Helio *View* VIP Reference Design

Version 2.0

March 17, 2014

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1 Reference Design Overview

1.1 Introduction and Goals

This document is intended to help you implemenet the VIP refernece design for the Mpression Helio Cyclone V SoC board with Helio *View* LCD module. The refernce design is a complete set of design files necessary to implement the FPGA with the VIP suite as referenced in the vWorkshop slide deck, however, the specifics of each block are not disussed here. It is left as an exploration excersize for the user to understand and modify, as desired, the indiviudal settings.

The Linux image provided incldes the necessary configuration of the NXP HDMI RX chip on the Helio *View* LCD add-on module. The details of the configuration are not discussed in the reference design.

1.2 Hardware and Software Requirements

- Macnica Helio SoC Evaluation board with micro-USB cable and *View* LCD module installed
- Quartus II v13.1 (web or subscription edition)
- WinZip or 7-zip for Windows (used to untar and unzip files)
- Win32 Disk Imager for Windows (writes Linux image/binary files to microSD)

1.3 Assistance

A dedicated e-mail account has been setup to receive support requests for the vWorkshop series. Please identify the course (in this case VIP Reference Design) in addition to details on the question. workshophelp@macnica.com

2   Reference Design Instructions

2.1   Download reference design project files

☐ Download compressed file that contains Quartus design from the following link and unzip the reference design to a location of your choice.

VIP Reference Design - Quartus Project

☐ Download the compressed Linux image from the following link and extract the image to a location of your choice.

VIP Reference Design - Linux Image

2.2   Program microSD card

☐ Use Win32DiskImager to image your microSD card with the Linux image, HW4_VIP_NXP_Drivers_SD_image.img, from the previous step. Insert the microSD card into the Helio main board.

2.3   Compile FPGA project

☐ Launch Quartus-II and **Open** ~/Helio_VIP_ref_design/Helio_VIP_ref_design.qpf

☐ Select **Tools -> QSYS** and then **Open** -> ~/Helio_VIP_ref_design/source/qsys/video_subsys.qsys

☐ Select the **Generate** from the **Generate** pull-down menu. Wait for completion message. (Note: You can open a second instance of Qsys and run the following two steps at the same time this step is running.)

☐ Select **Open** -> ~/Helio_VIP_ref_design/source/qsys/top_hps.qsys

☐ Select the **Generate** from the **Generate** pull-down menu. Wait for completion message and then close QSYS

☐ In Quartus-II, select **Processing -> Start Compilation**. Wait for completion message.

2.4   Program FPGA

☐ Connect USB cable between the Blaster USB port and host PC. Power on Helio board. From Quartus, select **Tools -> Programmer**

☐ Click on **Auto Detect** and select **5CSXFC6C6ES**. Click on **Yes** to overwrite settings.

☐ **Select** the **5CSXFC6C6ES** device in the graphical chain. Click on **Change File** and select ~/Helio_VIP_ref_design/output_files/Helio_VIP_ref_design.sof

☐ Select **Program/Configure** check box for the 5CSXFC6C6ES device. Click **Start**. Wait for Progress bar to reach 100% complete.

2.5   Run reference design

☐ On Helio main board, press **SW6**, **Warm Resetn** (top-back of board). Wait 30 seconds. This boots Linux and configures the NXP HDMI RX chip on the Helio *View* LCD module.

☐ Connect a 720p HDMI source to the RX connector on the Helio *View* LCD module.

☐ In Quartus, select **Tools -> QSYS**, then in QSYS select **Tools -> System Console**

☐ Select **File -> Execute Script**. Click **Don't Create** on the folder creation pop-up message.

☐ **Navigate** to ~/Helio_VIP_ref_design/system_console_scripts and select helio_setup.tcl

☐ Click **Open**. This executes the TCL script to set up the VIP demonstration and menu. The menu displays in the System Console TCL Console window in the lower right-hand corner. Resize the window for better viewing.

☐ Use commands as defined in menu to play with VIP reference design capabilities.

3   Notes

Document Revision History

Revision	Date	Comments
0.1		Initial Draft
0.2		Internal Review
1.0		Customer Release
2.0	March 17, 2014	Updated to v2.0, Quartus 13.1.3