

DELTA 7

TRANSMISSIVE WAVEFRONT MODULATOR



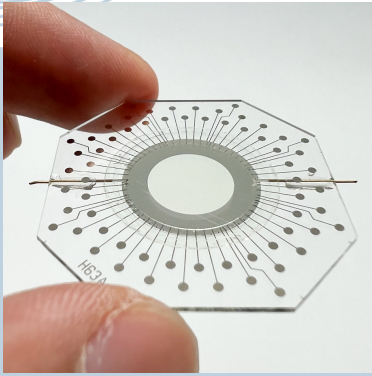
KEY FEATURES

- **Complex wavefront modulation**
63 electrodes enabling replication of up to the 7th radial order of Zernike polynomials (>35 modes) with high fidelity
- **Straightforward system integration**
Compact housing compatible with standard 30 mm cage systems by rods, lens tubes, and post assemblies
- **Linear & hysteresis-free response**
Electrostatic actuation suited for open-loop wavefront control
- **Remarkable optical quality**
Active best flat with an induced RMS wavefront error of less than $\lambda/40$
- **Polarization-independent**
Wavefront modulation independent of the light polarization for maximized efficiency



TECHNOLOGY

The Delta 7 is based on the Deformable Phase Plate (DPP) technology, exclusively developed by Phaseform GmbH. DPP is composed of a fluidic chamber, enclosed by a thin membrane, which is deformed by electrostatic force. The force is generated by a 2D array of transparent electrodes embedded within the optical aperture of the DPP. The sophisticated optofluidic design of the DPP enables gravity-neutral performance for orientation-independent, high-quality wavefront modulation.



GENERAL SPECIFICATIONS

Modulator type	Optofluidic DPP (Deformable Phase Plate), electrostatically actuated
Clear aperture diameter	10 mm
Number of actuators	63
Number of actuators across aperture diameter	7
Connectivity	USB 2.0
Operating system	Windows, Linux, and macOS
Driving software	SDK and GUI available in Python. Wrapper to execute Python functions in Matlab.
Included in the Delta 7 package	Driving electronics, control software, cables, manual

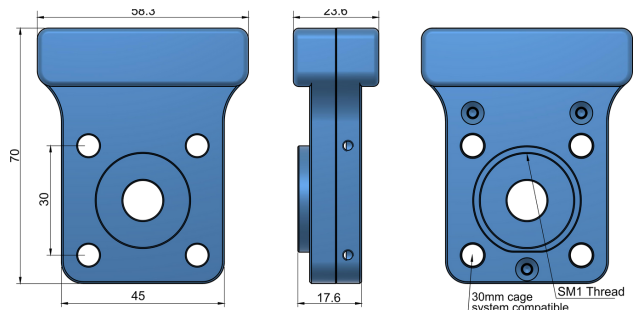
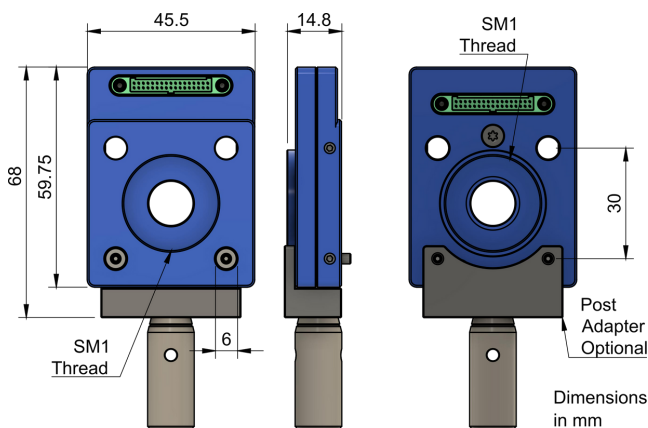
OPTICAL SPECIFICATIONS

Wavefront RMS error of best flat	< 15 nm (orientation independent)
Maximum peak-to-valley of the generated wavefronts	> 8 μm
Maximum spatial frequency of the correction	7th radial order of Zernike modes
Optical transmission (VIS-NIR version)	425 nm - 2200 nm 75% at $\lambda=800$ nm (no AR coatings applied)
Laser Induced Damage Threshold (LIDT)	10 W/cm ² for 10s @ 1070nm CW
Nominal operation laser power	Factory calibrated for < 100 mW CW (over full optical aperture)

MECHANICAL SPECIFICATIONS

Thickness (within clear aperture)	0.87 mm
Response time (best flat to maximum deformation)	< 55 ms
Hysteresis	< 1 %
Linearity	> 92 %
Mounting compatibility	30 mm cage system rods, SM1 tubing, and $\varnothing=1/2"$ post
Connector cable length	1.5 m, optional: 0.3 m

HOUSING MECHANICAL DRAWINGS



(New version coming soon...)

ELECTRICAL SPECIFICATIONS

Actuator voltage	up to 300 V DC
Maximum power consumption	< 9 W
Power supply	120/230 VAC, 2.5 phono plug (included)

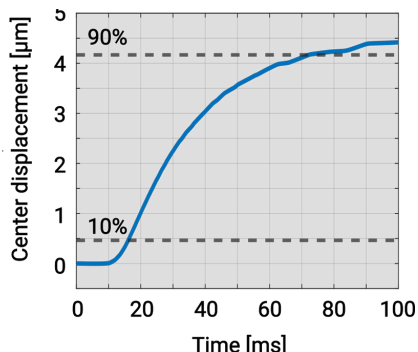
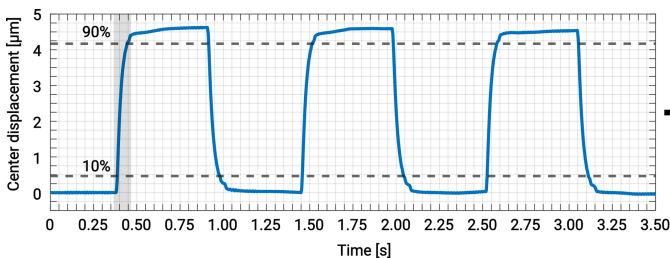
THERMAL SPECIFICATIONS

Storage temperature	10 °C to 35 °C
Operating temperature	20 °C to 25 °C

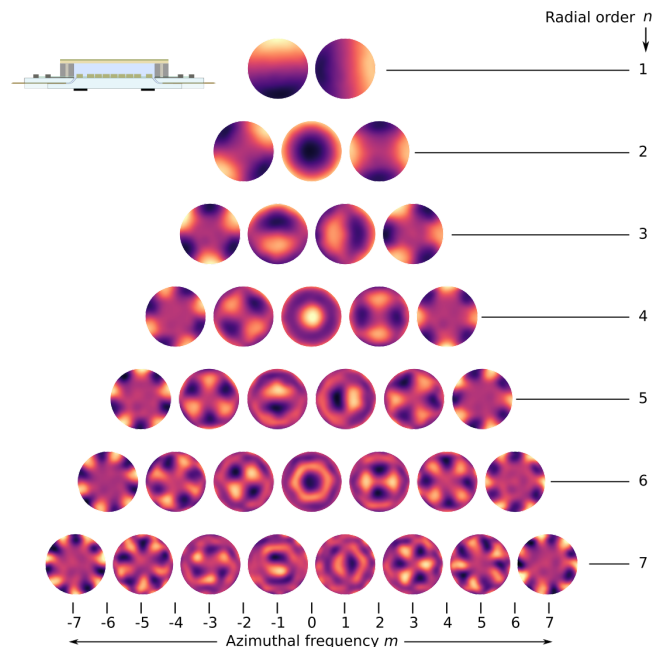
PEAK TO VALLEY OF THE GENERATED ZERNIKE MODES (OPTICAL PATH DIFFERENCES IN μm)

Z (1,-1)	8.0	Z (4,-4)	2.0	Z (5,3)	1.1	Z (7,-7)	0.7
Z (1,1)	8.0	Z (4,-2)	1.8	Z (5,5)	1.3	Z (7,-5)	0.6
Z (2,-2)	5.1	Z (4,0)	1.5	Z (6,-6)	1.0	Z (7,-3)	0.5
Z (2,0)	5.0	Z (4,2)	1.8	Z (6,-4)	0.9	Z (7,-1)	0.5
Z (2,2)	5.1	Z (4,4)	2.0	Z (6,-2)	0.9	Z (7,1)	0.5
Z (3,-3)	3.6	Z (5,-5)	1.3	Z (6,0)	0.7	Z (7,3)	0.5
Z (3,-1)	3.0	Z (5,-3)	1.1	Z (6,2)	0.9	Z (7,5)	0.6
Z (3,1)	3.0	Z (5,-1)	1.1	Z (6,4)	0.9	Z (7,7)	0.7
Z (3,3)	3.6	Z (5,1)	1.1	Z (6,6)	1.0		

RESPONSE TIME



REPRODUCED ZERNIKES



(Simulation model in OpticStudio ZEMAX is available)

DISCLAIMER

All specifications are preliminary and subject to change without further notice. No representation or warranty, either expressed or implied, is made as to the reliability, completeness, or accuracy of this specification sheet.

FURTHER INFORMATION

Phaseform GmbH Georges-Köhler-Allee 302
D-79110 Freiburg i.B., Germany

Email: info@phaseform.com
Web: www.phaseform.com
Phone: +49 761 6007 9018

For more information visit our website and send us an email to request a live demonstration.