CL-2 — User Manual

Contact Lens Calculator · Over-Refraction
Stile Ottica SA — stileottica.ch/app

Overview

CL-2 is a professional tool for opticians and eye-care practitioners. It calculates the **new contact lens prescription** resulting from an over-refraction performed on a patient who is already wearing contact lenses. The combination of the worn CL prescription and the over-refraction is computed using the full vectorial method (Keating/Naegle oblique axes formula), accounting for lens stabilization.

How It Works

CL-2 takes two inputs per eye:

1. **Current CL** — the prescription of the contact lenses the patient is currently wearing
2. **Over-refraction** — the refraction measured over those lenses, including a stabilization offset

It then vectorially combines them to produce the **New lenses** prescription — the corrected CL the patient should be fitted with next.

Interface Layout

The app is organized as a vertical sequence of cards:

1. **Patient** — name, date, language, settings
2. **CL** — current contact lens prescription input
3. **Over-refraction** — over-refraction values + stabilization offset
4. **New lenses** — computed new CL prescription (toric)
5. **Spherical CL** — spherical equivalent of the new prescription
6. **CL to order** — free-entry fields for the final order values

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Patient Card

At the top of the screen, the Patient card holds the record metadata and the main controls.

Name and **Date** fields identify the patient record. The date defaults to today.

Language selector (top-left, shows the current language code, e.g. `EN`) opens a language picker. Available languages: English, Italian, French, German, Spanish, Portuguese, Chinese, Japanese, Korean. The choice is saved and applied instantly.

Settings (gear icon, top-right) opens the Settings panel — see the Settings section below.

Share (share icon, top-right) captures the current screen as an image and opens the system share sheet.

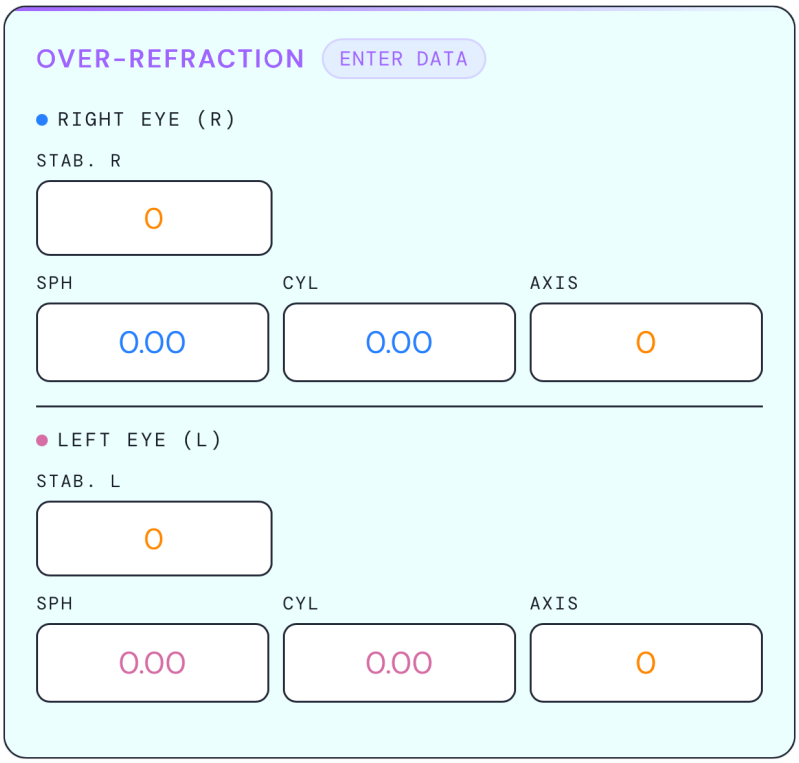
CL Card (Current Contact Lenses)

Enter the prescription of the **contact lenses the patient is currently wearing**, in negative cylinder convention.

FIELD	DESCRIPTION
SPH	Sphere power in dioptres (e.g. `-3.00`)
CYL	Cylinder power in dioptres, typically ≤ 0
Axis	Cylinder axis in degrees, 0–180

Fields are colour-coded: Right eye in blue, Left eye in pink, Axis in amber. Enter values for both Right (R) and Left (L) eyes.

Over-Refraction Card



Enter the **refraction measured over the current contact lenses**. This card has an additional field per eye: **Stab. (Stabilization)**.

Stabilization offset (Stab. R / Stab. L)

Toric contact lenses have a stabilization mechanism (e.g. prism ballast, peri-ballast) that causes the lens to rotate on the eye to a resting position. The **Stab.** field records this rotation angle in degrees — positive values mean the lens has rotated clockwise (when viewed from the front).

The stabilization offset is applied to the CL axis before the vectorial combination:

$$\text{Axis}{\text{real}} = \text{Axis}{\text{cl}} - \text{Stab} \pmod{180^\circ}$$

> *If the lens shows no rotation (ideal fit), leave Stab. at* `0`.

SPH, CYL, Axis

Enter the over-refraction values measured through the slit-lamp or trial frame, in standard negative cylinder notation.

Calculation Method

The new lens prescription is computed in four steps:

1. Stabilization compensation — the CL axis is adjusted:

$$\text{Axis}_{\text{real}} = \text{Axis}_{\text{cl}} - \text{Stab} \pmod{180°}$$

2. Vectorial decomposition (Keating/Naegle) — each refraction is expressed as three power components:

$$M = \text{SPH} + \frac{\text{CYL}}{2} \qquad J_0 = -\frac{\text{CYL}}{2}\cos(2\alpha) \qquad J_{45} = -\frac{\text{CYL}}{2}\sin(2\alpha)$$

where α is the axis in radians. Components are summed independently:

$$M_{\text{tot}} = M_1 + M_2 \qquad J_{0,\text{tot}} = J_{0,1} + J_{0,2} \qquad J_{45,\text{tot}} = J_{45,1} + J_{45,2}$$

3. Reconstruction into SPH / CYL / Axis:

$$\text{CYL}_{\text{new}} = -2\sqrt{J_{0,\text{tot}}^2 + J_{45,\text{tot}}^2}$$

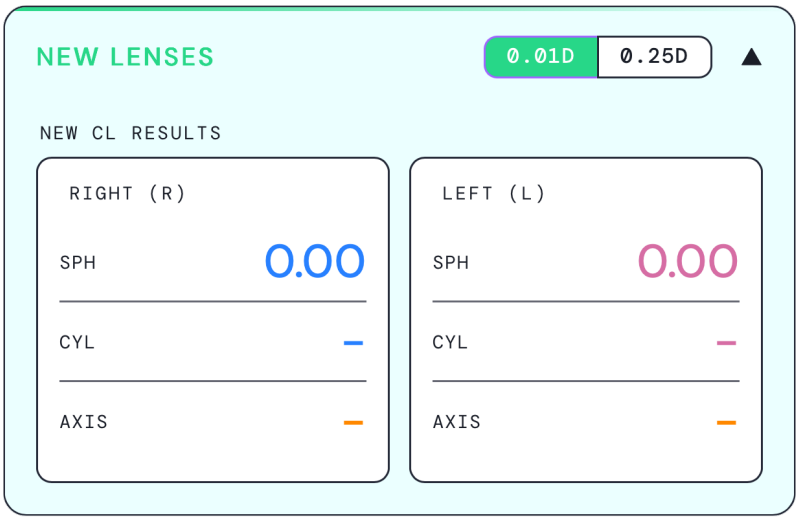
$$\text{Axis}_{\text{new}} = \frac{1}{2}\arctan!\left(\frac{J_{45,\text{tot}}}{J_{0,\text{tot}}}\right) \pmod{180°}$$

$$\text{SPH}_{\text{new}} = M_{\text{tot}} - \frac{\text{CYL}_{\text{new}}}{2}$$

4. Rounding — results are displayed at the selected precision (0.01D or 0.25D).

The result is always in negative CYL convention. This method correctly handles oblique axes, unlike simple arithmetic addition.

New Lenses Card



Displays the computed **new toric contact lens prescription**, updated automatically as you type.

If $|\mathrm{CYL}_{\mathrm{new}}| < 0.005, \mathrm{D}$, the CYL and Axis fields show `–` — the new lens is spherical.

Precision toggle (top-right of the card header):

- `0.01D` — full floating-point precision
- `0.25D` — values rounded to the nearest quarter dioptre

The card is collapsible: tap the header to show or hide the results.

Spherical CL Card

Shows the **spherical equivalent** of the new prescription for each eye:

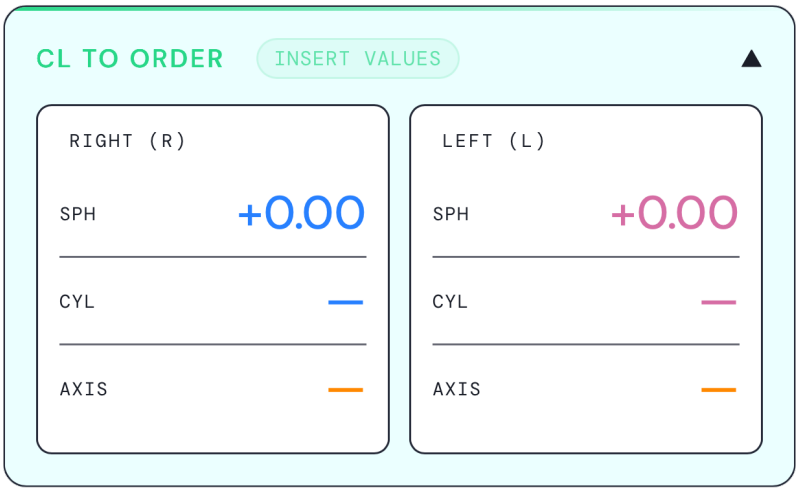
$$SE = \text{SPH}{\textit{new}} + \frac{\textit{CYL}}{\text{new}}}{2}$$

Useful when fitting spherical lenses as a compromise, or when the CYL component is clinically insignificant.

Precision toggle: separate `0.01D` / `0.25D` switch, independent from the New lenses card.

The card is collapsible.

CL to Order Card



A free-entry section for recording the actual lenses selected for the order, which may differ from the calculated values (e.g. due to available stock parameters or clinical judgment).

Enter SPH, CYL, and Axis for Right (R) and Left (L) eyes. The card is collapsible.

Reset

The ↺ **Reset all values** button clears all input fields and results, and resets the date to today.

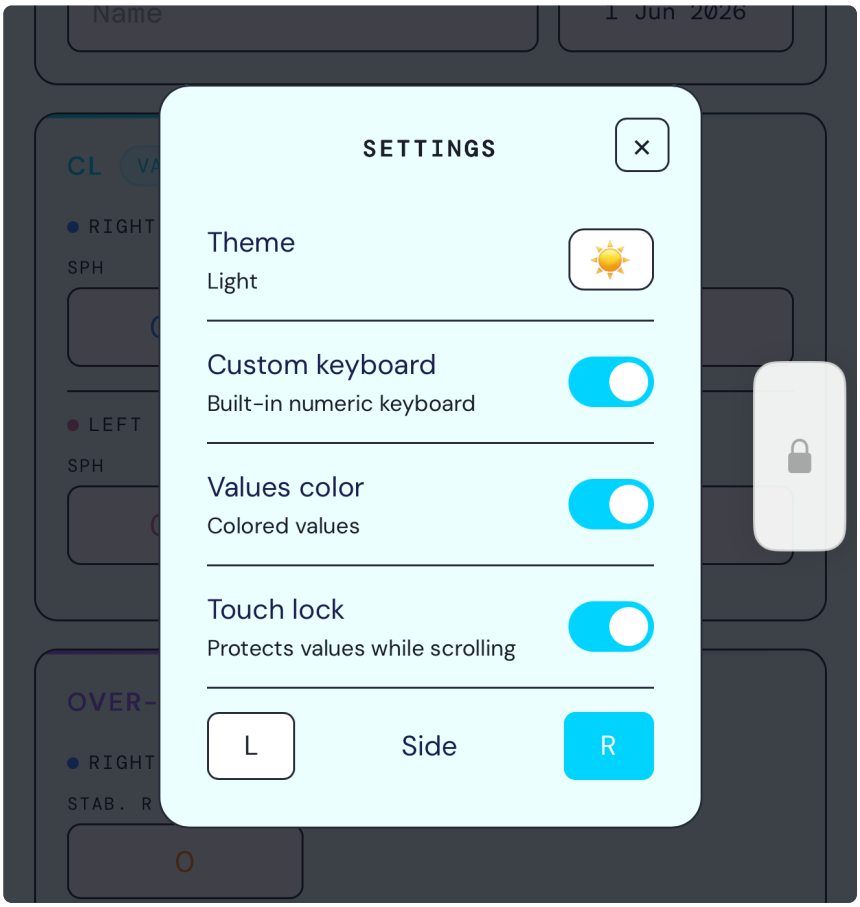
Technical Notes

Displayed at the bottom of the page:

- Vectorial combination (Keating/Naegle): M, J_0, J_{45} components summed independently, then reconstructed. If axes match: $\text{CYL}_{\text{new}} = \text{CYL}_{\text{cl}} + \text{CYL}_{\text{over}}$.
- Spherical equivalent: $SE = \text{SPH}_{\text{new}} + \text{CYL}_{\text{new}}/2$.
- The compensated values at 0.25D are indicative. The determination of the final value remains the responsibility of the professional.

Settings

Open via the **gear icon** in the Patient card header. Tap outside the panel or tap ✕ to close.

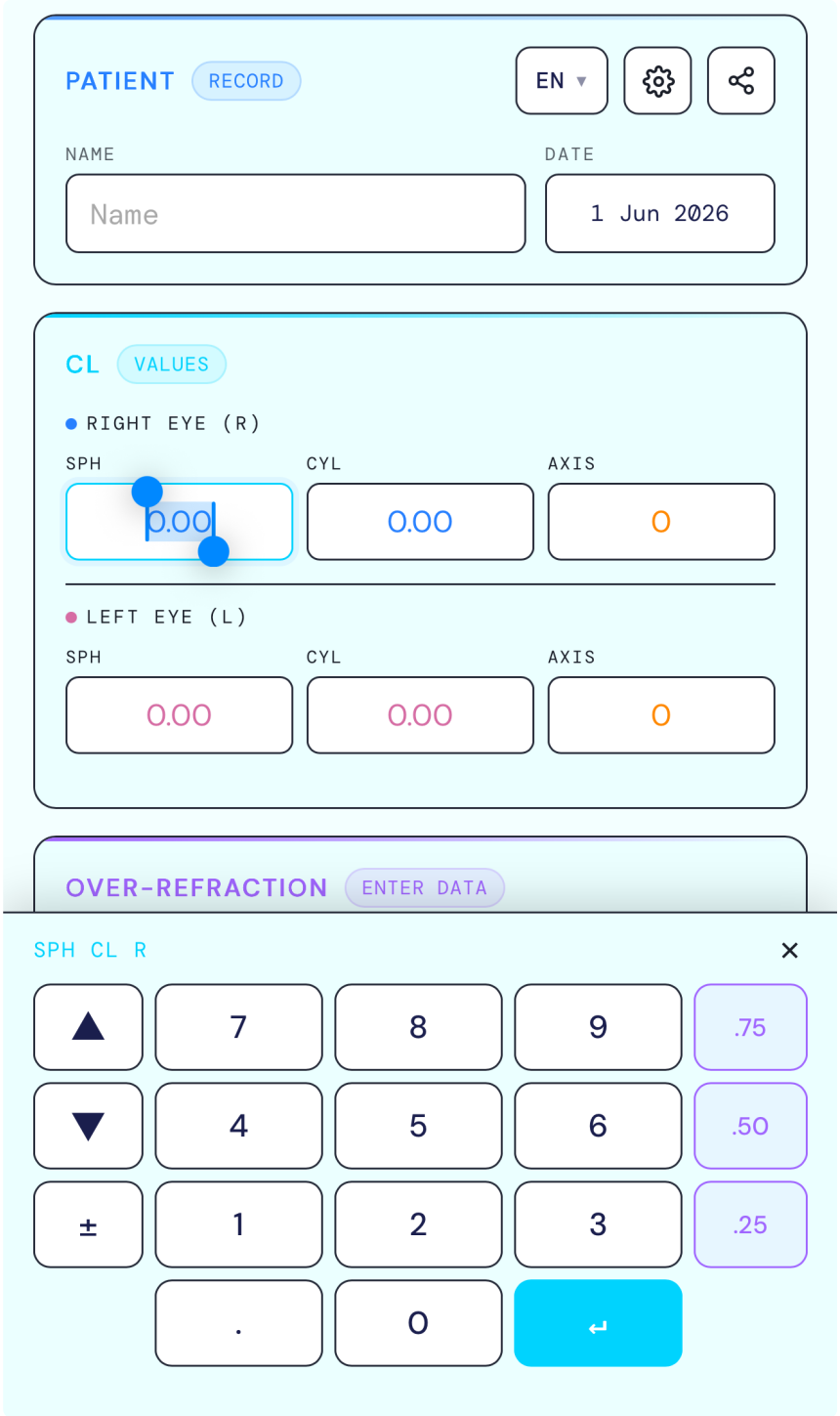


Theme

Toggles between **Light** and **Dark** mode. Saved automatically.

Custom Keyboard

Enables the built-in numeric keyboard — a purpose-built keypad optimised for entering optical values (SPH, CYL, Axis, Stab.). When active, tapping any numeric input field opens this keyboard instead of the system keyboard. A persistent bar at the bottom of the screen shows the custom keyboard toggle and provides quick access to all input fields.



Values Color

Toggles coloured vs. monochrome display of the calculated result values.

Touch Lock

Enables a floating **lock pill** on the side of the screen. When activated (by tapping the pill), it prevents accidental changes to input values while scrolling. Tap the pill again to deactivate. Choose **L** or **R** for the pill position.

Even with Touch Lock active, the following controls remain accessible:

- **0.01D / 0.25D** precision switches
- **Share** button

> *Touch Lock is available on iOS only.*

ⓘ Info Modal

The ⓘ **button** at the bottom of the page shows the app version and two links:

- **stileottica.ch/app** — opens in Safari
- **support@stileottica.ch** — opens in Mail

Tap outside the modal to close it.

Tips

- **Always check the stabilization mark** on the lens before entering the Stab. value — most toric CL brands print a mark at the 6 o'clock position that indicates the rotation.
- If you are fitting **spherical lenses** over a toric over-refraction, use the Spherical CL card result as a starting point, not the New lenses result.
- The vectorial combination correctly handles **oblique axes** (e.g. CL at 10° + over-refraction at 80°) which simple arithmetic addition would get wrong.
- When CYL is zero in both the current CL and the over-refraction, the New lenses result will also be spherical — CYL and Axis will show `–`.
- Use the **Share** function to attach the record to a patient file or send it directly to an ordering system.
- All settings (language, theme, keyboard, touch lock) are saved automatically and restored on the next launch.
