Imagenation PXC200A Frame Grabber & QNX4
CyberOptics Semiconductor

Introduction

CyberOptics Semiconductor recently introduced support for QNX4 for the Imagenation PXC200A frame grabber. This document explains the extent of that support. The QNX support package can be downloaded from our Web site at:

```
http://www.imagenation.com/dnpages/pxc_files.html
```

Contact information

For additional information or free technical support on all Imagenation products, please contact CyberOptics Semiconductor.

Web site:	http://www.imagenation.com
E-mail:	CSsupport@cyberoptics.com
Voice:	503.495.2200
Fax:	503.495.2201
Toll free:	800.366.9131

Working definitions

PXC SERIES FRAME GRABBERS:
> The Imagenation PXC200 and PXC200A frame grabbers will be collectively referred to as PXC Series frame grabbers or simply as PXC frame grabbers.

QNX4:
> The term QNX4 will be used to refer specifically to QNX 4.24 and QNX 4.25.

DISTRIBUTION PACKAGE:
> The package of libraries, samples, and documents that comprises QNX4 support for the PXC Series frame grabbers. The package can be downloaded from the Imagenation Web site.

Installing the distribution package

You can download the distribution package from the Imagenation Web site at:

```
http://www.imagenation.com/dnpages/pxc_files.html
```

The distribution package is in the form of a "tgz" file inside a self-extracting "zip" file. The file you download is named "QNX4_PXCv20.exe." Once you download and unzip it, you should have two files: "pxc2.tgz" and "readme.txt." The file named "readme.txt" contains detailed installation instructions. The simplest and best way to install the file on a QNX4 system is to put the file "pxc2.tgz" into a temporary directory and execute the "install" command with the file's name as an argument. Assuming you put "pxc2.tgz" in "/tmp," you would type the following command:

```
install -u /tmp/pxc2.tgz
```

What comprises support for QNX4

The QNX4 operating system is supported for the PXC Series frame grabbers by two static-link libraries.

✓ PXC200A API library
✓ Video API library

You must be logged into a QNX system as "root" in order to run a program that has been linked to these libraries.

PXC200A API LIBRARY

The PXC200A library actually consists of two sets of APIs:
✓ the PXC200A frame grabber API
✓ the PXC200A frame API

The "PXC200A frame grabber API" contains all of the functions for the frame grabber hardware. While the "PXC200A frame API" contains the functions for allocating, freeing, and manipulating frames.
The manual entitled "PXC200A Color Frame Grabber User's Guide" is the reference for both sets of APIs and can be downloaded from the Imagenation Web site at:

```
http://www.imagenation.com/dnpages/pxc_files.html
```

The PXC200A API is contained in two separate library files in distribution package:
✓ pxc200.lib - contains the frame grabber and frame APIs
✓ pxc200.a - an archive containing "pxc200.lib" and "video.a"

VIDEO LIBRARY

The Imagenation video library provides a set of graphics functions for displaying video on a QNX console screen. DO NOT use this video library with Photon or QNX Windows. GUIs like Photon and QNX Windows have their own sets of graphics functions.

The video library is actually an archive that consists of three libraries:
- ✓ 2 from QNX
- ✓ 1 from CyberOptics Semiconductor

The three libraries archived in "video.a" are listed in Table 1.

crt_util.lib	from QNX
vbios.lib	from QNX
video.lib	from CyberOptics Semiconductor

TABLE 1. CONTENTS OF "VIDEO.A" ARCHIVE

The Imagenation graphics functions contained in "video.lib" are documented in Chapter 7 of the manual, "Imagenation PXC200A Color Frame Grabber User's Guide." No interfaces are provided for the two QNX libraries, because they are called only by "video.lib" and not by any applications.

There are three ways to initialize the QNX VBIOS functions that underpin the Imagenation "video.lib" library. The three methods are controlled by an environment variable named VBIOS_METHOD and are explained in Table 2.

```
export VBIOS_METHOD=0
export VBIOS_METHOD=1
export VBIOS_METHOD=2
```

TABLE 2. VBIOS_METHOD VALUES

DO NOT export VBIOS_METHOD before you run one of the samples. In most cases, the samples will display video correctly. However, if you do experience a problem such as blank screen, then export VBIOS_METHOD and cycle through the values from 0 to 2 until you have a video display.

Samples

The samples contained in the distribution package are designed to get you up and running quickly. There are samples that run in console mode and use the graphics library described above, and there are samples that run under Photon and do not use the graphics library. Each set of samples is accompanied by a "readme" file that explains the purpose of the samples.

CONSOLE SAMPLES

The console samples are designed to show you how to initialize the PXC Series and video libraries, grab frames, and display video. There is a "make file" that will build all of the samples. It is called "Makefile," and you execute it as usual by typing the word "make" at the command prompt.

PHOTON SAMPLES

The photon samples are designed to show you a good method for displaying video in Photon. There are several different ways to display bit-mapped graphics within the Photon GUI. Some of them work well with video, and some don't. We found a method that works well, and we built several samples with it. Each sample illustrates a different method of using the PXC frame grabbers to grab frames: single buffering, double buffering, single fields, etc. The display methods among the samples are constant.

STRUCTURE OF THE PHOTON SAMPLES

The Photon samples are not complete Photon programs. They are designed to be started and stopped from the command line within a terminal window. Hence, the samples do not have any buttons or mouse controls. The intent was to keep the source code as clean as possible in order to illustrate the video display method and the PXC Series frame grabber handling.

PXCVU utility program

The PXCVU utility program is included in the distribution package and provides a convenient way to use many of the functions of the PXC Series frame grabber without writing any code. PXCVU is a console-mode utility.

Conclusion

Please feel free to download the distribution package from our Web site at:

```
http://www.imagenation.com/dnpages/pxc_files.html
```

If you have any problems or questions, please contact us for free technical support:

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