WIPER CONTROL SYSTEM

ABSTRACT:

I have designed a project entitled "WIPER CONTROL SYSTEM" by using STM32 based microcontroller.Here we can explain the design and implementation of the Wiper control system. Most wipers have a low and a high speed ,as well as an intermittent setting. When the wipers are on low and high speed ,the motor runs continuously.But in the intermittent setting,the wipers stop momentarily between each wipe,all automotive wipers are controlled by a microcontroller. By using stm32 to control the speed motor and display the value of speed.

INTRODUCTION:

Today’s car wipers are manual systems that work on the principle of manual switching. So here we propose an automatic wiper system that automatically switches ON on detecting rain and stops when rain stops. Our project brings forward this system to automate the wiper system having no need for manual intervention. For this purpose we use a rain sensor along with a microcontroller to drive the wiper motor. Our system uses a rain sensor to detect rain, this signal is then processed by the microcontroller to take the desired action. The rain sensor works on the principle of using water for completing its circuit, so when rain falls on it its circuit gets completed and sends out a signal to the microcontroller. The microcontroller now processes this data and controls the motor.This system is equally useful for Aircrafts and a smaller version of this can be used by motor bikers in their helmets so that they can drive easily in rains.

REQUIREMENTS:

ADVANTAGES:

* By using stm32 microcontroller that mounted behind the windshield.it sends out a beam of infrared light that, when water droplets are on the windshield,is reflected back at different angles.
* Low cost.
* Easy to use.
* Sensors used to measuring the how many raindrops are on the windshield and then sensor detects the light reflected back internally by the windshield glass,so if there were more rain drops on the windshield,the less light would be reflected back to the sensor.
* Major safety benefit as heavy rainfall causes serve visibility issues.
* This sensor is used in four wheeler, aircraft,train,six wheeler.
* Low cost "Automation project".

DIS-ADVANTAGES:

*The rain sensor based system functions when water falls on the sensor directly.
*The cost of the overall system increases as additional components are needed along with a rain sensor.
*In order to avoid false detection of rain, it requires rain sensors to make a decision after a few minutes.

FUTURESCOPE:

* Wiper is automatically ON during the time of rainfall.
* The sensor is fixed on the vehicle glass.
*The conductive sensor is used in this project.

COMPONENTS:

*STM32
*LED
*DISCOVERY BOARD

STM32:

STM32 is a family of 32-bit microcontroller integrated circuits by STMicroelectronics. The STM32 chips are grouped into related series that are based around the same 32-bit ARM processor core, such as the Cortex-M33F, Cortex-M7F, Cortex-M4F, Cortex-M3, Cortex-M0+, or Cortex-M0. Internally, each microcontroller consists of the processor core, static RAM, flash memory, debugging interface, and various peripherals

1. STM32 website.
2. STM32 marketing slides.
3. STM32 datasheet.
4. STM32 reference manual.
5. ARM core website.
6. ARM core generic user guide.
7. ARM core technical reference manual.
8. ARM architecture reference manual.

LED:

A light-emitting diode (LED) is a semiconductor light source that emits light when current flows through it. Electrons in the semiconductor recombine with electron holes, releasing energy in the form of photons. The colour of the light (corresponding to the energy of the photons) is determined by the energy required for electrons to cross the band gap of

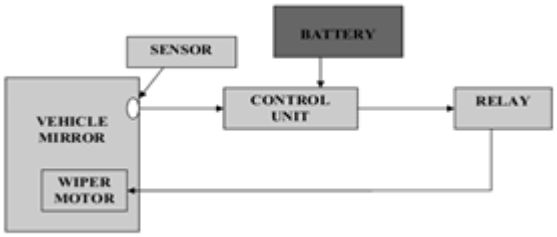
the semiconductor.LEDs have many advantages over incandescent light sources, including lower power consumption, longer lifetime, improved physical robustness, smaller size, and faster switching. In exchange for these generally favourable attributes, disadvantages of LEDs include electrical limitations to low voltage and generally to DC (not AC) power, inability to provide steady illumination from a pulsing DC or an AC electrical supply source, and lesser maximum operating temperature and storage temperature.

DISCOVERY BOARD:

STMicroelectronics STM32 Discovery Kits are an affordable and complete solution for evaluating STM32 MCUs. The kits include the necessary infrastructure to demonstrate specific device characteristics. A HAL library and comprehensive software examples allow for benefiting from device features and added values.discovery boards are **ways for teams to visualise their backlog refinement process**. The best discovery boards consist of a whiteboard or wall divided into columns that reflect the various steps a team takes to get product backlog items ready to be delivered (developed and tested) in an iteration.

DIAGRAM:

BLOCK DIAGRAM:



CONCLUSION:

The automobile windshield wipers based on the intensity of that rain. The demonstration is able to simulate the operation of the system as if installed in an automobile. The team was able successfully complete the project and satisfactorily meet the proposal goal of automating the driver's response to rain within the specified amount of time of 500milliseconds. Though the system functioned as desired, in retrospect then I Would have selected different design approaches. After noticing that more accuracy was required from the IR sensor to adequately detect the intensity of rain the team would have selected a more applicable IR sensor