ISSN:2348-2079

Volume-5 Issue-2

International Journal of Intellectual Advancements and Research in Engineering Computations

Iot based underground wire fault detection using electronic current transformer

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***Abstract*-This paper proposes fault location model for underground power cable using electronic current transformer and the thing which is based on the internet means the information will transfer through the internet access. The aim of this project is to determine the distance of underground cable fault from the base station in the kilometer and also find the exact location of that faulty place. This project uses the simple concept of ohm's law. When any fault like short circuit occurs, voltage drop will vary depending on length of fault in cable, since the current varies. A set of resistor are therefore used to represent the cable, since the current end and the fault is detected by detecting the change in the voltage using analog to voltage converter and a microcontroller is used to make the necessary calculation so that the fault distance is displayed on the LCD display. This fault details after send to any access point through the internet. Electronic current transformer is CT coil internet with IOT hardware circuit with molding.**

I. INTRODUCTION

Till last decades' cables were made to lay overhead& currently it is lay to underground cable which is superior to earlier method. Because the underground cable is not affected by any adverse weather condition such as storm,snow,heavy rainfall as well as pollution.But when any fault occurs in cable, then it is difficult to locate fault. So we will move to find the exact location of fault. Now the world is become digitalized so the project is intended to detect the location of fault in digital way. The underground cable system is more common practice followed in many urban areas. While fault occurs for some reason, at that time the repairing process s related to that particular cable is difficult due to not knowing the exact location of cable fault. Fault in cable is represented as:

- Any defect,
- Inconsistency,
- Weakness or non-homogeneity that affects performance of cable

II. Existing Block diagram

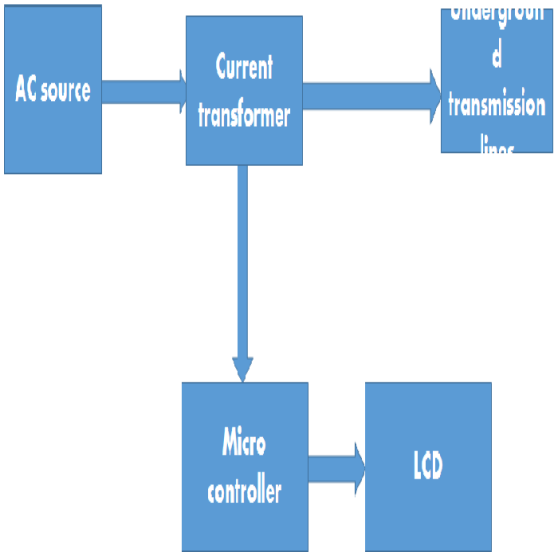

FIG 1Existing Block diagram

III. DISADVANTAGES

- In existing we cannot possible to monitor wireless and cannot able to detect fault location

IV. Proposed Block diagram

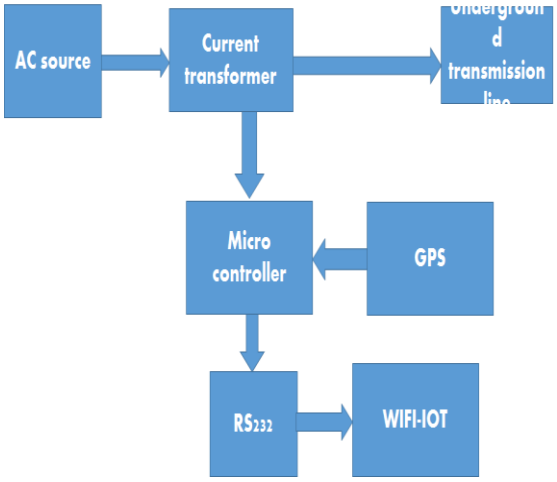

FIG 2 Proposed Block diagram

V. ADVANTAGE

- We can lively monitor under ground data parameter through IOT from anywhere
- Accurate detection of fault detection area

VI. HARDWARER DESCRIPTION

POWER SUPPLY

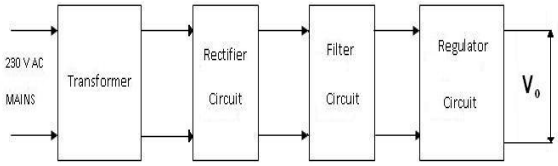

FIG 3 BLOCK DIAGRAM OF POWER SUPPLY

The given block diagram includes following:

Transformer: A transformer is an electro-magnetic static device, which transfers electrical energy from one circuit to another, either at the same voltage or at different voltage but at the same frequency.

Rectifier: The function of the rectifier is to convert AC to DC current or voltage. Usually in the rectifier circuit full wave bridge rectifier is used.

Filter: The Filter is used to remove the pulsated AC. A filter circuit uses capacitor and inductor. The function of the capacitor is to block the DC voltage and bypass the AC voltage. The function of the inductor is to block the AC voltage and bypass the DC voltage.

Voltage Regulator: Voltage regulator constitutes an indispensable part of the power supply section of any electronic systems. The main advantage of the regulator ICs is that it regulates or maintains the output constant, in spite of the variation in the input supply.

Voltage Regulation

- Two basic categories of voltage regulation are:
  - ❑ line regulation

- load regulation

- The purpose of line regulation is to maintain a nearly constant output voltage when the input voltage varies.

- The purpose of load regulation is to maintain a nearly constant output voltage when the load varies

Line Regulation

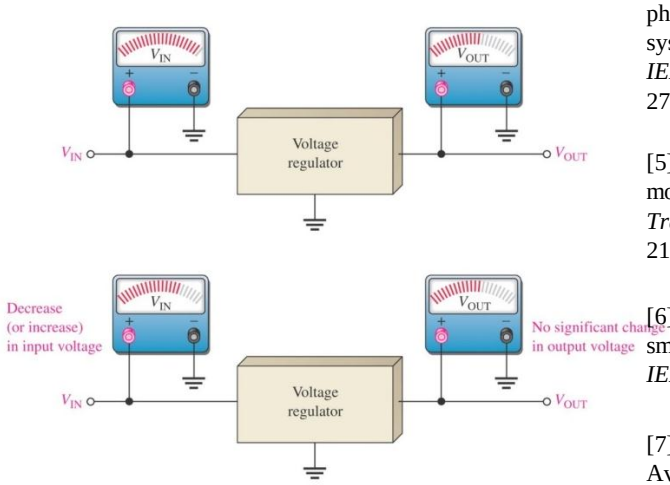

FIG 4 LINE REGULATION

Load regulation: A change in load current (due to a varying R_L) has practically no effect on the output voltage of a regulator (within certain limits)

- Load regulation can be defined as the percentage change in the output voltage from no-load (NL) to full-load (FL).

VII.CONCLUSION

Through this project we simplified the actual problem of the detecting the fault in the underground area. We discover the position or location were the fault will be occurring and also find the accurate distance of breaker point. By using software part, we encrypt the and transfer at controlling section and actual action will be working out.

VIII. REFERENCES

[1] D. A. Douglass and A. Edris, "Real-time monitoring and dynamic thermalratingof powertransmissioncircuits,"*IEEETrans.Power Delivery*,vol.11,no.3,pp.1407–1418,Jul.1996.

[2] A.A.Khan,N.Malik,A.Al-Arainy,andS.Alghuwainem,"Areview ofconditionmonitoringofundergroundpowercables,"in*Proc.2012Condition Monitoring and Diagnosis*, Bali, Indonesia, pp. 909–912, Sept.23–27,2012.

[3] F.P.Mohamed, W.H.Siew,J.J.Soraghan, S.M.Strachan, andJ.Mcwilliam, "The use of power frequency current transformers as partial discharge sensors for underground cables," *IEEE Trans. DielectricsandElectricalInsulation*,vol.20,no.3,Opp.814–824,Jun.2013.

[4] J. D. L. Ree, V. Centeno, J. S. Thorp, and A. G. Phadke, "Synchronized phasor measurement applications in power systems," *IEEETrans.SmartGrid*,vol.1,no.1,pp.20–27,Jun.2010.

[5] J.Yan,C.C.Liu,andU.Vaidya, "PMU-based monitoring ofrotor angle dynamics," *IEEE Trans. Power Systems*, vol. 26, no. 4, pp. 2125–2133,Nov.2011.

[6] R.Moghe, Lambert, andD.Divan, "Anovellow-cost smartcurrent sensorforutilityconductors," *IEEETrans.SmartGrid*,vol.3,no.2, pp.653–663,Mar.2012.

[7] Power Donut2, USi, 2012 [Online]. Available:http://www.usipower.com/

[8] LineSentry,GridSentry,2014[Online].Available:http://grid- sentry.com/products/

[9] LineIQ, Grid Sense, 2014 [Online]. Available:http://www.gridsense.com/solutions-products/transmission-and- distribution-line-monitoring/

[10] MV sensors, Tollgrade LightHouse, 2015 [Online]. Available:http://www.tollgrade.com/smartgrid/smart-grid-products/smart-grid-mv-sensor/

[11] Y.P.Tsai,K.L.Chen,andN.Chen,"DesignofaHalleffectcurrentmicro sensorforpowernetworks,"*IEEETrans.SmartGrid*,vol.2,no.3,pp.421–427,Sept.2011.

[12] Y. P. Tsai, K. L. Chen, Y. R. Chen and N. Chen, "Multi-function corelessHalleffectcurrenttransformerforprotectionandmeasurement ofpowersystem,"*IEEETrans.InstrumentationandMeasurement*,vol.63,no.3,pp.557–565,Mar.2014.

[13] C.T.Liang,K.L.Chen,Y.P.Tsai,N.Chen,"Newelectriccurrent transformercontaininga self-containedpowersupply,"*IEEETrans.on PowerDelivery*,vol.30,no.1,pp.184–192,Feb.2015.