

# PROC\_CamSim™ Camera/Machine Simulator

## Overview

Imaging and machine-vision systems development requires tremendous effort and resources. Final development and testing of such systems are done on site. This methodology forces companies to develop complex and expensive intelligent machines and to plan intricate field testing accordingly. Moreover, it is extremely difficult to detect and to analyze rare occurring bugs.

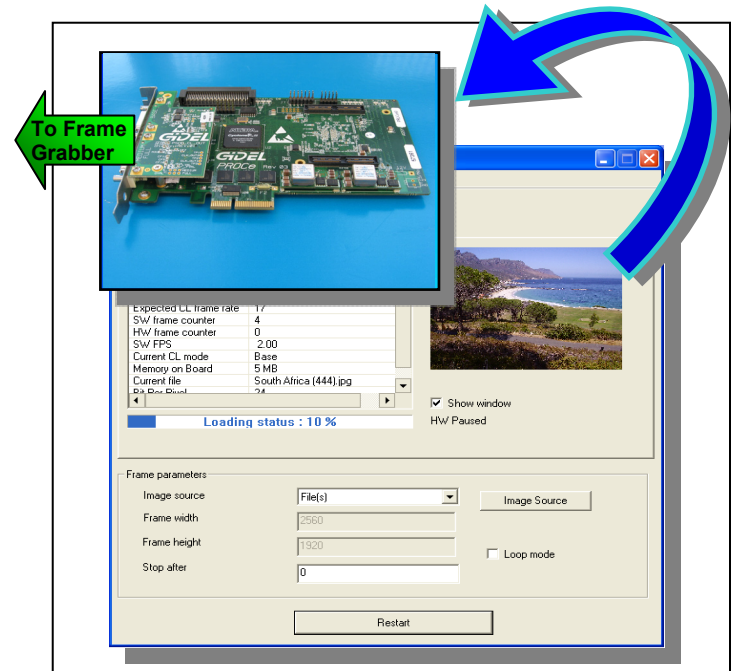
The *GiDEL PROC\_CamSim™* is a flexible high-performance camera simulator that generates Camera Link video and test patterns for a frame grabber enabling the users to perform most of the development at a low cost quiet lab environment. Thus, the *PROC\_CamSim* improves significantly the productivity and reduces the overall expenses of vision and imaging systems development.

GiDEL's *PROC\_CamSim* data flow repetition capability enables to perform accurate validation testing of algorithms to ensure that they function as expected with the relevant input. Moreover, once a rare occurring bug is detected, its respective data flow can be accurately reconstructed to locate the bug and fix it quickly.

**Flexibility:** Developers require a customized simulator regardless of whether it is only a camera, a machine or a system simulation. The *PROC\_CamSim* simplifies tremendously the simulation customization process by enabling the user to add FPGA code, to connect to the system IOs and to add a user processes to handle the additional tasks of the simulator. An additional application driver is automatically generated by the PROCWizard, a GiDEL provided development kit.

## Applications

- Vision algorithms development
- Image processing application testing
- Machine vision integration
- Vision system reliability testing.
- Debug of "rarely appearing bugs"



PROC\_CamSim System

## Key Features

- Simulates all *Camera Link v1.1* configurations (base / medium / full).
- Machine simulator capability by adding user IOs.
- Supports *AVI* videos and *BMP, JPG, PNG* images and *RAW* image/video files.
- Internal HW fixed-pattern generator.
- Fully programmable video timing and data parameters with an easy-to-use GUI.
- API methods for developing user simulation application.
- User-configurable camera control (CC) lines for triggering options.
- Outputs 1-8 pixel channels simultaneously at 20-85 MHz according to CameraLink v1.1 specifications.
- Software and FPGA customization for extended machine simulation and/or custom logic/processes.
- Up to 4GB image buffer.
- Two MDR-26 connectors interface for full mode Camera Link v1.1 configuration.

## Functional Description

The **PROC\_CamSim** can simulate a full-range of base/medium/full mode **Camera Link v1.1** cameras, sending up to 64 bits data (8 pixel channels) at 20-85 MHz pixel clock. An easy-to-use GUI provides fully programmable video timing and data parameters access according to the Camera Link specification. Alternatively, the **PROC\_CamSim API** provides a set of methods enabling the user to develop a customized host application. The **PROC\_CamSim** sends video/images to a frame grabber for developing applications and testing them without the need for a real camera. The source of the images can be from the user video/image files or from internally generated fixed test patterns.

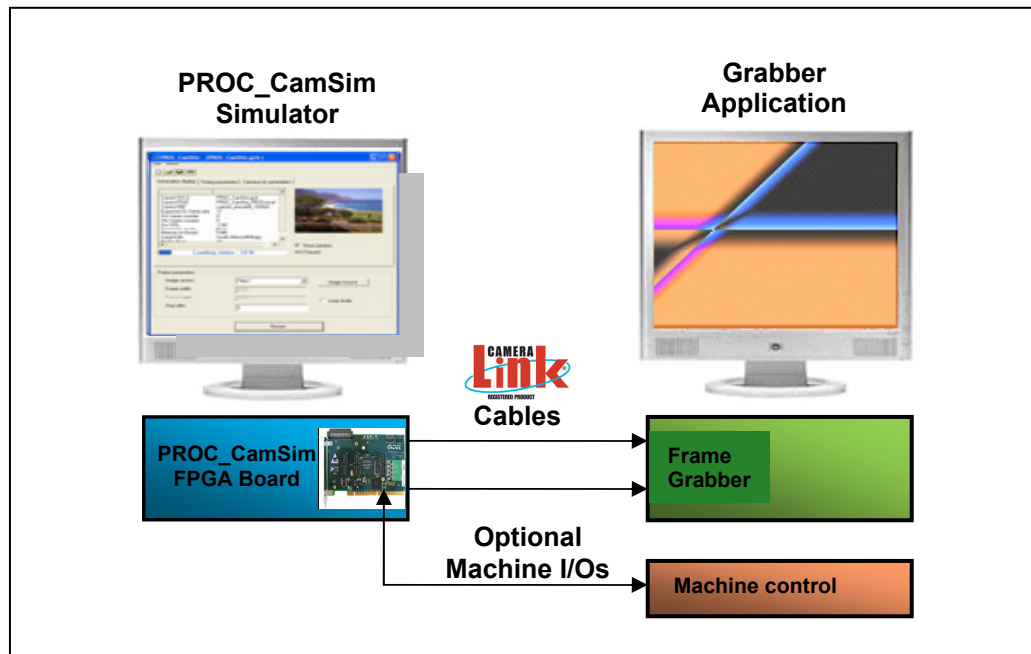
The **PROC\_CamSim** consists of an FPGA-based PCI or PCIe board and a host application with a GUI interface for control and configuration. The source video/images are transferred from the host. The source

can be AVI or RAW video or BMP/PNG/JPG image files. Alternatively, the fixed test patterns are grid and vertical, horizontal, diagonal ramps, generated by the HW. The test patterns can be generated at different color and bit-width configurations.

The **PROC\_CamSim** provides the ability to use Camera Link channels in parallel, as 1-8 taps and/or 1-8 consecutive pixels in each tap.

The **PROC\_CamSim** application GUI enables to configure resolution, channel configuration and simulation parameters in order to mimic virtually any Camera Link v1.1 camera.

A unique machine simulator can be achieved by using GiDEL's PROC developer's kit and/or PSDB\_IO. The PSDB\_IO adds digital and analog IO/s capabilities. User handshake and control can be added to the FPGA top level logic. Supplementary process control of the FPGA code is supported by the additional software driver generated by PROCWizard.



**PROC\_CamSim System Architecture**



[www.gidel.com](http://www.gidel.com)

**Worldwide:**  
2 Ha'ilan Street, P.O. Box 281  
Or Akiva, 30600, Israel  
Tel: +972 - 4610 - 2500  
Fax: +972 - 4610 - 2501  
Email: [sales\\_eu@gidel.com](mailto:sales_eu@gidel.com)

**USA:**  
1600 Wyatt Drive Suite 1  
Santa Clara, CA 95054, USA  
Tel: 1 - 408 - 969 - 0389  
Fax: 1 - 866 - 615 - 6810  
Email: [sales\\_usa@gidel.com](mailto:sales_usa@gidel.com)