

# Notes for Installing Software Tools for SE2DA4 Labs

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All the software tools for labs have been installed on the department lab computers and are ready to use. The installed Quartus Prime and Questa-Intel FPGA on our department lab computers are the Standard Edition of Version 23.1.1. These notes are for students who want to install those software tools on their own computers.

These notes are for Windows 11 operating system, which is used on our lab computers.

## 1. Install Quartus Prime Version 23.1.1

There are three editions of Quartus Prime. They are: Pro Edition, Standard Edition and Lite Edition. The Lite Edition is free and no license is required, but it has fewer features and supports limited devices, and its performance is not as good as the other two editions. The Pro Edition has the best performance, but it does not support the Cyclone V device, which will be used in our department labs. Therefore our department chose the licensed Standard Edition, and installed it on our lab computers. You can either download and install the Quartus Prime **Standard** Edition or the Quartus Prime **Lite** Edition on your computer. Both the Standard Edition and the Lite Edition support the DE1-SoC boards that will be used for our lab projects, and both of them work fine for our lab projects. Please remember, unlike the Lite Edition, the Standard Edition needs a license to be set up to use it.

### 1.1 Download the Quartus Prime

The Quartus Prime can be downloaded from <http://www.intel.com/>. Under its PRODUCTS category, find the section “FPGAs & Programmable Devices”. Then click “Quartus Development Software & Tools”. From that page, find “Quartus Prime Design Software”, you then can find the link to download the software of different Editions and different versions for Windows or for Linux.

Intel normally offers different ways to download the Quartus Prime and its necessary supporting files. Such as the way of Installer, or Complete Download, or Multiple Download, or Individual File Download. No matter which way you choose to use, please make sure the following components are downloaded and installed for our lab projects:

- 1) Quartus Prime.
- 2) Questa-intel simulator.
- 3) The device packages for the device you will use. In our labs, we will use DE1-SoC boards and its device is Cyclone V.
- 4) RISCFree IDE, which will be used to develop software applications for NIOS II or NIOS V systems.

## 1.2 Install Quartus, Questa and the Device Package for Cyclone V

The following notes are for using the “Installer” downloaded from the Intel website.

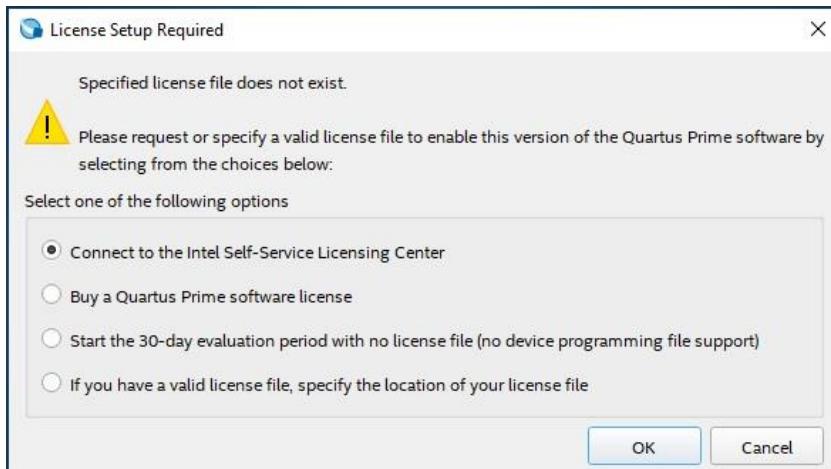
After the installer is downloaded to your computer, launch it and select the following components to download and install:

- 1) Quartus Prime.
- 2) Questa-Intel Starter Edition.
- 3) Questa-Intel FPGA edition.
- 4) Cyclone V Device support.
- 5) Quartus Prime Programming and Tools
- 6) Ashling RiscFree IDE.
- 7) Quartus Prime Help (optional)

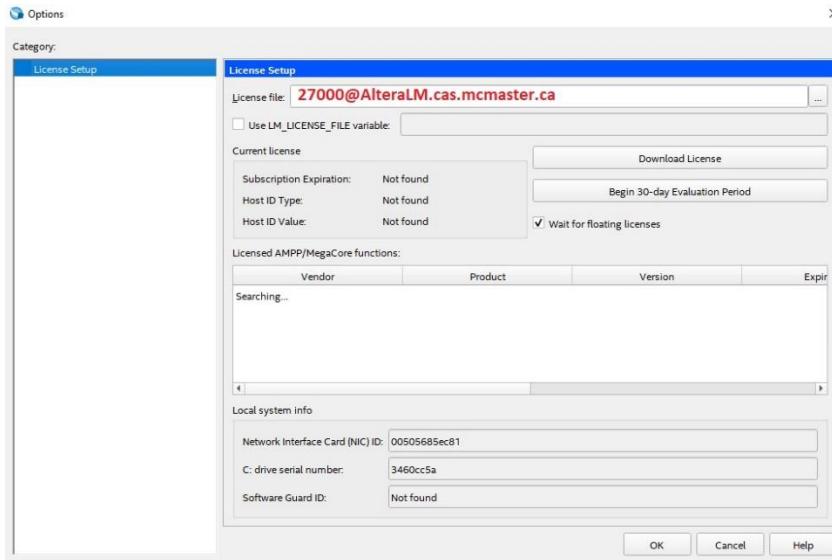
At the end of the installation process, please follow the system prompt to install the driver for JTAG cables or for Altera USB-Blaster II cables.

## 1.3 Setup License

The first time when Quartus Prime is launched, users will be reminded to set up a license for it:



To use our department license, please select the choice to specify the location of our department’s license file. Then in the License Setup window, input “**27000@alteralm.cas.mcmaster.ca**” as the license file, as shown in the following Figure.



In case you need to set up a license for Quartus Prime later, you can access the License Setup window by going to **Tools | License Setup ...** in Quartus Prime.

Our department license covers all the components of Quartus Prime that are required for our lab projects, including NIOS V processors, NIOS II EDS, Questa-Intel.

For using Questa-Intel, both the standard edition and the starter edition, as well as for using ModelSim-Intel standard edition which you may need to simulate your projects, users need to create a new **system environment variable** “LM\_LICENSE\_FILE” and set its value to our department’s license file, which is at: “27000@AlteraLM.cas.mcmaster.ca”.

The steps to set up the environment variable are as follows:

- 1) On the Windows task bar, right click the Windows icon and select “System”.
- 2) In the opened window, under the “Related Links” section, click “Advanced system settings”.
- 3) In the opened “System Properties” window, click the tab “Advanced”, then click the button “Environment Variables”.
- 4) Under the section “System Variables”, click the button “New...” to create a new environment variable.
- 5) In the “New System Variable” window, input “LM\_LICENSE\_FILE” as the variable name, and “27000@AlteraLM.cas.mcmaster.ca” as the variable value.

If you use Quartus Prime from off-campus, you need to use VPN to be able to connect to our department license server.