

**Development of a Maintenance and Repair Module for a WinCC-based SCADA
System with Interoperability Features**

By

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STATEMENT BY THE AUTHOR

I hereby declare that this submission is my own work and to best of my knowledge, it contains no material previously published or written by another person, nor material which to substantial extent has been accepted for the award of any other degree or diploma at any educational institution, except where due acknowledgement is made in thesis.

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● **ABSTRACT**

Development of a Maintenance and Repair Module for a WinCC-based SCADA
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This thesis shows the implementation and development of a SCADA-based maintenance and repair system with interoperability features, highlighting SCADA's untapped potential as a platform for an integrated maintenance and repair system. The system addresses SCADA's real-time data's limited integration with maintenance management systems, a method to reinforce maintenance activity, and a maintenance management system that can be developed and adapted by automation engineers and can be independently maintained without IT infrastructure.

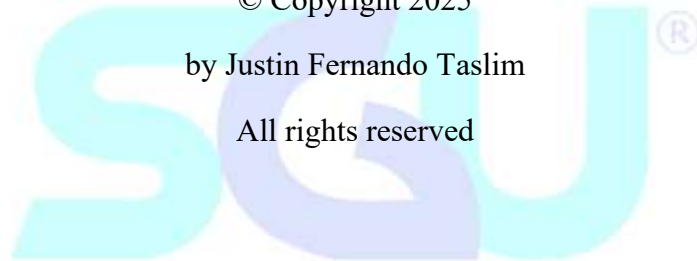
The system uses WinCC RT Professional and S7-1200 PLC for implementation, and incorporates functionalities such as preventive and condition-based maintenance scheduling, maintenance history logging, CSV-based interoperability, maintenance scheduling algorithm, and mobile device access via Microsoft Power App.

The implemented system usability and performance were evaluated through a one-week field trial and expert feedback at Landpack. The results demonstrated high acceptance, reliability, and user willingness to adopt the system. Although the

scheduling algorithm was validated using simulated data due to time constraints, the maintenance and repair system was implemented successfully from a single machine to a full production-line deployment, showing its scalability and usability.



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- **DEDICATION**

This thesis is dedicated to my parents, whose immense and unwavering support and sacrifice made this journey possible. Your encouragement was my source of strength. This thesis is also dedicated to my advisors, whose guidance and patience helped guide my research and discovery, and the completion of this thesis.



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