

Implementation of Distributed Control System for Rice Mill Using C#

Padmaja Assistant Professor,
padmaja70.alapati@gmail.com,

E Krishna Associate Professor,
krishna.cseit@gmail.com,

P V Sarath Chand Associate Professor,
chandsarath70@gmail.com,

Dr. M Bal Raju Professor,
drarajucse@gmail.com,

Department of CSE Engineering,

Pallavi Engineering College,

Kuntloor(V), Hayathnagar(M), Hyderabad, R.R. Dist. -501505.

ABSTRACT

In this article, we show you how to use C# to build a distributed control system for your rice mill. A more effective signal from the real-time control units may be used to construct the real-time manufacturing system. In comparison to more archaic forms of industrial control, current systems are much more expansive days. The Distributed Control System (DCS) is an innovative software-based system for controlling mechanical systems. More vogue than other traditional state-of-the-art security and safety technological advances in production. The focus of this study is on the DCS-based rice mill's implementation in visual C#.net. The In order to implement Industrial Ethernet (IE), the top-level controller for controller and command center for far-flung machinery. This model In terms of automation and efficiency, client-server architecture is preferable. Producing for scholarly investigation

Introduction

In Myanmar, RICE is used as a staple by all citizens. It's the most common source of calories in the human diet, surpassing even the grains themselves. In terms of availability on a per-person @ 31%, it fulfills 31%

of the daily calorie requirement based on the average adult male weight (73.8 kg). Among the people. Burma (Myanmar) is the leading producer. In the global rice supply. In addition to the rice milling process, it's important to farmers to process bran for oil extraction, and the bran allocation of resources with the purpose of maximizing wealth, productivity, and manufacturing services [1-7]. There are several rice-processing factories that are common hullers, and they don't get the job done. Modern and up-to-date modern rice mills have expanded capacities and

Include principal was focused, but ultimately inept. Miniature the modern rice mills have developed and are available on the market, but knowledge is required to make obstacles preventing it from being accepted by a possible industrialist. The A presentable duplicate would help immensely in bridging to have a pause in the information. Block schematic of the whole system Figure 1 depicts a DCS-based system for a rice mill.

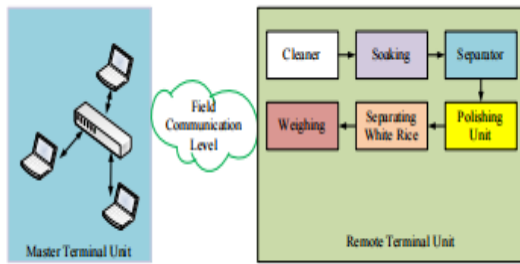


Figure 1. DCS-Based Rice Mill

Milling Process

Even if modern gear is a little expensive and the production rate is a little bit slower, the rice produced by it has advanced tremendously in recent years. Demand for more product in the free market. Introduction to A mechanical drier is an extremely supplementary addition. Process requiring physical labor and drying time in the sun. Right now, amid the dryness of machinery, method condensation is being used and it is a UN Six to seven hours is needed to dry paddy if the process is not interrupted. The rice mills can continue to function, even in wet weather, which is a huge condition. Integration of a Parboiling Machine with a Dryer mills, which are modern examples of Myanmar. All other medical treatments are standard in this part of the world (mar). In order for rice to be harvested, it must first shed its outer, poisonous husk. Adjacent hull to the main body. All the workers at the rice mill it's separated from trails and other distant material. A variety of specialized machines that produce jagged rice. When making parboiled rice, a condensation pressure is used. Operation performed before milling. Parboiled rice shell or hull, where the essence softens before being released allowing the outer starch, fiber, and other components to come together. Thereafter, the water is broken and the rice is sticky. Condensation dries

quite slowly. Dried, par-boiled rice is distributed through machines that remove the outer covering to bring out the core of it. The distribution of brown rice fascinates. Defending themselves from the tough rice with machineries get rid of the outer covering (hull) and replace it with bran layers intact surrounding the undamaged core. In order to produce white milled rice, the germ is eradicated involving the outer hull or shell and the inside bran. There are bran layers, which machine-generated separation by polishing irritated by the annoyances that cereals cause together while under duress this leads to a more polished final product. Essence, white (8-12)

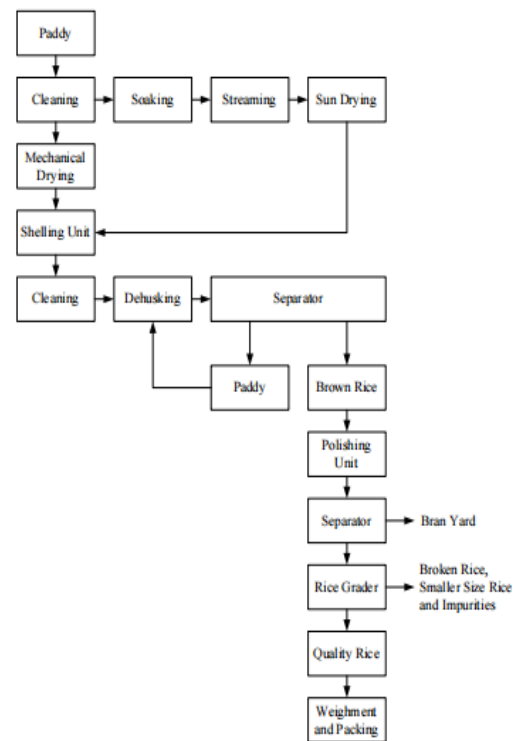


Figure 2. Block Diagram of Raw Rice/Parboiled Rice Processing

DCS System for Rice Processing

The distributed control system (DCS) is made up of a SCADA system and other front-end systems. The

acronym SCADA indicates that its primary purpose is dual: It pulls data from both the front-end mod and the back-end mod rules, and it suggests using controls for oversight examples include information dissemination, illustrating, and accurate considering several possibilities; amassing data. This makes it easier to manage orders, messages, and complaints. Primarily, this refers to the front strategies towards the end might be represented by cam campaigns and I/O interfaces Primitive methods used at the beginning of a process from a collection of I/O devices that are very simple to construct to complex methods reliant on high performance connectivity computer systems that are connected to SCADA systems through communication system in industry Continual Monitoring and Control System database contains proofs of factual situations when the data values are accurate cumulated. Each component of a distributed control system may be considered independently. Appropriate parts. There is the option to completely activate such a partition. Independently of other DCS components and advocating provides full SCADA capabilities to its customers. Two or A single control provision may be used to create a greater number of partitions. Via establishing connections between the many real-time databases. AP control provinces may be composed of as few as one did in addition to sight. Disturbances inside the limits of this regulator province swap information with by definition and Identifying and titling evidence in real-time, dispersed data base. This database access is the only exception; otherwise, zero further interaction acquaintances known certain subsystems of the control strategy. Figure Part of a control system, as shown in Figure 3, contains front-

end systems, linked with two departments, and Dedicated to the supervisory control and data acquisition errands without access to the starting points. These Powerful partitions may be erected, for instance in response to an appeal to the DAQ framework for the purpose of cup tying its partitioning [13].

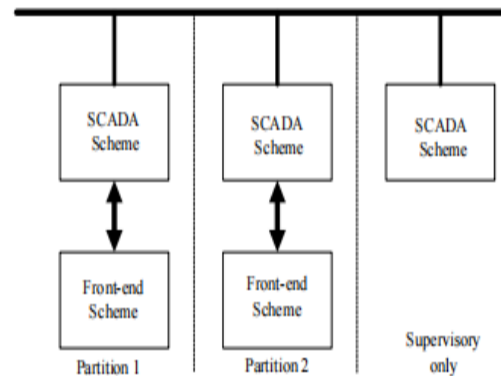


Figure 3. DCS Segregating Software Apparatus of DCS

As can be seen in connection with the data-flow friends in Figure 4, the same kinds of software gear must be used for all the various DCS divisions.

What follows are:

The use of distributed SCADA systems.

- Implementation of SCADA for control functions.
 - Support for front-end module interfacing.
 - Connecting to the outside world's buildings.
 - Non-SCADA front-end control functions.
- The SCADA architecture provides many different types of services. To go on with a determined plan to exert one's willed over process. Accessory front-end devices may be interfaced with in a variety of ways. Found out what else served as natural drivers in the SCADA system mechanisms to reliably connect to the gadgets the client-server architecture, etc.

Notably the con Every SCADA system relies on predetermined The OPC user software is a vice drivers that may communicate with any most industrial processes are now driven by either a manufactured or commissioned OPC server and a control function based on SCADA. The functions required for the detector to function properly. On the other hand, a reliable group of regulatory operations be provided, when needed, by a regulating function, components at the front end, such a VME-based system with a machine that's been dug in, or an IDE's attempt to pass for a Program Programmable Logic Controller. Assembling the front part there must be an acknowledged final structure for SCADA systems. In the event that at all conceivable, using a devoted OPC server. Specifically, the interface to the outer buildings must, if at all feasible, in place as Open Pluggable Component (OPC) servers or as specialized facilities whenever it is financially viable to do so discussion of the data's clear qualities, as in the communicate with the DAQ system on occasion. Secluded Internet-based forms of interaction with DCS would be permitted. With regard to the contact rights of the various classifications of manipulators

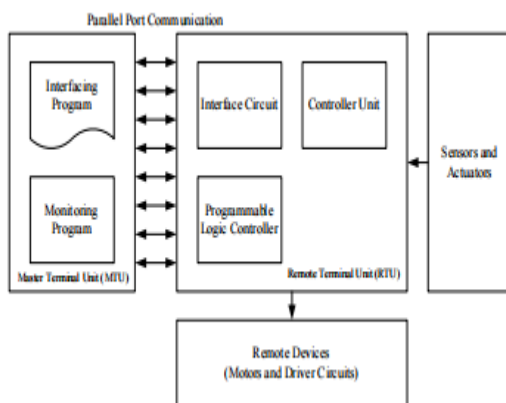


Figure 5. Block Diagram of DCS System for Rice Production Factory

Monitoring and Displaying for DCS System

The following is an explanation of the system's fundamental operating concept. In order to properly communicate, the main window's (computer's) monitoring program must be active and transmit the directive to the RTU (Remote Terminal Unit) [14, 15]. After data collection, command reception, and verification operation window) processing module through the sent order. If you choose the collect information from sensors and be asked to submit gather data, mode, we take in the analog signal from the operating system's input sensors, analyze the data, and then transmit the findings to an output system [16,17].

5.1 Linking Windows System for DCS Process

It was possible to control and halt the DCS process. Following the operator's control of the center window. The

Primary interface must automatically collect information condition and show it off in real-time while keeping the calm presentation of data. The strain on the graph connection occurs in only this is a one-second delay before the STOP instruction is recognized. When the main window software loses power, similarly, the gap between data collection and distribution has shrunk. Stop any further actions than emptying the command from the big pane of glass in

the middle. Because of this, the approach to the solicitation was gentle. Center window, through which the wares may be seen PCs and other windows, may be connected with one another. Windows in the DCS architecture.

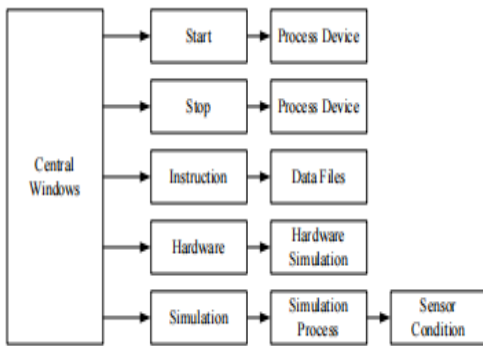


Figure 6. Block Diagram of Linking Window System

Designing the Program for Central Window

The primary window, which comes from the Visual Studio 2018 IDE, makes use of the Visual C#. Net ration of window soliciting. A window shape may be inferred from its use as a form in using the software to gather data for a solicitation and data consumption based on if/then rules applied to the characteristics of computer programs or applications. These are the control modules that goals are taken into account when filling out the form. Containment sleeve for the package contents. The professional training manuals also item-specific grammar is developed on the the Visual C# language code viewer. Data timing for interface is accomplished with the use of specialized timing tools. In addition to input and output data analysis processes stage. In order to foster an occurrence at us, we use a timer. Transitions that are clearly delineated by the er. Obtaining or establishing

a time, millisecond time interval, bookended by two ticks of a stopwatch. Window This form's timer element, the interval, contains a property that indicates the interval over which the limits the time in milliseconds before permission is granted time interval between two separate events that have a common occurrence. Without since the element is disabled, it cannot perform its intended function. Environments are shaped through windows. The informational Timer stances persist in order to accumulate the Tick occurrence at approximating the time difference between two points in a rough sense. This information and every time the output system galvanizes. Timer instrument is used. By use of (timer In Tick) to keep tabs on the port's internal clock. The alert signal once timer condition is sent to authorized a user's computer's password.

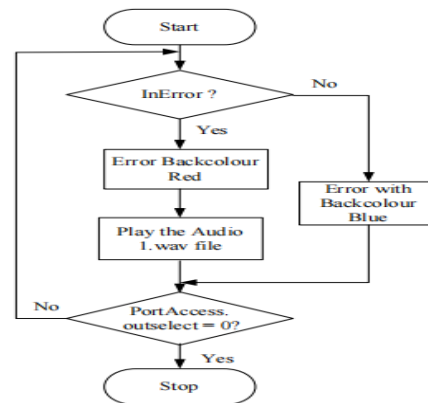


Figure 7. Flowchart of Error System

Designing the Program for Monitoring with Simulation Window

This time period relies on component monitoring on a fillable form (Simulation Form). Simulation-derived signal Beach procedure has its own button that may be used as a window based on the center window's timer (timer In Tick). Thus, the coordinates

of each picture are entered on the form by digital photo frame (picName). And then there's the phrase indicating the show both the active process and the completed procedure. Start the form by clicking the "Start" button on the state. For this system to verify the current input pin condition. Thus, it employs a timed mechanism. In which the parts are shown by use of a windowed program. The timer instrument (timer_) is used to simulate a moving conveyor. And it's shown in Figure 8 (Conveyor Tick). This input timer sends signal to conveyor (in Conveyor), displays of conveyor belts being shown on the form. Each of the robot gripper's three images is shown on the screen. Age-old plans to hold on tight. The timer utility (timer_) is used. Grow Indicator Gripper Tick) to get feedback from the control system. As a first step, lime should be used to calibrate the sensor's color to the work piece's color. Assuming the sig If the input pin's (inWorkpiece) nil is 1 then the image will be shown. Robot gripper (Robot Gripper) age at the site of picture (picGripper) and the red light detector for the work piece in the survey. The signal from the input pin (inRobotGripper) is checked for truthiness or falseness if none of the aforementioned applies. Certainly, a robot gripper icon is shown (Robot Gripper) wherever the picture is (picGripper). In the event that it is not accurate, in addition to the above, it depicts a standard robot grasp. Per (RobotGripperNormal) (RobotGripperNormal). It's like a flow chart, except for simulations. Figure 9 depicts the control configuration for the robot's gripper.

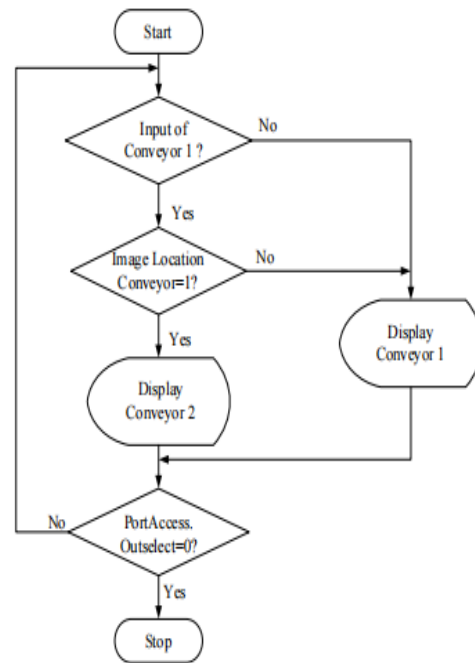


Figure 8. Flowchart of Monitoring for Conveyor

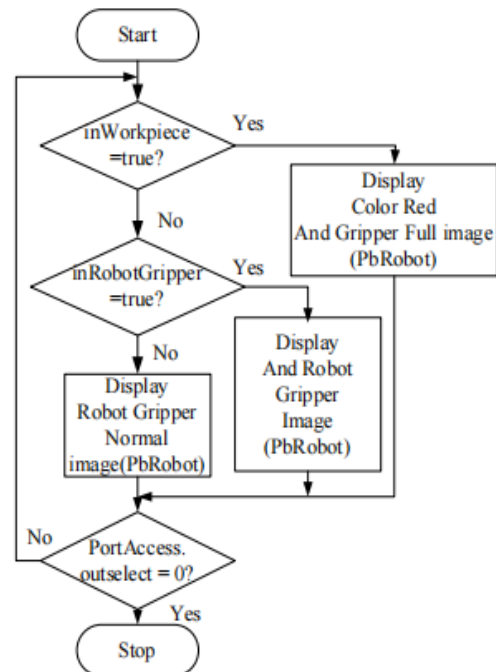


Figure 9. Flowchart of Simulation for Robot Gripper System

Display Result of Central Window

The five buttons in this window are "start," "stop," "process," "simulation," "instruction," "hardware," and "exit." And it incorporates the usage of the terms "appellation" and "title" together with "designer" designation, and alert hues based on the circum position of the error indicator. This break in the clouds is crucial for systemic, exhaustive, etc. It contains the interface design. For the parallel port's input and output signals in connects to other panes and guides the pliable signal input and output conditions are seen via a set of rudimentary windows. The use of the start and stop switches is essential for Keep tabs on the whole strategy in real time methodical observation. For the purpose of simulation, the show the result of the simulation runs. The usage of the instruction switch to bring up the user manual for means intended. Using a hardware toggle, we are able to confirm connecting with a piece of hardware in order to study it. Finally, the process is completed by pressing the "exit" button. Leaving the observing system via connecting with the the space for a yes or no answer. Figure 10 advertises this fact.

6.2 Display Result of the Simulation Window

There are two toggles in this panel: one for the back, and one for the sensors. This panel is essential for displaying the full operation. It is planned on the form. Sample parts for actual automotive equipment analytic procedure by drawing on the example data of genuine hardware. Each compo's tracking or repositioning is shown.

To receive and send data, it relies on a signal from the center window. For the device's operation, using each signal individually. It is Figure 12 shows this.

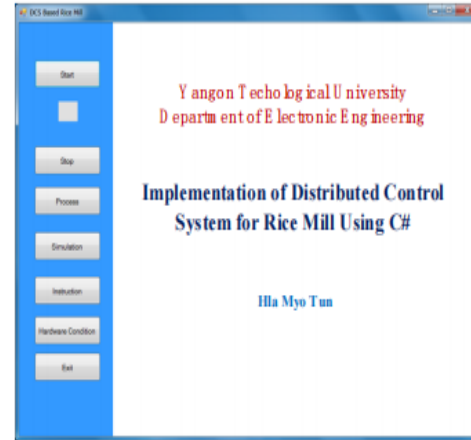


Figure 10. Display Result of the Central Window

Pressing the back button brings up the previous window, which may be used to shut the main window or the operation window. The sensor switch is connected to the sensors to convey their status. It. Data, hardware, sensors, and operable parts are all a part of this. The signals coming in from each input utilize all available windows.

6.3 Display Result of the Instruction Window

This pane verifies the comprehensive scheme's user manual, detailing both its operation and its contents. It is meant to be associated with the big window in the middle of the room. In Figure, it is advertised. In order to return to the main window, the user need just click the Padlocks will be placed on the instruction window.

6.4 The Outcome of the Visual Hardware Window's Display

The shown images are of the hardware in question. Reacting in such to the DCS architecture's modules. If when the user presses the button to begin, the whole process would follow; with images of arrows expressing themselves on back switch is utilized to go back the central window that exposed in Figure 14. The shape of a window. Connects to the main window.

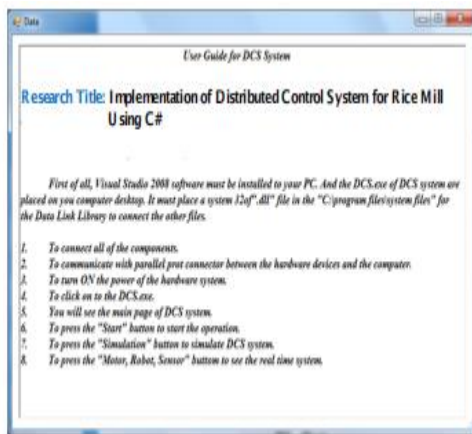


Figure 13. Display Result of Data Window

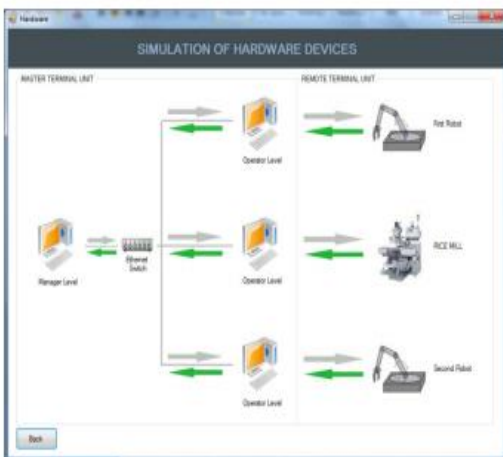


Figure 14. Display Result of Visual Hardware Window

Sensor Window Output Display

International Conference Latest Studies In Engineering Research

This pane changes colors to indicate the sensor conditions while the procedure is going. It the robot's location sensor (1), a proximity sensor (2), and a sensor for the conveyor's location, and sensor for the robot's location (2). If the input pins provide a signal to the sensors, the variables may Sensors' colors will be red or pale green on the display. Form. Creates a connection to the simulation interface. The reversal lever helps you return the simulation window to its previous state. As a result, it's out in the open.

On Figure 15

Result of Process Window Display

The steps involved in cultivating rice are shown in this window. Generate from rice. The whole method is now public knowledge. In the preceding chapter. As many as six distinct procedures to make rice from a paddy. They're washing, rinsing, and sorting. Weighing, sorting, aerating, and polishing rice to remove impurities. The Figure 16 displays the results of a screenshot.



Figure 15. Display Result of the Sensor Window



Figure 16. Display Result of the Process Window

Display Result of the Exit Window

The operator's options to continue with or deviate from the current state of the whole scheme are shown in this pane. Utilizing the in-built text-entry field, with checkboxes labeled "yes" and "no" if that's the case. If the answer is "yes," it will leave the plan, and if not, the precise would be able to withstand the treatment. Evidence of this may be seen in Figure 17.

Conclusions

Our goal in doing this research was to improve the governing hardware devices used all over the world by carefully monitoring and planning the whole system. The extra development may make touch with this observation strategy. This research is being set up to allow us to manage the rice milling process applying visual C#. Using the aforementioned method of regulating observations, hopes to improve process safety and efficiency certainty coming from the MTU. Affordable data collection based treatment, prescription, and monitoring plan on the study is a significant step forward for DCS. Due to the rapid

development of new technology, this system may quality depends on how easily it can be adapted to other uses. An intricate structure. Technologies are assumed for this study. The rice mill's D.C.S.-based Distributed Control System. It contains moving parts, sensors, and other components

Systems and software for managing VB code. DCS software-style net programming. Further, the pretending and tracking systems for automated manufacturing applications that don't use standard DCS software. Which means that the features that users are looking for in order to satisfy their needs? The pricing for utilizing this software is reasonable and offers announced the availability of high-powered computers and automated Increases in control may be used as a tool to both the product's quality and the fabrication's adaptability. To rephrase: For this investigation, Visual C#.Net used the rice milling process. DCS system monitoring software has been programmed. Planned and carried out Methods of contact interfaces components through a parallel port and circuit purposes. Hardware implementations of this strategy are in the works. by using an oversimplified iconic model and supporting evidence the hardware and software, and it could be or set up to begin and end with observational element plan, and it's possible to accomplish every state in quick succession.

References

- [1] Wang, L., Wei, H.Y., 2010. *Development of a Distributed Control System for PLC-Based Applications.* College of Electronic and Information Engineering, Hebei University.

- [2] Bradley, J.C., Millsaugh, A.C., 2009. *Programming in Visual C# 2008. Computer and Information Technology*, <http://www.primisonline.com>.
- [3] Abolrous, S.A., 2008. *Learn C#*.
- [4] Talamini, G., 1997. *Operator Interface Design for Industrial Control*. University of Queensland.
- [5] Tsourveloudis, N., Ioannidis, S., Valavanis, K., 2006. *Fuzzy Surplus Based Distributed Control of Manufacturing Systems, USA, APEM Journal*. pp-5-12.
- [6] Shivanand, M., Benal, M., Koti, V., 2006. *Flexible Manufacturing System*.
- [7] Cole, E., Krutz, R., Connelly, J., 2005. *The Network Security Bible*. New York: John Wiley & Sons.
- [8] Hugh, J., 2005. *Automation Manufacturing Systems with PLCs*. Person Education.
- [9] Kamen, E.W., 1994. *Introduction to Industrial Controls and manufacturing*. School of Electrical and Computer Engineering Georgia Institute of Technology.
- [10] Beum, H., 2004. *Technology Update: Cyber Security Guidance-Interface Technologies*. Control Engineering.
- [11] Cyberscience Lab report, 2003. *Introduction to Networking*.
- [12] Chen, L., Wang, Y.X., 2002. *Design and Implementation of a Web-Based Distributed Control System*.
Dept. of Electrical & Computer Engineering,
University of Calgary.
- [13] Anonymous, 2002. "Distributed Control Systems" Chemical Engineering Department, King Saud University.
- [14] Tun, H.M., 2008. *Distributed Control System for Vehicle Spare Parts Manufacturing Plant. Real Time Graphical User Interface Monitoring and Networking System*.
- [15] Tun, H.M., Kyaw, M., Naing, Z.M., 2011. *Development of process monitoring system in drilling process using fuzzy rules. International Journal of Systems Assurance*. 2, 78-83.