

# Vernier Bridge Competition Software

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## Getting Started

### About

With this stand-alone program, you can conduct a bridge competition that tests the greatest force sustained until a structure fails or no longer supports an increasing load. The software collects and displays results in real time for the structure being tested. Results for all structures tested are displayed in table form and a bar graph.

Individual results are saved in a comma separated value (.csv) file and an image file (.png). A compilation of all the names and maximum force values are also saved as a combined .csv file.

The software was developed in LabVIEW™ 2017 and then converted to a stand-alone program. LabVIEW is not required to be installed on a computer for the software to run, but the LabVIEW Run-Time Engine is needed. See the System Requirements section for more details.

### Downloading the Software

The Vernier Bridge Competition Software is a free download from the Vernier website. There are versions for Windows® operating systems and for macOS®.

### System Requirements

The program is designed to collect data from the Vernier Structures & Materials Tester (VSMT), connected to a computer through a LabQuest interface.

#### Windows

Run the Vernier Bridge Competition Software Installer.exe. This will automatically install LabVIEW 2017 Run-Time Engine, if needed, and the Vernier Bridge Competition Software.

The default installation location is the Local Disk (commonly denoted as C:). To open the application, double-click the file Vernier Bridge Competition.exe.

#### macOS

If you do not have LabVIEW 2017 or newer on your computer, you must manually install the LabVIEW 2017 Run-Time Engine. This is a free download from the National Instruments website: <http://www.ni.com/download/labview-run-time-engine-2017-sp1/7193/en/>

You will need to register on National Instruments' website before downloading the Run-Time Engine. After installing the Run-Time Engine, move the Vernier Bridge Competition Software to the Applications folder on the host computer.

## Privacy Statement

### COPPA, SOPIPA, and FERPA Compliance

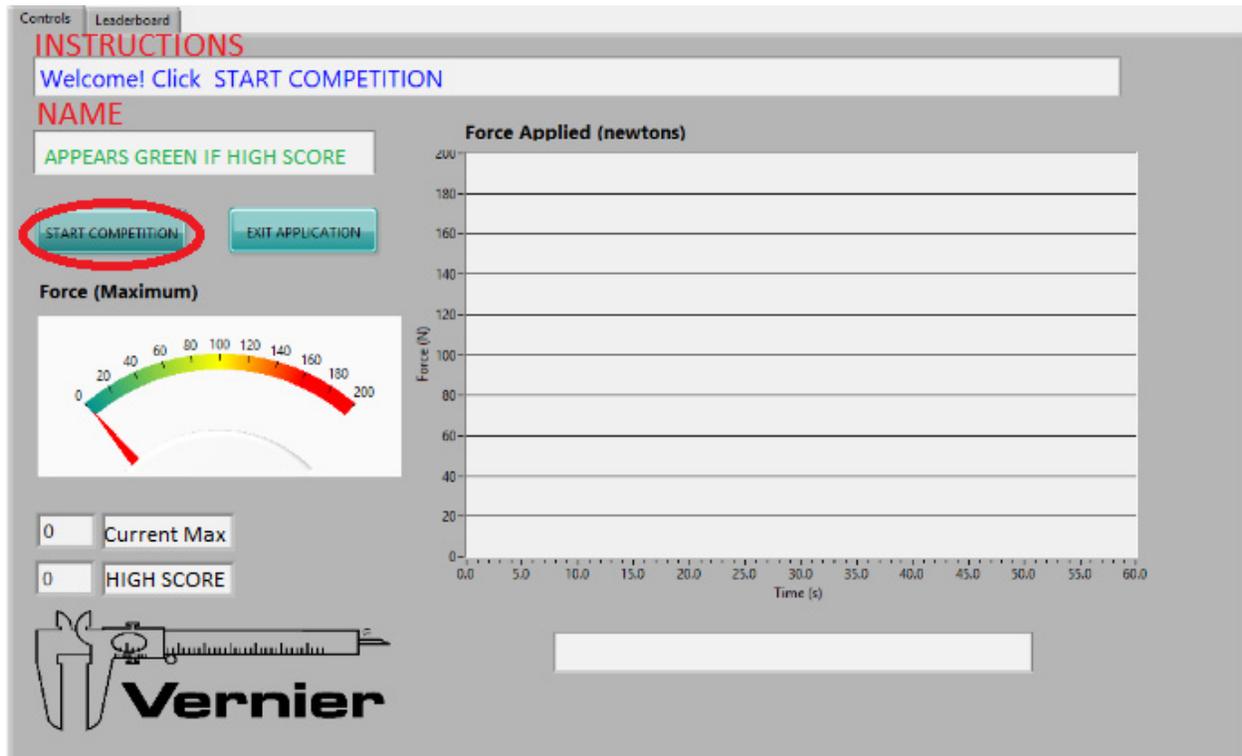
Vernier Bridge Competition Software complies with federal regulations pertaining to student privacy and safety in the following ways:

- Vernier Bridge Competition Software does not collect, request, share, or store any personal information from students or teachers. Names and contest results are saved to the host computer hard drive.
- Vernier Bridge Competition Software does not display advertisements.

## Quick Start Guide

1. Connect a LabQuest interface to your computer.
2. Connect the VSMT force sensor to the LabQuest interface.
3. Navigate to the location where you saved the program (the default location is C:\Vernier Bridge Competition Software for Windows computers and the Applications folder for macOS computers) and open the Vernier Bridge Competition file.

## Screen Elements



The top text bar shows instructions for entering information and conducting the competition.

The second text bar primarily shows the name of the current contestant. The text of the name changes to green if the current contestant has the highest score for the class.

The Force gauge has two needles. The current run is represented by the red needle, and the greatest force for the class is represented by a teal green needle. These values are duplicated numerically below the gauge.

The graph shows a live representation of the force applied to the structure as a function of time.

## Starting Competition

Click the START COMPETITION button. You will be prompted to enter a Class Name. A folder with this name will be created in the same location as the software on your computer hard drive. All of the results documentation will be saved to this file.

The program issues a passive prompt to click the FIRST CONTESTANT button. After you click this button, you will be prompted to enter the student's name. This helps identify the results files and is also displayed on the screen.

The button now displays BRIDGE READY. The student attaches their bridge to the VSMT and adjusts the tackle to prepare for testing. The VSMT ships with a variety of tackle so you can connect the structure to the tester. Depending on your particular criteria, it may work best to use a threaded rod and loading plate, or eye-bolts, quick links, and chain (if necessary). All students should use the same tackle to avoid questions of fairness. It is best to adjust the tackle so it immediately begins to apply a force at the first turning of the VSMT wheel.

When the student is ready and the bridge is set, click the BRIDGE READY button. The student can begin turning the VSMT wheel counterclockwise to begin loading the bridge. The software will collect and display real-time data on the meter and on the graph. When the bridge testing is complete, click the STOP RUN button.

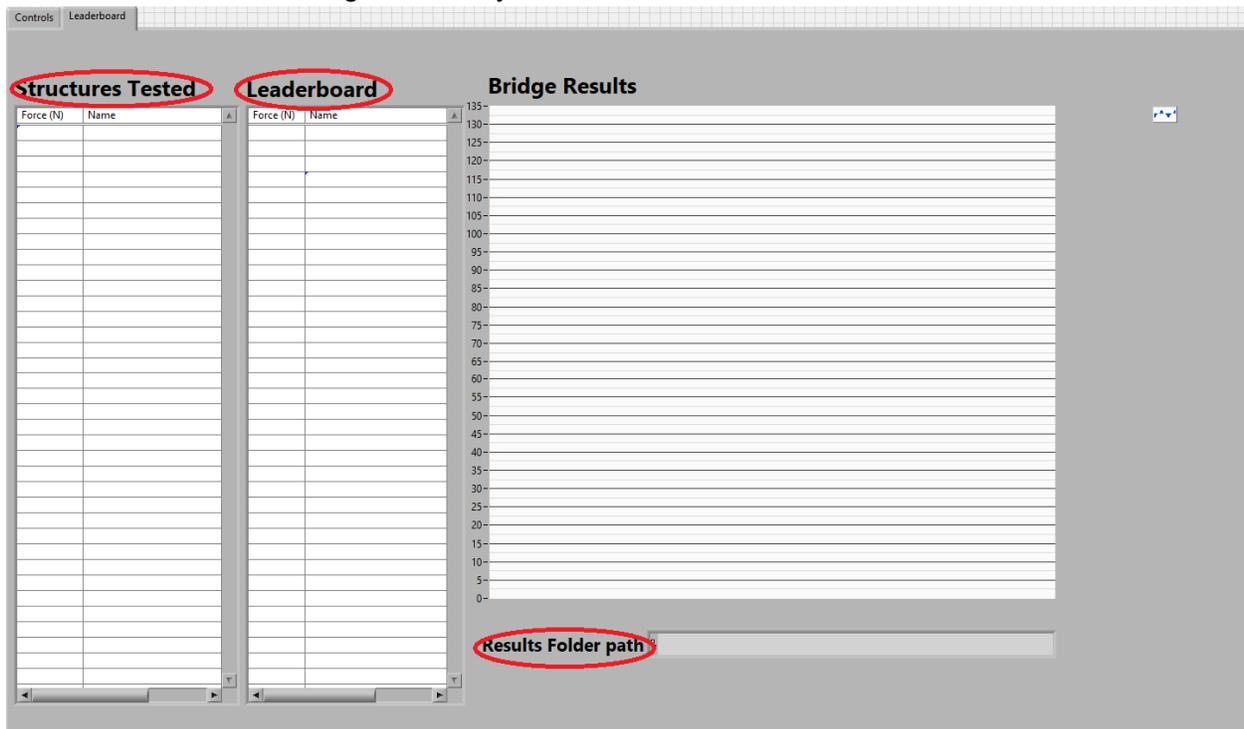
## Viewing Results

Once one bridge has been tested, you will be prompted to decide whether you will test another bridge.

- If yes, the program returns to the prompt to enter a (new) student's name.
- If no, the program terminates and the instructions indicate the path to view the final results.

To view the results of the competition—either during the event or afterwards—click the Leaderboard tab of the screen. You will see results posted in three ways:

- A table that lists the student and the results ordered chronologically
- A table that lists the student and their results ordered from highest to lowest
- A bar chart showing the side-by-side results for all the students



The results are also saved in the aforementioned set of files. Each student's data (force and time) is saved in a file with their name, along with an image file of their Force vs. Time graph. Finally, each student's maximum value from their test is stored in a file named MaxValue.csv. All of these files are found in the folder labeled with the class name.

To close the program, click the EXIT APPLICATION button.

## Notes

If you choose a Class Name (i.e., filename) that already exists, you will be prompted to decide whether you want to add additional contestants to this existing class or enter a new class name. This can be useful if students are absent during the day of the competition but you still want to have their results compiled with their classmates. This will save the individual results files in the same folder as their peers, and it also adds their data to the combined maximum values file.