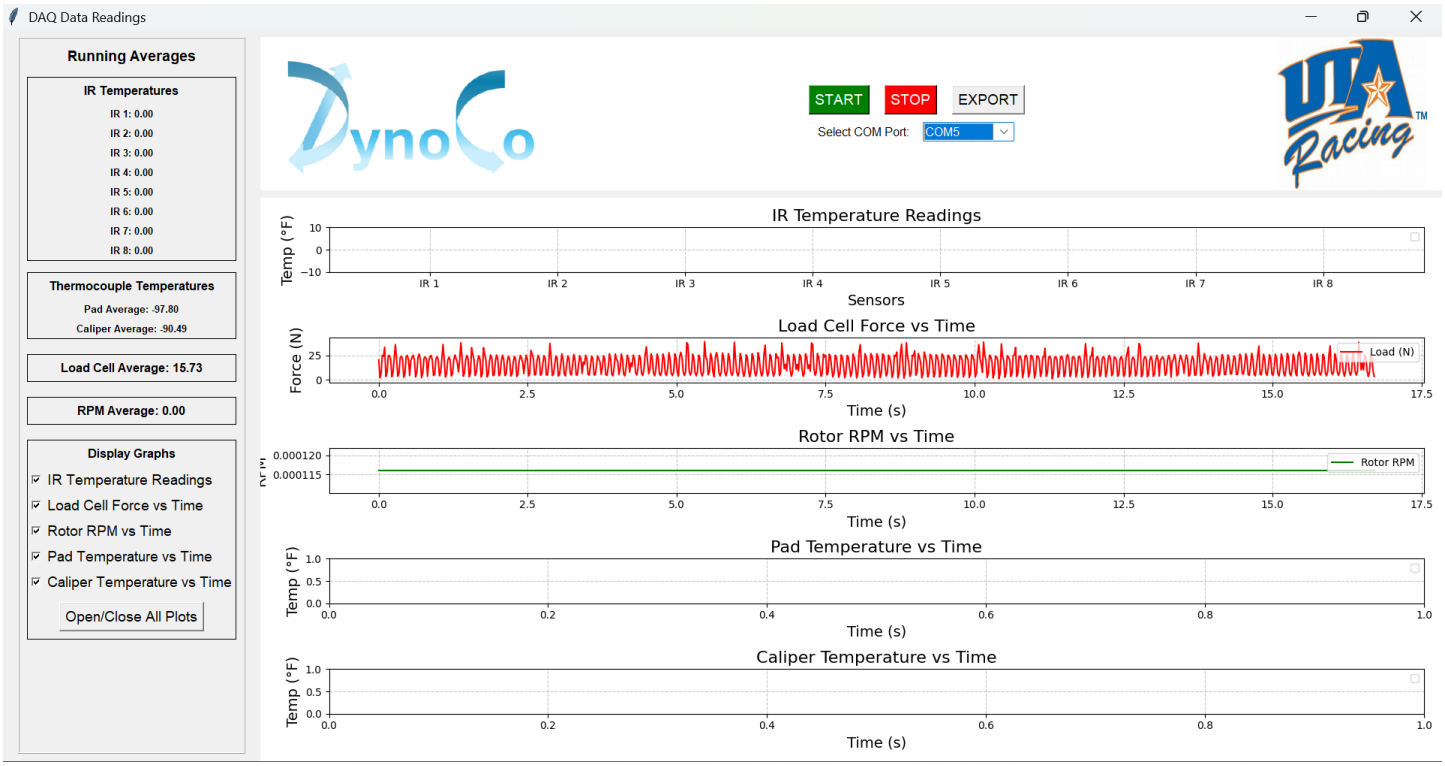
DAQ REPORT

Executable File(.exe) and Instruction Manual Creation



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Creating an exe executable file for GUI

To ensure ease of use, portability, and reliability, the Python-based GUI for the brake dynamometer's data acquisition system was converted into an .exe file and stored on a flash drive. This conversion eliminates the need for users to install Python and its dependencies, streamlining the deployment process and reducing potential compatibility issues across different computers. The .exe file was generated using PyInstaller, a Python packaging tool that bundles scripts and dependencies into a standalone executable. The following command was used to achieve this:

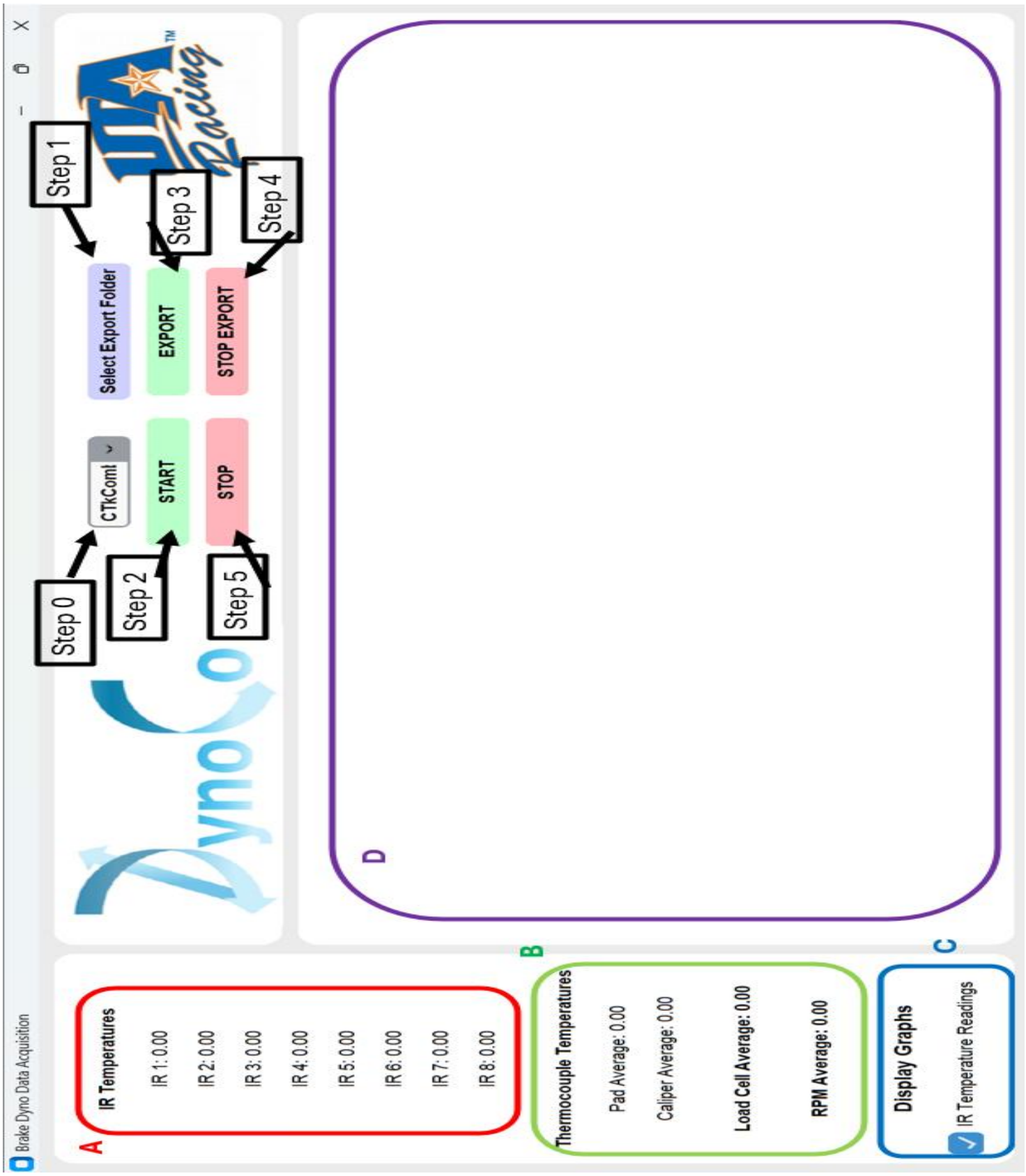
pyinstaller --onefile --windowed --icon=myicon.ico --add-data "right_icon.jpg;." --add-data "left_icon.png;." [name_of_file].py

This command ensured that all necessary resources, including images used in the GUI, were packaged within the executable. By packaging the script into a single-file executable, the software can be run on any Windows machine without requiring additional configuration, ensuring seamless data collection and visualization during testing. Additionally, storing the .exe on a flash drive allows for quick and convenient access, enabling the team to operate the software on multiple machines, particularly in lab or testing environments where internet access or software installation permissions may be limited. This approach enhances the robustness of the system while maintaining the flexibility needed for real-time data logging and analysis.

Instruction Manual Creation

To ensure users can effectively operate the .exe file and utilize the brake dynamometer's data acquisition system, an instruction manual was created. This manual provides a step-by-step guide on how to install, launch, and navigate the software, making it accessible even for those with minimal technical experience. It includes detailed explanations of the GUI interface, descriptions of each feature, and troubleshooting steps for common issues. Additionally, the manual outlines the hardware and software requirements needed for proper functionality, ensuring seamless integration with the testing setup. By providing clear documentation, the manual enhances usability, reduces the learning curve, and ensures consistency in data collection and analysis. Having this guide readily available allows for quick reference in lab settings, improving efficiency and minimizing downtime during testing. The follow page will be a copy of the instruction manual

BRAKE DYNO INSTRUCTION MANUAL 2.27.2025



Brake Dynamometer DAQ GUI Instruction Manual

Introduction

The Brake Dynamometer DAQ GUI is a user-friendly application designed to read real-time data from a Data Acquisition (DAQ) system via a serial port. This application allows users to visualize various sensor readings, including infrared (IR) temperatures, load cell force, rotor RPM, brake pressure, and thermocouple temperatures, through dynamic plots. Additionally, it provides an option to export collected data to a CSV file for further analysis.

This manual will guide you through the proper steps to use the software effectively. It also includes troubleshooting steps to ensure smooth operation. If the application does not open, make sure you run it as an administrator to avoid permission-related issues.

Getting Started

Step 0: Selecting the Correct COM Port

Before starting data collection, it is crucial to select the correct COM port for the DAQ system:

1. Locate the COM port dropdown menu in the GUI.
2. Select the appropriate COM channel that corresponds to your DAQ system.
    a. If no COM ports are listed, this means the DAQ system is not connected to the computer. Ensure that the device is properly plugged in and that no other applications are using the COM channel.

Step 1: Selecting an Export Folder

Before collecting data, you must specify where the recorded data will be saved.

1. Click the "Select Export Folder" button.
2. Choose a directory that you will easily remember and have access to.
    a. It is recommended to create a separate folder to store all CSV data files for better organization.

Step 2: Starting Data Collection

Once the correct COM port is selected and the export folder is set, you can begin collecting data.

1. Press the START button to begin real-time data collection.
    a. If no data appears, verify that:
        i. The correct COM port is selected.
        ii. The DAQ system is properly connected.
        iii. No other applications are using the COM channel.

Step 3: Starting Data Export

To save collected data for later analysis, you must initiate the export process.

1. Press the EXPORT button to begin exporting real-time data to the selected folder.
    a. It is highly recommended to perform a trial run before collecting large data sets to ensure that everything is working properly.

Step 4: Stopping Data Export

Once you have collected sufficient data:

1. Press the STOP EXPORT button to halt the data export process.
    a. This will finalize and save the recorded CSV file in the previously selected export folder.

Step 5: Stopping Data Collection

Once all the necessary data is collected:

1. Press the STOP button to terminate the data acquisition process.
    a. This ensures that the GUI stops communicating with the DAQ system and prevents accidental overwriting or corruption of data.

Understanding the GUI Components

1. **(A) Infrared (IR) Temperature Readings**

The section labeled A displays the real-time readings from eight IR temperature sensors. Each sensor's temperature is continuously updated, providing an overview of heat distribution across the system.

2. **(B) Running Averages of Sensor Data**

The section labeled B shows running averages of several key sensor values, including:

- Pad Temperature (Thermocouple)
- Caliper Temperature (Thermocouple)
- Load Cell Measurement (Force in Newtons)
- Rotor RPM (Revolutions Per Minute)

These values provide a real-time trend of the collected data, offering better insights into system performance.

3. **(C) Graph Display Controls**

The section labeled C allows users to toggle different graphs on or off.

- This feature enables customization of the displayed data, making it easier to focus on specific parameters.
- Users can choose to view IR temperature readings, load cell data, brake pressure, or RPM plots as needed.

4. **(D) Data Visualization Panel**

The section labeled D is the main graph display area, where all selected data plots appear in real time.

- As data is collected, the graphs dynamically update to reflect changes in sensor readings.
- Users can analyze trends, detect anomalies, and make adjustments as necessary.

Troubleshooting and Additional Notes

If the application **does not open**, make sure you are running it as an administrator. Right-click the .exe file and select "Run as Administrator" to prevent permission issues.

If **no COM ports are available**, check that the DAQ system is properly connected and not being used by another application.

If **data does not appear** after pressing START, ensure that:

- The correct COM port is selected.
- The DAQ system is powered on.
- The COM port is not being used by another program.

If the **export file is missing**, confirm that a valid folder was selected before starting data export and that the GUI is actually displaying data