Setup Guide

USB 3.2 xHCI-based Certification Platform

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Revision 2.3

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Revision History

Revision 1.0	Release
Revision 1.1	Added information about USB30CV and Drivers
Revision 1.2	Added information about UAC with USB30CV
Revision 1.3	Added information about USB30CV installation, equipment setup with the NEC (Renesas) xHCI
Revision 1.4	Updated information about USB30CV documentation and updated contact information for the USB-IF Technical Support
Revision 1.5	Updated information about USB30CV directory structure
Revision 1.6	Updated information about USB30CV driver names, updated installation settings required for 64-bit operating systems and updated Renesas PDK jumper settings
Revision 1.7	Updated information about PDK Jumper Settings
Revision 1.8	Updated to xHCI spec version 1.0 based PDK boards. Added information based on use of Stack Switcher
Revision 1.9	Removed Renesas PDK. Added Dell XPS8700 certification testing platform. Modifications to Dell XPS8700 system for certification testing.
Revision 2.0	Added Dell XPS8920 Special Edition and Modification to Dell XPS 8920 Special Edition Removed Fresco PDK and Added info on Point Grey Card Removed Windows 8.1 and added Windows 10
Revision 2.1	Added Dell XPS8930 and Modification to Dell XPS 8930
Revision 2.2	Added Dell XPS8930 (9th Gen), Updated USB 3.1 to 3.2 Removed Dell XPS8920
Revision 2.3	Added Dell XPS 8940 (11th Gen), Removed XPS 8700, 8920, 8930

Contents

Acronyms

ESD	Electro Static Discharge
DUT	Device Under Test
FW	Firmware
HW	Hardware
I/O	Input / Output
MB	Motherboard
NC	No Connection
OS	Operating System
PC	Personal Computer
PCB	Printed Circuit Board
PCI	Peripheral Component Interconnect
PCIe	PCI Express. Refer to the PCIe specification
PCLK	PHY Clock Signal
PDK	Peripheral Development Kit
PHY	Physical Layer
UAC	User Account Control
USB	Universal Serial Bus
USB-IF	Universal Serial Bus Implementers Forum
xHCI	extensible Host Controller Interface

1. INTRODUCTION

The USB-IF uses the DELL XPS8940 for USB3.2 Certification. Testing is performed using the on-board Intel xHCI host controller. This document provides information and instructions to modify the XPS8940 certification platform. Furthermore, the document also provides information and instructions to implement Point Grey xHCI Card (FL1100) used for LPM-L1 testing (Device Interop testing). The system hardware specifications and software installation have been tested by qualified hardware technicians. Deviation from these instructions may result in unpredictable behavior in the certification platform. This document is not a substitution for any referenced documentation. The procedures should be performed by a qualified technician only.

2. REFERENCES

3. WORKSTATION PREPARATION FOR POINT GREY CARD

3.1. Point Grey Card System Requirements

For best results when using a PDK the recommended minimum system requirements are:

- Dell XPS 8940
- Intel Core™i7
- 8192MB of RAM or higher
- 120GB or Higher SSD
- Microsoft Windows 11 Pro

3.2. Hardware

Point Grey Add-in Card is available from Point Grey:

https://www.ptgrey.com/point-grey-usb-30-pcie-20-x1-host-adapter-card-2-port-w-internal-head-connector-support-3

- Point Grey (Fresco Logic xHCI-based) PCIe Card

Figure 1: Point Grey (Fresco Logic FL1100 Silicon) add in card

3.2.1. Point Grey PCIe Card Installation

Installing the Point Grey Card:

1.   Shutdown the PC. Use *caution* anytime hardware is removed or inserted into a computer system.

2.   Unplug the power cord from the PC system before attempting to remove or insert the Point Grey Card.

3.   Power on the PC.

4.   When the system has finished booting the OS should recognize new hardware is attached.

5.   Install the FrescoLogic Driver for the FrescoLogic Host Controller and Root Hub (Identify the controller in Device Manager). Run the batch file FrescoU1U2Enable- LPMEnable.reg and Restart the system. This step will replace the Microsoft XHCI Driver with the FrescoLogic Custom driver for the FrescoLogic Host Controller and also enable U1U2 and LPM.

4. USB 3.2 CERTIFICATION PLATFORM PREPARATION

4.1. DELL XPS8940 Configuration

For best results when purchasing the DELL XPS8940 the recommended minimum system requirements are:

- Intel Core™i7 (11th Generation), 2.50GHz or faster processor
- 8 GB of RAM
- 120GB or Higher SSD with 10GB of free space
- Microsoft Windows 11 Pro Operating System

4.2. System Modification

DELL XPS8940 is shipped standard with a Wireless Card. This item should be removed before using the system for testing.

Modification Steps:
Step 1

Follow the DELL XPS8940 Owner's Manual for the modification listed below:

- **Remove the Wireless Mini-Card**
- **Ensure that system only has 8GB of RAM**

Step 2

Do a fresh install of Windows 11 Pro. Be sure to delete all partitions on the hard drive beforehand.

After Windows 11 Pro is installed, complete the Windows Updates.
BIOS for the system can be found at
https://www.dell.com/support/home/en-us/product-support/product/xps-8940-desktop/drivers
It is recommended to save a system image at this point.

Step 4

The DELL XPS8940 is a "Legacy Free" system, all USB ports are controlled by the Intel xHCI controller. When USB-IF tools like CV are launched control of Mouse and Keyboard will be lost. To avoid this issue, install a secondary PCIe USB card and connect the mouse and keyboard to the USB ports on it.

Intel USB 3.2 Gen 1 controller (11th Generation)

For 3.2 Gen 1 and USB 2.0 portion of the certification testing (i.e., for all USB 3.2 Gen 1 and 2, USB 2.0 products) use SS (port numbers 21 – 24) on the **back panel** routed to the Intel xHCI Host Controller. There are 4 SS ports on the back panel.   These ports are routed to the onboard Intel XHCI Controller. The front panel ports should not be used.

Figure 2: SS Ports on Back Panel of XPS8940

List of Known Issues with Dell XPS8940:

1) Please follow Figure 3 below in order to setup additional PCIe cards for testing:

   For USB3.2 Gen2 x1 testing please insert ASM3142 Host card in the x4 PCIe Slot (labeled 19 in the diagram)

   If installing EHCI card, please install in the x16 PCIe Slot (labeled 20 in the diagram)

   For FL1100 Si based xHCI Card (PointGrey: FrescoLogic FL1100 based xHCI Card) testing, please insert in x1 PCIe Slot (labeled 21 in the diagram)
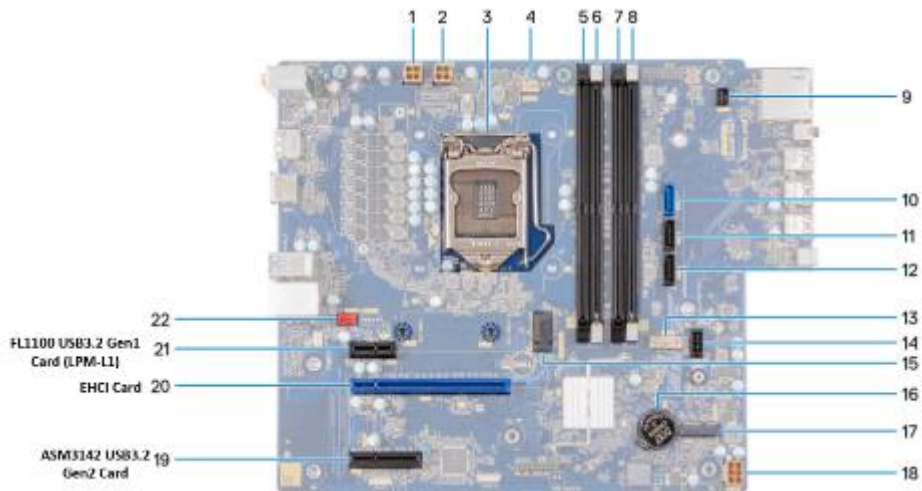

Figure 3: PCIe Add-In Card Slot Configuration for XPS8940

5.   SOFTWARE SETUP

> The USB3CV software is proprietary software provided by the USB-IF or their representative. Find more information regarding proprietary software setup at the USB-IF website:
> https://www.usb.org/compliancetools

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5.1.   Command Verifier Installation

If configuring system for use with the CV tool be sure that User Account Control (UAC) is disabled:

- In Control Panel window select **User Accounts**
- In the User Accounts menu select **User Accounts**
- In the User Accounts menu select **Change User Account Control Settings**
- Set notification status to **Never notify** and click **ok**
- Reboot the system

Install the USB3CV software available from the link:
https://www.usb.org/compliancetools

5.1.1. CV Stack Switcher

Under normal operation the CV software will automatically install the compliance driver in place of any other host controller driver when CV is opened. When CV is closed properly it will remove the compliance driver and allow Windows to automatically install whichever driver takes priority based on Windows internal driver installation algorithm. This process is accomplished using a tool called "Stack Switcher". When the compliance driver is correctly installed, it will be viewable from device manager as shown in Figure 4.

Figure 4: Compliance Driver

6. TROUBLESHOOTING

Issue	Possible Cause	Solution

For technical support, contact the USB-IF at usbcompliance@usb.org

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