Supervise and Administration of Individual Load using Hyper Terminals

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Abstract— The Supervised and protection of individual load is mandatory factor in electric field. The paper propose a supervising and administration of load by using hyper terminal based on Atmege328.The propose methodology is designed and implemented by using hyper terminals to control and record load fluctuation with respect to current, voltage and temperature. If there is any abnormality according to the load of the system. System predefined instruction and policies are stored in the memory of the Atmege328 microcontroller then through the hyper terminals alert to concern about individual load to the operator. This hyper terminal based technology will help the utilize to optimally and also utilize the protection to individual load and identify problem before any catastrophic failure. This system provide flexible control of individual load parameter accurately (current, voltage, temperature and vibration) and also provide effective means for rectification of fault if any abnormality occurs on individual load of motor.

Key words: Arduino (ATmega328), Hyper terminal single phase I.M. sensors and LCD Display

I. INTRODUCTION

Induction motors have a long service life if they are operated under good and rated conditions. However, their life is significantly reduced if they are overloaded, resulting in unexpected failures and loss of supply to a large number of customers thus effecting system reliability. Overloading are the major causes of failure in motor. Induction motor are currently monitored manually where a person periodically visits a motor site for maintenance and records parameter of importance. This type of monitoring cannot provide information about occasional overloads and overheating of motor and windings. All these factors can significantly reduce motor life. Our system is designed based upon monitoring of key operational parameters of can provide useful information about the health of motors which will help the utilities to optimally use their motors and keep the asset in operation for a longer period. This paper will help us to identify problems before any catastrophic failure, thus resulting in a long life service for induction motor. It is also has the advantages of significant cost savings and greater reliability.

II. INDUCTION MOTOR FAULT

A. Overload fault:

When there is increase in mechanical load on the motor beyond the rated value ,overload situation. Due to high load torque, motor begins to draw more current. Over load condition results in increased phase current overheating of machine, high stator & rotor copper losses.

B. Over and under voltage fault:

Over And Under Voltages Are Caused By Load Variations On The System. Over Loaded Circuits Result in Under Voltages. Under Voltage Fault Result In Increased Currents, Excess Heating Of Machine, Increased Stator & Rotor Losses. Over Voltage Fault Results in Harmful Effect.

C. Over temperature:

Over voltage, under voltage fuse blowing (single phase rotating) unbalanced three phase voltages.44% of motor failure problems are related to heat. Allowing a motor to reach & operate at a temperature 10degree celcious above its maximum temperature rating will reduce the motor expected life by 50%.operating at 10 degree celcious above this, the motor life will be reduced again .Temperature rise means that the heat produced in the motor winding (cu.losses),friction of the bearing, rotor& stator losses(core losses)will continue to increase until the heat dissipation equals to heat being generated.

The Uno is the latest in a series of USB Adriano boards, and the reference model for the Adriano platform; for a comparison with previous versions, The Adriano Uno can be powered via the USB connection or with an external power supply. The power source is selected automatically. External (non-USB) power can come either from an AC-to-DC adapter (wall-wart) or battery. The adapter can be connected by plugging a 2.1mm center-positive plug into the board's power jack. Leads from a battery can be inserted in the God and Vin pin headers of the POWER connector. Easily identifying the problems by using this hyper terminal technique we can easily identify the problems related to load. This technique is will significantly save both time and costs and also it is flexible.

This technique more useful for rectification fault and easily identifying. Avoid the failure of motors from overload, overheating and over temperature. This technique provide continuous data of current, voltage, temperature and vibration on display and hyper terminal.

III. BLOCK DIAGRAM

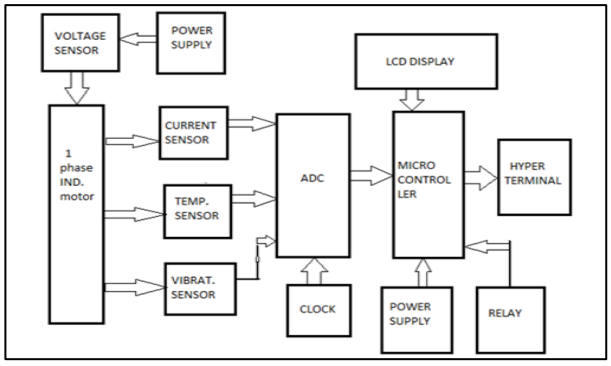

Fig. 1: Block diagram of supervise & administration of load using hyper terminals

It consist of single phase I.M. sensors, micro-controller, ADC , LCD display, Hyper terminal and relay. Normally in I.M, failure occurs due to voltage and current fluctuation overheating, etc. To sense these fault we have used current and voltage sensor , temperature sensor, vibration sensor ,respectively. All these sensors are connected to converter (ADC0808) and digital output from converter is given to micro-controller. MC89S51 has four ports viz. P1, P2, P3 and P0 to which we will be connected to address lines and LCD respectively. When fault occurs due to above any reason then change in ratings will be shown on LCD and Buzzer will alert the user . A brief discussion about components used is as given below. Sensors play a vital role in effective implementation of system. As we are interested in monitoring over current, over temperature and following sensors are selected and suitable designed with respect to prevailing conditions of power system and rating of motors to be protected.

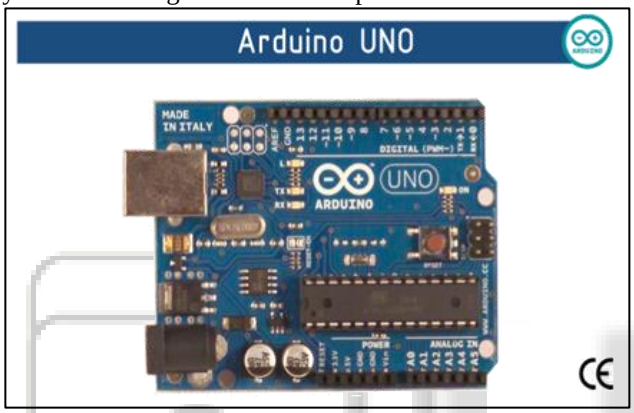

Fig. 2: Arduino (ATmega328)

The Arduino Uno is a microcontroller board based on the ATmega328 (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega8U2 programmed as a USB-to-serial converter. "Uno" means one in Italian and is named to mark the upcoming release of Adriano 1.0. The Uno and version 1.0 will be the reference versions of Arden, moving forward. The Uno is the latest in a series of USB Adriano boards, and the reference model for the Adriano platform; for a comparison with previous versions, The Adriano Uno can be powered via the USB connection or with an external power supply. The power source is selected automatically. External (non-USB) power can come either from an AC-to-DC adapter (wall-wart) or battery. The adapter can be connected by plugging a 2.1mm center-positive plug into the board's power jack. Leads from a battery can be inserted in the God and Vin pin headers of the POWER connector. The board can operate on an external supply of 6 to 20 volts. If supplied with less than 7V, however, the 5V pin may supply less than five volts and the board may be unstable. If using more than 12V, the voltage regulator may overheat and damage the board. The recommended range is 7 to 12 volts.

IV. POWER PINS

A. VIN:

The input voltage to the Adriano board when it's using an external power source (as opposed to 5 volts from the USB connection or other regulated power source).
You can supply voltage through this pin, or, if supplying voltage via the power jack, access it through this pin.

B. 5V, 3V3and GND:

The regulated power supply used to power the microcontroller and other components on the board. This can come either from VIN via an on-board regulator, or be supplied by USB or another regulated 5V supply and 3.3 volt supply generated by the on-board regulator. Maximum current draw is 50 mamp.GND is used for Ground pins.

C. MEMORY and I/P and O/P:

The Atmega328 has 32 KB of flash memory for storing code (of which 0,5 KB is used for the boot loader).It has also 2 KB of SRAM and 1 KB of EEPROM (which can be read and written with the EEPROM library).Each of the 14 digital pins on the Uno can be used as an input or output, using pin Mode, digital Write, and digital Read functions. They operate at 5 volts. Each pin can provide or receive a maximum of 40 am and has an internal pull-up resistor (disconnected by default) of 20-50 ohms. In addition, some pins have specialized functions:• Serial: 0 (RX) and 1 (TX). Used to receive (RX) and transmit (TX) TTL serial data. These pins are connected to the corresponding pins of the ATmega8U2 USB-to-TTL Serial chip.

D. External Interrupts and PWM:

2 and 3. These pins can be configured to trigger an interrupt on a low value, a rising or falling edge, or a change in value.3, 5, 6, 9, 10, and 11. Provide 8-bit PWM output with the analog Write function. SPI: 10 (SS), 11 (MOSI), 12 (MISO), 13 (SCK). These pins support SPI communication, which, although provided by the underlying hardware, is not currently included in the Adriano language.

E. LED:

There is a built-in LED connected to digital pin 13. When the pin is HIGH value, the LED is on, when the pin is LOW, it's off. The Uno has 6 analog inputs, each of which provides 10 bits of resolution (i.e. 1024 different values).

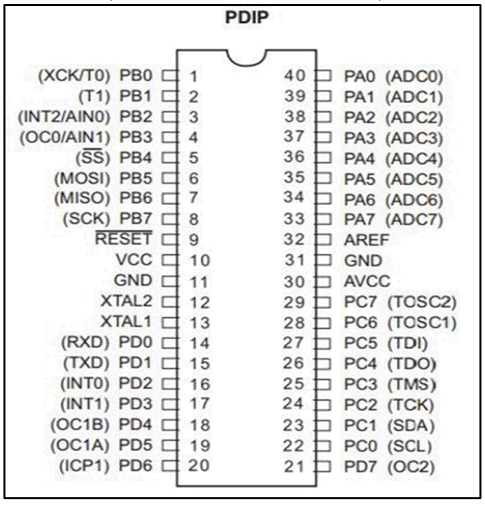

Fig. 3: ATMega 16 pin diagram

By default they measure from ground to 5 volts, though is it possible to change the upper end of their range using the AREF pin and the analog Reference function.

Pin connections is as shown in Figure. Pins 12and 13 serves as the crystal input and output of an inverting amplifier and it is configured as an On-chip oscillator. The connection as specified by the data sheet is as shown.

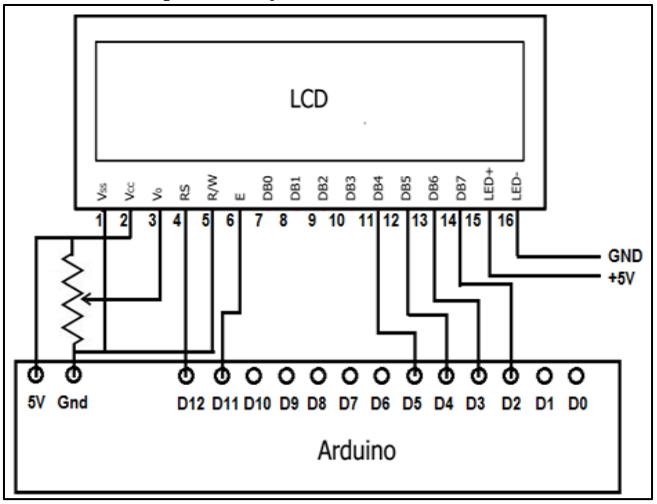

Fig. 4: LCD circuit

The LCD employed is a 16 x 2 type capable of displaying 32characters in alphanumeric form. It has a wide range of LCD driver power from -3 to 1V with high speed MPU bus interface of 2MHZ. when the supply voltage is Vcc = 5V. It can also be configured as 4 bit or 8 – bit interface enabled to transmit or receive data in either 4 bits or 8 bits. It consumes very small power with automatic reset circuit that initializes the controller/driver after power on. Internally there is an oscillator that has external resistors (LCD Data book The LCD was configured to drive its dot-matrix under the control of 4- bit output of the microcontroller. Regulated supply of 5V was used to supply the chip which is within the recommended supply voltage of the chip. A 100Ω resistor was included as a current limiting resistor. The pin 16 of the chip is the Vcc while pin 1 is the ground and was connected to the 0 line of the supply. Since only four bits are used to receive data from the micro, the upper nibble of the byte line was used while the lower nibble (Do to D3) was connected to the ground as recommended in the data sheet. To achieve this, pins 7, 8, 9 and 10 (upper nibble) were grounded while pins 11 to pin 14 (lower nibble) were connected to receive the 4-bit data from the main micro. A variable resistor is provided to adjust the brilliance of the LCD. The value as recommended in the datasheet is from 10k to 30k. For this project, a 10k variable resistor was used to vary the brightness of the LCD. Pin 5 of the LCD is used as the enable pin to activate the device and set it for operation. Pin 4 is the reset pin that is used to clear the registers of the LCD. The data transfer from the microcontroller is completed after the 4 bit data has been transferred twice. The order of transfer is that the four lower order bits (D4 to D7) are transferred before the four higher order bits (Do to D3).

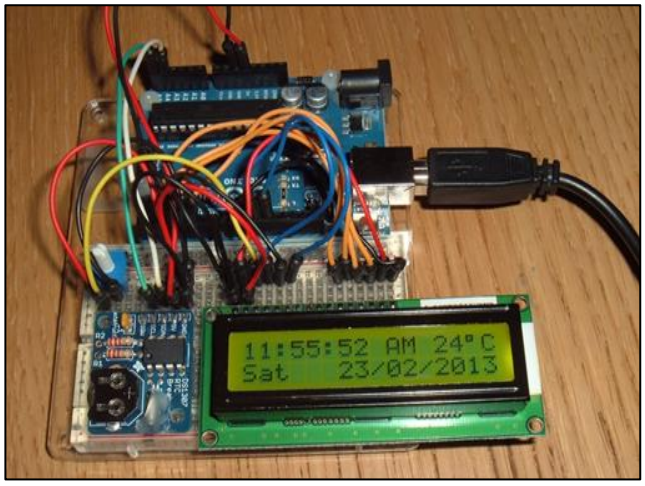

Fig. 5: The LCD circuit construction

The LCD display unit circuit was constructed on the circuit board using the components

V. HYPER TERMINAL

A. HyperTerminal (Windows):

HyperTerminal is the default to terminal program for any Windows OS up to XP – Windows Vista, 7, and 8 don't include it. If you're on Windows Vista, 7, or 8, and really just have to have HyperTerminal, a little scouring of the Internet should turn up some workarounds. Better alternatives are more easily available however- we'll get to those shortly. If you're on a pre-Vista machine, and only have HyperTerminal to work with, here are some tips and tricks for using it:

B. Initiating a Connection:

When initially opening up HyperTerminal, it will present you with a "Connection Description" dialog. Enter any name you please, and, if you really want to get fancy, select your favorite icon. Then hit "OK". (If this window didn't pop up go to File > New Connection to open it.)

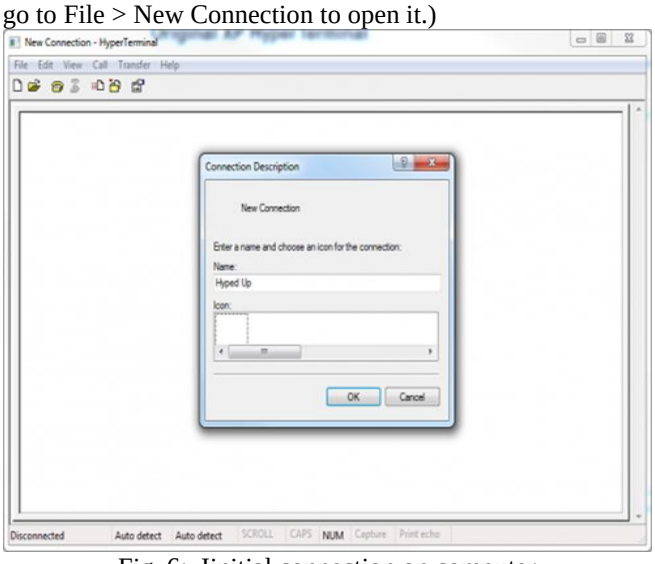

Fig. 6: Iinitial connection on computer

None of the settings in this first window have any effect on the serial communication. On the next window, ignore the first three text boxes – we're not working with a dial-up modem here. Do select your COM port next to the "Connect using" box. Then hit "OK".

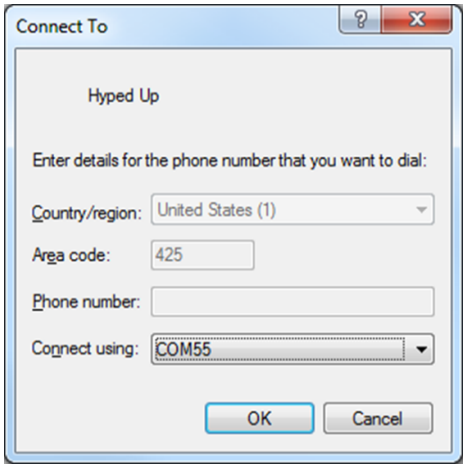

Fig.7: Common port box

The settings on the next box should look pretty familiar. Make sure the "Bits per second" dropdown is set to the correct baud rate. And verify that all of the other settings are correct. Hit "OK" once everything looks correct there.

VI. CONCLUSION

As the system is designed for a maximum load of 570mA.If the load current exceeds above 570mA by placing different loads the system will trip button for the lower values of current the system works normally, the same information will be conveyed to the operator and if any problem arises the same can be rectified by using hyper terminals on computer.

VII. FUTURE SCOPE

By using SMS IOT (INTERNET OF THINGS) we can Handily turn on or off the system by long distant at anywhere. MATLAB THROUGH:-in the future we can also turn on or off the system. Use of GSM and GPS in a SMT package will significant can implement.

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