



## DESCRIPTION

ATA has been developing and delivering custom high performance Fast Steering Mirrors (FSMs) for ground-based, airborne, and space-qualified applications for over ten years. Our FSMs are used to reduce jitter and provide pointing accuracy in Directed Energy Weapon (DEW) systems, long range Laser Communications (Laser Comm), and other optical imaging and scanning systems. ATA's 12-inch FSM is delivered on a Firm Fixed Price (FFP) contract with a set delivery schedule and no Non-Recurring Engineering (NRE).

## FEATURES

ATA FSMs use silicon carbide, single crystal silicon or metal (aluminum or beryllium) substrates depending on the specific requirements of the application. We can provide mirrors with virtually any coating requirement from basic metal coatings to high reflectivity dielectric coatings designed for HEL applications. ATA's 12" FSM flew operationally on the Airborne Laser (ABL) providing high acceleration ( $>500$  radians/sec<sup>2</sup>), high bandwidth ( $>800$  Hz optical,  $>500$  Hz position), and extremely low jitter ( $<1$   $\mu$ rad, 1-1,000 Hz). All FSMs come with a digital controller.

## BENEFITS

ATA FSMs are competitively priced to reduce program costs. Our mechanism designs are scalable, which eliminates NRE. Different mirror substrates and coatings provide customers the flexibility to tailor their FSM to specific program requirements. High acceleration provides greater torque authority enabling high bandwidth and providing rapid scanning capability. High bandwidth enables accurate jitter rejection from base motion and atmospheric turbulence in tip/tilt.

### **For more information, please contact:**

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## SPECIFICATIONS

OPTICAL	
Mirror Size	12" Circular
Clear Aperture	10" Circular
Mirror Substrate	Silicon Carbide/Single Crystal Silicon
Wavefront Error	$\lambda/20$ RMS Flatness
Reflectivity (%Ravg-avg)	>99.997% (1045-1080 nm)
Absorption	<10 ppm (absolute as measured @ 1064 nm)
PERFORMANCE	
Angular Range (Mechanical)	$\pm 0.46$ deg (8 mrad)
Acceleration	>500 rad/s <sup>2</sup>
Bandwidth (Close Loop - 3 db Point)	800 Hz Optical 500 Hz Position
Jitter (1-1,000 Hz)	<1 $\mu$ rad
Accuracy	<5 $\mu$ rad/mrad
MECHANICAL/ELECTRICAL	
Mechanism Size	15" x 15" x 8"
Mechanism Mass	60 lb
Reactionless	Yes
Digital Controller Size	10" x 10" x 5"
Digital Controller Mass	10 lb
External Command/Status Interface	Ethernet, serial (232, 422), SpaceWire, SPI, CAN
Input Voltage	28 VDC
Peak Power	40 W
Cable Length	<20 ft
ENVIRONMENTAL	
Temperature Range (Operating)	-20 to +50 °C
Humidity (Operating)	0 to 80% (non-condensing)
Vibration (Non-operating)	2.5 g RMS (0-2,000 Hz)
Shock (Non-operating)	20 g (10 msec pulse)

Specifications subject to change without notice.

This product is subject to U.S. Government approval as required in accordance with the U.S. Government Arms Export Control Act, Title 22, U.S.C., Sec 2751, et seq., or Export Administration Act of 1979, as amended, Title 50, U.S.C., Sec 2401, et seq. Disseminate in accordance with provisions of DoD Directive 5230.25.