

**DESIGNING AND DEVELOPING AN EXTERNAL HARDWARE  
CONTROLLER TO BE INTEGRATED INTO FMS SIMULATOR  
MODBUS NETWORK TO CONTROL SIMULATED FESTO MPS  
TESTING STATION DEVELOPED IN TECNOMATIX PLANT  
SIMULATION**

By

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## STATEMENT BY THE AUTHOR

I hereby declare that this submission is my own work and to the best of my knowledge, it contains no material previously published or written by another person, nor material which to a 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 the thesis.

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## ABSTRACT

### DESIGNING AND DEVELOPING AN EXTERNAL HARDWARE CONTROLLER TO BE INTEGRATED INTO FMS SIMULATOR MODBUS NETWORK TO CONTROL SIMULATED FESTO MPS TESTING STATION DEVELOPED IN TECNOMATIX PLANT SIMULATION

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This thesis project is about designing and developing the external controller which is applied to a control system for the process simulation of MPS Festo testing station purpose by using Siemens Tecnomatix Plant Simulation 11 software. The control system is made to execute the process simulation of MPS Festo testing station through wireless network. To achieve that purpose, the thesis work will be developed using Arduino IDE, Qt program and Modbus protocol over TCP/IP. The problem to be considered is to establish the communication system between the external controller and the process simulation in Tecnomatix Plant Simulation 11. Furthermore, the activity of material flow is also developed in the software to demonstrate the feedback of the actual process in the simulation to the user's indicators on the external controller. In the end this thesis work is successfully achieved when the communication between the external controller and the process simulation of MPS Festo testing station completely established.

*Keywords: Tecnomatix Plant Simulation, MPS Festo Testing Station, Modbus Protocol, TCP/IP Protocol, External Controller, Qt Protocol Converter.*



## **DEDICATION**

I dedicate this works to Allah SWT, my family, my friends, my girlfriend and Mechatronics Engineering Department, Faculty of Engineering and Information Technology in Swiss German University which has been a support throughout the completion of this thesis project.



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