

# MONITORING OF AUTOMATIC CIRCUIT BREAKER USING MICROCONTROLLER

NEHA T. MAKODE  
Department Of Electrical Engineering  
G. H. Raison College of Engineering,  
Nagpur 440016, India  
[makode\\_neha.ghrcemtechped@raisoni.net](mailto:makode_neha.ghrcemtechped@raisoni.net)

Dr. KANTILAL JOSHI  
Department Of Electrical Engineering  
G. H. Raison College of Engineering  
Nagpur 440016, India  
Kd.josh@raisoni.net

Mr. NARESH RAUT  
Department of Electrical Engineering  
Lokmat Media Pvt. Ltd  
Nagpur 440016,India

**Abstract**— In these paper , the Monitoring of Automatic Circuit Breaker using Microcontroller is Proposed . In any Industry or a Power System , Circuit Breakers are used for the protection purpose . Its is a Critical part of any Power system . During Faulty Situation the Circuit Breaker trips .Several times the voltage required by the Circuit Breaker is not available i.e the input and output voltage or the phase failure situation may occur at the Circuit Breaker side . To Overcome from this type of Abnormal Conditions and for proper working of Circuit Breakers , Monitoring of Automatic Circuit Breaker is proposed , which will be monitoring the health and performance of Breakers with the help of Micro Controller . The system to be designed will be consisting of PIC Micro Controller , Transformers, Circuit Breaker etc. Different physical conditions including over voltage, unbalance voltage, phase failure voltage can be Monitored . Then the provision can be given to display Monitored result On Liquid Crystal Display (LCD) . Displayed result thus helps in Identifying the specific type of Fault , Which Reduces Time of fault clearance and thus improving the performance of the power system .

**Keywords** - PIC Micro Controller , Transformer , Circuit Breaker .

## I. INTRODUCTION

Circuit breakers are electromechanical devices . There are various types of control panels used in power station, small and large scale industries, companies, colleges, etc. as LT & HT panels, power factor improvement panels for distribution, monitoring and controlling purpose. These control panels mainly consist of circuit breakers for the system protection. Generally they are found in factories to monitor and control machines or production lines and in places such as nuclear power plants, ships etc. The Circuit Breaker is one of important component used in such control panels. These circuit breaker require manual controlling for their switching ON/OFF operation such that they have on and off push buttons. It consists of different coils as shunt coil and closing coil. The function of closing coil is to ON and shunt coil is to trip or OFF the Breaker respectively for that they require supply in form of pulse in this way the on/off operation will done.

Fig 1- Automatic Circuit Breaker



## II. LITERATURE SURVEY

In these paper [1] , the following main features of the solutions were illustrated . The operation of the Circuit breaker is analyzed and monitored in an automated way using advanced signal processing and expert system techniques. During Breaker Operations the signals are recorded from the Control Circuitry by Signal processing which has to be capable of extracting relevant features of the signals . By using automated analysis function ,following goals were achieved. Firstly the Minimization for time needed to detect an abnormal Condition and , continuing in performance analysis.

In these paper [2] , The system developed is for automated monitoring of multiple Circuit Breakers . This system is designed for a wireless architecture for Communicating data between newly designed Circuit Breaker Monitors (CBMs), and concentrator computer with intelligent software for automated analysis. This system consists of three parts. The first and second parts give the hardware and software prototype specification respectively. The third part provides details of the filed demonstration. These solution is focused on automating the analysis of switching sequences using GPS from the control circuitry collected by CBM devices installed at each breaker.

In these paper [3] , The paper focuses on Design of microcontroller based circuit breaker Which supports the under voltage release Condition . This under voltage release, trips the circuit breaker . One more feature for these system is Temperature sensing. Whenever the temperature rises beyond the threshold value, the Thermal relay circuit will give the trip signal to circuit breaker. The user interface is provided with operating keys and LCD display. The communication interface between the relay and the remote terminal is facilitated with device drivers and networking protocols. The communication interface allows the end user to adjust all settings from a remote terminal.

In these paper [4] , The paper describes the manual analysis of available data. Further, a concept for improving performance analysis of controlled .switching operations is given . The Key element is to study the changeover times of CB auxiliary contacts in the recordings of each operation, which is non-invasive to the CB. The information obtained provides a straight-forward estimate of the actual mechanical CB operating times and, in turn, (pre-)arcing times. Basically , the point-on-wave controller itself has given both interfaces for auxiliary contact signals and software features for operation assessment, which eliminates the need for manual analysis and recording external equipment .

## III CONCLUSION

As per the Literature Survey done it is seen that the Circuit Breaker needs to be monitored . By Monitoring Circuit Breakers using PIC Micro Controller more protection can be given to the Breakers as they are the essential part of the power system . Circuit Breaker Monitoring System gives better Monitoring data which increases the system Performance . Further these system gives an idea for Checking Various or Different types of Switchgears of different makes and hence obtaining a Fault reducing and cost effective system design .

#### IV FUTURE SCOPE

1. Real time Monitoring can be done .
2. Finding Fault becomes easy as it Displays the result on LCD which reduces fault clearing time.
3. More Protection – When working at industrial site, During Faulty Condition Relay trips and hence more protection is given to the Power System.
4. Low cost – The design of CBM system will not affect more to the Cost of Circuit Breaker .

#### V REFERENCES

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