



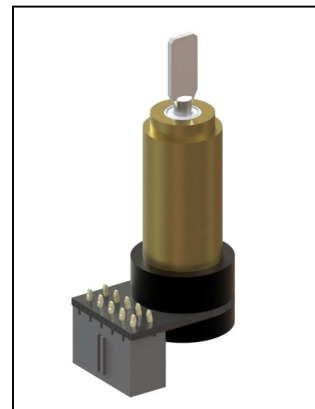
Saturn 1 Optical Scanner r 1mm - 3mm apertures

APPLICATIONS

- Laser entertainment (light show) displays
- Small-beam Tomography and Microscopy
- Optical Layout Templates
- Raster Image Projection

UNIQUE ScannerMAX FEATURES

- Stronger magnetic field
- Stronger rotor and shafts
- Stronger, integrated back-supporting mirror mount
- Stronger SV30/silicon dioxide ceramic hybrid bearings
- Stronger position feedback with low noise
- Cooler-running motor magnetic design



BENEFITS

- Highest-speed small-mirror positioning
- Wide-angle scanning, up to 80 degrees optical
- Convenient package size, compatible with many existing X-Y mounts
- Low coil resistance for low heat generation during scanning
- Low thermal resistance for enhanced heat removal
- Low wobble and jitter

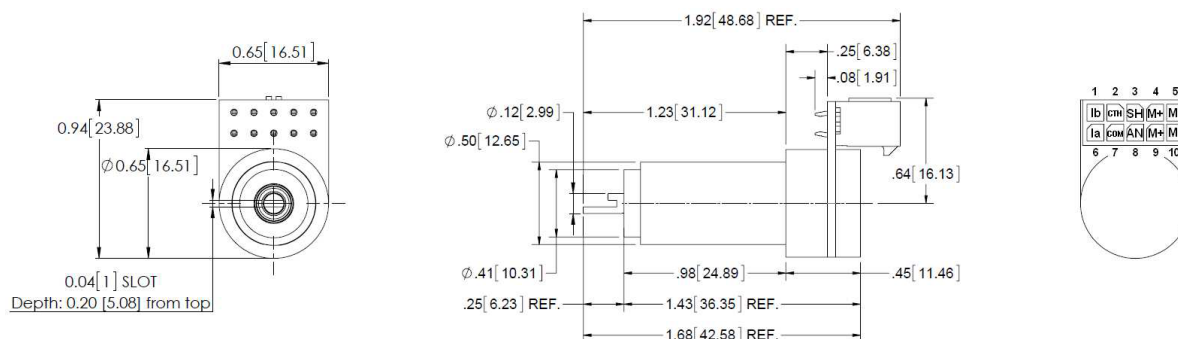
GENERAL DESCRIPTION

The Saturn 1 optical scanner is specifically designed to achieve the highest acceleration and RMS duty cycle of any motor-driven-mirror in the 1mm to 3mm aperture range. Applications include laser entertainment displays and small-beam galvanometer-based raster imaging.

Due to the very-small-diameter moving magnet and the use of special rotor materials, the Saturn 1 boasts the highest torque-constant-to-inertia ratio of any moving magnet galvanometer scanner available, as well as a motor-constant-to-inertia ratio that is more than 60% greater than competitive galvanometers having twice the rotor inertia. The Saturn 1 rotor construction along with the ScannerMAX X3 magnetic circuit allow this scanner to achieve scanning speeds of ILDA 60K / 5kHz small signal bandwidth with far less drive power and heat generation than ever before. Speeds exceeding ILDA 90K / 7.5kHz small signal bandwidth have also been demonstrated in public.

The Saturn 1 incorporates all of the other design features of other ScannerMAX Saturn-family scanners, including a half-inch round body diameter, back-supporting mirror mount design, and high-output, low-noise position detector.

OUTLINE DRAWING



PRELIMINARY SPECIFICATIONS

Optimal Mirror Size	1 – 3	Millimeters, clear aperture
Rotation Angle	+/- 20	Mechanical degrees
Rotor Inertia	0.010	Gram • Centimeters ²
Torque Constant *	18,000	Dyne • Centimeters per Ampere
Maximum Rotor Temperature	110	°C
Thermal Resistance	TBD	°C per Watt
Coil Resistance *	1.8	Ohms
Coil Inductance *	100	µh
Back EMF Voltage *	31.4	µV per degree per second
RMS Current *	TBD	Amperes at Tcase of 50°C, Maximum
Peak Current *	20	Amperes, Maximum
Small Angle Step Response *	75	µS with ScannerMAX 3mm mirror set
PD Linearity over 20 degrees	99.8	% Minimum
PD Linearity over 40 degrees	99.4	% Typical
PD Output Signal (Common Mode)	900	µA with LED current of 60mA
PD Output Signal (Differential Mode)	60	µA per degree, with LED current of 60mA
Mass	26	Grams

* The Saturn 1 can easily be fabricated with alternative coil configurations, thus achieving different specifications.

* Please contact us if you have different coil resistance, inductance, torque, current or connector requirements.

Specifications are at a temperature of 25° C. All mechanical and electrical specifications are +/-10%.

MORE INFORMATION

More information about the Saturn series of optical scanners, including additional application hints and tips can be found at www.ScannerMAX.com.

In addition, OEMs are strongly encouraged to work with us to make sure that the most appropriate scanner is chosen and designed-in.

PATENT AND TRADEMARK INFORMATION

US Utility Patent Number: 8,508,726
German Patent (Utility Model) Number: 20 2013 000 369.3
German Patent (Utility Model) Number: 20 2013 003 263.4
German Patent (Utility Model) Number: 20 2014 000 846.9
Chinese Application for Invention No. 2013101285865
Chinese Application for Invention No. 2013101515443
Chinese Utility Model No. 201420102156.6
US Patent Application Publication No. 2013/0181549A1
US Patent Application Publication No. 2014/0209729A1
Other US and International Patents Pending.

Saturn 1 and ScannerMAX are trademarks of Pangolin Laser Systems, Inc.

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