#Wiper Control System

#Introduction

The automated rain wiper system is used to detect rainfall and activate automobile automatic rain wiper without drivers to focus on their primary task of driving.

The distraction eliminated with the development of this product is the manual adjustment of windshield wipers when driving. The few seconds that a driver takes their

attention off the road to adjust a knob while driving in poor weather conditions could potentially lead to a car accidents.If we apply sensor on glass which senses

the act of sprinkling water,by automation the wiper will be operating automatically. When the water hits the sensor,it will send signal to the system thus moving

the wiper motor. once the wiper did not detect any water,the wiper will stop.

WORKING

* The RED LED is considered for the ACC position. Once the push button is pressed for 2 seconds, the RED LED keeps continuously glowing until the stop of the engine signifying the engine condition to be turned ON.

* On press of the user input push button, the other three Blue, Green and Orange LEDs come ON one at a time with the set frequency. The frequency changes on every alternate key press, 3 frequency levels with 1, 4 and 8 Hz.

* The LED glow pattern stops on the 4th press; the wiper action starts with the next press.

* If the push button is pressed for 2 seconds continuously, the RED light goes off and the pattern stops bringing it to default position which signifies the engine is turned OFF.

SOFTWARES REQUIREMENTS FOR THE PROJECTS:

---STM32Cube IDE

Xpack Packages :

---Windows Build Tools

---OpenOCD

---QEMU

COMPONENTS USED IN PROJECT:

---STM32F407G-DISC1

STM32F407 series of microcontrollers are high-performance MCUs designed for medical, industrial and consumer applications.

It is based on ARM Cortex-M4 and offers up to 168MHz.

* Flash memory of up to 1 megabyte.

* OTP memory of 512 bytes.

* Compact Flash, SRAM, PSRAM, NOR, and NAND memories are supported by this flexible static memory controller.

* Sleep, Stop, and Standby modes are low-power modes.

* 16-stream DMA controller with FIFOs and burst support for general-purpose DMA.

* Up to 54 Mbytes/s 8- to 14-bit parallel camera interface.

* Generator of true random numbers.

* Hardware calendar, CRC calculating unit, 96-bit unique ID RTC, subsecond accuracy.

####Features

When the button is pressed once the car will start (Ignition key postion at ACC)

When the button is pressed again the wiper will start(Wiper On)

When the button is pressed again the wiper will off(Wiper Off)

When the button is pressed thrice the car will stop(Ignition key position at Lock)

4 W'S

***What**

-- wiper control system (WCS)

***Where**

--Inside and out side the car

***When**

--When the weather condition is bad (like in rain and snow) the wiper is activate and clean the car window

***Who**

--Who is driving or controlling the car

SWOT Analysis

--Strength

* It is Visible

* Does not stop in the middle of the window during drive.

* Safety

---Weakness

* High cost

* Non automatic

---Opportunities

* Rain sensing and automatic operation can be implemented as further enhancement.

---Threats

* Once the board repaired cannot be replaced

REQUIREMENTS

High Level Requirements:

ID	Description	Status
HLR1	Car in ACC Mode	Implemented
HLR2	Car In Ignition Mode	Implemented
HLR3	Wiper Turned On	Implemented
HLR4	Wiper Turned Off	Implemented

Low Level Requirements

ID	Description	Status
LR1	Button pressed once for 2 sec	Implemented
LR2	Button pressed once again	Implemented
LR3	Button pressed two times	Implemented
LR4	Button pressed again two times	Implemented