# iCode Duo Ultimate SE H1-VX

A compact adapter that brings your classic Vectrex controllers to life on modern devices — from PCs and Macs to Nintendo Switch, MiSTer FPGA, and beyond. Dual DB9 ports, two status LEDs, and two configurable buttons in a streamlined design with no screen — all advanced settings are configured through the iCodeHub web app.

No drivers needed. Just plug in and play.

Visit iCodeHub at **https://hub.icode.com** to unlock the full potential of your device — fine-tune your stick response, customize your buttons, and get the most out of your Vectrex controller!

For help and assistance: https://www.icode.com/support

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## Getting Started

**Step 1.** Plug the Duo Ultimate SE into any USB port using the USB-C cable. You'll see both LEDs blink green three times, then settle into solid colors showing your current mode. (Don't forget the power switch on the device — make sure it's on.)

**Step 2.** Connect your Vectrex controller to either DB9 port — no coupler or extra accessory required. Port 1 is on the left, Port 2 on the right. Both ports work simultaneously, so two players can connect at once.

**Step 3.** Start playing! The default setting maps the analog joystick to the left analog stick, and the four face buttons to gamepad buttons. The stick is factory-calibrated for crisp response out of the box. Standard USB emulation is selected by default.

**Step 4.** Visit **iCodeHub** in your browser to unlock the full potential of your adapter! Fine-tune stick resolution and deadzone, configure button actions, and more — no software to install.

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## Supported Controller

The Duo Ultimate SE H1-VX is purpose-built for the Vectrex controller, and works on both DB9 ports simultaneously.

### Vectrex Controller

The Vectrex controller features an **analog X/Y joystick** and four face buttons.

The analog stick is read through a proprietary jitter-free pipeline for smooth, accurate, drift-free X/Y movement across the full range of motion, and it's factory-calibrated for crisp response right out of the box. You can fine-tune the stick's resolution and deadzone in iCodeHub to dial in the perfect feel for any game.

All four face buttons are fully mappable. Buttons 1 and 2 support multi-action mapping with rapid fire; Buttons 3 and 4 provide single-action mapping. No coupler or extra accessory is required — the controller plugs straight into the adapter.

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## Status LEDs

Without an on-device screen, the SE uses its two RGB LEDs to show your configuration at a glance:

- **LED 1 (left)** shows your active **USB emulation mode** by color — see the table in the next section.
- **LED 2 (right)** glows a fixed **magenta**, identifying this as the Vectrex (VX) adapter.

Because the VX supports a single controller type, there's no controller-switching combo to worry about — just plug in and play.

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## USB Emulation Modes

The USB Emulation Mode determines how your adapter identifies itself to the host device. Most of the time, the default Standard mode works fine — but if your platform isn't recognizing the adapter, you'll want to switch to the mode designed for it.

**Standard** — Works with Windows, Linux, and most emulators. This is the default.

**Classic** — Designed for retro gaming platforms and classic-style emulator setups.

**Nintendo** — Use this for Nintendo Switch and RetroArch with Nintendo button mapping. In this mode, the stick function automatically switches from Left Analog to D-Pad, since Nintendo devices expect D-Pad input. When you switch away from Nintendo mode, it reverts back to Left Analog.

**Legacy** — For older systems and emulators that need basic USB HID descriptors.

**iOS** — For iPhone, iPad, and Apple TV.

### How to Change It

Hold the **BLACK** button while plugging in the USB cable. Both LEDs will blink blue three times to confirm, and the mode advances to the next in sequence:

Standard → Classic → Nintendo → Legacy → iOS → Standard

The setting saves automatically and the device reboots into the new mode after a 2-second delay. Keep holding BLACK and re-plugging until you see the right color on **LED 1 (the left LED)**:

| LED 1 Color | Emulation Mode |
|---|---|
| Yellow | Standard |
| Blue | Classic |
| Red | Nintendo |
| Green | Legacy |
| White | iOS |

You can also change the emulation mode through the iCodeHub web app.

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## Unlock Full Potential — iCodeHub Web App

Your Duo Ultimate SE is ready to play right out of the box, but the real magic happens when you connect it to the **iCodeHub** web app. This is where you fine-tune how the analog stick responds, remap your buttons to do exactly what you want, and so much more. If you want to get the absolute best experience from your adapter, iCodeHub is the place to do it.

The best part? There's nothing to install. iCodeHub runs right in your browser. Just open it in **Chrome**, **Edge**, or **Opera**, click Connect Device, and select the Duo Ultimate SE from the browser's device picker. The app loads your device's current configuration and you're ready to customize.

The web app has three configuration tabs:

### Ports Configuration

This is where you set up your controllers. For each port you can choose the **Function** mapping — how the analog stick reports to the host: Left Analog, D-Pad, Right Analog, Trigger, or Buttons Only.

You can also fine-tune the stick response:

| Setting | Options |
|---|---|
| Resolution | Full, 80%, 60%, 40%, 20%, 10% |
| Deadzone | Off, 1%, 2%, 3%, 5%, 10% |
| Jitter Control | None, Low, Medium, High, Very High |

Resolution sets how much physical stick travel is needed to reach full deflection, Deadzone ignores small movements near center, and Jitter Control smooths out any analog noise for rock-steady output.

Finally, you can set up the **Fire Button Actions**. Buttons 1 and 2 each support up to 3 simultaneous action slots plus optional rapid fire; Buttons 3 and 4 each support a single action.

### Duo Ultimate SE Buttons

Here you can remap the BLACK and WHITE device buttons. Each button supports up to 3 simultaneous actions — choose from gamepad buttons (0–31), D-Pad directions, keyboard keys, or mouse actions. You can also set the Button Destination to control which port receives the button signals: Port 1 Only, Port 2 Only, or Both Ports.

### USB Settings

This tab controls how the adapter communicates with your host device. **Keyboard Emulation** lets you enable HID keyboard output (Off, On, or Standby) — handy when you've mapped buttons to keyboard keys. **USB Emulation** lets you choose how the device appears to the host: Standard (DInput), Classic (DragonRise), Nintendo (Switch), Legacy (Retro), or iOS (DS4). Note that switching keyboard or emulation modes requires a device reboot.

(Mouse emulation is not used on the VX — the Vectrex joystick reports as a gamepad stick — so it's turned off and hidden.)

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## Firmware Updates

### Via iCodeHub

Plug your adapter into USB, open your browser, and go to **https://hub.icode.com**. The app will let you know if an update is available — just follow the on-screen instructions.

**Important:** Your settings and presets are not preserved during updates. Save them to your iCodeHub Vault before updating, and reload them afterward.

### Forced Update Mode (Via Pinhole)

If iCodeHub updates aren't available or the device is unresponsive, you can update manually:

1. Hold **both BLACK and WHITE** buttons
2. While holding, plug in the USB cable
3. The device appears as a USB drive named **RPI-RP2**
4. If you don't see the new USB drive, turn off the device and use a pin in the pinhole found on top of the unit to press and hold the recovery switch inside, then turn the device back on
5. Drag the new `.uf2` firmware file onto the drive
6. The device reboots automatically with the new firmware

### Checking Your Firmware Version

Hold the **WHITE** button while plugging in. The LEDs will display your firmware version as a blink sequence: green blinks for the major version, blue blinks for the first minor digit, and magenta blinks for the second minor digit. A zero is shown as a brief pause with no blinks. For example, version **1.02** shows as: 1 green blink, pause (zero), 2 magenta blinks.

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## Troubleshooting

**No LED activity when plugged in.** Check the power on/off switch on the device and your USB cable, and try a different USB port. Make sure the cable supports data — some cables are charge-only.

**LEDs blink green but your controller isn't detected.** Make sure the controller is fully seated in the DB9 port. Try the other port to rule out a cable or connector issue.

**The stick drifts or doesn't sit at center.** The stick is factory-calibrated, but every controller is a little different. Open iCodeHub, go to the Ports tab, and increase the Deadzone slightly to ignore small movements near center.

**The stick feels jittery or twitchy.** Open iCodeHub, go to the Ports tab, and raise the Jitter Control setting until the input smooths out. You can also lower the Resolution for a calmer response.

**Your game or emulator doesn't recognize the adapter.** Try a different emulation mode — hold BLACK while plugging in to cycle through them. Check LED 1 to see which mode you're in. Nintendo mode uses D-Pad input; Standard uses analog stick.

**The web app can't find your device.** Make sure you're using Chrome, Edge, or Opera. Try a different USB port. Make sure no other browser tab is already connected to the device.

**Buttons seem mapped wrong.** Use the iCodeHub web app to check the button mapping for your active preset. You may need to adjust the mapping to match what your game expects.

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## Platform Compatibility

Your adapter works with any device that supports USB HID gamepads:

**PC** — Windows, macOS, Linux **Mobile** — iOS (use iOS mode), Android **FPGA** — MiSTer FPGA **Consoles** — Nintendo Switch (use Nintendo mode), Steam Deck **SBC Retro** — RetroPie, Batocera, RetroArch, EmuElec, Recalbox

## Specifications

| Feature | Detail |
|---|---|
| Microcontroller | RP2350 dual-core |
| Controller Ports | 2× DB9 (Vectrex compatible) |
| USB | USB-C, Full-Speed (12 Mbps) |
| Buttons | 2 (Black, White) |
| LEDs | 2× NeoPixel RGB |
| Emulation Modes | 5 (Standard, Classic, Nintendo, Legacy, iOS) |
| Controller Types | Vectrex Controller |
| Configuration | iCodeHub web app |
| Firmware Update | UF2 drag-and-drop |
| Power | USB bus-powered, with on/off switch |