Beat Machine Firmware Update: macOS vs Windows

Step	macOS (Terminal)	Windows (Command Prompt)
1. Install prerequisites	Install **Homebrew**: http://docs.brew.sh/Installation	Install **Python**: http://python.org/downloads (check "Add Python to PATH")
2. Install esptool	`brew install esptool`	`pip install esptool`
3. Verify installation	`esptool version`	`esptool.py version`
4. Copy .bin file	Save firmware file locally	Save firmware file locally
5. Navigate to folder	`cd /path/to/folder` (drag folder into Terminal for full path)	`cd "C:\path\to\folder"` (use quotes if path has spaces)
6. Connect Beat Machine	Via USB	Via USB
7. Find port	`ls /dev/cu*` (e.g., `/dev/cu.usbmodem31401`)	Check **Device Manager** → Ports (COM & LPT) (e.g., `COM4`)
8. Quit Arduino IDE	Close Arduino IDE (if open)	Close Arduino IDE (if open)
9. Get .bin path	Drag .bin file into Terminal and copy full path	Right-click .bin file → Properties → Copy full path
10. Flash firmware*	`esptool.py --chip esp32s3 --port /dev/cu.YOUR_PORT --baud 460800 write_flash -z 0x10000 /path/to/your_firmware.bin`	`esptool.py --chip esp32s3 --port YOUR_PORT --baud 460800 write_flash -z 0x10000 "C:\full\path\to\your_firmware.bin"`
11. Wait for transfer	Displays ESP32 details and progress	Displays ESP32 details and progress
12. Reset device	Press Reset button	Press Reset button

* At step 10: replace YOUR_PORT with the actual port name and your_firmware.bin with the path to your binary.