Spatial Light Modulator – 1536 x 1536

Custom designed for high-speed neuroscience applications

Pixel Count:	1536 x 1536	**Fill Factor:**	96%
Array Size:	30.7 mm x 30.7 mm	**Maximum GS Hologram Frame Rate at 1064 nm:**	600 fps
Pixel Pitch:	20 µm x 20 µm	(1000 fps available at reduced efficiency)	
Pixel Voltage:	12 V	**Trigger Response for On-board Holograms:**	6 µs latency / 3 – 9 µs jitter

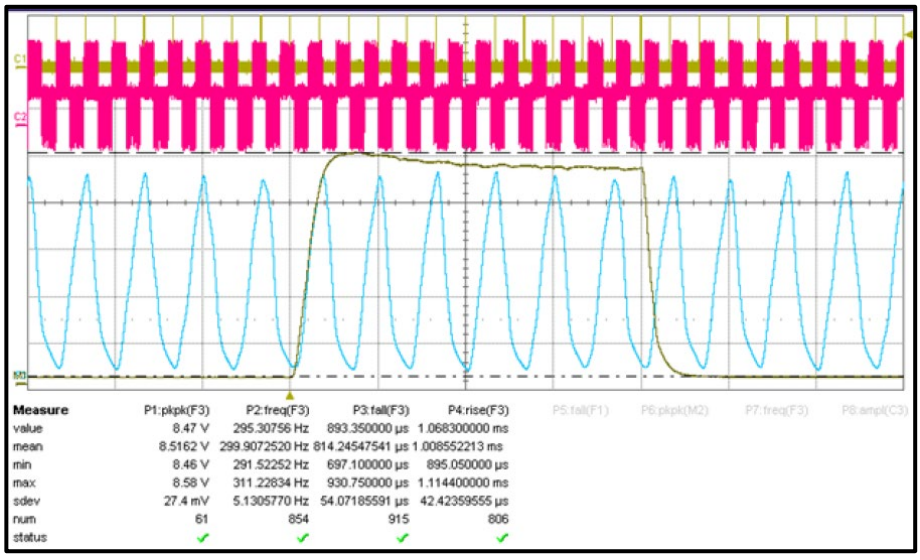
The High-Speed 1536 x 1536 Spatial Light Modulator (SLM), combining high pixel count and high frame rate with efficient diffraction. By building on success with other models, the 1536 x 1536 SLM leverages the same pixel design in a reduced array size format for even faster addressing.

The 1536 x 1536 SLM is built for speed. It uses large high-voltage, high-capacitance pixels which are essential for increasing switching speed. These factors also serves to reduce fringing field effects and phase ripple to improve photostimulation efficiency, especially at large diffraction angles. To optimize performance, the entire SLM head is thermally controlled for operation at elevated temperatures.

The SLM drive electronics receive 8-bit 1536 x 1536 phase masks from the host computer over a 16-bit PCIe pipeline for fast transfer rates. For further speed enhancement, a library of up to 2,045 user-specified phase masks can be stored on the driver board and then selected in any sequence using on-board OverdrivePlus transition calculation.

These capabilities work together to provide hologram-to-hologram frames rates of up to 600 fps at 89% of steady-state diffraction efficiency. Frame rates of up to 1,000 fps have been demonstrated with commensurate decreases in diffraction efficiency.

Fast Hologram-to-Hologram Operation



Blue = 600 fps; Gold = 100 fps