

Automatic Burglar alert, Cooling, Lighting and Drapes Control system, (A.B.C.L.A.D.S)

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1. About the A.B.C.L.A.D.S

1.1 Description

- This Project is an **Automatic Burglar alert, Cooling, Lighting and Drapes Control system, (A.B.C.L.A.D.S)** which will be useful for automatic lighting and cooling control system in home and when we are not in home we can activate Buglar alarm which will give a buzz noise alerting people around the home by buzzing noise when someone breaks the Door, When the user sets a required temperature and light intensity this system will automatically controls the Room temperature and Light intensity.

1.2 Identifying features

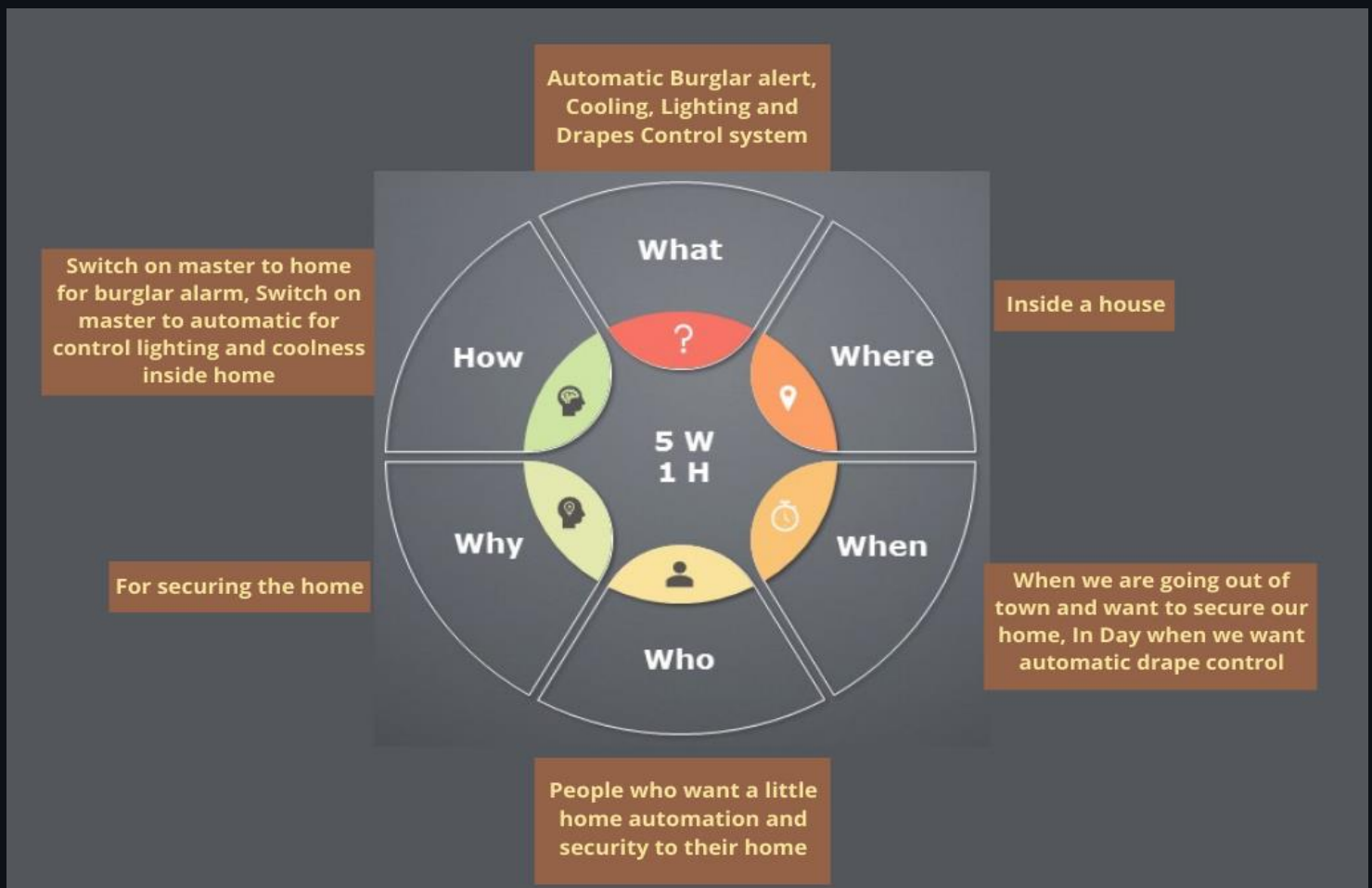
- It shall show how much %of drapes are opened according to room light intensity
- It shall dim/increase light intensity according to room light intensity variation
- It shall change the speed of fan accordingly to the temperature of the room
- When we are not at home it shall be able to sense if door is closed or broken and shall turn on a buzzer

1.3 State of art

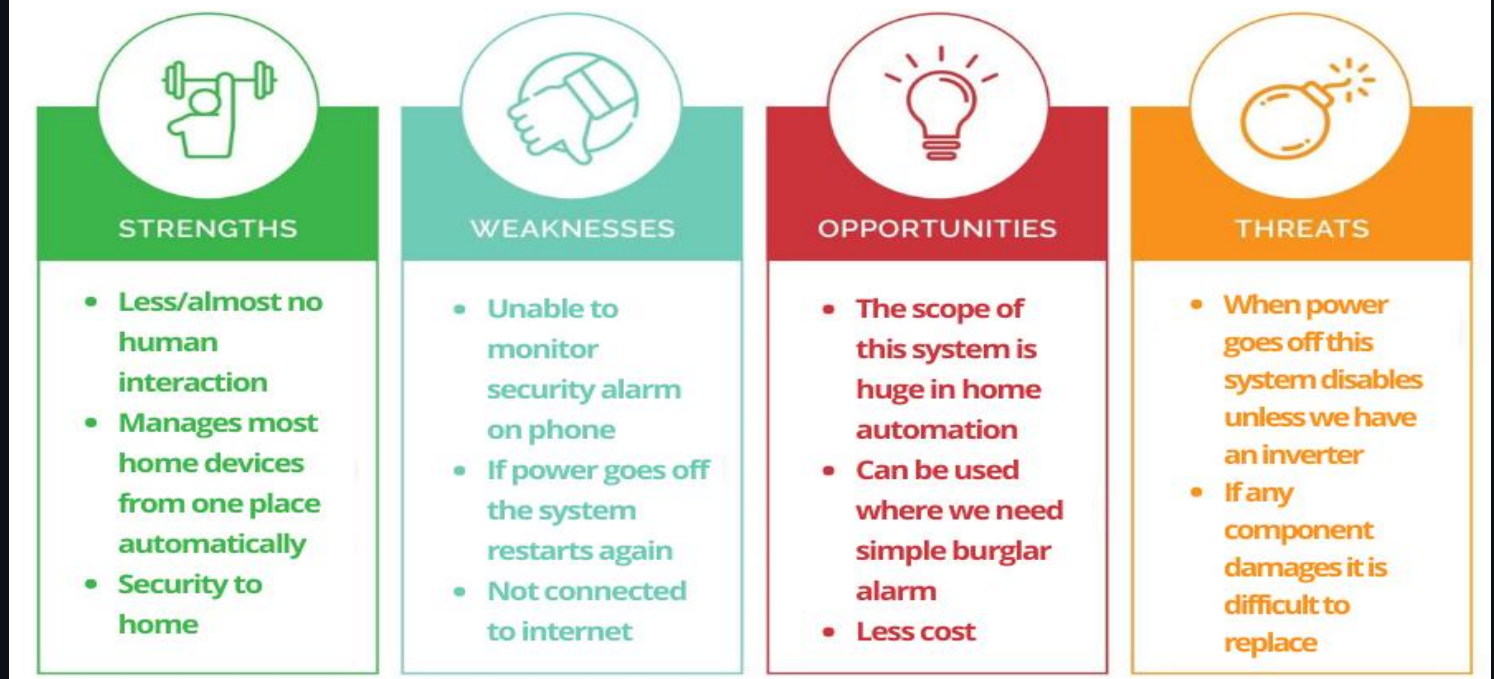
- The main focus point here is the controlling the Home without even touching a single button
- And also securing our home with a reliable **Burglar system**
- Now this two features are combined and made into one product i.e. **A.B.C.L.A.D.S**
- As the world PACE-FORWARD our technology needs to catch up to the world

1.4 5W's & 1H and S.W.O.T analysis is in the below table

5W's & 1H



SWOT ANALYSIS



2 Requirements

2.1 High Level Requirements

ID	High Level Requirements
HLR1	It shall control Lights, Fan Automatically when user selects desired light intensity and Temperature
HLR2	It shall control Drapes Automatically user selects desired light intensity
HLR3	It shall Sound buzzer when door is open and people are not at home
HLR4	It shall display How much %of drapes are open

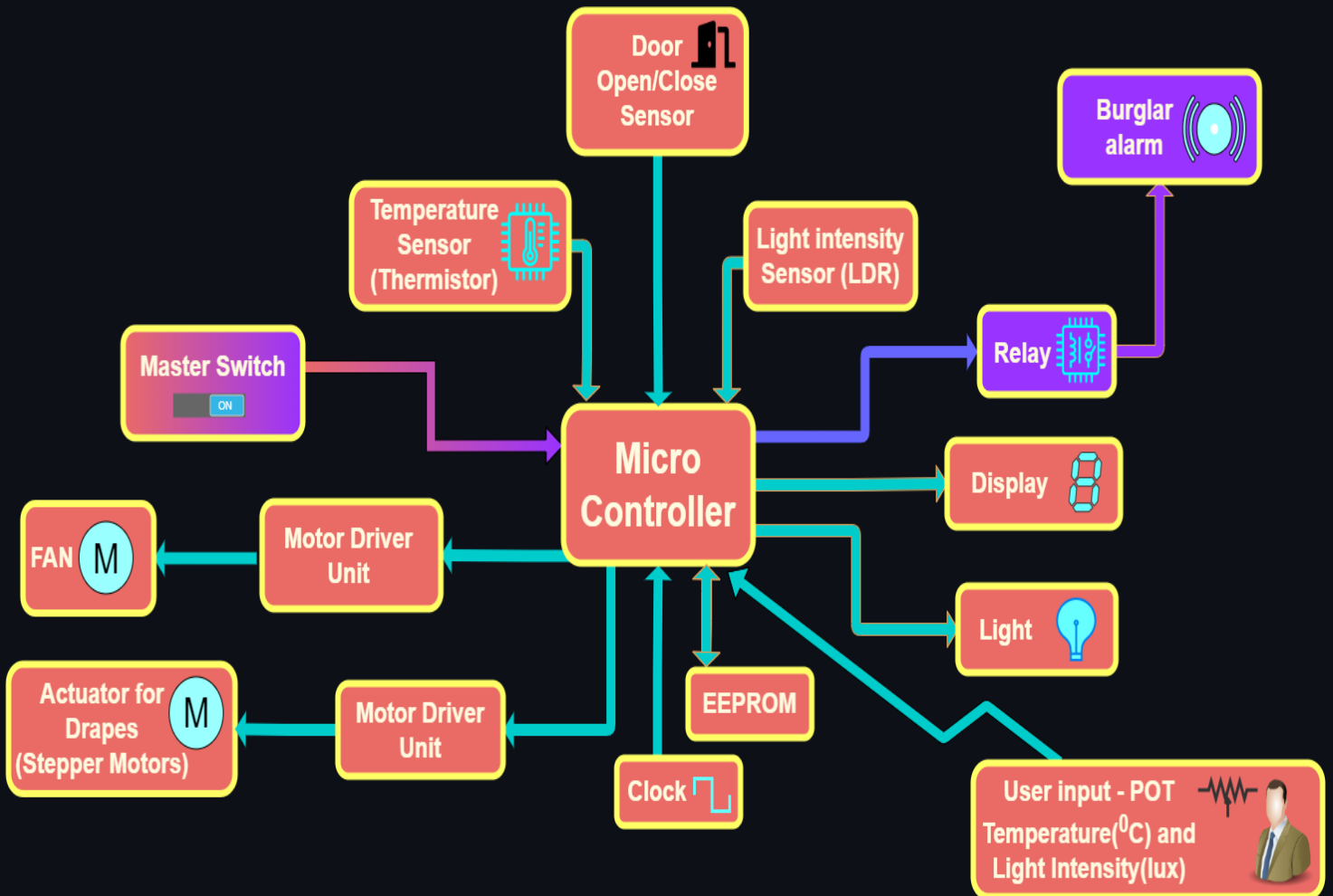
2.2 Low Level Requirements

ID	Low Level Requirements for H1	ID	Low Level Requirements for H2
LLR1.1	According to the values of LDR and User Light Intensity shall control the Drapes position	LLR2.1	According to the values of LDR and User Light Intensity shall control the lights
LLR1.2	According to the values of Thermistor and User Temperature shall control speed of fan	LLR2.2	Position of drapes shall be controlled by Stepper Motor

ID	Low Level Requirements for H3	ID	Low Level Requirements for H4
LLR3.1	The 555 Timer circuit shall send PWM signal to speaker	LLR4.1	It shall be able display the %of drapes opened according to value of LDR
LLR3.2	The micro controller shall activate buzzer circuit and turn off other systems	LLR4.2	It shall be able to convert integer to string for displaying %of drapes

3 Block Diagram and Blocks explanation

- 3.1 BLOCK DIAGRAM



3.2 SENSORS

- Temperature Sensor (Thermistor)**

- This Thermistor is a resistor whose resistance is dependent on temperature here this change in resistance produces change in voltage, this voltage is taken as input to micro controller

- **Light Intensity Sensor (LDR)**

- This LDR(Light Dependent Resistor) is a resistor whose resistance is dependent on intensity of light here this change in resistance produces change in voltage, this voltage is taken as input to micro controller

- **Door Open/Closed Sensor**

- This is actually a micro switch in real world which will send data to micro controller about the door (opened/closed) in our simulation we just used a normal switch

- **Master Switch**

- This switch controls the Burglar alarm and other automations as unit when this switch is on (we ON it when we want alarm)

- **Potentiometer (POT)**

- This is basically used to take user input i.e. Temperature and Light Intensity

3.3 ACTUATORS

- **FAN**

- This is a fan which control the cooling of room by increasing/decreasing it's speed

- **Actuator for drapes (Stepper motor)**

- This is a motor who's direction and angle can be controlled which will inturn controls the DRAPES

- **Relay**

- Here we have used Relay to switch on and off the Burglar alarm system

- **Light**

- The lighting inside the room is controlled by this lights

- **Display**

- Here we have used (Hd44780-26) LCD display for displaying how much %of drapes are opened and how much %of lights are on

3.4 MICRO CONTROLLER AND MEMORY

- **EEPROM**

- Here this is actually inside the microcontroller

- **Clock**

- Here we are using internal clock of our micro controller

- **Micro Controller**

- This is the brain of the system here we use Atmega328 every computation is done inside this controller it converts analog to digital and maps certain values, it controls LCD display, it sends PWM signals to Fan and Stepper motor

3.5 SUBSYSTEM & OTHERS

- **Burglar alarm**

- This system consists of **555 Timer**, some capacitors, resistors and a speaker connected in a specific way to make a buzzing sound

- **Motor Driver Unit**

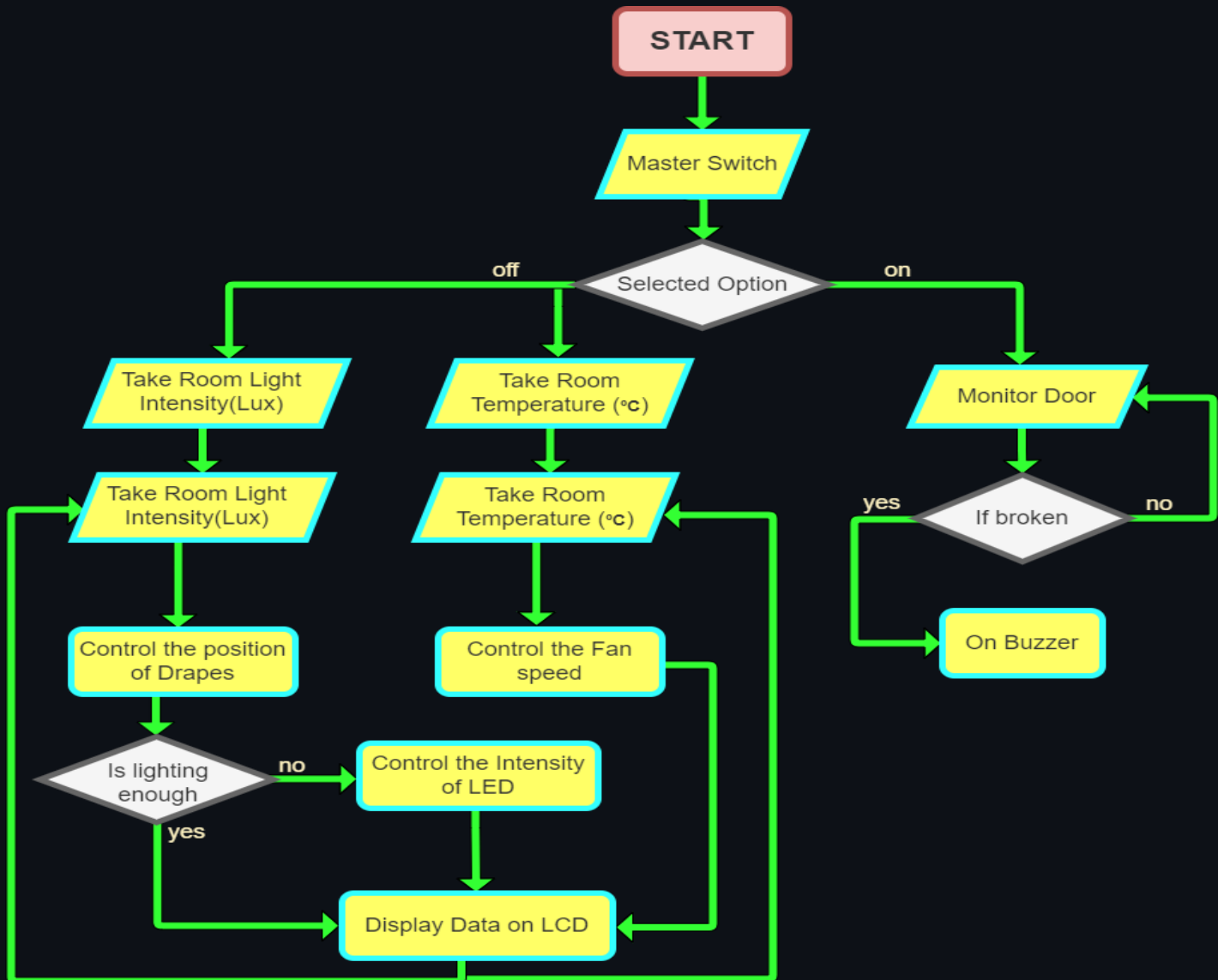
- This unit is different for both Drapes(we use Stepper motor driver i.e. ULN2804) and fan (we use motor driver L293183)

4 Architecture

- 4.1 Behavioral Diagram
 - 4.1.1 High Level Flow chart Behavioral Diagram

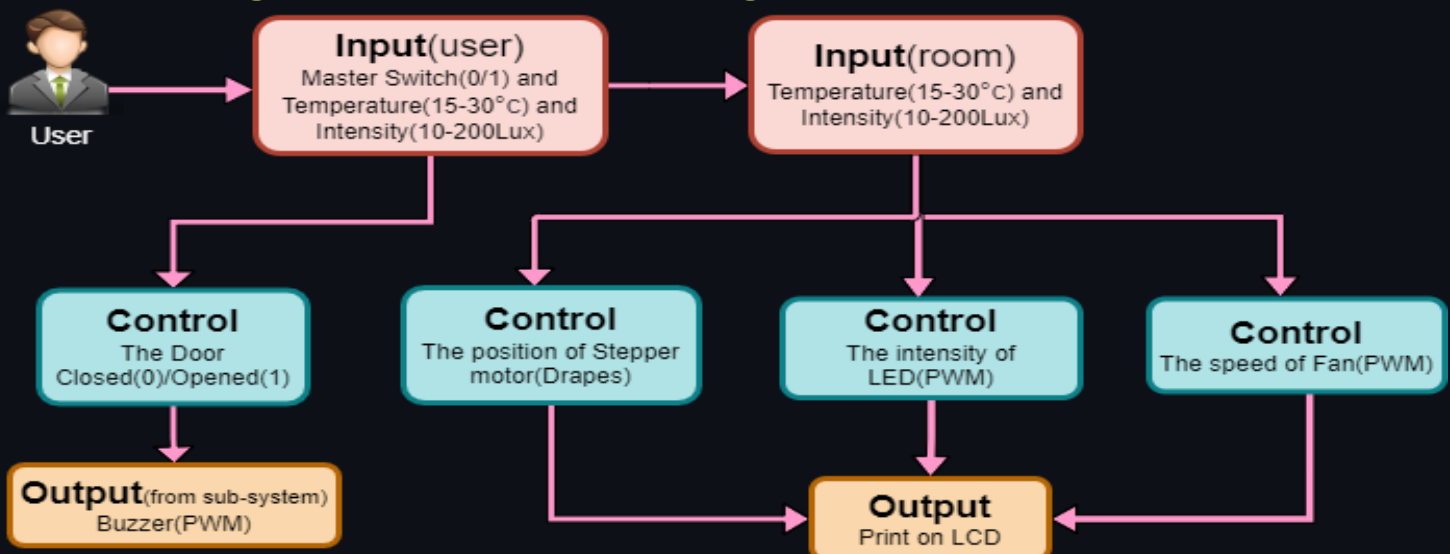


– 4.1.2 Low Level Flow chart Behavioural Diagram



• 4.2 Structural Diagram

– 4.2.1 High Level UML Use Case Structural Diagram



– 4.2.2 Low Level UML Use Case Structural Diagram



5 Test plan and output

5.1 HIGH LEVEL TEST PLAN / Integrated test plan

Test ID	Description	Input	Expected output	Actual Output	Passed or not
01	Temperature	25°C(User) 30°C(room/Thermistor)	Fan speed shall change accordingly	Fan speed shall change accordingly	To be done
02	Light Intensity	200Lux(User) 10Lux(LDR)	100% of drapes opened	100% of drapes opened	To be done
03	Master Switch	on(1)	Shall disable all automation(0)	Shall disable all automation(0)	To be done
04	Master Switch	off(0)	Shall disable Alarm(0) and on Automation(1)	Shall disable Alarm(0) and on Automation(1)	To be done
05	555 Timer and buzzer	Data from Micro controller(1)	Buzzing Sound	Buzzing Sound	To be done

Test ID	Description	Input	Expected output	Actual Output	Passed or not
01	Door Open/Close sensor	5v Or 0v	shall Send 1 to Buzzer circuit	shall Send 1 to Buzzer circuit	To be done
02	LCD display	%(50) of drapes opened and %(50) of lights intensity	"%(50) of drapes opened and %(50) of lights intensity" on screen	"%(50) of drapes opened and %(50) of lights intensity" on screen	To be done
03	Motor Control For	Data from Micro controller(shall	Data from Micro controller(shall	Data from Micro controller(shall	To be

	Stepper (MCFS)	sends values from PORTD to Motor driver)	sends values from PORTD to Motor driver)	sends values from PORTD to Motor driver)	done
04	Motor Control For Fan (MCFF)	Data from Micro controller(PWM from Controller to Motor Driver)	shall Change speed of fan (PWM)	shall Change speed of fan (PWM)	To be done
05	Stepper motor	Data from MCFS To Stepper	shall change position of Stepper Motor	shall change position of Stepper Motor	To be done

5.2 LOW LEVEL TEST PLAN / Unit test plan

Test ID (for LCD)	Description	Input	Expected output	Actual Output	passed/not
01	Check for LCD_Char()	N	N	N	To be done
02	Check for LCD_String()	automation	automation	automation	To be done
03	Check for LCD_String()	Home	Home	Home	To be done

Test ID (for ADC)	Description	Input	Expected output	Actual Output	passed/not
01	Check for ADC_Read()	To be done	To be done	To be done	To be done
02	Check for ADC_Read()	To be done	To be done	To be done	To be done

Test ID (for mapping, map)	Description	Input	Expected output	Actual Output	passed/not
01	Check for map()	To be done	To be done	To be done	To be done
02	Check for map()	To be done	To be done	To be done	To be done
03	Check for map()	To be done	To be done	To be done	To be done

6 Applications

- The scope of this project is vast in the area of home automation
 - Home security and when people want automatic home lighting and cooling system along with Intruder alert
 - In factories and function halls
 - In Schools and Collages to save energy
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