

# Quartus, Modelsim, and SystemBuilder Software Installation Guide

## EEC 18 and EEC 180 • UC Davis

This document provides instructions for setting up the [Quartus](#) design tool, [Modelsim-Intel](#) Verilog and FPGA simulator, and SystemBuilder project file setup tool, for use in EEC 18 and EEC 180.

EEC 18 and EEC 180 use Quartus II Prime and Modelsim Waveform viewer. Students can download the Lite edition for free and install it on a personal Windows or Linux computer. This document describes steps to download these software tools, and install and configure the necessary drivers.

### 1. Download Quartus and Modelsim

**Step #1:** Using your browser, navigate to the webpage:

<https://www.intel.com/content/www/us/en/software-kit/664527/intel-quartus-prime-lite-Edition-design-software-version-19-1-for-windows.html>

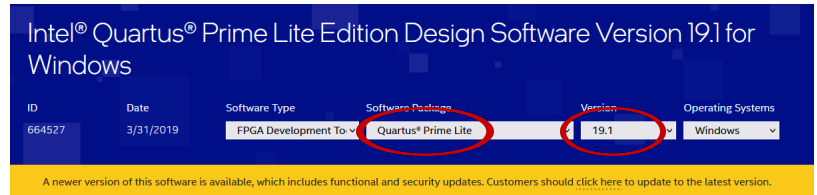
Select the edition “Quartus Prime Lite,” and version “19.1”.

Disable any popup blockers you may have running. If you do not, nothing will happen when you click the arrow.

Next, click the blue download. Three packages will be installed:

1. Quartus Prime Lite Edition
2. ModelSim - Intel FPGA Starter Edition
3. Devices > Max 10 FPGA

This should take approximately 15 GB.



Users should upgrade to the latest version of the Intel® Quartus® Prime Design Software. The selected version does not include the latest functional and security updates. If you must use this version of software, follow the [technical recommendations](#) to help improve security. For critical support requests, please contact our [support team](#).

The Intel® Quartus® Prime Lite Edition Design Software, Version 19.3 is subject to removal from the web when support for all devices in this release are available in a newer version, or all devices supported by this version are obsolete. If you would like to receive customer notifications by e-mail, please subscribe to our [subscribe to our customer notification mailing list](#).

To use the Intel® Quartus® Prime Lite Edition Design Software, Version 19.1 on Windows, **you must** download and install the patch available in this [KDB Solution](#).

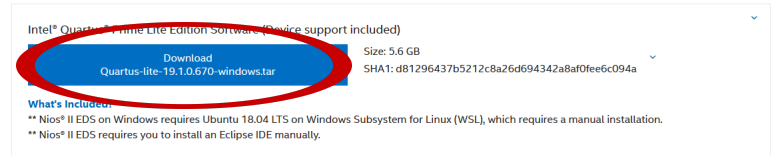
OS Support and IP support have changed in this release. Refer to the [Release Notes](#) for details.

Critical Issues and Patches for the Intel® Quartus® Prime Lite Edition Software, Version 19.1.  
[Knowledge Base: Search for Errata](#). Also see [Critical Issues and Patches](#).  
[Problems and Answers on specific IP or Products](#).

#### Downloads

[Multiple Download](#) [Individual Files](#) [Additional Software](#) [Copyleft Licensed Source](#)

#### Multiple Download

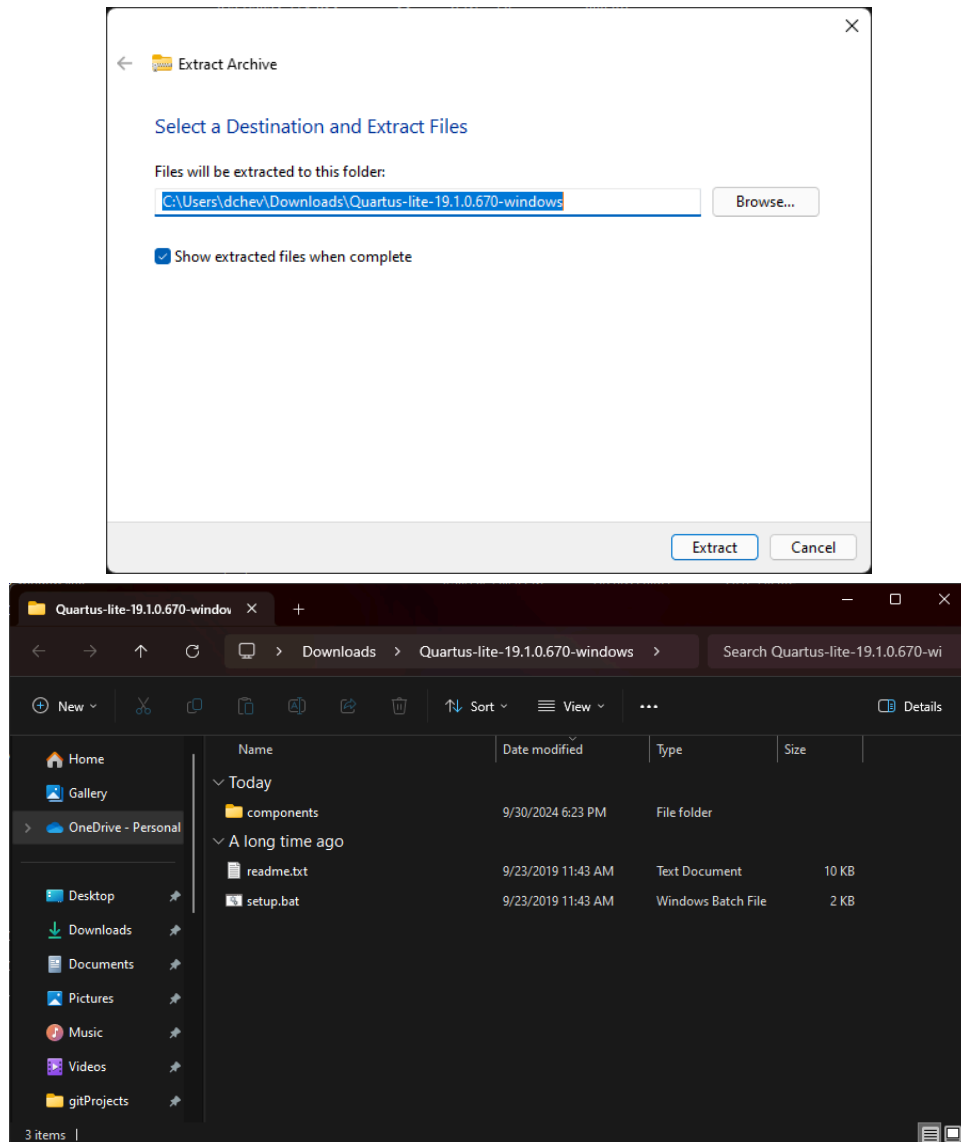


#### Download and install instructions:

1. Download the software .tar file and the appropriate device support files.
  2. Extract the files into the same temporary directory.
  3. Run the setup.bat file.
- [Read Intel® FPGA Software Installation FAQ](#)

Note: The Intel® Quartus® Prime software is a full-featured EDA product. Depending on your download speed, download times may be lengthy.

**Step #2:** Extract the compressed file. The downloaded file should be a '.tar' file. Right-click and select 'Extract All'. In the Extract Archive window, select Extract.



## 2. Install Quartus

Place the extracted files into the same folder (or Desktop) if they are not already.

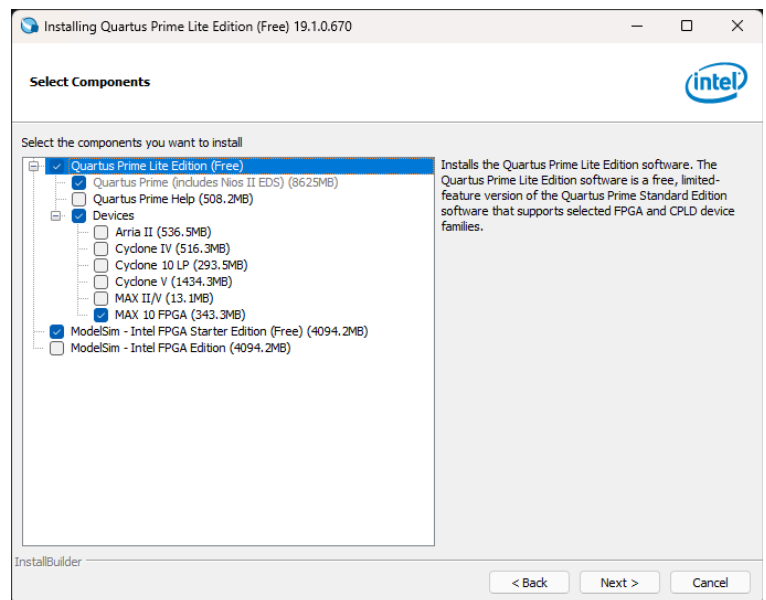
Double click the Quartus installer which is named something like: setup.bat

Accept all default options including the installation directory which is in an unfortunate location at C:\intelFPGA\_lite\19.1\ in the root directory but this is necessary because it cannot accept a space in the path so the normal location under C:\Program Files\ ... is not possible.

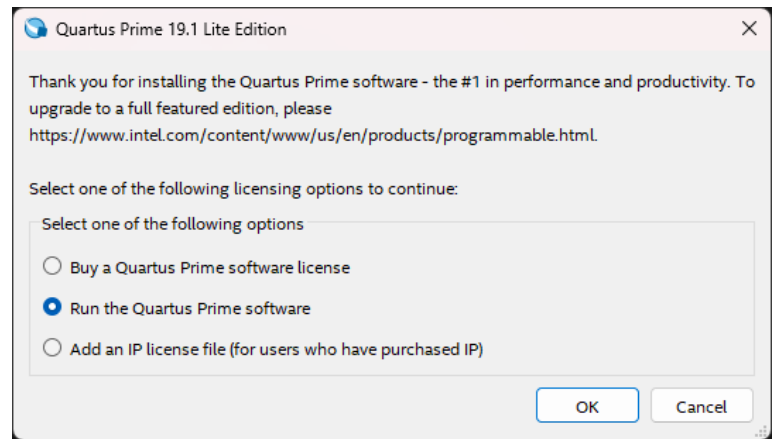
Accept the default components.

The download and installation takes a very long time — plan on approximately 60-90 minutes!

Next the tool will launch a Device Driver Installation Wizard.



And then this window. Choose “Run the Quartus Prime software” and OK. You will need to open Quartus again after this.

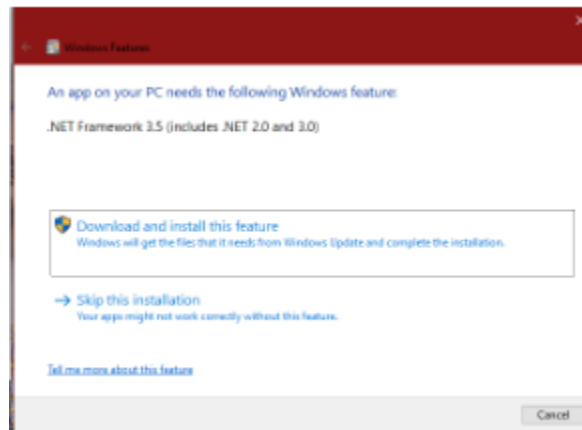


Try running Quartus. You may get this error message:

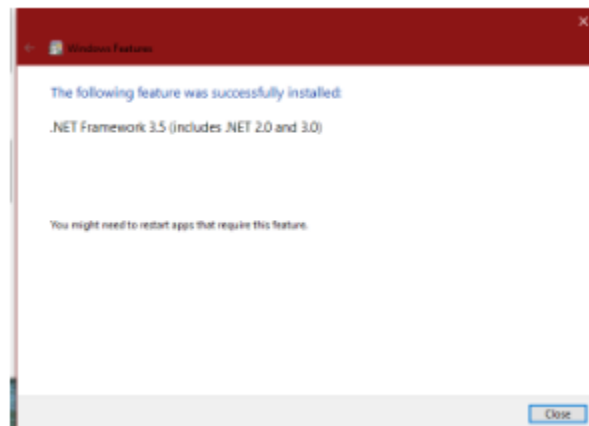


If you get this error message, follow these 3 steps:

- 1) download and install the VC 2015 redistributable package from Microsoft: <https://www.microsoft.com/en-us/download/details.aspx?id=48145>
- 2) reboot your computer. After restarting, you may get this installation request from Windows. Press “Download and install this feature”



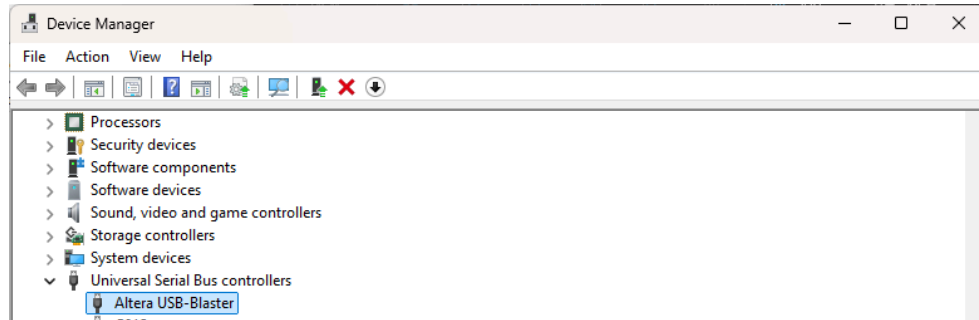
- 3) it takes a long time to complete; don't touch anything until you get the following window:



- 4) to be extra safe, reboot your machine again.

### 3. Update the USB Blaster Driver

Before your computer can connect to the DE-10 board, you will likely need to install or update the USB blaster driver. Plug the DE10-Lite FPGA board into your computer using the included USB cable, open the **Device Manager** utility program, open the **Universal Serial Bus controllers** category, and find the **Altera USB-Blaster** entry. It will likely have a yellow warning triangle by the name. Follow the instructions in Appendix A if you do not see the driver.



Right click on **Altera USB-Blaster**, click **Update Driver** and choose **Search automatically for updated driver software**. If the yellow warning triangle goes away, you are done. If it does not go away, follow the instructions in Appendix A.

### 4. Install SystemBuilder

Click on the following link which is believed to always point to the latest version:

<http://download.terasic.com/downloads/cd-rom/de10-lite/>

Download the file **DE10-Lite\_v.2.1.0\_SystemCD.zip** or similar under the **CD-ROMs** heading.

If for some reason you do not see the aforementioned .zip file, click instead on the following link and follow the indented instructions:

<https://www.terasic.com.tw/cgi-bin/page/archive.pl?Language=English&CategoryNo=234&No=1021&PartNo=4>

Under the **CD-ROM** heading, click on the round CD icon in the **DE10-Lite CD-ROM** row and **Download** column.

You will be asked to set up an account with Terasic, which is separate from the account you might have set up with Intel to download Quartus. Click Join Now, fill out information, submit, and click the link in an email sent to you by Terasic.

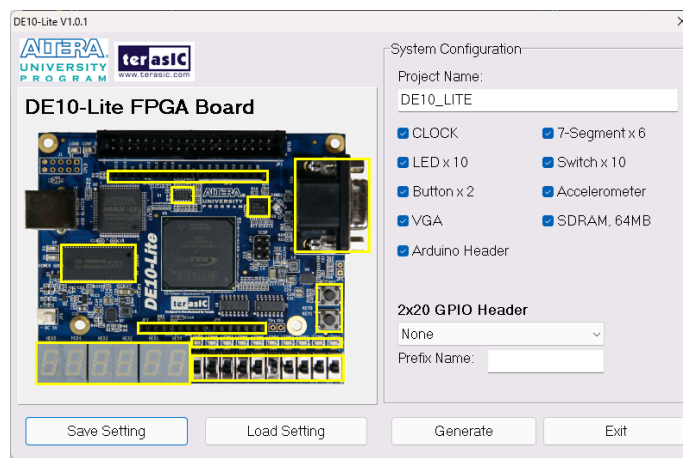
Log into the website, go back to the CD-ROM download page above, and download the file **DE10-Lite\_v.2.0.3\_SystemCD.zip** or similar under the CD-ROMs heading.

Unzip the .zip file (for example, by right-clicking and choosing “Extract All...”) into a convenient location.

Optional organization:

- Move the **DE10-Lite\_v.2.1.0\_SystemCD\** folder somewhere convenient such as into the folder **C:\Program Files (x86)\**
- Open the following folders inside that folder: **Tools\SystemBuilder\**
- Right-click on **DE10\_Lite\_SystemBuilder.exe** and choose **Create Shortcut**. Move the shortcut somewhere convenient such as on your Desktop.

Run SystemBuilder by double-clicking on the shortcut. You should see the main window:



As a test, enter a project name and select some configuration options, then click **Generate** which will create two files: a *projectname.htm* file which can be viewed by a web browser, and *projectname.qpf*, *projectname.qsf*, *projectname.sdc*, and *projectname.v* files to be used for implementing a design on your DE10-Lite board.

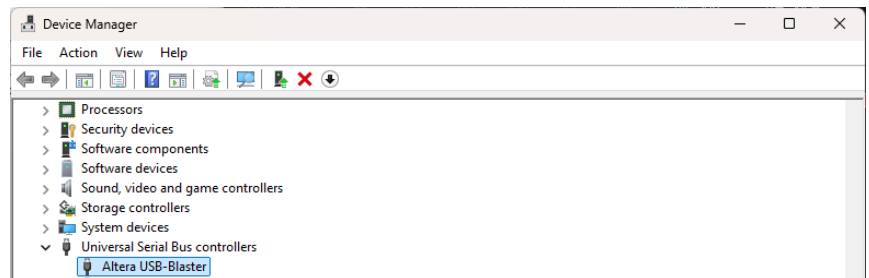
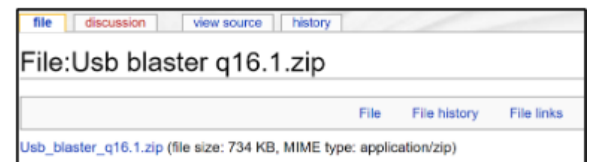
## Appendix A. Update the USB Blaster Driver with a Downloaded Driver

Follow the same instructions as Section 3, but click **Browse my computer for driver software** when asked how to search for drivers. Choose the location inside the Quartus installation directory, which should be `C:\intelFPGA_lite\19.1\quartus\drivers`

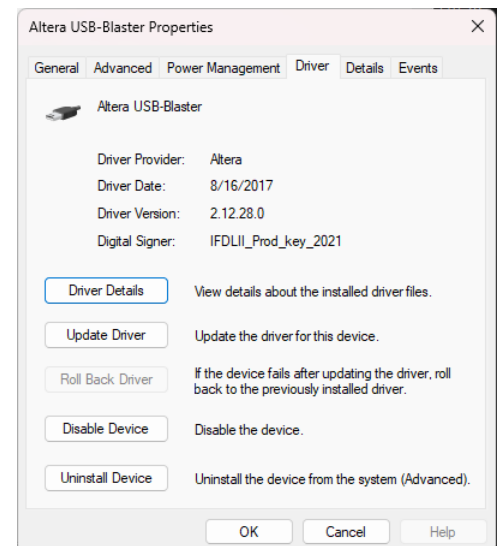
Do not go any deeper into the directory, simply select the drivers folder and ensure that 'Include subfolders' is checked.

If the USB-Blaster driver is not installed in the Quartus directory, follow the following steps to install it:

1. Download the zip file from [http://www.terasic.com.tw/wiki/File:Usb\\_blaster\\_q16.1.zip](http://www.terasic.com.tw/wiki/File:Usb_blaster_q16.1.zip)
2. Decompress and extract the .zip file you just downloaded to a location you can easily remember such as on your Desktop.
3. Go to the **Device Manager**



4. Right-click on Altera USB-Blaster and choose **Properties**.



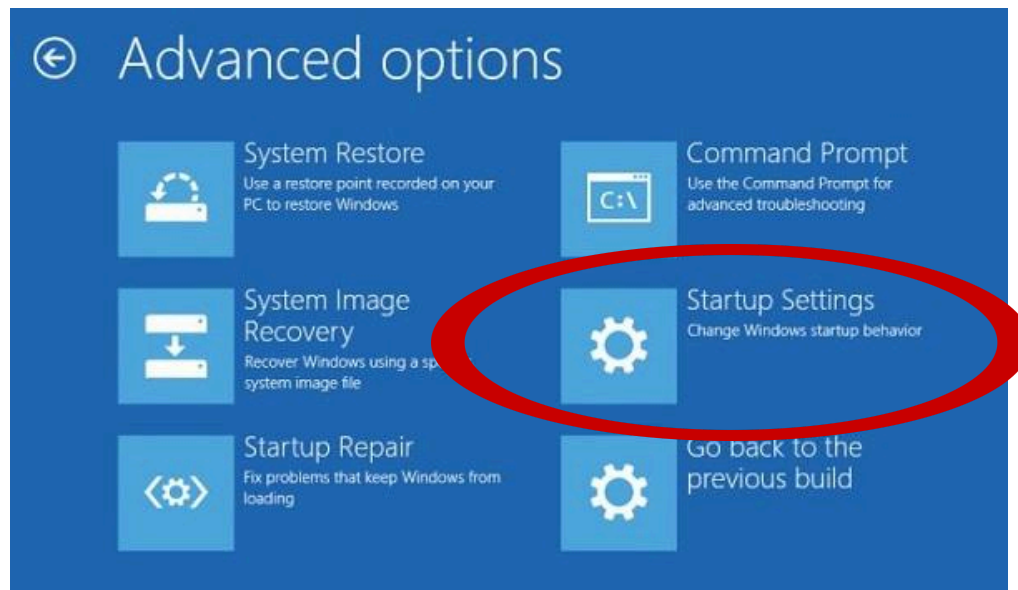
5. Go to **Driver** and choose **Update Driver**.



6. Choose **Browse my computer for driver software** and choose the downloaded file location in step 2.

The driver in the Quartus 19.1 version is not properly signed, so the installation might still fail. The best way to force the installation is to temporarily disable the driver signature enforcement.

1. Go to Settings > System > Recovery
2. Click on **Restart Now** next to Advanced startup
3. Select Troubleshoot > Advanced options > Startup settings > Restart



4. In the Startup Settings screen, select '7' to Disable driver signature enforcement. After driver installation, it can be re-enabled for security.

# Startup Settings

Press a number to choose from the options below:

Use number keys or functions keys F1-F9.

- 1) Enable debugging
- 2) Enable boot logging
- 3) Enable low-resolution video
- 4) Enable Safe Mode
- 5) Enable Safe Mode with Networking
- 6) Enable Safe Mode with Command Prompt
- 7) Disable driver signature enforcement
- 8) Disable early launch anti-malware protection
- 9) Disable automatic restart after failure

Press F10 or 0 for more options

Press Enter to return to your operating system

5. Follow the instructions above to install the driver from the Quartus install.

Some devices (such as Dell XPS laptops) might not have the Startup Settings option available in the Advanced startup menu. In this case, the driver signature enforcement must be turned off via the command prompt.

1. Ensure that Secure Boot is disabled in the BIOS
2. Log into Windows (entering BitLocker code if necessary from Microsoft account)
3. In an Administrator Command Prompt, run the following commands:
  - **bcdedit.exe /set nointegritychecks on**
  - **bcdedit.exe -set loadoptions DISABLE\_INTEGRITY\_CHECKS**
  - **bcdedit.exe -set TESTSIGNING ON**
4. Restart PC
5. Try installing the drivers as detailed above.

After installing the drivers, Secure Boot can be re-enabled to revert the changes done from the command prompt.

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2019/01/01 Original version written Shifu Wu

2020/02/01 Added windows installation notes

2020/04/04 Added Quartus installation details and Microsoft patch instructions

2020/04/06 Added SystemBuilder installation instructions

2021/01/14 Added a new step in Appendix A to decompress the downloaded file

2024/09/30 Updated instructions for Quartus v19.1 in 2024