



VirtuaPin™ Plunger Kit

Installation Guide

Things You'll Need

TOOLS

Screwgun / Drill (corded or battery powered)

Screwdriver

FASTENERS

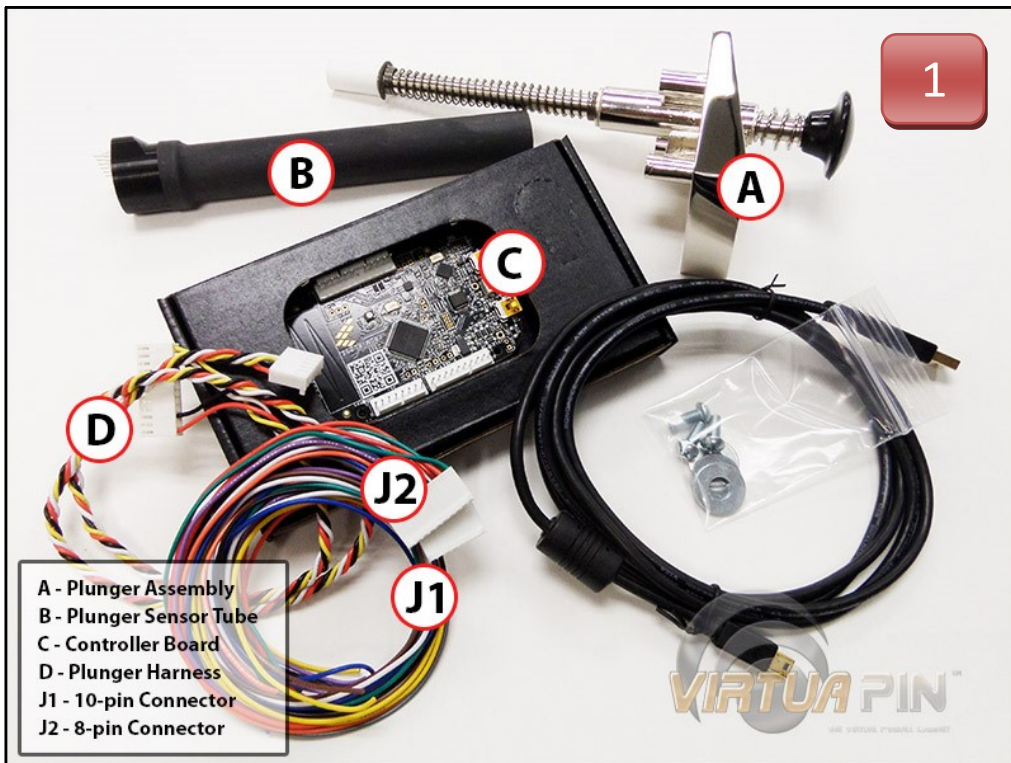
2 - #4 1/2" pan head screws (optional)

3 - 10-32 Machine Screws

3 - 1/4" Washers



Please read all warnings and follow all operating procedures of all equipment used in the installation of this product.



Plunger Kit Parts

When you receive your kit, please take a moment to ensure you've received all of the components found in the illustration on the left.

To wire the buttons to your kit, a terminal barrier strip, like the one below, is strongly suggested.



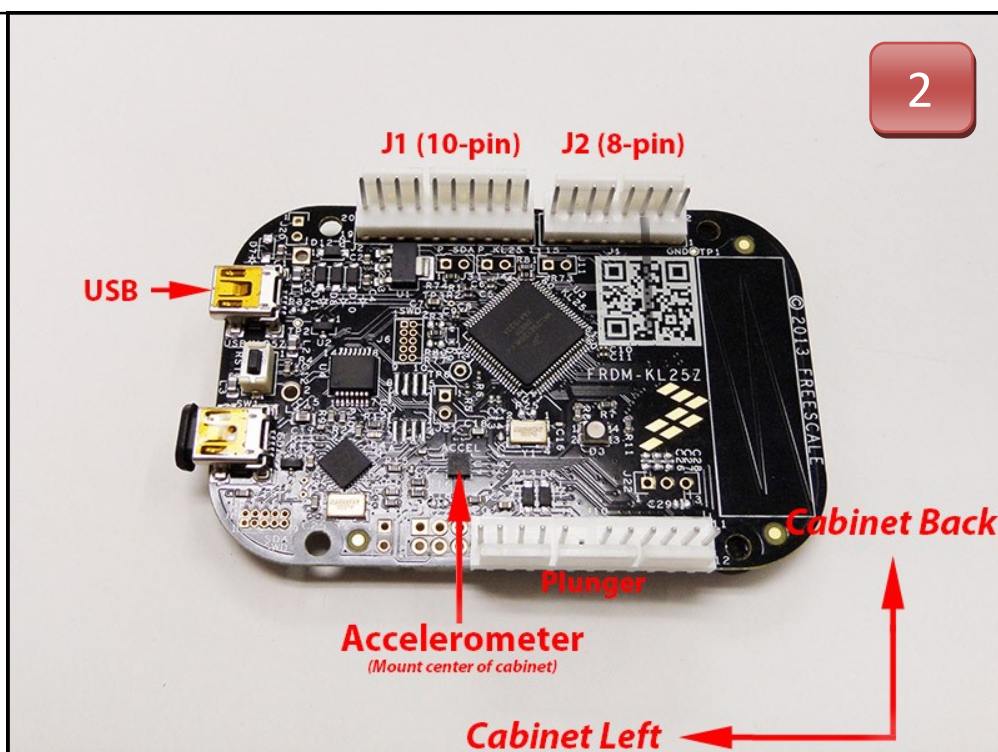
Note: If using screws to fasten the board to your cabinet's bottom, be sure to drill pilot holes, **DO NOT** over tighten and damage the board!

Setup

For optimal results, mount the board on the bottom of your cabinet face-up and oriented as pictured on the right. The J1 and J2 headers should be facing the cabinet and the USB connectors on the left side of the cabinet. Connect the plunger to the connector indicated to the right.

IMPORTANT!

Plunger MUST be connected before the board is powered on.



Warning: Motherboard USB power is often on, by default, even after shutdown. Be sure to disable power to your USB ports after PC is shutdown, or the board will be on 24/7, which can damage hardware and cause unexpected behavior (disconnecting). See ERP Settings in your motherboard manual for more info.

Wiring

(Pins are numbered left to right)

<u>J1 (10-Pin) Connector</u>				<u>J2 (8-Pin) Connector</u>			
<u>PIN</u>	<u>COLOR</u>	<u>BUTTON</u>	<u>Joy</u>	<u>PIN</u>	<u>COLOR</u>	<u>BUTTON</u>	<u>Joy</u>
<u>1</u>	Green	Launch Ball	1	<u>1</u>	Green	Start Game	9
<u>2</u>	Red	Right Flipper	2	<u>2</u>	Red	Left Flipper	10
<u>3</u>	—	Not Used	—	<u>3</u>	White	Left Magnasave	11
<u>4</u>	Black	Common/Ground	—	<u>4</u>	Yellow	Insert Coin 1	12
<u>5</u>	White	Right Magnasave	3	<u>5</u>	Purple	Insert Coin 2	13
<u>6</u>	Purple	Change Camera*	4	<u>6</u>	Brown	Test*	14
<u>7</u>	Orange	Toggle HUD*	5	<u>7</u>	Blue	Service*	15
<u>8</u>	Blue	Look at Backbox*	6	<u>8</u>	Black	Ground	—
<u>9</u>	Gray	Pause	7				
<u>10</u>	Yellow	Exit Table	8				

* Used with Future Pinball

USB and Calibration

DO NOT USE WINDOWS CALIBRATION!

Plug the cable into the connector pictured above in **Diagram 2**, and then into your PC. The controller will automatically be detected, and the drivers installed.

To initially calibrate the plunger, open the VirtuaPin Controller Software (<https://virtuapin.net/download/VirtuaPin-0.1.10.0.zip>), found on the product page.

- 1 - Pull the plunger all the way back and release.
- 2 - Find the plunger range value, next to the graphic for the plunger toward the top.
- 3 - Enter that value - 50 in the plunger range field at the bottom
- 4 - Click Save

The plunge behavior itself is entirely based on the plunger object in the table. For best results, I've found the following settings best ...

Pull speed: 1

Release speed: 110

Stroke length: 180

Mech strength: 85

Make sure the Enable Mechanical Plunger box is checked.

Note: some tables aren't easy to mod the plunger this way. Your mileage may vary per table.

Setting Up Visual Pinball

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	.	=	F11
(none)	(none)	(none)	(none)
Left Nudge	Fwd Nudge	Right Nudge	Mech Tilt
Z	Space	/	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	
O	D	Menu	
(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 BuyIn (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)

Nudge, Plumb, Plunger (Changes will not affect open tables)

Axis Assignments			
X Axis (L/R)	X Axis	<input type="checkbox"/> Reverse	X-Max 100 X-Gain 150 %
Y Axis (U/D)	Y Axis	<input type="checkbox"/> Reverse	Y-Max 100 Y-Gain 150 %
Plunger	Z Axis	<input type="checkbox"/> Reverse	Dead Zone 12 %
<input type="checkbox"/> Legacy/VP9-style non-realistic Keyboard Nudge 100 % Strength			
<input type="checkbox"/> Enable Nudge Filter (mainly for Analog/additional Board setups)			
<input checked="" type="checkbox"/> Enable Analog Nudge		<input type="checkbox"/> Normal Board Mounting Orientation	
<input type="checkbox"/> Tilt Sensitivity 400		<input type="checkbox"/> Accelerometer Rotation 0	

☒ Enable Mouse handling during Play

☐ Enable flying around (Arrow Keys + Left Alt Key) during Camera/Light/Material Edit Mode

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
Both	Both
Chimes	Bell
Both	Both
Gear	Shaker
Both	Both
Flippers	Targets
Both	Both
Drop Targets	
Both	
* This will only apply to tables that are using the Controller.vbs in their script code	
<input type="checkbox"/> Disable B2S	

OK

Cancel

Setting Up Future Pinball

Game Keys and Controls

Game Keys (Definable)

Diagram of a pinball machine control panel with buttons labeled for various functions:

- Nudge Left: Z
- Special 1: A
- Special 2: .
- Nudge Right: /
- Left Flipper: Left Shift
- Left 2nd Flipper: A
- Nudge Up: Space
- Right 2nd Flipper: Right Shift
- Right Flipper: .
- Start Game: 1
- Enter: Enter
- Insert Coin 1: 5
- Insert Coin 2: 6
- Insert Coin 3: 7
- Toggle HUD: .
- Test: T
- Service: S

To change a keys setting, click on its button and press the key you want to use.

Game Controls (Fixed)

ESC	Return to Editor	Pause / Break	Pause / High Score Display
F1 - F8	Change Camera View	Tab (Held Down)	Look at Backbox
F9	Display Frame Rate and Statistics	Page Up / Down	Music Volume Up/Down
F10	Wireframe Mode On/Off	Home / End	Sound Volume Up/Down
Numpad /	Test Roller On/Off	Scroll Lock	Adjust Second Monitor Position
Numpad -	Alternate Physics/Render Mode		

TrackIR Controller

☐ Enable TrackIR Player Height: F11 ... Enable Track IR Camera (on by Default)

Pinball Test Roller (uses Analog Axis controls)

Force: +1 Damping: +0.6

Mouse/Joypad Controllers

☒ Enable VirtuaPin Controller

Deadzone: +0.2

Button Actions

Left Flipper	Button 10	Left 2nd Flipper	Button 11
Right Flipper	Button 2 (B)	Right 2nd Flipper	Button 3 (C)
Insert Coin 1	Button 12	Insert Coin 2	Button 13
Start Game	Button 9 (S)	Insert Coin 3	-none-
Special 1	-none-	Test	Button 14
Special 2	-none-	Service	Button 15
Exit Table	Button 8 (R)	Volume Up	-none-
Digital Plunger	Button 1 (A)	Volume Down	-none-
Pause	Button 7 (L)	Music Up	-none-
Toggle HUD	Button 5 (Y)	Music Down	-none-
Pinball Roller	-none-	Look at Backbox	Button 6 (Z)
Change Camera	Button 4 (X)		

Analog Plunger, Nudge and Test Roller

Plunger	Z-Axis	Gain	<input type="text"/> +1
NudgeX	X-Axis	Gain	<input type="text"/> +1
NudgeY	Y-Axis	Gain	<input type="text"/> +1
Test Roller X	-none-	Gain	<input type="text"/> +1
Test Roller Y	-none-	Gain	<input type="text"/> +1

OK

Cancel

Controllers Settings:

* Factor values are exponential changes. values between 8 and 0 are recommended. 0 = no averaging. 8= 256 rolling average. A larger factor will slow the reaction time of events, so a lower running sample factor is recommended.

** Life values are used to keep a maximum value around longer. The sample rate of the control board is faster than the sample rate of virtual pinball software. This value allows the software to "see" the value and act on it.

*** Threshold values are based on the cleaned value (Green Bar).

Tilt Settings:

Nudge Threshold*** : A clean tilt value needs to be above this value to be reported. Raise this value you are getting unwanted tilt action.

Led Nudge Threshold*** : A clean tilt value above this will cause the leds on the controller to light.

Tilt Calibration Retry Count: If a bump is detected while calibrating the tilt sensor it will start over, once the retry count is hit, the calibration value use the average that has been calculated at that point.

Tilt Calibration Sample Factor*: How many samples to take while calibrating the sensor.

Tilt Running Sample Factor*: How many samples to average to use as the raw value.

Tilt Multiplier: This affects the strength of a nudge, increase this value to produce a larger clean value when nudged.

Tilt Life**: This increases the length of time that the max value of a nudge is reported.

The following three settings are used to orient the tilt sensor based on how it is mounted in your cabinet.

Invert X: This will reverse the direction reported for the X axis

Invert Y: This will reverse the direction reported for the Y axis

Swap Axis: This will swap the reported Y and X axis.

Plunger Settings:

Enable Plunger: This setting is used if you have a plunger attached to your board.

Invert Plunger: This will reverse the direction reported for the plunger.

Plunger Running Sample Factor*: How many samples to average to use as the raw value. A larger value will decrease jitter but also decrease response time to plunger changes.

Plunger Calibration Sample Factor*: How many samples to take while calibrating the plunger rest position.

Plunger Jitter Threshold*** : This will help steady the plunger when it is held at a specific location. Changes in plunger value that fall within the jitter range will not be report the last location.

Plunger Rest Threshold*** : This will help steady the plunger when it is at the rest location. Changes in plunger value that fall within the range will report zero, when the plunger is not in an active state.

Plunger Active Life**: This increases the length of time that the plunger is considered active when movement outside the rest threshold is detected. Set to zero to disable. The controller led will light green when the plunger is considered active.

Plunger Hit Zone Life**: This increases the length of time that the max value of the plunger is reported. Set to zero to disable.

Auto Plunger Life**: How long to activate the auto plunger button (button 16) . Set to zero to disable.

Plunger Rest: This is the default plunger rest value. This value will be used if auto calibrate plunger is disabled.

Plunger Range: This is the default plunger range. This value will be used when started. The range will be locked to this value is auto calibrate plunger is not enabled.

Plunger Timeout: The amount of time before communication is considered lost with the plunger sensor.

Action Buttons:

[Preview Config] This will write any changes to the active memory of the controller. These changes will be loss during a power cycle unless [Save Memory Config] is pressed.

[Cancel Changes] Reads the current configuration from the controller, this will replace any changes that were made but not saved.

[Save Config] Saves the current to the board. These settings will be used on power up.

[Default Config] Loads the default configuration into memory. These changes will be loss during a power cycle unless [Save Config] is pressed.

90 Day Limited Manufacturer's Warranty

The VirtuaPin Digital Plunger Kit, sold by VirtuaPin Cabinets, is covered by a 90-day Limited Manufacturer's Warranty. Any and all claims must be brought to the attention of VirtuaPin Cabinets to receive warranty service. Remember to retain a copy of your receipt to receive warranty service during the warranty period.

Tampering with, or altering in any way, the VirtuaPin Digital Plunger Kit will immediately void this warranty. In addition, warranty requests determined to be the result of abuse or improper usage will be denied.

The manufacturer warrants the VirtuaPin Digital Plunger Kit against defects in materials and workmanship as follows:

Labor - For a period of 90 days from receipt, if the manufacturer determines the equipment is defective, subject to the limitations of this warranty, the manufacturer will replace defective components, at no charge. The manufacturer warrants any such work against defects for the remainder of the original warranty period.

Parts - For a period of 90 days from receipt, the manufacturer will supply, at no charge, new or remanufactured parts in exchange for parts determined to be defective, subject to the limitations of the warranty. The manufacturer warrants any such parts against defects for the remainder of the original warranty period.

