



# VECTORLINK

WIRELESS & WIRED  
VECTREX JOYSTICK ADAPTER  
BY BRETT WALACH

# USER MANUAL

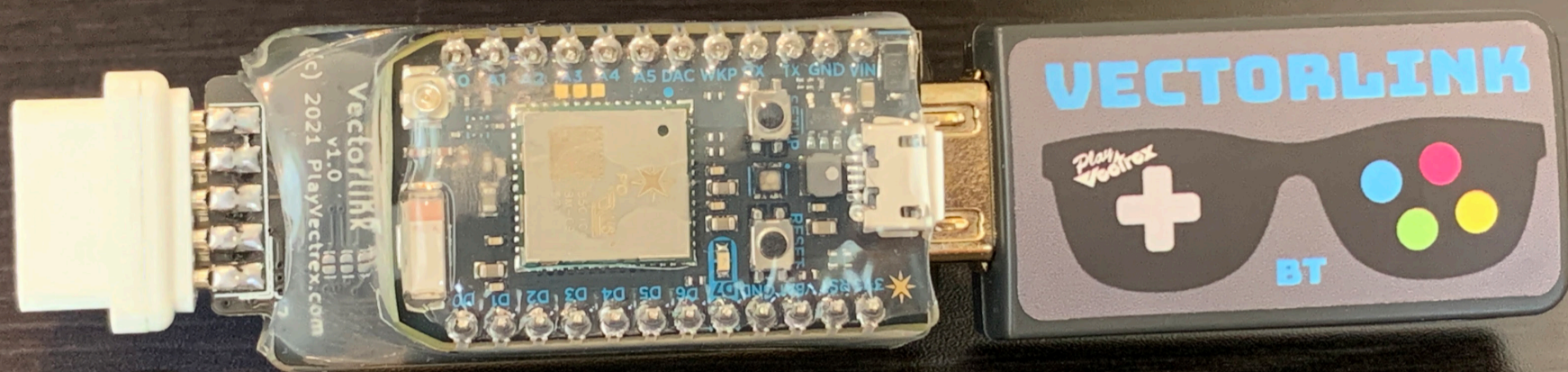
[PLAYVECTREX.COM](http://PLAYVECTREX.COM)



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# GET READY TO EXPERIENCE THE VECTREX LIKE NEVER BEFORE! VECTORLINK BRINGS YOU IN!

**Vectorlink** is a joystick adapter designed by Brett Walach of PlayVectrex.com in 2021 that allows many different types of high quality off-the-shelf wireless or wired controllers to be used with the Vectrex. It consists of a base adapter that has a connector that is the same one found on a Nintendo WiiMote. This enables the Vectorlink to connect to countless controllers out there. It was primarily designed to work with the 8BitDo SNES/NES Classic Bluetooth Retro Receiver (aka BT Dongle) and the 8BitDo Arcade Stick, but as you'll read it works with so much more!

**Besides offering wireless digital and wired analog support for the Vectrex, the Vectorlink offers some premium features you've likely never seen on a controller before.**

- » Individual button autofire rates are programmed in-game by pressing the button at the desired rate!
- » Manual shots can be taken very precisely even when autofire is enabled!
- » 8 controls can be mapped to up to 8 buttons without any special software!
- » Analog sticks and accelerometer can be passed through a Dynamic Filter that is adjustable by the player, giving enhanced stability and control!

The **BT Dongle** will pair wirelessly with many controllers: 8BitDo Arcade Stick and older N30 Arcade Stick, 8BitDo Lite, 8BitDo Zero 2, 8BitDo SN30 Pro, Xbox Series X Elite 2, WiiMote, Wii U Pro, and Nintendo Switch Joy-Con controllers. It is also supported by most of the current and older generation 8BitDo bluetooth controllers, which are very high quality, inexpensive and readily obtainable controllers. It also should pair with Xbox Series One, PS3 DualShock, PS4 DualShock and Pro, and the Switch Pro!

**Note:** From time to time, 8BitDo has firmware updates to support new controllers for the Retro Receiver.



Vectrex

PLAYER ONE

PLAYER TWO



MineStorm

ESCAPE THRUST FIRE

“ I FEEL BAD FOR THE  
STICK I JUST GOT LAST MONTH.

VECTORLINK IS EVERYTHING NOW! ”

— PAISLEYBOXERS





## 01

# VECTORLINK WIRELESS CONTROLLERS

For serious gaming, the 8BitDo Arcade Stick is the one to get. It's easily moddable with genuine Sanwa JLF joystick parts and 30mm snap in buttons in a wide range of colors (as pictured with cyan Sanwa controls). There is a step by step modding guide available for DIYers on PlayVectrex.com that shows exactly how to do this yourself. It's all plug and play, no soldering required. The arcade stick can also be used on many other systems, so it's truly universal.



8BitDo also makes a SNES Classic controller that is super well made and comes with its own 2.4GHz RF dongle that will plug into the Vectorlink just like the BT dongle. This one doesn't require pairing and works as soon as you turn it on and it's rechargeable just like all other 8BitDo controllers.

Another very good wireless controller is the Hori Wireless Fighting Commander (officially licensed by Nintendo) which comes with its own bluetooth dongle. This controller requires 2x AA batteries. You can create some interesting button mapping with 6 top side buttons.

It's hard to describe what makes a good controller, you just know it when you feel it. It's solid, responsive, and agile all at the same time. When you're giving it input, it doesn't flap around and it always does what you expect. That's exactly how these three controllers behave.



Something to note: all of the wireless controllers work in digital mode only, even if they have an analog thumbstick. This is because the **BT Dongle**, **RF Dongle**, and others were designed to be used at most with the SNES Classic which doesn't have analog thumb sticks. However, Vectorlink does support analog controllers... and some really nice ones!



# VECTORLINK WIRED CONTROLLERS

“ I’M FINALLY ABLE TO PLAY VECTREX WITH MY FAVOURITE CONTROLLER.  
IN THIS CASE IT’S THE WIRED SNES CLASSIC MINI. ” — TORBEN



For analog support, players can unplug the **BT Dongle** and plug a Wii Nunchuck, Wii Classic, Wii Classic Pro, or Playstation 1 or 2 (plus Mayflash PS2 to Wii adapter) directly into the Vectorlink adapter. Analog left or right stick is supported and there are even 10 player-selectable levels of Dynamic Filtering of the analog input. The Nunchuk accelerometer feature is also supported! All of these mentioned controllers have no deadband/deadzone on the analog sticks, which makes playing analog games very smooth and easy to control... even Hyperchase!

There are many other wired controllers that are fully supported by the Vectorlink, and you can be confident that anything that plugs into a NES/SNES Classic or WiiMote should work or support can be added in the future. Hyperkin also makes a SNES to SNES Classic adapter, so you can use your Super Famicom NTT Data Keypad controller with the Vectrex if you’d like (and if you have one!). NES Advantage and SNES Super Advantage should work as well.

Here’s one from EMIo that’s designed to be and look similar to the SNES Super Advantage arcade stick. This Edge Super Joystick from EMIo is also moddable: [https://www.youtube.com/watch?v=SDHULTuXu\\_o](https://www.youtube.com/watch?v=SDHULTuXu_o). Some claim it came with a Sanwa joystick in the past, but for \$35 from Amazon, there’s no way they are still doing that. Mine certainly doesn’t have one. It feels decent as is, but the buttons ride a bit high and the stock joystick is a bit loose. For \$35 though, it’s a great start for a wired controller. It has a bunch of individual turbo switches for each button. However, just like the Hori Fighting Commander joystick, you won’t need to use them with the Vectorlink because you can set the exact rate you desire on every button.

EMIo also has a NES Advantage clone called The Edge Joystick, for \$15. It works with the NES Classic and is limited to two buttons, B and A. Some games only require two buttons like Scramble, so it’ll work with Vectorlink as well!





## 03

# VECTORLINK WI-FI SETUP

**NOTE:** Setting up Wi-Fi is optional and not required to make the adapter function, but once done you will receive automatic updates to the latest Vectorlink software version.

**NOTE:** Your Wi-Fi Access Point needs to have a 2.4GHz mode enabled for the Vectorlink to connect to Wi-Fi. Most modern routers have a 2.4GHz legacy mode, but you might have to explicitly enable it if you don't see your Vectorlink connecting to Wi-Fi.

## SETUP OVER WEB USB (Preferred):

**This is by far the easiest way** to add your Wi-Fi credentials to your Vectorlink. It uses Web USB via the Google Chrome browser on Mac, Windows or Linux.

Please follow the instructions here: <https://playvectrex.com/vectech/vectorlink/>

## USB SERIAL (Backup Method):

01. Unplug your Vectorlink from the Vectrex and connect a micro USB cable between it and your computer.
  02. Open a USB Serial connection to the Vectorlink (See below for different ways to do this if you're not sure)
  03. You won't see any welcome message once you connect, but you can test the connection first by pressing the [ i ] key and you should be greeted with the serial number of your Vectorlink.
  04. Press the [ w ] key and follow the prompts to setup Wi-Fi
  05. If you mess up a character, there is no backspace. Please press the RESET button on the Vectorlink and start over at step 1.
  06. When the Vectorlink connects to Wi-Fi, the small blue LED will light up for approx. 30 seconds, then turn off.
  07. **You are all set!** By the way, your Wi-Fi credentials are not stored in plain text on the Vectorlink, but are rather encrypted and stored deep in the Wi-Fi module.
- A. **Mac OSX:** Open Terminal, to figure out what the serial port is... you can run:  
`ls /dev/cu.usbmodem*` and open a serial connection by running for example:  
`screen /dev/cu.usbmodem134301` (your port number will be different)
  - B. **Windows 10:** Download and Install TeraTerm from here:  
<https://osdn.net/projects/ttssh2/releases/>  
 Click TeraTerm's Setup menu / Serial menu, and select a COM port that's available. Once selected it should say VID\_2B04&PID\_C006 in the window below if it's the right device. Use Speed: 115200, Data: 8-bit, Parity: None, Stop Bits: 1-bit, Flow control: none. Click New Setting, and it should connect and essentially show a black terminal.
  - C. **Mac OSX & Windows 10:** Proceed with step 3 above.



## 04

# PAIRING WIRELESS CONTROLLERS WITH THE BT DONGLE

**NOTE 1:** Instructions for putting the controller in pairing mode can vary, so it's probably best to double check with the specific joystick instruction manual on how to enter pairing mode.

**NOTE 2:** The **BT Dongle** works best when the controller is in X pairing mode, rather than S pairing mode. On the 8BitDo Arcade Stick, there is a dedicated switch for this in the top left corner (see the cover of this User Manual). For other controllers you may have to power them on with a particular button sequence. Please refer to their respective manuals.



- 01.** To enter pairing mode on the 8BitDo Arcade Stick, there is a dedicated green button that you hold down until the 4 square LEDs start moving in a circle. The 8BitDo Lite also has a dedicated pairing button on the top edge of the controller that you hold down until its LEDs will sweep back and forth like a Knight Rider display. Other 8BitDo controllers don't have a dedicated button, and for those you hold down the SELECT button until their LED starts flashing.
- 02.** To enter pairing mode on the **BT Dongle**, press the red button once and the blue LED should start flashing.
- 03.** When pairing completes, the LEDs on both the controller and BT Dongle will stop flashing and be lit solid. Some controllers pair very quickly, and others like the Xbox Series X Elite 2 take a little longer.
- 04.** The **BT Dongle** will remember your pairing for most controllers. Some need to be re-paired when powering them on again, like the 8BitDo Zero 2 or Lite controllers.



## 05

# VECTORLINK

## AUTOFIRE & BUTTON REMAPPING

### SETTING AUTOFIRE:

01. Hold the START button
02. Tap a button you want to set autofire on at the rate you desire. The button will be active during setting this rate so you can get immediate feedback on screen. The Vectorlink RGB LED will also light up as you press it.
03. Repeat this for any additional buttons
04. Finally, release the START button to commit the autofire rates

**NOTE:** To disable autofire on all buttons, simply tap the START button once.

**NOTE:** While autofire is set, you can still tap the button and fire off a single shot immediately. You do not have to wait for the autofire rate to catch up and sync up with your pressed button like other autofire solutions. This is very useful when clearing a screen with autofire, but also needing accuracy at times

### BUTTON REMAPPING:

01. Hold the SELECT button
02. Tap a button you want to set, a specific number of TAPS that corresponds to the CONTROL you'd like to map to. Button 1-4=1-4 taps, LEFT=5, RIGHT=6, UP=7, and DOWN=8. (see the table as well)
03. Repeat this for any addition button(s).
04. Any button(s) not tapped will be disabled.
05. Finally release the SELECT button to commit the button(s) remapping.
06. To return to default button mapping, simply tap the SELECT button once.
07. If you have previously changed the button mapping while the Vectorlink has remained powered on, you can toggle back to those settings by tapping the SELECT button once again.
08. Repeat these steps for a new remapping if desired.

CONTROL	TAPS
Button 1	1
Button 2	2
Button 3	3
Button 4	4
Left	5
Right	6
Up	7
Down	8



# VECTORLINK ANALOG MODE & NUNCHUK ACCELEROMETER

## ANALOG MODE:

Analog Mode is supported only on wired controllers. It works best on the Wii Nunchuk, Wii Classic, Wii Classic Pro and PS1/PS2 controller (with Mayflash to Wii adapter). Analog is enabled by default for the Nunchuk because it doesn't have a D-pad, but the others will default to using the D-pad.

01. To enable the left analog stick, hold ZL, press and release the HOME button, and then finally release ZL.
02. To enable the right analog stick, hold ZR, press and release the HOME button, and then finally release ZR.

**NOTE:** The default analog mode has no Dynamic Filtering.

## NUNCHUK ACCELEROMETER:

The Wii Nunchuk 3-axis (X/Y/Z) accelerometer has been software manipulated to become Pitch (up/down) and Roll (left/right). If you point the thumbstick straight up and plum to the Earth, your joystick control should be centered. There is approximately 60° of deflection in both X and Y axes.

01. To enable, hold the C button and RESET the Vectorlink, then release C.

**NOTE:** The default accelerometer mode has no Dynamic Filtering.

## VIDEO DEMONSTRATION:

Check out this youtube video demonstrating how these analog, accelerometer, and dynamic filtering modes work.

<https://www.youtube.com/watch?v=CcMTdrRzoHY>



# VECTORLINK

## DYNAMIC FILTERING

### DYNAMIC FILTERING:

Dynamic Filtering effectively averages the analog or accelerometer values over time. The higher the setting, the longer in time the analog value is averaged, or takes to reach a steady state. The setting ranges from 0 (disabled) to 10 (max).

01. To enable, for Nunchuk hold button C (accelerometer) or Z (analog stick)
02. To enable, for Classic/Classic Pro/PS1/PS2 hold ZL (left stick) or hold ZR (right stick)
03. Then press and release the HOME button, or RESET the Vectorlink in case there's no HOME button (e.g. Nunchuk)
04. While still holding the C / Z / ZL / ZR button, press UP on the analog stick from 1 to 10 times for the desired level of dynamic filtering. You can press DOWN on the analog stick if you overshoot the desired level, but typically you'll only need to press UP the number of times desired.
05. If you do not press UP at all, the level will be 0, i.e. disabled. This is the same as simply enabling the Analog Mode.
06. After you've pressed UP/DOWN to the desired level, release the held C / Z / ZL / ZR button to commit the dynamic filter level.
07. To clear or change the dynamic filtering level, repeat the above steps.







# VECTORLINK DEVELOPMENT HISTORY

Vectorlink software has been in development for the past two years, originally starting as the base firmware in a next generation Vectorcade. If you're not familiar with the Vectorcade, it's a full-size/ built-like-a-tank/styled-like-a-race-car/arcade stick made for the Vectrex back in 2001 by me, Brett Walach. Vectorcade Pro was designed to have autofire, button remapping, and addressable LED strip under lighting. The first Vectorcade Pro prototype was put on demo at THAT Conference 2019 in Wisconsin (pictured above). The Vectrex and controller took plenty of day-long abuse over several days at the conference, and survived with only very minor life altering events (aka scratches).

Vectorcades are a ton of work to create, and the thought of making them in any real quantity put that idea on hold for most of 2020. In January 2021 I became aware of 8BitDo controllers and heard some testimony from a co-worker that they were high quality 3rd party retro controllers. After browsing their catalog, the SNES Classic Retro Receiver peaked my interest because it had the Nunchuk connector on it and it was pretty affordable for what it offered connectivity wise. The 8BitDo Arcade Stick looked amazing, and the thought of it being the next Vectorcade-like controller would not escape my brain; and it was wireless!! I immediately purchased the 8BitDo Lite controller and a Retro Receiver to play with. I had a Wii Nunchuk connector breakout board and started prototyping the additional analog circuitry that would be required to drive the XY analog inputs on the Vectrex. Within a short while I had proven the prototype could perform well, and quickly designed a PCB.





# VECTORLINK DEVELOPMENT HISTORY CONT'D

The first PCB went horribly wrong with several wrong component footprints, as they usually do, but it worked as intended without a single bodge wire. For a while, I just focused on the software with that first prototype, taking the Vectorcade Pro features and essentially making them all work with the Wii Extension Controller protocol. Pretty soon I had enough confidence that it was going to be amazing, and quickly ordered more 8BitDo controllers, including the Arcade Stick and components to modify it.

**The day I was play testing Vectorblade v1.12 with the Vectorlink Arcade Stick, I ended up beating it twice! That's when I knew the dream had become reality. Up until this point I had not scored much higher than 500K points, and now I blasted past 1M points reaching level 130 and 150 with ease.**

Luckily, the second PCB was the final revision and everything was perfect on it. I worked on creating professional looking labels for the BT Dongle, RF Dongle and Arcade Stick. Usually I let people know every little thing I'm working on, because it's fun... and it's a community. But this time, this was "the secret project". I wanted to work on it at my own pace, without any worry that someone else with more free time would beat me to it... and when it was finished, let people experience what I thought it could be, The ultimate Vectrex joystick system.

In June 2021, I started a beta testing group on the VEXTREME Discord server called Project Falkor. Everyone tested controllers not shown above, many new features were added, controllers supported, bugs fixed, and firmware updated to beta testers over Wi-Fi. Vectorlink is real now, and I hope you enjoy it as much as I've enjoyed developing it <3 — Brett Walach







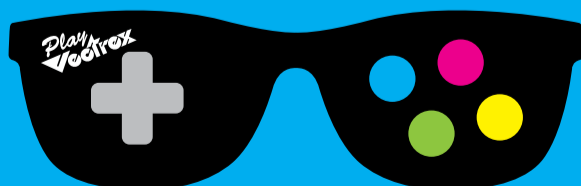
**I'M SO VERY EXCITED TO  
BRING YOU THE VECTORLINK!  
GAME ON!**

— BRETT WALACH

**Vectorlink was designed to be intuitive and easy to use, with powerful features not found anywhere else.**

It is my commitment to you, and the Vectrex community, to provide support and help you get the most out of your Vectorlink experience. Questions you may have about the Vectorlink or any other PlayVectrex.com products are just a few clicks away. Please feel free to reach out to me on the VEXTREME discord server, where we talk about lots of Vectrex related games and products.

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