

## VIRTUATILT - VISUAL PINBALL X SETUP

Following some basic instructions to have your new VirtuaTilt up and running with Visual Pinball X.

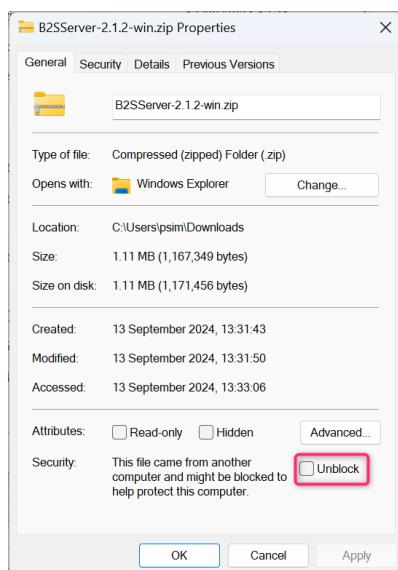
### DOF Installation

**IMPORTANT:** **DOF (Direct Output Framework) is needed if you want to experience a real pinball simulation with all feedback devices in Visual Pinball X. Latest DOF version is required for Pinscape**

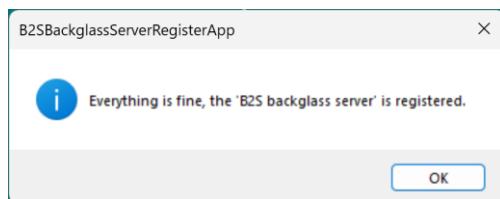
**Pico support:** <http://mjrnet.org/pinscape/dll-updates.html>

You need **B2S Server** installed first. If you have already installed it, skip this part.

For first-time users, download latest version from here: <https://github.com/vpinball/b2s-backglass/releases> and unblock it:

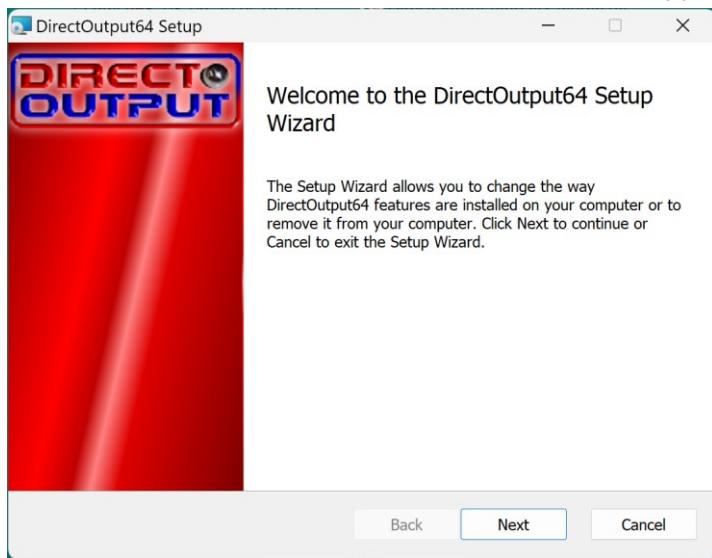


Unzip the B2SServer archive in VisualPinball folder (typically **C:\vPinball\VisualPinball\Tables**) and run the **B2SBackglassServerRegisterApp.exe** as Administrator (right-click). This registers the software as a COM object:

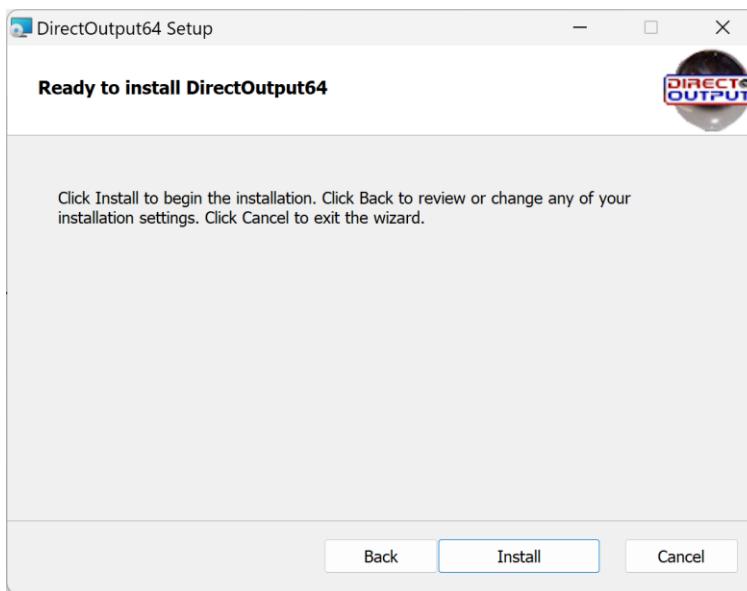
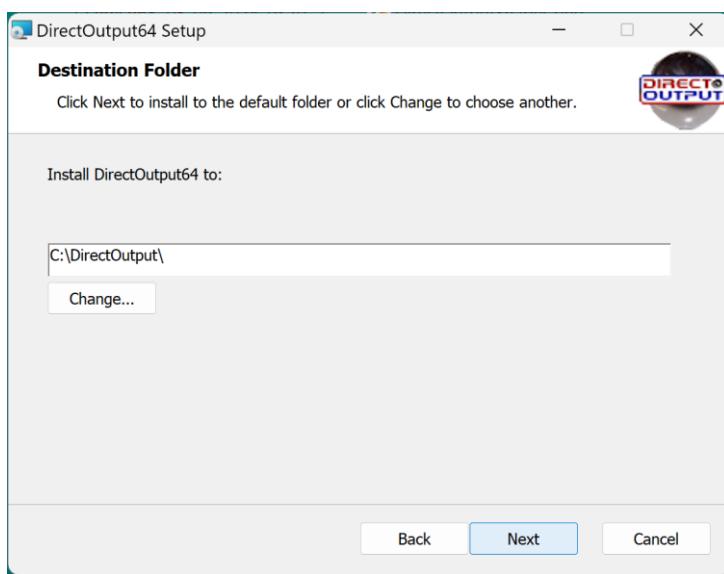


Latest version of DOF allows merging of X86 and X64 installs, so you can safely install both versions.

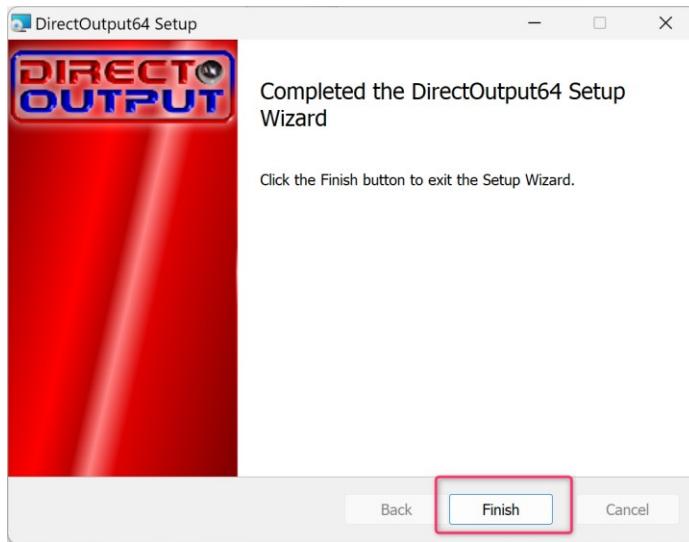
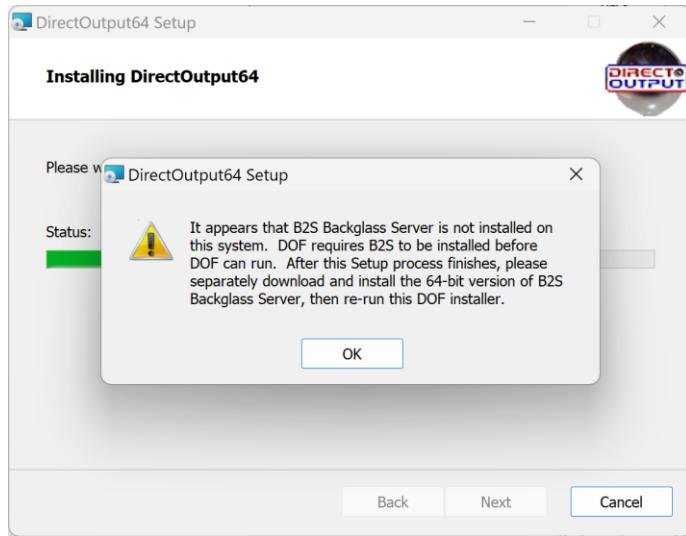
Install DOF using .msi files from official page: <http://mjrnet.org/pinscape/dll-updates.html> and launch it:



Leave installation folder as-is (**C:\DirectOutput**). Highly recommended:



Do not care about the following error (it should appear if you don't have B2S Server installed) and click OK:

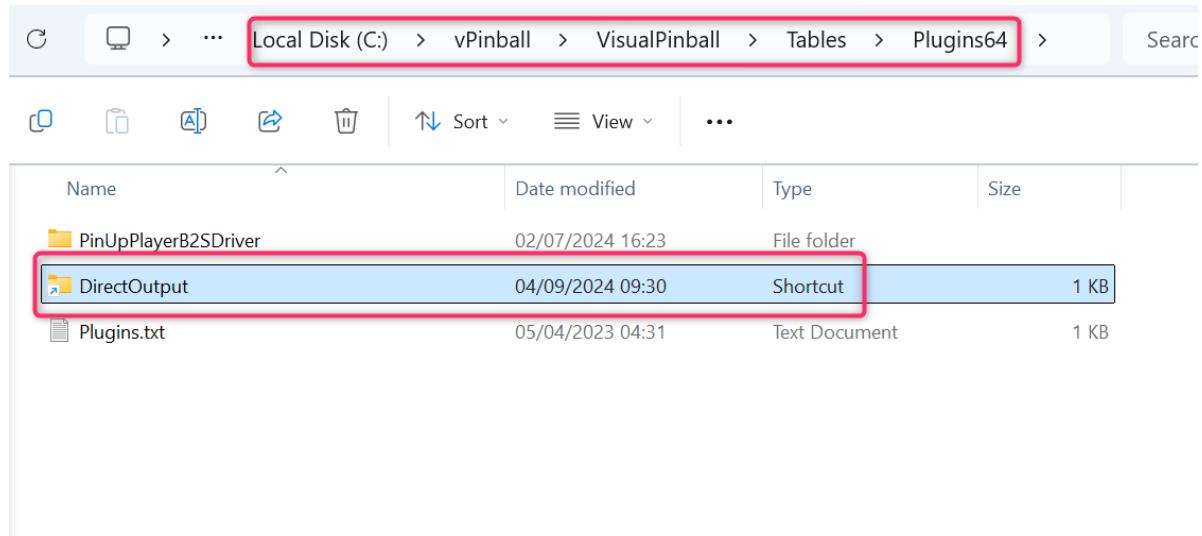


This is how the \DirectOutput folder will look like:

A screenshot of a Windows File Explorer window showing the contents of the \DirectOutput folder. The path is C:\This PC\Local Disk (C:)\DirectOutput\. The table lists the following files and folders:

Name	Date modified	Type	Size
Config	13-Sep-24 12:46	File folder	
x64	13-Sep-24 12:46	File folder	
DirectOutputShapes.png	07-Mar-18 17:58	FastStone PNG File	6 KB
DirectOutputShapes.xml	07-Mar-18 14:59	XML File	40 KB
LICENSE	30-Jan-18 13:09	File	2 KB

A shortcut to DirectOutput folder in **\Plugins64** folder of B2SServer installation should be present (created by DOF setup):



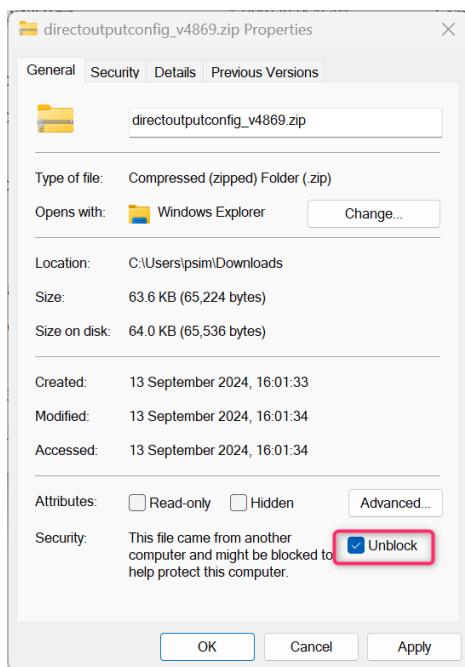
If not, manually create a shortcut to **DirectOutput** folder and put it in **Plugins64** folder of B2SServer installation.

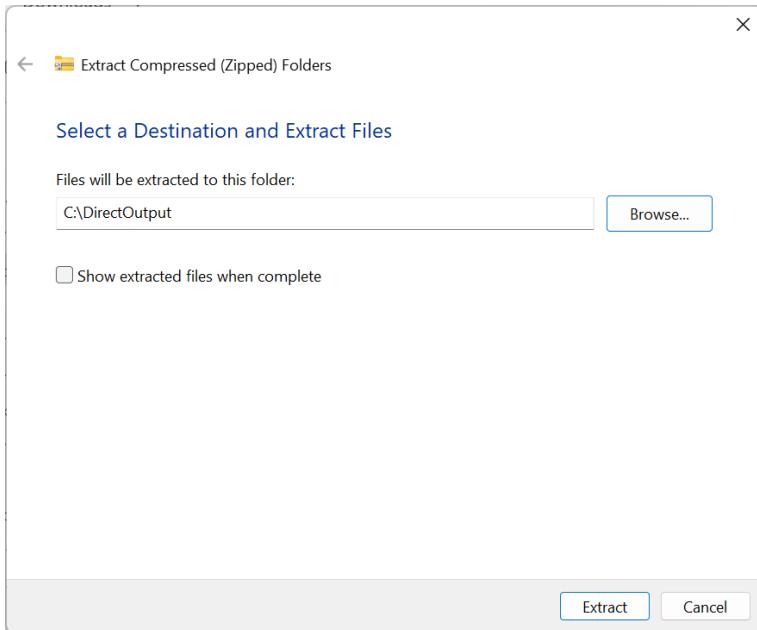
As a reference, the official step-by-step guide for DOF configuration is available here: [Pinscape Build Guide \(mjrnet.org\)](https://mjrnet.org/).

## Configure DOF for VirtuaTilt

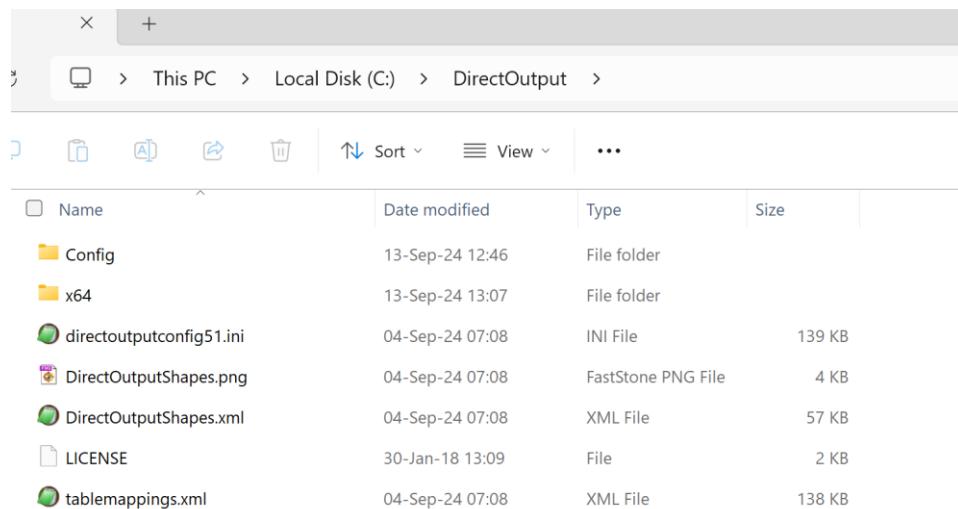
To configure DOF you need to set up a configuration file. You can create an account and login to the [DOF Config tool](#) webpage or [you can just download provided config files from our GitHub repository \(including cabinet file\)](#), unblock the file and copy/move the files into **C:\DirectOutput\** directory (or wherever DOF is installed on your PC), overwriting existing files:

Name	Last commit message	Last commit date
..		
VirtuaTilt.json	Added VirtuaTilt cabinet file for DOF ConfigTool	3 months ago
directoutputconfig_v5213.zip	Updated to v5213	3 minutes ago
readme.md	Updated to v5213	now

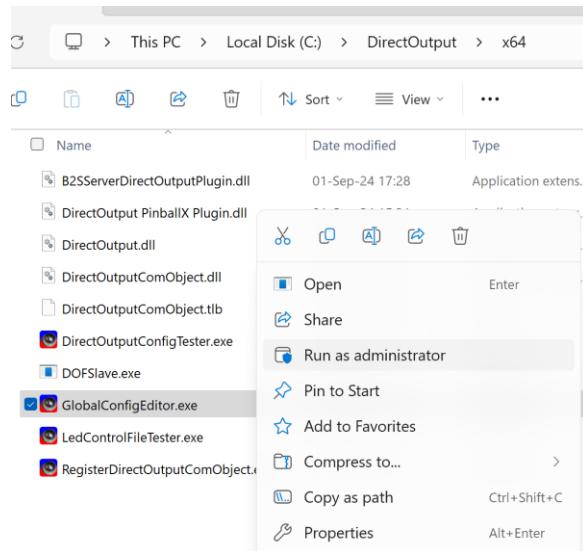




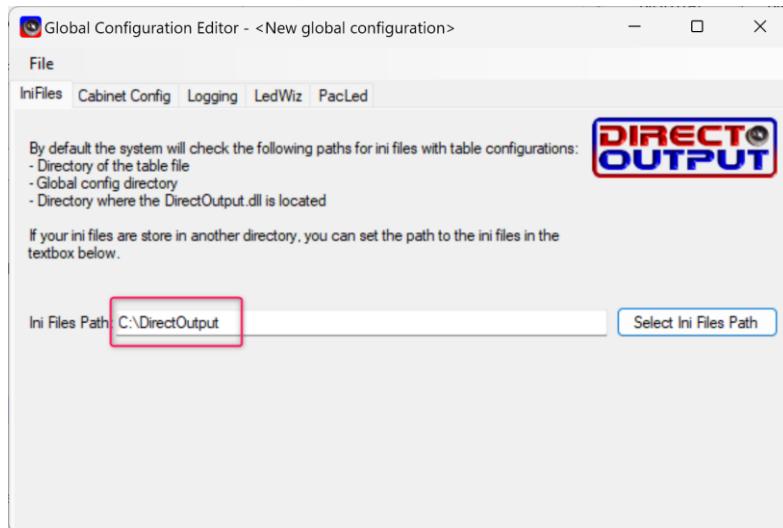
This is how the **DirectOutput** folder will look like:



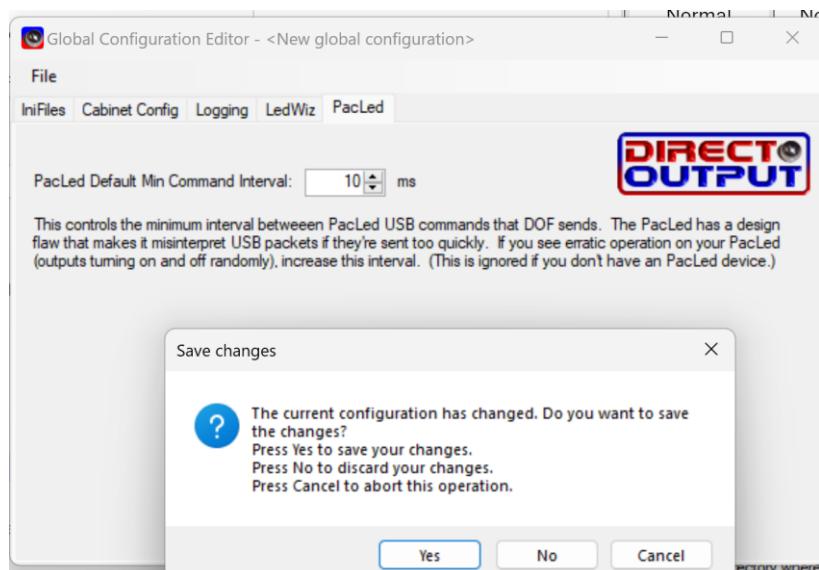
Now right-click **GlobalConfigEditor.exe** file in **/DirectOutput/X64** and in **/DirectOutput/X86** folder and launch it as Administrator:



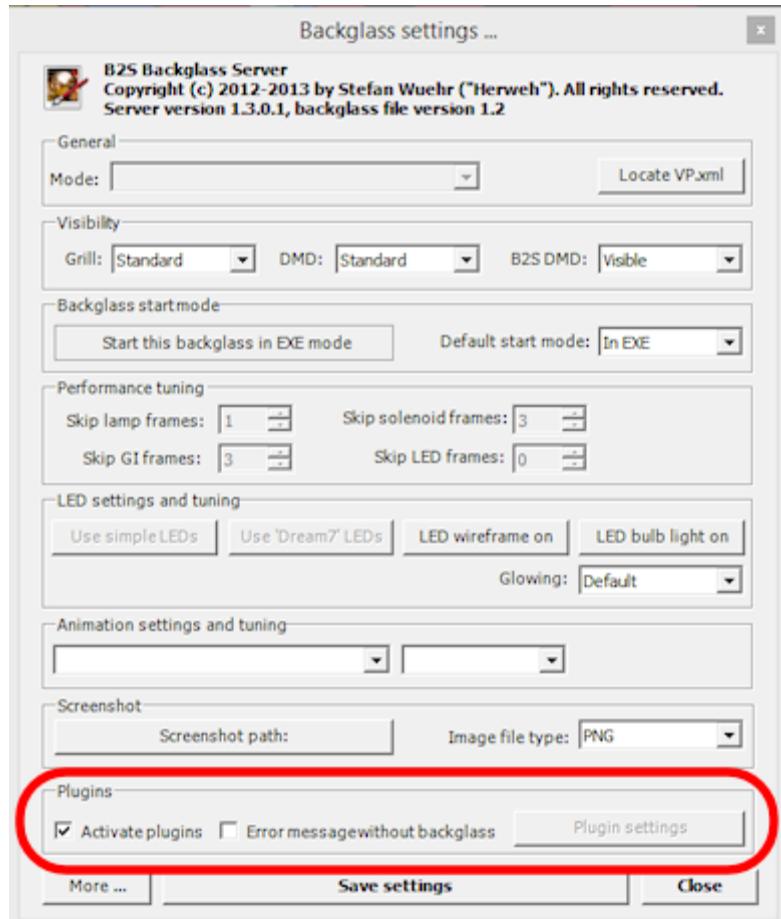
Configure .ini file path where you previously unzipped our config file (**C:\DirectOutput**):



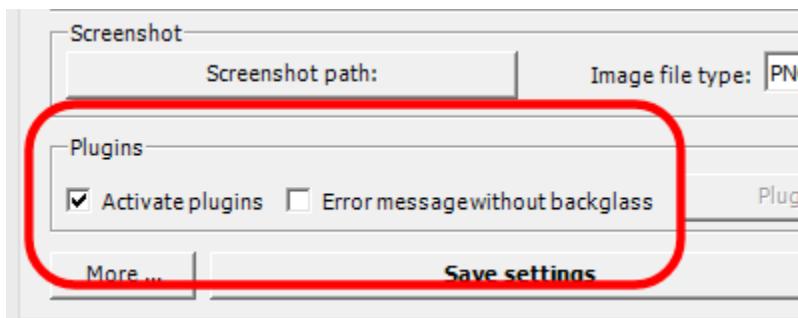
Close the window and press **Yes** to save all changes:



Start Visual Pinball and load a table that has a matching B2S backglass file installed; right-click the mouse anywhere in the backglass area to bring up the B2S options dialog:



Check the box **Activate plugins** and uncheck the box **Error message without backglass**.

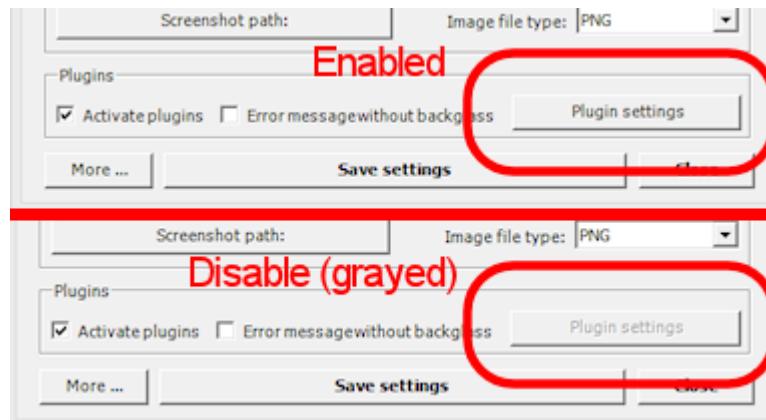


Make sure that **Activate plugins** flag is checked and **Error message without backglass** flag is un-checked

- Click Save Settings
- Exit the table (press "Q" and then "Q" again) and close VP

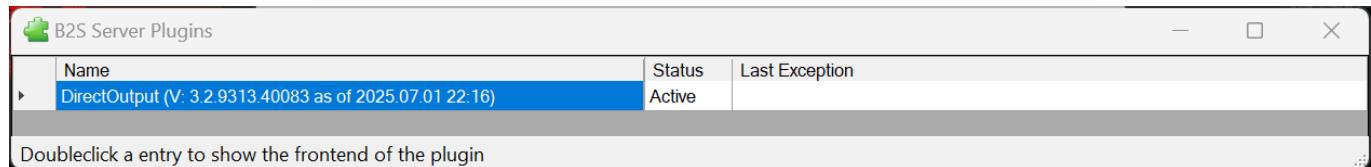
Now start VisualPinball and load a table that has a B2S backglass. You can use the same table you used during the setup procedure in the step where we updated the B2S backglass settings.

As before, when the backglass appears, right-click the mouse anywhere in the backglass display area to bring up the options dialog. Look to see if the **Plugins** button at the bottom is **enabled**:



If the button is disabled, DOF isn't getting loaded. Go to the official [troubleshooting](#) section for things to try.

If the button is enabled, click it. This will bring up a separate dialog that shows the status of each plugin.



Look for a **DirectOutput** entry in the list. If you don't see any such entry, it means the same thing as a disabled Plugin Status button, namely that DOF isn't being loaded. Go to the official [troubleshooting](#) section for help.

Finally, check the **Status** and **Last Exception** columns for the Direct Output entry.

If the Status is **Disabled**, or there's a message in the Last Exception box, see the official [troubleshooting](#) section for help.

If the Status is **Active** and the Last Exception column is empty, congratulations! Your DOF setup work was successful! DOF is loading and starting correctly.

## DOF Configuration Change

**IMPORTANT NOTE:** If you don't want to mess with following DOF configuration, you can just download

**VirtuaTilt cabinet file** from our GitHub and import it on DOF Config Tool:

<https://github.com/3DPTronics/VirtuaTilt/tree/main/DirectOutput>

The screenshot shows a GitHub repository page for 'VirtuaTilt / DirectOutput'. The repository has been updated to v5213. The contents include a folder named '..', and files: 'VirtuaTilt.json' (Last commit message: 'Added VirtuaTilt cabinet file for DOF ConfigTool' at 3 months ago), 'directoutputconfig\_v5213.zip' (Updated to v5213 at 6 minutes ago), and 'readme.md' (Updated to v5213 at 4 minutes ago). A 'readme.md' file is also present.

The screenshot shows the 'Manage Cabinets' section of the DOF Config Tool. A modal dialog titled 'Import Cabinet...' is open, prompting the user to drag & drop files or browse for a cabinet file. The 'Import Cabinet' button is highlighted with a red box. To the right, a context menu is open over a cabinet entry, with the 'Import Cabinet...' option also highlighted with a red box.

Once imported, you can generate your updated config file which contains all latest tables:

The screenshot shows the 'Devices' configuration page for the 'VirtuaTilt Pico' device. The left sidebar shows the navigation menu with 'Devices' selected. The main panel displays various configuration options for the device, including dropdown menus for Ledwiz, FRCM-KL25Z, PinOne, PacDrive, Pacted, Ultimate/I/O, WS2811, SainSmart, Pinscape, Philips\_Hue, Pincontrol1, Pincontrol2, and DudesCab. There are also sections for Artnet and PinscapePico. At the bottom, there are 'Options' settings for 'Generate NoFeedback Files' (set to 'No') and 'Remove Fade from Front Buttons' (set to 'No').

## Select your device

If you want to change the default DOF configuration for VirtuaTilt, you need to create an account and login to the [DOF Config tool](#) page.

Once you have an account setup, go to **Devices** and select the number of devices for your setup.

- Select **1** for number of **PinscapePico** devices and then click on **Update**:

The screenshot shows the 'Devices' section of the DOF Config Tool. On the left, there's a sidebar with various sections like Home, Stats, History, Feedback, Tables, Configurations (0 modified), Templates (0), Cabinet (Manage, Variables, Combine Toys, Devices 1 selected), and Port Assignments. The main area is titled 'VirtuaTilt Pico' and contains a grid of device configurations. The 'PinscapePico' row has a dropdown menu with '1' selected, which is highlighted with a red box. Other rows include Ledwiz, FRDM-KL25Z, PinOne, PacDrive, PacLed, Ultimate/IO, WS2811, SainSmart, Philips\_Hue, Pincontrol1, Pincontrol2, and DudesCab. At the bottom of the main area, there are 'Options' buttons for 'Generate NoFeedback Files' (set to 'No') and 'Remove Fade from Front Buttons' (set to 'No'). A blue 'Update' button is located in the top right corner of the main panel.

## Creating a config file

When creating a config file for your setup, it's simply a matter of selecting the outputs for each device in your cabinet. VirtuaTilt is already configured this way:

- **Port1** – Solenoid – Combo for bumpers and slingshots
- **Port2** – Shaker Motor
- **Port3** – Left Flipper Solenoid
- **Port4** – Right Flipper Solenoid

**Port Assignments**

VirtuaTilt Pico

Device: PinscapePico 1 - directoutputconfigini120

P:001	Combo1	P:033	P:065	P:097
P:002	Shaker	P:034	P:066	P:098
P:003	Flipper Left	P:035	P:067	P:099
P:004	Flipper Right	P:036	P:068	P:100
P:005		P:037	P:069	P:101
P:006		P:038	P:070	P:102
P:007		P:039	P:071	P:103
P:008		P:040	P:072	P:104
P:009		P:041	P:073	P:105
P:010		P:042	P:074	P:106
P:011		P:043	P:075	P:107
P:012		P:044	P:076	P:108
P:013		P:045	P:077	P:109
P:014		P:046	P:078	P:110
P:015		P:047	P:079	P:111
P:016		P:048	P:080	P:112
P:017		P:049	P:081	P:113

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The **Combo1** config is assigned to knocker, slingshots and bumpers:

**Toy Combo Management**

VirtuaTilt Pico

ID	Name	Toy Category	Toys
1001	Combo1	Mono	8 Bumper Center 8 Bumper Left 8 Bumper Right 8 Bumper Back Knocker Slingshot Left Slingshot Right 10 Bumper Back Left 10 Bumper Back Right 10 Bumper Middle Center

**Create New Combo**

Combo Name:

[Add](#)

You can change it according to your personal preferences. To do this, simply navigate to the "**Combine Toys**" section in the config tool and enter your new combos.

**NOTE:** Shaker Motor Intensity is already set at Maximum (**48**). You can change it according to your personal preferences:

The screenshot shows the DOF Config Tool V3.0 interface. On the left, there's a sidebar with various sections like Home, Stats, History, Feedback, Tables, Configurations, Templates, Cabinet, Manage, and Devices. Under Manage, 'Variables' is selected and highlighted with a yellow box. The main area is titled 'Variables' and shows settings for 'VirtuaTilt Pico'. It includes sections for Shaker Motor (Min: 48, Max: 48), Fan (Min: 1, Max: 48), Toy Durations (ms) (Chime: 60, Knocker: 60, Bell: 60), Custom Brightness (Strobe: 48, PF Strobe MX: FF, Flasher: FF, LED Strip Flasher: FF), and Contactor (Target Duration: 60, Target Intensity: 48, Drop Duration: 60, Drop Intensity: 48). There's also a note: 'Set Intensity and Duration to 0 if you don't want feedback to these events'. At the top right, there are 'Switch cabinet' and 'Generate config' buttons.

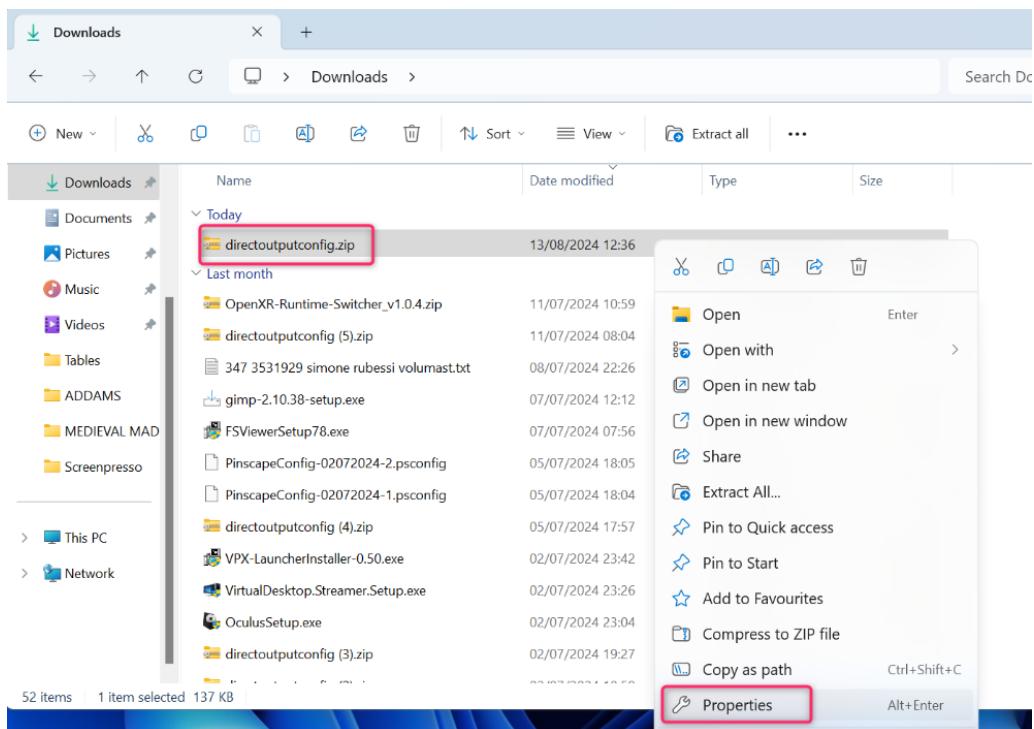
## Generate and Import your DOF config

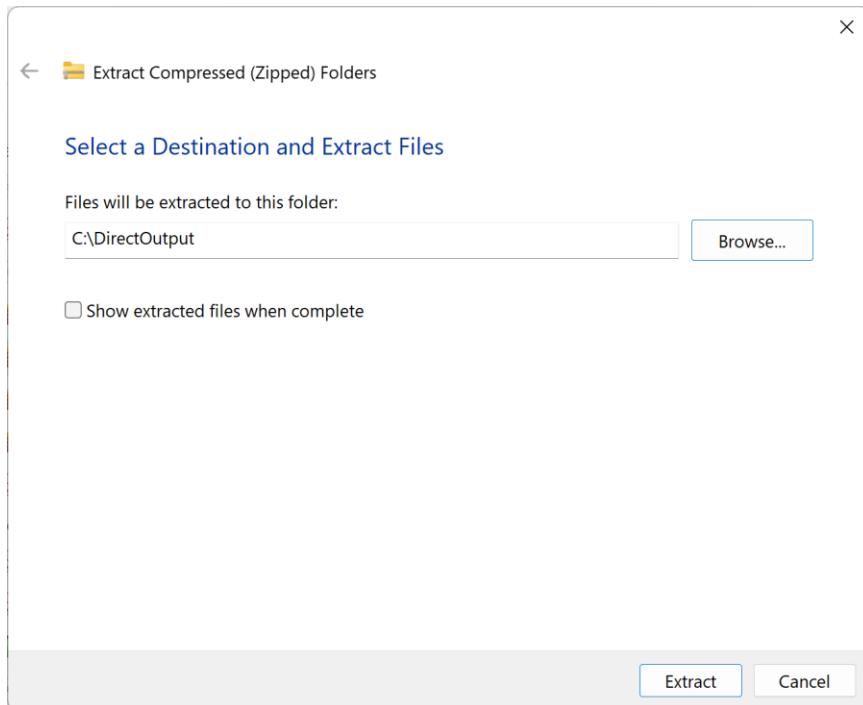
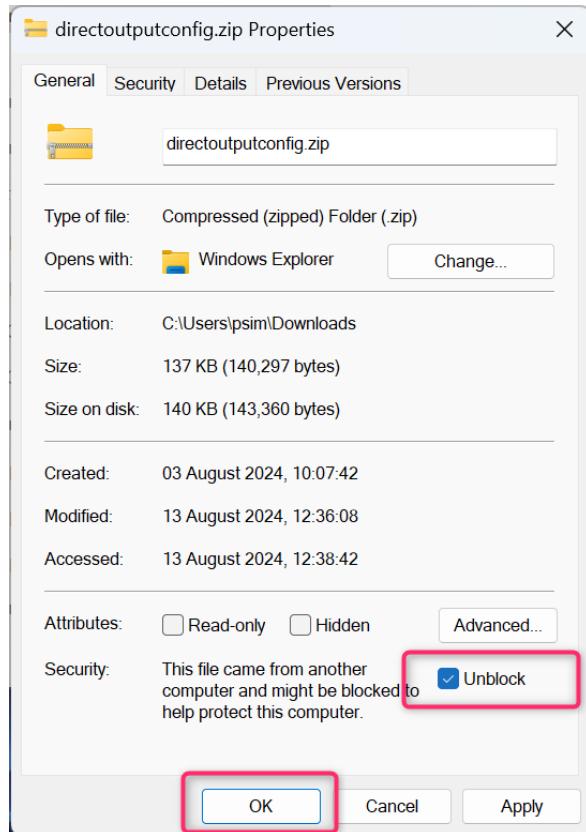
Once you have everything set in the config tool, click the **Update** button, then **Generate Config** button:

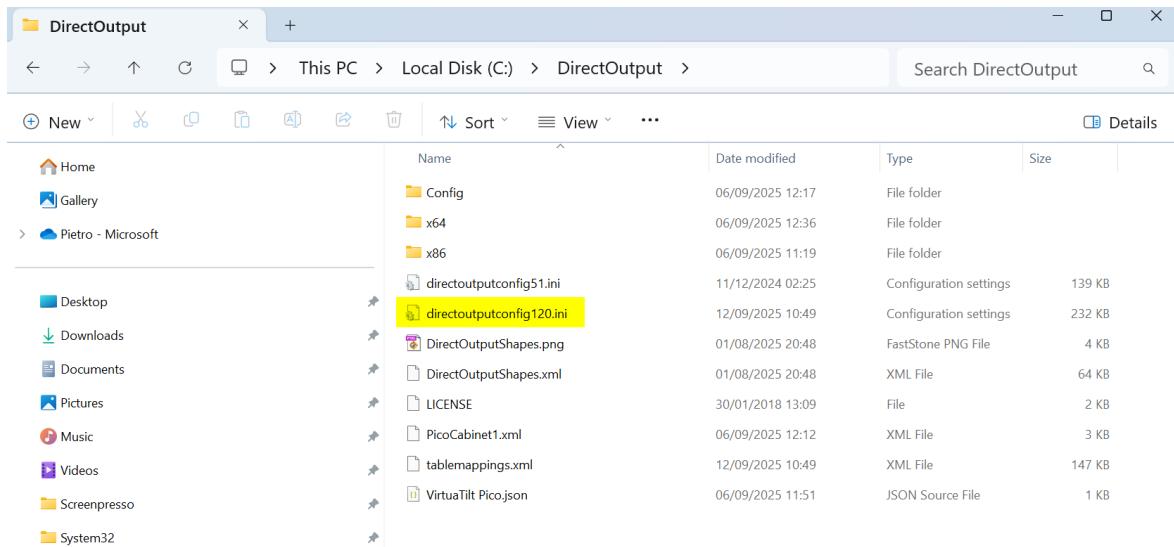
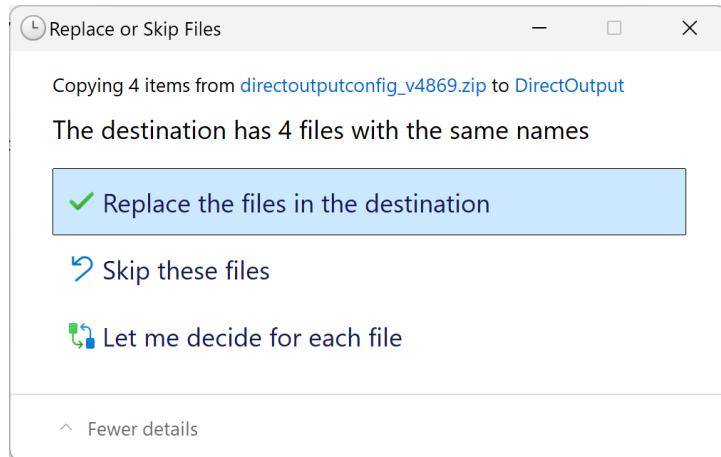
This screenshot is nearly identical to the one above, showing the DOF Config Tool V3.0 Variables page for 'VirtuaTilt Pico'. The 'Variables' section in the sidebar is selected. The main area displays the same configuration options for Shaker Motor, Fan, Toy Durations, Custom Brightness, and Contactor. The 'Generate config' button at the top right is highlighted with a red box, indicating it is the next step after updating the configuration.

The screenshot shows the DOF Config Tool V3.0 interface. At the top, it displays "Generating Configuration Files..." with a large circular progress bar. The left sidebar contains navigation links like Home, Stats, History, Feedback, Tables, Configurations (0 modded), Templates (0), Cabinet, Manage (2), Variables, Combine Toys (1), Devices (1), and Port Assignments. A "Donate" button is at the bottom of the sidebar.

This will download a copy of the configuration files onto your PC. All you need to do now is to extract the zipfile into your **C:\DirectOutput\** directory (or wherever DOF is installed on your PC) and overwrite all files:

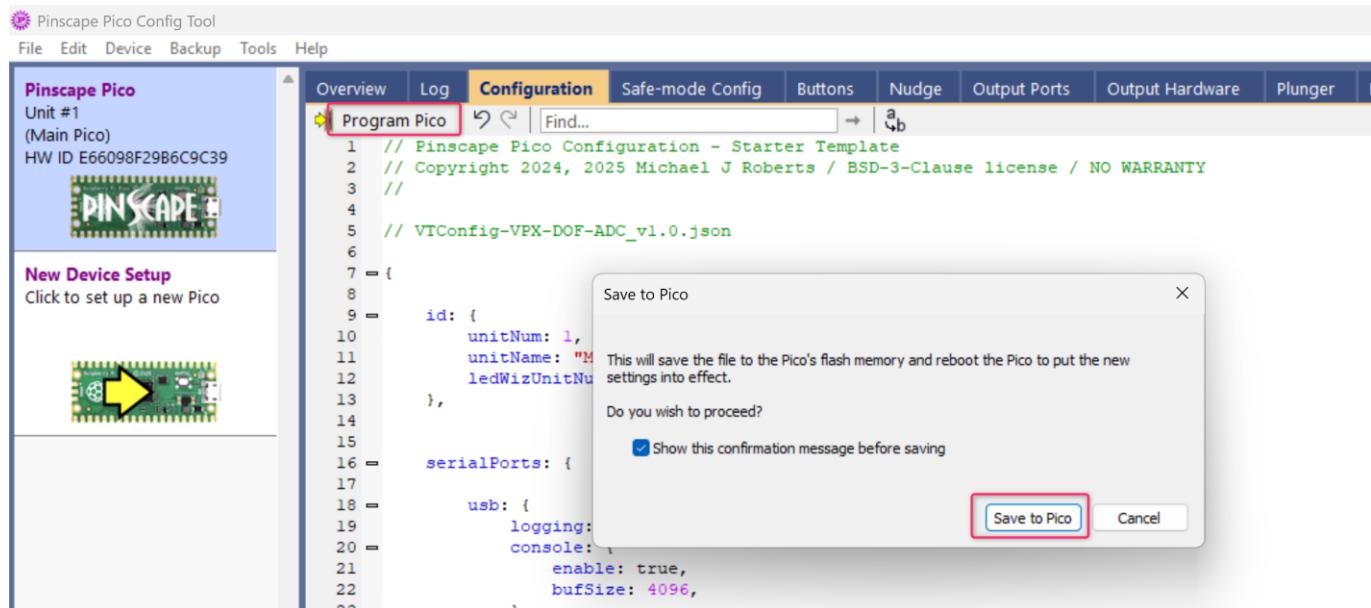
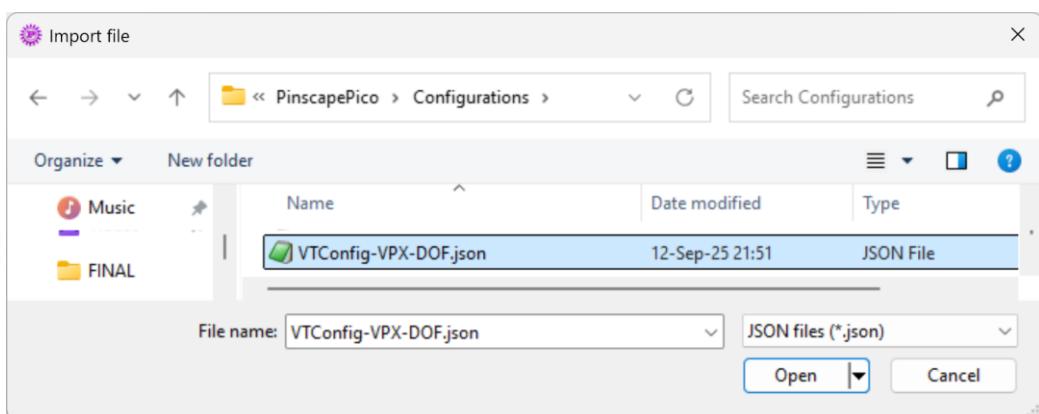
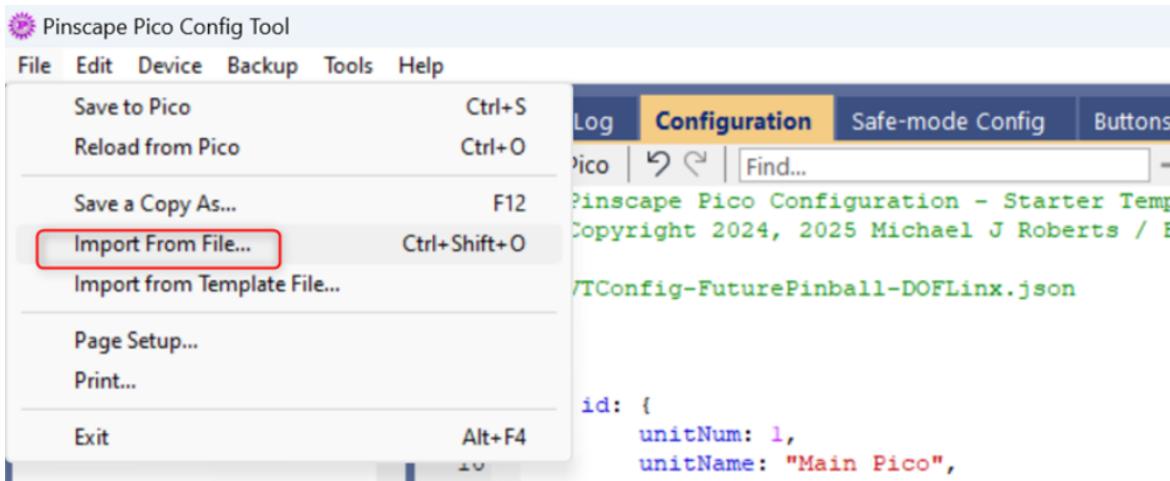




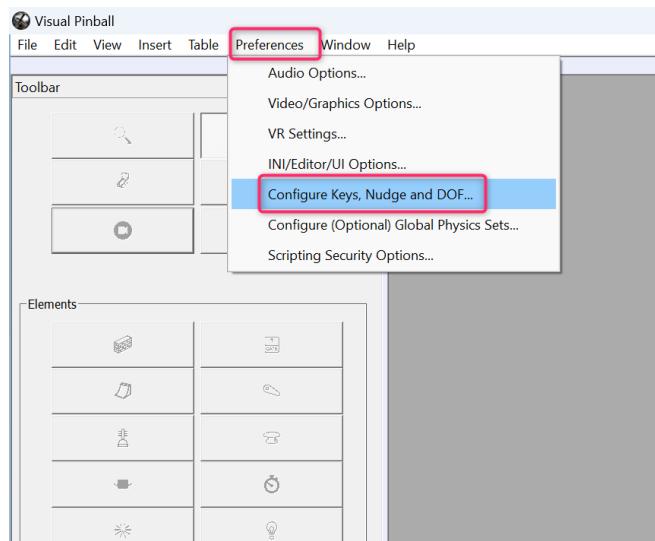


# Visual Pinball X configuration

Load in Pinscape Pico Config Tool the **VTConfig-VPX-DOF.json** profile first:



Replicate the following configuration in Visual Pinball X settings:



We're using the new **Open Pinball Device HID Interface** for Nudge and Plunger. [Pinscape Pico firmware fully supports it!](#)

## VPX 10.8.1.XXXX Settings

Keys, Nudge and DOF

**Button Assignments**

Left Flipper	Right Flipper	LMagnaSave	RMagnaSave
L Shift	R Shift	L Ctrl	R Ctrl
(none)	(none)	(none)	(none)
Start Game	Add Credit	Add Credit 2	Plunger
1	5	4	Enter
(none)	(none)	(none)	(none)
Exit Game	Volume -	Volume +	Debug/Perf.Info
Q	'	i	F11
(none)	(none)	(none)	(none)
Left Nudge	Fwd Nudge	Right Nudge	Mech Tilt
L Ctrl	Space	R Ctrl	T
(none)	(none)	(none)	(none)
Custom 1	Custom 2	Custom 3	Custom 4
Up	Down	Left	Right
(none)	(none)	(none)	(none)
Debug Balls	Debugger/I.Edit	Lockbar/Fire	Pause
O	D	Menu	P
(none)	(none)	(none)	(none)
StagedLFlipper	StagedRFlipper	Tweak	F12
L Windows	R Alt		(none)
(none)	(none)		

Override Default Button Layout     Disable ESC Key

\* To assign Custom Keys to Gamepad Buttons, click on the button and select desired key, then choose desired gamepad button from dropdown box.

**PinMAME Buttons**

EB Buyln (2)	Coin 3 (5)	Coin 4 (6)	Door (END)
(none)	(none)	(none)	(none)

**Service Buttons**

Cancel (7)	Down (8)	Up (9)	Enter (0)
(none)	(none)	(none)	(none)

Note that some keys can also be configured in the VPMKeys.vbs file

**Nudge & Plumb**

Enable Analog Nudge (hardware acceleration sensor)  
 X Axis (L/R) OpenPinDe  Reverse Max 100 Gain 150%  
 Y Axis (U/D) OpenPinDe  Reverse Max 100 Gain 150%

Board Mounted Face Up     Accelerometer Rotation 0  
 Legacy/VP9-style non-realistic Keyboard Nudge Strength: 100%  
 Enable Nudge Filter (mainly for Analog/additional Board setups)  
 Analog Nudge Input is Velocity  
 Simulate Tilt Plumb From Accelerator Sensor Threshold: 238 Inertia: 100.0

To interactively set, calibrate and test the Nudge parameters, please load the 'Nudge Test and Calibration.vpx' table and run it

**DOF Controller Options**

Contactors	Knocker
DOF	DOF
Chimes	Bell
DOF	DOF
Gear	Shaker
DOF	DOF
Flippers	Targets
DOF	DOF
Drop Targets	Targets
DOF	DOF

\* This will only apply to tables that are using the Controller.vbs in their script code

Disable B2S

**Input API**

Direct Input
--------------

**Ctrl. Rumble Behavior**

Table with generic fa
-----------------------

**Plunger**

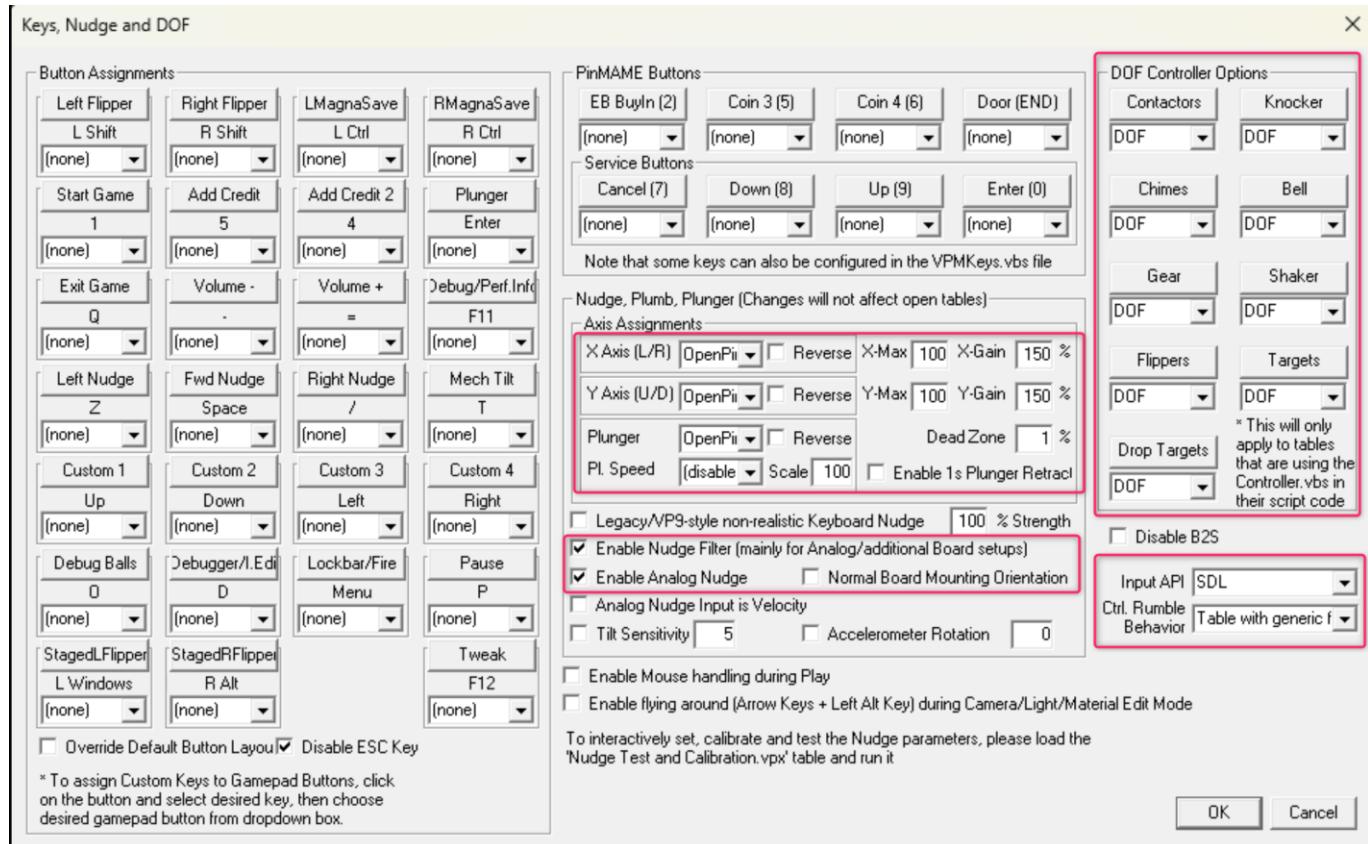
Enable 1s Plunger Retract  
 Position Axis OpenPinDe  Reverse Dead Zone 10%  
 Speed Axis (disabled) Scaling 100%

Enable Mouse handling during Play  
 Enable flying around (Arrow Keys + Left Alt Key) during Tweak Mode

**Manage DI Devices...**

**OK**    **Cancel**

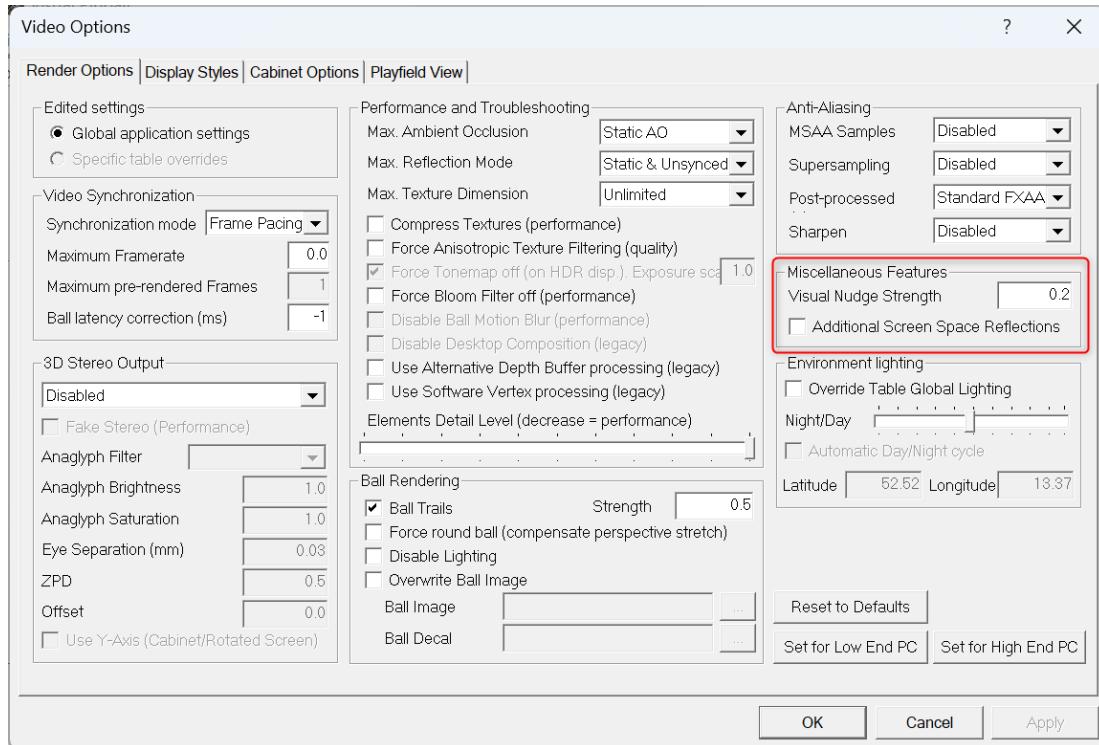
## VPX 10.8.0 Settings



**IMPORTANT NOTE:** Depending on VPX versions (<https://github.com/vpinball/vpinball/releases>), you may also need to select/unselect “**Analog Nudge Input Is Velocity**” to have nudge working.

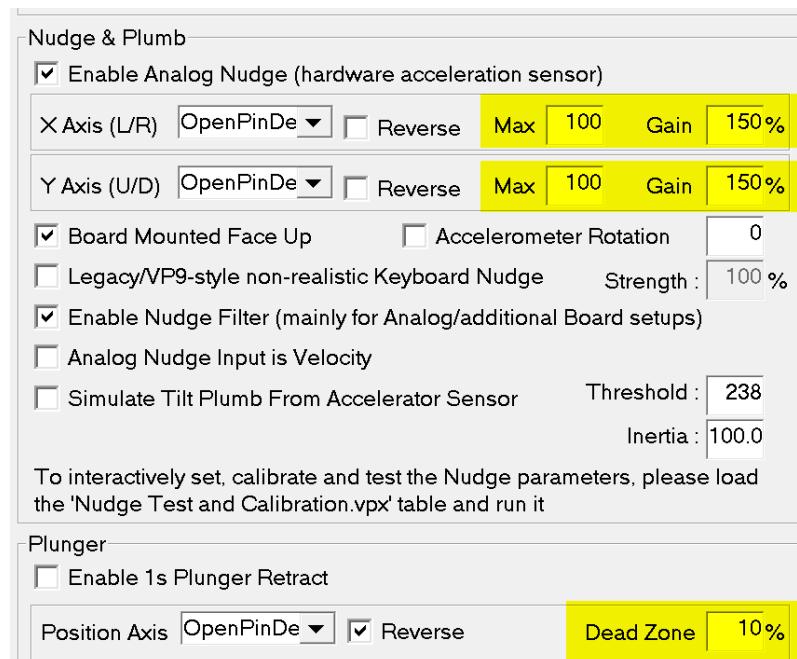
# Visual Pinball X Nudge/Tilt configuration

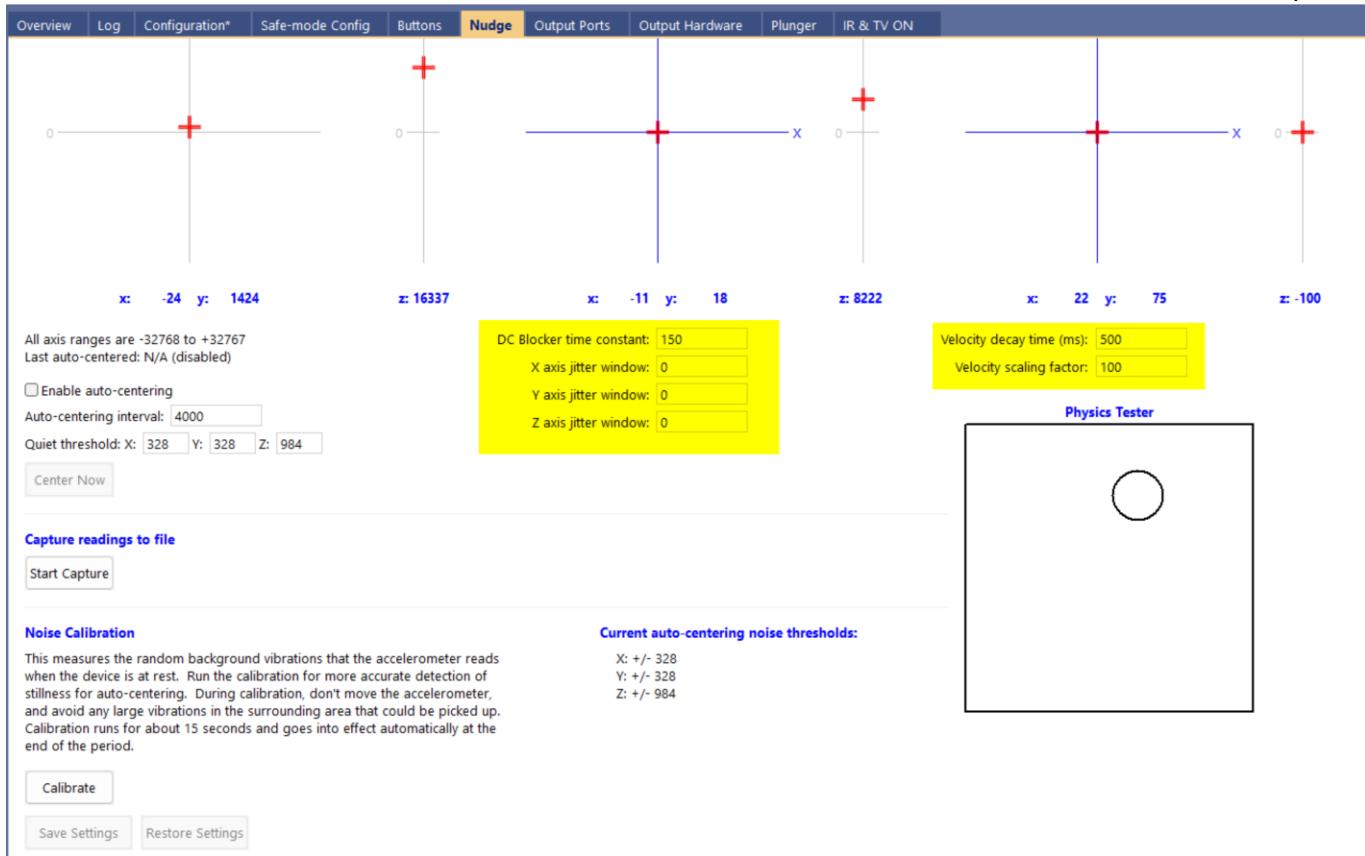
We recommend starting with the following values and modifying them afterwards:



Visual Nudge Strength: **0.2**

**VERY IMPORTANT NOTE:** You need to find your right settings (according to your personal preferences) for nudging. You can adjust both Pinscape Pico accelerometer settings and VPX settings until you find your perfect spot:





You can also increase accelerometer sensitivity by changing gRange value to 2 in any profile:

```

Overview | Log | Configuration* | Safe-mode Config | Buttons
Program Pico | ⌂ ⌂ | Find...
260
261
262 =
263     i2c: 0,
264
265
266     gRange: 2,
267 },
268

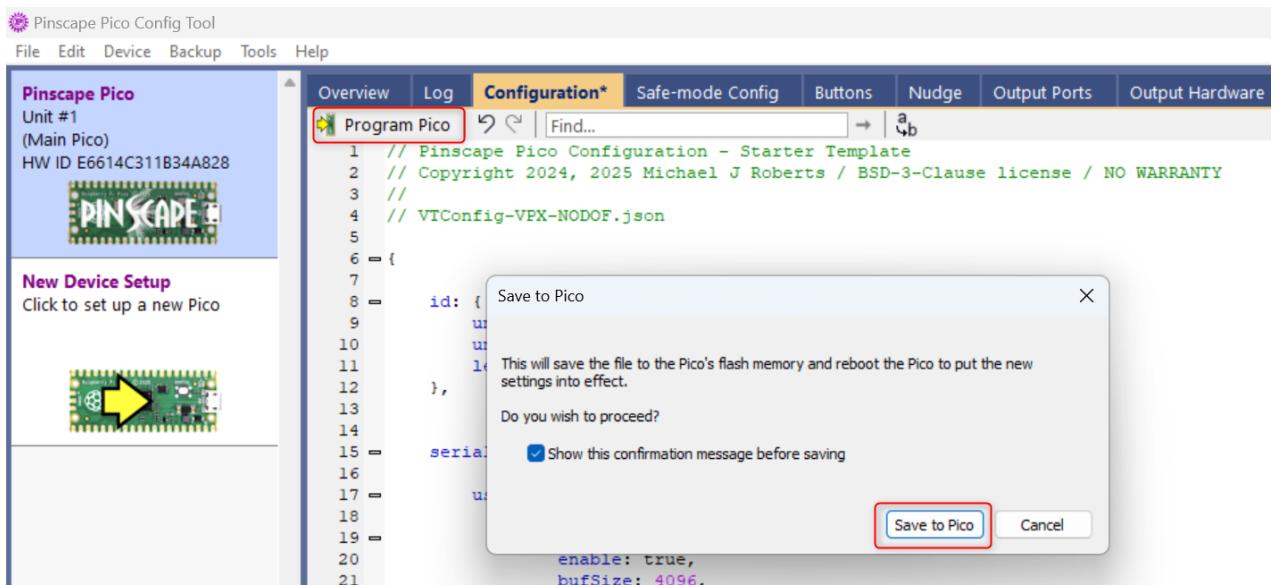
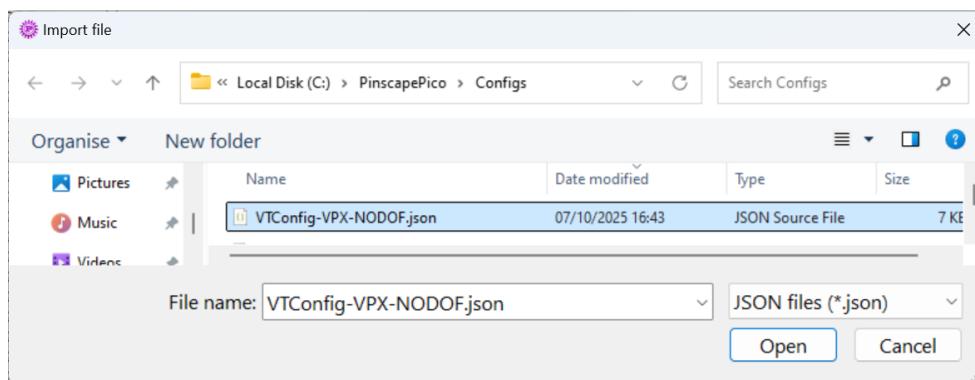
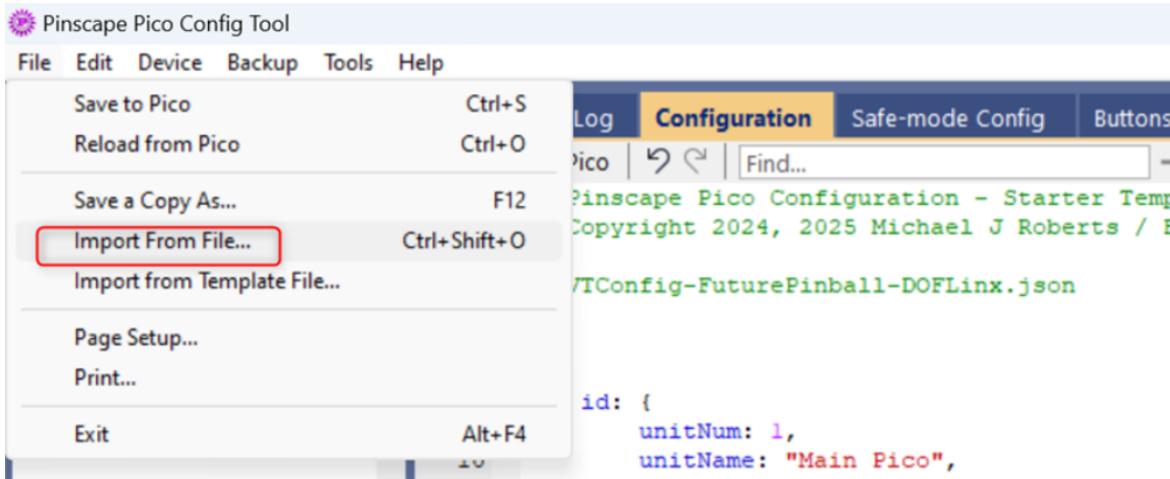
```

Please refer to the official Pinscape Pico reference for additional information about accelerometer parameters: <http://mjrnet.org/pinscape/PinscapePico/Help/NudgeWin.htm>

# Play Visual Pinball X without DOF

The new upgraded VirtuaTilt allows you to enjoy feedback from flipper's solenoids and shaker motor even without DOF configured!

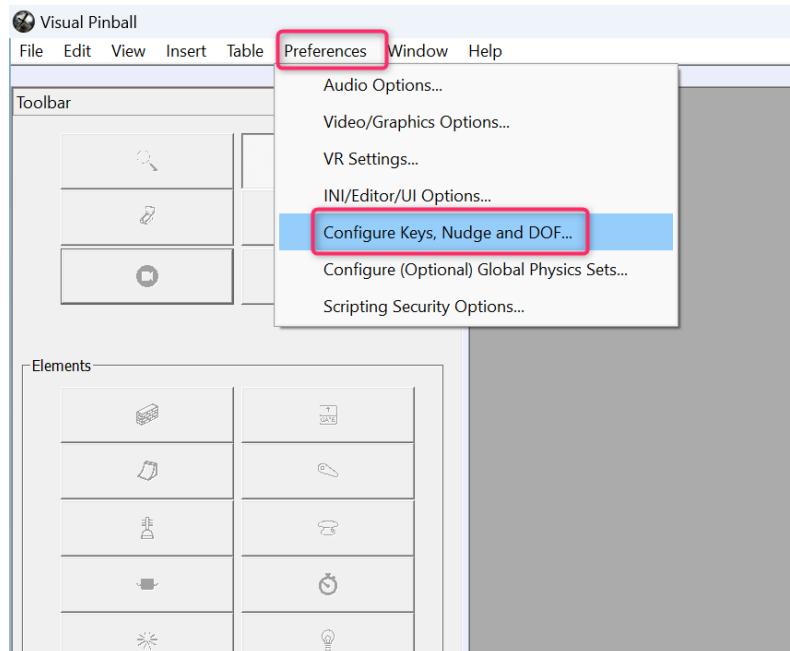
Load **VTConfig-VPX-NODOF.json** in Pinscape Pico Config Tool:

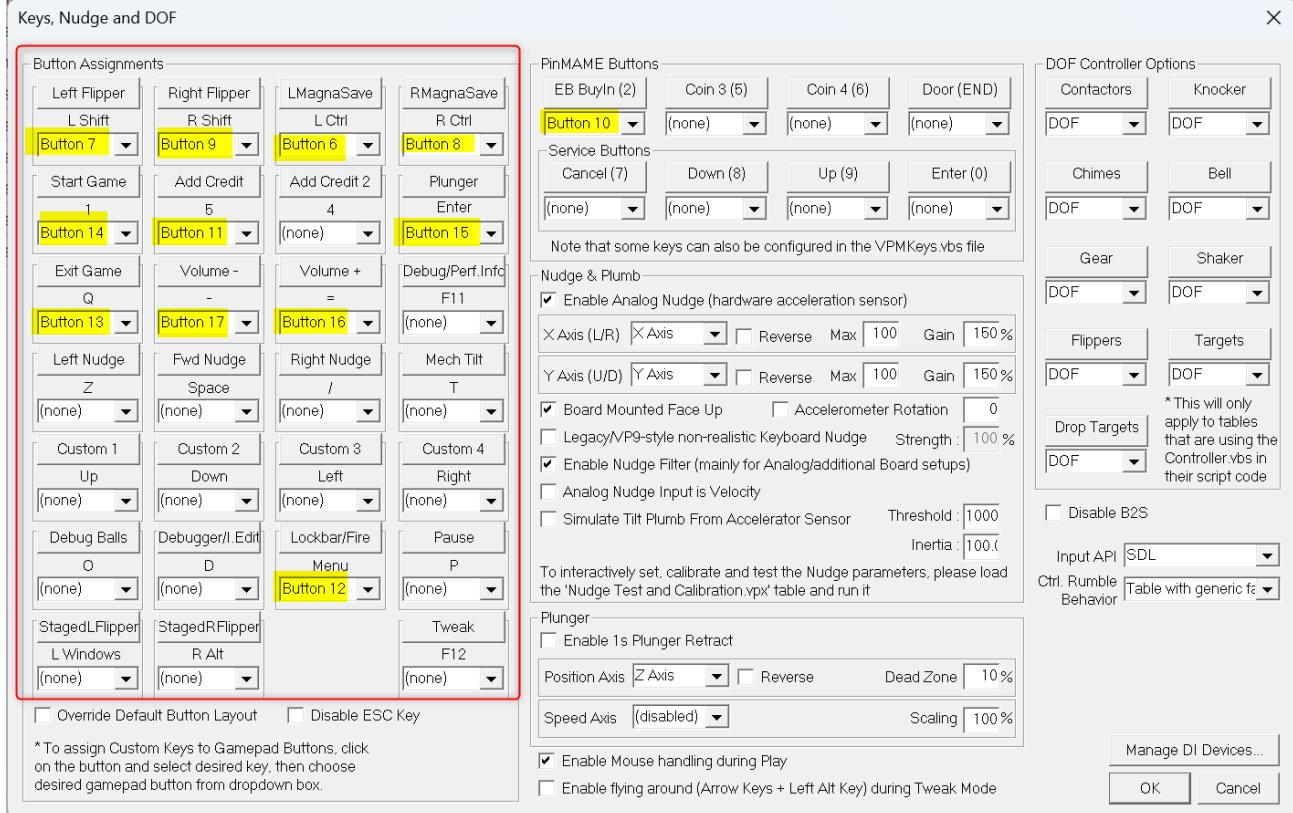


In Pinscape Pico config tool go to **Buttons** tab and note your buttons numbers (press every button):

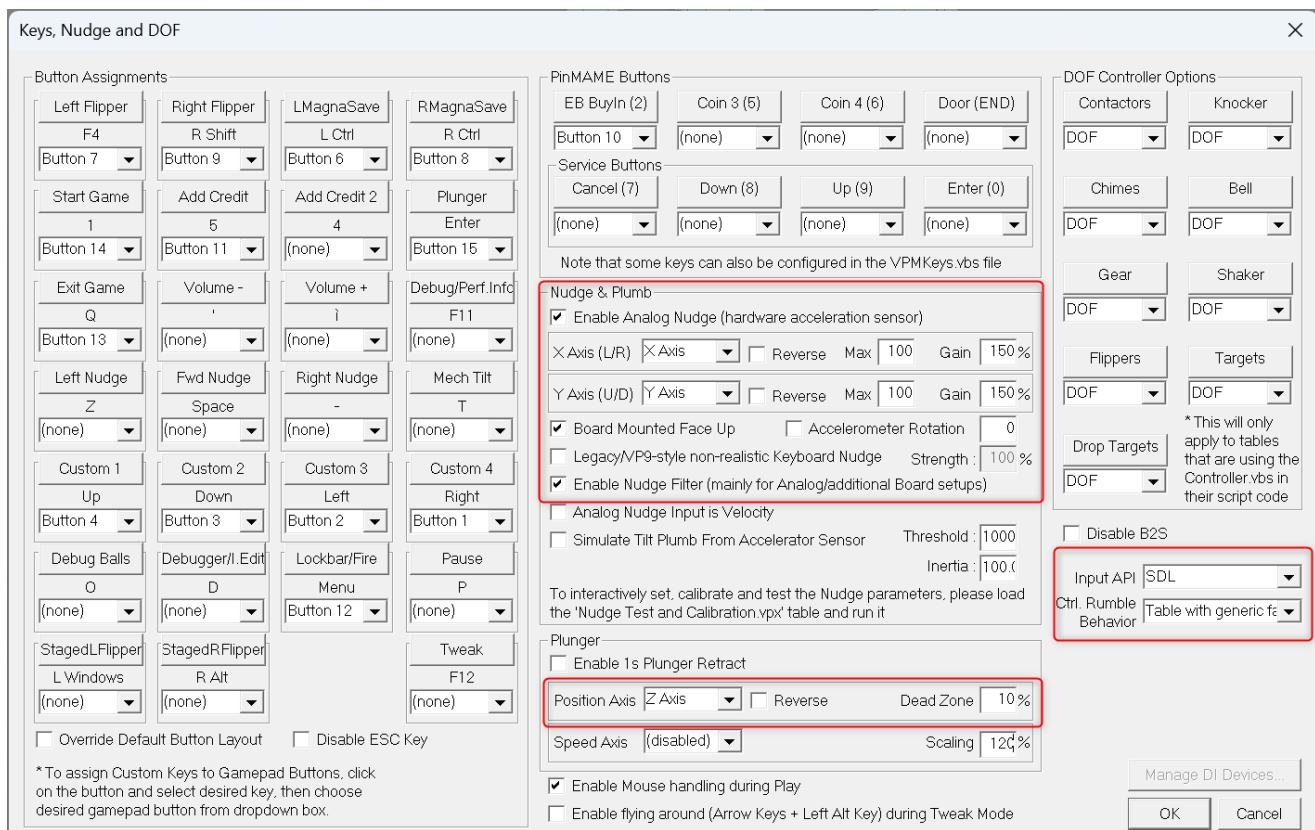
Logical Buttons
#0 Off Pushbutton GPIO (GP27) => Keyboard =
#1 Off Pushbutton GPIO (GP26) => Keyboard -
#2 Off Pushbutton GPIO (GP16) => Keyboard End
#3 Off Pushbutton GPIO (GP0) => Gamepad Button 5
#4 Off Pushbutton GPIO (GP1) => Gamepad Button 1
#5 Off Pushbutton GPIO (GP2) => Gamepad Button 2
#6 Off Pushbutton GPIO (GP3) => Gamepad Button 3
#7 Off Pushbutton GPIO (GP4) => Gamepad Button 4
#8 Off Pushbutton GPIO (GP10) => Gamepad Button 6
#9 Off Pushbutton GPIO (GP9) => Gamepad Button 7
#10 Off Pushbutton GPIO (GP18) => Gamepad Button 8
#11 Off Pushbutton GPIO (GP19) => Gamepad Button 9
#12 Off Pushbutton GPIO (GP13) => Gamepad Button 10
#13 Off Pushbutton GPIO (GP14) => Gamepad Button 11
#14 Off Pushbutton GPIO (GP11) => Gamepad Button 12
#15 ON Pushbutton GPIO (GP12) => Gamepad Button 13
#16 ON Pushbutton GPIO (GP15) => Gamepad Button 14
#17 Off Pushbutton GPIO (GP22) => Gamepad Button 15

Assign all buttons you need in VPX:



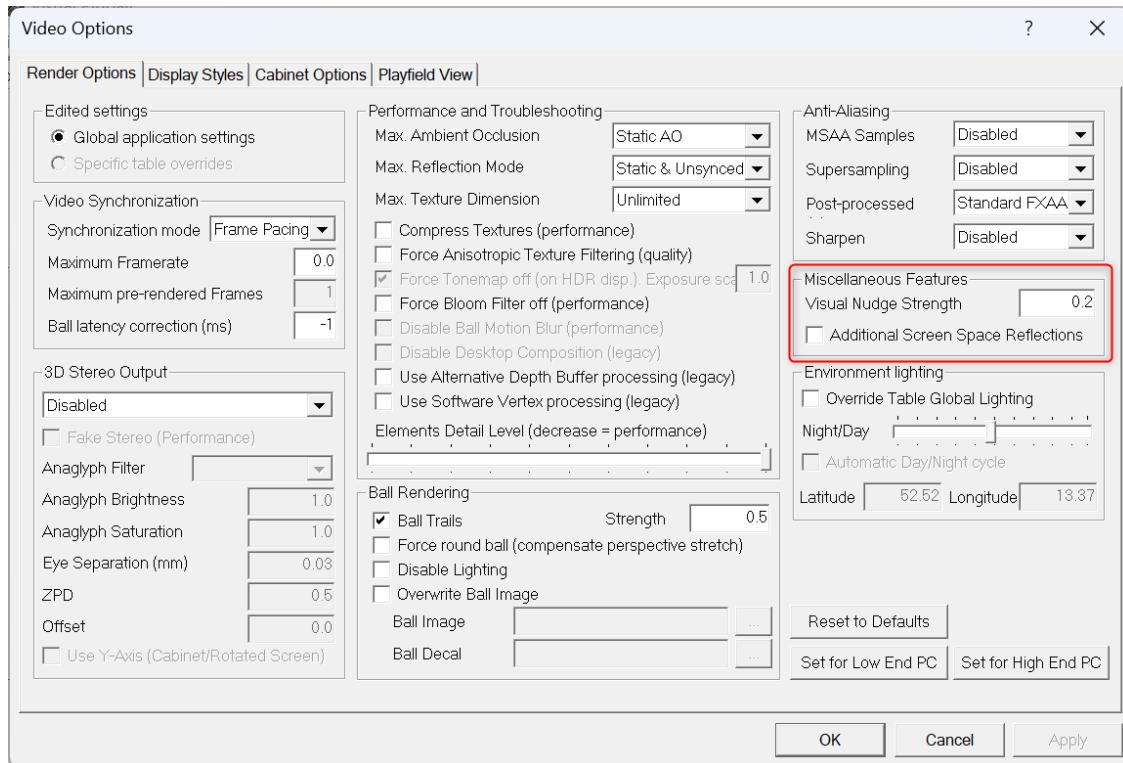


Replicate also the following configuration in Visual Pinball X settings:



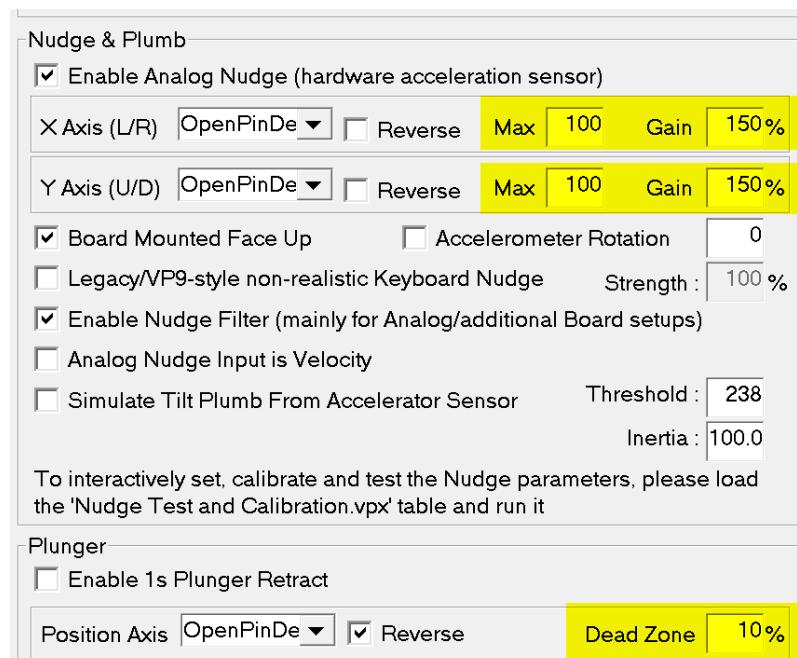
## Nudge/Tilt configuration

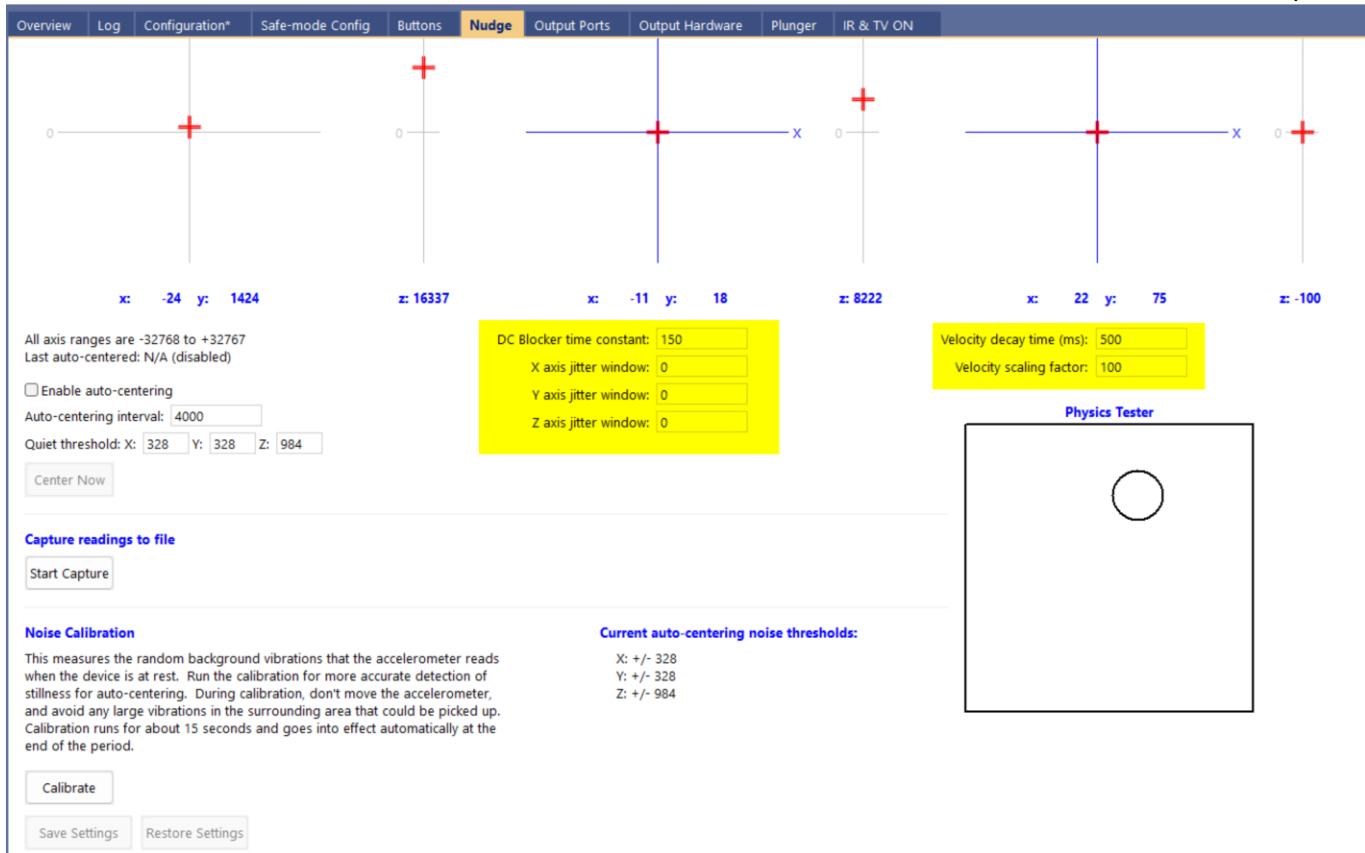
We recommend starting with the following values and modifying them afterwards:



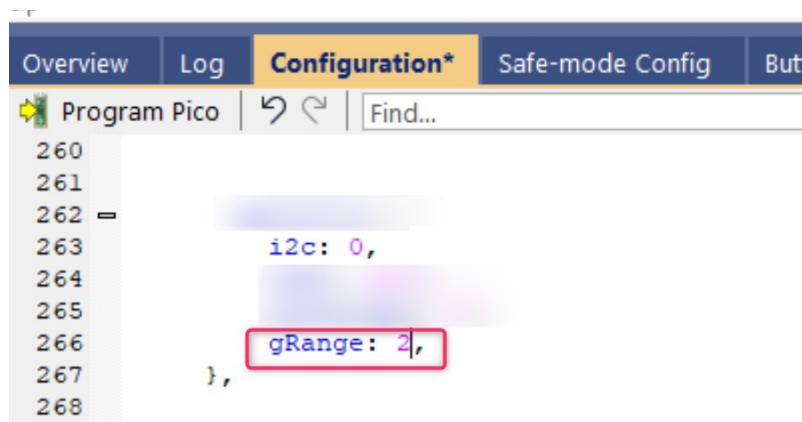
Visual Nudge Strength: **0.2**

**VERY IMPORTANT NOTE:** You need to find your right settings (according to your personal preferences) for nudging. You can adjust both Pinscape Pico accelerometer settings and VPX settings until you find your perfect spot:





You can also increase accelerometer sensitivity by changing gRange value to 2 in any profile:



Please refer to the official Pinscape Pico reference for additional information about accelerometer parameters: <http://mjrnet.org/pinscape/PinscapePico/Help/NudgeWin.htm>