

Bachelor's Thesis, Term Project

Conceptional Design of Portable Motor Drive Test Stand as an application for the Industry 4.0 (Sponsored by Ezz Steel)

(Industrial Project, With Collaboration with Ezz Steel)

Main Advisor(s): (Assoc. Prof. Dr. Eng. Amir Roushdy and Dr. Eng. Taher Salah eldeen)

Co-Advisor(s): (Eng. Malek Mahmoud)

Motor Drives is the middle point (interface) control between the control system and motor, which provides the user/system with a speed control on the motor to match the needs of certain plant conditions. The need to develop an online portable test rig for motor drives is very essential for direct setting and adjustment repaired motor drive to ensure its performance and prevent any abnormal stoppage at the plant. **There is a Master's student from Mechatronics Engineering Department, Senior Researchers from ARATRONICS also available to help and advice and The Lab Engineer from ARATRONICS, guiding and directing the student with Assoc. Prof. Dr. Eng. Amir Roushdy.**

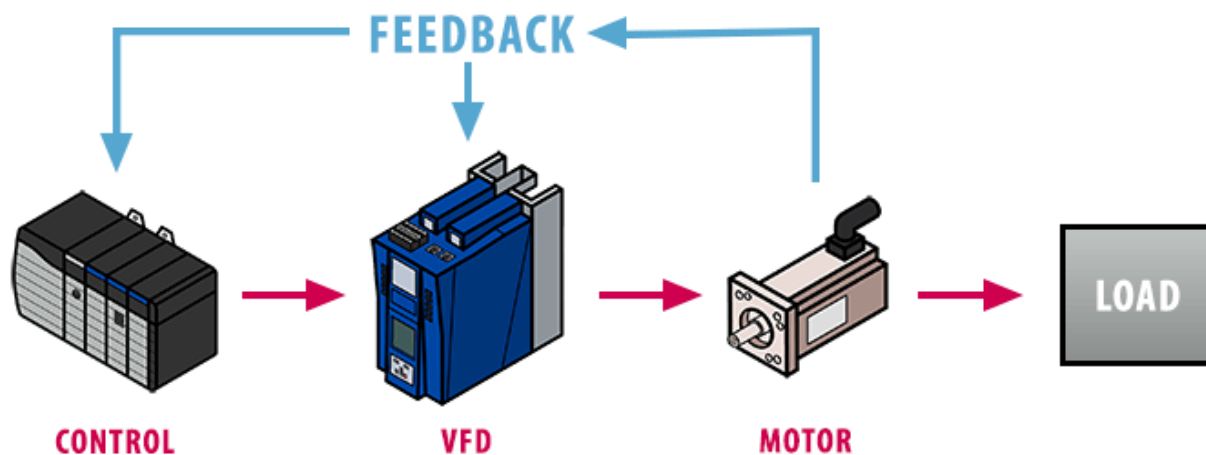


Fig.: A schematic for the motor drive in the industrial loop

Project outlines and chapters:

1. Overview and Principles of Electrical Motors.
2. Drives Principles of operation.
3. Principle design for the motor test stand, which include the following consideration:
 - o Max Motor Drive Power will be tested.

For more details please contact:

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- Suitable Motor which can be fit with most of Drives that will be tested.
 - Suitable Automation System for motor / Drive speed Control
 - Using Suitable HMI /MMI to make it easy to operator
4. Arduino / PLC can be used to control the drive.
 5. LCDs or Mini HMI with raspberry PI for user interface
 6. Design of control system.
 7. Define the needed sensors related to power unit control philosophy
 8. Define the needed data to be displayed and logged through the HMI.

Research focus of this project:

- Literature review on the project should be studied properly.
- Not only, creating a software control system for the project but also the hardware.
- Experiments using the gadget and control system should be built properly.
- The outcomes must be documented.

Requirements:

- Passionate to learn more about, Soft Robotics, 3D Printing design, Robotics and control.
- Prior mechatronic design expertise is desired like “SolidWork and Arduino”.
- Enthusiasm for completing actual practical work with 3D printing staff (design fabrication and construction).
- A method of working that is both structured and self-contained.

General tasks of the project:

- The complete methodology is already available in the ARATRONICS Lab, so we will discuss it from the first day to start the automation process for it
- Fabricate the machine/system using 3D printer/CNC machine (small parts).
- Assembly all parts of the Robot.
- Changing the working variables and see the effect on the locomotion of the robot.

Other notes:

- A weekly meeting with the advisors will be required for this project, as well as weekly progress updates (*The meeting could be more than once during the week based on your progress and based on your achievements*).
- You should to be in the Lab two days per week (*It could be more than two days based on your progress and based on your achievements*).
- All reports must be prepared in the style of a research paper.
- The outcome of this research will be published in one of the coming international Conferences and , or Journal