This document provides a brief introduction and instructions to install and run the MachXO2 Control Development Kit on Windows 7/Vista/XP/2000. Please refer to the complete documentation at www.latticesemi.com/mxo2-control-kit.

1 Check Kit Contents

The MachXO2 Control Development Kit includes the following items:

• MachXO2 Control Evaluation Board pre-loaded with Control SoC Demo
• USB cable
• AC adapter
• QuickSTART Guide (this document)

Note: Detailed information about the evaluation board is provided in the *MachXO2 Control Development Kit User's Guide* at www.latticesemi.com/mxo2-control-kit.

Note: Static electricity can shorten the lifespan of electronic components. Please handle the kit components carefully.

2 Download Windows Hardware Drivers

Before you begin, you will need to obtain the necessary hardware drivers for Windows from the Lattice web site.

1. Browse to www.latticesemi.com/mxo2-control-kit and locate the hardware device drivers for the USB interface.

2. Download the ZIP file to your system and unzip it to a location on your PC.

Linux Support:

The USB interface drivers for the evaluation board are included in Linux kernel v.2.4.20 or later, including distributions compatible with Lattice Diamond™ 1.1 and ispLEVER® 8.1 SP1 (Red Hat Enterprise v.3, v.4 or Novell SUSE Enterprise v.10).

3 Assemble and Connect to the MachXO2 Control Evaluation Board

In this step, power the board and connect it to your PC using the USB cable provided.

1. Install jumper J6. When the jumper connects 2-3, this jumper will route the JTAG signals to the MachXO2 device (shown in the image below). When the jumper connects 1-2, JTAG signals are routed to the ispPAC®-POWR1014A device.

2. Connect the AC adapter from a wall outlet to the power socket. After a connection is made, a red power LED (D12) will light indicating the board is powered on.

3. Connect the USB cable provided from a USB port on your PC to the board's USB interface socket on the bottom of the board as shown in the layout diagram on the last page of this document.

4. When you are prompted "Windows may connect to Windows Update" select **No, not this time** from available options and click **Next** to proceed with the installation. Choose the **Install from specific location (Advanced)** option and click **Next**.

5. Select **Search for the best driver in these locations** and click the **Browse** button to navigate to the Windows driver folder created in Step 2 of this QuickSTART Guide. Select the **CDM 2.04.06 WHQL Certified** folder and click **OK**.

6. Click **Next**. A screen will display as Windows copies the required driver files. Windows will display a message indicating that the installation was successful.

7. Click **Finish** to install the USB driver.

4 Set Up a Terminal Program

You will use a terminal program to communicate with the evaluation board. The following instructions describe the Windows HyperTerminal program which is found on most Windows PCs. You may use another terminal program but setup will be different. For Windows 7 and Linux, Minicom is a good alternative.

Note: This step uses the procedure for Windows XP users. Steps may vary slightly if using another Windows version.

1. From the **Start** menu, select **Control Panel > System**. The "System Properties" dialog appears.

2. Select the **Hardware** tab and click **Device Manager**. The "Device Manager" dialog appears.

3. Expand the **Ports (COM & LPT)** entry and note the COM port number for the "USB Serial Port".

4. From the **Start** menu, select **Programs > Accessories > Communications > HyperTerminal**. The HyperTerminal application and a "Connection Description" dialog appear.

5. Specify a Name and Icon for the new connection. Click **OK**. The "Connect To" dialog appears.

6. Select the COM port identified in Step 3 from the Connect using: list. Click **OK**.

7. The "COMn Properties" dialog appears where n is the COM port selected from the list.

8. Select the following Port Settings and click **OK**:

   > Bits per second: 115200
   > Data bits: 8
   > Parity: None
   > Stop bits: 1
   > Flow control: None

   The HyperTerminal window appears.
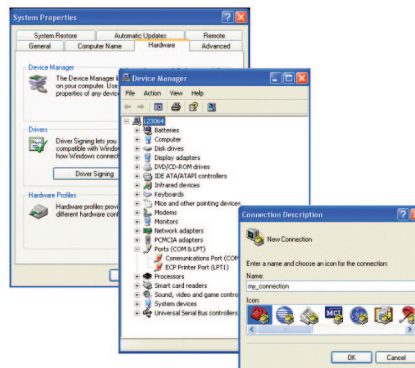
5 Run the Control SoC Demo

These instructions highlight the voltage monitoring and data logging function of the Control SoC Demo

1. On the evaluation board, press the **S1** push-button (GSR). The Control SoC Demo main menu appears in Hyper-Terminal.

   Note: Press 'm' to redisplay the main menu if it scrolls off screen. Refer to the MachXO2 Control Development Kit User's Guide for main menu command usage.

2. In the terminal window, press 'l' (lower case 'L' character). A data point from the voltage monitoring ADC will be saved in page 0 of the SPI Flash device on the board. Repeat logging a few more times.

3. In the terminal window, press 'd'. The first logged data point will be read on page 0 of the SPI Flash device and be displayed on the HyperTerminal. You can display additionally logged data points until the message "No More Data" is displayed.

4. To display the logged data again, press 'c'. This will clear the page address pointers and data will be read beginning with page 0 of the SPI Flash.

5. Press 'e' to erase the content of the SPI Flash device.

6. To vary the input voltage to the soft ADC core, connect a voltage source to pin #2 of the J9 header. The accuracy of the ADC is centered around 1.65V. The maximum voltage applied should not exceed 3.0V.

6 Done!

Congratulations! You have successfully connected and demonstrated the MachXO2 Control Development Kit. Please refer to the *MachXO2 Control Development Kit User's Guide* available on the Lattice web site at www.latticesemi.com/mxo2-control-kit for the following:

- Running advanced demos
- Details on additional evaluation board features and operation
- Programming the MachXO2 Control Evaluation Board with the USB cable
- Modifying and generating the demo bitstreams from the Diamond project source files
- Schematics
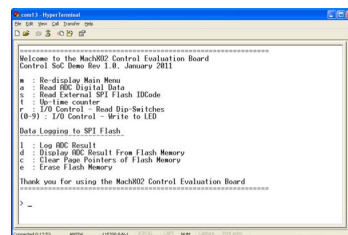
MachXO2 Control Evaluation Board Layout Diagram
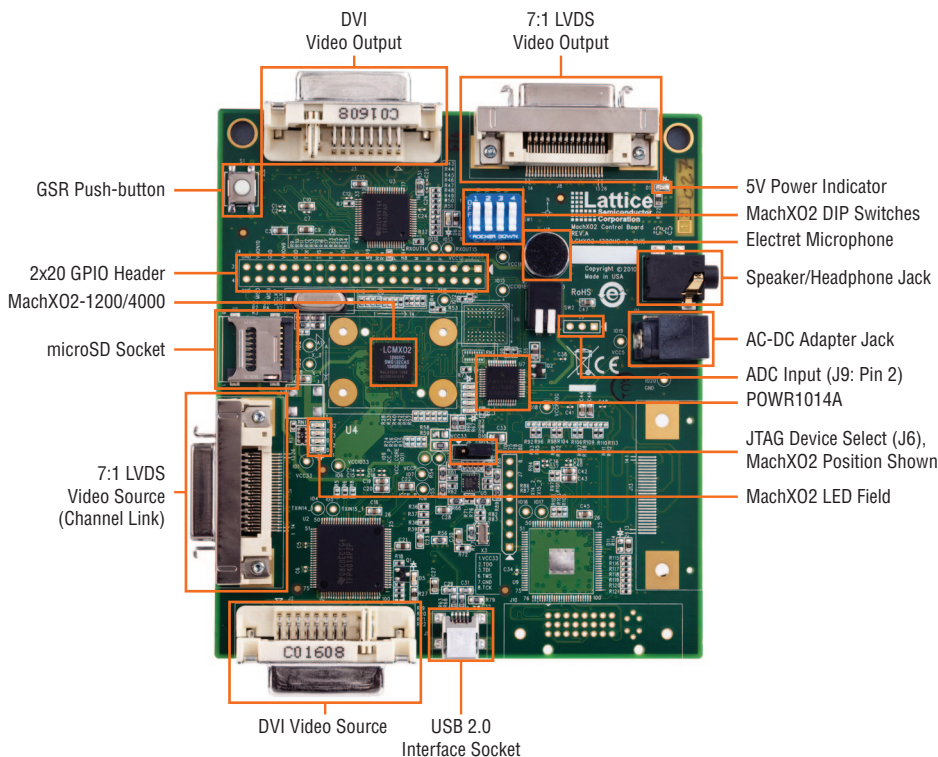
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