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RASPBERRY PI BASED EXTREME VIGILANT SYSTEM AND SUPERVISORY CONTROL IN INDUSTRIAL AREAS USING UBIDOTS

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ABSTRACT

Nowadays Raspberry pi is the advanced method in embedded technology. In industrial areas security and supervisory control is major issue. So our proposed system will protect and control the industrial applications with IOT technology (Internet of Things). And also temperature control through real time application.Rabbani OS can be used for Raspberry Pi and also Python language can be used for programming this system.

Keywords: Raspberry Pi, DC motor, L293D.

I. INTRODUCTION

In this system, Raspberry pi internally have WI-FI module. By using IoT technology, industrial motors can operate through UBIDOTS website by owner. No other person can access the devices without any permission of owner. Here PIR sensor can be fixed to the locker, if anyone takes money from locker. This update will be uploaded in UBIDOTS with date and time. So owner can easily find out the account errors and also email alert will send to owner.

Here we are implementing real time application to operate the fan for cool the industry. Through Wi-Fi Raspberry Pi access the real time temperature from server. And also fire detection is included in proposed system. Is there any fire detected it will upload the information in UBIDOTS.

Existing System

In existing system industrial motor controlling with Bluetooth technology and also vigilant system can give only message alert to the owner. So industrial area can be projected and control with these features by using proposed system. Here the proposed system is implemented with ARM7 (LPC2148).

Proposed System

In this proposed system we implemented the Raspberry Pi with IoT technology using UBIDOTS website. So the controlling and uploading the information about locker with EMAIL alert can be possible with this system. And also reduce the industry temperature with real time reading from server. Fire detection system can be used for detecting fire faults in those areas. In this way here we are implementing proposed system with all these futures.

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Block Diagram

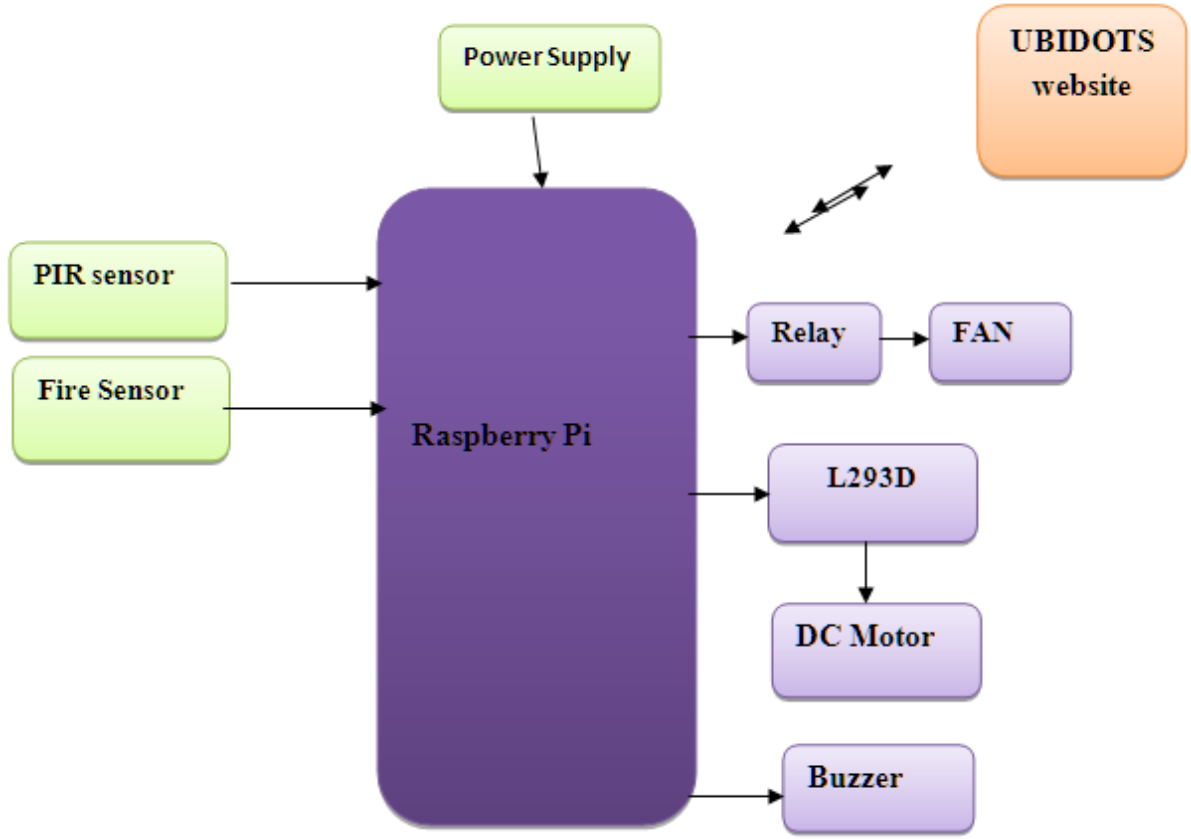

Figure 2.1: Block diagram of proposed system

II. HARDWARE DESCRIPTION

2.1 Raspberry Pi:

Raspberry Pi is a small smart card size CPU and it has many features compare to the other micro controllers. It consists of separate Rasbain OS for operating all things for projects. Raspberry Pi mainly consists of 40 pins. In those 26 pins are the GPIO pins and remaining pins are power supply, ground and some special function pins. We have different types of Raspberry Pi boards (A, B, B+, 3, 2).

Features of Raspberry Pi:

- **CPU**: ARM Cortex A53 clocked at 1.2 GHz with quad core 64 bit.
- **GPU**: 400MHz video core IV multimedia.
- **Memory**: RAM (1GB)
- **USB ports**: 4
- **Ethernet and 802.11n wireless LAN**
- **HDMI port**

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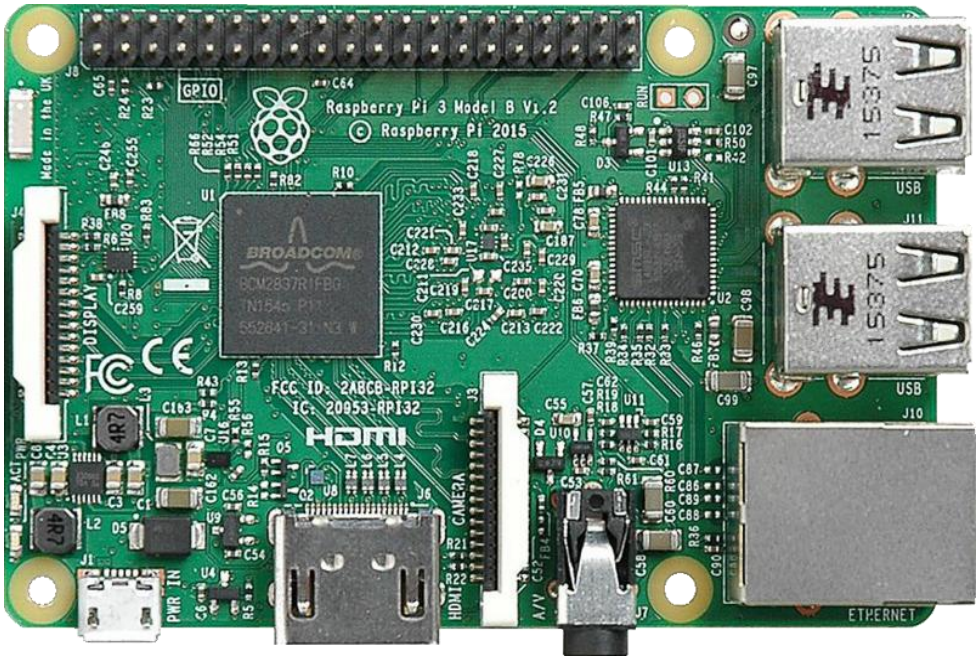

Figure 2.1: Raspberry Pi 3 board.

2.2 Power supply:

Micro controller needs 5v DC and in homes we got 230v AC supply. By using power supply circuit we need to convert 230v into 5v. For that we have transformers, rectifiers, filters, regulators. Step down transformer for converting 230v AC into 12v AC. Rectifiers can convert AC voltage into DC voltage. So we get 12v DC at end of rectifiers. It is not a pure DC; filters can convert these pulsating DC into pure DC. Regulators can give 5v constant voltage at regulator output. In this way 230v can be converting into 5v using power supply circuit.

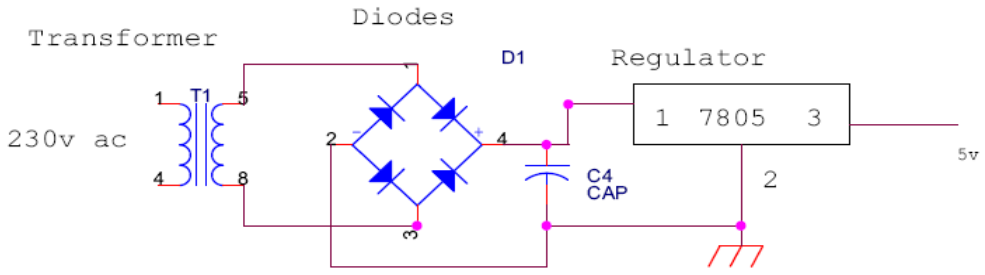

Figure 2.2: Power Supply

2.3 Relay:

Relay is a current amplification device. Micro controller will give only 50uamp current to the output. This current is not sufficient for an output device. By using relays we can increase the current from 50uamp to 1Amp. These will be possible with EMF, which will be generated through coils in relay.

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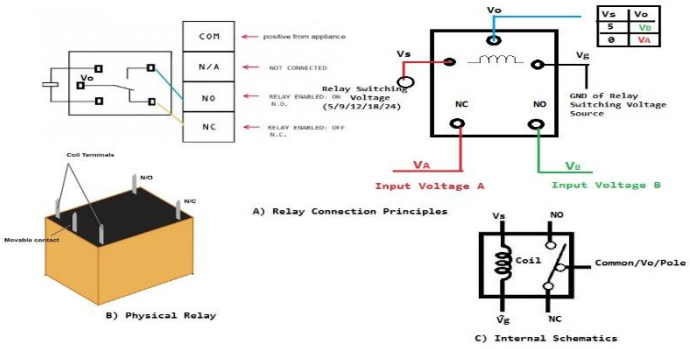

Figure 2.3: Relay

2.4 L293D:

L293D is the motor driver and l293d issupport currents 1A at voltage from 4.5vto 36v. Between coil1 and coil2 one copper wire can produce Electromagnetic force by using this force it can produce 1Amp current. It hasfour input and output pins for micro controller and motor.

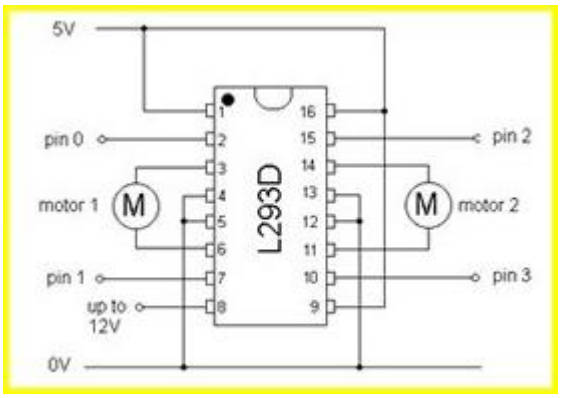

Figure 2.4: L293D motor Driver

2.6PIR sensor:

PIR means Passive infra-red sensor and PIR can detect the objects near to the sensor. Energy emitted by objects in the field of view can be detected by PIR sensor and to extract the desired information can be used by signal-processing algorithms.

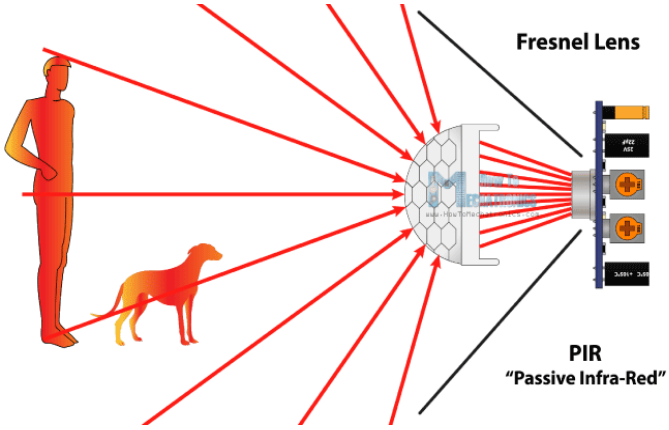

Figure 2.6: PIR sensor

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III. SOFTWARE DESCRIPTION

3.1 Operating systems

Various operative systems for the Raspberry Pi may be put in on a small SD, mini SD or SD Card, reckoning on the board and offered adapters; seen here is that the small SD slot set on very cheap of a Raspberry Pi two board.Raspberry Pi mainly uses UNIX OS. Different third party operative systems offered via the official web site embody Windows ten IOT Core, computer architecture OS and specialized distributions for media center and schoolroom management. Many different operative systems also can work on our system.

IV. SCHEMATIC AND WORKING

4.1 Schematic Diagram Description

Raspberry Pi mainly consists of 40 pins in those 26 are the GPIO pins. Getting real time temperature readings from server for cool the industry. Fan connects to 7th pin in board. PIR sensor connects to 3rd pin in board. Fir sensor connects to 5th pin in board. Supervisory control of motor connectsto 11th pin. Buzzer is use for giving information about fire detection and person detection near locker. This pin can be connected to 13th pin in board.

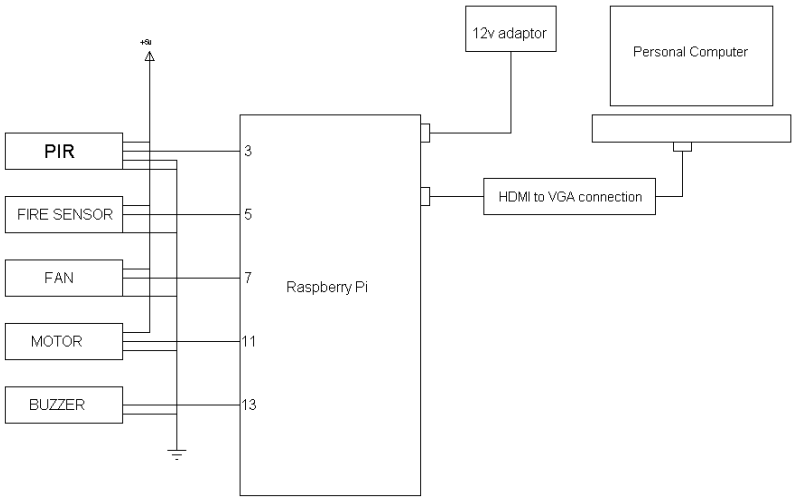

Figure 4.1: Schematic diagram of proposed system

4.2 Working Procedure of Proposed System

Raspberry Pi (ARM11) is the advanced technology in embedded system. Which have internal Wi-Fi, USB ports, LAN port, wireless camera and display port etc.? By using Raspberry Pi we are implementing extreme vigilant system and supervisory control in industrial area. And also real time temperature to cool the industry and fire detection. These all features are implemented in proposed system.Here PIR (Passive infrared sensor) is used for vigilant the industry locker with high assurance and intimation to the owner with email alert and also these information can upload into UBIDOTS website. Here the system will sound the buzzer when taking money from locker. Second feature is real time temperature readings are taken from server to operate the fan for cooling purpose. Third feature is to control the industrial motors with owner assurance. Without owner permission we can't operate the motor. Owner must have an account in UBIDOTS and he can control the motor easily using server. Motor can be ON and OFF by owner with token number and variable number taken from UBIDOTS.

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Fourth feature is fire detection in industry. If the fire detected buzzer will ON automatically otherwise it is in OFF state. In this way our proposed system will vigilant and control the motor with protective way. Also Raspberry Pi with IoT is the advanced system for current stage.

V. APPLICATIONS AND ADVANTAGES

5.1 Applications:

- In industrial areas
- In homes
- In military applications

5.2 Advantages:

- Real time server temperature readings to cool the industry
- Hyper projective for lockers
- Supervisory control from UBIDOTS using IoT technology
- Fire detection system

VI. CONCLUSION

Proposed system isconcluding that control and data uploading system will give protection in industry. Temperature controlled fan through server also implementing in this system. Here we can also detect the fire accidents in industrial areas. All sensors information can be uploading and controlling the industrial motors through UBIDOTS website.

VII. RESULTS

Data from the sensor nodes is stored on the Easyiot server. This data can be accessed by any authorized used from any lactation. The obtained data can be stored in various format and can be represented in graphical format, depending on day, week and month. Following figures shows obtained data and GUI.

Output Pic

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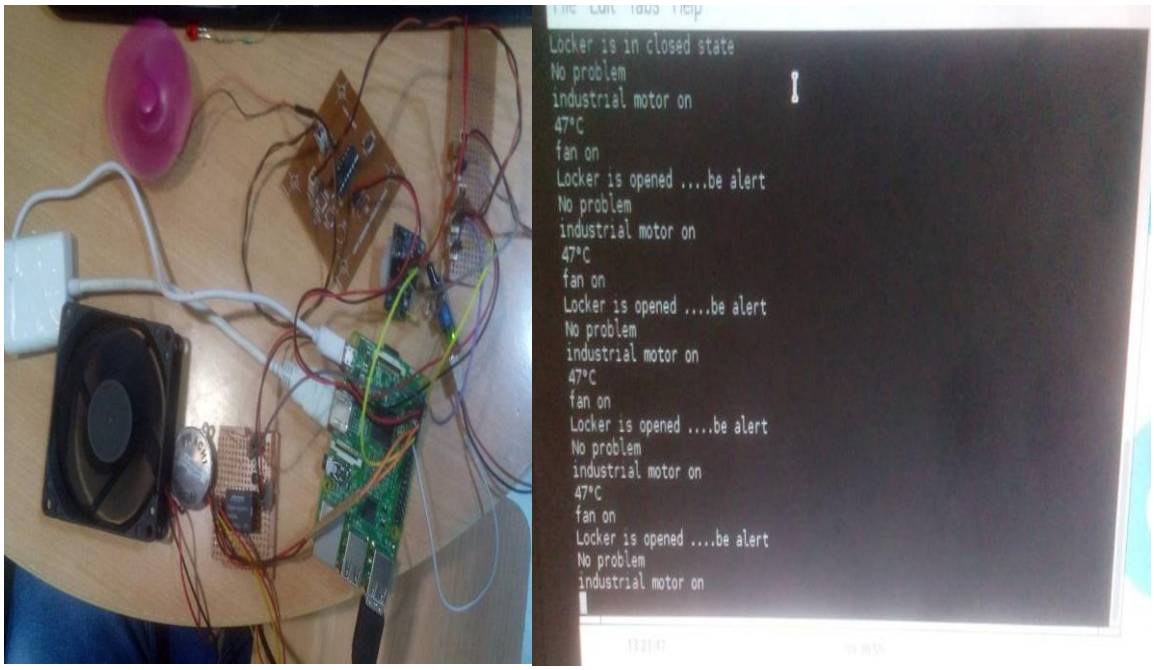

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