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INDUSTRIAL MONITORING SYSTEM

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Abstract— Monitoring of industry is needed for present fastest growing world. Because everyone expects to achieve scalable result and safety measurement. To ensure safety and optimised efficiency a monitoring system is required. This project gives you the simple design and operation of a industry monitoring system. In this we are using ardunio NANO and sensors such as temperature sensor, gas sensor, dust sensor, smoke sensor. The arduino is the main unit among whole system and which receives the information from sensors and the arduino is instructed by embedded C. arduino in this collects the real time data of industry through sensors process the data and compare it with the given information. If it exceeds the vaule that we given to the system then immediately it gives the information to user and activates the relay to turn on Fan. Then the over heat or dust can be removed outside.

***Index Terms*— Arduino NANO, Embedded C Monitoring, Sensors and Relays**

I. INTRODUCTION

Monitoring or controlled by automation is very essential part in industry. The need of control industrial machinery and processes is to reducing the human interference. Now days The technology is growing very fast so that the automated technology also growing rapidly and which is used for tracking and display the information of machine with using wireless technology. The examples for wireless technology are *Zigbee, GSM and GPRS*. Present using technology are not correct automatic system, these technology are need to control time to time . Presently some technology like SCADA is used for monitoring. Here the major problem is tha system cannot be use in remote places. In some industry completely monitored. Once the process started it runs continuously for month. From remote area we have to control some parameters like gas leakage, temperature, pressure, speed of the motor and need to observe fire safety also. Though the technology exist in industry need some skilled man power observing or monitoring parameters like leakage, temperature, pressure, speed of the motor and fire safety. So here we present and implementing a automation system that works even if concerned person is not present at field, he can become aware, update and control the status of that particular plant with the help of communication. Here sensors are used to collect the date from machine or plant in industry environment. These sensor signals are transferred to the arduino nano. Based on this information user can control the respective machine that means the signals from user can transfer to ARM device through display. These control signals will transfer from ARM device to sensor or relays to control the operation. In this way we controlled and monitored two or more tasks by user with using arduino.

II. HARDWARE DESCRIPTION

Implementation of the monitoring industry is shown in the figure1 consists of arduino NANO LM35 Temperature sensor, different appliances, relays and power supply.

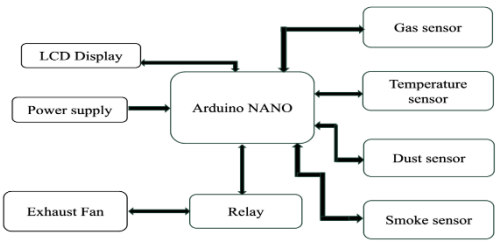

Fig1: BlocDiagram

A. Arduino NANO

The **Arduino Nano** is an open-source bread boardfriendly microcontroller board based on the MicrochipATmega328P (MCU) and developed by Arduino.cc and initially released in 2008. It

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offers the same connectivity and specs of the Arduino Uno board in a smaller form factor.[1]The Arduino Nano is equipped with 30 male I/O headers, in a DIP-30-like configuration, which can be programmed using the Arduino Software Arduino nano particularly suitable for industrial control and medical systems.

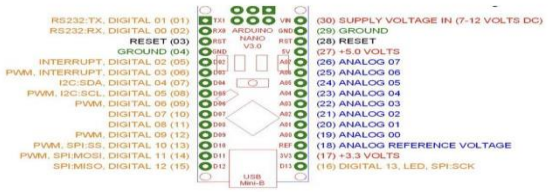

Fig2: Arduino NANO

B. Relay

Relay is an electromagnetic switch which is used to drive high voltage loads depending on the logic values of microcontroller. Relay coil is connected to the collector of a transistor through 12V Vcc. Emitter of the transistor is grounded. a biasing resistor is connected to the base of the transistor. This value can be varies between 220Ω to 1.5kΩ.

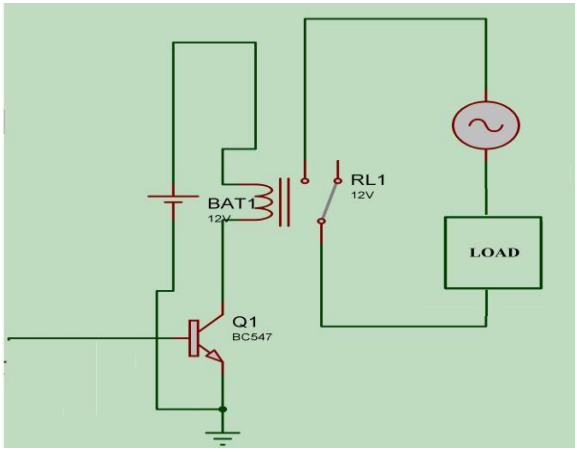

Fig3: RELAY

Inside the relay there are three terminals namely common, normally connected, normally open. By default the common terminal is connected to the normally integrated development environment (IDE), which is common to all Arduino boards and running both online and offline. The board can be powered through a type-B mini-USB cable or from a 9 V battery.[2]

connected terminal with a spring tension. Whenever we apply logic to the base of the transistor, the transistor acts as closed switch and makes the coil energized in to an electromagnet. This in turn attracts the small iron strip of the common terminal, which makes a connection between common and normally opened terminal. A load can be connected between these two terminals and a source as shown in the figure3.

C. Supply Unit:

As the microcontroller LPC2148 operating voltage is +5V
DC. Through this power supply circuit we have to create a +5V DC which is given to the micro controller. The below components are used to create the power supply.

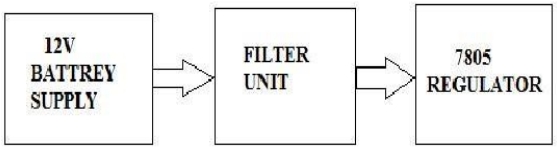

Fig4: Block diagram of power supply

Description:

12v dc power supply is given to filter unit That output DC Voltage is given to the positive voltage regulator LM7805 (i.e., 78 represents the positive series and 5 represent the output voltage it can provide). So the output of the regulator will be the regulated +5V DC. To indicate the condition of the circuit we place a LED at the end of the circuit.

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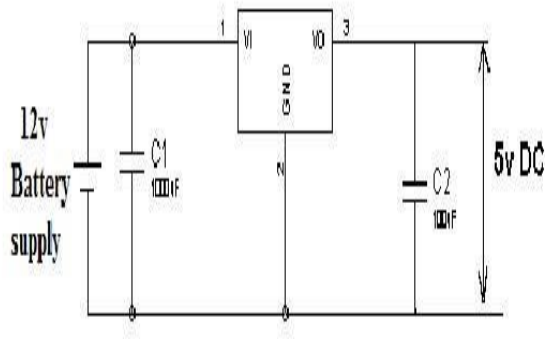


Fig5: Power supply unit circuit diagram

III. CIRCUIT DESCRIPTION

The circuit description of Embedded based Industrial Monitoring System Implementation through ARM and GSM is explained based on following schematic diagram. Port 0 (pin33& pin34) of microcontroller arm7 lpc2148 is connected to GSM modem (RXD&TXD). Here the circuit consist three loads which are fan, motor and lamp. The port 0 (pin46) is connected to transistor Q1 (BC547), The collector of the transistor is connected to rely1 and then connected to FAN. Base should be ground. The port 0 (pin47) is connected to transistor Q2(BC547), The collector of the transistor is connected to rely2 and then connected to MOTOR. Base should be ground. The port 0 (pin53) is connected to transistor Q3(BC547), The collector of the transistor is connected to rely3 and then connected to LAMP. Base should be ground. The supply voltage is +3v which is connected to pin49 and vss should be ground.

IV. SOFTWARE DESCRIPTION

This project is totally depends on embedded system so that it could be developed by using micro vision keil which is used to complied debugged and test by writing embedded –c . So here we use two software's those are micro vision keil software and proteus software. First one is used to control the execution of embedded c program. The second one is used to simulate the circuit.

A. Embedded C

It is possible to create the source files in a text editor such as Notepad, run the compiler on each C source file, specifying a list of controls, and run the Assembler on each Assembler source file, specifying another list of controls, run either the Library Manager or Linker (again specifying a list of controls) and finally running the Object-HEX .converter to convert the Linker output file to an Intel HEX file. Once that has been completed the HEX file can be downloaded to the target hardware and debugged. Alternatively KEIL can be used to create source file automatically compile, link and convert using options set with an easy to use user interface and finally simulate or perform debugging on the hardware with access to C variables and memory. Unless you have to use the tools on the command line, the choice is clear. KEIL greatly simplifies the process of creating and testing an embedded application

V. WORKING PROCEDURE

The heart of the project is arduino to control desire signal. We proposed the arduino is nano which is from arduino family. Embedded based Industrial Monitoring System Implementation through arduino and sensors system is used to the concerned person who is not present in the plant can monitor the industry appliance and control. It is possible with arduino nano. So the working procedure is the arduino receives instruction from sensors. And transfers instruction to respective loads. As per instruction the loads are worked. These commands are sent by user .these commands are transferred to arduino. It shown in

If suppose the temperature exceeds the normal temperature the arduino sends command to relay to switch on the fan Then the exceeds temperature will cooled. is working procedure of embedded based Industrial Monitoring System Implementation through Arduino system When we run on proteus software the following will be generated. The relays are used for controlling the action as ON or OFF. This total information will be forward to user through display. User can control the parameters in industry plant by switching ON/OFF fan These are possible with arduino modem The working procedure can be

controlled by using relay switching. For real-time execution use embedded C *programming language* and the instruction dumped into arduino nano.

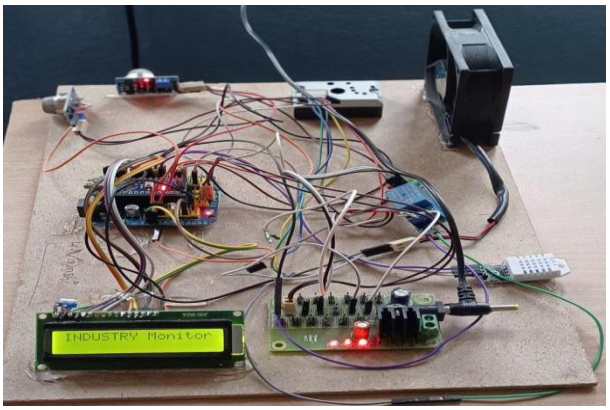
VI. CONCLUSION

Implementation of this project is helped me to gain few unknown things related to our branch and also could study the practical knowledge of embedded systems. In this project can be implemented in huge plants like nuclear plants and power plants. Thea sensors helps in monitoring the system from a distant area. The arduino used helps in connecting many input/output devices at a time. A user is able to control and monitor virtually any electrical devices.

Finally we have successfully implemented the scalable industrial monitoring system through arduino and sensors. In this the sensors collects the date from sensors and sends to user through the GSM modem. The user can monitor the
respective parameter via short message service.

VII. RESULT

Here the project of scalable industrial monitoring system is totally depends on arduino nano sensors. In INDIA, so many industries have been using following technologies to communicate the information from one end to the other end of the company. Bluetooth, limited to short range. range is up to only few kilometers maximum. Wi-Fi, it requires costly equipment setup and high power consumption. All the methods discussed above are quite expensive and complex to design. So we implemented this project through arduino. By this project we can monitor all parameters which are in industries and controlled.



APPENDIX

Introduction, Hardware description, blocks diagram description, working procedure, software description, conclusion and result.

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