"INDUSTRIAL DRIVES & AUTOMATION USING PLC"

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Abstract: Automation equipment, such as controllers and data systems and / or services. Provide systems and methods, statement or other unit that receives data from an automated interactive device, provided the statement to the appropriate system or service for processing, and optionally return a response, such as a result set. Further, in accordance with one aspect of the present invention, the machine controller code, variable, or label can be mapped to the stored data, or a combination of program data and / or programs, and automatically or semi-automatically be updated. Programmable logic controller (PLC) or programmable controller is used in electrical and mechanical processes, such as in a factory assembly line, rides, or lighting control automation mechanical digital computer. Many industries and the use of the machine PLC. Is different from the subject invention relates to the promotion of common industrial communication between computers, PLC is designed for multiple input and output devices, extended temperature range, resistance to electrical noise, vibration and shock. Programs to control machine operation are typically stored in battery-backed or non-volatile memory. PLC is a real time system since output results must be an example of a response to an input condition occurs within a bounded time, otherwise unintended operation will result.

Keywords: electromechanical, amusement rides, electrical noise, programmable logic controller, CAD, CAM Surround Space Imaging in virtual reality applications, such as voice conferencing multiple participants in the Internet Protocol (IP) networks is important to enhance the user's ability to distinguish between remote participants or virtual reality provides spatial cues. In VoIP applications, is not always easy between participants based on their voice-only

HISTORY

PLC is in response to the needs of US auto manufacturing industry invention. 1968 General Motors Hydramatic cars (General Motors automatic transmission subsidiary) issued an electronic alternative to hard-wired relay systems request proposals. The first PLC, designated the 084 because it was Bedford Associates' eighty-fourth project, was the result. Dick Morley, who is considered to be of the PLC "father."

FEATURES OF PLC

The main difference from other computers is that, PLC is armored harsh conditions (such as dust, moisture, heat, cold), and has facilities for a wide range of input / output (I / O) arrangements. Connecting the PLC to the sensors and actuators. The PLC read limit switches, analog process variables (such as temperature and pressure), and sophisticated positioning system location. Some use machine vision. In the side of the actuator, PLC operation electric motor, pneumatic or hydraulic cylinders, magnetic relays, solenoids, or analog outputs. Input / output devices can be built into a simple PLC, or the PLC may be connected to the PLC into the computer network of external I / O modules.
Architecture of PLCs

Early PLC designed to replace relay logic systems. This schematic PLC in “ladder logic”, which is very similar to relay logic programming. Choose this notation programs to reduce the demand for training prior art. Other early PLC instruction used in the form of a list of programming based on a stack-based logic solver.

Modern PLC programming can be performed in a variety of ways, from ladder logic to more traditional programming languages such as BASIC and C. Another method is State Logic, a very high-level language designed based on a state transition diagram to PLC programming.

PROGRAMMING IN PLC

Using proprietary programming panels or special-purpose programming terminals, often have a more dedicated function keys PLC, early various logical elements of PLC program, the mid-1980s, it is programmed. Program stored in the cassette. Printing and documentation facilities are very small, due to lack of memory capacity. Very old uses PLC nonvolatile magnetic core memory.

SCADA

The term SCADA usually refers to centralized systems which monitor and control entire sites, or complexes of systems spread out over large areas (anything between an industrial plant and a country). Most control actions are performed automatically by Remote Terminal Units ("RTUs") or by Programmable Logic Controllers ("PLCs"). Host control functions are usually restricted to basic overriding or supervisory level intervention. For example, a PLC may control the flow of cooling water through part of an industrial process, but the SCADA system may allow operators to change the set points for the flow, and enable alarm conditions, such as loss of flow and high temperature, to be displayed and recorded. The feedback control loop passes through the RTU or PLC, while the SCADA system monitors the overall performance of the loop. Data acquisition begins at the RTU or PLC level and includes meter readings and equipment status reports that are communicated to SCADA as required. Data is then compiled and formatted in such a way that a control room operator using the HMI can make supervisory decisions to adjust or override normal RTU (PLC) controls. Data may also be fed to a Historian, often built on a commodity Database Management System, to allow trending and other analytical auditing. SCADA systems typically implement a distributed database, commonly referred to as a tag database, which contains data elements called tags or points. A point represents a single input or output value monitored or controlled by the system. Points can be either "hard" or "soft". A hard point represents an actual input or output within the system, while a soft point results from logic and math operations applied to other points.

Fig:1 PLC Architecture

Fig:2 Automation Controller

DEVELOPMENTS IN PLC
Fig:3 Automation Controller

(Most implementations conceptually remove the distinction by making every property a "soft" point expression, which may, in the simplest case, equal a single hard point.) Points are normally stored as value-timestamp pairs: a value and the timestamp when it was recorded or calculated. A series of value-timestamp pairs gives the history of that point. It's also common to store additional metadata with tags, such as the path to a field device or PLC register, design time comments, and alarm information.

HUMAN MACHINE INTERFACE:

A Human-Machine Interface or HMI is the apparatus which presents process data to a human operator, and through Diagnostic data and management information such as scheduled maintenance procedures, logistic information, detailed schematics for a particular sensor or machine, and expert system troubleshooting guides. This means that the operator can see a schematic representation of the plant being controlled. For example, a picture of a pump connected to a pipe can show the operator that the pump is running and how much fluid it is pumping through the pipe at the moment. The operator can then switch the pump off. The HMI software will show the flow rate of the fluid in the pipe decrease in real time. Mimic diagrams may consist of line graphics and schematic symbols to represent process elements, or may consist of digital photographs of the process equipment overlain with animated symbols.

The HMI package for the SCADA system typically includes a drawing program that the operators or system maintenance personnel use to change the way these points are represented in the interface. These representations can be the position of all of the elevators in a skyscraper or all of the trains on a railway.

An important part of most SCADA implementations are alarms. An alarm is a digital status point that has either the value NORMAL or ALARM. Alarms can be created in such a way that when their requirements are met, they are activated. An example of an alarm is the "fuel tank empty" light in a car. The SCADA operator's attention is drawn to the part of the system requiring attention by the alarm. Emails and text messages are often sent along with an alarm activation alerting managers along with the SCADA operator.

ADVANTAGES:

The main advantages of automation are:

- Replacing human operators in tedious tasks.
- Replacing humans in tasks that should be done in dangerous environments (i.e. fire, space, volcanoes, nuclear facilities, under the water, etc)
- Making tasks that are beyond the human capabilities such as handling too heavy loads, too large objects, too hot or too cold substances or the requirement to make things too fast or too slow.
- Economy improvement. Sometimes and some kinds of automation implies improves in economy of enterprises, society or most of humankind. For example, when an enterprise that has invested in automation technology recovers its investment; when a state or country increases its income due to automation like Germany or Japan in the 20th Century or when the humankind can use the internet which in turn use satellites and other automated engines.

DISADVANTAGES

The main disadvantages of automation are:

- Technology limits. Current technology is unable to automate all the desired tasks.
- Unpredictable development costs. The research and development cost of automating a process is difficult to predict accurately beforehand. Since this cost can
have a large impact on profitability, it's possible to finish automating a process only to discover that there's no economic advantage in doing so.

- Initial costs are relatively high. The automation of a new product required a huge initial investment in comparison with the unit cost of the product, although the cost of automation is spread in many product batches. The automation of a plant required a great initial investment too, although this cost is spread in the products to be produced.

Applications
1. PLCs may need to interact with people for the purpose of configuration, alarm reporting or everyday control.
2. Most modern PLCs can communicate over a network to some other system, such as a computer running a SCADA (Supervisory Control And Data Acquisition) system or web browser.
3. Use of PLC in storing water - a facility needs to store water in a tank. The water is drawn from the tank by another system, as needed, and our example system must manage the water level in the tank.

Using only digital signals, the PLC has two digital inputs from float switches (Low Level and High Level). When the water level is above the switch it closes a contact and passes a signal to an input. The PLC uses a digital output to open and close the inlet valve into the tank.

CONCLUSIONS

ELF IN A COMPACT CONTROLLER OFFERS ADVANCED CONTROL FEATURES, NETWORK CONNECTIVITY EQUIPMENT INTEROPERABILITY AND THE ABILITY TO CORPORATE DATA FOUND IN PLC-, OR PC-BASED AUTOMATION CONTROLLER. WITH THESE FUNCTIONS, THE COMMISSION HAS BECOME AN INTEGRAL PART TO MEET THE REQUIREMENTS OF NEW AND DIVERSE NEEDS OF MODERN INDUSTRIAL APPLICATIONS.

REFERENCE

1. Http://www.plcs.net/chapters/history2.htm