Smart Pole Monitoring System Using Pic 16F And GSM Module

Milind Patil[1], Vikram Rotkar[2], Pratik Thakur[3], Shashank Mhatre[4], Prof. Jayashri Madrewar[5]

[1, 2, 3, 4] Dept of Electrical,
[5] Prof. , Dept of Electrical,
[1, 2, 3, 4, 5] Dilkap Research Institute of Engineering and Management Studies Neral, India

Abstract- In this paper we are proposing a device in order to determine the structural integrity of utility pole. Now a days all utility companies required to send their technician to assess each individual pole. That method of assessment include visual inspection. This process of inspection is time consuming ,Therefore to detect the pole fall at remote location our system is very much useful.

Keywords- Utility pole ,Gyroscope, Accelerometer, Pole angle Detection, GSM Module, Microcontroller PIC 16F877A

I. INTRODUCTION

n the last two decade demand of power is increase rapidly & the power system is very complex and interconnected. To defect the pole fall at remote location this system is very much useful. The energy infrastructure is one of several critical target for terrorists that, when disrupted, can cause major economic , safety and physical damage to the public health and wellbeing. Power transmissions lines are particularly vulnerable since many cross miles of remote country through dedicated corridors with no effective means for physical security detection or protection. Recent events have shown that these system are targets of attack in the United States and around the world. Successfully coordinated attacks on major transmission structure pull bring down entire regional grid power supply, high voltage transmission lines and associated structures are also time consuming to repair or replace and damage and associated outages cost millions, possibly billions of dollars in last revenue.

As our project aim is dedicated In that system gyroscope play vital role in measuring the angle of utility poles Gyroscope is a device which is used for measuring orientation and angular velocity, by using this feature we take advantages in our project for measurement of utility pole angle for deciding whether it tilt or not. The measure angle information compare with pre decided normal angle by using controller, and when abnormalities detect in pole angle it send information of that situation to dedicated utility by using GSM module.

Due to quick notification available from system to utility it will useful for proactive maintenance of that pole,

which will reduce the major damage to pole and transmission system, and hence it increases reliability and stability of transmission and distribution system

## II. BLOCK DIAGRAM AND DESCREPTION

Our project depends on utility pole angle detection for that purpose we are using accelerometer. Which will measure the angle of utility pole and continuously send data signal to microcontroller PIC16F877A. For status indication we use LCD and buzzer and for communication between utility company and project model we are using GSM module.
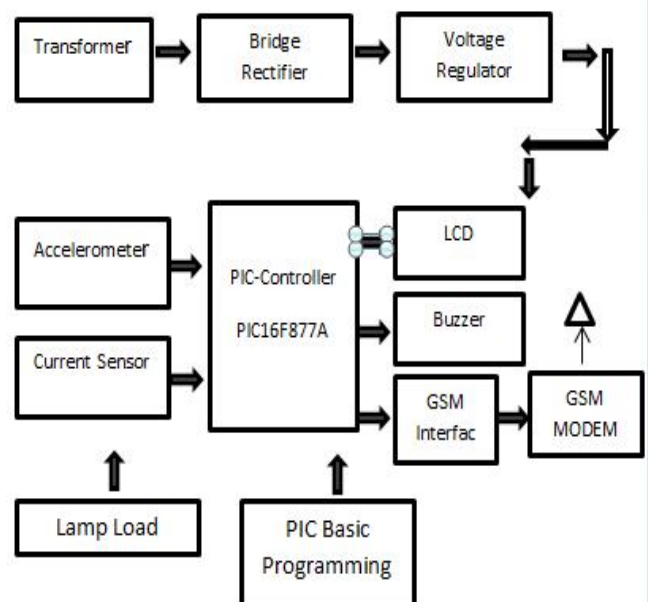
For protection against hazardous condition such as over current there is current sensor in model which will precisely detect the over current.

For programming the controller for our dedicated work we use PIC basic programming language.

III. GYROSCOPE
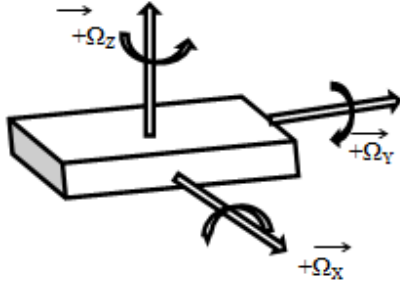
Gyro sensor is an angular rate sensor or angular velocity sensors. In simple terms, angular velocity is the change in rotational angle per unit of time. The accelerometer measures the acceleration +g (gravitational acceleration). Its function is based on elasticity of very small semiconductor beam inside the IC. Deflection of this beam is measured piezoelectricity. Gyro measures speed of angular rotation about an axis

IV. PROJECT MODEL

V. FEATURES

1. Proactive maintenance-

If the utility company knows there is possibility that a pole is likely to fall down, before it happens the company can schedule to replace the pole at right time, reducing major stresses and power loss.

2. Rapid outage reporting-

If a pole falls, or a power line fault occurs, the device can quickly report it to the utility company, decreasing outages time.

3. Pole tilt and incident monitoring-

If a pole tilt by some angle the device can quickly gives the status of the pole angle to the utility company.

4. User interface.

5. Less maintenance required-

As we use electronic components in the device it requires less maintenance.

6. Portable device-

The device is compact hence can be placed on any type pole such as telecommunication line pole, transmission line pole.

VI. FUTURE SCOPE

In order to determine the structural integrity pole, currently utility companies are required to send technicians to asses each individual pole. Our project will greatly improve by allowing remote monitoring of pole status.

VII. APPLICATION

-   Actual real time monitoring of pole angle.
-   Electric transmission pole monitoring
-   Telecommunication pole monitoring.
-   Overcurrent detection and protection.
-   Industrial application.

VIII. CONCLSION

In this project we detect exact location of tilted utility pole and detection of overcurrent in a transmission system, by using angle sensor, current sensor and PIC16F877A microcontroller.

REFERANCE

[1] Chandler T. 2005. The technology development of automatic metering and monitoring system. Power Engineering Conference, 2005. IPEC 2005. The 7th international, Vol., No., pp.1-147.

[2] Devidas A.R.; Ramesh M.V. 2010. Wireless Smart Grid Design for Monitoring and Optimizing Electric Transmission in India. Sensor Technologies and Applications (SENSORCOMM), 2010. Forth International Conference on, Vol., No., pp.637-640.

[3] Khan R.H., T.F. Aditi, V. Sreeram and H.H.C. Iu. 2010. A. Prepaid Smart Monitoring Scheme Based on WiMAX

Prepaid Accounting Model. Smart Grid and Renewable Energy, Volume 1, Number 2, pp. 63-69.

[4] https://www.google.com/patents/US201603209

[5] http://www.usriot.com/gsm-module-tilt-sensor-tilt-tower-online-monitoring-application/

[6] https://www.ece.cmu.edu/~ece549/spring17/team11/website/

[7] http://www.google.me/patents/CN204373644U?cl=en

[8] Alldatasheet.com

[9] Redcircuits.com

[10] Basic Electronics- B. Ram

[11] Digital Electronics- R.P.Jain