Design of an ATS System for a 8KW Generator

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***Abstract*—This thesis presents the design of an Automatic Transfer Switch (ATS) system for an 8KW generator. The author describes the system's components, including the ATS for grid and generator, and the control logic using PLC S7-1200. The work covers the design of both manual and automatic control modes, and the development of a WinCC Advanced interface. The thesis also outlines the educational value for students in understanding power supply, electrical devices, and PLC programming. The design process involved detailed calculations and simulations of electrical devices, ensuring the system's reliability and functionality. The author successfully developed the control algorithm and interface using WinCC Advanced, providing a deeper understanding of power supply, electrical devices, and PLC programming for students.**

***Index Terms*—ATS, PLC, 8KW generator, WinCC, Relay**

I. Introduction

The thesis introduces the design of an ATS system for an 8KW generator, covering the principles of ATS, Uninterruptible Power Supply (UPS), and the operation of grid and generator ATS. The author discusses the importance of ATS in ensuring continuous power supply and the need for a reliable control system. The design process involves detailed calculations and simulations of electrical devices, ensuring the system's reliability and functionality. The author emphasizes the educational value of the project, providing students with a comprehensive understanding of power supply, electrical devices, and PLC programming [1]. Published articles on the methods and subject of this project provide context for this English summary [6].

II. Methods

The author designs and calculates the electrical devices in the ATS cabinet, including the power relay circuits and the total circuit breaker. The design also includes the operation of relay control circuits and PLC S7-1200 control systems. The WinCC Advanced software is used to develop the control interface. The design process involves detailed calculations and simulations of electrical devices, ensuring the system's reliability and functionality. The author successfully developed the control algorithm and interface using WinCC Advanced, providing a deeper understanding of power supply, electrical devices, and PLC programming for students [1].

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III. Results

The thesis demonstrates the ability to design both manual and automatic control modes for the ATS system. The author successfully developed the control algorithm and interface using WinCC Advanced. The work provides a deeper understanding of power supply, electrical devices, and PLC programming for students. The design process involved detailed calculations and simulations of electrical devices, ensuring the system's reliability and functionality. The author successfully developed the control algorithm and interface using WinCC Advanced, providing a deeper understanding of power supply, electrical devices, and PLC programming for students [1].

IV. Discussion

The author discusses the potential for extending the system's functionality by integrating it with a management system through industrial communication protocols and using the Web server feature of the PLC S7-1200 to display system information on the internet. The design process involved detailed calculations and simulations of electrical devices, ensuring the system's reliability and functionality. The author successfully developed the control algorithm and interface using WinCC Advanced, providing a deeper understanding of power supply, electrical devices, and PLC programming for students [1].

V. Conclusion

The thesis concludes that the designed ATS system for the 8KW generator meets the basic requirements and provides valuable learning experiences for students in power supply, electrical devices, and PLC programming. The design process involved detailed calculations and simulations of electrical devices, ensuring the system's reliability and functionality. The author successfully developed the control algorithm and interface using WinCC Advanced, providing a deeper understanding of power supply, electrical devices, and PLC programming for students [1].

References

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