

Altera™ Quartus® Prime Lite v25.1 and Nios® V Install Instructions

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In 2022, we published the article [Intel® Quartus® Prime Lite and Nios® II SBT for Eclipse Installation Instructions \(annabooks.com\)](http://www.annabooks.com) and followed up with several FPGA articles for the MAX® 10 FPGA and Nios® II soft processor. A year later, Intel released an update to Quartus (23.1.1) and added Nios® V core to the available IP. Nios V is based on the RISC V open architecture. Another year goes by and Intel spun out Altera as an independent company. With the company changes and version 23.1.1 having some issues, we had to wait and re-plan the FPGA to cloud exploration. The delay was good to restart the effort. This article discuss the updated tools setup, and the next few articles will focus on the Nios V soft processor.

There are three editions for the Quartus Prime: Pro Editions, Standard Edition, and Lite Edition. The first two editions required a paid license. The Lite Edition is a free Standard Edition with some constraints. As of this writing, all Editions are at version 25.1. Altera has invested to make the installer a one stop setup. This article provides the instructions to install the Quartus Lite Edition v25.1 on Windows® 11. The installer includes the Ashling RiscFree™ IDE which is used to create Nios V projects. The Ashling RiscFree™ IDE is based on the Eclipse CDT. As an alternative to the RiscFree IDE, there is a Visual Studio Code plug in available, thus the final section will cover VS Code installation and configuration that will also be used for Nios V development.

Note: As the software changes, even this article will get a little dated so the steps covered in this article are for the 25.1 edition.

Links to the software:

- Altera Quartus Prime Lite Edition V25.1: [Quartus® Prime Lite Edition Design Software Version 25.1 for Windows](#)

Note: As of this writing, Altera is still migrating information and licensing details from Intel. You will see a mix of both company names until the transfer is complete.

1.1 Quartus Lite Edition Installation for Windows

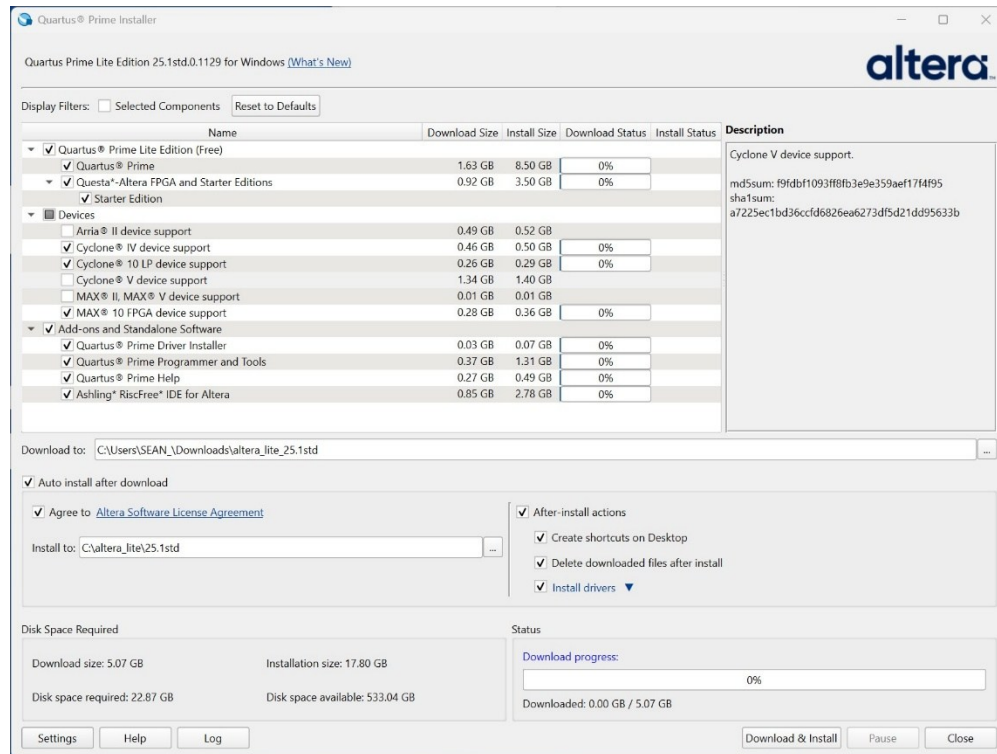
Quartus Lite will be installed first:

1. Open File Explorer
2. Create a folder called \Intel-Quartus-Software-25.1
3. Download the qinst-lite-windows-25.1std-1129.exe from the Quartus download page into the folder.
4. Run qinst-lite-windows-25.1std-1129.exe to start the installation.
5. Acknowledge any Windows warning to run the program.
6. The installer screen appears with all the options available. The install has improved since earlier versions so you don't have to download and install individual pieces. Select the following:
 - Devices – Select as many as you like, but select the following at a minimum. You can always add and remove later.
 - Max® 10 FPGA device support
 - Cyclone® 10 LP device support

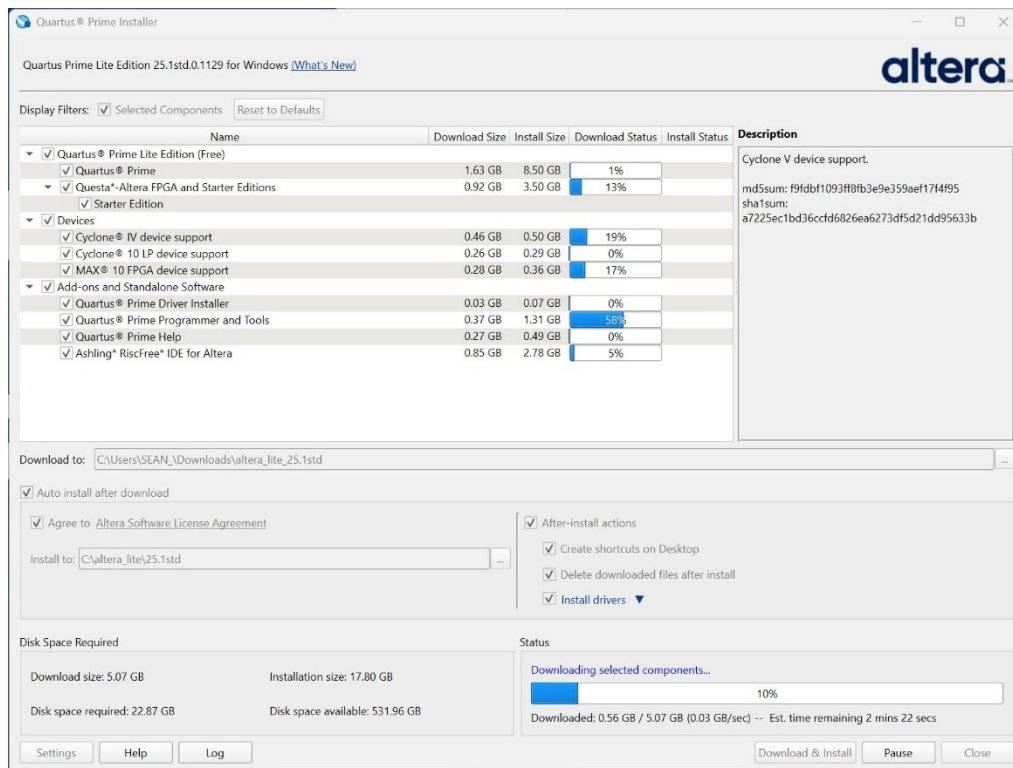
- Cyclone® IV device support
- Add-ons and Standalone Software – Select all items

7. In the option below, check the boxes next to the following:

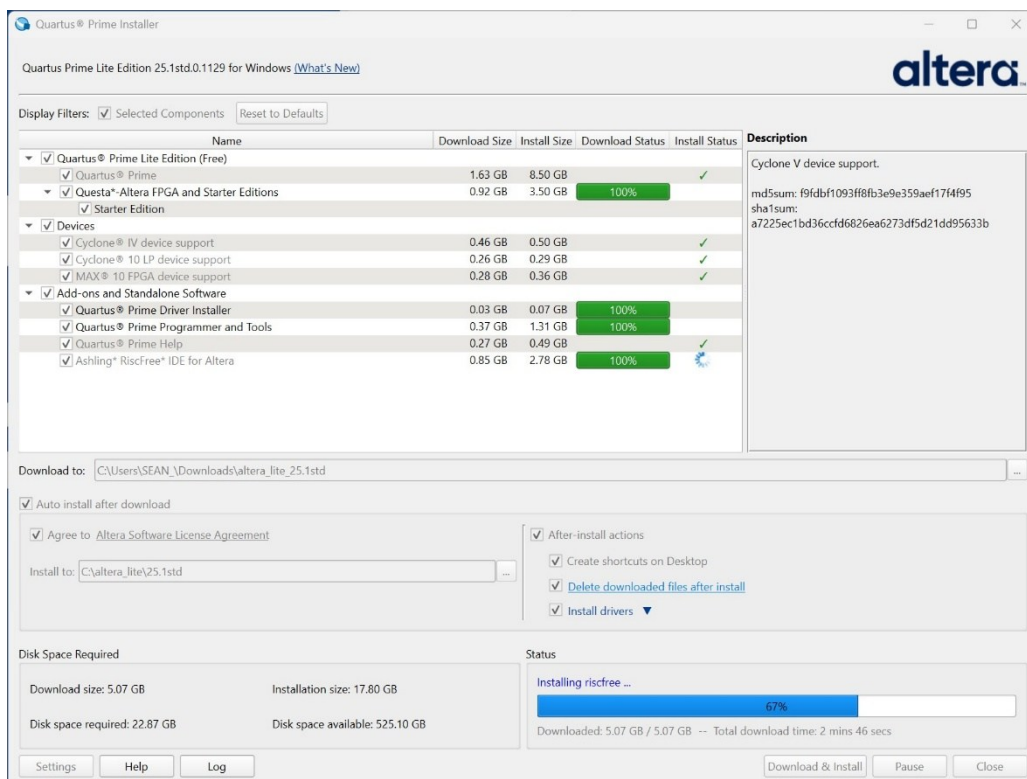
- Agree to Intel License Agreement
- Delete downloaded files after install



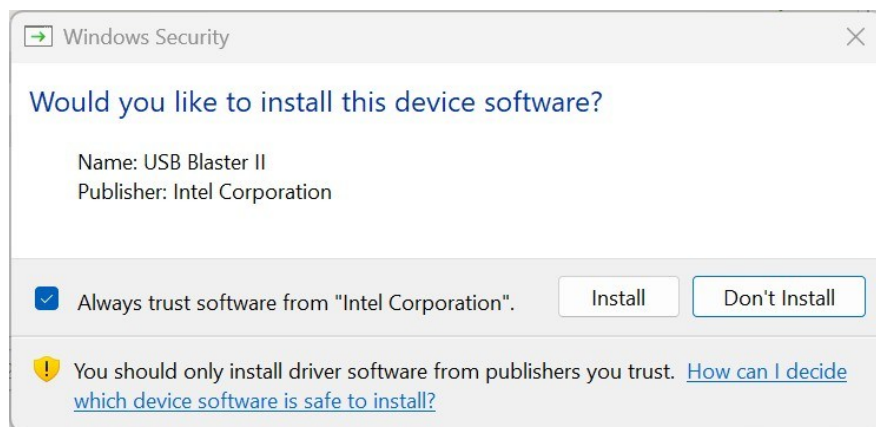
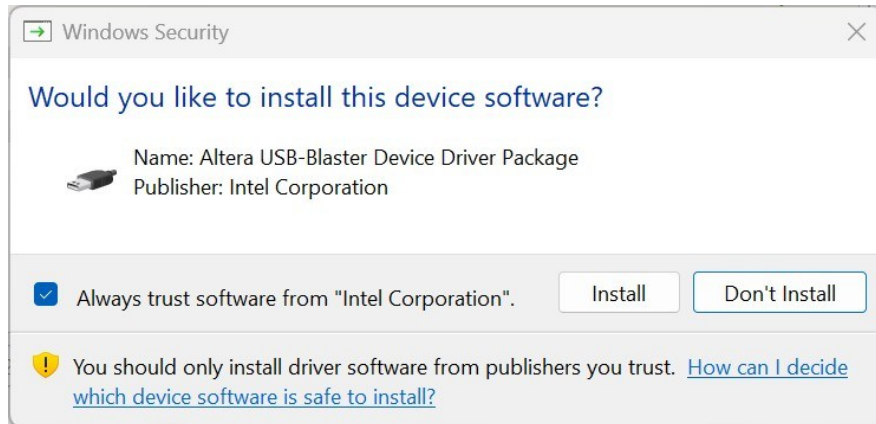
8. Leave all the other options settings are. The downloads will go into a specific folder and the installers will start after download. Click “Download & Install” button.
9. Accept the license agreement. The download process starts. The installation process will take a while.



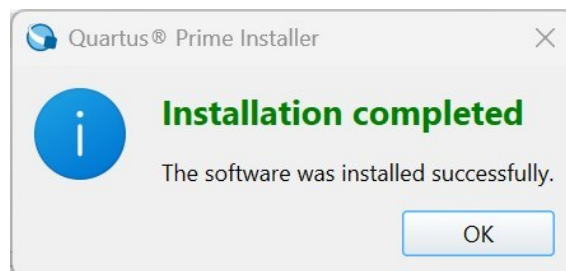
The installers will kick off after downloads are completed.



- Depending on the options selected, you may be asked to run two device driver installers for the USB-Blaster and USB-Blaster II programmer tool. Click Next to allow the driver to be installed.



- A message box appears after the last installers have completed. Click OK.



- Click Close in the installer.

1.2 Setup Nios V License

Nios V is free, but requires a license to be install in Quartus.

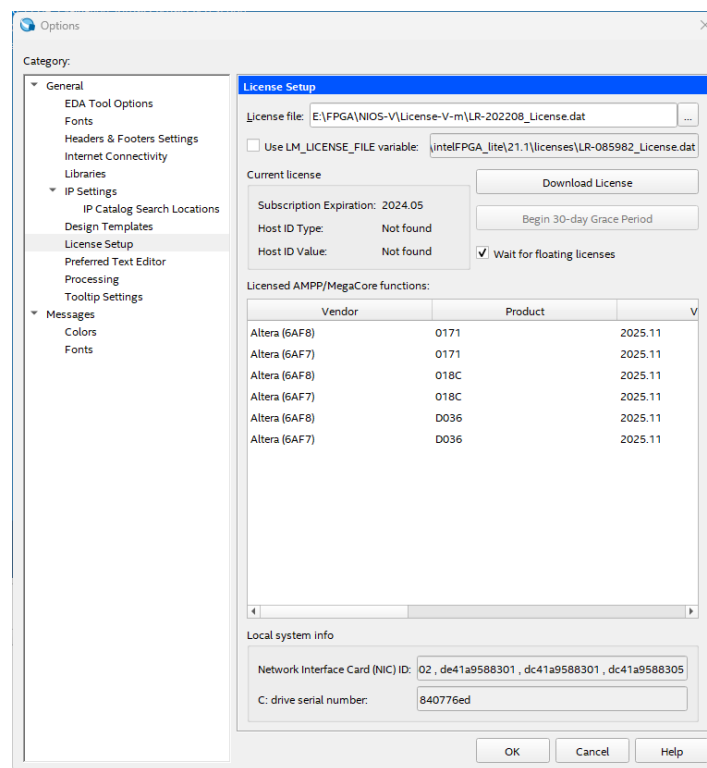
- Go to https://licensing.intel.com/psg/s/?language=en_US
- Sign-up or Sign into the FPGA Licensing center

3. If you have not done so, you will have to assign/register a computer to receive the specific software.
4. Once signed-in, click on the “Sign up for Evaluation or No-Cost License”.

There are 3 different Nios V options m, g, and c.

Nios V Processor	Description	MISC
Nios® V/c	Compact Microcontroller	
Nios® V/m	Microcontroller	RTOS Support
Nios® V/g	General Purpose Processor	RTOS Support, Data and Instruction Cache Hardware multiplication and division

5. Select the m option and click next.
6. Select the target computer and click generate. An e-mail will be sent to your address with the license .DAT file attached.
7. Save the file to a folder name License-V-m.
8. Start Quartus Prime
9. From the menu, select Tools->License Setup.
10. Point the license file to the newly downloaded license .DAT file.



11. Click OK.

Optionally, you can also repeat the steps to get the license for the g and c versions and store them in different subfolders. This will give you an option to test the different versions to see how they fit into your design.

1.3 Create Shortcuts on Desktop

The Quartus Prime Lite, Questa FSE, and Quartus Programmer shortcuts get created on the desktop. For convenience, shortcuts for the niosv-shell and RiskFree IDE can be placed on the desktop>

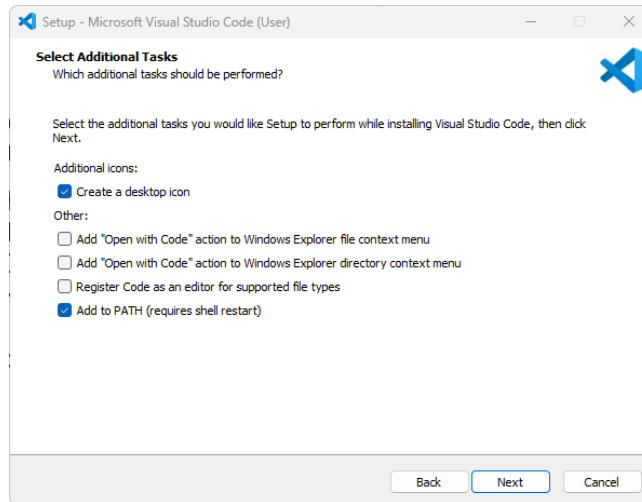
For a default installation, niosv-shell is found here: C:\intelFPGA_lite\25.1std\niosv\bin\niosv-shell.exe.

For a default installation, RiskFree IDE can be found here: C:\intelFPGA_lite\25.1std\RiscFree\RiscFree\RiscFree.exe

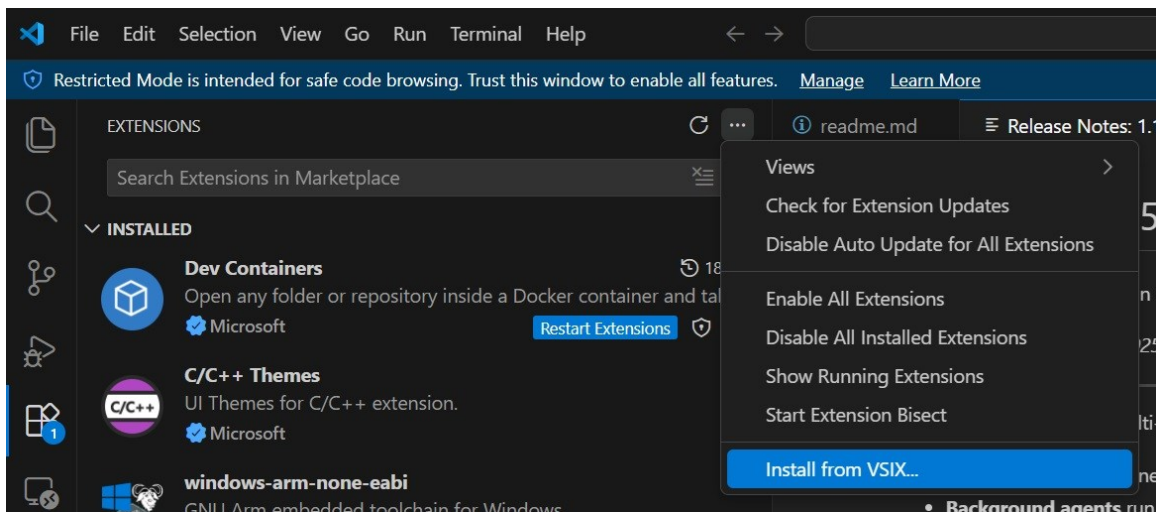
1.4 Visual Code Installation and Setup with “Ashling VS Code Extension for Altera FPFAs”

Ashling developed a VS code extension for Altera FPGAs so Nios V projects can be developed in VS Code. The extension is part of the Quartus installation and can be found in C:\intelFPGA_lite\25.1std\RiscFree\vscode folder, and the latest version can be found in the Visual Studio Market place.

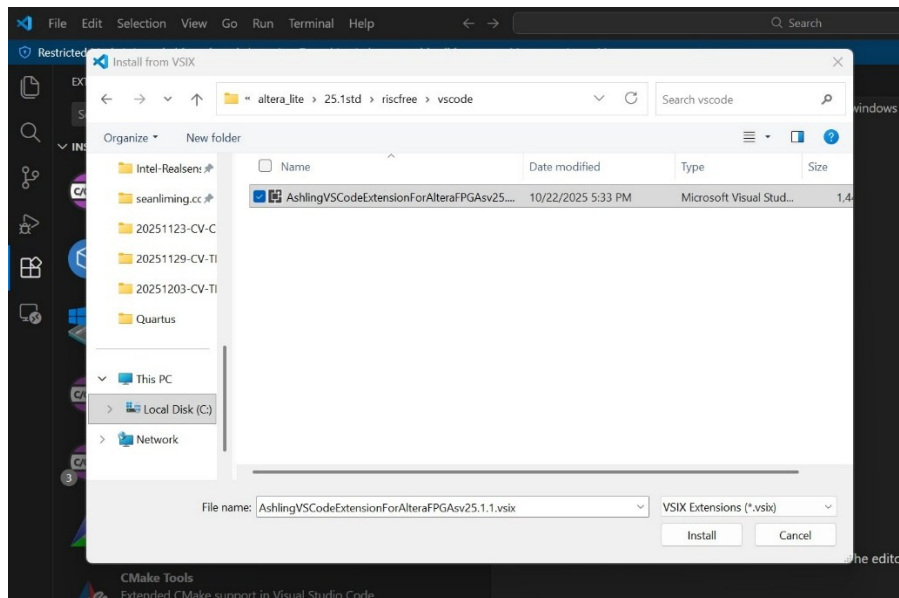
1. Download Visual Studio Code: <https://code.visualstudio.com/download>.
2. Run the installer and check the box to Create a desktop icon.



3. Click Next and click Install.
4. Click Finish and launch VS Code
5. On the left side, there is the “Extensions” icon. Click on the Extensions icon to open the Extensions pane.



6. Click on the “...” in the upper right of the pane, and select Install from VSIX...
7. Open the path to C:\altera_lite\25.1std\riscfree\vscod

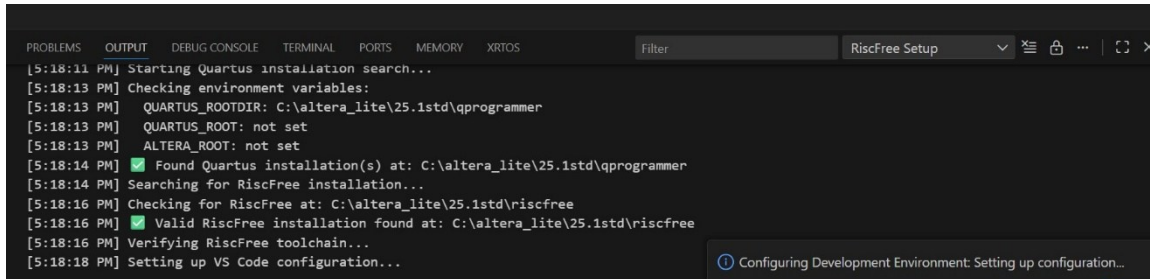
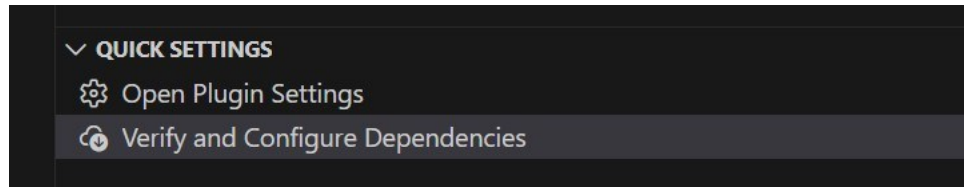


8. The extension will be installed.

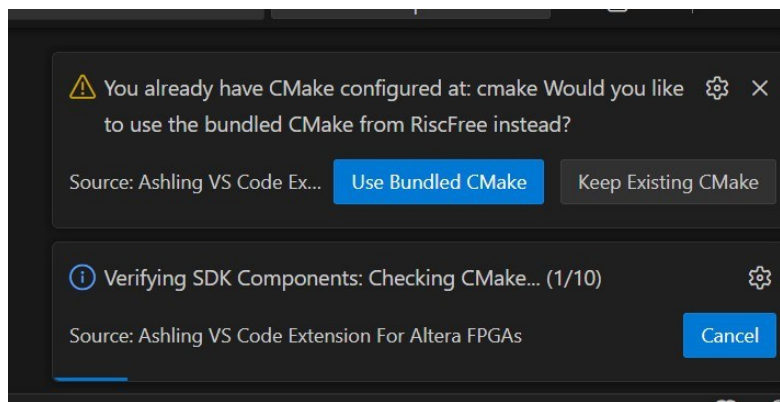
Note: You may see that an update is available. Go ahead and run the update.



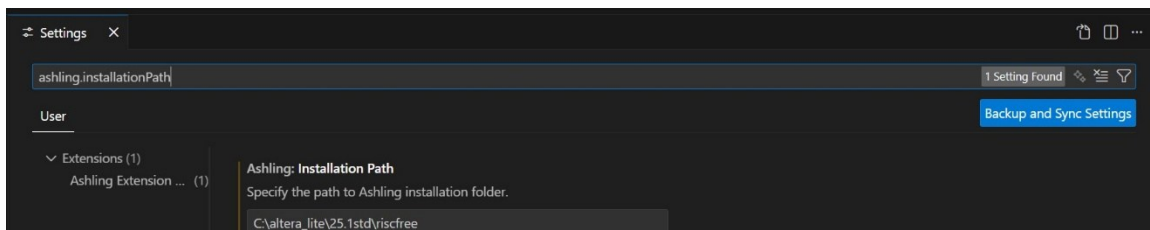
9. After the extension has been installed, a new Ashling icon appears in the left menu. Click on the Ashling icon.
10. In the bottom of the Ashling pane, click on “Verify and Configure Dependencies”.



11. When asked about CMAKE, choose the bundled version.



You can always check the path to the Quartus folder in the extension's "Settings".



Note: The VS Code extension is a shell to the RiscFree tools. It is important that the path to the Ashling installation directory be correct or the extension and available controls will not work.

1.5 Next Steps

Altera has made the Quartus installation process much easier, but the self-licensing is still a puzzle. With the system is setup to begin FPGA and Nios V development, the next few articles will explore the basics of Nios V and developing Nios V application using Ashling RiscFree IDE and VS Code.