

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 leading the industry 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 currently being installed on the Gemini Planet Imager instrument and our 3K-DM is included in the design for multiple space telescope concepts. Finally, the 2K-DM is currently installed as an enabling component in the Subaru Coronagraph Extreme Adaptive Optics (SCEAO) Instrument and has been on-sky multiple times.

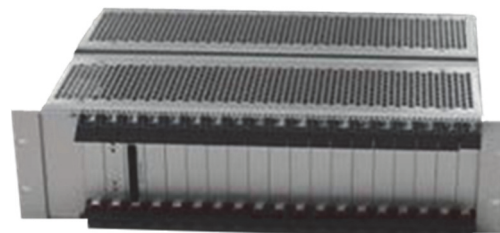
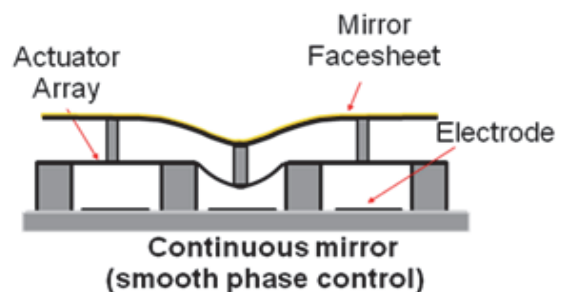
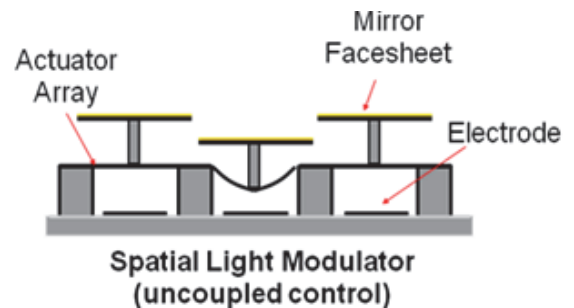
Driver Specifications:

- 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

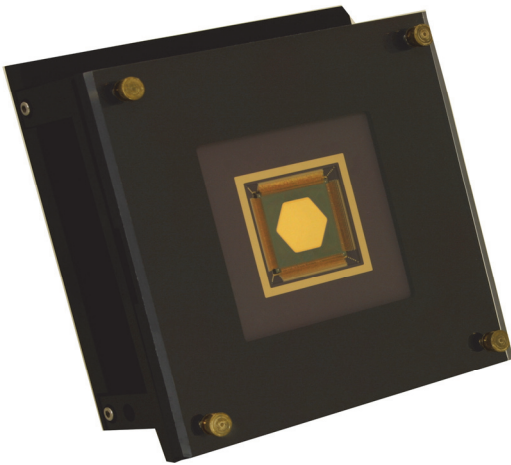
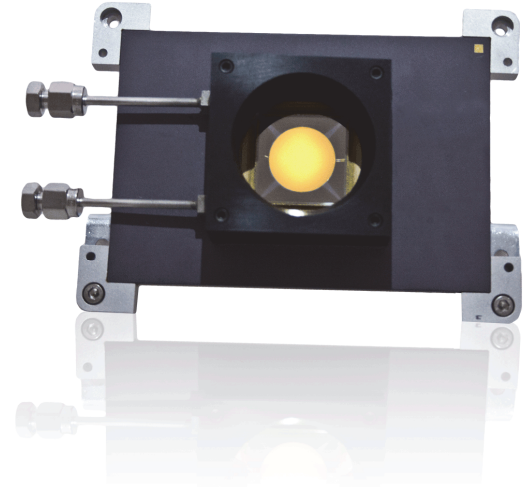
MEMS deformable mirrors are the most commonly used architecture in many AO applications given their versatility, maturity of technology, and the high resolution wavefront correction capabilities with sub-nm step size. Using advanced, inexpensive manufacturing technology, MEMS DMs' performance strengths 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 available
- Approx. Mechanical Response Time (10%-90%) < 75 μ s
- Approx. Interactuator Coupling (\pm 5%): 15%



3K (or 1021 Hex-TTP) DM Specifications

| Continuous/Segmented | Hex TTP |
|---|---|
| <ul style="list-style-type: none"> • 3063 Actuators • 62 actuators across the aperture • Active Aperture: 18.6mm • 1.5μm stroke • Approx. Mechanical Response Time (10%-90%) < 75μs • Approx. Interactuator Coupling (\pm5%): 15% | <ul style="list-style-type: none"> • 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%

