GenTL Producer for MATLAB® usage

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1 Introduction

1.1 Safety precautions

Please take the time to read through the precautions listed below in order to prevent preventable and unnecessary injuries and damage to you, other personnel or property. Read these safety instructions carefully prior to your first use of the product, as these precautions contain safety instructions that must be observed. Be sure to follow this manual in order to prevent misuse of product.

⚠ Caution! Read Carefully and do not disregard these instructions.
In the event of a failure, disconnect the power supply Disconnect the power supply immediately and contact our sales personnel for repair. Continuing to use the product in this state may result in a fire or electric shock.
If an unpleasant smell or smoking occurs, disconnect the power supply. Disconnect the power supply immediately! Continuing to use the product in this state may result in a fire or electric shock. After verifying that no smoking is observed, contact our sales personnel for repair.
Do not disassemble, repair or modify the product. This may result in a fire or electric shock due to a circuit shortage or heat generation. Contact our sales personnel prior to inspection, modification or repair.
Do not place the product on unstable surfaces. Otherwise, it may drop or fall, resulting in injury to persons or the camera.
Do not use the product if dropped or damaged. Otherwise, a fire or electric shock may occur.
Do not touch the product with metallic objects. Otherwise, a fire or electric shock may occur.
Do not place the product in dusty or humid environments, nor where water may splash. Otherwise, a fire or electric shock may occur.
Do not wet the product or touch it with wet hands. Otherwise, the product may fail or it may cause a fire, smoking or electric shock.
Do not touch the gold-plated sections of the connectors on the product. Otherwise, the surface of the connector may be contaminated by sweat or skin-oil, resulting in contact failure of a connector, malfunction, fire or electric shock due to static electricity discharge.
Do not use or place the product in the following locations. ▪ Unventilated areas such as closets or bookshelves. ▪ Near oils, smoke or steam. ▪ Next to heat sources. ▪ A closed (and not running) car where the temperature becomes high. ▪ Static electricity replete locations ▪ Near water or chemicals. Otherwise, a fire, electric shock, accident or deformation may occur due to a short circuit or heat generation.
Do not place heavy objects on the product. Otherwise, the product may be damaged.
Be sure to discharge static electricity from body before touching any sensitive electronic components. The electronic circuits in your computer and the circuits on the ***Iron*** camera and the ***Predator II*** board are sensitive to static electricity and surges. Improper handling may seriously damage the circuits. In addition, do not let your clothing come in contact with the circuit boards or components. Otherwise, the product may be damaged.

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1.2 Disclaimer

KAYA Instruments will assume no responsibility for any damage that may ensue by the use of this product for any purpose other than intended, as previously stated. Without detracting from what was previously written, please be advised that the company will take no responsibility for any damages caused by:

- Earthquake, thunderstrike, natural disasters, fire caused by use beyond our control, wilful and/or accidental misuse and/or use under other abnormal and/or unreasonable conditions.
- Secondary damages caused by the use of this product or its unusable state (business interruption or others).
- Use of this product in any manner that contradicts this manual or malfunctions that may occur due to connection to other devices. Damage to this product that is out of our control or failure due to modification
- Accidents and/or third parties that may be involved.

Additionally, KAYA Instruments assumes no responsibility or liability for:

- Erasure or corruption of data caused by the use of this product.
- Any consequences or other abnormalities following the use of this product

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2 Overview

The MATLAB® product family provides a flexible environment for solving complex imaging problems in a wide range of applications including machine vision.
Image Acquisition Toolbox™ enables you to acquire images and video from cameras and frame grabbers directly into MATLAB® and Simulink®. Image Processing Toolbox™ and Computer Vision System Toolbox™ provide algorithms and tools for image processing, analysis, visualization and algorithm development.

GenTL standard defines a generic programming interface standard for machine vision cameras.
MATLAB® and Simulink® users are able to integrate standard GenTL compliant cameras/frame grabbers into their workflows to capture live video and images for processing.

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3 Installation

3.1 For Matlab R2014a

1. Install Matlab software.
2. Install the Vision Point SDK package, which contains the KAYA Instruments KYFGLibGenTL.cti GenTL Producer.
3. Open Matlab and install the **Genicam Interface** according to the following guide:
   a. To open the Support Package Installer in MATLAB® type : supportPackageInstaller
      You can also open the installer from MATLAB by selecting **Home > Resources > Add-Ons > Get Hardware Support Packages**.
   b. On the **Select an action** screen, select **Install from Internet** and then click **Next** (This option is selected by default). Support Package Installer downloads and installs the support package and third-party software from the Internet.

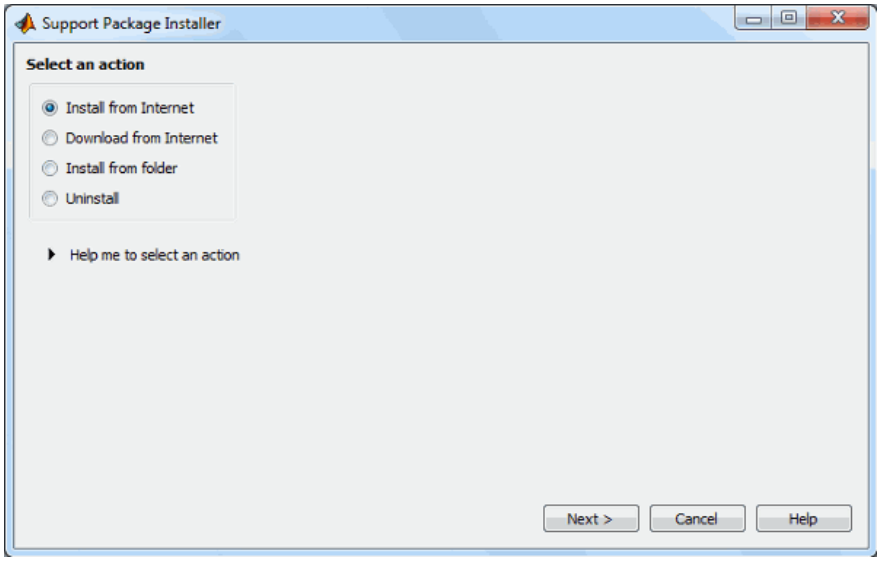

Figure 1 – Select an action screen

   c. On the **Select support package** to install screen, all of the adaptors are listed if you have the Image Acquisition Toolbox.
      In order to activate the MATLAB GenICam GenTL adapter choose: GenICam Interface.
      The table also tells you what files get installed for each adaptor. Accept and click **Next**.

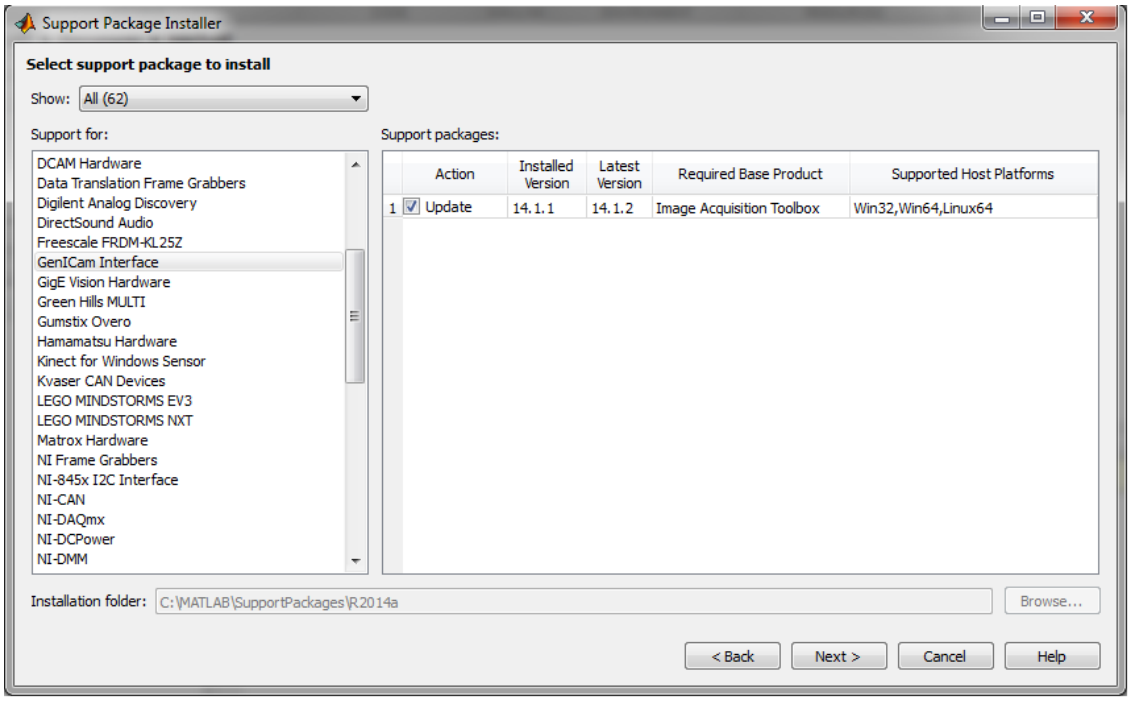

Figure 2 – Select support package

d. If you are prompted to log in to your MathWorks® account, click **Log In** to continue.
e. On the **MATHWORKS AUXILIARY SOFTWARE LICENSE AGREEMENT** screen, select the accept check box and click **Next**.
f. The **Third-party software licenses** screen appears if your support package includes third-party files.
g. Review the information, including the license agreements, and click **Next**.
h. On the **Confirm installation** screen, Support Package Installer confirms that you are installing the support package you selected, and lists the installation location. Confirm your selection and click **Install**.

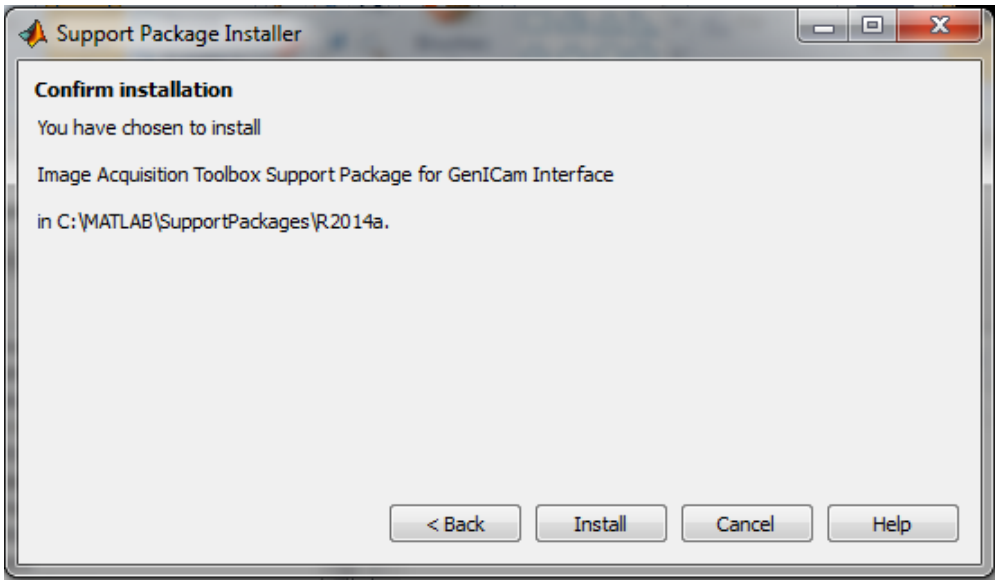

Figure 3 – Confirm installation screen

i. If your adaptor includes third-party files, that installation starts, and a download status dialog box appears during the installation.
You can continue working in MATLAB as the download proceeds.

j. After the installation of the third-party files (if included) and the Image Acquisition Toolbox files is complete you will see a confirmation message on the Support Package Installer **Install/update complete** screen. Click **Finish** to close the Support Package Installer.
k. You may be prompted to restart your computer. If you are prompted, you must restart for the installation to be complete. Click **OK** and then restart your computer.

For more information and instructions visit: http://www.mathworks.com/help/imaq/installing-the-support-packages-for-image-acquisition-toolbox-adaptors.html

4. Restart PC.

3.2 For Matlab R2013b and earlier

1. Install Matlab software.
2. Install the Vision Point SDK package, which contains the KAYA Instruments KYFGLibGenTL.cti GenTL Producer.
3. Open Matlab and run the **installgenicam.m** file from the following folder:
   C:\Program Files\MATLAB\R2014a\toolbox\imaq\imaqextern.
5. Restart PC.

4 Image Acquisition tool

The Image Acquisition Tool is a graphical interface for rapid hardware configuration, image acquisition, and live video previewing. To open tool select **APPS > Image Acquisition**.

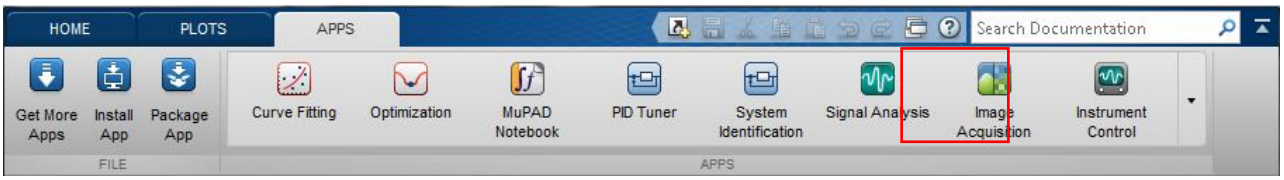

Figure 4 – MATLAB APPS menu - Image Acquisition tool

The preview window, as shown here, reflects adjustments made to the connected camera properties and provides a quick start in the development of image processing systems.

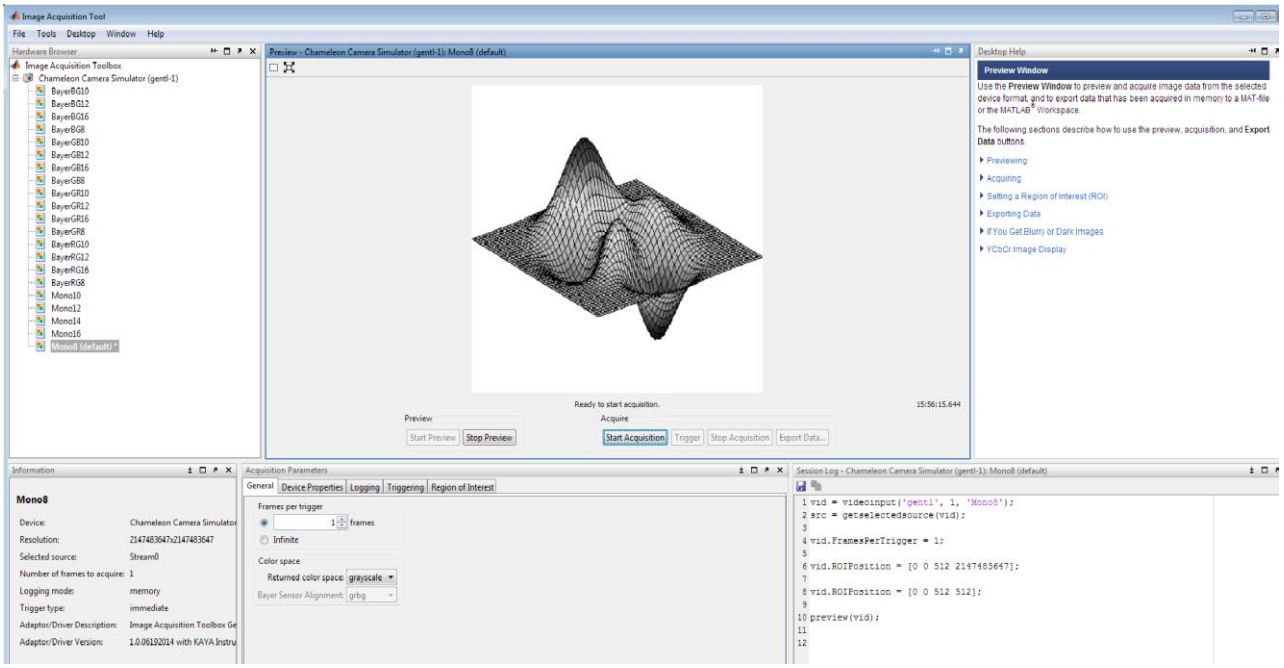

Figure 5 – Image Acquisition tool window

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5 Example

The toolbox has a comprehensive set of functions for command line programming of tasks such as device connection, image data acquisition, configuration of acquisition parameters and more.
The code below shows how to connect, configure and start frame acquisition. Acquired data can be retrieved using the created snapshot matrix:

```
% Access an image acquisition device

>> vidobj = videoinput('gentl', 1, 'Mono8');

% List the video source object's properties and their current values

>> get(vidobj)

% To access a specific property value, use the get function with the object and property
name

>> videoFormat = get(vidobj,'VideoFormat')

% List the video input object's configurable properties.

>> set(vidobj)

% To configure an object's property value, use the set function with the object, property
name, and property value or directly set a property value.

>> roivalue = [0, 0, 1024, 512]

   set(vidobj, 'ROIPosition', roivalue)

   vidobj.FramesPerTrigger = 50;

% Configure the object for manual trigger mode

>> triggerconfig(vidobj, 'manual');

% To obtain a property's description, use the imaqhelp function with the object and
property name. imaqhelp can also be used for function help.

>> imaqhelp(vidobj, 'LoggingMode')

% To obtain information on a property's attributes, use the propinfo function with the
object and property name.

>> propinfo(vidobj, 'LoggingMode')



% Acquire Multiple Frames

>> start(vidobj);                          % start acquisition

   for i = 1:100

        snapshot = getsnapshot(vidobj);    % get raw data of the acquired frame

        imagesc(snapshot);                 % show the acquired data as image

   end
```

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```
   stop(vidobj);                          % stop acquisition

% Cleanup the image acquisition object and the MATLAB® workspace

>> delete(vidobj);

   clear vidobj;
```

For more examples and information visit: http://www.mathworks.com/help/imaq/examples.html