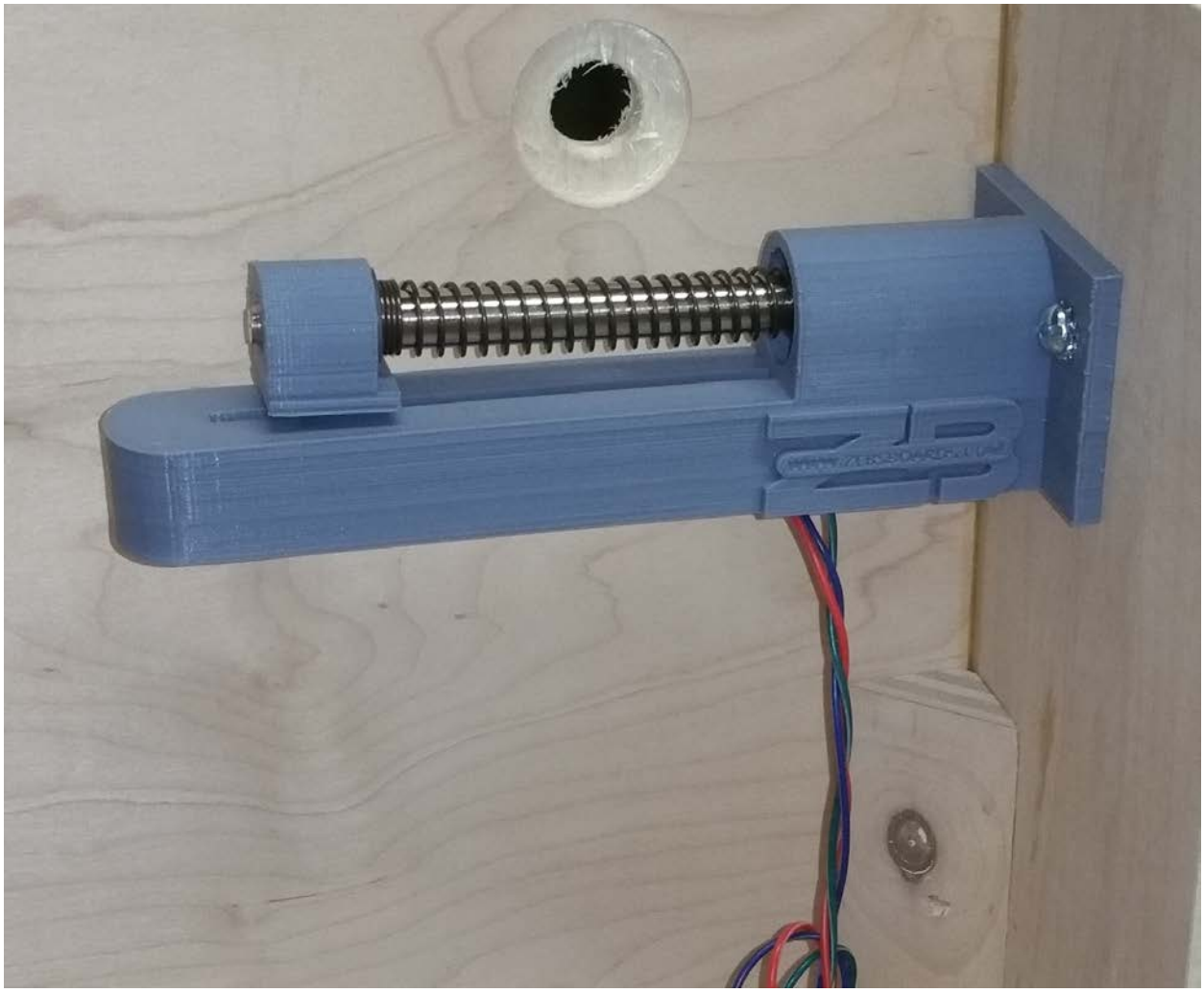
Digital Plunger Installation



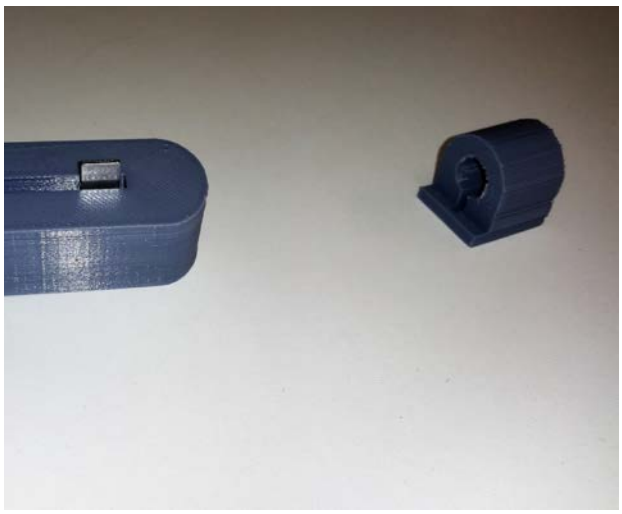
1. Ensure all parts are present

2. Assemble screws and star washers

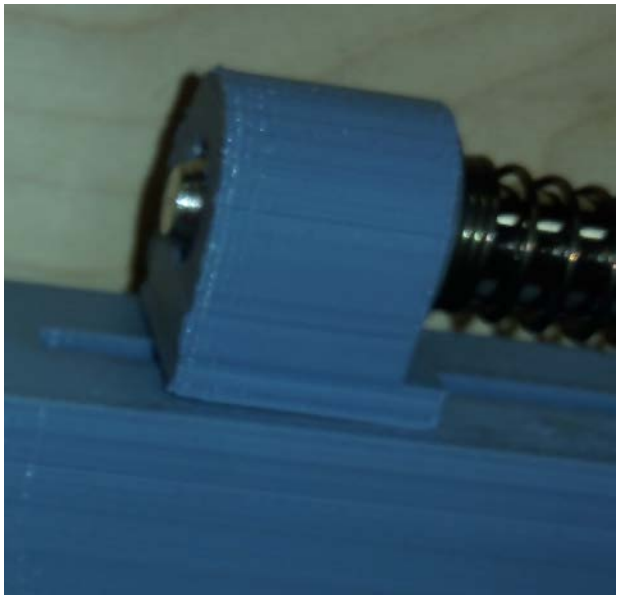
3. Suggested opening for Plunger

4. Mount ball shooter in opening using ¾” fender washer as shown. Tighten securely.

5. Position Slide Collar on plunger housing

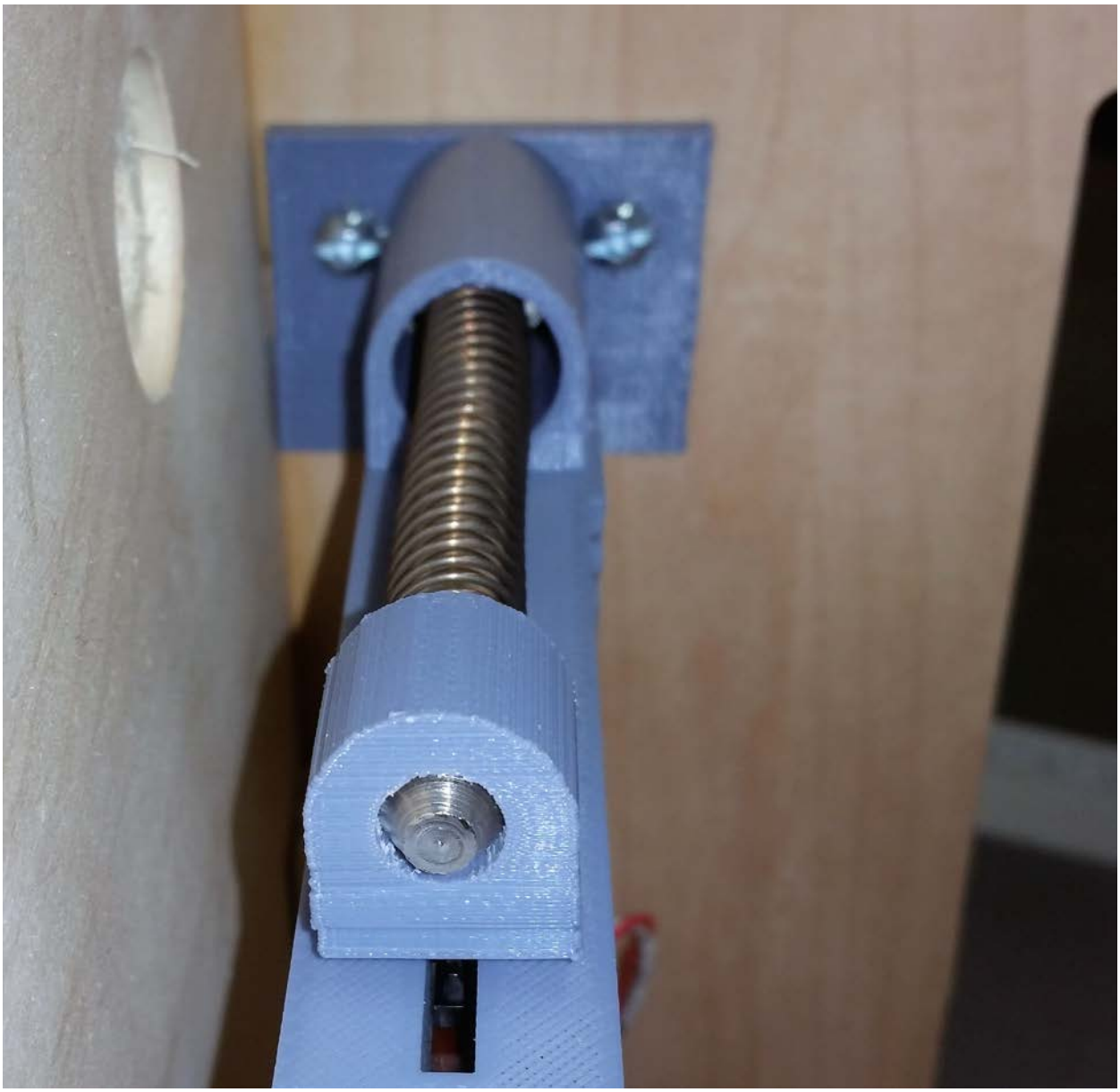



6. Press firmly to seat Slide Collar

6. Push plunger firmly onto ball shooter assembly until slide is seated against pin

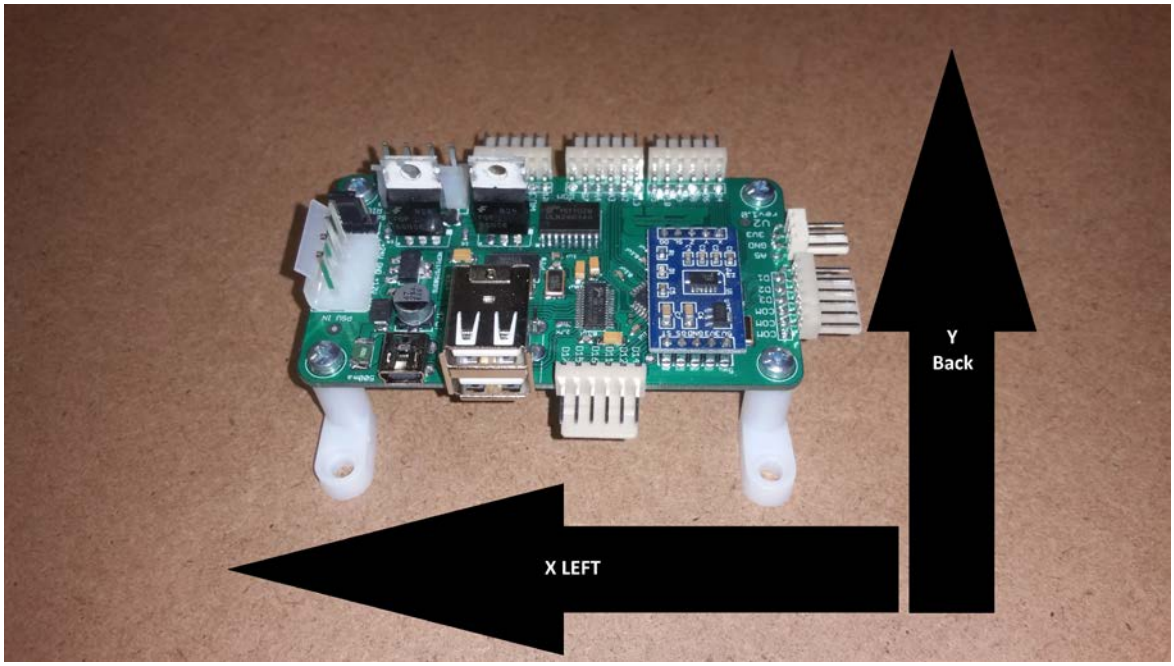
7. Insert remaining machine screws and affix snugly in place (do not over tighten)



Make sure not to overtighten and damage the plunger housing plate. Screws should be tight enough to hold the ball shooter in place but not so tight as to split mounting plate.

8. Mount Control Unit to cabinet floor in a convenient location using the normal orientation shown.

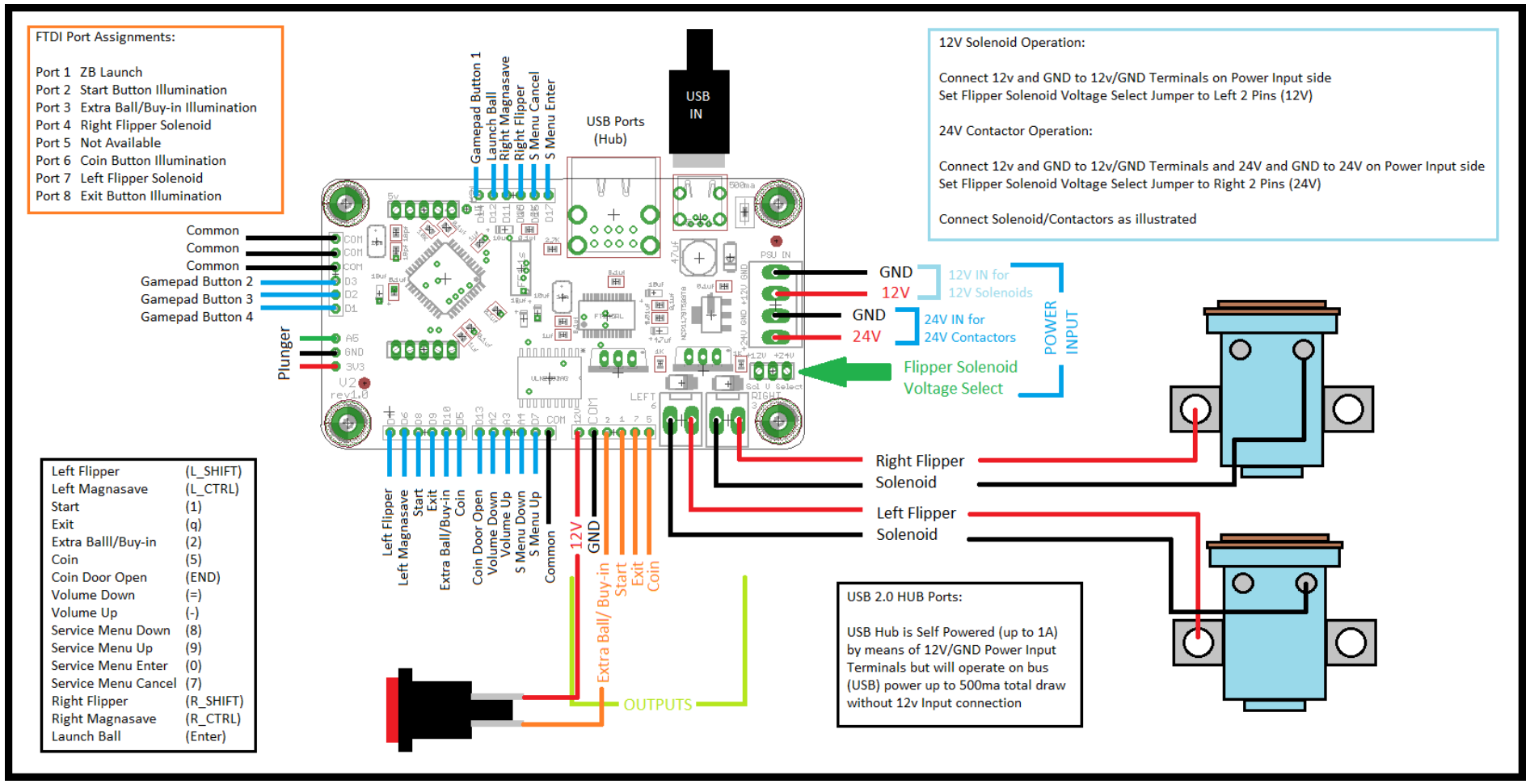
*Unit can be reversed but the axis (x left/right, y front/back) will need to be reversed in game settings



USB cable port should be toward the front of the cabinet with the plunger connector to the right side of the control box.

Choose a location that allows for easy access to the USB Hub ports from the coin door opening if possible and leave enough space to be able to plug into the USB hub ports.

9. Connect inputs from buttons as shown in diagram on the next page


FTDI Port Assignments:
Port 1 ZB Launch
Port 2 Start Button Illumination
Port 3 Extra Ball/Buy-in Illumination
Port 4 Right Flipper Solenoid
Port 5 Not Available
Port 6 Coin Button Illumination
Port 7 Left Flipper Solenoid
Port 8 Exit Button Illumination
12V Solenoid Operation:
Connect 12v and GND to 12v/GND Terminals on Power Input side
Set Flipper Solenoid Voltage Select Jumper to Left 2 Pins (12V)
24V Contactor Operation:
Connect 12v and GND to 12v/GND Terminals and 24V and GND to 24V on Power Input side
Set Flipper Solenoid Voltage Select Jumper to Right 2 Pins (24V)
Connect Solenoid/Contactors as illustrated
Gamepad Button 1
Launch Ball
Right Magnasave
Right Flipper
S Menu Cancel
S Menu Enter
USB IN
USB Ports (Hub)
Common
Common
Common
Gamepad Button 2
Gamepad Button 3
Gamepad Button 4
Plunger
GND
12V
12V IN for 12V Solenoids
GND
24V
24V IN for 24V Contactors
POWER INPUT
Flipper Solenoid Voltage Select
Right Flipper Solenoid
Left Flipper Solenoid
Left Flipper (L_SHIFT)
Left Magnasave (L_CTRL)
Start (1)
Exit (q)
Extra Balll/Buy-in (2)
Coin (5)
Coin Door Open (END)
Volume Down (=)
Volume Up (-)
Service Menu Down (8)
Service Menu Up (9)
Service Menu Enter (0)
Service Menu Cancel (7)
Right Flipper (R_SHIFT)
Right Magnasave (R_CTRL)
Launch Ball (Enter)
Left Flipper
Left Magnasave
Start
Exit
Extra Ball/Buy-in
Coin
Coin Door Open
Volume Down
Volume Up
S Menu Down
S Menu Up
Common
12V
GND
Extra Ball/ Buy-in
Start
Exit
Coin
OUTPUTS
USB 2.0 HUB Ports:
USB Hub is Self Powered (up to 1A) by means of 12V/GND Power Input Terminals but will operate on bus (USB) power up to 500ma total draw without 12v Input connection

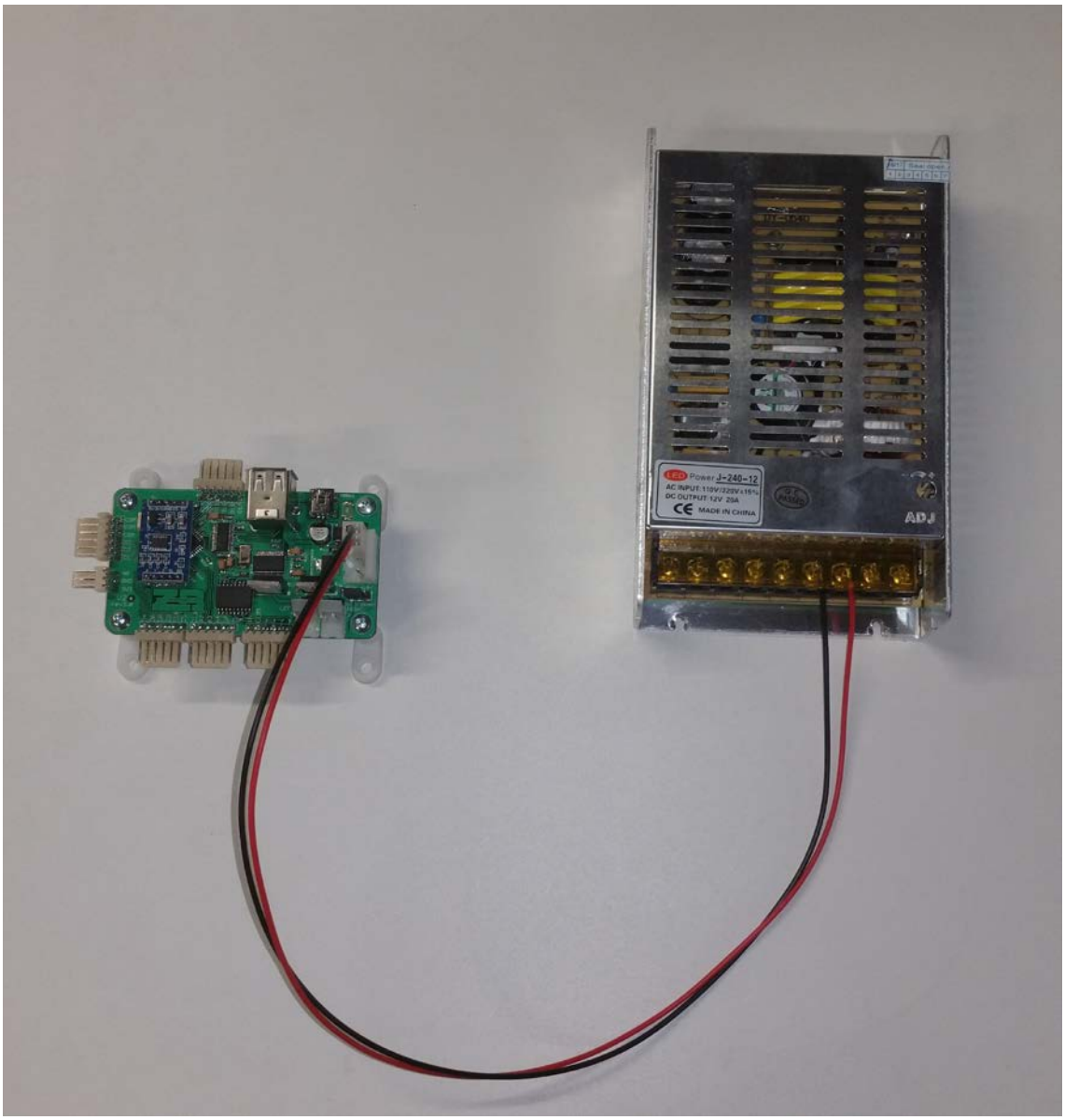
10. Connecting Power

The USB hub, solenoid outputs and button lighting outputs require power from an external power supply (not included) to function properly. At a minimum, a 12v power supply with an amperage rating of at least double the draw of your solenoids is required (eg: 1 solenoid draws 4A to operate so a 10A power supply would be required).

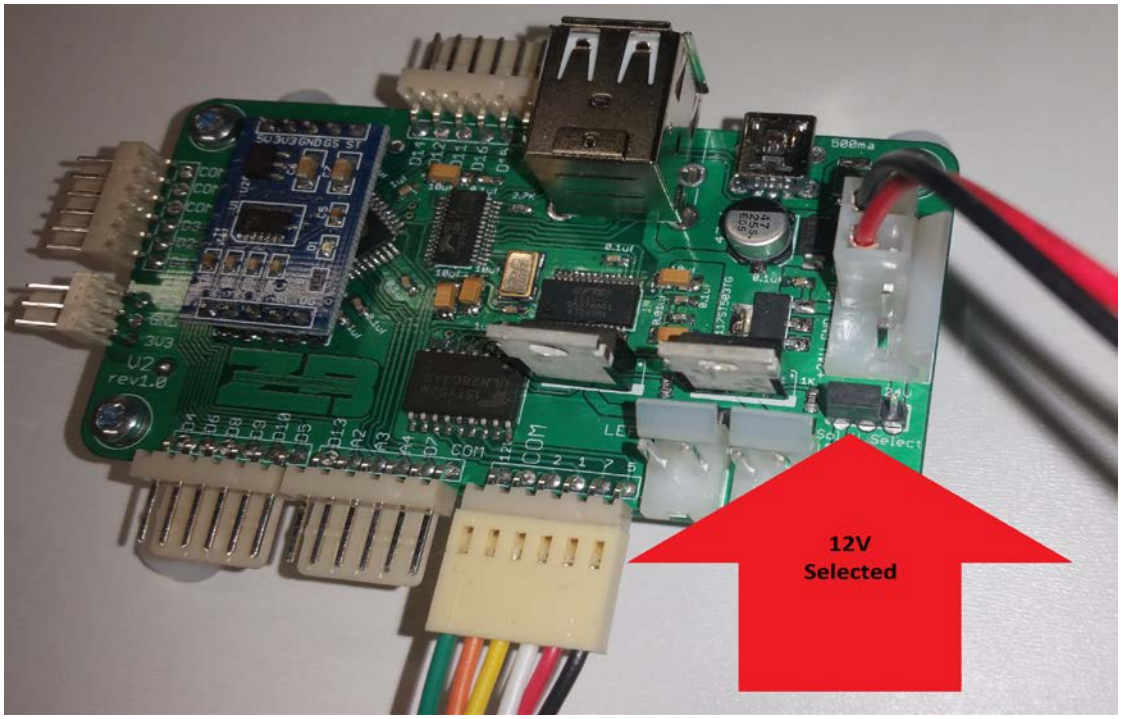
If connecting 24v contactors, a second supply for the 24v line is required.

For 12v solenoid operation:

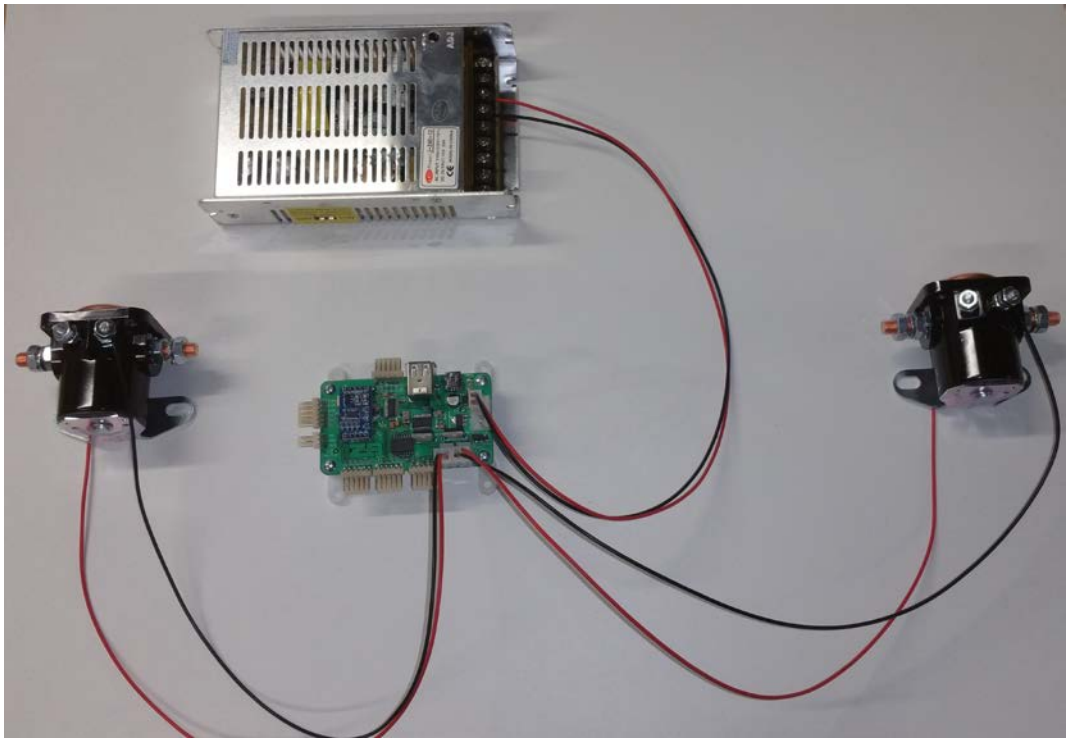
Connect the power supply as shown:



Ensure that you have the Voltage selector set for 12V operation:

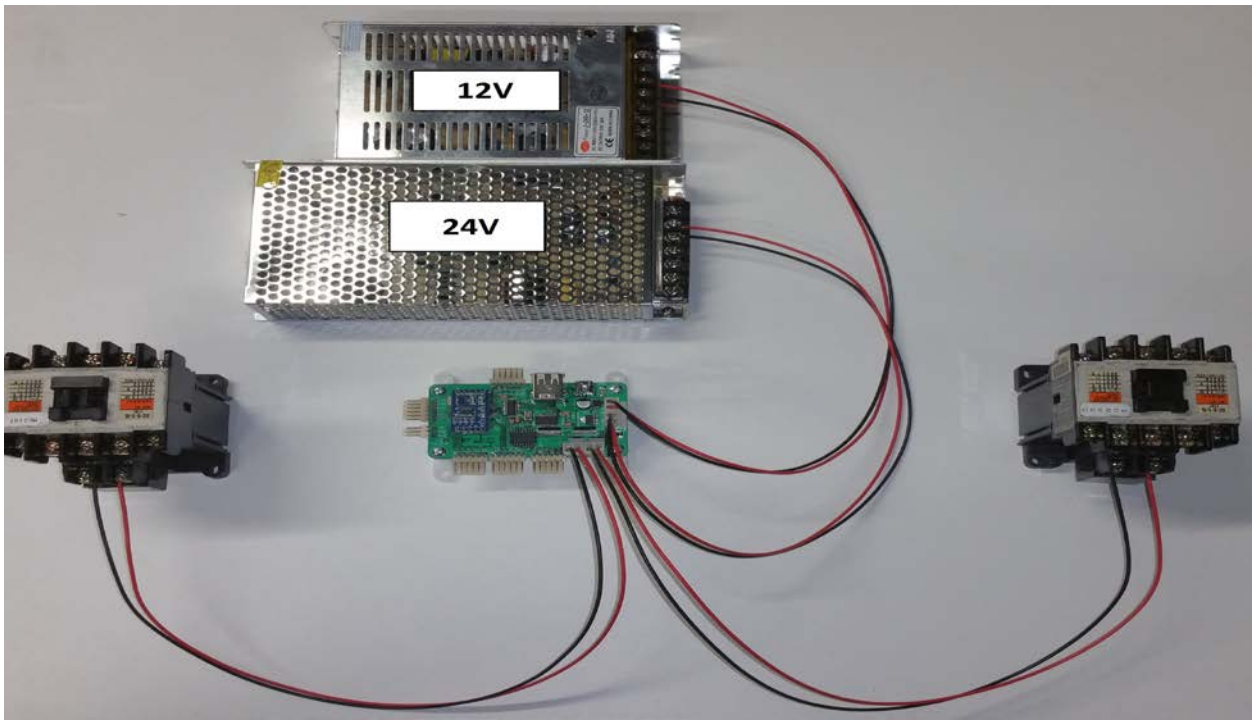


And connect solenoids as shown:

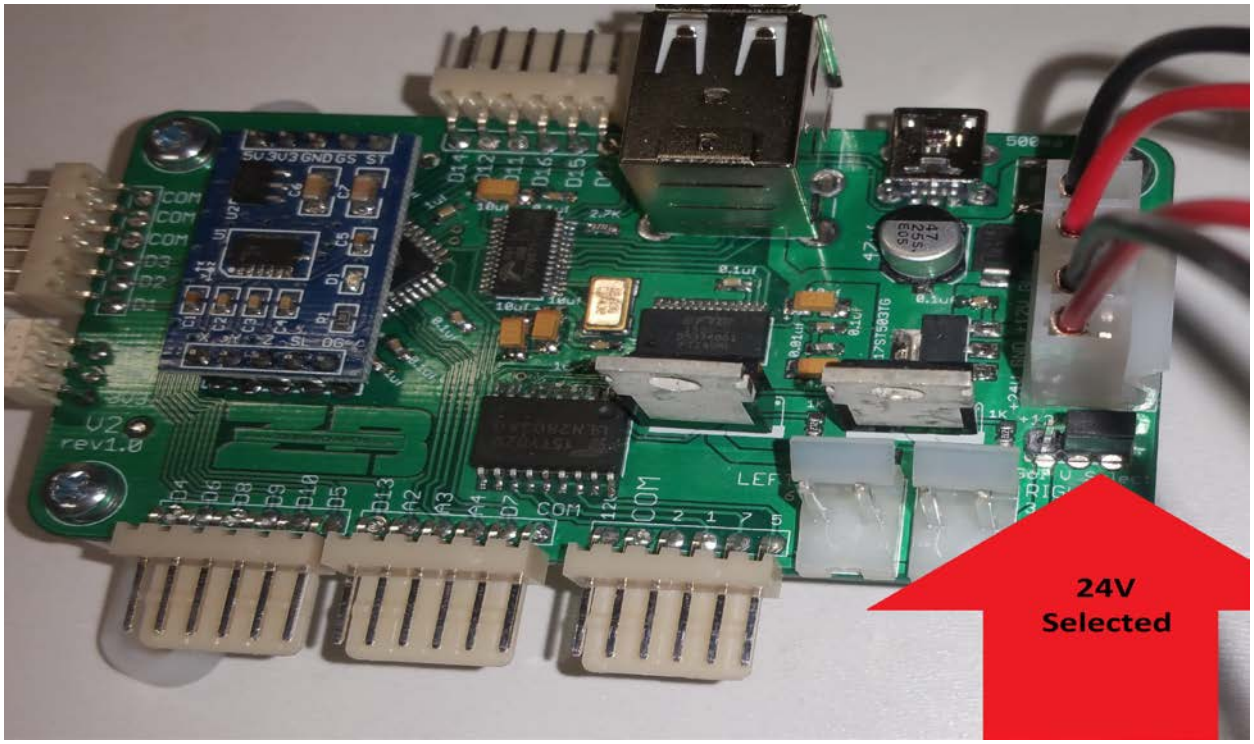


For 24v Contactor Operation:

Connect power supplies and contactors as shown:



Ensure that you have the Voltage selector set for 24V operation:



The solenoid/contactor outputs are controlled by Ports 4(Right Flipper) and 7(Left Flipper) of the onboard FTDI 245RL IC and driven by mosfet transistors capable of up to a maximum of 5A per side.

11. Button Lighting Outputs

Button lighting outputs are controlled by a FTDI 245RL integrated circuit attached to a bridged ULN2803A darlington transistor IC. Each button output is rated for a maximum output of 1A and 12V and GND connections have been provided on the harness for the button lighting.

The 4 ports available are as follow:

Port 2 – assigned to Start button

Port 3 – assigned to Extra Ball/Buy-in button

Port 6 – assigned to Coin button

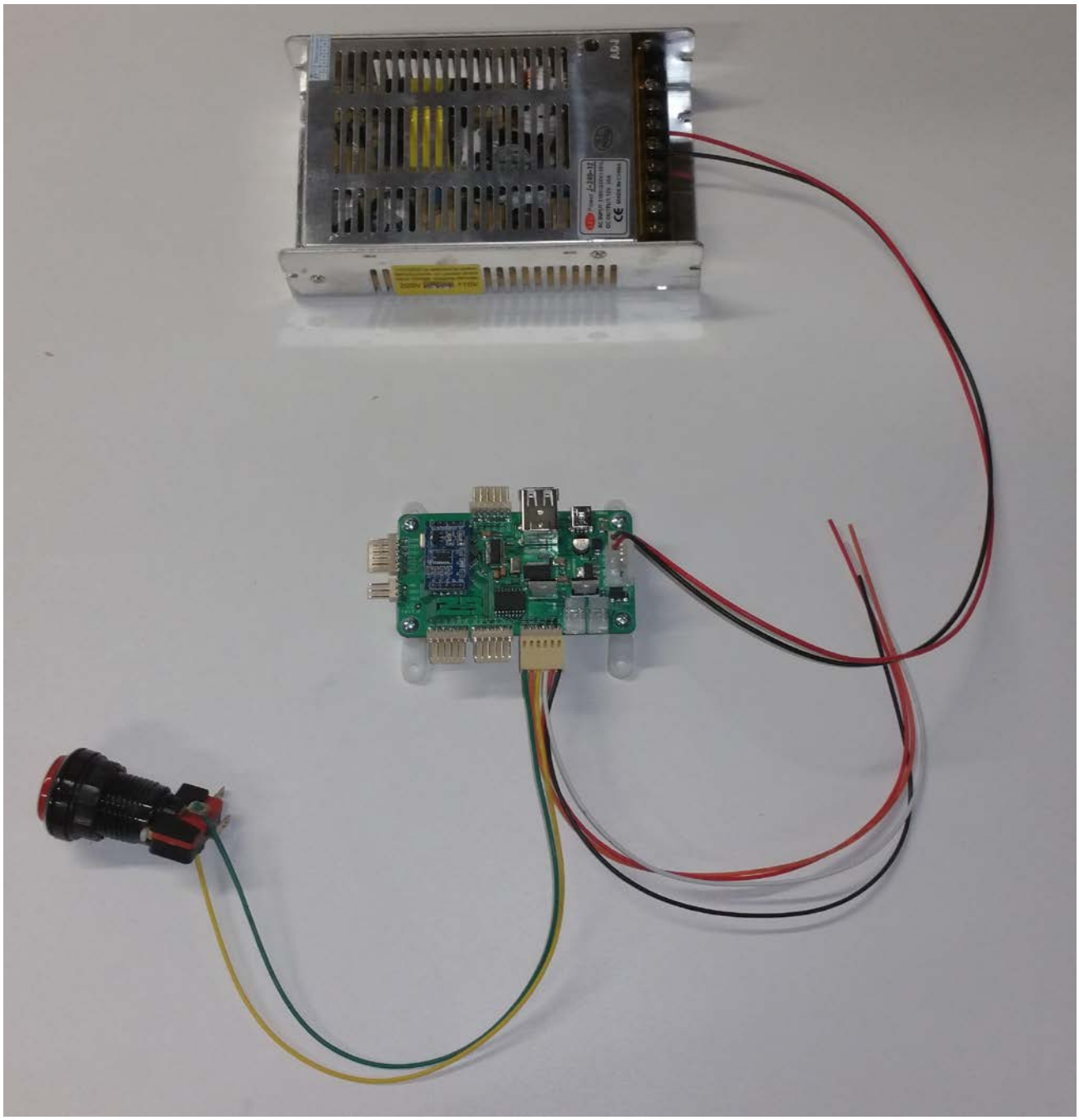
Port 8 – assigned to Exit button

While these ports are currently assigned to button lighting, there is nothing preventing them from being used for control of other toys as long as the toy being controlled does not require pwm signal capability (ie: RGB flashers would only be capable of displaying the full intensity of the 3 colours limiting the colour pallette available to 8 bit)

Any toy connected requiring more than 1A would require a relay or booster circuit to increase the output capability.

To connect button lighting, run a common +V to the (+) side of each button (daisy chain) and run an individual switched ouput line to the (-) side of the button.

An example of a button connection is illustrated below:



12. Driver Installation

In most cases, driver installation for the Serial Port (PinCabDriver.inf, d2xx.dll) will be unnecessary, however, operating systems older than windows 10 may require it.

Drivers can be downloaded in a package from here …..

http://www.zebsboards.com/media/kunena/attachments/17/DeluxeOutputConfig.zip

Installation instructions for the FTDI d2xx driver (required) can be found here ….

http://www.ftdichip.com/Support/Documents/InstallGuides.htm

Installation of the Pincab Controller driver are as follow:

Driver installation is fairly straight forward up until Windows 8

For **Windows XP and Windows 7** unzip the driver file located in DeluxeOutputConfig.zip.

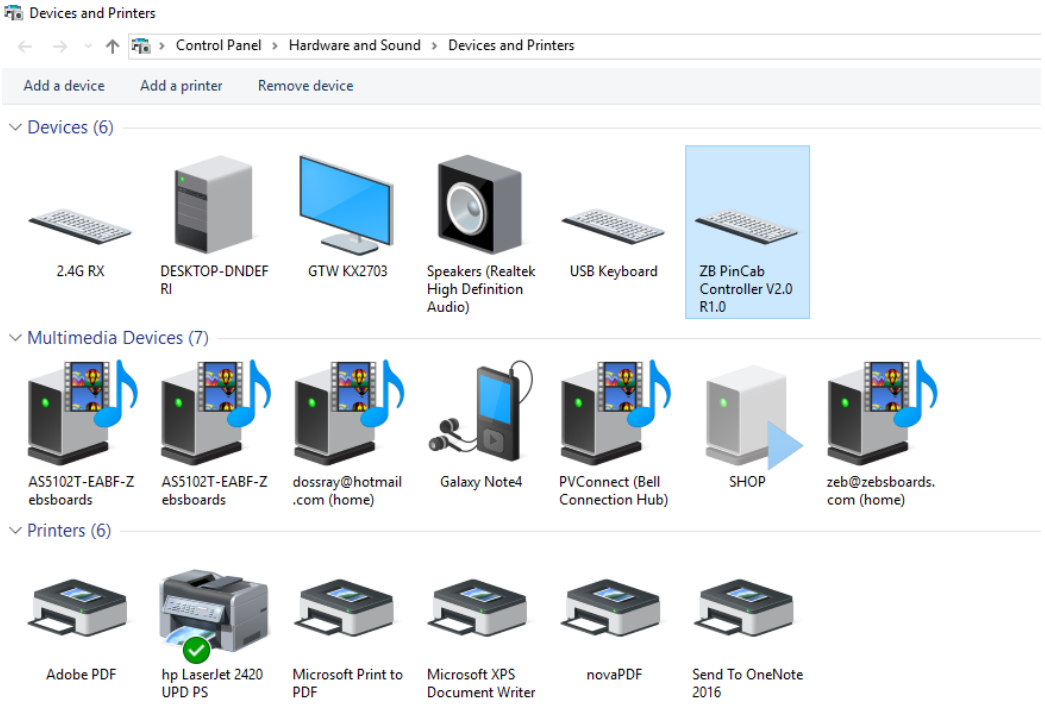
Go to the device manager a look for the exclamation mark beside unknown devices
Click on Update Driver then click on Browse My Computer, browse to the Pincab.inf file that you extracted from the download
Windows will give you an unsigned driver warning, click on "Install Anyway"

For Windows 8 through to Windows 10 follow the instructions from the link below to install unsigned drivers....

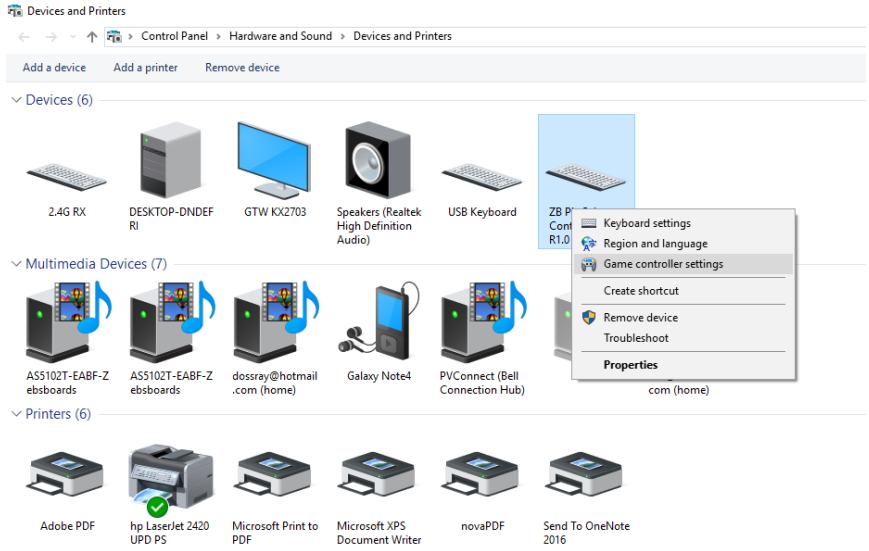
https://learn.sparkfun.com/tutorials/disabling-driver-signature-on-windows-8/disabling-signed-driver-enforcement-on-windows-8

13. Calibration

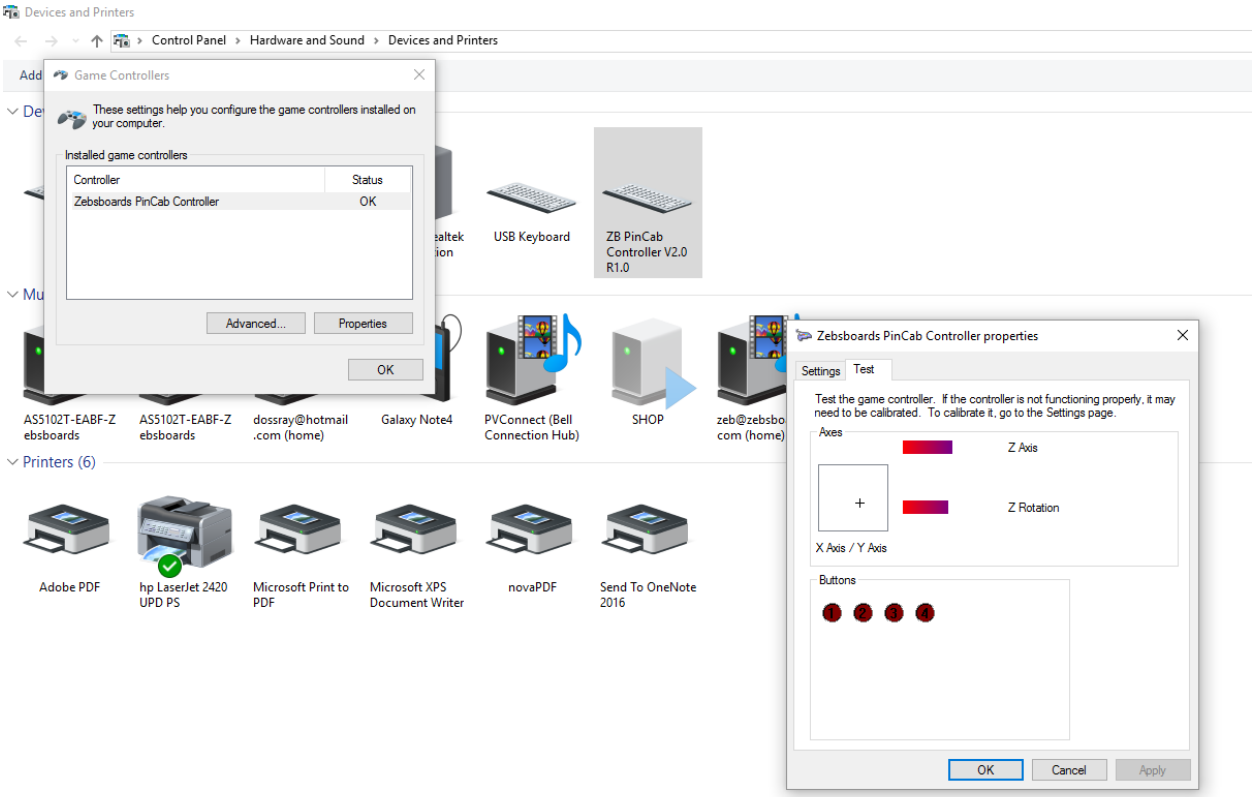
1) Open Devices and Printers and right click on “ZB PinCab Controller V2.0 RevXX” icon



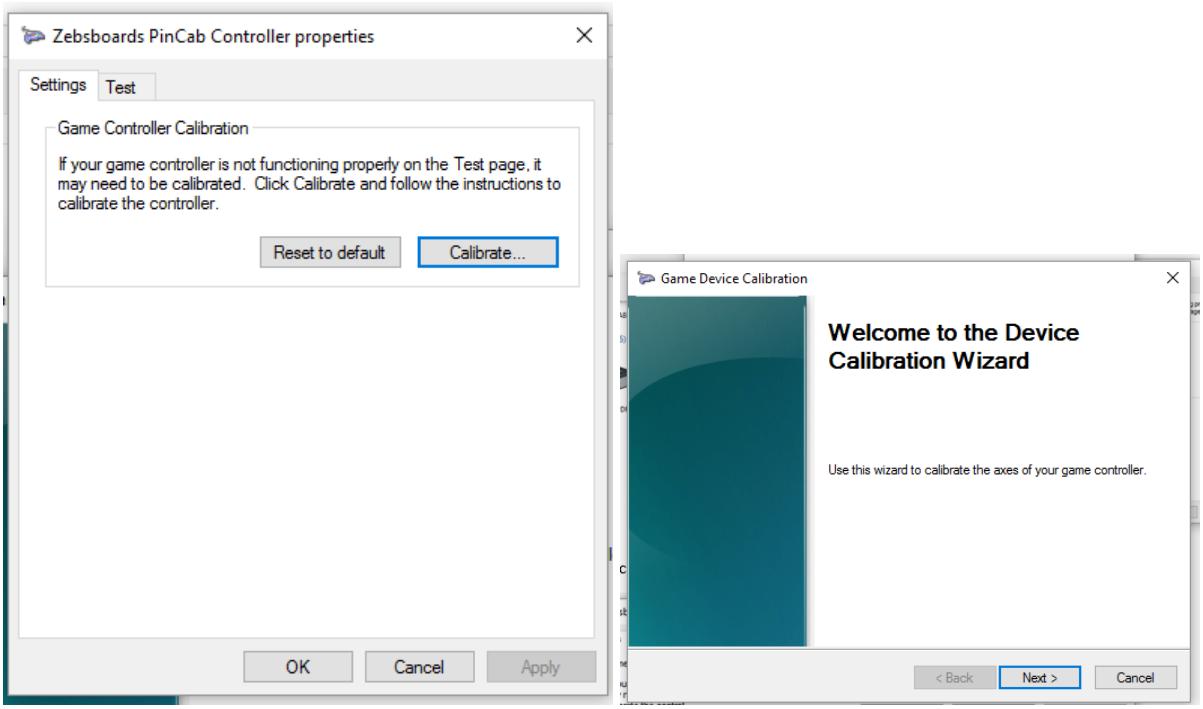
2) Right Click and select “Game Controller Settings”



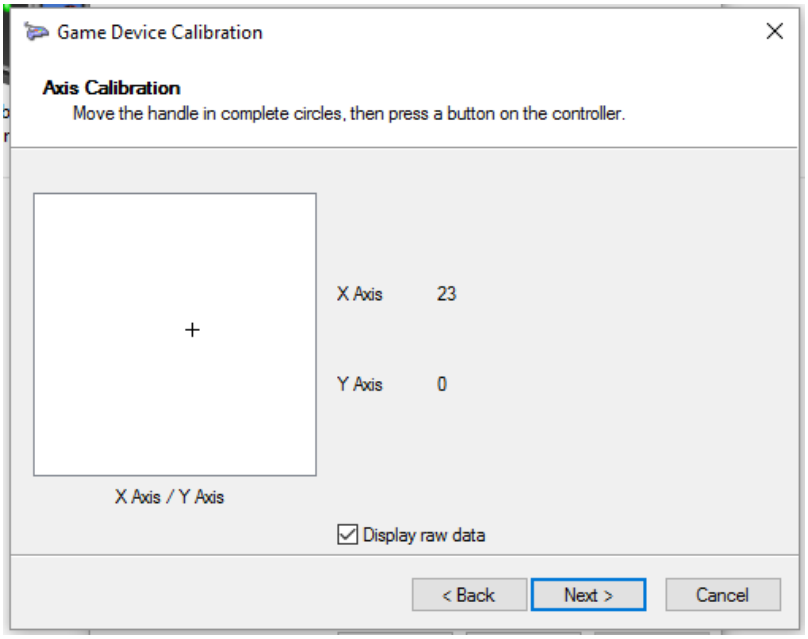
3) Select “Zebsboards Pincab Controller” and click on properties



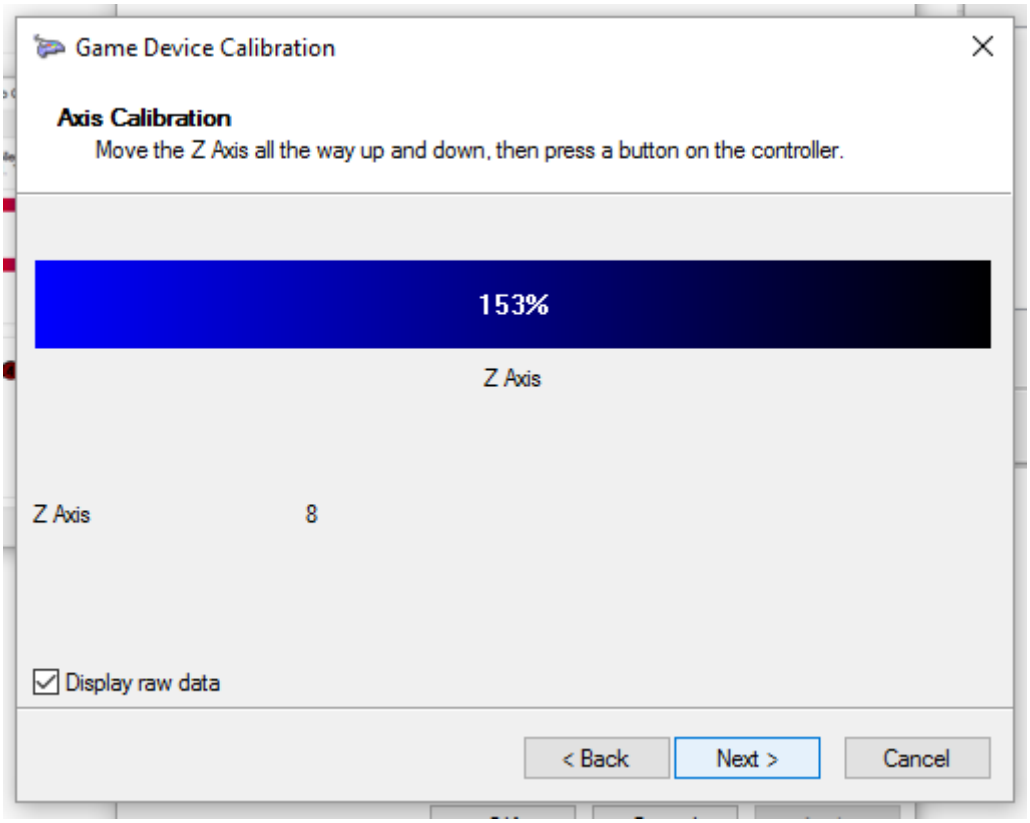
4) Click on settings tab and select Calibration button, click next



5) Click next at the Centered screen and then tick the box for Raw Data on the following screen as shown. Push cabinet in as many directions as nudging would occur and click next.



6) Click next on the centered screen with the cabinet at rest, you will now be at the plunger screen. The blue bar will flicker wildly, ignore that and do the following steps:

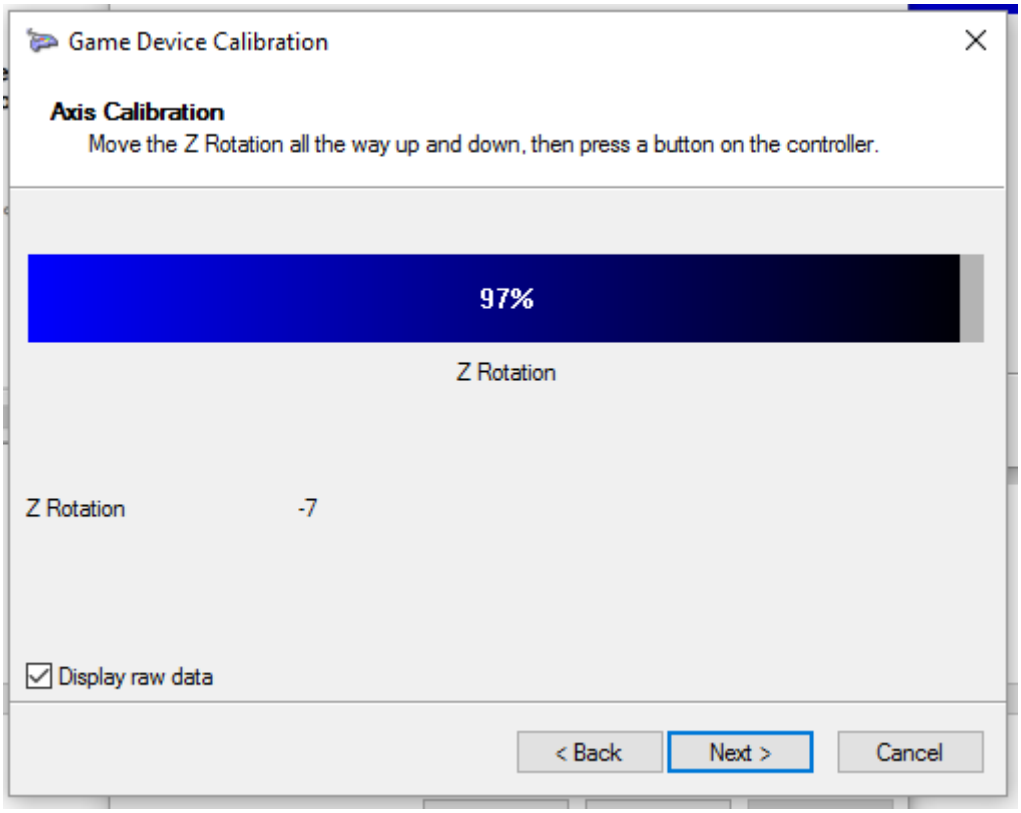


A) Press plunger all of the way in (data reading should be 125 or higher) and bring it back to 0 (rest)

B) Pull plunger all of the way back and release it.

C) Click next

7) Repeat procedure for the Z Rotation Axis screen

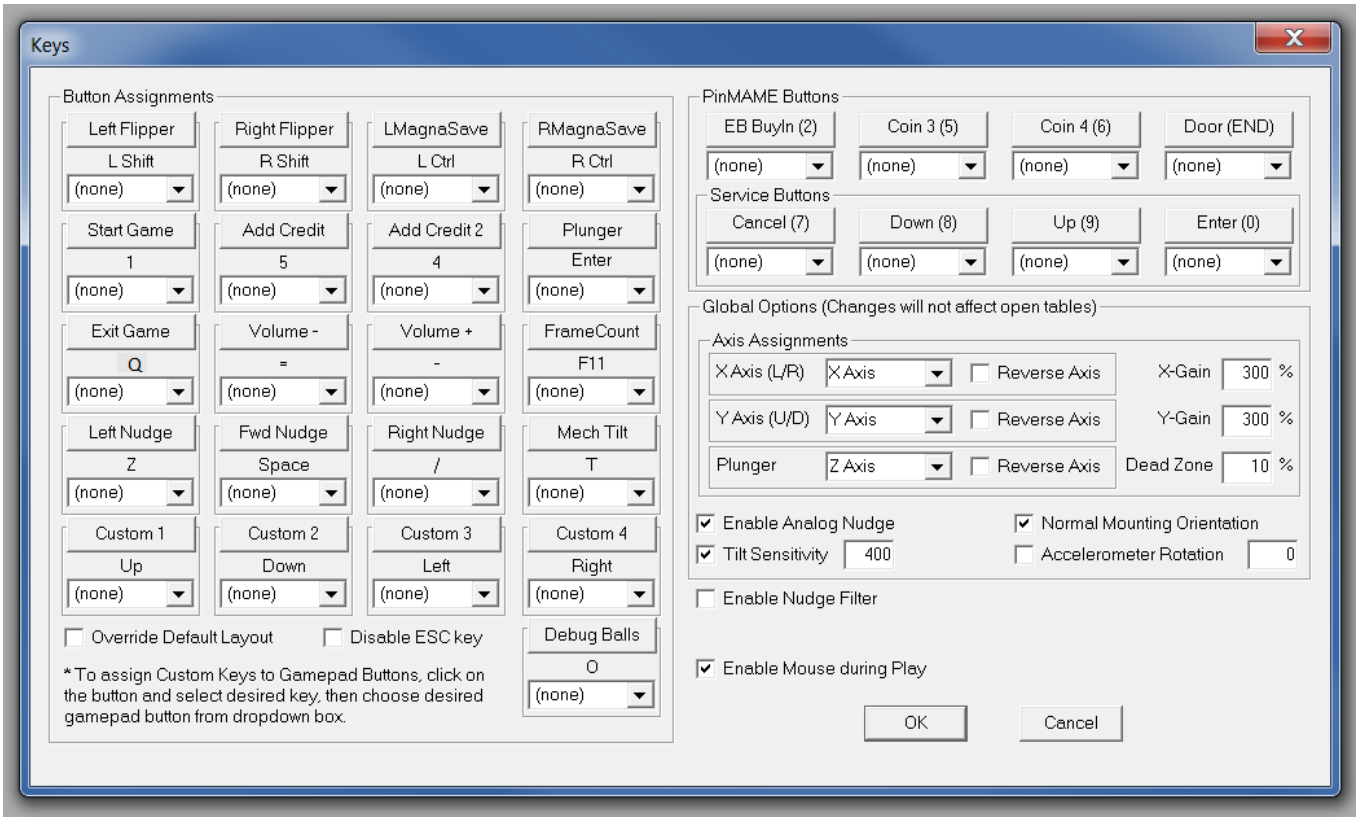


8) Click Finish

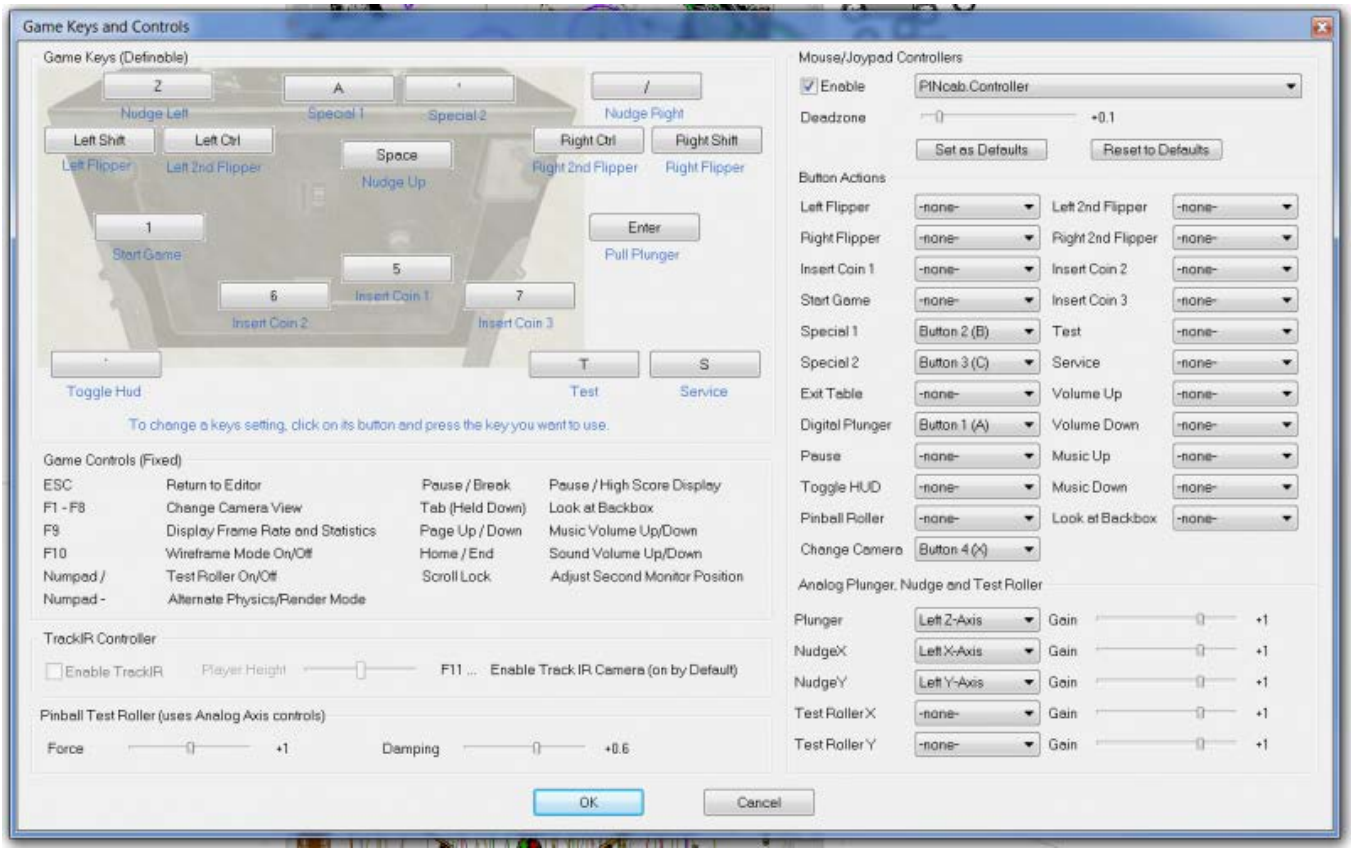
14. Settings

The plunger is hardcoded for the Standard button layout for Visual Pinball. Additionally, there are 3 gamepad buttons available to be assigned to any function not covered by the hardcoded keystrokes (4 gamepad buttons on the V2 Standard if not using ZB_Launch function).

Visual Pinball Settings……



Future Pinball Settings…….



15. Solenoid and Output Control

The outputs are controlled by a FTDI 245RL chip and are a direct equivalent of the SainSmart USB control board listed in the controllers list in DOF.

Setup of the output section in DOF is essentially the same.

Download the B2S server from here ....
http://www.vpforums.org/index.php?app=downloads&showfile=7426

Follow the instructions posted here .....
http://www.vpforums.org/index.php?showtopic=23364#entry214341

Make sure that it works by loading a table and verifying that you have a backglass and animations.

Download DOF R3 from here ....
http://pinball.weilenmann.net/DirectOutput_R3Beta_Build_5812.27024.zip

Tom's instructions are a bit wordy but they are here....
http://pinball.weilenmann.net/docu/DirectOutputWIP/index.html

Install it by:

1) downloading the zip file

2) Create a directory in the root of the drive (c:\DirectOutput) and create a sub-directory in DirectOutput called config (C:\DirectOutput\config)

3) Unzip the contents of the zip folder to the directory you created

4) Unblock the dlls in the directory in the properties tab for each dll if necessary

5) Create a sub-folder in Visual pinball\tables called plugins (will wind up being C:\visual pinball\tables\plugins or some such)

6) create a shortcut in the plugins folder to the DirectOutput folder that you created in C:

7) Start a table in vp with a B2S backglass, move the mouse onto the backglass and press the s key

8) Tick the activate plugins box and uncheck the error message without backglass box

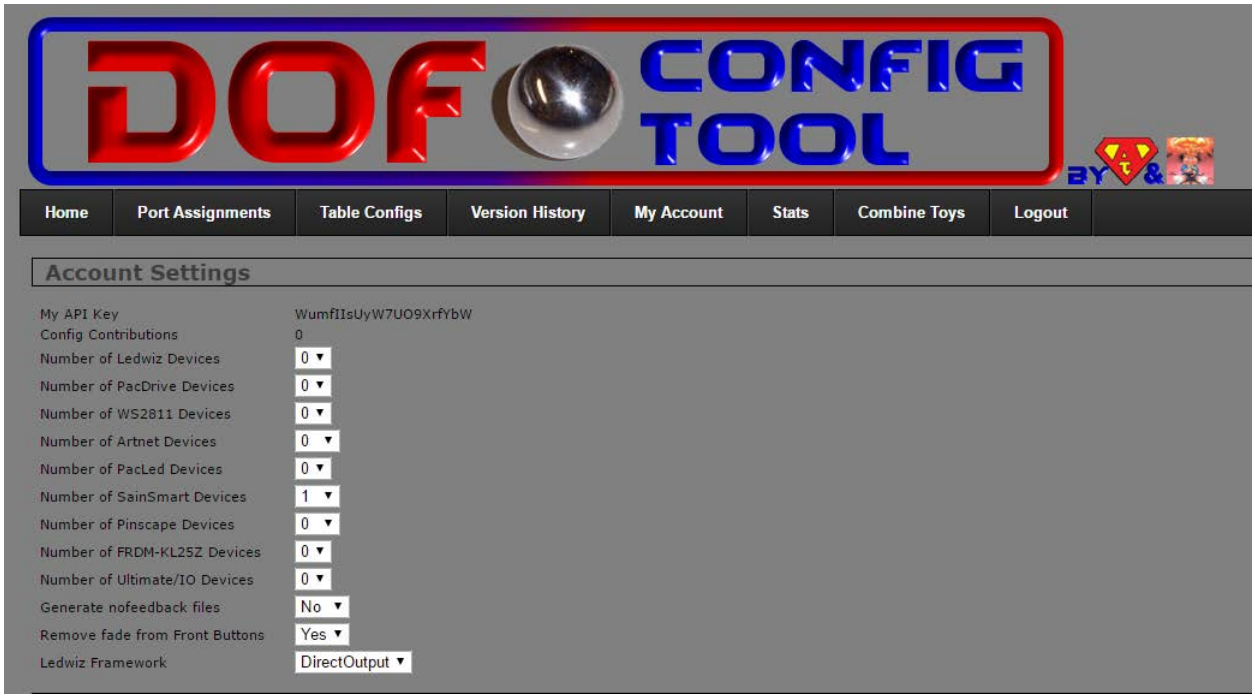
9) Drop the tablexml and directoutputconfig files that are in the zip file from my site here ….
http://www.zebsboards.com/media/kunena/attachments/17/DeluxeOutputConfig.zip into the config folder in DirectOutput

DOF configuration files are included with the kit but it is highly recommended that you create your own account and configuration in the DOFConfig Tool to keep current on the latest additions to the feedback options, tables and settings. The following instructions assume that you only have the one SainSmart device in your cabinet. Multiple devices may require differing setups.

DOF Configuration

Navigate to www.vpuniverse.com, login and navigate to [here](#).

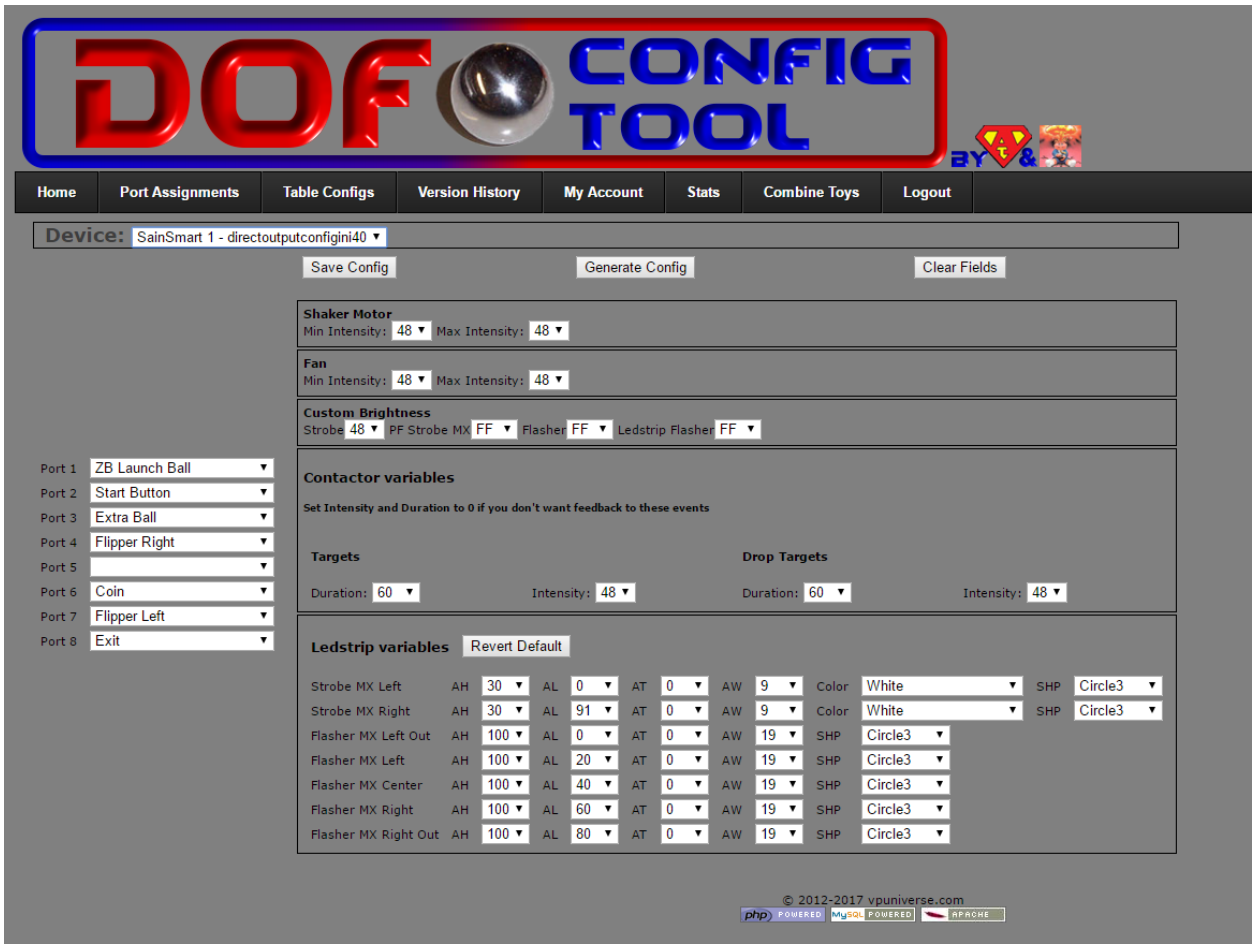
Select "Create Account" and set the parameters to....



Number of SainSmart Devices = 1
LEDWiz Framework = DirectOutput

All other settings can be left to the default settings.

Select "Port Assignments" and set the parameters to.....



Port 1 = ZB Launch Ball*
Port 2 = Start Button
Port 3 = Extra Ball
Port 4 = Flipper Right*
Port 5 = Not available
Port 6 = Coin
Port 7 = Flipper Left*
Port 8 = Exit

***While any other port can be assigned to any function available, ports marked with an asterisk (*) are fixed through traces on the board and unavailable for other usage. The configuration file included in the download is set to the above settings.**