

## Smart Monitoring of Poultry Farm



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### ABSTARCT

*Security is primary concern for every one. This Project describes a design of effective security system that can monitor a farm with different sensors. Abnormal raise in temperature and the smoke generated through any source can be monitored by the status of each individual sensor and day/night monitoring sensor is also given. Here moisture sensor is also placed to check whether the soil is dry or wet which can be used in agricultural fields.*

*Here we are also providing a facility of live streaming and this application uses Raspberry Pi as its controller and this can be placed where ever required so that the video of that place will be captured using high sensitive camera and then our controller makes available about the picture of the people through internet.*

*We can place this module either at a door near home or at offices, factories or any other place where we need monitoring every minute for the purpose of security/surveillance. This project uses regulated 3.3V, 750mA power supply. 7805 three terminal voltage regulator is used for voltage regulation. Bridge type full wave rectifier is used to rectify the ac out put of secondary of 230/12V step down transformer.*

### Existing system

In this project we are using ARDUINO as heart of entire system, humidity sensor and Temperature sensor to detect the temperature and humidity at at farm. LDR is given to detect day and night mode. CO sensor to know the dangerous gas around. All these data will be displayed on LCD and the same values are being sent to the PC using Zigbee communication. But this can be implemented within shorter ranges only using Zigbee.

#### BLOCK DIAGRAM:



**Figure-1 Block Diagram of the System**

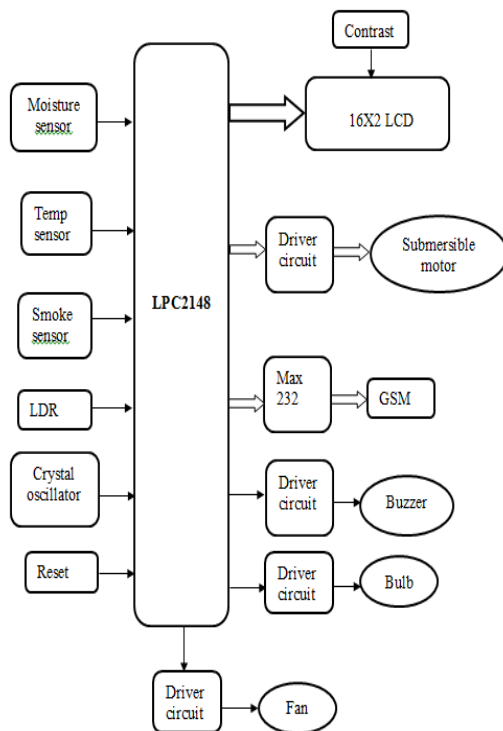
**Draw back:** Zigbee can be implemented within shorter distance. There is no video streaming.

**INTRODUCTION TO PROJECT**

Farm monitoring is being done with the help of all these sensors. The project is built around the LPC2148 micro controller. This micro controller provides all the functionality. People will be alerted with a buzzer and necessary measures can be taken immediately. A GSM modem is also interfaced to the controller to send an SMS alert to authorized mobile number. Few electrical appliances are also connected to respond according to their respective sensor status which is being monitored by our controller.

**Farm monitoring through sensors**

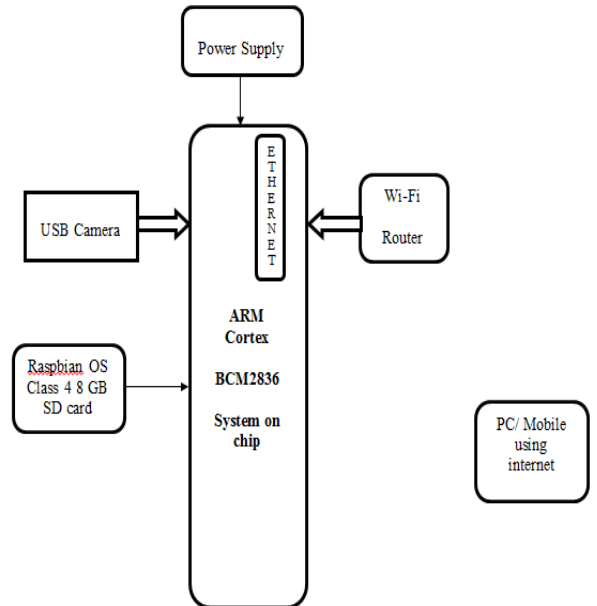
Block Diagram:



**Figure2: Modified Block Diagram of System**

The **Raspberry Pi** is a credit-card-sized single-board computer developed in the UK by the Raspberry Pi Foundation. The Raspberry Pi has a Broadcom BCM2836 system on a chip. It does not include a built-in hard disk or solid-state drive, but Uses an SD card for booting and long-term storage.

**Live streaming using Raspberry pi**



**Figure3: Live Streaming Using Raspberry Pi**

**MODULES USED:** Raspberry pi, LPC2148 sensors, LAN, Camera

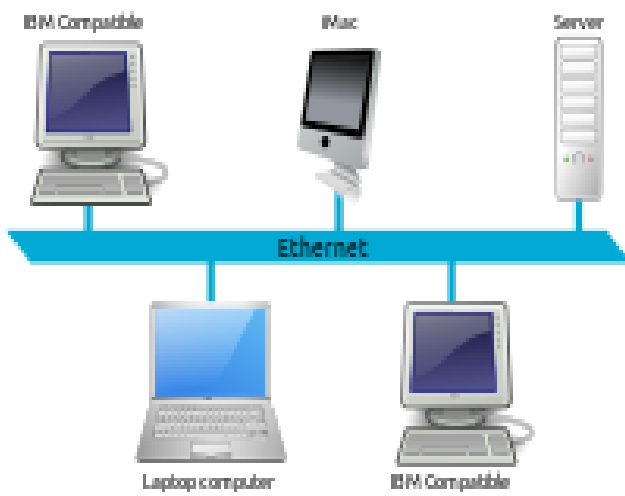
**Power supply section**

This project uses regulated 5V & 3.3V, 1A power supply. 7805 three terminal voltage regulator is used for voltage regulation. Bridge type full wave rectifier is used to rectify the ac out put of secondary of 230/12V step down transformer.

**LAN**

A local area network (LAN) is a computer network that interconnects computers within a limited area such as a home, school, computer laboratory, or office building, using network media. The defining characteristics of LANs, in contrast to wide area networks (WANs), include their smaller geographic area, and non-inclusion of leased telecommunication lines.

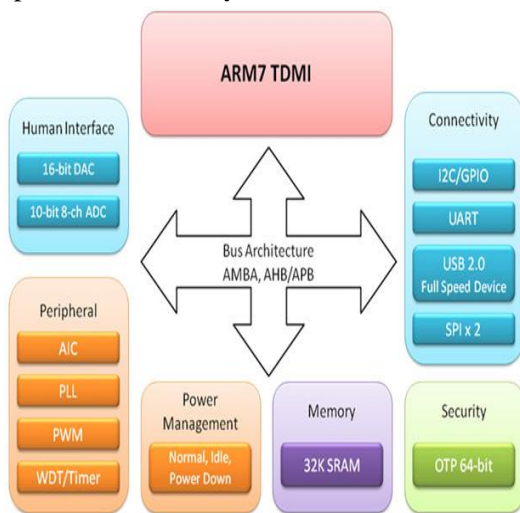
ARCNET, Token Ring and other technology standards have been used in the past, but Ethernet over twisted pair cabling, and Wi-Fi are the two most common technologies currently used to build LANs.



**Figure4: Local Area Network (LAN)**

### LPC2148

The **LPC2148** are based on a 16/32 bit ARM7TDMI-S™ CPU with real-time emulation and embedded trace support, together with 128/512 kilobytes of embedded high speed flash memory.

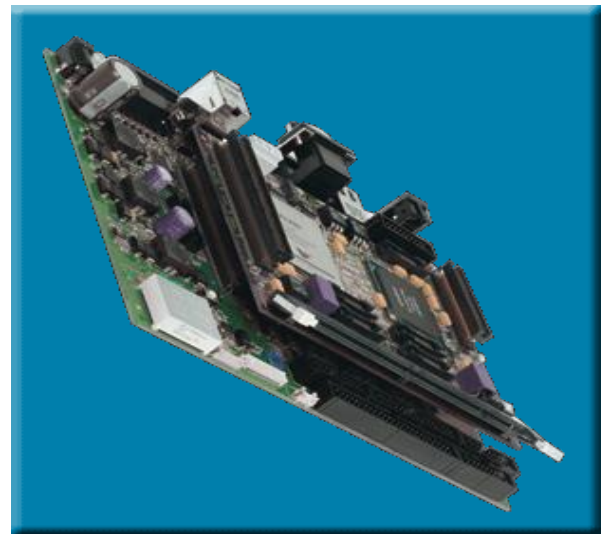


### Architecture

A 128-bit wide memory interface and unique accelerator architecture enable 32-bit code execution at maximum clock rate. For critical code size applications, the alternative 16-bit Thumb Mode reduces code by more than 30% with minimal performance penalty. With their compact 64 pin package, low power consumption, various 32-bit timers, 4- channel 10-bit ADC, USB PORT, PWM channels and 46 GPIO lines with up to 9 external

interrupt pins these microcontrollers are particularly suitable for industrial control, medical systems, access control and point-of-sale. With a wide range of serial communications interfaces, they are also very well suited for communication gateways, protocol converters and embedded soft modems as well as many other general-purpose applications.

### ARM PROCESSOR



**Figure6: ARM Board**

### RASPBERRY-PI



**Figure7:Raspberry pi Board**

The **Raspberry Pi** has a Broadcom **BCM2836** system on a chip (SoC), which includes an a quad-core Cortex-A7 cluster. The Cortex-A7 MP Core processor is a high-performance, low-power processor that implements the ARMv7-A architecture. The Cortex-A7 MPCore processor has one to four processors in a single multiprocessor device with a L1 cache



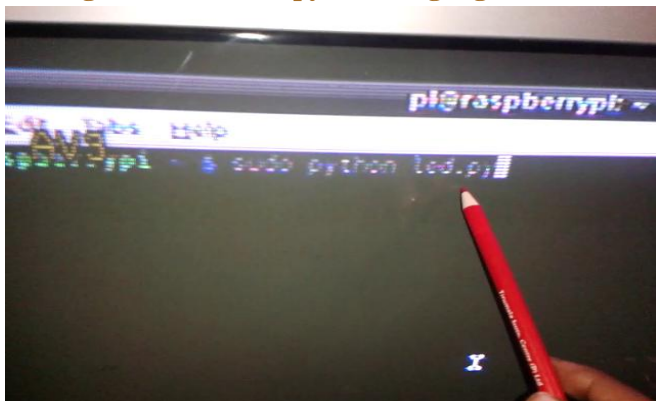
subsystem, an optional integrated GIC, and an optional L2 cache controller.

The Raspberry Pi foundation has finally released an upgraded version of the Raspberry Pi. Raspberry Pi 2 model B features much of the same ports and form factor as Raspberry Pi Model B+, by replaces Broadcom BCM2835 ARM11 processor @ 700 MHz with a much faster Broadcom BCM2836 quad core ARMv7 processor @ 900 MHz, and with an upgrade to 1GB RAM.

### Basic Hardware of Raspberry-PI OS used in Raspberry pi is Linux



### Coding will be done in python language



### Global System for Mobile Communication (GSM)

#### Definition:

GSM, which stands for Global System for Mobile communications, reigns (important) as the world's most widely used cell phone technology. Cell phones use a cell phone service carrier's GSM network by searching for cell phone towers in the nearby area. Global system for mobile communication (GSM) is a

globally accepted standard for digital cellular communication.

GSM is the name of a standardization group established in 1982 to create a common European mobile telephone standard that would formulate specifications for a pan-European mobile cellular radio system operating at 900 MHz. It is estimated that many countries outside of Europe will join the GSM partnership.



Figure-8 GSM Operation

### Sensors

#### LDR

LDRs or Light Dependent Resistors are very useful especially in light/dark sensor circuits. Normally the resistance of an LDR is very high, sometimes as high as 1000 000 ohms, but when they are illuminated with light resistance drops dramatically.

When the light level is low the resistance of the LDR is high.

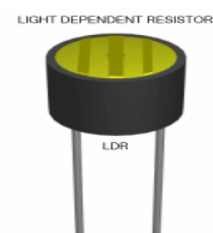


Figure-9 LDR Sensor

**MQ-2 SMOKE SENSOR**

Sensitive material of MQ-2 smoke sensor is SnO<sub>2</sub>, which with lower conductivity in clean air. When the target combustible smoke exist, the sensor's conductivity is higher along with the smoke concentration rising. Please use simple electro circuit, Convert change of conductivity to correspond output signal of smoke concentration. MQ-2 smoke sensor has high sensitive to LPG, Propane and Hydrogen, also could be used to Methane and other combustible steam, it is with low cost and suitable for different application.



**Figure-10 Smoke Sensor**

**MOISTURE SENSOR ( Dry and Wet sensor)**



**Figure-11 Moisture Sensor**

**Soil moisture sensors** measure the water content in soil. A soil moisture probe is made up of multiple soil moisture sensors. One common type of soil moisture sensors in commercial use is a Frequency domain sensor such as a capacitance sensor. Another sensor, the neutron moisture gauge, utilize the moderator properties of water for neutrons. Cheaper sensors - often for home use- are based on two electrodes measuring the resistance of the soil. Sometimes this simply consists of two bare (galvanized) wires, but there are also probes with wires embedded in gypsum.

**LM35**

- Calibrated Directly in ° Celsius (Centigrade)
- Linear + 10 mV/°C Scale Factor
- 0.5°C Ensured Accuracy (at +25°C)
- Rated for Full -55°C to +150°C Range
- Suitable for Remote Applications
- Low Cost Due to Wafer-Level Trimming
- Operates from 4 to 30 V
- Less than 60-µA Current Drain
- Low Self-Heating, 0.08°C in Still Air

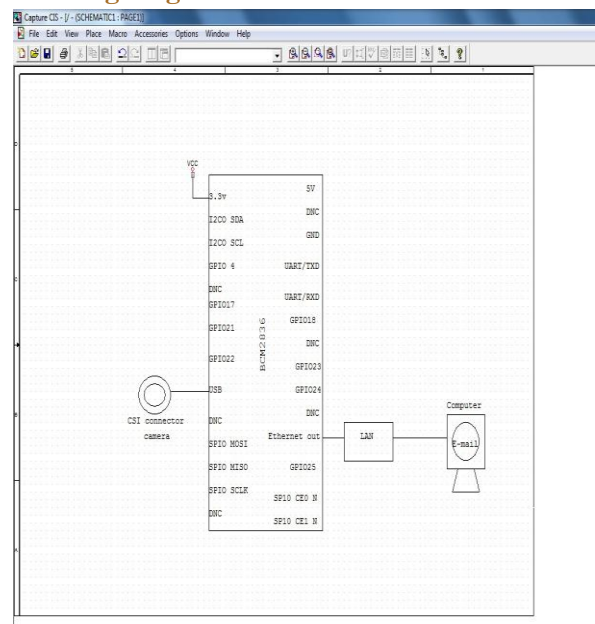
**ADVANTAGES**

- Highly-flexible
- Fit & Forget System
- No need of human effort
- High security is provided

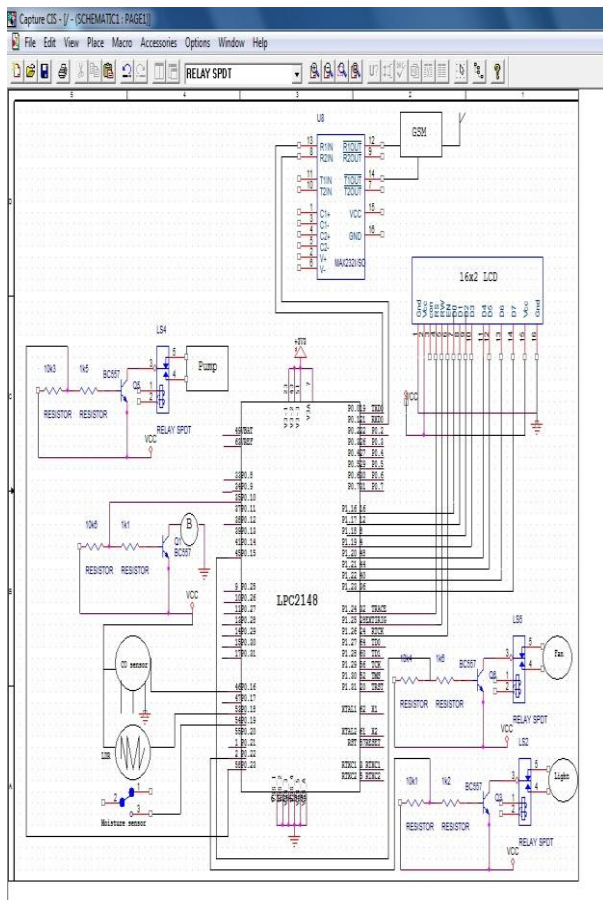
**APPLICATIONS**

- Agricultural fields
- Museums
- Home / Office security
- Jeweler shops
- Banks

**Interfacing diagrams**



**Figure -13 Interfacing Diagram**



**Figure -14 Interfacing Diagram**

**CONCLUSION**

The project “Farm monitoring using multiple Sensors & Live streaming” is successfully tested and implemented. This can be used for many applications in security purpose for Farms, Houses, Banks, Jeweler shops.

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