Smart Fault Indicator for Smart Grid

B.Janani[1], R.Narmadha[2], E.Sutharsanan[3], M.Santhosh Kumar[4], V.Krithiga Devi[5]

UG Students, Department of EEE, Knowledge Institute of Technology, Salem, India[1,2,3,4]

Assistant Professor, Department of EEE, Knowledge Institute of Technology, Salem, India[5]

ABSTRACT*:* Smart Grid is a network of transmission line, substation, transformers and deliver electricity from power plant to home or industry. The Digital Technology is a parameter used to transforms a normal grid into an smart grid, which allows the two way communication between utility side and its customers. It also senses the fault in transmission lines. Smart grid consists of computers, controls, automation, new technologies and equipment. The above mentioned technologies will work together with electrical grid to provide response digitally for growing the electricity demand. This project deals with the classification of faults in various equipments such as generators, sensors, circuit breaker and transmission line. In this method, high impact faults(Circuit breaker faults, Sensor faults,Generator faults)can be identified which cause severe damage to the equipments.

KEYWORDS*:*Microcontroller,IOT,Buzzer,Relay,VoltageMeasurement,CurrentMeasurement,Classification Of Faults.

I.INTRODUCTION

The Internet Of Things is the network of physical objects or things embedded with electronics, software, sensors and network connectivity, which enables these objects to collect and exchange data.
IOT allows objects to be sensed and controlled remotely across existing network infrastructure, creating opportunities for more direct integration between the physical world and computer based systems, and resulting in improved efficiency, accuracy and economic benefit.
Things in the IOT sense, can refer to a wide variety of devices such as heart monitoring implants, bio chip transponders on farm animals, electric clams in coastal waters, automobiles with built-in-sensors, DNA analysis devices for environmental/food/pathogen monitoring or field operation devices that assist fire-fighters in search and rescue operations.
These devices collect useful data with the help of various existing technologies and then autonomously flow the data between other devices.
Wireless System consist of two main components. They are transmitter and receiver. The transmitter handles the conversion of the audio signal into a radio signal and broadcasts it as a radio signal wave via an antenna. The antenna may stick out from the bottom of the transmitter or it may be concealed inside.

II.LITERATURE SURVEY

Paul J. Frey is the Manager of distribution operations at EEI.Paul received his BES from Johns Hopkins University and aMasters in Engineering Administration from GeorgeWashington University.

AleksandarVukojevićis a Manager in Smart GridDistribution Automation and Technology department at BGE.He received a BS degree in mathematics from Kennesaw State University, BSEE and MSEE degrees from the Georgia Tech, and an MBA from Robinson College of Business at Georgia State University.

Michael S. Smith is a lead engineer/work leader with Baltimore Gas and Electric's Automation & Technology unit.
Michael has 30 years experience in the utility business specializing in system protection, substation integration and SCADA.

SooryaKulooriis the Chief Technology Officer and is responsible for technology roadmap and product development

atGRIDiant Corporation. He holds a Ph.D. in Electrical and Computer Engineering from the University of Calgary. C.Nagarajan et al [4,8,12] have developed the technology roadmap and product.

Mohammad Farajollahi(S'15) received the B.Sc. de-gree in Electrical Engineering from University of Tehran, Tehran, Iran, in 2014, the M.Sc. degree in electrical engi-neering from Sharif University of Technology, Tehran, in 2016, and is currently pursuing the Ph.D. degree at Uni-versity of California, Riverside, CA, U.S. His research interests include distribution network planning, operation, and relability, as well as optimization of smart electricity grids.

Mahmud Fotuhi-Firuzabad(F'14) received the B.S. and M.S. degrees in electrical engineering from Sharif University of Technology and Tehran University, Iran, in 1986 and 1989, respectively, and the M.S. and Ph.D. degrees in electrical engineering from the University of Saskatchewan, Saskatoon, SK, Canada, in 1993 and 1997, respectively.

Software Requirement:
Embedded C is one of the most popular and most commonly used Programming Languages in the development of Embedded Systems. So, in this article, we will see some of the Basics of Embedded C Program and the Programming Structure of Embedded C. Embedded C is perhaps the most popular languages among Embedded Programmers for programming Embedded Systems. There are many popular programming languages like Assembly, BASIC, C++ etc. that are often used for developing Embedded Systems but Embedded C remains popular due to its efficiency, less development time and portability.

III. BLOCK DIAGRAM
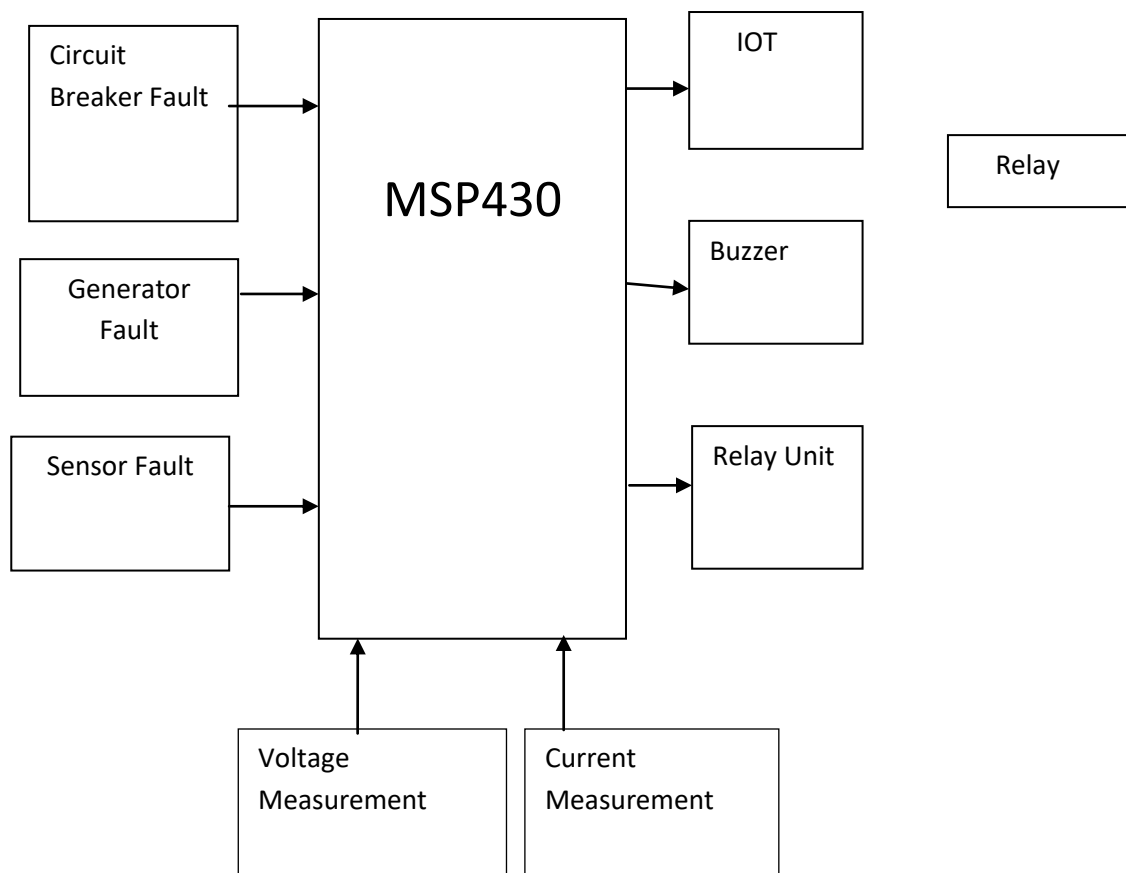
IV.DESCRIPTION OF PROPOSED METHOD

This project involves classification of faults in equipments.In power plant, there is the concept of high impact fault, low impact faults.Low impact faults doesnot cause any serious damage but high fault impact will cause serious damage to the equipment.Our project concentrates on high impact faults such as Circuit breaker fault, Sensor fault and Generator faults.MSP430 is the microcontroller used and it is interfaced with IOT by means of Transmitter and Receiver pins in MSP430.If fault occurs, high impact faults will be given priority by microcontroller which was already programmed.The advantage of MSP430 is low power consumption.Finally, fault occurs and it is classified and by IOT,it will be displayed.So,that we can know what type of faults is occurred.The buzzer will be alarmed and relay will stopped the operation of the equipment under faulty conditions.

HC-05 Bluetooth Module is an easy to use Bluetooth SPP(Serial Port Protocol) module, designed for transparent wireless serial connection setup. Its communication is via serial communication which makes an easy way to interface with controller or PC. HC-05 Bluetooth module provides switching mode between master and slave mode which means it able to use neither receiving nor transmitting data.

Specification:
- Model: HC-05
- Input Voltage: DC 5V
- Communication Method: Serial Communication
- Master and slave mode can be switched.

MSP430 microcontroller:

It is the medium version microcontroller which has inbuilt ADC(Analog to Digital Converter) RX(Receiver port), TX(Transmitter port). It consist of 20 pins in that 17 pins are provided for I/O ports and other 3 are provided for Reset, ground and Vcc

4.2.SensorUsed

LM35 is the temperature sensor used for monitoring.The LM35 is one kind of commonly used temperature sensor that can be used to measure temperature with an electrical o/p comparative to the temperature (in °C). It can measure temperature more correctly compare with a thermistor. This sensor generates a high output voltage than thermocouples and may not need that the output voltage is amplified. The LM35 has an output voltage that is proportional to the Celsius temperature. The scale factor is .01V/°C.

4.3.Relay

Relay is an electrically operated switch. Many relays use an electromagnet to mechanically operate a switch, but other operating principles are also used, such as solid-state relays.Relays are used where it is necessary to control a circuit by a low-power signal (with complete electrical isolation between control and controlled circuits), or where several circuits must be controlled by one signal. The first relays were used in long distance telegraph circuits as amplifiers; they repeated the signal coming in from one circuit.

V.CONCLUSION

Fault classification diagnosis methods developed for different generator turbine components such as gearbox,main bearings and generators are widely proposed.The methods based on the analysis of generator turbine performance clearly separated prefailure data from other normal operating data.However,it is challenging to associate a drifting gernerator performance to a particular failure using only global features as the produced power.

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