# The Goodin and Associates'
# VGA Core RTL Model
# (In Partnership with Elpin Systems, Inc.)

## Overview

Current PC graphics architecture requires that the vendor, while providing a high-resolution, accelerated, cost effective graphics solution, must also provide at least a minimal level of compatibility with the VGA standard. This is demonstrated time and again when even the newest versions of the most popular PC operating systems, such as Windows NT, Windows 95, Windows 98, require VGA compatibility during initialization and critical error handling. Even if a graphics chip set is targeted at specific sectors of the PC industry (including high-end 3D accelerators), vendors are expected and therefore *are required to provide a VGA-compatible solution*.

Since VGA compatibility is a necessary piece, but is not the main feature of most graphics solutions, it is important to provide a VGA core as compatible as possible without distracting attention away from the main focus of the graphics product: namely, price and performance. Developed and tested by Goodin and Associates, Inc. in cooperation with Elpin Systems, Inc. and using the Elpin Systems' **VGA Core Test Suite** and the **VGA Core Sample Implementation**, the **VGA Core RTL Model** provides an engineering solution to the problem of supplying VGA compatibility.

By providing a well-documented system interface specification and an implementation of the VGA in completely synthesizable Verilog, a development team can design a graphics subsystem that best fits their environment and best suits their target market without having to concentrate on the physical internals of the legacy architecture and all the compatibility issues that surrounds the VGA device.

## VGA Core RTL Model

### Features

- Functionally equivalent to the IBM VGA
- RTL Model in Synthesizable Verilog
- Includes complete documentation
  - -- Interface Specification
  - -- Reference Specification
  - -- Internal Code Documentation
- Extensions to the CRTC for linking to higher native mode (non-VGA) resolutions
- Supports both Chronologics and Cadence environments
- Runs on Hewlett-Packard and Sun workstations
- Runs under HPUX 10, Sun OS, and Solaris operating systems
- Test environment for linking with the **VGA Core Test Suite**
- Engineering assistance for integration / Complete design review

### Design Goals

- Memory Clock (System Clock) less than or equal to 125 MHz
- Dot Clock less than or equal to 220 MHz
- Gate count of less than or equal to 25K gates
- Fully Synchronous Design

*Description*

"VGA Compatibility" is defined as behavior that is functionally similar to that of the motherboard VGA on the IBM PS/2 Model 70. Variations from this standard are defined as "incompatibilities" except during initialization of an adapter VGA where the differences are documented in the "Setup" chapter of the **VGA Core Test Suite** documentation. The **VGA Core RTL Model** documentation includes a definition of every register including the physical address and power up state; block diagrams of each functional block; and a detailed description of the functionality and interface for internal and top level interfaces.

The **VGA Core RTL Model** is in legal form for the Synopsys™ Design Compiler.


## Acquiring the VGA Core RTL Model

For pricing, technology license agreement, and other delivery terms regarding the **VGA Core RTL Model**, contact Elpin Systems, Inc. at the address listed below. Engineering support for integration and verification of the model is included. Additional design engineering support is available, either on-site or remote.

When evaluating various options, it is sometimes necessary for an organization to reveal certain technologies. If this information must be supplied under non-disclosure agreement ("NDA"), then Elpin Systems, Inc. will gladly execute a mutual NDA to expedite and assist in such an evaluation.


## Other Elpin Systems, Inc. Products

- VGA Core Test Suite
- VGA Core Sample Implementation
- VGA BIOS w/ VESA BIOS Extensions (VBE 3.0)
- VGA BIOS Test Specification
- ANSI.SYS (DOS 6.0 compatible)
- VGA Diagnostics Tool


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