Title: # Indicator Lights Training

Purpose: **Internship -training for students**

Scope: **Embedded C Introduction**

Project	Author
Project name: Hardware Related Software Training	Name: Hardware Related Software Team Sibiu
DG number: -	Segment / Dept.: VED

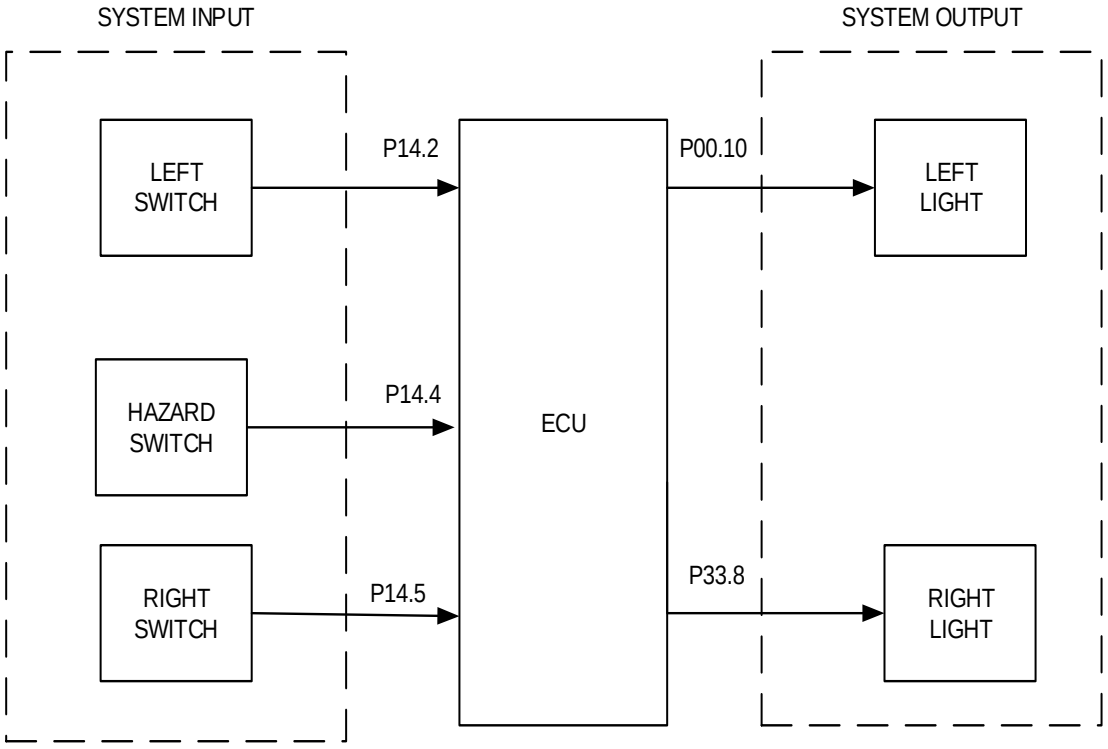
1 System Requirements

This chapter describes the system functional requirements. The embedded system is comprised out of an electronic part and a software one. Therefore there will be specified in the following chapters separate requirements for electronics and for software.

1.1 General purpose of the system

The car's indicator lights will be simulated.

1.2 Schematic block of the system



2 Requirements

2.1 REQ000: Module name

The module shall be named IL.

The following functionality is requested:

2.2 REQ001: Indicator light

The default state for the indicator lights shall be the OFF state.

2.3 REQ002: Number of switches

Three switches will be used for all lane modes.

2.4 REQ003: Car's indicator lights modes

Car's indicator lights should cover the following 3 functional modes:

- Lane change mode;
- Normal mode;
- Hazard mode.

2.5 REQ004: Activation of lane change mode

The corresponding indicator light should be switched to lane change mode when the coresponding switch is pressed less than 500ms.

2.6 REQ005: Effect of lane change mode

The effect of lane change mode is that corresponding indicator light flashes three times with a 300ms ON phase and a 700ms OFF phase.

2.7 REQ006: Deactivation of lane effect of lane change mode

Deactivation of lane change mode should be performed automatic.

2.8 REQ007: Activation of normal mode

The coresponding indicator light should be switched to normal mode when the corresponding switch is held for more than 500ms.

2.9 REQ008: Effect of normal mode

While the switch is pressed the light must flash with a 50% duty cycle and frequency given by a potentiometer. into the range 1Hz – 10Hz.

2.10 REQ009: Deactivation of normal mode

Deactivation of normal mode should be performed by releasing the corresponding switch for at least 100ms.

2.11 REQ010: Activation of hazard mode

Car's indicator lights should be switched to hazard mode when the corresponding switch is pressed for at least 200ms and released again.

2.12 REQ011: Effect of hazard mode

While in the hazard mode all other modes are overridden by a symmetric flashing (50% duty cycle) with a 1Hz frequency .

2.13 REQ012: Deactivation of hazard mode

Car's indicator lights should be released from the hazard mode when the corresponding switch is pressed for at least 200ms and released again.

2.14 REQ013: Cyclic routine

The main routine of the software shall be executed on a 10ms task.

2.15 REQ014: Overridden priority

-All other modes can be overridden by hazard mode.

-Lane change mode (for ex. the left lane) can be overridden by any Normal mode (left or right) or the other Lane change mode

2.16 REQ015: Display info

Any pressed button and the current system state should be displayed on a LCD display.

2.17 REQ016: Security start

The application should start only if a code is introduced from a keypad or a IR remote control