iCode Duo Ultimate H1

Bring your classic Atari, ColecoVision, Intellivision, Vectrex, and Sega Genesis controllers to life on modern devices — from PCs and Macs to Nintendo Switch, MiSTer FPGA, and beyond. Supports controllers from five console families (Atari 5200 with the 5200 coupler) with full button remapping, mouse and keyboard emulation, and a built-in color display — and plays arcade, Atari, and iCode games right on that display.

No drivers needed. Just plug in and play.

Visit iCodeHub at **https://hub.icode.com** to unlock the full potential of your device — manage presets, fine-tune every setting, customize your buttons, and get the most out of your classic controllers!

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

Getting Started

Step 1. Plug the Duo Ultimate H1 into any USB port using the USB-C cable. The color display will light up, the RGB LEDs will start cycling, and the start-up menu appears — choose **Game Adapter** (or wait a few seconds). No drivers needed — your device is recognized as a standard USB gamepad.

Step 2. Connect your retro controller to either DB9 port. Port 1 is on the left, Port 2 on the right. Both ports work simultaneously.

Step 3. Start playing! The default preset (Preset 0) is set to Atari **Auto**, which detects joysticks, paddles, keypads, driving controllers, and trackballs by itself. Your joystick directions map to the gamepad D-pad, and the fire button maps to Gamepad Button 0. The six colored buttons on the device are also active — Red is Button 0, Green is Button 1, Blue is Button 2, Yellow is Button 4, Black is Button 8, and White is Button 9.

Step 4. Visit **iCodeHub** in your browser to unlock the full potential of your adapter! Configure button mappings, fine-tune paddle sensitivity, adjust jitter control, enable mouse emulation, and much more — no software to install.

Start-up Menu

Each time the Duo powers up, the start-up menu appears:

- **Game Adapter** — use the Duo as a controller adapter for your computer, console, or MiSTer — everything from **Using the Menu** onward.
- **Arcade Games** — classic arcade games on the built-in display (see **Arcade Games**).
- **Atari Games** — Atari computer and 5200 games on the built-in display (see **Atari Games**).
- **iCode Games** — Iron Dome, Brick Bash, and Jaw Cruncher (see **Games**).

Move up and down with the 5-way hat, then press the hat in or press **Red** or **Green** (or your controller's fire button) to start. Press **Menu** to go straight to the Game Adapter.

The item with the yellow **star** is the default. If you don't touch anything, it starts by itself after 8 seconds — the bar under the list shows the time left. To make another item the default, highlight it and press **Yellow** or **Blue**, or push the hat left or right.

When you leave an arcade or Atari game, the Duo comes back as a game adapter without the start-up menu. To turn the menu off — the Duo then starts the default right away — see **General Settings**.

Know Your Device



Button & Port Layout

Your Duo Ultimate H1 features six colored face buttons (Red, Green, Blue, Yellow, Black, White), a 5-way hat switch that moves in four directions and clicks, and a gray Menu button near the hat. The color display shows your controller state and menus, with two RGB LEDs and a speaker alongside it.

You'll also find two DB9 controller ports for connecting your retro controllers and a USB-C port on the bottom. There is a tiny pinhole to the left of the Yellow button — this is the firmware update reset button, used only for emergency firmware recovery.

Using the Menu

Press and release the gray **Menu** button to open the on-screen menu. Press it again to close and return to normal operation.

Navigate using the **5-way hat**: push up and down to move through items, push right or click to select, and push left to go back. You can also use the colored buttons in menus — **Red** works like pushing right (select or increase a value) and **Green** works like pushing left (go back or decrease a value).

When you open the menu, **Games** is at the top (see **Games**), followed by four sections:

- **Settings** for your current preset configuration.

- **USB Settings** for how the adapter talks to the host.
- **General** for system-wide preferences.
- **System** for diagnostics, reset, and firmware updates.

Supported Controllers

The Duo Ultimate H1 supports controllers from five console families. Here's what's available:

Atari

Auto — The most versatile mode, and the default. Plug in a joystick, paddles, a keypad, a driving controller, or a trackball and the adapter detects it and switches to it — no need to change anything in the menu. The display shows the controller it found.

- **Paddles** and **keypads** are detected as soon as they're plugged in.
- A **driving controller** is detected once you turn the wheel.
- A **trackball** (in trackball mode) is detected once you roll the ball up or down.
- Swapped back to a **joystick**? Just move it.

On Auto, the port settings show everything the detected controllers use: **Buttons**, **Paddles**, **Driving & Trackball**, and a **Keypad Keys** page for mapping the 12 keypad keys. **Axis** is fixed on Auto — to change it, select **Driving** or **Trackball** mode instead.

Stick — For the standard digital joystick with 4 directions and a fire button (Atari 2600 CX40 and compatibles), and the Atari 7800 two-button joystick (CX78). Use this mode if you don't want the system to detect other controllers accidentally.

Paddles — Supports dual analog paddle controllers with up to 4 players. Use this mode if you are only going to use paddles and you want the system to force the unit into paddles mode, bypassing auto-detection.

Driving — For the steering wheel controller used in games like Indy 500. Make sure to review Mouse settings as some emulators will work with Driving controller only if mouse is turned on.

Trackball — Works with the CX-22 and CX-80 trackball controllers. Make sure your trackball is in trackball mode. Also review Mouse settings as some emulators will work with trackball only if mouse is turned on.

Keypad — For the 12-key keypad controllers (CX50 Keyboard Controller and CX21 Star Raiders keypad) — each key can be individually mapped.

Atari 5200 (5200 Coupler)

With the iCode 5200 coupler (sold separately), Atari 5200 controllers work on the Duo. Press **Menu**, go to **General**, and set **5200 Coupler** to **Enabled**. Then pick the device in the port settings:

- **5200 (Dual)** — the dual coupler: a 5200 controller on each port, with its analog stick, both fire buttons, and Start, Pause and Reset.
- **5200 (Single)** — the single coupler across both ports: one 5200 controller, including its 12-key keypad.

- **Trackball** — also works with the 5200 Trak-Ball (CX-53) on the coupler; the Duo detects the coupler by itself.

Each 5200 mode has its own settings for the buttons, Start / Pause / Reset, the keypad, and the analog stick.

ColecoVision

Hand Controller supports the standard controller with joystick, 2 fire buttons, and 12-key keypad. **Super Action** supports the enhanced controller with joystick, 4 fire buttons, keypad, and speed roller.

Intellivision

Hand Controller supports the Intellivision controller with directional disc, 3 fire buttons, and 12-key keypad.

Sega Genesis

3-Button supports the standard controller with D-pad, A/B/C, and Start. **6-Button** supports the extended controller with D-pad, A/B/C/X/Y/Z, Start, and Mode.

Vectrex

The **Vectrex controller** plugs straight in — no coupler needed — with its analog joystick and all four buttons. In the port settings, **Vectrex Joystick** sets the stick's **Resolution**, **Deadzone**, **Jitter Control**, and **Jitter Averaging**, and each of the four buttons can be mapped like any other.

How to Change Your Controller Type

Press the gray **Menu** button, then scroll down to **Settings** and push right to enter it. Scroll to **Console** and push right to choose your console (Atari, Coleco, Sega, Intellivision, or Vectrex). Then scroll to the port you want to configure (Port 1 or Port 2), push right, and select the specific controller type. Your choice takes effect immediately.

For a shortcut, hold **White + Menu** to jump straight to Port 1 settings, or **Black + Menu** for Port 2.

Fine-Tuning Your Controller

Once you've selected your console and controller type, you can fine-tune how it behaves. These settings are all inside the port configuration — press the gray **Menu** button, go to **Settings**, select the port, and you'll find them there. Everything is saved per-preset and per-port.

Function Mapping

This controls how your controller's directional input is reported to the host. Scroll to **Function** inside the port settings and push right to cycle through the options: **Left Analog** (left stick), **D-Pad** (digital hat switch), **Right Analog** (right stick), **Trigger Analog** (trigger axes), or **Buttons Only** (directions as button presses). Choose whichever your game or emulator expects.

Paddle Settings

If your paddles don't feel quite right, scroll to the **Paddles** section inside the port settings. From there you can adjust the **Axis** (Left, Right, or Trigger), **Range** (Full or Half), and **Sensitivity** (Full, 80%, 60%, or 40%). If your paddles are jittery, increase the **Jitter Control** (None to Very High) and **Jitter Averaging** (1–5 cycles) until the input smooths out.

You'll also find **Dual Paddles Mode** here: **Combined** keeps both paddles on one USB device, while **Split** gives each paddle its own USB device — Port 1 paddles use the X axis, Port 2 paddles use the Y axis.

Driving, Trackball, and Roller Settings

These controllers share similar tuning options inside their port settings. Scroll through to adjust **Axis Orientation** (Normal or Flip options), **Behavior** (Linear or Circular), **Resolution** (1–10 step size), **Acceleration** (Off to Very High), and **Range** (Full or Half, roller only) until the response feels right.

Fire Buttons

Each controller port has up to 2 fire buttons (A and B). Scroll to the **Fire Buttons** section inside the port settings to configure them. You can assign up to 3 actions to each fire button so a single press triggers multiple things at once. You can also turn on rapid fire for automatic repeat — set the value higher for faster firing.

Remapping Your Device Buttons

Want to change what the colored buttons and 5-way hat do? Press the gray **Menu** button, go to **Settings**, then scroll down to **Duo Buttons** and push right to enter it. You'll see a list of all 11 buttons. Select the one you want to change and you can set up to 3 action slots for it — this lets a single button press trigger multiple actions at the same time. You can also turn on **rapid fire** for automatic repeat on any button.

To control which USB gamepad receives your button presses, look for **Button Destination** at the top of the Duo Buttons section. Push right to cycle through Port 1, Port 2, or Both.

What You Can Map To

You have a wide range of actions to choose from: **Gamepad Buttons 0–31** (standard USB gamepad buttons), **Gamepad Directions** (Up/Down/Left/Right), **Mouse Clicks** (Left/Right/Middle/Back/Forward), and **Keyboard Keys** (A–Z, 0–9, F1–F12, arrows, Enter, Esc, Space, Tab, symbols, and modifiers like Shift/Ctrl/Alt/GUI).

Keypad keys (12 Atari / 14 Coleco) and Sega buttons (C, Start, X, Y, Z, Mode) are each individually mappable the same way.

USB Settings

These settings control how your adapter presents itself to the host device. Press the gray **Menu** button and scroll down to **USB Settings** to find them.

Port Mode

Scroll to **Ports Active** and push right to cycle through the options. **Both Same** mirrors Port 1's configuration to Port 2 — both ports behave identically. **Both Independent** gives each port its own separate settings. **Port 1 Only** and **Port 2 Only** disable the other port entirely — the device will need to reboot when you switch to these. A confirmation screen will appear where you can press **Red** or **Green** to confirm, or **Yellow** to cancel without rebooting.

USB Emulation Mode

If your platform isn't recognizing the adapter, scroll to **USB Emulation** inside USB Settings and push right to cycle through the modes. Keep cycling until you find the one that works for your platform:

Mode	Best For
Standard	Windows, Linux, emulators
Classic	Retro gaming platforms
Nintendo	Nintendo Switch
Legacy	Older basic HID systems
iOS	iPhone, iPad
Classic 2	Atari Gamestation Pro

Playing on the Atari Gamestation Pro

Choose **Classic 2**. The Gamestation Pro then treats the Duo like its own joystick:

- Set **Function** to **D-Pad** so joystick directions work.
- For paddle games, set the paddle axis to **Trigger** in iCodeHub.
- Mouse and keyboard output are turned off automatically in this mode.

Mouse & Keyboard Emulation

Want to use your trackball or paddles as a USB mouse? Or map controller buttons to keyboard keys? Your adapter can output mouse and keyboard signals alongside the gamepad data.

To turn on mouse mode, press the gray **Menu** button, scroll to **USB Settings**, push right to enter it, then scroll to **Mouse** and push right to cycle through the options: **Off**, **On** (actively reports mouse data), or **Standby** (the host sees the mouse device but no data is sent until you need it). You can also adjust the sensitivity from Very Low (1×) up to Very High (8×).

To turn on keyboard mode, go to **USB Settings**, scroll to **Keyboard**, and push right to cycle through **Off**, **On**, or **Standby**.

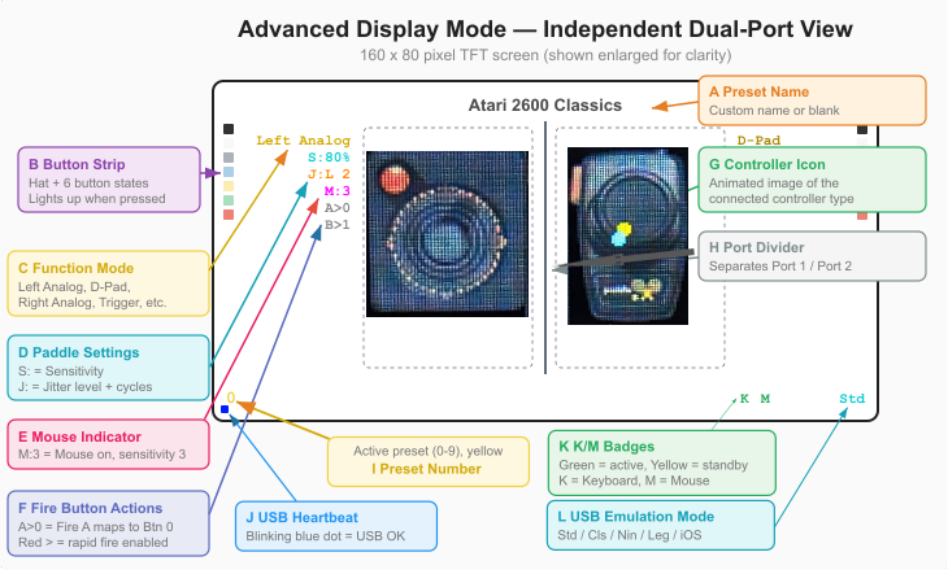
Note that changing mouse or keyboard modes may require the device to reboot since the USB descriptors need to change.

Display Modes

Your adapter has three display modes. The quickest way to change them is to hold **Green + Menu** while the menu is closed — each press cycles to the next mode. You can also press the gray **Menu** button, go to **General**, scroll to **Display**, and push right to cycle through them.

Off turns the display off completely. **Animated** (the default) shows a real-time animated visualization of your controller — you'll see it respond as you move the joystick and press buttons. **Advanced** shows a detailed HUD with your preset info, controller status, and diagnostic data at a glance.

Advanced Display Elements



Advanced Display Mode

The Advanced display packs a lot of information onto the screen. Here's what each element shows:

ID	Element	Description
A	Preset Name	Custom name from iCodeHub
B	Button Strip	Hat + face button states
C	Function Mode	Directional mapping type
D	Paddle Settings	Sensitivity & jitter values
E	Mouse Indicator	Active when mouse on + sensitivity
F	Fire Actions	Fire A/B mappings, red = rapid fire
G	Controller Icon	Animated controller with overlays
H	Port Divider	Separates Port 1 / Port 2
I	Preset Number	Active preset (0–9)
J	USB Heartbeat	Blinking blue = USB active
K	K/M Badges	Green = active, Yellow = standby
L	USB Mode	S/C/N/L/i

General Settings

These settings apply across all your presets. Press the gray **Menu** button and scroll to **General** to find them.

To change the **RGB Lights**, scroll to RGB Lights and push right to cycle through Off, Rainbow (animated cycling, the default), Red, Green, or Blue. The lights turn off by themselves while you play a game on the Duo.

To adjust the **Volume**, scroll to Volume and push right to increase or left to decrease. It goes from 0 (muted) to 10 (maximum), with 5 as the default.

To change the **Menu Theme**, scroll to Menu Theme and push right to cycle through Sunset Haze (warm, default), Midnight Ocean (cool blue), Ember (deep red/orange), or Neon Terminal (bright green retro look).

5200 Coupler — set to **Enabled** when you use the 5200 coupler; it adds the 5200 devices to the port settings (see **Atari 5200**).

Start-up Menu turns the start-up menu **On** (the default) or **Off**. **Start-up Default** chooses what starts by itself — **Adapter**, **Arcade**, **Atari**, or **iCode** games; with the menu off, it starts right away. You can also set the default from the start-up menu itself.

Presets

Your Duo Ultimate H1 stores **10 presets** (numbered 0–9). Each preset remembers your entire setup — console type, controller settings for both ports, all button mappings, rapid fire settings, USB emulation mode, port mode, and mouse/keyboard settings.

To switch presets, press the gray **Menu** button, scroll to **Settings**, push right to enter it, then scroll to **Preset** and push right to cycle through the numbers 0–9. The new preset takes effect right away.

Preset 0 is always available. To unlock presets 1–9, register your device with iCodeHub. You can also give each preset a custom name (up to 52 characters) through iCodeHub, making it easy to remember what each setup is for.

Games

The Games menu brings all the games together: **Arcade Games**, **Atari Games**, and **iCode Games**. Open it from the start-up menu, by holding **Yellow + Menu** while the menu is closed, or with **Games** at the top of the main menu. While you play, the RGB lights turn off so they don't distract you; they come back when you return to the adapter.

iCode Games holds three games you can play right on the color display:

Iron Dome is a Missile Command-style defense game. Use the 5-way hat to move your targeting cursor and click or press fire to launch interceptors. Protect your cities from incoming missiles across multiple difficulty levels.

Brick Bash is an Arkanoid-style paddle game. Move your paddle left and right and bounce the ball to destroy all the bricks. The ball speeds up as you progress through the levels.

Jaw Cruncher is a Pac-Man-style arcade game — guide your muncher through the maze, gobble the dots, grab the power pellets, and avoid the ghosts.

You can play with the 5-way hat or the controller on Port 1. High scores are saved on your device and can be synced to the iCodeHub leaderboard.

Arcade Games

The Duo can also play 13 classic arcade games on its built-in display: **Pac-Man**, **Ms. Pac-Man**, **Galaga**, **Frogger**, **Donkey Kong**, **Donkey Kong Jr.**, **Dig Dug**, **Space Invaders**, **Pooyan**, **Time Pilot**, **Xevious**, **Super Cobra**, and **Scramble**. The games run from the original arcade ROM files, which you provide — **ROMs are not included**. Use only ROM files you are entitled to use.

To start, pick **Arcade Games** from the start-up menu or the Games menu (**Yellow + Menu**). The Duo restarts into the arcade and shows the game list. While the arcade is running, the Duo works as a stand-alone arcade machine — it is not a game controller for your computer until you exit.

Adding Your Games

If the drive has no games yet, the Duo first shows how to add them, with the help address **icode.com/help/duo**. To add games:

Step 1. In the game list, select **ROM Drive (USB)**. The Duo restarts as a USB drive.

Step 2. Connect the Duo to your computer. A drive called **ARCADE ROMS** appears.

Step 3. Copy the ROM zip files onto the drive — in the main folder or in a folder called **ROMS**. Keep the file names exactly as below.

Step 4. Eject the drive on your computer, then press **Menu** or **Black** on the Duo to return to the game list.

Game	ROM file
Pac-Man	puckman.zip
Ms. Pac-Man	mspacman.zip
Galaga	galaga.zip
Frogger	frogger.zip
Donkey Kong	dkong.zip
Donkey Kong Jr.	dkongjr.zip (US) or dkongjrj.zip (Japan)
Dig Dug	digdug.zip
Space Invaders	invaders.zip
Pooyan	pooyan.zip
Time Pilot	timeplt.zip

Game	ROM file
Xevious	xevious.zip
Super Cobra	scobra.zip
Scramble	scramble.zip

The Duo uses the **MAME** ROM set for each game — the parent set, non-merged, so the zip contains every file the game needs. The 1 MB drive holds all of them, with plenty of room for your Atari games, which share the drive. A game only appears in the list once its zip is on the drive. If a zip isn't the right set, the game is listed in **red**; select it to see which file is missing or wrong.

Your games stay on the drive when you update the Duo's firmware.

The Game List

Move with the 5-way hat or the Port 1 joystick, and press **Fire**, **Red** or **Black** to select. Below the games you'll find **Display** (**Landscape**, or **Portrait** — turn the Duo on its side for a taller picture), **Show FPS**, **ROM Drive (USB)**, **Volume**, and **Exit**, which returns to the Duo (a quick press of **Menu** does the same).

Playing

Control	Action
5-way hat or Port 1 joystick	Move
Red, Yellow, Port 1 fire, or hat press	Fire (A)
Green or Blue	Second button (B)
Black	Start
White	Insert coin
Tap Menu	Change the picture width
Hold Menu (1 second)	Back to the game list

Press **White** to insert a coin, then **Black** to start. **Xevious**, **Super Cobra** and **Scramble** use two buttons: **A** for the first, **B** for the second. Each tap of **Menu** in a game steps through the picture widths (the narrowest is the game's true shape; the widest fills the screen), each also as a **crop** that is taller but cuts a little off the top and bottom. The Duo remembers your choice.

High Scores

Each game keeps its high-score table, and the Duo remembers it when you turn it off. Your scores are saved when you **leave the game** (hold **Menu**), so return to the game list before switching off.

Atari Games

The Duo can also be an **Atari 400/800/XL/XE computer** — and an **Atari 5200** — playing games on its built-in display with your Atari joysticks and paddles. It runs game files you provide — **games are not included**. Use only files you are entitled to use. The Atari operating system is built in (AltirraOS), so no Atari ROM files are needed.

To start, pick **Atari Games** from the start-up menu or the Games menu (**Yellow + Menu**). The Duo restarts into the Atari and shows its game list. While it is running, the Duo is not a game controller for your computer until you exit.

Adding Your Games

The Atari games share the arcade's **ARCADE ROMS** drive. In the game list, select **ROM Drive (USB)** (at the end of the list), connect the Duo to your computer, and copy your game files onto the drive — anywhere you like; folders are fine. Eject the drive, then press **Menu** or **Black** on the Duo to return to the game list.

Kind of game	Files
Programs	.xex, .com, .exe
Cartridges	.car, .rom, .bin
Atari 5200 cartridges	.a52 (also 5200 .bin, .rom and .car files)
Disk images	.atr, .xfd (read only)
Zip files	one game per zip, holding any of the above

Real Atari ROMs (optional). A few early games need the original Atari operating system. Copy your own **ATARIOSB.ROM** (400/800), **ATARIXL.ROM** (XL/XE) or **5200.ROM** onto the drive and they are used instead of the built-in ones.

The Game List

Move with the 5-way hat or the Port 1 joystick. Press **Fire**, **Red** or **Black** to play the game on an 800XL, or **White** to play it on a 400/800. Below the games you'll find **Settings** (Scale, Keyboard, FPS display, Volume, Machine, TV system, Paddles, and a Controller test) and **ROM Drive (USB)**. Press **Menu** to return to the Duo.

Playing

Control	Action
Ports 1 and 2	Atari joysticks 1 and 2; paddles
5-way hat / press	Joystick 1 / Fire
Red	Fire
Black	START
White	SELECT
Green	OPTION
Yellow	SPACE
Blue	On-screen keyboard (with RETURN)
Tap Menu	Next picture Scale mode
Hold Menu (1 second)	Back to the game list

Turn each paddle from end to end once so the Duo learns its range. Press **Blue** to open a keyboard with the Atari's keys at the bottom of the screen; the game pauses. Move the cursor with the joystick or hat and press fire to type a key, then press **Blue** again to close it.

Each tap of **Menu** in a game picks the next **Scale** mode — Smooth (the default), Sharp, Drop, or Crop (no blur, but the lines above and below the playfield are cut). The Duo remembers it.

Button Shortcuts

You can quickly access common features without opening the menu by holding button combinations while the menu is closed:

Green+Menu — Cycle through the three display modes.

White+Menu — Jump straight to Port 1 settings.

Black+Menu — Jump straight to Port 2 settings.

Yellow+Menu — Open the Games menu.

Red+White+Menu — Enter firmware update mode.

Diagnostics

If something isn't working right, the built-in diagnostics can help you see exactly what your controller is sending. Press the gray **Menu** button, scroll to **System**, push right, then scroll to **Diagnostics** and push right again. Each diagnostic can be toggled on or off:

Diagnostic	What It Shows
USB Heartbeat	USB communication indicator

Diagnostic	What It Shows
FPS Indicator	Frames-per-second counter
Show Positions	Numeric axis values
Paddles Data	Raw paddle analog values
Trackball Raw	Raw encoder X/Y/delta
Driving Raw	Raw driving encoder data
Roller Raw	Raw speed roller data
Sega Raw	Raw button state (hex)

System Menu

Press the gray **Menu** button and scroll to **System** to find these options.

To **Reset Defaults**, scroll to Reset Defaults and push right. A confirmation screen will appear — this restores all settings across all presets to factory defaults.

To view **System Info**, scroll to System Info and push right. You'll see your product name, model, and firmware version.

To enter **Firmware Update** mode, scroll to Firmware Update and push right. This puts the device into update mode (same as holding Red + White + Menu).

Unlock the Full Potential — iCodeHub Web App

Your Duo Ultimate H1 has powerful features right out of the box, but the real magic happens when you connect it to the **iCodeHub** web app. This is where you can manage all 10 presets with custom names, fine-tune paddle jitter and sensitivity, dial in driving and trackball response, remap every button with multi-action slots and rapid fire, enable mouse and keyboard emulation, back up your configurations to the Cloud Vault, 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** or **Edge**, click Connect, select your device, and sign in.

Visit: **https://hub.icode.com**

Firmware Updates

Via iCodeHub (Recommended)

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. Your arcade games, Atari games and arcade high scores are kept.

Manual Firmware Update

You can also install an update yourself. Put the device into firmware-update mode: hold **Red + White + Menu** while the menu is closed (or use System → Firmware Update). The device appears on your computer as a USB drive. Download the firmware file (.uf2) for the Duo Ultimate from **https://hub.icode.com** and copy it onto the drive; the device installs it and restarts by itself.

Make sure you download the correct file for your device (for example, DuoUltimateV230H1.uf2). Installing the firmware for a different device can stop the unit from working.

Backup Reset (Pinhole)

If your device becomes unresponsive and normal updates don't work, use the small pinhole near the Yellow button:

1. Press & hold button inside pinhole with a paperclip 2. While holding, plug in the USB cable 3. Release — the device appears as a USB drive 4. Use iCodeHub device recovery to install the firmware

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Troubleshooting

Your controller isn't detected. Make sure it's firmly plugged into the DB9 port. Press the gray Menu button, go to Settings, and check that you've selected the correct console and device type. Try the other port. You can also turn on diagnostics to see raw input data — press Menu, go to System, then Diagnostics.

Your host device doesn't recognize the adapter. Try a different USB cable or port. Press Menu, go to USB Settings, scroll to USB Emulation, and push right to try a different mode. Standard works for most platforms, but some require Classic, Nintendo, Legacy, or iOS.

Your paddles are jittery. Press Menu, go to Settings, select the port, scroll to the Paddles section, and increase Jitter Control and Jitter Averaging until the input smooths out. You can also reduce Sensitivity. If it persists, try cleaning the paddle potentiometer contacts.

Buttons aren't responding. Make sure you're not in the menu — press Menu to exit. Press Menu again, go to Settings, then Duo Buttons, and check that your buttons are mapped to the actions you expect. Also check the Button Destination setting. If something seems wrong, go to System and select Reset Defaults to start fresh.

The display is blank. Hold Green + Menu to cycle through display modes — it may be set to Off. If it's still blank, press Menu, go to System, and select Reset Defaults.

Mouse or keyboard not working on your host. Press Menu, go to USB Settings, scroll to Mouse or Keyboard, and make sure it's set to On (not Off or Standby). Your host may need a reboot after the USB descriptors change. Try disconnecting and reconnecting the adapter.

No arcade games are listed. Select ROM Drive (USB) in the game list and check that the zip files are on the ARCADE ROMS drive with the exact names shown in Arcade Games. A game listed in red

has the wrong ROM set — select it to see which file is missing or wrong.

An Atari game crashes or shows a blank screen. Some early games need the original Atari operating system: copy ATARIOSB.ROM and ATARIXL.ROM onto the drive (see Atari Games), or start the game with White to run it on a 400/800.

On Auto, a controller isn't recognized. Turn a driving controller's wheel, or roll a trackball up or down, so it's detected. If you'd rather not rely on detection, choose the controller's own mode in the port settings.

You see two gamepad devices on your host. That's normal — the Duo H1 presents two USB gamepads (one per port). If you only want one, press Menu, go to USB Settings, scroll to Ports Active, and set it to Port 1 Only or Port 2 Only.

Help and Resources

Visit **icode.com/help/duo** for how to add games, videos, guides, and the latest manual.

- **Videos** — youtube.com/@i-code
- **Discord** — chat with other owners: discord.gg/SVeHruD2d3
- **Community forums** — questions, troubleshooting, and ideas: icode.com/community
- **Facebook** — news and updates: facebook.com/icodeusa

Platform Compatibility

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

PC — Windows, macOS, Linux **Mobile** — iOS, Android **FPGA** — MiSTer FPGA **Consoles** — Nintendo Switch, Steam Deck, Atari Gamestation Pro **SBC Retro** — RetroPie, Batocera, RetroArch, EmuElec, Recalbox

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Specifications

Spec	Detail
Processor	RP2350 dual-core, 250 MHz
Controller Ports	2× DB9
USB	USB-C, USB 2.0 Full Speed
USB HID Devices	Up to 4 (2 pads+mouse+kbd)
Display	160×80 color TFT (ST7735)
LEDs	2× addressable RGB
Audio	10-channel polyphonic
Storage	On-board flash (LittleFS)
Power	USB bus-powered
Consoles	Atari (5200 with coupler), ColecoVision, Intellivision, Vectrex, Sega
Presets	10 device / 100 cloud
Arcade	13 games, 1 MB USB ROM drive
Atari Games	400/800/XL/XE and 5200, same drive

Open-Source Software

Atari Games uses the open-source atari800 emulator by the atari800 development team, with AltirraOS by Avery Lee built in, and Arcade Games uses Pico2Arcade. Both are released under the GNU GPL v3; the source code for the version in your firmware is available at github.com/alijani1/Pico2Atari8 and github.com/alijani1/Pico2Arcade.

Duo Ultimate H1

For web configuration and updates, visit https://hub.icode.com For help and assistance, visit https://www.icode.com/support