QUANTUM3D®
Technology for Solutions

Mantis® V3.0
Scene Management Software Platform

Image Generation, Redefined

Mantis is the only Real-time Scene Management software package supported on a range of platforms from off-the-shelf PCs* to advanced multi-channel Independence Image Generators (IGs). Mantis is equipped with a suite of features that support communication functions, interfacing to peripheral devices and displays, and support multi-channel synchronization.

The Mantis Advantages

Mantis is a module based image generation software platform for use in a variety of simulation and training applications. Supported on a range of hardware from off-the-shelf PCs* to Quantum3D's powerful Independence image generators, Mantis provides faster, smoother graphics enabling users to work at higher resolutions with higher frame rates to delivering a sense of realism. Unique effects and specific features can be created by developers to meet the demands of any simulation and training needs.

Mantis' architecture supports a full range of special effects, 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 capabilities, such as ocean effects, rotorwash and more.

Mantis is based on Windows for easy configurability, management and use and leverages industry standards such as CIGI to interface with host devices.

Ideal for Multiple Applications

Mantis offers advanced visual simulation solutions for multiple applications, including Fixed- and Rotary-Wing Flight Simulation, Ground Vehicle Simulation, Tank Simulation, Mission Rehearsal, Sensor Simulation, and more.

Key Features

- Windows-based user interface for easy configurability and management
- Industry standard CIGI 2.0, 3.0 and 3.2 host interface
- Support for up to 32 visual channels
- Large area terrain database support, including seamless worldwide database
- Moving model support
- Particle effects - user tunable smoke, dust, flames, explosions, trails, tracers, and more
- Run-time terrain color correction – gain, level and saturation
- Up to three spotlights or flares with user configurable profile
- Advanced light points providing glow and glare halo effects
- Mission function processing including Height Above Terrain (HAT), Height Of Terrain (HOT), Line Of Sight (LOS), volume and segment collision detection
- Scene load management via Level of Detail scaling and priority culling
- 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 and moon
- 4x4 dither matrix for 12-bit color depth
- Support for off-the-shelf PC* hardware
- Up to 4 channels per Image Generator Renderer (IGR) on IDX 7000

Plug-In Features and Benefits:

Quantum3D's advanced plug-ins for Mantis provide additional visual enhancements to meet the most demanding simulation and training needs

Advanced Ocean Plug-In

- Uses shaders to generate a high quality ocean including sun/moon reflection, true 3D waves, shoreline effect, terrain and model reflections.
- Bow and stern wakes and spray for moving vessels.
- Renders inland water using a shader to simulate ripples and reflections, including reflection of sun or moon.

Advanced Weather Plug-In

- Advanced Weather Plug-In renders a three dimensional volumetric cloud layer with realistic illumination and in-cloud effects.
- Provides mechanism for defining regionalized weather patterns.
- Renders up to five volumetric storm clouds with associated rain squall and randomized lightning.
- Volumetric cloud LOS intersection queries facilitate accurate simulation of judder on penetration of clouds.
- Provides layered fog effect with fog density interpolated based on altitude.
- Accurate cloud shadows cast on terrain and models.
- City light glow illuminates both cloud and terrain.
- Night-time texturing of lights in urban areas.

RunwayFX Plug-In

- Facilitates simulation of effects such as wet, patchy wet, ice, patchy ice, snow, patchy snow, sand / dust, patchy   sand / dust, blowing snow / sand / dust.
- Supports reflection of runway lights on wet regions of runway.
- Runway condition returned in HAT/HOT/LOS queries.

Real-Time Foliage Plug-In

- Allows SpeedTree™ 3D high quality foliage and grass to be added to terrain.
- Simulates localized wind effects, for rotorwash effects.

Shadow Plug-In

- Supports various algorithms for generating real-time shadows, including full-scene self-shadowing.

ViXsen® Plug-In (ITAR)

- Physics-based simulation of sensors.
- Supports NVG and short / medium / long range infrared sensors.
- Supports databases with material coded textures.
- Supports dynamic diurnal cycle.

Di-Guy™ Plug-In

- Uses the Boston Dynamics Di-Guy tools to implement animated humans and animals.
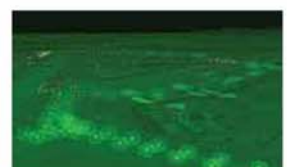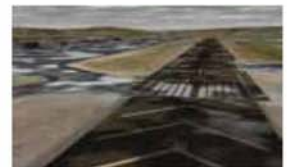
Rotorwash Plug-In

- Implements a flexible particle effect to simulate rotorwash effects.
- Appearance of effect can be made to change automatically dependent upon type of terrain under helicopter, e.g., sand, water, concrete.

QUEST2 Plug-In (ITAR)

- Provides support for software-based sensor post processing effects.
- Supports gain, level, AGC, blur, random noise, fixed noise, scintillation, hot spot detection, hot spot contrast estimation, pan roll and zoom, etc.

IData Plug-In

- Provides support for dynamic overlays such as HUD, reticules, instrumentation, moving map, etc.