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Low Cost Scada System for Micro Industry

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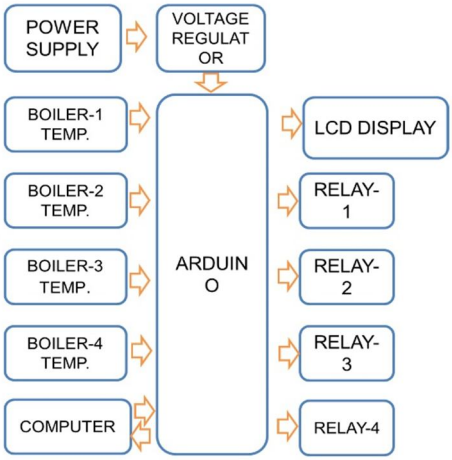
Abstract: ***The main goal of the project is to use a SCADA system to wirelessly handle real-time data acquisition. It is necessary to monitor all processes and control the elements affecting them because several processes are run simultaneously in large industries. We can achieve the goal by utilizing a technology like Wireless SCADA (Supervisory Control and Data Acquisition). The AT89S52 microcontroller is interfaced with temperature sensors. The microcontroller wirelessly transmits data continuously from the sensors, which is subsequently received at a corresponding USB type trans-receiver attached to a PC or laptop. The computer software that logs the data into the database and displays it on the front panel of the PC or laptop is loaded. On the SCADA screen, we can change parameters like the set point, lower limit, and upper limit. The microprocessor sends an instruction to the appropriate relay as soon as a sensor's temperature drops below the predetermined level. In relation to their sensors, the field devices connected through relay contacts are switched from ON to OFF. For the purpose of triggering an alarm on the PC in the event of system failure, higher limit and lower limit options are available. SCADA can therefore be used to accurately and safely control processes at hazardous locations. On the SCADA screen, we can change parameters like the set point, lower limit, and upper limit***

I. BLOCK DIAGRAM



II. WORKING

SCADA (Supervisory Control and Data Acquisition) is a type of software application and industrial control system that enables industrial organizations to monitor and control various industrial processes and systems remotely. It is typically used in industries such as oil and gas, water and waste management, power generation, and manufacturing. SCADA systems collect data from sensors and control devices located at remote sites, and then present this data in a centralized control room for monitoring and analysis. They allow operators to remotely monitor and control processes and systems, and can also be used to automate various tasks and functions. SCADA systems typically consist of several key components, including a human-machine interface (HMI), programmable logic controllers (PLCs), remote terminal units (RTUs), and communication networks. These components work together to gather data, provide control, and transfer information between the control room and remote sites. In recent years, SCADA systems have become increasingly complex, with the integration of advanced technologies such as cloud computing, artificial intelligence, and the Internet of Things (IoT). This has allowed organizations to improve efficiency, reduce downtime, and optimize processes and systems in real-time.

SCADA (Supervisory Control and Data Acquisition) system is a software application that enables remote monitoring and control of various types of industrial and infrastructure processes.

The working of a SCADA system involves the following steps:

1) *Data Acquisition:* The SCADA system gathers data from various field devices, such as sensors, actuators, and PLCs (Programmable Logic Controllers), using protocols like Modbus, DNP3, or OPC.
2) *Data Processing:* The collected data is processed, analyzed, and stored in a central database for further use.
3) *Monitoring:* The SCADA system provides a graphical interface for monitoring the status of the processes and the field devices. The interface displays real-time information about the process parameters, alarms, and trends.
4) *Control:* The SCADA system allows operators to control the processes remotely by sending commands to the field devices. The commands are executed by the field devices and the process parameters are adjusted accordingly.
5) *Reporting:* The SCADA system generates various reports and provides historical data analysis, which helps in decision making and process optimization.
6) *Alarm Management:* The SCADA system provides an alarm management system that alerts the operators about any abnormal conditions or deviations in the processes. The operators can then take corrective actions to minimize downtime and prevent losses.

Overall, the main objective of the SCADA system is to automate and optimize industrial and infrastructure processes by providing a centralized platform for data acquisition, monitoring, control, and report

III. RESULT

The system works appropriately to avoid any inconvenience. The system works smart with the help of Arduino Nano, LCD, Relay, Power Supply, and Temperature Sensor. The Arduino Based languages is used to create a website for SCADA system based on the Internet of Things. The results are properly checked and are accessible by everyone.

IV. CONCLUSION

In order to monitor the load conditions and temperature in a remote plant, we created a prototype of a wireless SCADA system. This system uses technology to collect data in the remote plant, which is connected to a PC to monitor the parameters of the remote plant and transformer load conditions. By using the platform of (programming language) environment, we successfully tested the performance of low-cost SCADA which is interfaced to monitor and supervises the entire plant process and can be installed and implemented in small scale running units and a SCADA interface to monitor and supervise the entire plant process. It also has the ability to access real-time data on processes that are currently underway and the status of plants that are currently in operation. When compared to commercial goods, this can be adopted in small and medium sized businesses, isolated micro grid systems, and hybrid micro grid systems with great ease. The findings of this study can be used to build SCADA to monitor and control the entire industry for both commercial and educational purposes. The user interface can be made more user-friendly so that it can be operated from the webpage directly by using the selector switches and input data, and SMS alerts can be delivered to system administrators of any essential notifications for a more facilitated and enlarged service.

V. FUTURE SCOPE

The future scope of SCADA (Supervisory Control and Data Acquisition) systems is very promising due to the increasing demand for smart and efficient industrial control systems. The future of SCADA systems is expected to be impacted by the integration of new technologies such as Internet of Things (IoT), cloud computing, machine learning, and artificial intelligence.

1) *IoT Integration:* The integration of IoT devices with SCADA systems will provide real-time data collection, remote monitoring and control of assets, and predictive maintenance capabilities.
2) *Cloud Computing:* The use of cloud computing will provide unlimited storage capacity, increased security, and easy access to data from anywhere in the world.
3) *Machine Learning:* Machine learning algorithms will enable the analysis of large amounts of data and improve decision-making capabilities.
4) *Artificial Intelligence:* The use of artificial intelligence will enhance the automation of industrial processes and provide real-time monitoring and optimization of systems.
5) *Increased Automation:* The trend towards Industry 4.0 and the increasing use of automation in industries will drive the demand for SCADA systems.

In conclusion, the future of SCADA systems is expected to be characterized by increased efficiency, improved decision-making, and enhanced automation capabilities.

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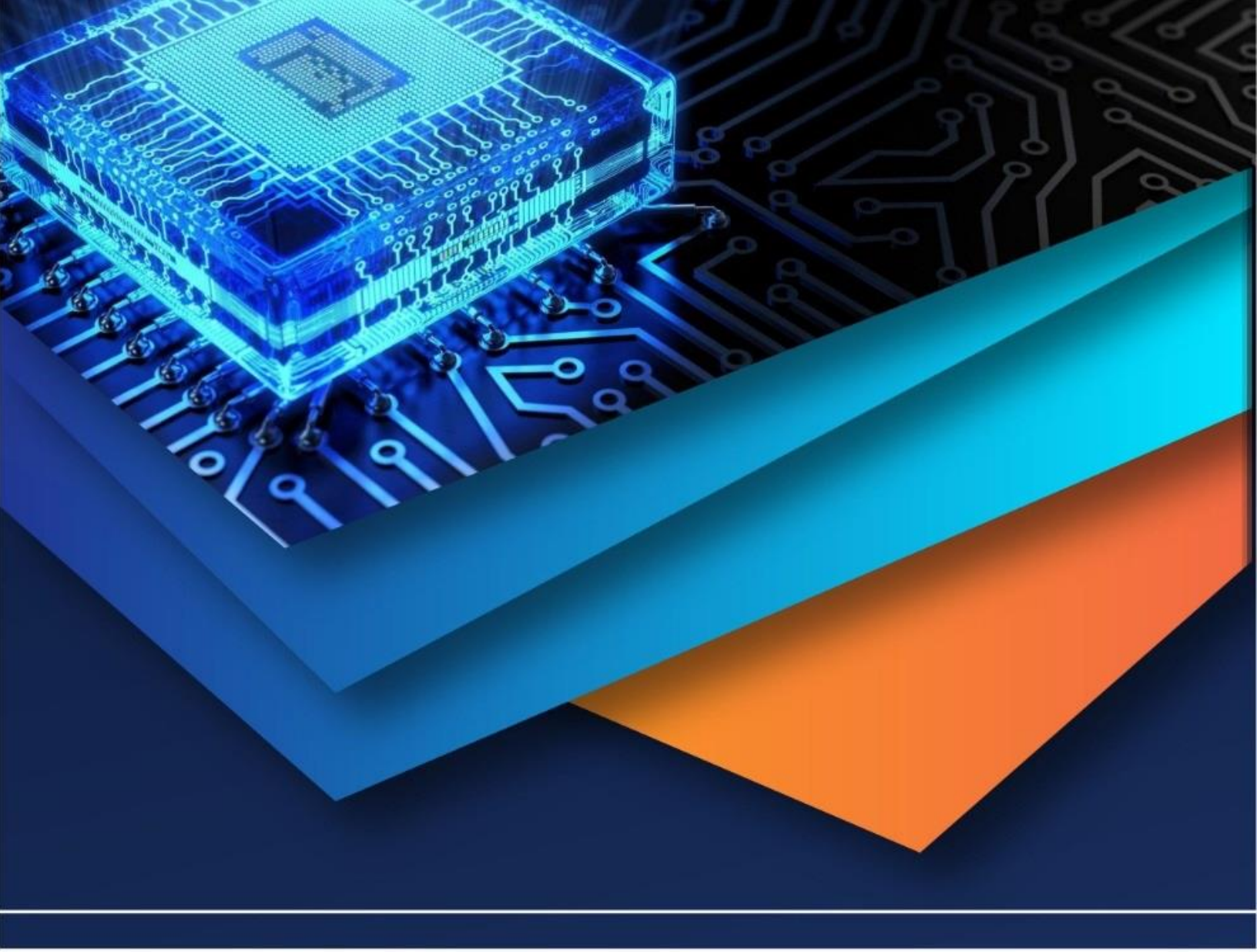

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