VmodCamera Guide

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Abstract

This tutorial will show in depth how to set up the hardware and software for a Virtex 5 board to use the VmodCamera. Additionally, specifications for jumpers and other minor, but important, details will be included.

1 Preliminary Set-up

1.1 Hardware Configuration

Before starting any software compilation or building any platform, the FPGA needs to be physically configured properly. Certain jumpers will need to be "in place" for the camera to work properly. Make sure that the following jumpers are bridged:

- The VSWT x VUEWP (JP1) jumpers on the right hand side in between the two VHDCI ports on the board.
- The M2 voltage mode jumpers on the upper right of the board. There should only be one jumper in this location. No other mode (M1 or M0) should be connected.
- Other jumpers on the board should be ok at their default states

1.2 Cables

For the base project, the FPGA will need:

- VmodCamera plugged via VHDCI in the upper right port
- Power connected in the upper left
- HDMI to DVI cable connected to a display
- MicroUSB cable connected via the "Diligent" port

1.3 Downloading Resources

Go to the class resources and download the file titled *Getting Started Resources.* When unzipped, this folder will contain a directory called *VMOD Camera Tutorial.* This folder will contain everything needed to start the project. Under the folder *VmodCam,* there is a proj folder that has every file needed to get started.

2 Creating a platform

2.1 Launch Platform Studio

Select *Open an Existing Project* and choose the *system.xmp* from the *proj* folder from the resources. Update any files/packages if necessary. Once you get to the main platform studio window, make sure that all you desired peripherals, buses/resources you wish to include in your project are present. If not, **now** is the time to make changes. Simply add any interface to the IP.

2.2 Generate the Platform

When you are ready to create your platform, click *Export the Design to the SDK*. THis will take a long time (roughly 20-30 minutes)

3 Xilinx SDK

3.1 Select a workspace

When the SKD finally starts, a prompt will ask for a work space. The downloaded package contains some preliminary code to use. The *HelloCamera* workspace in the *\proj* folder will have enough to get the camera working.

3.2 Create a new Application

Select *File -> New -> Application Project*. Title it anything and create a new board support package. Next we will import the premade source files into the project. Select *File -> Import -> FIle System* and find the source files in \proj\TestApp_VmodCAM\src.

3.3 Changing memory

Go the file *lscript.ld* from the newly imported files and locate the table that organizes *Section Names* and *Memory Region*. The desired values for every cell under *Memory Region* should be set to *ilmb_ cntrl_ dlmb_ cntlr*. Failure to do so will cause insufficient memory for the camera to function properly.

4 Testing the Camera

4.1 Program the FPGA

Select *Project -> Program FPGA* and *Program.* Naviage to the imported main.c file and select *Run-> Run on Hardware.* The display should show a pair of gradients from green to black.