

From Left to right: 3K-DM, 4K-DM, 2K-DM

The +K-DM Family: High spatial-resolution wavefront correctors for 'Next Generation' applications in astronomy and laser communications.

Boston Micromachines Corporation is the industry leader in high actuator-count MEMS deformable mirror technology. These mirrors are fielded at prominent astronomical facilities around the world to improve wavefront correction capabilities, enabling cutting edge science.

The 4K-DM is installed on the Gemini Planet Imager instrument and the 2K-DM is included in the design of multiple space telescope concepts. Also, the 2K-DM is installed as an enabling component in the Subaru Coronagraph Extreme Adaptive Optics (SCEAO) Instrument and the experimental coronagraphic extreme adaptive optics system at the Magellan telescope (MagAO-X). Both have been observing on-sky continuously for years.

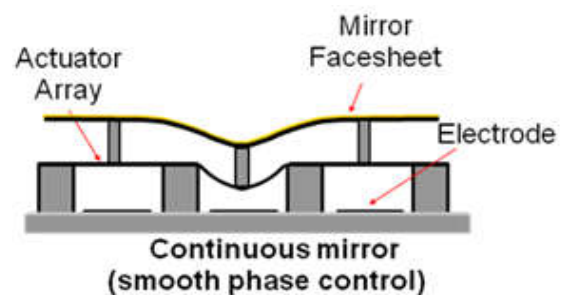
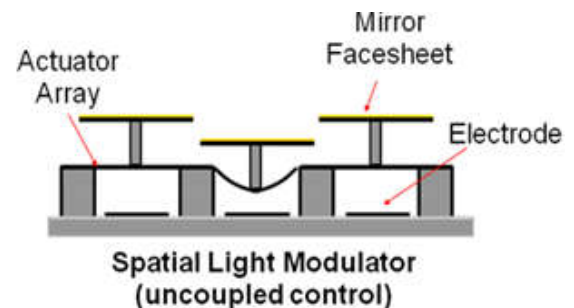
Driver Specifications:

- DIO interface: SFP fiber link (2.5 Gbps)
- 14 bit step resolution
- Frame Rate: 20 kHz
- Dimensions: 5.25" x 19" x 14" (3U Chassis)

MEMS Deformable Mirrors

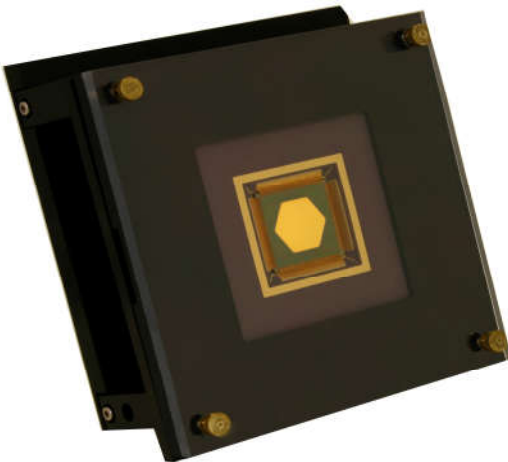
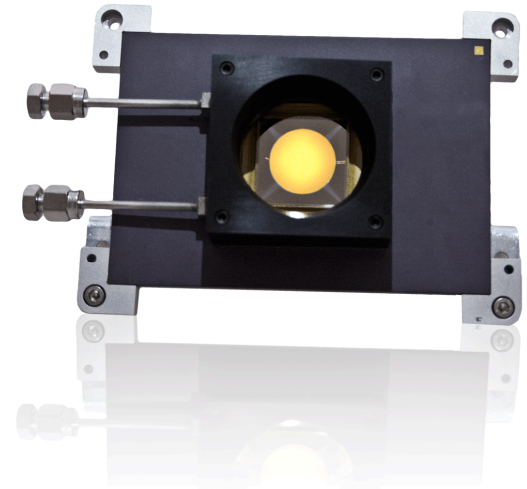
MEMS deformable mirrors are the most commonly used architecture in many AO applications given their versatility, maturity of technology, and the high resolution wavefront correction capabilities with sub-nm step size. Using advanced manufacturing technology, MEMS DMs' performance strengths are inherent to micromachining:

1. Large arrays create high resolution wavefront correction.
2. Advanced microstructures allow minimal influence between adjacent actuators for high spatial frequency surfaces
3. Optimized design enables rapid wavefront shaping for high speed applications.



2K DM Specifications

- Continuous or segmented surface
- 2048 actuators
- 50 actuators across the aperture
- Active Aperture: 20mm
- 1.5 μ m, 3.5 μ m stroke
- Approx. Mechanical Response Time (10%-90%) < 75 μ s
- Approx. Interactuator Coupling (\pm 5%): 15%



3K (or 1021 Hex-TTP) DM Specifications

Continuous/Segmented

- 3063 Actuators
- 62 actuators across the aperture
- Active Aperture: 18.6mm
- 1.5 μ m stroke
- Approx. Mechanical Response Time (10%-90%) < 75 μ s
- Approx. Interactuator Coupling (\pm 5%): 15%

Hex TTP

- 1021 hexagonal segment
- 19 rings of hexagonal segments
- Active Aperture: 21.1mm

4K DM Specifications

- Continuous surface
- 4092 actuators
- 64 actuators across the aperture
- Active Aperture: 25mm
- 3.5 μ m stroke
- Approx. Mechanical Response Time (10%-90%) < 100 μ s
- Approx. Interactuator Coupling (\pm 5%): 13%

