



॥ सा विद्या या विमुक्तये ॥

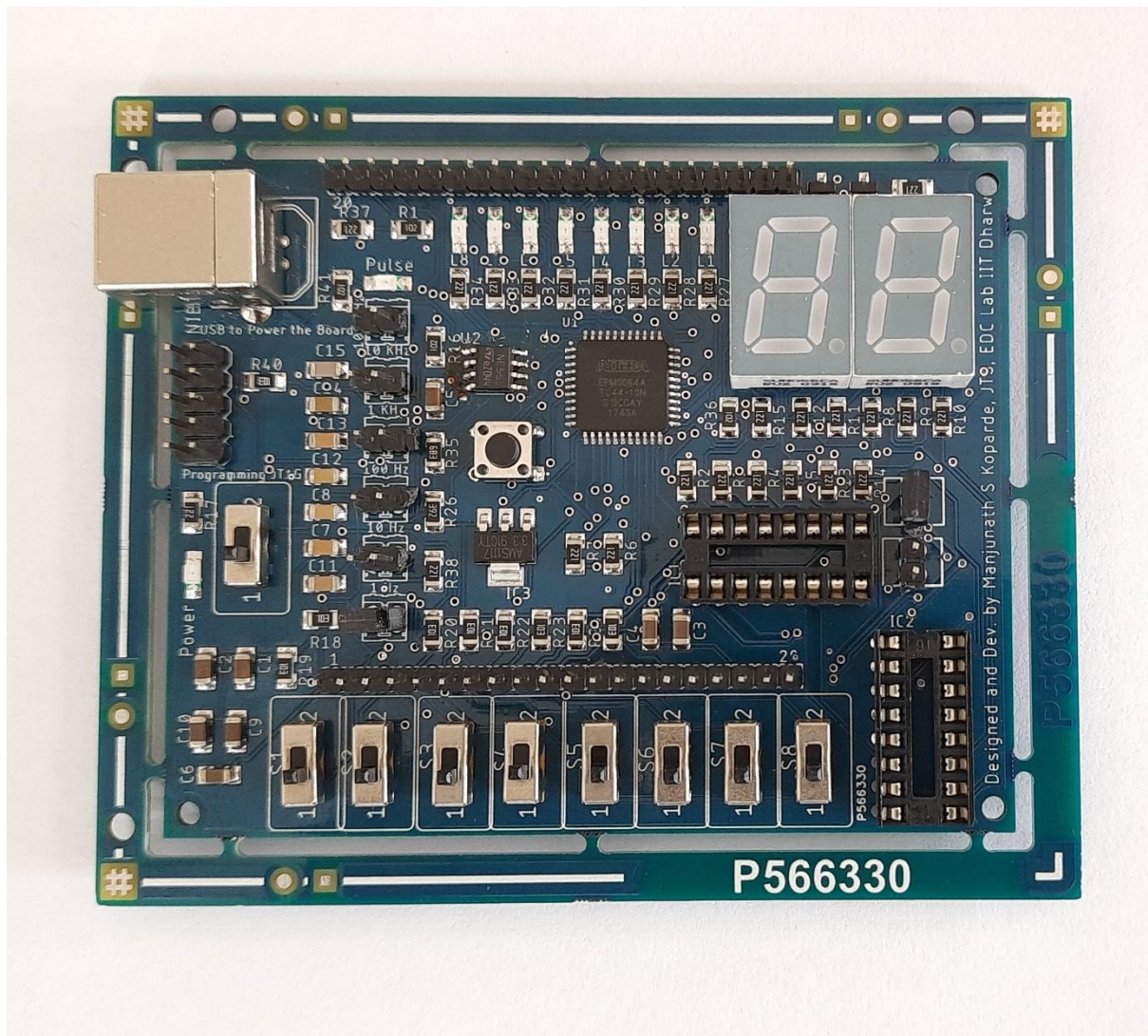
भारतीय प्रौद्योगिकी संस्थान धारवाड
Indian Institute of Technology Dharwad

CPLD MAX3000A BOARD

Ver 2.0

Designed and Developed by
Manjunath S Koparde, JTS
EDC Lab, IIT Dharwad

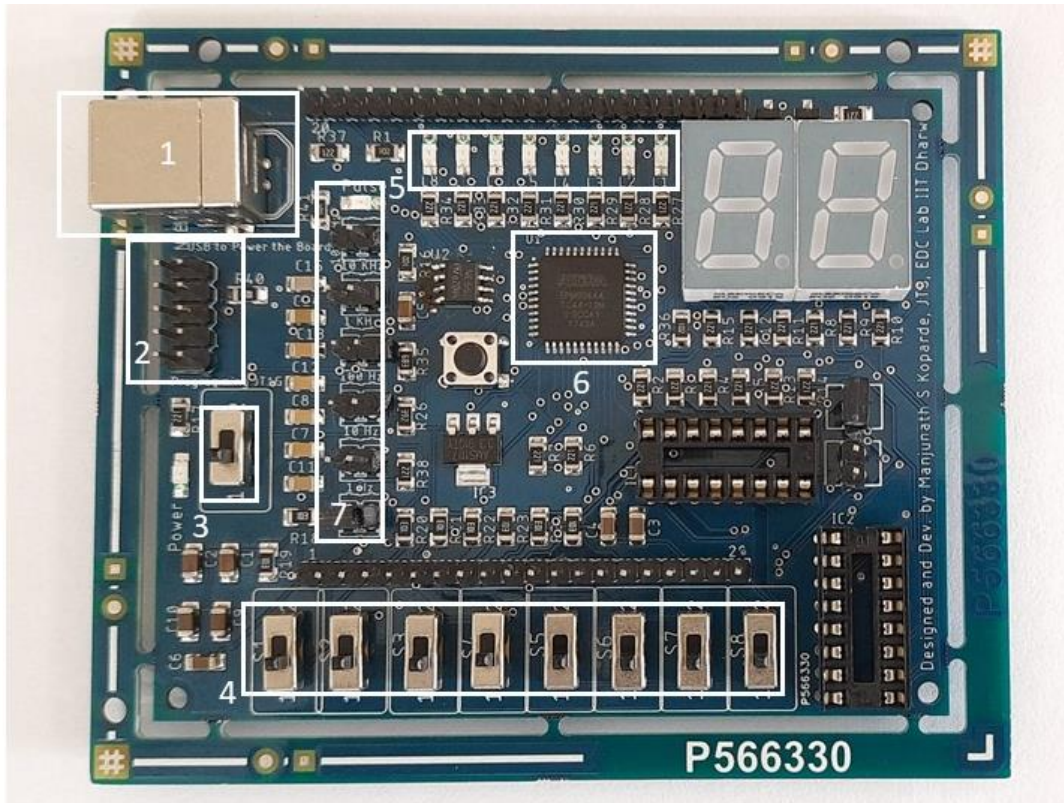
Top view of MAX3000A Board



Brief description of the Board

1. The board is driven by EPM3064ATC44-10N CPLD IC.
2. On-board eight input switches, can be used to provide input data to CPLD.
3. On-board eight output LEDs, can be used to verify different output combinations.
4. The board is programmed with ALTERA BUS Blaster cable.
5. The board is powered by Type-B USB bus cable from the computer.

Familiarization of CPLD MAX3000A Board



1. USB to Power the board.
2. JTAG Programming Port.
3. ON/OFF slide switch.
4. Input switches for board.
5. Output display LEDs.
6. EPM3064ATC44N CPLD IC.
7. Pulse Generator section.

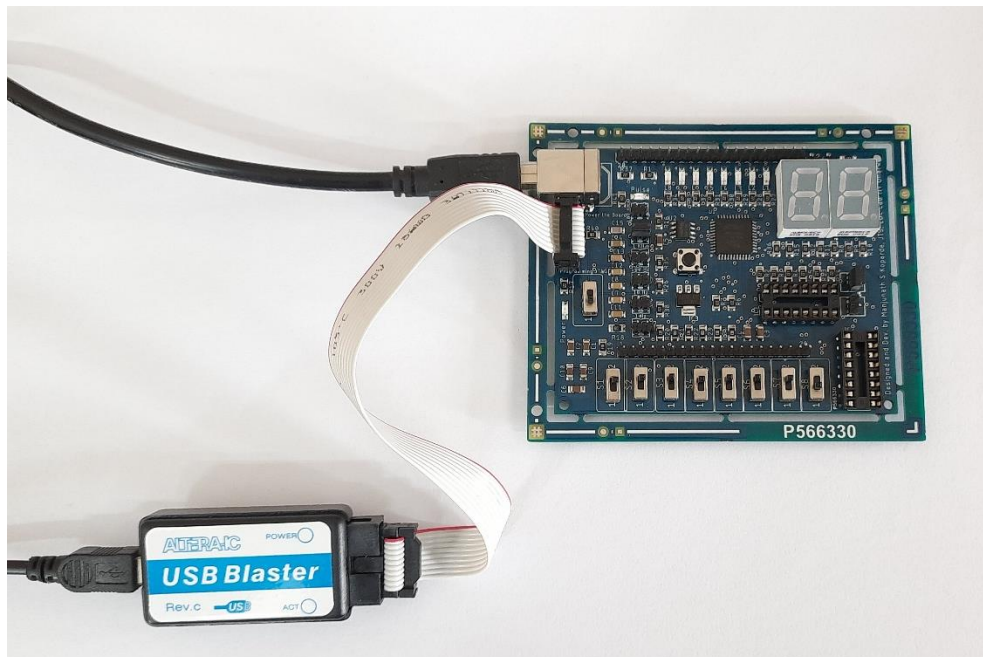
1. From S1 to S8 are the input slide switches. The pin assignment details are as mentioned below.

Switch Number	Pin of CPLD
S1	02
S2	03
S3	05
S4	06
S5	08
S6	10
S7	12
S8	13

2. There are eight on-board LEDs, can be assigned to verify the output. The pin assignments details are as mentioned below.

LED Number	Pin of CPLD
D1	23
D2	22
D3	21
D4	20
D5	19
D6	18
D7	15
D8	14

3. The board is programmed with ALTERA BUS Blaster cable provide with board. Altera bus blaster cable connection details are as mentioned below.



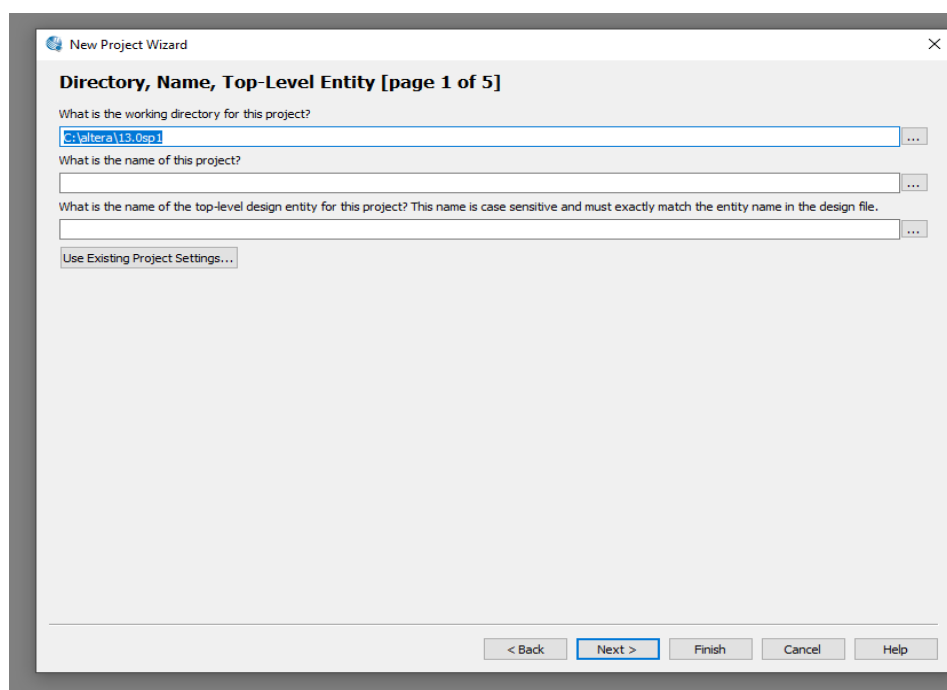
- a. Please refer the above image while connecting bus blaster to JTAG port of CPLD board. The cable need to be connected in same fashion. The other end of cable need to be connected to computer.
- b. As shown in the above image Type-B USB cable need to connected to computer to power up the board.
- c. Please apply gentle pressure to remove or insert these connections.

Programming the CPLD board

1. Two connections need to be made to CPLD one is JTAG and the other is need to power up the CPLD board before programming. Kindly refer previous image for details.
2. Open the Quartus software and select the Create new project.



3. Press next button.
4. Provide the name for your project with proper location in the computer.



5. Next page it request to add files we will do it later so press next.

6. Next window will ask for which CPLD you like to program, kindly follow the details
 - a. Family : MAX3000A
 - b. Package : TQFP
 - c. Pin out : 44
 - d. Speed Grade : 10
 - e. In the available devices list select the third as shown in below image.

Family & Device Settings [page 3 of 5]

Select the family and device you want to target for compilation.
You can install additional device support with the Install Devices command on the Tools menu.

Device family

Family: MAX3000A
Devices: All

Target device

☐ Auto device selected by the Fitter
☒ Specific device selected in 'Available devices' list
☐ Other: n/a

Show in 'Available devices' list

Package: TQFP
Pin count: 44
Speed grade: 10
Name filter:
☒ Show advanced devices ☐ HardCopy compatible only

Available devices:

Name	Core Voltage	Macrocells
EPM3032ATC44-10	3.3V	32
EPM3032ATI44-10	3.3V	32
EPM3064ATC44-10	3.3V	64
EPM3064ATI44-10	3.3V	64

Companion device

HardCopy:
☐ Limit DSP & RAM to HardCopy device resources

< Back Next > Finish Cancel Help

7. Next page will be EDA tool settings do not make any changes press next and Finish the project creation window.
8. Go to file and select NEW. In the list of design files select VHDL file. Save the file in project location.
9. Write your program in the file and save it before compilation.
10. Compile the file using play button

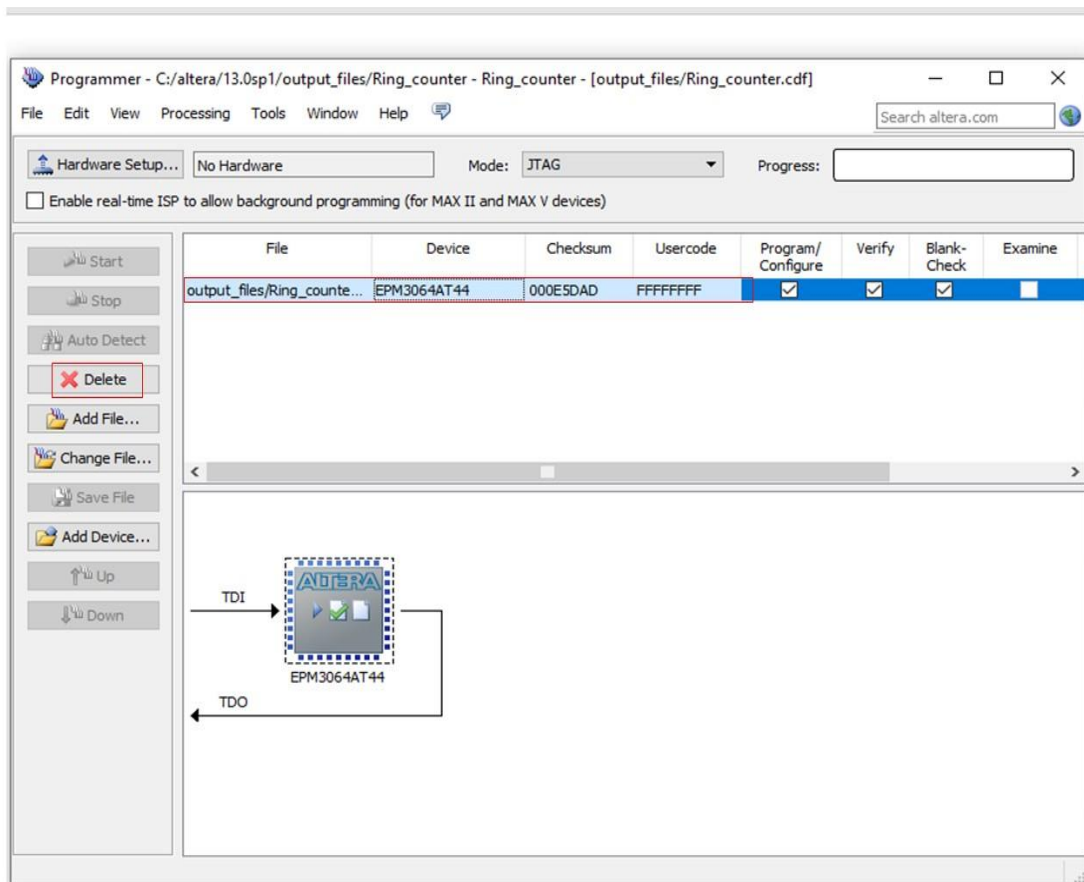


11. Once compilation is successful with zero errors. Click on assignments tab mentioned on the top. Select Pin planner in the drop down list.

12. In the pin planner assign the pins corresponding to input and output of your program. Once assigned, minimize the pin planner window and press save all than re-compile the program.

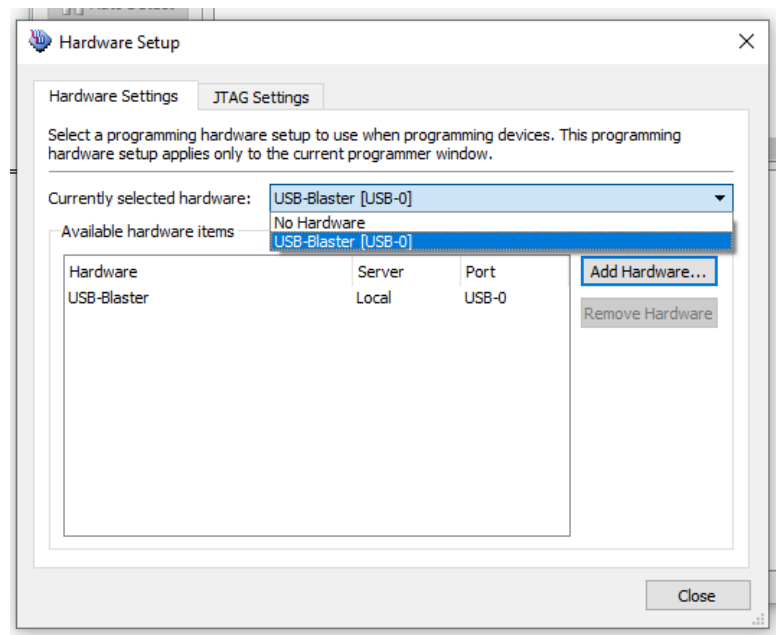
Note: Re-compilation of the program is mandatory to make sure the changes made in pin planner reflect on to output file.

13. Once re-compiled, connect the ALTERA BUS Blaster to CPLD board and the other end to your computer and power up the board by connecting Type-B USB to computer.
14. Once board is ON, click on the Tools tab and select programmer from the drop down list.



15. The programmer window should appear as above. Select and delete the existing old file if any. In the above window existing file and delete option is marked for you reference.
16. Now press Add File button and select the .pof file. The location of the file will be your project folder. The name of .pof file will be same your project name.
17. Once you have selected the file, press the Hardware setup and click the down arrow of currently selected hardware menu and select USB-Blaster (USB0) from the drop down menu.

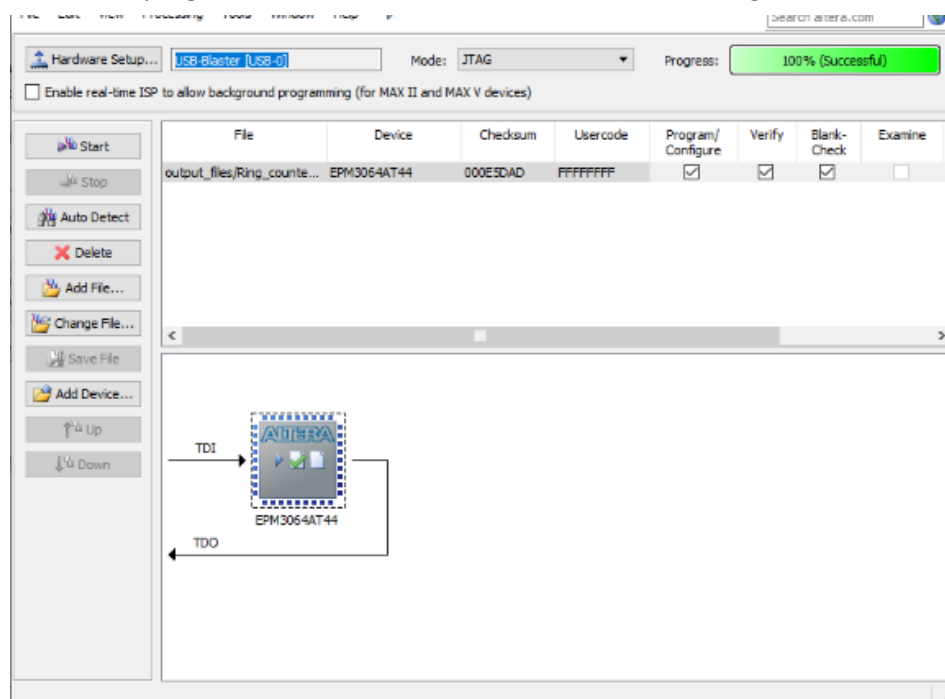
18. After setting all the required parameters the hardware window should look like



19. Now, close the Hardware setup window. In the programme window tick mark Program/Configure, verify and blank-check windows and press start to begin the programming process.

File	Device	Checksum	Usercode	Program/Configure	Verify	Blank-Check	Examine
output_files/Ring_counte...	EPM3064AT44	000E5DAD	FFFFFFFF	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

20. Once CPLD is programmed it will show “100% Successful” message.



----- Thank You -----