

# Guidance on download and install Quartus Prime and Questa Intel FPGA

## Introduction

This document provides the guidance on how to download and install software for your practical exercises of Digital Electronics unit.

The unit will use two separate software, namely Quartus Prime from Intel, and Questa from Siemens. Quartus Prime is an Electronic Design Automation (EDA) tool to design, validate and programme Intel Field Programmable Gate Array (FPGA) devices.

One of the most important validation methods is to use a software called simulator to simulate the behaviour of logic circuits. Quartus used to have its own built-in simulator. But the performance is inferior to other commercial simulators, so Quartus Prime now use third party simulators, including Questa from Siemens.

The version of Questa we are using is called Questa Intel FPGA. It's a free version to be used with Quartus Prime. In other words, customers who have a license (paid or non-paid) of Quartus Prime can use it for free. Questa Intel FPGA contains the compiled models of Intel FPGA components for simulation, so that customers don't need to compile these components.

By now, you should have realised that although we say two pieces of software are needed for this unit, they are actually used hand-in-hand. However because they come from two separate companies, there are some extra steps to make them work together, especially regarding the license.

The following sections describe how to download, install these two pieces of software.

## Quartus Prime Lite:

Download Quartus Prime Lite edition from Intel FPGA software download centre. Make sure you download the Lite version, for example the 21.1.1. version can be found:

<https://www.intel.com/content/www/us/en/software-kit/736572/intel-quartus-prime-lite-edition-design-software-version-21-1-1-for-windows.html>

The easiest way to download is to use "Multiple Download", this download one compressed file (a big one of 5.5 G) that contains all the files needed, as shown in Figure 1

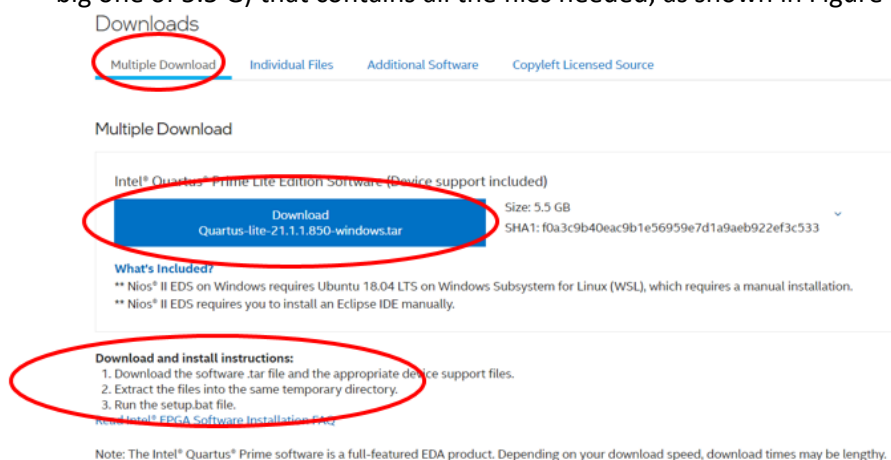


Figure 1: Download Quartus Prime by choosing Multiple Download

If it's too big for your PC, or too slow to download, you can download individual files that are required for your work. You will need to download Intel Quartus Software (QuartusLiteSetup-21.1.xxx-windows.exe, Questa-Intel FPGA Edition), and For Devices, you will need Intel MAX 10 FPGA device support, as shown in Figure 2.

The screenshot shows the 'Downloads' section of the Intel Quartus website. The 'Individual Files' tab is selected. Under 'Intel® Quartus® Software', there are two download buttons: 'Download QuartusLiteSetup-21.1.1.850-windows.exe' (1.6 GB) and 'Download QuestaSetup-21.1.1.850-windows.exe' (784.1 MB). Below these, there are instructions for Nios II EDS on Windows. Under 'Devices', there are several download buttons for device support files, including 'Download max10-21.1.1.850.qdz' (2,653 MB). At the bottom, there are 'Download and Install Instructions' and a link to the 'Intel® FPGA Software Installation FAQ'.

Downloads

Multiple Downloads Individual Files Additional Software Copyleft Licensed Source

Intel® Quartus® Software

Intel® Quartus® Prime (includes Nios II EDS)

Download QuartusLiteSetup-21.1.1.850-windows.exe Size: 1.6 GB SHA1: a78ac4ce8d3635b11f541e9811468f91befa90

\*\* Nios® II EDS on Windows requires Ubuntu 18.04 LTS on Windows Subsystem for Linux (WSL), which requires a manual installation.  
\*\* Nios® II EDS requires you to install an Eclipse IDE manually.

Questa®-Intel® FPGA Edition

Download QuestaSetup-21.1.1.850-windows.exe Size: 784.1 MB SHA1: d985442ac1441fbd8cac7a509a2a3d5978e4ab0

Devices

Intel® Arria® II device support

Download arria\_lite-21.1.1.850.qdz Size: 499.1 MB SHA1: 73c76f098cc068be6e4bb713951b1fbc0cde29c

Intel® Cyclone® IV device support

Download cyclone-21.1.1.850.qdz Size: 466 MB SHA1: 0da78d840eaba15e23486e983b8dce4a7bf24bf7

Intel® Cyclone® 10 LP device support

Download cyclone10lp-21.1.1.850.qdz Size: 265.7 MB SHA1: 7dcb21cb70fafa142afd261ea766700248aba657

Intel® Cyclone® V device support

Download cyclonev-21.1.1.850.qdz Size: 1.3 GB SHA1: 467123b7bd5e6907beb7d6b1e073ed7bad3e5e94

Intel® MAX® II, Intel® MAX® V device support

Download max-21.1.1.850.qdz Size: 11.4 MB SHA1: c6f109a926864ecd1cb3e86c6b11a8e931525e66

Intel® MAX® 10 FPGA device support

Download max10-21.1.1.850.qdz Size: 2,653 MB SHA1: f2361585ed0f224281f17c07ae9b93466d38c6a5

Download and Install Instructions

1. Download Intel® Quartus® Prime software, and any other software products you want to install, into a temporary directory.
2. Download device support files into the same directory as the Intel® Quartus® Prime software installation file.
3. If you want to use add-on software, download the files from the Additional Software tab. Save the files to the same temporary directory as the Intel® Quartus® Prime software installation file.
4. Run the .exe file.

Read Intel® FPGA Software Installation FAQ

Figure 2: Download Quartus Prime by choosing individual files

After downloading, you follow the instruction on the website to install Quartus. This should also install Questa Intel FPGA as well.

## Generating and Install Intel FPGA Questa License

This section comes from Intel's [online document](#). It is copied here for your convenience:

Quartus Prime Lite is free, so is Intel Questa. However, you will have to request and generate a free 1-year license to run Intel Questa.

### Generating License:

You can obtain a license from the Intel FPGA Self Service Licensing Centre (SSLC). If you do not have access to SSLC, you must first complete registering to SSLC and create an account by visiting [Register for Intel FPGA Self Service Licensing Center \(SSLC\)](#).

Follow these steps to generate the license:

1. Go to the [Intel FPGA Self-Service Licensing Center \(SSLC\)](#).
2. Select the **Sign up for Evaluation or Free Licenses** option on the menu bar.
3. In the list of products displayed, select the **Questa\*-Intel® FPGA Starter Edition SW-QUESTA** option.
4. Under the **# of Seats** column, enter the number of seats you require. For your individual usage, the number should be 1.
5. Click Next
6. Click **Create a New Computer** if you want to assign the license to a new computer. You must provide information about the required hardware and license type. For information about the license type, refer to [Intel® FPGA Software License Types](#). For information about how to extract information about your computer hardware, refer to [Hardware Information Required When You Request a License](#).

(For Computer Name, enter a name you give to your computer; For License Type: choose Fixed; For Computer Type, choose NIC ID; For Primary Computer ID, find out the NIC number as mentioned below:

**Network Interface Card (NIC) Number:** Your NIC number is a 12-digit hexadecimal number. Most licenses use your NIC. You can find the NIC number for your card by typing `ipconfig /all` at a command prompt. Your NIC number is the number on the physical address line, minus the dashes. An example is shown below:)

```
ipconfig /all
```

The command prints network information. The NIC Address appears as **Physical Address**.

Figure 7. NIC ID in Output of ipconfig Command

```
Ethernet adapter Ethernet 2:
Connection-specific DNS Suffix . : 
Description . . . . . : 
Physical Address. . . . . : 
DHCP Enabled. . . . . : 
Autoconfiguration Enabled . . . . : 
IPv4 Address. . . . . : 
Subnet Mask . . . . . : 
Default Gateway . . . . . : 
DNS Servers . . . . . : 
Primary WINS Server . . . . . : 
Secondary WINS Server . . . . . : 
NetBIOS over Tcpip. . . . . :
```

If the system has more than one network card, you can use the NIC ID of any network card connected to the computer.

7. Read the license terms of use.
8. Select the "I have read and agree to the terms of use of this license as listed below" check box.
9. Click **Generate**.
10. A license will be emailed to you.

### Setting Up the Questa\*-Intel® FPGA Starter Edition Software License

After you receive and save the license.dat (It might be called a different name) file on your computer, follow these instructions:

#### On Windows System

1. Go to **This PC**, right-click, and select **Properties**.
2. Click **Advanced System Setting**.
3. In the **Advanced** tab, select **Environment Variable**.
4. Under **System variables**, create a new variable with the name as LM\_LICENSE\_FILE and value as <license.dat file path>.
5. Click **OK** and restart the Questa\* software.

Alternatively, open a command prompt and run the following command to set up the LM\_LICENSE\_FILE environment variable:

```
setx LM_LICENSE_FILE <path_to_license_file>;%LM_LICENSE_FILE%
```

For example: setx LM\_LICENSE\_FILE C:\intelFPGA\license.dat;%LM\_LICENSE\_FILE%