

Image Processing in Real-Time



During the years the »RealTime Suite«™ has been used for high-performance solutions for Windows® by numerous manufacturers of testing rigs, as well as in mechanical engineering, automation and robotics. Now the integration of industrial image processing solutions is made possible in real-time applications.

Hereby Kithara Software closes a gap because despite of the efficient tools, no real-time solution for image acquisition and image processing existed so far under the Windows operating system. However, it is required in mechanical engineering for quality assurance, e.g. for immediate response to product defects.

The Kithara »RealTime Suite« supports industrial cameras compliant with the GigE Vision® standard and thus enables an immediate control reaction when the image has been captured and received in the PC. The widely used image processing library HALCON™ of MVTec from Munich/Germany is suitable for further processing of image data in real-time.

The real-time interface of the GigE Vision® cameras can be operated with up to 125 MByte/s per Gigabit Ethernet connection, and therefore reaches far beyond data rates achievable under Windows to this day. The instant reaction to arriving images allows new solutions to become feasible.



Kithara »RealTime Suite« – Camera Module & Vision Module

Camera Module features (GigE Vision® support):

General

- » Based on RealTime, MultiTasking and Packet Module (see NIC hardware support!)
- » Every GigE Vision® compliant camera is supported
- » Connectable to multiple cameras
- » Hot-plugging

Control

- » Automatic connection handling
- » Full access to camera configuration space
- » Read and write camera memory
- » Set custom heartbeat timeout
- » Set acquisition mode by software
- » Start and stop acquisition of images by software
- » GenICam XML configuration file automatically downloaded
- » Access to GenICam features to configure your camera
- » Error handling

Streams

- » One or more streams per camera possible
- » Acquisition of images in real-time
- » High performance acquisition, no unnecessary copying performed
- » Instant call-back on received image in real-time task context
- » Image is saved in shared memory buffer and can be accessed on kernel-level and user-level
- » Set your own buffer size and buffer count for buffering incoming images while being processed
- » Get informed on missed or incomplete images

Speed support according to GigE Vision® 2.0:

- » 125 MByte/s (standard)
- » 250 MByte/s over double Gigabit Ethernet connection (Link Aggregation)
- » 1.250 MByte/s over 10 GbE Ethernet connection

GenICam™ features:

- » Support of GenICam™ 2.0 for configuring the camera and the transport layer
- » Enumeration of all categories
- » Set and retrieve all accessible camera features (like image format, pixel format, frame rate, exposure time and more)

Vision Module features (HALCON™/OpenCV support):

- » Real-time image processing—Write your own machine vision application using libraries like HALCON™ or OpenCV
- » Image processing library is loaded into real-time context
- » Image processing is done in real-time tasks
- » Do operations like:
 - matching
 - segmentation
 - 3D matching
 - OCR, and more
- » After processing, instantly initiate control reaction, e.g. via EtherCAT® Master, CANopen® Master or PLC

Operating systems:

- » Windows 8 / 8.1 (32-bit & 64-bit)
- » Windows 7 (32-bit & 64-bit)
- » Windows Vista (32-bit)
- » Windows XP (32-bit), >= SP 3
- » Windows Server and Embedded versions also supported

Programming languages:

- » C/C++, Delphi, C# and others
- » to achieve real-time capabilities, native 32-bit or 64-bit code (x86/x64) must be generated by the compiler
- » access via COFF or OMF import library, ANSI C
- » recommended: Microsoft® Visual Studio®/C++ 2010 or Embarcadero® C++Builder®

For the latest list of features, supported hardware, operating systems and programming languages, visit our web site at www.kithara.de. We recommend downloading a test/evaluation version. Please contact us for any questions regarding your project!

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