

**RETROFITTING FLEXIBLE MANUFACTURING SYSTEM 104 WITH NEW
CONTROLLER (ASSEMBLY SUBSTATION)**

By

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11112056

BACHELOR'S DEGREE
in

MECHANICAL ENGINEERING – MECHATRONICS CONCENTRATION
FACULTY OF ENGINEERING AND INFORMATION TECHNOLOGY



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August 2016

Revision after the Thesis Defense on 27 July 2016

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

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SGU automation laboratory has FESTO FMS 104 for 15 years. This teaching facility is to educate students how a model of a flexible manufacturing system (FMS) works and to let the students reconfigure the system based on the module provided from FESTO. The FMS 104 consists of conveyor station, assembly station and ASRS station. This thesis only focused on the assembly station. The main controller for this station was broken a few years ago and made the assembly station stop working. It is found that the controller is a discontinued FESTO industrial PC and replacement controller is no longer available in the market. The purpose of this research on FMS is to retrofit, adapt and implement functionalities of the old industrial PC controller by using ARM Cortex microcontroller. The first method is by checking the parts of the whole system and then building an electrical connection system so that the microcontroller can interface with the whole system. The electrical connection and control program are also successfully tested. Finally, main purpose of this project is achieved as demonstrated by running again the whole assembly sequence with the implementation of microcontroller as its controller.

Keywords: Flexible Manufacturing System, Assembly Station, Encoder, Cartesian handling unit, Microcontroller.



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DEDICATION

In dedication to God and my beloved family.



ACKNOWLEDGEMENTS

I would like to thank God firstly for his grace and blessing throughout this thesis, secondly I would like to thank you my family for their support throughout this thesis, my father and my mother who always give their support and encouragement.

I would like to thank Mr. Ir. Arko Djajadi, Ph.D. also for his guidance throughout this thesis, as my thesis advisor, Mr. Ir. Arko Djajadi, Ph.D. has shown his support, patience and guidance to help me finish this thesis. His advices, helps, and knowledge has help me a lot throughout this thesis. I would like also to thank Mr. Cepi Mohammad Hanafi, SST, Mr. Erikson Ferry S. Sinaga, ST., M.Kom and Mr. Maskula for their support, whenever I was having problem on this project, they have been always there to show the knowledge and guidance to solve the problem.

I would like also to thank all of my friends, Prastha Delta, Nur Rizza, Albert Sariputra, Kennan Jonathan, Ignasius Kevin, Charles, Kevin Susanto, Kevin Baskoro, Emely, M. Kemal, Sherwin and James, thank you for the knowledge that has been shared, all the suggestion and thank you for accompanying me throughout this thesis, thank you for all the conversation and the humor that has made this thesis project seems enjoyable.

And to all the Mechatronics Batch 2012 students, especially Mechatronics class A, throughout my study here in SGU, you have given a good memory. I wish you guys all success in the future.

I would like to thank SGU for providing the flexible manufacturing system in SGU Automation laboratory and the laboratory to be used for doing the thesis project until late in the night, so that this thesis is possible.

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