



# RETROLOOP NEO AND CODE MACHINE QUICK START GUIDE

## Introduction

The Retroloop Neo is the “simple as vintage” DIY board for everyone developed by professional live looper and recording artist Adam Searan. It is based on the popular Arduino Leonardo, combined with the simplicity of a retro arcade stick. The Neo, like the Leonardo is a microcontroller board based on the ATmega32u4. It has 19 digital input/output pins, with 1 (Pin 13) dedicated RGB port (7 can be used as PWM outputs and 12 as analog input, USB C connection, and ICSP header. However, unlike the Arduino Leonardo the Neo comes ready to plug and play. Simply plug in your buttons and addressable NEO PIXEL LEDs to the RGB port (up to 32 max) and the solder free quick connectors on the board and you’re ready to go straight to midi learn.

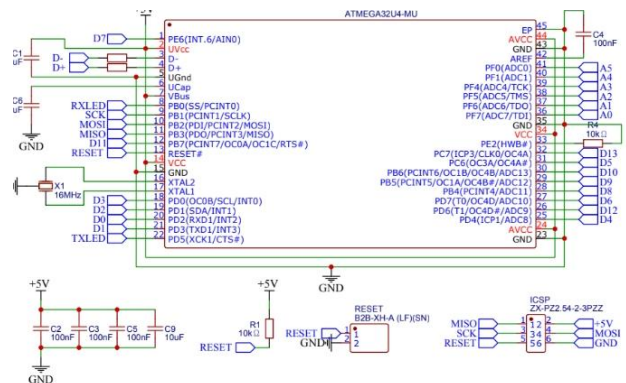
Want to customize your board? No drivers. No Code. No problem. Connect to your Mac/Pc via USB C cable and you are ready set everything from button assignments to LED fx. The the way you want to. This is the only code optional DIY solution available right now! So let’s get started. By default all inputs are set to momentary notes with LED FX mapped as follows

**NT 38-50 MIDI CH.2 PIN D0-12 Digital Pins**

**NT 51-55 MIDI CH.2 PIN A0-A5 Analog Pins**

**LED FX respond to Ch.2 CC19(OFF) CC20-CC29**

**\*Send midi clock to device for beat sync FX**



# Getting Started

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All Retroloop Neo boards come preset with firmware 2.5.6c . This by default gives you access to start playing shows or using The Retroloop Code Machine app right out of the box. Future updates may come available to fix bugs, or add features, so it's good to get familiar on how to flash an .ino or Arduino sketch to your board.

1. Download the latest Arduino IDE
  - a. Under tools menu click manage libraries
  - b. Search and install MIDIUSB and FASTLED libraries
2. Under tools menu click manage boards
  - a. Select AVR boards
  - b. Select Arduino Leonardo
3. Then under tools menu click ports and select your Arduino Leonardo
4. Download and open the .ino file or sketch
5. Click the upload button and that's it!

## ⚡ Connecting to The Retroloop Code Machine.

1. Getting connected is easy. There are no drivers required, but there are a couple things you need.
  - a. A USB C cable that supports data and a Mac, Pc, or Chromebook computer. This will not connect to your device on a tablet or mobile device. The app uses Web Serial connection so mobile browsers are not supported.
  - b. You will need buttons and RGB LEDS connected to the Neo for the full experience.

## ⚡ The Code Machine gives you the keys to the cool stuff without the code stuff.

**This app contains several useful tools for everyone including full customization of LEDs (Colors, FX) button routing, midi monitoring, and even a way to create presets and profiles with import and export. Also your presets are saved in the app so you can access them anywhere. The Code Machine can also be installed and cached in your browser for offline use. You do have to have the internet to access the app initially.**

**This app is totally optional as all devices ship programmed for performance once buttons are connected.**



# Control Tab

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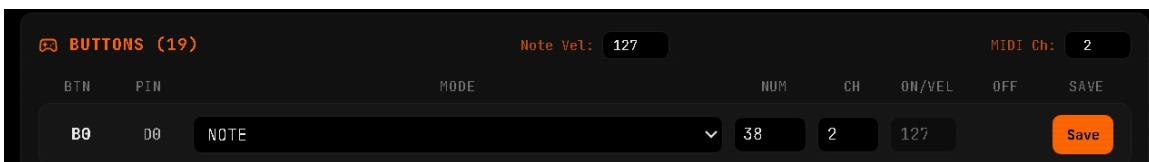


## Connect

Plug in your device. Click connect. Click allow permissions in your browser. Select your device in the pop up list. You're connected! Now you are ready to go! Underneath the connect button you can see at a glance what firmware you are running. If certain features aren't working you may need to check your f/w in the settings tab.

**Help icon; Click the question mark in the circle to show hover guides for all functions.**

## Button Section



BTN/PIN: This is the button to pin index. B0 is button zero to correspond to D0 the first pin on the Neo. The pins on the board are not in order but you actually should connect them in order sequentially especially if you want to make the RGB LEDs easier to configure. You can reroute your buttons and LEDs in the app but for the best experience go the simple route above.

\*Click the VIS switch in the LED Maps+Controls section to see realtime button press feedback on screen.

MODE: NOTE, CC, or PC. You can set what type of message your buttons will send.

NUM: MIDI, CC, or PC Number

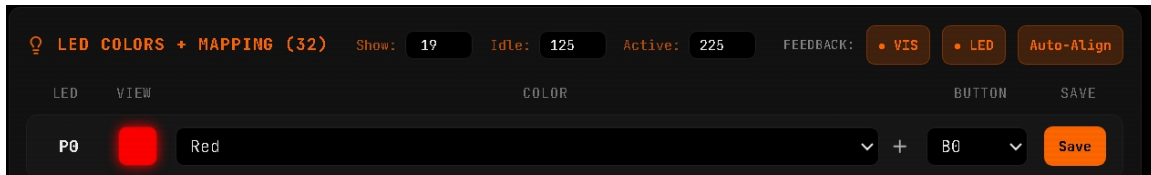
CH: The MIDI Channel the button will operate on

ON/VEL: Press value. (CC and PC only)

OFF: Release value. (CC and PC only)

GLOBAL CH./VEL: Set MIDI channel and/or velocity for all buttons

**\*Use NOTES for performance pads, CC for FX control or expression pedals.**



## LED Colors + Mapping Tap

**This only controls addressable RGB LEDs plugged into pin 13 not general LEDs plugged into LED port. You can also set up 32 LEDs to be visible or hidden. This is great if you only have 12 buttons/Pedals/LEDs/Pixels so you only see useful information.**

SHOW: Shows visible on screen LED Color preview. Select from a list or select the + icon to dial in and save your own custom color.

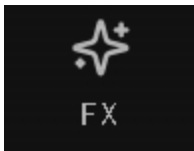
IDLE: Idle brightness of RGB buttons when not being pressed.

ACTIVE: Active brightness of buttons when being pressed. Press LED button to enable press feedback to preview Idle/Active brightness

VIS/LED: VIS feedback shows what button is connected to what LED on screen. LED feedback shows on button Idle/Active feedback.

AUTO Align: Most RGB LED Strips, rings, buttons, etc have a parallel order of their own. You can adjust what LEDs respond to which button but Auto align will attempt to fix this for you. In the settings tab you can run LED Debug to see the order in which the buttons flash. To fix a button firing a light on another button you need to change the button input in the button field next to the LED color. There is also an undo button if it the Auto Align doesn't work for you.

**\*Always read the manual that comes with your buttons or RGB lights or strips especially if they run on a harness. They can be very specific of the order they need to be plugged in. Also, plan your layout in a straight left to right order in rows it that is easy to keep track of. If you can't look at your board and know where your buttons start (0-12) it's too complicated.**



# FX Tab

The FX tab is split into two sections and is powered by the FASTLED library. This an open source library that is very powerful. The two sections are **Global**, all LEDS/PIXELS 32 MAX

The screenshot displays the FX / EFFECTS control interface. At the top, there's a 'CONNECTED' status indicator. Below it, a grid of effect buttons is shown, with 'Static' selected. The effects include: Static, Rainbow, Glitter, Confetti, SineLon, Juggle, BPM, Breathe, Chase, Twinkle, and Wipe. A note below the buttons states: 'Static LED colors - no animation'. The 'CC TRIGGERS' section lists each effect with its corresponding MIDI channel number (e.g., Static 19, Rainbow 20, Glitter 21, Confetti 22, SineLon 23, Juggle 24, BPM 25, Breathe 26, Chase 27, Twinkle 28, Wipe 29). A note below this section says: 'Send CC # on trigger channel to activate FX - ▶ sends a test trigger'. The 'PIXEL GROUPS' section shows four groups, each with a grid of effect buttons and a 'Preview' button. The total number of LEDs is 16 / 32, and the trigger channel is 3.

## Global FX

There are a total of 10 effects. You can click through each effect and see a realtime preview and there is a description of each one displayed.

1. **CC19# STATIC (OFF)**
2. **CC20# RAINBOW - CYCLES RAINBOW COLORS**
3. **CC21# GLITTER - RAINBOW WITH RANDOM WHITE SPARKLES**
4. **CC22# CONFETTI - CONFETTI**
5. **CC23# SINELOK - COLOR DOT BOUNCING ON A SOUND WAVE (BPM CC COLOR)**
6. **CC24# JUGGLE - 8 BIT DOTS JUGGLING AROUND (BPM CC COLOR)**
7. **CC25# BPM - BEAT SYNCED FLASHING (BPM CC COLOR)**
8. **CC26# BREATHE - SLOW PULSE (BPM CC COLOR)**

9. CC27# CHASE – SINGLE WHITE DOT (BPM SYNCED CC COLOR)
10. CC28# TWINKLE – RANDOM LED TWINKLE
11. CC29# WIPE – COLOR WIPE LOOP (BPM SYNC)

**\*CC COLOR IS DETERMINED BY CC VALUE. FOR BPM SYNC SEND MIDI CLOCK TO THE DEVICE.**

Each effect has its own customizable CC# and a global MIDI channel so you can make sure they are running in their own space. By default this is MIDI channel 2. Some effects have colors that can be altered depending on the value your daw sends for feedback. Just remember Global means all buttons, and global effects run on their own channel separate from groups to offer the most flexibility and creativity.

⚡ **Global FX overrides group FX instantly so static will always turn all effects off.**

### **Group FX**

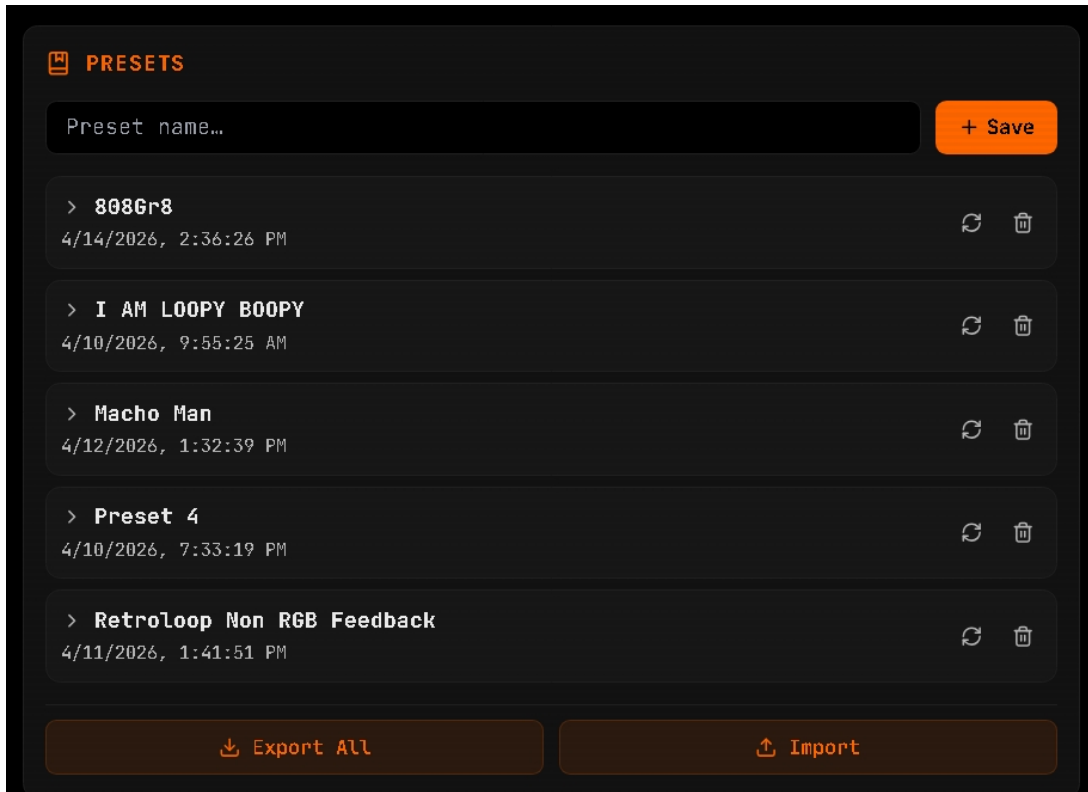
There are 4 groups available for selection. The preview button previews and saves each of their custom CC# assignments. The group FX also have their own midi channel assignments. **You can select a custom number of LEDs/Pixels for each group but the sum of all LED/Pixel groups cannot exceed 32. Color variation by CC value is also available to certain FX like in the Global FX section.**

⚡ **Group FX = precision control (colored feedback, etc). Global FX = full scene.**



Presets

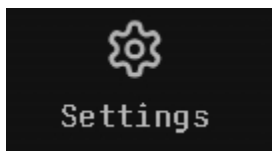
## Presets Tab



Save, Import, Export, Export All.

Update or delete presets anytime. This saves all of your changes including LED/Pixel colors.

⚡ **Your device will remember and the app will recall your preset on load.**



Settings

## Settings Tab

#Pixels displayed up to 32, Idle Bright, Active Bright, Note Velocity, MIDI Channel, Auto Disconnect. You can also set your visual and LED/Pixel feedback from here as well.

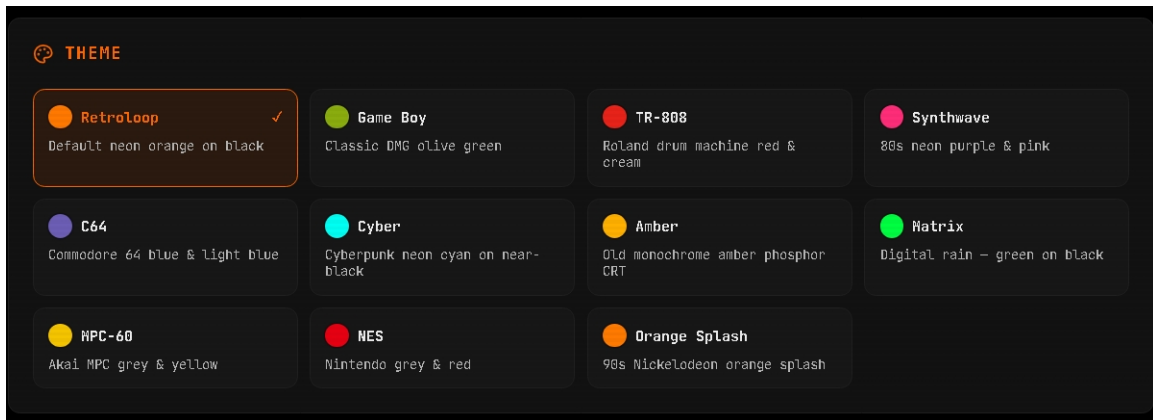
**LED DEBUG: This triggers a sequence flashing of your LEDs/Pixels. This can be helpful in setting up your LEDs for feedback especially if you are using RGB buttons.**

**RESET: Reset your device to factory default instantly.**

**IMPORT/EXPORT: Backup your global settings. Restore your global settings.**

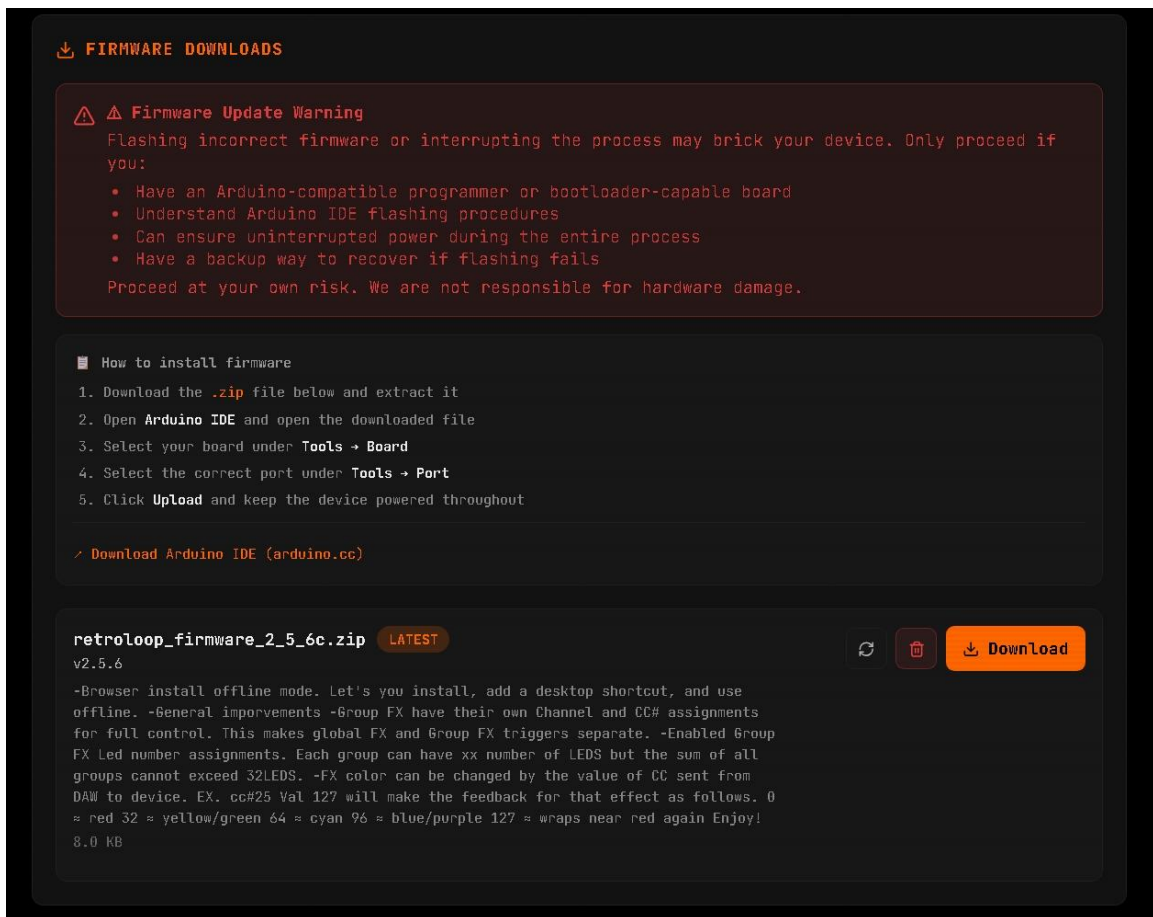
⚡ Save to board and global save to board are hard save options just in case.

## Themes



Choose your own visual style based on fun retro machines!

## Firmware



Latest firmwares and change logs are located and also an included is a link to the latest Arduino IDE.

**⚡ Incorrect flashing can brick the device — proceed carefully it is not a bad idea to get an ISP programmer to easily fix it they are available on Amazon for \$10.**

**FIRMWARES ARE ALSO COMPATIBLE WITH ALL ARDUINO CHIPS THAT SUPPORT .INO FILES AND USB MIDI.**

**THE BOOT-LOADER IS OPEN BUT THE CODE MACHINE IS DESIGNED TO WORK WITH CUSTOM RETROLOOP BUILT FIRMWARES.**

## Troubleshooting

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**⚡ If something feels off, disconnect and reconnect first — it fixes most issues.**

**⚡ Check your switch/button wiring.**

**⚡ Flip your USB C cable. Also make sure that you are using a USB C data cable.**

### Disclaimer

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