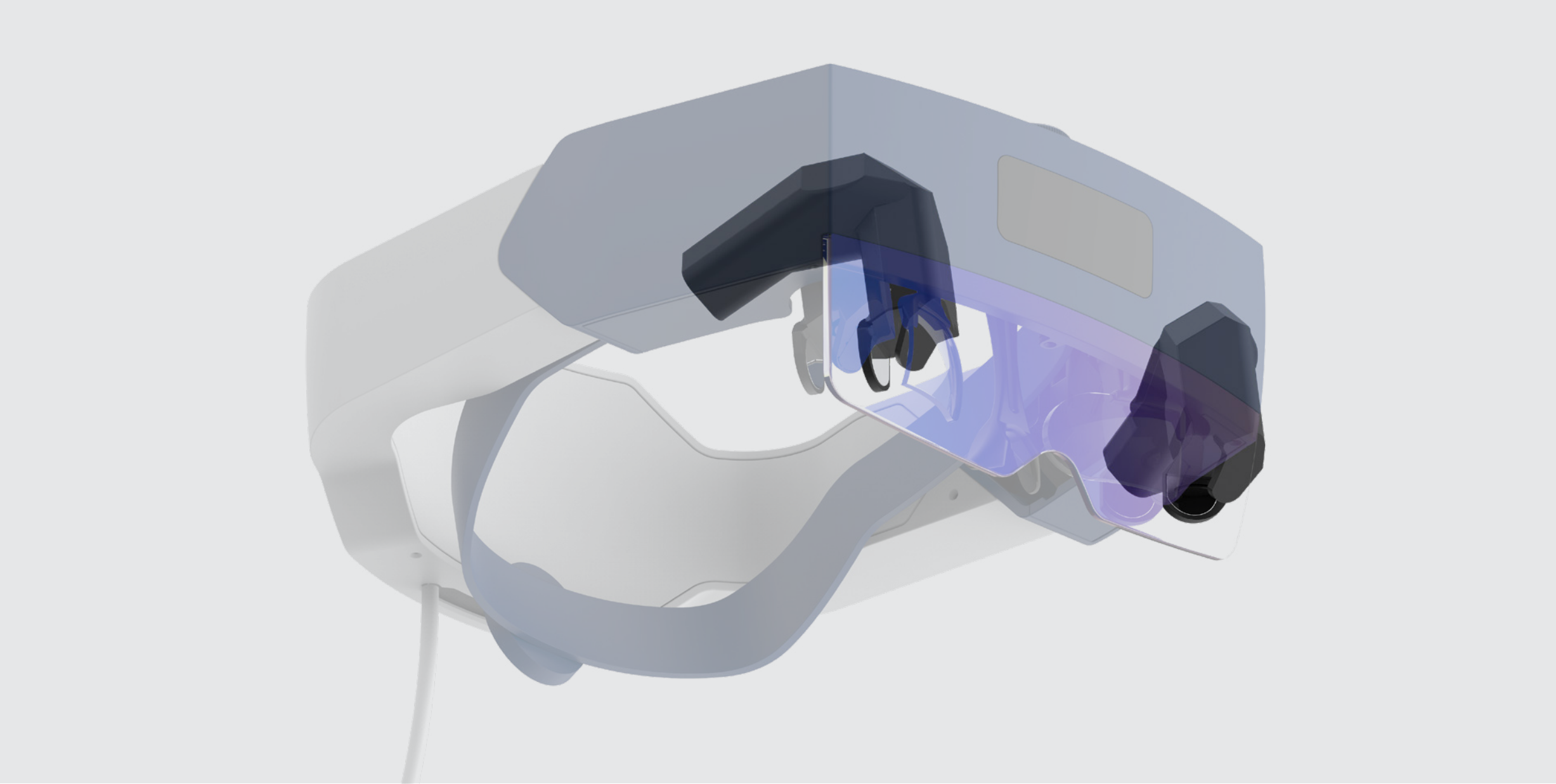
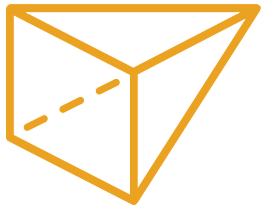
CREAL

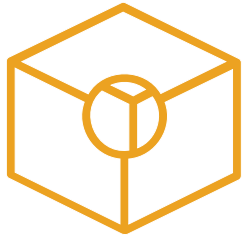
AR WITHIN ARM'S REACH



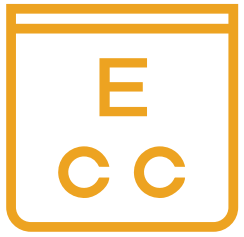
Genuine image depth
offers extended usage without eye-strain or nausea.



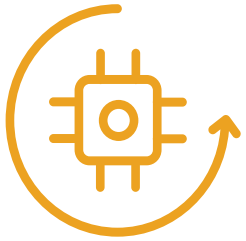
Continuous focus
allows users to focus correctly on virtual objects at any distance, enhancing user interaction.



High spatial resolution
offers a truly immersive experience with retinal resolution imagery.



Adaptive prescription
offers users a tailor-made experience matching their visual needs.



Computational efficiency
allows real-time light-field rendering on mobile platform.

No eye-tracking required
enables a simple and robust system architecture.

	Digital light-field (sequential) CREAL	Holography	Classical light-field (spatial)	Multiple depth planes	Varifocal element
Genuine image depth	Yes	Yes	Yes	No	No
Continuous focus (planes)	Unlimited[1]	Unlimited[1]	> 10	2 - 4	> 100
Spatial resolution	High	Medium	Low[2]	High	High
Adaptive prescription	Yes	Yes	Yes[3]	Only SHY	Only SHY
Computational efficiency	High	Very low	Medium[4]	High	High
Eye-tracking required	No	No	No	No	Yes
Hardware complexity	Low	High	Medium	Low	Low

[1] Resolution is finite, however much higher than an eye can resolve
[2] To achieve high spatial resolution would require HD microdisplay (8K and above)
[3] Only in small range
[4] Computational efficiency is usually limited by the image data transfer bandwidth

Per eye	Today	Target 2023
Angular resolution at infinity	20 px/°	45 px/° (MTF 60 px/°)
Modulator resolution	1 Mpix	1 Mpix
Depth resolution	Continuous	Continuous
FoV (diagonal)	55°	Light-field: 30° (Flat periphery: 60°)[1]
Effective eyebox (exit pupil)	11 mm (4 mm)	11 mm (4 mm)
Eye relief	27 ± 3 mm	20 ± 3 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
Brightness	300 nits	2000 nits

Per eye	Today	Target 2023
Contrast	1 000/1	1 000/1
Combiner type	Curved semi-reflective	Holographic, presecription compatible
Transparency	30%	> 80%
Power consumption	3800 mW	800 mW
- light source and driver	500 + 400 mW	50 + 50 mW (@500 nits)
- modulator and driver	600 + 1600 mW	200 + 500 mW
Module volume (l.-f. engine)	60 cm^3	10 cm^3
Module weight (l.-f. engine)	81 g	32 g
Spatial tracking	Intel Real Sense T265	Custom
Hand-tracking	Ultraleap	Ultraleap

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

Vydar
Rhodum
Mass
4.9E+09 [Kg]
Rotation period
24 [h]
Temperature
5000 [°K]
Composition
Silicates, water
Climate
Tropical

Vydar
Rhodum
Ukros
Uremis

Eye focus

0.3 M

Eye focus

0.5 M

Eye focus

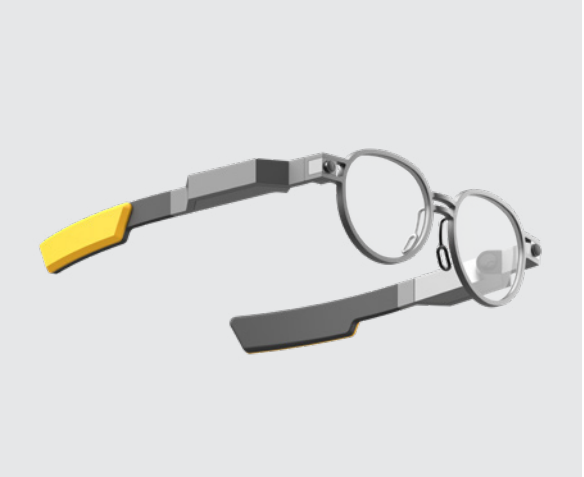
3 M

Q1 2020

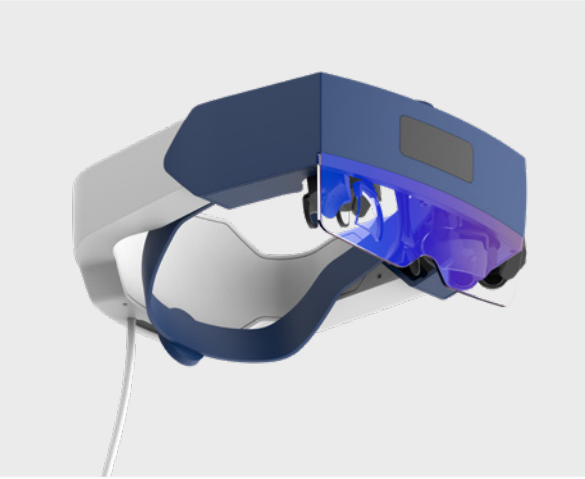
Q1 2021

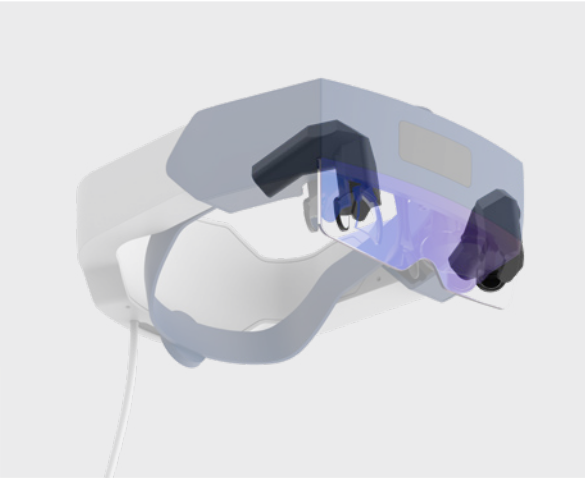
2023

2025+



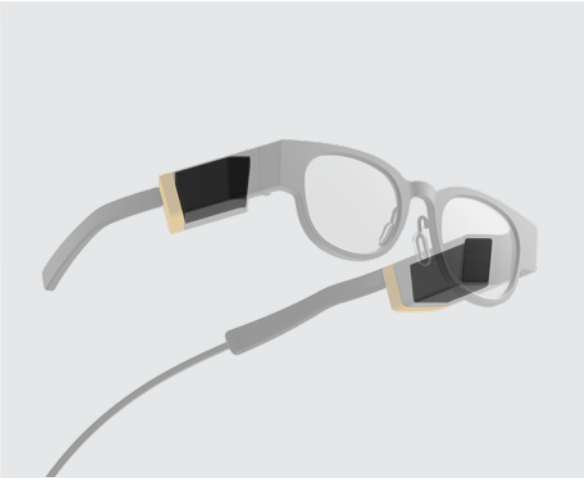
Q1 2021



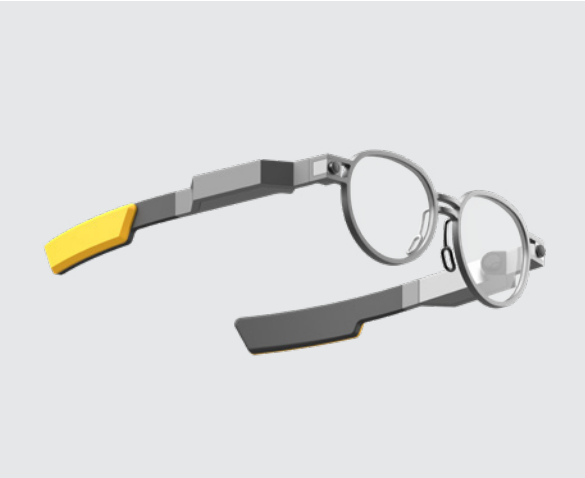


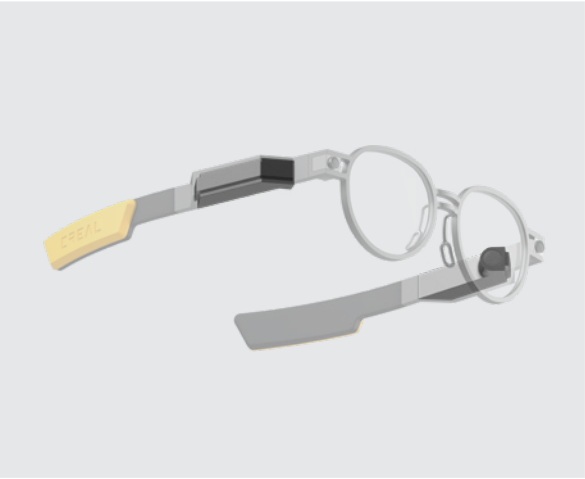
Full evaluation kit and optical engine available today

2023



2025+



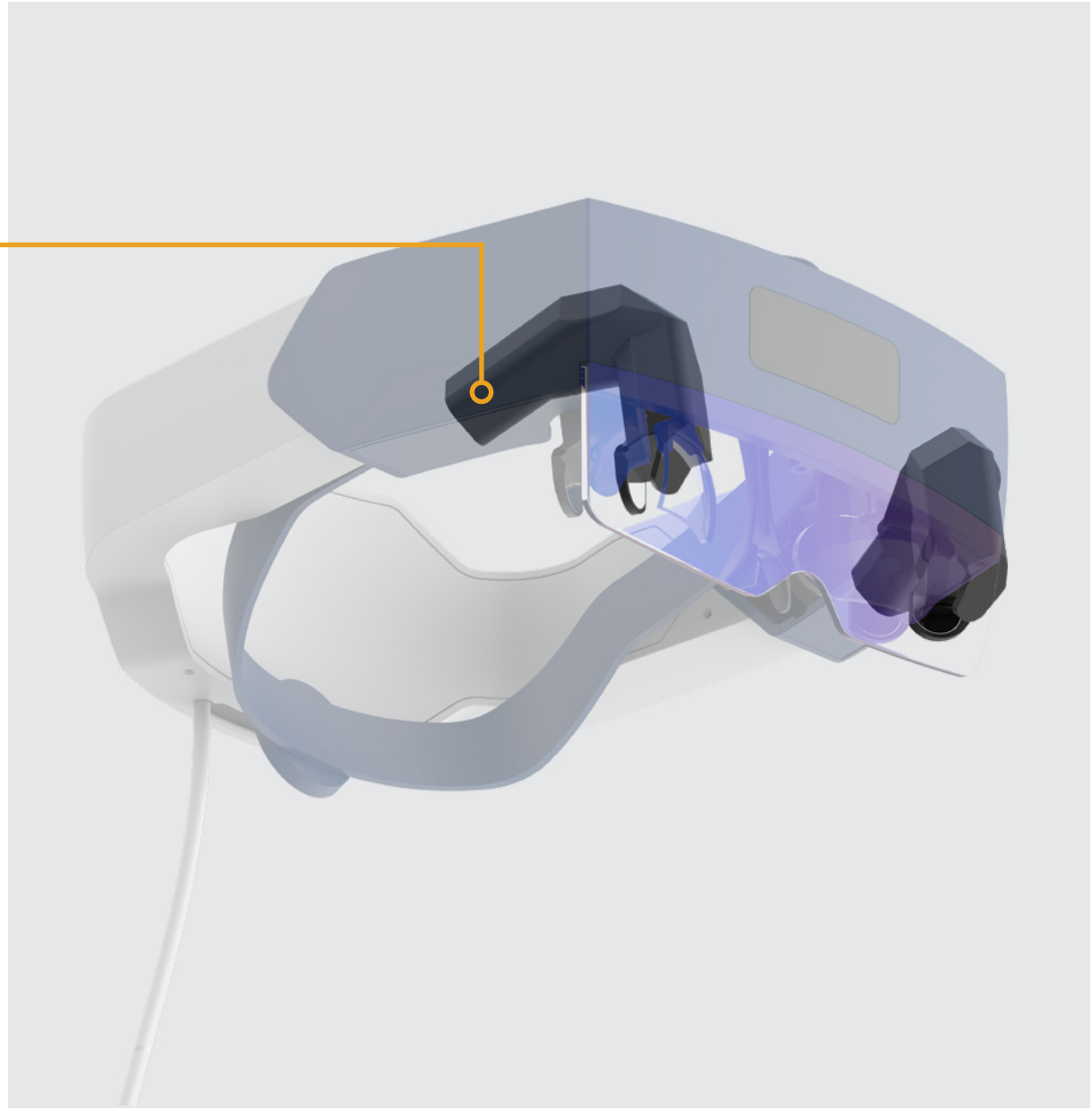


+ Complete light-field optical engine solution

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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