

Wireless Data Acquisition System for Single Phase Induction Motor

K.M. Dhenge¹, Ashwin Digambar Labhane², Kalyanee Mukesh Ambade³, Rohit Ravindra Dange⁴,
Rutuja Rudesh Gedam⁵, Sachin Pandurangrao Gadade⁶.
Kdk College Of Engineering Nagpur Electrical Engineering (India)

Abstract:- Wireless communication systems are changing into a viable resolution for employment at very cheap level of manufacture automation systems, typically mentioned as either “device” or “field” level, wherever the requested performance is also rather important in terms of each TRM and responsiveness. During this paper, we have a tendency to manage the employment of wireless networks at the device level. This paper presents a coffee value wireless system for information acquisition. Device nodes associate degraded frame format of the device information are designed mistreatment a microcontroller. Each the physical and electrical circuit layers are taken directly from existing wireless native space networks and wireless personal space networks standards, whereas the applying layer springs from the foremost well-liked wired field buses. We have a tendency to additionally address some vital aspects associated with information security and power consumption.

I. INTRODUCTION

In the current era automation has become a basic would really like for the industries. Induction Machines are the nerves of the various industries. Thus, Industrial automation is also a requirement for his or her reliable and safe operation. We have a tendency to tend to are proposing a wireless management degree looking system for associate degree induction motor supported wireless communication protocol. For safe and economic electronic communication in industrial fields where the wired communication is expensive or unacceptable due to physical conditions. A transducers and sensors monitors the parameters of induction motor and transmit the information through wireless communication. A microcontroller primarily based system is collects and stores information through laptop computer interface developed with serial communication. Knowledge Acquisition is that the sampling of planet information, and it's national instrument that measured the physical information and convert that information in digital kind. Throughout this project, a wireless information Acquisition system for Single half Induction motor is realized victimization wireless Communication protocol. Varied parameters of induction motor are measured. The digital type is calculated by transducer/other sensing element. Method analyze, store and show the noninheritable knowledge with the assistance of code python. The utilization of wireless networks at the device level of works automation systems is influenced by some factors that ought to be fastidiously analyzed. 1st of all, each the radio transmission systems and therefore the protocols used ought to be accurately hand-picked to satisfy the particular needs. Such a thought is even a lot of vitals since these networks

are planned to be put in hostile environments, wherever many forms of noise could cause transmission errors. Second, additionally the facility consumption of the radio elements needs to be fastidiously thought-about. The utilization of computers and microprocessor-based instrumentality to live, control, and check processes and instrumentality became the norm, together with method, producing industries, and automation. One explicit space that has been revolutionized by the speedy technological evolution of the laptop is that the knowledge acquisition (DAQ), unremarkable additionally mentioned as DAQ.

II. A/D AND D/A SIGNAL CONVERTERS

Our system is basically based on the idea of acquiring data of motor or any other device to remote places and reduce human efforts and dangers associated with it. In industries the motor parameters are checked by the in-charge person. By using our system all the motor parameters like Temperature, Voltage, Current and Speed can be analyzed in real time in the control room itself. In the Python software, real time graph will be plotted of the above parameters. Wireless data acquisition will be done using wireless modules like HC12/HC05. A Atmega based microcontroller board will be the heart of the system. Different parameters of single phase induction motor will be monitored by different sensors connected to Arduino. RPM will be sensed by IR sensor, Voltage will be sensed by voltage transformer 6Volt, Current will be sensed by using current sensor ACS712, and will be sensed using lm35 temperature sensor. All these parameters will be transmitted to Python using wireless sensors. On receiver side wireless receiver will receive data and serial to usb convertor will give data to Computer (python installed). python will read data from com port and accordingly plot the graph on different parameter's respective axes.

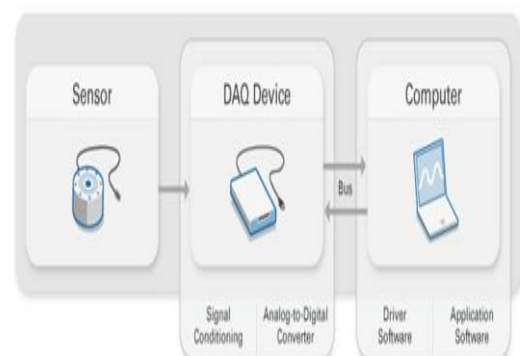


Fig. 1: PROCESSOR DIAGRAM

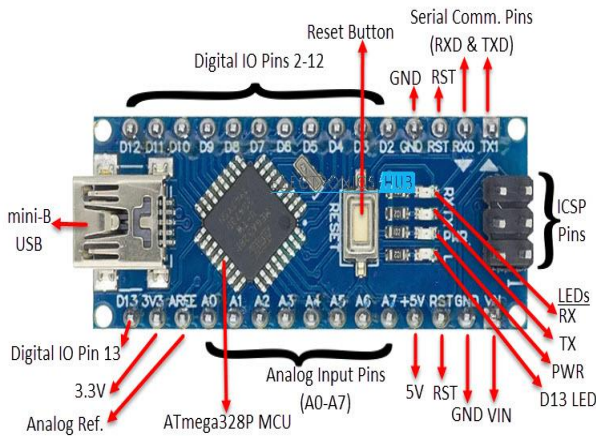


Fig. 2: Arduino Nano

III. ARDUINO NANO BOARD LAYOUT

The following the image shows the layout of typical Arduino nano board. As you will see from the previous image, there are a handful of elements on a very cheap facet of the board yet 5V Regulator and USB-to-Serial device IC are the most ones. As you can notice, the Type-B USB connector from Arduino UNO is replaced with mini-B type connector. Also, there is no 2.1 mm DC jack to provide external power supply. Apart from that, the layout of Arduino Nano is very much self-explanatory. Regarding the pin, I will discuss about them in the Arduino Nano Pinout Section. Technical Specifications of Arduino Nano As Arduino Nano is also based on ATmega328P Microcontroller, the technical specifications are similar to that of UNO. But none the less, let Maine offer you a short summary regarding some necessary specifications of Arduino Nano. MCU ATmega328P design AVR operative Voltage 5V Input Voltage 7V – one2V Clock Speed sixteen MHz nonvolatile storage thirty-two computer memory unit (2 computer memory unit of this employed by bootloader) SRAM two computer memory unit EEPROM 1 computer memory unit Digital IO Pins twenty-two (of that vi will manufacture PWM) Analog Input Pins eight the way to power up the Arduino Nano? There ar one or two of how during which you'll power the Nano board. The primary and simple manner is victimization the mini-B kind USB connection. Consecutive manner is provided[to produce] a regulated 5V supply through the 5V pin (Pin range 27). Finally, the Nano has AN aboard regulator at the lowest (along with the USB – to – Serial Converter). To use, you'll offer AN unregulated offer within the very of 6V to 20V to VIN pin of the Nano (Pin range 30). What are completely different recollections of Arduino Nano? To be precise, this is often specific to the MCU used on the Nano Board, that is ATmega328P. There are 3 completely different recollections on the market in ATmega328P. They are: thirty-two KB of nonvolatile storage a pair of KB of SRAM one KB of EEPROM a pair of KB of the nonvolatile storage is employed by the bootloader code. What are the Input and Output Pins of Arduino Nano? Of the thirty pins on the market on the Nano board, twenty-two pins are related to input and output. therein fourteen pins (D0 to D13) are true digital IO pins, which might be organized as per you application mistreatment pinMode(), digitalWrite() and

digitalized() functions. Of these Digital IO pins ar capable of sourcing or sinking 40mA of current. An extra feature of the Digital IO pins is that the accessibility of internal pull-up electrical device (which isn't connected by default). The worth of the inner pull-up electrical device are within the vary of 20KΩ to 50KΩ. There also are eight Analog Input Pins (A0 to A7). This is often one or two quite Arduino UNO (which solely has 6). All the analog input pins give a 10-bit resolution ADC feature, which might be browse mistreatment analog Read operate. A very important purpose regarding Analog Input pins is that they'll be organized as Digital IO pins, if needed (all analog pins except A6 and A7 are often organized as digital IO). Digital IO pins three, 5, 6, 9, ten and eleven ar capable of manufacturing 8-bit PWM Signals.

IV. WORKING PRINCIPLE

We have successfully interface all the sensors with Arduino controller. The sensor we are using are transformer, current sensor, voltage sensor, temperature sensor which is also known as one wire temperature sensor and IR sensor for speed measurement. We have connect the transformer with controller via bridge rectifier circuit and potential divider circuit which will calculate the voltage or act as an voltage sensor. One wire sensor is used for temperature measurement and IR sensor is used to detect motor speed. LCD display is successfully interfaced with controller and we have shown the output on LCD display. We have send data wirelessly using Python successfully. The UI is shown in figure below.

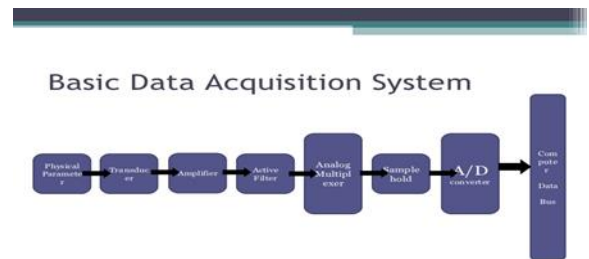


Fig. 3 : Basic Data Acquisition System

V. SETUP OF PROJECT



Fig. 4: Setup of project

VI. CONCLUSION

In this project we have used multiple sensors like temperature, voltage sensor, current sensor. As respective condition detected microcontroller takes action and shows result on LCD display. This whole system updates data on thing speak server using internet connection.

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