

GSM Based Link Monitoring Of Distribution Transformer

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Abstract: The main objective of this project is to develop a system capable of detecting the blown fuse at distribution transformer and informing the maintenance staff of electricity automatically. In distribution transformer fuses are connected in each phase to protect the system from overloading. When load (current) in any of the three phases exceeds a safety limit, the respective fuse is blown. Fuse blowing occurs many times in summer due to overloading; electricity supply of that particular phase is cut off. The detection circuitry will detect it and microcontroller will process that signal received from detection circuitry. Microcontroller will access the GSM module through AT commands and will send the location of fault to the repair team.

Key world: GSM module, Microcontrollers, Single Phase Transformer

I. INTRODUCTION

In distribution transformer the fuses protect the system from overloading whenever there is over loading the fuse is blown and the repair team is called for the correction of fault by any of the affected consumer. Sometimes, due to some reasons no one may call and electricity breakdown lasts for longer time. In this project we want to make the detection of blown fuse and informing the repair team in an automatic fashion. A transformer is as static device used for the transform of the electrical energy from one circuit to the other by mean of the magnetic coupling i-e transformer coils. An alternating current in the primary winding induce a varying magnetic flux in the transformer core and hence through the secondary winding. These varying magnetic fluxes in the secondary winding induce an electromotive force or voltage in the secondary winding of the transformer. Transformers range in size from thumbnail-sized used in microphones to units weighing hundreds of tons interconnecting the power grid. A wide range of transformer designs are used in electronic and electric power applications. Transformers are essential for the transmission, distribution, and utilization of electrical energy. GSM is a TDMA based wireless network technology developed in Europe that is used throughout most of the world. GSM phones make use of a SIM card to identify the user's account. The use of the SIM card allows GSM network users to quickly move their phone number from one GSM phone to another by simply moving the SIM card. Currently GSM networks operate on the 850MHz, 900MHz, 1800MHz, and 1900MHz frequency bands. Devices that support all four bands are called quad-band, with those that support 3 or 2 bands called tri-band and dual-band, respectively. In the United States, Cingular operates on the 850 and 1900MHz bands, while T-Mobile operates only on the 1900MHz band. Also known as "Global System for

Mobile Communications", "Group Special Mobile" GSM is a global system for mobile communication. GSM is an international digital Cellular telecommunication. The GSM standard was released by ETSI (European Telecommunication Standard Institute) back in 1989. The first commercial services were launched in 1991 and after its early introduction in Europe; the standard went global in 1992. Since then, GSM has become the most widely adopted and fastest-growing digital cellular standard, and it is positioned to become the world's dominant cellular standard. Today's second-generation GSM networks deliver high quality and secure mobile voice and data services (such as SMS/ Text Messaging) with full roaming capabilities across the world. GSM platform is a hugely successful technology and as unprecedented story of global achievement. In less than ten years since the first GSM network was commercially launched, it become, the world's leading and fastest growing mobile standard, spanning over 173 countries. Today GSM technology is in use by more than one in ten of world's population and growth continues to sour with the number of subscriber worldwide expected to surpass one billion by through end of 2003. Today's GSM platform is living, growing and evolving and already offers an expanded and feature-rich 'family' of voice and enabling services. An embedded microcontroller is a chip, which has a computer processor with all its support function (clocking and reset), memory (both program storage and RAM), and I/O (Including bus interfaces) built into the device. These built in function minimize the need for external circuits and devices to the designed in the final applications. The improvements in micro-controller technology has meant that it is often more cost effective, faster and more efficient to develop an application using a micro-controller rather than discrete logic. Microcontrollers are widely using in the embedded

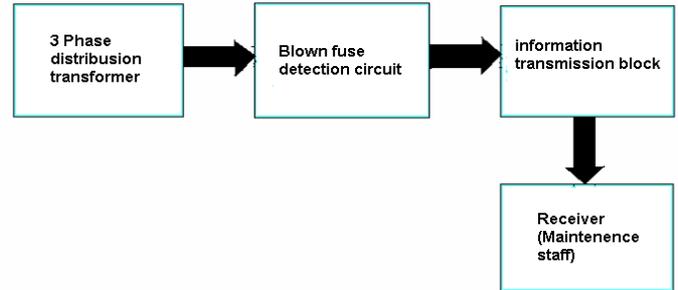
system products. It uses microcontroller to do one task. Its example is a printer, keyboard. Since the processor inside them perform only one task, which is getting the data and printing it. In embedded system, there microcontroller inside it, that perform one task.

II. MATERIAL AND METHOD

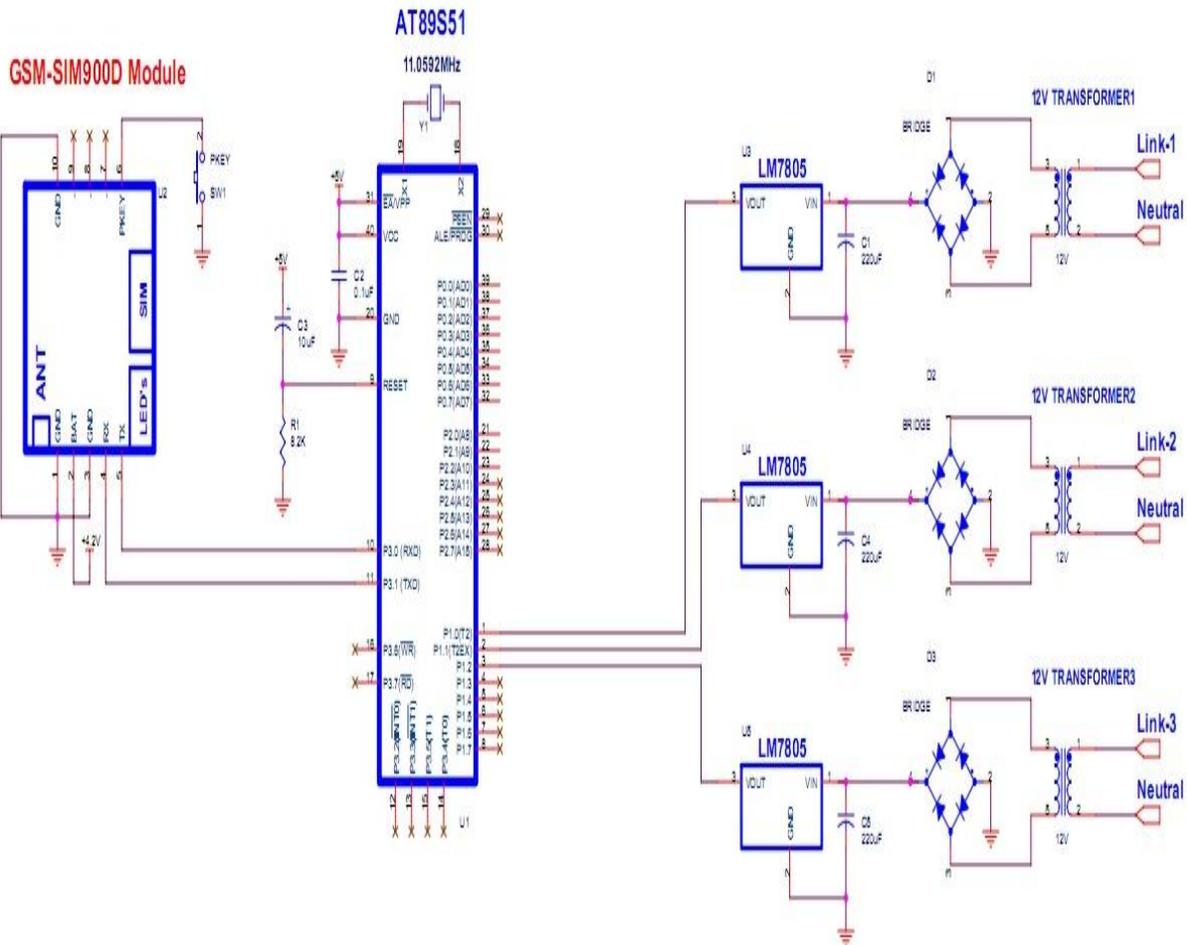
The detection circuit connected on the secondary side of transformer detects the blown fuse. The signals from the blown fuse detection circuit would be processed by micro-controller, which would in turn access the GSM module incorporated in the system itself through its port and eventually the alert about blown fuse would be received at the cell phone of maintenance staff of electricity. So the project can be severed into two parts: the hardware part and the software part. While the hardware part is AT89C51 with the detection circuit to build a working circuit, the software is to make an ingenious C-code for programming the micro-controller. The cell phone is used at the receiving side, which will receive the address of the blown fuse distribution transformer

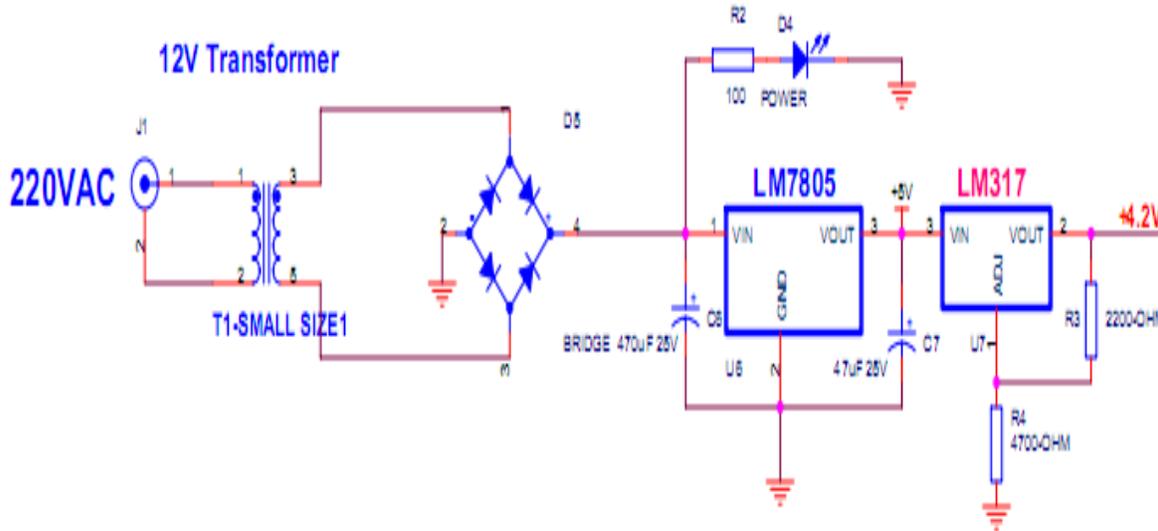
III. MAIN PARTS

- 1: Single Phase Transformer
- 2: Bridge Rectifier
- 3: Micro-Controller At89C51-24pc
- 4: GSM Module
- 5: DC Adaptor

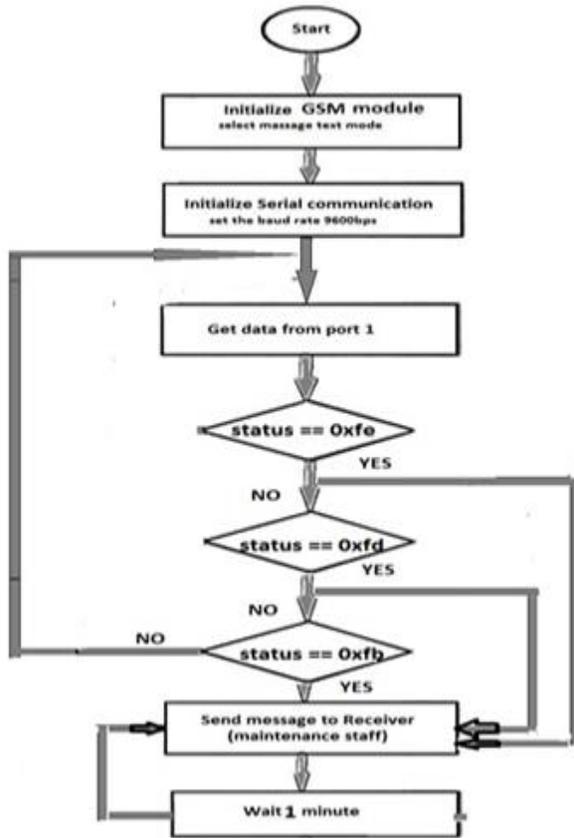


Block Diagram





Circuit Diagram



Flow Chart

IV. CONCLUSION

The detection of blown fuse and gsm based dispatch of the information automatically to the maintenance team. It is primarily used for the blown fuse of the distribution transfer to enhance the reliability, remove

user dependability of the system and the improvement of system inspection. Beside the basic function, we can use it for a number of other applications.

- 1: Domestic Use
- 2: Industrial Use
- 3: Economy and Reliability
- 4: Multiple User Modes
- 5: User Friendly

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