

# Chapter 1: Introduction to the DE2-115 Development and Education Board

## 1.1 Overview of DE2-115

A link describing the DE2-115 board is given below:

<http://www.youtube.com/watch?v=1FYYGrNQ4iM>

This device is specifically designed for to create, implement, and test digital designs using programmable logic.

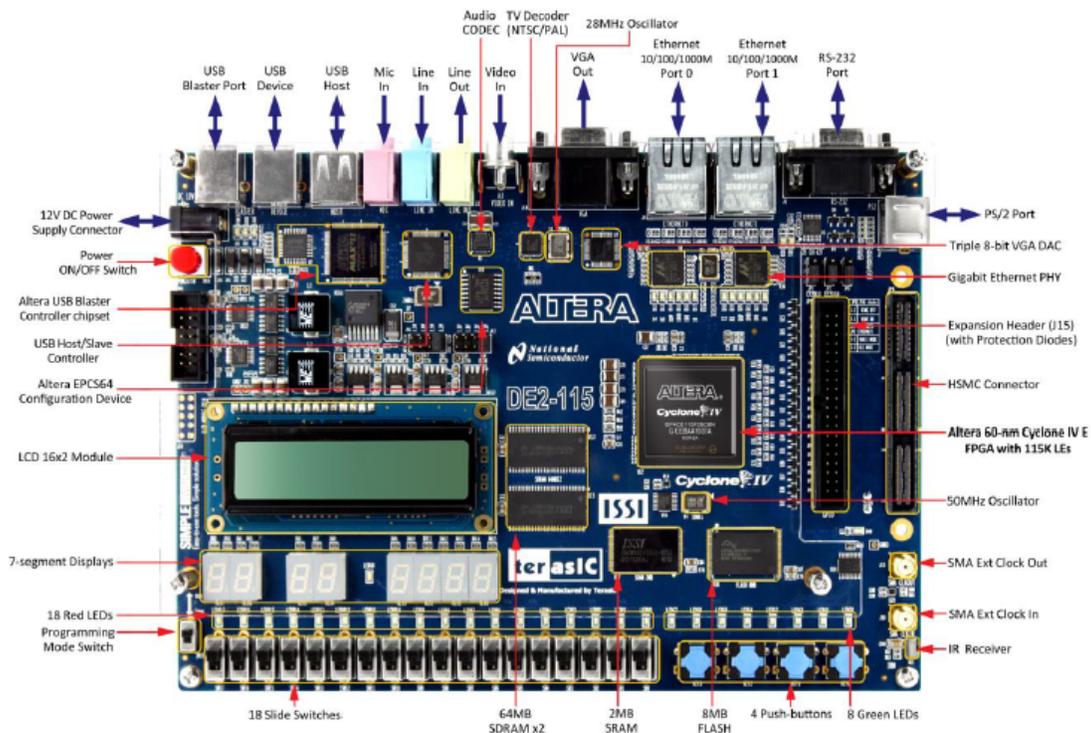


Figure 2-1 The DE2-115 board (top view)

## 1.2 Getting Started

After getting the overview of the tool next step is to download the necessary software development tools and drivers for the DE2-115 which will connect to your host computer via USB.

*Note :At this point you may read through the instructions of the tutorial or follow along by watching the video tutorial*

Getting Started with Altera's DE2-115 Board:

`<system cd>\DE2_115_tutorials\tut_tutorialDE2-115.pdf`

• *Focus: Read page 2 of tutorial. Hardware installation will be reviewed in later sections and is not important in this phase.*

### **Required Downloads:**

The majority of resources listed below are found on the DE2-115 and tPad System CDs. These CDs can be downloaded from Terasic's website free of charge. Students should first download these files onto their personal computers. Each student will need to become a Terasic member. **This is done on first download attempt.**

Resources on the System CD are not available for single file download directly from Terasic website. Specific files, unavailable for download, will be referred to as

“ `<system cd>\pathname\filename`”

To download Quartus II and Nios II:

<https://www.altera.com/download/dnl-index.jsp>

To download system CDs:

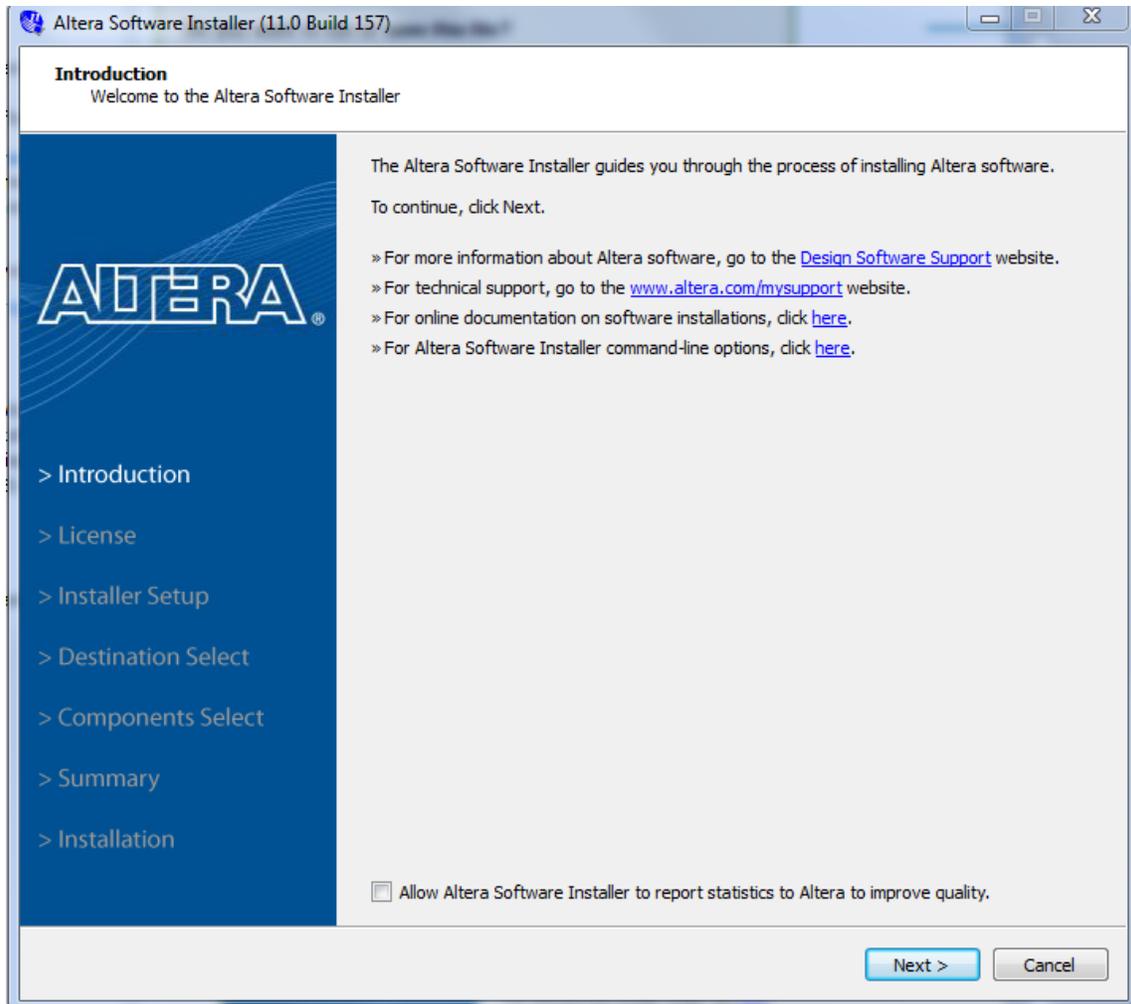
1. DE2-115 resource site: <http://www.terasic.com.tw/cgi-bin/page/archive.pl?Language=English&CategoryNo=139&No=502&PartNo=4>
2. tPad resource site: <http://www.terasic.com.tw/cgi-bin/page/archive.pl?Language=English&CategoryNo=139&No=550&PartNo=4>

## Downloading Quartus II and Nios II

Step 1) Go to the link below

<https://www.altera.com/download/dnl-index.jsp>

Step 2) Click on the icon “Download Windows Version” and run The Altera Software Installer will open



Step 3) Click Next then Agree to the Terms and Conditions, then click Next

Altera Software Installer (11.0 Build 157)

### Installer Setup

Select the location of the installation files.



- > Introduction
- > License
- > **Installer Setup**
- > Destination Select
- > Components Select
- > Summary
- > Installation

Specify the Installation Files Directory

Select this option if you want the Altera Software Installer to retrieve installation files from your hard disk or local network.

Installer Source Directory:

Download Installation Files from the Internet

Select this option if you want the Altera Software to retrieve installation files from the Internet.

Specify how you are connected to the Internet:

No proxy (recommended)

Manual proxy configuration

Web Proxy:  Port:

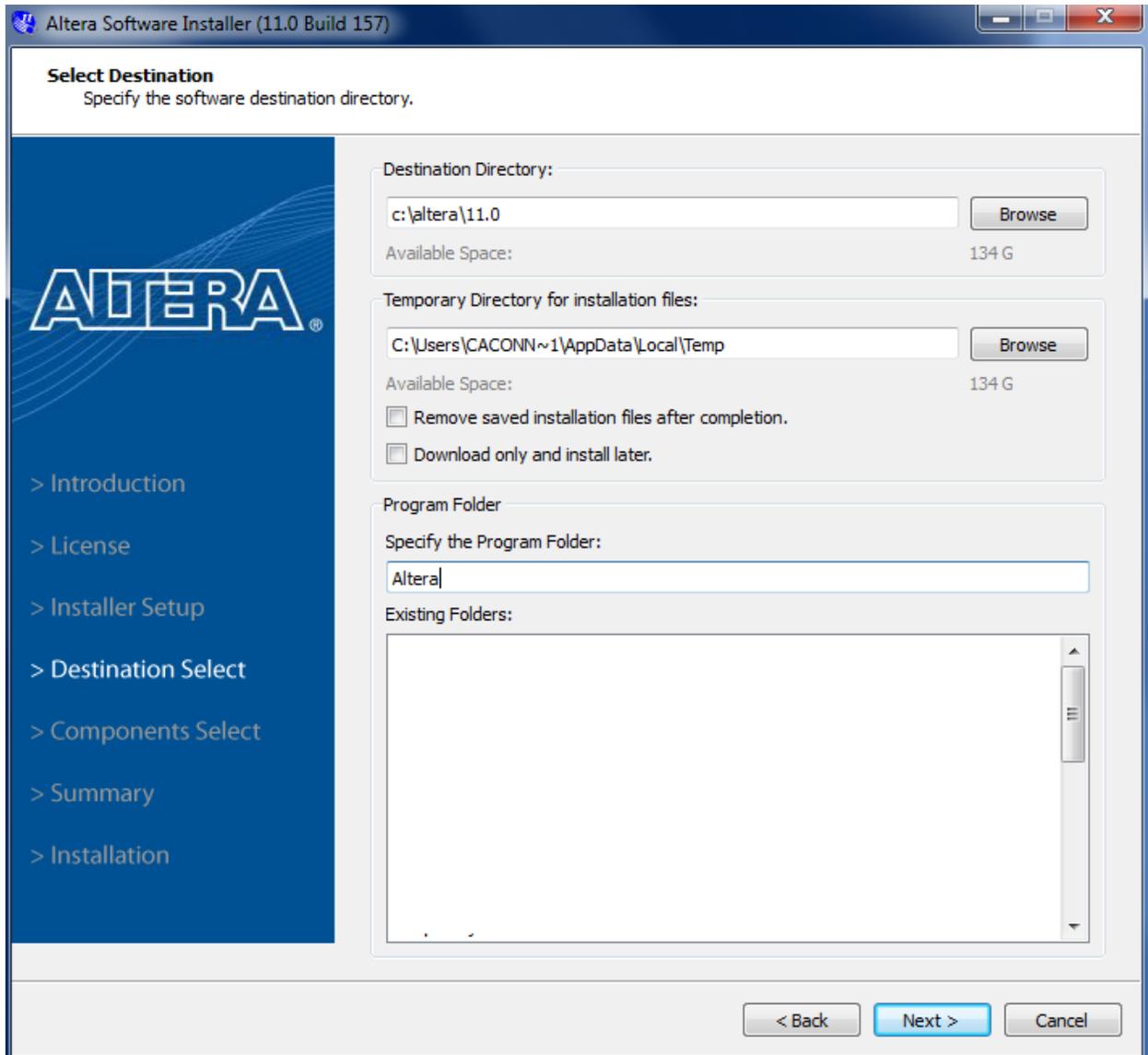
Username:

Password:

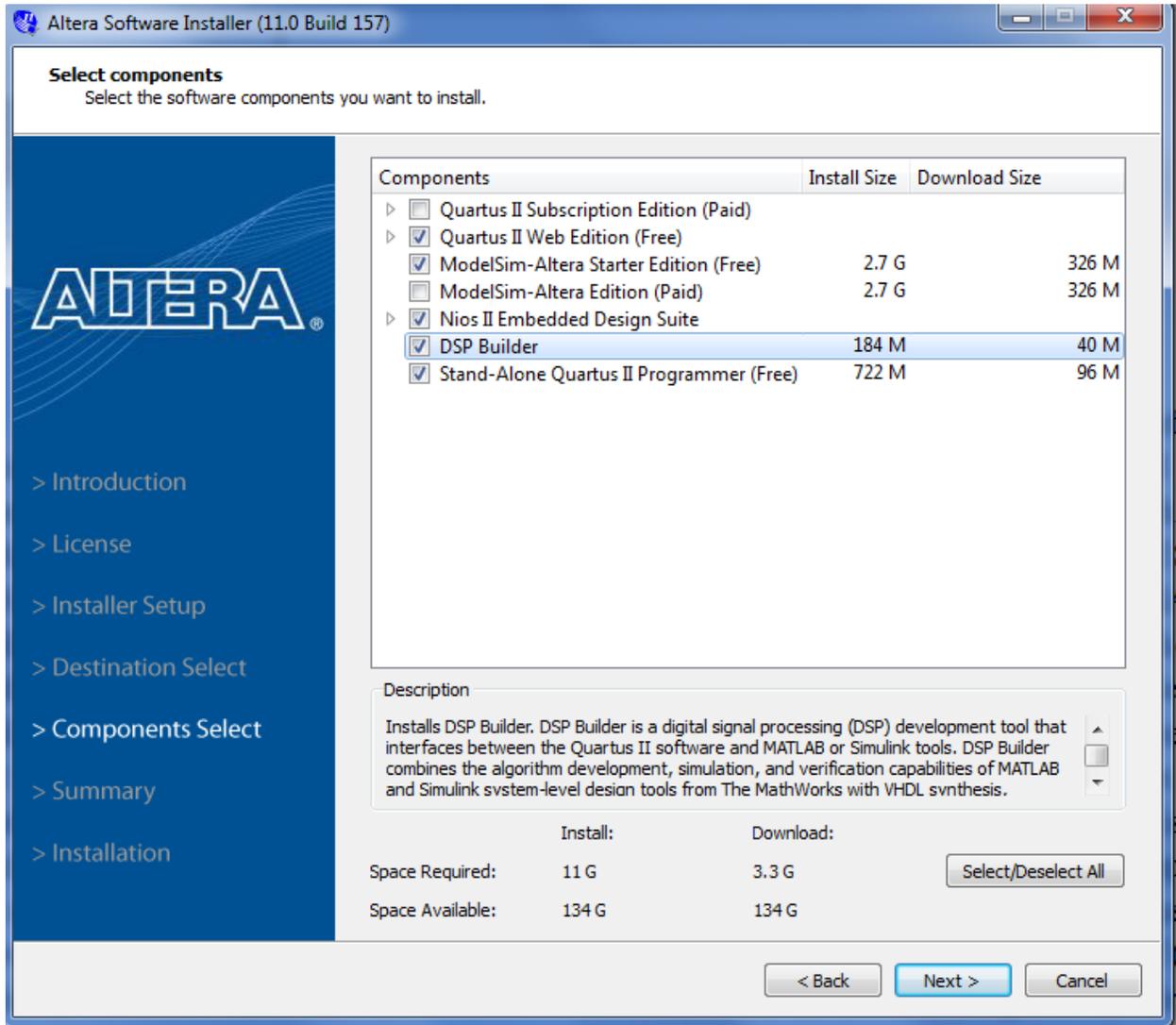
< Back   Next >   Cancel

Step 4) Select the Destination where the Altera folder is going to be located and the name of the folder

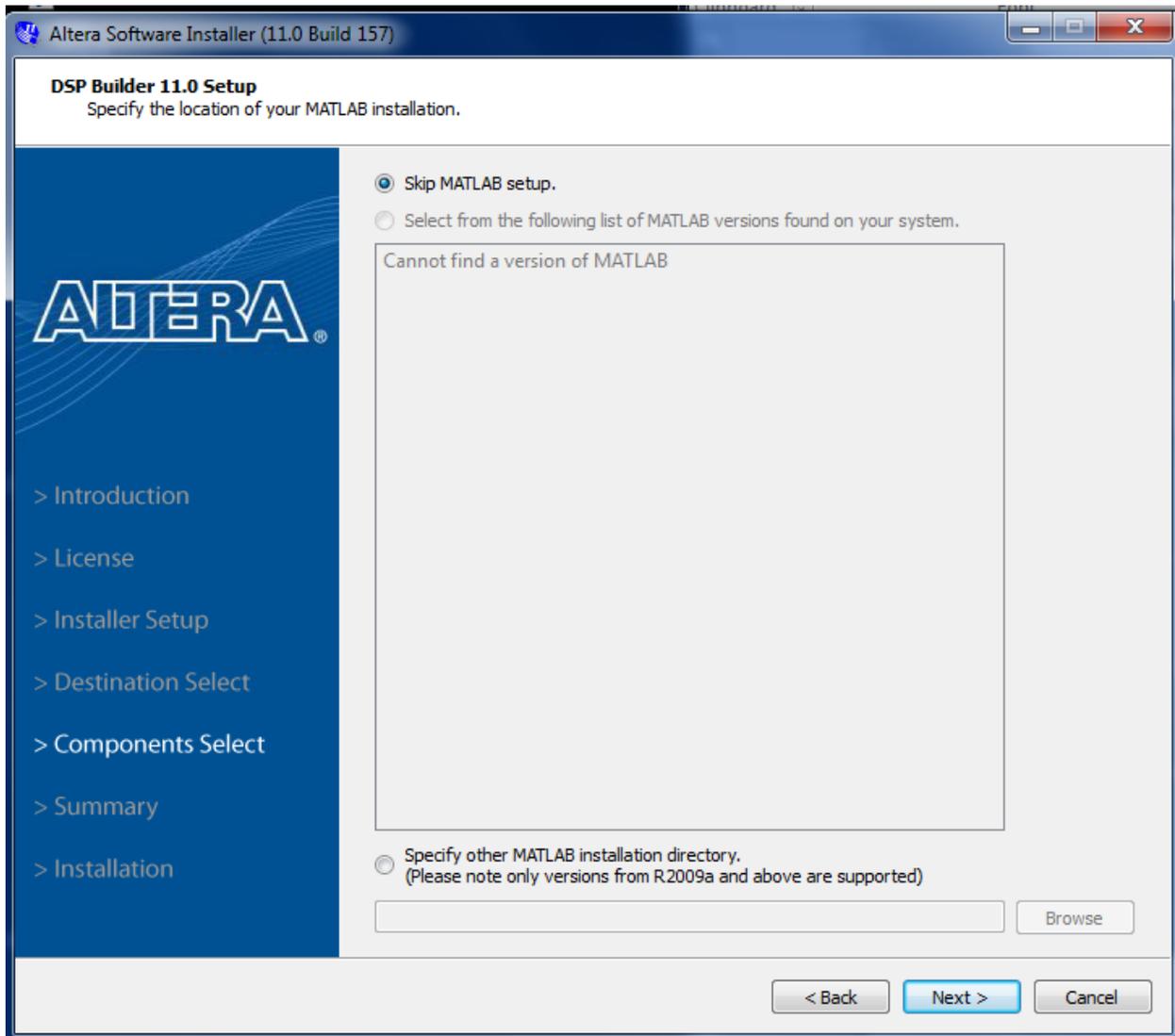
Click next



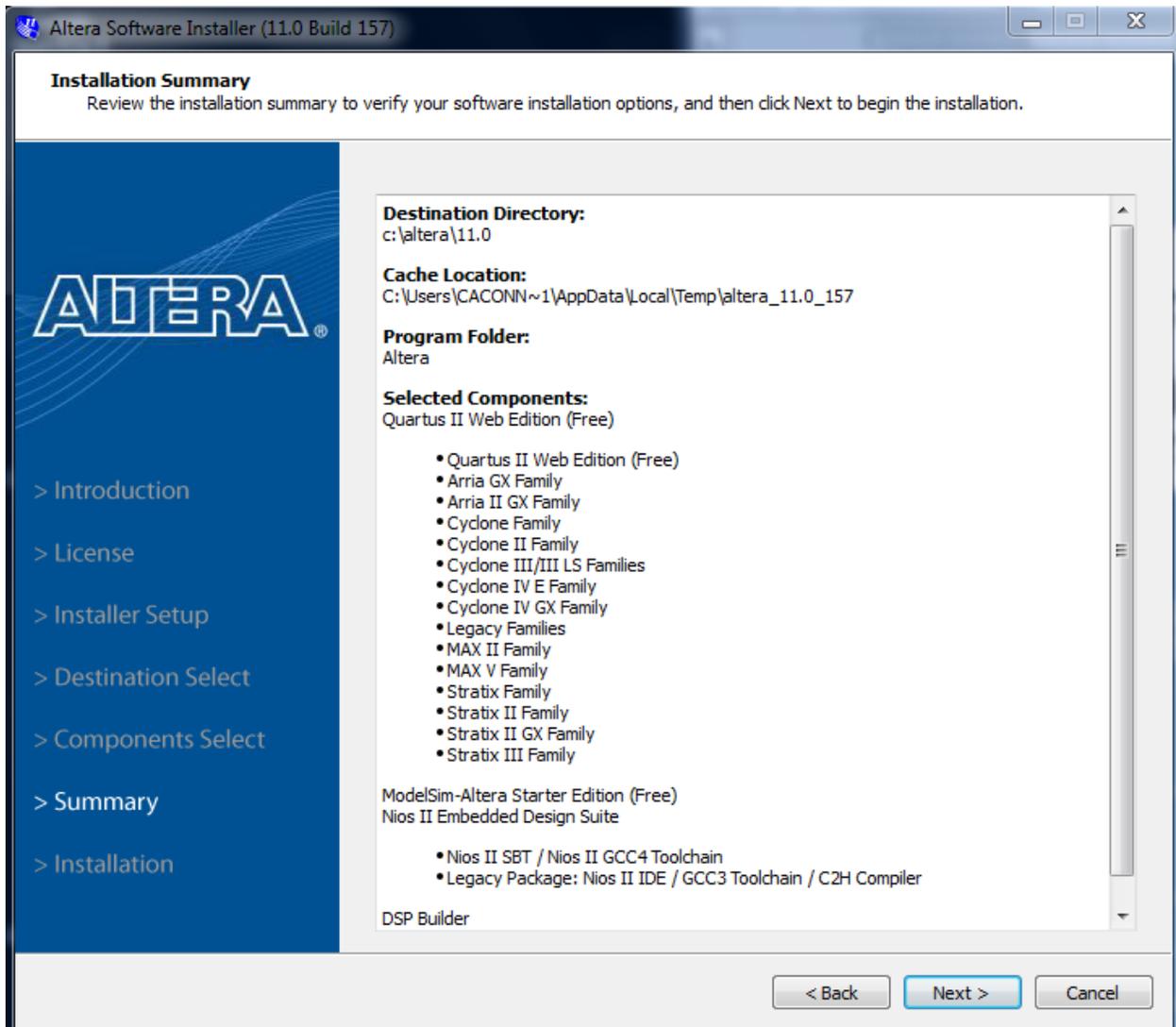
Step 5) Select everything except for the Components that say "Paid". The Paid version is a 30-day trial after that you will not be able to use it. Click next



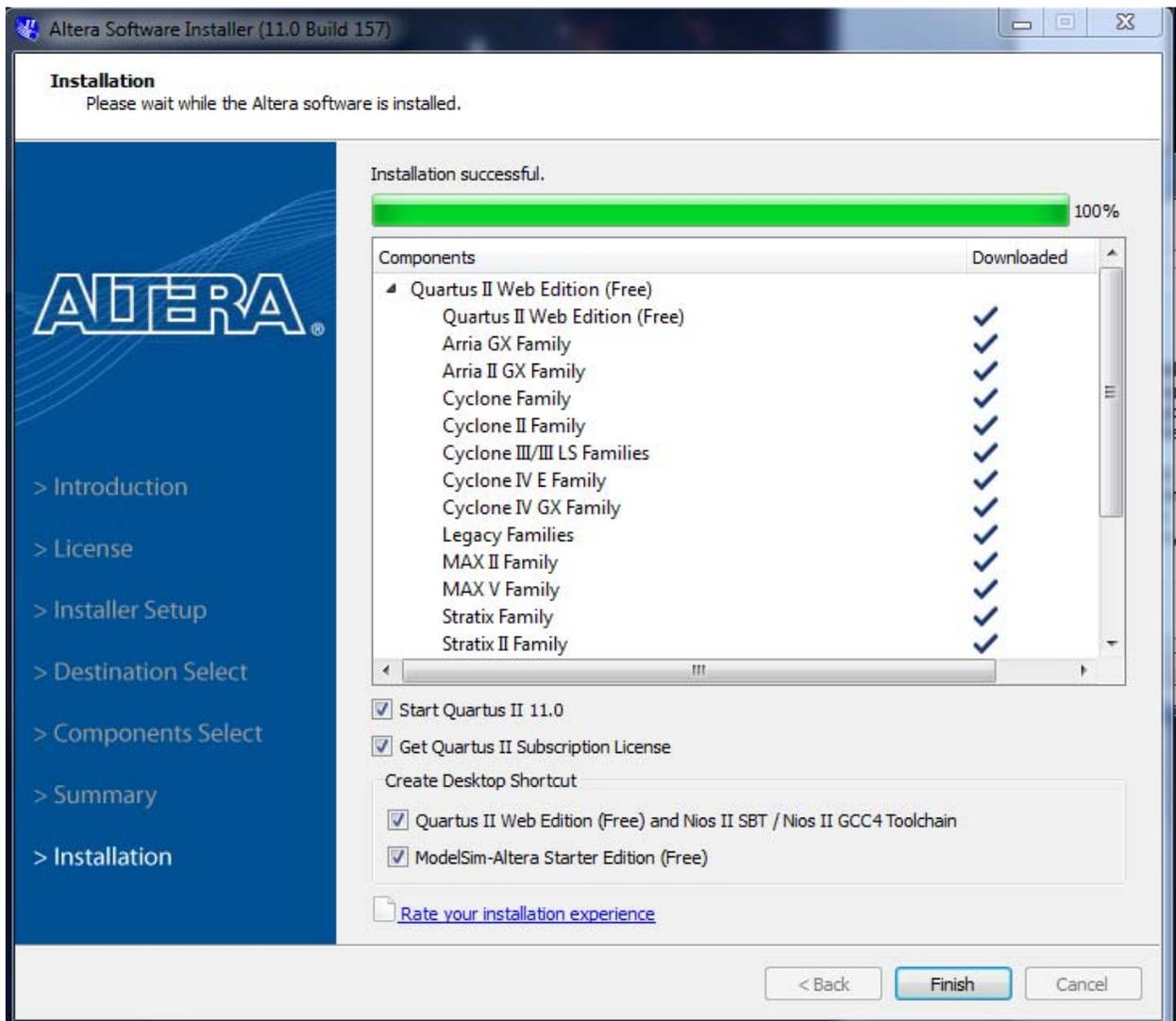
Step 6) Click next for the DSP Builder setup



Step 7) A summary of what will be installed to the computer will appear



Step 8) After the installation is complete click finish.



### 1.3 Control Panel Demonstration

{Include video of demo with tutorial}

This tutorial requires downloading and installing Quartus II on your computer. In

this tutorial you will be executing *Control Panel* which automatically uses Quartus II to run a demonstration on the DE2-115. A video link demonstrating the same is given below:

<http://www.youtube.com/watch?v=F1e0XG83sLU>

Step 1: Connect the DE2-115 to your host computer through the USB port. Turn on the power by pressing the big red push-button. Make sure that SW-19 is set to *Run*.

Step 2: open `<system cd>\DE2_115\DE2_115_tools` within this file you will find `control_panel.exe`. With the DE2-115 connected to your host computer, execute this Control Panel file by double-clicking its icon.

Note: If your Operating System is running on 64 bit, click on `win7_64bits` and then click in the DE2\_115 Control Panel

Step 3: It may take a few minutes for the program load. Control Panel provides a GUI for you to play with all the peripherals on the DE2-115.

Once the Control Panel is open, follow the pattern shown in the picture below and type your name into the LCD Display:



#### 1.4 ) Suggested Reading before creating your own designs to implement on the DE2-115,

The resources suggested here are to be *overviewed* but not read in depth. The sections which are important are mentioned below.

1. DE2-115 User Manual: Download from [http://www.terasic.com.tw/cgi-bin/page/archive.pl? Language=English&CategoryNo=139&No=550&PartNo=4](http://www.terasic.com.tw/cgi-bin/page/archive.pl?Language=English&CategoryNo=139&No=550&PartNo=4)

- *focus*: Be familiar with Control Panel(), System Builder(), DE2-115 peripherals(), and information on pin assignments().