

# Project Report on Electronic Eye for Modern House

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**Abstract**— The system of Electronic eye is the microcontroller based door image capture security system for home and offices. It provides the user with efficient and reliable security system for door image capture for home, offices and industries it use of an sensor at the door which capture and send the signals to control unit of electronic eye with buzzer alarm for security purpose as soon as the door opens with image capture at the output of laptop or pc with VB application. Security is primary need with day to day. This paper describes effective security alarm system that can monitor image capture system with the help of VB application. As door opens sensor gets activated and capture the image with the help of web camera which is mounted on door in PC captured image gets saved within VB application. It also serves function of sensing and detecting false intrusion. The term false intrusion here is used to mean any form of attempt to gain entry without proper pre design protocols.

**Key words:** Modern House, Electronic Eye

## I. INTRODUCTION

Control system for modern house is based on the Intel's 8051 family of microcontroller using Atmel at 89C51 microcontroller since this has four ports and is most suitable for our project. Its standby current is also low compared to 89c51. The project for the modern house is implemented for security purpose and the different things are considered while implementation.

A. *Project consist Microcontroller interface with different units:*

The functional units of projects are

- 1) LCD Display
- 2) Arrival at door detector
- 3) Smoke/fire detector
- 4) Mail indicator
- 5) Audio and Visual indication
- 6) Overhead tank overflow detector.
- 7) Serial interface for GSM modem
- 8) Regulated power supply

B. *Microcontroller 89C51RD2*

The device has four 8-bit I/O ports; three 16-bit timer/event counters a multi-source a four-priority-level. Nested interrupt structure. An enhanced UART on-chip oscillator and timing circuits the added features of 89C51 make it a powerful microcontroller for applications that require width modulation, high-speed I/O and up/down counting capabilities such as motor control. The embedded microcontroller used here is 89C51 microcontroller since this microcontroller has in-built peripherals it is called as embedded controller. the 89C51 microcontroller is a derivative is a derivative of 8051 microcontroller whose architecture and instructions are same 8051 microcontroller

with some added facilities GSM technology can provide a sophisticated theft alert system.

## II. BLOCK DIAGRAM

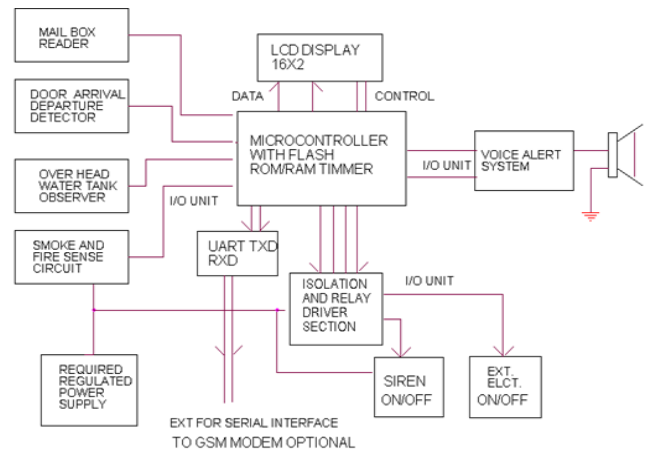


Fig. 1: Block Diagram of Electric Eye For Modern House

A. *Mail Box Reader:*

It uses infrared diode and phototransistor. Infrared (IR) diodes operate by converting electric current into infrared light. Infrared detectors do the opposite; they detect infrared light by turning infrared light into an electric current. The electric current generated by an infrared detector is a signal that indicates infrared light.

Infrared light is electromagnetic radiation similar to visible light, which is measured by wavelength in nanometers (nm). IR is a longer wavelength. (above ~720nm) and is invisible to the naked eye. It can be used to form images with common digital sensors such as charge-coupled devices (CCDs) chips found in digital cameras and even cell phones with cameras. Infrared sensors are used to interpret remote television and audio controls. Among their other uses are motion detectors and automatic door openers.

Light-emitting diodes (LEDs) produce light when they receive an electric current. The energy of electrons in the electric current is converted to light. Different types of LEDs produce different wavelengths of light. Infrared LEDs produce light in the range of infrared. You can "see" infrared light through imaging with a digital camera. If you focus on the transmitter on the front of the remote and press a button, the infrared signal will appear on the digital camera's display screen as a white or pink light. Infrared detectors are also LEDs. They are wired differently so that they convert incoming infrared light to an electric current. The current is sent to a device that reads the current to determine the strength of incoming light, or to interpret signals meant to control a television, for example IR detectors can be made more sensitive through electronics. Amplifiers make IR detectors extremely sensitive so that even very faint signals are recorded. Sensitivity can be adjusted so a detector is suitable for its anticipated purpose.

When the letter is coming in the letter box, infrared signal interrupt & detector detects the interrupt signal & gives input to microcontroller. And the output is displayed & the announcement is given through speaker.

#### B. Door Arrival/Departure Detector:

Same components are used in this unit as used in the mail box reader unit. The same operation or working is done in this unit. It uses infrared diode and phototransistor. Infrared (IR) diodes operate by converting electric current into infrared light. Infrared detectors do the opposite; they detect infrared light by turning infrared light into an electric current. The electric current generated by an infrared detector is a signal that indicates infrared light.

Infrared light is electromagnetic radiation similar to visible light, which is measured by wavelength in nanometers (nm). IR is a longer wavelength (above ~720nm) and is invisible to the naked eye. It can be used to form images with common digital sensors such as charge-coupled devices (CCDs) chips found in digital cameras and even cell phones with cameras.

#### C. Observer Head Water Tank Observer:-

There are four probes in this unit of the water tank observer. One probe is common at base of the water tank, the common probe is of red color. One probe is fixed at slightly above the base is of yellow color. One probe is fixed at the top level which is of green color it is the overflow level or the tank is overflow. One probe is fixed at the middle level of the tank it is of blue color. when the water level is up to the yellow probe then the tank is empty the signal is given to the microcontroller as input. And the output is given to the LCD display and the message "Tank is empty" is displayed on the display. When the water level is up to the green probe then the tank is full the signal is given to the microcontroller as input. And the output is given to the LCD display and the message "Tank is full" is displayed on the display.



Fig. 2: The principle of level sensing of Water Level Controller System

The automatic controlling of water level in storage tank is an old concept but the technology adopted to do so is advancing continuously. Various methods were used to sense the water level in the storage tanks which includes mechanical float ball attached to an electrical limit switch, plastic molded reed relay arrangement, direct sensing of low voltage DC electrical signals, etc. All of them had one or the other disadvantages or needed periodical maintenance to

keep the system working. This even affected the reliability of the Level Controller systems. We have developed the most advanced yet cost effective method of Level Sensing, known as ac signal sensing. This is based on the principle of Conduction through Water wherein 1.5V 100 Hz AC signal will be sent to the water, and the sent signal will be received through the level sensors set at desired levels. This type of sensing will not result in any corrosion of sensors and deposition of salt on the surface of sensors. This will have an advantage that sensors need not be periodically cleaned or changed. As there are no moving parts, the dirt in the water will not affect the performance. The Sensors which are used will have life more than a decade and absolutely does not need any maintenance.

#### D. LCD Display:



Fig. 3: LCD Display

A liquid crystal display (LCD) is a thin, flat panel used for electronically displaying information such as text, images, and moving pictures. Its uses include monitors for computers, televisions, instrument panels, and other devices ranging from aircraft cockpit displays, to every-day consumer devices such as video players, gaming devices, clocks, watches, calculators, and telephones. Among its major features are its lightweight construction, its portability, and its ability to be produced in much larger screen sizes than are practical for the construction of CRT display technology.

#### E. Voice Alert System:

Voice acknowledgement is provided by the APR 9600 (IC). It is a single-chip voice recording and playback device that can record and play multiple messages at random or in sequential mode for 60 second. The user can select sample rates with corresponding-quality recording lengths. Microphone amplifier, automatic gain control (AGC) circuit, internal antialiasing filter, internal output amplifier and message management are some of the features of the APR9600.

Here the APR9600 is configuring in random-access mode, which supports two, four and eight message of fixed duration. The length of each message is the total recording length available divided by the total number of memory segment / tracks enabled. The segments are enabled through port 3 of the controller.

Audio processor APR9600 can store up to eight voice messages. Port P3 is configured to communicate with IC. Port P3 pins trigger selection of the message.

A speaker is connected to IC for audio output. LED2 flashes to show the busy status of IC2 during recording and playback. The audio message to be recorded in APR9600, by using trigger switches S9 through S16, is shown in table III. SPST switch S19 is closed for recording and switch S19 is opened for playback.

#### F. Isolation Relay Driver Section:-

##### 1) Opto-coupler Isolation and relay driver Section:

As we have to operate external device with the help of relay drive circuit. The Isolation is provided to relay section with

driver circuit. The data line from Uc port is used to drive the relay. To achieve isolation from noise pickup, we are inserting opto-coupler. The port data is applied to the photo LED of the opto-coupler through the 330 ohm current limiting resistor. As the logical input from the port is 1, Photo diode will go into full conduction and emits the light which is following on the base of photo transistor of the opto-coupler. Hence photo transistor will go into full saturation. It will conduct from 12 V supply then collector to emitter and through 1 k resistor. 4.7k resistor is the base biasing for the transistor SL100/BC547. Regenerative feedback is applied to the opto-coupler through 470k resistor. When the Opto-coupler transistor is in full saturation will drive the transistor SL100/BC547 into full saturation and hence relay will be in energized condition. The status of the relay is indicated by the LED which is connected in series with 1.5k resistor at the collector terminal. The diode will act as freewheeling diode for the relay coil. The coolant is connected in NO and COMM terminal of the relay. The coolant will turn on only when the relay is on. Hence it can be made on or off as per our requirement through software

### III. SYSTEM OUTLINE

#### A. Advantages:

- Very easy to implement
- It gives more security
- It can be used anywhere
- Circuit design is very simple

#### B. Limitations:

- If the power goes off then whole system will not in use

#### C. Applications:

- For security purpose
- It save time

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