

WSN BASED INDUSTRY MONITORING AND CONTROL SYSTEM THROUGH IOT USING RASPBERRY PI

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ABSTRACT

Intrusion plays an essential role as compared to other security systems, automation systems have been much in demand as compared to other systems. Security policy of intrusion has a big challenge in today's world. Not designing a proper security system in industry may damage and lead to a cyber attack on the system; this may result in loss of important data. However, current intrusion systems only work on security policy but fail when actual implementation of the system is required. Work in this paper gives us a correct approach of this and how to solve the thinks of instruction and Security related thinks. Security policy generally consists of Decisions and it ignores security policy implementation. In this paper Security consists of Table driven management Security and service cluster. In this project we have Genetic formula for sorting the data in proper manner. The task in system is reconfigured through associated integrated programming theme wherever system tasks and response tasks are mapped moreover, results from each simulation of numerical values and a real time application simulation showed that the projected technique will implement the Security system.

INDEX TERMS: automation in industry, intrusion, security protection, Raspberry pi(Model B), Sensors, HDMI...etc

I. INTRODUCTION

Automation Device in networks is used to collect all knowledge regarding physical phenomena in numerous applications like environment watching, Industry automation and home automation. Etc. The Technology that we are using can be implanted in both such wire and wireless communication has attracted lots of attention and is anticipated to bring advantages to many application areas as well as industrial Automation systems, and aid systems producing. Automation systems are well-suited for semi permanent industrial environmental knowledge acquisition. Thus, we will higher perceive the skin setting data. However, so as to fulfill the necessities of future industrial environmental knowledge acquisition within the IoT, the acquisition interface device will collect multiple device knowledge at an equivalent time, in order that additional correct and various knowledge data is collected from industrial Automation

With the advancements in web technologies and industrial Automation, a brand new trend is forming the new Key technologies that drive the longer term of IoT(Internet of Things) area unit associated with sensible sensing element technologies. Since industrial Automation is related to sizable amount of wired sensing element devices, it generates a large range of knowledge. Sensor knowledge acquisition interface instrumentation is one i.e. same among all key components of Automation applications. knowledge assortment very essential application of Automation and additionally significantly it's the inspiration of different advanced applications in industrial Automation surroundings.

Industrial Automation is used to support much application in real life. The design of industrial Automation. It consists of 3 layers:

1) Physical layer; 2) Network layer; and 3) application layer. The Physical layer consists of principally composed of sensors, RFID readers, cameras, M2M terminals, and numerous information assortment terminals. acquisition interface is chargeable for the mixing and collaboration of varied environments and assortment of sensing element of different data.

II. EXISTING METHOD

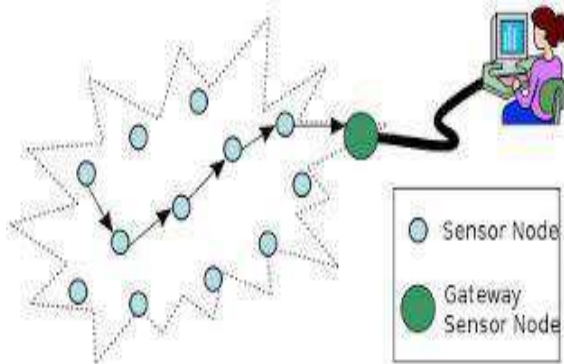
In current industry most of the system are wired and control board measure system, however most of the management control panels in industries square measure wire panels and machines square measure controlled and monitor by the room operator exploitation wire network. The wires square measure moving through conducts, generally within walls and generally underground additionally. thus breakdown maintenance of those wires is troublesome task in industries. This wire are too long so it is difficult to find losses in wire. And even when locating the fault it takes time to repair them. The second disadvantages of this technique square measure operator console cannot move from one area to a different. on every time for operator must difficult to watch everything in specific area.

III. PROPOSED SYSTEM

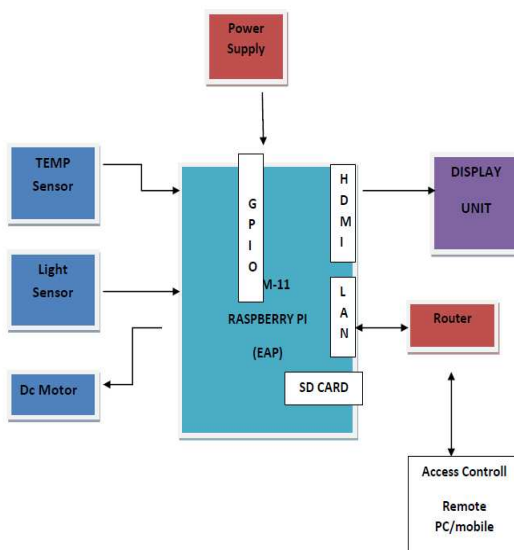
TECHNOLOGIES:

INDUSTRIAL AUTOMATION SENSOR NETWORK:

Industrial Automation sensor network plays a vital role in automation sensor to observe physical or environmental conditions, like Smoke temperature, LDR, Fire, etc. and to hand in glove pass their information through the network to a main location. The unit of network that can be used for sensing different element and parameter. The event of wireless sensing element networks was driven by many applications like piece of ground surveillance; these days such networks area unit employed in several industrial and shopper applications, like process observance and management, machine health observance.



BLOCK DIAGRAM:

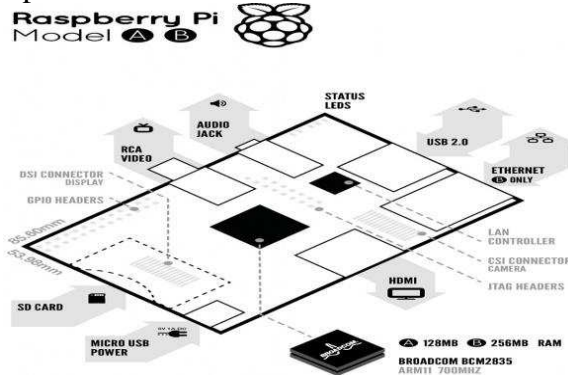


IV.HARDWARE IMPLEMENTATION

A. RASPBERRY PI:



It was launched in 2014. It has 4 ports of USB, 1 HDMI, LAN connection (RJ45), ARM7 processor with compatible chipset, 3.5 mm jack, 5V 2A power supply used for mobile charging, SD (Secure Digital) card slot and 1GB RAM. Here we are using HDMI to VGA Converter for regular VGA Monitor. There are separate organizations where we can get download of different O.S and video for support. It has python programming with support of Java/C++...etc. By giving simple commands we can upgrade the O.S. It has a command line prompt where we can access the pages on the Raspberry Pi site. It has a processor speed of 1.2 GHz. In this project we are using GPIO (General Purpose Input Output) for connecting sensors where we have written code to access those that are placed on the board. There are 40 GPIO pins to access.



B. LM 35 (TEMPERATURE SENSOR)

These devices measure the amount of heat energy generated from an object or surrounding area. They find application in Air Conditioners, refrigerators, and similar devices used for environmental control. Temperature sensors can be used almost in every IOT (Internet of Things) environment, from manufacturing sensors to agriculture. In agriculture, this can be used to monitor the temperature of soil, water, and plants. Temperature sensors include thermistors, resistors, temperature detectors, and I.C.

C. LDR (LIGHT DEPENDENT RESISTOR):

It is a variable component when light falls on it, it changes its value. It can be used as a sensor for sensing elements when light falls on it. It is also called a photo-resistor or photovoltaic cell. The device works in both power of intrinsic and extrinsic conditions also. It has more application in street lights, outdoor clocks, solar street lamps, etc. The characteristic of LDR is an inverse ratio: when resistance decreases, the intensity of light increases, and vice-versa.

D. PCF8591 (ANALOG TO DIGITAL)

It is similar to an I2C bus where data can be transferred in a bidirectional way. It is used as an analog-to-digital converter. It is an 8-bit CMOS with 4 ports programmable. The module integrates a photo-resistor by analog-to-digital conversion. In this project, it is programmable through the Raspberry Pi and it acts as an interface between serial data and a serial clock.

E. BUZZER

In this project we are using buzzer instead of FAN were it is used for cooling purpose. Here we get audio signaling when click on sound from display(Mouse).This buzzer can be used for judging panels , Educational purpose, Game show lockout device, sporting events such as basketball, electrical alarms, joy buzzer..etc

F. M.Q 5(GAS SENSORS)

These Sensors are used to detect toxic gases. The Sensing technologies most commonly used are electrochemical, Photo-ionization and semiconductor. With technical advancement and new specification, there are multide gas sensor available to help to extend the wired and wireless connectivity deployed in IOT(Internet of Thinks) applications.

G. SMOKE SENSORS

Smoke decters have been in use home and industries for quite a long time with advent of IOT (Internet of Thinks) their application has become more convenient and user friendly.Futhermore adding a wireless connection enables additional features that increase safety and connivance.

H. MONITOR

Here monitor is used for display purpose. In this project I have used HDMI to VGA convertor for display. Here we also use only HDMI if we HDMI port to monitor/T.V. For display purpose on VGA monitor we have to do some setting in config file in operating system of raspberry pi.The Modern VGA monitor is combination of TFT-LCD(Thin-Film-Transistor and Liquid Crystal Display) with backlighting. For display purpose we use RGB combination color. The main measurement for display are width, height total area and diagonal.

V.SOFTWARE REQUIREMENTS

A. LINUX OPERATING SYSTEM:

Linux is free and open source operating. It has package file of Linux distribution and used for both server and desktop P.C.In this project Linux O.S is used due to its storage capacity, open source, easily upgrade by giving simple command easily to use. The source code of this file can be changed modified worked on commercial and non-commercial purpose also. This O.S can be used for both companies and personal also. It has wide variety of application due to its open source. code The kernel used Linux O.S has most programming in c/c++ and a many assembly language sprinkled in it

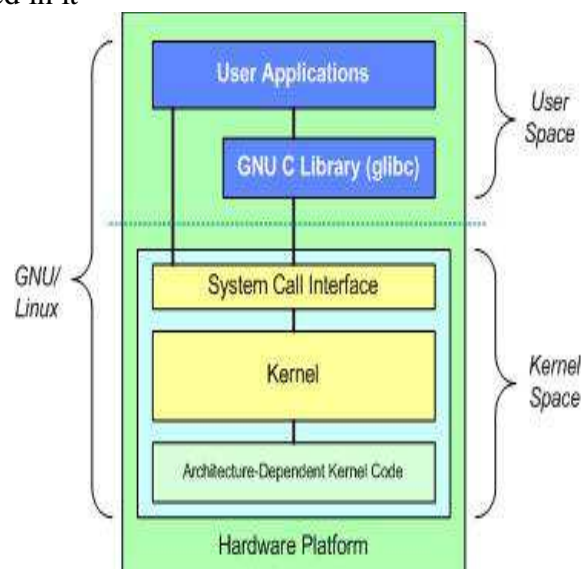
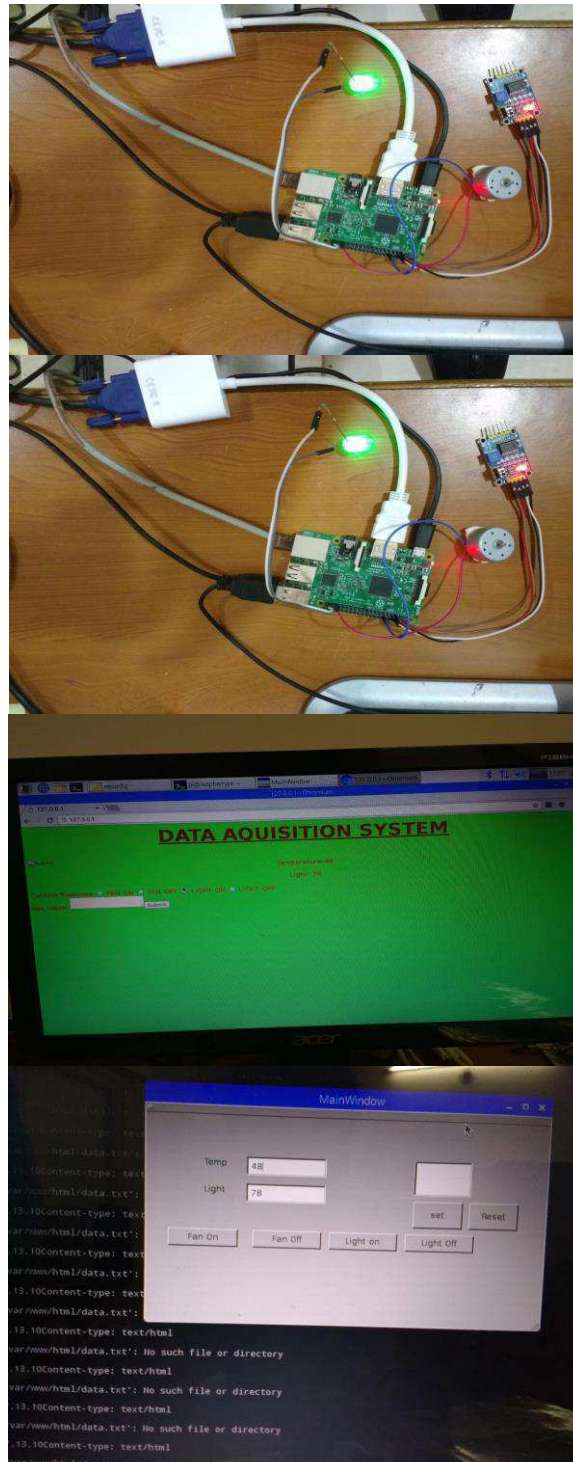


Fig: Raspbian Operating System Architecture

B. QT FOR EMBEDDED LINUX

Q.T is cross compiler to execute the code on raspberry. to run Q.T we have to type some command and execute it has lot of package files which are used to run files. It has link of directory that are combine execute. In this Q.T it support C++ were the main use of QT were the main code is written. Q.T is an open source main use of Q.T is to deploy application software and application frame work. It support very good GUI(Graphical User Interface).

VI.RESULTS



VII. CONCLUSION

As from above work we conclude that, We also get the thought regarding the System summary of raspberry pi. We also discuss the varied challenges within the IoT and additionally in Industrial automation constrain. However handle this challenge is additionally mentioned by the authors. The authors additionally survey the economic marketplace considering the IoT perspective. A good comparison done by the author during which why to use raspberry pi in industrial propose is explained. As raspberry pi(model B) is tiny in size and additionally consumed less power together with doing complex process of collected knowledge.

This system attempt to minimize the energy waste by providing sufficient data to the owner or high level hierarchy persons via remotely and may be created applicable call. It conjointly helps to investigate the summary consumption of power and material demand.

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