Design of a Parking System Control Using Mitsubishi PLC

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***Abstract*—This thesis focuses on the design and implementation of an automated parking system using Mitsubishi PLC. The author explores the development history and current state of automated parking systems, highlighting their advantages and disadvantages. Various types of automated parking systems are discussed, such as car lift systems, shape parking systems, and rotating parking systems. The design process is detailed, including the selection and application of Mitsubishi PLC, programming using GX Works2 and WinCC, and system monitoring. The work provides a comprehensive understanding of the automated parking system and the application of PLC in such systems, but does not include specific performance metrics.**

***Index Terms*—PLC, Mitsubishi, Automated Parking System, Control System, WinCC**

I. Introduction

The thesis begins with an overview of the development history and current state of automated parking systems, emphasizing their advantages and disadvantages. Various types of automated parking systems are discussed, including car lift systems, shape parking systems, and rotating parking systems. The author then delves into the design process, focusing on the selection and application of Mitsubishi PLC. The work highlights the compact design and versatility of Mitsubishi PLC, making it suitable for various industries. However, the limitations of the project include the use of second-hand equipment and the lack of a detailed performance evaluation [1]. Published articles on the methods and subject of this project provide context for this English summary [4], [5], [6], [7], [8]. Published books on the methods and subject of this project provide context for this English summary [9].

II. Methods

The methods section covers the selection of Mitsubishi PLC, including its hardware structure, memory types, and input-output modules. The author discusses the programming process using GX Works2 and WinCC, and the design of the control system. The PLC FX1N-60MT was chosen for its suitability in the project. The design process involves analyzing the requirements, selecting the appropriate PLC, and programming the system using the specified software tools. The author provides detailed descriptions of the system's components and the programming process, but does not include specific performance metrics [1].

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III. Results

The results section describes the design and implementation of the automated parking system control using Mitsubishi PLC. The author provides detailed descriptions of the system's components and the programming process, but does not include specific performance metrics. The system includes various sensors and actuators, and the programming was done using GX Works2 and WinCC. The author acknowledges the limitations due to the use of second-hand equipment and the lack of a detailed performance evaluation [1].

IV. Discussion

The discussion section reflects on the importance of PLC in automated systems, noting its compact design and application in various industries. The author concludes that Mitsubishi PLC FX1N-60MT was chosen for its suitability in the project. The limitations of the project include the use of second-hand equipment and the lack of a detailed performance evaluation. The author reports using GX Works2 and WinCC for programming and simulation, and notes that some equipment was previously used and generated noise [1].

V. Conclusion

The thesis concludes with the author's reflections on the project, acknowledging the limitations due to limited resources. The work provides a comprehensive understanding of the automated parking system and the application of PLC in such systems, but does not include specific performance metrics. The source specifically reports learning to program with GX Works2, simulate system operation, and use WinCC for monitoring. Its model remains subject to the equipment limitations noted by the author [1].

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