A Survey on Data Acquisition and Remote monitoring Display

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Abstract – *This paper discusses implemented various data acquisition and remote monitoring system. Data acquisition method is based on gathering the information from different types of sensor used and convert these information in digital form. Remote monitoring is the term comes with data acquisition method, in this information which has been taken from sensor can monitored remotely and display its current status. Now a days, there are greater demand for this type of system. As, world's industry culture changes rapidly, remote monitoring is basic requirement of large scale industries. The advantage of these type of system is ease of operation, reduce time. There are different techniques used for data acquisition. For example, Zig-Bee based, GSM based for remotely access the data, by using software like LAB-view designed by national instrument laboratory also by using Web-Scada software for data acquisition. In this paper, different types of data acquisition techniques and there operations has briefly explained also merits, communication system and technology has explained. This paper also discuss the future scope of the data acquisition and remote monitoring display.*

***Key Words*: Microcontroller, different types of sensor, GSM, web-SCADA, different modules for data acquisition**

1. INTRODUCTION

Data acquisition technology, mainly researches the acquisition, processing and control of the information and is an important part of modern science and plays an important role in modern industry control. A DAQ system consist of sensors, DAQ measurement hardware, and a computer with programmable software. Compared to traditional measurement systems, DAQ systems exploit the processing power, display and productivity of industry standard computers providing a more powerful, cost effective and more flexible measurement solution. With reference to remote monitoring, wireless transmission comes into the picture, it provides simplicity instead of a wired data transmission.

In today's Internet of Things (IOT) era, the sensor data

Sampling can fed live into webserver and can be accessed anywhere as long as internet access is allowed. Unmanned monitoring system can be established in order to overcome the difficulties, also human site visits for configuration and

maintenance could be minimized. Because of that, extra project and manpower cost gets reduced. Remote Data Acquisition System was designed with the help of RTD, Linear potentiometer, DAQ card and with web-access SCADA. By using this, it can create simple SCADA to display data and also it sends data of several sensors to smart phone application. Also single mobile device or multiple mobile device can access data remotely in real-time. Because of this, user can identify the faults remotely using mobile device. [Meet, Sharma, Prof.Patel, 2018][1]

Design of Remote Data Acquisition System Based on 3G. And was designed based on microcontroller, different types of sensor, GSM 3G module Dongle, PC, GUI. Sensors are used to monitor environmental conditions such as sound, temperature, pressure etc. & pass their data through the network to a main location. Remote data can be acquire by 3G module. [Patil, Salokhe, Parit, 2015][3]. Remote Data Monitoring System with Android Application was developed with help of GSM/GPRS, Bluetooth module, AVR controller, apache server.by using a Bluetooth module data can access remotely. Data acquired can be collected in database, which is created by apache server. [Tambe, Prof. Itkarkar, 2015][4]

2. SURVEY DETAILS

2.1 Data Acquisition and remote monitoring

Fig.1 shows data acquisition system using lab view software, following fig.1.1 shows lab view block diagram for DAQ and fig.1.2 shows output based on DAQ program. By using lab view tool the block diagram has designed and output graph can be plotted with the help of amplitude and time, which is recorded in MS-Excel sheet. [2]
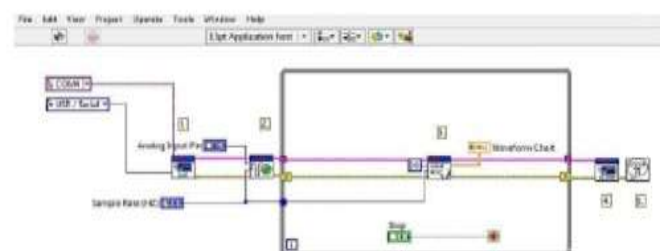

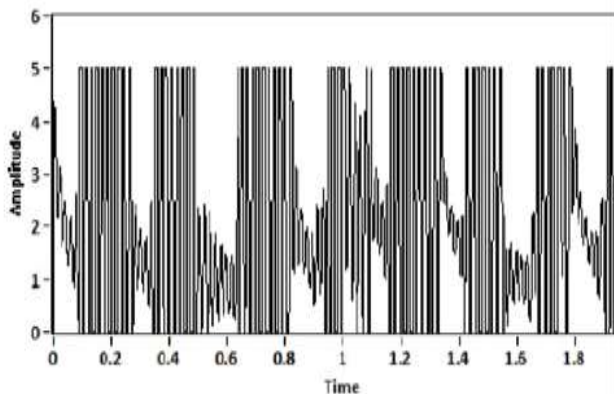Fig. 1.1 LabView Block diagram for DAQ

Fig.1.2 Output Based on DAQ program

Pratiksha Sarma, 2018 Fig. 2.1 shows block diagram of real time DAQ system. It mainly consist of sensing unit, which includes plastic fiber optic red LED(IFE91A) followed by signal processing unit mainly consist of IA AD620,the output of this stage is converted to digital form for further processing, by using arduino uno board the o/p is sent to pc through serial port. For monitor and display serial data, python code is run on the PC. [5]
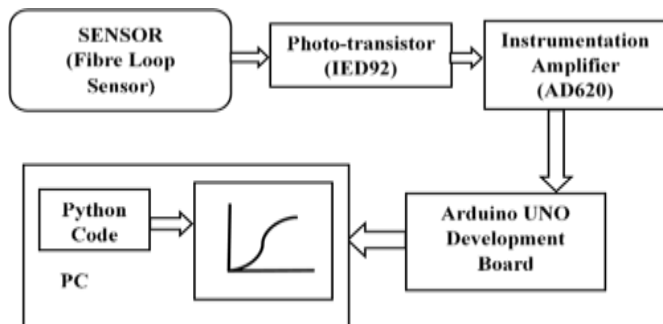

Fig. 2.1 Complete system block diagram

2.1 Result of above block diagram

For experimentation of proposed DAQ carried out on fiber-loop sensing system for measuring volume of liquid samples collected in beaker.so, fig 2.2 shows result of DAQ system, this DAQ can generate series of curves for all liquid samples for different time interval, with reference to sample table shows in fig. a, curves can be generated. Fig. b shows for two different time intervals of 120s and 180s for sample S3. [5]
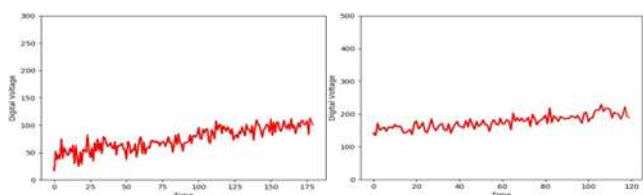

Fig. a liquid sample table   Fig. b curves for sample S3

Fig.2.2 result of DAQ system

Downey, Bombinski, Nejman, 2015 Fig.3 shows the automatic multisensory data acquisition system. This is

REALISM project used for automatic acquisition of vibrations, force acoustic emission and visual tool condition registration in real time production environment. In this, system is controlled by CNC controller on machine work and work without any intervention of machine tool operator. [5]
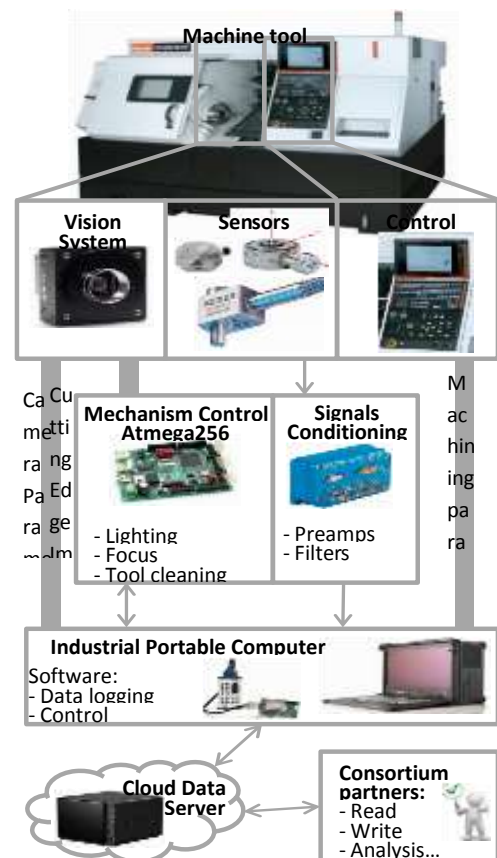
Liquid Samples	Concentration (in mL)		Density (in g/mL)
	Water	*Glycerine*	
S1	100	0	0.996
S2	85	15	1.039
S3	75	25	1.069
S4	50	50	1.138
S5	30	70	1.189
S6	10	90	1.235

Fig. 3 Multisensory data acquisition system
Comparison between different data acquisition and remote display techniques used for implementation

	Pratiksha s. 2018[5]	Lad,Mahajan, Mandkulkar 2017[2]	Bombinski, Downey,Nej man 2015
Data transmission method	Wired	Wired	Data loggers
Micro-	Arduino Uno	AVR	Atmega256

controller		Atmega32	
Used	Monitoring continuous data from sensor	Prototyping tool for engineering and educational projects.	Tool condition monitoring

3. CONCLUSIONS AND POSSIBLE FUTURE SCOPE

In this survey paper, we have discussed different types of data acquisition methods. Also different terms used for remote monitoring purpose. From these we can say that, data acquisition and remote monitoring system is one of the important need of all large scale as well as some small scale industries. With reference to above, some project uses wired and some of them uses wireless technique for remote monitoring of the data. But only particular types of sensor has been used for measurement of level, temperature of the other parameters. All sensors are with voltage output. No one from above used current output sensors.

As some special sensor (industrial sensor) has current output i.e. 4 to 20ma, so no has used these type of sensor, also application area of these sensor is wide. Its greatest requirement of industry for remote monitoring of data collected by sensors.

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