

ProcCamSim™ 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.

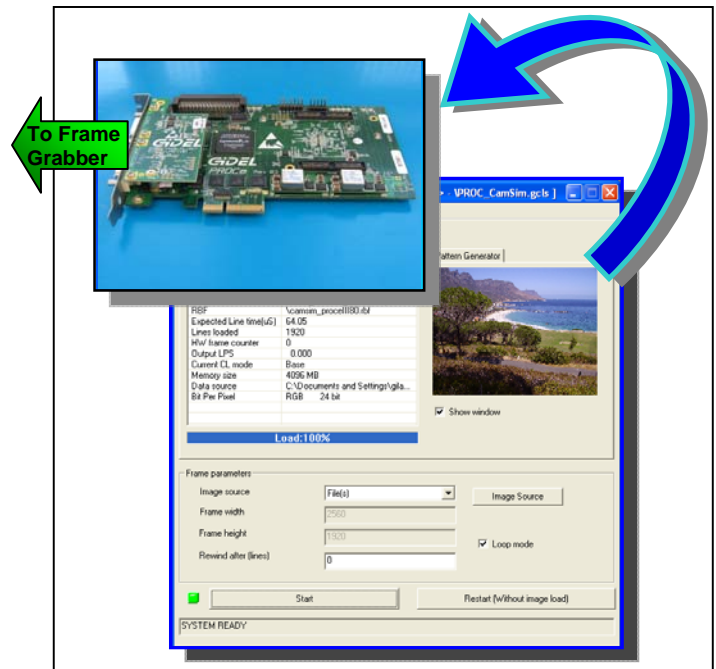
The *GiDEL ProcCamSim™* is a flexible high-performance camera simulator that generates Camera Link video and test patterns for a frame grabber enabling the users to perform most of the development at a low cost quiet lab environment. Thus, the *ProcCamSim* improves significantly the productivity and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

GiDEL's *ProcCamSim* 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: Whether it is a camera, machine or system simulation, inevitably developers require a customized simulator. The *ProcCamSim* 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 software. Furthermore, API methods enable to create at ease a fully customized simulator application.

Applications

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



ProcCamSim 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.
- SW static-pattern generator.
- Fully programmable video timing and data parameters with an user-friendly GUI.
- API methods for developing user simulator 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.
- 4GB image buffer.
- Two MDR-26 connectors interface for full mode Camera Link v1.1 configuration.

Functional Description

The *ProcCamSim* 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 *ProcCamSim API* provides a set of methods enabling the user to develop a customized host application. The *ProcCamSim* 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 software-generated static test patterns.

The *ProcCamSim* consists of an FPGA-based PCIe board and a host application with a GUI interface for simulation control and configuration.

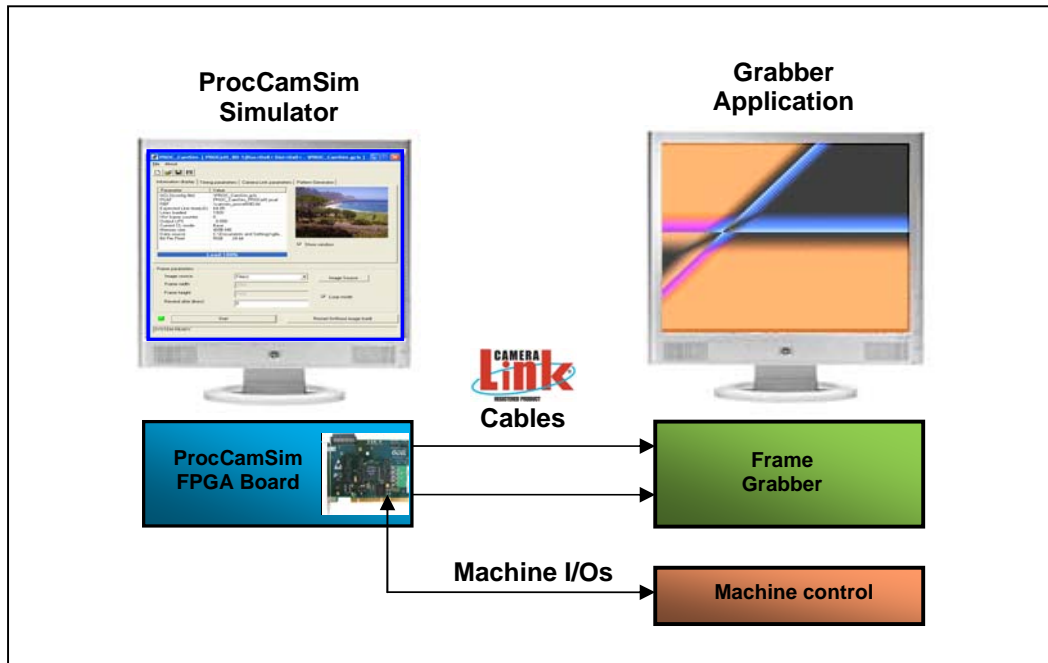
The source video/images can be AVI or RAW video,

or BMP/PNG/JPG image files. Alternatively, the application SW can generate user-defined static test patterns including grids, vertical, horizontal, diagonal ramps, and color ramps. The test patterns can be generated at a variety of grayscale and RGB configurations, and at specified image dimensions.

The *ProcCamSim* provides the ability to use Camera Link channels in parallel, as combination of 1-8 parallel taps and 1-8 parallel pixels per tap.

The *ProcCamSim* application GUI enables to configure timing and triggering parameters, Camera Link parameters, and a diversity of image standards 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 the FPGA board's I/Os. User handshake and control can be added to the FPGA top-level logic. Supplementary process control of the FPGA code is supported by an additional software driver generated by the GiDEL ProcWizard software.



ProcCamSim System Architecture

MaxxVision®
Sigmaringer Str. 121
70567 Stuttgart
Tel.: +49 (0) 711 997 996 3
www.maxxvision.com