iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 9 **Issue:** V **Month of publication:** May 2021

DOI: https://doi.org/10.22214/ijraset.2021.34819

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.429
Volume 9 Issue V May 2021- Available at www.ijraset.com

Automation Supply Control of Substation during Disaster

Roshani Chandekar[1], Vaishnavi Jiwankar[2], Priyanka Lokhande[3], Prajakta Sahare[4], Mrs. S.R. Gawande[5]
[1, 2, 3, 4, 5]*Department of Electrical Engineering, KDK College of engineering, Nagpur, India*

Abstract: Green and sustainable power is the need of the day. With widening supply and demand gap, power management has become one of the most critical areas of concern all over the world. India's energy consumption is increasing at one of the fastest rates in the world. Hence, we require Substation Automation Systems in the present day substations to efficiently control and deliver power.

The main objective is to create a SCADA system for the desired substation. Power automation serving electric supply locations often require special protection against the effects of fault-produced. Protection relays need to function immediately when a faulty condition occurs. This is why Intelligent Electronic Devices (IED's) are brought in for safe operation of switchyard devices, which can prevent disasters to energy supply and help in human safety. With the introduction of IEC 61850, utility communication will be used for substation automation and also for protection purposes within a substation and between substations.

A Substation Automation System (SAS) provides facility to control and monitor all the equipment in the substation locally as well as remotely. A Supervisory Control & Data Acquisition (SCADA) system provides users with a Human Machine Interface (HMI) which can be used for controlling, monitoring and protection of devices. This saves us cost and time.Substations are key components of the power grid, facilitating the efficient transmission and distribution of electricity Substation automation systems make their control and monitoring possible in real time and help maximize availability, efficiency, reliability, safety and data integration.

I. INTRODUCTION

Technology has made a significant place in our life. With advancement of technology things are becoming simpler and easier for us. Automation is the use of control systems and information technologies to reduce the need for human work in the production of goods and services.

Automation is a step beyond mechanization. Whereas mechanization provided human operators with machinery to assist them with the muscular requirements of work, automation greatly decreases the need for human sensory and mental requirements as well. Automation plays an increasingly important role in the world economy and in daily experience. Automatic systems are being preferred over manual system. Through this project we have tried to show automatic control of a cars condition.

In old era it was simple and have tough access to its features. Today this access is not made simple but made automatic using modern era sensors.

The automobile industry can be a innovative place if we include all these modern sensor in the industry.

In this project our main aim is to revolutionaries the automobile industry using these sensors and make high cost features cheap. Some of the feature we have include in our project are these.

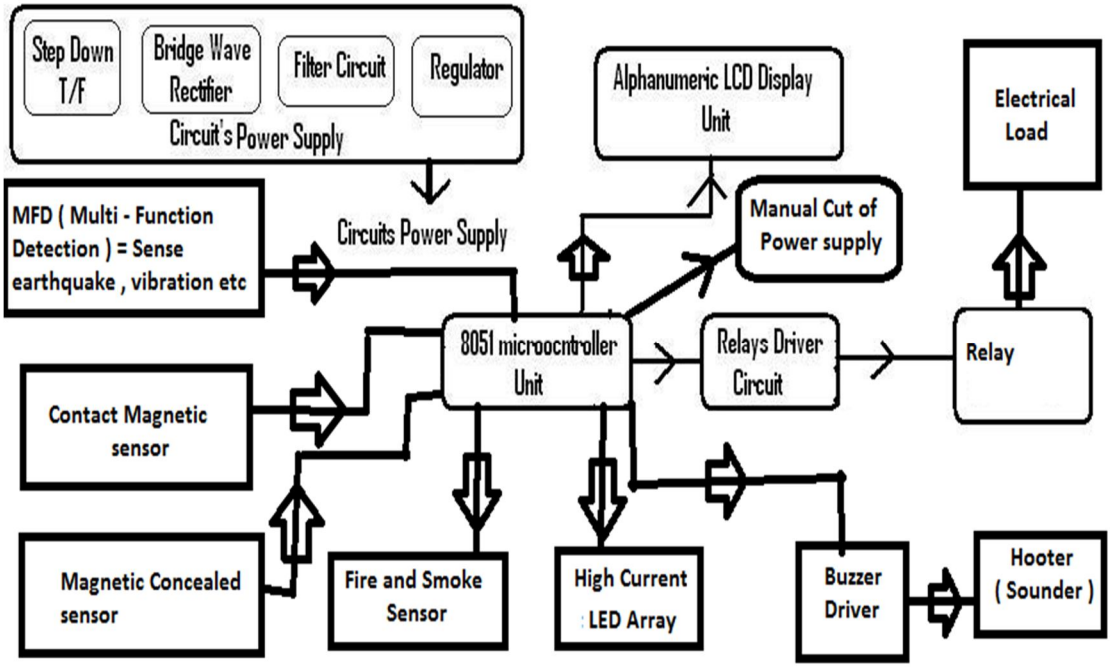
II. OBJECTIVE

1) *MFD:* Multi-function detection Feature (Will detect shocks and vibration on the substation).
2) *Concealed Magnetic Sensor:* detects the impact on the car and decides whether the airbags should open or not.
3) *Contact Magnetic Sensor:* detects some dangerous part are on their place or not.
4) *IR Sensor:* Stops supply if somebody is go to the prohibited area and hence avoid accidents.
5) *Universal Gas Sensor:* Will detect the combustible gases and smoke inside the engine chamber.

These all features we have provided here are done at low cost using modern technique, so that we can give advance feature to the whole automobile industry.

ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.429
Volume 9 Issue V May 2021- Available at www.ijraset.com

III. BLOCK DIAGRAM



In this diagram, various blocks present the working of circuit.

A. Power Supply

Transformers used here are Step down transformers. As output of transformer is AC, so it gets converted into DC by using capacitor circuit. Above circuit shows output of first module.

B. Comparator Circuit and Indicators

Keypad Comparator circuit gets data from the sensors like the IR sensor and LDR sensor and send it to the microcontroller. In actual comparator circuit sends the digital data to the microcontroller. Indicators we have used are high power 10mm LED's which glow using transistor as a driver circuit. We can't run this indicator directly using microcontroller. We need drivers so that they can fulfill the requirement of current.

C. Microcontroller part

Microcontroller is the heart of the project. This is backbone for all processing operation of the microcontroller. It takes data from all the sensors and process it for further operation for example whether airbags to be opened or not etc.

D. IC1 7806

It is a voltage regulator meant to give regulated 6V supply when provided with suitable input.

The 78xx (sometimes LM78xx) is a family of self-contained fixed linear voltage regulator integrated circuits. The 78xx family is commonly used in electronic circuits requiring a regulated power supply due to their ease-of-use and low cost. For ICs within the family, the xx is replaced with two digits, indicating the output voltage (for example, the 7805 has a 5 volt output, while the 7812 produces 12 volts). The 78xx line are positive voltage regulators: they produce a voltage that is positive relative to a common ground. There is a related line of79xx devices which are complementary negative voltage regulators. 78xx and 79xx ICs can be used in combination to provide positive and negative supply voltages in the same circuit.

78xx ICs have three terminals and are commonly found in the TO220 form factor, although smaller surface-mount and larger TO3 packages are available. These devices support an input voltage anywhere from a couple of volts over the intended output voltage, up to a maximum of 35 or 40 volts, and typically provide 1 or 1.5 amperes of current (though smaller or larger packages may have a lower or higher current rating).

IV. HARDWARE

A. IR sensor
B. Transformer(6-0-6 500 mA)
C. Capacitor 30 pF
D. Voltage regulator 7806
E. General Purpose PCB
F. Pin Connectors
G. Diode1N4007
H. Microcontroller8051(AT89C52P6)
I. Sensor magnetic contact and detector
J. MFD Multifunction detector
K. CPU fan
L. Relay
M. DriverICL293D

V. ADVANTAGES

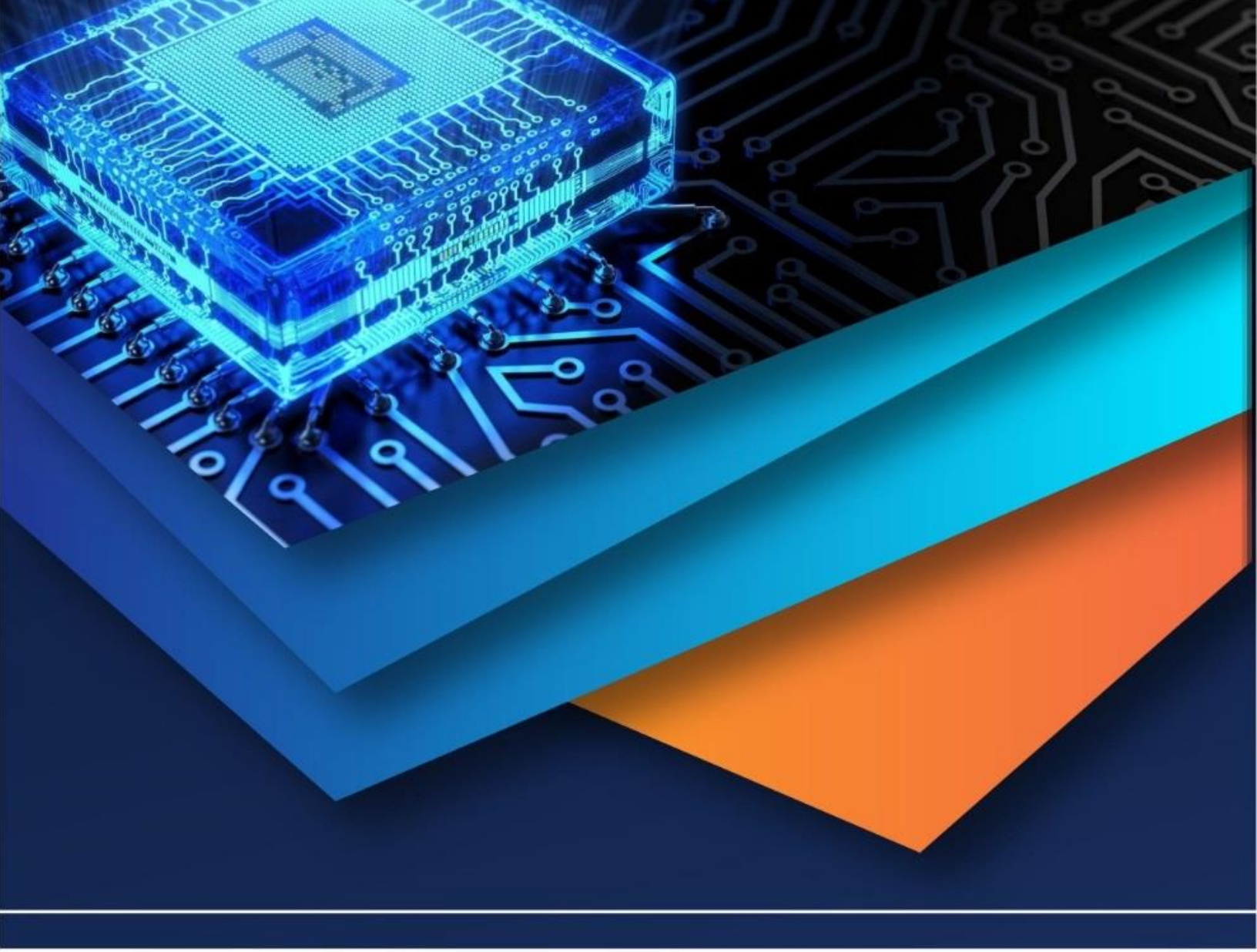
A. 78xx series ICs do not require additional components to provide a constant, regulated source of power, making them easy to use, as well as economical and efficient uses of space. Other voltage regulators may require additional components to set the output voltage level, or to assist in the regulation process. Some other designs (such as a switching power supply) may need substantial engineering expertise to implement.
B. 78xx series ICs have built-in protection against a circuit drawing too much power. They have protection against overheating and short-circuits, making them quite robust in most applications. In some cases, the current-limiting features of the 78xx devices can provide protection not only for the 78xx itself, but also for other parts of the circuit.

VI. CONCLUSION

After working on this project we have reached to the conclusion that this project has proved itself to be very simple, user friendly, cheap in comparison with its utility, accurate and fast. It can be used to establish completely automated control on distanced switching of the motor or other appliances through the mobile of user. Which can further give rise to many other applications.

REFERENCE

[1] "Introducing iec61850 in distribution system" substation automation system bycarlos cartono, miguel pernes Abb S.A. Portugal
[2] "Toward the smart grid: substation automation architecture and technologies" bya. Leonardi, k. Mathioudakis, a. Wiesmaier and F. Zeiger, AGT International, hilpertstrate 35, 64295 darmstadt, germany 20 Aug 2014
[3] "Substation automation system for 33/66 KV S/S at north delhi power limited" by chetan s. Kulkarni, member, IEEE and narendra mannazhi, member, IEEE
[4] "Electrical substation emergency disaster response planning through the use of geographic information system" by vivian sultan center of information systems and technology, claremount graduate university, claremount, CA, AU VO, brian hilton
[5] "Seismic vulnerability of power supply: lessons learned from recent earthquakes and future horizons of research" by eric frigosaki, shakhzod takhirov, quiang xie, and khalid m. Pacificgas and electric company, san ramen, CA, USA



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY