

REPORT

Abstract

A wiper is a necessary component that cleans raindrops or any other liquid off the vehicle's windscreen. The prior system required manual wiper activation, by changing the frequency. As its results the operation of bringing up the wiper speed is varied. The project's goals are to improve ageing cars' systems by giving automated transmission. Wiping system, to improve the system by incorporating a sensor and actuator, and to create a simple software that would completely operate with the system. The framework This proposed wiper system's principle is comparable to those of other existing conventional wipers. Despite the fact that. This system will be upgraded to an automatic control system using a Peripheral Interface to remove water from the windscreen.

Requirements

SOFTWARE REQUIREMENTS

STM32 CUBE IDE

COMPONENTS

STM32F407VG MICROCONTROLLER BOARD

DESCRIPTION

STM32F407VG

The STM32F407 Kit takes advantage of the high-performance STM32F407 microcontrollers' capabilities to make it simple for users to create audio-based applications. It comes with an ST-LINK embedded debug tool, an ST-MEMS digital accelerometer, a digital microphone, an audio DAC with integrated class D speaker driver, LEDs, pushbuttons, and a USB OTG micro-AB connector. Ethernet connectivity, an LCD display, and other features have been added to the STM32F4 DISCOVERY kit. The STM32F405xx and STM32F407xx families are built around the high-performance Arm® Cortex®-M4 32-bit RISC core, which runs at up to 168 MHz.

FEATURES OF STM32F407VG MICROCONTROLLER

- In a LQFP100 package, the STM32F407VGT6 microcontroller has a 32-bit ARM Cortex-M4 with FPU core, 1-Mbyte Flash memory, and 192-Kbyte RAM.
- On-board ST-LINK/V2 or ST-LINK/V2-A on STM32F4 DISCOVERY (old reference) or STM32F407G-DISC1 (new order code)
- USB ST-LINK with three separate interfaces and re-enumeration capability.

- Virtual Com port Debug port (with new order code only)
- Large-scale storage (with new order code only)
- Board power is supplied through USB or an external 5 V supply source.
- 3 V and 5 V external application power supply.

HIGHLEVEL REQUIREMENTS

Programming language(C language)

Arm based
microcontroller(STM32F40VGT6)

operating system(Windows)

RAM(Min 4GB)

Hard Disk(Min 250GB)

LOWLEVEL REQUIREMENTS

ON-Ignition key

Press Multi-functional
button

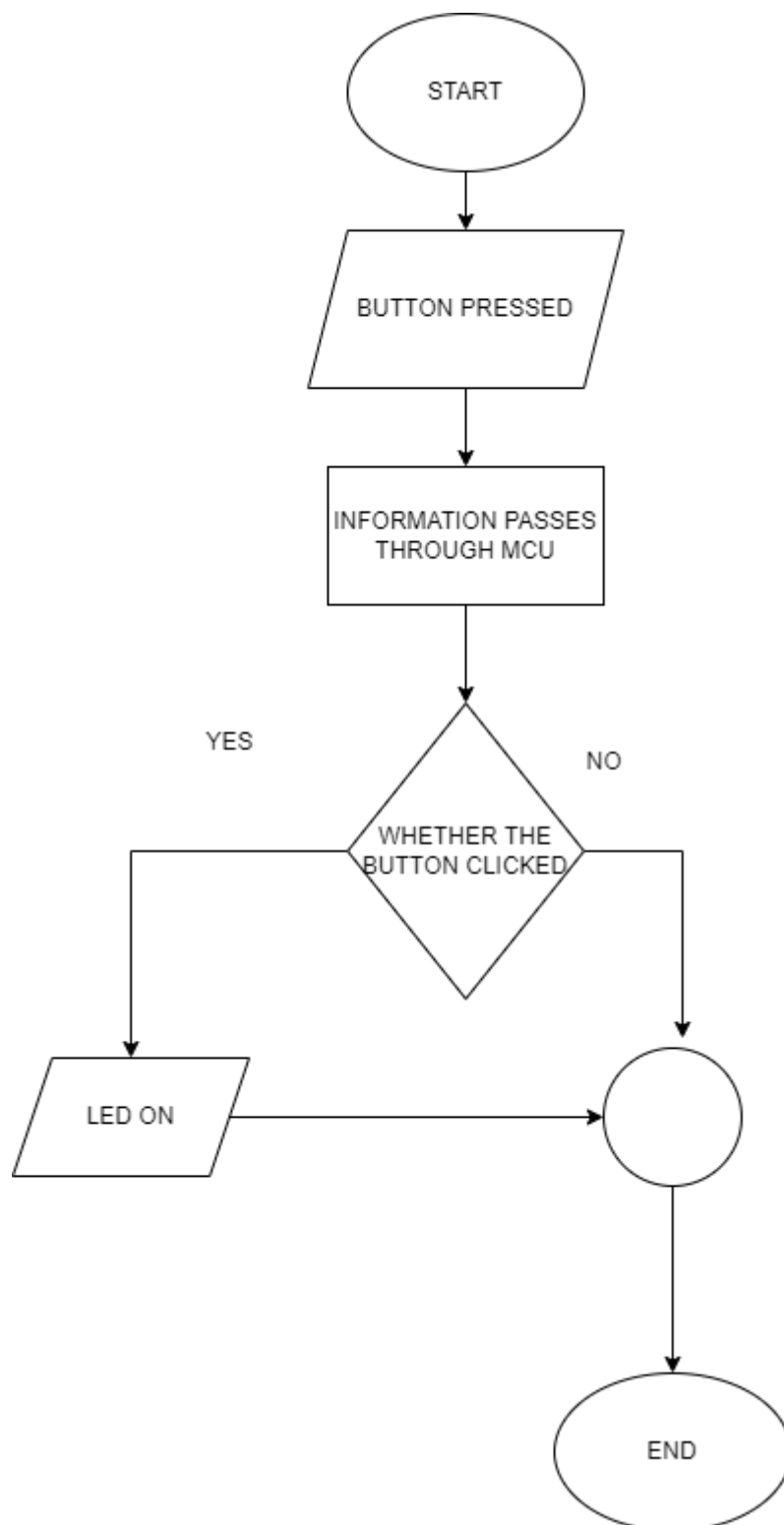
4 Different Color Leds

Timer

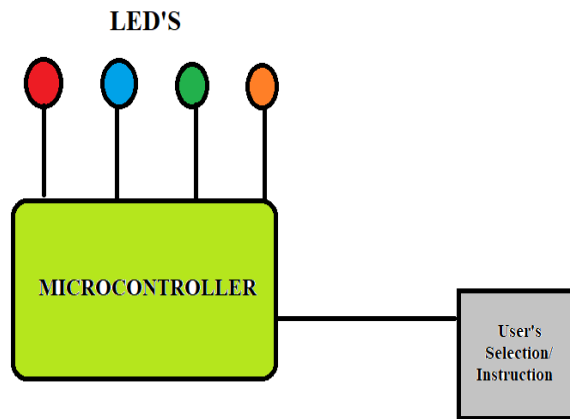
OFF-Wiper button

DESIGN

FLOWCHART



BLOCK DIAGRAM



TEST CASES

High Level Test Cases

Test ID	Description	Exp.i/p	Exp.o/p	Actual o/p	STATUS
1	check if the BUTTTON is pressed	progra m executio n	Microcontroller/Eng ine starts	LED ON(RED)	PASS
2	check if the BUTTTON is pressed	progra m executio n	WIPER starts	LED ON(BLUE)	PASS
3	check if the BUTTTON is pressed	progra m executio n	WIPER starts	LED ON(GREEN)	PASS

Tes t ID	Descripti on	Exp.i/p	Exp.o/p	Actual o/p	STATU S
4	check if the BUTTTON is pressed	progra m executio n	WIPER starts	LED ON(ORANG E)	PASS
5	check if the BUTTTON is pressed	-	Microcontroller/Eng ine stops	LED TURNED OFF	PASS

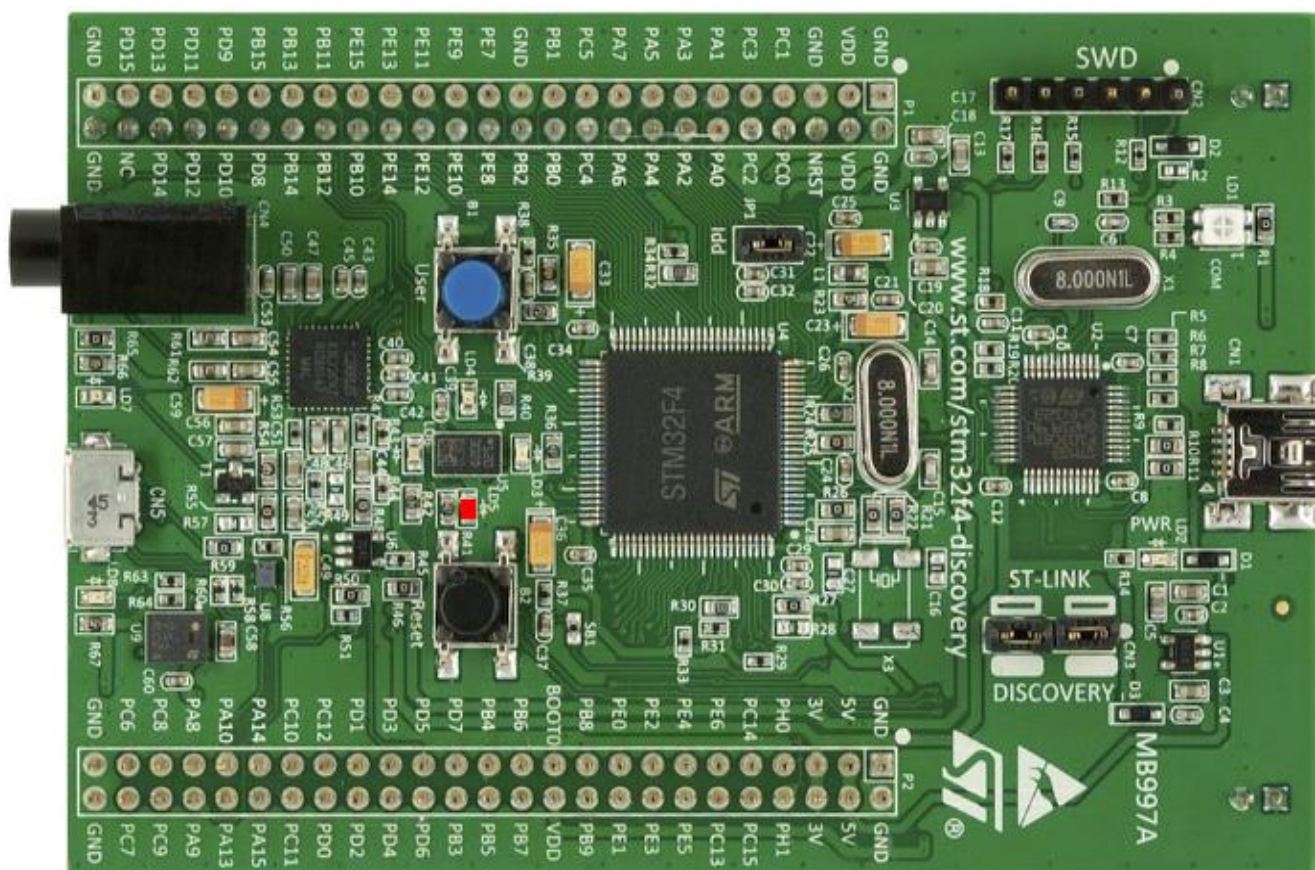
Low Level Test Cases

Tes t ID	Descripti on	Exp.i/p	Exp.o/p	Actual o/p	STATU S
1	check if the BUTTTON is pressed	progra m executio n	Microcontroller/Eng ine starts	LED ON(RED)	PASS
2	check if the BUTTTON is pressed again	progra m executio n	WIPER starts and speed of wiper is slow	LED ON(BLUE)	PASS
3	check if the BUTTTON is pressed again	progra m executio n	WIPER starts and speed of wiper is moderate	LED ON(GREEN)	PASS
4	check if the BUTTTON is pressed again	progra m executio n	WIPER starts and speed of wiper is good	LED ON(ORANG E)	PASS

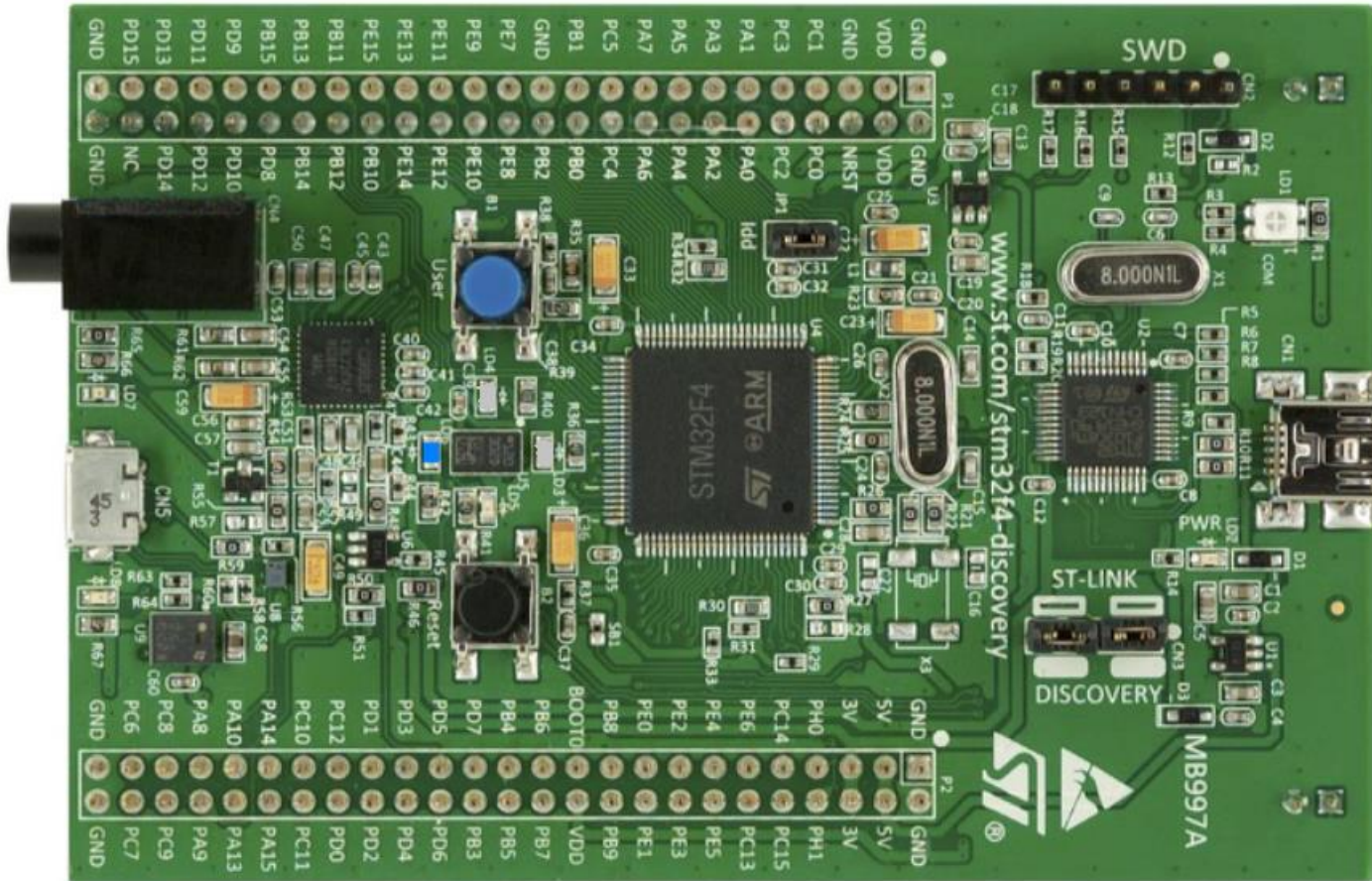
Test ID	Description	Exp.i/p	Exp.o/p	Actual o/p	Status
5	check if the BUTTON is pressed again	-	Microcontroller/Engine stops	LED TURNED OFF	PASS

OUTPUT

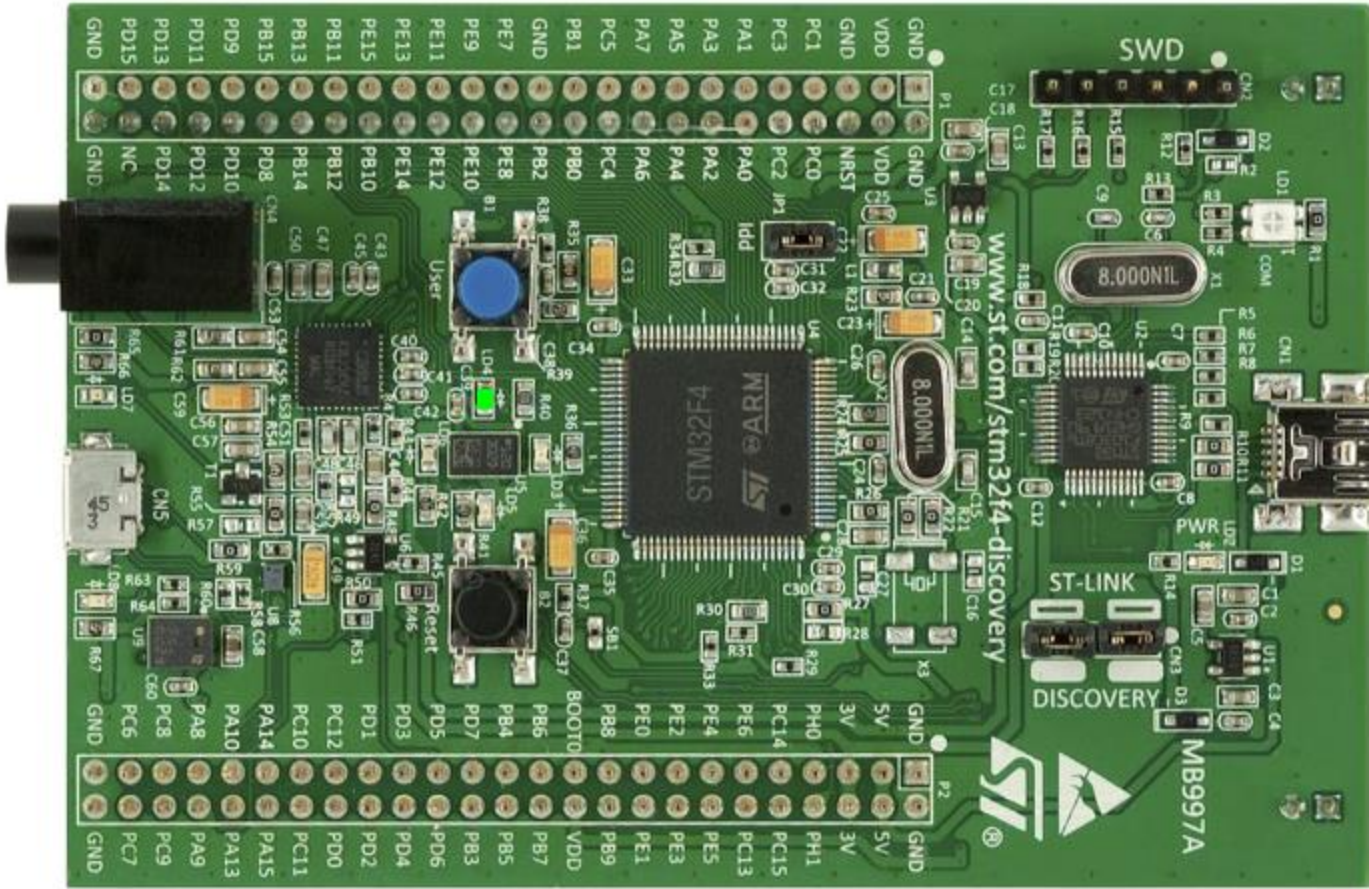
ENGINE ON STATE



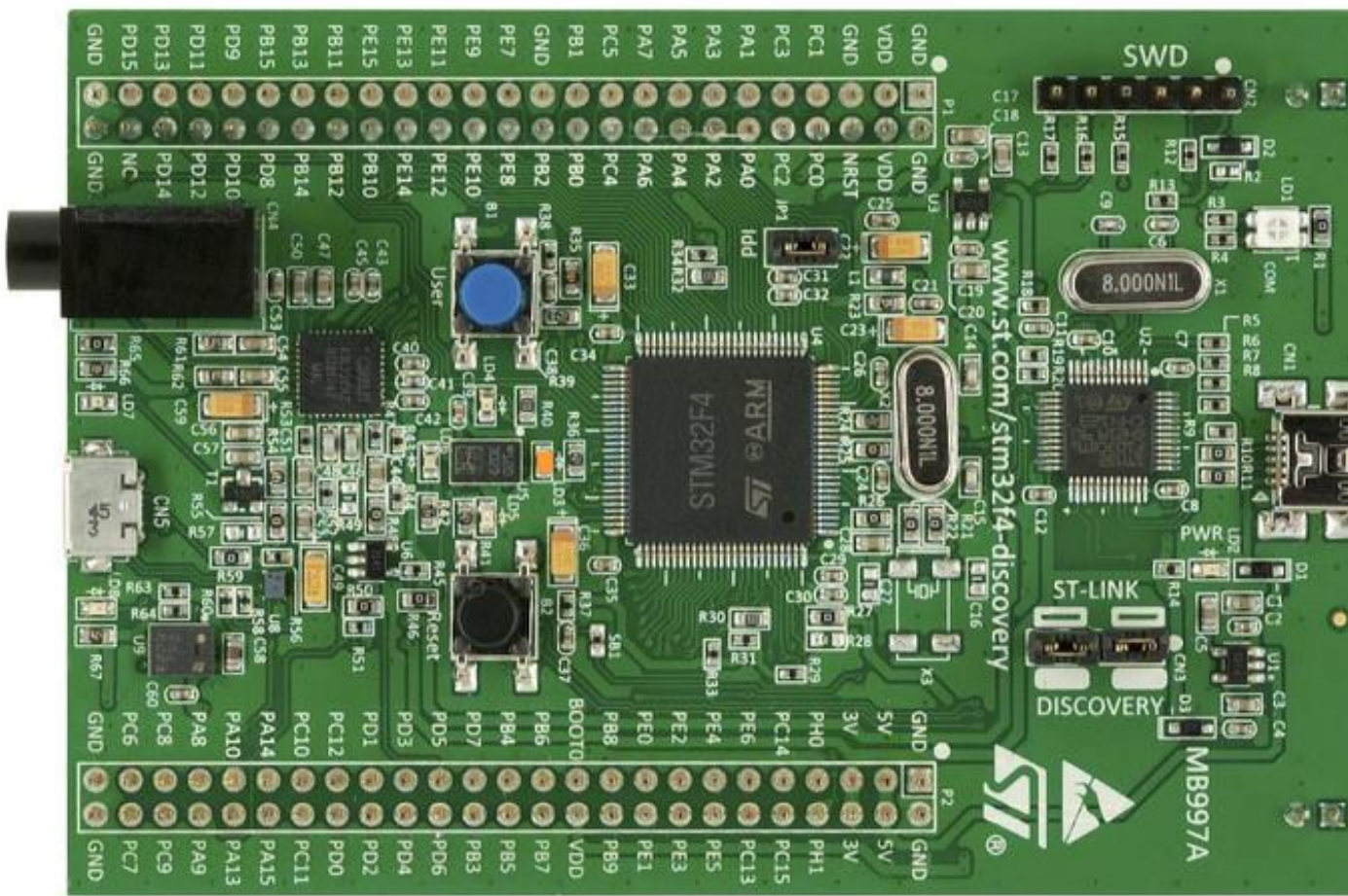
WIPER SPEED IS LOW



WIPER SPEED IS MODERATE



WIPER SPEED IS HIGH



OFF STATE

