Hardware-in-the-Loop Simulation Systems
Multispectral Target Simulation for Hardware-in-the-Loop Applications

e.sigma Hardware-in-the-Loop Simulation Systems are developed to support virtual prototyping, evaluation and testing of optical sensor systems and fire control systems for tanks, air defense systems and missiles. The system offers continuous experimentation of complete weapon-systems or individual components during conception, through the design phase to their final implementation and validation. In addition, the performance of already existing weapon-systems can be rated by testing their combat efficiency in ground and airborne engagements.

Operational Benefits

- Evaluation of performance of weapon-systems and optronic sensors
  - Detection and tracking behavior of optronic systems
  - System behavior with multiple targets
  - Dynamics and precision of target assignment
  - System behavior under optronic countermeasures
- Combat profile test-runs for optimization of weapon-systems and optronic sensors

- Evaluation of performance of weapon-systems and optronic sensors
- Analysis of jamming and deception systems
- Technological support during the development phase of weapon-systems using virtual prototyping
- Analysis of high security sensitive systems
- Realization of experiments not feasible in the real environment
- No impact on environment

Technical Features

Facility Infrastructure

- Simulation domes with up to 45 diameter with a precision superstructure
- Movable high payload (> 70 tons) platforms with +/- 15 degrees tilt angle for testing weapon envelope limits
- Dome surface with super high gain and reflecting in the UV, visual and IR spectrum

Visualization System

- High resolution multichannel visualization system with > 270 x 120° FOV
- Photo-realistic visual and IR databases of typical environmental scenes, e.g. desert, mountains, shore lines, weather effects and time of day and year
- High fidelity visual and true multispectral infrared target representation with dynamic non-linear image mapping

Motion System

- High dynamics 2 and 3 axis motion system for precise target projection and target masking for seeker systems under test
- Exactly reproducible test conditions

High speed and high accuracy data acquisitions, data evaluation and data analysis system

- Sustained real time rate of 1000 Hz
- Masterclock jitter of less than 1 µsec

V1.0