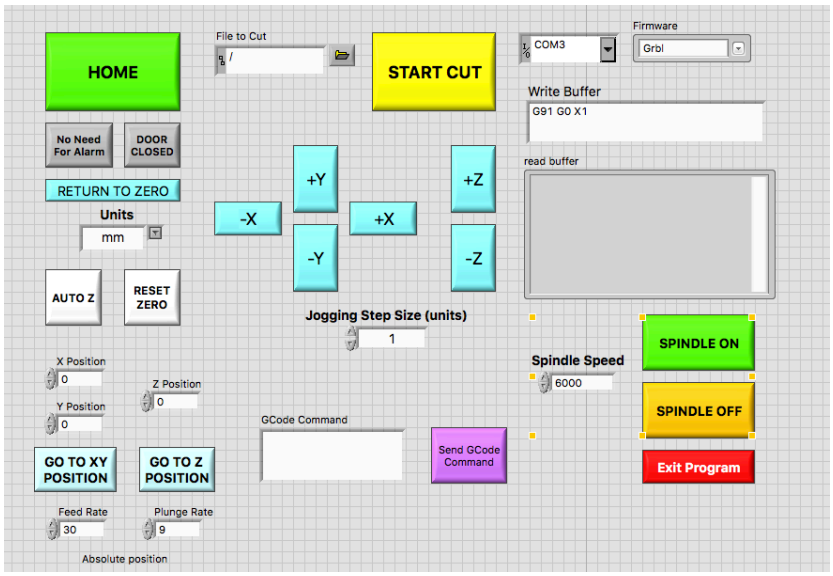
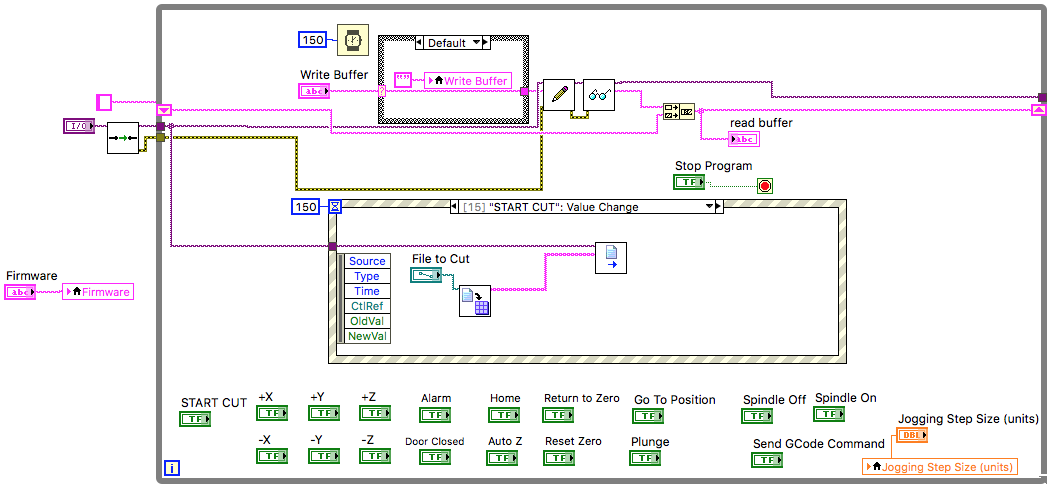
CNC Machine Control Interface

The CNC Machine Control Interface allows users to control their machine from one central front panel.

Controls include:

- Homing Commands: home, set current position to zero, return to home position
- Set machine units
- Jogging with step size control
- Spindle control
- Go to desired position
- Upload a file to cut, preview that file, and cut it out
- Type in G-Code command and send it to machine
- Silence machine alarms and set machine door as closed (Carvey only)

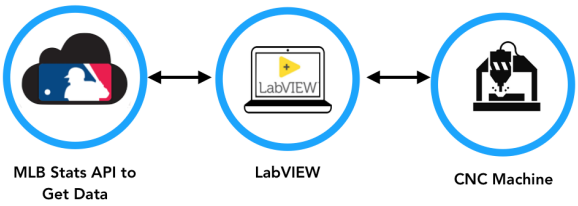


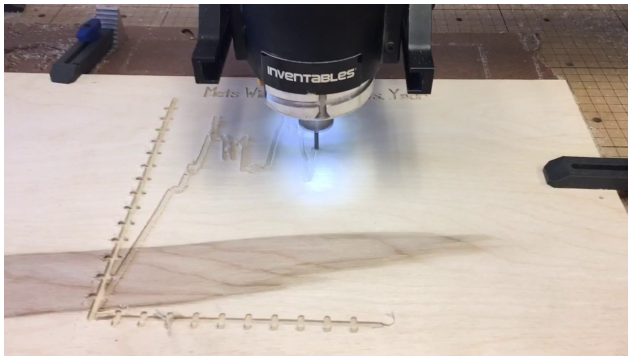


Physical Data Plots

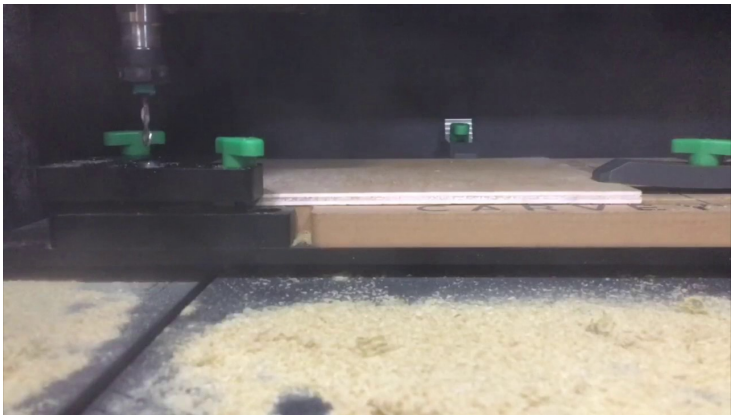
One of the many advantages of connecting digital fabrication tools to LabVIEW is the ability to read in data and programmatically format it using the Machine Control toolkit to create a physical representation of that data. In the examples below, data was read in from the internet and formatted into a graphs that were CNC'd out.

In the first example, data from the MLB Stats API was read into LabVIEW. The Machine Control Toolkit was then used to format the baseball stat (NY Mets winning percentage each year since 1962) into a scaled plot with a title. The plot was then sent to the machine to be fabricated.LabVIEW Code Screenshots:



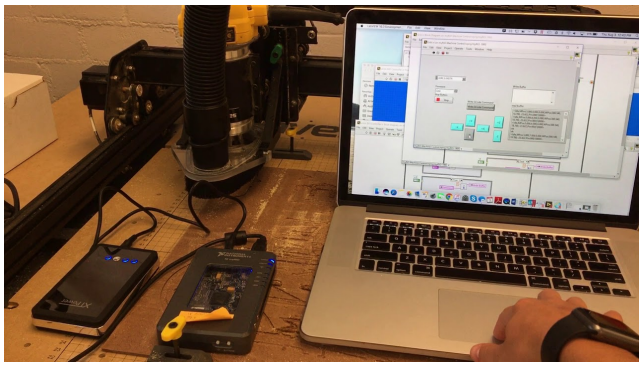


Another example of creating physical data plots is shown below. In this example, the temperature in a specified zipcode was read from Weather Underground every hour for 15 hours. Each temperature value was then converted to an XY position, and fed into the “Go to Position” VI from the Machine Control Toolkit. That VI then generated the necessary G-Code string to plot each data point and wrote each string to a G-Code file. This file was then saved to the user’s computer and sent to the CNC machine through a user created interface.



myRIO CNC Controller

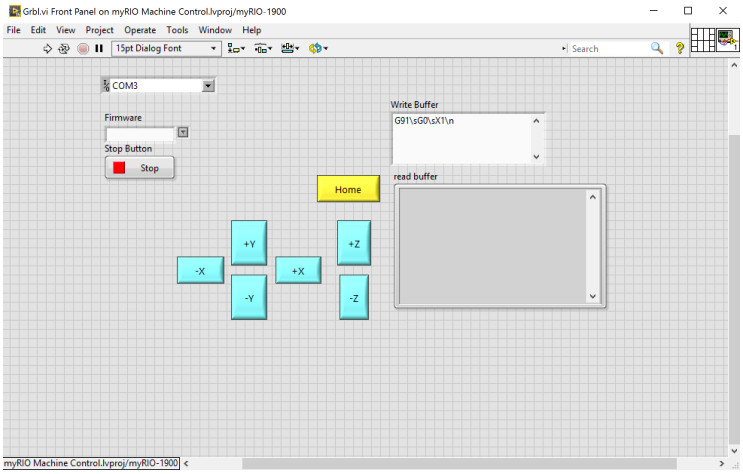
This example shows how the Machine Control Toolkit VIs can be used on the myRIO. This would allow users to control their machine remotely, without needing their computer to be tethered to the machine, or even needing to be in the same place as the machine. The video below shows a the user jogging the machine from a computer that is wirelessly connected to the myRIO.



Similarly, files could be sent using this method. Eventually, the goal is to integrate sensors to be able to read in data about the machine as it runs, and adjust cut setting accordingly.

LabVIEW Code Screenshots:

Front Panel:



Block Diagram: