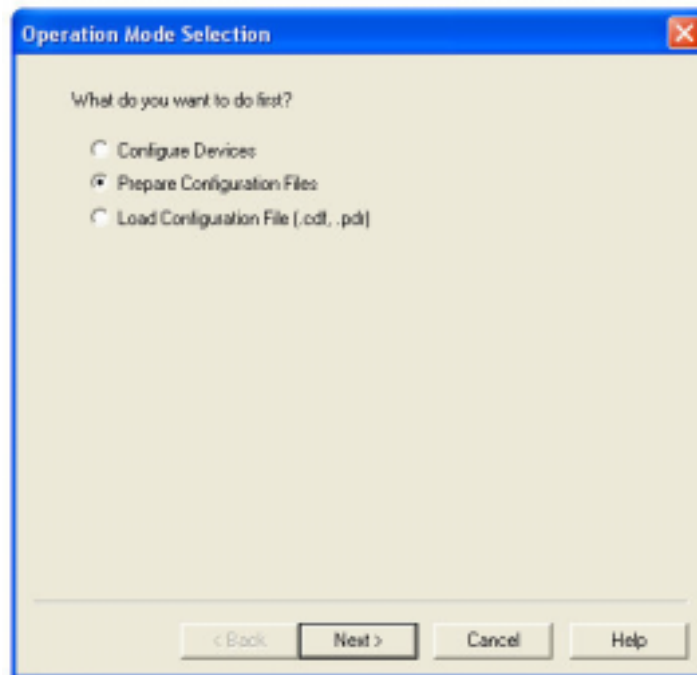


Figure B-1 Operation Mode Selection Window

3. Select "Boundary-Scan File" and then click "Next".

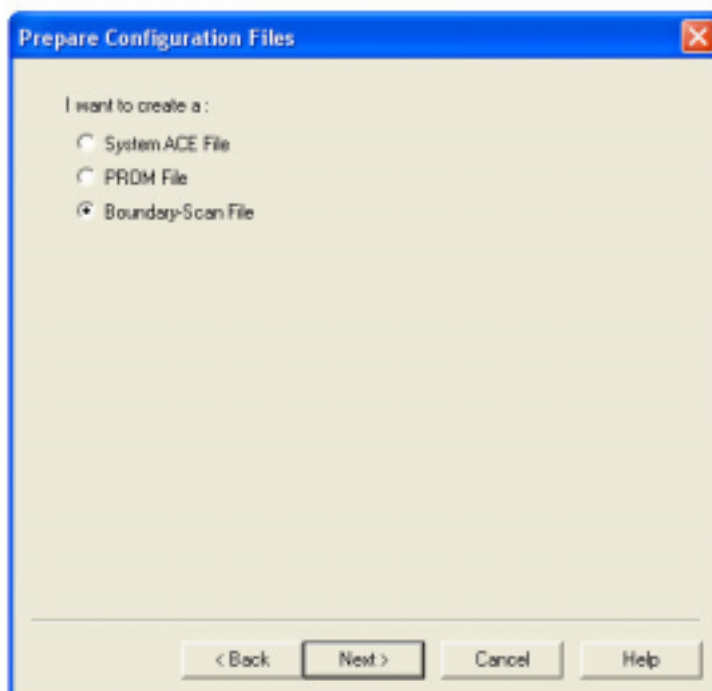


Figure B-2 Prepare Configuration Files Selection Window

4. Select "XSVF File" and then click "Finish".

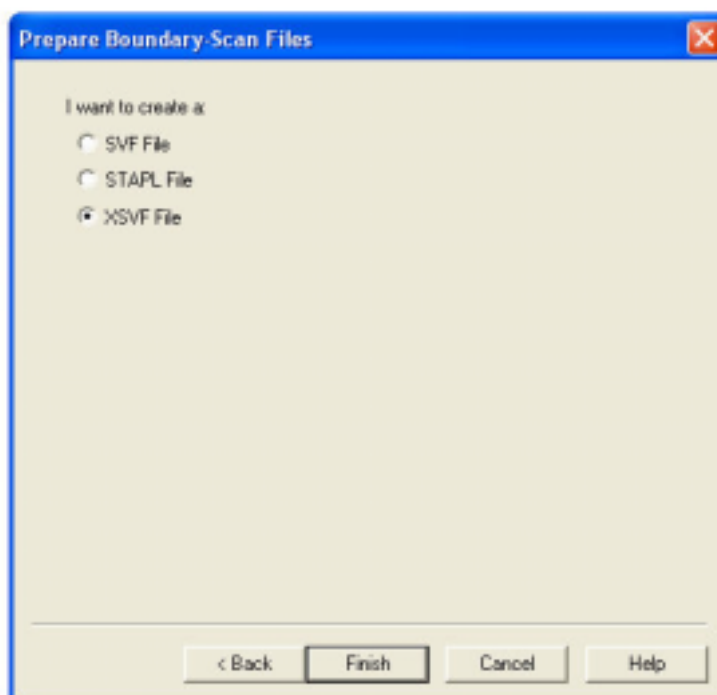


Figure B-3 Prepare Boundary-Scan Files Selection Window

5. Specify the name of the configuration file to be created and the folder to save it in.

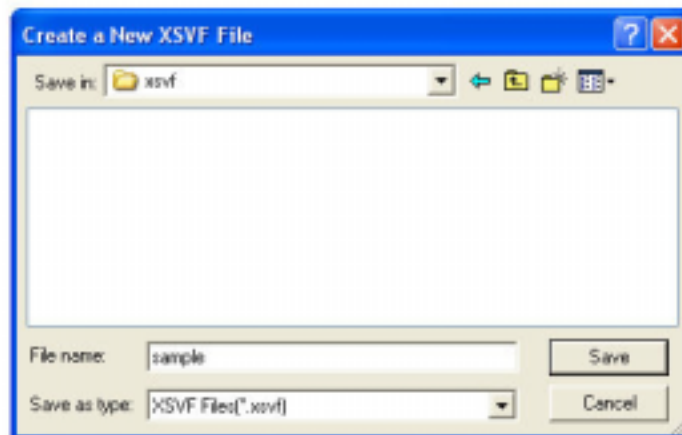


Figure B-4 Create a New XSVF File Dialog

6. Click "OK".

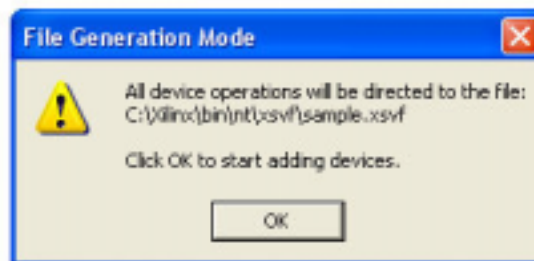


Figure B-5 File Generation Mode Window

7. Select a design file.
Appropriate design file extensions for each device are as follows:
CPLD = *.jed
FPGA = *.bit
PROM = *.mcs

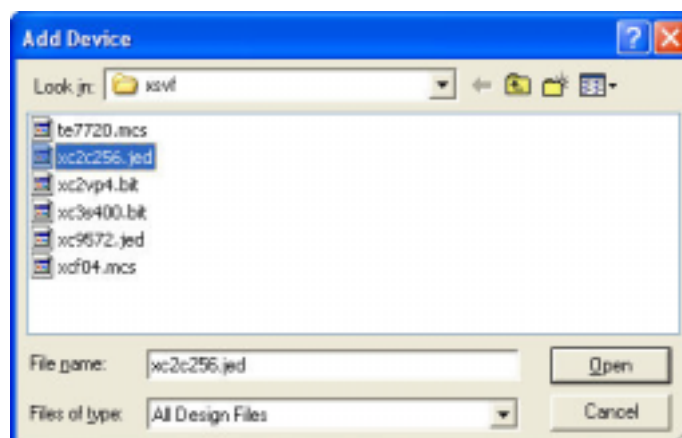


Figure B-6 Add Device Dialog

8. Select (click) a device displayed on the screen. With a right-click or from "Operations" on the menu bar select "Program".

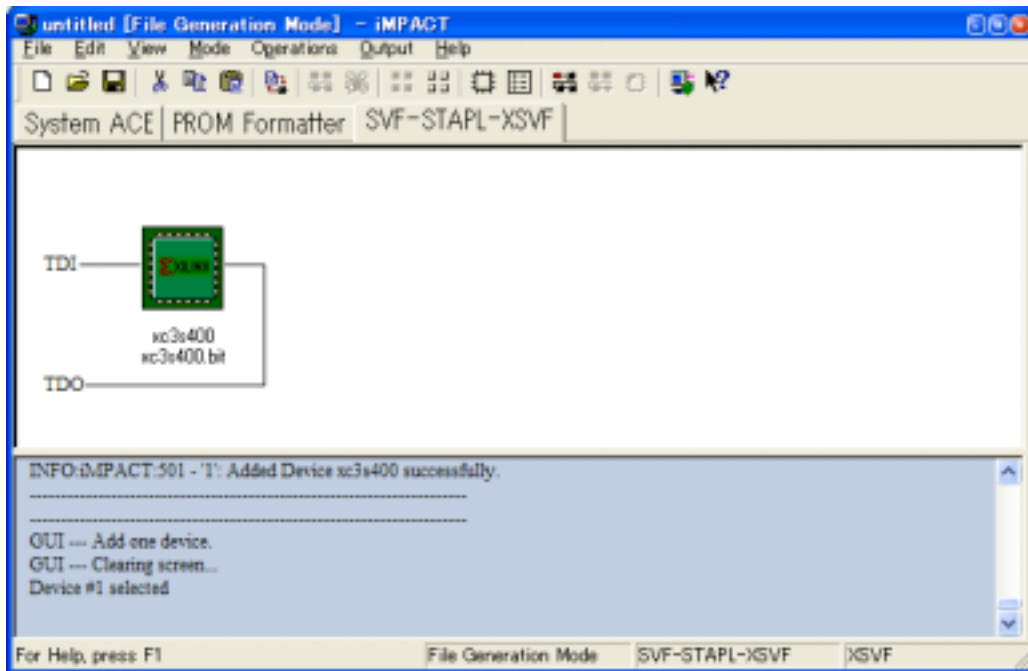


Figure B-7 SVF-STAPL-XSVF Window

9. Select options.

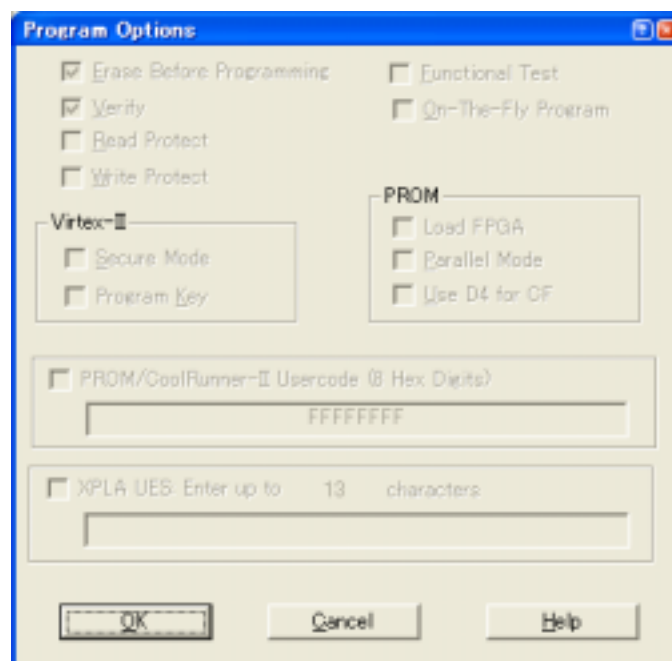


Figure B-8 Program Options Window

10. When "Programming Succeeded" appears on the screen, select Menu, Output, XSVF File, Stop writing to XSVF File. This completes the creation of a configuration file.

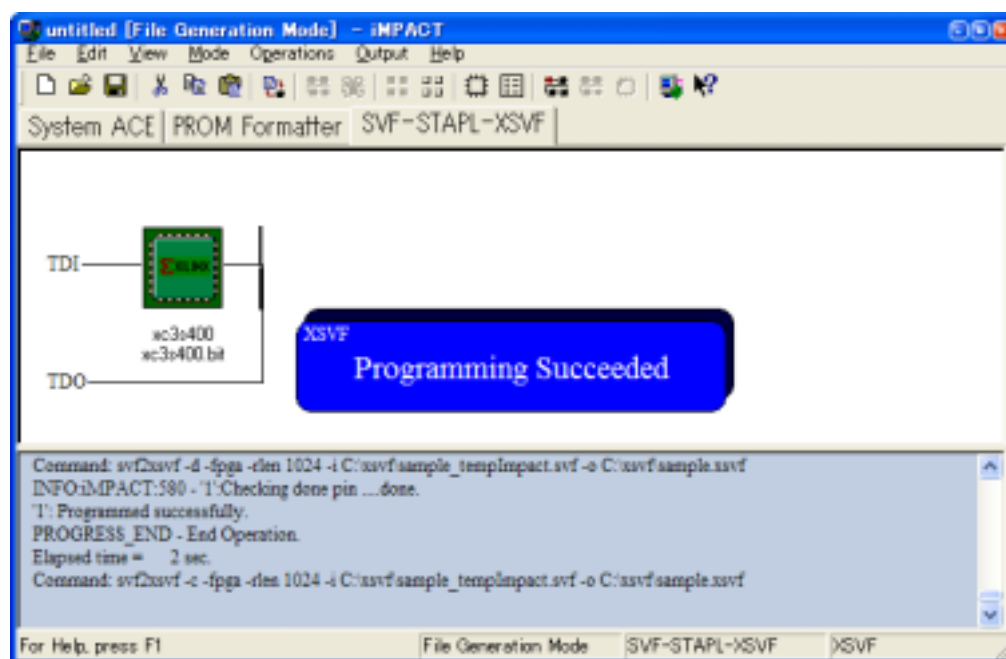


Figure B-9 Programming Succeeded Window

Creating Multiple Configuration Files

Follow the same procedure for creating one configuration file until reaching the device selection stage (8).

- Without selecting a device, with a right-click or from Edit, Add Device on the menu, select "Xilinx Device" or "Non-Xilinx Device".

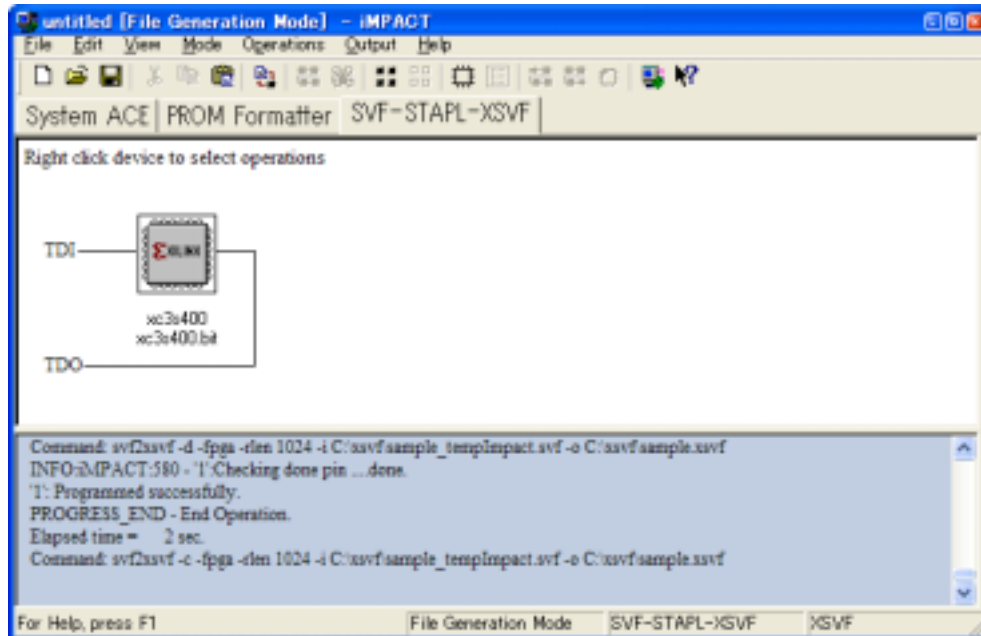


Figure B-10 SVF-STAPL-XSVF Window

- Select the appropriate design file for the chained device.

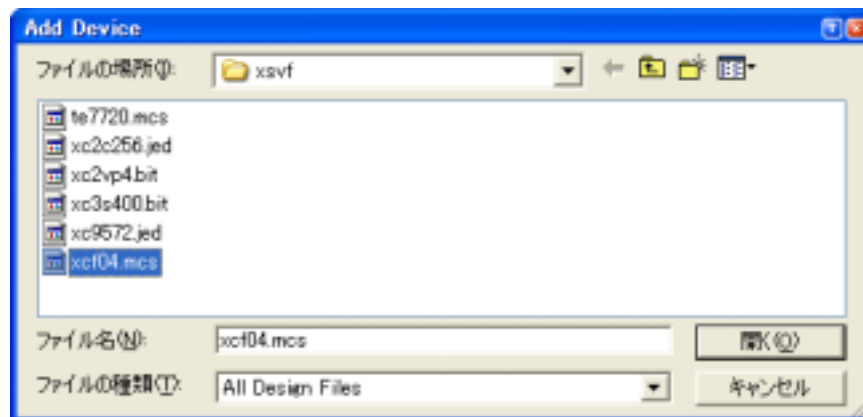


Figure B-11 Add Device Dialog

- If you selected a PROM design file, the **Select Device Part Name** dialog opens as shown in Figure B-12. From the combo box select the appropriate device name.

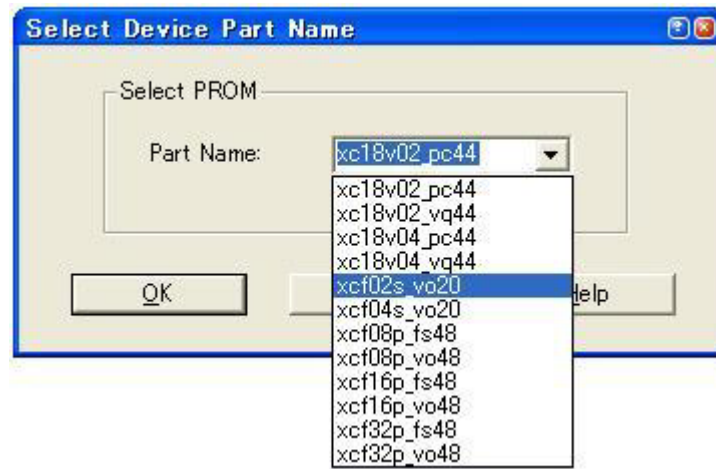


Figure B-12 Select Device Part Name Dialog

- The new device is added on the screen. If you want to add another device, repeat the same procedure from step one above.

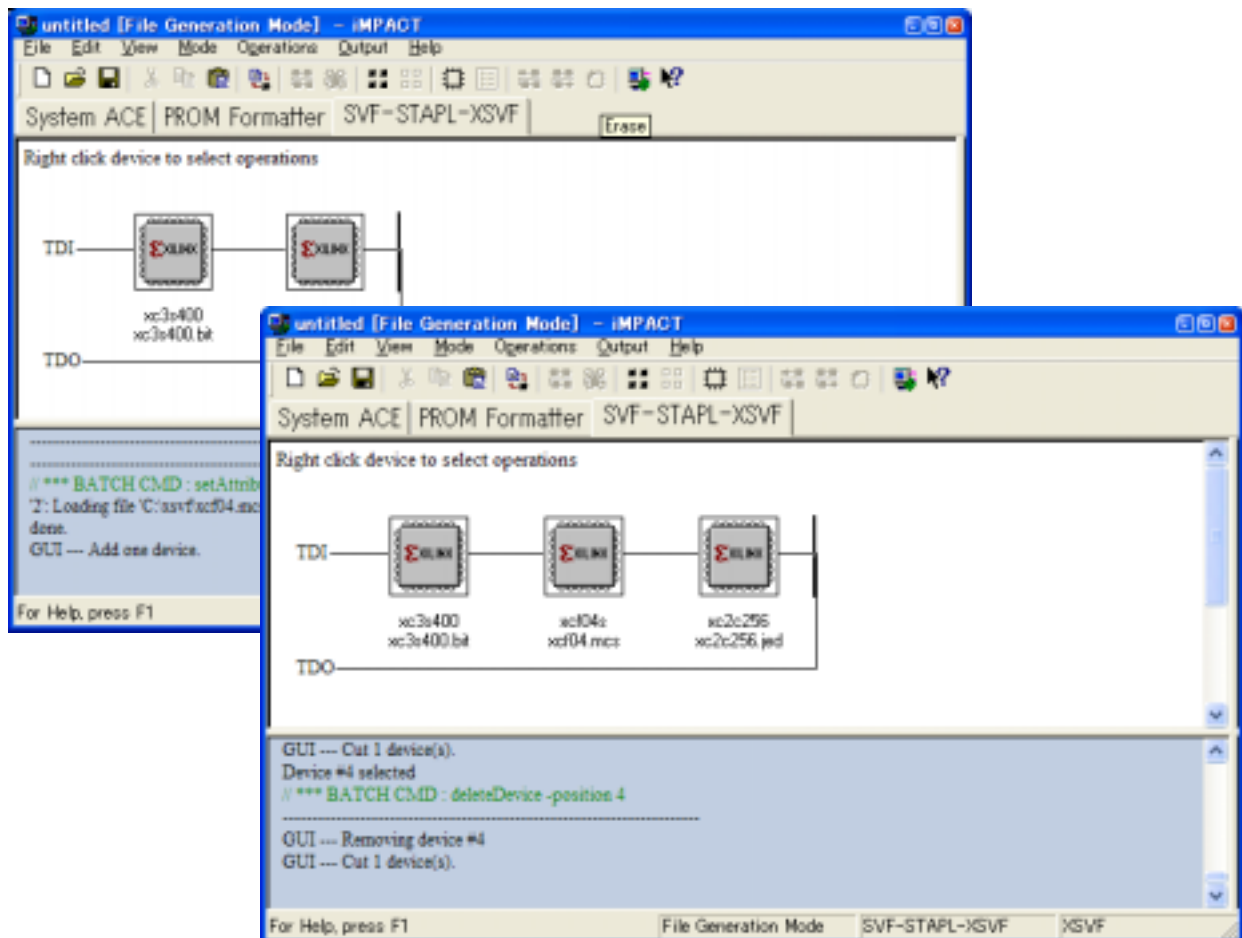


Figure B-13 SVF-STAPL-XSVF Window

- From the devices displayed on the screen, select the particular devices to be configured and then with a right-click or from Operations on the menu select Program.

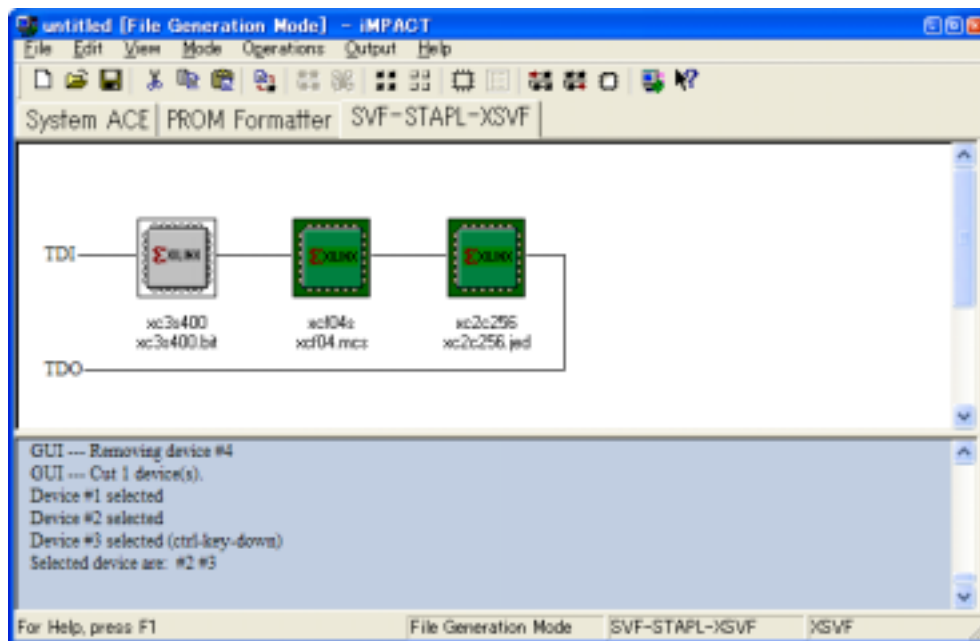


Figure B-14 SVF-ATAPL-XSVF Window

- Select options.

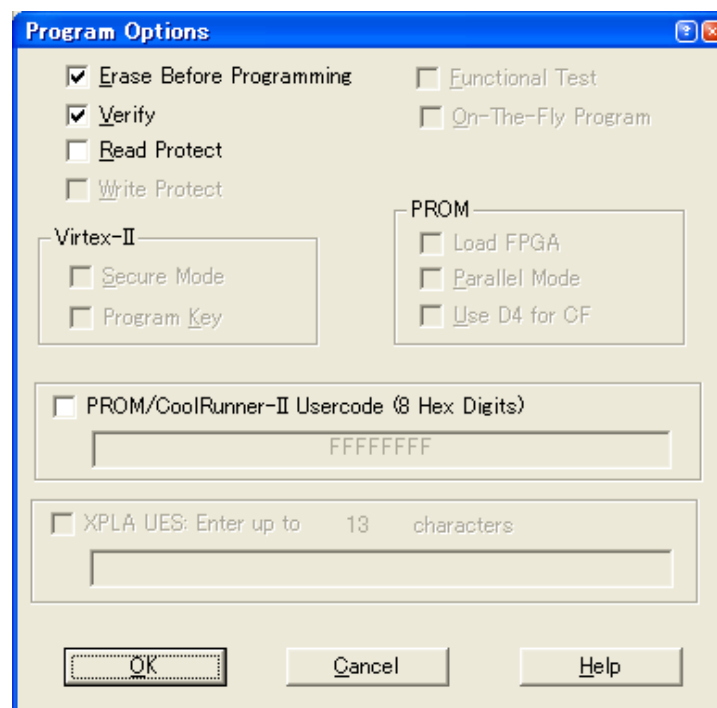


Figure B-15 Program Option Window

7. When "Programming Succeeded" appears, select Menu, Output, XSVF File, Stop writing to XSVF File. This completes the creation of the configuration files.

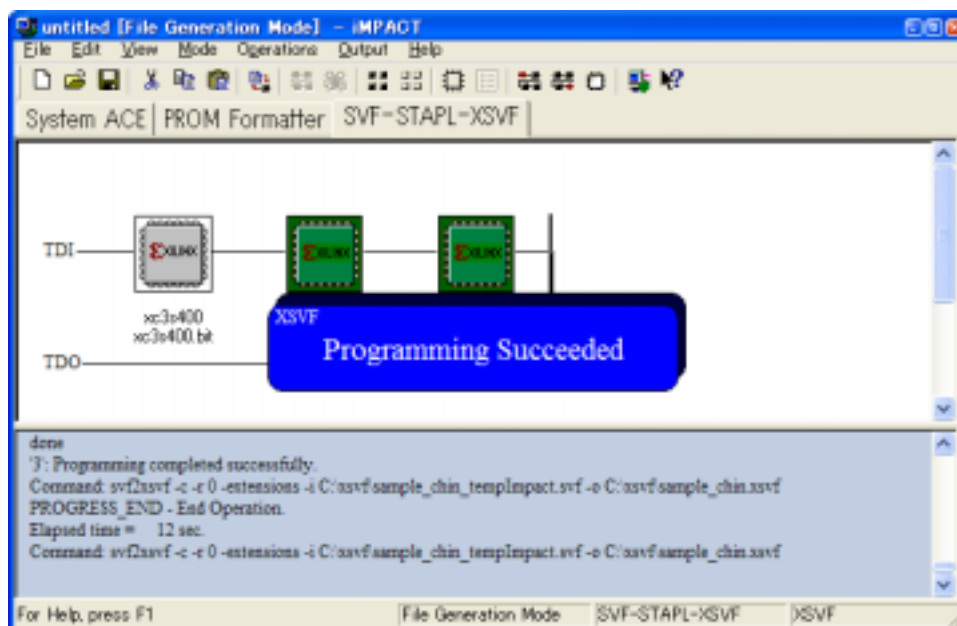
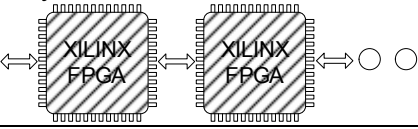
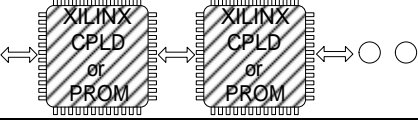
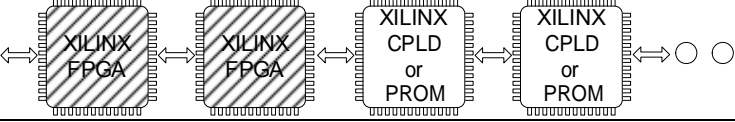
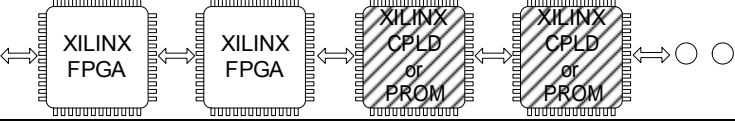
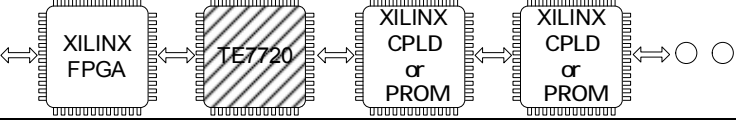


Figure B-16 Programming Succeeded Window

Possible Configuration Patterns

The following table shows possible patterns for simultaneous configuration of chained devices. XSVF files must be created in one of these patterns.

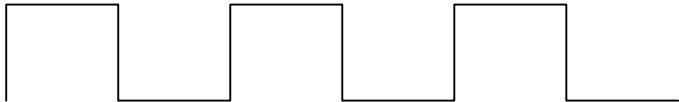
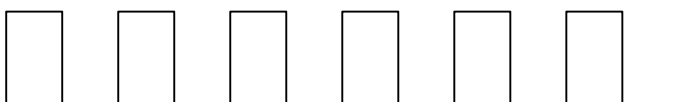
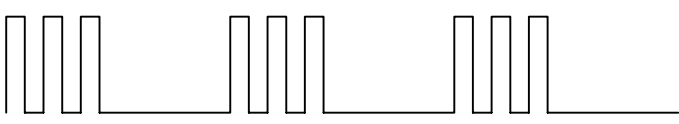

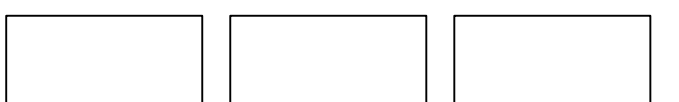
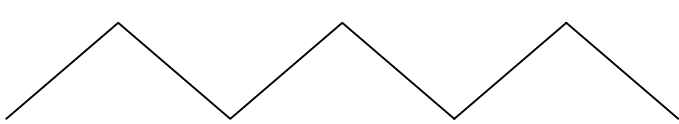
- Multiple FPGAs can be configured simultaneously (in this case neither CPLD or PROM can be configured).
- Multiple CPLDs and PROMs can be configured simultaneously (in this case the FPGA cannot be configured).
- Multiple TE7720s can be configured simultaneously (in this case neither the FPGA, CPLD or PROM can be configured).

<p>Only FPGAs are chained:</p> 	<p>All or specific FPGAs can be configured simultaneously.</p>
<p>Only CPLDs and PROMs are chained:</p> 	<p>All or specific CPLDs and PROMs can be configured simultaneously.</p>
<p>FPGAs, CPLDs and PROMs are chained:</p> 	<p>All or specific FPGAs can be configured simultaneously. In this case neither CPLDs nor PROMs can be configured.</p>
<p>FPGAs, CPLDs and PROMs are chained:</p> 	<p>All or specific CPLDs and PROMs can be simultaneously configured. In this case FPGAs cannot be configured.</p>
<p>TE7720s and other devices are chained:</p> 	<p>All or specific TE7720s can be configured simultaneously. In this case other devices cannot be configured.</p>

Appendix C. Error List

Code	Message	Cause
0xFFFF0001	Opening file unsuccessful	The inputed file name is not available.
0xFFFF0002	Reading file unsuccessful	The file is being used by other applications.
0xFFFF0003	Request cancelled	Request was cancelled.
0xFFFF0011	Connection unsuccessful	The power switch of JTAG-Blazer is turned off. IP address is incorrect.
0xFFFF0012	Abnormal disconnection	A connection was abnormally disconnected.
0xFFFF0013	Data receive unsuccessful	Data receive from the JTAG-Blazer was unsuccessful.
0xFFFF0014	Data transmit unsuccessful	Data transmit to the JTAG-Blazer was unsuccessful.
0xFFFF0021	Invalid file size	The selected file is oversize.
0xFFFF0023	Invalid response	The JTAG-Blazer hanged.
0xFFFF0024	Version mismatch	JB Manager or firmware is old.
0x0000FFFE	Protocol version mismatch	JB Manager or firmware is old.
0x0000FFFF	Busy	JTAG-Blazer is handling another request.
0x00010002	Data mismatch	Irregularity of XSVF file. TE7720 option is incorrect.
0x00010003	Data check unsuccessful	Irregularity of XSVF file.
0x00010004	Non-response XSVF command requested	Irregularity of XSVF file.
0x00010005	State transition unsuccessful	Irregularity of XSVF file.
0x00010007	BUSY weight timeout	Irregularity of XSVF file. TE7720 option is incorrect.
0x00010008	Target unconnected	A target board is not connected. The power switch of the target board is turned off. A JTAG cable is not properly connected.
0x0003000A	Target device undetected	A target board is not connected. The power switch of the target board is turned off. A JTAG cable is not properly connected.
0x0001000D 0x00020020 0x00040003	Data acquisition unsuccessful	A LAN cable is not connected.
0x00010105 0x00020021 0x00080004	Memory reservation unsuccessful	The JTAG-Blazer has hanged.
0x00040011	Irregularity program data	A file format is incorrect.
0x00080002 0x00080005	File not stored	Data has not been written to the internal memory of the JTAG-Blazer.

Appendix D. Illumination Pattern of ERR Lamp

Illumination Pattern		Cause of Error
ON OFF		Data Check Error (2-second cycle) Irregularity in a file written to the internal memory, or the file is not for a target device.
ON OFF		TARGET Unconnected (0.2- second cycle) A target board is not connected, or there is an irregularity in the JTAG cable connection.
ON OFF		File Abnormality A file is not stored in the internal memory of the JTAG-Blazer or the file is damaged.
ON OFF		BUSY The JTAG-Blazer is handling another request.
ON OFF		Boot Error The JTAG-Blazer boot-up was unsuccessful. A firmware upgrade is required.
ON OFF		Other

Appendix E. JTAG Connector Pin Assignment

14-Pin Connector Assignment

No.	Signal Name
1	GND
2	VCC
3	GND
4	TMS
5	GND
6	TCK
7	GND
8	TDO
9	GND
10	TDI
11	GND
12	NC
13	GND
14	NC

10-Pin Connector Assignment (6-pin Parallel Cable)

No.	Signal Name	Parallel Cable Terminal	Cable Color
1	TCK	TCK	Yellow
2	GND	GND	Black
3	TDO	TDO	Purple
4	VCC	VCC	Red
5	TMS	TMS	Green
6	NC	-	-
7	NC	-	-
8	NC	-	-
9	TDI	TDI	White
10	GND	-	-

Appendix F. List of Connectors for JTAG Cables

List of recommended 14-pin connectors for Target end

Type	Model	Maker
SMT type, straight	87832-1420	MOLEX
Through-hole type, straight	87831-1420	MOLEX
Through-hole type, right-angle	87833-1420	MOLEX

List of connectors for JTAG end

Type	Model	Maker
2.54mm-pitch box type, straight 10-pin	103308-1	AMP
2mm-pitch box type, straight 14-pin	87831-1420	MOLEX

Appendix G. Precautions for Target Board Design

Please take the following precautions when designing a target board.

- The use of a lengthy cable for connecting an on-board JTAG connector to a target device or connecting two chained target boards can cause a noise susceptible environment and result in signal delay, cross-talk or reflection. Please minimize the wire length of on-board JTAG signal lines. We also recommend the use of multi-layer circuit boards with GND planes and JTAG signal ground pattern guard wiring.
- JTAG signals, TMS and TCK, are common to a target device. Parallel connection of TMS and TCK signals in many target devices increases the input terminal volume and signal line length, which can cause a noise susceptible environment, signal delay, cross-talk or reflection. Be sure to restrict the number of chained target devices to a maximum of five. Otherwise, insert a buffer to add more target devices that this. We also recommend minimizing the wire length of on-board JTAG signal lines.
- Be sure to apply the same input VCC voltage to the JTAG connector as that applied to the target device.
- Be sure to set the pull-up resistance of each JTAG signal to the same VCC voltage as the target device.
- To enable high-speed configuration and allow the use of low-voltage target devices, we recommend using 14-pin flat cable JTAG connectors. 14-pin flat cables are provided with a ground wire between each JTAG signal to increase noise tolerance and suppress cross-talk.

Appendix H. JB Manager for Linux

The following provides a brief description for JB Manager for Linux.

Installing JB Manager for Linux

Install JB Manager for Linux as follows:

1. Insert the supplied CD-ROM into the PC on which JB Manager for Linux is to be installed.
2. Mount the CD drive.
3. Copy DRIVE/Application/JBManagerLinux.tar.gz to the local drive.
4. Decompress it using "tar zxvf JBManagerLinux.tar.gz".

Note that DRIVE refers to a directory path like "/mnt" specified when mounting a drive.

This completes the installation of JB Manager for Linux. After decompressing it and moving to the created directory, you can compile it by executing a make command.

List of Commands

Command	Function
jbtargset	Writes to a target board via network.
jbflash	Writes a file into the internal memory of the JTAG-Blazer for standalone writing.
jbdevicelist	Displays information concerning devices on the target board connected to the JTAG-Blazer.
jbfiledata	Displays information concerning files stored in the internal memory of the JTAG-Blazer.
jbgetspeed	Displays the JTAG clock used when writing to a target board.
jbsetspeed	Sets the JTAG clock used when writing to a target board.
jbversion	Displays information on the JTAG-Blazer firmware.
jbprogsize	Displays the size of the JTAG-Blazer firmware.
jbprogupdate	Updates the JTAG-Blazer firmware.
jbdatasize	Displays size of stored configuration data.
jbcomp	Compresses configuration data.
jbdiscover	Searches for the JTAG-Blazer.
jbipconfig	Sets the IP address of the JTAG-Blazer.

Note that help information for all commands can be accessed by using the "-h" option.

Sample Script for Writing to the Internal Memory

You can specify the IP address, configuration file and TE7720 options when executing a script.

Example: FlashWrite.sh 192.168.x.x sample.xsvf  TE7720 option: ON
(No setting when OFF)

```
#!/bin/sh

JBDATASIZE_CMD="./jbdatasize"
JBCOMP_CMD="./jbcomp"
JBFLASH_CMD="./jbflash"

XSVF_EXT="*.xsvf"
COMPED_EXT="*.jbc"

GetFileSize(){
    Size=`wc -c $1`
    for i in $Size
    do
        Size=$i
        echo $i
        break
    done
    return $Size
}

IP_Address=$1
Conf_File=$2
Option=$3

Max_Size=`$JBDATASIZE_CMD $IP_Address`
File_Size=`GetFileSize $Conf_File`

if [ $File_Size -le $Max_Size ] ; then
    Write_File=$Conf_File
else
    Comped_File=`echo $Conf_File | sed "s/$XSVF_EXT/$COMPED_EXT/"`
    $JBCOMP_CMD $Conf_File -o $Comped_File
    File_Size=`GetFileSize $Comped_File`
    if [ $File_Size -le $Max_Size ] ; then
        Option="$Option -c"
        Write_File=$Comped_File
    else
        printf "*** Input file size is too large!%n"
        rm $Comped_File
        exit
    fi
fi

echo "$JBFLASH_CMD $Option $IP_Address $Write_File"
$JBFLASH_CMD $Option $IP_Address $Write_File
if [ $Comped_File ] ; then
    rm $Comped_File
fi
```


Sample Firmware Update Script

You can specify the IP address and firmware data file options when executing a script.

Example: FirmUpdate.sh 192.168.x.x jb_image.jb

```
#!/bin/sh
JBPROG_SIZE_CMD="./jbprogsz"
JBPROG_UPDATE_CMD="./jbprogupdate"

GetFileSize(){
    Size=`wc -c $1`
    for i in $Size
    do
        Size=$i
        echo $i
        break
    done
    return $Size
}

IP_Address=$1
JB_File=$2

Max_Size=`$JBPROG_SIZE_CMD $IP_Address`
File_Size=`GetFileSize $JB_File`

if [ $File_Size -gt $Max_Size ] ; then
    printf "*** Input file size is too large!\n"
    exit
fi

echo "$JBPROG_UPDATE_CMD $IP_Address $JB_File"
$JBPROG_UPDATE_CMD $IP_Address $JB_File
```

Revision History

Ver.	YR/MO/DAY	Contents
1.0.0	2004/09/01	• Initial release
1.0.1	2004/09/17	• Addition in precautions of "5.2.1. Preparing a XSVF File" • Addition in precautions of "5.3.1. Preparing a XSVF File" • Addition of list of connector parts for JTAG-Blazer in Appendix F. List of Connectors for JTAG Cables • Correction of a typographical error for CPLD
1.0.2	2004/10/04	• Addition of "Appendix H. JB Manager for Linux" • Addition of Acknowledgements in "1. Introduction" • Correction to supported devices in "Appendix A. Product Specifications" • Correction to a duplication in "4.3."
1.0.3	2004/12/07	• "Ground beta pattern" changed to "GND plane" in "Appendix G. Precautions for Target Board Design" • Company address updated

Warranty Services

◆ Maintenance Services

Atmark-Techno warrants that all hardware components included in this product will be free from defects under normal usage for one year after the purchase. Based on this warranty clause, if some components failed, return them to our local distributor or dealer from who you purchased them together with a warranty card. Atmark-Techno will repair them at no charge. Take note that shipping cost for the returned components should be paid by the sender.

However, even within a warranty period, any defects caused by accident, misuse, overuse and improper use may be repaired on a chargeable basis.

◆ Warranty Card

Should any defects occur during a warranty period, Atmark Techno offers a maintenance service according to the description on the warranty card. Please read carefully the description on the warranty card after the purchase.

The warranty card certifies a warranty period of a product. Please make sure that date for purchase and name of distributor fields are filled. Unless these fields are filled, it can be difficult to recognize a claimed maintenance service as in-warranty service. If you received a warranty card not filled with these descriptions, please let the distributor know it. Please keep a warranty card at hand. For warranty period and condition, refer to a warranty card.

◆ Consumable Items

The following lists consumable items. Please replace all worn-out items with new ones.

- 6-pin parallel cable
- 14-pin flat cable

◆ Inquiry

Please make all inquiries concerning technical and upgrade issues to a local distributor or dealer from who you purchased the product.

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