Erae Lab

User Manual

Embodme

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1 Introduction

1.1 What is Erae Lab?

Erae Lab is the companion editor for Erae, Embodme's expressive MPE controller. This manual describes it with the Erae 2; see Erae Touch for the Erae Touch. It runs as a standalone desktop application on macOS, Windows, and Linux, and gives you a visual workspace for designing and managing everything that lives on your device: the layout of touch zones across the surface, how each zone sends MIDI, what it looks like, and how your projects are organized.

Everything you build in Erae Lab is transferred directly to the Erae 2 over USB. Changes sync automatically while the device is connected, so what you design on screen is what you play immediately.

1.2 Relationship to the Erae 2

Erae Lab does not make sound on its own. It is a configuration tool. The Erae 2 is the instrument; Erae Lab is how you shape it. When you add a keyboard element to the canvas, assign a MIDI channel, or choose LED colors, those settings are encoded into a layout that the device firmware interprets at performance time.

You can work in Erae Lab without a connected device: designs are saved as project files on your computer and pushed to the hardware when you reconnect. See the Erae 2 User Manual, Chapter 1 for a full introduction to the hardware itself.

> **Tip:** You can open and edit projects while the Erae 2 is disconnected. Connect at any time and Erae Lab will sync your current project automatically.

1.3 Key Features

- **Visual canvas**: a 42 x 24 LED grid canvas mirrors the Erae 2 surface at 1:1 resolution. Drag, resize, and arrange elements directly on screen.

- **Project and layout management**: organize your work into named projects, each holding eight layout slots you can switch between on the device.
- **Element library**: a palette of factory elements (keys, faders, buttons, keyboards, LivePad for Ableton Live session control, and more) plus a personal library of saved element presets.
- **Tune and Style panels**: per-element MIDI and CV settings (channel, note, CC, MPE configuration) and appearance settings (colors, LED styles, animations) in a unified right-side panel.
- **Custom scales**: build your own tunings, from simple modes to microtonal systems, and play them on a Keygrid.
- **Live sync**: edits reach the connected device as soon as you pause, so you can audition changes in real time.
- **Firmware updates**: Erae Lab keeps your Erae firmware up to date directly from the app.

> **Tip:** Each Erae Lab version comes with the matching Erae firmware. Use the Settings menu to check for app updates or reinstall managed components when needed.

1.4 What's New in This Beta

This beta adds and changes the following compared with the current public release.

- **Diagnostics:** a new **Diagnostics** setting lets you choose how much Erae Lab and Erae Sound share with us when something goes wrong. See Settings.
- **Custom scales** (see Custom Scales):
  - Custom scales are a Keygrid feature; a Drumpad keeps chromatic pads.
  - A scale with degrees off its grid says so under the degree grid, with a **Switch to Free** button.
  - Deleting a scale in use sets the keyboards that used it to `Major`.
  - **Show Offscale** only appears when the scale leaves some divisions unused.
  - Keys are colored by the scale's own degrees.
- **Sync:** projects the Erae cannot read from its SD card are left untouched, and Erae Lab tells you about them. See Device Sync.
- **Show tips again:** a new **TIPS** row in Settings brings back the Erae Sound tip about saving a preset to a slot. See Settings.
- **Erae Touch updates:** Erae Lab only installs a firmware that is newer than the one on the device. See Erae Touch.

1.5 Who This Manual Is For

This manual is written for musicians, producers, and performers who want to get the most out of their Erae 2. Whether you are building a layout from scratch, adapting a factory template, or designing a complex multi-layout performance setup, each chapter walks you through a specific area of the application.

1.6 Manual Conventions

Throughout this manual:

- Parameter names appear in **bold** (e.g., **Channel**, **Note**).
- Parameter values appear in `code formatting` (e.g., `MPE`, `CC74`).
- Screenshots are referenced by caption where applicable.
- Cross-references to other chapters in this manual are linked (e.g., Projects, Elements).
- Cross-references to the Erae 2 hardware documentation use plain text: "See the Erae 2 User Manual, Chapter X."

> **Tip:** Look for tip callouts like this one throughout the manual for shortcuts, best practices, and things worth knowing before you need them.

2 Installation & First Launch

Erae Lab is available as an installer package for macOS, Windows, and Linux. Download it from embodme.com and run the installer for your platform.

2.1 System Requirements

	Minimum	Recommended
macOS	macOS 11.0 (Big Sur) or later, Intel or Apple Silicon (universal binary)	macOS 12 or later
Windows	Windows 10 (64-bit)	Windows 10/11 (64-bit)
Linux	Ubuntu 20.04 or equivalent, x86_64	Ubuntu 22.04 or later
RAM	4 GB	8 GB or more
USB	One available USB-A or USB-C port for the Erae 2 connection	Same as minimum

Erae Lab runs standalone: no DAW or audio interface is required. MIDI routing to your DAW or synth is handled by the Erae 2 firmware directly over USB.

2.2 Download and Install

1. Go to **embodme.com** and navigate to the **Downloads** section.
2. Select your operating system and download the latest Erae Lab installer.
3. Run the installer and follow the on-screen prompts.
4. Launch **Erae Lab** from your Applications folder (macOS), Start menu (Windows), or application launcher (Linux).

> **Tip:** Once installed, Erae Lab checks for updates automatically and offers new versions when they are available. No separate tool is required. You can also check at any time from the Settings menu, see Settings.

2.3 macOS: Gatekeeper and Code Signing

The macOS build of Erae Lab is code-signed and notarized with Apple. In most cases the installer opens without any warning. If you see a message stating the application is from an unidentified developer or cannot be verified, follow these steps:

1. Open **System Settings > Privacy & Security**.
2. Scroll to the **Security** section.
3. Find the message about Erae Lab being blocked and click **Open Anyway**.
4. Confirm when prompted.

You only need to do this once. After that, macOS will remember your choice.

> **Tip:** On Apple Silicon Macs, Erae Lab runs natively: no Rosetta translation layer is needed.

2.4 First Launch

When you open Erae Lab for the first time, the application sets up your personal projects folder and installs its managed components: the factory content, the firmware for your Erae and, where available, Erae Sound. This happens automatically in the background.

2.4.1 Quick Start: Open Existing Work

Use the **Projects** section in the left sidebar to load, import, and manage your work:

1. Double-click a project row to load that project.
2. Right-click any project row to open the project menu: **Rename**, **Duplicate**, **Delete**, **Import...**, **Export...**, and **Open Projects Folder**.
3. To import a full project, choose **Import...** from that right-click menu and select an `.erproj` file, `.eraeproject` file, or exported project folder.
4. To import a single layout, select the destination layout slot first, then press `Cmd+O` (macOS) or `Ctrl+O` (Windows/Linux) and choose the file, or drag the layout file onto the Erae Lab window.

> **Tip for Erae Touch users:** Old `.emk` files are layout files, not full projects. Import an `.emk` into the active project's current layout slot. Use `.erproj` files or exported project folders when you want to import a whole project.

2.4.2 Auto-load Last Project

After the first launch, Erae Lab remembers which project you had open when you last closed the application. On subsequent launches it reopens that project immediately, so you can pick up where you left off without any extra steps.

2.4.3 Factory Project Initialization

On first run, the factory content component places a set of factory projects in your projects folder, and they appear in the **Projects** section as soon as they are in place. These projects give you ready-made starting points for common setups such as keyboards, drum pads, and performance-focused layout variations.

Factory projects are installed into your normal project library, not kept as locked templates. You can open, edit, rename, duplicate, delete, save, and revert them like any other Erae Lab project. **Reinstall components** in the Settings menu installs the factory content again if you need the original starting points back.

> **Tip:** Factory projects are a great way to learn how elements are configured. Open one, explore the canvas and settings panels, and modify it freely. Duplicate it only when you want to keep a separate copy of your own variation.

2.4.4 Connecting the Erae 2

Plug the Erae 2 into any available USB port before or after launching Erae Lab. The application detects the device automatically. When a connection is established, the **E** logo at the right of the top bar lights up and syncing starts.

The first time you connect an Erae to this computer, Erae Lab asks: "Pair this Erae with this computer? This will synchronize all projects back and forth." Choose **Yes** to start syncing. If you choose **No**, Erae Lab leaves the device alone until you unplug it and asks again on the next connection. See Device Sync.

You do not need to install drivers on macOS or Windows: the Erae 2 appears as a standard USB MIDI device. On Linux, the system may deny Erae Lab access to the device the first time. Erae Lab then shows "Erae detected but USB access is denied." with a **Fix Now** button. Click it and enter your admin password to install the required system permission.

> **Tip:** If Erae Lab does not detect your device, try a different USB cable or port. Some passive USB hubs can prevent detection. A direct connection to the computer is always most

> reliable.

2.5 Auto-Save

Erae Lab saves your project automatically a fraction of a second after you stop editing. There is no manual file-save button you need to remember. When a project row shows Save/Revert controls, the project is still already saved on disk; those controls manage a snapshot baseline you can return to. See Projects for details.

2.6 Troubleshooting

2.6.1 Application does not open on macOS

See the Gatekeeper instructions above. If the problem persists after clicking **Open Anyway**, try re-downloading the installer from embodme.com and running it again.

2.6.2 Device not detected after connecting

1. Check that the USB cable is a data cable, not a charge-only cable.
2. Try connecting directly to the computer rather than through a hub.
3. Restart Erae Lab with the device already plugged in.
4. On Linux, if a **Fix Now** notification appears in Erae Lab, click it and enter your admin password to install the required system permission, then reconnect the device.

2.6.3 Projects folder location

By default, Erae Lab stores projects in its app-data folder under `EraeLab/projects`:

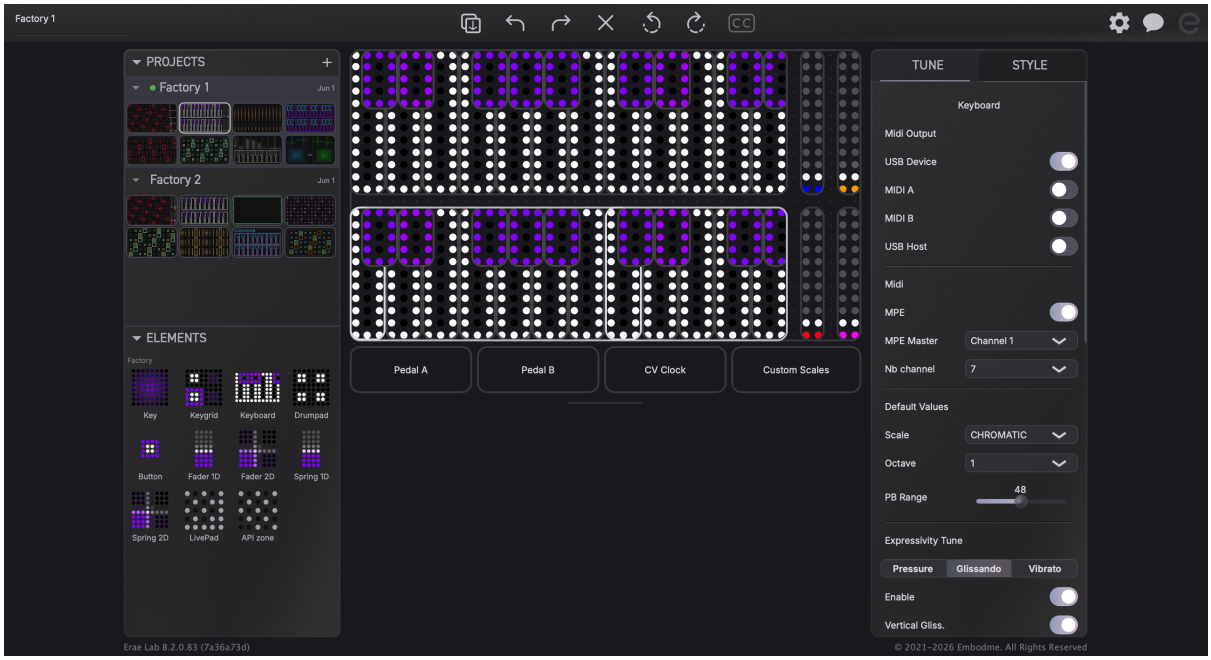
Operating system	Default project folder
macOS	`~/Library/Application Support/Embodme/EraeLab/projects`
Windows	`%APPDATA%\Embodme\EraeLab\projects`
Linux	`$XDG_DATA_HOME/Embodme/EraeLab/projects` or `~/.local/share/Embodme/EraeLab/projects` when `XDG_DATA_HOME` is not set

To access the folder quickly, right-click a project in the **Projects** section and choose **Open Projects Folder**. This opens the exact location Erae Lab is using on your system.

For further diagnostics, see Troubleshooting.

3 Interface Overview

This chapter walks you through the main areas of the Erae Lab window. Understanding where things live before diving into detail makes every later chapter easier to follow.



Full Window

3.1 Window Layout

The Erae Lab window is divided into regions arranged around a central canvas:

Region	Position	Purpose
Top bar	Top strip	Lab/Sound controls, project name, editing tools, bug reports, settings, device status
Left sidebar	Left column	Project library and element palette

Region	Position	Purpose
Central canvas	Center area	Visual representation of the Erae 2 surface, with the pedal, CV Clock and Custom Scales controls below it
Right settings panel	Right column	Per-element Tune and Style settings
Learn panel	Bottom of the center area	Contextual help for the control or section under the pointer
Bottom bar	Bottom strip	Application version and copyright

Each region is described in detail below. Later chapters cover the controls in each region at full depth.

3.2 Top Bar

Top Bar

The top bar spans the full width of the window and remains visible at all times. Depending on the current mode and installed components, it contains:

- **Lab / Sound toggle**: switches between Erae Lab editing and the hosted Erae Sound controls when Erae Sound is available.
- **Sound power**: the small speaker icon inside the Sound tab starts or stops the hosted Erae Sound engine.
- **Project name**: shows the active Lab project.
- **Editing tools**: duplicate, undo, redo, delete, rotate and CC overlay buttons for canvas work. They are hidden while the Sound view is shown.
- **Bug report button**: opens the in-app bug report form.
- **Settings gear**: opens the Settings menu (device, audio and MIDI, diagnostics, updates, components). See Settings.
- **E logo**: shows whether an Erae is connected.

3.2.1 Embodme Logo

The **E** logo sits at the far right of the top bar. It doubles as the device connection indicator: it is lit with the accent gradient while an Erae is connected, and dimmed when no Erae is connected.

3.2.2 Project Name

The current project name is displayed as a label in the top bar. It updates whenever you switch projects from the left sidebar. The label is read-only here: to rename a project, right-click it in the Projects section of the left sidebar, or double-click the active project's name.

3.2.3 Editing Tool Buttons

A row of icon buttons gives quick access to the most common canvas operations:

Button	Action
Duplicate	Copy the selected element(s) and place the copy on the layout, with CC and CV numbers incremented (also available with `Cmd+D` / `Ctrl+D`)
Undo	Revert the last change (also available with `Cmd+Z` / `Ctrl+Z`)
Redo	Reapply a reverted change (also available with `Cmd+Shift+Z` / `Ctrl+Shift+Z`)
Delete	Remove the selected element(s) from the canvas (also available with `Delete` or `Backspace`)
Rotate CCW	Rotate the selected element 90 degrees counter-clockwise (one element at a time)
Rotate CW	Rotate the selected element 90 degrees clockwise (one element at a time)
CC	Toggle the CC overlay: shows each element's assigned CC numbers on the canvas. The icon takes the accent color while the overlay is active

> **Tip:** Most editing operations also work with keyboard shortcuts. See Shortcuts and Interactions for the full list.

3.2.4 Device Connection Indicator

The **E** logo at the far right of the top bar serves as the connection indicator: lit while an Erae is connected, dimmed otherwise. When the indicator is dim, Erae Lab is still fully functional: you can edit projects and they sync when the device is next connected. Sync progress itself is shown in notifications, see Device Sync.

3.3 Left Sidebar

Left Sidebar Projects

The left sidebar is a column running the full height of the window (excluding the top and bottom bars). It contains the **PROJECTS** and **ELEMENTS** sections. Each section can be collapsed from its header. Use the sidebar to switch between projects, manage layouts, and drag elements onto the canvas.

3.3.1 ERAESOUND PRESET Section

When Erae Sound runs inside Erae Lab and plays a preset that has a layout, an **ERAESOUND PRESET** section appears above **PROJECTS**. It holds one thumbnail: the layout of the current Erae Sound preset. The thumbnail follows every preset change in Erae Sound.

Click the thumbnail to show that layout on the Erae and edit it on the canvas, as you would a project slot. Click a project slot to go back to the project. You can also drag the thumbnail onto a layout slot of any project row to copy the preset layout there. See Presets.

3.3.2 Projects Section

The **Projects** section lists every project in your Erae Lab library. Each row shows the project name, how long ago it was last modified, and, when the row is expanded, a grid of small layout thumbnails: one thumbnail per layout slot in that project. A green dot marks the active project.

Left Sidebar Projects

What you can do here:

- **Expand or collapse a project**: click the project name to show or hide its layout thumbnails.
- **Load a project**: double-click an inactive project name to load it.
- **Rename the active project**: double-click the active project name to rename it inline.
- **Switch layouts**: click a layout thumbnail in the active project row to switch the canvas to that layout. Double-click an inactive project's thumbnail to open that project at that layout.
- **Create a new project**: use the **+** button in the section header.
- **Rename a project**: right-click the project row and choose **Rename**.
- **Duplicate a project**: right-click and choose **Duplicate**.
- **Delete a project**: right-click and choose **Delete**, then confirm. If you delete the last project, Erae Lab creates a new empty project automatically.
- **Import or export projects**: right-click a project row and choose **Import…** or **Export…**. The same menu also includes **Open Projects Folder**.
- **Copy layouts between projects**: drag a layout thumbnail from one project row and drop it onto a layout slot in another expanded row. The layout is copied into that slot.
- **Copy, paste, or clear a layout slot**: right-click a thumbnail in the active project row.
- **Save a project snapshot**: when the live project differs from its snapshot baseline, click the per-row Save icon to accept the current saved-on-disk state as the new snapshot.
- **Revert to snapshot**: click the per-row Revert icon to restore the last snapshot baseline and discard the live changes for that project.

The active layout within the active project is highlighted among its thumbnails.

The current project row stays pinned at the top of the list while you scroll, so it is always in reach as a drop target.

With an Erae Touch connected, the section shows its four slots above the Library. See Erae Touch.

> **Tip:** Erae Lab autosaves a fraction of a second after any change. Even when a project shows Save/Revert controls, it is not waiting to be written to disk. Save creates a snapshot checkpoint; Revert restores the last checkpoint.

For a full walkthrough of project management, see Projects. For layout-specific operations, see Layouts.

3.3.3 Elements Section

The **Elements** section is your palette for building layouts. It contains all the building blocks you can drag onto the canvas.

Left Sidebar Elements

The section sizes itself to its content, up to five rows of elements or half the window height, then

scrolls. It cannot be resized by dragging. When you collapse it, its header stays docked at the bottom of the sidebar and **Projects** takes the freed space.

The section is divided into two groups, **Factory** and **User**:

3.3.3.1 Factory Elements

The **Factory** group shows the built-in element types that ship with Erae Lab. Each factory element is displayed as a small square thumbnail showing a preview of the element's default LED appearance:

- **Key**: a single expressive pad that plays one MIDI note, with X, Y and pressure control.
- **Keygrid**: an isomorphic keyboard spanning multiple rows, with advanced tuning and MPE settings.
- **Keyboard**: a piano-style keyboard with white and black keys.
- **Drumpad**: a grid of pads designed for drum racks.
- **Button**: a button whose **Type** selects what it sends: Note, Control Change, Program Change, Control Voltage, or Tap Tempo. There is one Button element rather than separate note, CC or program change buttons.
- **Fader 1D**: a one-dimensional fader that sends a continuous value as you slide along it.
- **Fader 2D**: a two-dimensional pad that sends X and Y values.
- **LivePad**: an Ableton Live session controller. Trigger clips and control channel volume, mute, solo and sends.
- **API zone**: a programmable area for your own software: it streams multi-touch finger positions over MIDI SysEx and can display pixels, rectangles and bitmaps.

To add any factory element to the canvas, drag it from this section and drop it onto the canvas. Erae Lab fits the new element into the free space at your drop point.

3.3.3.2 User Element Presets

The **User** group appears once you have saved at least one element preset: an element you saved from the canvas with its custom configuration. Presets are displayed as thumbnail cells in a 4-column grid, sorted by name.

To save a canvas element as a preset, drag it from the canvas into the Elements section. Erae Lab names it after its type (for example Key 1). Right-click a preset to **Delete**, **Rename**, **Duplicate**, **Export…** it, or **Import Elements…** from files. Right-click an empty part of the section to import element presets.

> **Tip:** Element presets capture the element's type, size, MIDI settings, and appearance together. Use them to quickly replicate a configuration across multiple layouts or projects.

For detailed coverage of every element type and its settings, see Elements.

3.4 The Canvas

The central canvas is the main workspace. It shows a visual representation of the Erae 2 surface as a grid of 42 columns by 24 rows: one cell per LED on the physical device.

Each element you place on the canvas occupies a rectangular region of that grid. The canvas renders each element using its configured LED style, so the view closely approximates what you see on the device surface.

3.4.1 Working on the Canvas

Action	Result
Click an element	Select it and populate the right settings panel with its parameters
Drag an element	Move it to a new position; Erae Lab keeps elements on the grid and prevents overlaps
Click empty space and drag	Draw a selection rectangle to select every element it touches
Drop from Elements section	Place a factory or preset element at the drop location
Alt-drag (Option-drag on macOS) an element	Place a copy instead of moving it

> **Tip:** Use `Cmd+A` (macOS) or `Ctrl+A` (Windows/Linux) to select all elements on the current layout at once. With multiple elements selected, the right settings panel shows shared parameters you can edit in bulk.

Below the canvas, a strip holds four controls: **A** and **B** for the two pedal inputs, **CV Clock**, and **Custom Scales**. Click a pedal area to open its Pedal settings in the right panel, where you choose the pedal type and its MIDI routing. **CV Clock** opens the CV clock output settings (see Settings), and **Custom Scales** opens the Scale Manager (see Custom Scales).

For a complete guide to working on the canvas, see The Canvas.

3.5 Learn Panel

The **Learn** panel has its own area at the bottom of the center section, below the canvas. It updates with contextual help as you hover controls, project rows, element presets, canvas elements, and

settings. This keeps guidance visible without taking space from the Projects and Elements sidebar.

3.6 Right Settings Panel

When an element is selected on the canvas, the right settings panel shows its configuration. The panel has two tabs: **Tune** and **Style**.

3.6.1 Tune Tab

The **Tune** tab contains all MIDI and CV settings for the selected element. What you see here depends on the element type: a keyboard shows MPE, channel, scale and expressivity settings; a fader shows its default values and its Control Change and Control Voltage outputs; a button shows its type and the messages it sends.

Common parameters found in the Tune tab:

Parameter	What it controls
Midi Output	Which outputs the element sends to: **USB Device**, **MIDI A**, **MIDI B**, **USB Host**
Channel	MIDI channel (1 to 16). With MPE on, keyboards show **Nb channel** instead
Root Note / **Octave**	The note played by keys and keyboards
Control Change	CC outputs driven by pressure, position or finger motion
Control Voltage	CV outputs on the Erae's CV jacks

> **Tip:** When multiple elements are selected, the Tune tab shows only the parameters that are shared by all selected types. Editing a shared parameter updates all selected elements simultaneously.

For a full breakdown of Tune parameters by element type, see MIDI Settings.

3.6.2 Style Tab

The **Style** tab controls the visual appearance of the selected element: what it looks like on the Erae 2 surface.

Main sections in the Style tab:

Section	What it controls
Color selection	The colors used by the element's style
Orientation	The element's rotation
Style	The lighting pattern (for example Solid Color, Linear Gradient, Circular Gradient) and how pressed keys light up
Key selection	For keyboards: which keys or scale degrees you are coloring
Finger Animation	Animations for **Click**, **Slide** and **Release**

> **Tip:** The Style tab updates in real time on a connected Erae 2. Adjust colors while watching the device: there is no need to save or push manually.

For complete coverage of all appearance options, see Appearance and Styling.

3.7 Bottom Bar

Bottom Panel

The bottom bar is a thin strip at the very bottom of the window. It displays:

- **Application version**: the current Erae Lab version number.
- **Copyright notice**: Embodme copyright information.

Update prompts and component install progress are shown by the updater, the Settings menu, or notifications rather than by the bottom bar.

3.8 What's Next

Now that you have a map of the interface, the following chapters go deep into each area:

- Projects: creating, switching, and organizing projects.
- Layouts: managing multiple layouts within a project.
- The Canvas: placing and editing elements.

- Elements: every element type and its settings.
- MIDI Settings: the Tune panel in full detail.
- Appearance and Styling: the Style panel and LED colors.
- Presets: element presets.
- Device Sync: how Erae Lab communicates with the Erae 2.

4 Projects

A project is the top-level container for your Erae Lab work. Each project holds eight layout slots and a project name. Projects are stored as folders on your computer and sync automatically with your connected Erae 2.

Projects Sidebar

4.1 The Projects Sidebar

The left panel's **Projects** section lists every project in your library. Each row shows:

- The **project name**, which expands or collapses the row when clicked. A green dot marks the active project.
- When the project was last modified (for example `just now`, `5m`, `3d`, or a date for older projects).
- When the row is expanded, a grid of eight **layout thumbnails** displayed as two rows of four, each showing a miniature preview of that layout's content. Empty slots are shown as dimmed placeholders.

Click a project name to expand or collapse its layout thumbnails. Double-click an inactive project name to load that project. Double-click the active project name to rename it inline. Press Enter to confirm a rename or Escape to cancel.

Click a thumbnail in the active project row to switch to that layout. Clicking an empty slot selects it so you can start building a layout there. Double-click a thumbnail in an inactive project row to open that project at that layout.

Right-click a project row to open the project menu. It includes **Rename**, **Duplicate**, **Delete**, **Import...**, **Export...**, and **Open Projects Folder**. Right-click a layout thumbnail in the active project row to copy, paste, or clear that layout slot.

The current project row (the open project, or the loaded slot with an Erae Touch) stays pinned at the top of the visible list while the rest of the list scrolls under it. A layout dragged from a row lower in the list can still be dropped on it.

With an Erae Touch connected, the list also shows its four slots. See Erae Touch.

When a project row has keyboard focus (after you click one of its thumbnails), `F2` renames the project and `Cmd+D` / `Ctrl+D` duplicates it. See Shortcuts and Interactions.

4.2 Creating a New Project

To create a new project, click the **+** button in the Projects section header. Erae Lab creates an empty project named `Untitled`, and it becomes the active project immediately.

On first launch, Erae Lab installs its factory content, which adds a set of factory projects to your library so you always have a starting point to explore.

Factory projects are regular editable projects once they are in your library. You can modify them directly, or duplicate one first if you want to preserve an untouched copy.

4.3 Loading a Project

Double-click any inactive project name in the sidebar to load it. The active project is marked and it is sent to the connected device.

You can also open a project from outside the library:

1. Right-click a project row in the **Projects** sidebar and choose **Import...**.
2. Browse for a legacy `.erproj` file, a legacy `.eraeproject` file, or a current project folder. You can select several at once.
3. Erae Lab reads the project, adds it to the library, and activates it.

You can also drag a supported project file or folder directly onto the Erae Lab window, or press `Cmd+O` / `Ctrl+O` and choose it.

Legacy `.emk` layout files can also be imported individually:

1. Select the project and layout slot where the layout should go.
2. Press `Cmd+O` / `Ctrl+O` and choose the file, or drag the `.emk` file onto the Erae Lab window.
3. Erae Lab replaces the active layout slot with the imported layout and syncs the change like any other layout edit.

> **Tip for Erae Touch users:** `.emk` files are individual layouts. They do not appear as standalone projects in the Projects sidebar. Use `.erproj` files or exported project folders when you want to import a complete project.

Last-project auto-load: When Erae Lab starts, it automatically reopens the last project you had active, so you can pick up exactly where you left off.

4.4 Saving

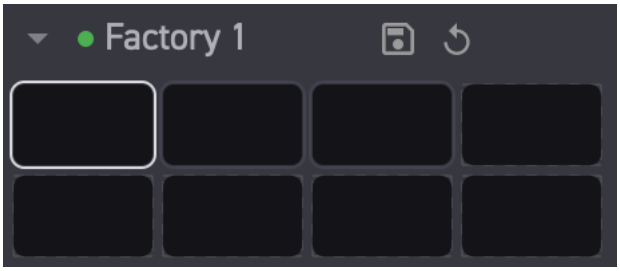
Erae Lab saves your project automatically. Any change to the project (moving an element, adjusting a parameter, switching layouts) is written to disk a fraction of a second after you stop editing.

4.5 Save and Revert Snapshot

Autosave keeps the project files up to date. Even when the Projects sidebar shows Save/Revert controls, your latest edits have already been saved to disk. The controls do not mean “write this project now”; they manage a return snapshot.

Each project has a snapshot baseline: the last version you accepted with the project-row **Save** button. It lets you try edits freely, keep working across launches, and return to the previously accepted version at any time.

When a project differs from its snapshot baseline, two small icons appear on that project row in the Projects sidebar:



Project Save/Revert Controls

- **Save snapshot**: captures the project's current saved-on-disk state as the new snapshot baseline. After this, the Save and Revert icons disappear until you make another change.
- **Revert snapshot**: restores the project from the last snapshot baseline. This discards changes made since the last snapshot Save.

A reverted project is marked to sync back to the Erae through the normal sync flow. If the device is disconnected, the project stays marked and is pushed the next time syncing is available.

You can undo a revert. Press `Cmd+Z` / `Ctrl+Z` right after it to get back the work it discarded: layouts, project files and the Erae. The project shows as changed again, and the edits you made before the revert stay undoable. `Cmd+Shift+Z` / `Ctrl+Shift+Z` reverts again.

If a snapshot baseline is missing, Erae Lab shows only the Save icon. If a snapshot baseline is damaged, Revert is disabled and Save replaces the damaged snapshot with the current project state.

> **Tip:** Think of autosave as "write my current work to disk" and project-row Save as "make this saved version my checkpoint." Revert returns to that checkpoint.

4.6 Duplicating a Project

Right-click a project row and choose **Duplicate**. Erae Lab creates an independent copy of the project, including all layouts, under a new name. The first duplicate is named `<Project> Copy`; if that name already exists, Erae Lab adds a number. The duplicate is added to the library and becomes the active project.

4.7 Deleting a Project

Right-click a project row and choose **Delete**. Erae Lab asks you to confirm ("This cannot be undone."). After you confirm, the project leaves your library. Rather than erasing it right away, Erae Lab moves it to an archive folder in its app-data folder, and records the deletion so that sync removes the project from your Erae too.

If you delete the last remaining project, Erae Lab automatically creates a new empty `Untitled` project so the application always has something active.

> **Tip:** Archived projects are kept for 7 days before being purged automatically. If you delete a project by mistake, contact support before that time runs out to locate the archive folder.

4.8 Exporting a Project

To share a project or back it up outside the library:

1. Right-click the project row and choose **Export…**.
2. A file picker opens. Choose a destination folder.
3. Erae Lab copies that project's full folder to the chosen location.

The exported folder can be re-imported on any machine running Erae Lab.

> **Tip:** Exported project folders are self-contained. You can zip them for email or store them in cloud storage.

4.9 Importing a Project

To bring a project into your library:

1. Right-click any project row in the **Projects** sidebar and choose **Import…**.
2. Select a legacy `.erproj` file, a legacy `.eraeproject` file, or a current project folder.
3. Erae Lab reads the project, adds a number to its name if a project with that name already exists, and adds it to the library.

You can also drag a supported project file or folder directly onto the Erae Lab window.

An imported project starts with a fresh Save/Revert checkpoint: another computer's checkpoint never affects yours.

You can also import individual layout files (`.eraebin` or legacy `.emk`) with `Cmd+O` / `Ctrl+O` or by dragging the file onto Erae Lab. The layout is placed in the active project's current layout slot. To export the current layout as an `.eraebin` file, press `Cmd+S` / `Ctrl+S`.

4.10 The Project Folder Format

Each project is a folder in your projects library. You can back it up with any file tool, but let Erae Lab manage what is inside: edit projects in Erae Lab, not by moving files by hand.

4.11 Toolbar Device Operations

There are no manual push or pull buttons. While an Erae is connected, Erae Lab keeps it in sync on its own: edits reach the device as you work, and projects changed on the device come back to Lab. See Device Sync.

4.12 Project Library Location

By default, projects are stored in Erae Lab's app-data folder under `EraeLab/projects`:

Operating system	Default project folder
macOS	`~/Library/Application Support/Embodme/EraeLab/projects`
Windows	`%APPDATA%\Embodme\EraeLab\projects`
Linux	`$XDG_DATA_HOME/Embodme/EraeLab/projects` or `~/.local/share/Embodme/EraeLab/projects` when `XDG_DATA_HOME` is not set

To open the projects folder, right-click a project in the **Projects** section and choose **Open Projects Folder**. This is the safest way to reveal the exact location for your operating system and installation type.

See Layouts for details on working with the layouts within a project.

5 Layouts

A layout is a canvas of elements assigned to one of your project's layout slots. Each layout is independent: it has its own set of elements and its own visual and MIDI configuration. Switching layouts in Erae Lab also switches the layout on your connected Erae 2.

5.1 Layouts per Project

Each project holds exactly **eight layout slots**, numbered 1 to 8 on the Erae. Slots can be empty or filled. An empty slot contains no elements; a filled slot holds a complete canvas configuration.

The Projects sidebar shows each expanded project's layout slots as two rows of four small thumbnails directly beneath the project name. Filled slots render a miniature preview of the elements they contain; empty slots appear as dimmed placeholders. This gives you an at-a-glance picture of how densely each project is populated.

> **Tip:** Each layout can hold up to 254 elements. When you reach it, Erae Lab shows "Maximum number of elements reached (254)".

5.2 Project Size and Erae 2 Capacity

The Erae 2 supports larger and more complex layouts than the Erae Touch, so most layouts you build in Erae Lab fit comfortably on the device.

There is still a limit on how much a single layout and a single project can store on the device. A project's layout slots share one storage budget. A layout becomes "heavy" mainly through the number of elements and how much configuration each one carries: many elements, many CC and CV mappings, and rich appearance settings all add up.

If you are building an unusually large or complex project, keep these guidelines in mind:

- Stay well within each layout's element limit rather than filling every slot to the maximum.
- Spread a sprawling control surface across several projects rather than forcing every dense layout into one project, since the layout slots in a single project share one storage budget.

- Reuse element presets for repeated controls so each one stays lean.

Erae Lab checks this budget while you edit. When a layout or project is full, adding an element is refused with “This layout is full. Remove some elements before adding more.” or “This project is full. Remove some elements before adding more.” Remove some elements, or move some layouts into another project.

5.3 The Layout Selector Panel

You select layouts from the thumbnails of the active project in the Projects sidebar; there is no separate layout selector bar above the canvas.

- **Filled slots** show a miniature preview.
- **Empty slots** are shown dimmed.
- The **active layout** is highlighted.

Click a thumbnail to switch to that layout. The canvas updates immediately to show the selected layout’s elements, and the connected Erae switches to the same layout.

> **Tip:** When the active project row has keyboard focus, you can copy, paste and clear layouts with shortcuts. See Shortcuts and Interactions.

5.4 Layout Operations

Right-click a layout thumbnail in the active project row to access the following operations:

Operation	Description
Copy	Copies the layout to the internal clipboard so it can be pasted into another slot or project. Available only when the slot is filled.
Paste	Pastes the previously copied layout into the slot, replacing its current content if any. Available only when the clipboard holds a copied layout.
Clear	Empties the slot. Available only when the slot is filled.

Paste and Clear can be undone.

> **Tip:** Use **Copy** and **Paste** to move a layout between slots or projects instead of rebuilding it from scratch.

5.5 Drag-and-Drop Between Projects

You can copy a layout from one project to another by dragging its thumbnail in the Projects sidebar:

1. In the Projects sidebar, expand both the source and destination project rows.
2. Drag a layout thumbnail from the source project and drop it onto a slot in the destination project row.
3. The layout is copied into the target slot. The source layout stays where it was.

If the target slot is already filled, the existing layout is replaced. A drop into the active project can be undone; a drop into another project is written to that project directly.

You can also drop a layout thumbnail onto the canvas: it replaces the layout currently shown on the canvas, and you can undo it.

> **Tip:** Dragging a layout between projects is a fast way to assemble a new project from your best layouts across multiple existing ones.

5.6 Layouts as Containers

A layout is a container for elements: all visual and behavioral properties live on the elements placed within it.

Undo and redo operate on project actions, including layout edits. When you switch layouts, Erae Lab keeps enough context to undo recent layout-aware edits safely.

See The Canvas for how to place, move, and configure elements within a layout.

6 The Canvas

The canvas is the central workspace for the current layout. It represents the Erae surface as a **42 x 24** grid, matching the playable area of Erae 2.

6.1 Placing Elements

Drag an element from the **Elements** section onto the canvas. Erae Lab shows a placement outline while you drag. Release to place the element.

Erae Lab fits the new element into the free space at the drop point, up to the element's default size. If there is no free space there, nothing is placed: try a different position or make room first.

Element presets can also be dragged from the **User** group of the Elements section. They create a new element with the saved size, behavior, and appearance from that preset.

6.2 Moving, Resizing, and Rotating

- **Move**: drag a selected element to a new grid position.
- **Resize**: drag a corner or an edge of the selected element. On Keygrid, Keyboard and Drumpad elements, resizing adds or removes keys; hold **Shift** while resizing to change the key size instead.
- **Rotate**: use the rotate buttons in the top bar. Rotation works on one selected element at a time.
- **Drag-copy**: hold **Alt** (Option on macOS) while dragging to place a copy instead of moving.

Erae Lab prevents elements from overlapping. When several selected elements move together, they keep their relative positions and are checked against all non-selected elements.

6.3 Multi-Select

You can select multiple elements in two ways:

- **Lasso selection**: drag across empty canvas space to select every element touched by the rectangle.
- **Cmd/Ctrl-click**: hold **Cmd** on macOS or **Ctrl** on Windows/Linux while clicking an element to add it to, or remove it from, the current selection.

Use `Cmd+A` / `Ctrl+A` to select all elements in the current layout.

6.3.1 Resizing a Multi-Selection

With several elements selected, drag the resize handles of any one of them: every selected element takes the same new size, each keeping its position. An element that cannot fit the new size at its position (it would overlap a neighbor or leave the grid) keeps its current size. This is the quickest way to give a row of buttons or faders identical dimensions.

6.3.2 Showing CC Assignments

The **CC** button in the top bar toggles an overlay that prints each element's assigned CC numbers directly on the canvas, so you can check a whole layout's mappings at a glance without selecting elements one by one. The labels update live as you edit CC assignments. See Interface Overview for the button's location.

6.4 Undo and Redo

Erae Lab records canvas edits as undoable project actions.

- **Undo**: `Cmd+Z` / `Ctrl+Z`
- **Redo**: `Cmd+Shift+Z` / `Ctrl+Shift+Z`

The top bar also has Undo and Redo buttons.

Undo also covers these steps:

- **Push to slot from Erae Sound**: when Erae Sound assigns its layout to a project slot (press and hold a slot button in Erae Sound), `Cmd+Z` puts the previous layout back in that slot, in the project files and on the Erae. `Cmd+Shift+Z` pushes it again. The next `Cmd+Z` continues with the edits you made on that slot before the push.
- **Revert snapshot**: `Cmd+Z` brings back the work the revert discarded. See Projects.
- **Edits of the Erae Sound preset layout**: see Presets.

6.4.1 One History with Erae Sound

When Erae Sound runs inside Erae Lab, Lab and Erae Sound share one undo history. `Cmd+Z` undoes the newest step, whichever product made it, and `Cmd+Shift+Z` redoes it. This works from the Lab view, from the Erae Sound view and with the Undo and Redo buttons.

When the next step belongs to the view you are not looking at, the first press only switches to that view and changes nothing, so you see what is about to change. Press again to undo or redo the step. When that view is already shown, one press does it.

Example: in Erae Sound you turn a knob, then assign the layout to slot 1. The Erae Sound view is shown.

1. `Cmd+Z` shows the Lab view. Nothing changes yet.
2. `Cmd+Z` puts the old layout back in slot 1.
3. `Cmd+Z` shows the Erae Sound view.
4. `Cmd+Z` puts the knob back where it was.

Edits of the Erae Sound preset layout on the canvas belong to the Lab view. Erae Sound in a DAW keeps its own undo history.

6.5 Copy, Paste, and Duplicate

With one or more elements selected:

- **Copy**: `Cmd+C` / `Ctrl+C`
- **Paste**: `Cmd+V` / `Ctrl+V`
- **Duplicate**: `Cmd+D` / `Ctrl+D`, or the **Duplicate** button in the top bar
- **Delete**: `Backspace` or `Delete`

Duplicate copies and pastes in one step, and within the same layout it increments the copy's CC and CV numbers so the new element does not send the same messages as the original. Paste keeps the copied values as they are, and pasting into another layout also keeps them unchanged.

6.6 Layout Drops

You can drag a layout thumbnail from the Projects sidebar onto the canvas to replace the current layout with it. This is undoable. To copy a layout into a specific slot instead, drop the thumbnail onto that slot in the Projects sidebar (see Layouts).

6.7 Live Device Updates

When an Erae is connected, canvas edits are autosaved and sent to the device as soon as you pause. There is no manual push or pull step after each change.

7 Elements

Elements are the building blocks of a layout. Erae Lab offers the following element types in the **Factory** group of the Elements section.

7.1 Keyboards

7.1.1 Keygrid

An isomorphic grid for interval-based playing, with advanced tuning and MPE settings. Good for chords, transposition-friendly patterns, and expressive performance. The Keygrid is the only element that can play a custom scale.

7.1.2 Keyboard

A piano-style chromatic layout with white and black keys, for a familiar note arrangement.

7.1.3 Drumpad

A pad grid designed for drum racks: each pad plays its own note.

7.2 Continuous Controls

7.2.1 Fader 1D

A single-axis fader sending Control Change values, for volume, cutoff, or send level. Enable pressure to add a second control dimension.

7.2.2 Fader 2D

An XY pad sending Control Change values from the X and Y position. Enable pressure to add a third control dimension.

7.2.3 Spring 1D

A fader that springs back to its Center when you release it, with tunable stiffness, drag, maximum speed and bounce. Sends Control Change values, enable pressure to add a second control dimension. See Spring Faders.

7.2.4 Spring 2D

An XY pad with an independent spring on each axis, returning to its Center point when you release it. Sends Control Change values from the X and Y position, enable pressure to add a third control dimension. See Spring Faders.

7.3 Triggers and Pads

7.3.1 Button

A two-state element. Its **Type** selects what it sends: Note, Control Change, Program Change, Control Voltage, or Tap Tempo. In Program Change mode, a **Preset** menu fills in the values for common actions such as switching to another layout or project.

7.3.2 Key

A single expressive note pad with X, Y and pressure control. Useful for large one-shot pads, drones, or dedicated performance triggers.

7.4 Integrations and Utility Elements

7.4.1 LivePad (Ableton Live)

An Ableton Live session controller: trigger clips and control channel volume, mute, solo and sends. Its only setting in the Tune tab is **Zoom** (`Small` or `Large`).

7.4.2 API Zone

A programmable touch area for your own software: it streams multi-touch finger positions over MIDI SysEx, and your software can draw pixels, rectangles and bitmaps on it.

7.4.3 Pedal Input

A non-surface element for each of the two pedal inputs, **A** and **B**, shown below the canvas. It maps an attached footswitch or expression pedal to MIDI or CV. See MIDI Settings.

7.5 Working with Elements

For every element, the normal workflow is the same:

1. Drag it from the sidebar onto the canvas.
2. Resize and position it.
3. Tune its behavior in the **Tune** tab.
4. Style its LEDs in the **Style** tab.

Every parameter is listed in Appendix A: Element Parameter Reference.

8 MIDI Settings

The **Tune** panel controls how each element sends MIDI and CV data. Settings are grouped in sections (**Midi Output**, **Midi**, **Default Values**, **Expressivity Tune**, **Control Change**, **Control Voltage**, and so on); the sections you see depend on the element type. Every parameter is listed in Appendix A.

8.1 Common Settings

Most playable elements share these core parameters:

- **Channel**: the MIDI channel, 1 to 16.
- **Trig on entry**: whether a finger that slides onto the element, without lifting, triggers it. `Off` never; `Default` when the finger comes from empty canvas or from an element of the same kind; `All` when it comes from anywhere.
- the note, root note and octave where relevant
- **Control Change** assignments
- **Control Voltage** assignments where supported

Motion mappings use the continuous speed of your finger movement, not note-on velocity. The value is smoothed and normalized so `0 cm/s` is the minimum and `100 cm/s` reaches the maximum configured CC value.

Each CC assignment has an **Enable** checkbox, a **Type** (`CC`, `CC 14-bit`, `RPN`, or `NRPN`), the controller number (with **Bank** and **Index** for RPN and NRPN), and a **Min/Max** range. Controller numbers the MIDI specification reserves for special behavior are marked `(reserved)` in the list.

8.2 MIDI Output Destination

Each element can send to any combination of the available destinations:

- **USB Device**: the Erae appears as a USB MIDI device to your computer (on by default).
- **MIDI A** / **MIDI B**: the physical MIDI output jacks.
- **USB Host**: a USB MIDI device connected to the Erae's USB host port.

Disable all outputs to silence an element without deleting it.

8.3 Keyboards

Keygrid, Keyboard and Drumpad elements let you configure:

- **MPE** on or off, the **MPE Master** channel (1 or 16), and the **Channel** (or, with MPE on, **Nb channel**: the number of MPE channels, which is the number of fingers with independent control)
- **Root Note** and **Octave**
- the **Line Offset** between rows (**Degrees** and **Semitones** on a Keygrid, **Semitones** on a Drumpad)
- **Show Offscale** and **Scale** on a Keygrid, **Scale** on a Keyboard
- **PB Range**: the pitch bend range in semitones, 1 to 96
- **Expressivity Tune**: **Pressure** (aftertouch), **Glissando**, and **Vibrato**
- **Sound Brightness (CC 74)** when MPE is on
- **Control Change** outputs for **Pressure**, **X abs**, **Y abs**, **Motion**, **X rel** and **Y rel**
- **Control Voltage** outputs, with **Num Voices** for polyphonic CV

Turning MPE on sets **PB Range** to 48 and **Nb channel** to 8; turning it off sets **PB Range** back to 12 and **Channel** to 1. Match the pitch bend range in your synth for correct behavior.

8.3.1 Use global scale

Keygrid and Drumpad elements also have a **Use global scale** checkbox in the Tune tab (on a Keygrid, directly above the **Scale** dropdown). When it is on, the keyboard follows the project's global scale: change the scale of any element that has the checkbox on, on any layout, and every element with the checkbox on follows immediately. Root note and octave stay individual to each element. The Keyboard (piano-style) element never takes part, because it is a fixed 12-tone layout. See the Custom Scales chapter, section "Global scale", for the full behavior.

8.4 Faders

Fader 1D and Fader 2D provide:

- **Default Y** (and **Default X** on a Fader 2D): the position loaded with the layout and saved in presets
- **Center Y** (and **Center X**): the visual center of the fader, where its fill bar starts
- **Control Change** outputs for **Pressure**, the position axes (**Y abs**, plus **X abs** on a Fader 2D) and **Motion**
- **Control Voltage** outputs for **Pressure** and the position axes

8.5 Buttons and Keys

A Button's **Type** selects Note, Control Change, Program Change, Control Voltage, or Tap Tempo. **Latched** makes it toggle on each press instead of acting only while held.

- **Note**: the note sent (Root Note and Octave).
- **Control Change**: an **ON Control Change** sent on activation and an **OFF Control Change** sent on release, each with its own controller and **Value**.
- **Program Change**: an **ON Program Change** and an **OFF Program Change**, each with an optional **Bank** (Bank MSB and Bank LSB). The **Preset** menu fills these in for common actions: **Layout Change** (with **Target Layout**) or **Project Change** (with **Target Project**).
- **Control Voltage**: a CV output switched between an **On/Off** pair of voltages.
- **Tap Tempo**: tap to set the tempo.

A Key plays one note (Root Note and Octave) with **PB Range**, **Pressure** and **Vibrato** expressivity, and the same Control Change and Control Voltage outputs as a keyboard.

8.6 MPE and Expressivity

Where supported, MPE and expression settings control how finger pressure and motion are translated into MIDI. **Pressure** sends channel or poly aftertouch, **Vibrato** turns small finger movements into pitch bend, and **Glissando** lets you slide between keys. Match the pitch bend range in your target synth for correct behavior.

8.7 Pedal Inputs

Pedal inputs have a **Type** selector: `Disable`, `Switch`, `Kick`, `Sustain (Binary)`, `Sustain (Continuous)`, or `Expressive`. The Tune panel changes to show the parameters for the selected pedal type.

- **Switch** sends a Note, Control Change, Program Change or Tap Tempo message (**Message Type**), optionally **Latched**.
- **Kick** plays a note whose velocity follows how hard the pedal is hit.
- **Sustain (Binary)** sends a controller (CC 64 by default) with an **On Value** and an **Off Value**.
- **Sustain (Continuous)** and **Expressive** send the pedal position as a continuous controller (CC 64 and CC 11 by default), with **Invert** to flip the direction.

9 Step Sequencer

The Step Sequencer is a pattern based MIDI sequencer built into the Erae surface. Where the Looper captures a free performance, the Sequencer lets you build patterns two ways: draw and edit them step by step directly on the LED grid, or record them live into the pattern while the clock runs. You get independent control over pitch, velocity, gate length, and continuous expression for every step. Its state is saved with your project, per layout.

9.1 What you can sequence

The Sequencer does not only record keyboards. It captures keyboards, faders and buttons, and the lanes it shows change to match whichever element is focused:

Element	What a step records	Lanes offered
Keyboard (scale, chroma, drumpad)	A note: pitch, velocity, gate length, and expression	Note, Pressure, Slide, Glissando, plus one lane per enabled key gesture (pressure CC, X abs, Y abs, X rel, Y rel)
Fader2D (an XY pad)	X, Y, and Z (pressure) values	X, Y, Z
Fader1D (a single fader)	One value automation	Value
Button	An on or off state per step (a press with duration)	State (shown as `steps`)

The sequencer focuses whichever layout element you touched last. On a fresh project, nothing is focused until you touch an element, so touch a key, fader, or button first (or peek a slot, see below) and the sequencer binds to it.

To change which element you are sequencing, hold its layout button (N1 to N8) on its own, without holding Sequencer. The surface shows that slot's normal full layout so you can tap the element you want. Release the button and the three zone sequencer view returns. Note the difference between a hold and a tap: a quick tap and release of your current layout's own button leaves sequencer mode entirely.

9.2 The surface: three zones

While the Sequencer is active the touch surface is split left to right into three fixed zones, each spanning the full height:

- **Live**, the leftmost 7 columns: a live recording surface for the focused element. See The Live zone below.
- **Grid**, the 32 columns in the middle: the step grid where you draw and edit.
- **Launcher**, the rightmost 3 columns: eight stacked pads, one per pattern slot, used to switch patterns. The top pad is pattern 1, the bottom pad is pattern 8.

The visible grid is only 32 of the surface's 42 columns; the Live strip and the Launcher flank it. With **Swap Sides** on (see Settings) the Launcher moves to the left, Live moves to the right, and the grid stays centered. The grid is always 32 columns wide; only the two side strips change ends.

Each finger's zone is fixed at the moment you touch down. A gesture that begins in the grid keeps editing even if the finger slides toward the launcher, so the zones never cross trigger mid gesture.

9.3 The Live zone

The Live zone is a playable mirror of the focused element, and it records. Whether it records depends on whether recording is armed, which is the same Play/Rec arming used by the Looper:

- **Recording armed** (Play/Rec on): playing in the Live zone captures straight into the active pattern at the current playhead. A keyboard records notes with their pressure curve and true held length; a Fader1D records value automation; a Fader2D records X, Y, and Z; a Button records on steps at the playhead. Recording over a span replaces what was there.
- **Recording not armed**: the Live zone plays sound and MIDI without recording, so you can audition a part or perform along while a pattern runs.

Arming is read live, moment by moment, so you can punch in and out during a take: it is never latched to the start of a gesture. Recording is also suppressed while you are in Mapping selection.

For a keyboard the Live mirror is rotated a quarter turn compared with the normal layout: pitch runs vertically up the strip, so slide up for higher notes and down for lower ones. The mirror shares the grid's pitch scroll, so a lit playable row lines up with the same grid row. Fader and button mirrors render the normal way up and do not move with the pitch scroll.

9.4 What a cell means: the pitch grid

For keyboard patterns the grid is a chromatic piano roll. The vertical axis is one MIDI semitone per row, each row two LEDs tall, and rows are shaded like a piano: white key semitones glow dimly,

black key semitones stay dark. Higher rows are higher pitches. A note is drawn as a small amber head (two LEDs by two LEDs) plus a tail:

- **Horizontal position** is when the note starts.
- **Width** is the gate length, how long the note holds.
- **Vertical row** is the pitch.
- **Head brightness** is the velocity, how hard the note hits. The tail brightness follows the recorded pressure.

While the playhead crosses a note the note brightens.

9.4.1 Scale relative recording

How a note is stored depends on the keyboard:

- On a **scale (in-scale) keyboard**, a note stores a scale DEGREE, not a fixed pitch. Degrees below the root are allowed. The actual pitch is worked out at playback against the element's current scale and root, so if you later change the scale or transpose the root, the whole recorded pattern follows. A recorded degree sounds identical to playing it by hand.
- On a **chroma keyboard or drumpad**, a note stores an absolute pitch or pad index and stays fixed.

Whether a keyboard is in-scale or chromatic is set by the **Show Offscale** toggle on the keyboard element (see the Keyboard element chapter). Off means one key per scale degree; on means offscale, chromatic keys are shown, and steps are stored as semitone positions.

Microtonal custom scales play in tune: the exact pitch is split into a base note plus a small pitch bend, sent as an MPE note with a pitch wheel and the correct per note bend range, accurate to within about a cent, so Erae's own synth and spec conformant MPE synths both track it.

9.5 Editing steps on the grid

The grid gesture depends on where you touch and which way you drag.

To draw a note, touch empty space and drag:

- The row under your finger sets the pitch.
- Touch pressure at the start sets the velocity (press harder for a louder note).
- How far you drag horizontally sets the gate length, snapped to the quantize division. A plain tap with no drag makes a note at the minimum length (about two LEDs, or one division, whichever is larger).
- Vertical drift while you draw is recorded as a pitch bend (glissando) curve on that note. One row of drift is one semitone or degree, regardless of the note's MPE bend range. Small wobble does not count: as long as your finger stays within one cell of where the note started, the note stays perfectly straight and no bend is recorded. Once you leave that cell the bend is captured from that point on, even if you drift back.

- A brief finger dropout mid draw still yields one note, not two: on lift the note is held for a moment, and a re-touch within a few cells of the lift point continues the same note. Leaving sequencer mode commits any note still pending, so a draw finished inside the grace window is never lost.

On an existing note head:

- A **tap** deletes the note.
- A **drag up or down** edits its velocity (bottom of the grid is 0, top is maximum).
- A **drag to the right** edits the focused expression curve for that note (which curve depends on the lane selected in the header).

Each note carries several recorded curves at once: a pitch bend curve (edited from the Note or Glissando lane), a pressure curve, a slide curve, and one curve per enabled key gesture (pressure CC, X abs, Y abs, X rel, Y rel). Values are recorded at high resolution, so expression is smooth.

While you hold a note to edit its curve, the curves of the other notes dim so the one you are working on stands out. They return to full brightness when you lift your finger. The curve lane is the full height of the grid, independent of the pitch window: a curve drawn on a row lands on that row, and when a note scrolls out of the pitch window its curve leaves with it instead of floating over the notes still on screen.

Gesture lanes play back as the same CC messages the live keys send, on the same channel, using the gesture's own range, and they are kept when you bounce a loop into a sequence.

For a **Fader1D** the grid records a value curve; for a **Fader2D** it records X, Y, and Z; for a **Button** a tap toggles the on or off state of a step.

9.5.1 Selecting and moving a group of notes

To move several notes at once, hold one finger still on empty grid space and touch a second finger: the two fingers define a box that selects every note inside it. Drag the second finger to move the whole selection, both in time and in pitch. If the box catches no notes, both fingers fall back to normal editing.

9.6 Moving around a large pattern

The 32 column grid is a window onto the pattern, not the whole thing. A pattern can be up to 256 steps, so on anything longer than the window you see only part at a time and scroll or zoom to reach the rest.

- **Grab scroll:** hold the **Sequencer** button and drag a finger on the surface. The content follows your finger in both directions. This is the main way to move through a long pattern. Without holding Sequencer, a drag in the grid edits notes instead.

- **Octave scroll:** the **Plus** and **Minus** buttons jump the pitch window up (Plus) or down (Minus) by one octave (twelve semitones) per press. You cannot scroll the window bottom past the ends of the MIDI range. Octave scroll is ignored while the Encoder switch is held, and while you are editing the pattern Length in the footer.
- **Zoom:** hold **Sequencer** and press **Plus** to zoom in (fewer bars visible) or **Minus** to zoom out (more bars). Zoom moves in whole bar steps (one bar is four steps), and the widest zoom out always frames the entire pattern.
- **Encoder scroll:** hold **Sequencer** and turn the main encoder to nudge the window sideways, four columns per click. With Sequencer not held, turning the encoder moves the LCD focus and edits instead (see The Sequencer LCD).

A fresh pattern opens framed to its first 16 steps. Your last scroll and zoom are remembered per pattern slot and restored when you return to it.

Follow Playhead (a Setting, off by default) auto scrolls the grid to keep the moving playhead on screen, re centring on it when it leaves the window. Leave it off to keep editing a fixed region while the pattern plays.

Fader and button patterns have no pitch axis, so for them only horizontal (time) scrolling applies.

9.7 Sequencer button shortcuts

Hold the **Sequencer** button and press another control for these performance shortcuts. They work alongside the scroll and zoom gestures above:

Hold Sequencer and press	Action
N1 to N8	In sequencer mode, switch the active pattern to that slot. Out of sequencer mode, launch that slot as a scene across layouts. To turn a Looper loop into a pattern, use the **Bounce Loop** row in Sequencer Settings.
Encoder switch	Tap tempo (internal clock only).
Play/Rec	Mute or unmute the active pattern. Double-click to unmute every pattern.
Stop	Mute or unmute the active pattern. Double-click to mute every pattern.
Plus or **Minus**	Zoom in or out (see Moving around a large pattern).

Hold Sequencer and press	Action
Return	Clear the focused element's track (every pattern of that element). This is destructive, so take care not to hit it while reaching for scroll or undo.

9.8 The Sequencer LCD

The LCD is a fixed three band screen: a Header on top, the Grid in the middle, a Footer along the bottom. Turn the main encoder (with the Sequencer button not held) to move the highlight across the three selectable controls, in the order Header, then Division, then Length, wrapping around. Click the encoder to start editing the highlighted control, and click again to stop.

9.8.1 Header: the lane selector

The header shows one expression lane at a time as an icon in a white disc plus a lowercase label. It is a selectable control. To change lane, highlight the header, click the encoder to enter edit, turn the encoder to cycle lanes, and click again to leave edit. While a control is in edit, its value blinks and its icon stays lit, so you can see you are editing.

Only the lanes that make sense for the focused element are offered:

Element	Lane cycle	Labels
Keyboard	Note, Pressure, Slide, Glissando, then one lane per enabled key gesture (wraps)	note, pressure, slide, glissando, pressure CC, X abs, Y abs, X rel, Y rel
Fader2D	X, Y, Z (wraps)	X, Y, Z
Fader1D	Value only (cycling does nothing)	value
Button	State only	steps

The **Note** lane shows notes as bars at their pitch rows. **Pressure**, **Slide**, and the gesture lanes draw the recorded curve on top of every note, and the note head dims to about 40 percent so the curve reads as the foreground. **Glissando** displays each note's pitch bend curve: a note with no bend shows a flat bar, a note with bend shows its curve. The gesture lanes appear only for the gestures enabled on the focused element (in its MIDI settings); disabling a gesture removes its lane, and if that lane was selected the header falls back to Note. Changing lanes re points what the LED grid lets you edit and relabels the header, but the LCD grid keeps showing all of the element's data.

The header also has two special states. If a pattern runs out of memory it shows **Pattern full** in red for about two seconds. If the element you were sequencing gets deleted it shows **Element deleted** in grey, rather than an empty lane.

9.8.2 Grid: the map

The LCD grid always draws the whole pattern edge to edge. A translucent outlined box marks the slice currently mapped onto the pad surface: horizontally it tracks your time position, and for keyboards it also shrinks vertically to the pitch band on the surface, so it shows which octave your fingers are on. Faders and buttons have no pitch axis, so their box spans the full height and only moves sideways.

Notes appear as white bars whose vertical position shows relative pitch; the pitch axis auto scales to fit whatever notes exist. Fader lanes appear as a stepped line and dot curve of the recorded value (on a 2D fader the X axis is white and the Y axis is red). Button patterns show their on steps as centred bars. Step and bar gridlines thin out automatically on long patterns so they stay readable.

A strip down the right edge shows all 8 pattern slots: the active slot is a red square with its number, the rest are grey dots. A moving white line marks the playhead while the pattern plays and disappears when it stops. The window box and the slot strip are read only feedback; you switch patterns from the Launcher on the surface.

9.8.3 Footer: division and length

The footer holds three items: the quantize **division** on the left, a live thumbnail of the layout in the centre, and the pattern **length** on the right. The division and the length are both selectable: highlight one, click to edit, then turn the encoder to change the value.

Control	Values	Default
Quantize division	Off, 1/16, 1/12, 1/8, 1/6, 1/4, 1/3, 3/8, 1/2, 3/4, 1, 5/4, 2, 3, 4	1/4
Pattern length	1 to 256 steps, one step per encoder click	16 steps

While you are editing the Length, the Plus and Minus buttons are inhibited (so they do not fight the length edit); they return to octave scrolling once you leave the edit.

The centre thumbnail is a small live picture of the layout: the element you are sequencing is highlighted, and each element flickers when its steps trigger, so you can see which tracks are firing.

9.8.4 Encoder and Return in this view

- **Click the encoder** to toggle editing of the highlighted control (lane, division, or length).
- **Return** exits an edit if one is in progress; otherwise it undoes your last sequencer edit.

9.9 Switching patterns

Each layout has 8 independent pattern slots, each with its own length, notes, and expression. Tap a pad in the Launcher zone (top pad is pattern 1) to switch. Pads respond on touch down only. How the switch lands depends on **Switch Mode**, set in Settings:

- **Wait:** the new pattern is queued and takes over when the current loop ends. The pending launcher pad blinks amber (about twice a second) on the surface until it takes over.
- **Jump:** the new pattern takes over immediately, continuing from the same position in the bar.
- **Restart:** the new pattern takes over immediately and restarts from its first step.

9.10 Sequencer Settings

Press **Settings** while the sequencer view is active to open Sequencer Settings; press **Settings** again to return, or **Return** to leave for the default view. Turn the encoder to move between items, click to act.

Item	Description
Clear Pattern	Removes all step data from the active pattern only. Confirms with a toast and returns you to the sequencer.
Clear Element	Removes all step data from every pattern of the focused element. Confirms with a toast and returns you to the sequencer.
Switch Mode	Wait, Jump, or Restart, as above.
Copy Pattern	Copies the active pattern into another slot. The screen asks you to tap a pattern pad in the Launcher; tap the destination and the copy happens. If the destination already has notes, or the source is longer than the destination, a confirmation lets you Replace, Extend, Trim, or Cancel. Tapping the source pad asks you to pick a different pattern; Return cancels silently.

Item	Description
Copy Element	Same as Copy Pattern, but copies only the focused element's notes into the same element on the destination pattern. Refused with a toast when the element has nothing to copy.
Bounce Loop	Converts the loop recorded on this layout by the Looper into sequencer notes in the active pattern, and clears the loop. If the active pattern already holds notes, a confirmation names it, lists which patterns are empty, and asks "Bounce the loop into pattern N?" (**Bounce** or **Cancel**). Confirms with "Loop bounced to pattern N" and returns you to the sequencer. Refused with "No loop to bounce" when there is no loop, or "Loop too big to bounce" when it does not fit.
Reset Pattern Settings	Restores the active pattern's length, quantize grid, and play style to their defaults. Notes are kept. If the pattern holds notes past the default length, a confirmation explains that those notes stay stored but stop playing.
Follow Playhead	Auto scrolls the grid to keep the playhead on screen. Off by default.
Swap Sides	Swaps the Live and Launcher zones left to right. The grid stays centred.

Changing the layout while a copy is waiting for a destination cancels the copy with a toast.

9.11 Auto-save

Editing that changes pattern content (drawing or recording notes, clearing a pattern or element, copying into a pattern, bouncing a loop, or resetting pattern settings) is saved automatically with the rest of your project. A brief save indicator appears once the save completes, so you never save sequencer content by hand.

9.12 Clock

The sequencer runs on the project clock, the same clock as the Looper. The project clock source is one of INT (internal), USB-dev, MIDI, or USB-host. On the internal clock the sequencer plays at the project tempo. When the project is slaved to an external clock it follows that clock and respects Start, Stop, and Continue, and will not run until a Start or Continue arrives.

10 Appearance & Styling

The **Style** tab controls how elements look on the Erae surface. It is organized in sections: **Color selection**, **Orientation**, **Style**, and **Finger Animation**; keyboards add a key selection section.

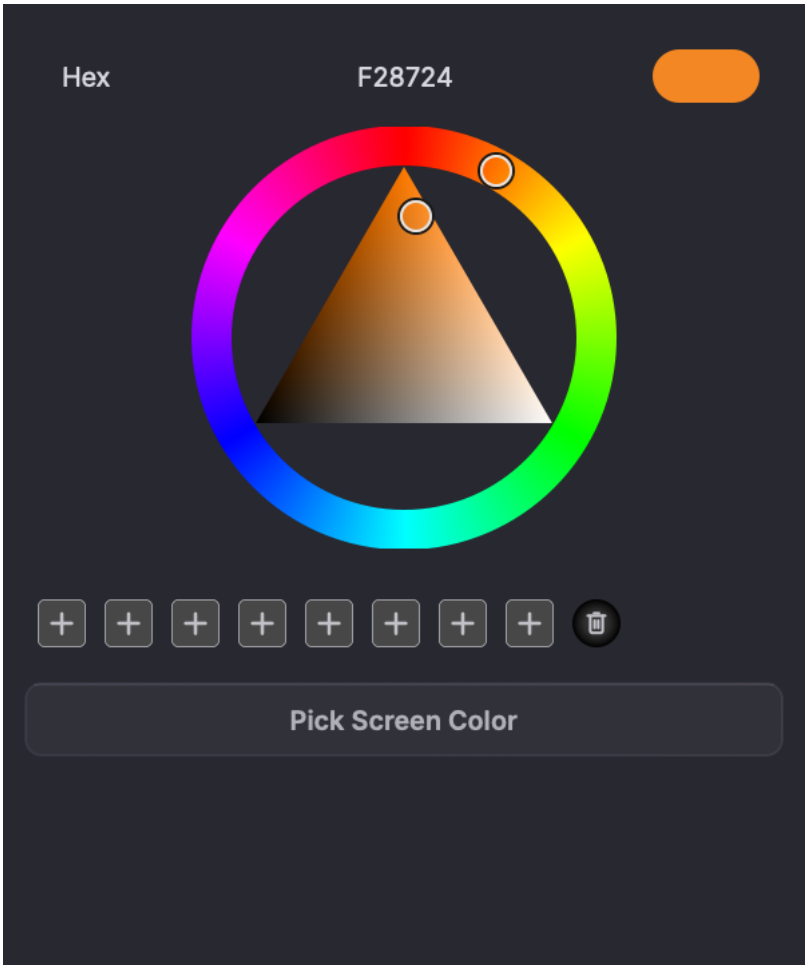
10.1 What You Can Edit

For each element, you can configure:

- the lighting **Style**: `Solid Color`, `Linear Gradient`, `Circular Gradient`, `Rectangular Gradient` or `Edge Color` for keys and keyboards, and `Solid Color`, `Dual Intensity`, `Dual Color` or `Center Fill` for buttons
- the colors that style uses (for example **Start** and **End** with **Grad angle** and **Grad curve** for a linear gradient, **Center** and **Edge** for a circular one, **Edge** and **Background** with **Edge width** for an edge color)
- how a pressed key lights up: **Brightness** (the pressed brightness offset) and **Duration** (how long a released key takes to return to its normal brightness)
- the element's **Orientation**
- **Finger Animation** for **Click**, **Slide** and **Release**
- shared style updates across a multi-selection

10.2 Color Picker

Click a color control in the Style tab to open the color picker. Choose a color with the hue ring and the triangle, or type it in the **Hex** field. Below the picker, a row of eight swatches keeps colors you want to reuse: click a swatch to apply its color, drag a swatch onto the trash can to clear it, and Shift-click the trash can to clear them all. On macOS, **Pick Screen Color** lets you pick any color on your screen.



Color Picker

10.3 Keyboard Styling

Keygrid, Keyboard and Drumpad elements are colored key by key. The key selection section (**Chromatic key selection** or **Degree key selection**, depending on whether the keyboard shows off-scale notes) lets you pick the notes to style: hold Cmd/Ctrl to select several, double-click to select all. This lets you keep root notes, playable zones, and performance areas visually clear.

10.4 Fader Styling

Faders expose direct color controls for their **Bar**, **Edge** and **Background**, so their current position stays easy to read. A Fader 2D also has **OffZone int**, which sets the color of the area outside the bar as a fade between the bar and background colors.

10.5 Finger Animation

Choose an animation **Shape** for each finger event: **Click** (`Glow`, `Ripple`, `Color Morph` or `Disable`), **Slide** (`Glow`, `Halo`, `Color Morph` or `Disable`) and **Release** (`Glow`, `Ripple`, `Color Morph` or `Disable`). **Coloring** decides whether the animation takes its color from the element (`From Element`) or from a color you **Set**; **Speed** sets how fast it changes, and **Amount** sets the strength of a Color Morph.

10.6 Multi-Select Editing

When several elements are selected, changes in the Style tab apply to all of them at once. Values that differ across the selection display as **Mixed** until you assign a new value.

11 Presets

This chapter covers element presets and the Erae Sound factory presets.

11.1 Element Presets

Element presets save a configured canvas element so you can reuse it later. A preset captures the element type, size, MIDI and CV behavior, and appearance settings. It does not store the element's position on the canvas.

11.1.1 Saving an Element Preset

To save an element preset, drag an element from the canvas into the Elements section of the left sidebar. Erae Lab creates a new preset in the **User** group, named after the element type (for example `Key 1` or `Fader 2`). Presets are available in every project.

11.1.2 Loading an Element Preset

Drag an element preset from the **User** group of the Elements section onto the canvas. Erae Lab creates a new element with the saved configuration.

11.1.3 Renaming and Organizing

Right-click a preset to open its menu:

- **Delete** removes the preset.
- **Rename** lets you type a new name in place. Use clear names that describe the intended use, such as `lead-keygrid-mpe` or `filter-fader-cc74`.
- **Duplicate** makes a copy named `<Preset> Copy`.
- **Export…** saves the preset as an `.eraebin` file you can share.
- **Import Elements…** adds one or more `.eraebin` preset files to your library. This entry is also available when you right-click an empty part of the Elements section.

Presets are listed in alphabetical order.

11.2 Erae Sound Factory Presets

If Erae Sound is installed and hosted in Erae Lab, its sound preset browser includes factory sound presets. These are separate from Erae Lab element presets.

Erae Sound factory presets are read-only. You can load them and edit sound parameters while you work, but you cannot rename, delete, or overwrite the factory preset file. Use **Save As...** in Erae Sound to create an editable user preset from a factory preset.

11.3 Editing the Erae Sound Preset Layout

When Erae Sound runs inside Erae Lab, you can edit the layout of its current preset on Lab's canvas.

11.3.1 Opening the Preset Layout

Use either of these:

- Click the thumbnail in the **ERAESOUND PRESET** section, above **PROJECTS** in the left sidebar.
- In Erae Sound, hover the layout thumbnail and click **Edit layout in Lab** in its top right corner.

The Erae shows the preset layout and Lab's canvas shows it ready to edit. The **ERAESOUND PRESET** thumbnail is selected and no project slot is. A header above the canvas reads **Erae Sound preset**, followed by the preset name.

The section and the button appear only when an Erae is connected, Erae Sound is licensed or in demo mode, and the current preset has a layout.

11.3.2 Editing, Saving and Discarding

Edit the layout as you would a project layout. Each edit shows on the Erae right away and marks the Erae Sound preset as modified (an asterisk after its name in Erae Sound). Project slots and project files never change.

Once the layout is modified, the header shows a dot and two buttons on the right:

- **Discard**: puts the preset's saved layout back, on the Erae and in Lab.
- **Save to preset**: writes the edited layout into the preset. The preset's other settings are saved as they are in Erae Sound.

For a read-only factory preset the button reads **Save as new preset**. Click it, type a name in the field (Lab suggests the preset name followed by "copy"), then click **Save** or press Enter. **Cancel** or Escape closes the field. A name already in use shows "This name is taken" and an empty name shows "Enter a name". The new user preset becomes Erae Sound's current preset.

`Cmd+Z` / `Ctrl+Z` and `Cmd+Shift+Z` / `Ctrl+Shift+Z` step through your preset layout edits. If the Erae shows a project slot at that moment, undo first puts the Erae back on the preset layout.

To go back to the project, click a project slot. Click the **ERAESOUND PRESET** thumbnail to return to the preset layout.

11.3.3 Copying the Preset Layout to a Project

Drag the **ERAESOUND PRESET** thumbnail onto a layout slot of any project row in the **Projects** section, on an Erae 2 or an Erae Touch. Expand the row first so its slots are visible. The slot receives a copy of the preset layout, as if you had dropped a layout from another project (see Projects): on the open project it replaces the layout, can be undone and shows on the Erae right away; on another project it is saved to that project and synced. The preset itself does not change.

The copy keeps the preset layout's identity, so with Erae Sound sync on, the slot and the preset stay paired.

On an Erae Touch, the rules for slot rows apply. See Erae Touch.

11.3.4 A Preview from Another App

If the Erae shows a layout pushed by another app, for example Erae Sound in Ableton Live, Lab shows it read only under the header **Erae Sound preview** and never changes it. The same happens when another app takes the Erae while you edit: editing stops at once. Click the **ERAESOUND PRESET** thumbnail to put your preset layout back on the Erae, ready to edit.

When Lab opens on an Erae that already shows the Erae Sound preview, the canvas first shows that layout read only, then the editable preset layout as soon as Erae Sound is ready.

11.3.5 Preset Changed in Another Erae Sound

All Erae Sound instances, in Lab and in your DAWs, share the preset library. When another instance saves the preset you are using and the Erae Sound view is hidden, Lab asks in a notification:

- **Preset modified on disk. Reload?** when you have no unsaved changes.
- **Preset modified on disk. Reload and lose your changes?** when you have unsaved changes.

Reload loads the saved version. **Keep** keeps your sound as it is and marks the preset as modified. While the Erae Sound view is shown, Erae Sound asks the same question itself.

If you kept your version and then click **Save to preset**, the header asks **This preset was changed in another instance. Overwrite it?** with **Save as new** (opens the name field) and **Overwrite** (writes your layout into the preset).

12 Device Sync

Erae Lab keeps a live, two-way link between your project library and a connected Erae 2. When you connect a device, Lab compares what is on the hardware against what is in your library and reconciles the two automatically: it pushes new or updated projects to the device, pulls projects that were created or edited on the device, and asks you when the same project changed on both sides.

For hardware-side sync behavior, see the Erae 2 User Manual, Chapter 14.

12.1 Requirements

Full two-way sync requires:

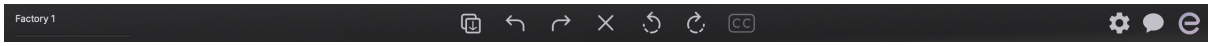
- An **Erae 2** running firmware 2.0 or later, connected over USB.
- An **SD card** inserted in the Erae 2. Projects are stored on and read from the SD card. Without one, Erae Lab shows "No SD card detected. Please insert one to enjoy all of Erae's features." and does not sync.

> **Note:** Edits made in Erae Lab while no device is connected are kept and pushed the next time a compatible Erae 2 is connected.

12.2 Connection Detection

Erae Lab detects a connected Erae 2 automatically over USB as soon as the device is ready. The **E** logo in the top bar lights up while an Erae is connected and dims when it is disconnected. Sync progress is shown in notifications (see "Sync Status Notifications" below).

The first time you connect an Erae to this computer, Erae Lab asks: "Pair this Erae with this computer? This will synchronize all projects back and forth." Choose **Yes** to pair and start syncing. If you choose **No**, Erae Lab leaves that device alone until you unplug it, and asks again the next time you connect it.



Sync Connected

> **Tip:** Leave your Erae 2 powered on and connected while working in Erae Lab. The sync engine keeps the device up to date in the background as you edit, so your hardware always reflects your most recent work.

> **Note:** Best USB synchronization performance is guaranteed only when Erae 2 is powered from its dedicated USB power supply. Powering the device from a computer USB port can introduce shared-bus power constraints that affect sync reliability. For stable and consistent device sync, always use the dedicated supply.

12.3 Multi-Device Support

Erae Lab can detect more than one connected Erae 2. Only one device is the **active device** at a time: this is the device Lab edits, syncs, updates, and uses for hosted Erae Sound input.

When multiple devices are connected, open the **Settings** menu and choose the intended device in the **DEVICE** section before editing or syncing. The selected device is remembered between launches.

Erae Lab tells your devices apart, so two Erae units are never mixed up just because they contain projects with matching names.

Use the active device selector when you:

- Connect a studio device and a performance device at the same time.
- Want to copy Lab changes to one device without touching another connected device.
- Need to pull edits from a specific device after editing layouts directly on hardware.
- Host Erae Sound inside Lab and need its MIDI and touch input to follow a specific Erae.

Lab and hosted Erae Sound share the same active device selection. Changing the active device in Lab also changes which connected Erae is used by hosted Erae Sound.

12.4 Erae Sound in a DAW and Erae Lab Together

You can run Erae Sound in a DAW (for example Ableton Live, on one or more tracks) while Erae Lab is open. Open them in any order: they share the Erae and stay in sync.

- Every layout edit you make in Lab reaches the Erae and every Erae Sound in the DAW.
- A layout that Erae Sound in the DAW assigns to a slot shows in Lab.
- When the DAW quits or crashes, Lab keeps the Erae, with no reconnect needed. When the DAW opens again, its Erae Sound follows Lab's layouts.
- When you unplug the Erae and plug it back, Lab and the DAW reconnect by themselves and Lab syncs again.
- A preset saved in one Erae Sound is offered to every other Erae Sound using it (see Presets).

Erae Sound in a DAW keeps its own undo history and has no **Edit layout in Lab** button. Both are for Erae Sound running inside Lab.

12.5 The Sync Protocol

When a device connects, Lab compares the projects on the Erae with your library, then pushes Lab projects to the device, pulls device projects into Lab, applies renames, and deletes on the device the projects you deleted in Lab.

Progress is shown in a notification during sync, which closes when all actions complete.

12.6 Push and Pull Operations

12.6.1 Push to Device

A project is pushed from Lab to the device when:

- The project exists in Lab but not on the device (new project).
- The project exists on both sides but the Lab copy has been edited since the last sync.

12.6.2 Pull from Device

A project is pulled from the device to Lab when:

- The project exists on the device but not in Lab (created on the device).
- The project exists on both sides but was edited directly on the hardware since the last sync.

> **Tip:** When you edit a project directly on the Erae 2 while it is not connected, Lab pulls the updated version automatically the next time you connect. You do not need to start a pull yourself.

If the device reports projects it cannot read from its SD card, Lab leaves them untouched and tells you: “N project(s) on the Erae card could not be read. They were left untouched. Check the card if this persists.”

12.6.3 Rename Detection

If the same project has a different name on each side, sync treats it as a rename:

- **Renamed in Lab**: the device copy takes the new name.
- **Renamed on device**: Lab adopts the device’s name as the new local name.

12.7 Conflict Resolution

If you edit the same project in two places, once in Lab and once directly on the Erae, Lab cannot know which version you want to keep. When you reconnect, it asks you with a notification: “Project”My Song” has been modified in Lab and on Erae. Which version would you like to keep?” with three buttons:

Keep Device · Keep Both · Keep Lab

Pick one and Lab finishes the sync accordingly. Until you choose, that project is not changed on either side.

12.7.1 What each choice does

Keep Device: Lab replaces its copy with the version on your Erae. The edits you made in Lab on that project are discarded. There is no automatic backup.

Keep Lab: Lab sends its version to the Erae, overwriting the device’s copy. The edits you made on the device for that project are discarded. There is no automatic backup.

Keep Both: Lab keeps both versions, side by side, on both your computer and your Erae:

1. Your Lab version keeps its original name (for example `My Song`).
2. The version that was on the Erae is renamed by adding `_erae` to the end (for example `My Song_erae`) and copied into Lab as a separate project.
3. After sync finishes, both projects exist in Lab **and** on the device. You can open them, compare, and delete whichever you do not want later.

If a project called `My Song_erae` already exists, Lab uses `My Song_erae_2`, then `_erae_3`, and so on, so nothing is ever overwritten.

> **If you are unsure which side has the changes you need, choose Keep Both.** It is the only choice that never destroys work. You can always clean up the extra copy afterwards.

12.7.2 Closing the notification

If you click the close button (X) on the conflict notification instead of choosing, Lab treats it as **Keep Lab**: your Lab version is pushed to the Erae and the device's changes are discarded. The notification itself reminds you of this. If you want to think about it first, leave the notification on screen until you decide.

12.7.3 What triggers a conflict

A conflict only appears when **both** sides changed the same project since the last successful sync. If only one side changed, Lab syncs that side automatically with no notification.

12.7.4 Flash-Only Projects

If a project exists on the Erae but not yet on its SD card, sync writes it to the card so it is stored like the others.

12.8 Live Layout Editing

When you are actively editing a layout in Lab while the device is connected, Lab does not push every mouse move to the device. It waits until you pause briefly (a fraction of a second) before sending the updated layout. This prevents a flood of partial transfers during rapid edits.

> **Tip:** The delay is imperceptible during normal editing. If you need the device to reflect a change immediately, for example before a performance, make your edit and pause for a moment.

12.9 Deleted Projects

When you delete a project from Lab while no device is connected, the next sync deletes that project on the device too. If a device is connected at the moment of deletion, the project is deleted on the device right away.

12.10 Sync Status Notifications

The sync engine communicates its progress through notifications in the Lab window:

- “Syncing N project(s)…” appears when transfers begin, and updates as each project is transferred.
- “Sync complete: N project(s) synced” confirms that all actions finished.
- A “Sync timed out” warning appears if the device stops answering. Unplug and reconnect the Erae.
- “USB connection lost… recovering” appears when the connection drops briefly, followed by “Connection recovered”.
- A warning that the Erae “is connected via legacy MIDI only” appears when the device came up without its sync connection. Replug it or try another USB port (see Troubleshooting).

> **Tip:** Sync errors most often result from briefly disconnecting the USB cable during a transfer. Reconnect the cable and Erae Lab restarts the sync from the beginning automatically.

13 Firmware Updates

Erae Lab keeps your Erae 2 firmware up to date. Each Erae Lab version comes with the firmware that matches it: Lab installs that firmware as one of its managed components and keeps it on your computer, so the update itself runs from the local copy. Keeping Erae Lab up to date is how you receive new firmware.

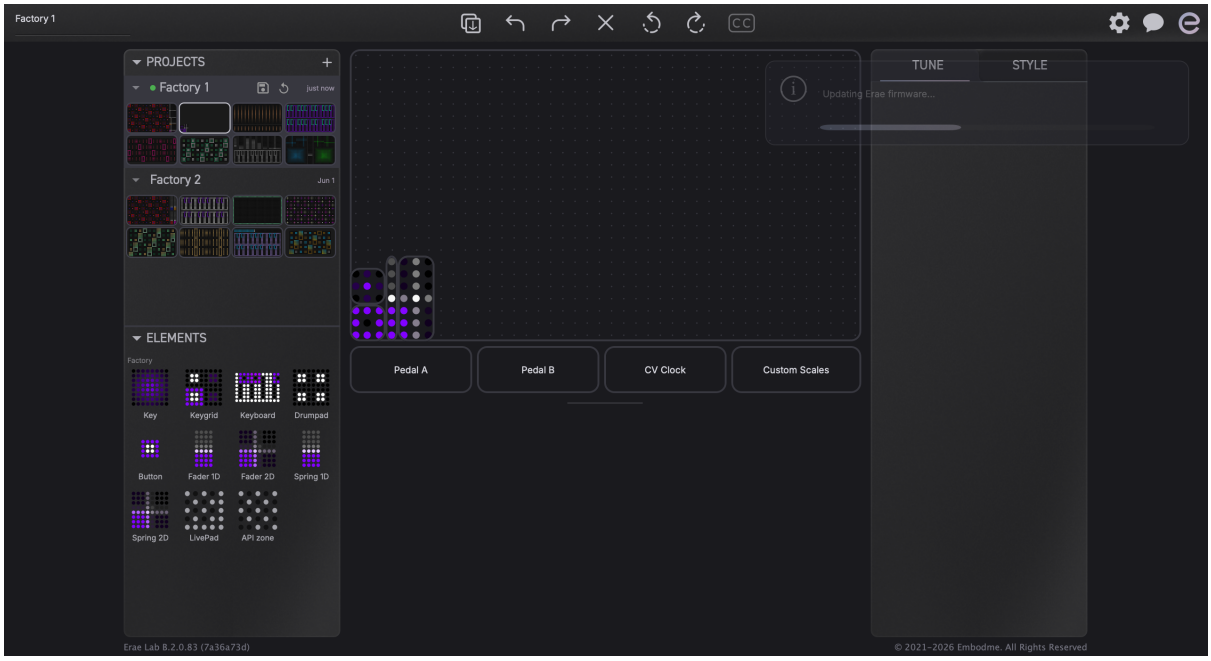
13.1 Automatic Update Checking

When an Erae 2 connects, Erae Lab compares the device's firmware version against the firmware it has on your computer. If Lab's firmware is newer, the update starts automatically.

The Erae must be powered from an external power supply to update. If it is not, Lab shows "Please connect your Erae to a power supply before updating firmware." and waits.

An Erae still on firmware older than 2.0 is never updated silently: Lab first asks you to confirm ("Firmware update required.") and reminds you to keep the device on external power and switched on for about a minute after the update while it finishes installing. Choose **Start Update** or **Cancel**.

> **Tip:** Keep Erae Lab up to date to receive the latest firmware. If the firmware component looks missing or damaged, use **Reinstall components** in the Settings menu (see Settings).



Firmware Update

13.2 How an Update Works

On an Erae 2, an update runs in three steps:

1. **Reboot to bootloader**: Lab asks the device to restart in its bootloader, the small program that installs firmware. The device reconnects to your computer as a MIDI device named "Bootloader".
2. **Transfer**: Lab sends the firmware. A progress bar tracks the transfer.
3. **Reboot to firmware**: when the transfer is complete, the device restarts into the new firmware and reconnects as a normal Erae 2.

> **Tip:** Do not disconnect the USB cable during a firmware update. If the transfer is interrupted, reconnect the device: if it comes back in bootloader mode, Lab detects it and offers recovery options (see below).

13.3 Bootloader Detection and Orphan Recovery

Lab also notices a device that is waiting in bootloader mode when no update is in progress, for example after an interrupted update.

13.3.1 Orphan Bootloader Recovery

In that case, after a few seconds Lab shows “Bootloader detected.” with three choices:

- **Install latest firmware**: Lab installs the firmware it has on your computer.
- **Select file**: Lab opens a file chooser so you can pick a `.syx` firmware file yourself. The transfer then runs like a normal update.
- **Dismiss**: Lab leaves the device alone. It stays in bootloader mode until you update it.

> **Tip:** If your device is waiting in bootloader mode and Erae Lab does not offer recovery, disconnect and reconnect the USB cable. Detection starts again on each connection.

13.4 Progress Tracking

A notification in the Lab window tracks the update in real time:

- “Updating Erae firmware…” appears when the transfer begins, with a progress bar.
- “Firmware updated!” confirms that the device restarted on the new firmware.
- If a transfer fails, Lab retries it (“Retrying firmware update…”). If the update still cannot complete, an error notification tells you what to do; in most cases, unplugging the device, reconnecting it and letting the update run again resolves the issue.

13.5 macOS: MIDI Device Reset After Update

After a firmware update completes on macOS, the Erae 2 reconnects as a new MIDI device. If Erae Lab does not reconnect, or if the device does not appear in other MIDI applications:

1. Open **Audio MIDI Setup** (in `/Applications/Utilities`).
2. Locate any stale Erae 2 entries and remove them with the minus button.
3. Unplug and replug the USB cable. The device reconnects cleanly.
4. Relaunch Erae Lab if the connection indicator does not respond.

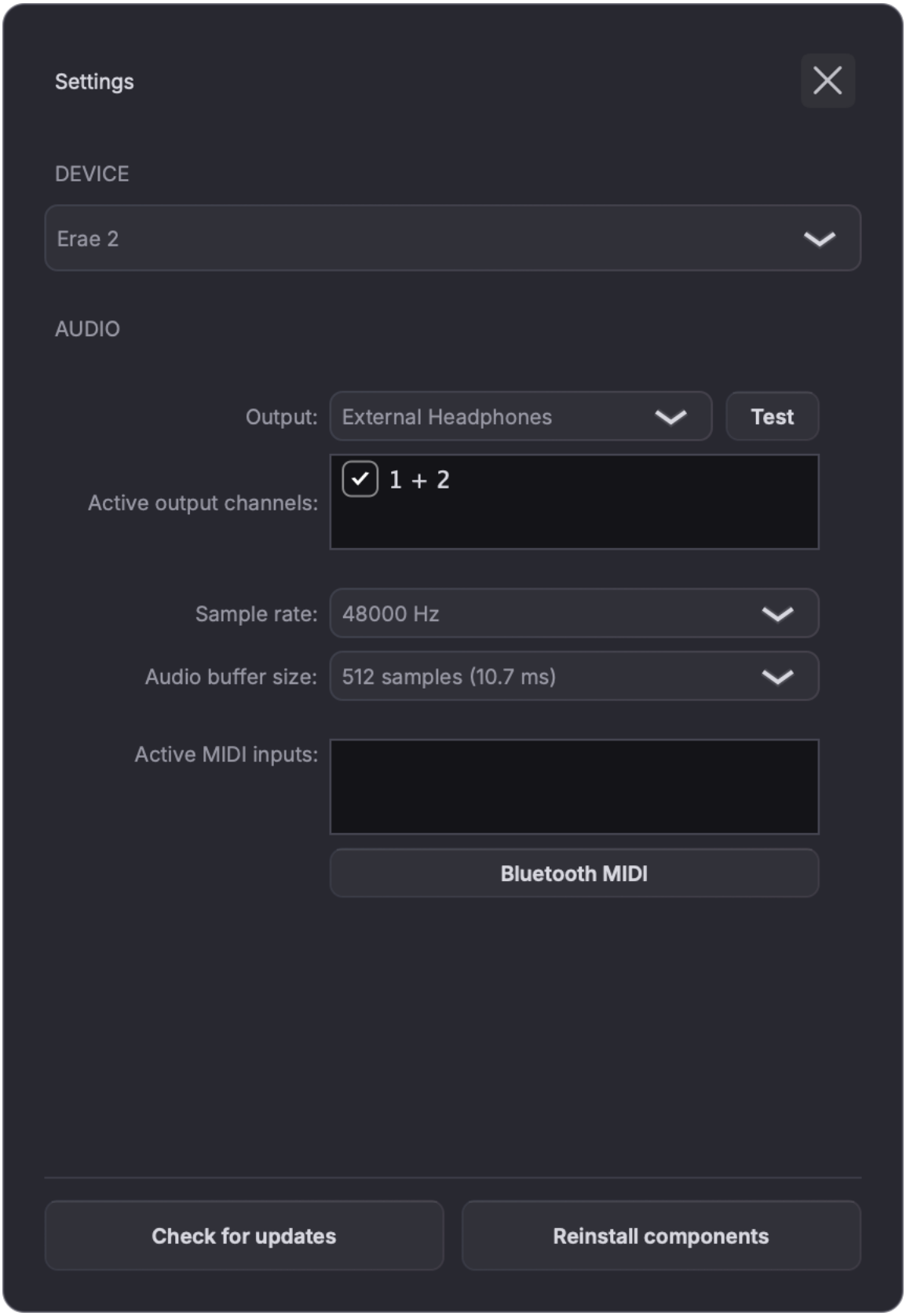
13.6 Boot Failure Troubleshooting

If the device does not boot normally after a firmware update:

- **Blank or frozen surface**: hold **Settings** while powering the Erae on. This starts it in bootloader mode. Erae Lab then shows "Bootloader detected."; choose **Install latest firmware**.
- **No USB connection**: try a different USB cable and port. If the device still does not appear, contact Embodme support (support@embodme.com). Do not power-cycle it repeatedly.
- **Recovery `.syx` file**: the firmware Erae Lab uses is stored in the `firmware` folder of the Embodme data folder (on macOS, `~/Library/Application Support/Embodme/firmware`; on Windows, `%APPDATA%\Embodme\firmware`; on Linux, `~/.local/share/Embodme/firmware`). Choose **Select file** in the recovery notification to use it or any other `.syx` file you have.

14 Settings Menu

Open the Settings menu by clicking the gear icon in the top bar, or press `Cmd+,` (macOS) / `Ctrl+,` (Windows/Linux). The menu opens as an overlay with the **DEVICE**, **AUDIO**, **DIAGNOSTICS** and **TIPS** sections, followed by the **Check for updates** and **Reinstall components** buttons.



Settings Panel

14.1 Device Selection

If more than one Erae device is connected, the Settings menu shows a **DEVICE** section with a device selector. Choose the device you want Erae Lab to control before editing, syncing, updating firmware, or hosting Erae Sound. The active device selection is remembered for the next launch.

If only one Erae device is connected, this section is hidden because there is nothing to choose.

14.2 Sound Settings

When Erae Sound is available for hosting inside Erae Lab, the Settings menu shows an **AUDIO** section. Use it to choose the audio output device, output channels, sample rate, buffer size, and related driver options exposed by the operating system.

These settings affect hosted Erae Sound playback. Erae Lab's project editing features do not require an audio interface; they continue to work even if no audio output is configured.

14.3 MIDI Settings and Auto Erae

The same AUDIO section includes MIDI input checkboxes. Erae Lab automatically enables connected Erae MIDI inputs for Erae Sound so notes, pressure, and performance gestures reach the sound engine without manual setup.

This automatic selection is sometimes called **Auto Erae**. It runs on first launch and again whenever an Erae is connected or reconnected, including after a firmware update.

You can still use the MIDI input list to inspect or adjust the enabled inputs manually. Erae Lab enables Erae MIDI inputs automatically; the port an Erae shows while it is being updated is ignored for performance input.

14.4 Check for Updates

Click **Check for updates** to ask Erae Lab's app updater to look for a newer Erae Lab version immediately. Erae Lab also checks for app updates automatically in the background, but this button is useful when you want to verify your installation before a session.

If an app update is available, follow the updater prompts. Your open project is not overwritten by checking for updates. Managed components are checked automatically on launch and can be refreshed manually with **Reinstall components**.

14.5 Install or Reinstall Components

Click **Reinstall components** to force Erae Lab to reinstall its managed component packages: Erae Sound, the Erae firmware, the Ableton Live script, and the factory content.

Use this when a component appears missing or broken, when factory content did not install correctly, or when support asks you to. Erae Lab downloads the components again and shows its progress in notifications. On Windows, the installer may ask for administrator approval. Your projects and user presets are never deleted.

If you are offline, Erae Lab reports the failure and you can retry when the network is available.

14.5.1 macOS: Component Install Troubleshooting

If installing or reinstalling the Erae Sound component fails on macOS, the cause is usually a permission or security restriction on where the audio plug-in is placed. Check the following:

1. **Plug-in folder permissions.** Erae Sound is installed as an Audio Unit into `~/Library/Audio/Plug-Ins/Components/`. Make sure that folder exists and is writable by your user account. If a previous install left a locked file there, remove it and run **Reinstall components** again.
2. **macOS security.** If macOS reports that it is from an unidentified developer or cannot be verified, open **System Settings > Privacy & Security**, find the message about the blocked component, and click **Open Anyway**, then retry the install.
3. **Retry.** Once permissions and the security prompt are resolved, click **Reinstall components** again.

If the component still fails to install after these steps, contact **support@embodme.com** with your Erae Lab version and macOS version. See also Troubleshooting.

14.6 CV Clock

The **CV Clock** button in the strip below the canvas opens the **CV Clock Output** settings for the project in the right panel:

- **Enable**: turns CV clock output on or off.

- **Beat Division**: chooses the clock rate: 1, 2, 4, 8, 24, or 48 ppqn.
- **Output**: chooses the pair of CV outputs used by the clock (for example Output 1 / 2).

14.7 Diagnostics

One row in the Settings menu, **Diagnostics**, controls what Erae Lab sends:

- **Full**: Erae Lab sends a detailed report when something goes wrong, so support can match it to your messages, plus daily usage statistics (app version, Erae model and firmware, the MIDI controllers you use with Erae Lab and the DAW Erae Sound runs in) with your machine id. The machine id is the same identifier used for license activation and crash reports, so these records are linked to your license and crash reports when you have them. It is shown in this section with a **Copy** button.
- **Without identifiers** (the default): only an anonymous report when the app closes unexpectedly. Update checks are counted as daily unique users with a pseudonymous code that our server computes from your IP address and app details, using a key that changes every day and is then destroyed. The code is deleted within 48 hours, only daily totals are kept, and your IP address is never stored.
- **Off**: no diagnostics are sent. Update checks still happen but are not counted as users. Manual bug reports still work.

In every mode, the update check sends the app version, your operating system, the Diagnostics mode and the model and firmware of the connected Erae, so Erae Lab can offer the right updates. It carries no identifier.

To have your usage records deleted, send the machine id shown in this section, or the email address of your license, to **support@embodme.com**.

You are asked once, the first time you use Erae Lab: **Yes** selects **Full**, **Not now** keeps the default. The privacy notice at embodme.com/privacy-policy describes what is sent, the legal bases and how long it is kept.

14.8 Tips

Erae Sound shows a tip explaining how to save a preset to a slot of your Erae, until you close it. Click **Show tips again** in the **TIPS** row to bring it back.

14.9 Project and Element Settings

Project-specific settings live in their dedicated panels rather than in the gear menu. For example, CV Clock, pedals and per-element MIDI settings are configured from the canvas and the right-side settings panel. See MIDI Settings, The Canvas, and Device Sync for those workflows.

14.10 Saved State

Erae Lab remembers your setup between launches: the active device, the Lab or Sound view, whether Erae Sound is on and its current sound, its audio and MIDI settings, and which sidebar sections are expanded.

15 Keyboard Shortcuts & Interactions

This chapter is a quick-reference guide to the keyboard shortcuts, mouse gestures, and drag-and-drop interactions available in Erae Lab. Keep it open while you explore the canvas.

15.1 Keyboard Shortcuts

Canvas shortcuts work when the canvas has keyboard focus. Undo, redo, and the file shortcuts also work from the other panels, except inside a text field, where `Cmd+Z` / `Ctrl+Z` undoes typing in that field.

Action	macOS	Windows / Linux
Clear the current layout slot (new empty layout)	`Cmd + N`	`Ctrl + N`
Open / Import a layout or project file	`Cmd + O`	`Ctrl + O`
Export current layout as an `.eraebin` file	`Cmd + S`	`Ctrl + S`
Open Settings	`Cmd + ,`	`Ctrl + ,`
Undo	`Cmd + Z`	`Ctrl + Z`
Redo	`Cmd + Shift + Z`	`Ctrl + Shift + Z`
Copy	`Cmd + C`	`Ctrl + C`
Paste	`Cmd + V`	`Ctrl + V`
Duplicate	`Cmd + D`	`Ctrl + D`
Delete selected	`Delete` or `Backspace`	`Delete` or `Backspace`
Select all	`Cmd + A`	`Ctrl + A`
Close the Scale Manager	`Esc`	`Esc`

> **Tip: Duplicate** (`Cmd + D`) copies the selected elements and places the copy on the layout with CC and CV numbers automatically incremented: useful for building a row of faders without adjusting each one by hand. **Paste** keeps the copied numbers unchanged.

> **Tip:** Undo and redo history belongs to the project and survives panel switches. You can undo edits made in the Tune and Style tabs, not just canvas moves.

> **Tip:** With Erae Sound running inside Lab, the history also holds Erae Sound's steps. When the next step belongs to the view you are not looking at, the first `Cmd + Z` only switches to that view and the next one undoes it. See The Canvas.

15.1.1 Project Row Shortcuts

After you click a thumbnail in the active project row, that row has keyboard focus and these shortcuts act on the project and its selected layout slot:

Action	macOS	Windows / Linux
Copy the selected layout	`Cmd + C`	`Ctrl + C`
Paste into the selected slot	`Cmd + V`	`Ctrl + V`
Clear the selected slot	`Delete` or `Backspace`	`Delete` or `Backspace`
Duplicate the project	`Cmd + D`	`Ctrl + D`
Rename the project	`F2`	`F2`

Click the canvas to give the keyboard back to the canvas.

15.2 Mouse Interactions on the Canvas

15.2.1 Selecting Elements

Gesture	What it does
Click an element	Select it. Any previous selection is cleared.
Cmd + click (macOS) / **Ctrl + click** (Windows/Linux) an element	Add the element to the current selection, or remove it if it is already selected.
Click + drag on empty canvas area	Draw a selection rectangle. Every element the rectangle touches is selected.
Click on empty canvas area	Deselect all.

15.2.2 Moving and Resizing Elements

Gesture	What it does
Click + drag a selected element	Move it. All elements in the current selection move together, snapped to the grid.
Alt + drag (Option on macOS)	Place a copy instead of moving.
Drag a corner or edge	Resize the element on the grid. With several elements selected, all of them take the new size.
Shift + drag a corner or edge of a Keygrid, Keyboard or Drumpad	Change the key size instead of adding or removing keys.

Elements cannot overlap: a move or resize that would overlap another element is not applied.

15.3 Drag-and-Drop

15.3.1 Sidebar to Canvas

Drag an element from the **Factory** group of the Elements section and drop it onto the canvas. Erae Lab shows an outline as you drag, sized to the free space under the pointer. Release the mouse to create the element there.

15.3.2 Element Preset to Canvas

Drag an element preset from the **User** group of the Elements section and drop it onto the canvas. The element is created with all saved MIDI, CV, and appearance settings from the preset.

15.3.3 Canvas to Sidebar

Drag an element from the canvas into the Elements section to save it as a preset.

15.3.4 Layout Drag-and-Drop

Drag a layout thumbnail from the Projects sidebar:

- onto a slot of an expanded project row, to copy the layout into that slot;
- onto the canvas, to replace the current layout with it.

15.3.5 Files

Drag a project folder, an `.erproj` or `.eraeproject` file, or a layout file (`.eraebin` or `.emk`) onto the Erae Lab window to import it. One file at a time.

15.4 UI Feedback Conventions

Erae Lab uses a consistent set of visual cues to communicate state:

State	What you see
Selected	The element gains an accent border.
Multi-selected	All selected elements show the accent border.
Dragging from the sidebar	An outline on the grid shows where the element will be placed.
Lasso active	A translucent rectangle appears as you drag across empty canvas space.
Active project	A green dot next to the project name.
Changed since snapshot	The project row shows Save/Revert controls when the autosaved project differs from its snapshot checkpoint.
Connected	The **E** logo in the top bar is lit.
Syncing	A notification shows sync progress.

16 Troubleshooting

This chapter covers the most common problems you may encounter while using Erae Lab. For hardware-specific issues, refer to the Erae 2 User Manual, Chapter 10.

If you cannot resolve an issue using this guide, use the in-app bug report button in the top bar, or contact Embodme support at **support@embodme.com**.

16.1 Device Not Detected

Symptom: The **E** logo in the top bar stays dim after plugging in the Erae 2.

Steps to resolve:

1. Try a different USB cable. A charge-only cable will not work: make sure the cable supports data.
2. Try a different USB port, preferably a port directly on the computer rather than a hub.
3. On macOS, open **System Information > USB** and check whether the Erae 2 appears. If it does not appear there either, the hardware or cable is the problem.
4. On Linux, Erae Lab needs permission to access the device. When access is denied, Erae Lab shows "Erae detected but USB access is denied." Click **Fix Now** and enter your admin password, then replug the device.
5. Quit Erae Lab, unplug the device, wait five seconds, replug, then relaunch Erae Lab.

> **Tip:** If you plug in after launch you do not need to restart: wait a moment and the **E** logo lights up. If Erae Lab gives up, it shows a "No Erae device detected" notification with a **Rescan** button; check the cable and power, then click **Rescan**.

16.2 Device Detected but Not Connecting

Symptom: The device appears briefly then disconnects, or the indicator flickers.

Steps to resolve:

1. If the device firmware is too old for this version of Erae Lab, Lab offers a firmware update automatically: follow the instructions in Firmware Updates.
2. If the Erae 2 is waiting in bootloader mode, see Update Recovery below.
3. If Erae Lab shows "Erae is connected but not responding", power-cycle the device, then click **Rescan** in that notification.

16.3 Connected but Not Syncing

Symptom: The Erae 2 is connected and appears as a MIDI device, but Erae Lab cannot sync projects to it and hosted Erae Sound does not receive its input.

Full sync and hosted Erae Sound input rely on the Erae's dedicated sync connection over USB. If the device comes up as a plain (legacy) MIDI device instead, Erae Lab can still see the MIDI ports but cannot establish the sync link, and warns that the Erae "is connected via legacy MIDI only".

Steps to resolve:

1. Unplug the Erae 2, wait a few seconds, and plug it back in.
2. If a replug does not help, try a different USB port, preferably one directly on the computer rather than through a hub.
3. Use a known-good data cable.
4. Confirm the device firmware is 2.0 or later, as required for two-way sync (see Device Sync).
5. Check that an SD card is inserted: without one, the Erae does not sync.

> **Tip:** The **E** logo lights up whenever the device is present over USB, so on its own it does not confirm that sync is working. The reliable sign is that the "legacy MIDI only" warning clears and a sync notification appears after a replug. If the warning keeps coming back, repeat the replug on another port before contacting support.

16.4 Sync Conflicts

Symptom: When you connect the Erae 2, a notification asks you to choose how to resolve conflicting project versions.

Erae Lab raises a conflict when both the Lab copy and the device copy changed since the last clean sync.

Resolution options in the notification:

Choice	What happens
Keep Device	The device version is pulled into Lab for the conflicting project.
Keep Both	Lab keeps its version and imports the device version as a separate copy named with an `_erae` suffix.
Keep Lab	The Lab version overwrites the device version for the conflict.

> **Tip:** Choose **Keep Both** if you are unsure which version contains the changes you need.

16.5 Project Recovery

If a project file is damaged or accidentally removed from the Erae Lab library folder, the Erae 2's SD card holds the last synced copy. Connect the Erae 2: sync pulls device projects that are missing from the local library. A project you deleted in Erae Lab is different: sync deletes it on the device too.

Projects are stored locally in Erae Lab's app-data folder under `EraeLab/projects`. Right-click a project row and choose **Open Projects Folder** to reveal the exact path for your operating system. Time Machine or any file-level backup covering that folder provides an additional safety net.

16.6 File Format Troubleshooting

Symptom: An `.erproj` or `.emk` file does not open or import correctly.

Steps to resolve:

1. Verify the file extension. Current projects are folders containing `settings.eraebin`; `.eraeproject`, `.erproj`, and `.emk` are legacy formats you can import. Files with the `.emk` extension are layout files: select the destination layout slot, then press `Cmd+O` / `Ctrl+O` or drag the file onto Erae Lab.
2. Check that the file is not zero bytes (an incomplete download or copy). If so, obtain the file again from its source.
3. If the file was created with a newer version of Erae Lab than you currently have, update Erae Lab to the latest release.
4. Contact support@embodme.com with the file attached if the issue persists. Include the version of Erae Lab and the operating system.

16.7 MIDI Port Conflicts

Symptom: MIDI from the Erae 2 is not received by your DAW, or MIDI is received by the wrong application.

Steps to resolve:

1. On macOS, some applications claim exclusive access to MIDI ports. Check that no other application has the Erae 2 MIDI port open exclusively.
2. Verify the correct MIDI port is selected in your DAW's MIDI input preferences. The Erae 2 appears as a USB MIDI device named "Erae 2".
3. If you are using a virtual MIDI routing utility (IAC Driver on macOS, LoopBe on Windows), ensure the routing is configured correctly and does not create feedback loops.
4. On macOS, open **Audio MIDI Setup** and check whether the Erae 2 appears and is not showing an error icon. Quitting and relaunching Audio MIDI Setup can force the system MIDI daemon to re-enumerate devices.

16.7.1 macOS: Forget Device After MIDI Issues

If the Erae 2 MIDI port stops responding after a firmware update or unexpected disconnection:

1. Open **Audio MIDI Setup**.
2. Select the Erae 2 device in the list.
3. Press the minus button to remove it.
4. Unplug and replug the USB cable. The device re-enumerates with a clean entry.

16.8 Firmware Update Failures

Symptom: The progress bar stops partway through a firmware update, or Erae Lab reports an update error.

Steps to resolve:

1. Do not unplug the device during an update. If the device does not come back within about a minute, Erae Lab stops waiting and displays an error.
2. After a timeout, quit Erae Lab, unplug the device, wait 10 seconds, then reconnect. If the device boots normally, relaunch Erae Lab and let it retry the update automatically.
3. If the device does not boot after a failed update, restart it in bootloader mode: see Update Recovery below.

16.9 Update Recovery

Symptom: The Erae 2 does not respond normally and its surface is blank or frozen.

Restart the device while holding **Settings**. This starts the Erae in bootloader mode so Erae Lab can detect it and install the firmware again.

1. Connect the device to the computer and keep Erae Lab open.
2. Hold **Settings** while rebooting the device.
3. Wait a few seconds for the Erae Lab notification "Bootloader detected."
4. Choose **Install latest firmware** and keep the USB cable connected until the device reboots.

If Erae Lab does not show the notification after the recovery reboot, disconnect and reconnect USB, then restart the device while holding **Settings** again. If the device still does not recover, contact support@embodme.com.

> **Tip:** Do not power-cycle the device repeatedly during recovery. Enter bootloader mode once, choose **Install latest firmware**, and wait for the update to complete.

16.10 Erae Lab Crashes

Symptom: Erae Lab quits unexpectedly or becomes unresponsive.

Steps to resolve:

1. If the application is unresponsive, force-quit it:
   - **macOS:** Press `Cmd + Option + Esc`, select Erae Lab, and click **Force Quit**. Alternatively, right-click the Dock icon and choose **Force Quit**.
   - **Windows:** Press `Ctrl + Shift + Esc` to open Task Manager, find Erae Lab, and click **End Task**.
2. Relaunch Erae Lab. The application automatically reloads the last saved project state.
3. What Erae Lab sends after a crash depends on the **Diagnostics** setting, see Settings. There is no prompt after a crash.
4. If the problem happens again, submit a bug report from inside Erae Lab. The last crash report is attached automatically when there is one. When possible, reconnect the device and reproduce the issue first so the report shows what happened.
5. If in-app reporting is not available, email support@embodme.com with a description of what you were doing when the crash occurred.

16.10.1 What a Crash Report Contains

The **Diagnostics** setting decides what leaves your computer:

- **Without identifiers** (the default): an anonymous report is sent when the app closes unexpectedly. It cannot be traced back to you. Update checks are counted as daily unique users with a pseudonymous code that is deleted within 48 hours.
- **Full**: a detailed report is sent when something goes wrong, so support can match it to your messages. Daily usage statistics (app version, Erae model and firmware, the MIDI controllers you use with Erae Lab and the DAW Erae Sound runs in) are also sent with your machine id, the identifier used for license activation and crash reports.
- **Off**: no diagnostics are sent. Update checks still happen but are not counted as users. Manual bug reports still work.

Reports are used only to find the cause of a problem. To have your Full reports or usage records removed, write to **support@embodme.com** with the machine id shown in Settings or the email address of your license. The full description is at embodme.com/privacy-policy.

16.10.2 Choosing What Is Sent

The first time you use Erae Lab, one prompt asks:

> Help us make Erae better. When something goes wrong, Erae Lab sends a short technical report that doesn't identify you. Would you also share full diagnostics? That adds the recent log, your Erae's state and Erae usage statistics linked to this computer. You can change this anytime in Settings.

Yes sets **Diagnostics** to **Full**. **Not now** leaves it at **Without identifiers**, and closing the notification counts as **Not now**. You can change it at any time in the Settings menu, see Settings.

16.10.3 Local Copies of Crash Reports

Erae Lab keeps a few recent crash reports on your computer, in the `crashpad` folder inside the Embodme data folder, and deletes each one once it has been sent. Personal details are removed from these files, so you can also send one to support by hand. You can delete them at any time.

16.11 Erae Crash Reports

If the Erae stops and restarts because of a problem, it keeps a crash record. The next time it connects, Erae Lab sends that record to Embodme by itself, with no report window, following the **Diagnostics** setting in the Settings menu:

- **Full** or **Without identifiers**: the report is sent at once. The Erae shows **Bug report sent** for a few seconds and Lab shows a **Bug report sent** notification. The record is then cleared, so it is never sent twice.

- **Off**: nothing is sent on its own. A notification says your Erae stopped and restarted, with **Switch to Full** and **Keep my setting**. **Switch to Full** sends the report. **Keep my setting** sends nothing.

If the upload fails (no internet, server unavailable), the record stays on the Erae and is sent at the next connection.

16.12 Erae Sound Asks to Reload or Overwrite a Preset

Symptom: A notification says **Preset modified on disk. Reload?** or **Preset modified on disk. Reload and lose your changes?**, or saving asks **This preset was changed in another instance. Overwrite it?**

Another Erae Sound, in Lab or in a DAW, saved the preset you are using. Nothing is wrong:

- **Reload** loads the version just saved. **Keep** keeps your sound and marks the preset as modified.
- **Overwrite** replaces the saved version with yours. **Save as new** keeps both by saving yours under a new name.

See Presets.

16.13 Erae Sound in Live and Erae Lab Out of Sync

Symptom (earlier versions): With Erae Sound in Ableton Live and Erae Lab open at the same time, Live's Erae Sound stayed on old versions of your layouts, or slots were lost.

This is fixed. Update Erae Lab and Erae Sound to the current version. They now stay in sync in any start order, when Live quits or crashes, and when you unplug the Erae and plug it back. See Device Sync.

16.14 In-App Bug Reports

The bug report button in the top bar opens an in-app report form. Use it for crashes, sync issues, device communication problems, hosted Erae Sound issues, and reproducible UI problems.

A bug report includes your current project, recent logs and details about your Erae, and the last crash report when there is one. This helps support reproduce the problem, but it can include

project and preset names. Review your description before submitting, and use email support if you prefer to discuss sensitive material first.

If the button is not visible, contact **support@embodme.com** and include your Erae Lab version, operating system, connected device model, firmware version, and the steps that trigger the issue.

16.15 MIDI Device Not Appearing in Settings

Symptom: A MIDI interface is connected but does not appear in the MIDI input list of the AUDIO section in Settings.

Steps to resolve:

1. Close the Settings menu, then reopen it.
2. On macOS, open **Audio MIDI Setup** (found in `/Applications/Utilities`). Verify that the device appears there and is not showing an error icon. Sometimes quitting and relaunching Audio MIDI Setup causes the system MIDI daemon to re-enumerate devices.
3. On Windows, check **Device Manager** for driver errors on the MIDI device. Reinstall the device driver if a warning icon is present.
4. Verify the device is not exclusively claimed by another application. Some MIDI interfaces do not support shared access: close other DAWs or MIDI utilities that may hold the device open.

> **Tip:** Virtual MIDI ports (such as those created by IAC Driver on macOS or LoopBe on Windows) appear in the Erae Lab device list like physical ports. If you are using a virtual port for routing, make sure it is enabled before opening Erae Lab.

17 Custom Scales

Custom Scales let you define your own tuning systems, from simple modes to full microtonal systems, and play them on a Keygrid element with MPE enabled. A scale library of up to 64 scales lives on your Lab install and on your Erae, and syncs between them the way your projects do.

Custom scales are an Erae 2 feature. Erae Touch plays the built-in scales only: Lab does not offer custom scales for an Erae Touch project or a connected Erae Touch, does not send your scale library to it, and a keyboard that refers to a custom scale plays Major on an Erae Touch.

17.1 What a scale is

A custom scale is made of:

- A **name** (up to 31 characters, stored as "CUSTOM" by default).
- An **octave ratio**: the frequency ratio at which the scale repeats. Default is 2.0, a true octave. It does not have to be an octave.
- A fixed **root**: degree 1 of the scale. It is always present, cannot be removed, and is not edited like the other degrees. You set it either as a semitone offset from the keyboard's base note or as an absolute frequency in Hz (see "The root" below).
- An ordered list of **notes**, the degrees above the root (degree 2 onward). Each note is a frequency ratio relative to the root (cents are only a convenience when you type or import values).
- A **mode**: Free ratio or Equal Division.

When you play a keyboard that uses a custom scale, successive keys walk from the root through the notes in list order and repeat at the octave ratio. Because the octave ratio can be something other than 2.0, the repeat can be a non-octave interval (a tritave, a stretched octave, and so on).

17.2 The root

The root is where the scale starts. It is degree 1, it is always there, and there is no remove control for it: a scale can be the root alone (a one-degree scale that repeats at the octave ratio). The root has two modes, and each scale carries its own root setting, in Lab and on your Erae.

Mode	Meaning	Range
Semitone	The root sits this many semitones above the keyboard's base note (the note and octave you set on the keyboard element). 0 is the default and means the root is exactly the base note. Fractional values are allowed, so a whole scale can sit a quarter tone up.	-24.00 to +24.00, in 0.01 steps
Frequency	The root is an absolute pitch in Hz. The keyboard's root note is ignored; its octave still moves the whole scale up or down by whole periods (one octave ratio per step), so the octave buttons keep meaning "one period up or down". The pitch is computed against the standard A4 = 440 Hz reference: 440 Hz lands exactly on MIDI note 69, and Lab shows the nearest note and the offset in cents (for example 432 Hz reads "A4 -32 cents").	20 to 20000 Hz, 2 decimals

In Frequency mode the root sounds at exactly the entered frequency when the keyboard's octave is the one that contains A4 (the octave of MIDI note 69, shown as octave 4 in Lab). Each octave step away from it shifts the root by one octave ratio. The Erae sends MIDI, so the receiving synth's own tuning reference is outside its control; every common synth defaults to A4 = 440 Hz.

The root applies in both modes: in Equal Division it moves the whole grid, cell 1 included.

17.2.1 How degrees are sounded

A degree whose pitch does not land on a whole semitone is played as an ordinary MIDI note plus a per-note pitch bend, so the note and its bend together reconstruct the exact target pitch (accurate to about 1 cent). This is why custom scales require MPE (see "Assigning a scale to a keyboard"

below). The pitch you hear when you press a key live is exactly the pitch the sequencer plays back for that same degree.

17.3 Free ratio vs Equal Division

Mode	What it is	Note rule
Free ratio	Arbitrary ratios per degree. Use it for just intonation, historical tunings, or any freeform set of intervals.	Any positive ratio is allowed.
Equal Division	The octave ratio is split into N equal steps (N-tone equal temperament). You choose which of the N steps are active degrees.	Every degree must snap onto a grid step.

In Equal Division mode:

- The division count is 1 to 128.
- You cannot select more degrees than there are divisions.
- Each degree must land on a grid step within 0.1 percent, and two degrees may not share a step.

Switching from Free to Equal Division starts at 12 divisions and regenerates every degree as an evenly spaced grid (all steps selected), which discards your previous free-ratio notes. This happens right away, with no separate confirmation. Switching back to Free keeps the current notes as arbitrary ratios.

17.4 Octave ratio

Property	Value
Meaning	Interval the scale repeats at
Default	2.0 (a normal octave)
Range	0.5 to 4.0
Lab step	0.001 (shown to 3 decimals)
Device step	0.01 (shown to 2 decimals)

The value 1.0 is not allowed in any mode, because a ratio of 1.0 has no period. If a saved scale carries an out-of-range or 1.0 octave ratio, it is snapped back to 2.0 on load. Non-octave periods are fully supported, for example 3.0 for a Bohlen-Pierce tritave or 1.965 for Carlos Alpha.

17.5 Note count

A scale holds 1 to 128 degrees: the root plus up to 127 notes above it. The root is never removable, so a scale is never empty, and every note above the root can be removed, down to a root-only scale. Adding a note when 127 already exist shows “Degree Limit Reached”.

17.6 The Scale Manager (Lab)

Open the Scale Manager by clicking the **Custom Scales** button on the pad’s bottom bar. It is a toggle: click it again, or press Esc, to close. The manager overlays only the pad drawing area, so the bottom bar (with the Custom Scales button, CV clock, and pedals) stays visible.

17.6.1 Header

Left to right, the header shows:

- A **Custom Scales** title.
- A **count pill** reading “n / 64”.
- A **Search…** field.
- An **Import .scala** button.
- A **+ New scale** button.

The library holds a maximum of 64 scales. At 64, both **+ New scale** and **Import .scala** are disabled, dimmed, and relabeled **Library full (64)**. The library is global (one per Lab install, one per device); keyboards reference scales by a stable identity, not by a slot number.

If the library is empty, the card grid is replaced by a centered panel: “No custom scales yet”, “Create a tuning to use across your projects.”, and a **+ New scale** button.

17.6.2 The card grid

Scales show as a responsive grid of cards. The manager targets four columns at the normal center width and drops to fewer columns as the window narrows (never below one), so wider windows can show more cards per row. The grid scrolls vertically. Each card shows, top to bottom:

- An **octave-wheel** preview.
- The **name** (“CUSTOM” for a scale still on its default name, ellipsized if long).

- Three chips: note count (“N notes” or “1 note”), mode (“Free ratio” or “[N] EDO”), and octave (“Octave [r]x” to 3 decimals).

Hovering a card reveals a top-right **x** delete button. A plain click selects the card (accent lavender border plus a glow) and opens that scale’s editor in the right sidebar.

17.6.3 Reading the octave wheel

The wheel is drawn from the scale’s own tuning. Each degree is a dot at the rim joined by a solid accent spoke, and the root always sits at 12 o’clock in a distinct color. A Free-ratio scale shows a solid ring with just the note constellation. An Equal Division scale shows a dashed ring plus dotted, muted spokes for the unused grid steps, so you can see the whole division lattice at a glance. For scales above 48 divisions the individual unused-step markers are omitted to keep the wheel readable.

17.6.4 Creating a scale

+ New scale opens a menu with nine choices:

Choice	What it creates
Empty	The root only, Free ratio. Named “Custom Scale”.
24-TET	24 notes, octave 2.0, 24 equal divisions
Bohlen-Pierce	13 notes over a 3.0 tritave, 13 equal divisions
53-TET	53 notes, octave 2.0, 53 equal divisions
Maqam Rast	7 notes on a 24-division grid
Just Intonation Major	7 free ratios (1/1, 9/8, 5/4, 4/3, 3/2, 5/3, 15/8)
Meantone	7 free notes, quarter-comma meantone
Pythagorean	7 free ratios (1/1, 9/8, 81/64, 4/3, 3/2, 27/16, 243/128)
Carlos Alpha	9 notes over a non-octave 1.965 period, 9 equal divisions

Picking a template creates the scale, names it after the menu label (the Empty choice names it “Custom Scale”), and selects the new card.

17.6.5 Importing a Scala file

Import .scala opens a file chooser limited to `.scl` files. On success the scale is added and selected. A file that cannot be parsed shows an **Import Error**: “Could not parse the Scala file. Check format.”

Import follows the standard `.scl` format:

- Comment lines (starting with `!`) are skipped.
- The first data line becomes the scale name (truncated to 31 characters).
- The second data line is the note count (0 to 128).
- Each remaining line is a pitch. A pitch that contains a decimal point is read as **cents** (for example `701.955`); a pitch with `/` or `,` is a **ratio** N/D; a bare integer is N/1.
- The implicit unison 1/1 becomes the root (Semitone mode, offset 0), and the **last** pitch becomes the octave ratio (period) and is removed from the note list. This means a non-octave `.scl` file imports as a non-octave scale.
- A comment line of the form `! root: 432.00 Hz` (or `! root: 0.50 semitones`), as written by Lab's own export, restores the root setting. Any other file gets the default root.

Ratios above 64.0 (six octaves), non-finite values, and non-positive values are rejected, and the whole file is rejected if the result is not a valid scale.

17.6.6 Search and reorder

Typing in the search field filters the cards to those whose name contains the text (case-insensitive; an empty query shows everything).

You can drag a card to reorder the library. An accent indicator shows where the card will land. The new order is saved and flows to the keyboard scale dropdowns. Reordering never changes which scale a keyboard uses, because bindings are by identity. Dropping a card back in place does nothing. Drag-reorder is disabled while a search filter is active.

17.6.7 Deleting a scale from a card

The card hover **x** always confirms first, and every delete is undoable with Ctrl+Z.

- A scale used by no keyboards shows: "Delete Scale / Delete this custom scale? You can undo this with Ctrl+Z."
- A scale in use shows: "This scale is used by N keyboard(s). Delete anyway? They'll revert to Major. You can undo this with Ctrl+Z." Confirming rebinds those keyboards to Major and deletes the scale together, both reversible in a single undo.

(The editor's own Delete button behaves a little differently for a scale that no keyboard uses, see below.)

17.7 The single-scale editor (Lab)

Selecting a card loads its editor into the right sidebar (TUNE tab). With the manager open but nothing selected, the editor shows a "No scale selected" placeholder that prompts you to pick a scale to tune it.

Every change is saved automatically, propagates to the cards and the keyboard dropdowns, and can be undone (Ctrl+Z) or redone (Ctrl+Shift+Z).

17.7.1 Fields

Field	Behavior
Name	Commits on Return or focus loss. Blank or whitespace-only names are rejected. Capped at 31 characters.
Oct. Ratio	Slider plus numeric entry, range 0.5 to 4.0 in 0.001 steps, shown to 3 decimals. Accepts a ratio (“3/2”, “1.5”) or a cents value. Out-of-range entries are rejected and the slider is restored.
Mode	Two buttons: “Free ratio” and “Equal div”.

17.7.2 Equal Division controls

When Equal Division is selected:

- A **Divisions** slider appears, range 1 to 128 (step 1). Changing it rebuilds every degree for the new grid.
- The degrees are edited as a grid of numbered cells (1-based), one cell per division. Tapping a cell adds or removes that degree. Cell 1 is the root: it is always on and cannot be tapped off. Its pitch comes from the Root block (Semitone or Frequency), not from the grid.
- **All** selects every degree; **None** removes every degree above the root, leaving a root-only scale.

If a scale carries notes that do not line up with the current grid (for example after importing arbitrary ratios), a **Degrees Off Grid** dialog warns that N degrees are not shown and suggests switching to Free mode to keep arbitrary ratios. Those notes are hidden from the grid but not deleted.

17.7.3 The Root block

Above the degrees, in both modes, a **Root** block holds the root setting: a Semitone | Frequency toggle, then either an offset slider (-24.00 to +24.00 semitones, labeled “above base note”) or a Hz entry (20 to 20000, two decimals) with a read-only nearest-note hint such as “A4 -32 cents”. The block has no remove control. Dragging the slider is one undo step and saves once on release; the toggle and the Hz entry save immediately. An out-of-range Hz value is rejected and the previous value restored.

17.7.4 Free ratio controls

In Free ratio mode each note above the root is a **Degree N** block, numbered from Degree 2, with three linked sliders and a text entry:

Control	Range
Semitone	0 to 48
Cents	-50 to +50
Ratio	0.01 to 16.0
Value (text)	ratio or cents

Editing any slider re-derives the others. The **Value** entry accepts a ratio ("3/2"), a plain decimal ("1.5"), or cents. A value is read as cents when it ends in `c` (for example "701.955c") or when it has a decimal point and a magnitude greater than 4.0; otherwise it is a raw ratio. A typed value is accepted only if it resolves to a positive ratio no greater than 64.0 (six octaves); anything else, including unparseable text, shows "Invalid ratio/cents" inline. Each note has a remove **x** (every note above the root can be removed), and a **+ Add Note** button adds a new degree above the root, placed at the octave ratio for you to tune down (at 127 notes it shows "Degree Limit Reached").

17.7.5 Editor actions

- **Duplicate**: deep-copies the scale, inserts the copy right after the original, names it "[name] copy" (then "copy 2", "3", …), and selects it. It does nothing at the 64-scale cap.
- **Export .scala**: opens a save dialog pre-filled with "[name].scl" (or "scale.scl" if unnamed) and writes a standard `.scl` file. The notes above the root are written in cents to 6 decimals, with the period as the final cents line; the root is the implicit unison of the format. A Frequency root, or a non-zero Semitone offset, has no place in the Scala format, so it is written as a comment line (`! root: 432.00 Hz` or `! root: 0.50 semitones`) that Lab reads back on import; other programs ignore the comment. An unnamed scale is written with the description "Unnamed Scale". A write failure shows "Export Error: Could not write the Scala file."
- **Delete**: for a scale in use, this confirms with "This scale is used by N keyboard(s). Delete anyway? They'll revert to Major." and, on confirm, rebinds those keyboards to Major and deletes the scale (one Ctrl+Z restores both). For a scale that no keyboard uses, the editor Delete removes it immediately without a confirmation dialog; it is still undoable with Ctrl+Z. After deletion the editor returns to its empty state.

17.8 Assigning a scale to a keyboard

Custom scales can be assigned only to a Keygrid element that has **MPE enabled**.

- Keygrid (grid) keyboards can carry a custom scale when MPE is on.
- The Chroma keyboard is always excluded, because it is a fixed piano layout hard-wired to 12-tone equal temperament and cannot represent arbitrary note counts.
- Drumpad elements are always excluded too: a drumpad is one sound per pad, with no scale degrees to retune, so it stays chromatic.

MPE is required because a custom tuning gives each note its own pitch offset, which has to travel as a per-note pitch bend on that note's own MIDI channel. Without MPE all notes share one channel and one pitch bend, so a chord of microtonal degrees would be mistuned. On the wire, a custom-scale note lands on an MPE member channel (2 to 16, never the master channel 1), carries its own pitch bend, and advertises its per-note bend range (12, 24, or 48 semitones) so receivers decode the microtones correctly.

Turning MPE on sets the keyboard's per-note pitch-bend range to 48 (the widest, for the finest microtonal resolution). Turning MPE off resets that range to 12.

If you turn MPE off on a keyboard that has a custom scale, the assignment is cleared automatically: the keyboard reverts to a factory scale. This happens both in Lab and on the device, so a keyboard can never end up holding a scale it can no longer play in tune.

17.8.1 Assigning in Lab

On a Keygrid with MPE on, the TUNE tab's **Scale** dropdown lists the keyboard's factory scales (Chromatic is not offered here), then every custom scale labeled "[name] ([N] notes)", then a final **Custom scales…** entry that opens the Scale Manager. Selecting a custom entry binds that scale to the keyboard; selecting a factory entry clears the custom assignment.

The custom entries appear only while the keyboard qualifies. On a Keygrid without MPE, a hint asks you to enable MPE; for an Erae Touch, the dropdown lists the built-in scales only and a hint reads "Custom scales are an Erae 2 feature"; on a Keyboard element, a hint explains that custom scales require a Keygrid element. Enable MPE first and the custom entries become selectable; turn MPE off and they disappear (the current selection is preserved when it is still valid). There is no path, even from stale UI state, to attach a custom scale to a keyboard that cannot play it.

17.8.2 Show Offscale

The **Show Offscale** toggle (default on) decides whether the keyboard displays every chromatic or grid step, or only the notes in your scale. When on, off-scale steps are shown (dimmed) and are playable; when off, the keyboard shows one key per scale degree. The toggle is hidden and forced off when the scale leaves no off-scale step to show: for a Free-ratio custom scale, which has no chromatic grid, and for an equal-division custom scale whose degrees fill every division. It is available for factory scales and for equal-division custom scales with unused divisions.

When an equal-division custom scale is assigned, the **Semitones** line offset also widens its range to match the scale, up to the number of divisions minus one (capped at 63), rather than the usual limit of 11.

17.9 Global scale

Normally every keyboard element carries its own scale. When you want one scale to rule the whole project, turn on **Use global scale** in the element's TUNE tab (the checkbox sits directly above the Scale dropdown). Every element with this checkbox on shares one project-wide scale: change the scale of any of them, on any layout, in Lab or on your Erae, and all of them follow immediately, across all layouts of the project.

A few details worth knowing:

- The scale that is shared is the scale choice itself, factory or custom. Root note and octave stay individual to each element, so you can keep different registers and roots per layout while the scale stays in sync.
- The first element you opt in sets the global scale to its own current scale, so nothing changes when you tick the first checkbox. Every element you opt in afterwards adopts the global scale.
- Turning the checkbox off simply detaches the element: it keeps its current scale, and later global changes no longer affect it.
- The Chroma (piano-style) keyboard cannot opt in: it is a fixed 12-tone layout. Drumpad elements can opt in, but they always stay chromatic: custom scales are for Keygrid elements only, so a custom global scale leaves a drumpad on Chromatic.
- Custom scales still require MPE. If the global scale is a custom scale, an opted-in element without MPE keeps a factory scale instead (the same rule as assigning a custom scale directly), and picks the custom scale up as soon as you enable MPE on it.
- Deleting a custom scale that is currently the global scale resets the global scale to Major, together with the usual revert of every keyboard that used it.

On your Erae, the SCALE screen of an opted-in keyboard works as usual: turning the scale roller changes the global scale and every opted-in element on every layout follows, then everything syncs back to Lab. The SCALE screen also has a **GLOBAL** switch to opt the focused keyboard in or out directly on the device. On an Erae Touch (MK1) the checkbox is set from Lab, and scale edits made on the device fan out the same way.

17.10 Syncing with your Erae

Your scale library transfers automatically when your Erae connects to Lab, the same way your projects do. If your Erae runs an older firmware, Lab skips the scale sync and tells you so: update the firmware and the scales sync on the next connection. Edits, reorders, and deletes track correctly across both sides. A deletion made on one side propagates to the other and wins over a scale that is merely present, so deleting a scale does not resurrect it on the next sync.

If a scale was edited independently on both sides since the last sync, Lab shows a conflict notification, "A custom scale was changed in Lab and on Erae. Which version would you like to keep?", with three choices:

- **Keep Device**: Lab replaces its copy with the version on your Erae.
- **Keep Lab**: Lab sends its version to the Erae, overwriting the device's copy.
- **Keep Both**: Lab keeps both versions as separate scales, so nothing is lost.

If you are unsure which side has the changes you need, choose Keep Both. It is the only choice that never discards work. Closing the notification is the same as choosing Keep Lab.

17.11 Working with scales on the device

You do not need Lab connected to work with scales. On your Erae, open **Settings > Custom Scales** to reach the Custom Scales list.

17.11.1 The Custom Scales list

The list (titled "Custom Scales") scrolls vertically and shows:

- One row per existing scale (its name). Selecting a row opens that scale in the on-device editor.
- **+ Create New** (only while under the limit).
- **Save Scales to Project**.
- **Load Scales from Project**.

The device list shows and lets you create up to 16 scales, even though a library synced from Lab can hold up to 64. **+ Create New** disappears once 16 scales exist on the device.

Save Scales to Project and **Load Scales from Project** each open a list of the device's project slots and save or load the whole scale library to or from the chosen project. They are not a separate backup store, and they are tied to your projects, not to a sync.

17.11.2 Creating a scale on the device

Choosing **+ Create New** opens the editor titled "NEW SCALE" and creates the scale immediately: name "CUSTOM", octave ratio 2.0, and the root only (no notes above it yet). There is no separate confirm or save step and no cancel that discards it; leaving with Return keeps the new scale. If the library is full or the scale is somehow invalid, the view simply returns without creating anything.

17.11.3 The device editor

Selecting an existing scale opens the editor ("EDIT SCALE"). You navigate the rows with the main encoder (turn to move, click to activate) and press Return to leave. The rows, top to bottom, are:

Row	Behavior
Name	Opens an on-pad QWERTY keyboard. Names are capped at 31 characters.
Octave ratio	Numeric, 0.50 to 4.00 in 0.01 steps. In Equal Division, changing it re-spaces all degrees.
Divisions	0 shows “Free”; 1 to 128 show “N ED” and split the octave into N equal steps. Setting it from 0 (Free) to a division count rebuilds the notes above the root as an even grid; setting it back to 0 (Free) keeps the current notes.
Root Mode	“Semitone” or “Frequency”, the root setting described in “The root” above.
Root Semitone	Shown in Semitone mode: the root’s offset above the keyboard’s base note, -24.00 to +24.00 in 0.01 steps.
Root Freq	Shown in Frequency mode: the root’s absolute pitch, 20 to 20000 Hz in 1 Hz steps (a fraction of a hertz set in Lab is kept until you turn this row).
Degree N	One block per note above the root, numbered from DEGREE 2: Ratio (0.010 to 10.000), Semitone (-80 to +40), and Cents (-99 to +99), plus Delete Note. Ratio and Semitone+Cents are two views of the same pitch. Editing any degree’s pitch by hand while in Equal Division silently forces the whole scale to Free (the Divisions row snaps to “Free”).
+ Add Note	Adds a degree above the root (ratio 1.0, to be tuned), up to 127. Hidden in Equal Division mode.
Load Template	Loads one of the built-in templates.
Delete	Deletes the scale.

There is no Delete row for the root. Delete Note works on every note above the root, down to a root-only scale.

The device shows eight templates under **Load Template**: 24-TET (Quarter-tone), Bohlen-Pierce (13), 53-TET, Arabic Maqam Rast, Just Intonation Major, Meantone Quarter-Comma, Pythagorean, and Carlos Alpha (9). There is no “Empty” template on the device (Create New

already gives you an empty scale).

17.11.4 Creating a scale from the keyboard's scale picker

You can also make a scale straight from a keyboard. When you open the scale picker on an MPE, non-Chroma keyboard, the roller lists the factory scales, then your custom scales, then a **NEW SCALE** entry (shown while there is room under the limit). Selecting NEW SCALE jumps straight into the on-device editor and creates the scale in place.

This roller re-gates live: if you turn MPE off while the picker is open, the custom entries and the NEW SCALE shortcut disappear on the spot, and a keyboard that was on a custom scale drops back to a factory scale immediately.

17.12 Live and sequencer playback

A recorded scale degree plays back from the sequencer at exactly the same pitch as pressing that degree live. Your custom tunings sound identical whether you play them by hand or play them back.

If a keyboard is left pointing at a custom scale that is no longer in the library (for example the scale was deleted, or the device has no SD card to load it from), that keyboard falls back to plain factory pitches with no microtonal bend. The keyboard keeps its scale setting, so the tuning returns as soon as the scale is available again.

18 Spring Faders

Spring faders extend normal faders with a simulated return movement. While your finger is on the surface the handle tracks it exactly, like an ordinary fader. When you release, the virtual handle animates on its own: a spring pulls it toward a configured center position, a flick gives it momentum that can overshoot and bounce, and friction lets the motion settle. Every step of that motion streams out as MIDI or CV, so you can play the return as a gesture, not just the touch.

Spring faders come in two flavours: a one-dimensional fader with a spring on the Y axis (palette name Spring 1D) and a two-dimensional pad with an independent spring on each axis (palette name Spring 2D).

18.1 How the spring feels

The return is a damped spring. While your finger is down the spring is suspended: the handle tracks your finger exactly with no fight, just like a normal fader. The spring only acts once you let go.

On release the handle carries whatever momentum your finger had, and from then on it moves on its own, pulled toward Center by the spring and slowed down by Drag. Five settings shape that motion:

- **Stiffness** is how fast the handle springs back. 0 is no spring at all (a plain fader). 1 to 100 runs from a slow 0.1 Hz sway to a quick 5 Hz wobble, on a scale where each step feels alike: about 0.7 Hz at 50 and 1.9 Hz at 75.
- **Drag** sets the shape of the return. Below 50 the handle wobbles around Center before it settles, at 50 it returns as fast as it can without wobbling, and above 50 it glides back more and more slowly. Drag counts wobbles, not time, so a given Drag gives the same number of wobbles at any Stiffness. With Stiffness at 0, Drag is plain friction on a flicked handle.
- **Max Speed** caps how fast the handle may travel. 0 is no limit, low values make the fader crawl, and 100 is fast enough for any spring, so it never holds the spring back.
- **Bounce** is what happens when the handle hits either end: 0 stops it there, 100 bounces it back with no loss, and values in between keep that share of its speed. The default is 60.
- The speed of your **release** (how hard you flick) is carried into the motion as momentum, so a fast flick overshoots Center and may hit an end, while a gentle release just settles. The flick speed is measured over the last moments of your slide and is clamped to Max Speed at release.

The Lab shows a live readout under Stiffness with what you will get: “Oscillates at about 1.9 Hz”, or “Returns without oscillating” when Drag is 50 or more. It is hidden at Stiffness 0.

A few behaviors follow from this:

- **Released exactly at Center with no flick, it does not move.** It self-animates only when there is leftover flick speed, or when Stiffness is on and the handle is away from Center.
- **With a spring, the rest value is exact.** When the motion settles (velocity near zero and, with Stiffness on, the handle at Center), the position snaps precisely to Center and a final value is sent. With Stiffness 0 it freezes wherever the momentum ran out, and no final snap happens.
- **An incoming CC repositions it.** If the fader receives a Control Change on its own Y absolute controller (for example feedback from a DAW), the spring stops, its velocity is zeroed, and the handle jumps to the received value, remapped through that output’s Min and Max. The fader ignores its own outgoing messages. When this fader’s layout is the one currently shown, the matching Y absolute CV (and the Pressure CV) is re-driven to the new position too.

The physics run off a real elapsed-time accumulator on the device, so the feel is the same on every build and under any load. The handle updates whenever at least one millisecond has passed since the last update, and each update carries however many whole milliseconds actually elapsed. Under heavy load a single update may cover several milliseconds at once, which keeps the timing consistent rather than dropping the motion.

18.2 Center is not the same as Default

This is the most common point of confusion. There are two separate positions:

- **Default** (labelled “Default Y” and “Default X” in the Lab, “Y Default” and “X Default” on the device): the starting position loaded with the layout and saved in presets. It is what the fader shows and reports before you first touch it. It does not attract the spring.
- **Center** (labelled “Center Y” and “Center X” in the Lab, “Y Center” and “X Center” on the device): the spring rest position. Stiffness pulls the handle toward Center, and Center is also the origin of the LED fill bar.

The spring returns to **Center**, not to Default. Center defaults to 0 (the bottom, or bottom-left on a 2D pad), so a freshly created spring fader returns all the way to the bottom. If you want it to spring back to where it started, set Center equal to Default. Set Center to 64 for a bipolar fader whose fill grows up or down from the middle and whose spring rests in the middle.

18.3 Default physics values

A freshly created spring fader has Stiffness 50 (about 0.7 Hz), Drag 50 (returns without wobbling), Max Speed 100 (no practical limit) and Bounce 60. The device and Erae Lab store and show the

same 0-100 values, so a fader feels the same whichever editor you set it in.

18.4 Placing the element

The palette items are named Spring 1D and Spring 2D. Spring 1D lands 2 units wide by 8 tall; Spring 2D lands 8 by 8. When you click-place a fader it grows to the largest free rectangle that fits at the click point, up to 3 wide by 12 tall for a 1D fader and 12 by 12 for a 2D fader. After placement you can resize it freely.

The palette tooltips read: Spring 1D, “One dimensional spring fader, returns to center on release. Sends Control Change values, enable pressure to add a second control dimension.” Spring 2D, “Two dimensional spring fader, returns to center on release. Sends Control Change values from X and Y position, enable pressure to add a third control dimension.”

18.5 Spring Fader 1D

A one-dimensional fader with spring physics on the Y axis. Selecting one in the Lab opens the “Spring Fader 1D” settings panel. Its sections, in order, are: Midi Output, Midi, Spring Physics, Control Change (a Pressure / Y abs / Motion tab bar) and Control Voltage (a Pressure / Y abs tab bar).

18.5.1 MIDI and position

Parameter	Lab label	Device label	Range	Default	Meaning
MIDI Channel	Channel	Channel	0-15 (shown 1-16)	1	Channel of every CC this fader sends
MIDI Group	(in Midi Output)	(in routing)	0-15	0	MIDI 2.0 UMP group for internal loopback routing, not a channel; leave at 0 unless using groups

Parameter	Lab label	Device label	Range	Default	Meaning
MIDI Output Dest	Midi Output	Out Routing	USB Device, USB Host, MIDI A, MIDI B	USB Device only	Which ports the CCs go to; more than one may be enabled
Trig on entry	Trig on entry	Transfer	Off, Default, All	Default	Whether a finger sliding in from a neighbour re-triggers this fader (see Trig on entry below)
Default Y	Default Y	Y Default	0-127	63	Position shown and reported before the first touch
Center Y	Center Y	Y Center	0-127	0	Spring rest position and LED fill-bar origin

18.5.2 Spring physics

Parameter	Lab label	Range	Default	Meaning
Drag	Drag %	0-100 %	50 %	Shape of the return: below 50 it wobbles around Center, 50 returns as fast as possible without wobbling, above 50 it glides back slowly. The number of wobbles does not depend on Stiffness
Max Speed	Max Speed %	0-100 %	100 %	Caps how fast the handle travels. 0 is no limit, low values make it crawl, 100 is fast enough for any spring
Bounce	Bounce %	0-100 %	60 %	Share of speed kept when the handle hits either end: 0 stops it there, 100 bounces it back with no loss

Parameter	Lab label	Range	Default	Meaning
Stiffness	Stiffness %	0-100 %	50 %	How fast it springs back to Center: 0 is no spring (normal fader), 1 to 100 runs from 0.1 Hz to 5 Hz. The readout under it shows the resulting oscillation

18.5.3 Outputs

Each output has an on and off state and a controller number plus a Min and Max value; the sent value spans Min to Max across the fader travel. On a freshly created fader Y Absolute is already enabled; Pressure and Motion Speed start off and must be enabled.

Output	Lab tab	Device section	Default CC	Enabled by default	Purpose
Y Absolute	Y abs	Y AXIS (Y CC, Y Min, Y Max)	CC 61	Yes	The handle position. This is the main output
Pressure	Pressure	PRESSURE CC	CC 59	No	How hard you press. Reads 0 during the automatic spring-back (no finger)

Output	Lab tab	Device section	Default CC	Enabled by default	Purpose
Motion Speed	Motion	Motion Speed CC	CC 59	No	How fast the handle is moving, both under your finger and during the return. Silent on the initial touch and on lift

Each output can also drive a CV jack. Each CV output starts disabled, carries the same normalized signal as its CC, and has its own Min and Max (default 0 V to 5 V; the hardware supports the full -5 V to +8 V range) plus an output-jack selector that picks one of 24 physical CV jacks (shown 1-24). Spring 1D exposes CV for Y Absolute and Pressure. A Speed CV field exists in the data model but is not exposed in either editor, so it cannot be configured and has no effect.

18.6 Spring Fader 2D

A two-dimensional pad with an independent spring on each axis. The Lab panel is titled “Spring Fader 2D”.

Spring 2D runs two fully independent springs. X and Y each have their own Default, Center, position, velocity, Absolute CC and Absolute CV, and their own Drag, Max Speed, Bounce and Stiffness. Pressure and Motion Speed are shared single outputs; the 2D motion speed uses the combined X and Y velocity magnitude. You can flick diagonally and each axis returns on its own timing and bounces on its own edges. The spring returns to the (Center X, Center Y) point.

18.6.1 Spring physics per axis

A freshly created Spring 2D has its physics linked: one set of Drag, Max Speed, Bounce and Stiffness drives both axes, and any edit writes the same value to X and Y. The link is saved with the element.

- **Link X and Y** (Lab: a toggle at the top of the Spring Physics section; device: the **Link X and Y** switch under SPRING PHYSICS). On by default.
- **Unlinked**, each axis keeps the values it had, and you pick the axis the four physics settings edit: in the Lab with the **X / Y** switch above the four sliders (styled like the Pressure / X abs / Y abs switch), on the device with the **Axis** row (X or Y). The switch and the row only appear while the physics are unlinked.

- **Relinking** copies the X values onto Y.

For example, unlink, set Stiffness 0 on X and keep a spring on Y: the pad stays where you leave it horizontally and springs back to Center Y vertically. Default X only applies while X has Stiffness 0, Default Y only while Y has Stiffness 0.

On a freshly created Spring 2D both X Absolute (CC 60) and Y Absolute (CC 61) are enabled; Pressure and Motion Speed start off.

The 2D panel adds, alongside everything in the 1D panel:

Parameter	Lab label	Device label	Range	Default
Default X	Default X	X Default	0-127	63
Center X	Center X	X Center	0-127	0
X Absolute CC	X abs	X AXIS (X CC, X Min, X Max)	controller plus Min and Max	CC 60, enabled
X Absolute CV	X abs	CV X Abs (Min, Max, Out)	as above	disabled

The 2D CC tab bar is Pressure / X abs / Y abs / Motion; the 2D CV tab bar is Pressure / X abs / Y abs.

18.7 What the return sounds like on the MIDI side

- **On release, the position CC snaps to the exact lift point first.** A definitive value is sent at the spot where your finger left, so the receiver never gets a stale value.
- **Then the position CC follows the whole animation.** As the spring travels and bounces, the position CC (X and Y on a 2D pad) is re-sent each time its value changes, at most every 5 ms, so a receiver hears the entire glide, not just the endpoint, without flooding a DIN MIDI output.
- **When it settles with Stiffness on, a final value is sent exactly at Center.** The resting CC is always exact. With Stiffness 0 there is no final snap: the last value sent is wherever the momentum died.
- **Pressure drops to 0 the instant you lift** and stays 0 through the whole spring-back, even though the position keeps moving. Anything you map to Pressure falls to zero the moment your finger leaves.
- **Motion Speed is silent on press and on lift.** It only reports during continuous movement: your finger's travel speed while sliding, and the spring's own speed during the return. During the return the speed is derived from the spring velocity (the magnitude of the velocity times the elapsed time, normalized so full scale is 0.08 units per frame; the 2D value uses the combined X and Y velocity), then sent through the same output as a touch speed would use. Map it, for example, to a filter that opens as the fader whips back.

18.8 Trig on entry

Trig on entry decides whether a finger sliding out of a neighbouring element into this one re-triggers this fader. It is a single dropdown with three choices, Off, Default and All (stored internally as 0, 1 and 255; no other values are valid). New spring faders are created set to Default.

Only the element being entered decides. The source element's own setting does not matter: a source set to Off still hands its finger off into a Default or All target, and the gate is read entirely from the target.

- **Off:** nothing can enter this element by sliding in. The finger stays on whatever it started on.
- **Default:** a finger can enter this element only from the same family. All four fader types (Fader 1D, Fader 2D, Spring 1D, Spring 2D) belong to the Fader family, so any of them can hand off into any other, including 2D pads. A fader cannot hand off into a keyboard or a button under Default.
- **All:** any neighbour type can enter this element (for example a keyboard into a fader).

A related gate covers starting a touch just outside the element and sliding in over blank canvas: that entry is allowed only when this element is set to Default or All, regardless of family. With Off, sliding in from empty space does nothing.

18.9 Editing on the device

On Erae itself, spring-fader parameters live in the MAPPING LCD view; the correct screen for 1D or 2D is chosen automatically from the element type. Turn the main encoder to move the selection or adjust a value, click it to enter or confirm, and press Return to exit back to the default view.

The Spring 1D mapping screen lists, in order:

- Out Routing and Channel
- SPRING PHYSICS: Drag, Max Speed, Stiffness, Bounce (each shown as a percentage, 0-100)
- Y AXIS: Y CC, Y Min, Y Max, Y Default, Y Center (the Y CC row is bounded to the valid Control Change range, not 0-127)
- PRESSURE CC: enable, Pressure CC, Pressure Min, Pressure Max
- Motion Speed CC: enable, Motion Speed CC, Min, Max
- CV: CV Y Abs (enable, Min, Max) and its output jack CV Y Out, then CV Pressure (enable, Min, Max) and its output jack CV Pres Out
- Transfer

Spring 2D mirrors this and adds an X AXIS section (X CC, X Min, X Max, X Default, X Center) and a CV X Abs group (with a CV X Out jack), each placed before the Y equivalents. Its SPRING PHYSICS section starts with the **Link X and Y** switch; while it is off an **Axis** row (X or Y) follows, and Drag, Max Speed, Stiffness and Bounce show and edit that axis.

18.10 LED feedback

The fill bar grows from Center, so with Center at 0 it fills upward from the bottom and with Center at 64 it grows up or down from the middle. As the spring animates after release, the fill follows the handle in real time, so the LED strip shows the bounce and settle you hear on the MIDI side. Exactly which colours the surface uses during the return depends on the layout's style and is best seen on a device.

18.11 In the sequencer and with multi-select

Spring faders record in the sequencer just like ordinary faders: a 1D spring records an automation lane, a 2D spring a 2D fader lane, and the captured values keep the spring motion, so a recorded pass plays back the bounce. You can also edit several selected spring faders at once through the multi-select settings panel.

18.12 Tuning the return

Stiffness sets how fast the fader moves, Drag sets how many wobbles it makes, and Bounce sets how lively the ends are. Because Drag counts wobbles rather than time, you can pick the character with Drag and then speed it up or slow it down with Stiffness without changing it.

- **Long, slowly decaying wobble:** keep Drag low (10 to 20) and pick the speed with Stiffness.
- **Softer wobble:** raise Drag toward 40 so the wobbles shrink faster.
- **Fast snap back with no wobble:** Drag 50 with a high Stiffness.
- **Slow, weighted glide home:** Drag above 50, or a low Max Speed so the handle crawls back at a steady pace.
- **Dead ends:** Bounce 0 stops the handle on the end it hits; raise Bounce for rebounds that keep more of their speed.
- **A plain latching fader:** set Stiffness to 0. It tracks your finger while held and stays where you release it (only a residual flick, calmed by Drag, will move it).

19 Erae Touch

This chapter is for users of the original Erae hardware, the Erae Touch. The main Erae Lab manual describes the Erae 2 workflow; everything that works differently on the Erae Touch is collected here so it does not interrupt the main setup, sync, and update chapters. The Erae Touch also has its own manual (the Erae Beta User Manual) covering the device itself.

19.1 Four Slots, Not a Project List

An Erae Touch holds exactly **four projects**, in **slots** named **A**, **B**, **C** and **D**. Each slot holds up to eight layouts. Slots have no project names: they are only a letter. Your named projects live in Lab's **Library**, and Lab puts a Library project into a slot when you ask it to.

Lab never sends your other projects to the Erae Touch on its own. Only the four slots exist on the device.

19.1.1 How the Projects List Looks

While an Erae Touch is connected, the **Projects** section of the left sidebar is split in two zones:

- **On Erae Touch**: four rows, one per slot. Each row shows the slot letter, then what the slot holds. The slot that is loaded on the device comes first and carries the green dot; the others follow in letter order.
- **Library**: all your other projects.

A slot row shows one of three things next to its letter:

- **The name of a Library project**: the slot is **linked** to that project. A linked project is a Library project that is bound to a slot of this Erae Touch. The slot and the project are the same content: Lab keeps them in sync, as described below.
- **Not in Library yet**: the slot holds layouts that no Library project is linked to yet. Lab links them when the Erae Touch connects and syncs.
- **Empty**: the slot has no layouts in use.

A project can be linked to one slot at a time, and a slot has one linked project. A linked project stays an ordinary Library project: you can rename it, expand it, duplicate it, export it. **Rename**

changes the name in Lab only; the slot keeps its letter on the device. A linked project cannot be deleted: **Delete** is greyed out in its menu, with a note to load another project on the slot first.

When you unplug the Erae Touch, the four slot rows stay visible, greyed, as the device last reported them. You can still look at them and edit the linked projects; the changes wait for the next connection. With an Erae 2 connected instead, there are no slot rows: linked projects are ordinary Library projects.

19.1.2 Projects Created from a Slot

Lab creates a Library project named **From slot B** (with the letter of the slot) in two cases. When you load a project on a slot whose content is not in the Library yet, Lab first saves that content under this name so nothing is lost. And when you drop a layout onto an empty slot, Lab creates the project that takes it (see Dragging Layouts). If the name is taken, Lab adds a number.

19.2 Loading a Project on a Slot

To put a Library project on the Erae Touch, choose a slot for it. The Erae Touch must be connected. Any of these opens the **Load on Erae Touch** window:

- Double-click the project in the **Library** zone.
- Right-click the project and choose **Send to slot...**.
- Drag the project row onto one of the four slot rows (that slot is preselected).

The window shows the four slots as tiles with their letter, their layouts and what they hold. A tile is tagged **loaded** when it is the slot the Erae Touch currently plays, and **already here** when the project is already linked to that slot (it cannot be picked). Click a tile to choose it. A line under the tiles tells you what will happen to the slot's current content:

- The slot is empty: nothing is replaced.
- The slot holds content that is not in the Library yet: it is saved to your Library as **From slot B** first.
- The slot is linked to another project: that project stays in your Library and is unlinked from the slot.
- The slot holds the untouched factory project: it is replaced.

The button reads **Load on slot** for an empty slot and **Replace and load** otherwise. Press Enter to confirm or Escape to cancel.

What happens next:

1. If needed, the slot's current content is saved to the Library.

2. Lab sends the project to the slot, replacing what the slot held. A progress message shows the transfer.
3. The slot becomes linked to the project you sent, and the Erae Touch loads it.

If the project is already linked to another slot, or if sending it would change it (custom scales that cannot go on the Erae Touch, sequences that do not fit), Lab links a **copy** to the slot and leaves your project as it is. The window tells you when this happens.

If anything fails, every link stays as it was, and Lab tells you why. A refusal because of size or a failed transfer offers **Try Again**. The window is unavailable while the Erae Touch is syncing; try again when the sync ends.

19.2.1 Memory Limit

The Erae Touch has far less memory than the Erae 2. Expand a project row to see an **Erae Touch memory** bar with a percentage: an estimate of how much of the Erae Touch's memory and project storage the project's layouts use. The bar turns red above 100 percent. Hover it for the details.

A project over 100 percent cannot be sent: all four tiles are disabled in the Load window and Lab says how much it needs. Remove elements or layouts until the bar is under 100 percent. The bar appears on slot rows, on linked projects and, while an Erae Touch is connected, on every Library project. It does not appear when an Erae 2 is connected.

19.3 Switching Slots

Double-click a slot row to load that slot on the Erae Touch at its first layout. Double-click a layout thumbnail in a slot that is not loaded to load the slot at that layout. You can also right-click a slot row and choose **Load on Erae Touch**. Both are available only while the Erae Touch is connected and the slot holds layouts. Lab shows a **Loading** message until the Erae Touch confirms.

The other way works too: when you switch slots on the Erae Touch itself, Lab follows. The slot moves to the top of the list with the green dot, and the canvas shows its project. Click a layout thumbnail in the loaded slot to switch layouts, as in any project.

Double-clicking a Library project does not load it in Lab alone while an Erae Touch is connected: it opens the Load window instead. With no Erae Touch connected, double-clicking a Library project opens it in Lab as usual.

19.4 Editing and Sync

An Erae Touch syncs with Erae Lab in both directions, slot by slot, through the linked projects.

- **Editing the loaded slot**: edits to the project of the slot the Erae Touch is playing reach the device live, as you work.
- **Editing a linked project that is not loaded**: Lab sends the change to its slot, without loading it. Edits to a Library project that is not linked to any slot stay in Lab.
- **Editing with the Erae Touch unplugged**: the project is marked as changed and Lab sends it to the slot on the next connection.
- **Editing on the device**: changes made on the Erae Touch (layouts, scale, CC mapping, octave, sequencer patterns) come back into the linked project in Lab. A slot whose layouts differ from its linked project when the Erae Touch connects is pulled into the project, so Lab never overwrites the device by mistake.
- **Both sides changed**: if the same slot changed on both sides while they were apart, Lab asks you to choose **Keep Device**, **Keep Both** or **Keep Lab**, as described in Device Sync. On an Erae Touch, **Keep Both** puts the Lab version in the slot, on both sides, and saves the device version in Lab as a separate project.

19.4.1 Save and Revert on a Slot

A slot row shows the same **Save** and **Revert** icons as any project row, for its linked project; see Projects. **Revert** restores the project to its snapshot in Lab, then sends it to the slot. If the slot is the loaded one, the Erae Touch reloads it. **Save** makes the current content the new snapshot.

19.5 Dragging Layouts Between the Library and Slots

Drag a layout thumbnail and drop it on a layout position of another row, as between two Library projects (see Projects). It works in both directions between Library projects and slot rows, and between two slots. Expand the target row first so its thumbnails are visible. What happens depends on the target:

- **A loaded slot**: the layout replaces the one at that position and goes live on the Erae Touch.
- **A slot that is not loaded**: the layout is written into the slot's linked project and sent to the slot right away, without loading it.
- **An empty slot with no Library project**: Lab creates a project named **From slot B** (with the slot letter), links it to the slot and puts the layout in it.
- **A slot showing Not in Library yet**: the drop is refused and nothing changes. Wait for Lab to link the slot, which happens when the Erae Touch connects and syncs.
- **A Library project**: the layout lands in the project and stays in Lab. If that project is linked to a slot, Lab sends the change to the slot.

Dragging a whole project row (not a layout) onto a slot row opens the Load window described above.

19.5.1 Dropping an Erae Sound Preset Layout on a Slot

You can also drag the thumbnail of the **ERAESOUND PRESET** section onto a slot's layout position, as described in Presets. The slot receives a copy of the preset layout, with the same rules as above (live on the loaded slot, sent right away to another slot, new linked project for an empty slot). The copy keeps the preset layout's identity, so with Erae Sound sync on, the slot and the preset stay paired. The preset itself does not change.

19.6 Firmware Updates

The Erae Touch updates in two stages. When the firmware that comes with Lab is newer than the device's, the update starts automatically. An Erae Touch still running the previous generation of firmware is updated the same way after you confirm the prompt with **Start Update**. Either way, do not disconnect or power off the Erae until the update finishes.

19.6.1 Stage 1: Update Program

1. **Restart into update mode**: Lab asks the device to restart into its bootloader.
2. **Load the update program**: Lab sends a small update program to the device.
3. **Wait for the update program**: the device reconnects running the update program, and its surface shows USB.

19.6.2 Stage 2: Firmware Transfer

1. **Firmware transfer**: Lab sends the new firmware to the update program, which shows a progress bar with a percentage on the surface.
2. **Write and restart**: the device writes the firmware, restarts into it and reconnects normally. Writing can take a few minutes.

The Erae Touch two-stage process takes longer than Erae 2 updates. The progress indicator advances through both stages. Keep the device connected and powered throughout.

If the device comes back still running the update program (for example after an interrupted update), Lab resumes the firmware transfer automatically, and tells you if the update still cannot complete. If it comes back in its recovery bootloader, Lab shows **Erae Touch bootloader detected, would you like to update?**: choose **Install latest firmware** to reinstall. If the firmware cannot be installed on your Erae Touch, Lab says so instead of starting the update.

20 Appendix A: Element Parameter Reference

This appendix lists the parameters you can set for each element type in the **Tune** tab of Erae Lab, with the labels shown in the app. Parameters are grouped by element type and by the section they appear in.

A few sections are shared by most elements:

- **Midi Output**: **USB Device**, **MIDI A**, **MIDI B** and **USB Host** checkboxes. A new element sends to **USB Device** only.
- **Channel**: the MIDI channel, 1 to 16.
- **Trig on entry**: `Off`, `Default` or `All`. Decides whether a finger sliding onto the element triggers it: `Default` accepts a finger coming from empty canvas or from an element of the same kind, `All` accepts any finger.
- **Control Change** outputs: each has **Enable**, **Type** (`CC`, `CC 14-bit`, `RPN`, `NRPN`), **Controller** (or **Bank** and **Index** for RPN and NRPN), and **Min/Max**. **Motion** outputs follow the continuous speed of your finger, smoothed and normalized from `0` to `100 cm/s`.
- **Control Voltage** outputs: each has **Enable**, **Output** (the CV jack, 1 to 24) and a **Min/Max (V)** range.

20.1 Iso Keyboard

The **Keygrid** element: a grid keyboard where each pad plays a scale degree or a semitone. Resizing adds or removes keys; hold Shift while resizing to change the key size.

Parameter	Section	What it does	Values
MPE	Midi	MIDI Polyphonic Expression: each finger gets its own channel	on / off
MPE Master	Midi	The MPE master channel	1 or 16

Parameter	Section	What it does	Values
Channel / Nb channel	Midi	Without MPE, the MIDI channel. With MPE, the number of MPE channels (fingers with independent control)	`1` to `16`
Trig on entry	Midi	See above	`Off`, `Default`, `All`
Degrees	Line Offset	Degrees between rows, used when **Show Offscale** is off	`1` to `48`
Semitones	Line Offset	Semitones between rows, used when **Show Offscale** is on	`0` to `11` (wider with an equal-division custom scale)
Show Offscale	Default Values	Shows off-scale notes (dimmed) between the scale degrees	on / off
Root Note	Default Values	Root note of the keyboard	`C` to `B`
Octave	Default Values	Octave of the root note	`-2` to `8`
Use global scale	Default Values	Follow the project's global scale	on / off
Scale	Default Values	Factory scale, or a custom scale when MPE is on	Factory scales (Chromatic excluded), custom scales
PB Range	Default Values	Pitch bend range in semitones; match your synth	`1` to `96` (12 without MPE, 48 with MPE)
Pressure, **Glissando**, **Vibrato**	Expressivity Tune	See "Key Attribute Sub-Structures" below	
Sound Brightness (CC 74)	Sound Brightness (CC 74)	Shown with MPE on; see below	

Parameter	Section	What it does	Values
Pressure, **X abs**, **Y abs**, **Motion**, **X rel**, **Y rel**	Control Change	Extra CC outputs driven by each gesture	
Num Voices	Control Voltage	Number of polyphonic CV voices	1 to 15
Gate, **1V / Oct**, **Gate Mode**, **Trig Duration (ms)**, **Gate Delay (ms)**	Control Voltage	Note CV outputs. **Gate Mode** is `Gate`, `Trig` or `Retrig`; trigger length 25 to 250 ms; gate delay 0 to 5 ms	
CV Velocity, **CV Pressure**, **CV X abs**, **CV Y abs**, **CV X rel**, **CV Y rel**	Control Voltage	Extra CV outputs for each voice	

For each voice, enabled CV outputs are used in this order, starting at the chosen **Output**: Gate, 1V/Octave, Velocity, Pressure, X absolute, Y absolute, X relative, Y relative.

20.2 Chroma Keyboard

The **Keyboard** element: a piano-style layout with white and black keys in chromatic order. It is always 12-tone and cannot use a custom scale or the global scale.

Parameter	Section	What it does	Values
MPE, **MPE Master**, **Channel / Nb channel**	Midi	As on the Keygrid	
Scale	Default Values	Scale used for the key colors	All factory scales, including Chromatic
Octave	Default Values	Octave of the lowest key	-2 to 8
PB Range	Default Values	Pitch bend range in semitones	1 to 96

Parameter	Section	What it does	Values
Pressure, **Glissando**, **Vibrato**	Expressivity Tune	See below	
Sound Brightness (CC 74)	Sound Brightness (CC 74)	Shown with MPE on	
Control Change and Control Voltage		As on the Keygrid	

20.3 Drumpad Keyboard

The **Drumpad** element: a grid of pads for drum racks, where each pad plays its own note. It has no scale.

Parameter	Section	What it does	Values
MPE, **MPE Master**, **Channel / Nb channel**, **Trig on entry**	Midi	As on the Keygrid	
Semitones	Line Offset	Semitones between rows	`0` to `11`
Root Note, **Octave**	Default Values	Note of the first pad	
Use global scale	Default Values	Takes part in the global scale; a drumpad itself always stays chromatic	on / off
PB Range	Default Values	Pitch bend range in semitones	`1` to `96`
Expressivity, Sound Brightness, Control Change, Control Voltage		As on the Keygrid	

20.4 Key

The **Key** element: a single pad playing one note, with X, Y and pressure control.

Parameter	Section	What it does	Values
Channel, **Trig on entry**	Midi	See above	
Root Note, **Octave**	Note	The note played	`C` to `B`, `-2` to `8`
PB Range	Note	Pitch bend range in semitones	`1` to `96`
Pressure, **Vibrato**	Expressivity Tune	See below	
Pressure, **X abs**, **Y abs**, **Motion**, **X rel**, **Y rel**	Control Change	Extra CC outputs	
Note CV and **CV Velocity**, **CV Pressure**, **CV X abs**, **CV Y abs**, **CV X rel**, **CV Y rel**	Control Voltage	CV outputs	

20.5 Key Attribute Sub-Structures

20.5.1 Glissando Tune

Controls how pitch follows your finger as it slides between keys.

Parameter	What it does	Values
Enable	Turns glissando on	on / off
Vertical Gliss.	Also bends the pitch when you slide between rows	on / off
Retrigger	Sends a new note when the pitch reaches the next key	on / off
Tune Loc	Where the pitch settles: on the pad center or where your finger is	`Pad`, `Finger`

Parameter	What it does	Values
Smoothing	How smoothly the pitch settles	Low to High
In Tune Width	Size of the zone around each key where the pitch stays exactly in tune	`0` to `100`

20.5.2 Vibrato Tune

Turns small finger movements into pitch bend.

Parameter	What it does	Values
Enable	Turns vibrato on	on / off
Strength	Depth of the vibrato	slider
Return Speed	How fast the pitch returns to the note	None to Max

The pitch bend range is set by **PB Range**.

20.5.3 Pressure Tune

Sends finger pressure as aftertouch.

Parameter	What it does	Values
Enable	Turns aftertouch on	on / off
Type	Channel aftertouch or polyphonic aftertouch	`Channel`, `Poly`
Min/Max	Output range	`0` to `127`

20.5.4 CC74 Tune (Sound Brightness)

The **Sound Brightness (CC 74)** section, the MPE timbre axis. It is shown when MPE is on.

Parameter	What it does	Values
Gesture	Which finger gesture drives the output	`None`, `Pressure`, `X Absolute`, `Y Absolute`, `X Relative`, `Y Relative`, `Motion Speed`
Initial value	Value sent at touch, for the relative gestures	`0` to `127`
Min/Max	Output range	`0` to `127`

20.6 Button (Note / Control Change / Program Change / Control Voltage / Tap Tempo)

A single-pad button. **Type** selects what it sends and which parameters are shown. **Latched** makes the button toggle on each press instead of acting only while held.

20.6.1 Shared Button Parameters

Parameter	What it does	Values
Type	What the button sends	`Note`, `Control Change`, `Program Change`, `Control Voltage`, `Tap Tempo`
Midi Output	Output ports	See above
Channel	MIDI channel	`1` to `16`
Latched	Toggle instead of momentary	on / off

20.6.2 Button: Note Mode

Parameter	What it does	Values
Trig on entry	See above	`Off`, `Default`, `All`
Root Note, **Octave**	The note sent	`C` to `B`, `-2` to `8`
Control Voltage	Note CV outputs (**Gate**, **1V / Oct**, **Gate Mode**)	

20.6.3 Button: Control Change Mode

Parameter	What it does	Values
Enable On	Send a CC when the button turns on	on / off
ON controller and **Value**	The controller and value sent on activation	`0` to `127`
Enable Off	Send a CC when the button turns off	on / off
OFF controller and **Value**	The controller and value sent on release	`0` to `127`

20.6.4 Button: Program Change Mode

Parameter	What it does	Values
Preset	Fills in the values for a common action	`Disable`, `Layout Change`, `Project Change`
Target Layout	With **Layout Change**: the layout to switch to	`1` to `8`
Target Project	With **Project Change**: the project to switch to	`1` to `8`
Program (ON)	Program Change sent on activation, with an optional **Bank** (**Bank MSB**, **Bank LSB**)	`0` to `127`
Program (OFF)	Program Change sent on release, with an optional **Bank**	`0` to `127`

20.6.5 Button: Control Voltage Mode

Parameter	What it does	Values
Enable, **Output**	The CV jack used	1 to 24
On/Off (V)	The voltages for the off and on states	range slider

20.6.6 Button: Tap Tempo Mode

Tap the button to set the tempo. There are no other parameters.

20.7 Fader 1D

A one-dimensional fader. Your finger's position along the fader is the main value; pressure can add a second output.

Parameter	Section	What it does	Values
Channel, **Trig on entry**	Midi	See above	
Default Y	Midi	Position loaded with the layout and saved in presets	`0` to 127
Center Y	Midi	Visual center of the fader, where its fill bar starts	`0` to 127
Pressure, **Y abs**, **Motion**	Control Change	CC outputs	
Pressure, **Y abs**	Control Voltage	CV outputs	

20.8 Fader 2D

A two-dimensional pad. X and Y each drive their own output; pressure can add a third.

Parameter	Section	What it does	Values
Channel, **Trig on entry**	Midi	See above	
Default X, **Default Y**	Midi	Position loaded with the layout and saved in presets	`0` to 127
Center X, **Center Y**	Midi	Visual center of the pad	`0` to 127

Parameter	Section	What it does	Values
Pressure, **X abs**, **Y abs**, **Motion**	Control Change	CC outputs	
Pressure, **X abs**, **Y abs**	Control Voltage	CV outputs	

20.9 LivePad

The **LivePad** element: an Ableton Live session controller. Trigger clips and control channel volume, mute, solo and sends.

Parameter	What it does	Values
Zoom	Display size of the session grid	`Small`, `Large`

20.10 API Zone

A programmable zone for your own software: the Erae streams finger positions and pressure over MIDI SysEx instead of sending MIDI notes or CCs, and your software can draw on the zone.

Parameter	What it does	Values
Zone Index	Identifier of this zone for your software	`0` to `127`
Max Num Fingers	Maximum number of fingers reported	`0` to `10`
Finger Data Rate	How often finger data is reported	`0` to `255`

20.11 Pedal (PedalV2)

Each of the two pedal inputs, **A** and **B**, has its own settings: click **A** or **B** below the canvas. **Type** is `Disable`, `Switch`, `Kick`, `Sustain (Binary)`, `Sustain (Continuous)` or `Expressive`.

20.11.1 Shared Pedal Parameters

Parameter	What it does	Values
Type	Operating mode	See above
Midi Output	Output ports	See above
Channel	MIDI channel	1 to 16

20.11.2 Pedal: Switch Mode

Sends a message on press and release.

Parameter	What it does	Values
Latched	Toggle instead of momentary	on / off
Message Type	What the pedal sends	`Note`, `Control Change`, `Program Change`, `Tap Tempo`
Root Note, **Octave**	With Note: the note sent	
Enable On, controller and **Value**	With Control Change: the CC sent on press (CC 64, value 64 by default)	`0` to 127
Enable Off, controller and **Value**	With Control Change: the CC sent on release (CC 64, value 65 by default)	`0` to 127
ON Program Change, **OFF Program Change**	With Program Change: program and optional bank sent on press and release	`0` to 127
Control Voltage	A CV output switched between an **On/Off (V)** pair	

20.11.3 Pedal: Kick Mode

Plays a note when you hit the pedal, with a velocity that follows how hard you hit it.

Parameter	What it does	Values
Root Note, **Octave**	The note played (MIDI note 36 by default)	
Velocity Sensitivity %	How much the hit strength affects velocity	`0` to `100` (default `100`)
Impact Threshold %	Minimum hit strength that triggers the note	`1` to `100`
Duration Mode	How long the note lasts	`Until Release`, `Fixed`
Fixed Duration (ms)	Note length in Fixed mode	`1` to `5000` (default `100`)
CV Gate, **CV Velocity**	CV outputs	

20.11.4 Pedal: Sustain Binary Mode

Sends a controller with an on value and an off value.

Parameter	What it does	Values
Latched	Toggle instead of momentary	on / off
Controller	The CC sent (CC 64, sustain, by default)	
On Value	Value sent when active	`0` to `127` (default `127`)
Off Value	Value sent when inactive	`0` to `127` (default `0`)
Control Voltage	A CV output switched between an **On/Off (V)** pair	

20.11.5 Pedal: Sustain Continuous Mode

Sends the pedal position as a continuous controller.

Parameter	What it does	Values
Controller	The CC sent (CC 64 by default)	
Invert	Flips the pedal direction	on / off
Control Voltage	A CV output following the pedal position	

20.11.6 Pedal: Expressive Mode

Sends the pedal position as an expression controller.

Parameter	What it does	Values
Controller	The CC sent (CC 11, expression, by default)	
Invert	Flips the pedal direction	on / off
Control Voltage	A CV output following the pedal position	