

Bachelor's Thesis, Term Project

Design of Automatic Electro-Hydraulic Cylinder Test Rig Based on the Industry 4.0 Technology

This is an Industrial Project Supported by: Al Ezz Dekheila Steel Co. – Alexandria SAE (EZDK)

Supervisor (s): (Assist. Prof. Dr. Eng. Amir Roushdy)
(Assist. Prof. Dr. Eng. Taher Salah El-Din)



This project will introduce virtual instruments technology and develop an Electro-Hydraulic Cylinder Test Rig based on it. This test rig realizes the function of data acquisition, real-time display, output configuration, pressure adjustment, test data saving and report generation. Architecture of the test bench is introduced and its LabVIEW-based software design method is illustrated in detail. Compared to traditional systems, this test bench has many advantages like fast designing, easily expanding and automatic data judgment. **There is an industrial team from Al Ezz Dekheila Steel Co. and the Lab Engineer from ARATRONICS, guiding and directing the student with Assist. Prof. Dr. Eng. Amir Roushdy and Assist. Prof. Dr. Eng. Taher Salah El-Din**

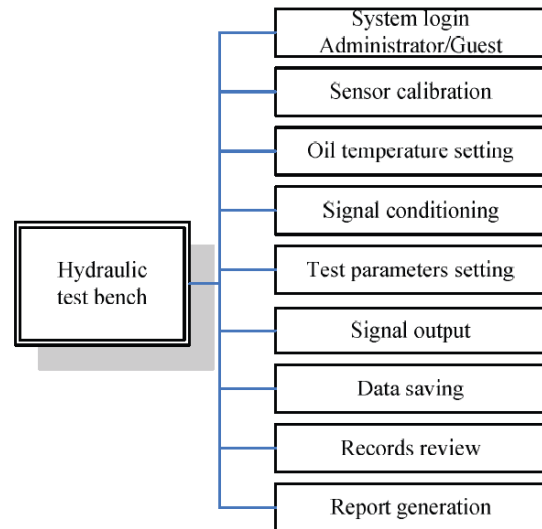
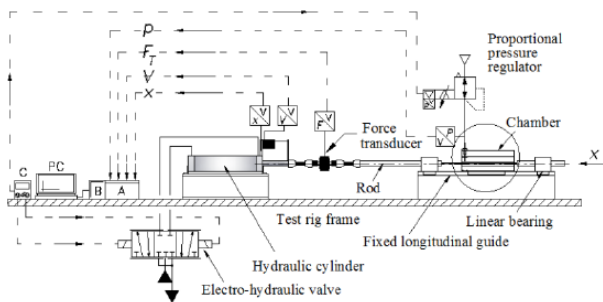
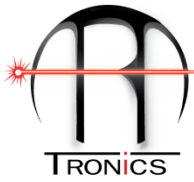


Fig.: Automatic Design for the Electro-Hydraulic Cylinder Test Rig

Research focus of this project:

For more details please contact:

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

Requirements:

- Passionate to learn more about Industrial Automations, Electro-Hydraulic, Design and Control, SCADA and Industry 4.0 Technologies.
- Prior mechatronic design expertise is desired like “SolidWork, LabVIEW, Automation Studio and Arduino”.
- Enthusiasm for completing actual practical work on the Industrial Automations 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 a prototypes for some parts of the machine/system using 3D printer/CNC machine (small parts).
- Assembly all parts of the Machine.
- Changing the working variables and see the effect on the proposed solution.

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*).
- **You should to be able to visit the factory in Alexandria at least two days per month.**
- 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