Smart Home Project using

Cortex M4 STM32F401TXve

Team Members:

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About:

- It is a popular project nowadays, it is a very comfortable application for humans, it aims to convert anything around to be controllable and smart.
- Project features:
  - Remotely controlled by mobile.
  - Locally controlled without mobile use LCD and Keypad.
  - The controlled components are 5 lamps “4 on/off lamps, one dimming lamp”, door, air conditioner according to the ambient temperature.
  - TFT is used to display the real time visualization of system
  - Edit password at runtime.
  - If entered passwords were wrong more than 3 trials, the system must break down and fire alarm then call police immediately.

Specifications:

(1) Bluetooth & keypad:

We can control system locally and remotely

- Keypad for controlling the system locally
- Bluetooth for controlling system remotely from any Bluetooth device.
    - Transmitting/Receiving between MC and PC/mobile.
    - Every action, Message must be printed on Mobile/PC screen.
    - Transmitting/Receiving the commands to run the system.

(2) LCD & TFT Displays:

- Displays is used as an indicator for the user for each system stage.
- There are 4 main taps
    - Password tap
    - Welcome tap
    - Wrong input tap
    - Calling police tap
    - Password change
- After login, user can control all features.
- The interfacing of TFT displays the real time visualization and animation for each system component status.
- For future update we can use TFT as touch pad to control the system remotely.

(3) LED, & Dimmer:

- There are 5 lamps “4 on/off lamps and one brightness controlled lamp”,

(4) Temperature Sensor, DC motor:

- Temperature sensor reads the ambient temperature, if the temperature is higher than selected temperature, DC motor (Air conditioner) will run until it reaches the selected temperature.
- DC motor is Automatically controlled according to selected temperature at run time.

(5) Door:

- a servo motor (Door) is used to control the opening and closing of the door.

(6) Password change:

- It’s used to edit the user password through keypad or Bluetooth.

(7) System lock:

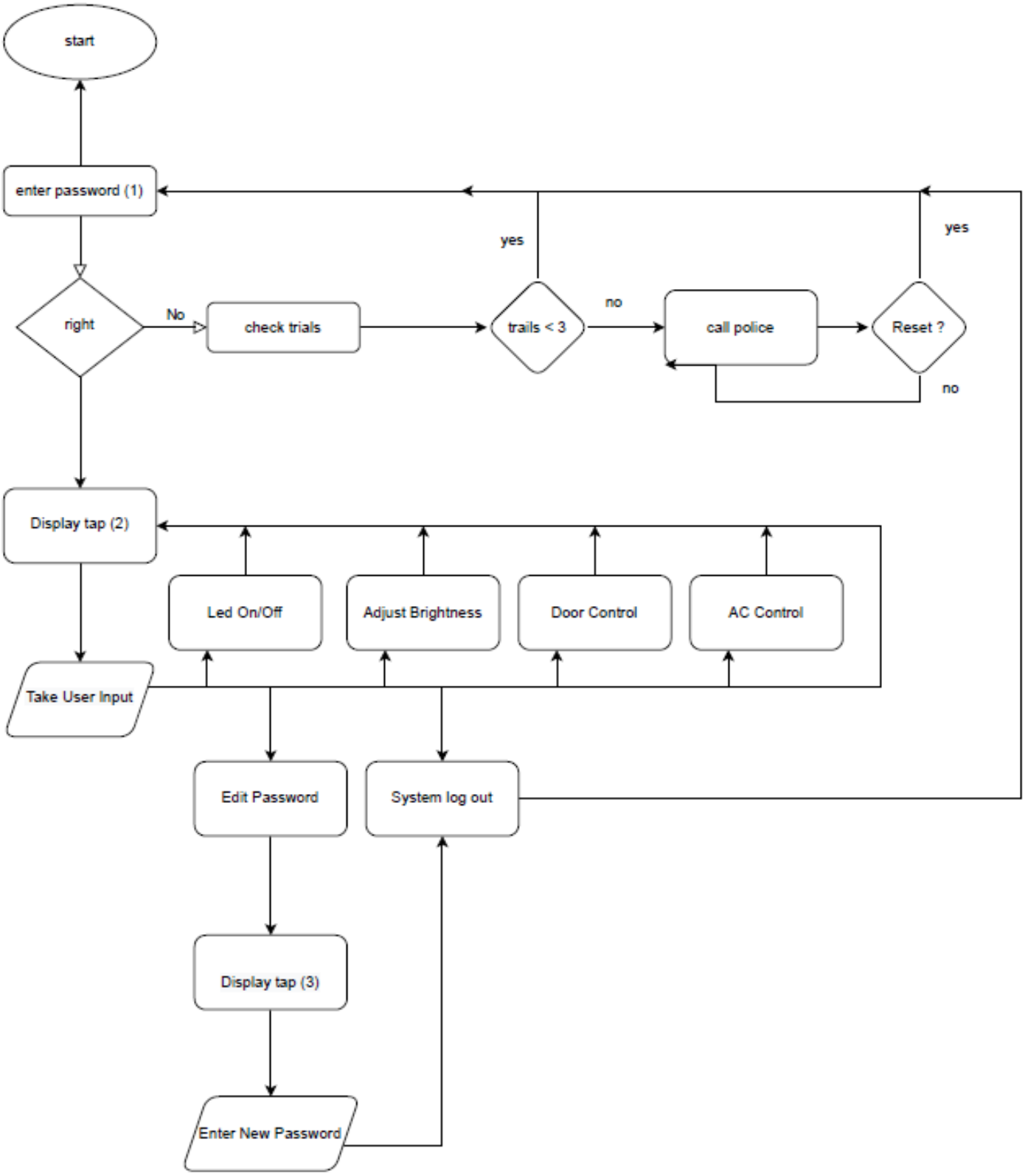
- It’s used as a safety feature to logout from the system.

Component involved:

(1) Microcontroller STM32F401TXVE.
(2) 24C08 EEPROM(Optional).
(3) Bluetooth module HC 05.
(4) LM35 temperature sensor or equivalent.
(5) DC motor(L293D)
(6) 5 LEDS.
(7) Keypad, Lm01602A Character LCD and ILI9341 TFT.
(8) Servo motor.

Smart Home Flow Chart Diagram:

- This flow chart discusses the project and defines how the project is run.



Protues simulation: