

VIRTUATILT - VISUAL PINBALL X SETUP

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

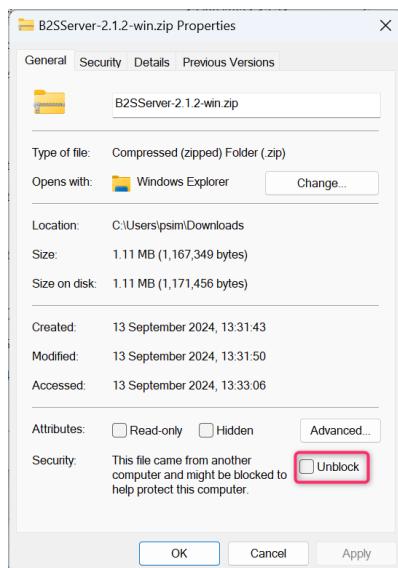
DOF Installation

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**

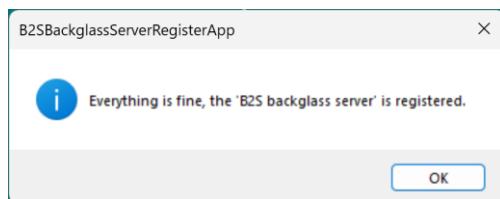
Pico support: <http://mjrnet.org/pinscape/dll-updates.html>

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:

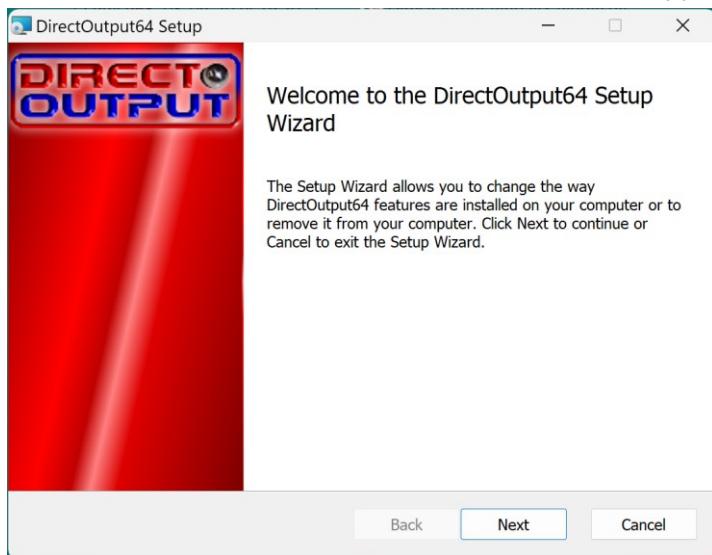


Unzip the B2SServer archive in VisualPinball folder (typically **C:\vPinball\VisualPinball\Tables**) and run the **B2SBackglassServerRegisterApp.exe** as Administrator (right-click). This registers the software as a COM object:

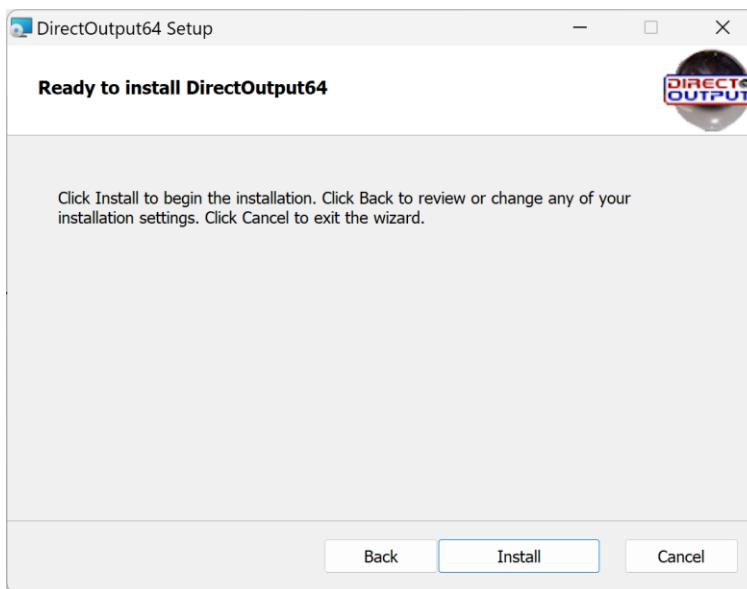
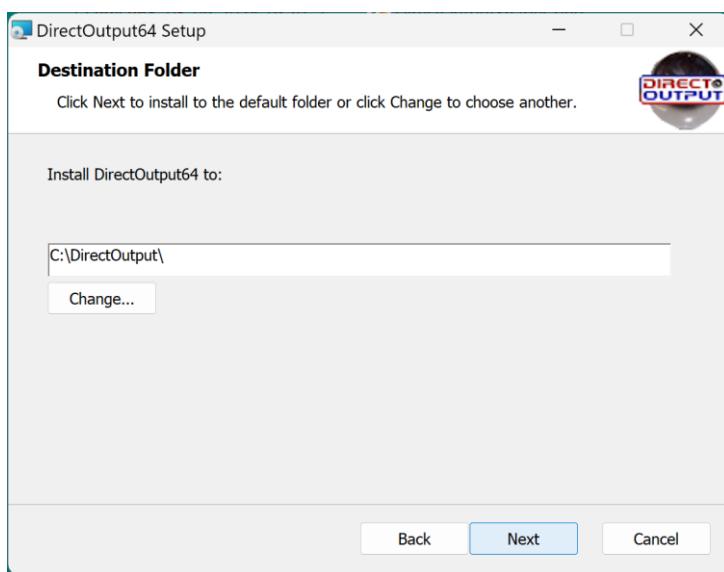


Latest version of DOF allows merging of X86 and X64 installs, so you can safely install both versions.

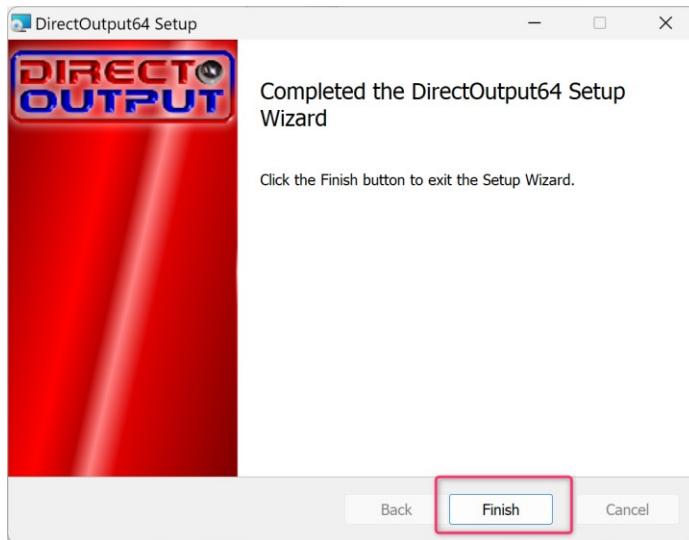
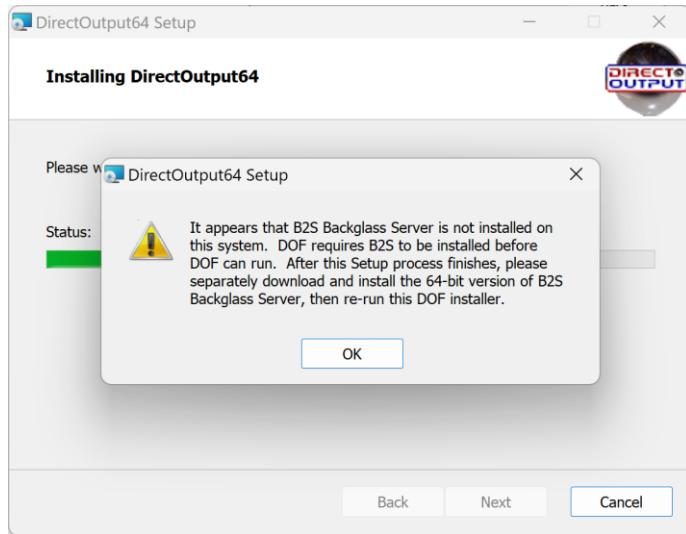
Install DOF using .msi files from official page: <http://mjrnet.org/pinscape/dll-updates.html> and launch it:



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:

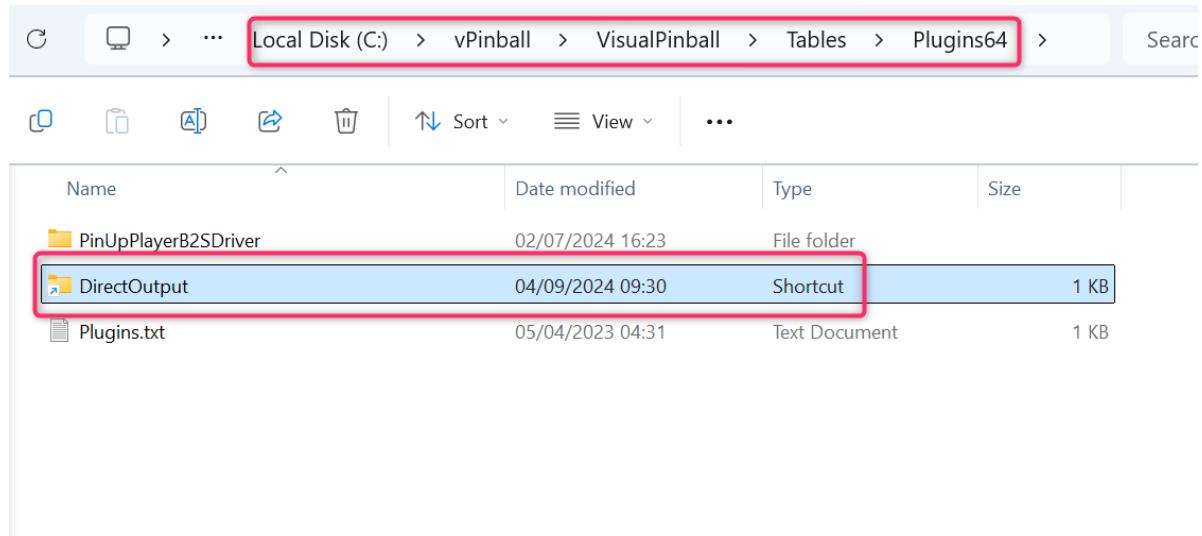


This is how the \DirectOutput folder will look like:

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 folder contains several files and subfolders: "Config", "x64", "DirectOutputShapes.png", "DirectOutputShapes.xml", and "LICENSE".

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):



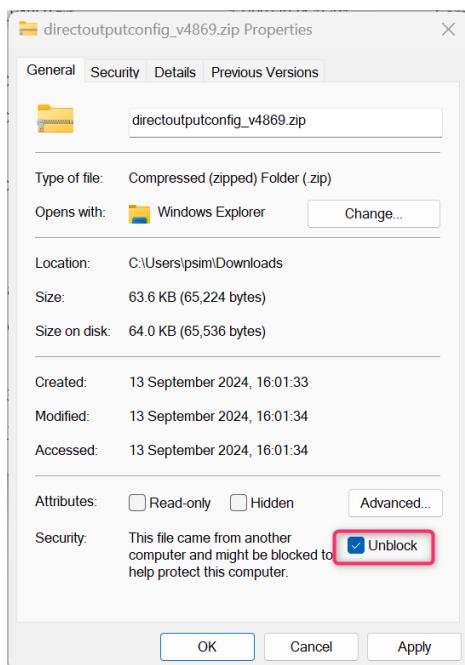
If not, manually create a shortcut to **DirectOutput** folder and put it in **Plugins64** folder of B2SServer installation.

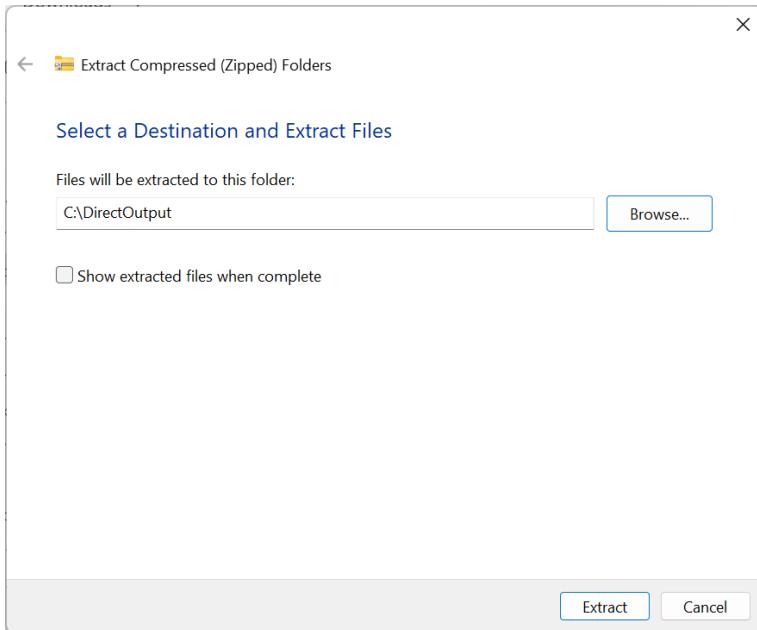
As a reference, the official step-by-step guide for DOF configuration is available here: [Pinscape Build Guide \(mjrnet.org\)](https://mjrnet.org/).

Configure DOF for VirtuaTilt

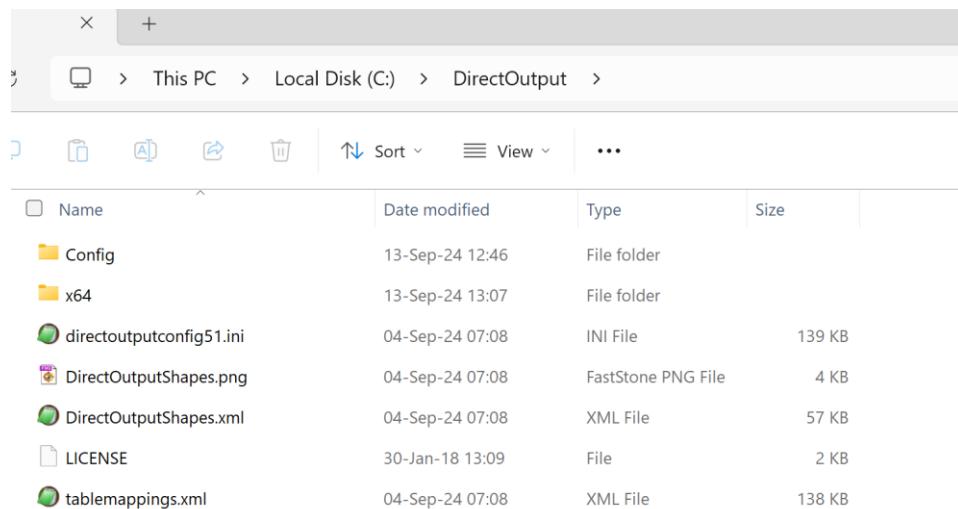
To configure DOF you need to set up a configuration file. You can create an account and login to the [DOF Config tool](#) webpage or [you can just download provided config files from our GitHub repository \(including cabinet file\)](#), unblock the file and copy/move the files into **C:\DirectOutput**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

Version	Submitted By	Approved By	Table	Comment	Recorded
5213	Mecols	outhere	JAWS 50TH Anniversary	Jaws	Sep 7, 2025

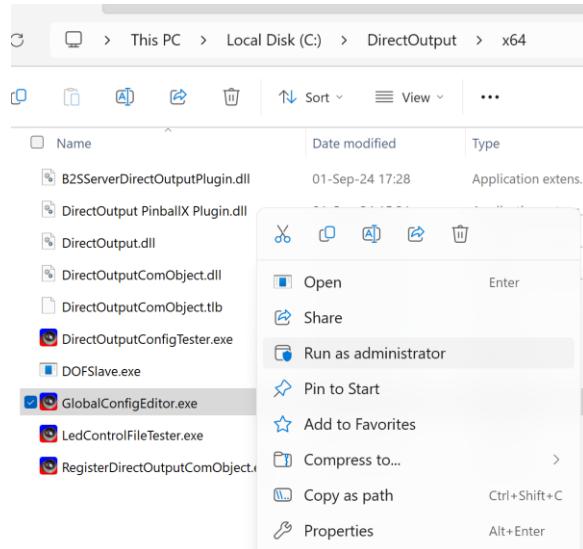




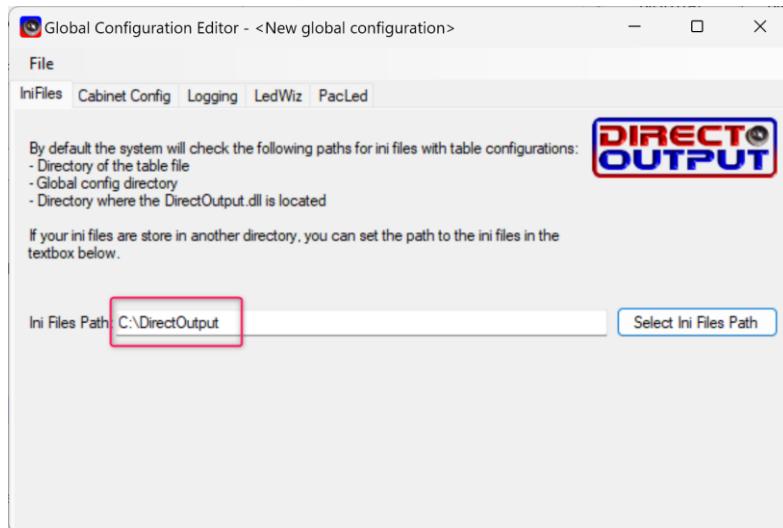
This is how the **DirectOutput** folder will look like:



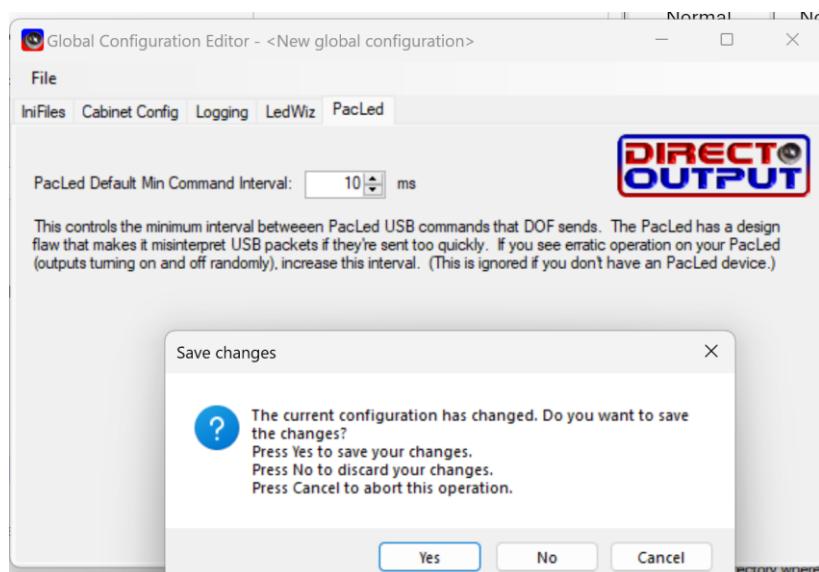
Now right-click **GlobalConfigEditor.exe** file in **/DirectOutput/X64** and in **/DirectOutput/X86** folder and launch it as Administrator:



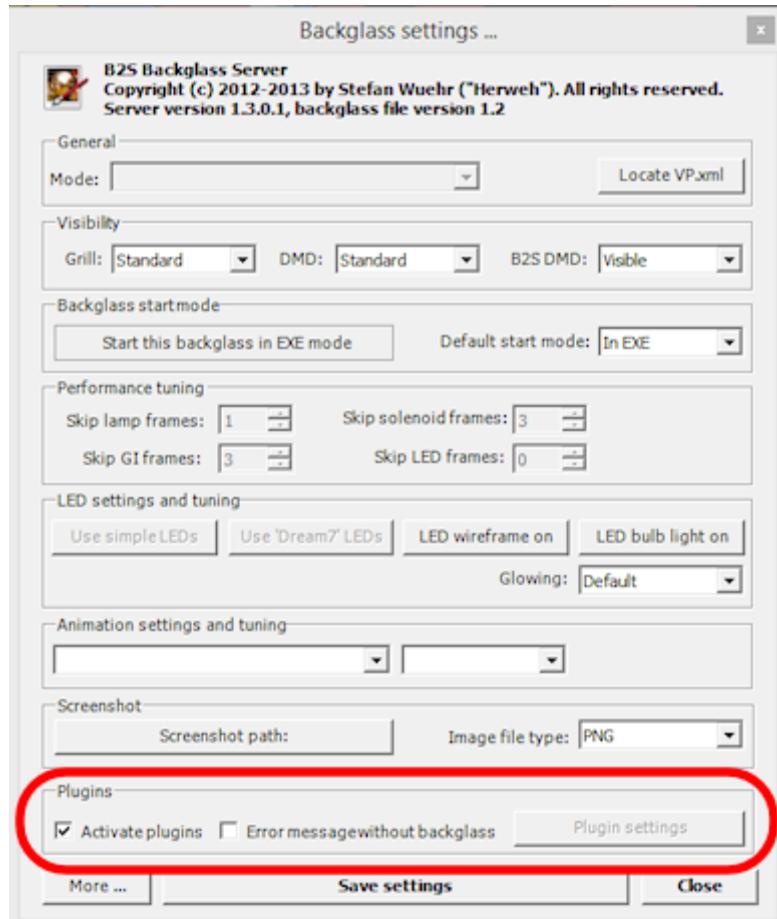
Configure .ini file path where you previously unzipped our config file (**C:\DirectOutput**):



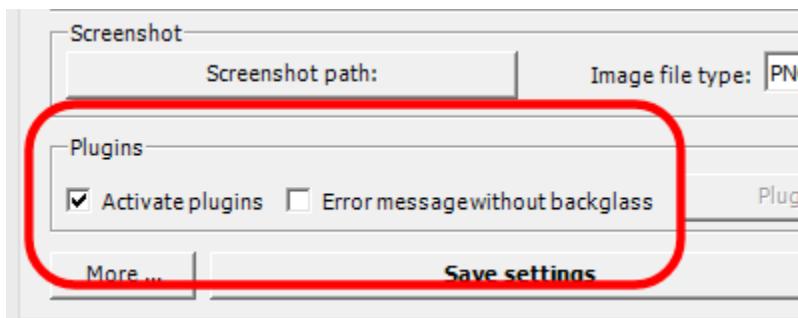
Close the window and press **Yes** to save all changes:



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**.

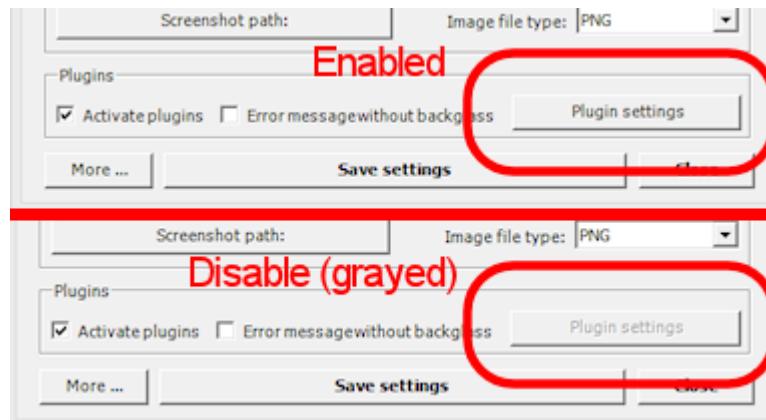


Make sure that **Activate plugins** flag is checked and **Error message without backglass** flag is un-checked

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

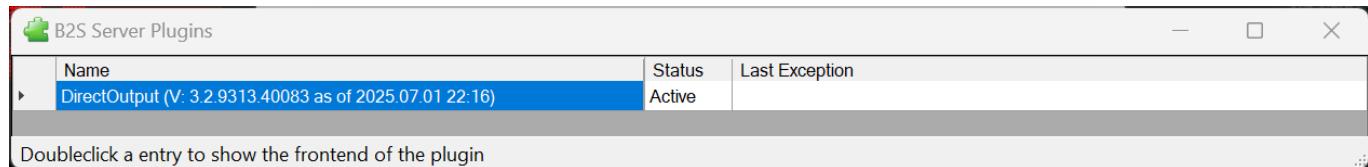
Now start VisualPinball and load a table that has a B2S backglass. You can use the same table you used during the setup procedure in the step where we updated the B2S backglass settings.

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 the GitHub interface for the `VirtuaTilt / DirectOutput` repository. The left sidebar shows a tree view of files: `main`, `Configurations`, `DOFLinx`, `DirectOutput` (which is selected), and `Images`. The main area displays a list of files with their last commit messages and dates:

Name	Last commit message	Last commit date
<code>..</code>		
<code>VirtuaTilt.json</code>	Added VirtuaTilt cabinet file for DOF ConfigTool	3 months ago
<code>directoutputconfig_v5213.zip</code>	Updated to v5213	6 minutes ago
<code>readme.md</code>	Updated to v5213	4 minutes ago
<code>readme.md</code>		

The screenshot shows the DOF Config Tool V3.0 interface. On the left, there's a sidebar with sections like Home, Stats, History, Feedback, Tables (Configurations, Templates), Cabinet (Manage, Variables, Combine Toys, Devices, Port Assignments), and a search bar for '1481 Tables'. The main area is titled 'Manage Cabinets' and shows a modal window for 'Import Cabinet...'. The modal has a 'Cabinet File' input field with a 'Drag & Drop your files or Browse' placeholder and two buttons: 'Import Cabinet' (highlighted with a red box) and 'Cancel'. To the right of the modal, there's a context menu with options like 'Actions', 'Rename', 'Regenerate API Key', 'Export Cabinet', 'Import Cabinet...', and 'Transfer Cabinet'.

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

The screenshot shows the DOF Config Tool V3.0 interface with the 'Devices' section selected in the sidebar. The main area displays the 'VirtuaTilt Pico' device configuration. It includes dropdown menus for various components: Ledwiz, FRCM-KL25Z, PinOne, PacDrive, Pacted, Ultimate/I/O, WS2811, SainSmart, Pinscape, Philips_Hue, Pincontrol1, Pincontrol2, and DudesCab. Below these are 'Options' settings for 'Generate NoFeedback Files' (set to 'No') and 'Remove Fade from Front Buttons' (set to 'No'). The top right of the device card has 'Switch cabinet' and 'Generate config' buttons, with 'Generate config' highlighted with a red box.

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 modded), 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

[Home](#)
[Stats](#)

1481 Tables

[History](#)

Latest Version: 5211

[Feedback](#)
[Tables](#)
[Configurations](#)

0 modded

[Templates](#)

0

[Cabinet](#)

^

[Manage](#)

2

[Variables](#)
[Combine Toys](#)

1

[Devices](#)

1

[Port Assignments](#)
[Donate](#)

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Port Assignments

[Switch cabinet](#)
[Generate config](#)
[More Actions...](#)

VirtuaTilt Pico

[Clear](#)
[Update](#)

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	▼

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

[Home](#)
[Stats](#)

1481 Tables

[History](#)

Latest Version: 5211

[Feedback](#)
[Tables](#)
[Configurations](#)

0 modded

[Templates](#)

0

[Cabinet](#)

^

[Manage](#)

2

[Variables](#)
[Combine Toys](#)

0

[Devices](#)

1

[Port Assignments](#)
[Donate](#)

Toy Combo Management

[Switch cabinet](#)
[Generate config](#)

VirtuaTilt Pico

[Edit](#)
[Delete](#)

ID

Name

Toy Category

Toys

 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

[Add](#)

Combo Name:

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:

DOF Config Tool V3.0

Variables

VirtuaTilt Pico

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

Contactor: Target Duration 60, Target Intensity 48, Drop Duration 60, Drop Intensity 48

Set Intensity and Duration to 0 if you don't want feedback to these events

Generate and Import your DOF config

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

DOF Config Tool V3.0

Variables

VirtuaTilt Pico

Shaker Motor: Min 48, Max 48

Fan: Min 1, Max 48

Toy Durations (ms): Chime 60, Knocker 60, Bell 60

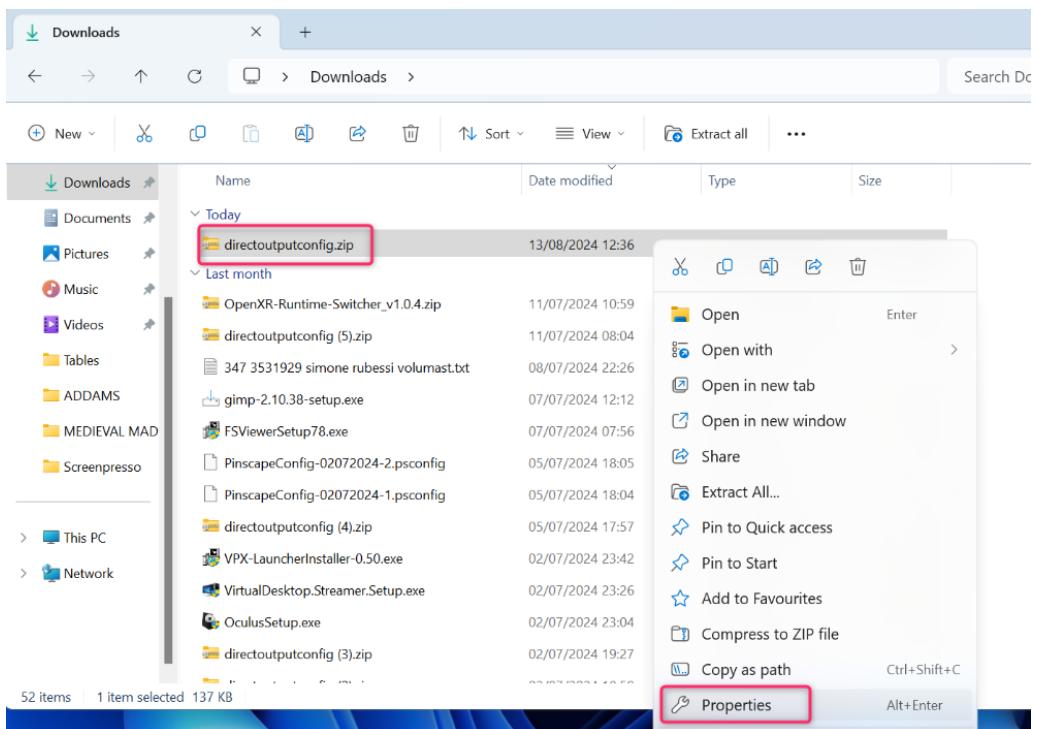
Custom Brightness: Strobe 48, PF Strobe MX FF, Flasher FF, LED Strip Flasher FF

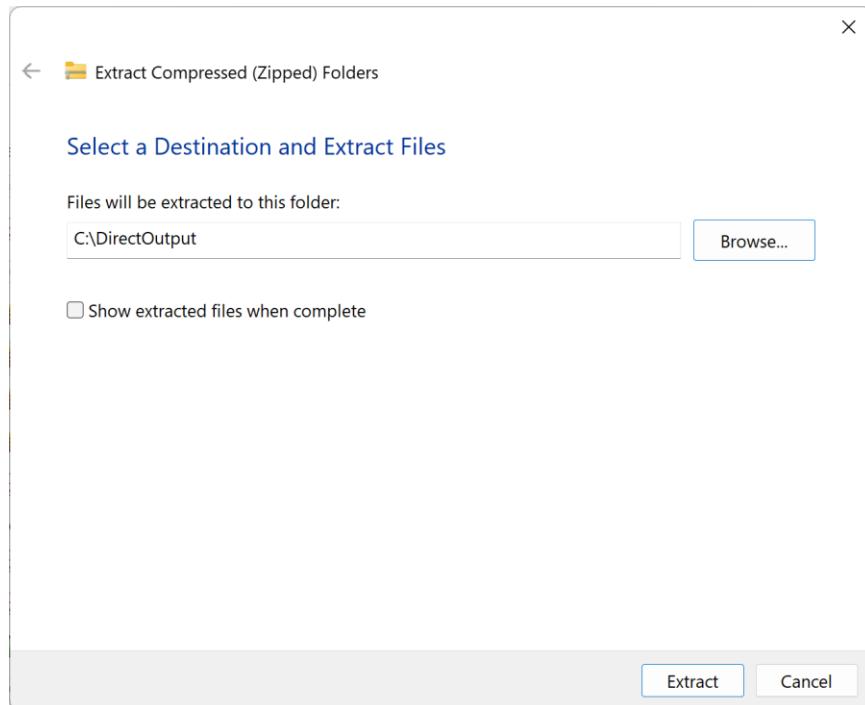
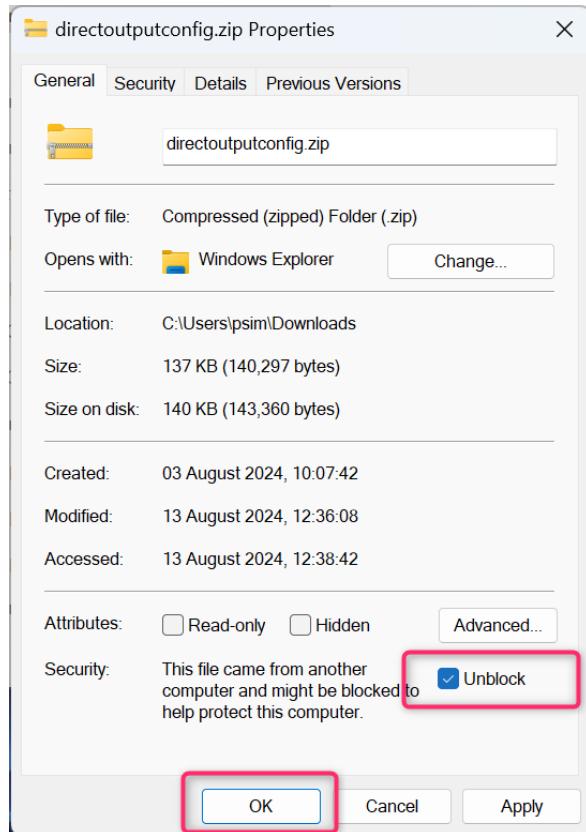
Contactor: Target Duration 60, Target Intensity 48, Drop Duration 60, Drop Intensity 48

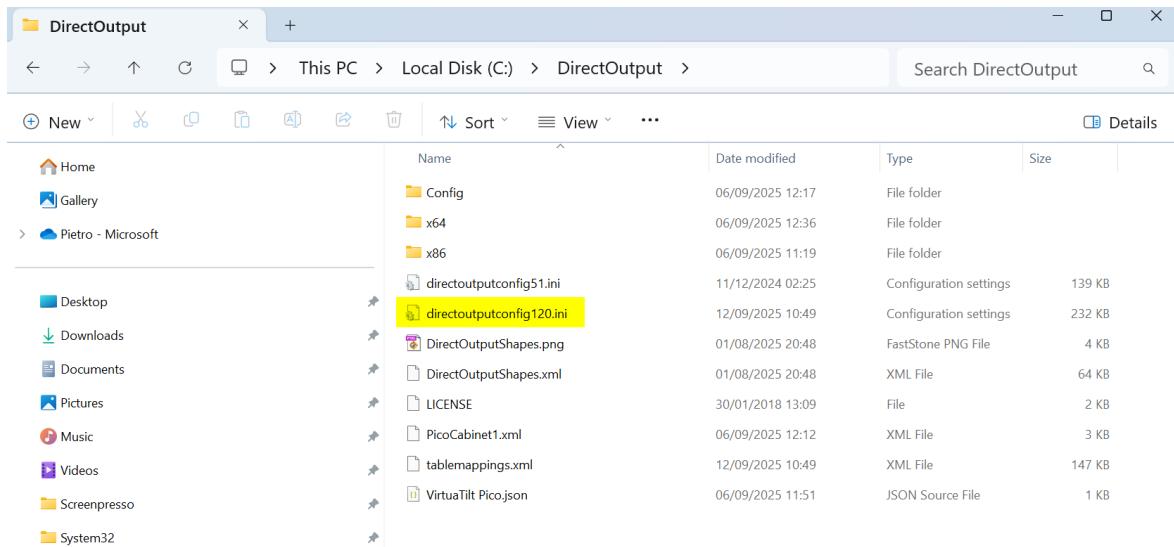
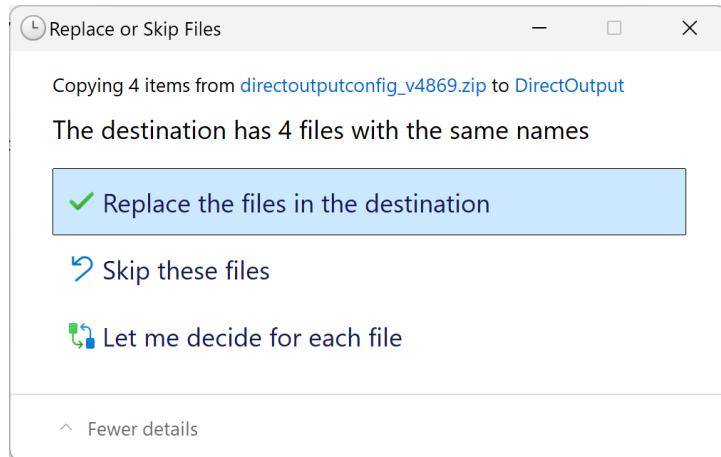
Set Intensity and Duration to 0 if you don't want feedback to these events

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 located at the bottom left 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:

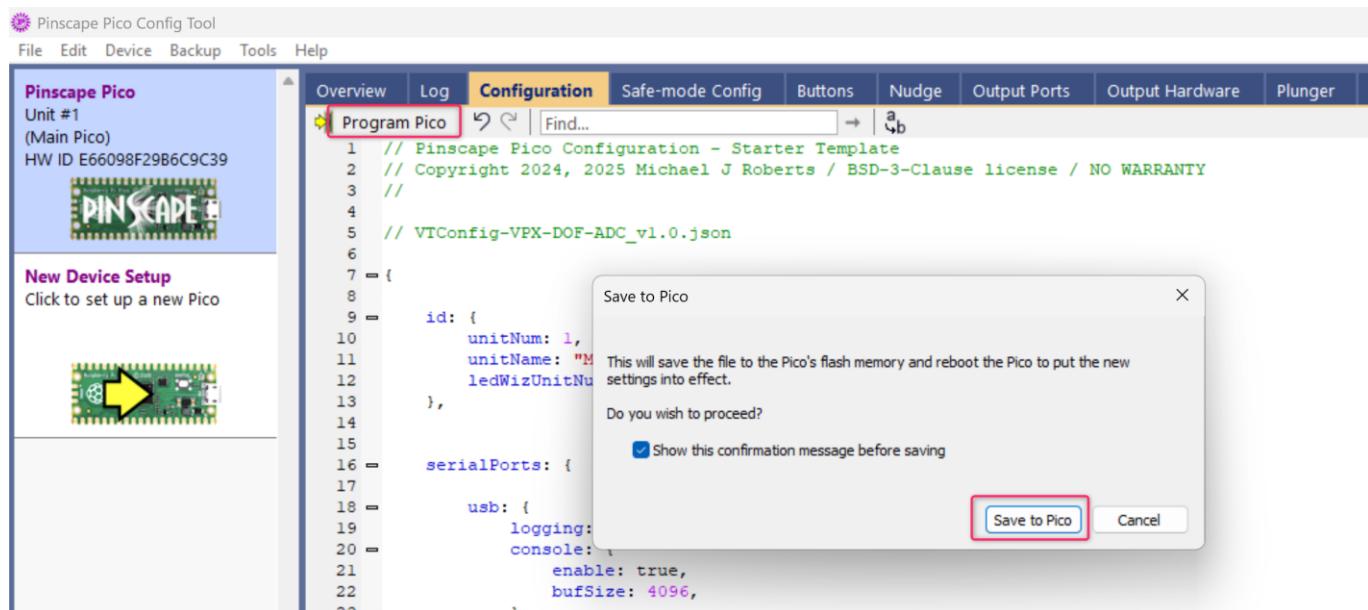
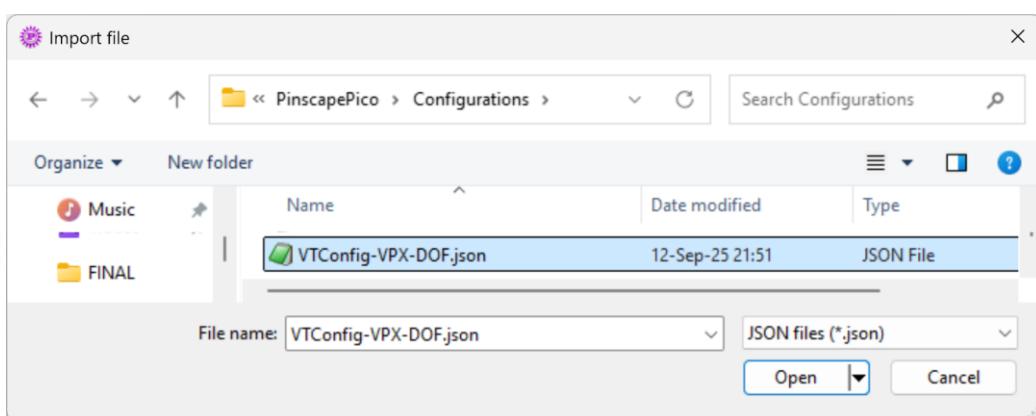




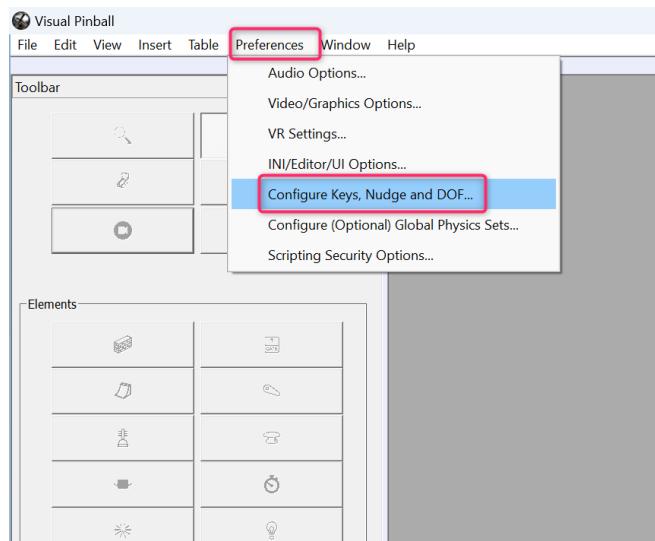


Visual Pinball X - General Configuration

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

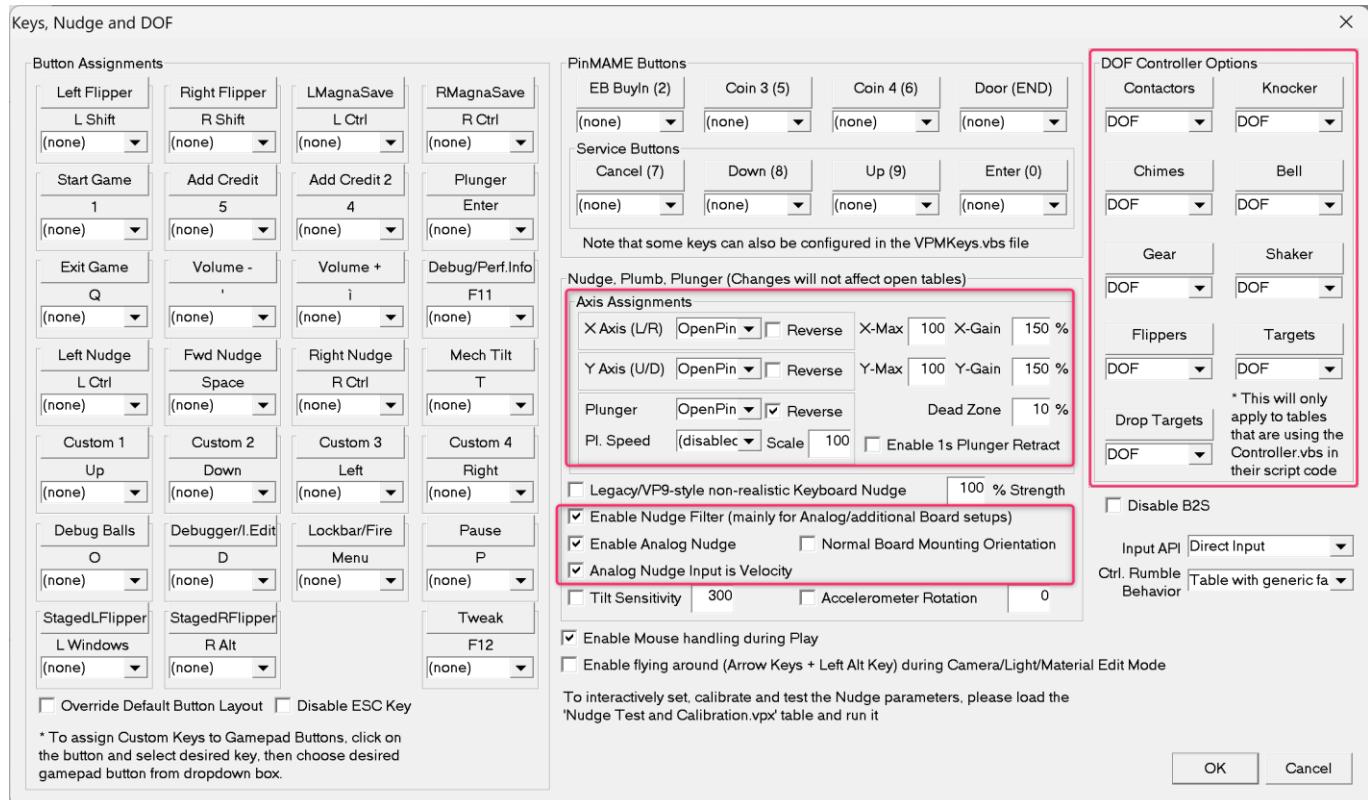
Enable 1s Plunger Retract
 Position Axis OpenPinDe Reverse Dead Zone 10%
 Speed Axis (disabled) Scaling 100%

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

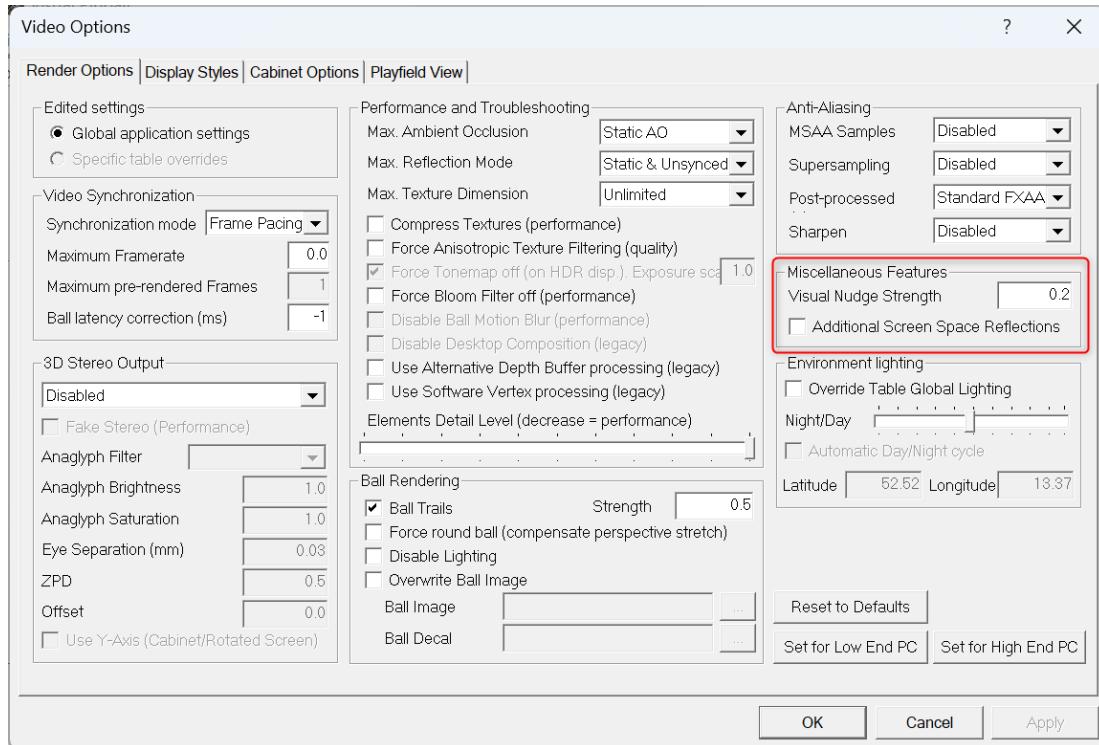


IMPORTANT NOTE: Depending on VPX versions (<https://github.com/vpinball/vpinball/releases>), you may also need to select/unselect “**Analog Nudge Input Is Velocity**” to have nudge working.

We strongly recommend to use latest VPX version.

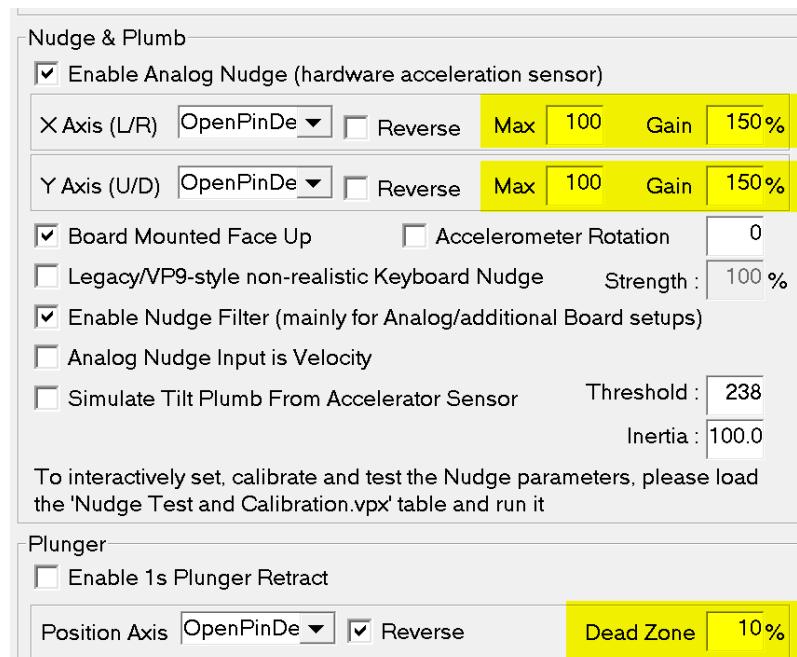
Visual Pinball X - Nudge/Tilt configuration

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



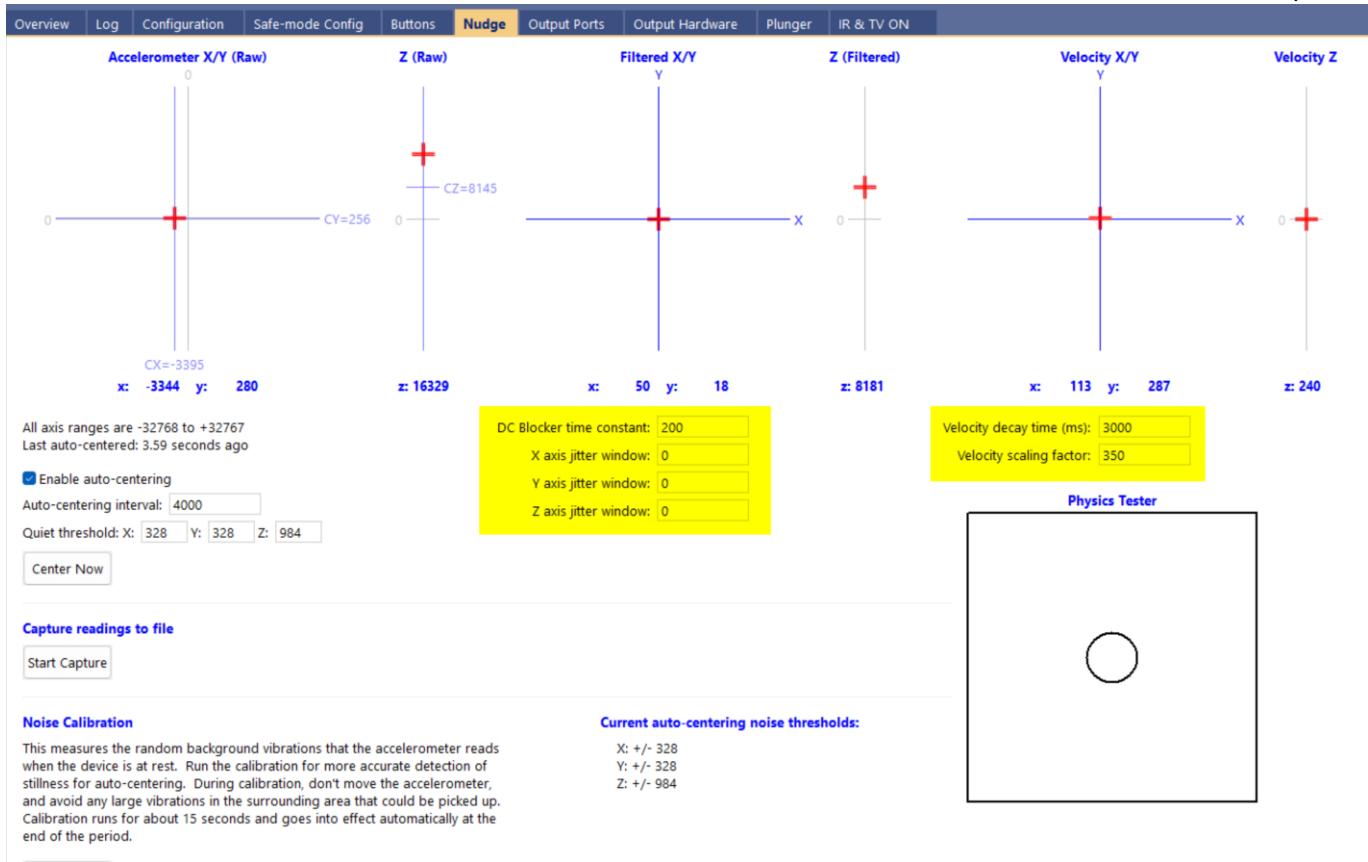
Visual Nudge Strength: **0.2**

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:

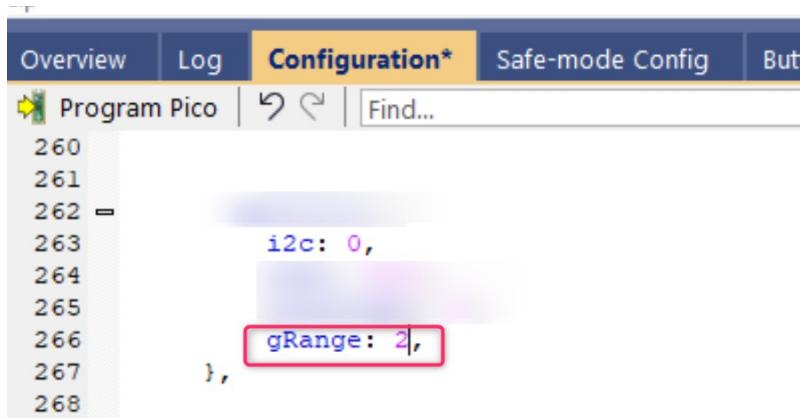


3DPTronics

VirtuaTilt RP2040–VPX Setup v1.3



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

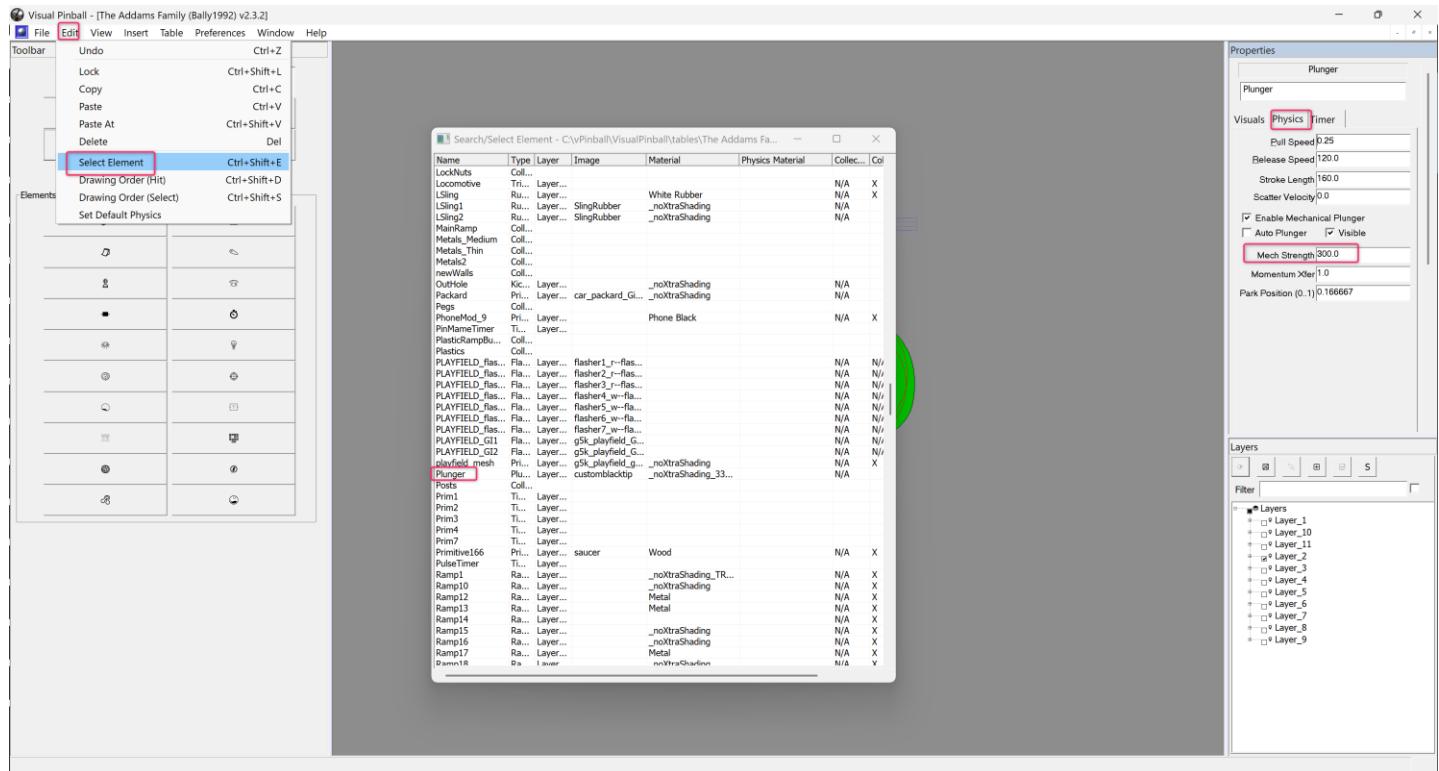


Please refer to the official Pinscape Pico reference for additional information about accelerometer parameters: <http://mjrnet.org/pinscape/PinscapePico/Help/NudgeWin.htm>

Visual Pinball X - Plunger configuration

If you feel that plunger is not strong enough for some VP tables, you can raise its **mechanical strength** in any table via software:

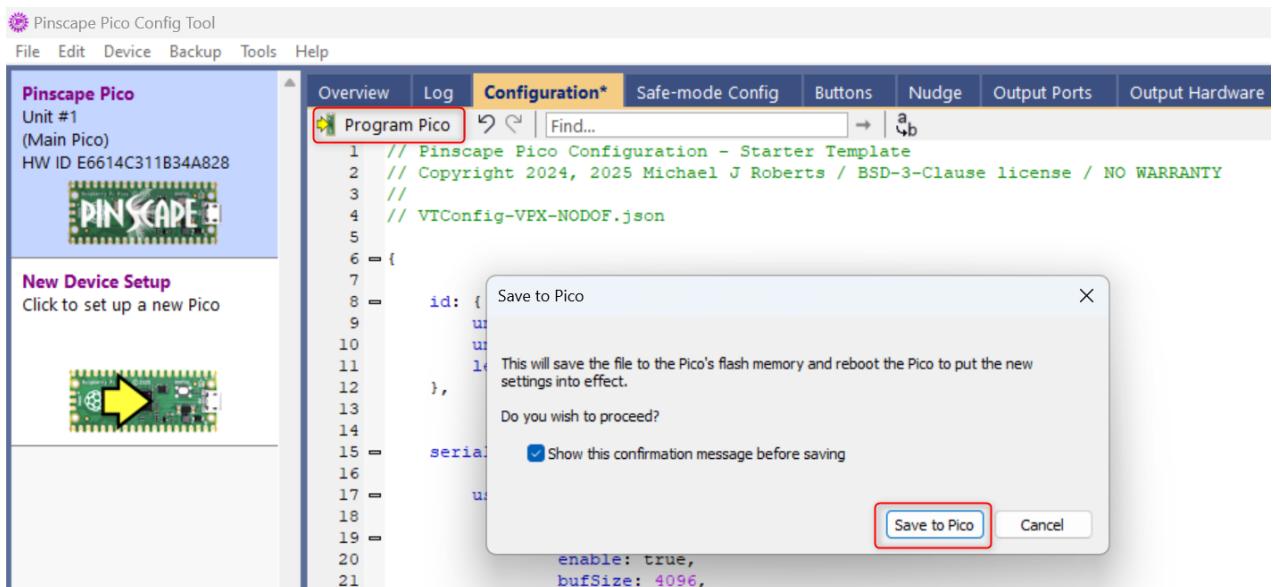
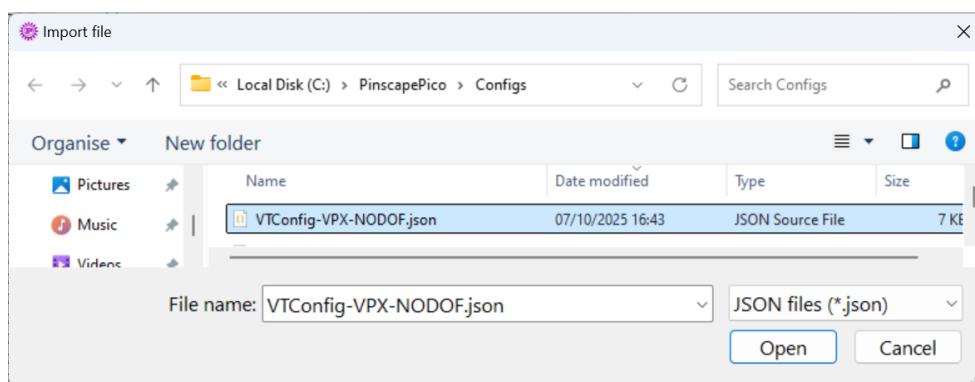
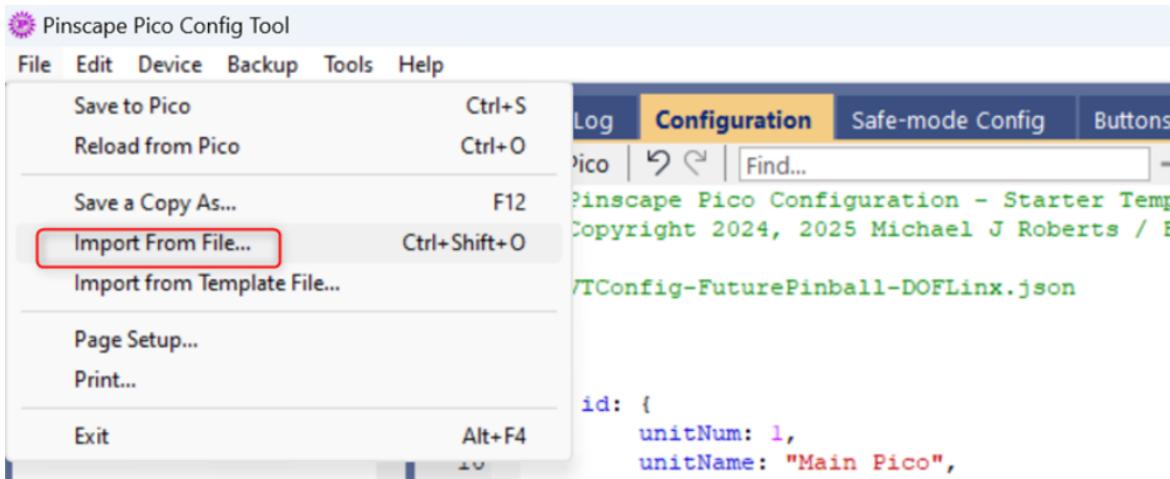
Edit → Select Element → Plunger → Physics → Mech Strength



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!

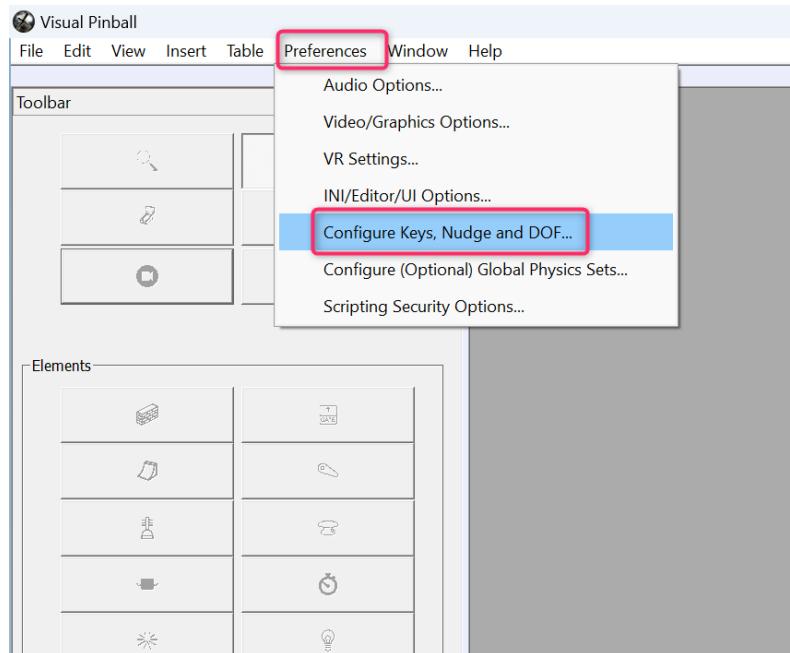
Load **VTConfig-VPX-NODOF.json** in **Pinscape Pico Config Tool**:

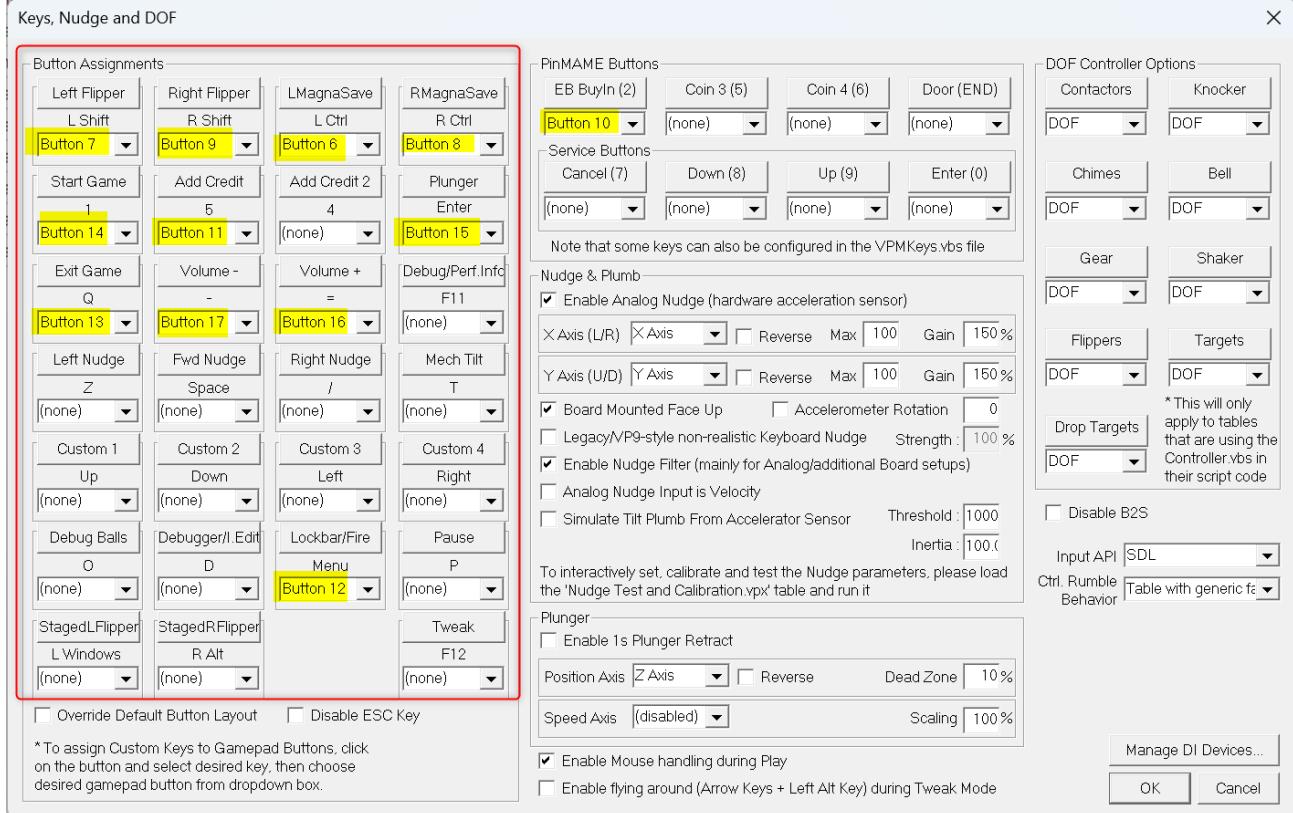


In Pinscape Pico config tool go to **Buttons** tab and note your buttons numbers (press every button):

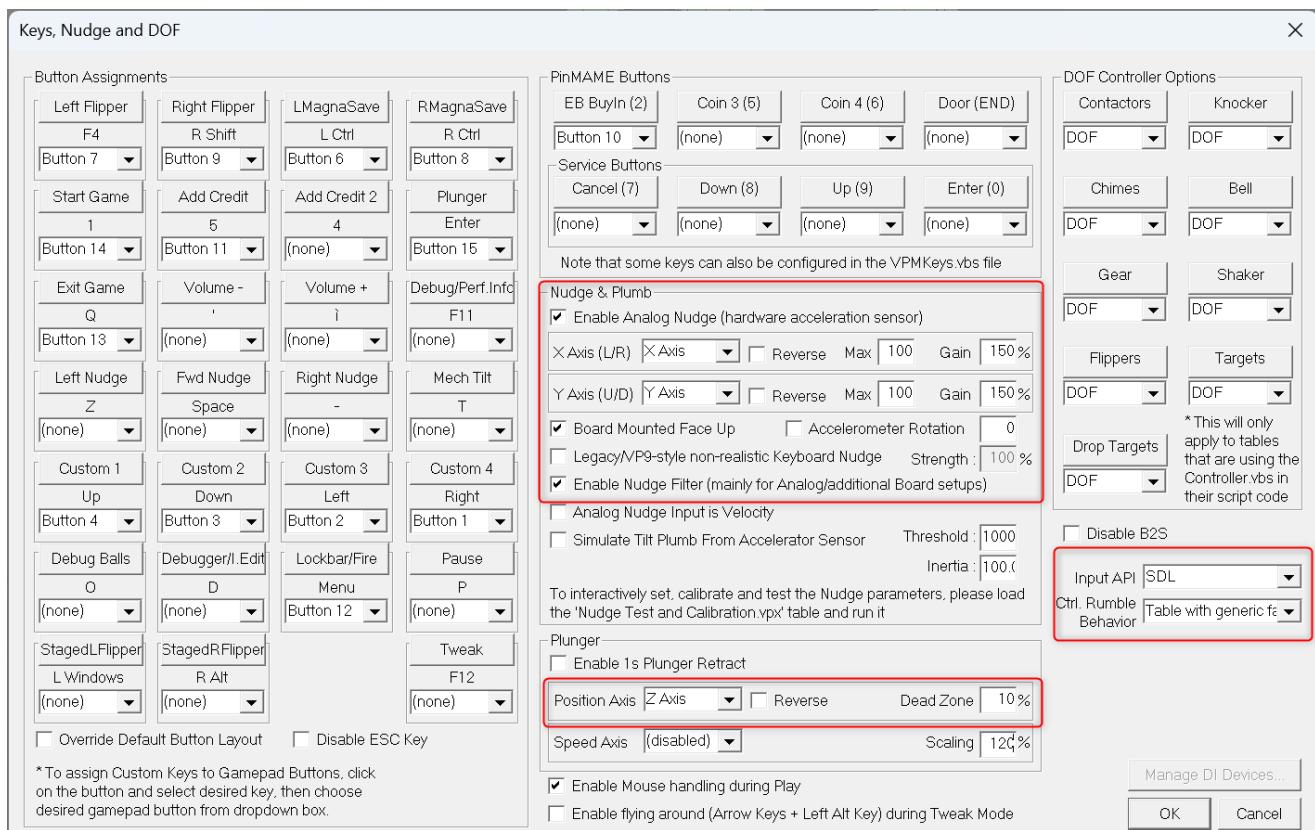
Logical Buttons			
#0	Off	Pushbutton	GPIO (GP27) => Keyboard =
#1	Off	Pushbutton	GPIO (GP26) => Keyboard -
#2	Off	Pushbutton	GPIO (GP16) => Keyboard End
#3	Off	Pushbutton	GPIO (GP0) => Gamepad Button 5
#4	Off	Pushbutton	GPIO (GP1) => Gamepad Button 1
#5	Off	Pushbutton	GPIO (GP2) => Gamepad Button 2
#6	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:



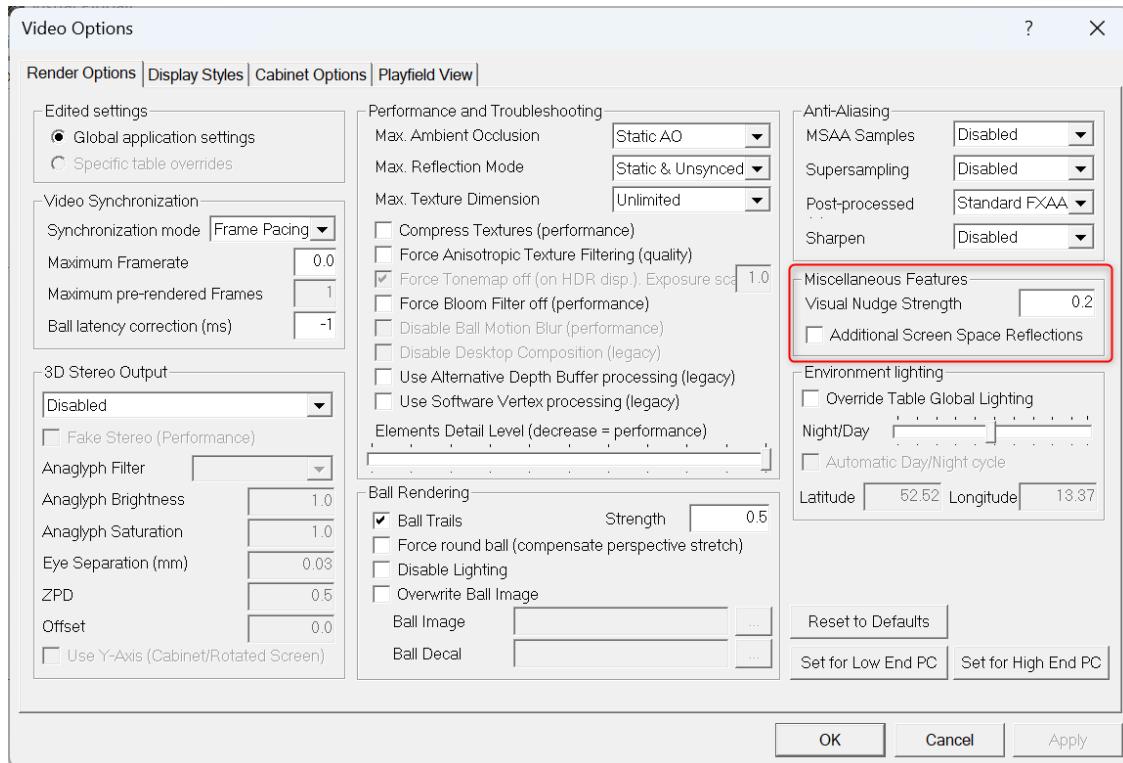


Replicate also the following configuration in Visual Pinball X settings (**VPX 10.8.1.XXXX**):



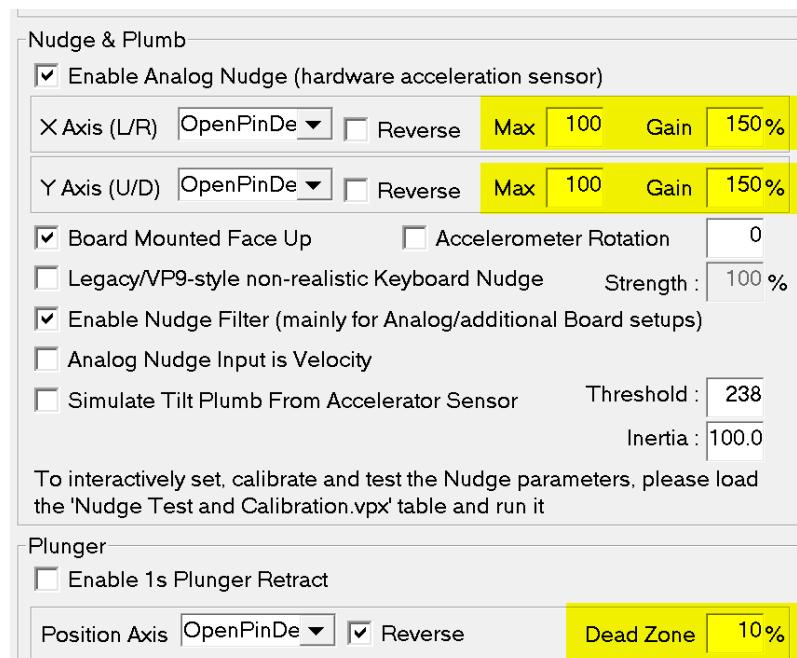
Nudge/Tilt configuration

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



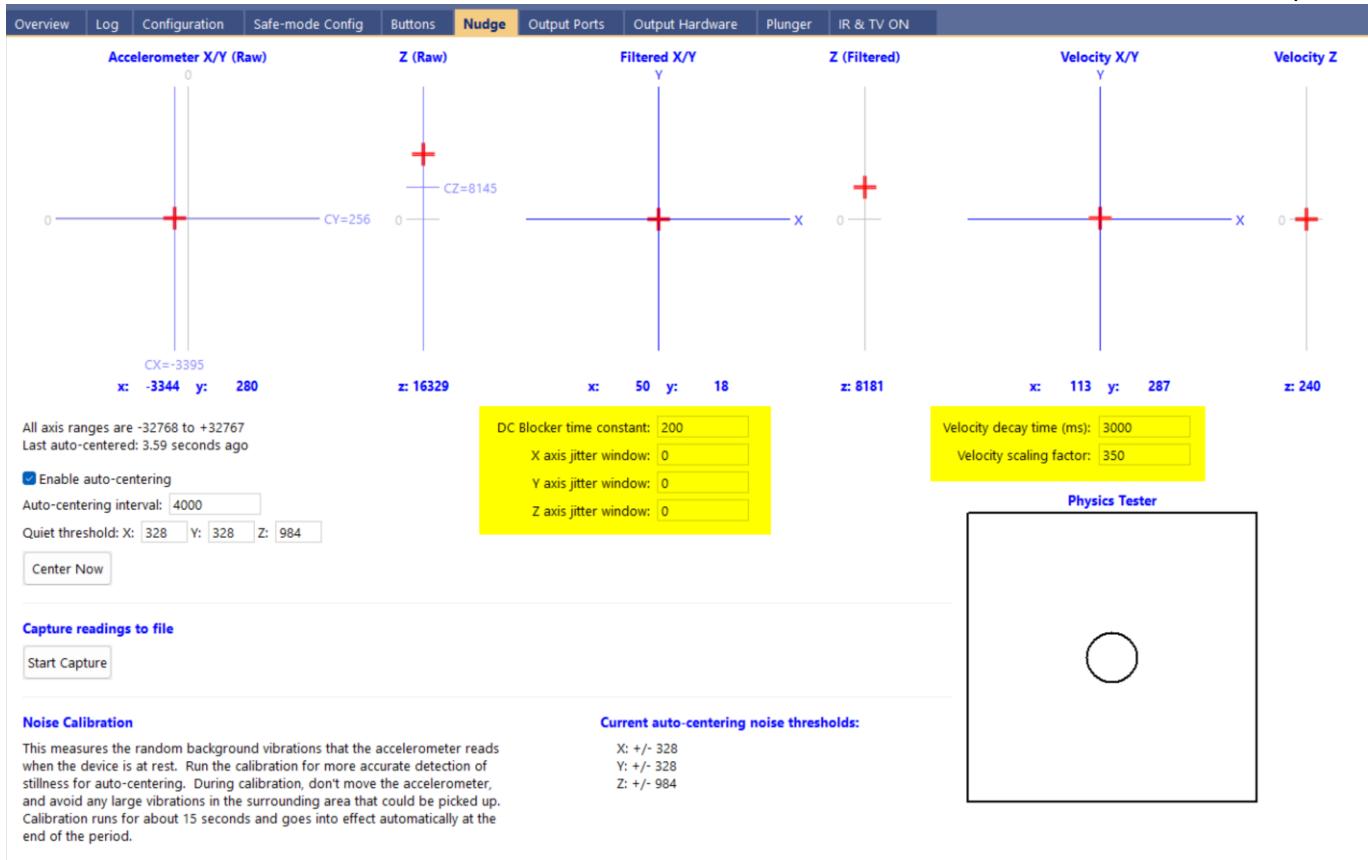
Visual Nudge Strength: **0.2**

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:

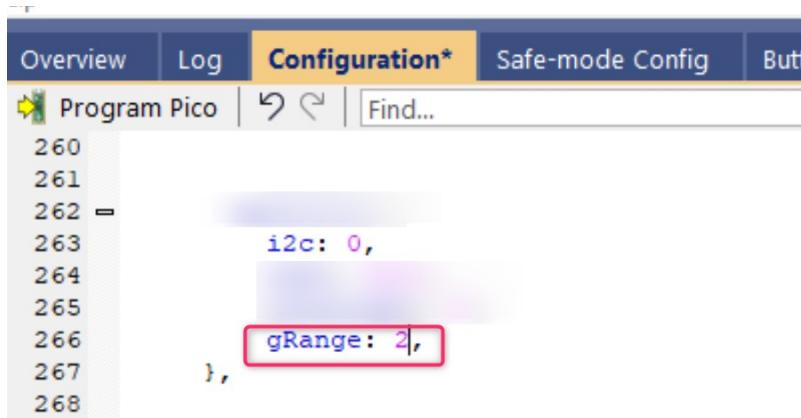


3DPTronics

VirtuaTilt RP2040–VPX Setup v1.3



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>