Graphics Processing Unit (GPU) computing

This section describes the graphics processing unit (GPU) computing feature of OptiSystem.

> ***Note:*** The GPU computing feature is only configurable with OptiSystem Version 11 (or higher)

What is GPU computing?

GPU computing or GPGPU takes advantage of a computer's grahics processing card to augment the speed of general purpose scientific and engineering computing tasks.

Compute Unified Device Architecture (CUDA) implementation for OptiSystem

NVIDIA revolutionized the GPGPU and accelerated computing when it introduced a new parallel computing architecture: Compute Unified Device Architecture (CUDA). CUDA is both a hardware and software architecture for issuing and managing computations within the GPU, thus allowing it to operate as a generic data-parallel computing device. CUDA allows the programmer to take advantage of the parallel computing power of an NVIDIA graphics card to perform general purpose computations.

OptiSystem CUDA implementation

The OptiSystem model for GPU computing involves using a central processing unit (CPU) and GPU together in a heterogeneous co-processing computing model. The sequential part of the application runs on the CPU and the computationally-intensive part is accelerated by the GPU. In the OptiSystem GPU programming model, the application has been modified to map the compute-intensive kernels to the GPU. The remainder of the application remains within the CPU.

CUDA parallel computing architecture

The NVIDIA CUDA parallel computing architecture is enabled on GeForce®, Quadro®, and Tesla™ products. Whereas GeForce and Quadro are designed for consumer graphics and professional visualization respectively, the Tesla product family is designed ground-up for parallel computing and offers exclusive computing

features, and is the recommended choice for the OptiSystem GPU. For the complete list of products, see the NVIDIA website at http://www.nvidia.com/page/products.html

Enabling GPU for calculations

To enable GPU processing and/or to view information on CUDA-enabled devices perfrom the following procedure.

Step	Action
1	Double click on the Project layout window. *The **Layout parameters** dialog box appears.(see* Figure 1
2	Enable the GPU feature by selecting the CUDA GPU parameter in the Value column (check-box)

Note: If the computing platform on which OptiSystem is running does not contain a CUDA-capable graphics card, the CUDA GPU paramter will be disabled

3	To view information on the GPU configuration for the computing platform select the ***View GPU Info*** task button *The **GPU Info** dialog box appears.(see* Figure 2
4	To export the information contained in the GPU Info dialog box as a text file, select the ***Export to Text File*** task button *The user will be prompted to enter the file name and directory to which the .txt file should be saved*

Figure 1 Layout parameters dialog

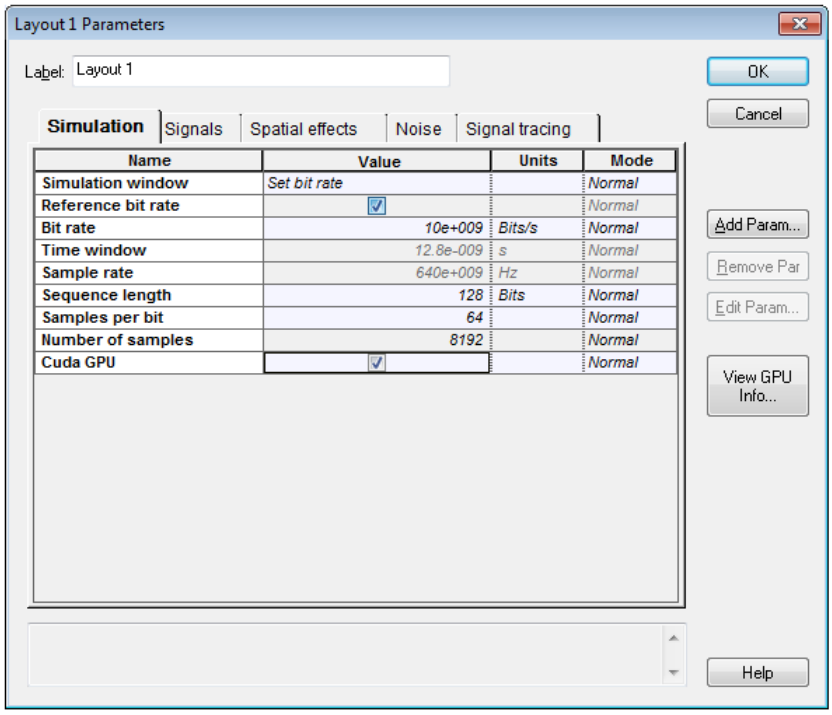

Figure 2 GPU Information dialog box