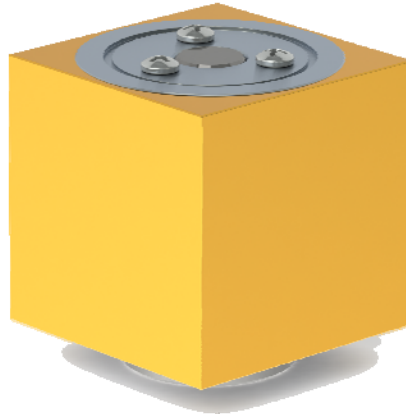


MIM™ Motor In Mirror LIDAR Scanner for AVs



Large aperture in compact size

Autonomous Vehicles require long range, high resolution LIDAR at highway speeds for navigation and collision avoidance. This requires a large aperture and high speed scanning. Polygon scanners meet all these requirements but a large aperture polygon scanner might not fit in a compact LIDAR system.

MIM™ scanners are the solution. MIM stands for 'Motor In Mirror'. This unique MIM scanner design has a very low profile by building the compact, precision scanning motor inside a hollow, precision polygon mirror. A four sided MIM scanner can scan 120 degrees wide in front of the vehicle. The mirror aperture is large enough to see hundreds of meters ahead of the vehicle. Depending on the configuration, scan rates in the KHz range are possible with very low power consumption.

MIM scanners are rugged for motor vehicle use. Scanning is not upset by shock and vibration. Wide temperature swings do not affect performance. Start Of Scan detection provides highly accurate beam positioning.

The MIM scanner design is scalable for a wide range of aperture sizes, scan angles and scan rates.

MIM™ Motor in Mirror

(General specs for typical mirror sizes.)

Speed: 1,000 – 10,000 RPM

Speed control: TTL Ext freq reference

Rotation: CW standard

Facet Flatness: $\lambda/6$ @ 633 nm per inch

Surface Roughness: < 70Å RMS

Surface quality: 60/40

Dynamic track: < 45 arc sec

Facet-Facet: < 45 arc sec total

Facet-Datum < 30 arc sec total

Jitter: < 0.03%

Speed stability: < 0.03%

Bearing: Ball bearing

Operating attitude: Any

Supply Voltage: 12-24 VDC

Run Current: < 1.0 A

Time to speed: < 30 sec

Motor-Controller cable: TBD

Controller Power-I/O cable: TBD

Controller: 3 phase BDC

Start/Stop control: TTL

Speed @ sync signal: TTL

Speed PLL locked to external reference

Temperature -40C to +105C

MIRRORS

Facets: Any number

Scan angle: Depends on facet count

Four facets could give 120 degrees

Up to 360 degrees by illuminating multiple facets

Coating: for IR

Aspect ratio: 1:1 to 2:1 diameter/height typical

SPECS SUBJECT TO CUSTOMER REQUIREMENTS

MIM scanners are made to OEM specifications for volume applications.

OPTIONAL START OF SCAN DETECTION

An SOS detector is required to achieve accurate line to line registration with any polygon scanner. It is used to synchronize a CW or pulsed laser to the scanner. (Galvo scanners need absolute encoders, polygon scanners need Start-Of-Scan detection.) Read more about it here:

<http://precisionlaserscanning.com/start-of-scan-sos-detection-for-polygon-scan-heads/>



The PRECISION SOS DETECTOR™ is the first commercially available Start-Of-Scan detector made for the challenging environment inside a high power Polygon Scan Head. It is designed to work with the PRECISION SOS LASER DIODE MODULE™