
Inertial Guidance Test Instrument, Motion Simulator

Three Axis Motion Simulator Model AC3350-140

Modes of Operation

- Absolute Positioning:
0.00001 deg. resolution
- Rate – absolute and relative, excellent instantaneous rate stability
- Track Mode – for real time simulation of complex motion profiles
- Synthesis mode – Sinusoidal motion, command amplitude and frequency
- Local or remote control via touch sensitive operator panel or digital interface
- Analog readout and command with 16 bit resolution



Feature

Large, high torque, direct drive, brushless motors produce high acceleration in all axes. The rigid structural design caters for high bandwidth applications and high fidelity real time motion simulation. The range of environmental simulation can be enhanced with the optionally available gas cooled temperature chamber.

Description

The AC3350-140 Motion Simulator has three degrees-of-freedom. The middle gimbal (Pitch Axis) and inner gimbal (Roll Axis) are closed frames offering high torsional stiffness. The inner gimbal has T-slots to fasten the payload. Since the gimbals are symmetrical about the axis of rotation, the balancing weights can be minimized to compensate for unbalances due to the payload.

Slipping assemblies feature power rings and single shielded signal rings. Signal lines have four brush contacts per ring to avoid micro interruptions, which could corrupt digital signals. A wide variety of slipping capsule designs and wiring schematics are optionally available.

The ACUTROL® Model ACT3000 controls the table. The digital controller has a touch sensitive operator interface and scalable analog input/output interface. Programmable Event Pulses can be used for calibration and synchronization with external computers or test equipment. Optionally, the standard digital interfaces, Ethernet (TCP/IP) and IEEE-488 can be supplemented with real time reflective memory interfaces SCRAMNet or VMIC.

Dimensions

Height, max	2715 mm
Height of outer axis	1890 mm
Width across outer axis	2000 mm
Base, diameter	1000 mm
Payload Size	550 mm cube
T-slots	Sized for M6 bolts

Unit under Test (UUT)

Payload, peak	100kg
Clearance envelope	550mm cube
Electrical lines to UUT	100 lines total: 10 x 20A 90 x 2A

	<u>ROLL, inner axis</u>	<u>PITCH, middle axis</u>	<u>YAW, outer axis</u>
Orthogonality	5 arcsec	5 arcsec	5 arcsec
Wobble	5 arcsec	5 arcsec	5 arcsec
Dynamic Parameters			
Angular freedom	continuous	continuous	continuous
Positioning accuracy	1 arcsec RSS	1 arcsec RSS	1 arcsec RSS
Position resolution	0.00001 deg	0.00001 deg	0.00001 deg
Rate range	+/-800 deg/s	+/-400 deg/s	+/-300 deg/s
Rate resolution (command)	0.00001 deg/s	0.00001 deg/s	0.00001 deg/s
Rate accuracy	0.0010%	0.0010%	0.0010%
Installed torque	930 Nm	2'900Nm	15'000Nm
Inertia no load	2.5kgm ²	45 kgm ²	290 kgm ²
Acceleration, no load	20'000 deg/s ²	3'500 deg/s ²	2'750 deg/s ²
Bandwidth (-3dB)	80Hz	22Hz	40Hz

Options

- Digital interface options are: RS232, SCRAMNet, or VMIC
- Temperature chamber range up to -40°C to +90°C
- Non standard slirings, GPS (HF), MIL1553 ways, Gas
- Special UUT adapters

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