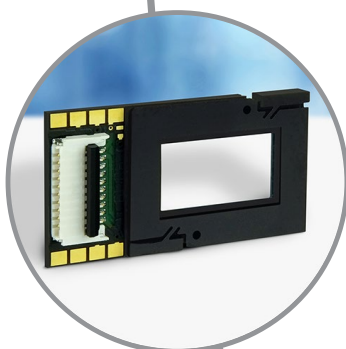


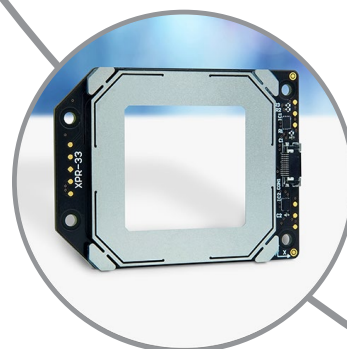
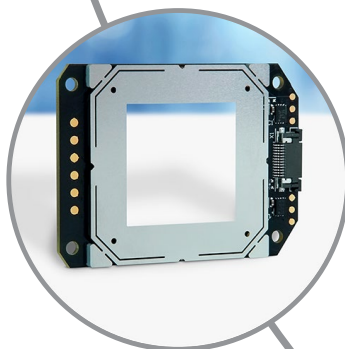


Beam shifting



## XPR-Series

XPRs are Extended Pixel Resolution 2- and 4-position actuators. By accurately 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.



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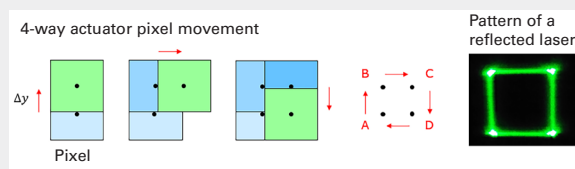
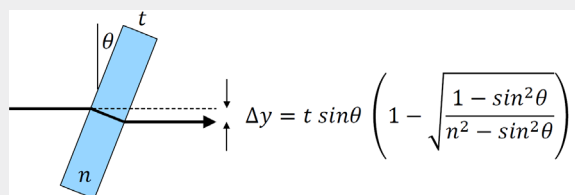
# Pixel shifting for resolution enhancement

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 millimeters 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.

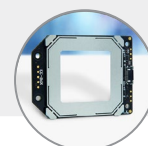
## Advantages

- > Compact, light-weight
- > Fast transition times
- > Low acoustic 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 separate 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.

