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Power Loom Monitoring System by Using Internet of Things

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ABSTRACT: This paper's IoT-based Power Loom Monitoring system mainly focuses on monitoring the power consumption of the power loom through the Internet of Things. Detect faults of motor and control. Due to quite a number motives motor might also ride many nascent faults. It is very essential to guard motors from such faults. The quite a number faults are over-voltage, overload, yarn breakage display etc. So, pick out such faults most necessary parameters are voltage, current, and yarn breakage. Here motor is covered the use of microcontroller. For this the variable potentiometer is linked throughout the circuitry by using which we can range the voltage of the motor. This machine is dependable for checking harm or breakage of thread. The yarn breakage detection device is monitored the use of IR sensors. The IR sensor consists of an IR transmitter and the receiver. The yarn thread is run between the sensors to observe the yarn breakage. The output of the IR receiver is related to a comparator the comparator compares the entire voltage with the reference voltage. When the entire voltage exceeds the threshold fee the comparator offers a excessive voltage output, else it will stay low. When the comparator output is in greater workable the alarm will be raised to point out the yarn breakage via a driver circuit, which will grant the required voltage to power the buzzer alarm. Finally, thus obtained data from the sensors deployed in the power loom is pumped to the android application and the data is made available anywhere in the world.

KEYWORDS: IoT, Sensors, embedded electronics, Power Loom

I. INTRODUCTION

Many motors are used in home gear and fabric Industrial. Electric motors are integral & fundamental to many industries. These motors operate vast ranging features as required. Induction Motors are used for automation, appliances, induction control; due to the fact they are robust, reliable, and durable. Induction Motor runs at estimated pace when electricity is resources at endorsed specification, however variable pace is required through many purposes for their operations. Many sorts of AC induction motors are reachable in market. Different purposes use extraordinary motors as per requirements. An AC induction motors are less complicated to sketch than DC motors. Induction motors are dependable however they are subjected to undesirable stresses which motives faults resulting in decrease effectivity or failures. Incorrect design, brief circuits, or immoderate load leads to these electrically associated faults. Due to artificial error or herbal going on activities in addition provides to this. Monitoring of an induction motors is a rising technological know-how for detection of preliminary faults and to keep away from sudden failure of an industrial process. Therefore recently, situation monitoring of electrical machines has acquired greater recognition. Control of parameters like current, voltage, pace and temperature is grow to be necessary for the fitness of motor.

INTERNET OF THINGS

The Internet of things, or IoT, is a machine of interrelated computing devices, mechanical and digital machines, objects, animals or humans that are supplied with special identifiers (UIDs) and the capacity to switch facts over a community barring requiring human-to-human or human-to- laptop interaction. A component in the web of matters can be a individual with a coronary heart screen implant, a farm animal with a biochip transponder, an car that has built-in sensors to alert the driver when tire strain is low or any different herbal or man- made object that can be assigned an Internet Protocol (IP) tackle and is capable to switch information over a network.

Increasingly, agencies in a range of industries are the usage of IoT to function greater efficiently, higher recognize clients to supply improved consumer service, enhance decision-making and make bigger the price of the business.



II. EXISTING SYSTEM

In this device the energy loom is thoroughly automatic and the universal overall performance of the electricity loom is monitored inside the industries. This machine is used for checking whether or not the rotation is reachable in the motor or not, to calculate the wide variety of gadgets and run time of machine, to show the manufacturing of stand close to and threaten due to the fact of the above three process, there will no longer purpose loss for the manufacturing of the cloth making machine, to ship the small print to the supervisor via SMS.

III. PROPOSED SYSTEM

This undertaking is designed with

- Arduino
- Current Transformer
- Potential Transformer
- Induction motor
- LCD display
- Relay
- Alarm

In this undertaking we are going to reveal the Voltage, current, temperature, Yarn breakage detector and vibration detection. All the 5 parameters are monitored with the following techniques. Yarn is monitored by way of the IR sensor. It is the one kind of transducer. It detects the Yarn and generates the voltage pulse. The corresponding pulse signal is given to microcontroller. Voltage and Current fed on by way of the motor is measured with the assist of a Potential and modern-day transformer. The modern transformer will convert the load modern-day in to decrease values that modern-day output will be transformed in to voltage with the assist of the shunt resistor. Then the corresponding the AC voltage will be rectified with the assist of a rectifier. Then the rectified output will be given to the arduino. If modern cost I s accelerated motor grant will be tripped by using arduino. Vibration of the motor is detected by using the vibration sensor and given to the arduino. If any vibration will be took place capacity arduino prompts the alarm in a similar fashion arduino receives temperature price from temperature sensor. If the temperature price will extend capability arduino flip off the motor.

PROPOSED BLOCK DIAGRAM

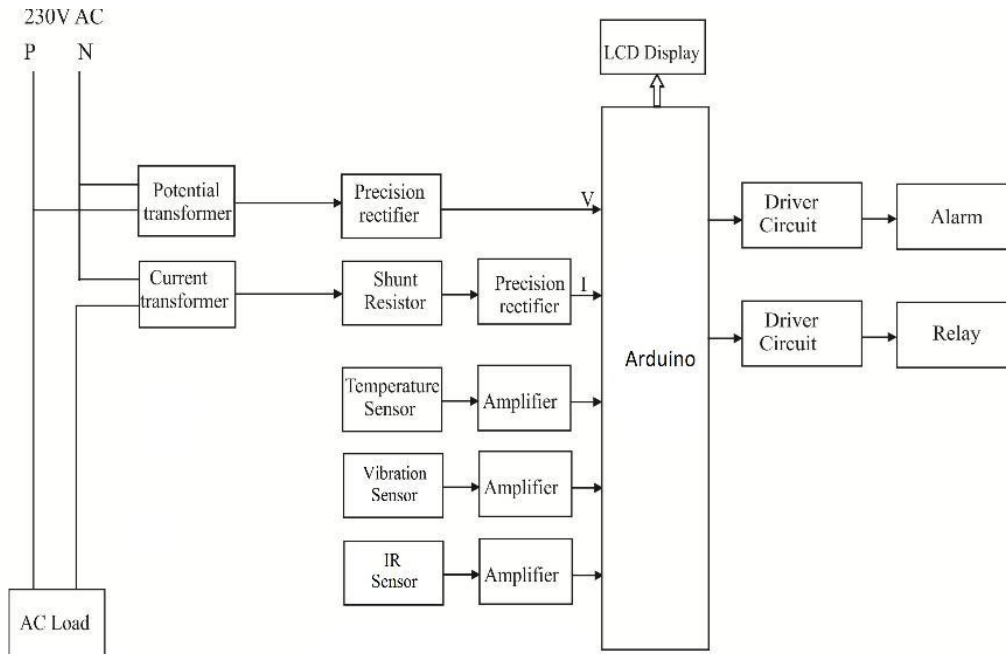


Fig 1. Block Diagram

IV. MICROCONTROLLER ARDUINO

Arduino Uno is primarily based on AVR microcontroller referred to as Atmega328. This controller comes with 2KB SRAM, 32KB of flash memory, 1KB of EEPROM. Arduino Board comes with 14 digital pins and 6 analog pins. ON-chip ADC is used to pattern these pins. A sixteen MHz frequency crystal oscillator is geared up on the board. Following parent indicates the pinout of the Arduino Uno Board.

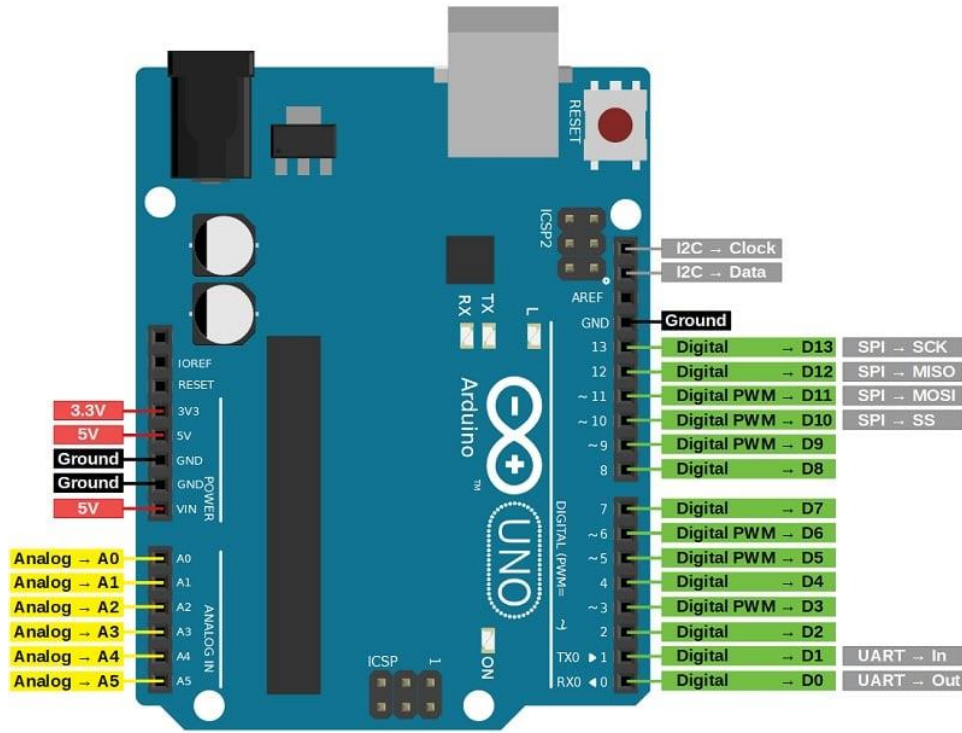


Fig 2. Arduino Pin Diagram

1. RELAY

We understand that most of the excessive quit industrial utility units have relays for their fine working. Relays are easy switches which are operated each electrically and mechanically. Relays consist of a n electromagnet and additionally a set of contacts. The switching mechanism is carried out with the assist of the electromagnet. There are additionally different running standards for its working. But they fluctuate in accordance to their applications. Most of the gadgets have the software of relays. The principal operation of a relay comes in locations the place solely a low-power sign can be used to manipulate a circuit. It is additionally used in locations the place solely one sign can be used to manage a lot of circuits. The excessive give up purposes of relays require excessive electricity to be pushed by way of electric motors and so on. Such relays are referred to as contactors.

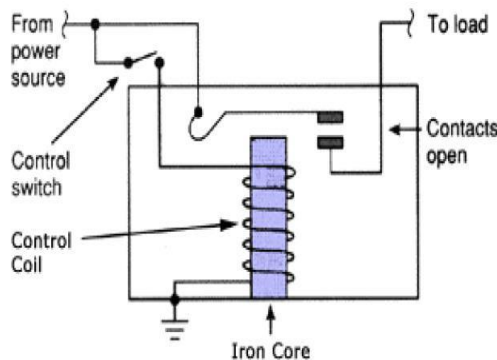


Fig 3. Relay

2. Buzzer

Buzzer or beeper is an audio signaling device. Buzzer will automatically turn on when alcohol is detected.



Fig 4. Buzzer

3. IR SENSOR

An Infrared sensor (IR sensor) is an electronic device that measures infrared (IR) light radiating from objects in its field of view. Apparent motion is detected when an infrared source with one temperature, such as a human, passes in front of an infrared source with another temperature, such as a wall.



Fig 5. IR Sensor

All objects emit what is acknowledged as black physique radiation. It is typically infrared radiation that is invisible to the human eye however can be detected by using digital units designed for such a purpose.

“Infra” that means beneath our capacity to notice it visually, and “Red” due to the fact this coloration represents the lowest electricity degree that our eyes can experience earlier than it turns into invisible. Thus, infrared potential beneath the power stage of the coloration red, and applies to many sources of invisible energy.

Infrared transmitter is one kind of LED which emits infrared rays usually known as as IR Transmitter. Similarly, IR Receiver is used to get hold of the IR rays transmitted by using the IR transmitter. One vital factor is each IR transmitter and receiver have to be positioned straight line to every other. The transmitted sign is given to IR transmitter on every occasion the sign is high, the IR transmitter LED is conducting It passes the IR rays to the receiver. When receiver receives the sign from the transmitter it resistance cost is low.it resistance price end up excessive when the sign used to be cut. By this sensor experience the value.

4. TEMPERATURE SENSOR

A thermistor is a type of resistor whose resistance varies with temperature. The word isa portmanteau of thermal and resistor. Thermistors are widely used as inrush current limiters, temperature sensors, self-resetting overcurrent protectors, and self-regulating heating elements.

Thermistors differ from resistance temperature detectors (RTD) in that the material used in a thermistor is generally a ceramic or polymer, while RTDs use pure metals. The temperature response is also different; RTDs are useful over larger temperature ranges, while thermistors typically achieve a higher precision within a limited temperature range [usually -90°C to 130°C].



Fig 6. Temperature Sensor

V. RESULT & DISCUSSION

The Arduino is related with the voltage sensor and modern-day sensor and IR sensor. These sensor records are gathered via the arduino of some targeted pins. As voltage regulator is used for any digital gadget that keeps the voltage of energy supply inside appropriate limits. The voltage regulator is wished to maintain voltages inside the prescribed range. The arduino is linked to a show that shows the electricity consumption readings. The price of the readings can be checked and managed the usage of the android app. The android app serves as a storage medium for the monitoring of current, voltage and yarn in the industry, which may also be acquired at any time. If the sensor shows up any strange it turns off motor routinely and supply warning to the owner. By the usage of this way, we can in a position to limit energy loss in the loom and we can become aware of the fault in the loom very easily.

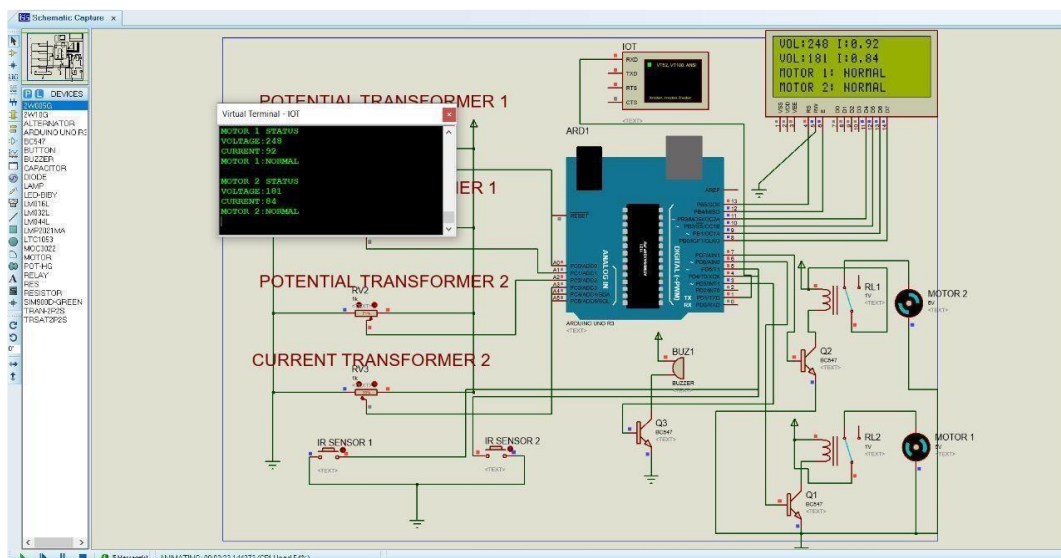


Fig 7. Simulation Diagram

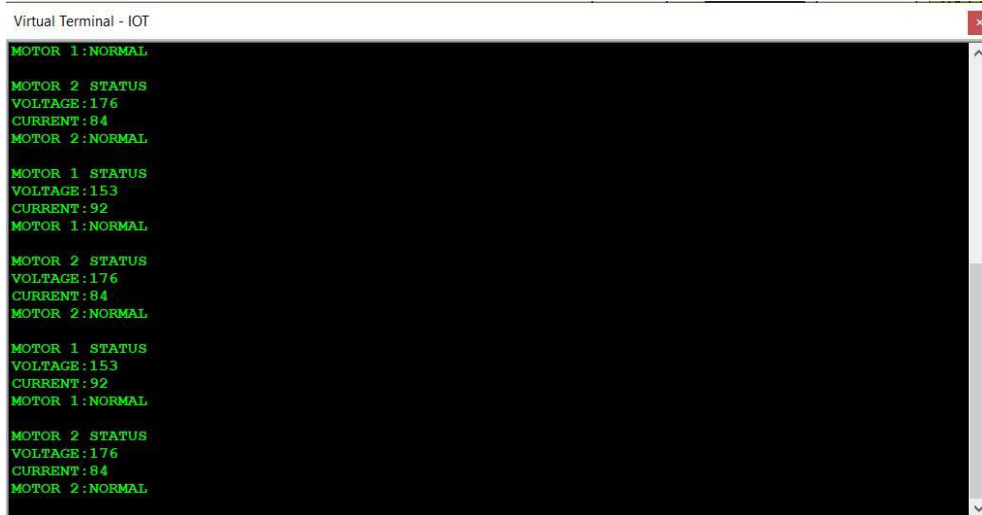


Fig 8. Hardware Result

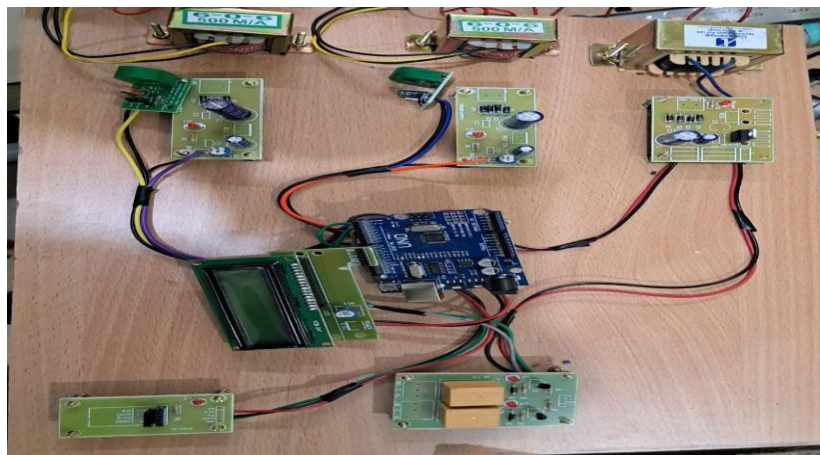


Fig 9. Hardware

VI. CONCLUSION

This venture introduced a reliable, fast, and environment friendly for cloth motor protection. It is encouraged for the enterprise in all instances of drives using induction motors. Protection of three segment induction motor from electrical faults ensures non-

stop and easy strolling of motor, and improves its lifestyles span. The prototype mannequin of microcontroller-based safety gadget is very easy in design, reliable, and value advantageous and ensures rapid response.



REFERENCES

- [1] Ramazan Bayindir, Ibrahim Sefa, Ilhami Colak and Askin Bektas "Fault Detection and Protection of Induction motor using sensor" IEEE -Transactions On Energy Conversion, Vol. 23, No 3, September 2008
- [2] N. Sreerama Reddy, Rajasekhar Thota, Roop Teja Neeluru "A microcontroller Based Protection and Control of Low Voltage Motors by Using ZigBee Technology" International Journal of Engineering Sciences and Research, Vol 04, special issue 01, 2013.
- [3] Brijesh Kumar Singh, Devesh Kumar, Piyush Kumar, Ravindra Singh, Vishal Singh, "Single Phasing, Phase Reversal, Over Voltage and Overheating protection of three phase induction motor" Internatinal Journal of Scientific Research and Management Studies, Vol 1, issue 1.
- [4] Ms. Pragati Deepak Patil, Sambhaji Patil, Smita Jaywant Patil "Fault Detection and Correction of Three Phase Induction Motor" Vol 3, issue 8, August 2014.
- [5] Ramazan Bayindir, Ibrahim Sefa, Ilhami Colak and Askin Bektas "Fault Detection and Protection of Induction motor using sensor" IEEE -Transactions On Energy Conversion, Vol. 23, No 3, September 2008.
- [6] N. Sreerama Reddy, Rajasekhar Thota, Roop Teja Neeluru "A microcontroller Based Protection and Control of Low Voltage Motors by Using ZigBee Technology" International Journal of Engineering Sciences and Research, Vol 04, special issue 01, 2013.
- [7] Brijesh Kumar Singh, Devesh Kumar, Piyush Kumar, Ravindra Singh, Vishal Singh, "Single Phasing, Phase Reversal, Over Voltage and Overheating protection of three phase induction motor" Internatinal Journal of Scientific Research and Management Studies, Vol 1, issue 1.
- [8] Ms. Pragati Deepak Patil, Sambhaji Patil, Smita Jaywant Patil "Fault Detection and Correction of Three Phase Induction Motor" Vol 3, issue 8, August 2014.



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