

Training on "Embedded Linux Development with Xilinx Petalinux and MPSoC FPGA [Ultra96V2 or Kria KV260 FPGA]"

Training Hours: 20+20 Credit Hour

Training Outlines Document- LogicTronix

January 2022

Main Training Sessions- Outlines [20 Credit Hour]

Objective: Device Driver development, Kernel Debugging , Configuration in Embedded Linux

1. Getting the Kernel Source and Kernel Code Structure
2. Configuring Kernel and Testing it and applying patch
3. **Lab 1:** Downloading Kernel and Configuring it
4. Debugging Kernel faults using Ftrace, GDB and KGDB
5. **Lab 2:** Debugging kernel panic faults
6. Device Driver
 - a. Theory, Working and Development of Device Driver
 - b. Char Devices
7. **Lab 3:** Creating dummy char driver and testing it
8. Device Tree and device enumeration in embedded linux
9. **Lab 4:** Interfacing I2C real time clock, updating device tree and configuring kernel for new devices
10. System programming for interfacing with bus devices
11. **Lab 5:** Program for reading I2C sensor data using syscalls and using in system programming
12. MIPI device interfacing in embedded Linux
13. **Lab 6:** Device tree and v4l2 utils for configuring MIPI camera device in embedded Linux



MIPI
Mezzanine for
Ultra96v2

Sensors
Interfacing-
MIPI, I2C
and SPI

Advanced Training Sessions- Outlines [20 Credit Hour]

1. Creating Vitis/VIVADO pipeline for Zynq MPSoC baremetal design,
2. OpenAMP Implementation on MPSoC FPGA for running Petalinux and Baremetal,
3. Creating Multi-threading applications on Petalinux, using CPU Isolation, thread prioritizing methodologies, real time optimization on Petalinux,
4. Petalinux design with custom devices and creating custom application,
5. Creating MIPI based complete hardware pipeline for Machine Learning Acceleration example,
6. Using GStreamer for GUI development for "edge detection" and custom ML application.

*Credit Hour= Hour

Revision History

The following table shows the revision history of this **Training Outline – TOL022**.

Date	Version	Detail
January 6, 2022	2.0	Initial Release with Revised outlines for multiple MPSoC Boards

Table 8. Training Outline Revision History

About LogicTronix

LogicTronix provides turnkey Solutions, design services, and Intellectual Property (IP) to customers on FPGA Design, Computer/Machine Vision, Learning Acceleration for various applications including ADAS, Surveillance, Computer Vision, etc.

LogicTronix also offers solutions on “Real-Time Traffic Video Analytics Solution (TVAS) - including ANPR Solution”, “Enhancing Financial Trading Algorithms with AI/ML” and “High Frequency Trading (HFT) based Infrastructure”.

For Trainings, IP Licensing, Sales and Support: **Contact**

LogicTronix Technologies Pvt. Ltd.

FPGA Design and Machine Learning Company

Xilinx Certified Partner + Design Service Partner for Xilinx Kria SoM for AI/ML

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