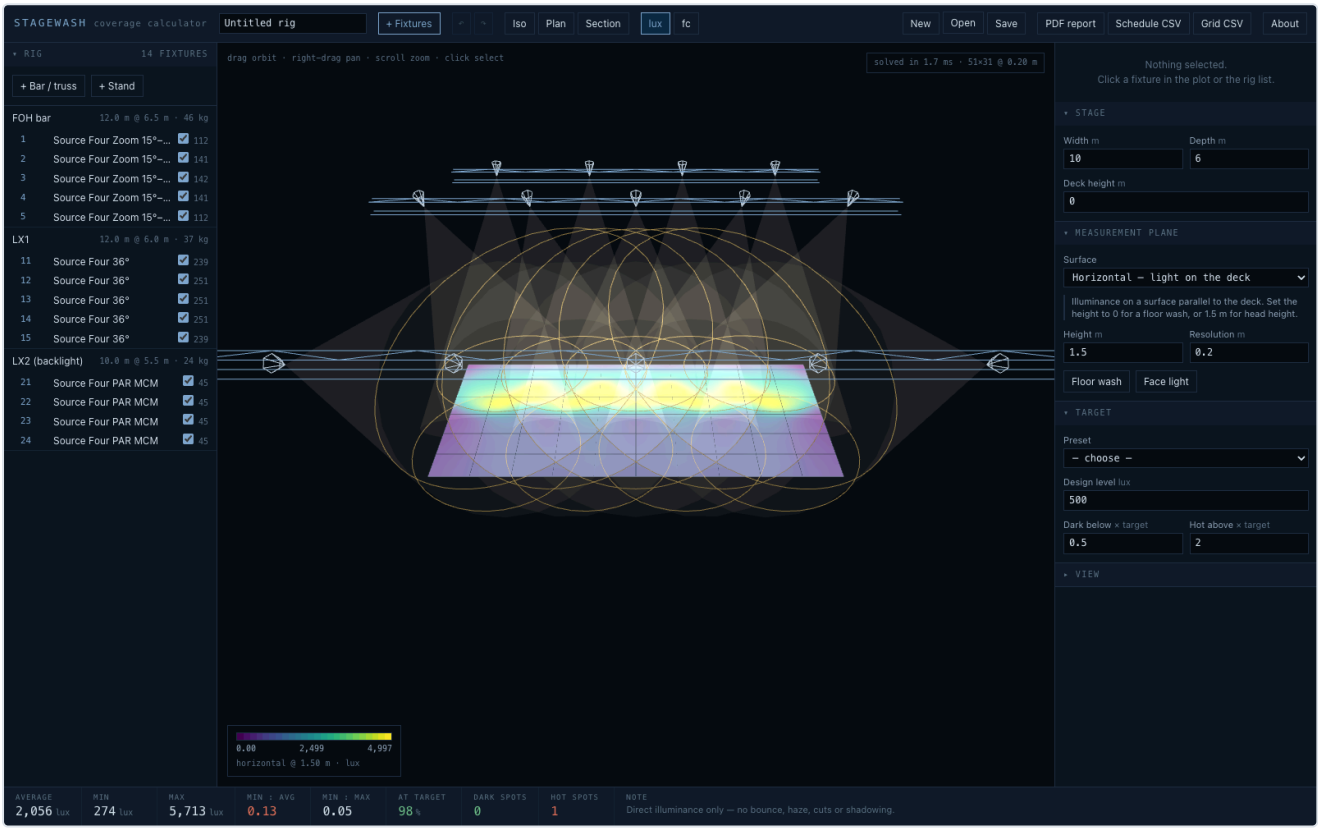
stagewash user guide

Model a stage and a lighting rig, focus the fixtures, and see the light levels and coverage on the deck — before you get to the venue.

A browser app. Nothing is installed, nothing is uploaded: the whole calculation runs in the tab.



> **Before you rely on this:** the illuminance model is **calibrated rather than assumed** — eight published photometric rows from real datasheets are held as tests, and the estimator lands within about 10% given a manufacturer's own field lumens, about 25% from bare lamp lumens alone. The importers are checked against real files: an entire published fixture bundle, 132 photometric files, parses with no failures or warnings, and candela tables integrate back over the sphere to the lamp flux the file declares within 0.1%.
>
> **This is a direct illuminance calculation only** — no inter-reflection, haze, shutter cuts, gobos or shadowing — and **nothing here has ever been checked against a light meter on a real stage.**
>
> This codebase was created with AI assistance, directed and reviewed by a human author.

The two planes, which is the point

Most of the value in this tool is in a single toggle.

- **Horizontal** — illuminance on a surface parallel to the deck. The classic floor wash.
- **Vertical** — illuminance on a surface facing the audience, at head height. **What a *face* receives.**

A rig can look perfectly even on the floor and be flat and shadowless on faces, because overhead light arrives nearly edge-on to a vertical surface and contributes almost nothing to it.

Flip between the two and the ranking of your fixtures inverts: on the default rig **the backlight contributes exactly zero to the face plane**, and the front-of-house units more than double.

That is the calculation catching the most common mistake in a stage rig. If you read nothing else here, flip that toggle before you sign off a plot.

Building a rig

Truss, scaff, bars and wind-up stands. Hang fixtures along a bar at a spacing, or place them individually.

Focus by aiming a fixture at a point on the stage — it resolves the pan and tilt for you — or set pan and tilt directly. Zoom fixtures have a zoom; **moving heads are checked against their pan and tilt range**, so an impossible focus is reported rather than drawn.

See the levels as a heatmap on the stage, updated as you drag, with beam cones and footprints in a rotatable wireframe plot.

Find the problems: uniformity, coverage against a design level, and **contiguous hot and dark spots listed by area with their centres** — which is the form you can actually act on, rather than a number for the whole stage.

How much to trust a fixture's numbers

Every fixture carries a **badge saying where its numbers came from**, because a lux figure computed from a guess is worth nothing and you have to be able to tell which is which.

Badge	What it means
measured	Read from a manufacturer photometric file (`.ies` / `.ldt`) that you imported. As good as this gets — **do this when the answer has to be right.**
published	Beam angle, field angle and centre-beam candela transcribed from a named datasheet; only the roll-off between those anchors is modelled.
estimated	A generic archetype synthesised from lamp output and beam angle. Useful for blocking out a rig, **not for promising a level.** Always named `Generic`.

Building a custom fixture: **if you have its centre-beam candela, or its lux at a stated distance, use that** — it assumes nothing. **Bare lamp lumens is the weakest option**, because it has to assume an optical efficiency, and real fixtures of the same class run anywhere from 42% to 65%.

The real floor on accuracy

Worth knowing before you argue with a number: for four of eight fixtures checked, the manufacturer's **own** photometric file and the manufacturer's **own** datasheet agree to within 1% — and for the other four they differ by **5–15%**, because the files and the sheets are different revisions.

±15% between two first-party sources for the same fixture is the real floor on accuracy in this business. It is larger than anything the maths in here contributes.

What is not modelled

Inverse square, the cosine law, and each fixture's intensity distribution. That is all.

It does **not** model inter-reflection from the deck, walls or a cyc; atmospheric haze; shutter cuts, gobos or barn doors; or shadowing by people and scenery.

On a dark stage that is the right model. In a white studio, inter-reflection can add a third again to these figures.

Reporting

A PDF with the levels, the problem areas, a full fixture schedule with focus and heights, and the structural loading.

It carries **three plots drawn from the same model** — the heatmap in plan with a colour key, an isometric of the rig and its beams, and a wireframe layout by channel that **shares the plan's frame, so a pool on the map sits over the fixture that made it.** Plus CSV of the schedule and of the raw grid.

If a number looks wrong

Symptom	Cause
Faces are dark and the floor is even	The vertical plane. That is the toggle, and the point of the tool.
A level is 15% off a manufacturer's figure	That is within the gap between the manufacturer's own file and its own datasheet.
A studio reads darker than it looks	Inter-reflection is not modelled, and can add a third again in a white room.
A fixture is badged `estimated`	Its numbers are synthesised. Import a photometric file when the answer has to be right.
A focus is refused	The moving head cannot reach it within its pan/tilt range.