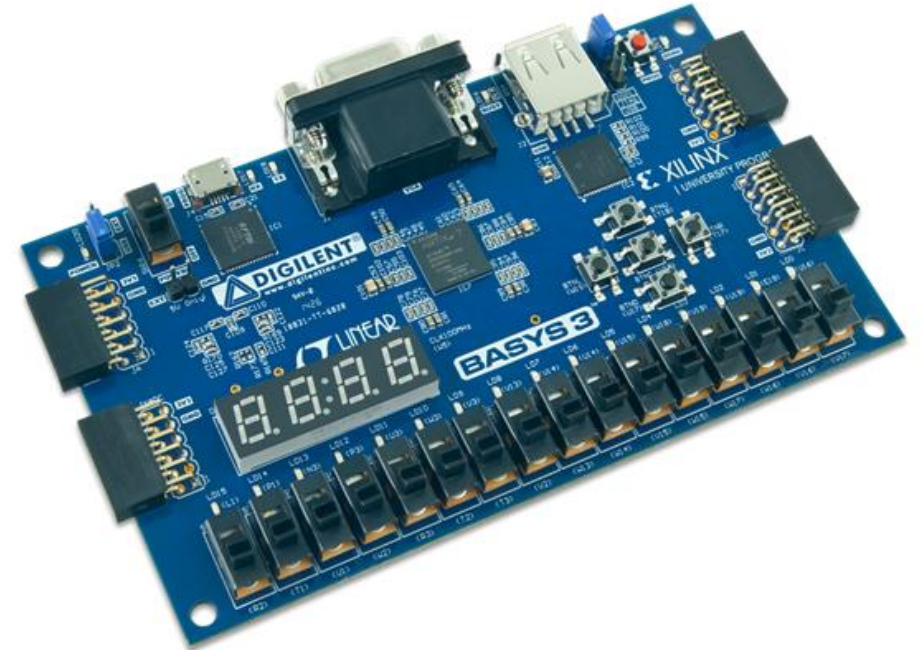# Introduction

- This project aims to use the modules available in the DIGILENT BASYS 3 board.

  - Includes hardware acceleration (the7-segment controller and the input debouncing are done by hardware, releasing processing time from the processor)

  - Includes external devices management by addressing a camera module

  - Manages the VGA port for image reconstruction

  - All the communication is done through the IoB peripheral bus
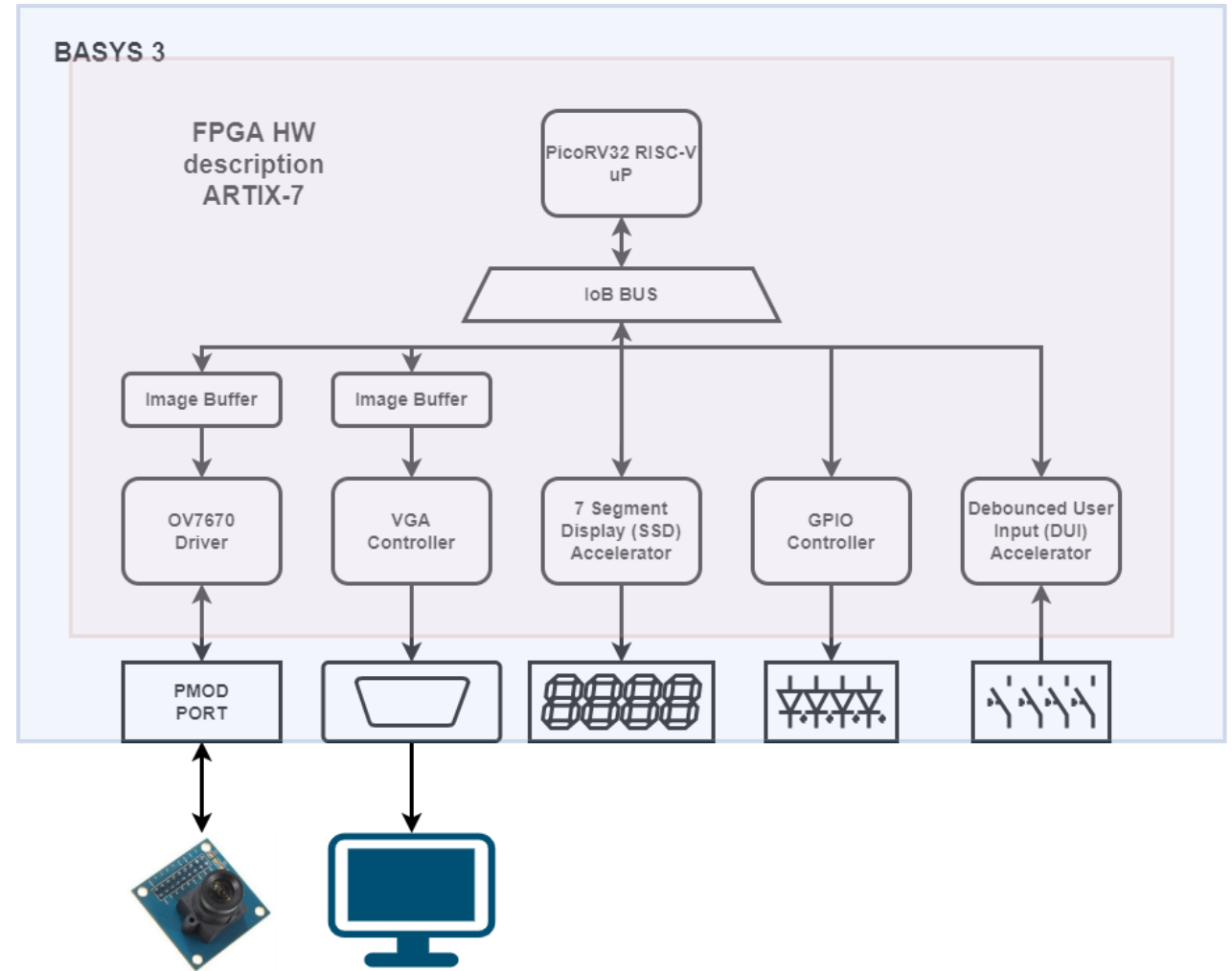

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Hardware Modules

- Drivers:
  - Camera (OV7670)
  - VGA

- HW Acceleration
  - 7 Segment Display
  - Input de-bouncer (PB and SW)

- Observations:
  - Camera and VGA hold an independent image buffer to relax the uP charge
  - The uP reads and writes to the buffers (software-addressed registers)

Device operation (flowchart)

- Start: peripherals initialization.

- Mode: selection through board switches (SW).

- Acquire image: image sources change according the user selection.

- Output: image display interface.

- Device status: inform the user about operation status and errors.

- Observations: mode one is the most important, being the development target. The others are essential to test the modules independently.