

Wireless Data Acquisition System

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Abstract – In steel and metal industries the temperature factor is very important, as it defines the quality of the product used. Minute change in temperature can affect the product thus causing faulty or defective product. So we must design a wireless facts acquisition system to measure correct temperature up to at least one degree Celsius and for you to preserve in around seven-hundred degree Celsius. So all sensors and components need to be chosen as a considerably. Here the product details are saved in a computer at the server end. The wireless statistics acquired on the receiving quit, may be displayed on 7 segment display same facts need to be logged in to laptop software program with time to devise the graph on the equal time. Also buzzer will sound if any severe condition takes place. The product layout of the machine must be carried out to face up to circuit in seven hundred degree Celsius environment.

Keywords – Data acquisition, data logging, high temperature, accuracy.

I. INTRODUCTION

Data acquisition could be a technique of robotically getting facts from one or additional sensors or transducers directly into the laptop device. A sensor is a tool that responds to a physical alternate and outputs an electrical signal and a transducer is a device that converts power from one shape to another [1]. E.g. A thermocouple junction generates accomplice electric phenomenon way to 2 multiple steel joined at the junction. The emf generated is a low degree voltage. When this voltage is sent to a cord it's referred to as a voltage signal. An electrical tool are often accustomed convert the low stage voltage signal to a high level voltage signal. Process of sampling signals that live planet bodily conditions and converting the following samples into virtual numeric values for you to be manipulated through a pc.

Tasks:

1. Stores occasion statistics (Data logging)
2. Provides manipulate, configuration and tracking facilities

Data acquisition packages are normally managed by using software program. Programs advanced using various general cause programming languages consisting of Assembly, BASIC, C, C++, C#, FORTRAN, Java, Lab VIEW, Lisp, Pascal, and so forth. Stand-by myself statistics acquisition systems vicinity unit commonly referred to as records loggers.

For actual time requirement in metal industries. Nowadays in industries this procedure became done in normal temperature. As in step with the requirement we are carrying out this procedure on temperature among 600 to 700 Degree Celsius which is maximum at this factor for this gadget in a

closed chamber. Here we are designing a gadget to acquire data from harsh surroundings typically we need to degree a temperature of about 450 degree Celsius with sensor attached to a heating frame (metallic ball).The whole gadget we ought to maintain inside the identical environment. There might be two chambers wherein the method is carried out and the WIRELESS RF conversation is handed from this two chambers. The variety of WIRELESS RF conversation is passes round two-three meters outdoor the chamber. The device is designed in any such way that, if around 1 degree Celsius temperature alternate takes place within the atmosphere of the chamber and the fabric used, the device will without delay display the change through WIRELESS RF communication on computer so that exchange inside the temperature may be made in line with the data received. The advanced machine will offer accuracy of around 1 diploma Celsius in the excessive temperature round 600-700 degree Celsius, in order that proper system might be carried at the fabric used and this could help in durability of the cloth.

As a matter of first importance rest of the paper is an audit paper not an examination paper. So, it composed as follows, section I contains the presentation of what is mean of remote information procurement framework and their need. Section II portrays the past research work as remote information obtaining framework and the diverse kinds of DAQ. Section III quickly depict the proposed system, experimental structure and the strategy which is employments. Section IV finishes up the audit work with their particulars and future bearings.

II. LITERATURE SURVEY

Here we discuss about the literature survey of DAQ methodologies which incorporates ARM Processor primarily based, Internet primarily based, FPGA based totally, Wireless, RTOS primarily based, VI based, USB based totally, Network primarily based, PC based totally, Web server primarily based multichannel DAQ systems control/exploit/run for design and implementation.

This system introduces a few hardware features like small length, low power intake, programming upkeep, stable operation and up gradation.

Also it overcomes many realistic problems skilled in industries and affords quicker conversation, accurate, low fee, secured, real time and certainly gives a better preference for DAQ.

ARM PROCESSOR BASED DAQ SYSTEM

Qin Bin (2012) defined a brand new DAQ system based on 3G era the usage of ARM Embedded processor and SIM 308 which consist of workstations, records facilities, Data series terminals and Wi-Fi communicate community.

From this gadget we've studied that, a way to use browser server (B/S) Structure, and using the web a way to provide human-pc interfacing that's published on the network and in what number of methods we will transmit complicated facts together with sound, photographs, movies for a community used [2].

The DAQ layout is made for ARM cortex – M3 and in Lab VIEW software which has to combine a DAQ card. From this system, we realize how DAQ card is hooked up to the net and data accessed from any internet linked laptops. It's very useful in developing application quicker and less difficult and its miles proved by means of Patel Hiren and Patel Dipak in (2012) by using the use of Lab VIEW equipment.

Tao Li (2011) offered a clever ARM 9 Multitask DAQ System and communicates with pc using UART. It efficaciously achieved smart design and dynamic priority scheduling and other features for DAQ.

INTERNET BASED DAQ SYSTEM

Min Wu (2008) defined on net based totally teaching and experimental gadget for manipulate engineering (ITESCE) that provides a simulator and the capability to shop, search simulation and experimental outcomes [3].

It become based totally on a general browser/server architecture .It offers person pleasant interfaces and real time videos of the experiment being achieved.

FPGA BASED DAQ SYSTEM

Abdallah (2009) provided a hardware reconfigurable device for audio acquisition, processing, storing and monitoring which uses SOC generation. This gadget can map the unique

features into a unmarried FPGA chip and reduces switching time.

Also it revealed in (2011) a DAQ and processing device to gather information from multichannel in gadget on chip thru FPGA via using first-rate excessive speed ADC. It works in a stand-alone mode without the pc and can be used for real international software.

Li Nan (2010) applied an FPGA primarily based Novel Embedded Automobile DAQ System which is used to file (car) surroundings motive force's operation statistics. It uses Ethernet for Wi-Fi communicate. The person can talk with the DAQ system based totally on FPGA which acts as Web Server. This system is beneficial for extra flexible in operation and more convenient to transfer the data.

Design of high pace DAQ system based on FPGA proposed via Wang Fei (2011). This system has the benefit of configurable statistics acquisition channels, high accuracy and high pace [4].

RTOS BASED DAQ SYSTEM

Ying Liu (2007) given an outline of EAST (Experimental Advanced Superconducting Tokamak) distributed records system the usage of HT-7 facts device and it became a Real time dispensed and Scalable machine. It chargeable for storing and publishing records. It provides clean connections, speedy, flexible and handy information guide for person.

Real time Linux OS is used for utility improvement. The designed DAQ device became tested at RDB (Rational Data Base) configuration with 32 analog, 128 digital, and 8 incremental inputs with the approach of integration with two one-of-a-kind OS tightly cooperating inside an embedded device .This system is realized or designed by way of Puchr & Ettlner in 2012.

The DAQ technique continuously acquires diagnostic sign statistics from the digitizer to statistics servers with a purpose to retrieve the real time facts.

VI BASED DAQ SYSTEM

Yazidi (2011) depicted the development of a virtual platform for a web primarily based far flung application devoted to conditional tracking & fault detection for AC electric machines [5].

The dealt about the simulation of electrical gadget laboratory experiment by means of Jabbar Khan (2010) uses a graphical language which lets in a natural vibrant & consumer pleasant interaction.

Zilong Wang (2009) targeted at the improvement of DAQ gadget which can be designed the use of VI gadget & MCU for measuring ocean turbulence. From this weak signals are acquired as it should be with shear probes & it's far achieved the use of Lab VIEW.

This device also presents High precision, flexibility and top reliability.

USB BASED DAQ SYSTEM

Yujun Bao & Xiaoyan Jiang (2010) offered the USB based DAQ system card delivered super changes in computer connecting era which affords Good overall performance, High velocity information pipe, High transmission speed, extended reliability and help plug and play.

The DAQ system is primarily based on USB and MMC designed through Zhiyong Zhang (2008). In this USB protocol & DA systematic shape for single chip pc information is introduced. Where, the answer encompass the DAQ Module hardware, USB installation interface design debug, and embedded software program & document system design [6].

The complete gadget achieves fast, reliable & delay less layout with small length, low power and price.

NETWORK BASED DAQ SYSTEM

By the usage of the Secure Access Gateway (SAG) Act, and via a smart home, we are able to achieve the interface among far off users and target devices (Tongtong Li 2012). From this DAQ machine we recognize that how a secured and green communicate arise between human being and controlled gadgets for smart grid and clever domestic automobile programs.

Here we studied the software program resources for the DAQ gadgets and it obtained from the server vigorously to be stored and perform or accomplish in nearby memory to reduce the useful resource use of embedded DAQ unit. And surprisingly bendy systems are used to guide occasion pushed simultaneous and allochronic statistics driven push operation are also advanced.

PC BASED DAQ SYSTEM

In the previous couple of years, business pc enter-output interface products have grow to be more and more reliable, accurate and inexpensive.

Selecting and building a DA and manipulate system that truly does what you want it to do requires some information of electrical and pc engg. From this system, we discussed on experimental system and the huge quantity of information (600MB/quick) procedure.

In this gadget we need to studied and consists of numerous subsystem which include fundamental manage, synchronization statistics analysis, safety and network communicate similar to as a some dispensed control structures.

WEB SERVER BASED DAQ SYSTEM

Soumya Sunny & Roopa (2012) found out an embedded based totally web server which enables DAQ and status tracking with the help of fashionable web browser. From this machine we contains a No. Of applications written in c for accessed information and update internet porting of Linux 2.6.3x kernel on ARM 9 board.

By using this, Administrator can manipulate and display the equipment's without the usage of any extra hardware. The

Embedded web server improvement is primarily based on ARM-LINUX OS. It succeeds in network video monitoring. The device has low price, transportable in length, clean to operate and keep.

Mo Gaun & Minghal Gu (2010) centered on embedded web server that's tested to signify that it responding unexpectedly and operates efficaciously and gradually which achieves the expectant designing cause.

Various embedded internet services and recent activities in the extensions of internet architecture is implemented towards restricted environments.

III. PROPOSED SYSTEM BLOCK DIAGRAM

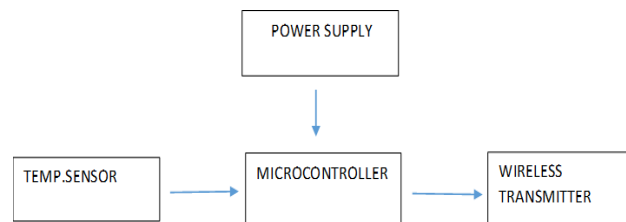


Fig 1: Transmitter section

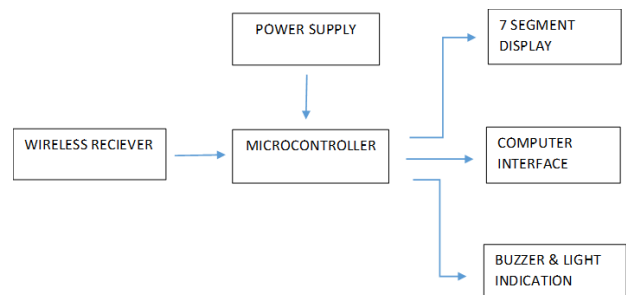


Fig:2 Receiver section

In this machine we have to layout a wireless records acquisition device to measure accurate temperature up to one degree Celsius and to be able to maintain in around seven hundred degree Celsius. So all sensor and additives have to be chosen hence.

To resist circuit in those temperature range we're choosing frequently industrial and army grade components. The Wi-Fi facts received at the receiving quit, may be displayed on 7 phase display and the identical information ought to be logged in to pc software program with time to plot the graph on the equal time.

Also buzzer will sound if any excessive condition occurs, while mild warning signs will show present day function of system with 3 colors as, Green(device ok), Red (System

Problem) & Orange(machine Ideal). We should keep all this device in hot chamber with seven-hundred degree Celsius temperature that's why we should do product/enclosure chamber layout of the system therefore.

IV. CONCLUSION

This is a unique data acquisition gadget, in which total electronic part goes to be placed in high temperature range. Also doing Wireless communicate on this much temperature is a challenge itself for the reason that at excessive temperature problems of EMI is a chief project. We ought to layout a product enclosure in such manner that to resist the whole circuit in mentioned temperature range. Also want to choose digital components to work properly in high temperature which includes battery backup.

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