Basler runner

Line Scan Cameras

GiGE®
VISION

GEN<i>CAM

- High-quality line scan technology meets
  a cost-effective GigE interface

- Real color support in a compact housing size

- Shading correction compensates
  for difficult lighting conditions

- Flexible, easy integration supported
  by a variety of I/O features

BASLER
VISION TECHNOLOGIES

click. see. smile!

Are You Looking for Line Scan Cameras That Don't Need a Frame Grabber?

The Basler runner family is a line scan series that combines high-quality line scan technology with Gigabit Ethernet (GigE) interface technology. Proven image quality and an easy-to-use GigE interface make the runner family a perfect solution for a wide variety of applications. With the GigE interface, it's simple and straightforward for the user to adapt a camera to their system, to acquire their first images, and to adjust the camera's parameter settings to obtain the best results for their particular application. And because a Camera Link frame grabber and cables are not needed with runner cameras, a GigE line scan bundle is a highly cost-effective solution.

The runner family's compact housing is designed for use in harsh industrial environments. To ensure secure connections, the camera includes a screwable GigE connector. The integrated heat sink on the back of the runner is a standard feature on all models. It ensures efficient heat dissipation to reduce heat induced noise.

The general purpose I/O offers a flexible way to easily synchronize the camera to an application. Using its flexible input lines, the runner can receive real-time trigger signals or can accept conveyor belt speed information from a shaft encoder. Software modules such as the Multiplier and Divider can be used to modify the incoming trigger signals and ensure that the camera is operating at the correct line speed. The camera's outputs can be used to transfer the trigger signal to another runner camera operating in parallel. The runner's IO features help to simplify your integration effort by shifting much of the I/O adaptation from a hardware effort to a simple software configuration. This saves you time and money!

runner Monochrome Sensor Technology

The monochrome version of the runner is equipped with a single-line CCD sensor that has a square, 10 μm × 10 μm pixel size. This provides exceptional sensitivity and dynamic range, as reflected by the availability of video output formats up to 12 bits. The runner mono camera is available in 1k and 2k resolutions and several speed variants.

runner Color Sensor Technology

The ruL2098-10gc incorporates a tri-linear sensor with three separate light-sensitive lines to collect red, green, and blue information. A built-in spatial correction capability can be used to compensate for the small space between each of the sensor's lines, resulting in a true RGB image in a wide variety of applications.

Features and Benefits

Your benefits from the Basler runner camera family include:

· Gigabit Ethernet supports up to 100 meter cable lengths
· 12 bit image digitization
· LED indicators and test image generation capabilities reduce your integration time and aid troubleshooting
· Reliable, high-bandwidth data transfer at the lowest CPU load with the pylon driver package
· Simple integration environment provided by runner's flexible I/O capabilities
· Superior image quality improves your image processing results
· 100% factory testing ensures consistent product quality

Additional Benefits from the runner ruL2098-10gc variant:

· Optimum image quality without the need for an expensive matched lens, providing you with an affordable solution for color imaging
· Use of a tri-linear sensor results in a very compact camera, reducing the space needed in your installation
· An integrated spatial correction feature combines pixel data from the lines in the sensor, eliminating the need for computer resources to perform this task
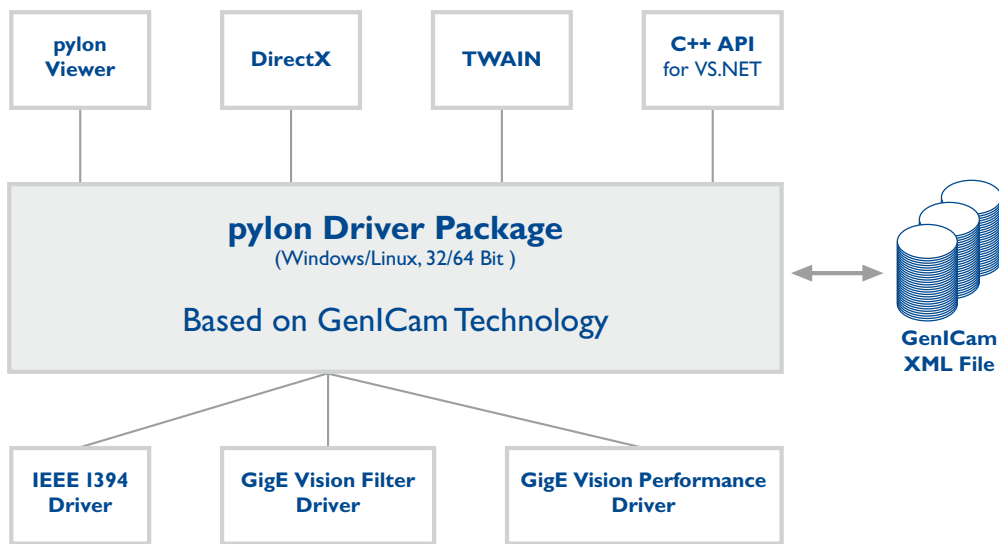
Typical Applications

Basler runner cameras are perfect for use in applications such as:

· Web inspection (wood, paper, foil, etc.)
· Surface inspection (printed circuit boards, flat panels and displays, semiconductors, etc.)
· Document scanning and postal sorting
· Food inspection
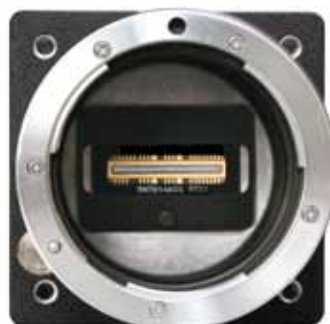
Basler pylon Driver Package

The pylon driver package is designed to work with all Basler cameras that have a FireWire or GigE Vision interface. You can select the interface technology that best fits your application or you can use both interface technologies simultaneously in your application. The pylon driver offers reliable, real-time image data transport into the memory of your PC with a very low CPU load.

pylon Viewer	DirectX	TWAIN	C++ API for VS.NET

pylon Driver Package
(Windows/Linux, 32/64 Bit)

Based on GenICam Technology

GenICam XML File

IEEE 1394 Driver	GigE Vision Filter Driver	GigE Vision Performance Driver

The internal architecture of the pylon driver package is based on GenICam Technology, which offers you easy access to the newest camera models and the latest features. Changes to an existing camera device in your application essentially become a plug-and-play process.

The pylon GigE Vision Performance Driver quickly separates incoming packets carrying image data from other traffic on the network and makes the data available for use by your vision application while requiring the lowest CPU resources. This driver can only be used with network cards that include specific Intel chipsets. The pylon GigE Vision Filter driver supports all kinds of

hardware, common GigE network cards, and GigE ports on your motherboard as well. The pylon IEEE 1394b driver gives you access to a well-established interface technology, but with double the bandwidth offered in the past. And by using the newest driver stack technology, Basler raises the quality of this service above the Microsoft standard.

The pylon Viewer offers you a convenient application for testing and evaluating Basler cameras. The new tree oriented design and the different levels of user access let you quickly and easily determine the best camera settings for your application.

Basler runner cameras and the Basler pylon driver package are 100% GigE Vision compliant. The GigE Vision Standard has become a synonym for the new interface technology used in machine vision systems and in related industries like intelligent traffic systems and medical imaging.

The physical implementation of the GigE Vision interface, such as cables and RJ-45 connectors, are based on Gigabit Ethernet technology. This new technology breaks bandwidth barriers and offers 100 meter cable lengths to make a change from the established FireWire or Camera Link Technology much more attractive. Lower cable costs and eliminating the need for a frame grabber also argue in favor of the change.

The logical implementation of the GigE Vision Standard is based on the internet UDP protocol. Compared to other common protocols such as TCP/IP, UDP's lower protocol overhead limits the resources needed for image data transfer. The GigE Vision protocols implemented on top of UDP provide real-time capability, proper error handling, and the secure transfer of image data (no image loss). These techniques ensure reliability and are the premise that makes Gigabit Ethernet applicable to vision systems.

An AIA committee is continuing to expand the GigE Vision standard. Basler is pushing this effort forward by contributing personnel and technical know-how. For more information see www.machinevisiononline.org

What Makes Basler Camera Quality So Special?

To ensure consistently high product quality, we employ several quality inspection procedures during manufacturing. The following list describes some of the most essential actions we take to meet your highest requirements:

- The back focal length on each camera is carefully measured and adjusted. This guarantees an optimum distance between the lens flange and the sensor and ensures compliance with optics standards.
- Our advanced Camera Test Tool (CTT+), the first fully-automated inspection system for digital cameras, checks all of the significant quality aspects of each camera we produce. The CTT+ is a unique combination of optics, hardware, and software that can be quickly and efficiently used to calibrate a camera and to measure its performance against a set of standards. For defined sets of conditions, an automated software program examines the camera's output, makes any calibration adjustments necessary, and compares the output to a strictly defined set of performance criteria.

Specifications

Basler runner	ruL1024-19gm	ruL1024-36gm	ruL1024-57gm	ruL2048-10gm	ruL2048-19gm	ruL2048-30gm	ruL2098-10gc
Camera							
Sensor Size		1024 pixels			2048 pixels		2098 pixels per line
Sensor		Thompson TH7813A Linear monochrome CCD			Thompson TH7814A Linear monochrome CCD		Kodak KLI-2113 tri-linear color CCD
Pixel Size				10 µm × 10 µm			14 µm × 14 µm
Max Line Rate	18.7 kHz	35.7 kHz	56.1 kHz	9.7 kHz	18.7 kHz	29.2 kHz	9.2 kHz
Interface				Gigabit Ethernet (GigE Vision compliant)			
Pixel Bit Depths				Selectable 8 bit or 12 bit			
Video Output Format			Mono 8, Mono 12, Mono 12 Packed				RGB 8, RGB 12, YUV 4:2:2
Synchronization				Via external signal or software			
Exposure Control				Trigger width, timed, or off			
Mechanical / Electrical							
Housing Size (L x W x H)				54.5 mm × 62.0 mm × 62.0 mm			
Housing Temperature				Up to 50°C			
Lens Mounts				C or F-mount			F or V-mount
Digital I/O				3 in / 2 out or direct encoder input			
Power Requirements				12 VDC (±10%)			
Power Consumption (typical)	6.0 W	7.0 W	8.0 W	6.5 W	7.5 W	8.5 W	5.1 W
Weight (typical)				235 g			
Conformity				CE, FCC, GenICam, GigE Vision, IP 30			

Specifications are subject to change without prior notice.

For detailed technical information, please see the camera manual that can be found on our website: www.baslerweb.com/manuals
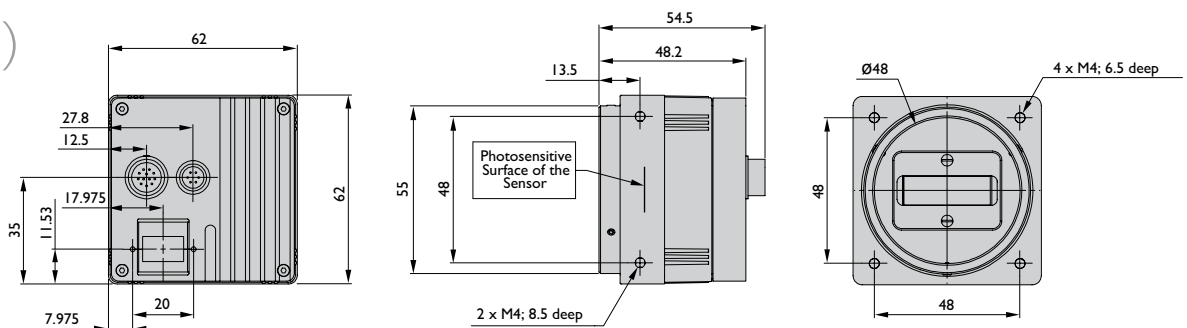
Dimensions
(in mm)

Germany, Headquarters
Phone   +49 4102 463 500
Fax   +49 4102 463 599
bc.sales.europe@baslerweb.com

USA
Phone   +1 610 280 0171
Fax   +1 610 280 7608
bc.sales.usa@baslerweb.com

Japan
Phone   +81 45 227 6210
Fax   +81 45 227 6220
bc.sales.japan@baslerweb.com

Singapore
Phone   +65 6425 0472
Fax   +65 6425 0473
bc.sales.asia@baslerweb.com

Korea
Phone   +82 707 1363 114
Fax   +82 707 0162 705
bc.sales.korea@baslerweb.com

www.baslerweb.com

BASLER COMPONENTS

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