Computer Architectures **02LSEOV 02LSEOQ [AA-LZ]**	Delivery date: Sunday 20/1/2019
Extra-points Project **Part 2**	Expected delivery of **extrapoint_02.zip** must include: - The zipped folder of your project - A 2-pages "application note" in pdf format: the application note is intended to briefly describe the structure of your project, with a synthetic explanation about the configuration of the used system components.

Purpose of Part 2: to acquire full confidence in the usage of the LANDTIGER Board.

This part is evaluated to assign a maximum of 2 extra-points for qualified students taking the exam with vote >= 18

Start from the extrapoint_01 project to implement an advanced version of the controller of the pedestrian crossing semaphore.

You are asked to write a project for the LandTiger Board that implements the following additional functionalities with respect to the basic behaviour already implemented.

A) Button INT0 is used to receive a crossing request from blind persons. This button fully complies with the current behaviour (please see the state diagram of the extra-points lab 1). The additional behaviour to be implemented is the following:

INT0
Blind persons
pushbutton panel

1) As soon as INT0 is pressed, the loudspeaker emits a confirmation sound until the button is released.
2) When the traffic light is green for pedestrians, the loudspeaker alternates 1s sound ON and 1 s OFF
3) When the traffic light is flashing green for pedestrians, the loudspeaker alternates sound ON and OFF synchronously with the flashing frequency (according to previous specifications).
4) When the traffic light for pedestrian is red, the sound is OFF.

B) The Joystick is used to enter into a configuration mode of the traffic light system. This configuration can be entered only in the car=red / pedestrian=green state (please, see the state diagram below).

1) When the joystick switch is pressed to the right, the traffic light system enters into the "maintenance" status by:
   i. Flashing red for pedestrians
   ii. Flashing yellow for cars
   iii. Flashing frequency is 1 s ON / 1 s OFF
   iv. The loudspeaker alternates ON/OFF sound with the same frequency of the lights
   v. The normal behaviour is restored when the Joystick switch is pressed to the left

Maintenance is entered when the Joystick is pushed right

Maintenance is exited when the Joystick is pushed left

2) In this mode, it is also possible to use the potentiometer to regulate the loudness of the loudspeaker
   i. As soon as the potentiometer regulator is turned, the loudspeaker tone loudness is modified according to the regulator position
      • All turned right – minimum intensity
      • All turned left – maximum intensity

ADC Potmeter
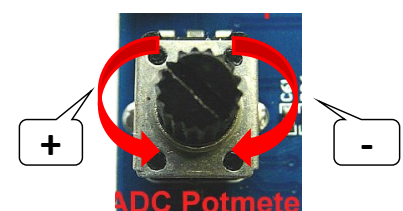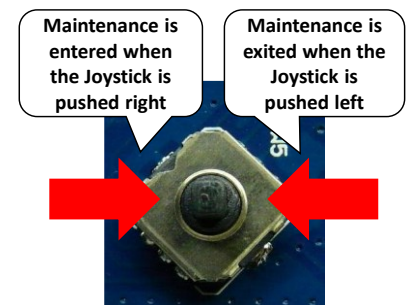
ii. The selected loudness is saved when exiting the maintenance status (please, see the state diagram to know how to return to the normal behaviour).

The modified state diagram of the traffic light is reported here, including the indication about how to return from "maintenance" (green for cars/red for pedestrians).