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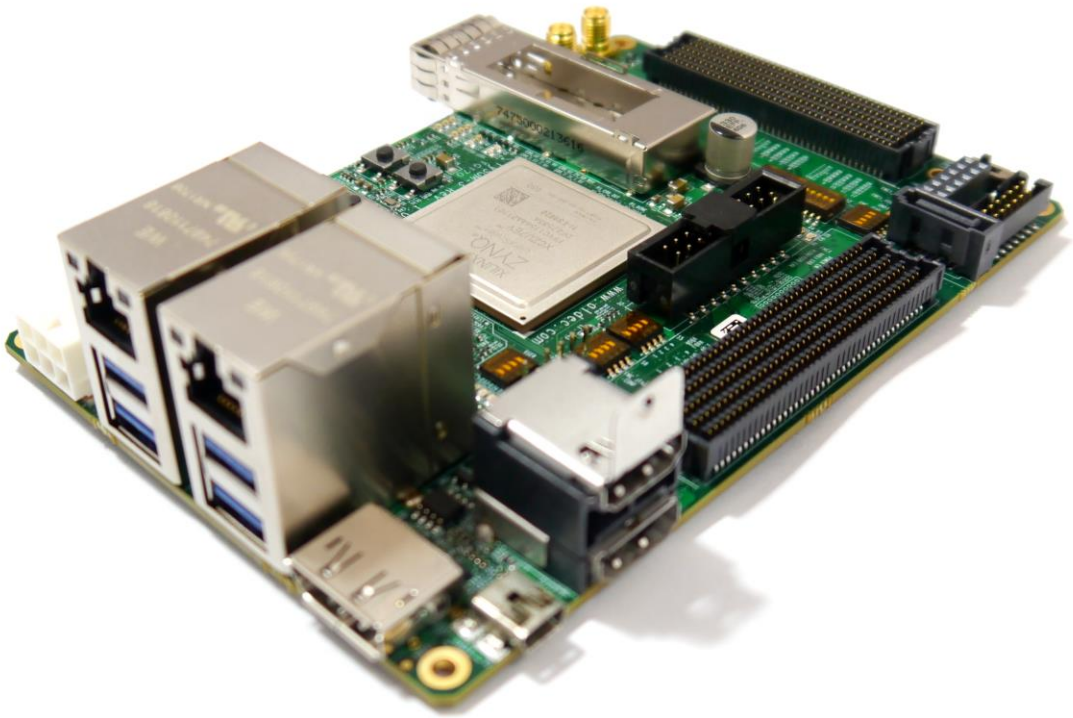
How to use Aldec TySOM boards in Xilinx SDx



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3 Introduction

Aldec *TySOM* is a set of development boards which apply for embedded applications and systems. The boards contain Xilinx® Zynq™ chip built with FPGA and ARM® Cortex processor. This configuration allows to use the board in applications where a processor is not fast enough and a hardware implementation of some algorithms is required. Moreover, the boards are composed of standard interfaces such as USB, HDMI, Ethernet and additional FMC connectors which can be used to extend available interfaces with an FMC card. The board combined with FMC cards can be used in various embedded applications such as Automotive, IoT, Industrial automation or embedded HPC.

One way of using TySOM board is using it in *Xilinx SDx* tool which provides mechanism to convert C/C++ functions to HDL and accelerate them in the FPGA part. This possibility demonstrates the power of Zynq chips and Aldec boards what is out of reach for standard processors. Additionally FPGA chips consume less energy than processors, so the boards can be used in embedded application with battery power supply.

This document provides information how to use Aldec TySOM board in Xilinx SDx tool. In case of any additional questions visit Aldec website *www.aldec.com*.

4 Requirements

Hardware

- Aldec TySOM board:
  - *TySOM-3A-ZU19EG*
  - *TySOM-3-ZU7EV*
  - *TySOM-2-7Z100*
  - *TySOM-2A-7Z030*
  - *TySOM-1-7Z030*
- Aldec FMC-board (optional):
  - *FMC-ADAS*
  - *FMC-VISION*
  - LI IMX274MIPI FMC V1.1

Software

- Xilinx SDx tool 2017.4 or never

5 Available platforms

All SDx platforms for Aldec TySOM boards are freely available on Aldec *GitHub*. Therefore, a user does not have to prepare all necessary files such as: Vivado hardware project, Operating System, File System, Device Tree etc. for TySOM board to use the board with SDx tool. The platform contains all of them and is ready to use with the tool.

> *Note: The SDc platform contains additional libraries for Linux OS used on the boards which utilize Linux symbolic links. Therefore. The platforms must be downloaded and extracted on Linux OS and then copied to Windows. Extracting them on Windows will cause a library syntax error.*

Accordingly, to the used board version and a configuration a user must choose one of the available platforms:

1. **TySOM_3A_ZU19EG** – platform for *TySOM-3A-ZU19EG* board that provides support for all main interfaces on the board.
2. **TySOM_3A_ZU19EG_FMC1_ADAS** – platform for *TySOM-3A-ZU19EG* board that provides support for all main interfaces on the board and support for *FMC-ADAS* card connected to the FMC1 connector.
3. **TySOM_3A_ZU19EG_FMC1_ADAS_AI** – platform for *TySOM-3A-ZU19EG* board that provides support for all main interfaces on the board and support for *FMC-ADAS* card connected to the FMC1 connector. There is also support for AI application by added Xilinx DPU module.
4. **TySOM_3_ZU7** – platform for *TySOM-3-ZU7* board that provides support for all main interfaces on the board.
5. **TySOM_3_ZU7_FMC1_FMC_ADAS** – platform for *TySOM-3-ZU7* board that provides support for all main interfaces on the board and *FMC-ADAS* card connected to the FMC1 connector.
6. **TySOM_3_ZU7_FMC1_FMC_ADAS_AI** – platform for *TySOM-3-ZU7* board that provides support for all main interfaces on the board and *FMC-ADAS* card connected to the FMC1 connector. There is also support for AI application by added Xilinx DPU module.
7. **TySOM_3_ZU7_FMC2_LI_IMX274MIPI_FMC_V1_1** – platform for *TySOM-3-ZU7* board that provides support for all main interfaces on the board and LI IMX274MIPI FMC V1.1. Leopard camera connected to the FMC2 connector.
8. **TySOM_2_7Z100** – platform for *TySOM-2-7Z100* board that provides support for all main interfaces on the board.
9. **TySOM_2_7Z100_FMC2_FMC_ADAS** – platform for *TySOM-2-7Z100* board that provides support for all main interfaces on the board and *FMC-ADAS* card connected to the FMC2

connector.

10. **TySOM_2_7Z100_FMC3_FMC_ADAS** – platform for *TySOM-2-7Z100* board that provides support for all main interfaces on the board and *FMC-ADAS* card connected to the FMC3 connector.
11. **TySOM_2_7Z100_FMC2_FMC_VISION** – platform for *TySOM-2-7Z100* board that provides support for all main interfaces on the board and *FMC-VISION* card connected to the FMC2 connector.
12. **TySOM_2_7Z100_FMC2_VISION_FMC3_ADAS** – platform for *TySOM-2-7Z100* board that provides support for all main interfaces on the board, *FMC-ADAS* card connected to the FMC3 connector and *FMC-VISION* card connected to the FMC2 connector.
13. **TySOM_2A_7Z030** – platform for *TySOM-2A-7Z030* board that provides support for all main interfaces on the board.
14. **TySOM_2A_7Z030_FMC2_FMC_ADAS** – platform for *TySOM-2A-7Z030* board that provides support for all main interfaces on the board and *FMC-ADAS* card connected to the FMC2 connector.
15. **TySOM_1_7Z030** – platform for *TySOM-1-7Z030* board that provides support for all main interfaces on the board.

Every platform contains some of the following examples as well:

1. File_IO
    a. Bilateral Filter
    b. Harris Corner Detection
    c. Dense Non Pyramidal LK Optical Flow
    d. Stereo Vision
    e. Warp Transform

6 How to use

Using Aldec TySOM boards in SDx tool is quite straightforward because provided SDx platforms contain all necessary files and configurations required by the tool. In that case user should follow a standard process of creating project described in *Xilinx User Guide* and add Aldec TySOM platform in the *Platform Selection* page of the *SDx New Project Wizard* by *Add Custom Platform* button (Figure 1).

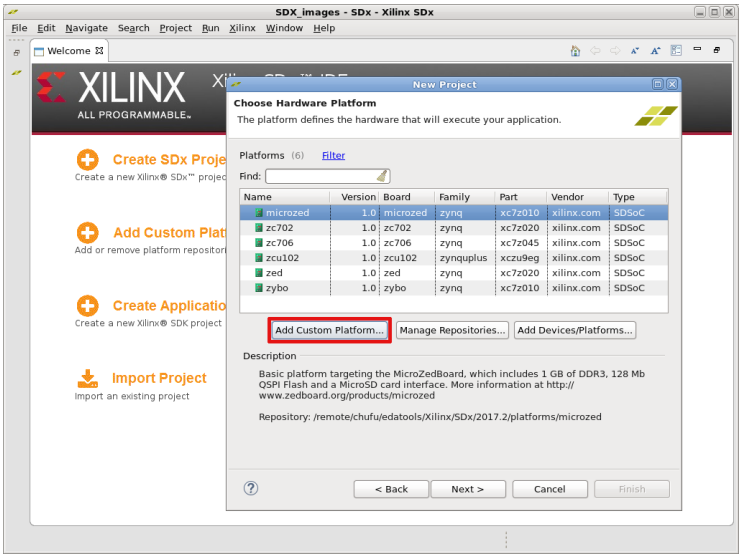

Figure 1. Xilinx SDx – Add Custom Platform.

Added platform should be selected as a project hardware platform (Figure 2).

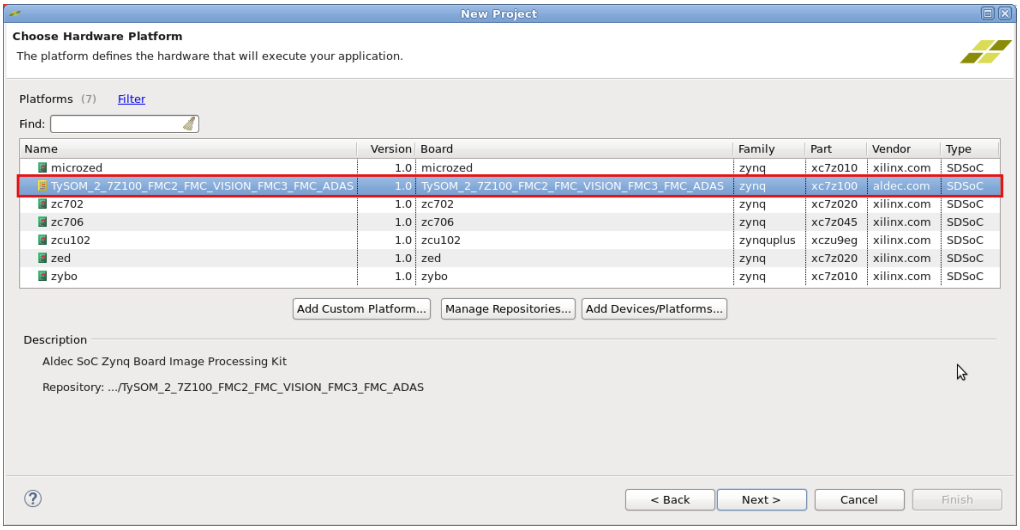

Figure 2. Xilinx SDx – Select added Aldec TySOM platform.

7 About Aldec, Inc.

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