RESEARCH PAPER | Engineering | Volume : 6 | Issue : 3 | March 2016 | ISSN - 2249-555X | IF : 3.919 | IC Value : 74.50

Atmel 89S51 Using Powerloom Management System

KEYWORDS: Microcontroller, Bar Sensor, MOC Sensor, IR LED, Relay.

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ABSTRACT *This project entitled Power loom Management System is about programmed machinery management of power loom without the access of manual power and energy. It's saves manual energy and on the other hand enhances the quality of cloth materials. This project is very useful for the handling of looms. Only one person is required for the handling of 16 looms. Thus it naturally saves manpower.*

HISTORY

A power loom is a mechanized loom powered by a line shaft, and it was one of the key developments of weaving industry during the early Industrial Revolution. The first power loom was designed in 1784 by Edmund Cartwright and first built in 1785. It was refined for the next 47 years until a design by Ken worthy and Bullough made the operation completely automatic. By 1850 there were 260,000 in operation in England. Fifty years later came the Northrop Loom that replenished the shuttle when it was empty and this replaced the Lancashire loom.

OPERATION – POWER LOOM

Operation of weaving in a textile mill is undertaken by a specially trained operator known as a weaver. Weavers are expected to uphold high industry standards, and are tasked with monitoring anywhere from ten to as many as thirty separate looms simultaneously. During their operation shift, weavers will first utilize wax pencils or crayons to sign their initials onto the cloth to mark a shift change, and then walk along the cloth side (front) of the looms they tend, gently touching the fabric as it comes from the reed. This is done to check the filler threads in the fabric. On finding the broken picks, the weaver disables the machine to rectify the error, typically by replacing the bobbin of filler threads. They are trained that, ideally, no machine should stop

working for more than one minute, with faster turnaround times being preferred.

The rectification of the circuits in the initial machines will automatically rectify the machines at

the progressive stages. At this point they will gently stroke their hand over the raised metal "tells" on the back of the machine. These tells, located over a special metal circuit, are held up by the tension of the thread coming from the warp. If the warp threads are broken, the tells will stop the machines from working. However, these are liable to get struck in the upward position, creating problems in weaving. By gently touching the tells it is possible for the weaver to trace the malfunctions and to rectify it. As with pick breaks, the weavers are trained to keep the machines running as much as possible; with speedy knot tying and correction being stressed. In this situation, they are expected to take less than a minute, with the mean ideal time to be ten to thirty seconds, to correct a break. The weaver also keeps a keen observation of warps that are about to run out, or problems in the warp itself which were not detected in the slashing process. Typically, weavers can expect to make several dozen circuits of their machines a night, with most of their time spent ensuring the quality of the cloth and the company standards of production.

EMBEDDED SYSTEMS

An embedded system is a computer system with a dedicated function within a larger mechanical or electrical system, often with real-time computing constraints.They consist of microprocessors, input and output devices, memories etc., on chip and they can be used for specific applications.

A small computer designed in a single chip is called a single chip microcontroller. A single chip microcomputer typically includes a microprocessor,

RAM, ROM, timer, interrupt controller and peripheral controller in a single chip. This single chip microcomputer is also called as microcontroller. These microcontrollers are used for variety of applications where these replace the computer. The usage of these microcomputers for a specific application, in which the microcontroller is a part of application, is called embedded systems.

Embedded systems are used for Real Time Applications with high reliability, accuracy and precision. Embedded systems are operated with Real Time Operating systems (RTOS) like WinCE, UC Linux, Works, VRt x, and PSOS etc. Embedded systems are very popular these days. Most of the Electrical, Electronics, Mechanical, Chemical, Industrial, Medical, Space and many more areas have the embedded systems in their applications.

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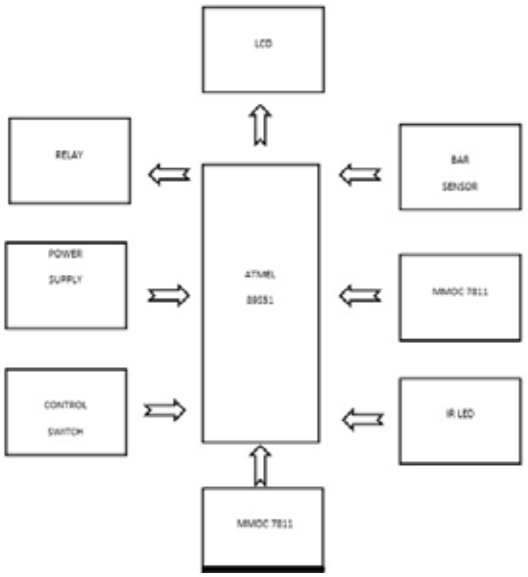
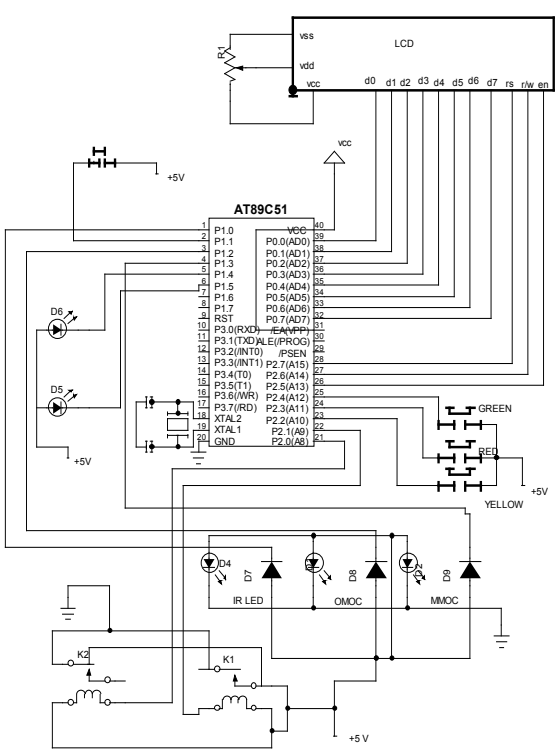
BLOCK DIAGRAM:



The Atmel AT89S51 is an 8051 based Full Static CMOS controller with Three-Level Program Memory Lock, 32 I/O lines, 2 Timers/Counters, 6 Interrupts Sources, Watchdog Timer, 2 DPTRs 4K Flash, 128 Bytes On-chip RAM.

CIRCUIT DIAGRAM:



In this circuit AT89S51 get the signal from Bar sensor, MOC7811, switch control, IR Sensor.

CIRCUIT OPERATION

This paper proposes to manipulate the power loom by enhanced programs to optimize the performance of the same.

It saves the human power. We have automated power loom function step by step in a gradual manner which requires low man power.

To minimize man power we used ATMEL 89S51 Controller and the following work is effectively programmed and performed. ATMEL

which is used to automate all the performance using assembly language program.

Bar sensor is used to sense the warp of the power loom which is the vertical thread of power loom. While running if the warp is disturbed or cut, immediately it is sensed by the bar sensor and it makes RED LED glow and also it intimates the forward relay to turn off and for a moment turns on the reverse relay and stops the power loom

MOC Sensor is used to sense the length of the cloth in meter and it is displayed in LCD continuously. If the machine needs to be stopped, then the warp should rest on one particular side and it should sense the warp placement side. This process automatically stopes the machines from working.

IR LED is used to intimate the completion of weft thread by glowing green led. This is also connected to the forward relay which stops and stops the reverse relay for a second and finally stops the machine.

The control switch block consist of three switches namely red, green and yellow. Green switch is used to run the loom continuously. Red switch is to stop the loom and yellow switch is to check the machine performance manually by pushing for a while.

SOFTWARE DETAIL

MICROVISION KEIL:

Concept of cross compiler: -

A cross compiler is similar to the compilers but we write a program for the target processor (like

8051 and its derivatives) on the host processors (like computer of x86). Being in one environment and writing code for another environment is called cross development. The compiler used for cross development is called cross compiler.So the definition of cross compiler is a compiler that runs on one computer but produces object code_for different types of computer. Cross compilers are used to generate software that can run on computers with a new architecture or on special-purpose devices that cannot host their own compilers. Cross compilers are very popular for embedded development, where the target probably could not run a compiler. Typically an embedded platform has restricted RAM, no hard disk, and limited I/O capability. Code can be edited and compiled on a fast host machine (such as a PC or UNIX workstation) and the resulting executable code can then be downloaded to the target to be tested.

FUTURE ENHANCEMENT

- It is used to change the power loom machineries to fully automatic**.**
- It saves the power.
- It increases the cloth manufacturing production.
- We operate the loom in anywhere.
- We take the details in anywhere.

CONCLUSION

Volume : 6 | Issue : 3 | March 2016 | ISSN - 2249-555X | IF : 3.919 | IC Value : 74.50

This project is power loom management system. It saves the human power and enhances the quality of the clothe materials. It's saves manual

energy and on the other hand enhances the quality of cloth materials.

This project is very useful for the handling of looms. Only one person is required for the handling of 16 looms. Thus it naturally saves manpower.

Promotion of this system of manipulating the performance of the power loom would effectively bring forth reduced man-power accession and increased production of goods.

HARDWARE:

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