# Selex ES
## A Finmeccanica Company

# VIR3X
## HIGHEST PERFORMANCE MULTI-PURPOSE IMAGE GENERATOR

Selex ES's VIR3x Image Generator System combines the highest performance and quality standards with an unprecedented simplicity and speed in scenario database preparation. Image richness and quality is dynamically enhanced automatically by the system.

VIR3X scenario database creation can be as simple as providing the unprocessed source data in common GIS formats and letting the software infer all the details of the scene. Customisation is always possible and typical, or specific models in the most standard formats can be integrated seamlessly with the dynamically generated objects.

The ability to dynamically enrich the scene with details inferred in real-time is one of the most innovative and precious characteristics of VIR3X because it allows the possibility of having huge, content-rich databases with very low human effort and preparation time.

VIR3X generates the scene with the level of detail required by the current Field of View (FOV). This includes static objects, textures and detailed features correlated with the

geographical information provided, such as shape files or terrain feature identification codes. Therefore, if the area is marked as forest, the appropriate tree models will be shown when the FOV requires it.

Dynamic details can reach levels up to single blades of grass or ground stones without the need of inserting hundreds of thousands of objects in the database, thus reducing database size and building time.

Moving model and water surface effects with VIR3X



Light emitters in VIR3X

## FEATURES

### Enhanced Ambient and Weather Effects

The system provides volumetric cloud simulation and multiple cloud layers, whose parameters can be defined by the simple coverage index, to a complete visibility/density profile through all the altitude levels.

VIR3X renders the whole scene with homogeneous transition light conditions due to the position of the sun, moon and stars according to the almanac.

Physical aspects of fog and visibility are handled by integrating the optical path of each scene element immersed in the atmosphere field, therefore reaching the highest level of natural colour and fog/visibility realism.

### Natural Shadows and Self-shadowing

Natural shadows are among the most visible element of a visual scene and VIR3X provides unparalleled real-time full scene complete shadow computation: every single object (static or dynamic) will cast complete, physically accurate and complex shadows on every other object at any level of detail.

### Light Emitters and Enhanced Light Effects

The physics of light emitters are considered in all aspects to correctly render glows around airfield lights, if the local humidity requires it, and so search lights project visible cones capable of casting volumetric shadows and even inner cone shadow volumes.

### Correlated Sensors Display

VIR3X simultaneously allows physically correct and detailed simulation of several sensors such as Electro Optic (EO) cameras, Long Wave and Medium Wave Infrared (LWIR – MWIR) sensors, Night Vision Goggles (NVG), and even high resolution renders of correlated Synthetic Aperture Radar (SAR) images. Each sensor renders the scene in total and accurate correlation with the others to provide the highest realism and fidelity.

### Real Multichannel Applications

The system uses Commercial-Off-The-Shelf (COTS) hardware (PC Windows) and is based on proprietary software that implements specific original algorithms developed by the VIR3X team at Ronchi dei Legionari.

VIR3X has been created with simulation in mind and therefore intrinsically scales from the single sensor simulator channel to large synchronised multichannel Full Mission Simulation Systems.

### Interoperability and Compatibility

The system allows reutilisation of databases and models already produced for other image generator systems because of its compatibility with the principal standards of 3D modelling. This allows interfacing with the most common protocols employed in the field of Distributed Simulation such as HLA, DIS, CIGI, DDS and XNET and integrates with Selex ES SYENA Synthetic Environment and Terrain Server.



Enhanced visibility effects with VIR3X