

BPMI Valve Control

Mechanical/Electrical Engineering Senior Design Project

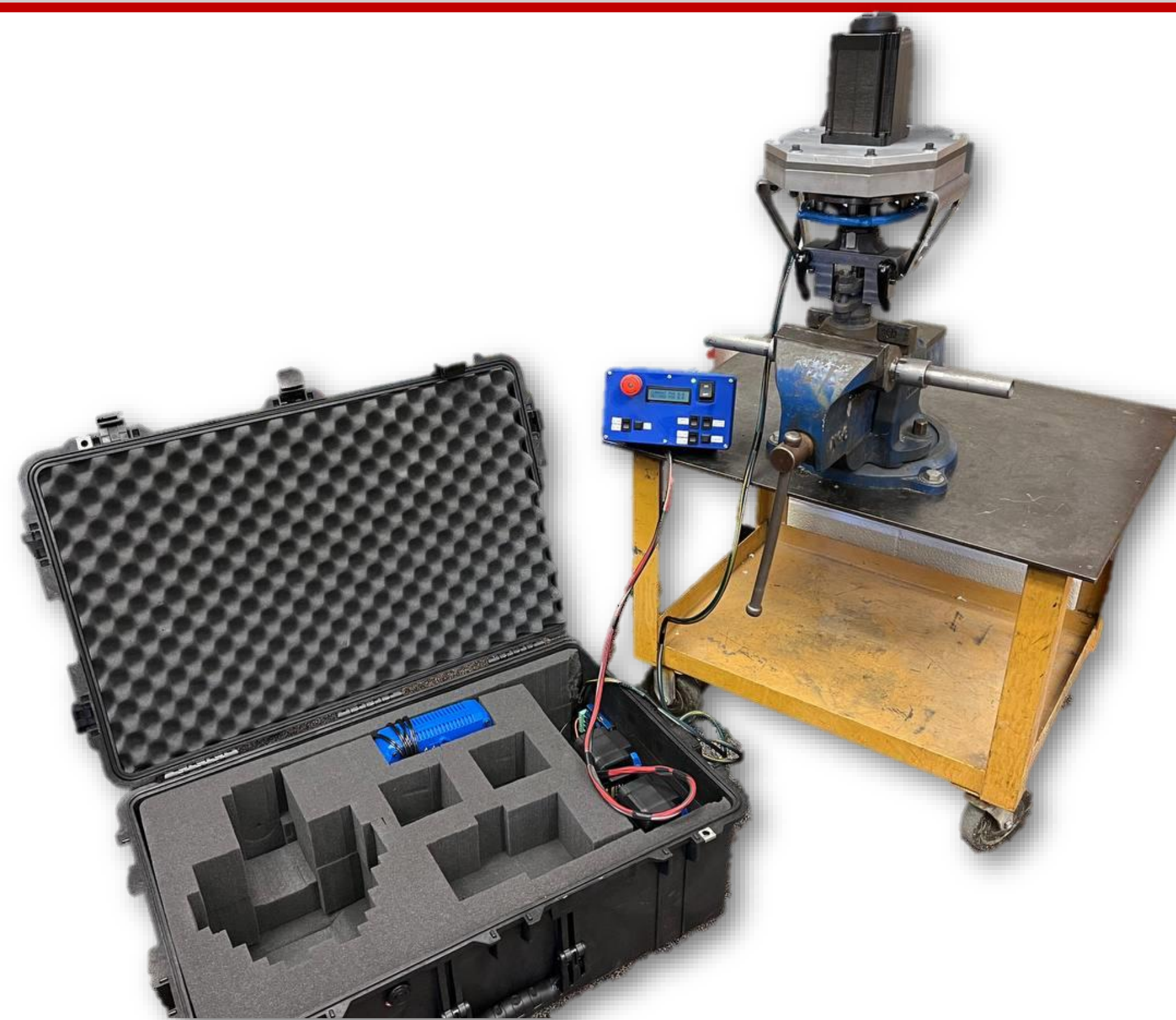


Problem Statement:

Tasked by BPMI to design an operator for a manual valve that can be automatically actuated.

Requirements:

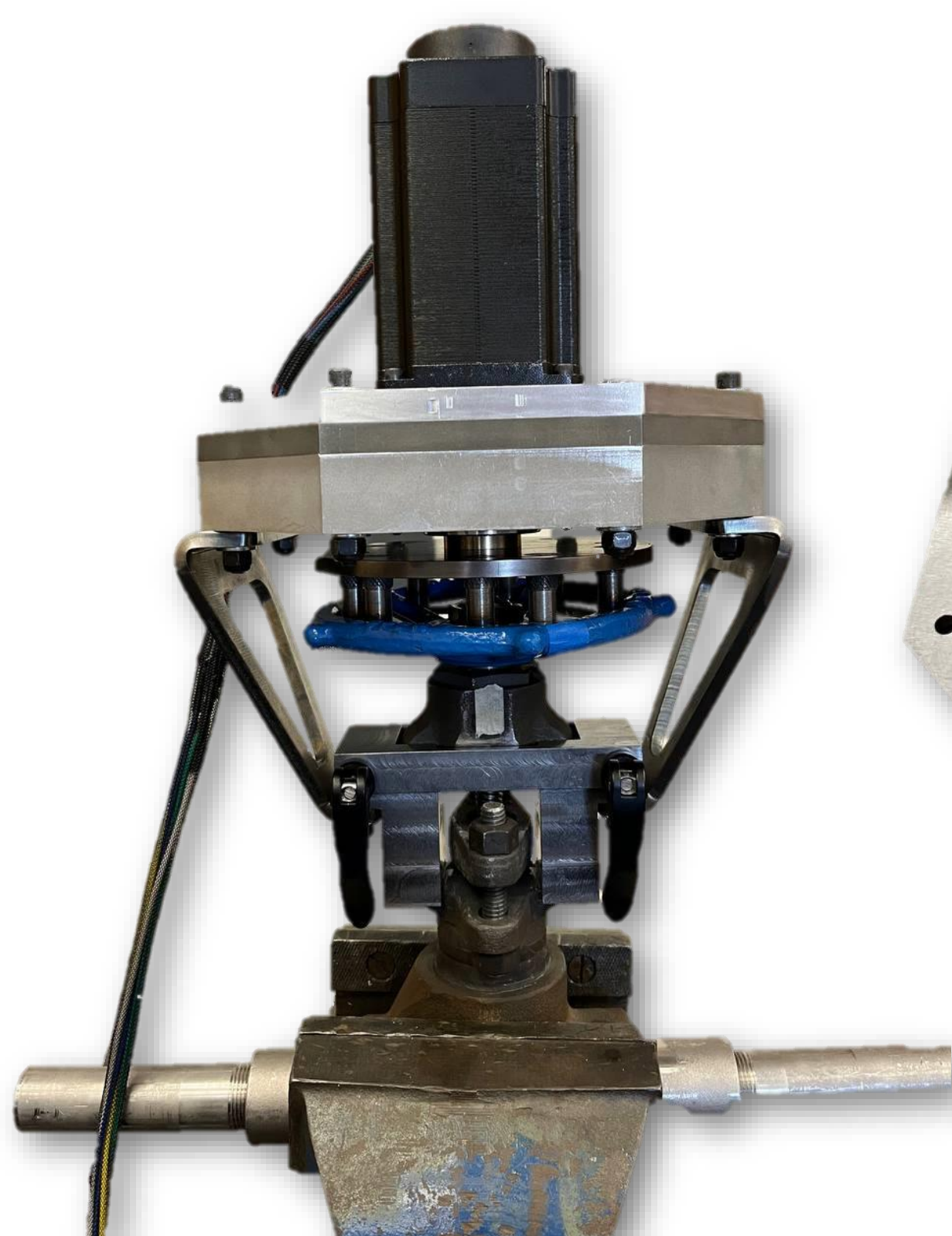
- Use a Human-Machine Interface (HMI).
- Able to engage and disengage easily.
- As small as possible in both height, width, and depth.
- The operator must be transportable.



Mechanical Design:

- Utilizes a planetary gear system to achieve torque and size requirements.
- Arms with handles connect to valve yoke to improve ergonomics.
- Yoke clamp design attaches to the valve yoke holding the operator above the handwheel.
- The yoke clamp also provides stability in the X, Y, and Z directions.

Planetary Gear System



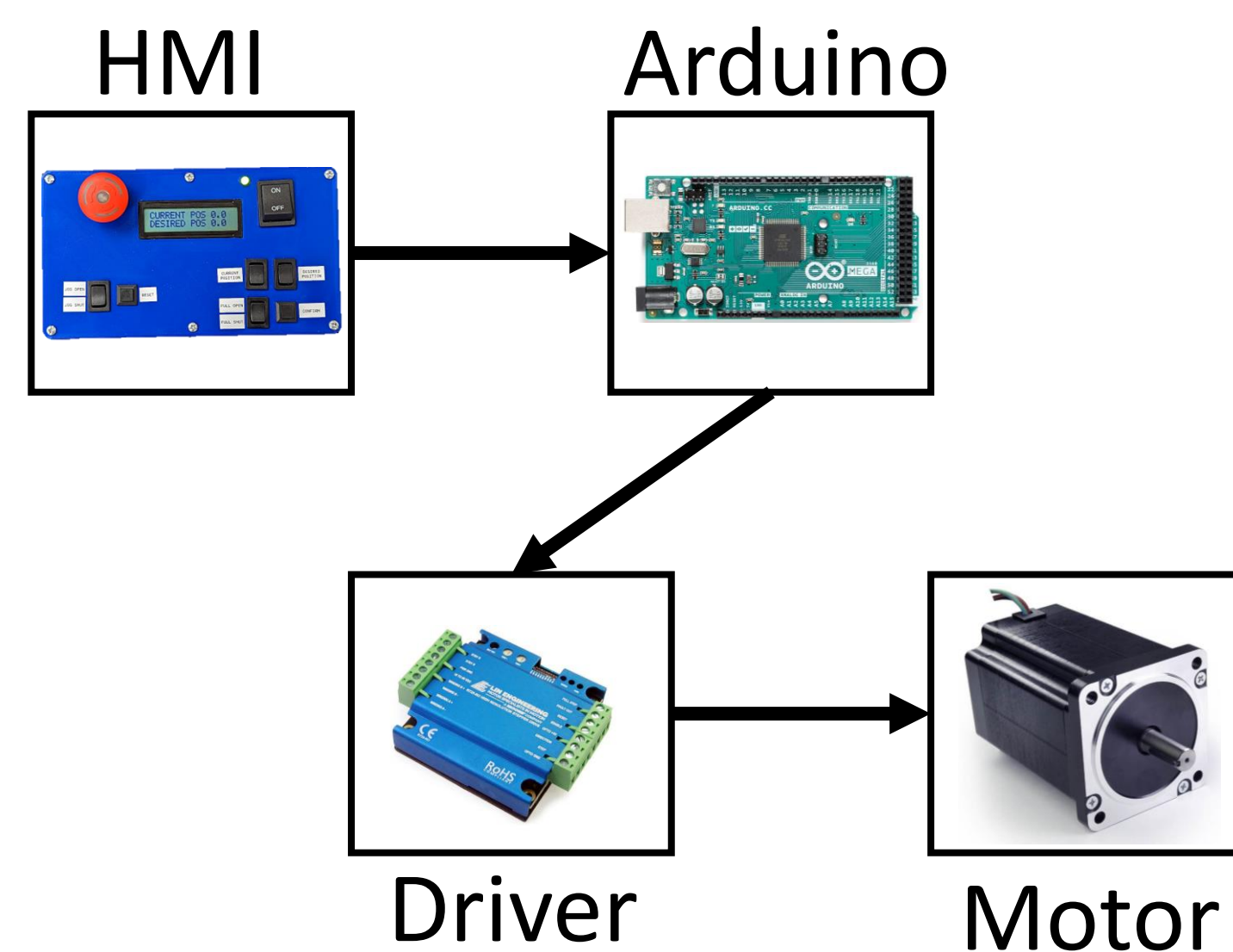
HMI Pendant:



Electrical Design:

To achieve control over the operator, a Human-Machine Interface (HMI) design allows for user input via buttons and switches.

High-Level Block Diagram:



Special Thanks: BPMI, Mark Dillon, Brycen Grey, Dr. Ulrich, Luke Johnson, Mr. Jaillet

Team Members (From Top Left to Bottom Right):
Evan Miller, Jessica Mendheim, Matthew Kowalski, Bob Mathews, Calvin Kuligin, Christian Eberly, Josh Gaydos