Low Cost Fire Detect System

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ABSTRACT

Fire alarms are used in the event of a fire or fire drill. They are activated either manually or automatically. After the fire protection goals are established–usually by referencing the minimum levels of protection mandated by the appropriate model building code, insurance agencies, and other authorities–the fire alarm designer undertakes to detail specific components, arrangements, and interfaces necessary to accomplish these goals. This paper specifies various circuits for detecting fire.

Keyword: Fire, code, Module

1. INTRODUCTION:

An automatic fire alarm system is designed to detect the presence of fire by changes associated with combustion. Fire alarm systems are used to notify people to in the event of a fire or other emergency, to request such civil defense as fire brigade's emergency services,and to send digital signals to the associate systems interface to control the spread of fire and smoke. Fire Alarm Detection Systems are classified as either Conventional or Analogue Addressable.

Requirements for Proper use of Fire Alarm Detection Systems For residential applications, smoke detectors should be installed outside of each separate sleeping area in the immediate vicinity of the rooms and every additional story of the family living plan, including basements and excluding crawl spaces and remaining attics. Smoke detectors should be installed and activated in sleeping rooms in new construction and it is recommended that they should also be installed in sleeping rooms in existing construction. It is recommended that more than one smoke detector should be installed in a room hallway if it is more than 30 feet long. It is suggested that 136 Manav Jain et all there should never be less than two smoke detectors per apartment. It is suggested that smoke detectors be located in any room where an alarm control is located, or in any room where alarm control connections system to an AC source or phone lines are made. If detectors are not so located, a fire within the bedroom could prevent the control from reporting a fire. All fire alarm systems are require notification devices, including sirens, bells, horns, and/or strobes. In apartmential applications, each automatic alarm initiating device when activated should cause the operation of an alarm notification device that should be clearly audible in all rooms over ambient or background noise levels) with all intervening doors closed. It is suggested that a smoke detector with an integral sounder (smoke alarm) be located in every bedroom and an additional notification device be located on each level of a residence. The most common cause of an alarm system not functioning when a fire occurs is without mannerwise maintenance. As such, the alarm system should be tested weekly once to make sure all sensors and transmitters are working properly. Although designed for long end, fire alarm devices including smoke detectors may fail at any time. It is recommended that residential smoke detectors should be changed every 10 years. Any smoke detector, fire alarm system or any component of that system which errors should be repaired or replaced immediately

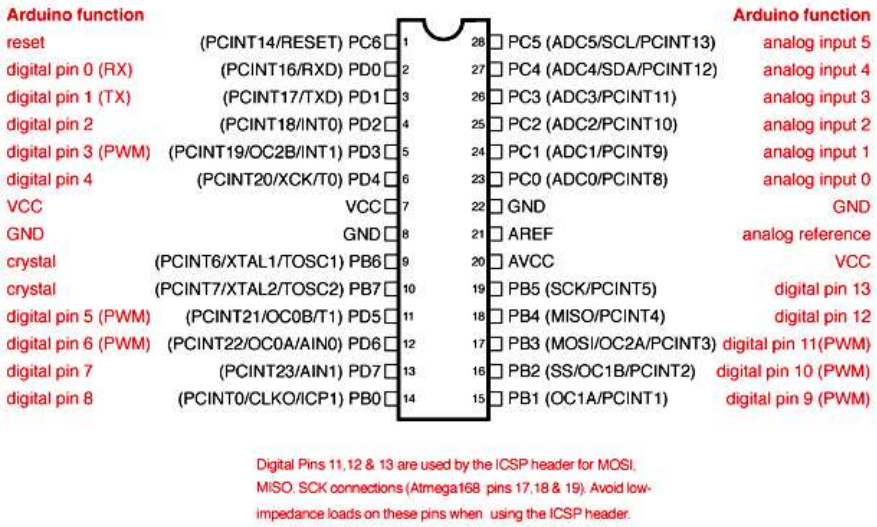
Operating voltage of it is a 5 v. Recommended input voltage is set as a 7-12v . Input voltage limit is 6-20 analog input pins are 6(A0 -A5). Digital I/O pins are of 14(out of which 6 provides PWM output). DC current on I/O pins 40mA. DC current applied on 3.3V pin 50mA. Flash memory is 32 kB. SRAM is 2kB. EEPROM 1 kB. Frequency measured (clock wise) 16 MHz

. Low Cost Fire Alarm Circuit When there is a fire breakout in the room the temperature increases automatically. This ultra-compact and low-cost fire alarm detection senses fire breakout based on this fact. Transistor BC177 (Q1) is used as for the fire sensor here. When the temperature get increases the leakage current of this transistor also

increases. The circuit is designed so that's why when there is an increase in the leakage current of Q1, transistor Q2 will get biased.. The load can be connected through the C, NC, NO points of the relay according to as your need. Fig. 2: Low cost Fire Alarm Detection Circuit. The calibration can be done using a soldering iron, and a thermo meter as required. The operations applied are: Switch ON the power supply. Keep the tip of soldering iron of near to the Q1. Same time also keep the thermometer and close to it. When the temperature reaches your desired value adjust R1 that it so relay gets ON. Done!.

Arduino Uno

It is a microcontroller board based on AT mega328P microcontroller devicer. Along with microcontroller it consists other devices such as serial communication, crystal oscillator, voltage regulator, etc. to support the microcontroller. Arduino Uno consist of 14 digital input/output pins, 6 analog input pins, a USB connection, A Power support jack, an ICSP header and a reset button.

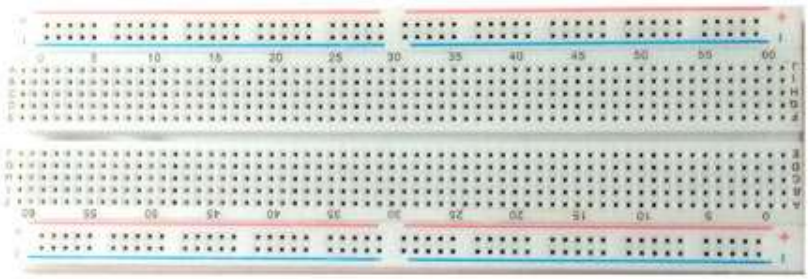


2.2.2 Bread board

A breadboard is a arrangement base for prototyping of electrical components. Originally it was a bread board, a polished piece of wood used for cutted bread. In the 1970s the soldering less breadboard became available and till the day the term "breadboard" is commonly used to refer to these.

Because the soldering less breadboard does not require soldering, can be usable. This makes it easy to use for creating temporary prototypes and experimenting with circuit design. For this reason, solderless breadboards are also popular with students and in technological education. Older breadboard types did not have this property. A stripboard (Veroboard) and similar prototyping printed circuit boards, which are used to build semi-permanent soldered prototypes or one-offs, cannot easily be reused. A variety of electronic systems may be prototyped by using breadboards, from small analog and digital circuits to complete central processing units (CPUs)

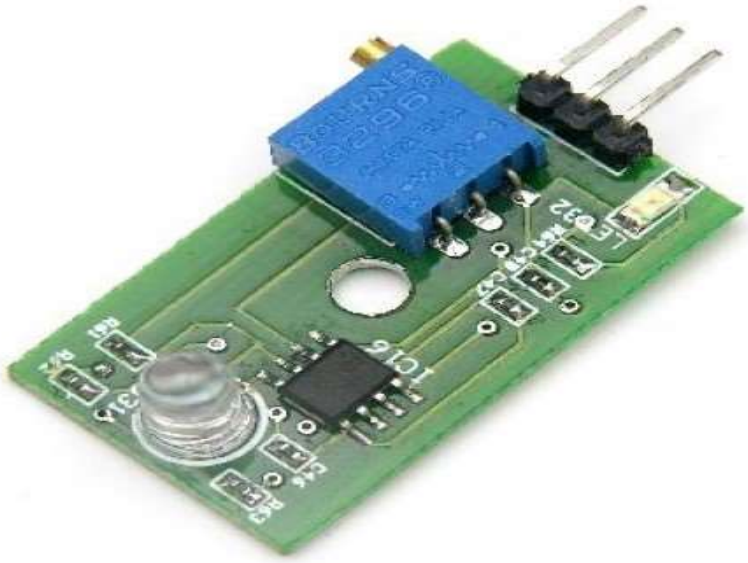
It **is** bunch of small holes and is used for building and testing circuits. It has holes are connected internally in a particular pattern as shown in the figure. The holes are connected through black line represents they are connected internally.



Features and Specifications

- 2 Distribution Strips, 200 tie-points
- 630 tie-points in IC/ circuit areas
- ABS plastic with color legend
- Dimension: 6.5*4.4*0.3 inch
- Hole/Pitch Style: Square wire holes (2.54mm)
- Rating: 300/3 to 5Amps
- Insulation Resistance: 500MΩ / DC500V
- Withstanding Voltage: 1,000V AC / 1 minute

Fire Sensor



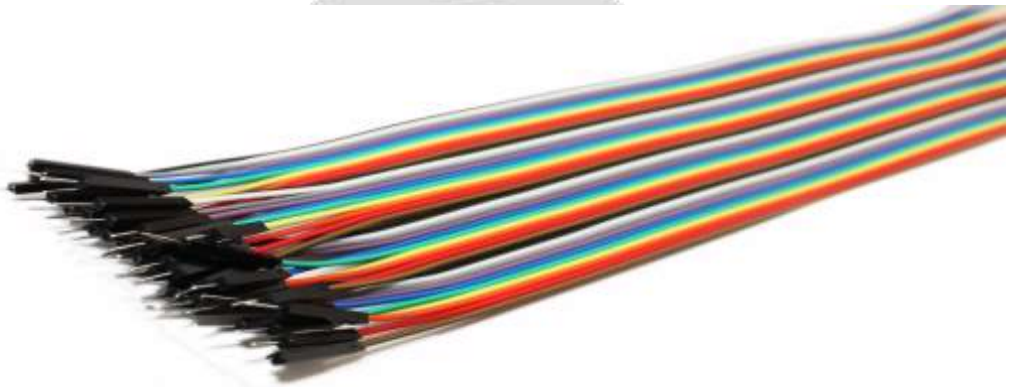
Responses to a detected flame depend on the activation, but can include sounding of an alarm, deactivating a fuel line (such as a propane or a natural gas line), and activating a fire detection suppression system. When used in applications such as industrial furnaces, their role is to provide confirmation that the furnace is working in

mannerwise or properly; in these cases, they take neither direct action beyond sending the operator or control system. A fire detector can often respond faster and more accurately than a smoke or heat detector due to the mechanisms it uses to detect the flame.

2.2.4 Jumper pins

A jump wire is an electrical wire, or grouping of them in a cable, with a connector or pin at each end (or sometimes without them – simply "tinned"), which is normally used to interconnect the components of a breadboard or other prototype or test circuit, internally or with other equipment or devices, without soldering.

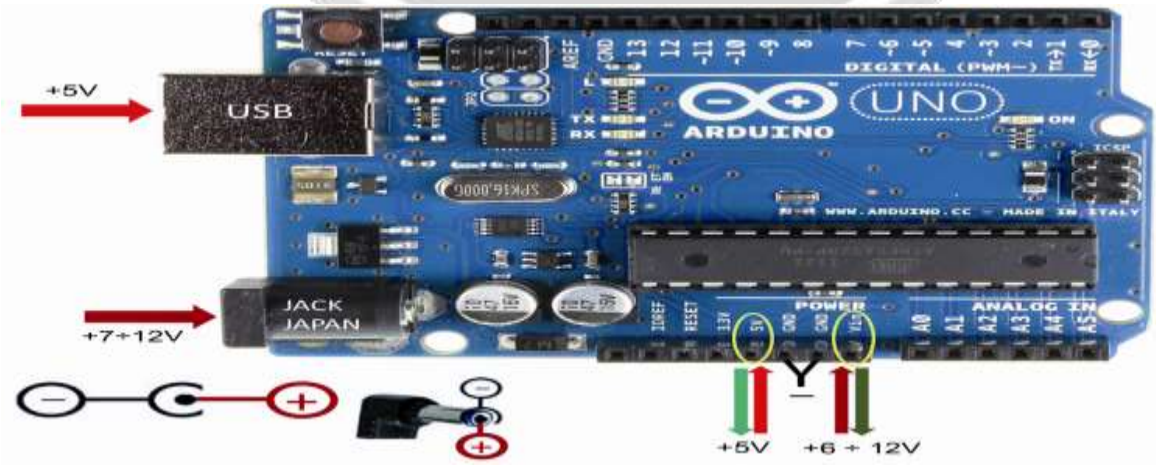
Independent jump pin or wires are set by inserting their "end connections" into the slots specialized in a breadboard, the header connector of a circuit board.



2.2.5 Power Supply

The power supply gives +5v and +12v supply to the required circuit. The power supply can be of four stages namely transformer, rectifier, filter, and regulator. Transformer

giving output of 15v at the secondary stage. This 15v AC is rectified by bridge rectifier including of four diodes, which converts the AC wave into fully rectified wave. The next stage is the filter stage consisting of capacitor, which changes the fully rectified wave into the DC wave with some ripple. Last stage is the regulator stage. Regulator caught out the entire ripple and gives pure DC.



Conclusion

Thus electronic circuits can be designed for the flame based alarms and they provide very high efficiency and can be used for the security reasons. Early fire detection system is best taken by the installation and maintenance of fire detection equipment in all rooms and areas of the house or building. The various circuits explained in the paper can be used.
In future scope we can put fire sensors so that in case of fire, the doors will automatically get open.

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