GEN<i>CAM

Generic Interface for Cameras

Interconnection made easy

Why GenICam?

GenICam allows developers to easily use and interchange a range of GenICam-compliant cameras, regardless of the interface and/or protocol technologies, using a compliant application running on their PCs.

How does GenICam work?

GenICam is relevant for three product categories:
· Cameras
· Transport Layers
· Libraries

Simply put, these product categories form a chain, in which image data is transported from the camera via Transport Layers (low-level software drivers or frame grabbers) to Libraries (or applications) running on a PC. In the other direction, control data can be sent from the PC to the camera, allowing users to adjust features and settings inside the camera. A key objective of GenICam is to allow users to control a wide range of cameras – GigE Vision, Camera Link, IEEE 1394 IIDC, USB UVC, and others – using the same application.

How is GenICam structured?

GenICam consists of four modules:
· **GenApi** – an XML description file format defining how to capture the features of a device and how to access and control these features in a standard way;
· **The GenICam Standard Features Naming Convention** – common naming convention for camera features, which promotes interoperability between products from different manufacturers;
· **GenTL** – a generic Transport Layer Interface, between software drivers and libraries, that transports the image data from the camera to the application running on a PC; and
· **CLProtocol** – the specification of the interfaces of a platform dependent dynamic-link library (CLProtocol DLL) being used to convert a vendor-specific Camera Link serial protocol interface to a GenApi interface.

What levels of GenICam compliance are there?

The GenICam standard has been divided into two parts, with different levels of GenICam compliance. The two parts are:
· GenICam
    and
· GenICam TL

See the following sections as a guide to understanding what constitutes GenICam compliance, and more specifically, the differences between GenICam-compliance and GenICam TL-compliance.

When is a product GenICam compliant?

GEN‹i›CAM

GenICam: The XML File and the GenApi

A product is considered GenICam-compliant if it:
· produces an XML file compatible with GenApi;
  or
· consumes an XML file compatible with GenApi.

Examples of GenICam Producers include cameras and potentially frame grabbers.
Examples of GenICam Consumers include libraries and software packages (e.g. including a driver and a library).

The XML file presented by a GenICam Producer must include all the public features of the product it describes. Furthermore, it must follow the GenICam Standard Features Naming Convention, whenever applicable or possible, in order to be considered GenICam-compliant.

The result is that GenICam-compatible software packages can be used with any GenICam-compliant cameras, and GenICam-compatible devices can be used with any GenICam-compliant applications. This solution provides great flexibility for users designing a complete machine vision system.
In the case of Camera Link, a GenICam Producer advertising GenICam Camera Link support must provide a CLProtocol DLL for each type of operating system the vendor wants to provide support for. A GenICam Consumer advertising GenICam Camera Link support must be able to support CL-Protocol DLLs on all operating systems for which GenICam Camera Link support is provided.

When is a product GenICam TL compliant?

GEN‹i›CAM
TRANSPORT LAYER

GenICam TL: The Transport Layer Interface

A product is considered GenICam TL-compliant if it:
· produces a Transport Layer Interface compatible with GenTL.

Examples of GenTL Producers include Transport Layer software drivers.
Examples of GenTL Consumers include software libraries and packages.

While Transport Layer consumers are not eligible to use the GenICam TL logo, they are eligible to use the standard GenICam logo.
GenICam TL provides end users with additional flexibility and the ability to mix and match components more freely in the system. For instance, GenICam-compliant cameras from Vendors A, B and C could be controlled by an application from Vendor D, where the default filter driver has been replaced with a high-performance driver from Vendor E.

Product categories and levels of compliance

Product		Logo
Cameras	· Provides a GenICam XML file	**GEN‹i›CAM**
Driver	· Provides software Transport Layer functionality for supported camera interfaces and/or protocols · Includes a GenTL interface (producer)	**GEN‹i›CAM** TRANSPORT LAYER
Library	· Library · Interprets GenICam XML files · Includes a GenTL interface (consumer) · Does not provide TL functionality	**GEN‹i›CAM**
SDK (Library + Driver)	· Library · Interprets GenICam XML file · Provides software Transport Layer functionality for supported camera interfaces and/or protocols · Exposes a GenTL interface (producer and consumer)	**GEN‹i›CAM** TRANSPORT LAYER
SDK (Library + Driver)	· Library · Interprets GenICam XML file · Provides software Transport Layer functionality for supported camera interfaces and/or protocols · Does not expose a GenTL interface	**GEN‹i›CAM**
Camera	· Does not provide a GenICam XML file	none
Driver	· Does not expose a GenTL interface	none
SDK (Library + Driver)	· Library · Does not interpret a GenICam XML file · Does not expose a GenTL interface	none

How can your GenICam compliant product be labeled?

There are two possibilities for labeling a GenICam compliant product:
the text version and the matrix version.

Text version example

GenICam Version	1.0
GenICam XML Producer	Yes
GenICam XML Consumer	No
GenTL Producer	No
GenTL Consumer	Yes
Camera Connectivity	
Camera Link	No
GigE Vision	Version 1.0
IEEE 1394 IIDC	Yes
USB UVC	N/A
Proprietary	

Matrix version example[1] [2]

GEN<i>CAM	
VERSION	**XML**
1.0	**Producer Consumer**
GenTL	**CAMERA CONNECTIVITY**
Producer Consumer	GiGE VISION · CAMERA link · 1394 · USB *- Your logo here [3] -*

[1] Vendors with proprietary interfaces and/or protocols can put their logo in the matrix. For instance, a proprietary protocol over Gigabit Ethernet.
[2] Logo usage rights might be restricted.
[3] If applicable

GenICam – a standard by EMVA

· Would you like to find out more about the benefits of the GenICam Standard and how to apply it?

· Would you like to contribute to developing the standard?

· Would you like to make your own products GenICam compliant?

Then visit our website at **www.genicam.org** or contact us at:

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