

Calamus UI Specification

Sounit Builder Canvas

Version 1.0 — December 2025

Overview

The Sounit Builder Canvas is a floating window displayed on a secondary screen where sounits are visually constructed. It provides a node-editor interface for placing containers and connecting them to define the signal flow of a sound unit.

This specification covers the visual elements and interaction patterns for the canvas. For container editing (default values, config options, connection functions), see the Sound Engine Tab specification. For container port definitions, see the Container Port Specification.

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

Window Frame

Standard Qt window decoration with title bar, minimize/maximize/close buttons, and resizable edges.

Element	Specification
Title (empty)	"Sounit Builder"
Title (loaded)	"Sounit Builder — [sounit name]"
Chrome	Standard OS window decoration only

Toolbar

Container insertion buttons organized by category. Each category has a distinct background color. Clicking a button inserts that container type at the center of the visible canvas.

Container Categories

Color	Category	Containers
Blue	Essential	HarmonicGenerator, SpectrumToSignal
Orange	Shaping	RolloffProcessor, FormantBody, BreathTurbulence, NoiseColorFilter
Green	Modifiers	PhysicsSystem, EasingApplicator, EnvelopeEngine, DriftEngine, GateProcessor

Special Toolbar Buttons

Marquee Select: Activates marquee selection mode for drag-selecting multiple containers.

Canvas Surface

Property	Value
Background	White (preference-settable)
Grid	None
Snap	None — chaos encouraged

Status Bar

Section	Contents
Transport Controls	Play ■, Stop ■, position, tempo, time signature
Cursor Context	Time, pitch, and other context-sensitive information

Containers

Containers are the visual nodes representing sound processing units.

Property	Specification
Size	Variable height based on number of ports
Header	Colored bar (blue/orange/green by category) with instance name
Body	Light background with port labels
Shape	Rounded corners

Ports

Property	Specification
Shape	Small circles (uniform size)
Input position	Left edge of container
Output position	Right edge of container
Labels	Inside body, next to circle (left-aligned for inputs, right-aligned for outputs)
Data type styling	None — all ports same style to avoid color overdose

Connections

Property	Specification
Routing	Rounded right-angle (orthogonal with rounded corners)
Path	Auto-routes around containers — never passes over/under container bodies
Color (normal)	Source container category color at 50% intensity
Color (selected)	Source container category color at 100% intensity
Function label	Oval shape near destination port, shows "function:weight" (e.g., "add:0.5")
Label color	Same as connection line

Interaction Patterns

Canvas Navigation

Photoshop-style navigation:

Action	Input
Pan	Alt + Spacebar + drag (hand cursor)
Zoom	Ctrl + Spacebar + drag (magnifier cursor)

Selection

Action	Input
Select container	Click container
Select connection	Click connection line or function oval
Deselect all	Click empty canvas
Add/remove from selection	Shift + click
Marquee select	Toolbar button → drag rectangle → selects containers and connections

Marquee mode exits automatically on mouse/pen up.

Container Operations

Action	How
Add container	Click toolbar button → appears at center of visible canvas, selected
Move container	Drag selected container(s) — connections re-route automatically
Delete container	Select + Del key — associated connections disappear

Connection Operations

Action	How
Create connection	Drag from output to input (or input to output) — line follows cursor
Invalid drop	Drop on empty canvas or incompatible port — connection cancels
Delete connection	Select + Del key, or Inspector Disconnect button

Keyboard Shortcuts

Shortcut	Action
Del	Delete selected container(s) or connection(s)
Ctrl+C	Copy selected container(s)
Ctrl+V	Paste container(s) at center — no connections
Ctrl+Z	Undo
Ctrl+Y	Redo
Escape	Deselect all / cancel current drag

Window States

State	Canvas	Title Bar	Toolbar	Notes
Empty	Blank white	"Sounit Builder"	Normal	Can add containers to start building
Working	Full interaction	"Sounit Builder — [name]"	Normal	All features available
Switching	Clears → loads new	Updates to new name	Normal	Warns if unsaved, selection resets

Related Documents

- Sound Engine Tab Specification v1.0 — Inspector and editing controls
- Container Port Specification v1.2 — Port definitions for all containers
- Calamus Architecture v1.4 — System overview and data relationships
- Calamus Class Diagram v0.3 — Container and Connection class definitions