**Fire Alarm System AVR**

Fire Alarm System Controlled by MCU AVR Microcontroller

**Software Architecture Layers :-**

APP -> { main.c+ TEMP\_Filter.c }

LIB -> { MemMap.h+ StdTypes.h+ Utels.h}

HAL -> { LCD\_Interface.h+ MOTOR\_Interface.h+ Keypad\_Interface.h}

MCAL -> { DIO\_Interface.h+ ADC\_Interface.h}

CFG -> { DIO\_Cfg.h+ MOTOR\_CFG.h+Keypad\_CFG.h+LCD\_CFG.h }

**System Features:**

**1- Security System :**

user have a Password Saved in configurable global variable at Start of System The Program ask User Password user have one try only to enter the correct password. after try out of Rong Password the System will Alarm by Turn On Buzzer and Close the System. if user entre the correct Password the System will Open Temperature sensor and get the status.

**2- Temperature System Alarm :**

In this Mode the System of use **LM35** to transducing temp from 0:5V representative to 0oC:50oC with **ADC** **10-bit Resolution** with PRESCALER CLK/64.

the MCU use **Main Filter** To take 10 symbols of Reads and get filtering of data to fare away any flash effect on ADC or signal noise.

**3- Smoke Detection :**

In this Mode the System of use **MPX4115** to transducing Pressure referred to Smoke transfer from **55:976 ADC linear Read on carve representative 15Kpa:115Kpa** with **ADC** **10-bit Resolution** with PRESCALER CLK/64.

Using **Interpolation function,** I made my calculation to smoke%.

the MCU use **Main Filter** To take 10 symbols of Reads and get filtering of data to fare away any flash effect on ADC or signal noise.

**4- Fan Motor Control :**

In this Feature Fan will operating with H-Bridge Interface, with **L293D** to control of power polarity.

**Control Loop Status**:

* Temperature Read ]20oC:50oC] >> “LCD display ALL IS FINE” Green LED is On.
* Temperature Read ]50oC:∞oC[ >> “Heat Detected” and Yellow LED is On,
* Heat Function Is use **Hysteresis** **control Mechanism** to 45oC **Reversable** Function.
* Smoke will display after Heat is more Than 50oC.
* Smoke Read More than 50%

1. Smoke alarm Is displayed On LCD “SMOKE Detected”.
2. Red LED will On.
3. Fan Motor is on CW.
4. If smoke is on it will not be **Unreversible** function.

**Components** :-  
{ atmega32 +LCD16x2 + Keypad + Motor + LM35 (Temp) + MPX4115 (Smoke) + LEDs }