

- Before creating your first Quartus project:
 - Install the Quartus software see "Quartus Software Setup"

- Quartus Project File System
 - Quartus collects all the files and setting for a design into what it calls a Project
 - Multiple designs can be stored in a single project but
 - for CPE1500 I suggest you create a new project for each design
 - A single design may have more than one Block inside it
 - Consequently, a single project may have more than one block stored in it
 - Quartus maintains a concept of a "top level block" to track which block is currently being worked on in the project
 - When you start Quartus it will ask you to open a new or existing project
 - It also lists 3-4 recent projects to choose from



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- Quartus Project File System
 - Quartus was, and continues to be, developed for Linux based computer systems
 - Linux systems are commonly used for sophisticated engineering programs
 - Linux systems do not allow spaces in file paths or file names
 - Use _ (underscore) instead
 - Quartus support for Windows 11 is very buggy
 - We must use version 18.1 for now (Quartus is beyond 23.0)
 - Quartus and OneDrive do not work well together
 - At MSOE OneDrive has been configured by IT to backup most of your personal files
 - Quartus will fail if OneDrive tries to back it up (file access issues)
 - You must create a folder to store your Quartus Projects in a location that OneDrive will not back up

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- Quartus Project File System
 - To create a OneDrive/Quartus safe location for your projects
 - File Explorer → This PC → Windows(C:) → Users → Your_User_Name
 - rt-click → New → Folder and enter the folder name CPE1500_Quartus_Projects
 - To create a new project first create a new folder in your CPE1500_Quartus_Projects folder
 - Use appropriate names
 - Lab2_Project
 - HW11_Vending_Machine

- Quartus Prime Project Setup
 - Start the Quartus software
 - Under File select New Project Wizard ...

-	5	Quartus Prime Lite Edition		
	File	Edit View Project	Assignments Proce	essing Tools Window Help
		New	Ctrl+N	- Z 🗳 🔆 🚸 💷 📑
	~	Open	Ctrl+O	
Ì		Close	Ctrl+F4	COLLABORATE, DESIGN, IN
	A	New Project Wizard	>	Intel' Quartus' Prime
	K	Open Project	Ctrl+J	Design Software
		Save Project		Find Out How
		Close Project		
		Save	Ctrl+S	
		Save As		
	ę.	Save All	Ctrl+Shift+S	U
		File Properties		
			6	

- Quartus Prime Project Setup
 - Select Next

🕥 New Project Wizard

Introduction

The New Project Wizard helps you create a new project and preliminary project settings, including the following:

- Project name and directory
- Name of the top-level design entity
- Project files and libraries
- Target device family and device
- EDA tool settings

You can change the settings for an existing project and specify additional project-wide settings with the Settings command (Assignments menu). You can use the various pages of the Settings dialog box to add functionality to the project.

Don't show me this introduction again

CPE 1500

< <u>B</u>ack

Next >

Finish

Cancel

Help

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- Quartus Prime Project Setup
 - Select your project directory
 - •/Name your project
 - Your project name and top level entity name should be

the same

Click Next

New Project Wizard
 Directory, Name, Top-Level Entity
 What is the working directory for this project?
 C:/ OPE1500_Quartus_Projects/MyFirstCounter
 What is the name of this project?
 MyFirstCounter
 What is the name of the top-level design entity for this project? This name is case so design file.
 MyFirstCounter
 Lyse Existing Project Settings...

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- Quartus Prime Project Setup
 - Select Empty project
 - Click Next



Create new project by specifying project files and libraries, target device family and device, and EDA tool settings.

O Project <u>t</u>emplate

Create a project from an existing design template. You can choose from design templates installed with the Quartus Prime software, or download design templates from the <u>Design Store</u>.

< <u>B</u> ack <u>N</u> ext > <u>F</u> inish Cancel

Help

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- Quartus Prime Project Setup
 - We will not add any files right now
 - Click Next

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Add Files

Select the design files you want to include in the project. Click Add All to add all design files in the project directory to the project.

Note: you can always add design files to the project later.

<u> </u>							×	Add A
								AUU A
File Name	Type L	ibrary	Design Entry/Synthesis Too	l HDL Versi	on			<u>R</u> emov
								<u>U</u> p
								Dowr
								Propert
Specify the	path nam	es of a	ny non-default libraries. U <u>s</u>	er Libraries				

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- Quartus Prime Project Setup
 - Select Max 10 (DA/DF/DC/SA/SC) under Family

New Project Wizard

- Select Max 10 DA under Device
- Scroll down to 10M50DAF484C7G under Available devices
- Click Next

ect the family and de	evice you want to tar al device support wi	get for com th the Instal	pilation. Il Devices comm	and on the Tools	menu.		
determine the versio	on of the Quartus Pri	me software	e in which your t	arget device is su	pported, refer to th	e <u>Device Support List</u> webpa	
Device family				Show in 'Availabl	e devices' list		
Eamily: MAX 10 (DA	/DF/DC/SA/SC		-	Pac <u>k</u> age:	Any	-	
Dev <u>i</u> ce: MAX 10 D	A		•	Pin <u>c</u> ount:	Any		
Target device				Core sp <u>e</u> ed grade	ed grade: Any		
Auto device select	ted by the Fitter			Name filter:			
Specific device sel	lected in 'Available d	evices' list		Show advanc	ed devices		
Other: n/a							
ailable devices:							
Name	Core Voltage	LEs	Total I/Os	GPIOs	Memory Bits	Embedded multiplier 9	
0M50DAF484C7G	1.2V	49760	360	360	1677312	288	
						>	

Quartus Prime – Project Setup

🕥 New Project Wizard

EDA Tool Settings

Under simulation – select ModelSim-Altera and VHDL

Specify the other EDA tools used with the Quartus Prime software to develop your project.

Click Next

DA tools:			
Tool Type	Tool Name	Format(s)	Run Tool Automatically
Design Entry/Synth	<none></none>	<none></none>	🗌 Run this tool automatically to synthesize the current design
Simulation 🤇	ModelSim-Altera 🔹	VHDL	Run gate-level simulation automatically after compilation
Board-Level	Timing	<none></none>	
	Symbol	<none></none>	
	Signal Integrity	<none></none>	
	Boundary Scan	<none></none>	

< Back

Next >

Finish

Cancel

Note: ModelSim-Altera not ModelSim

Help

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- Quartus Prime Project Setup
 - You will get a summary window
 - Click Finish

🕥 New Project Wizard

Summary

When you click Finish, the project will be created with the following settings:



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Quartus Prime – Project Setup

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 Your project will now appear in the Project Navigator window



- Quartus Prime Project Setup
 - We will be using the 2008 version of VHDL
 - Assignments -> Settings -> Compiler Settings -> VHDL Input
 - Select VHDL 2008

Category:	Device/Board
General	VHDL Input
Files	Options for directly compiling or simulating VHDL input files. (Click on the EDA Tool Settings category to enter
Libraries	options for VHDL files generated by other EDA tools.)
✓ IP Settings	
IP Catalog Search Locations	VHDL version
Design Templates	O VHDL 19 <u>8</u> 7
 Operating Settings and Conditions 	O VHDL 1993
Voltage	
Temperature	• VHDL <u>2</u> 008
Compliation Process Settings	Library Mapping File
EDA Tool Settings	
Design Entry/Synthesis	File name:
Simulation	Show information messages describing LMF mapping during compilation
Board-Level	
Compiler Settings	
VHDL Input	
Verilog HDL Input	
Default Parameters	
TimeQuest Timing Analyzer	
Assembler	
Design Assistant	
Signal Tap Logic Analyzer	
Logic Analyzer Interface	
Power Analyzer Settings	
SSN Analyzer	
	Buy Software OK Cancel Apply Help

Quartus Prime – Project Setup

• Your project is ready to use