<div align="center">(For Quartus v25.1 and ModelSim 19.1)</div>

Throughout EEL 3701, we will be using Intel's Quartus Prime software suite to design, simulate, and compile digital circuit designs for use on the DE10-Lite FPGA Development Board. The installation of Quartus Prime will take multiple steps. Make sure to install both Quartus and one simulator, either ModelSim or Questa. I recommend using ModelSim, as it has a far simpler setup and does not require a license. The Questa simulator has a more complicated setup and is even more complicated to use, but works better on Linux.

University of Florida   EEL 3701   Dr. Eric M. Schwartz
Department of Electrical & Computer Engineering   Revision 0   M. Hershfield, J. Fugate, Logan Burns
Page 2/20   **Quartus Installation Instructions**   18-Jan-26
(For Quartus v25.1 and ModelSim 19.1)

QUARTUS INSTALLATION INSTRUCTIONS

Quartus Installation for Windows 10/11

1) Go to the [Quartus Prime Lite 25.1 Windows download page](#) and select the "Individual Files" tab of the website, as shown in the red rectangle. (Note that newer version may be available but have **NOT** been tested.)

2) Download the following (You may need to accept license agreements):
   a. `Quartus Prime`
   b. `Intel MAX 10 FPGA Device Support`
   c. `Intel MAX II, Intel MAX V Device Support`
   d. `Intel Cyclone V Device Support`

Individual Files

Quartus® Prime

| Download QuartusLiteSetup-25.1std.0.1129-windows.exe | Size: 1.6 GB SHA1: 09e2c614d37d1553ae8c1e58e280b950460855da |

Questa*-Altera FPGA and Starter Editions

| Download QuestaSetup-25.1std.0.1129-windows.exe | Size: 942.2 MB SHA1: 164348081f610cd652280d0e3f8a27d173b0cddf |

Add-On and Stand-Alone Software

Ashling RiscFree IDE for Altera

| Download RiscFreeSetup-25.1std.0.1129-windows.exe | Size: 869 MB SHA1: 8da1e9e29354ff53fb3de86c203c88ccdd8cd660 |

Intel® Quartus® Prime Driver Installer

| Download QuartusDriversSetup-25.1std.0.1129-windows.exe | Size: 33.4 MB SHA1: 1b6c0c6aad8b21d7e499c7ce659f7468142c5d9c |

Intel® Quartus® Prime Help

| Download QuartusHelpSetup-25.1std.0.1129-windows.exe | Size: 278.8 MB SHA1: 7fad1301e810e7a7ae5b8ebd12376b9c9575a440 |

Intel® Quartus® Prime Programmer and Tools

| Download QuartusProgrammerSetup-25.1std.0.1129-windows.exe | Size: 378.9 MB SHA1: 09c3987b197ee4d5c34434c704bbe853d516b190 |

Devices

Arria® II device support

| Download arria_lite-25.1std.0.1129.qdz | Size: 499.1 MB SHA1: d803f8a865d260f47cdb1f856c123fab5a9934bf |

** Installation size: 0.52 GB

Cyclone® IV device support

| Download cyclone-25.1std.0.1129.qdz | Size: 466 MB SHA1: 835d2b1732549294eed625b692d044135499b5e8 |

** Installation size: 0.50 GB

Cyclone® 10 LP device support

| Download cyclone10lp-25.1std.0.1129.qdz | Size: 265.7 MB SHA1: b3cc2ca1b2e1b225407968e2f380e596dff5b80d |

** Installation size: 0.29 GB

Cyclone® V device support

| Download cyclonev-25.1std.0.1129.qdz | Size: 1.3 GB SHA1: a7225ec1bd36ccfd6826ea6273df5d21dd95633b |

** Installation size: 1.40 GB

MAX® II, MAX® V device support

| Download max-25.1std.0.1129.qdz | Size: 11.4 MB SHA1: a3bc065b42a9d005f8d27fe45525411b49c13c43 |

** Installation size: 0.01 GB

MAX® 10 FPGA device support

| Download max10-25.1std.0.1129.qdz | Size: 288.1 MB SHA1: 8936dac1b092853f3b49a67fef22968ec10f8087 |

** Installation size: 0.35 GB

3) After the Quartus software has finished downloading, open the QuartusLiteSetup-25.1std.windows.exe file from the download to install the Quartus software. I suggest that you use all the defaults. After a few steps, you will see the image below that will install each of the downloaded devices along with Quartus itself.
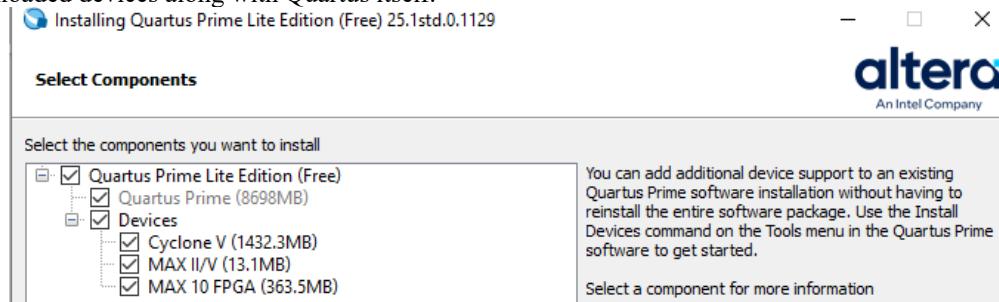

Note that the numbers following std change depending on Intel's build identifiers and should be ignored.

     a. Windows may tell you that it is not safe to run this program with something like *Windows Protected Your PC*. Ignore this message. Select *More Info* and then select *Run Anyway*.

     b. Leave all default options in the installer and select Next as necessary.
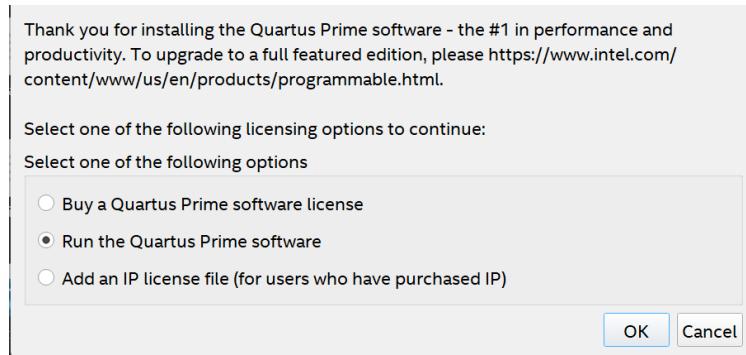
4) When the installation is done, run the Quartus software. When a `Quartus Prime 25.1 Lite Edition` window appears, select *Run the Quartus Prime software* and then select *OK*.

5) If you have a High DPI display, some Quartus programs such as the simulation editor will not look correct. To fix this problem, navigate to `C:\altera_lite\25.1std\quartus\bin64` and find `quartus.exe`. Right click on `quartus.exe` and choose *Properties*. Click on the Compatibility tab and click on the button labelled *Change high DPI settings*. In the window that appears, check the checkbox next to *Override high DPI scaling behavior* and choose the *System (Enhanced)* option in the dropdown menu. Click *OK* in the High DPI settings window and then *Apply* in the properties window.
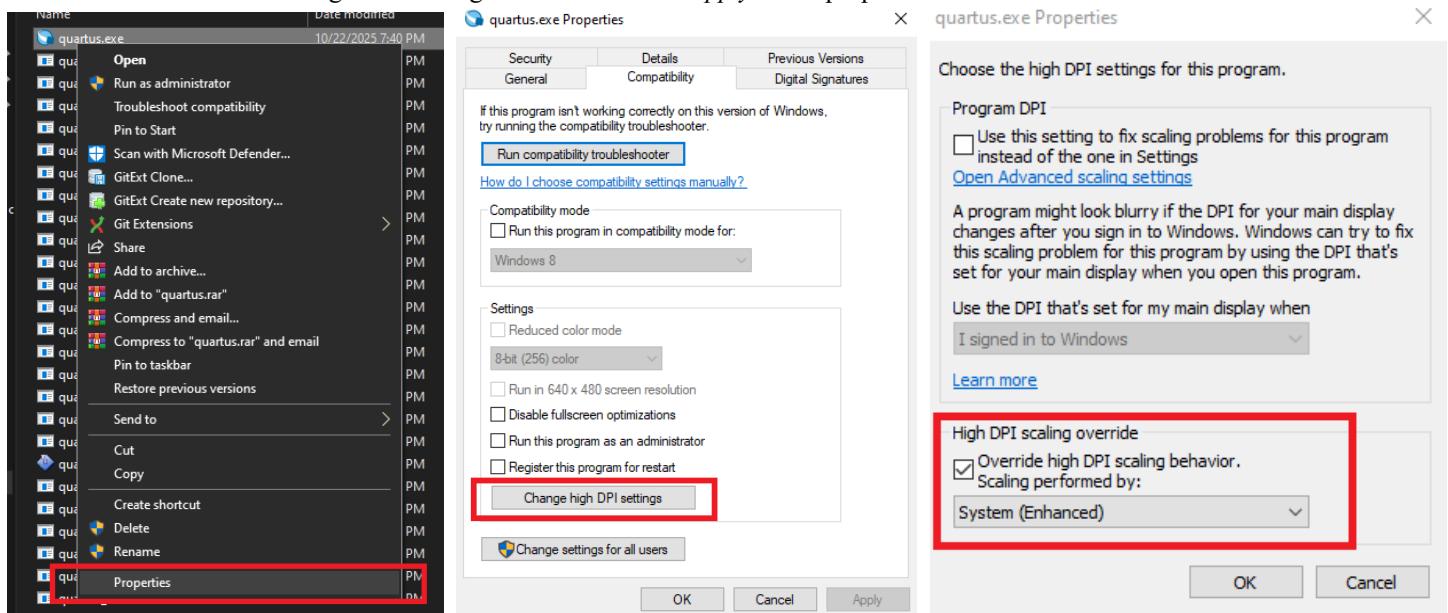
6) Once you get your DE10-Lite, attach it to your computer and complete the driver installation as specified below. This should work for both Windows 11 and Windows 10.

    a. Connect the USB-Blaster (DE10-Lite) to your PC.

    b. Open Device Manager.

    c. Locate `USB-Blaster` under `Other devices`.

    d. Right-click on `USB-Blaster` and select `Update Driver`.

    e. Choose `Browse my computer for drivers`.

    f. Select the `Browse...` button in the new window.

    g. Navigate to your Quartus installation directory:

    h. Default: `C:\altera_lite\25.1std\quartus\drivers` (Adjust to your Quartus version)

    i. If you can't find this directory, try clicking "*This PC,*" then you should be able to find the C: drive or the `altera lite` folder.

    j. Note: Stop at the `drivers` folder, do not go deeper by opening a folder within the `drivers` folder.

    k. Confirm the file path and click `Next`.

    l. If prompted by Windows Security:

    m. Check the box for `Always trust software from "Altera Corporation"`.

    n. Click `Install`.

When completed with the above, proceed to the **ModelSim Installation for Windows 10/11** section of this document (on page 8). ModelSim 19.1 is strongly recommended over Questa for students in 3701.

QUARTUS INSTALLATION FOR LINUX (THIS SECTION MIGHT NEED UPDATES)

The installation directions provided in this document were designed for default Ubuntu 22.04 LTS, as this is the most recent distribution that is officially supported by Quartus.

1) Go to the Quartus Prime Lite 25.1 Linux download page and select the "Individual Files" tab of the website, as shown in the red rectangle. (Note that newer version may be available but should **NOT** be installed.)

2) Download the following (You may need to accept license agreements):
   a. Intel Quartus Prime
   b. Intel MAX 10 FPGA Device Support
   c. Intel MAX II, Intel MAX V Device Support
   d. Intel Cyclone V Device Support

Individual Files

Quartus® Prime
Download
QuartusLiteSetup-25.1std.0.1129-linux.run
Size: 1.8 GB
SHA1: ce0773469eacab5b7035c175484625f4ec3737d1

Questa*-Altera FPGA and Starter Editions
Download
QuestaSetup-25.1std.0.1129-linux.run
Size: 3.1 GB
SHA1: 149fe1e1cf253f2929804582c6cb658bca941dd5

Add-On and Stand-Alone Software

Ashling RiscFree IDE for Altera
Download
RiscFreeSetup-25.1std.0.1129-linux.run
Size: 865.3 MB
SHA1: 2d457bd18bfbf32f8f4037266b6c04853caed8e8

Intel® Quartus® Prime Driver Installer
Download
QuartusDriversSetup-25.1std.0.1129-linux.run
Size: 9.1 MB
SHA1: eb15977b79df7ddebd102eec182148068d273714

Intel® Quartus® Prime Help
Download
QuartusHelpSetup-25.1std.0.1129-linux.run
Size: 276.5 MB
SHA1: 078ec6422fe6bbdceecf1a7683965a45e3e08411

Intel® Quartus® Prime Programmer and Tools
Download
QuartusProgrammerSetup-25.1std.0.1129-linux.run
Size: 421.7 MB
SHA1: b4e2d0ddafd969dbe01a255171327817682be019

Devices

Arria® II device support
Download
arria_lite-25.1std.0.1129.qdz
Size: 499.1 MB
SHA1: d803f8a865d260f47cdb1f856c123fab5a9934bf
** Installation size: 0.52 GB

Cyclone® IV device support
Download
cyclone-25.1std.0.1129.qdz
Size: 466 MB
SHA1: 835d2b1732549294eed625b692d044135499b5e8
** Installation size: 0.50 GB

Cyclone® 10 LP device support
Download
cyclone10lp-25.1std.0.1129.qdz
Size: 265.7 MB
SHA1: b3cc2ca1b2e1b225407968e2f380e596dff5b80d
** Installation size: 0.29 GB

Cyclone® V device support
Download
cyclonev-25.1std.0.1129.qdz
Size: 1.3 GB
SHA1: a7225ec1bd36ccfd6826ea6273df5d21dd95633b
** Installation size: 1.40 GB

MAX® II, MAX® V device support
Download
max-25.1std.0.1129.qdz
Size: 11.4 MB
SHA1: a3bc065b42a9d005f8d27fe45525411b49c13c43
** Installation size: 0.01 GB

MAX® 10 FPGA device support
Download
max10-25.1std.0.1129.qdz
Size: 288.1 MB
SHA1: 8936dac1b092853f3b49a67fef22968ec10f8087
** Installation size: 0.36 GB

University of Florida
Department of Electrical & Computer Engineering
Page 6/20

EEL 3701
Revision 0
Quartus Installation Instructions
(For Quartus v25.1 and ModelSim 19.1)

Dr. Eric M. Schwartz
M. Hershfield, J. Fugate, Logan Burns
18-Jan-26

3) Open a terminal and navigate to your Downloads folder. We can then run the Quartus installer by issuing the following commands. Make sure that you do not run the Quartus installer as root!

```
chmod +x QuartusLiteSetup-25.1std.0.1129-linux.run
./QuartusLiteSetup-25.1std.0.1129-linux.run
```

Leave all default options in the installer and select Next each time it is necessary.

4) To allow easy access to your Quartus installation, create a text file called quartus.desktop using the text editor of your choice and copy the following contents into it. Make sure to change YOURUSERNAME to the username of the account that you installed Quartus for.

```
[Desktop Entry]
Version=1.0
Type=Application
Terminal=false
Exec=/home/YOURUSERNAME/altera_lite/25.1std/quartus/bin/quartus
Name=Quartus
Icon=/home/YOURUSERNAME/altera_lite/25.1std/quartus/adm/quartusii.png
```

    a. If your distribution supports desktop icons, you can copy this file to your Desktop folder and it will work as a desktop shortcut

    b. To add a Quartus shortcut to your Apps menu, copy this file to ~/.local/share/applications, creating that folder if necessary. This was tested for GNOME 44.

5) To allow Quartus to program your DE10-Lite board, we must add a udev rule enabling access to the USB-Blaster programming hardware on the DE10-Lite. Create the text file /etc/udev/rules.d/51-altera-usb-blaster.rules (requires superuser privileges) and populate it with the following:

```
SUBSYSTEM=="usb", ATTR{idVendor}=="09fb", ATTR{idProduct}=="6001", MODE="0666"
SUBSYSTEM=="usb", ATTR{idVendor}=="09fb", ATTR{idProduct}=="6002", MODE="0666"
SUBSYSTEM=="usb", ATTR{idVendor}=="09fb", ATTR{idProduct}=="6003", MODE="0666"
SUBSYSTEM=="usb", ATTR{idVendor}=="09fb", ATTR{idProduct}=="6010", MODE="0666"
SUBSYSTEM=="usb", ATTR{idVendor}=="09fb", ATTR{idProduct}=="6810", MODE="0666"
```

6) Restart your computer so that the new udev rules take effect.

7) Many Linux systems still encounter a permissions error when trying to connect to the USB Blaster, even after adjusting the udev rules. This shows up in an "Unable to read device chain – JTAG chain broken" error while using the programmer. This can be remediated by adjusting the JTAG daemon's settings. Run the following in a terminal:

```
killall jtagd
cd ~/altera_lite/25.1std/quartus/bin
sudo mkdir /etc/jtagd
sudo cp ../linux64/pgm_parts.txt /etc/jtagd/jtagd.pgm_parts
./jtagd
```

8) You can verify that you are able to program your DE10-Lite by disconnecting and reconnecting it to your computer and running ./jtagconfig in the same terminal you ran the above commands. If your setup is correct, you should see output that looks like:

```
1) USB-Blaster [1-2]
   031050DD 10M50DA(.|ES)/10M50DC
```

9) Run Quartus using either the .desktop file we made earlier or by running ~/altera_lite/25.1std/quartus/bin/quartus. In the window that appears, select *Run the Quartus Prime Software* and then select *OK*.

> Thank you for installing the Quartus Prime software - the #1 in performance and productivity. To upgrade to a full featured edition, please https://www.intel.com/content/www/us/en/products/programmable.html.
>
> Select one of the following licensing options to continue:
> Select one of the following options
>
> ○ Buy a Quartus Prime software license
>
> ● Run the Quartus Prime software
>
> ○ Add an IP license file (for users who have purchased IP)
>
> [OK] [Cancel]

10) Once you get your DE10-Lite, attach it to your computer and complete the driver installation as specified in https://www.terasic.com.tw/wiki/Altera_USB_Blaster_Driver_Installation_Instructions.

When completed with the above, proceed to the ModelSim Installation for Linux instructions.

QUARTUS INSTALLATION FOR INTEL MACS

The best way to run Quartus on an Intel Mac is to dual boot Windows on your device by setting up Bootcamp. Students have also had success running the Windows version of Quartus through Parallels and other virtual machine software. Macs are <mark>NOT</mark> officially supported in this course (or by Altera!), so you may need to do additional troubleshooting to get everything working correctly. See the Windows tutorials for installing Quartus and a simulator for more information.

QUARTUS INSTALLATION FOR ARM MACS

Quartus is x86 software and it has no native Mac port, so the best way to get it running is to run it in a Linux VM with the FEX x86 emulator. I have chosen to use UTM (free), but you could also do this in Parallels (paid).

11) Download UTM from https://docs.getutm.app/installation/macos/. You can download it for free by clicking Download from Github. Install UTM like you would install any other Mac application.

12) Ubuntu does not provide a generic Desktop ISO for ARM systems. download the Ubuntu 22.04 LTS Server (ARM64) installer. file should be called ubuntu-22.04.5-live-server-arm64.iso.

    a. Open UTM.

    b. Choose Create -> Virtualize -> Linux.

    c. Select the downloaded ubuntu-22.04.5-live-server-arm64.iso.

    d. Ensure the QEMU backend is used (not Apple Virtualization.

    e. RAM: 4096+ MB. CPU: 1 core (multiple cores reduces emulated Quartus performance). Storage: 32+ GB

13) Start the virtual machine Start the virtual machine and install Ubuntu Server normally.

    a. Do a minimal installation to ensure sufficient disk space for Quartus to install.

    b. The installation will take 10-30 minutes depending on your computer.

14) After installation completes and you log in, install the Ubuntu desktop:

```
sudo apt update
sudo apt install ubuntu-desktop
```

15) Once complete, reboot the VM to enter the graphical desktop. From the UTM VM info page, remove ubuntu-22.04.5-live-server-arm64.iso from the disk drive. Power on the VM and log in using the username and password you set up during the installation.

16) From the applications grid in the bottom left of the screen, open a terminal and run the following commands to update your system and install necessary packages. These commands will have you enter your password, and what you type for your password will be completely hidden. This is normal.

```
sudo apt update
sudo apt upgrade
sudo apt install curl
```

17) Install the FEX x86 emulator by running the following command (all one line). You will be prompted to enter your password.

```
curl --silent https://raw.githubusercontent.com/FEX-Emu/FEX/main/Scripts/InstallFEX.py \
--output /tmp/InstallFEX.py && python3 /tmp/InstallFEX.py && rm /tmp/InstallFEX.py
```

18) The installer will prompt you for some options. You should have the installer download and install a rootfs automatically and set it as the default. You should be able to answer 'y' for every question it asks.

19) In a terminal, enter the FEX environment by typing FEXBash. You can now follow the Linux installation instructions to install Quartus within the FEXBash environment.

20) The only modification you need to make to the installation process is to insert FEXBash before the Exec command in the Quartus desktop entry if you decide to make one.

Anytime you want to run Quartus, you must start it from within a FEXBash environment.

University of Florida   EEL 3701   Dr. Eric M. Schwartz
Department of Electrical & Computer Engineering   Revision **0**   M. Hershfield, J. Fugate, Logan Burns
Page 8/20   **Quartus Installation Instructions**   18-Jan-26
(For Quartus v25.1 and ModelSim 19.1)

SIMULATOR INSTALLATION INSTRUCTIONS

MODELSIM INSTALLATION FOR WINDOWS 10/11

ModelSim is a free simulator that doesn't require a license to use. We will install ModelSim 19.1, as it doesn't throw errors for the deprecated parameters that Quartus inserts into waveforms.

1) Go to the ModelSim-FPGAs Standard Edition Software Version 19.1 and select the "Windows Software" tab of the website. (Newer versions throw errors for the *-novopt* parameter and should **NOT** be installed).

2) You only need `ModelSim-Intel FPGA Edition (includes Starter Edition)`.

3) After ModelSim has finished downloading, run the following file to install it: `ModelSimSetup-19.1.0.670-windows.exe`
   a. Windows may tell you that it is not safe to run this program with something like *Windows Protected Your PC*. Ignore this message. Select *More Info* and then select *Run Anyway*.

University of Florida   EEL 3701   Dr. Eric M. Schwartz
Department of Electrical & Computer Engineering   Revision 0   M. Hershfield, J. Fugate, Logan Burns
Page 9/20   **Quartus Installation Instructions**   18-Jan-26
(For Quartus v25.1 and ModelSim 19.1)

4) When prompted to select which version of ModelSim you want to install, choose to install ModelSim Starter Edition
   a. Leave all default options in the installer and select *Next* as necessary.
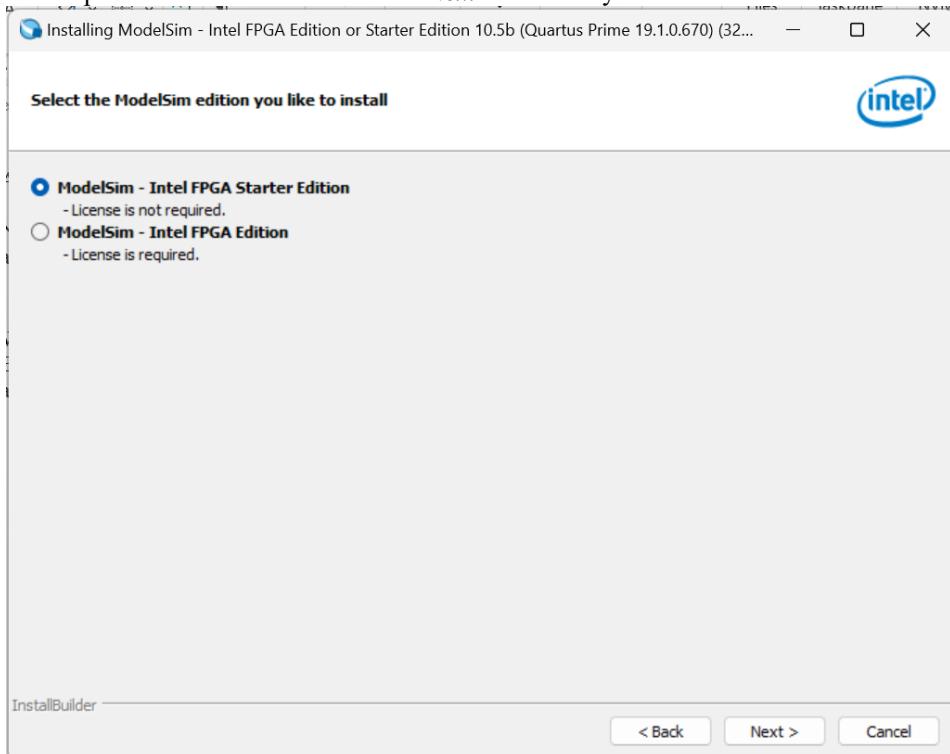
5) Once the installation has completed, open Quartus and navigate to *Tools->Options*. In the Options window, select *EDA Tool Options* in the left panel. In the text box next to the ModelSim label, insert the path to ModelSim's `win32aloem` folder. The default install location uses the path `C:\intelFPGA\19.1\modelsim_ase\win32aloem`. Click *OK* to save the simulator settings. Now you will be able to use ModelSim from the Quartus VWF editor. See the below two figures for more information.
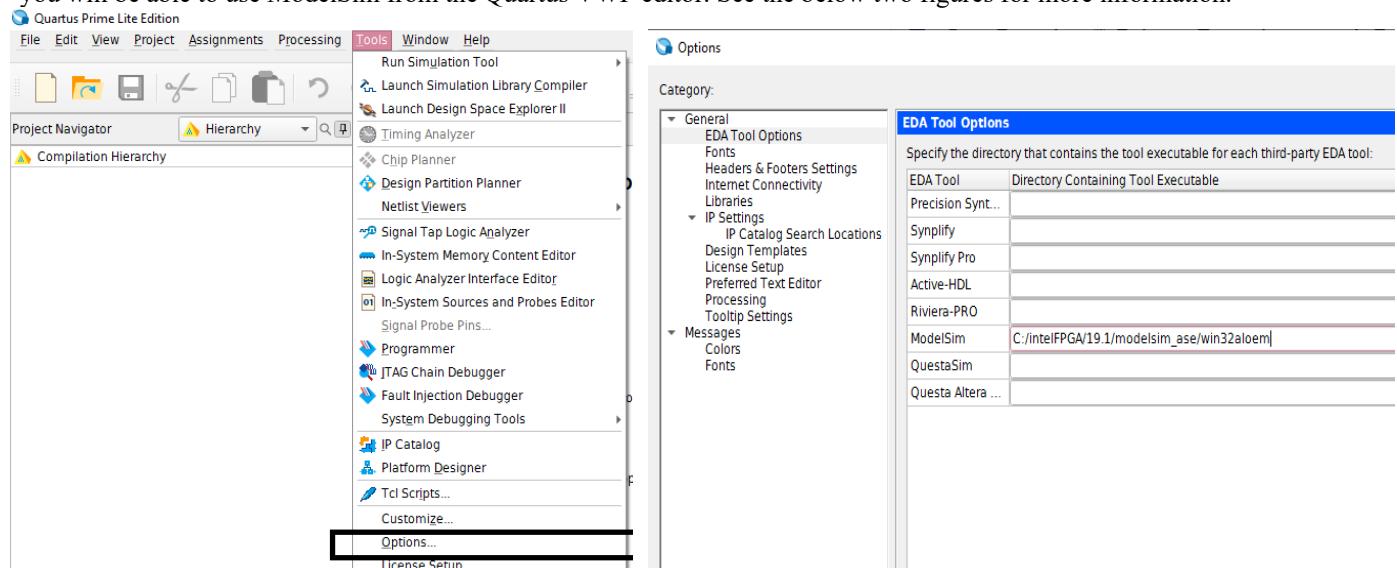
MODELSIM INSTALLATION FOR LINUX

ModelSim is a free simulator that doesn't require a license to use. We will install ModelSim 19.1, the last version of ModelSim released by Intel. This installation guide was designed for stock Ubuntu 22.04 LTS.

1) Go to the [ModelSim-FPGAs Standard Edition Software Version 19.1](#) and select the "Linux Software" tab of the website. (Newer versions throw errors for the *-novopt* parameter and should <mark>**NOT**</mark> be installed.)

2) You only need `ModelSim-Intel FPGA Edition (includes Starter Edition).`

3) Open a terminal and navigate to your Downloads folder. We can then run the ModelSim installer by issuing the following commands. Make sure that you do not run the ModelSim installer as root!

```
chmod +x ModelSimSetup-19.1.0.670-linux.run
./ModelSimSetup-19.1.0.670-linux.run
```

4) When prompted to select which version of ModelSim you want to install, choose to install ModelSim Starter Edition
   a. Leave all default options in the installer and select `Next` each time it is necessary.
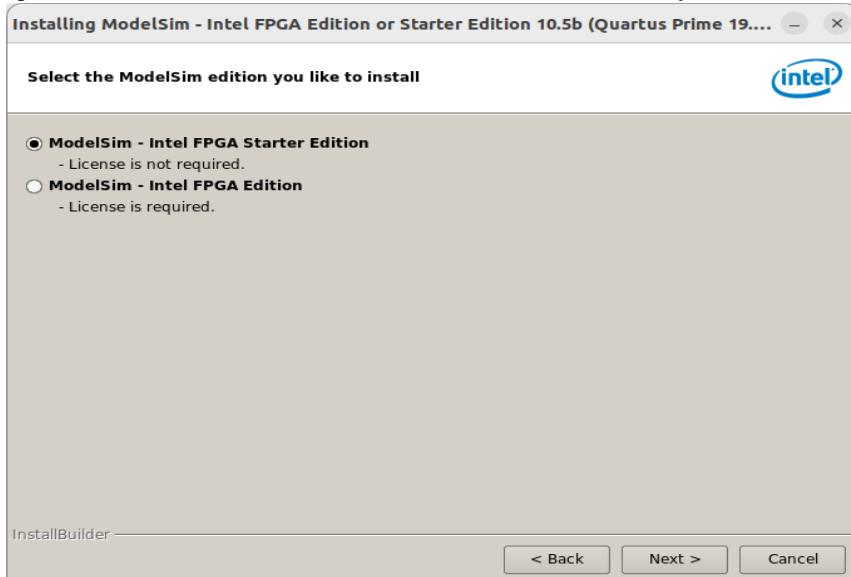
University of Florida   EEL 3701   Dr. Eric M. Schwartz
Department of Electrical & Computer Engineering   Revision 0   M. Hershfield, J. Fugate, Logan Burns
Page 11/20   **Quartus Installation Instructions**   18-Jan-26
(For Quartus v25.1 and ModelSim 19.1)

5) ModelSim uses a number of old 32-bit dependencies that we must install. Luckily, these packages can still be found in Ubuntu's repositories. To install these packages, open a terminal and run:

```
sudo dpkg --add-architecture i386
sudo apt update
sudo apt install \
    libc6:i386 \
    libstdc++6:i386 \
    libncurses6:i386 \
    libx11-6:i386 \
    libxext6:i386 \
    libxft2:i386
```

6) To force ModelSim to use the libraries we just installed, we must edit its launch script. Use the text editor of your choice to edit `~/intelFPGA/19.1/modelsim_ase/bin/vsim` and make the following changes. You will need superuser privileges to edit this file.
   a. Change mode=${MTI_VCO_MODE:-""} to mode=${MTI_VCO_MODE:-"32"}
   b. Change vco="linux_rh60" to vco="linux"
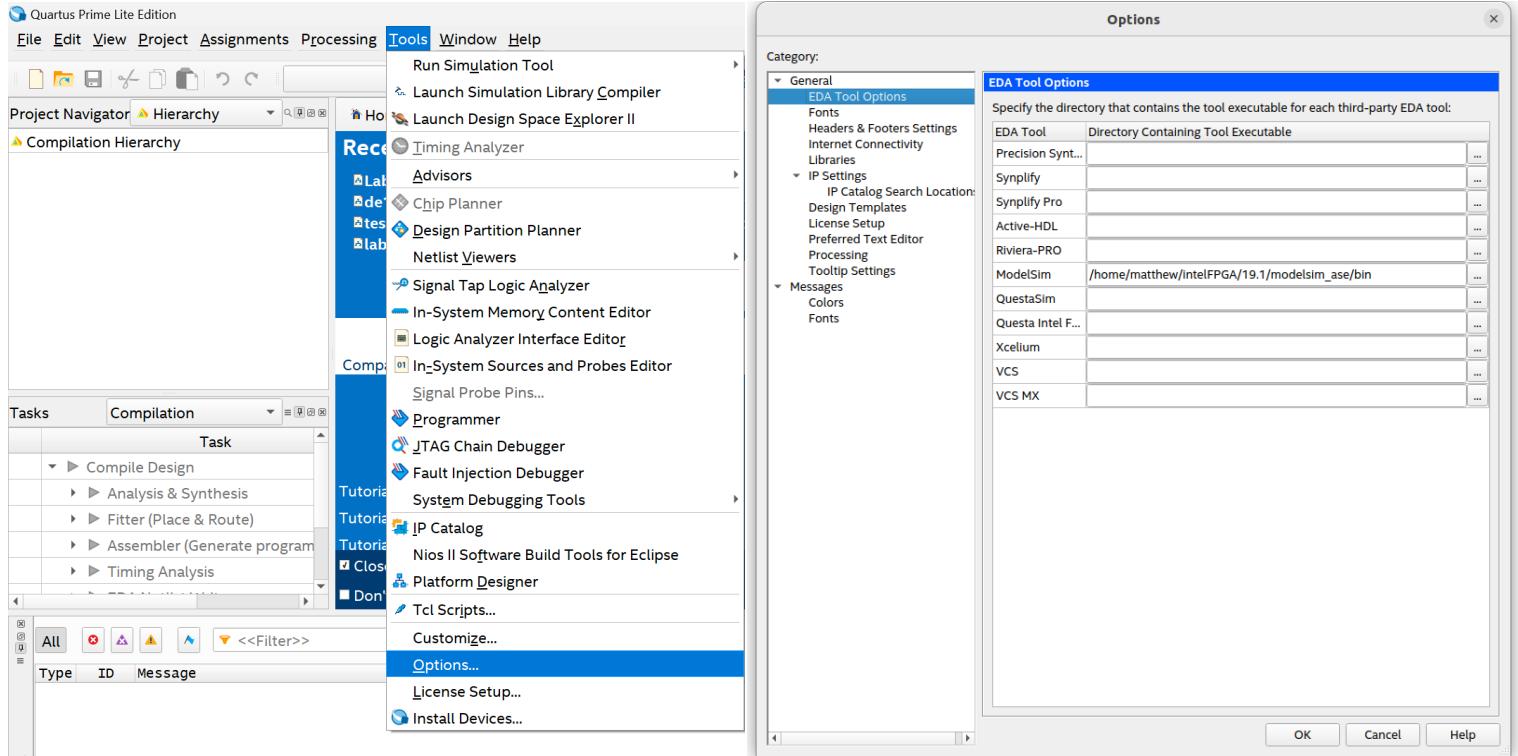
7) Once the installation has completed, open Quartus and navigate to `Tools->Options`. In the Options window, select `EDA Tool Options` in the left panel. In the text box next to the ModelSim label, insert the path to ModelSim's `bin` folder. The default install location uses the path `/home/YOURUSERNAME/intelFPGA/19.1/modelsim_ase/bin`. Click OK to save the simulator settings. Now you will be able to use ModelSim from the Quartus VWF editor.

Unfortunately, the ModelSim GUI (used in Digital Design) does not work when following these installation instructions. I'm not sure if this is due to something being broken in ModelSim or if it can be fixed by installing additional dependencies.

QUESTA INSTALLATION FOR WINDOWS 10/11

8) Go to the Quartus Prime Lite 25.1 Windows download page and select the "Individual Files" tab of the website. (Note that newer version may be available but have <mark>NOT</mark> been tested.)

9) You only need to download `Questa - Intel FPGA Edition`. You may need to accept a license agreement.
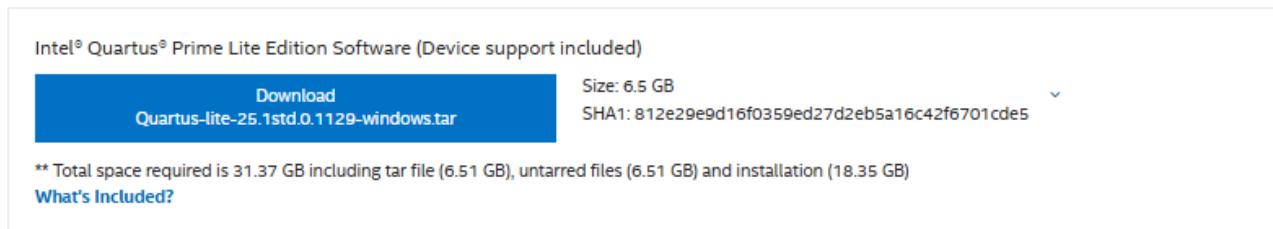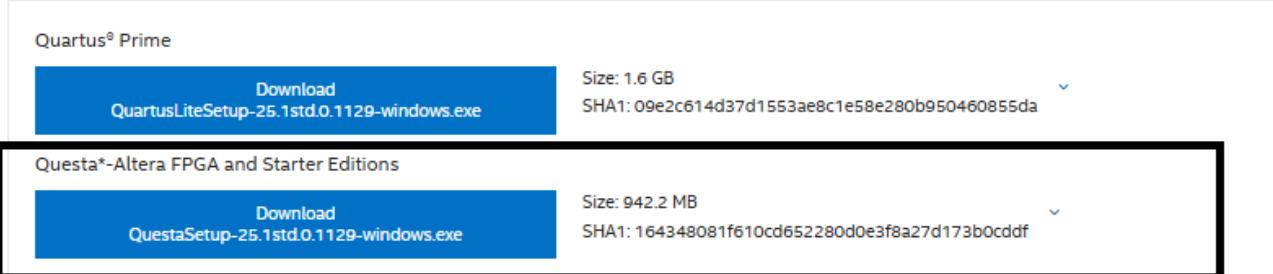
10) After the Quartus software has finished downloading, run the below installation file to install the Quartus software. `QuestaSetup-25.1std.0.1129-windows.exe`

    a. Windows may tell you that it is not safe to run this program with something like *Windows Protected Your PC*. Ignore this message. Select *More Info* and then select *Run Anyway*.

11) When prompted to select the version of Questa to install, choose *Questa – Intel FPGA Starter Edition.*

   a. Leave all default options in the installer and select `Next` as necessary.
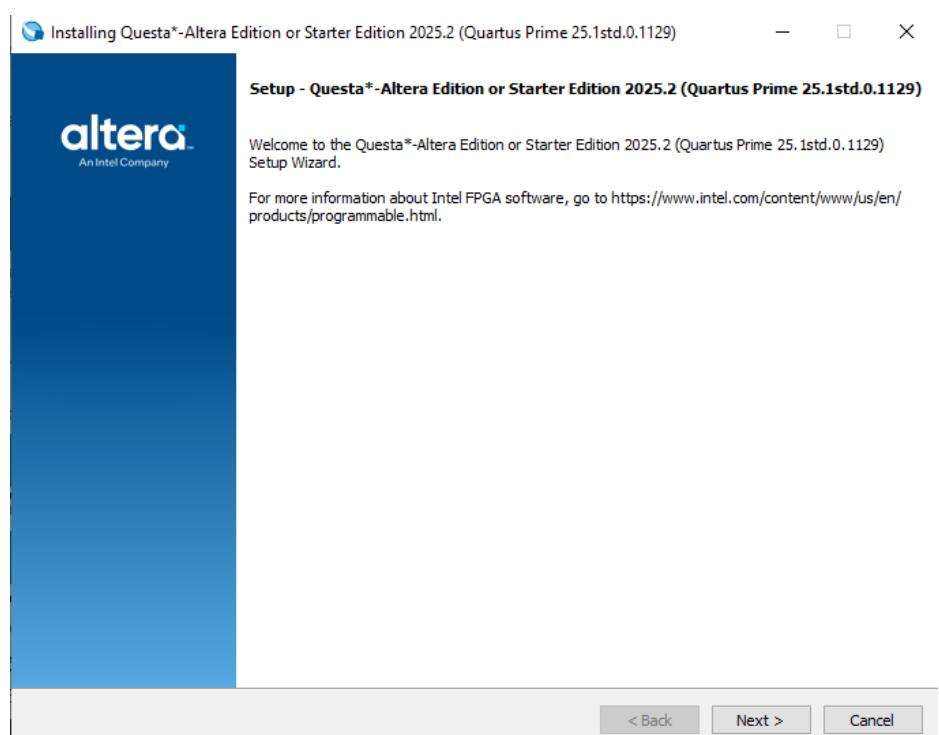
University of Florida   EEL 3701   Dr. Eric M. Schwartz
Department of Electrical & Computer Engineering   Revision 0   M. Hershfield, J. Fugate, Logan Burns
Page 13/20   **Quartus Installation Instructions**   18-Jan-26
(For Quartus v25.1 and ModelSim 19.1)

12) To prepare for acquiring a Questa License, we must find the hardware ID number of your network card. Intel uses this number to verify that your computer is licensed to use Questa. Open a PowerShell window and run the command `ipconfig /all.` (without the period) This will list all the network adapters connected to your computer. Look for your computer's main Wi-Fi or network card in this list and locate its Physical Address. The hardware ID number that you will put into the Intel website is your network adapter's Physical Address **with the dashes removed**. Save this number for use when requesting your Questa License. For example, the ID number in the below screenshot is `c423609f3c29`.
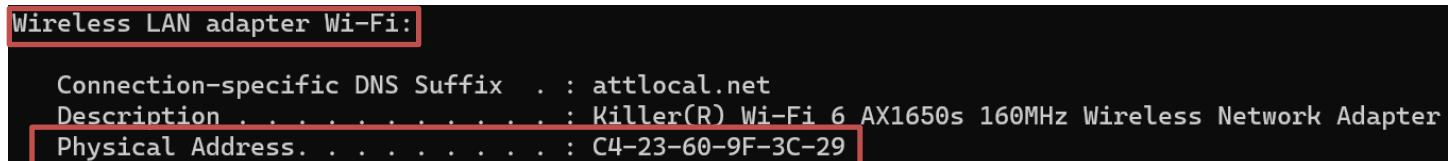

```
Wireless LAN adapter Wi-Fi:

   Connection-specific DNS Suffix  . : attlocal.net
   Description . . . . . . . . . . . : Killer(R) Wi-Fi 6 AX1650s 160MHz Wireless Network Adapter
   Physical Address. . . . . . . . . : C4-23-60-9F-3C-29
```

13) Follow the instructions in [Obtaining a Questa License]

14) Once you have obtained your Questa license, copy it to a safe folder where it won't accidentally get deleted. This tutorial assumes that you create the folder `C:\intelFPGA\licenses` and copy your license file there.

15) We need to set the `LM_LICENSE_FILE` environment variable globally so that Questa knows where to find the license file.

    a.   In the Start menu, search for Edit the system environment variables.

    b.   Click the Environment Variables button in the bottom right corner of the window that appears.

    c.   Under the System Variables section (bottom half of the window), click New.

    d.   In the window that appears, type in LM_LICENSE_FILE for the variable name. To set the variable's value, click the Browse File button in the bottom left corner of the window and navigate to where you stored your license file. Double click on the license file to save its path to the environment variable.

    e.   Click OK to confirm the new environment variable.

    f.   Restart Quartus for your changes to take effect.
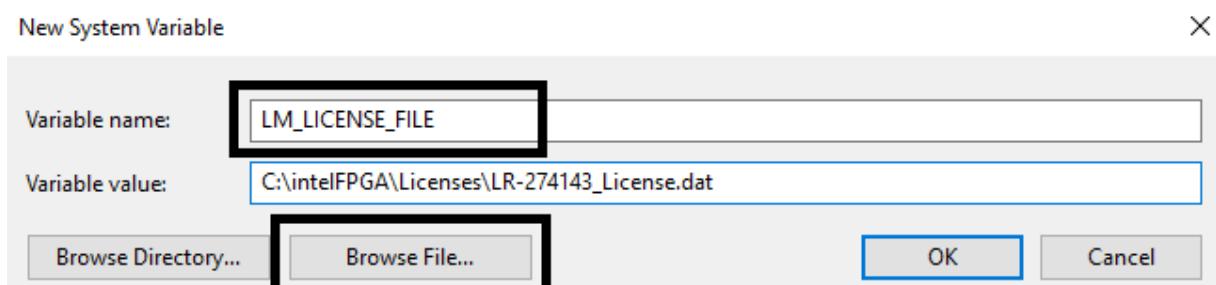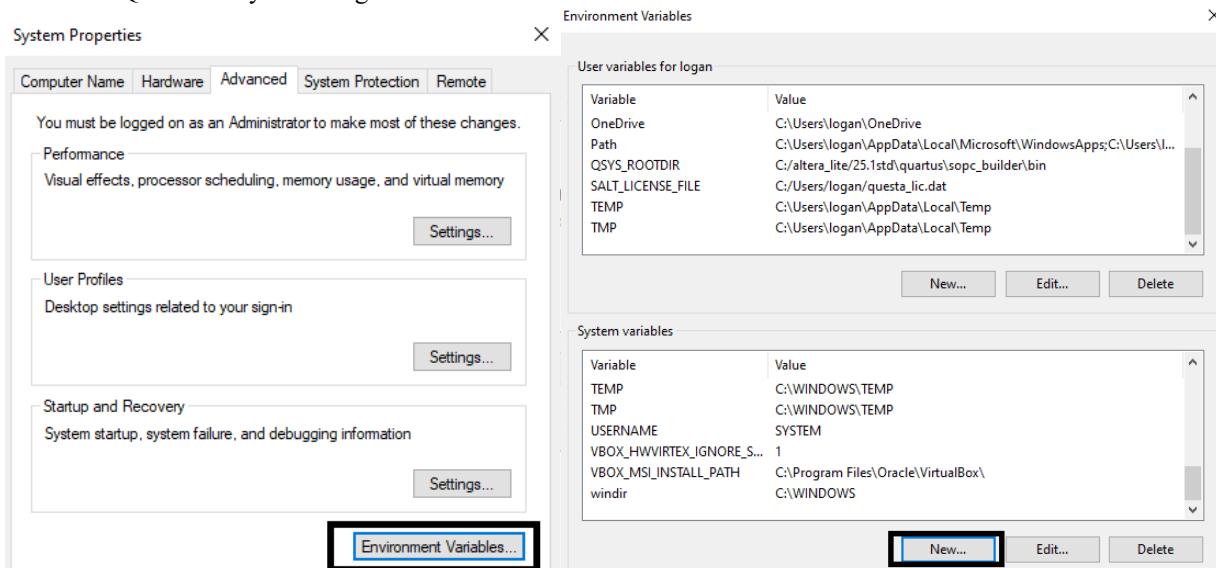
16) Open a command prompt (type `cmd` in the Start menu) and enter `lmutil lmdiag` to confirm that your license is found correctly. If your license cannot be verified, double check that your LM_LICENSE_FILE environment variable is set correctly.

University of Florida
EEL 3701
Dr. Eric M. Schwartz
Department of Electrical & Computer Engineering
Revision 0
M. Hershfield, J. Fugate, Logan Burns
Page 14/20
Quartus Installation Instructions
18-Jan-26
(For Quartus v25.1 and ModelSim 19.1)

17) Open Quartus and navigate to *Tools->Options*. In the Options window, select *EDA Tool Options* in the left panel. In the text box next to the Questa label, insert the path to Questa's `bin` folder. The default install uses the path `C:\altera\25.1std\questa_fse\win64`. Click *OK* to save the simulator settings. Now you will be able to use Questa from the Quartus VWF editor.
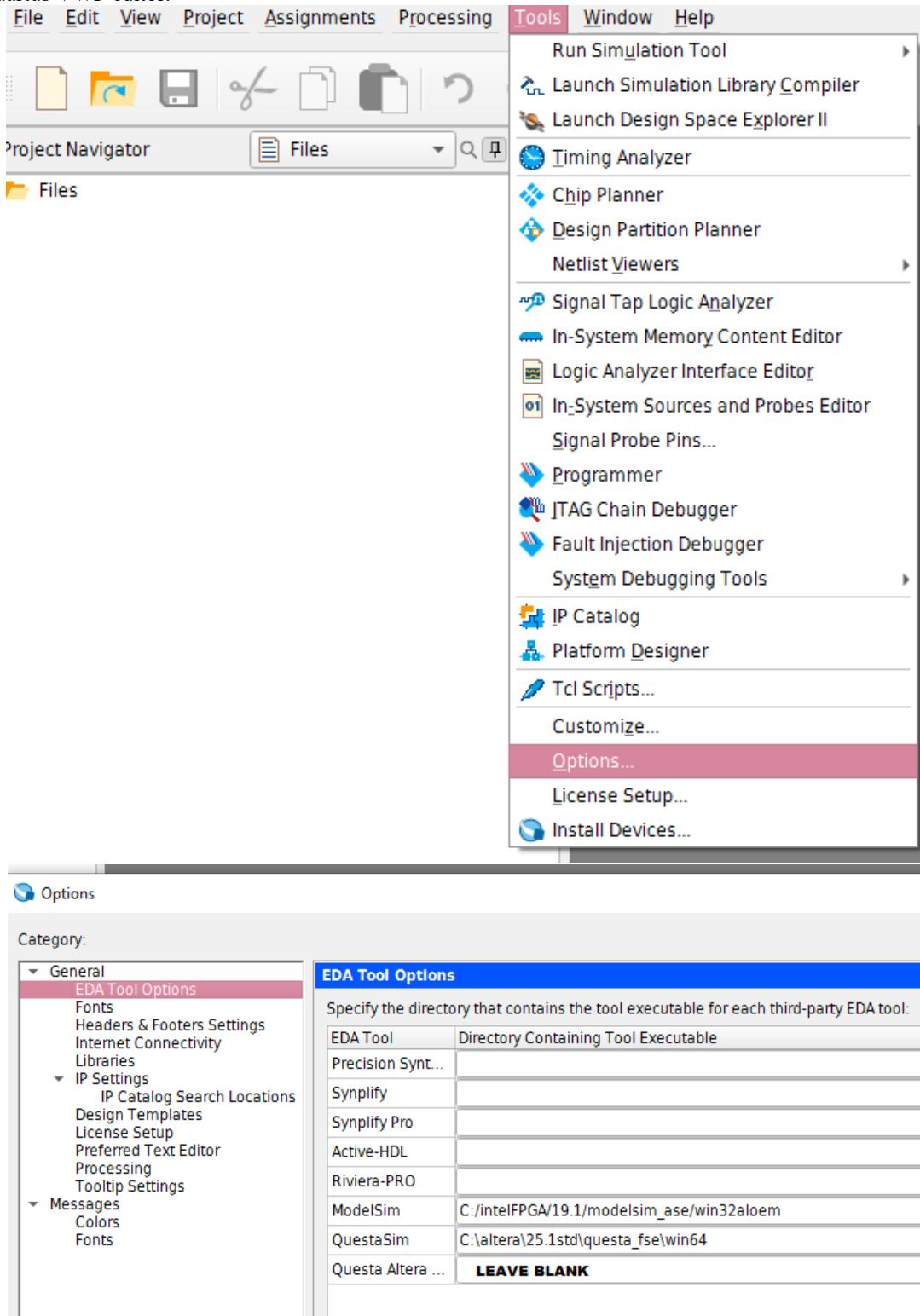
University of Florida   EEL 3701   Dr. Eric M. Schwartz
Department of Electrical & Computer Engineering   Revision **0**   M. Hershfield, J. Fugate, Logan Burns
Page 15/20   **Quartus Installation Instructions**   18-Jan-26
(For Quartus v25.1 and ModelSim 19.1)

QUESTA INSTALLATION FOR LINUX

The installation directions provided in this document were designed for default Ubuntu 22.04 LTS.

1) Go to the Quartus Prime Lite 25.1 Linux download page and select the "Individual Files" tab of the website. (Note that newer version may be available but have **NOT** been tested.)

    1. You only need to download `Questa – Intel FPGA Edition`.
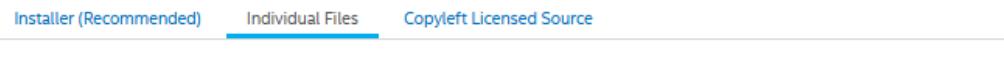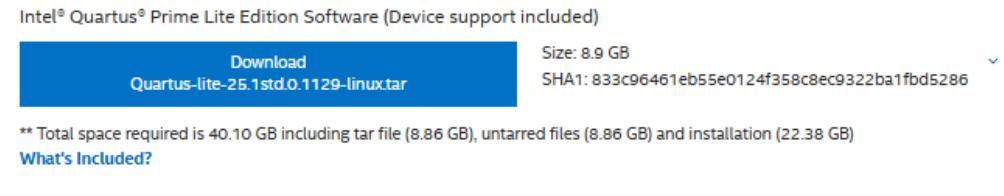
2) Open a terminal and navigate to your Downloads folder. We can then run the Questa installer by issuing the following commands. Make sure that you do not run the Questa installer as root!

```
chmod +x qinst-lite-linux-25.1std-1129.run
./qinst-lite-linux-25.1std-1129.run
```

3) When prompted, choose Questa – Intel FPGA Starter Edition

    a. Leave all default options in the installer and select `Next` each time it is necessary.

University of Florida
Department of Electrical & Computer Engineering
Page 16/20

EEL 3701
Revision 0
Quartus Installation Instructions
(For Quartus v25.1 and ModelSim 19.1)

Dr. Eric M. Schwartz
M. Hershfield, J. Fugate, Logan Burns
18-Jan-26
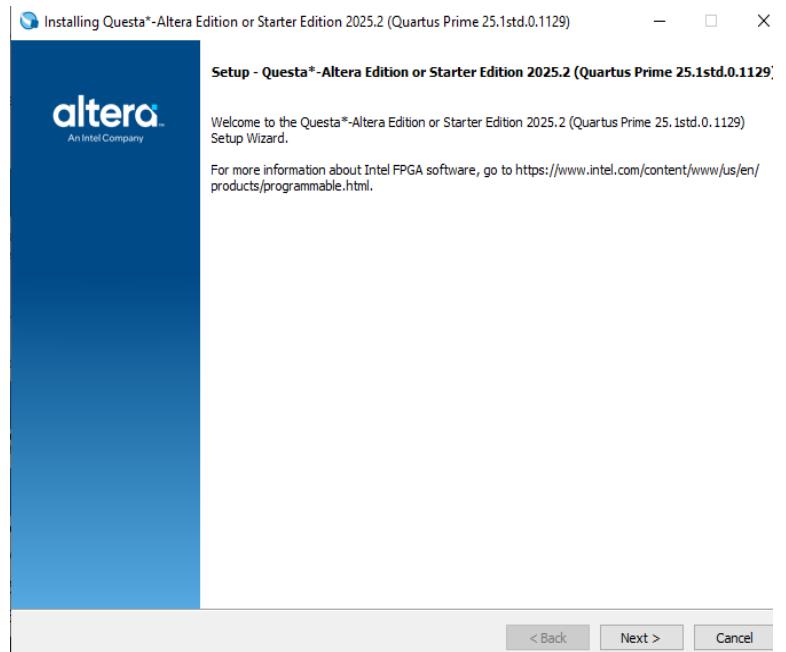
4) To allow easy access to your Questa installation, create a text file called `questa.desktop` using the text editor of your choice and copy the following contents into it. Make sure to change `YOURUSERNAME` to the username of the account that you installed Questa for.

```
[Desktop Entry]
Version=1.0
Type=Application
Terminal=true
Exec=/home/YOURUSERNAME/C:/altera/25.1std/questa_fse/bin/vsim
Name=Questa
```

    a. If your distribution supports desktop icons, you can copy this file to your Desktop folder and it will work as a desktop shortcut

    b. To add a Quartus shortcut to your Apps menu, copy this file to `~/.local/share/applications`, creating that folder if necessary. This was tested for GNOME.

5) To prepare for acquiring a Questa License, we must find the hardware ID number of your network card. Intel uses this number to verify that your computer is licensed to use Questa.

    a. Open a terminal and run the command `ip link`. (without the period)

    b. Look for an adapter named `eth0` or `enp0sXX`. Under that entry, look for a line starting with `link/XXXX` followed by a series of digits and letters. This series of digits and letters (**without colons**) is your network card ID. Save this number for use when requesting your Questa License. For example, the ID number in the below screenshot is `001d098ebed3`.
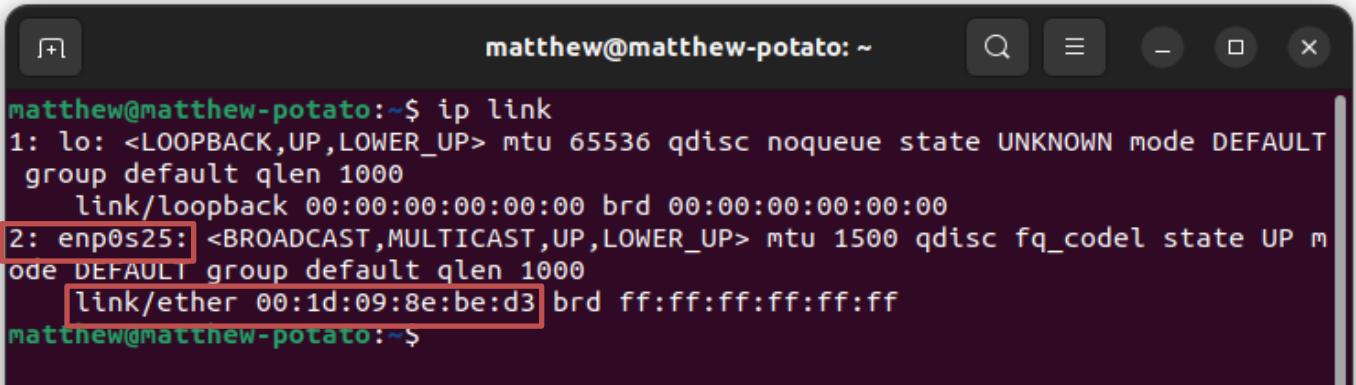

6) Follow the instructions in [Obtaining a Questa License](#).

7) Once you have obtained your Questa license, copy it to a safe folder where it won't accidentally get deleted. This tutorial assumes that you create the folder `~/intelFPGA/licenses` and copy your license file there.

8) We need to set the LM_LICENSE_FILE environment variable globally so that Questa knows where to find the license file. To do this, create `/etc/environment.d/90quartus-license.conf` and populate it with the following text. Make sure to use the username you installed Questa for and the correct name of your license file. You will need superuser privileges to create this file.

```
LM_LICENSE_FILE=/home/YOURUSERNAME/intelFPGA/licenses/LR-XXXXXX_License.dat
```

9) Restart your computer so that the changed environment variable takes effect.

10) Open Quartus and navigate to *Tools->Options*. In the Options window, select *EDA Tool Options* in the left panel. In the text boxes next to the Questa and Questa – Intel labels, insert the path to Questa's `bin` folder. default path: `/home/`YOURUSERNAME`/intelFPGA/25.1std/questa_fse/bin`. Click *OK* to save the simulator settings. Now you will be able to use Questa from the Quartus VWF editor.
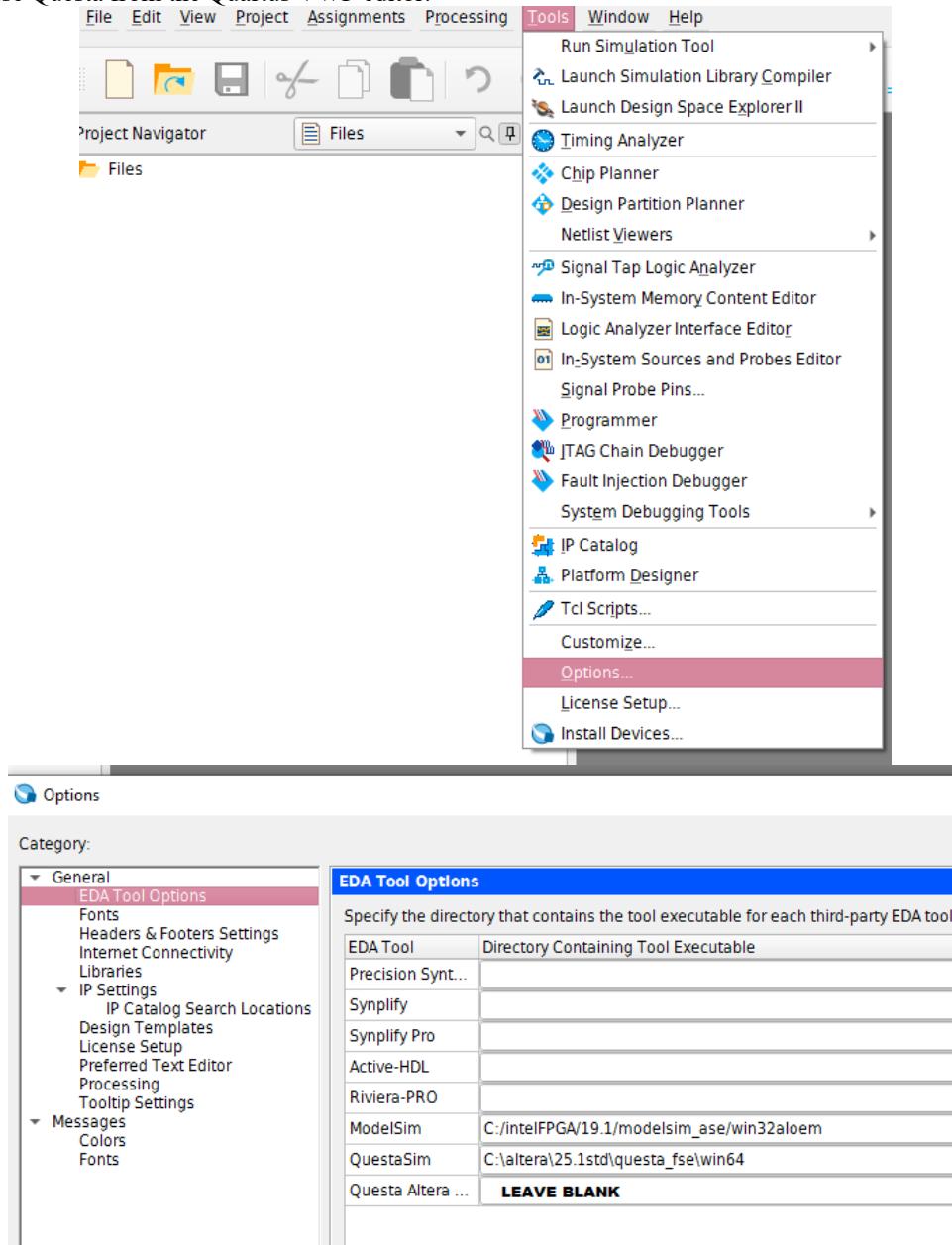
APPENDICES

OBTAINING A QUESTA LICENSE

Questa is the newest simulator provided by Intel. It supports modern hardware and uses modern dependencies, but it unfortunately requires a free license to use. Getting a Questa license is a somewhat involved process. Only follow these instructions if you are installing Questa. If you are using ModelSim as your simulator you do not need to get a license.

1) Using Google Chrome or Chromium, navigate to the Intel Self-Service Licensing Center. The website will not allow you to get a license if you use Firefox. Click `Enroll for Intel® FPGA Self Service Licensing Center (SSLC)` and create an account. I would recommend signing up using your UF email. The enrollment process may require you to download the Microsoft Authenticator app onto your phone for two-factor authentication. I have not found a way to circumvent this requirement.

2) Once you have activated your account, go to the Home Page for the Self-Service Licensing Center and click on `Sign up for Evaluation or No-Cost Licenses`.

3) Click the radio button next to `Questa-Intel FPGA Starter Edition`. Set the *# of Seats* to `1`.

University of Florida   EEL 3701   Dr. Eric M. Schwartz
Department of Electrical & Computer Engineering   Revision **0**   M. Hershfield, J. Fugate, Logan Burns
Page 19/20   **Quartus Installation Instructions**   18-Jan-26
(For Quartus v25.1 and ModelSim 19.1)

4) In the window that appears, click *New Computer*.
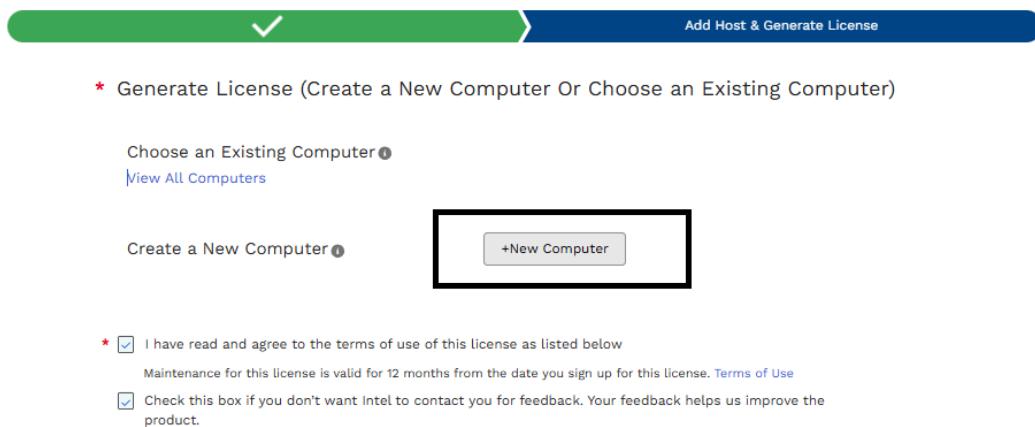
5) Give the computer a memorable name. Under *License Type*, select *Fixed*. This creates a single-user license tied to your individual computer. Under *Computer Type*, select *NIC ID*. This will tell Intel that your computer will be identified by its network card. Under *Primary Computer ID*, type in the hardware ID of your network card (found earlier in your operating system's Questa installation tutorial). The hardware ID should only include hexadecimal digits (0-9, a-f). **Make sure to remove any spaces, dashes, or colons in the number**. Finally, click *Save*, then *Generate*.

6) Look for an email from authorization@intel.com sent to the address you used to create your Intel account. A license file named `LR-XXXXXX_License.dat` should be attached to the email. Download that file and return to the Questa Installation Tutorial.

Sources

- https://stackoverflow.com/questions/18704913/unable-to-lock-chain-insufficient-port-permissions
- https://wiki.archlinux.org/title/Intel_Quartus_Prime
- https://cdrdv2-public.intel.com/666293/quartus_install-683472-666293.pdf
- https://web.archive.org/web/20220614084754/https://ecen3350.rocks/static/usb-blaster.pdf