Calamus UI Specification

Sound Engine Tab

Version 1.0 — December 2025

Overview

The Sound Engine Tab is where sounits are built and configured. When this tab is active, the Canvas Window displays the Sounit Builder — a visual node editor showing containers and their connections.

The Control Panel provides detailed editing capabilities while the Canvas provides visual layout and connection creation.

Division of Labor

Tasks are divided between the Canvas Window and Control Panel:

Canvas Window	Control Panel
Visual layout of containers	Edit default values
Selection (click to select)	Edit connection function and weight
Connection visualization	Edit container config options
Create connections (drag port to port)	Edit instance names
Show selection and connection context	Sounit metadata (name, comment)

Principle: Canvas is your map. Inspector is your workbench.

Control Panel Layout

The Control Panel contains three areas that provide context-sensitive information and editing:

Sounit Info

Always visible when Sound Engine tab is active. Shows metadata for the current sounit.

Field	Editable	Description
Name	Yes	Sounit identifier (e.g., "Violin I")
Used by	No (read-only)	List of tracks using this sounit
Comment	Yes	Notes to distinguish similar sounits

Container Inspector

Visible when a container is selected on the Canvas. Provides complete editing access to all container properties.

Header Section

- Container type (read-only)
- Instance name (editable) — auto-generated as "Type 1", "Type 2", can be renamed

Inputs Section

Lists all input ports for the selected container. Each input shows:
- Port name
- Default value (editable)
- Unit label where applicable (Hz, %, etc.)
- Connection indicator (if connected)

Connection Display Format:

When an input has a connection, it displays below the port line:
- ● (dot indicator)
- Function (add, multiply, modulate, etc.)
- Weight value
- Source: Container(instance).port

Important: The default value is not overridden by connections (except passthrough). Connection functions combine the source with the default value: add, multiply, subtract, replace, modulate.

Outputs Section

Lists all output ports with their destinations (if connected). Read-only, informational.

Config Section

Container-specific configuration options from the Container Port Specification. Each container type has different config options (e.g., resonance model for FormantBody, easing mode for EasingApplicator).

Empty State

When no container is selected, the Container Inspector is blank. No placeholder text, no prompts — just empty space.

Connection Inspector

Visible when a connection is selected. A connection can be selected by:
- Clicking the connection line on the Canvas
- Clicking the ● indicator in the Container Inspector

Fields

Field	Editable	Description
From	No	Source container and port
To	No	Destination container and port
Function	Yes (dropdown)	How values combine (see table below)
Weight	Yes	Multiplier for the source value

[Disconnect] button at bottom of inspector.

Connection Functions

Function	Behavior
passthrough	Source replaces input entirely
add	input + source × weight
multiply	input × source × weight
subtract	input − source × weight
replace	input × (1−weight) + source × weight
modulate	Bipolar modulation around input

Empty State

When no connection is selected, the Connection Inspector is blank.

Canvas Visual States

Containers and connections have visual states to provide feedback without clutter.

Container States

State	Appearance
Normal	Standard colors per container category
Selected	Highlighted border (strong visual emphasis)
Connected-to-selection	Slight opacity/tint change (subtle context cue)

No hover effects. Canvas stays clean — click to select, that's it.

Connection States

When a connection is selected, both the source and destination containers show the "connected-to-selection" state for visual context without losing focus on the connection itself.

Workflow Summary

Task	Where / How
Create connection	Canvas — drag from output port to input port
Select connection	Canvas (click line) or Inspector (click ●)
Edit connection	Inspector — function dropdown, weight field
Delete connection	Canvas (select + Del) or Inspector (Disconnect)
Edit default values	Inspector — Container Inspector inputs section
Edit config options	Inspector — Container Inspector config section
Rename container	Inspector — Container Inspector header
Edit sounit metadata	Inspector — Sounit Info section

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