

Implementation of Fault Identification System in Wind Turbine using CAN Protocol

Jakkula Thirupathi¹, Dr. D.R.V.A. Sharath kumar²

¹M. Tech, St Martin's Engineering College, Dhulapally, Medchal, Telangana, India.

²M. Tech, Ph. D, Prof. St Martin's Engineering College, Dhulapally, Medchal, Telangana, India.

Abstract- This paper is a CAN based architecture designed for the purpose of monitoring and fault diagnosis of wind turbine. CAN is a Message based protocol designed specifically for Automotive, later Aerospace, Industrial automation and Medical equipment's. CAN interface module is used to communicate the monitored parameters between the wind turbine and the control center. During the transmission of data from one node to another node disturbance occurs. To avoid these disturbances we are using CAN protocol. The project involves ARM core1 runs with CAN and LPC2148 as wind turbine unit to which sensors are connected and ARM core2 as Fault diagnose and monitoring section. A discussion about weather condition (WC) monitoring and generation voltage(GV) display is also added in this design. Data acquisition node collects the sensor data through CAN protocol.

Keywords- will module, ARMIpc2148, sensors, actuators, display

I. INTRODUCTION

Wind energy is that the most generally used resource for the assembly of voltage. Presently wind energy is employed to scale back the emission of dioxide. throughout the transmission of knowledge from one node to a different, node disturbance happens. To avoid these disturbances, to watch and to sight the fault, will protocol is employed. will could be a Message based mostly protocol designed particularly for Automotive, later region, Industrial automation and Medical equipment's. will interface module is employed to speak the monitored parameters between the turbine and therefore the management centre. Earlier, the vibration analysis, vibration signals created by the rotating elements in Wind Turbine's whose current health conditions ought to be diagnosed square measure unremarkably analyzed either by broad band based mostly ways or spectral line analysis ways. In our paper we tend to declare the system with ARM and may protocol to watch and diagnose the issues within the turbine application. The project deals with the info transmission between 2 units within the actual time with none disturbance. the info coordinated universal time is enhanced with the will protocol. ARM core1 runs with will and LPC2148 as turbine unit to that sensors square measure connected and ARM core2 as Fault

diagnose and observation section. information acquisition node collects the detector information through will protocol. Wind turbine could be a rotating computer that converts wind energy into energy leading to the assembly of electricity. Wind turbines square measure fault prone, that's they're deployed in harsh atmosphere like desert, plains excluding that complicated mechanical device system that are set distant from the center. that the probability of fault prevalence and therefore the aspect effects are a lot of, even it ends up in power off. it's necessary to develop the remote observation and fault identification system to watch the run time standing and therefore the identification of fault to enhance the potency and therefore the life time service of the turbine. turbine observation system collects the parameters like Speed, Temperature, vibration, power, voltage and current from the most elements of turbines like shaft, gear box, generator and enclosure. The advantage of mistreatment will bus within the automation is an extra worth to the system and increase its dependableness. the aim of mistreatment will bus is to change any system to speak with different system while not swing an excessive amount of load to the most controller. will bus could be a quick serial bus with the speed of one Mbps that's designed to supply AN economical, reliable and economical link between varied will systems, sensors and actuators. we tend to use will to speak between the turbine.

Proposed block diagram:

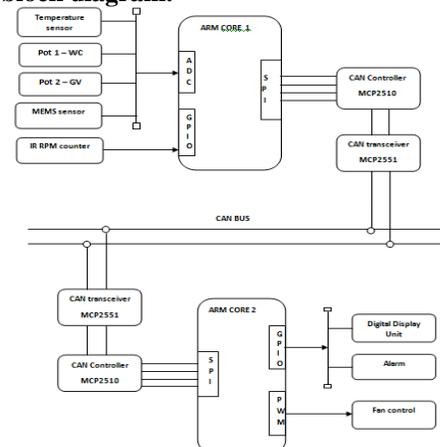


Fig.1: CAN bus – Fault identification

b. Lcd show

Liquid crystal displays (LCDs) have materials that mix the properties of each liquids and crystals. instead of having a temperature, they need a temperature vary at intervals that the molecules square measure virtually as mobile as they might be during a liquid, however square measure sorted along in AN ordered type kind of like a crystal.



c. Mems technology

MEMS accelerometers square measure one in every of the only however conjointly most applicable micro-electromechanical systems. They became indispensable in industry, pc and audio-video technology. This seminar presents MEMS technology as a extremely developing trade. AN measuring instrument is AN mechanical device that measures acceleration forces. These forces could also be static, just like the constant force of gravity actuation at our feet, or they may be dynamic - caused by moving or vibratory the measuring instrument.

RPM Controller by mistreatment IR Sensor:

IR transmitter and receiver may be obtained at low worth. Their form is appearance precisely the same as diode. to tell apart between transmitter and receiver, the transmitter invariably are available in clear diode whereas receiver is black in color. aside from that, there's conjointly receiver that's wont to develop specific frequency IR, 38kHz. For your info, 38kHz frequency IR is usually utilized in remote. IR transmitter can emit infra-red once hopped-up. you'll be able to connect the IR transmitter sort of a diode along side a current limiting electrical device. this limiting electrical device is employed to forestall an excessive amount of of current passing through the transmitter and burnt it. i'm mistreatment 330 ohms electrical device for the IR transmitter.

Potentiometer:

The Potentiometer indicates weather conditioandGeneration voltage. All rotary potentiometers have 3 terminals ANd an adjustable shaft, as shown within the image below.

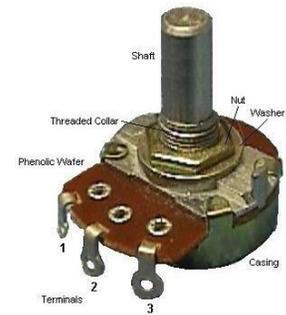


Fig.3: Potentiometer

In a normal potentiometer configuration, Terminal one would be assigned because the ground, Terminal a pair of would be the wiper (output), and Terminal three the input. the bottom and input terminals square measure placed at either finish of a (typically circular) resistive part; the wiper might slide on the element whereas creating contact with it. By turning the shaft, the wiper will vary the device's resistance from ground (no signal) to input (maximum signal). Basic potentiometers — even those delineated as "full-turn" square measure capable of 270 degrees (or close to 3/4 of a turn) of rotation.

III. CONCLUSION

This project is enforced in 2 sections. initial one famous runs with ARM as master node and another as traditional ARM information acquisition node to that sensors square measure connected. Communications between 2 nodes square measure accomplished through High Speed will communication. Sensors connected square measure temperature, speed, and Alcohol sensors. The master node collects of these info through will network and stores in 3 sessions. to accumulate the results, various session switches square measure provided at the master node. These results may be monitored on show.

IV. REFERENCES

- [1]. FU Zhixin and Yuan Yue(2012), 'Condition Health Monitoring of Offshore Wind Turbine based on Wireless Sensor Network' IEEE Transaction and IPEC.
- [2]. K. Kim, G. Parthasarathy, O. Uluyol and W. Foslien, I, S. Sheng and P. Fleming, ' Use of SCADA Data for Failure
- [3]. Detection in Wind Turbines', 2011 Energy Sustainability Conference and Fuel Cell Conference.
- [4]. Wang chuhang Network Center of ChanchunNormal University, Remote Monitoring and Diagnosis System for Wind Turbine.
- [5]. Analytical techniques for performance monitoring of modern wind turbines,20 12EWEA, Copenhagen.

Author profile

Mr. Jakkula Thirupathi was born on March 09 1995, completed his graduation in Electronics and Communications Engineering from CMRCET. Currently he is pursuing his M.Tech in Embedded systems from St. Martins Engineering College. His areas of interest include data analyzing and communication systems.



Prof. Dr. D.R.V.A. Sharath Kumar working as an Professor in the Dept. of Electronics and Communications at St. Martin's Engineering College. He received his bachelor's degree and master's degree from V.T. University and he was received Ph.D from Andhra University. He has about 17 years of teaching experience. He is a co-author of many International Conference and Journal Publications.