

# Test Drive the Ultra96 Development Platform with the Zynq UltraScale+ MPSoC

Today you will experience the Ultra96 Development Platform containing the Xilinx Zynq® UltraScale+™ MPSoC device and associated Linux system built using the Xilinx PetaLinux Tools and a Yocto flow.

## Hardware

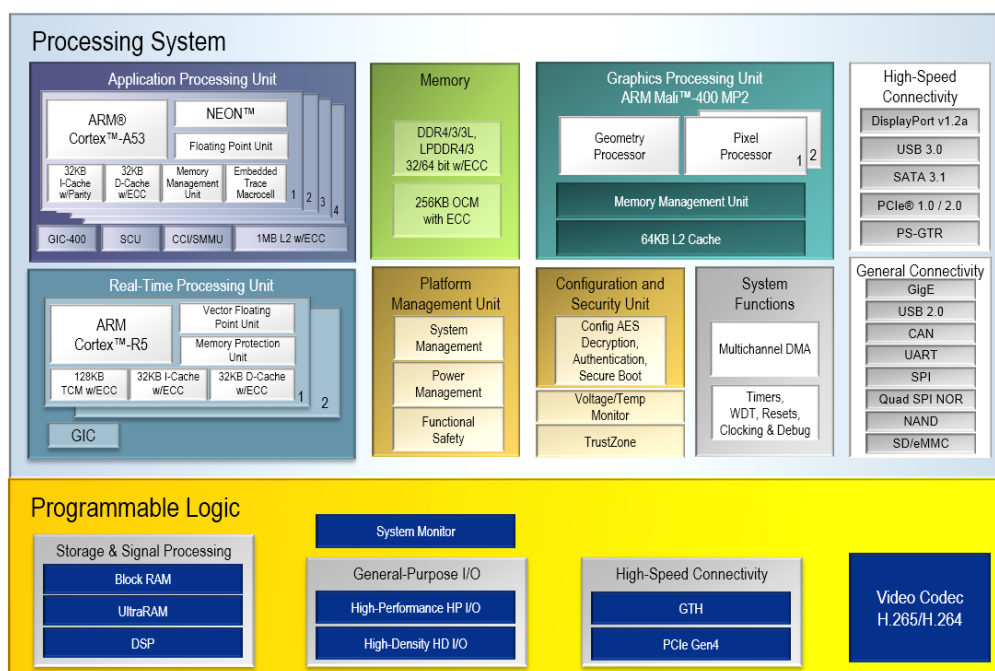
The Ultra96 Development Platform contains a Zynq UltraScale+ MPSoC ZU3EG device and the board is based on the Linaro 96Boards Consumer Edition specification. Thus, we can use the mezzanines, accessories, and community-created content from that ecosystem.

## Software

Because we are using Linux, we were able to add RPM packages with the libraries when we ported the example applications for the Grove Starter Kit. You will have the opportunity to run and modify one or more software applications.

## About Zynq UltraScale+ MPSoC Devices

Zynq UltraScale+ MPSoC devices provide 64-bit processor scalability while combining real-time control with soft and hard engines for graphics, video, waveform, and packet processing. Built on a common real-time processor and programmable logic equipped platform, three distinct variants include dual application processor (CG) devices, quad application processor and GPU (EG) devices, and video codec (EV) devices, creating unlimited possibilities for applications such as 5G Wireless, next generation ADAS, and Industrial Internet-of-Things.



## Running, Editing and Creating Software Applications

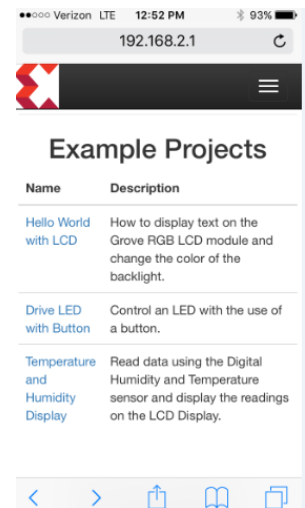
1. The home page pictured to the right should be displayed in the web browser.

If not, depending on your device/browser either:

- a. Click on the Bar Stack in the upper right corner and select **Home**
- b. Click on the **Home** button in the upper left corner next to the Xilinx Logo

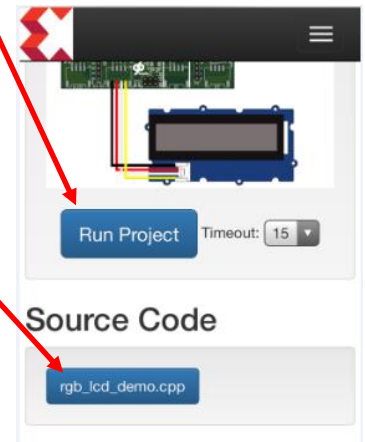
Please:

- Do Not change the Configuration settings
- Do Not start the PYNQ environment
- Plug or unplug any of the connectors



2. Browse and click the **Hello World with LCD** project on your browser and click **Run Project**

- a. Notice that the LCD displays **Xilinx**, **ZZSoC**, and **Board!** in Red, Green, and Blue, respectively.  
If the words or colors are wrong, don't worry, we will fix these in just a moment
- b. To modify the code, under **Source Code** click on **rgb\_lcd\_demo.cpp**
- c. Click on **Revert Code** to reset the code to its original form
- d. Using the integrated text editor change: `string str3 = "Board!";` to `string str3 = "<your name>";`
- e. Click **Run Code** and you will see your changes
- f. Feel free to make additional changes
- g. When done Click on **Revert Code** to reset the code to its original form



3. Now go Back and try any of the additional projects:

- a. GPIO LEDs
- b. Touch Sensor and Relay
- c. Drive LED with Button
- d. Buzzer and Light Sensor

Note: Instructions say light sensor is at A0, but your hardware setup is different. Code must be changed to address A1.

- e. Temperature and Humidity Display

Note: Instructions say temp/humidity sensor is at A0, but your hardware setup is different.

Code must be changed to address A2 (module: read DHT.ino).

- f. OpenAMP Matrix Multiplication
- g. OpenAMP Proxy Application

## Setup (Only if not already done for you)

## 1. Hardware setup:

- Attach the Grove mezzanine card and screw in place with the provided standoffs and nylon screws
- Insert the micro-SD card into the board SD card slot as shown to the right
- Connect the LCD screen to the I2C0 connector on the mezzanine via the cable provided as shown to the right. If you just want a quick demo using the LCD screen you can skip the next step.

### d. Connect additional IO devices to the mezzanine card via cables:

- (Push) Button A0
- Light Sensor A1

note: Demo instructions say A0. Code must be changed to A1

### iii. Temp/Humidity A2

note: Demo instructions say A0. Code must be changed to A2

### iv. LED Socket D3

**LED** plugged into the board with the **Long Leg** connected to the +

- Buzzer D4
- Relay G2 (see picture to the right for location)
- Touch (Sensor) G3 (see picture to the right for location)

### e. Connect power

## 2. Press the small “**PWR**” button on the sensor board as shown above

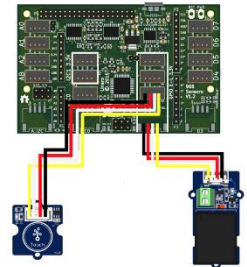
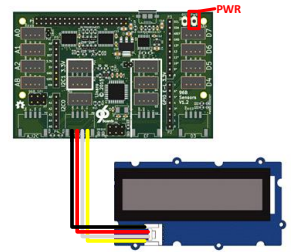
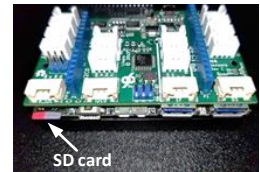
## 3. The board will start and the LCD will show the following data:

- The first line shows the MAC address of the board
- The second line shows the ip-address of the Ultra96 board
- Connect a phone, tablet, or laptop and use the SSID containing the MAC address from line one of the LCD display (Only connect 1 phone, tablet, or laptop)

Note: If other boards are in the vicinity, these boards will have very similar access point names

## 4. After connecting to the board, open up a web browser on your phone, tablet or laptop

- In the browser enter the IP address from Step 3: <http://<ip-address>>  
(for example <http://192.168.2.1>)



## Shutting Down

- Press the small “**PWR**” button on the sensor board as shown above
- Once the display turns off the board power may be disconnected

## Additional Notes

- If you want to connect a different device to your board's Access Point:
  - Disconnect the device from your Ultra96 WiFi network (e.g. “Forget this network”)
  - Push the “RST” button
  - When it boots back up, go to Step 3 above.
- If the Pynq environment is accidentally started you can come back to PetaLinux via one of the following:
  - Run the Jupyter notebook in the getting\_started folder to reboot:  
**/getting\_started/7\_reboot\_petalinux\_or\_pynq.ipynb**
  - Open a terminal window and type: **reboot\_petaLinux**