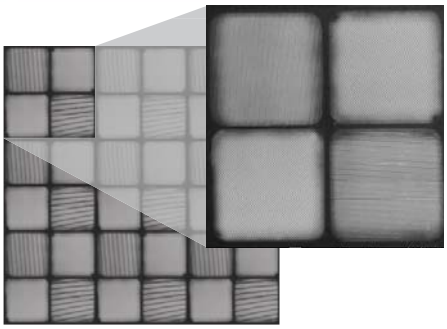
ProFlux
Nanowire® Technology

Pixelated Polarizers

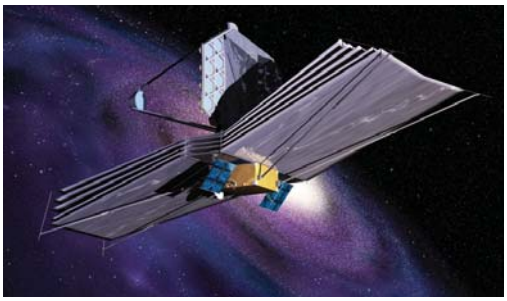
PIX Series Datasheet



Close-up of 4 State Pixelated Polarizer

Applications

- Polarimetry and 3D Cameras
- Biometric facial recognition
- Biological Analysis
  - Cell differentiation
- Polarization Microscopy
- Polarized Fiber-optic Probes
- Remote Sensing
- Target discrimination
- Interferometry
- Pollution Detection



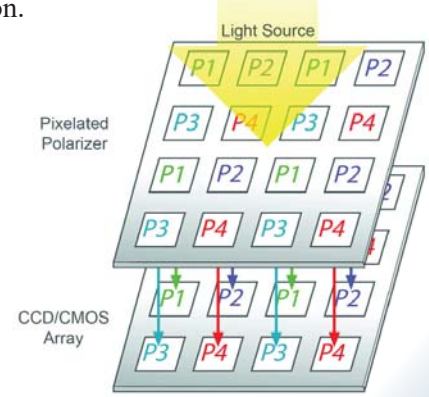
Courtesy ESA. To meet the extreme polishing and surface requirements of the James Webb Telescope, a new interferometer was developed with advanced, state-of–the-art defining capabilities using Moxtek's pixelated polarizer technology.

Pixelated polarizers enable real-time, clear imaging when speed and resolution is critical. Pixelated polarizers are designed using Moxtek® Nanowire® Technology and are available as two, three and four-state devices in both visible and IR wavelengths. Customizable pixel pitches are available for specific CCD/CMOS sensor arrays. In addition, thermal imaging combined with polarization provides enhanced imaging for target identification, facial recognition, and identification of oil on water.

Features	Benefits
Nanowire® Technology	Brightness and contrast uniformity
	>20˚ half angle without performance loss
	Wavelength and AOI independent
	UV and IR wavelengths
Pixelation	User defined geometries
	Low cross-talk
	Accurate registration
	Allows for single camera systems

Direct Pixel-to-Pixel Overlay

Pixelated polarizers are designed to align with CCD/CMOS camera arrays. Pixelated polarization enables real-time 3D imaging without the camera image overlay difficulty. Traditional 3D imaging. requires two images be taken with different polarizations and two cameras precisely aligned to each other. The resulting image data must then be carefully overlaid and aligned which requires added time, equipment, space, and precision.

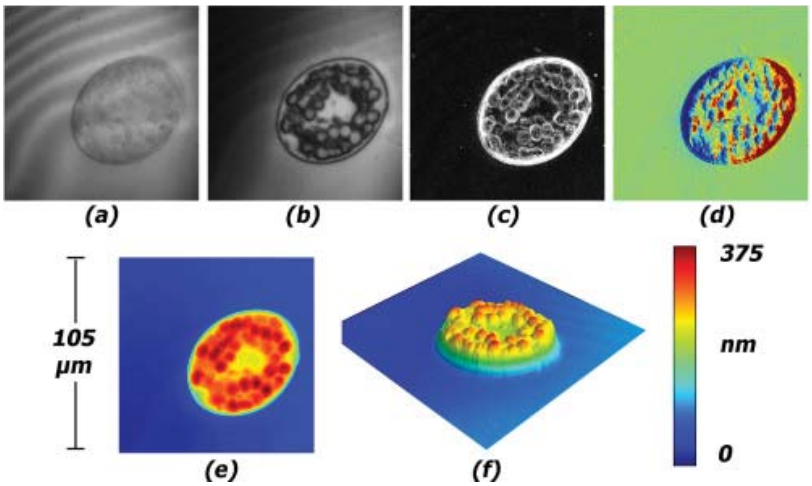


General Specifications		
Substrate Materials	Display Grade Glass	Silicon (for MW and LWIR)
Transmission	>80% @ 550nm at pixel center	Based on pixel size
Contrast Ratio	>200:1 @ 633nm at pixel center	Based on pixel size
Bandwidth	350nm to 3µm	3 to 15µm (based on AR coating design)
AR Coating	Visible spectrum	Custom engineered for application
Substrate Thickness	0.7mm ± 0.07	0.675 ± 0.095 mm
Index of Refraction	435.8nm: 1.5198	10.33nm: 3.421
	643.8nm: 1.5078	4.132nm: 3.427
Thermal Expansion	31.7 x 10-7/˚C (0-300˚C)	2.6 x 10-6/˚C
RoHS	Compliant	Compliant

MOXTEK®

Application Example of Dynamic Quantitative Phase Imaging

The pixelated phase mask sensor enables a number of different types of images to be obtained simultaneously as illustrated in images of a protozoa in the figure below.



Images of a protozoa determined from pixelated phase data. (a) Brightfield (irradiance/intensity). (b) Phase contrast (interference – a single interferogram). (c) Phase gradient magnitudes (simulated dark field). (d) Simulated DIC (x gradient). (e) Pseudo-colored optical thickness (from phase). (f) 3D optical thickness (from phase).

Dynamic quantitative phase imaging for biological objects using a pixelated phase mask, Biomedical Optics Express, Vol. 3, Issue 11, pp. 2866-2880 (2012)

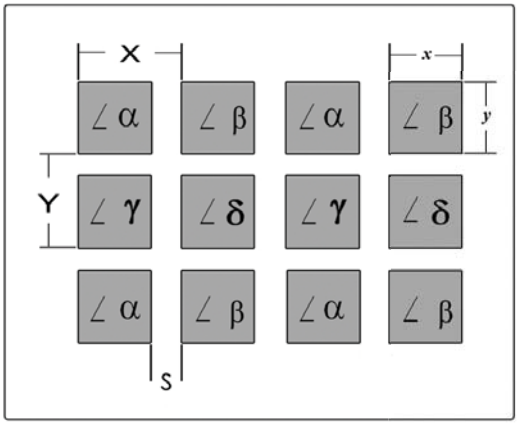
Standard Dimensional Specifications

Pixel Pitch (X, Y): 9.0μm, 8.0, 7.4μm standard, custom pitches available

Feature Dimensions(x, y): Pixel aperture dimensions (typical pitch: -1μm)

Feature Spacing (S): ≥1μm

Max Number of Polarization Axes: 4 angle (α, β, γ, and δ) line scan row arrangement available also



MOXTEK®
452 West 1260 North / Orem, UT 84057
Phone 801.225.0930 / Fax 801.221.1121
www.moxtek.com
info@Moxtek.com