



Programming the LT-50K, LT-300K and the XG-300K

Summary

This application note describes how to program the LT-50K, LT-300K and the XG-300K with a Xilinx Parallel Cable IV or equivalent JTAG programming cable interface.

Introduction

The LT-50K, LT-300K and the XG-300K each have a IEEE 1149.1 JTAG compliant input integrated on the board allowing the user to program the boards with a programming interface such as the Xilinx Parallel Cable IV. This application note describes how to configure iMPACT to program the LT-50K, LT-300K and XG-300K (iMPACT is a part of the Xilinx ISE software suite).

This document uses the Xilinx Parallel Cable IV and the Parallel Cable Fly Leads. At the time of the creation of this document these items were the current Xilinx programming solutions. Other equivalent Xilinx items may be available at the time of this reading. The part numbers of these current items through Xilinx are:

Xilinx Parallel Cable IV = HW-PC4

Parallel Cable Fly Leads = HW-FLYLEADS

This application note was written referencing Xilinx WebPack ISE 6.1. Other versions of the Xilinx ISE may have dialog windows that differ than what is shown in this document. From this point on the XG-300K will be used as a reference but the steps and information presented in this document will also apply to the LT-50K and LT-300K.

Programming the XG-300K FPGA

The following describes how to program the XG-300K FPGA by using the iMPACT software tool.

Note: This procedure uses a bit file called "ddrcode.bit". This file is just used as an example. The same procedure will be used for any *.bit programming file.

1. Connect the Xilinx Parallel Cable IV or equivalent JTAG parallel port programming cable connect it to the parallel port connector on your PC and the JTAG connector (J4) on the XG-300K. The Fly Leads is connected to the 0.1 inch output of the Xilinx Parallel Cable IV. The Fly Leads are connected to the XG-300K J4 connector in the following way:

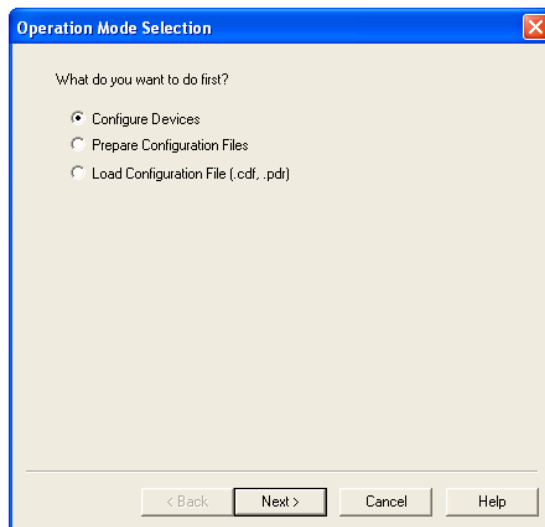


<u>XG-300K J4 Connector Pin</u>	<u>Fly Leads Wires</u>	<u>Signal</u>
1	White	TDI
2	Purple	TDO
3	Yellow	TCK
4	Green	TMS
7	Black	GND
8	Red	VCC

2. After you have successfully implemented your design in the Xilinx Project Navigator software, in the Project Navigator software double-click “**Configure Device [iMPACT]**” in the “**Process for Current Source**” window under “**Generate Programming File**”. This will generate a bit file and bring up the Xilinx iMPACT software programming interface.

The following steps assume that you have a cable already connected between your computer and the XG-300K and that power is applied to the XG-300K.

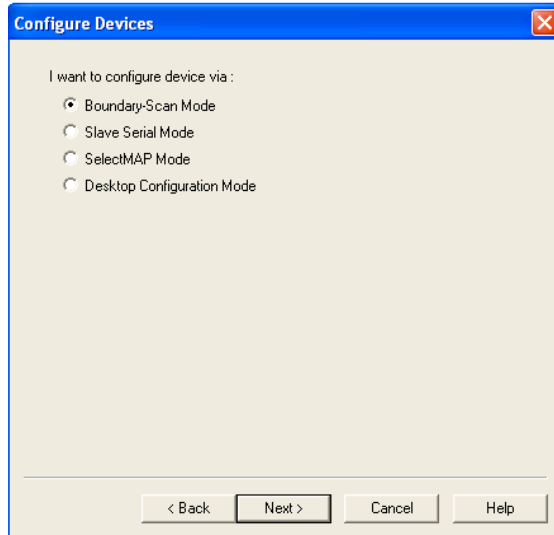
3. The first window that will appear in the iMPACT software is the “**Operations Mode Selection**” dialog window.



Select “**Configure Devices**” as shown above and click “**Next**”.

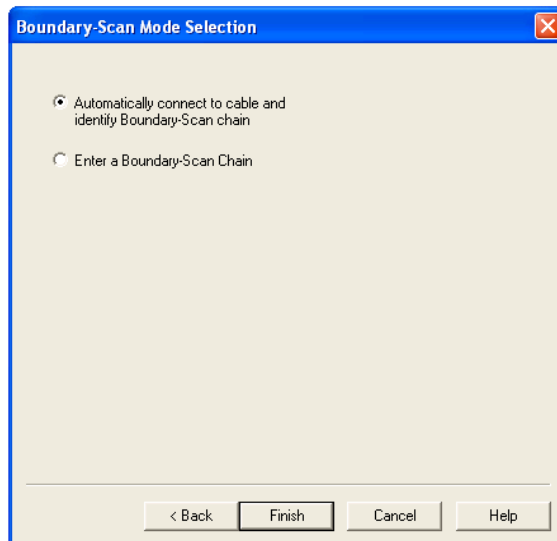


4. Next the “**Configure Mode**” dialog window will appear.



Select “**Boundary-Scan Mode**” as shown above and click “**Next**”.

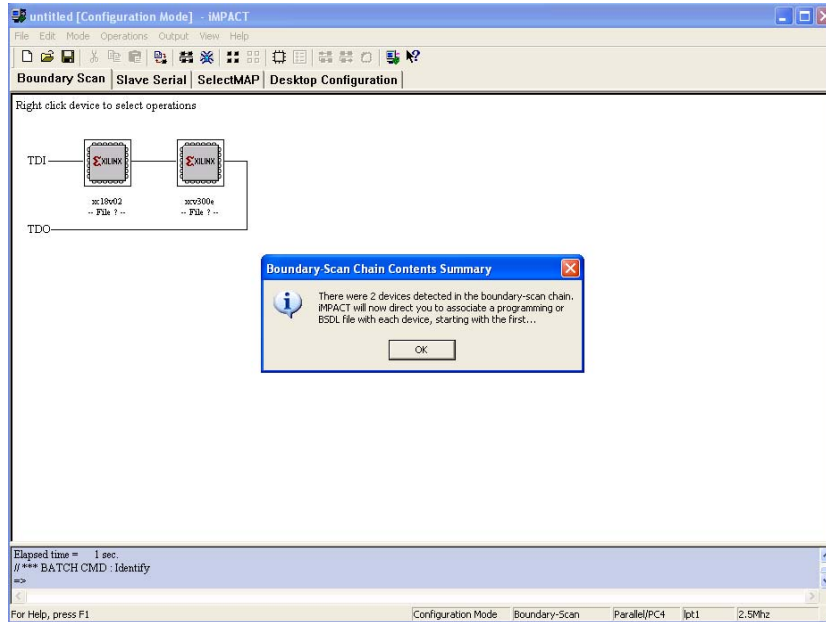
5. Next the “**Boundary-Scan Mode Selection**” dialog window will appear.



Select “**Automatically connect to cable and identify Boundary-Scan chain**” as shown above and click “**Finish**”.



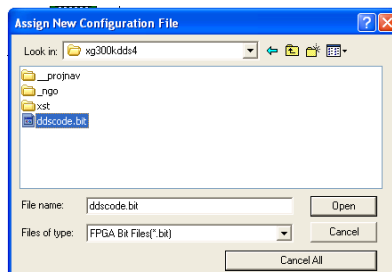
- Next a “**Boundary-Scan Chain Contents Summary**” window should appear. This window confirms that iMPACT detected the Spartan IIE FPGA on the XG-300K and the XC18V02 configuration PROM.



Click “**OK**” to continue.

NOTE: If iMPACT is unable to establish communications with the XG-300K refer to the section titled Configuring iMPACT located in this document for possible solutions.

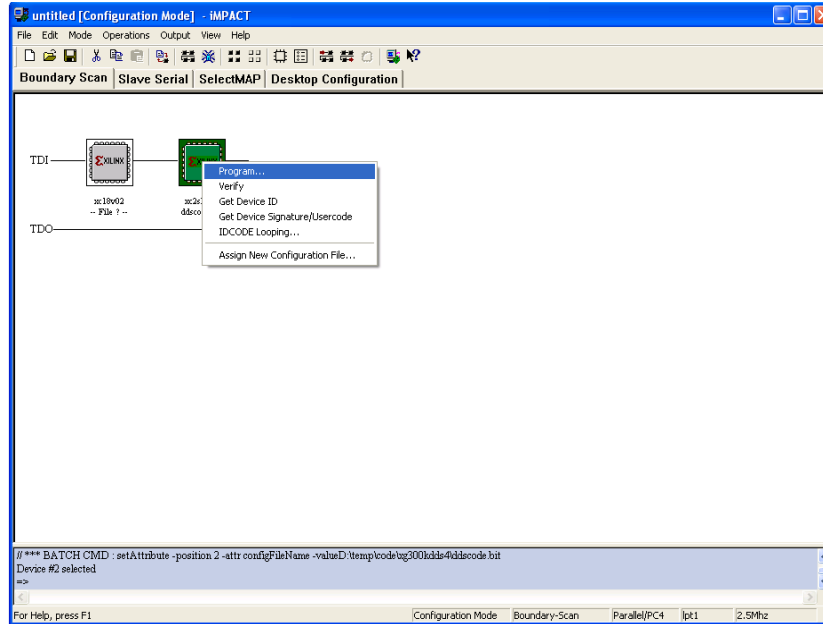
- Next the “**Assign New Configuration File**” dialog window will appear. This window queries the user for a JED, BSDL or BIT file to program into the XG-300K. The first “**Assign New Configuration File**” dialog window will be to program the 18V02 FPGA configuration PROM. Select “**Cancel**” to bypass this window. The Second “**Assign New Configuration File**” dialog window will appear. This will be to program the FPGA. Select the appropriate directory and file that was created in Project Navigator to program into the XG-300K.



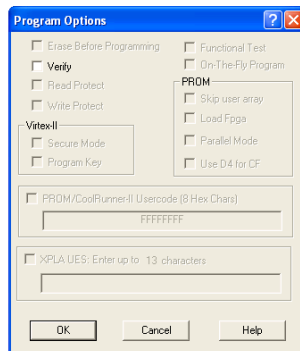
Once the correct file is selected click “**Open**”.



8. Placing the mouse cursor on top of the graphic of the Spartan-IIe FPGA, right click one time and select “**Program...**” from the device menu.



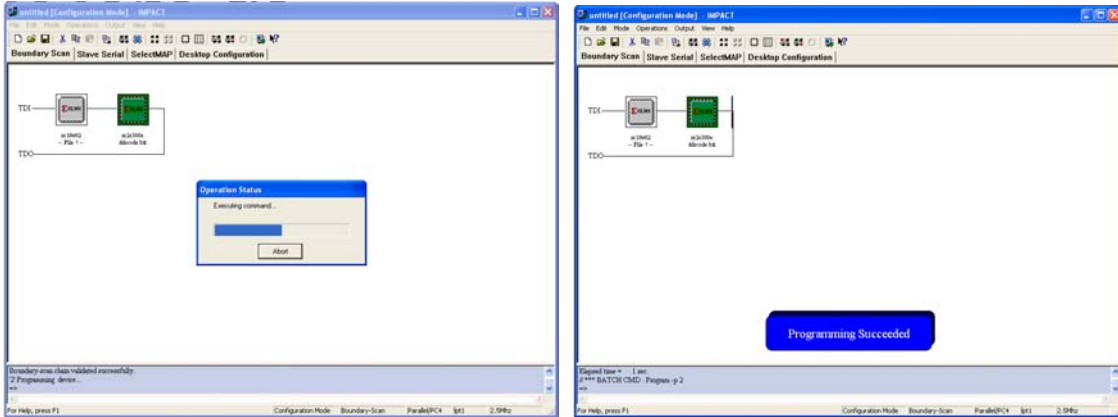
9. Next the “**Program Options**” dialog window will appear.



Click “**OK**”.



10. Next the “**Operations Status**” window will appear indicating the progress of programming the XG-300K FPGA followed by a “**Programming Succeeded**” status window.



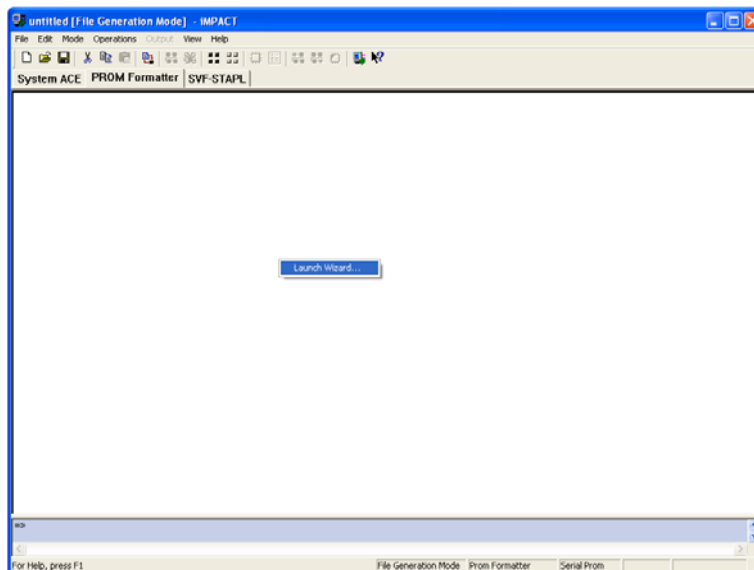


Programming the XG-300K XC18V02 Configuration PROM

The following describes how to program the XG-300K XC18V02 Configuration PROM by using the iMPACT software tool. First the sequence of steps describes how to use iMPACT to convert a *.bit file created with the Xilinx ISE software into the proper file format (*.mcs) and then how to program the XC18V02.

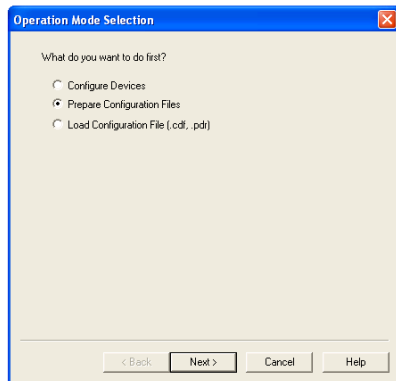
Note: This procedure uses a bit file called “ddscore.bit”. This file is just used as an example. The same procedure will be used for any *.bit programming file.

1. Connect the Xilinx Parallel Cable IV or equivalent JTAG parallel port programming cable connect it to the parallel port connector on your PC and the JTAG connector (J4) on the XG-300K. The Fly Leads is connected to the 0.1 inch output of the Xilinx Parallel Cable IV. The Fly Leads are connected to the XG-300K J4 in the same way as was described in the section Programming the XG-300K FPGA.
2. It will be assumed that you have already been through the steps for Programming the XG-300K FPGA section of this document and are ready to program the XC18V02 Configuration PROM. It will also assume you have the iMPACT program already running and that you have a cable already connected between your computer and the XG-300K and that power is applied to the XG-300K.
3. In the iMPACT software window select from the top menu “**Mode**” and then “**File Mode**”. This will put iMPACT into the file mode configuration which is needed to convert a *.bit file into a *.mcs file which is what is used to program the XC18V02. Right click to launch the wizard and then select “Launch Wizard...”.



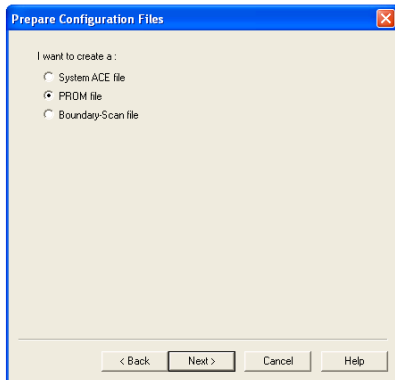


4. The **Operation Mode Selection** window will appear.



Select **“Prepare Configuration Files”** as shown above and click **“Next”**.

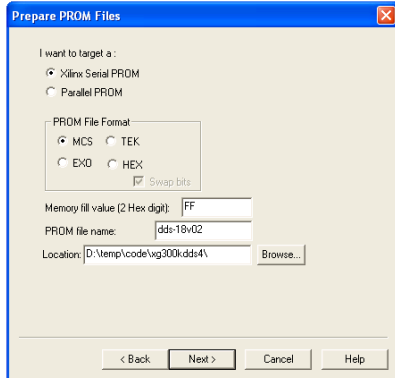
5. The **Prepare Configuration Files** window will appear.



Select **“PROM file”** as show above and select **“Next”**.



6. The **Prepare PROM files** window will appear.



For **“I want to target a:”** select **“Xilinx Serial PROM”**. Select **“MCS”** for **“PROM File Format”**. **“Memory fill Value (2 Hex digit)”** should be set to **“FF”**. For **“PROM file name”** type in a name you want to call the new *.mcs file and for **“Location”** browse to the location where you want the new *.mcs XC18V02 configuration file to be located. Then select **“Next”**.

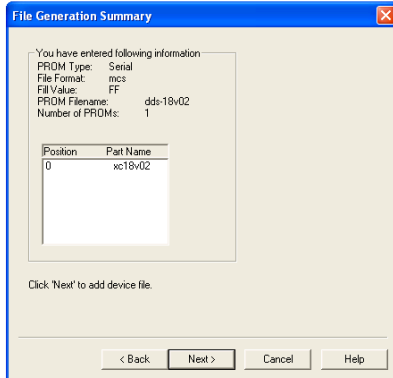
7. The next window will be the **Specify Xilinx Serial PROM device** window.



For **“Select a Serial PROM:”** use the drop down menu to select **“xc18v”** and **“xc18v02”** and then click **“Add”**. Then select **“Next”**.

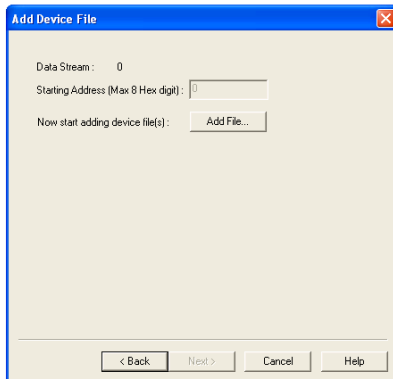


8. The **File Generation Summary** window will appear next.



Review the information, if anything is not correct select “**Back**” and go back and correct the information. Otherwise select “**Next**”.

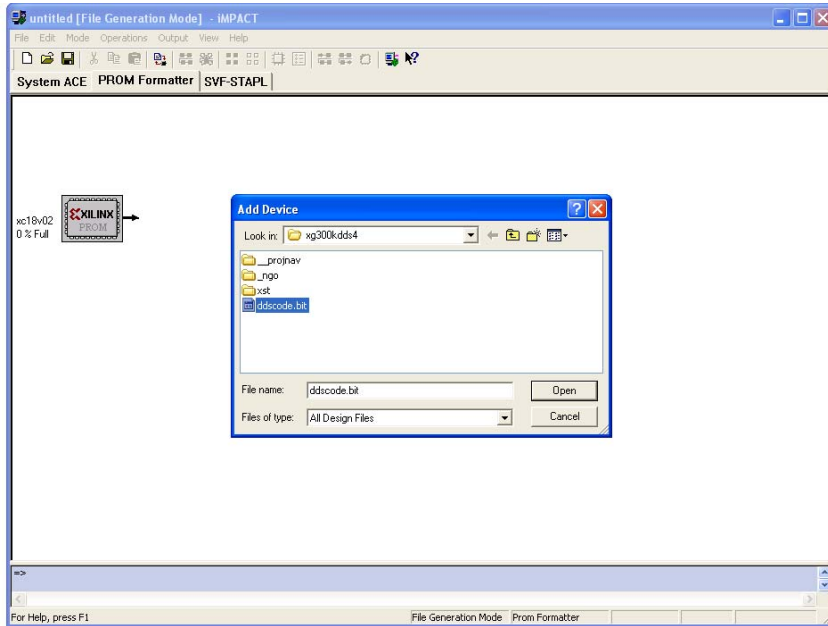
9. The **Add Device File** window will appear next.



Select “**Add File...**”.

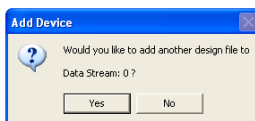


- The targeted xc18v02 device will appear in the main window and the “Add Device” window will appear. Browse to the location of where the *.bit file is to be converted into a *.mcs file and programmed into the XC18V02.



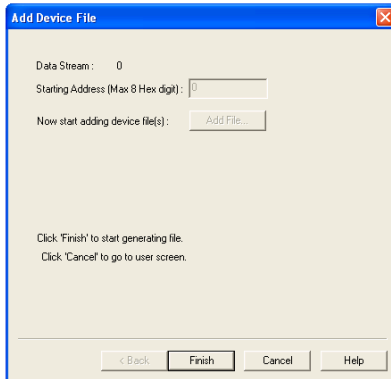
Then select “Open”.

- You will be asked if you would like to add another design file to the data stream. Select “No”.

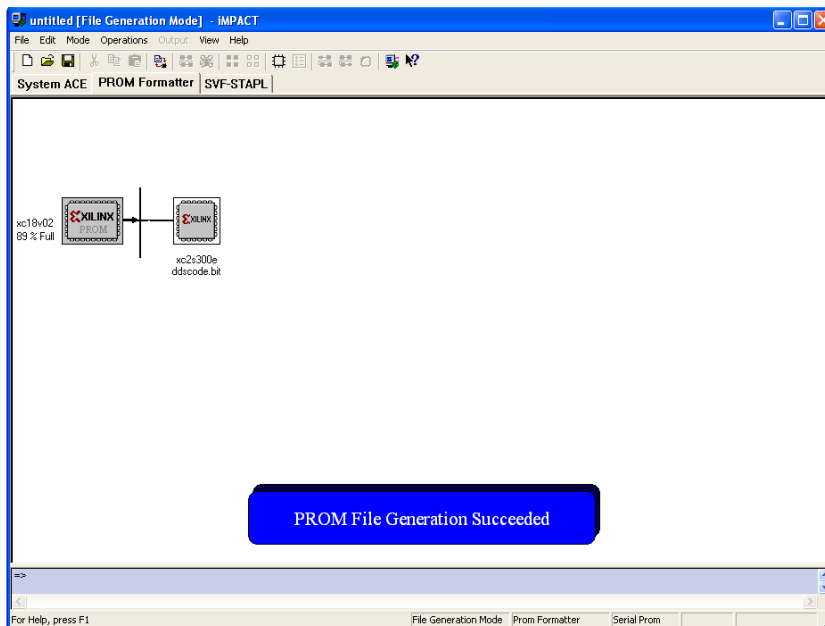




12. The **Add Device File** window will appear. Select “**Finish**” to start generating the *.mcs file.



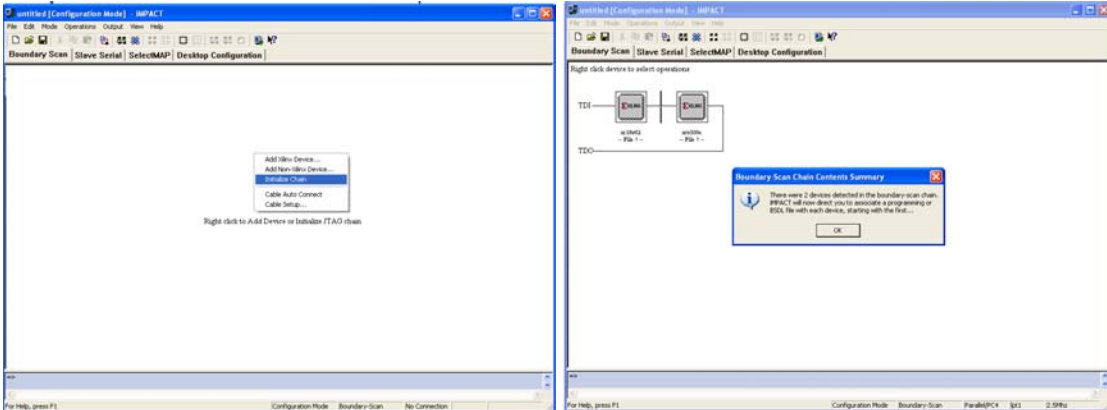
13. The next step will be a confirmation that the *.mcs file was created.



14. Only the *.mcs file has been created. To program the XC18V02 with the newly created *.mcs file, from the top menu items select “Mode” and then “Configuration Mode”.

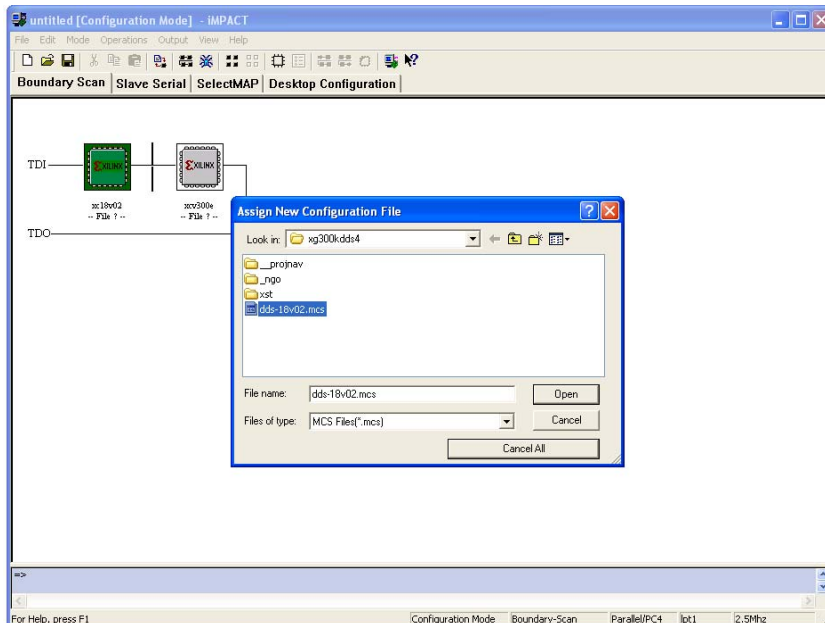


15. Right click and select “**Initialize Chain**” from the menu. This will display the FPGA and the XC18V02 on the XG-300K. If there is an error, verify the XG-300K is powered up and the Xilinx Parallel Cable IV is properly connected.



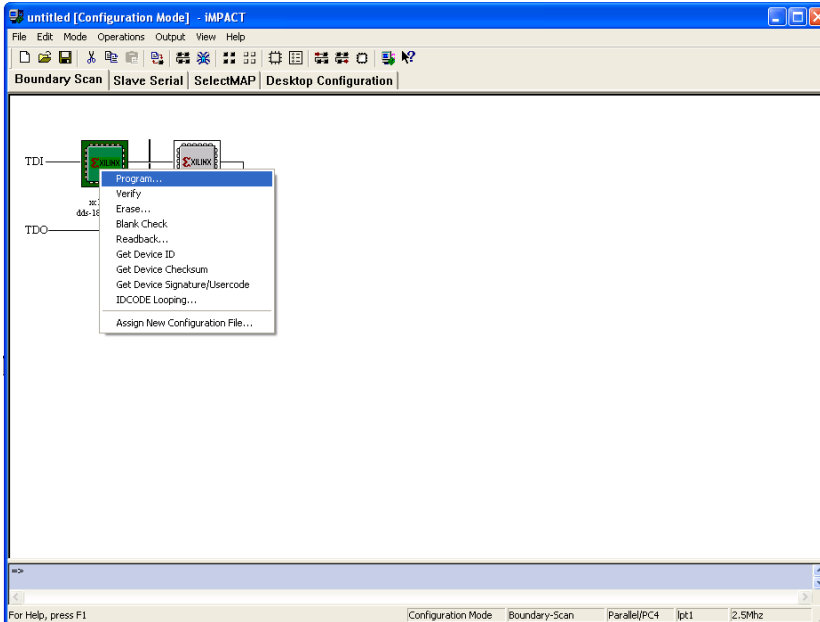
NOTE: If iMPACT is unable to establish communications with the XG-300K refer to the section titled Configuring iMPACT located in this document for possible solutions.

16. The **Assign New Configuration File** window will appear. Select the *.mcs file that was just created for the XC18V02 and select “**Open**”.

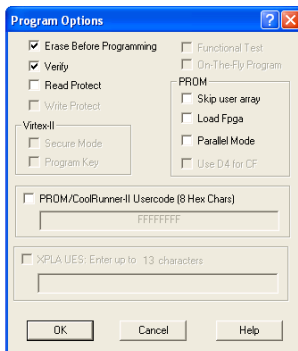




17. A second **Assign New Configuration File** window will appear for you to select a *.bit file to program the FPGA. Select **“Cancel”**.
18. Right click on top of the icon of the XC18V02 and select **“Program”** from the menu.



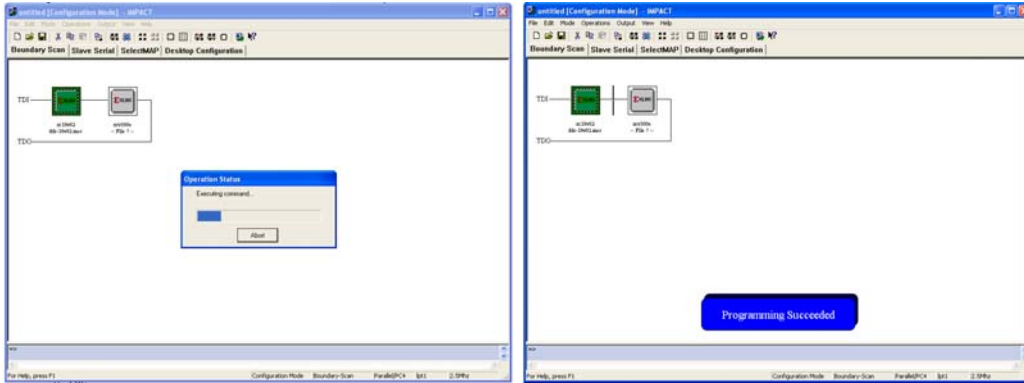
19. The Program Options window will appear.



Select the **“Erase Before Programming”** and **“Verify”** options and select **“OK”**.



20. The Operation Status window will appear indicating the progress of the programming of the XC18V02 and then the Programming Succeeded windows will appear.

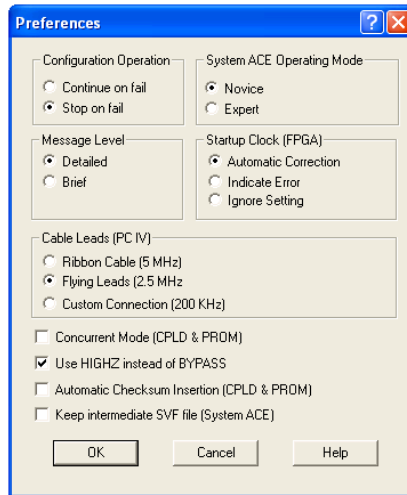




Configuring iMPACT

This section describes the communication settings for the Xilinx iMPACT software for communication to the XG-300K regardless of the communication cable being utilized. Generally iMPACT will auto detect and auto connect with the XG-300K but in some instances iMPACT will not auto detect the XG-300K due to configuration setting in iMPACT. This section defines the configuration settings in iMPACT that will allow it to communicate with the XG-300K if communication problems are encountered.

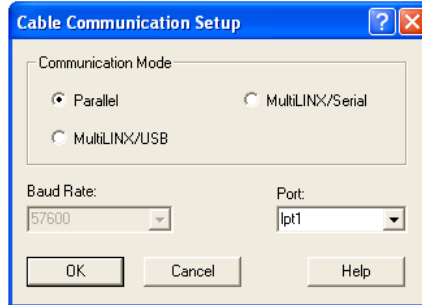
1. In the iMPACT software under the “**Edit**” menu select “**Preferences...**”. The “**Preferences**” dialog window will appear.



Select the same settings as shown above and click “**OK**”.



2. Under the “**Output**” menu select “**Cable Setup...**”. The “Cable Communication Setup” dialog window will appear.



For “**Communication Mode**” select “**Parallel**” and for “**Port**” select the parallel port connected to the XG-300K, usually “**lpt1**”.

3. The iMPACT program may have to be stopped and restarted before the above settings take affect.
4. Be sure that no other program on your computer is currently utilizing or has reserved the parallel port that is connected to the XG-300K.
5. Also, only one instance of iMPACT should be running on your computer. If you have iMPACT currently running on your computer and inadvertently start a second session of iMPACT the parallel port may temporarily stop communicating with the XG-300K.
6. Consult the help section of iMPACT and Project Navigator for additional information about working with iMPACT.

Document Revision History

Revision	Date Issued	Description of Change
01	2/15/2004	Initial release.

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