

Perkins Braille Bloom™

UM-BB200-1
User Manual



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Product Overview

The **Perkins Braille Bloom™** turns any Perkins Classic Braille into a modern, plug-and-play Braille keyboard for computers, tablets, and mobile devices, supporting both uncontracted and contracted Braille input.

When mounted to your Perkins Classic Braille, the Perkins Braille Bloom™ captures each six-dot chord, translates it on board into text, and streams it in real time over USB or Bluetooth to the connected computer, tablet, or smartphone. Because it uses standard HID profiles, no drivers or special software are required.

With Bluetooth Low Energy and USB-C connectivity, the Perkins Braille Bloom™ delivers a low-latency link to Windows, macOS, ChromeOS, iOS, and Android. A single press of the left-side spring-loaded switch toggles between uncontracted and contracted Braille. A single beep signals the device is set to uncontracted braille, while two short beeps signal the device is set to contracted braille.

Key Features

- **Bluetooth LE & USB-C** Plug-and-play across desktop and mobile OSes; no apps and no drivers required.
- **Dual-Grade Braille Input** Defaults to uncontracted Braille with each power cycle; press the on-board switch to change to contracted Braille.
- **Battery Optimization:** The device uses an intelligent, motion-aware power management system designed to maximize battery life.
- **Long Battery Life** Up to 8 hours of continuous use or 24 hours of intermittent use; fully recharges in 5 hours.
- **Firmware upgrade:** Via the supplied USB cable to unlock new features and Braille tables.
- **Broad App Compatibility** Works in any application that accepts typing, including Word, Google Docs, Notepad, messaging apps, and more.

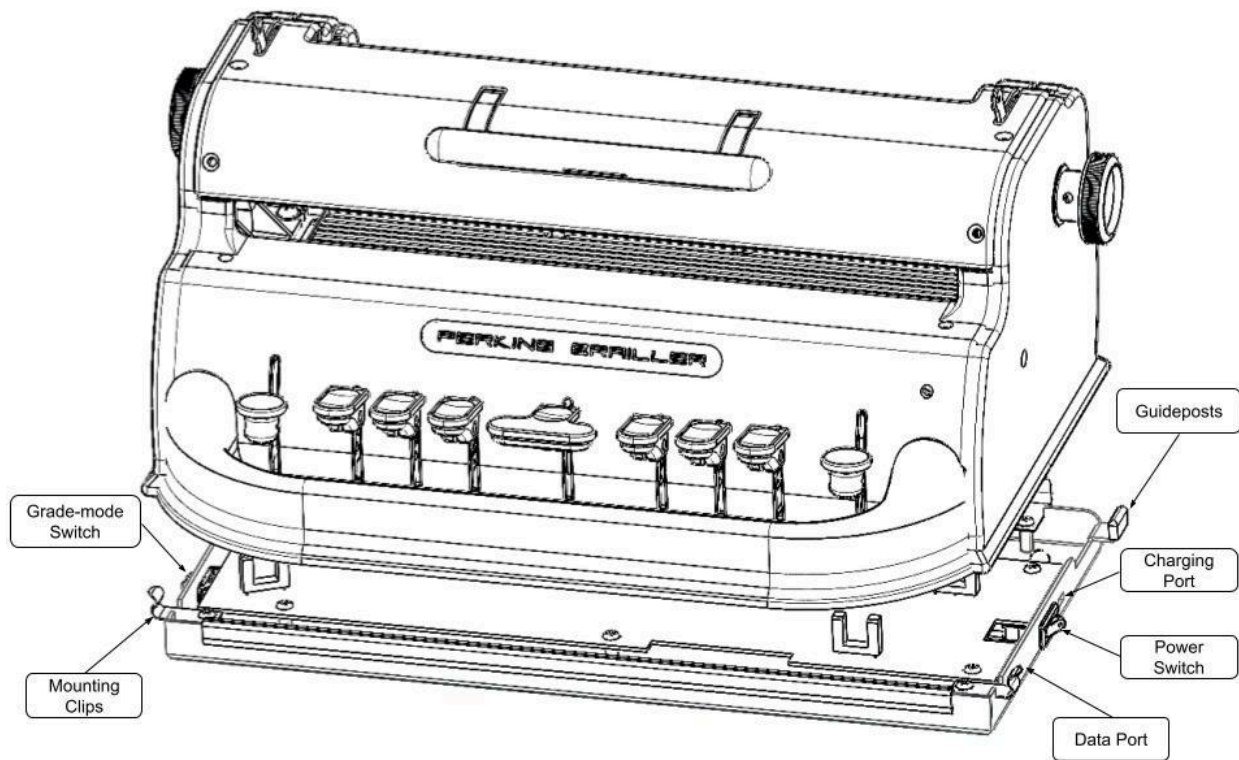


Diagram showing the correct orientation of the Perkins Classic Brailer with the Perkins Braille Bloom™ below it, with labels pointing to switches and ports for orientation confirmation.

Device Overview & Layout

Before installing the Perkins Braille Bloom™, take a moment to become familiar with the device and where its main controls and ports are located. Understanding the layout of the Perkins Braille Bloom™ will make installation and setup easier in the next section.

Power Switch

The power switch is located in the middle of the right side of the Perkins Braille Bloom™.

- To turn the Perkins Braille Bloom™ on, push the switch towards the back of the device.
- Audio and haptic feedback will indicate that the device has powered on.
- To turn the Perkins Braille Bloom™ off, push the switch towards the front of the device.
- Audio feedback will indicate that the device has powered off.
- **IMPORTANT:** when attempting to restart the Perkins Braille Bloom™, wait 3-5 seconds after turning the Perkins Braille Bloom™ off before turning it back on.

USB-C Ports

There are two USB-C ports on the right side of the Perkins Braille Bloom™, each serving a different purpose:

- The USB-C port closest to the front of the device is used for data transfer, including sending key presses to a connected device and performing firmware updates.
- The USB-C port closest to the back of the device is used for charging the internal battery.
- **Note:** The Perkins Braille Bloom™ can be used while charging, although charging may occur more slowly during active use.

Mode Switch

The mode switch is a spring-loaded switch located on the left side of the Perkins Braille Bloom™. It is used to switch between uncontracted and contracted Braille modes.

- The Perkins Braille Bloom™ will always default to uncontracted braille mode. Each time you turn the device on, you will need to select which braille mode you want.
- Pressing and releasing the mode switch will change the device to contracted Braille mode.
- Two short beeps and two haptic pulses indicate that the device has switched to contracted mode.
- When the device is in contracted Braille mode, pressing and releasing the mode switch will return it to uncontracted Braille mode.
- One short beep and one haptic pulse indicate that the device has switched back to uncontracted mode.

Alignment Guideposts

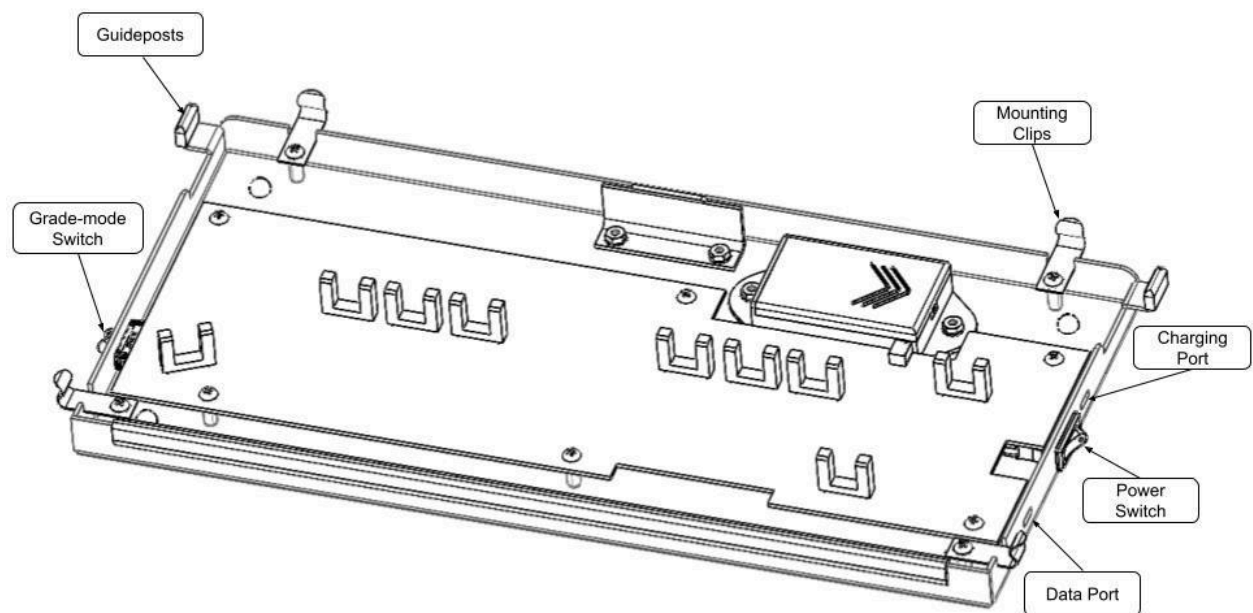
Near the back of the left and right sides of the Perkins Braille Bloom™ are two alignment guideposts.

- These guideposts have rubber endcaps.
- They do not move.
- They are used to help ensure that a Perkins Classic Braille is properly aligned before mounting.

Spring Clips

On the rear side and the two short sides of the Perkins Braille Bloom™ are spring clips.

- These clips do not have rubber endcaps.
- They are used to secure the device to a Perkins Classic Braille.



Top-down diagram of the Perkins Braille Bloom™ with labels for the grade-mode switch on the left side and the USB-C ports and power switch on the right side.

Packaging Contents & Accessories

- Perkins Braille Bloom™ module
- 3 ft USB-C to USB-A cable
- Mini Screwdriver
- Quick Start Guide

Installation & Hardware Setup

Orientation

- Place the Perkins Braille Bloom™ flat on a table with the long side with the clips facing away from you.
- On the right side, the power switch is in the middle of the two USB-C ports. The power switch is on when flipped towards the back.
- The spring-loaded switch on the left side toggles between uncontracted and contracted braille.
- On each side near the back are two rubber-coated alignment guides.

Tools & Workspace Requirements

- #1 Phillips screwdriver
- Clean, dry, flat work surface
- Protective gloves or handle boards by the edges

Pre-Installation Checklist

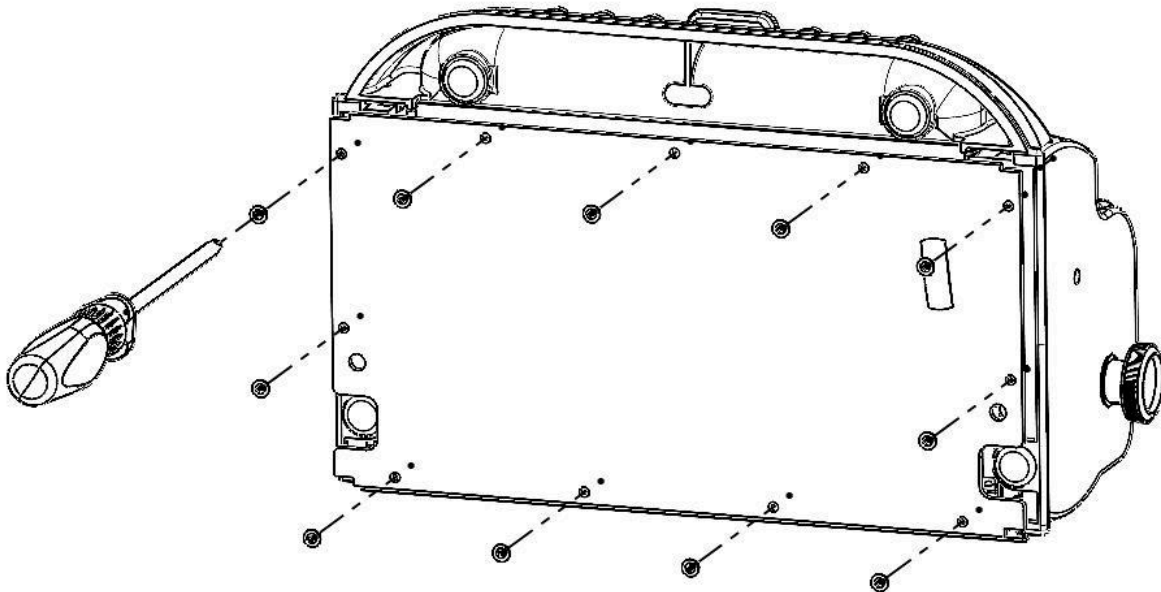
Before you begin, ensure:

- The Perkins Braille Bloom™ battery is at least 50% charged
 - To determine the current charge level, flip the power switch to on by pushing the switch towards the back of the device. After an initial two-tone “up” sequence, there will be one or more quick, short tones. Each quick tone represents 25% power.
 - If the power level is below 50%, plug the supplied USB-C to USB-A cable into the Perkins Braille Bloom™’s USB-C port (near the front of the right side).
- The work area is free of dust and liquids
- **IMPORTANT:** Your Perkins Braille needs to be in good working order. If it has not been cleaned or serviced recently, it is very important to do that before connecting your new Perkins Braille Bloom™. An uncleaned braille could cause transcription discrepancies.

Step 1: Remove the Original Bottom Board

1. Place your Perkins Classic Braille on its back, bottom side facing you or upside down with the bottom side facing up.
2. Using the #1 Phillips screwdriver, remove the 11 screws around the perimeter:
 - 3 screws along the front edge
 - 2 screws on each side edge
 - 4 screws along the back edge

3. Take off the original bottom board and set it, along with its screws, aside. These will only be needed again if you choose to remove the Perkins Braille Bloom™ and replace the bottom board. Alternatively, the Perkins Braille Bloom™ serves as the new bottom board for the Perkins Braille, and you only need to remove your Perkins Braille Bloom™ for battery replacement or deep cleaning.



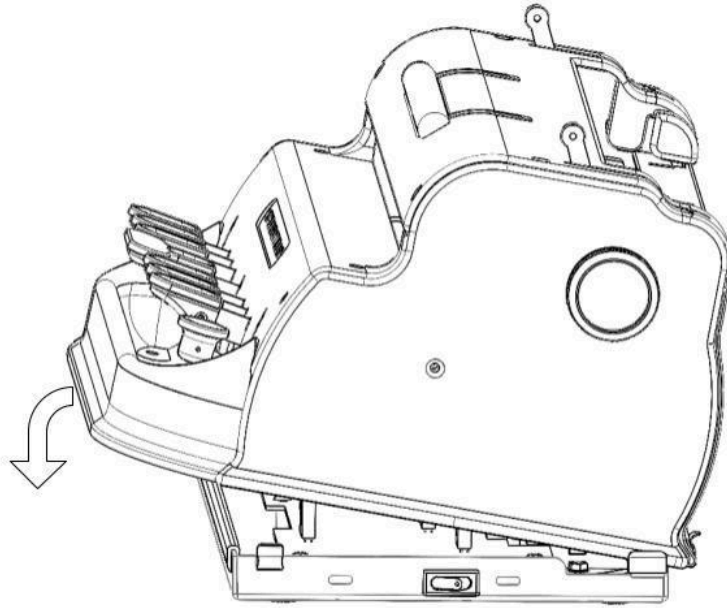
Bottom view of the Perkins Braille, showing the location of the Phillips head screws to be removed.

Step 2: Attach the Perkins Braille Bloom™ Bottom Board

Caution: The new bottom board has exposed circuitry and sharp-edge clips. Handle it by the centers of the sides or wear protective gloves.

1. Orient the Perkins Braille Bloom™ board so that:
 - **Back edge** (the long end with clips) faces away from you.
 - **Front edge** (the long end without clips) faces toward you.
2. Lay the board flat on your work surface with the front edge parallel to the table's edge.
3. Position the braille beside the board, front edge facing you.
4. Pick up the braille, tip it back slightly, center it over the back edge of the board, and place the back edge of the braille just in front of the two rear clips.
5. Ensure that the braille is centered on the Perkins Braille Bloom™ by feeling that the side guides align with the short edges of the braille.

6. With the back clips engaged and the braille centered using the side guides, lower the front of the braille and press gently until it clips into position.



Install the Perkins Braille on the Perkins Braille Bloom™ by engaging the rear clips first, then lowering the front down onto the side clips.

Step 3: Verify Installation

1. The Perkins Braille Bloom™ now takes the place of the bottom board on the Perkins Braille. Gently lift the braille off the surface, and confirm the board stays firmly attached.
2. Power on Perkins Braille Bloom™ using the power switch on the right side of the device and listen for the “up” tone plus haptic pulse.
3. Toggle the left mode switch once, listen for the mode-toggle tone.
4. Connect via USB-C or Bluetooth and open a text field to verify chords are correctly transmitted.

Connectivity

The Perkins Braille Bloom™ works over both USB-C and Bluetooth with Windows, macOS, ChromeOS, iOS, and Android - no drivers and no apps required. Every chord you enter appears as the corresponding text in any text field.

Connection Overview

The Perkins Braille Bloom™ supports both USB and Bluetooth connections, allowing flexible use across multiple devices.

- **USB Connection**

- When the Perkins Braille Bloom™ is connected to a smart device using a USB cable, it is instantly ready to use. No setup or pairing is required at this point.
- Use the USB-C port closest to the front of the Perkins Braille Bloom™ when connecting to a computer, tablet, or phone.

- **Bluetooth Connection**

- If the Perkins Braille Bloom™ has never been paired or if the last paired device is out of range, it will automatically enter Bluetooth discovery mode, allowing new devices to find and pair with it.
- If the Perkins Braille Bloom™ has been previously paired and the paired device is within range, it will automatically reconnect to that device.
- See 'Wireless (Bluetooth) Connection' below for instructions on how to pair.

- **Simultaneous Use**

- If you want to connect to two different devices simultaneously, you can connect the Perkins Braille Bloom™ to one device over USB and another device over Bluetooth.
- If you are only connecting to one device, it is recommended that you do not attempt to connect over USB and Bluetooth at the same time, as this can cause translation issues.

Wired (USB-C) Connection

1. Power on the Perkins Braille Bloom™ (right side switch): listen for the “up” tone and haptic pulse.
2. Locate the USB-C port closest to the front on the right side. Plug the supplied USB-C to USB-A cable into the module and your host's USB-A port. Phones and tablets may require a USB-C OTG adapter (sold separately) to work over USB.
3. Open any text field (Notepad, Word, Google Docs, etc.). Braille chords appear instantly as Grade 1 or Grade 2 text.

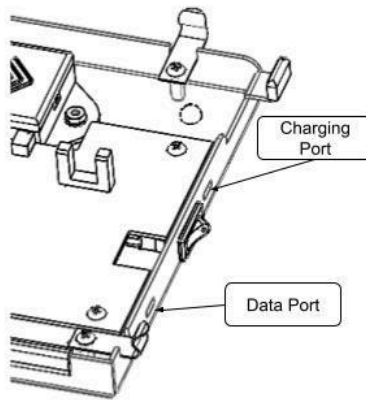


Illustration of the right side of the Perkins Braille Bloom™ with the two USB-C ports labelled. The port near the front of the device is for connecting over USB and for firmware updates. The port near the back of the device is for power.

Wireless (Bluetooth) Connection

1. Power on the Perkins Braille Bloom™ (listen for the “up” tone and haptic pulse).
2. On your host device:
 - a. Windows: Settings, Devices, Bluetooth & other devices, Add Bluetooth.
 - b. macOS: Menu, System Settings, Bluetooth.
 - c. ChromeOS: Settings, Bluetooth, Pair new device.
 - d. iOS: Settings, Bluetooth.
 - e. Android: Settings, Connected devices, Pair new device.
3. Select “PerkinsBB” followed by a series of numbers from the list.
4. Listen for multiple simultaneous “up” and “down” tones confirming a successful pairing.
5. When a pairing request appears on your device, accept the pairing connection.
6. Open any text field and start typing.

Reconnect Behavior: Once paired, the Perkins Braille Bloom™ will auto-connect on power-up anytime your host’s Bluetooth is enabled.

Troubleshooting Tips

- If your host doesn’t recognize the Perkins Braille Bloom™ over USB, toggle the power switch or unplug/replug the USB-C cable.
- If Bluetooth pairing fails:
 - Turn Bluetooth off/on in your host’s settings.
 - Power-cycle the Perkins Braille Bloom™ (switch off then on).
 - Forget the device that starts with “PerkinsBB” on the host, then repeat pairing.
- Keep the Perkins Braille Bloom™ within 30 feet or 10 meters of your host and avoid large metal obstructions to minimize latency.

Daily Operations & Modes

The Perkins Braille Bloom™ “just works” every time you pick up your Brailier. Clear audio and haptic cues keep you informed of mode, connection, and battery status.

User Feedback Cues

Event	Tone
Power On	“Up” tone and haptic pulse
Power Off	“Down” tone
Bluetooth Pairing	Multiple simultaneous “up” and “down” tones
Battery Status indicator	After the power-on tone, 1 to 4 short beeps signaling the following: • 1 Beep: 0-25% charged • 2 Beeps: 26-50% charged • 3 Beeps: 51-75% charged • 4 Beeps: 76-100% charged
Charging Indicator	“Buzzing” sound when first connected to power
Low Battery Warning	Two “Down” audio tones in quick succession
Mode Toggle	Single beep with haptic pulse (uncontracted Braille) or double-beep with haptic pulses (contracted Braille)

Uncontracted and Contracted Mode Switching

- On power-up, the module defaults to uncontracted Braille.
- Press the left-side spring-loaded switch once to toggle into contracted Braille.
- Press again to revert to uncontracted Braille.

Operating System Support

The Perkins Braille Bloom™ is recognized as a keyboard by Windows, macOS, ChromeOS, iOS, and Android. To ensure maximum compatibility with each operating system, the Perkins Braille Bloom™ has a mode for each of these operating systems that can be selected upon startup, and then the Perkins Braille Bloom™ will remember that selection across power cycles. To select an operating system mode, you can hold down a specific key while powering on the Perkins Braille Bloom™ until the power-on tone and haptics have been triggered. The following chart lists which key to hold for each operating system:

Operating System	Key to hold during power up
Windows	Dot 1
MacOS, iOS, iPadOS	Dot 2
ChromeOS, Android	Dot 3

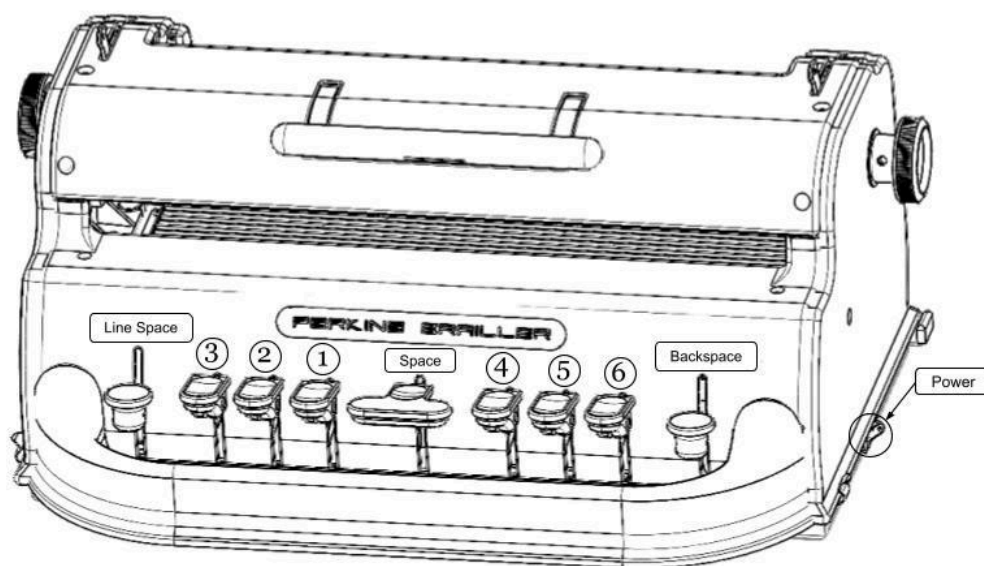


Diagram of the Perkins Classic Braille with each key, as well as the power switch, labelled.

Application Support

The Braille Bloom works with any application that accepts standard keyboard input, including programs like Microsoft Word, Google Docs, email, and messaging apps. No special software is required.

In most cases, you can begin typing immediately. However, some applications may automatically modify what you type through features such as:

- Automatic capitalization (e.g., capitalizing the first word of a sentence)
- Autocorrect or spelling corrections

To ensure that your braille input is reflected exactly as typed, you may want to disable these features in your application settings before use.

Braille typeform indicators (such as italic, bold, or underline) are not applied automatically. Because formatting is handled differently across applications and operating systems, these indicators will not translate into formatted text.

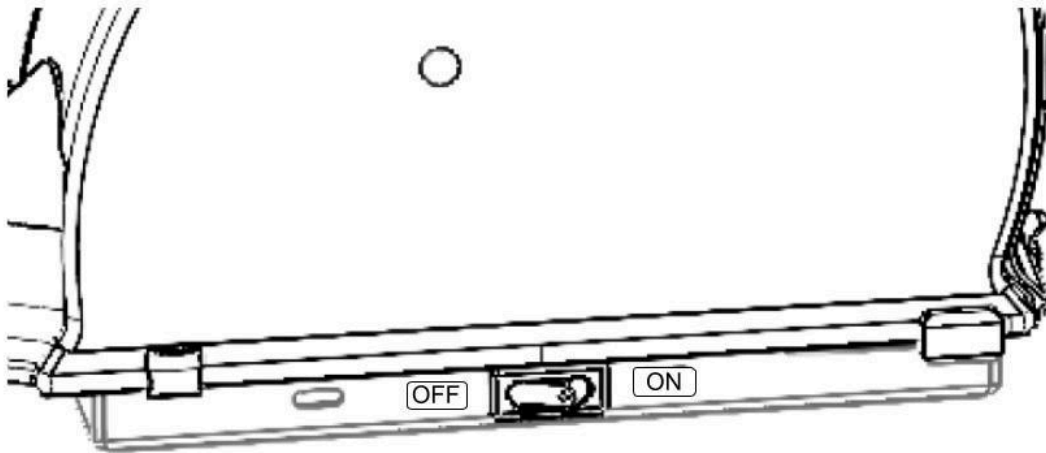
Power Management

Power Conservation

- The device uses an intelligent, motion-aware power management system designed to maximize battery life.
- If the device is sitting still and you're not pressing any keys, a built-in motion sensor reduces power to sensors in the device while keeping the device ready in the background.
- When a key is pressed or the device is moved, the built-in motion sensor turns all sensors back on automatically.

Power Control

- Slide the power switch (right side) forward (toward the back of the Perkins Braille Bloom™) to power on.
- You'll hear the "up" tone and feel a short haptic pulse.
- Slide the switch back (toward the Braille Bloom's front) to the power off position.
- You'll hear the "down" tone.
- **IMPORTANT:** When attempting to restart the Perkins Braille Bloom™, wait 3-5 seconds after turning the Perkins Braille Bloom™ off before turning it back on.



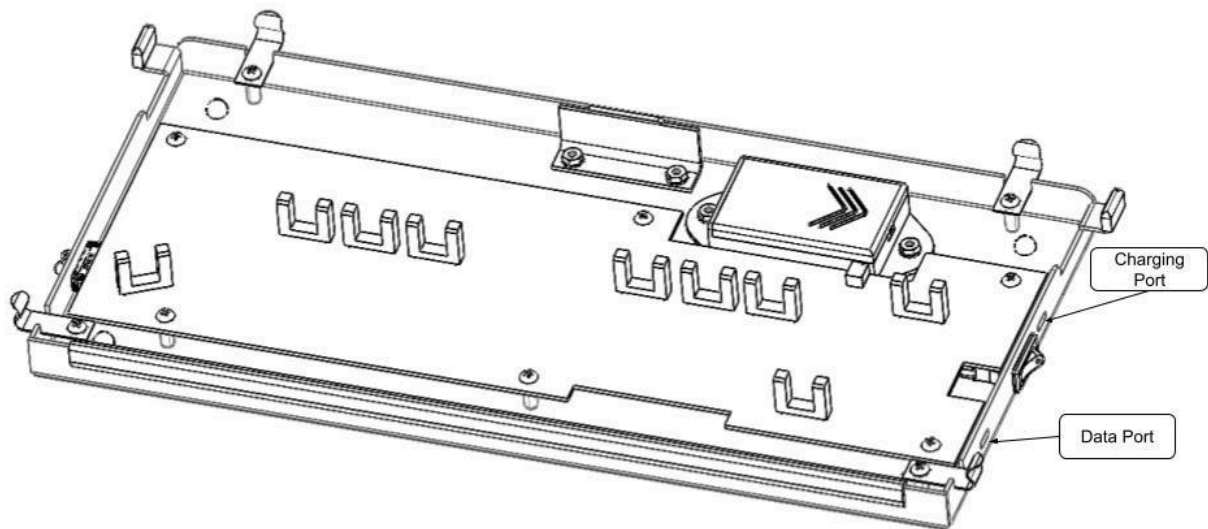
The right side of the Perkins Braille Bloom™ with the power switch visible, showing which direction the switch should be in for the device to be on or off.

Battery Specifications

- 3.7 V, 2000 mAh LiPo battery (EEMB Part No. LP103454)
- Runtime: Up to 8 hours continuous use; up to 24 hours intermittent use
- Lifespan: 3-5 years or 2,000 charge cycles under normal conditions

Charging the Battery

1. Plug the supplied USB-C to USB-A cable into Perkins Braille Bloom™'s USB-C port.
2. Connect the USB-A end to a 5 V/1 A (or higher) wall charger or computer USB port.
3. The Perkins Braille Bloom™ can be used and charged at the same time.
4. Allow approximately 5 hours to charge from 0 to 100%.



Top-down view of the Perkins Braille Bloom™, labeling the USB-C data port towards the front of the device and the USB-C charging port towards the rear of the device.

Maintenance & Care

Keep your Perkins Braille Bloom™ and Perkins Classic Braille in top form by following these care and maintenance guidelines. Regular attention will extend module life, ensure reliable performance, and keep braille input accurate.

Cleaning & Storage

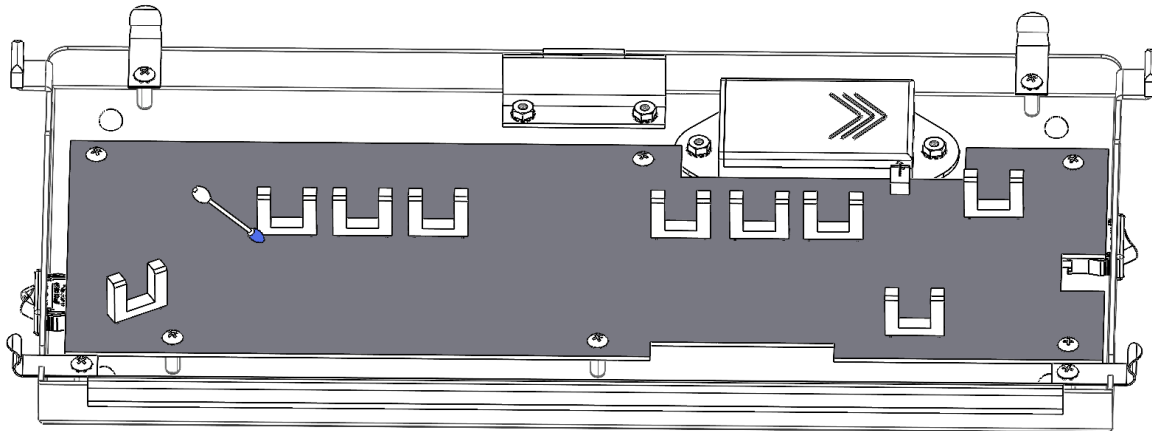
You only need to remove your Perkins Braille Bloom™ from the Perkins Classic Braille for battery replacement or deep cleaning. An annual cleaning is recommended under normal use, and twice annual cleaning is recommended for heavy use, when used around pets, and in dusty environments.

Before You Begin

- Power off the Perkins Braille Bloom™ and, if needed, detach by pressing the two rear clips and pulling straight down.
- Work on a clean, dry, static-safe surface away from liquids and excessive dust.
- Gather: soft, lint-free cloth; small soft-bristle brush or canned air; (for plastic parts) 90% isopropyl alcohol.

Cleaning Steps

1. Apply a small amount of isopropyl alcohol to a lint-free cloth.
2. Gently wipe down the green PCB surface.
3. Use the same cloth to gently clean around the interior of the Perkins Braille Bloom™ case.
4. Use a chiseled Q-tip to clean around the sensors and speaker.



The illustration above shows where to clean with a Q-tip, around the edges of the sensors.

Storage Guidelines

- Charge to ~50% before long-term storage.
- Store the Perkins Braille Bloom™ (and Braille, if detached) in an anti-static bag at 0 °C–20 °C and 10%–50% RH.
- Avoid direct sunlight, dust, and moisture.
- For storage over six months, recharge to 50% every three months.

Warranty

The Perkins Braille Bloom™ is under warranty for one year after purchase. Proof of purchase is required to be eligible for warranty services. For all warranty conditions, refer to the Perkins Terms and Conditions. Contact solutions@perkins.org with questions.

Battery Replacement

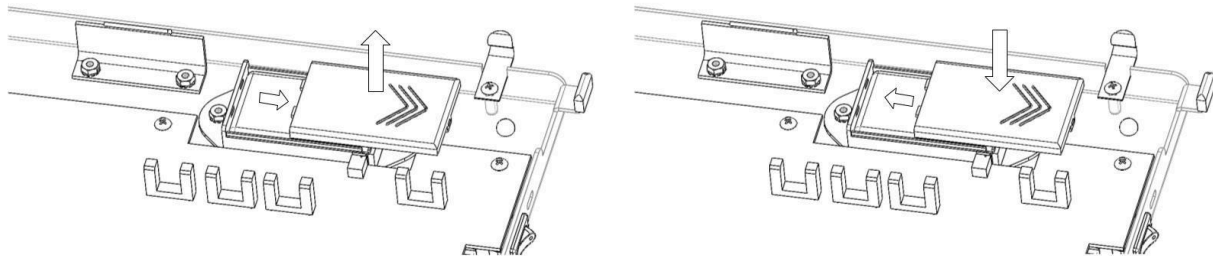
Only use the specified EEMB 3.7 V, 2000 mAh LiPo pack. Substitutes may damage the module or pose safety risks.

Replacement Steps

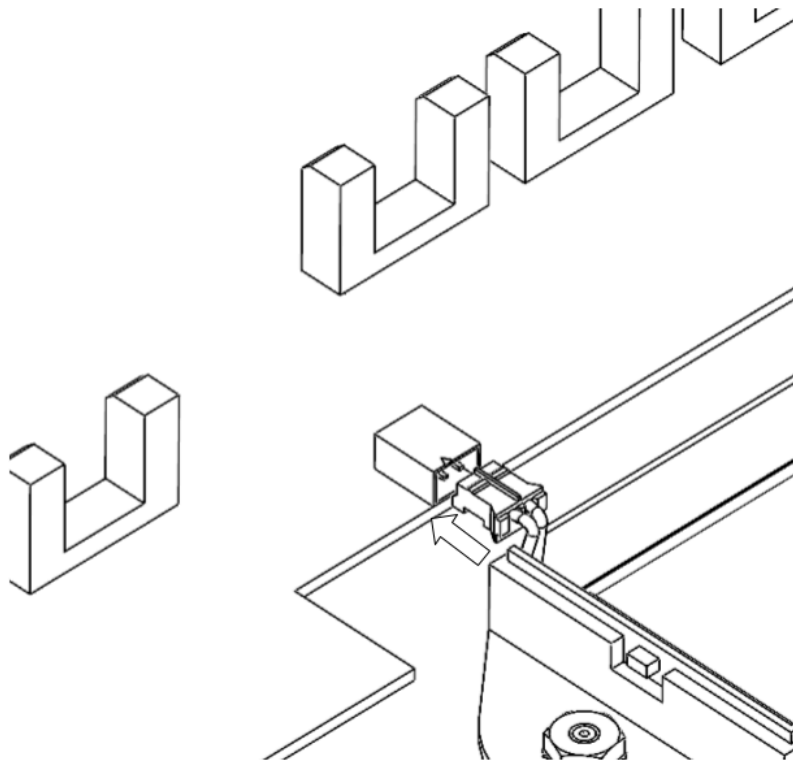
1. Detach the Perkins Braille Bloom™ from the Braille (rear clips).
2. Ensure the module is powered off.
3. On the module's back-right, slide the battery compartment lid to the right and open it.
4. Unplug the old battery connector by pulling straight out—do not twist.
5. Remove and recycle the LiPo pack per local regulations.
6. Insert a new battery, routing its wire through the slot; reconnect the plug (only fits one way).
7. Slide the compartment lid closed until it clicks.
8. Snap the Perkins Braille Bloom™ back onto the Braille (see Section 4), power on, and fully recharge before use.

Safety & Best Practices

- Never charge or use a swollen, punctured, or damaged pack.
- Charge only between 0 °C and 45 °C.
- Do not dispose of LiPos in household waste—use a certified recycler.



The first diagram above shows how to remove the battery cover, and the second diagram above shows how to reattach the battery cover.



Close-up diagram of how to connect the battery to the board

Firmware Updates

Only update when notified by support or when new releases are available.

Preparation

- Charge to $\geq 50\%$.
- Download the latest firmware file from the Perkins Brailier website

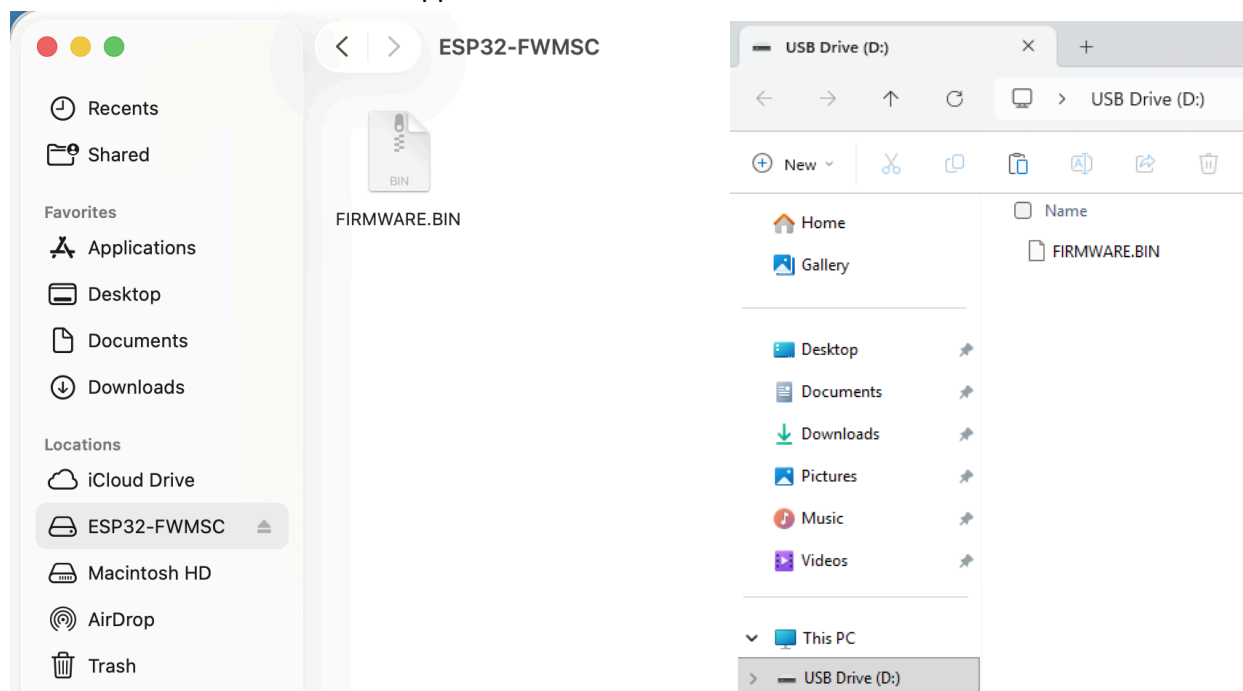
Update Procedure

- Use the provided USB-C to USB-A cable to connect the USB-C port at the front of the Perkins Braille Bloom™ to a computer with the latest firmware downloaded.
- A storage drive will appear, like when connecting a flash drive or portable hard drive to your computer, with a **firmware.bin** file in it.
- Move the firmware file that was downloaded from the Perkins Brailier website into this drive.

- The Perkins Braille Bloom™ will automatically detect valid firmware files, apply the firmware update, and restart in less than 60 seconds.

Verification & Troubleshooting

- Wait for progress to reach 100%; the Perkins Braille Bloom™ reboots and emits the “up” tone.
- If the update fails, turn off the Perkins Braille Bloom™, wait 5 seconds, and retry. If unsuccessful, contact support.



When connected to a MacOS computer, the Perkins Braille Bloom will show with the name ESP32-FWMSC. When connected to a Windows computer, the Perkins Braille Bloom will appear with the name USB Drive. To update the firmware in either case, place an updated firmware file in this drive, and the update process will start automatically.

Safety & Compliance

Compliance

The Perkins Braille Bloom™ is EMC and Safety compliant.

Note:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates,

uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Safety Precautions

Battery Handling

- Contains a 3.7 V, 2000 mAh Li-Po pack (EEMB LP103454 only).
- Risk of fire or chemical burn if misused, punctured, or exposed to temperatures above 60 °C.
- Charge only between 0 °C and 45 °C; never leave charging unattended.
- Do not disassemble or crush the battery; recycle through certified programs.

Mechanical Hazards

- Sharp edges on the bottom board: handled by its center.
- Pinch points around mounting clips: keep fingers clear during installation and removal.

Radio-Frequency Exposure

- Operate with a minimum separation of 20 cm from the body when using Bluetooth to comply with RF exposure limits.
- When using USB to connect to a computer, tablet, or phone, always use the included USB cable.
- Do not use in the presence of flammable anesthetics or oxygen-enriched environments.

Environmental Limits

- Operating Temperature: 0 °C to 45 °C
- Storage Temperature: –20 °C to 60 °C
- Operating Humidity: 10% to 90% RH, non-condensing
- Storage Humidity: 5% to 95% RH, non-condensing

Disposal & Recycling

- The WEEE symbol indicates this product must not be disposed of as household waste.
- Recycle electronics and Li-Po batteries according to local regulations at designated collection centers.
- Remove and recycle the Li-Po battery separately before electronic recycling.

By observing these certifications and safety guidelines, you ensure your Perkins Braille Bloom™ module operates reliably, safely, and in full compliance with applicable regulations.