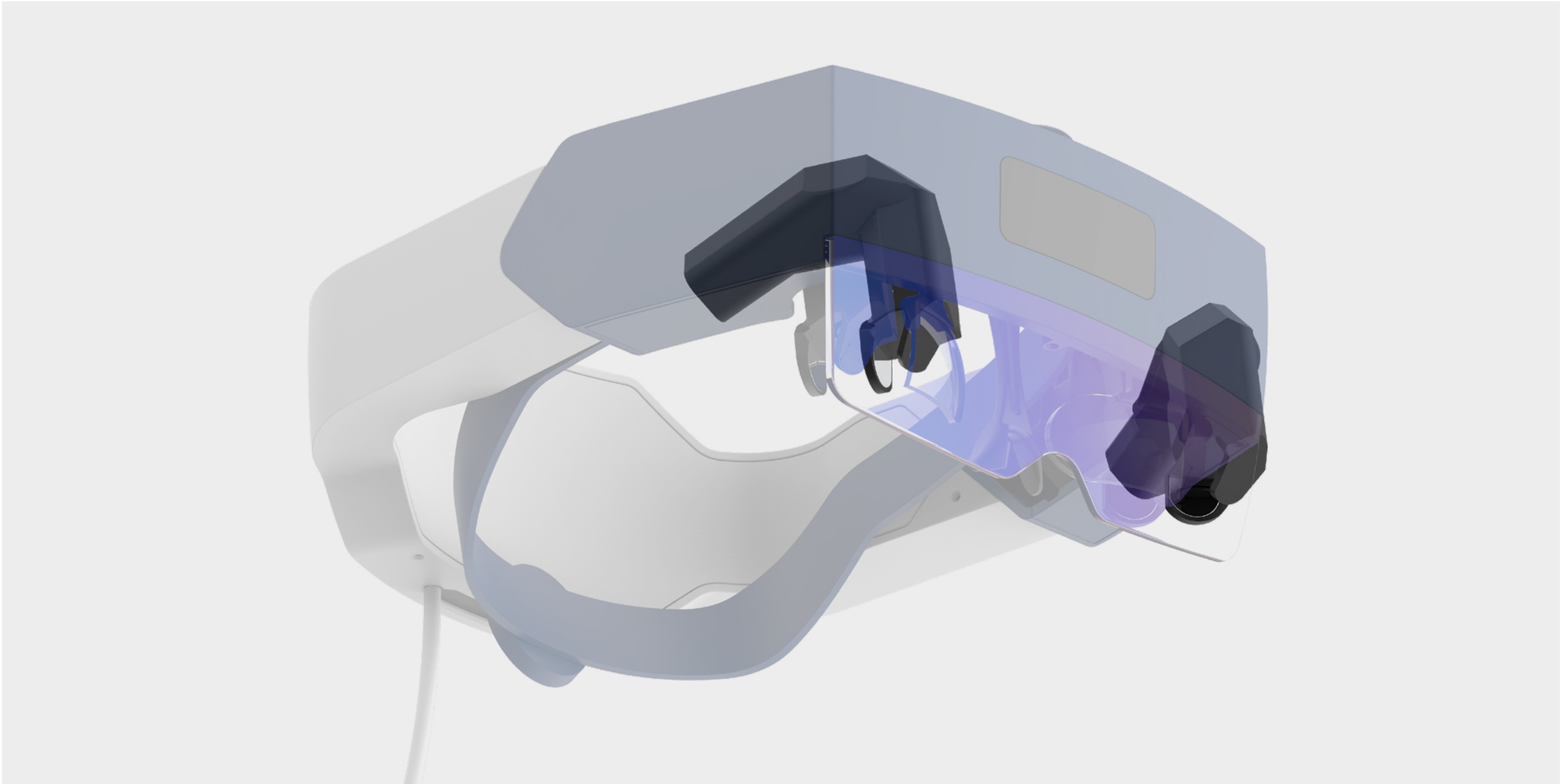
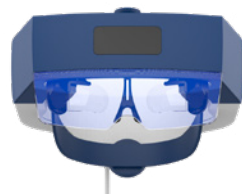




AR WITHIN ARM'S REACH





Per eye	Today	Target 2023
Angular resolution at infinity	20 px/°	45 px/° (MTF 60 px/°)
Modulator resolution	1 Mpix	1 Mpix
Depth resolution	Unlimited *	Unlimited *
FoV (diagonal)	55°	Light-field: 30° (Flat periphery: 60°) **
Effective eyebox (exit pupil)	11 mm (4 mm)	13 mm (6 mm)
Eye relief	27 mm	18 mm
Colors	1 million	2 millions
Rendering load (equivalent to flat image)	HD	HD
Frame rate	120 Hz	150 Hz
Sub-frame rate	2.9 kHz	6.5 kHz



Per eye	Today	Target 2023
Brightness	300 nits	up to 7000 nits
Contrast	1 000/1	1 000/1
Combiner type	curved semi-reflective	Holographic, prescription compatible
Transparency	30%	80%
Power consumption	3800 mW	900 mW
- light source and driver	500 + 400 mW	50 + 50 mW (@500 nits)
- modulator and driver	600 + 1600 mW	400 + 400 mW
Module volume (l.-f. engine)	60 cm ³	10 cm ³
Module weight (l.-f. engine)	81 g	32 g

* Resolution is finite, however much higher than an eye can resolve.

** Image consisting of high-resolution light-field in 30° FoV and possible low-resolution peripheral image up to 60° FoV.

	Real light-field	No eye-tracking required	Depth resolution (planes)	Spatial resolution	Complexity (HW/SW)	Image quality	Eye box
	✓	✓	Unlimited*	> 1 Mpix	✓	✓	—
Holography	✓	✓	Unlimited*	> 1 Mpix	∧	—	—
Lens array	✓	✓	> 10	< 100 Kpix	—	∨	—
Multiple depth planes	✗	—	2-4	> 1 Mpix	∧	✓	✓
Varifocal elements	✗	—	> 100	> 1 Mpix	✓	✓	✓

* Resolution is finite, however much higher than an eye can resolve







Eye focus

0.3 M



Eye focus

0.5 M



Eye focus

3 M

Q1 2020



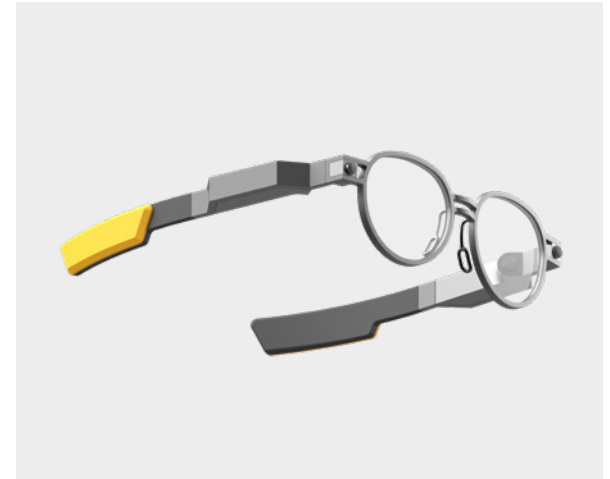
Q1 2021



2023



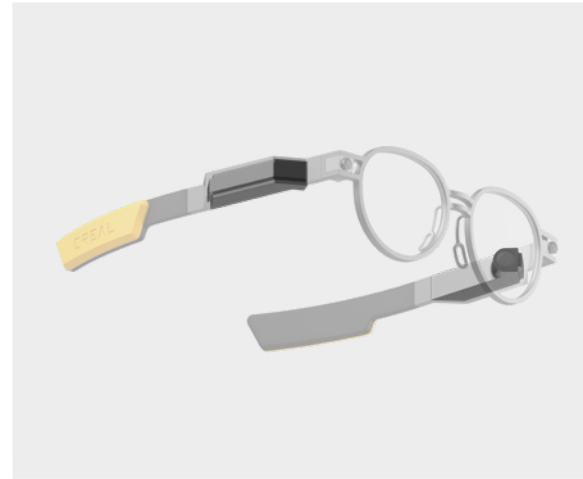
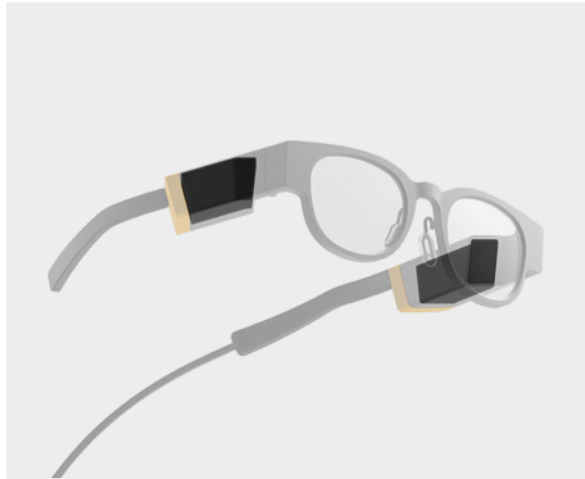
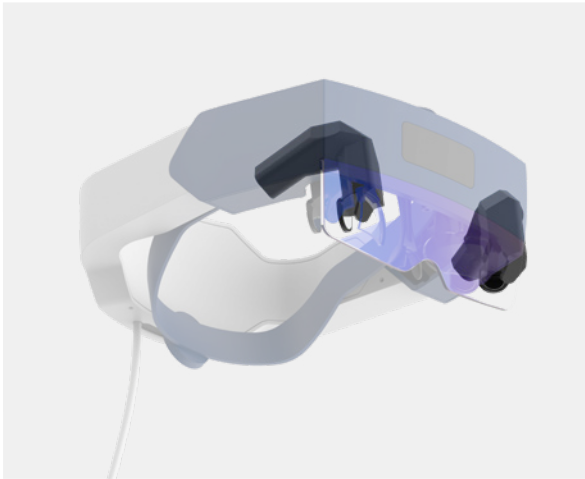
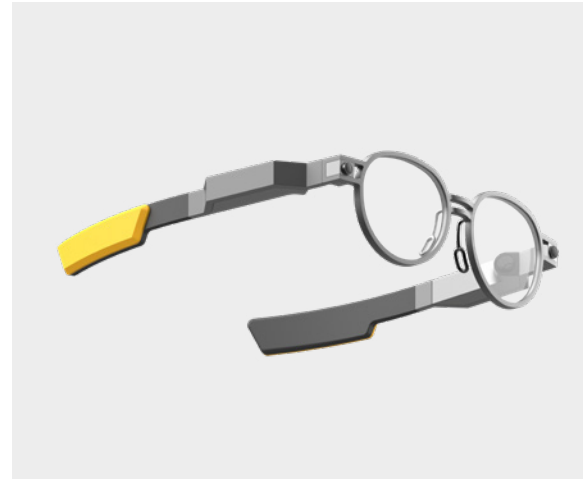
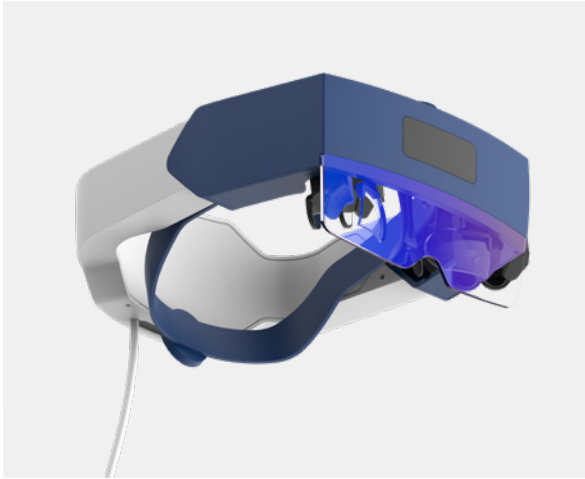
2025+



Q1 2021

2023

2025+



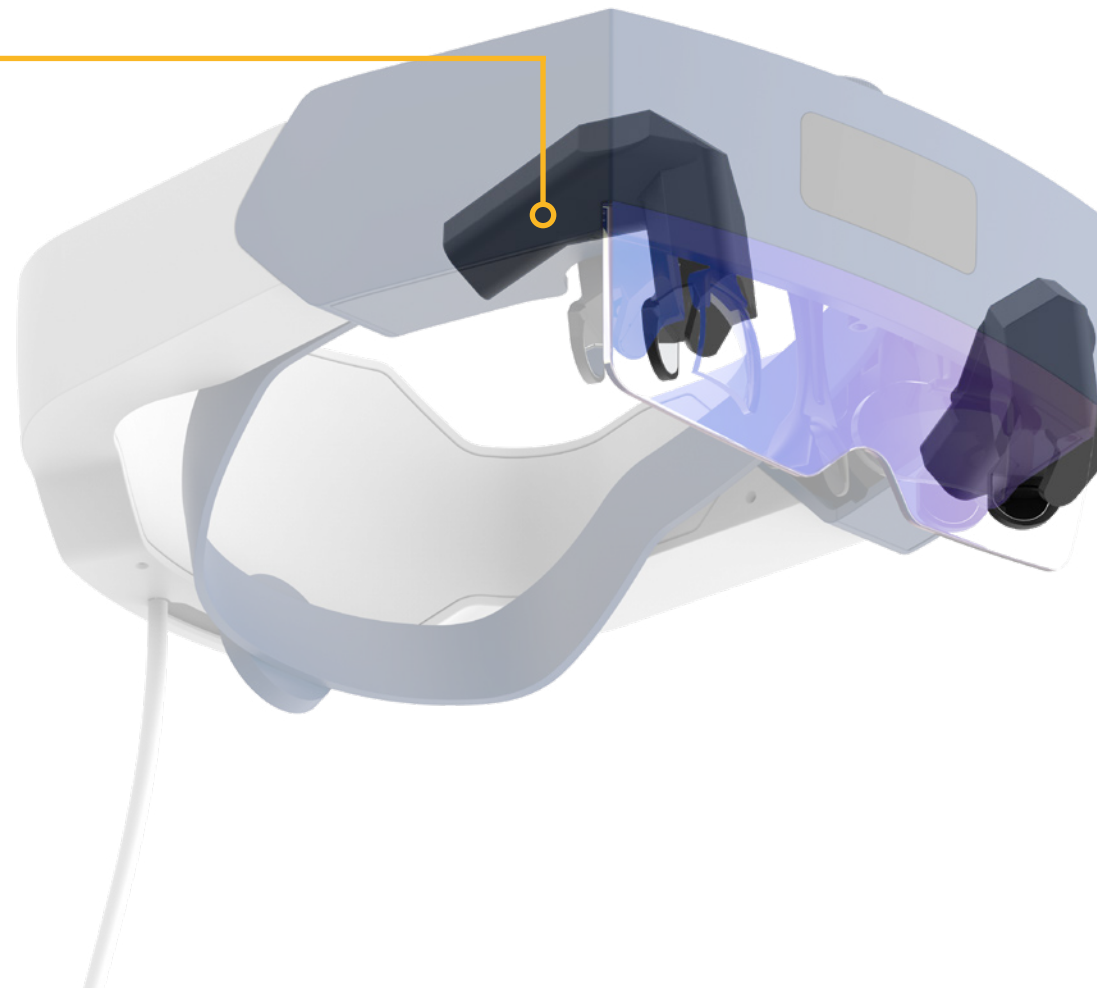
Full evaluation kit and optical engine available today

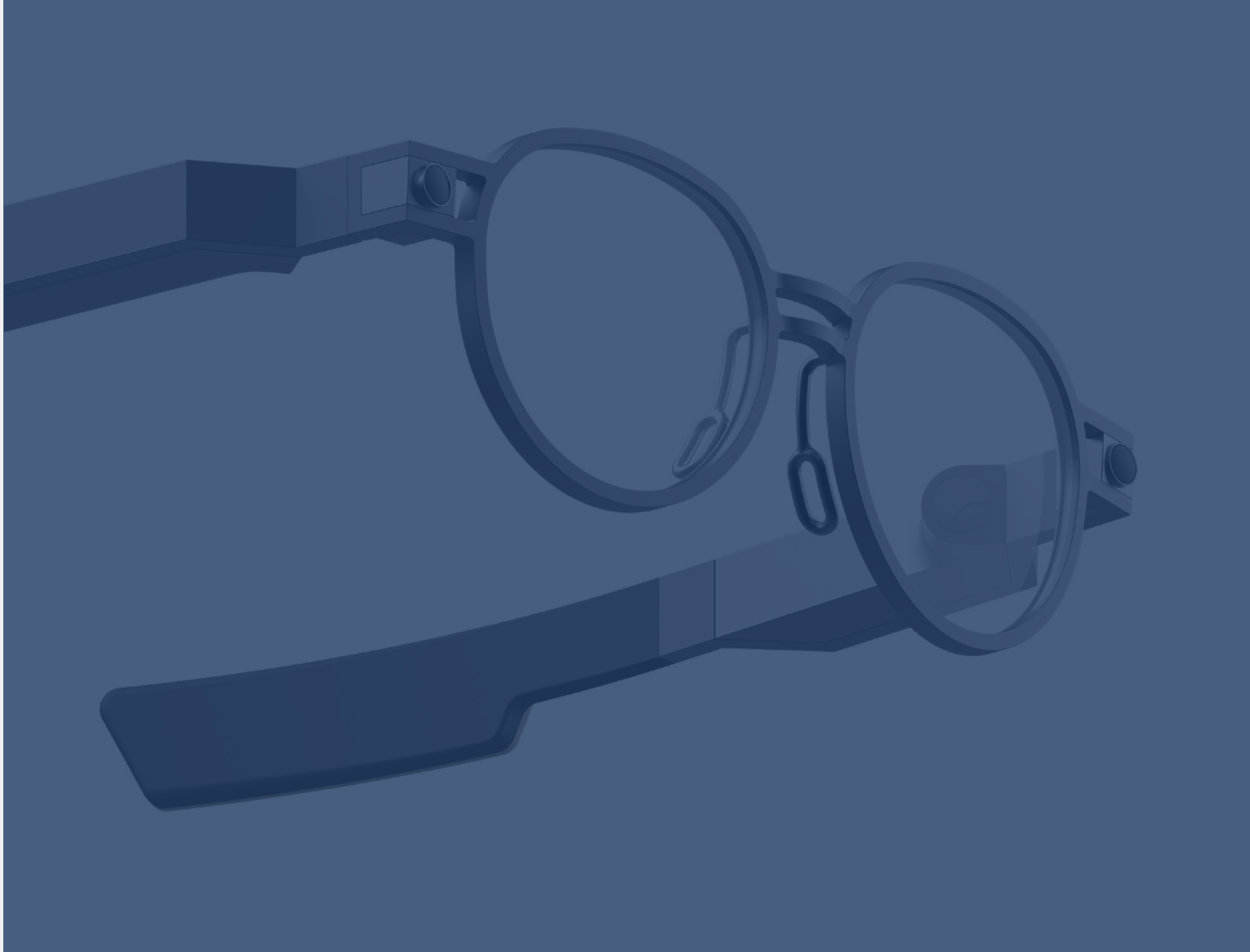
+ Complete light-field optical engine solution

Light-field can make **your next generation headset a market success**. It will be the first to allow comfortable extended interaction with virtual objects in the personal space.

Please ask us at sales@creal.com for:

- 1 AR technology evaluation kits
- 2 Engineering and integration support
- 3 Specifications for the smart glass light-field optical engine planned for 2023





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EPFL Innovation Park, Switzerland