



Reference Manual

Mpression LVDS Interface Card

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1. For Ensuring Safe Use



Be sure to follow the instructions given in this Manual which are intended to prevent harm to the user and others as well as material damage.


1.1 Legend

 Danger	Indicates an imminent hazardous situation which if not avoided will result in death or serious injury.
 Warning	Indicates a potentially hazardous situation which if not avoided could result in death or serious injury.
 Caution	Indicates a potentially hazardous situation which if not avoided may result in minor or moderate injury or in property damage.

1.2 Cautions

 Danger	<p>Make sure to use the AC adapter (if uses or required) that is specified in this Manual or included one in package.</p> <p>Using an AC adapter not meeting the specifications described in this Manual will cause the kit to emit heat, explode, or ignite.</p>
 Warning	<p>Do not apply strong impacts or blows to the kit.</p> <p>Doing so may cause the kit to emit heat, explode, or ignite, or the equipment in the kit to fail or malfunction. This may also cause fire.</p> <p>Do not put the main unit or the AC adapter in cooking appliances such as microwave ovens, or high-pressure containers.</p> <p>Doing so might cause the main unit or AC adapter to emit heat, explode, ignite, or emit smoke, or its parts to break or warp.</p> <p>Do not wrap the main unit that is in use with cloth or other materials that are likely to allow heat to build up inside the wrapping.</p> <p>This will cause heat to build up inside the wrapping which may cause the main unit to ignite or malfunction.</p> <p>When disposing of the main unit, do not dispose of it along with general household waste.</p> <p>Throwing the main unit into fire may cause it to explode. Dispose of the main unit following the laws, regulations, and ordinances governing waste disposal.</p> <p>Do not use the kit in places subject to extremely high or low temperatures or severe temperature changes.</p> <p>Doing so may cause the kit to fail or to malfunction.</p> <p>Always be sure to use the kit in a temperatures ranging from 5°C to 35°C and a humidity range of 0% to 85%.</p>

 Warning (Continued from previous page)	<p>Do not pull the power supply cable with excessive force or place heavy items on it. Do not damage, break, bundle, or tamper with the power supply cable. Damaged parts of the power supply cable might cause a short circuit resulting in fire or accidents involving electrical shock.</p>
	<p>Do not unplug the power plug with wet or moist hands. This might cause injuries or equipment malfunctions or failures due to electrical shock.</p>
	<p>Plug the power plug securely into the outlet. If the power plug is not securely plugged into the outlet, it may cause accidents involving electrical shock or fire due to heat emitted.</p>
	<p>Do not connect many electrical cords to a single socket or connect an AC adapter to an outlet that is not rated for the specified voltage. Failing to do so may cause the equipment to malfunction or fail, or lead to accidents involving electrical shock or fire due to heat emitted.</p>
	<p>Periodically remove any dust accumulated on the power plug and around the outlet (socket). Do not use a power plug with dust accumulated on it because doing so will lead to insulation failure due to moisture which may lead to fire. Remove any dust on the power plug and around the outlet with dried cloth.</p>
	<p>Do not place any containers such as cups or vases filled with water or other liquid on this Board. If this Board is exposed to water or other liquids it may cause the Board to malfunction or lead to accidents involving electrical shock. If you spilled water or other liquid on this Board, immediately stop using the Board, turn off the power, and unplug the power plug. If you have any requests for repairs or technical consultation, please contact the Manufacturer.</p>
 Caution	<p>Do not place the kit on unstable places such as shaky stands or tilted locations. Doing so may cause injuries or cause this Board to malfunction if the Board should fall.</p>
	<p>Do not attempt to use or leave the kit in places subject to strong direct sunlight or other places subject to high temperatures such as in cars in hot weather. Doing so might cause the kit to emit heat, break, ignite, run out of control, warp, or malfunction. Also, some parts of the equipment might emit heat causing burn injuries.</p>
	<p>Unplug the power supply cable when carrying out maintenance of devices in which the main unit is embedded. Failure to do so may lead to accidents involving electrical shock.</p>
	<p>Do not place this Board in locations where excessive force is applied to the Board. Failure to do so may cause the PC board to warp, leading to breakage of the PC board, missing parts or malfunctioning parts.</p>
	<p>When using the kit together with expansion boards or other peripheral devices, be sure to carefully read each of their manuals and to use them correctly. Manufacturer does not guarantee the operation of specific expansion boards or peripheral devices when used in conjunction with this Board unless they are specifically mentioned in this Manual or their successful operation with this Board has been confirmed in separate documents.</p>
	<p>Be sure to turn off the power switch when moving this Board to connect to other devices. Failure to do so may cause this Board to fail or lead to accidents involving electrical shock.</p>

 Caution (Continued from previous page)	<p>Do not clean this Board by using a rag containing chemicals such as benzine or thinner.</p> <p>Failure to do so will likely to cause this Board to deteriorate. When using a chemical cloth be sure to comply with any directions or warnings.</p>
	<p>Do not immediately turn on the power if you find that water or moisture had condensed onto the main unit after removing the board from the package.</p> <p>Condensation might occur on this Board when taking it out of the box, if the board is cool yet the room temperature is warm.</p> <p>Do not apply power to the Board while water or moisture has condensed on it because the moisture may cause the Board to break or may shorten the service life of the parts.</p> <p>When you first take this Board out of the box be sure to leave it at room temperature for a while before using it. If condensation or moisture has occurred on this Board, first wait for the moisture to fully evaporate before installing or connecting the Board to other devices.</p>
	<p>Do not disassemble, dismantle, modify, alter, or recycle parts unless they are clearly described as customizable in this Manual.</p> <p>Although this kit is customizable, if parts not specified in this Manual as customizable are modified in any way, then the overall product operation cannot be guaranteed.</p> <p>Please consult with Manufacturer beforehand if you wish to customize or modify any parts that are not described in this Manual as customizable.</p>

1.3 Developer Information

The Developer of this product is:

Altima Corp.

1-5-5 Shin-Yokohama, Kouhoku-ku, Yokohama, 222-8563 JAPAN

<http://www.altima.co.jp>

1.4 Inquiries

In case you have any inquiries about the use this product, please contact your local Macnica company or make inquiries through the contact form in the following web site:

<http://www.m-pression.com/contact>

Macnica companies:

- | | | |
|------------------|-----------------------|---|
| • China & HK: | Cytech Technology | http://www.cytech.com/ |
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| • North America: | Macnica Americas | http://www.macnica-na.com/ |
| • Brazil: | Macnica DHW | http://www.macnicadhw.com.br/en/ |
| • Japan: | Altima | http://www.altima.co.jp |
| | Elsena | http://www.elsena.co.jp |

2. Introduction

This document is the reference manual for the reference design of LVDS Interface Card (hereinafter, this Card).

Download the programming data into the FPGA according to the procedure described in this document. The FPGA on the board will start operating to check the operation of this Card.

With this design, the operation of this Card can be checked along with the LVDS and GPIO.

This document uses menus and other screens of Quartus® II ver. 12.1. The screens of Cyclone IV® GX Development Kit are used for the operation check.

3. Items to Prepare

- This Card (including the provided cable for the LVDS Interface Card)
- Cyclone IV GX Development Kit (hereinafter, the Cyclone IV board)
Model: DK-DEV-4CGX150N
URL: <http://www.altera.com/products/devkits/altera/kit-cyclone-iv-gx.html>

4. Connection Procedure

1. Set up the jumper pins of this Card as shown in the figure below.

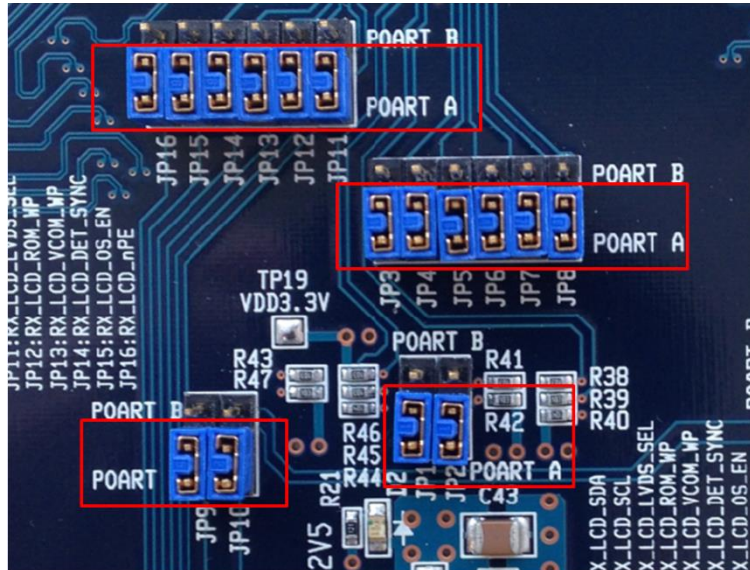


Fig. 4-1. Setting up the jumper pins

2. Connect the provided cable for the LVDS Interface Card and this Card.

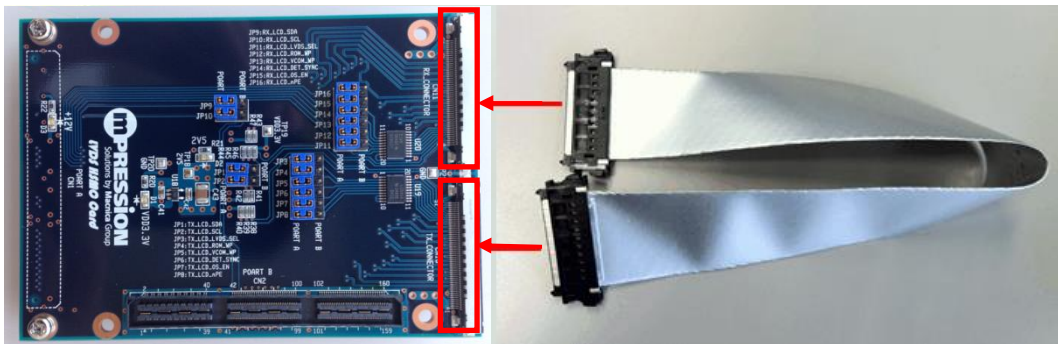


Fig. 4-2. Connecting the cable for the LVDS Interface Card

3. Connect the provided cable for the LVDS Interface Card and this Card.

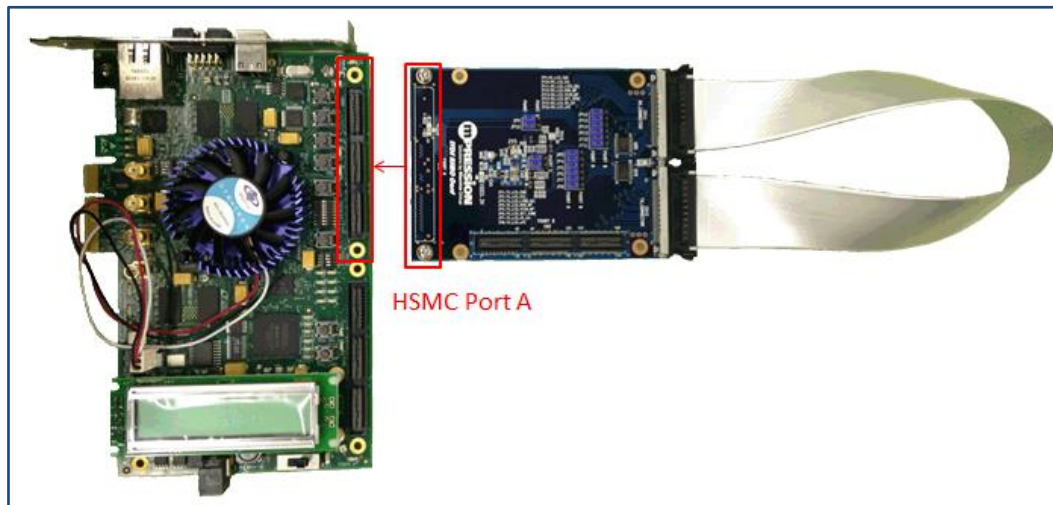


Fig. 4-3. Connecting this Card and the Cyclone IV board

4. The appearance after connection is as shown in the figure below.

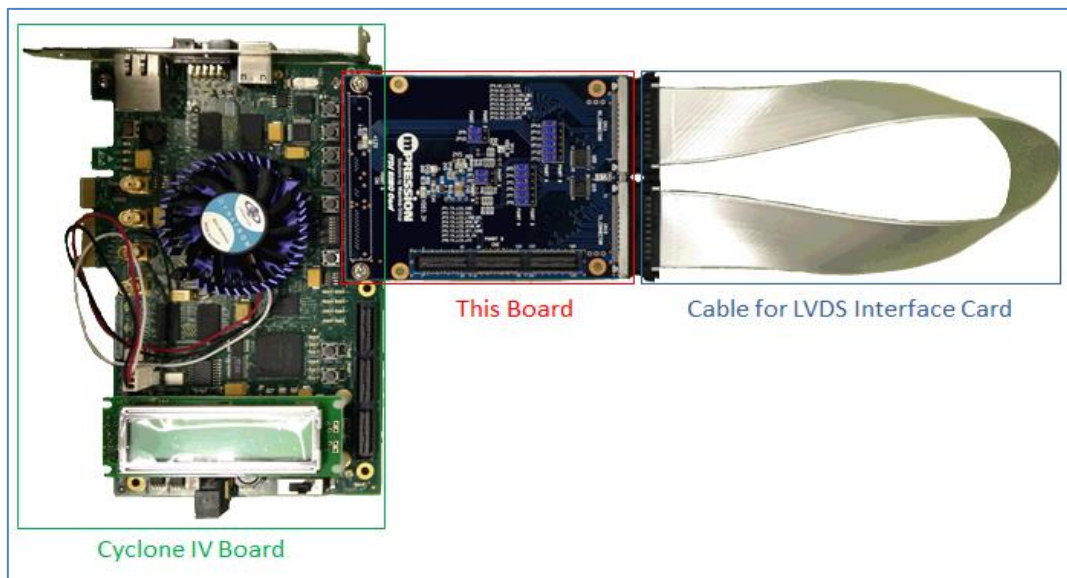


Fig. 4-4. Connecting this Card and the Cyclone IV board

5. Turn on User DIP Switch (SW2) #1 and Board Settings DIP Switch (SW1) CLK_SEL.

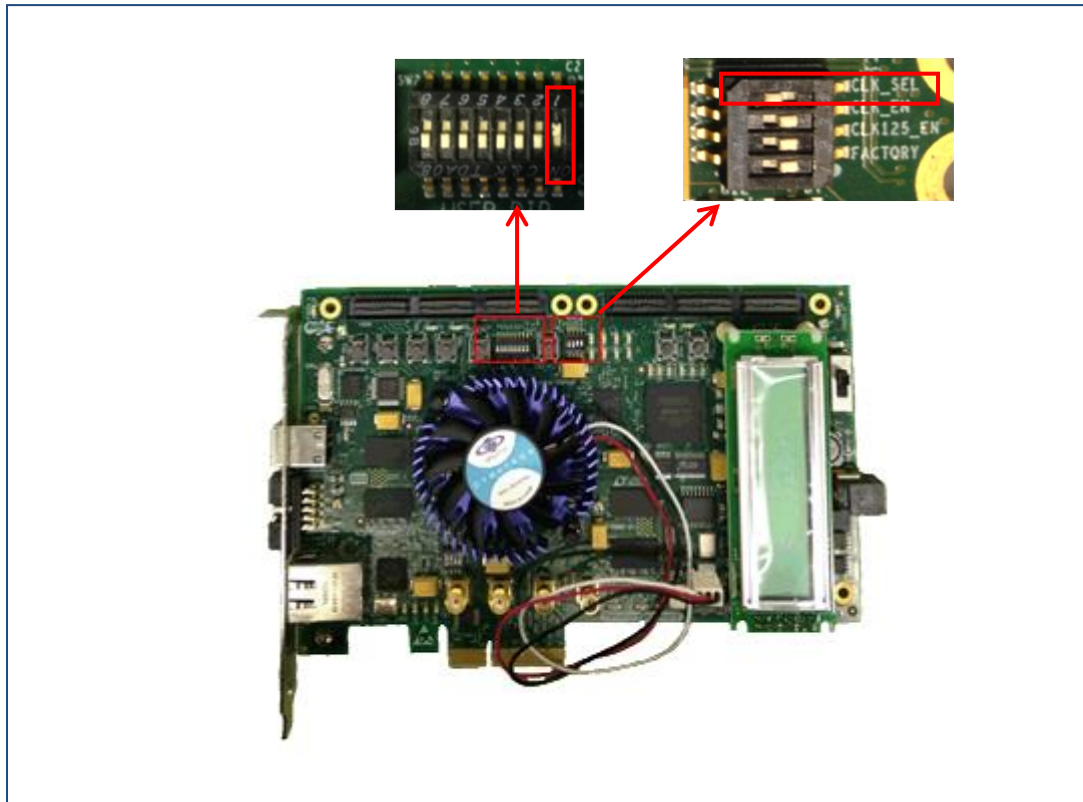


Fig. 4-5. Settings on the Cyclone IV board

6. The appearance after connection is as shown in the figure below.

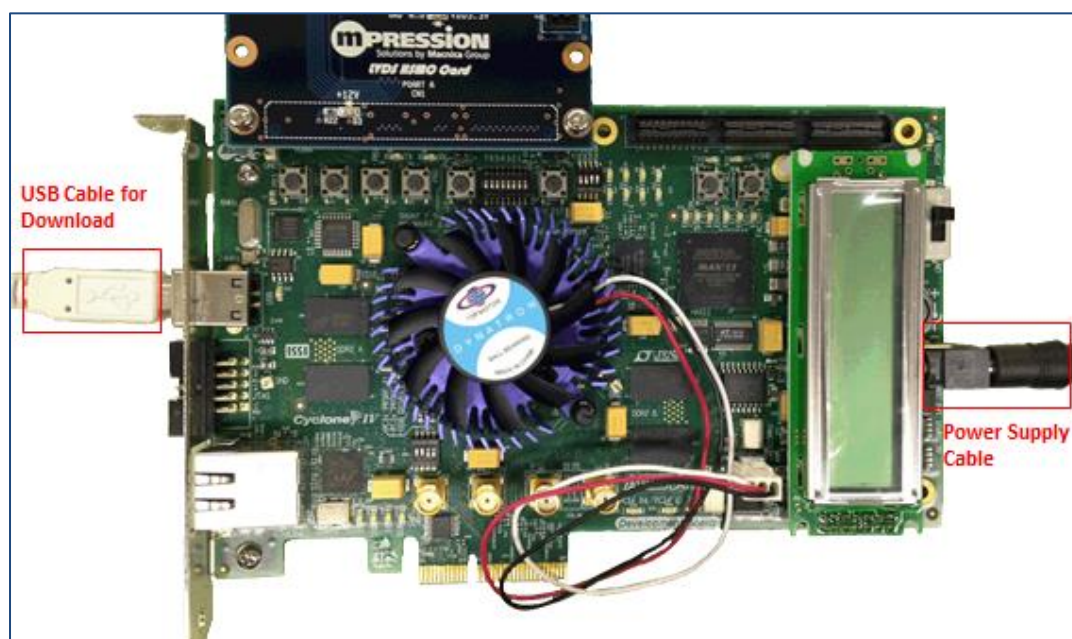


Fig. 4-6. Connecting the power supply cable and USB cable

5. Operation Procedure

5.1 Checking the operation of the LVDS

1. Connect this Card, the cable for LVDS HSMC Card, and the Cyclone IV board. (See Section 4.)
2. Turn on the Cyclone IV board.

The following describes how to download the .sof file onto the Cyclone IV board.

3. Boot Quartus II. When Quartus II is running, the following pop-up dialog box appears. If you do not have a Quartus II license, select “Continue using the software without compilation support” and then [OK].

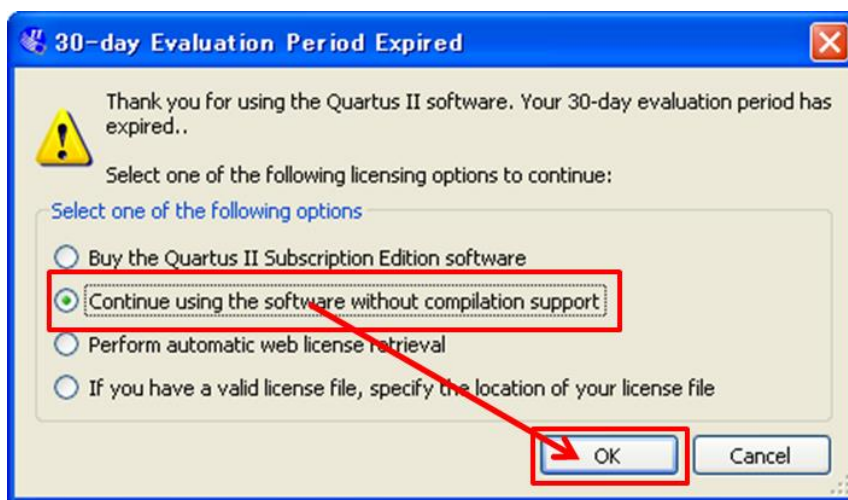


Fig. 5-1. Pop-up dialog box that appears when Quartus II is booted

4. Decompress the provided sample.zip.

5. Select [File] and [Open Project...]. Then, select the sample.qpf stored in the sample directory that you decompressed.

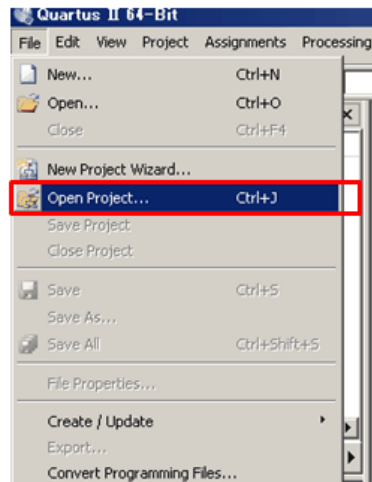


Fig. 5-2. Opening the design project

6. If the name of the top directory of the specified project (sample_top) is displayed in Project Navigator (which is displayed at the upper left of the Quartus II screen), the project setup is complete.

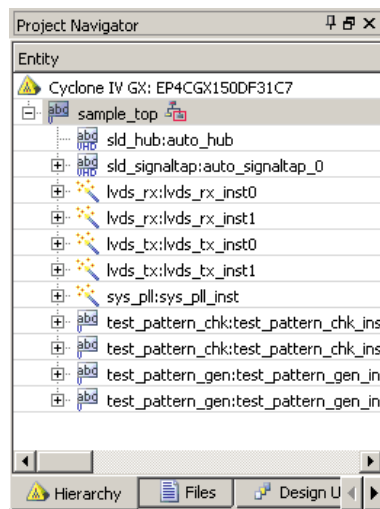


Fig. 5-3. Project window

7. The Quartus II window opens. On the menu bar, click [Tools] and then [Programmer].

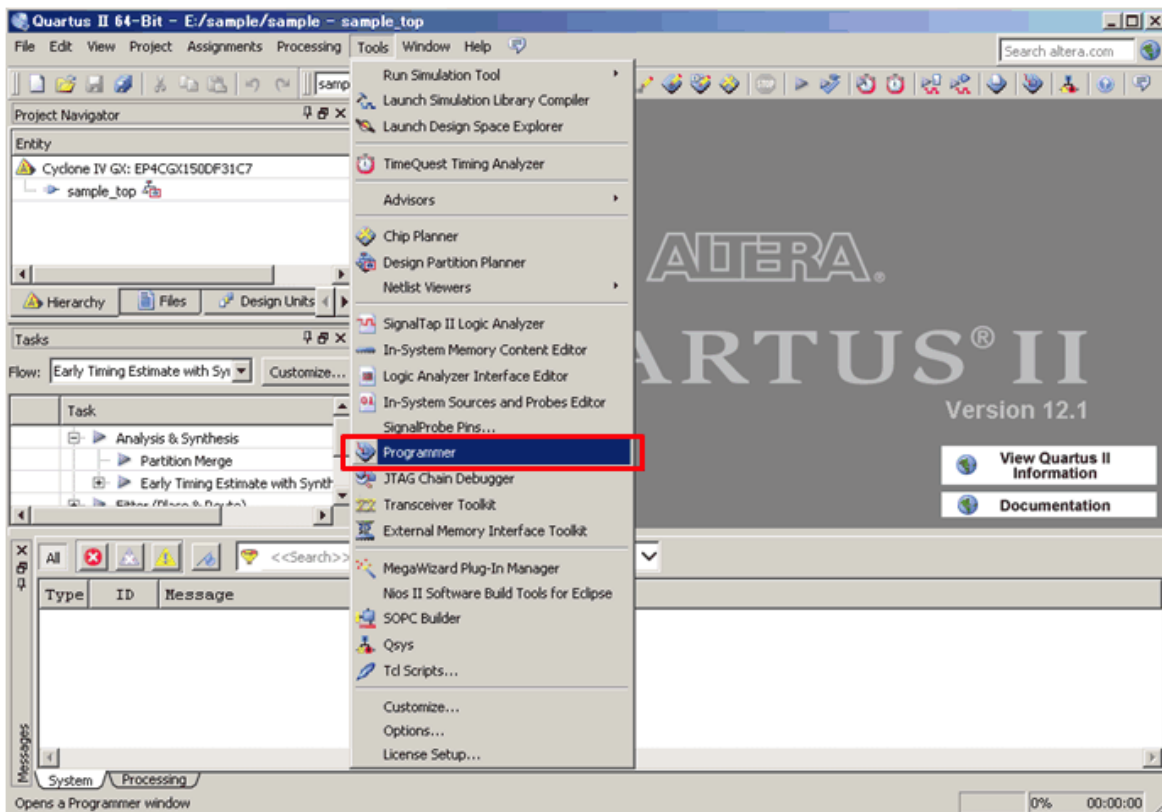


Fig. 5-4. Quartus II window

8. The Programmer window opens. Click [Hardware Setup].
* If no settings need to be made in Hardware Setup, go to 10.

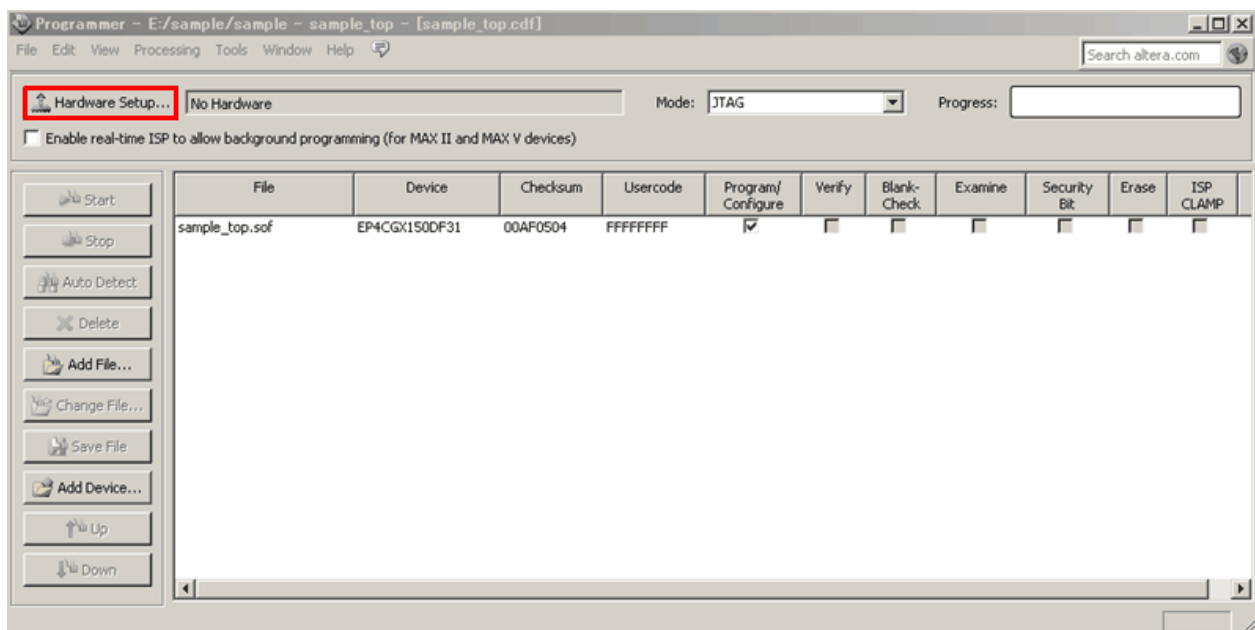


Fig. 5-5. Programmer window

9. “USB-Blaster™” should be displayed in “Available hardware items.” Select and double-click it. Then, click [Close] to close the window.

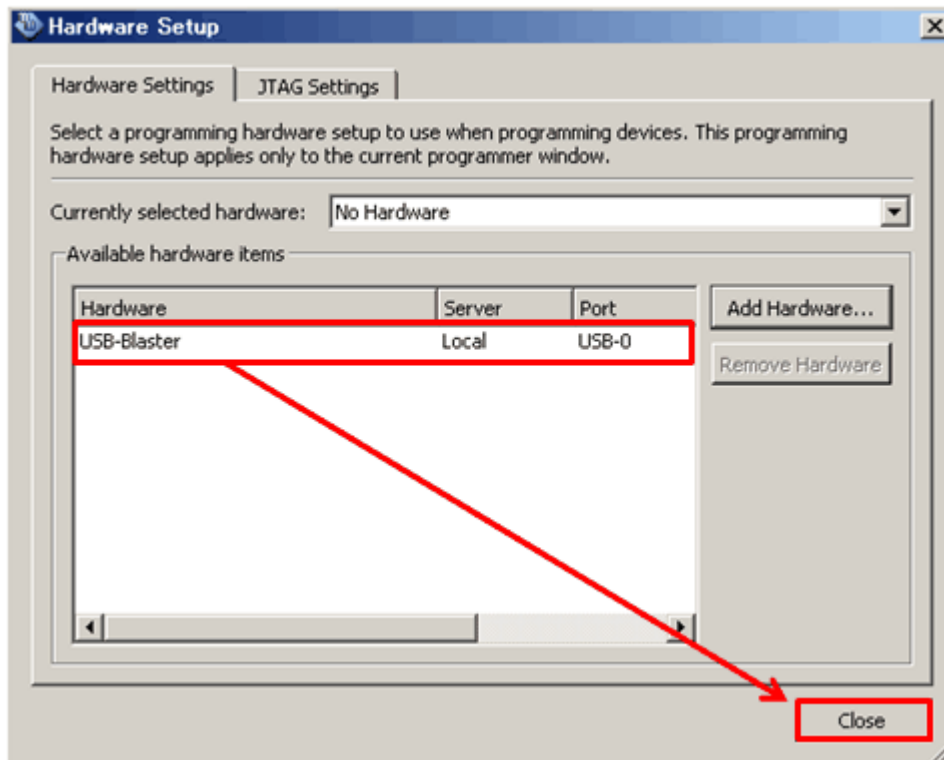


Fig. 5-6. Hardware Setup window

10. Click [Auto Detect]. The devices on the Cyclone IV board will be displayed.

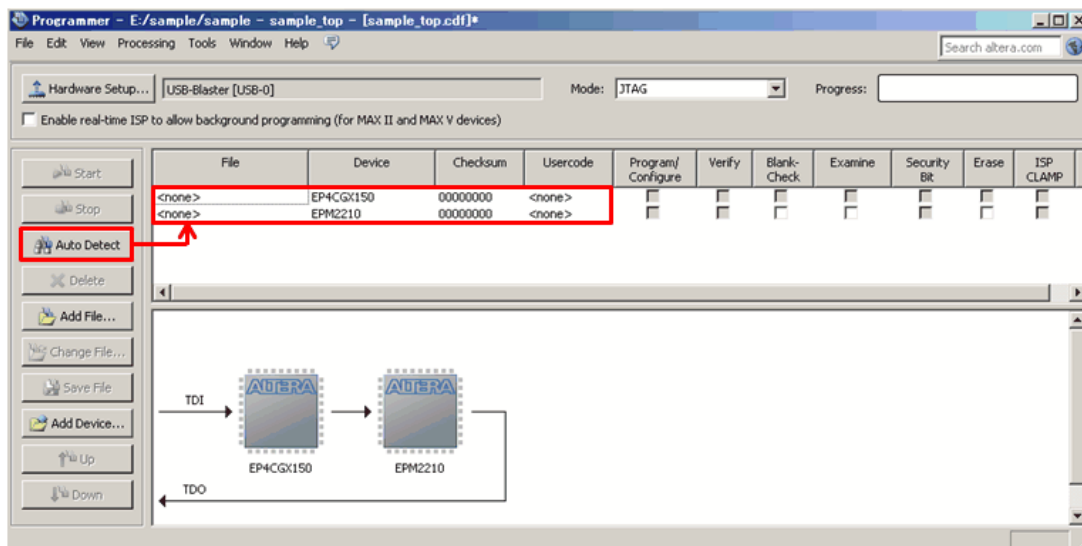


Fig. 5-7. Clicking Auto Detect

11. Double-click the area enclosed in red.

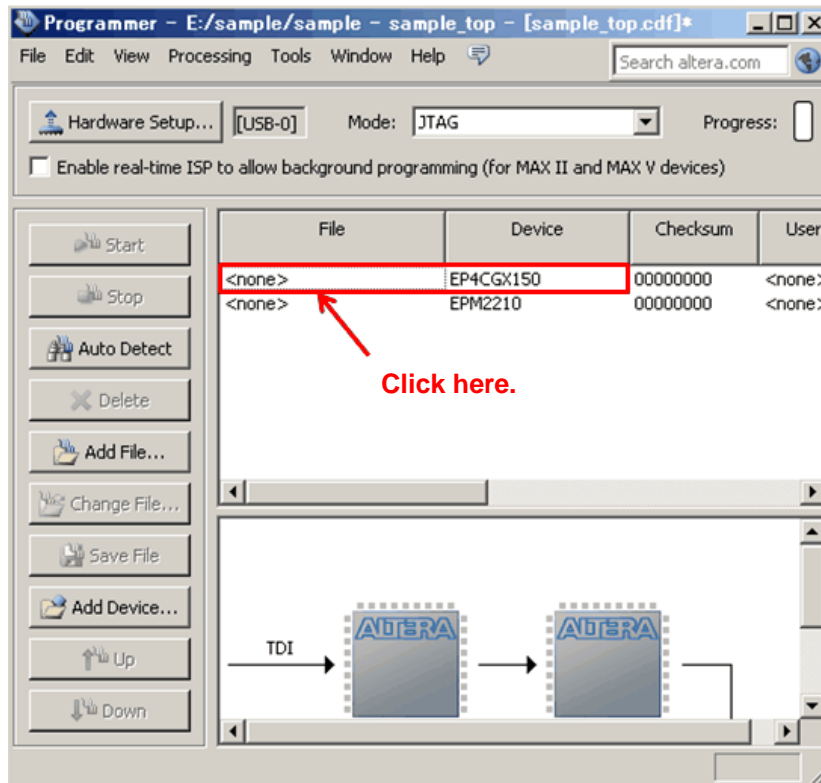


Fig. 5-8. Double-clicking EP4CGX150

12. The Select New Programming File window opens. Select the provided sample_top.sof file and then, click [Open].

13. Select “Program/Configure” and then click [Start]. The download of the .sof file onto the Cyclone IV board starts.

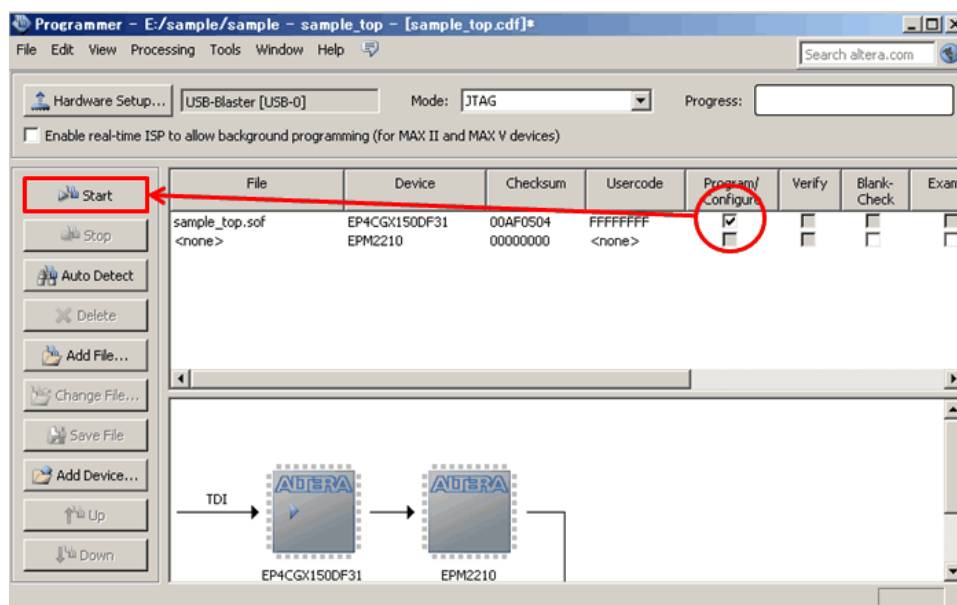


Fig. 5-9. Starting the download of the .sof file

14. After programming is complete, press PB0 once to start verification. If the operation is normal, USER LEDs [0] to [3] come on and USER LEDs [4] and [5] go off. The function of each LED is as follows:

USER LED[0]: sys_pll is in the locked state.

USER LED[1]: tx is in the locked state.

USER LED[2]: rx is in the locked state.

USER LED[3]: LVDS alignment is complete.

USER LED[4]: Error (inst0)

USER LED[5]: Error (inst1)

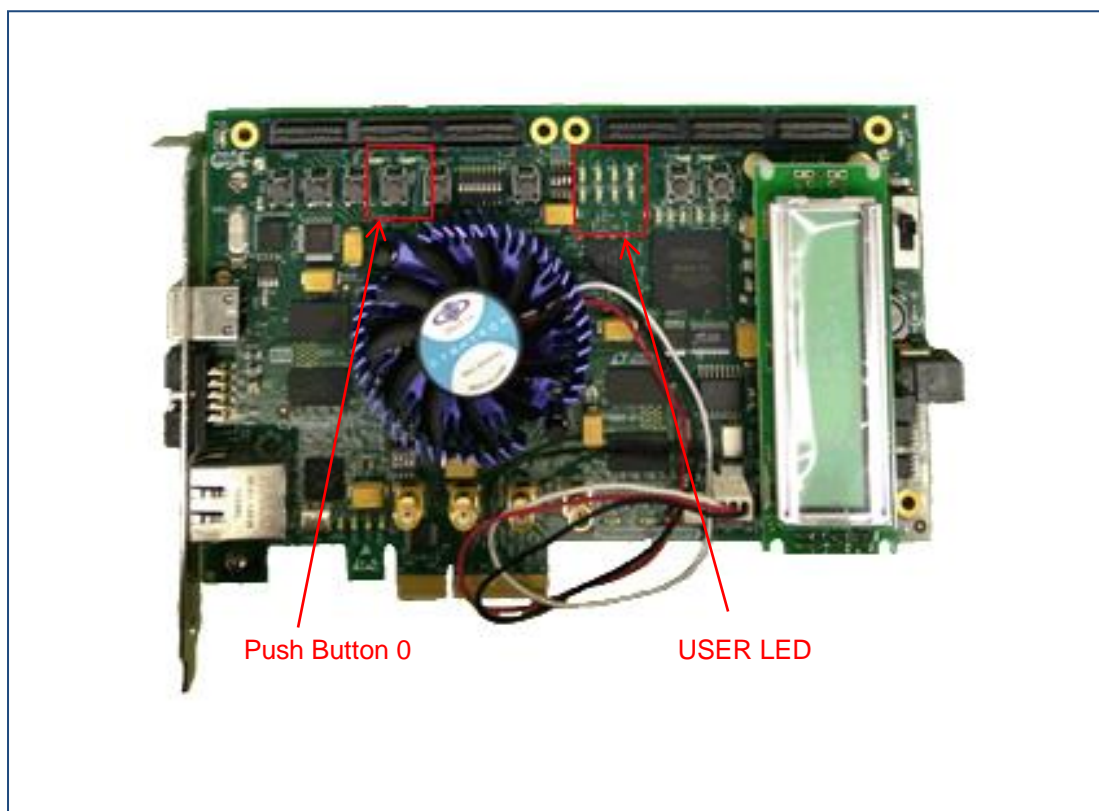


Fig. 5-10. Locations of USER LEDs and Push Button 0

5.2 GPIO operation check procedure

1. Decompress the provided gpio_test.zip file.
2. Connect this Card, the Cyclone IV board, and the connector. (See 3-1.)
3. Turn on the Cyclone IV board.
4. Download the gpio_test.sof file onto the Cyclone IV board (FPGA). (See steps 5 to 13 of 5.1.)
5. When programming is complete, verification automatically starts. Check that USER DIPSW [7] is on. While verification is in progress, USER LEDs [0] to [3] turn on one by one, from one end to the other. If an error is detected, USER LEDs [4] to [7] all start to flash.

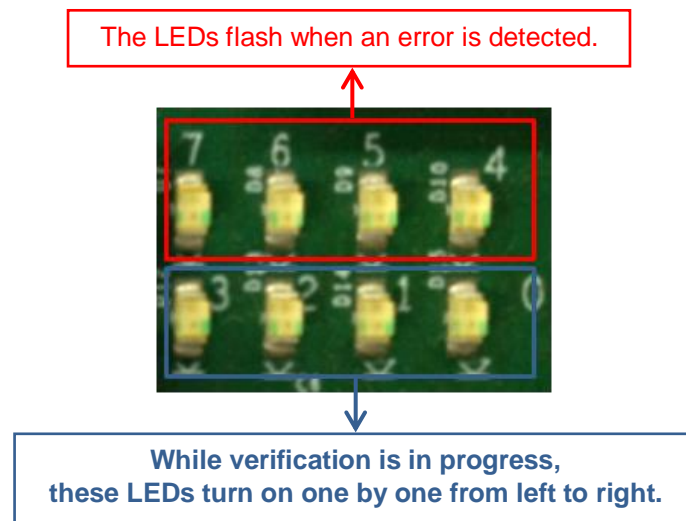


Fig. 5-11. Status and result indication with User LEDs

6. Document Revision History

Date	Revision	Changes
February 1, 2014	1.0	Initial release

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