

Portable Syringe Pump with Feedback Function

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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

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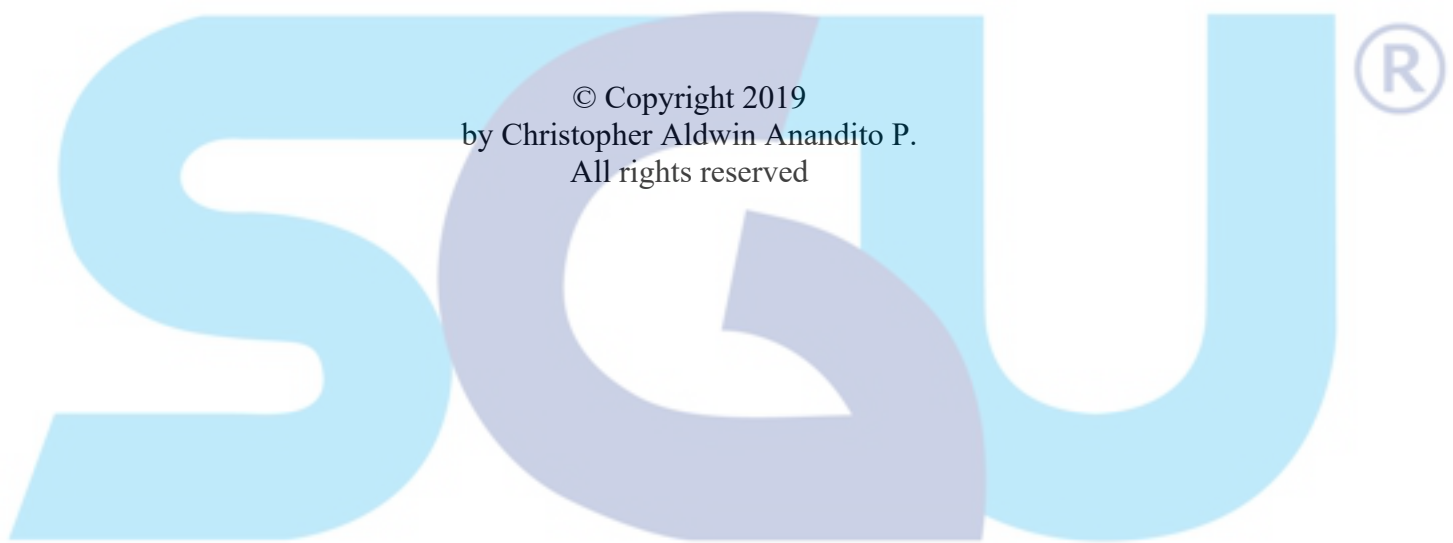
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Syringe pump is a device that can control the flow rate of a syringe. The available syringe pump is expensive. There is an open source syringe pump, but it is lack of feedback. This research is to make a cheap alternative of the commercially available syringe pump using an open source software and hardware, but in this research the design is modified to have a feedback system that have three sensors, such as Force Sensing Resistor (FSR), linear potentiometer (Soft Pot), and rotary encoder. The syringe pump uses a stepper motor and an Arduino Mega 2560 for the controller while the system is powered up by a series Battery Management System (BMS). There is multiple testing and measurement for each of the sensor and the flow rate of the syringe pump at the end. The conclusion is that the syringe pump is a precise and accurate device that was made using open source, the Arduino could control the syringe and all of the sensors can be used to detect the flow rate. The settings of the flow rate have been adjusted to have around 5% error rate; it goes lower as the flow rate goes higher.

Keywords: Syringe Pump, Feedback, Force Sensing Resistor, Linear potentiometer, Rotary Encoder.

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DEDICATION

I dedicate this works for my advisor, co-advisor, family and friends who helped on the making this report from the start until the end.



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I wish to thank you the one that reading this, because I write it down for all of you. I hope you will my writing rather enjoying than mesmerizing. I would thank you for my advisor, Mr. Fuad Ughi that patiently guiding me through working with this project and also to let me submit this thesis report. Mr. Fuad Ughi helped me through giving the ideas everything on the report. I would also like to thank you Mr. Arga Aridarma, that would give me some input to the device. Finally, I would like to thank you my family and my friends, especially my parents, Stanley my brother and Jessilia that gave me support that I need through the hard times. I don't know I would get here if it wasn't because of you.

I have found that I am learning a lot of new things from the project, that will be a tool to explore the future. I hope that the things that I have learned in the university will also gave a me an insight of the future work experience.



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