GenesisSN™
A REAL-TIME, PHYSICS-BASED SENSOR IG MODULE

GenesisSN™ is an advanced EO/IR/NVG sensor module that enables the simulation of correlated and accurate NVG, EO, MWIR, and LWIR sensors, with the following features:

Features:

Run-time Dynamic Scene Construction

GenesisSN combines our GenesisRTX rendering engine along with JRM's physics based sensor libraries to enable run-time "Dynamic Construction" of high-quality, physics based, materially-encoded 3D scenes composed of high-definition terrain, cultural features, and special effects, directly from unprocessed GIS source data.

GenesisSN™ Sensor Physics Module

Renders physics-based sensor output imagery in real-time, at user-configurable resolutions and frame rates.

On-theFly Physics-Based Signature & Sensor Modeling

Predicts ephemeris, angle-dependent irradiances & thermal loading, fully-transient material surface temperatures, atmospheric transmission & path radiance, and postaperture sensor optics, detector, & electronics effects.

In addition, GenesisSN™ quickly provides the correct spectral radiance from man-made light sources, including tungsten, sodium, mercury, neon, and poly-metallic lamps.
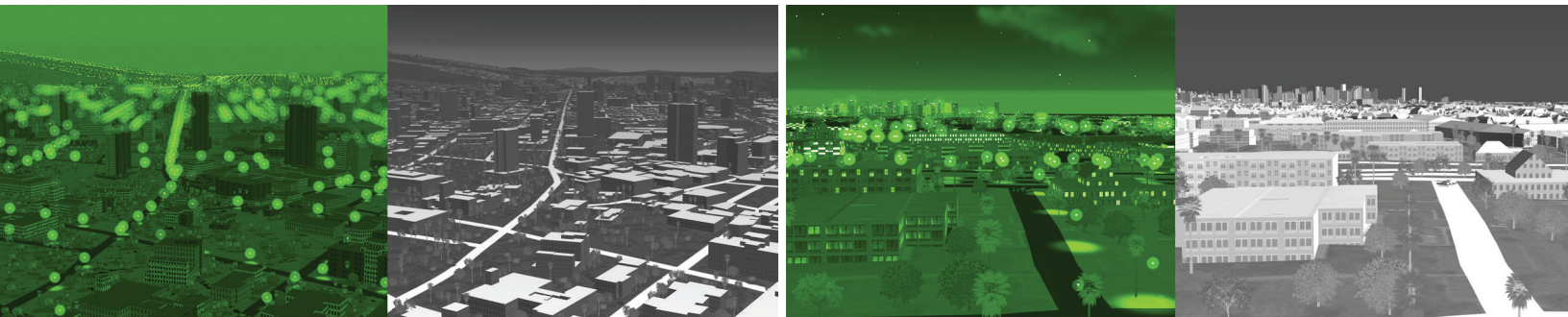
Real-time EO/IR Atmospherics

Implements JRM's innovative, extremely fast pathintegral/ transport algorithms based on MODTRAN atmospheric physics licensed from AFRL. These algorithms operate on a common atmospheric data model, allowing the user to assign such parameters as the pressure, temperature, molecular species concentrations, and weather state at any position in the ellipsoidal atmospheric model.

Multiple views of different sensor bands can be run simultaneously on single channel
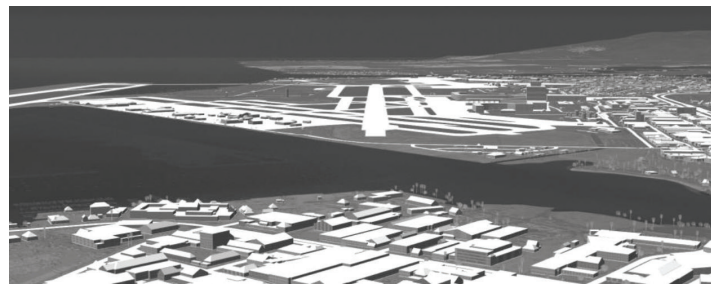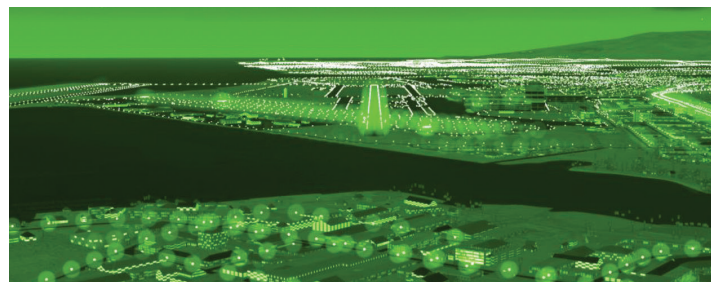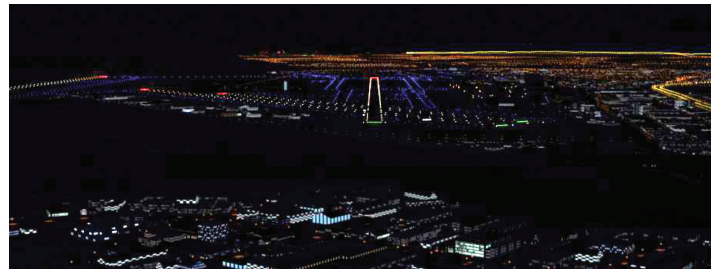
Customized atmospheric profiles designed in the accompanying ModtranGUI™ tool allow for arbitrary user-defined air temperatures, background temperature, wind speeds, rain/snow rate, rain temperatures, humidity, season, cloud particulate parameters, and other MODTRAN atmosphere related data.

Diamond Visionics®
RTX
GENESIS SN
Physics Based Sensors

JRM Technologies
Real Physics • Real Sensors • Real-time

Optional GUI-based modeling tools make it easy to generate and classify complex 3D environments and entity models for use in GenesisSN!

Features:

- Customizable MODTRAN-based atmospheric modeling
- Physics-based, man-made light sources
- Dynamic scene construction
- Real-Time signature modeling (ephemeris, atmospherics, irradiance, reflection, thermal absorption and emission)
- Real-Time sensor modeling (optics, detector, electronics)
- 16-bit radiance output
- Optional 3D geometry modeling and material classification tools
- Supports Color E/O

Complex Scenes

Easily load a complex 3D terrain database, completely specify any number of arbitrary sensors, atmospheric and weather conditions, and place 3D vehicle or human models in the scene, then display in real-time. Users can run multiple sensor view types simultaneously from a single GenesisSN channel.

Realistic Sensor Simulation

GenesisSN™ provides accurate simulation of arbitrary imaging sensors in the UV through far IR (0.20-25.0 μm) spectrum and RF frequencies with optimized, physics-based signature synthesis and MODTRAN-based atmospheric propagation modeling.

Special Effects

GenesisSN™ provides support for scene special effects such as flares, fire, smoke, and dust clouds, as well as the ability to individually control active thermal systems of entity models, adjustable visualization of laser beam and spot designators based on sensor bandwidth and heat exhaust.

Realistic Dynamic Range

GenesisSN™ also offers support for 16-bit high-dynamic range (HDR) output images. This allows the IG to simulate and represent special effects like plumes & flares at full dynamic range without clipping or burying the terrain signature in noise.

Modeling Tools

GenesisMC™ Material Texture Classification Tool
*Sold Separately
An advanced-algorithm, semi-automated software tool for creating material-classified maps from remote-sensed terrain imagery or RGB textured 3D models — complete with physical properties and thermal boundary conditions for realistic physics-based sensor simulations.

ModtranGUI™ Weather/Atmosphere Modeling Tool
GUI-based tool for creating, editing, and saving MODTRAN-based weather/atmosphere state files.

GenesisAM™ Database Tool
GenesisAM™ is a Windows Graphical User Interface (GUI) that allows users to construct and modify XML- based project files for use by GenesisRTX™. By utilizing GenesisAM™, the user is given complete control over how GenesisRTX™ interprets and utilizes the source data. Project changes can be rapidly visualized, enabling an iterative approach to 3D scene development.

Export

The Commodity Jurisdiction determination for Diamond Visionics Genesis family of software products, including Genesis IG, RTX, SDK, SN, RDR are Non-ITAR and classified as EAR99.

TO SET UP A DEMO, CONTACT US AT: sales@diamondvisionics.com, 412-999-8399 or visit us online at diamondvisionics.com

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λ JRM Technologies
Real Physics • Real Sensors • Real-time