



Getting Started

Mpression USB 3.0 Interface Card SV

Revision 1.0

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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>

 <p>Caution (Continued from previous page)</p>	<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/
• ASEAN & India:	Cytech Global	http://www.cytechglobal.com/
• Taiwan:	Galaxy Far East Corp.	http://www.gfec.com.tw/
• 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 is a Getting Started for the USB 3.0 Interface Board (this Board) Reference Design.

This reference design allows developers to use Cypress EZ-USB[®] FX3[™] to implement a USB video class (UVC) function, transfer image data captured from the Cyclone[®] IV GX FPGA development board (the Cyclone IV board) through GPIF[™] II to a host PC via USB, and then display the image on the host PC.

Both color bar output (see Section 6-2 for details) and live image output (see Section 6-3 for details) can be used on this reference design.

3. Items to prepare

3.1 Color bar output

- This board set(this includes a supplied USB 3.0 cable)
- Cyclone IV board (Ordering code : DK-DEV-4CGX150N)
Linked URL : <http://www.altera.com/products/devkits/altera/kit-cyclone-iv-gx.html>
- Host PC

3.2 Live image output

- This board set(this includes a supplied USB 3.0 cable)
- Cyclone IV board (see the above)
- Microtronix HDMI Receiver/Transmitter HSMC Daughter Card (Microtronix HDMI daughter card)
Ordering code : 6256-00-00
Linked URL:
<http://www.microtronix.com/hsmc-daughtercard-solutions/hdmi-receiver-transmitter-hsmc-daughtercard-1>
- Image source (that can be output via 1080p (RGB) HDMI)
- HDMI cable
- Host PC

4. Operation environment

4.1 Operation check system

The operation of this reference design was checked using the following components.

- Host PC : eX.computer® Aero Stream RA5J-U41/CP1
Chipset: Intel Z77 Express
CPU: Intel Core i7-3770K (3.5 GHz)
Memory: 16 GB (4 × 4 GB PC4-12800 DDR3-1600)
Motherboard: ASUS P8Z77-V LK
OS: Windows 7 Professional SP1 64-bit
- Host PC application: VLC media player Version 2.0.2
- ALTERA Quartus II® 12.1 sp1
- Cypress EZ-USB FX3 SDK Version 1.2.1
- Cypress USB Control Center Version 1.2.1.0
- Image source: Dvico TVIX HD M-6500A

5. Connection Procedure

5.1 Color bar output

1, Connect this board to HSMC port B on the Cyclone IV board

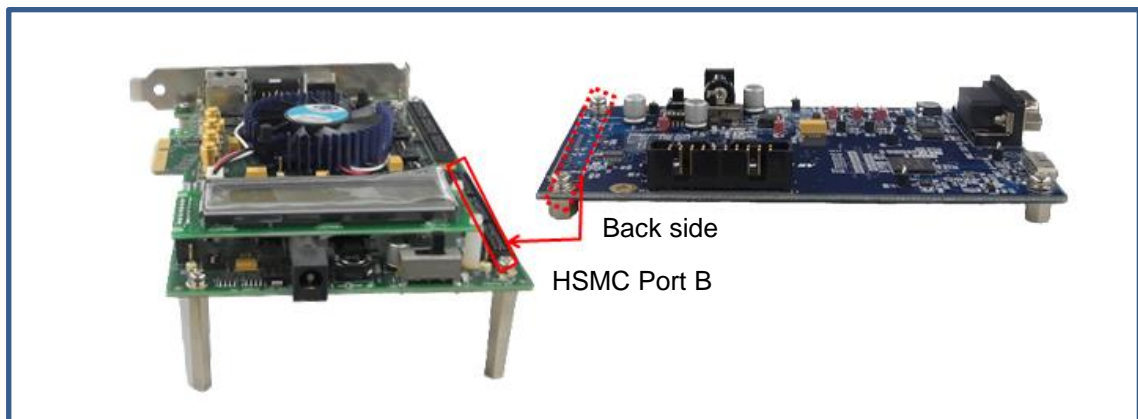


Fig. 5-1 Connection procedure for this Board

The following figure shows this Board connected to the Cyclone IV board.

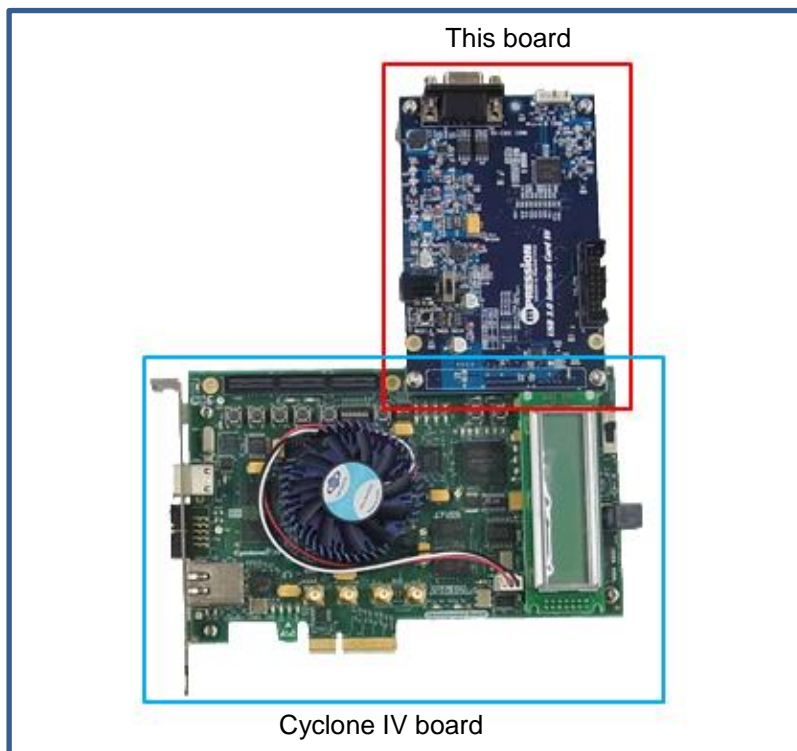


Fig. 5-2. A card and a board connected for using the color bar output

2, Set Pin 1 of DIP switch (SW2) to OFF.

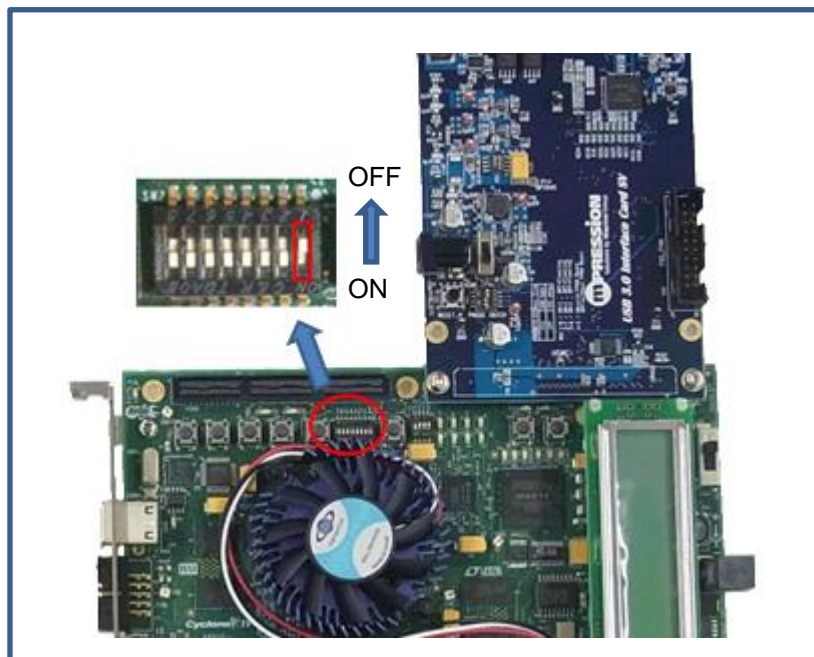


Fig. 5-3 Setting pin 1 of DIP Switch (SW2) to “OFF”

3, Connect the accessory power supply cable for Cyclone IV board and connect the USB cable for downloading .sof file.

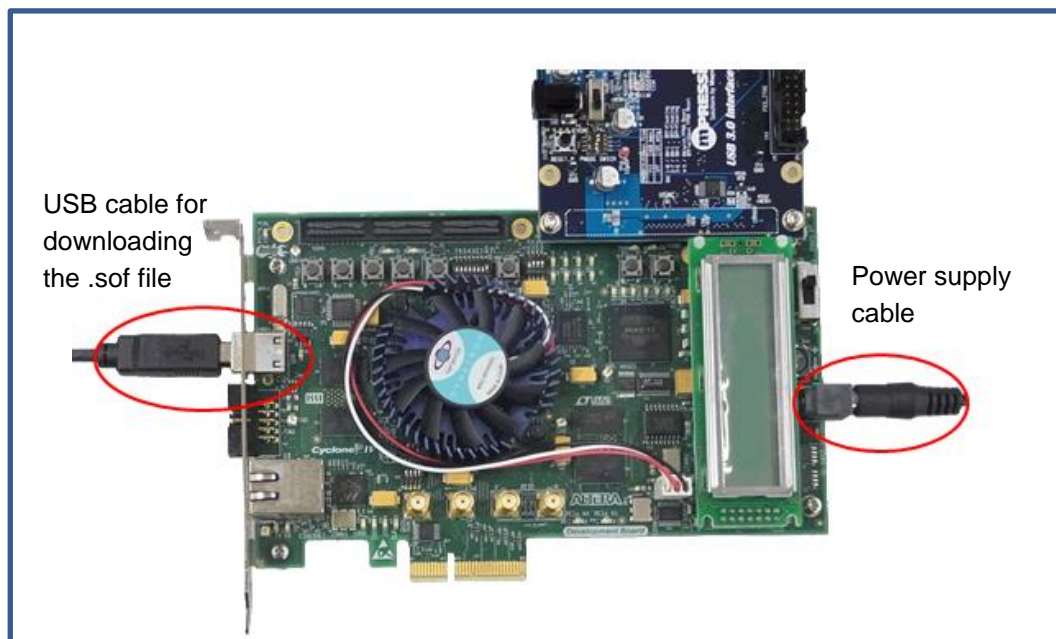


Fig. 5-4 Connecting the power supply cable and USB cable

4, Connect this Board to the host PC by using the supplied USB 3.0 cable.

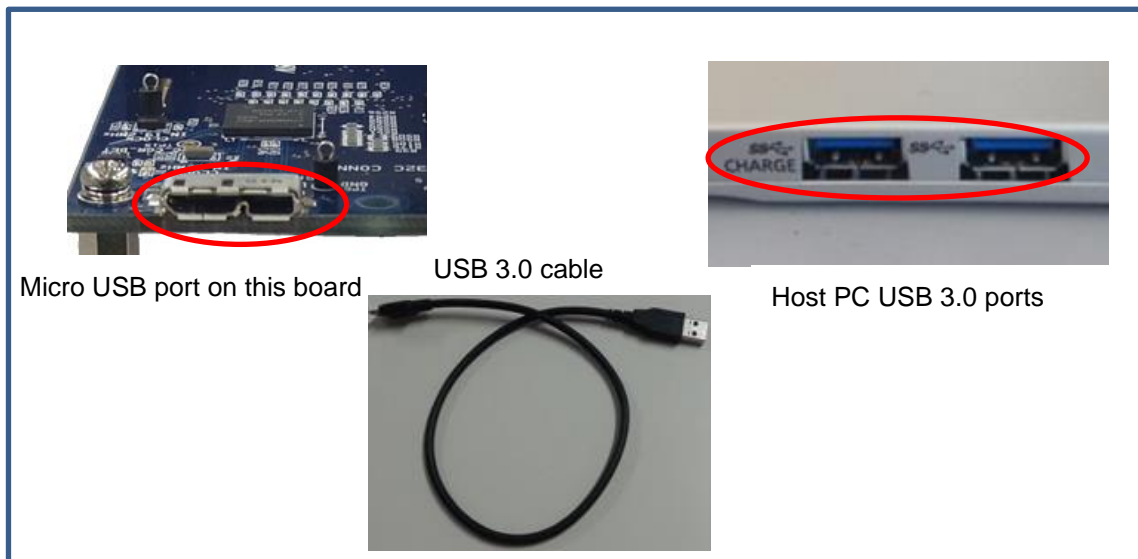


Fig. 5-5 Use the USB 3.0 cable to connect this Board to the host PC

5.2 Live image output

- 1, Connect this board to HSMC port B on the Cyclone IV board. (see Fig. 5-1)
- 2, Connect the Microtronix HDMI daughter card to HSMC port A on the Cyclone IV board.

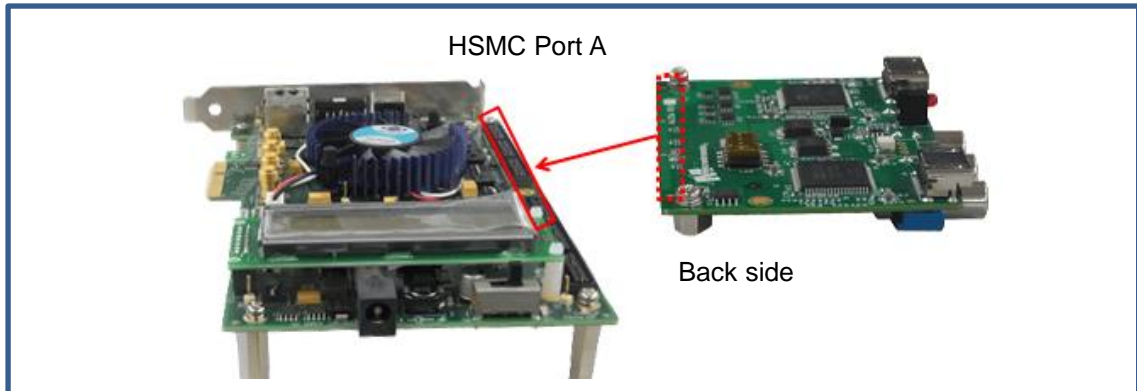


Fig. 5-6 Connection procedure for the Microtronix HDMI daughter card

The following figure shows this Board, Cyclone IV board, and Microtronix HDMI daughter card connected together

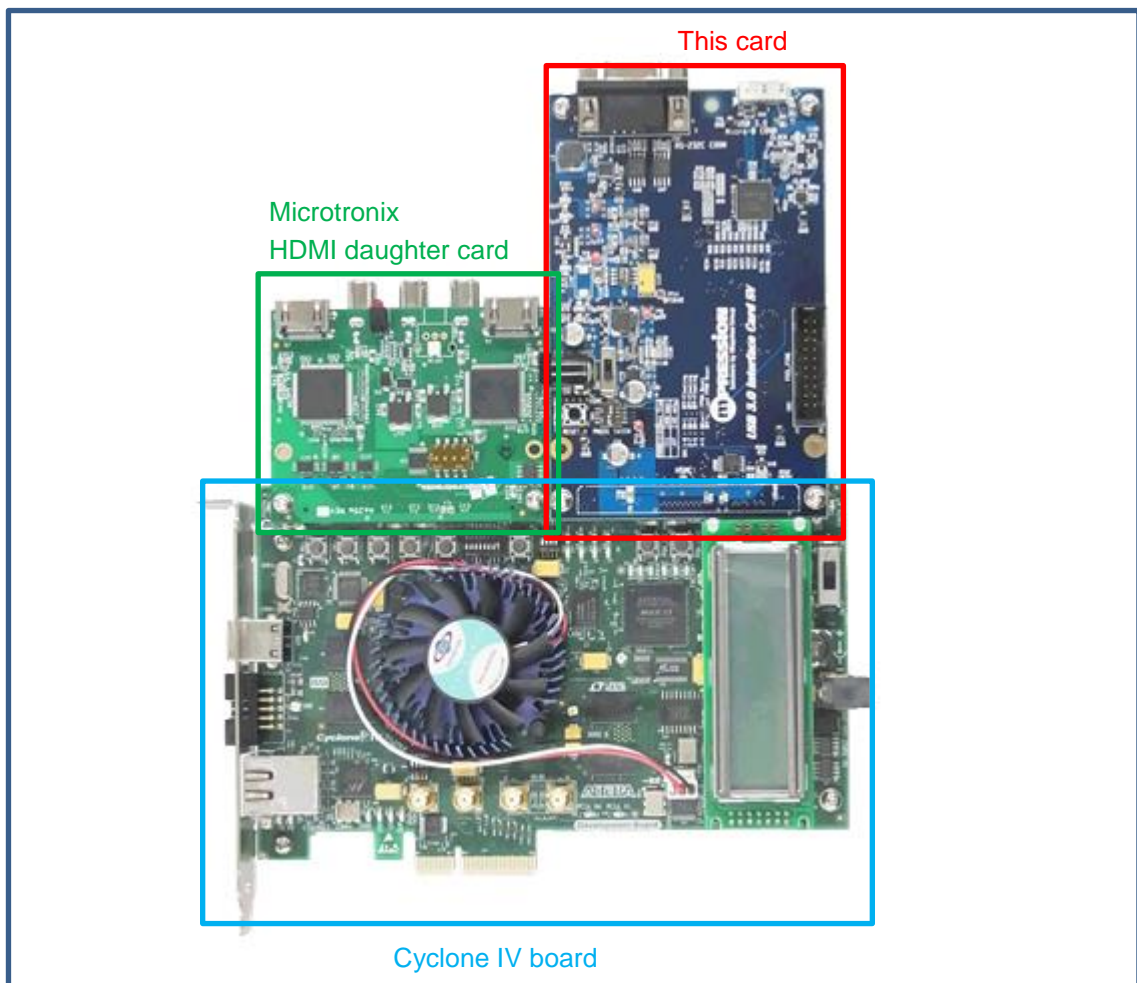


Fig. 5-7 Two cards and a board connected together for live image output

3, Set Pin 1 of DIP switch (SW2) to “ON.”

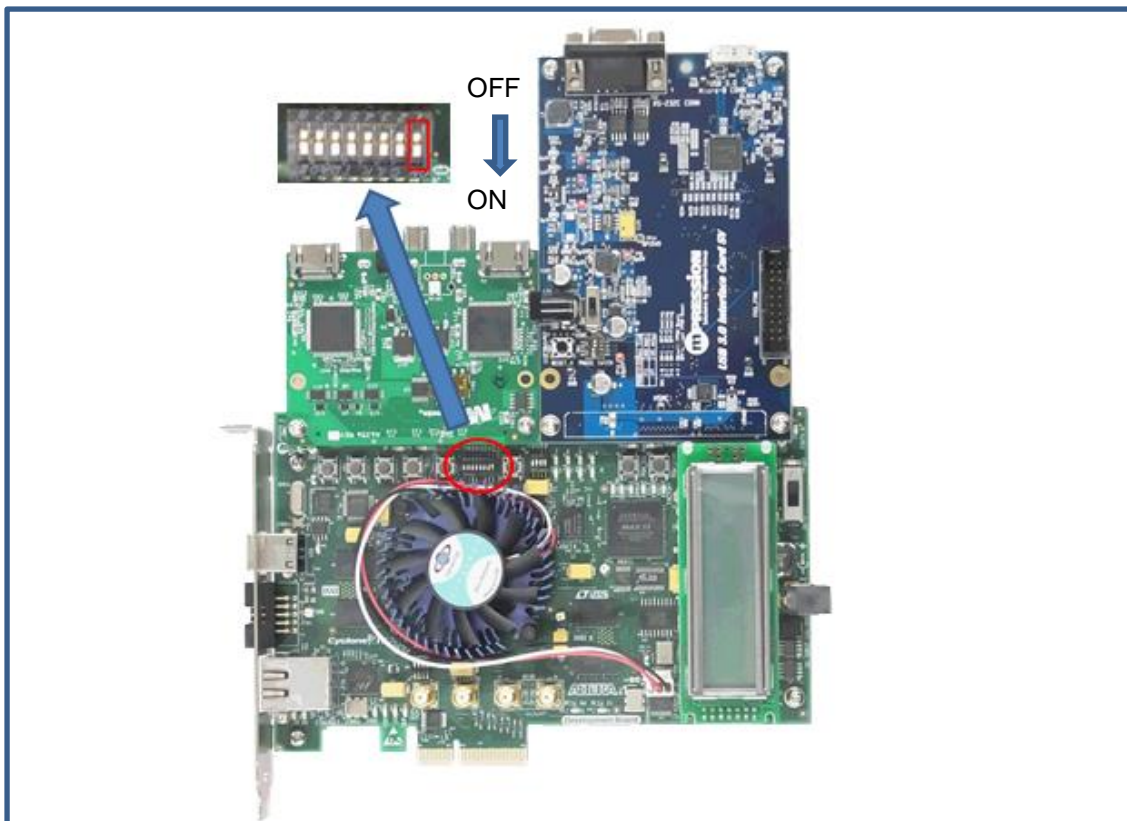


Fig. 5-8 Setting pin 1 of DIP Switch (SW2) to “ON”

4, Connected the accessory power supply cable for the Cyclone IV board and connect the USB cable for downloading the .sof file. (see Fig.5-4)

5, Connected the Receiver port of Microtronix HDMI daughter card to the image source with the HDMI cable.

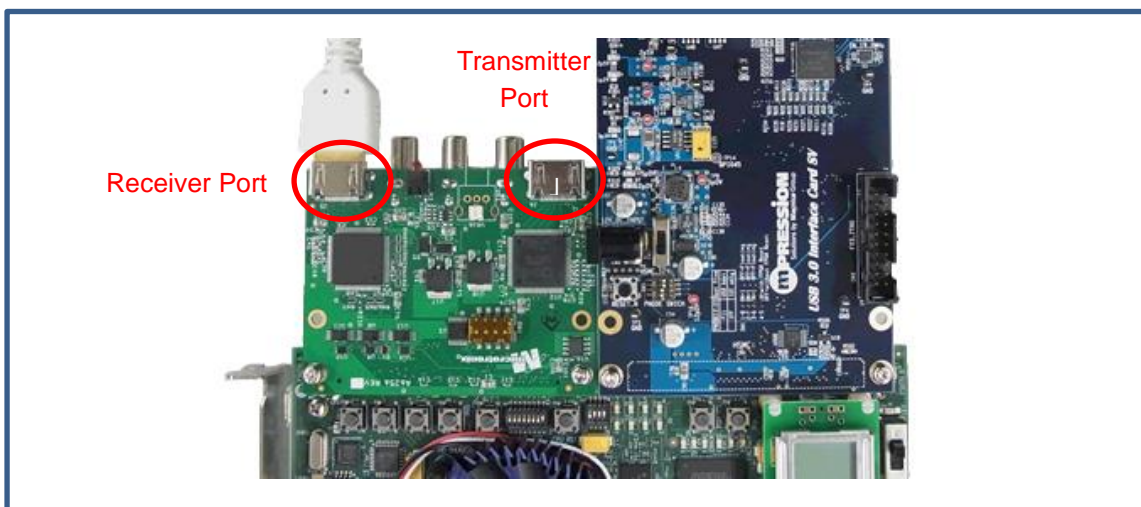


Fig. 5-9 Microtronix HDMI daughter card and image source connected with HDMI cable

6, Connect this Board to the host PC by using the supplied USB 3.0 cable. (see Fig. 5-5)

6. Operation Procedure

6.1 Operation procedure

This operation procedure requires installation of the following software development tools.

- ALTERA Quartus II
- Cypress USB Control Center(included in EZ-USB FX3 Software Development Kit)

These tools can be downloaded from the following links (as of March 1, 2014).

ALTERA Quartus II Web Edition software : <https://www.altera.com/download/software/quartus-ii-we/>

Cypress EZ-USB FX3 software Development Kit : <http://www.cypress.com/?rID=57990>

6.2 To use color bar output

1, Connect this board and the Cyclone IV board (see Section 5-1 for details)

2, Board and the Cyclone IV board (see Section 5-1 for details) Cyclone IV

To download the .sof file to the Cyclone IV board, follow the procedure described in Steps3 to 10 below.

3, Star Quartus II. The popup window shown below will then appear. If you do not have a Quartus II license, select **Continue using the software without compilation support** and then click .

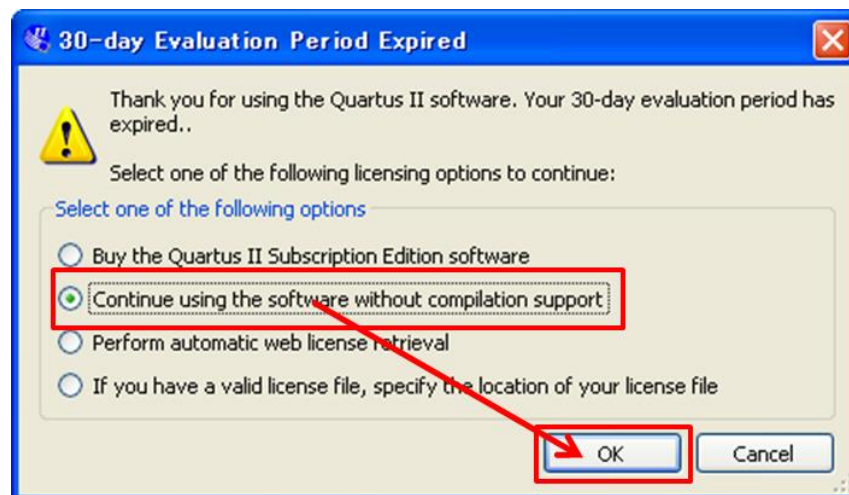


Fig. 6-1 Popup window appearing when Quartus II has started

4, When the Quartus II window opens, click **Tools** and then **Programmer** on the menu bar.

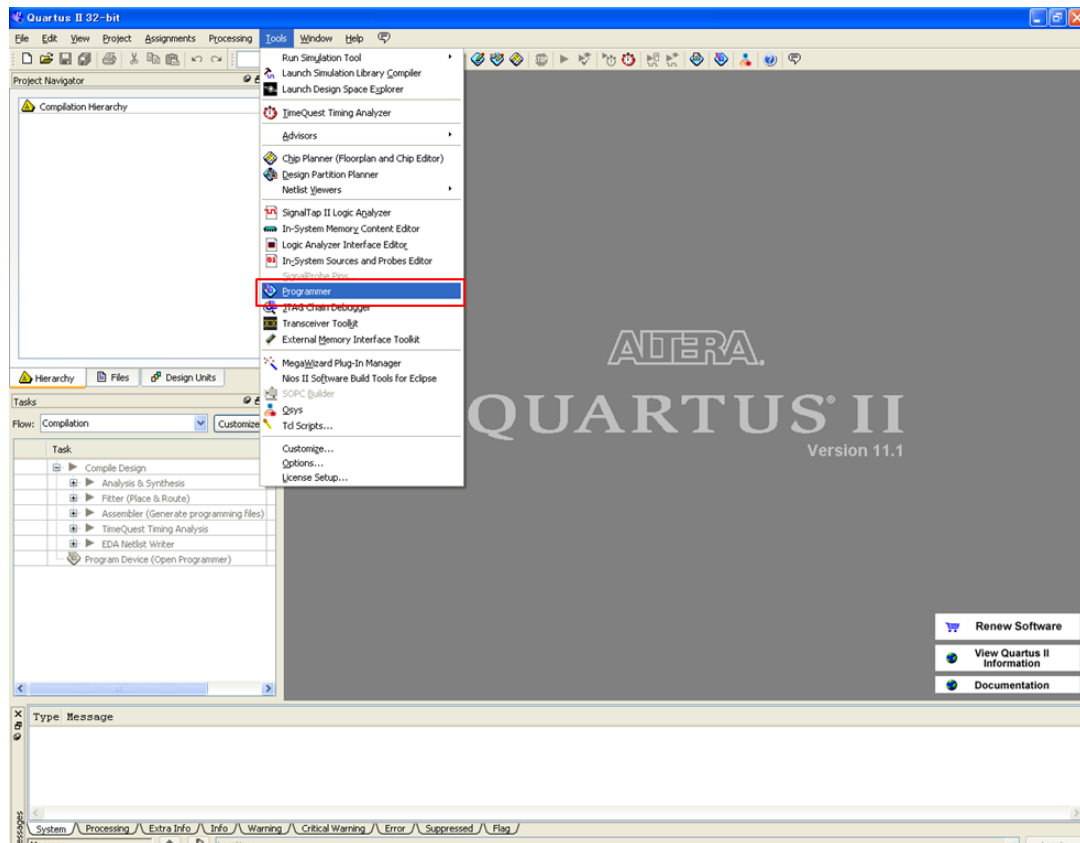


Fig. 6-2 Quartus II window

5, When the Programmer window opens, click Hardware Setup

* If Hardware Setup is not needed then jump to Step 7.

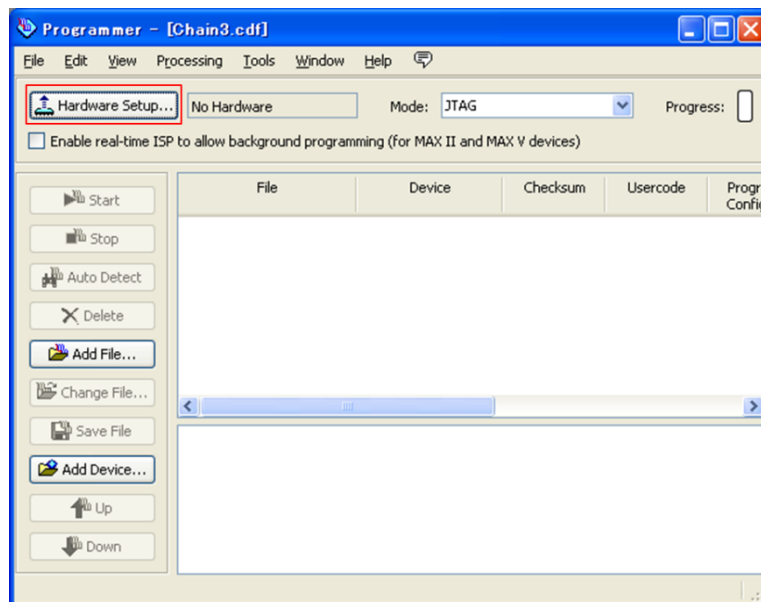


Fig. 6-3 Programmer window

6, Now you should see USB-Blaster™ in the Available hardware items area. Select and double-click it and then click Close to close the window.

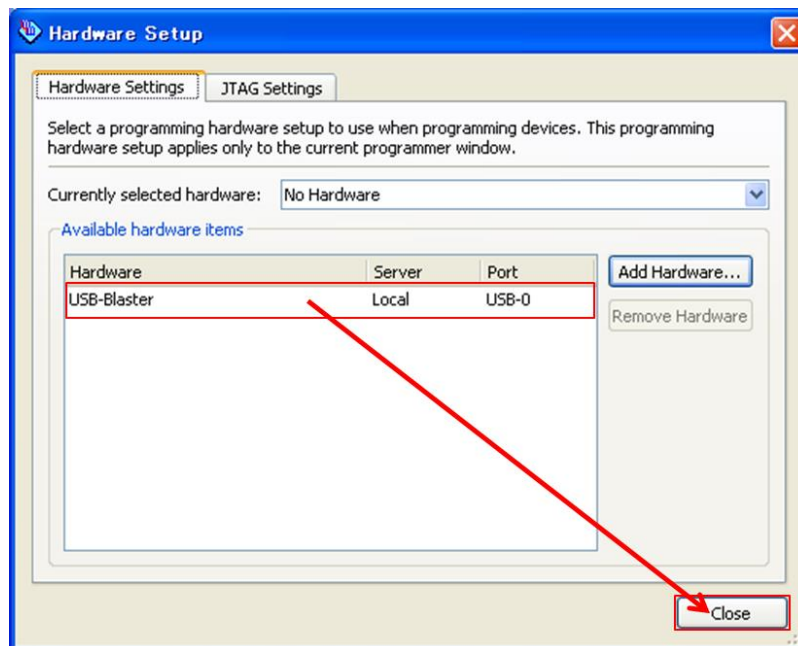


Fig. 6-4 Hardware Setup window

7, Click **Auto Detect**. You should now see the Cyclone IV board devices.

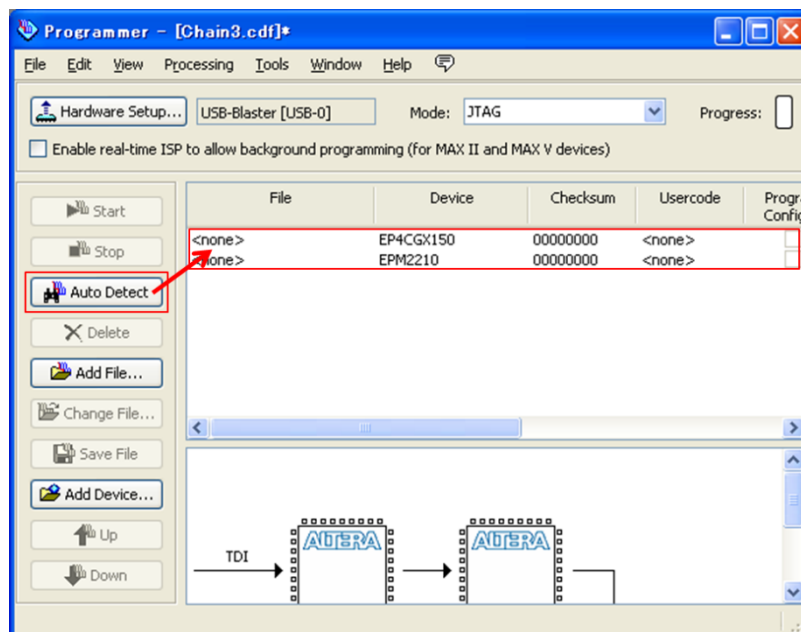


Fig. 6-5 Click Auto Detect

8, Double-click the area enclosed with a red line below.

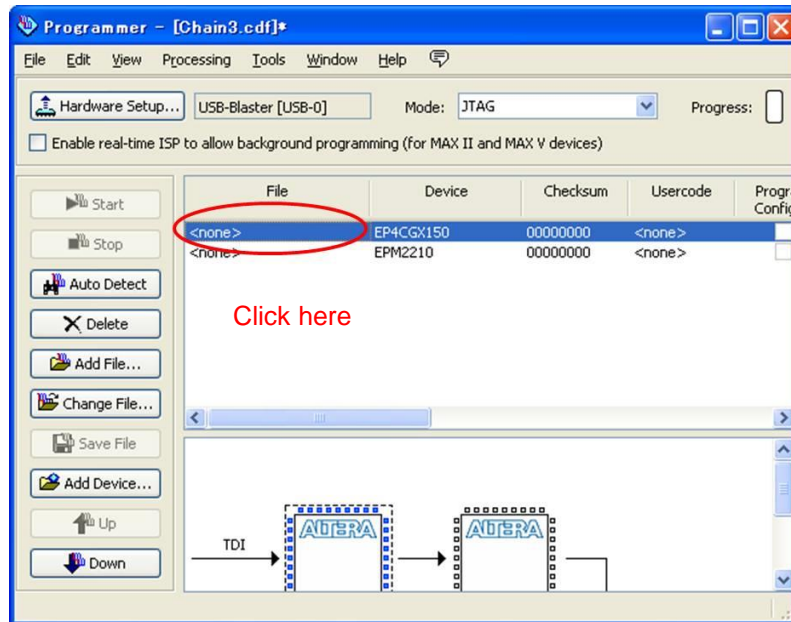


Fig. 6-6 Select and double-click EP4CGX150

9, When the **Select New Programming File** window opens, select the attached fx3_uvc.sof file, and then click **Open**.

10, Check Program/Configure and click Start. Downloading of the .sof file to the Cyclone IV board will then start.

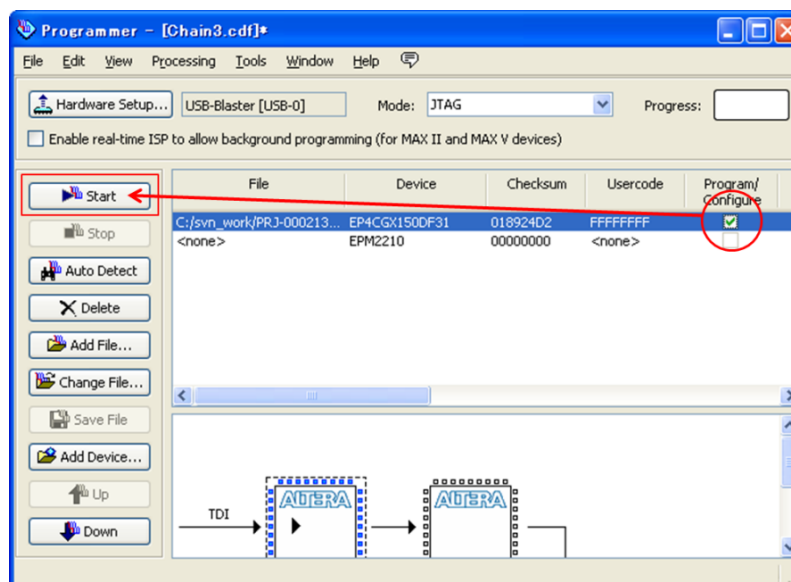


Fig. 6-7 Starting download of .sof file

<<Reference Information>>

Program/Configure
Writes (programs) programming data to the device.

To download the .img file to this Board, follow the procedure described in Steps 11 to 14 below.

- 11, Start USB Control Center. Confirm that this Board is recognized as Cypress USB BootLoader by the USB Control Center.

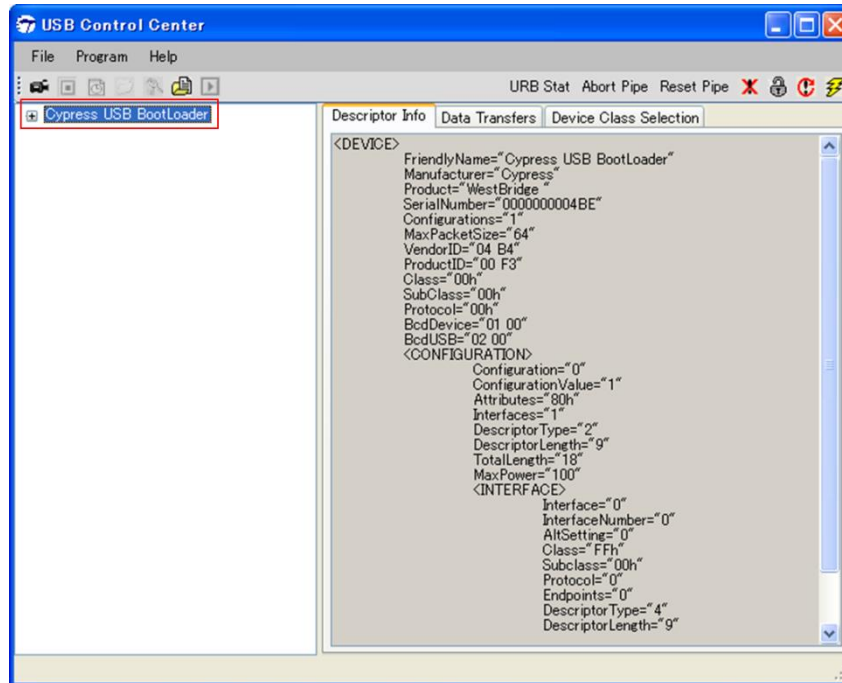


Fig. 6-8 Window appearing when USB Control Center has started

- 12, After selecting Cypress USB BootLoader, click **Program, FX3**, and then **RAM** on the menu bar.

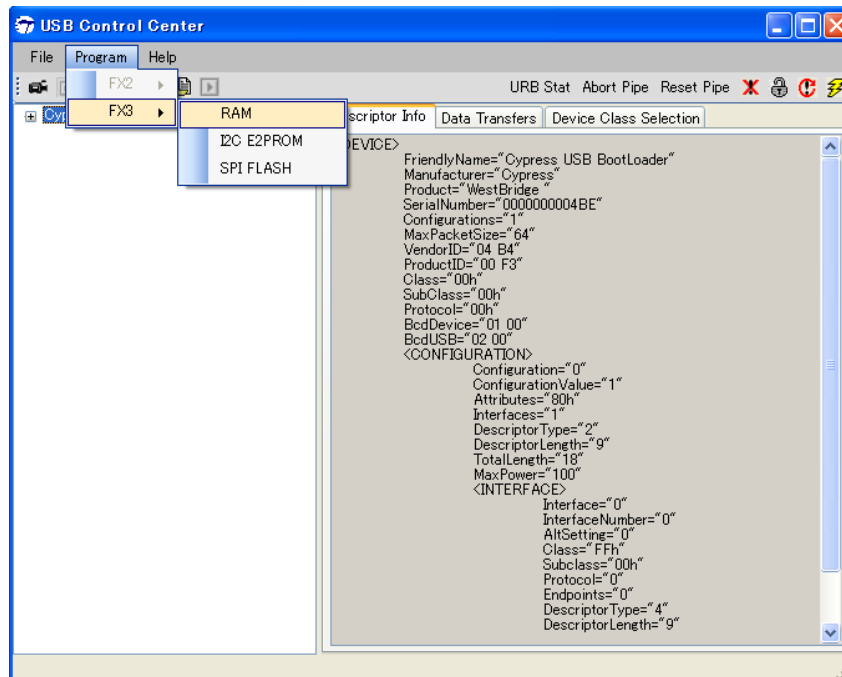


Fig. 6-9 Selecting Cypress USB BootLoader

- 13, When the **Select New Programming File** window opens, select the attached fx3_uvc.img file, and then click **Open**.
- 14, When the .img file has been downloaded successfully, it is recognized as the imaging device FX3 by the host PC.

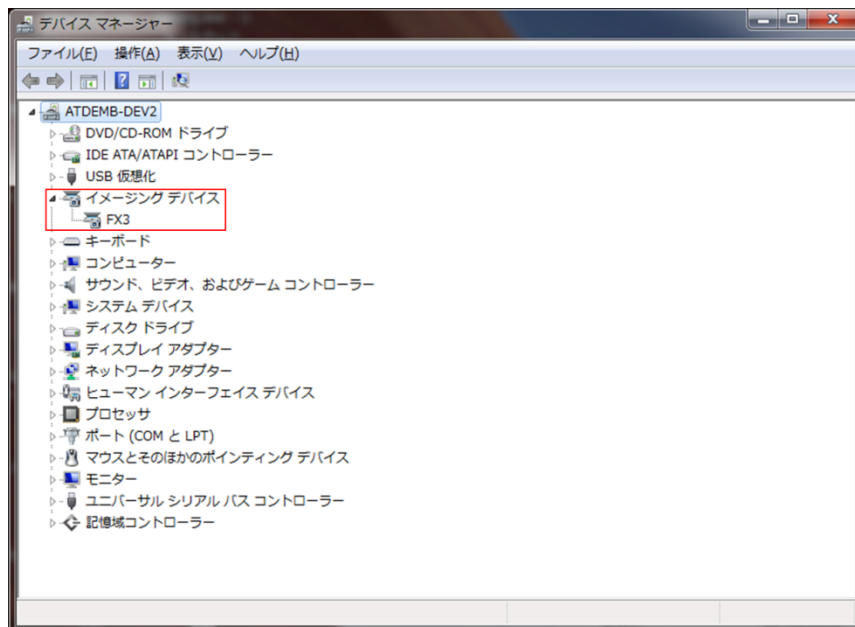


Fig. 6-10 Recognition as imaging device (Example of check by device manager)

- 15, A color bar is output when the image is displayed on a UVC compatible application (VLC media player, AMCap, etc.).

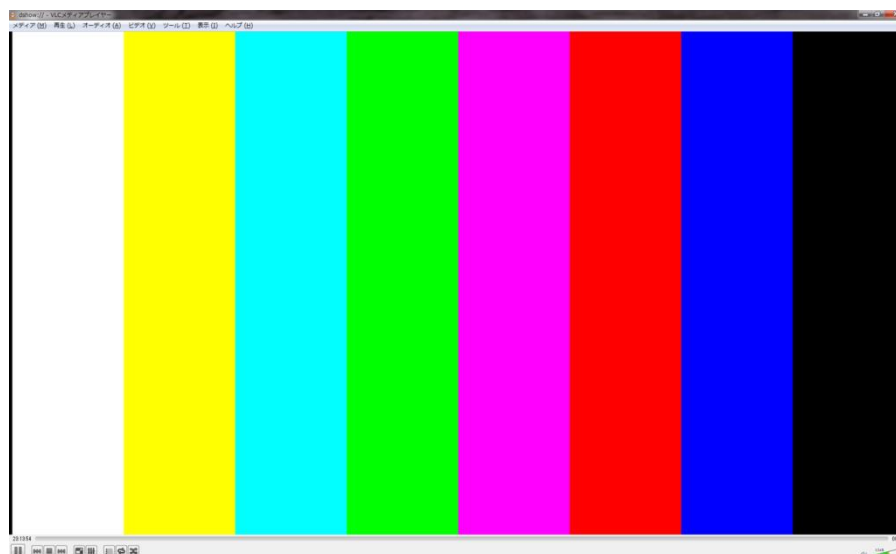


Fig. 6-11 Color bar display (Example of check on VLC media player)

6.3 To use live image output

- 1、 Connect this Board, the Cyclone IV board, and the image source (see Section 5-2 for details).
- 2、 Turn on this Board, the Cyclone IV board, and then the image source.
- 3、 Download the .sof file to the Cyclone IV board (see Steps 6-1-3 to 6-1-10 in Section 6-1 for details), .img file to this Board (see Steps 6-1-11 to 6-1-14 in Section 6-1 for details).
- 4、 When the image is displayed on the host PC, a live image is output (see Step 6-1-15 in Section 6-1 for details).

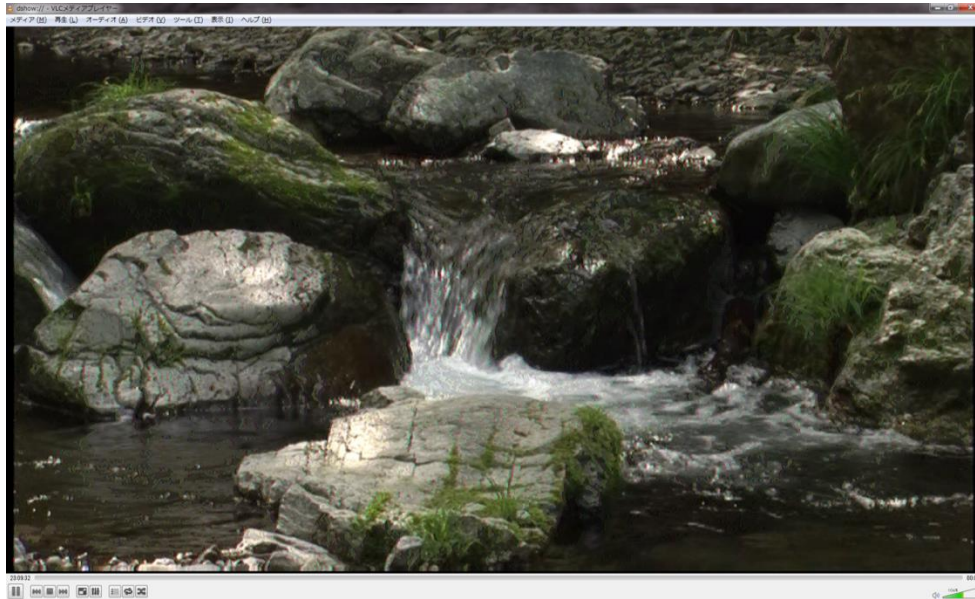


Fig. 6-12 Live image being displayed (Example of check on VLC media player)

7. Document Revision History

Date	Revision	Changes
March 1, 2014	1.0	Initial release