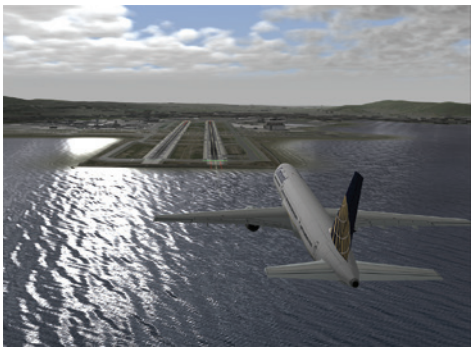
QUANTUM3D
TRAINING. SIMULATION. TECHNOLOGY.

MANTIS | Image Generation Software

Real-Time Scene Management Software supported on a range of platforms from off-the-shelf PCs to advanced multi-channel Independence® Image Generators.

The MANTIS® Advantages

A key tool in the training and simulation market, MANTIS is a module based image generation software platform producing high-fidelity 3D graphics at 60 frames-per-second (FPS) or more, for use in a variety of simulation and training applications. Mantis focuses on providing exceptionally realistic imagery delivered at fixed frame rates to maximize suspension of disbelief. Unique effects and specific features can be created by developers to meet the demands of almost any simulation and training need.



MANTIS' architecture supports an extensive range of features, including the new CDB native support, sensors, weather, and lighting, along with mission functions such as height-above-terrain and line-of-sight intersection testing. Quantum3D's plug-ins extend Mantis to support additional visual effects, such as ocean effects, rotorwash and more.

MANTIS is compatible with Windows or Linux for easy configuration and management, leveraging the industry standard CIGI protocol to interface with the host system.

MANTIS offers advanced visual simulation solutions for multiple applications, including fixed and rotary-wing flight simulation, ground vehicle simulation, tank simulation, maritime simulation, mission rehearsal, sensor simulation and more.

Key Features

- Native support for direct loading of terrain databases in Common Database (CDB) format. Use of CDB provides many advantages, including: interoperability between various components of a complete simulator, and across multiple simulators; reduced, development, update and configuration management times; enhanced reusability; and reduced obsolescence
- Global airports option dynamically inserts almost 30,000 airfields worldwide
- Supports Windows and Linux
- Free version with most features enabled is available
- Industry standard CIGI 2.0, 3.0, 3.2, 3.3 and 4.0 host interface
- Support for up to 16 channels per PC, 64 channels total
- Large area terrain database support
- Moving model support
- Particle effects - user tunable smoke, dust, flames, trails, explosions, tracers and more
- Sensor simulation capability
- Run-time terrain color correction of gain level and saturation. For example, allows simulation of gradual snow build up
- Advanced light points providing fog glow and glare halo effects
- Mission function processing, including Height Above Terrain (HAT), Height of Terrain (HOT), Line of Sight (LOS), volume, segment and power-line collision detection
- Scene load management via LOD scaling and priority culling or dynamic anti-alias level
- Environment and weather-range based haze and fog model; up to three 2D cloud layers; precipitation effects including rain and snow
- Ephemeris model for sun, moon and stars
- Support for geometry distortion correction using EasyBlend™, domeprojection.com or VIOSO AnyBlend tools
- HDR support using either HDR projectors or Shader dithering providing effectively 10 bit per component color depth greatly enhancing dark night scenes
- Plug-in architecture facilitates flexibilty and extensibility

Plug-In Features

Di-Guy™ Plug-In

- Uses MAK Technologies Di-Guy™ tools to implement animation of humans and animals

Rotorwash Plug-In

- Implements a flexible particle effect to simulate varying rotorwash appearance over different terrain and water surface types, e.g. sand, ocean, concrete

Autonomous Traffic Plug-In

- Automatically populates scene with land and water vehicles
- Vehicles follow road network derived from OpenStreetMap data

Advanced Weather Plug-In

- Up to two 3D volumetric cloud layers
- Define regionalized weather patterns
- Up to 5 volumetric storm clouds with rain squalls and lightning
- Altitude based layered fog/haze
- Cloud Shadows on terrain
- Illumination of clouds above cities and towns

ViXsen® Plug-In

- Physics based simulation of sensors
- Supports NVG and short/medium/long range infra red sensors, databases with material coded textures.
- Uses dynamic changing diurnal cycle
- JRM SigSim-based sensor simulation option available

Shadow Plug-In

- Generates real-time shadows including full scene shadows

OpenVR Plug-In

- Allows MANTIS to be used to drive VR, AR and MR tethered HMD's that support the OpenVR, OpenXR and Varjo Native standards. This includes HTC Vive Cosmos, HTC Vive Pro, Varjo XR-3/VR-3/Aero and Oculus Rift

Viewport Effect Plug-In

- Allows custom shaders to be applied as a post processing pass to the image
- Example usage – rain drops or frost on windshield, blur effects, monochrome effects, G-Force blackout/redout

Advanced Ocean Plug-In

- High quality ocean effects, including sun/moon reflection, true 3D waves, shoreline effect, terrain and model reflections
- Bow wakes, stern wakes and vessel spray
- Ocean and inland water effects

RunwayFX and Global Airport Plug-Ins

- Global airport capability with almost 30,000 dynamic airfields
- Facilitates runway conditions including wet, standing water, ice, snow, sand, wind blown sand and snow effects
- Reflection of runway lights
- Conditions returned in HAT/HOT/LOS quaries

Laser Designator Effect Plug-In

- Simulates IR laser target designator viewed in NVG

Quest2 Plug-In

- Software based sensor post processing effects including gain, level, AGC, LACE, blur, unsharp mask, random noise, fixed noise scintillation, hot spot detection, hot spot contrast estimation, pan/roll/zoom and display color

StaticModels Plug-In

- Provides a mechanism to efficiently populate the terrain with a set of modelled features. E.g. this allows new tall constructions (such as buildings, wind-turbines, radio towers) to be added to the terrain without having to re-generate the complete terrain, allowing the terrain to be kept up to date with the real world

Real-Time Foliage Plug-In

- Allows high quality 3D foliage and grass to be added to the terrain
- Simulates global and localized wind effects (e.g. rotorwash)

Custom Symbology Plug-In

- Allows customer developed code to be executed after scene is rendered
- Typical usage is to render symbology or reticles over image

Test Pattern Plug-In

- Facilitates rendering a wide range of test patterns, including those necessary for FAA certification