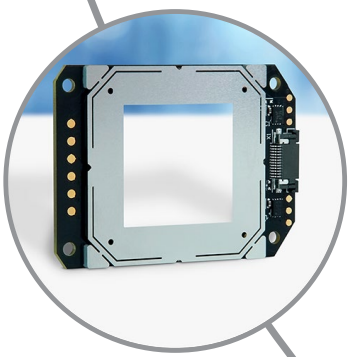
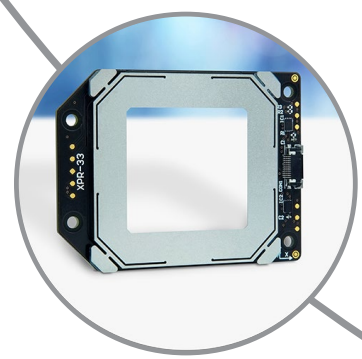
Beam shifting

XPR-Series

Optotune’s XPRs are Extended Pixel Resolution 2- and 4-position actuators. By acurately tilting a glass window, light that passes through it is shifted laterally. In projection & imaging systems, this allows for increasing resolution by a factor of 2 or 4.





optotune

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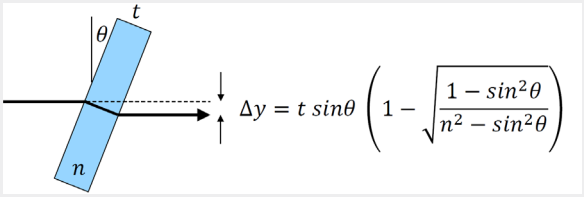
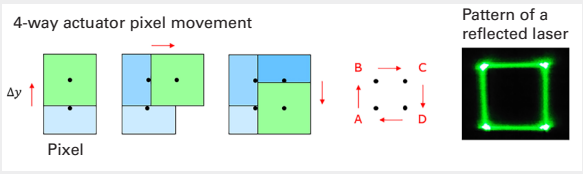
Pixel shifting for resolution enhancement

High native resolution can be costly, in particular when pixels need to be large. This holds true for DMD and micro-LED displays or thermal and high sensitivity CCD or CMOS sensors. Optotune's Pixel Shifters are an affordable and elegant way to double or quadruple resolution. Only a few milimeters thin, they can be placed between display/sensor and the projection/imaging optics.





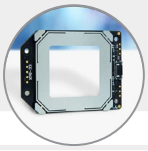
Optotune's XPRs are ideally controlled by a bi-direction linear or PWM current source.

Advantages

> Compact, light-weight
> Fast transition times
> Low accoustic noise
> Fully pre-calibrated up to 75°C
> Lower cost than higher native resolution

Applications

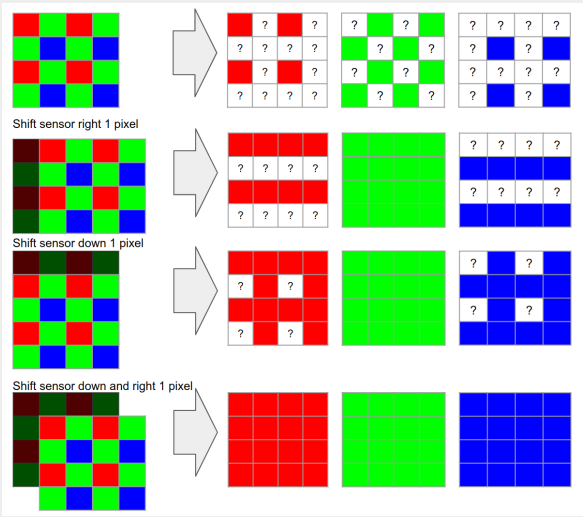
> Projectors & Laser TV
> Cameras (visible & thermal)
> 3D printers
> Head-up displays (HUDs)
> Optical fiber-couplers



Key specifications	XPR-9-2P	XPR-20	XPR-33
Clear aperture	8.35 x 4.4 mm	20 x 20 mm	32 x 30 mm
Size (width x height x depth)	19 x 10 x 1.5 mm	47 x 35 x 3.3 mm	67 x 50.9 x 4 mm
Positions	2	4	4
Glass thickness	0.7 mm	2.0 mm	2.0 mm
Glass movement full angle	0.909° diagonal	0.225° in x and y	0.317° in x and y
Pixel shift	3.8 µm diagonal	2.7 µm in x and y	3.8 µm in x and y
Transition time	1.0 ms	1.2 ms	1.5 ms
Standard frame rate	50 & 60 Hz	50 & 60 Hz	50 & 60 Hz
Transmission	>98 %	>98 %	>98 %
Power consumption (average)	<0.1 W	<1.5 W	<4 W
Compatible DMD	0.23"	0.47"	0.65"

Color camera enhancement

Pixel shifting is particularly interesting to get the most out of color cameras that use Bayer filters to seperate the RGB colors. By shifting the image a full pixel in X and Y, it is possible to capture the full sensor resolution for each color channel.



For more information, please contact sales@optotune.com