Intelligent Plant Automation

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***Abstract*—Now days, marketing demands are increasing continuously. If you can't satisfy demand, then you will knock out of the race. Our project satisfies this need by using a data analysis by making use of high end technology. The proposed design is to provide industrial automation is useful for monitoring the devices from any distance. A micro controller is used which monitors the components according to the given message, with the sensed information sent from the sensors. This paper discusses the working of temperature a heat controlling devices. As the automation is micro controller based it automatically regulates the temperature changes.**

***Key words*—** Automation Plant Industries, Thermo-Industries, Sensing Technologies.

I INTRODUCTION

Consider one case, that you are field engineer, company will start at 9 o'clock. But you have to turn on boiler at 7 o'clock to start working at 9 o'clock. In this case, you have to go at 7 o'clock. But by using this project you can start boiler by just sending SMS command from your mobile. Boiler is just example you can turn on or turn off any controlling device. Now consider another case, you need to monitor few parameters in the industry, say Humidity in a paint shop machine or a critical thing like LPG gas leakage, then you need to be present in the industry/plant. The second part of our project meets this requirement, it monitors the parameters on the LCD and at the same time sends a notification when these parameters cross threshold limit. Monitoring of the Critical sensor monitoring is very important in several industries (Nuclear plants, power plants, petroleum and gas). This job should be done with at most accuracy and reliably. The sensor information should be available at various locations simultaneously to take accurate decisions This kind of requirement can be met by using the central servers and connecting the sensor networks through the controllers to the central servers.

II LITERATURE SURVEY

Monitoring of the Critical sensor monitoring is very important in several industries (Nuclear plants, power plants, petroleum and gas). This job should be done with at most accuracy and reliably. The sensor information should be available at various locations simultaneously to take accurate decisions This kind of requirement can be met by using the central servers and connecting the sensor networks through the controllers to the central servers.

IOT or Internet of things is a technology that deals with bringing control of physical devices over the Internet. Here we propose efficient industry automation system that allows user to efficiently fetch data from physical machines over the Internet. Our system will analysis that particular data and determine exact loss or profit of company. For demonstration of this system we use 2 loads as industrial appliances like temperature and counter. Our system uses an atmel family micro-controller for processing all user commands. A STMP protocol use to transfer data over the Internet and receive user commands. On sending commands through the Internet they are first received by our serial communication system. Our main system takes the information and passes it to the Internet for further processing. The micro-controller will use for sending data from machine to system. Also, it displays the

system state on an LCD display. Thus, we automate entire industry using on-line GUI for easy industry automation.

III IMPLEMENTATION

The circuit unit consists of temperature sensors which are connected to Micro-controller unit which measures the radiations emitted from hot broilers. A signal conditioning circuit is used for energizing the signal coming from the sensors. A feedback circuit is provided in order to reduce the isolation between the ac line and output. The micro-controller based design are very advantageous in protecting the circuit from leakage currents and high voltages and power losses.
We can design the automation circuit by using op-amps or IC voltage regulator but they don't give quick responses and not that efficient as a micro-controller based design.

The keil software is very advantageous in programming flash memories. It provides an interface for connecting target via serial line.

To overcome the drawback of existing system we have developed Intelligent Plan Automation.

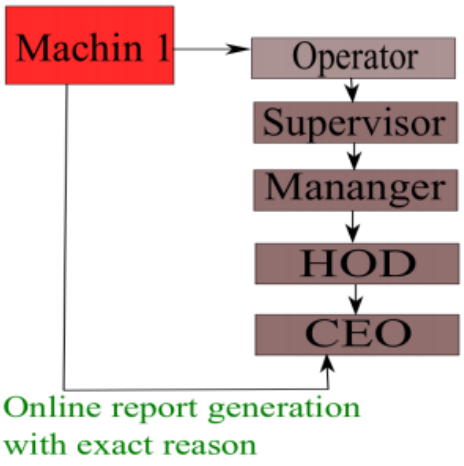


Figure : work-flow of existing system

We are dividing proposed system into following four modules given as :

- Hardware Implementation.
- Programming.
- Assembly
- Testing and Troubleshooting.

IV FUNCTIONAL REQUIREMENTS

Hardware Requirements :

- PROGISP
- ADC
- USBASP Programmer
- Power Supply
- LM35 temp sensor
- LCD display & Crystals
- Atmel 8051 controller
- Resistors & Capacitors

- ADC

In electronics, an Analog to Digital Converter (ADC) is a device for converting an analog signal (current, voltage etc.) to a digital code, usually binary. In the real world, most of the signals sensed and processed by humans are analog signals. Analog-to-Digital conversion is the primary means by which analog signal are converted into digital data that can be processed by computers for various purposes, there are many types of ADC for different applications. The most inexpensive type of ADC is a Successive-Approximation ADC.

- LM35 temp sensor

The LM35 series are precision integrated-circuit temperature devices with an output voltage linearly proportional to the Centigrade temperature. The LM35 device has an advantage over linear temperature sensors calibrated in Kelvin, as the user is not required to subtract a large constant voltage from the output to obtain convenient Centigrade scaling.

Temperature: Temperature sensor used is LM35 which is analog temperature sensor. It is actually a voltage divider network in which the resistance varies according to the

temperature and so does voltage across that resistor.

- Atmel 8051 controller

A micro-controller can be compared to a small stand alone computer, it is a very powerful device, which is capable of executing a series of pre-programmed tasks and interacting with other hardware devices. Being packed in a tiny integrated circuit (IC) whose size and weight is usually negligible, it is becoming the perfect controller for robots or any machines requiring some kind of intelligent automation.
An 8051 microcontroller features :

• 64K bytes on-chip program memory (ROM)
• 128 bytes on-chip data memory (RAM)
• Four register banks
• 128 user defined software flags
• 8-bit bidirectional data bus and 16-bit unidirectional address bus
• 32 general purpose registers each of 8-bit
• 16 bit Timers

Software Requirements :

- Eagle
- SDCC (Small Device C Compiler)
- Python (GUI development)
- Inkscape software (Programming structure design)

- Eagle

EAGLE stands for, Easily Applicable Graphical Layout Editor in English. It is a flexible, expandable and scriptable, electronic design automation (EDA) application with schematic capture editor, printed circuit board (PCB) layout editor, autorouter and computer-aided manufacturing (CAM) and bill of materials (BOM) tools.

- Python (GUI development)

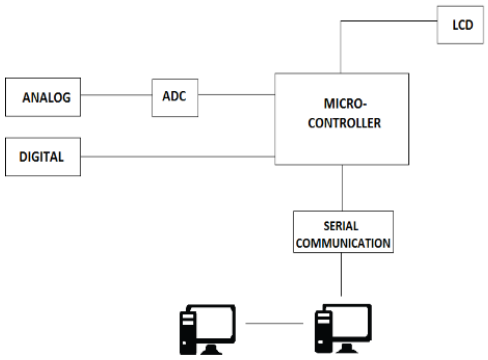
We are using python for GUI development. Python has a huge number of GUI frameworks (or toolkits) available for it, from TkInter (traditionally bundled with Python, using Tk) to a number of other cross-platform solutions, as well as bindings to platform-specific (also known as "native") technologies.

VI SERIAL COMMUNICATION

Introduction :

One of the 8051s many powerful features is its integrated UART, otherwise known as a serial port. The fact that the 8051 has an integrated serial port means that you may very easily read and write values to the serial port.
we simply need to configure the serial ports operation mode and baud rate.
Once configured, all we have to do is write to an SFR to write a value to the serial port or read the same SFR to read a value from the serial port. The 8051 will automatically let us know when it has finished sending the character we wrote and will also let us know whenever it has received a byte so that we can process it. We do not have to worry about transmission at the bit level--which saves us quite a bit of coding and processing time.

VII BLOCK DIAGRAM



Architectural design of proposed system

VIII CONCLUSION AND FUTURE SCOPE

The proposed system is mainly used by the organizations where confidentiality and integrity of the data has utmost importance. Following are some of the application that can make use of this system:

- Applications and future scope of proposed system can be used in homes, industries etc.
- By using this automation design, we can reduce the usage of man power, and the damage of devices can also be reducing.
- By using transmission units, we can control the equipment from long distances.

- Thus, we can conclude that this kind of devices is very useful for regulating the temperature change-s in the equipment.

IX REFERENCES

[1] Geng Wu, ShilpaTalwar, Kerstin Johnsson,
NageenHimayat, and Kevin D. Johnson, Intel
(2011): M2M from mobile to internet.

[2] Weiping Liu, Yanwen Liu, Ru Li, Pai Wang
(2011): Research on development of
communication between PC and mobile base
embedded system.

[3] Xiang Yang, Hui-hong Wang (2011): The
design and implement of embedded M2M Smart
Home System.

[4] Takashi Yamanoue, Kentaro Oda, Koichi
Shimozono (2012): A M2M system using
Arduino, Android and Wiki Software.