

# FPGA Pin Assignment

- FPGA pins can be assigned using the Pin Planner  
or
- FPGA pins can be assigned by importing a pin assignment file from the web page
  - DE10\_Lite.qsf
- download the file from the website and save it to a central location so that you can easily import it each time you create a new project
- select **save as**, change the file types to **all files**, and make sure the file name extension is **.qsf** and not **.txt**

# FPGA Pin Assignment

- Design Entry
  - Pin Assignments
    - Assignments -> Import Assignments
    - Point to the DE10\_Lite.qsf file
  - This has all pins in it and will generate warnings later on for each unused pin
  - You can copy and modify the file to remove the warnings by removing unused pins

```
DE10_Lite.qsf - Notepad
File Edit Format View Help
#=====
# Altera DE10-Lite board settings
#=====

set_global_assignment -name FAMILY "MAX 10 FPGA"
set_global_assignment -name DEVICE 10M50DAF484C7G
set_global_assignment -name TOP_LEVEL_ENTITY "DE10_Lite"
set_global_assignment -name DEVICE_FILTER_PACKAGE FBGA
set_global_assignment -name SDC_FILE DE10_Lite.sdc
set_global_assignment -name INTERNAL_FLASH_UPDATE_MODE "SINGLE IMAGE WITH ERAM"

#=====
# CLOCK
#=====
set_instance_assignment -name IO_STANDARD "3.3-V LVTTTL" -to CLOCK_50
set_instance_assignment -name IO_STANDARD "3.3-V LVTTTL" -to CLOCK2_50
set_instance_assignment -name IO_STANDARD "3.3-V LVTTTL" -to CLOCK_ADC_10
set_location_assignment PIN_P11 -to CLOCK_50
set_location_assignment PIN_N14 -to CLOCK2_50
set_location_assignment PIN_N5 -to CLOCK_ADC_10

#=====
# Arduino
#=====
set_instance_assignment -name IO_STANDARD "3.3-V LVTTTL" -to ARDUINO_IO[0]
set_instance_assignment -name IO_STANDARD "3.3-V LVTTTL" -to ARDUINO_IO[1]
set_instance_assignment -name IO_STANDARD "3.3-V LVTTTL" -to ARDUINO_IO[2]
set_instance_assignment -name IO_STANDARD "3.3-V LVTTTL" -to ARDUINO_IO[3]
set_instance_assignment -name IO_STANDARD "3.3-V LVTTTL" -to ARDUINO_IO[4]
set_instance_assignment -name IO_STANDARD "3.3-V LVTTTL" -to ARDUINO_IO[5]
set_instance_assignment -name IO_STANDARD "3.3-V LVTTTL" -to ARDUINO_IO[6]
set_instance_assignment -name IO_STANDARD "3.3-V LVTTTL" -to ARDUINO_IO[7]
```

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- Note on pin names

For example:

- In the qsf file and most documentation the toggle switches are called SW[9] to SW[0] or SW9 to SW0
- Since VHDL uses parentheses rather than square brackets, these switches are referred to as SW(9) to SW(0) in the HDL or bdf files.
- They can also be referred to as an array SW(9 downto 0).