

# Basler runner

## LINE SCAN CAMERAS

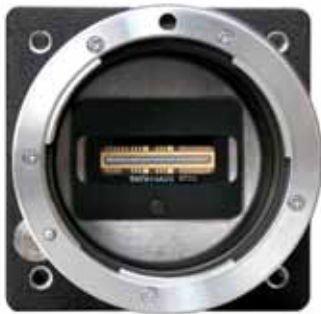


- High-quality line scan technology meets a cost-effective GigE interface
- Real color support in a compact housing size
- Shading correction compensates for difficult lighting conditions
- Flexible, easy integration supported by a variety of I/O features

# OVERVIEW

## Proven Image Quality and Easy to Use Without 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.



### runner Monochrome Sensor Technology

The monochrome version of the runner is equipped with a single-line CCD sensor that has a square, 10  $\mu\text{m}$  x 10  $\mu\text{m}$  pixel size. This provides exceptional sensitivity and dynamic range, as reflected by the availability of video output formats up to 12 bits.

### 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.

Basler runner cameras are an ideal fit for a variety of applications including web inspection (wood, paper, foil, etc.), surface inspection (printed circuit boards, flat panels and displays, semiconductors, etc.), document scanning and postal sorting, or food inspection.

### Your benefits include:

- More than 100 megabytes of data per second and up to 100 meter cable length with GigE
- Reliable, high-bandwidth data transfer at the lowest CPU load with the pylon driver package
- Superior image quality improves your image processing results
- 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
- Simple integration environment provided by runner's flexible I/O capabilities (general purpose I/O), for example to transfer the trigger signal to another runner camera operating in parallel
- LED indicators and test image generation capabilities reduce your integration time and aid troubleshooting
- Broad variety of software features, such as the Multiplier and Divider to modify the incoming trigger signals and ensure that the camera is operating at the correct line speed
- An integrated spatial correction feature combines pixel data from the lines in the sensor eliminating the need for computer resources to perform this task
- Very attractive price/performance ratio

# TECHNICAL DETAILS

## Specifications

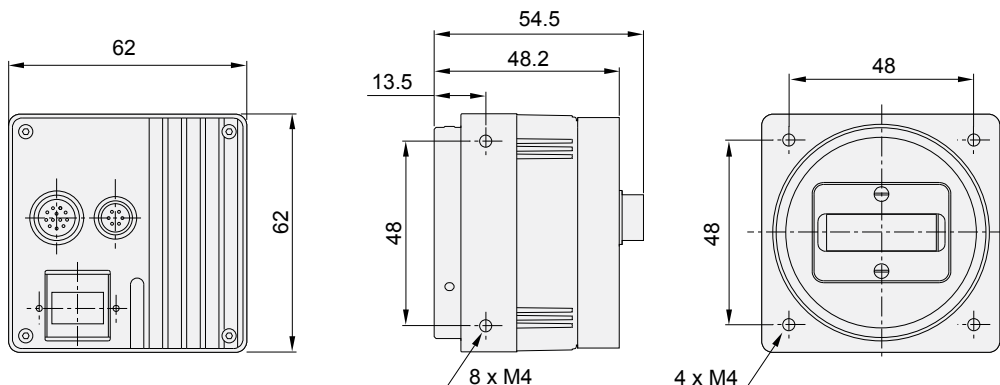


Basler runner	ruL2048-10gm	ruL2048-19gm	ruL2048-30gm	ruL2098-10gc
<b>Camera</b>				
Sensor Size	2048 pixels			2098 pixels per line
Sensor	Thompson TH7814A linear monochrome CCD			Kodak KLI-2113 tri-linear color CCD
Pixel Size	10 $\mu\text{m}$ x 10 $\mu\text{m}$			14 $\mu\text{m}$ x 14 $\mu\text{m}$
Max Line Rate	9.7 kHz	18.7 kHz	29.2 kHz	9.2 kHz
Interface	Gigabit Ethernet			
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			
<b>Mechanical / Electrical</b>				
Housing Size (L x W x H)	54.5 mm x 62.0 mm x 62.0 mm			
Housing Temperature	Up to 50 °C			
Lens Mount	C or F-mount			F or V-mount
Digital I/O	3 in / 2 out or direct encoder input			
Power Requirements	12 VDC ( $\pm 10\%$ )			
Power Consumption (typical)	6.5 W	7.5 W	8.5 W	5.1 W
Weight (typical)	235 g			
Conformity	CE, FCC, IP 30, RoHS, GenICam, GigE Vision			

Specifications are subject to change without prior notice.

For detailed technical information, see the camera User's Manual that can be found at [www.baslerweb.com/manuals](http://www.baslerweb.com/manuals)

## Dimensions (in mm)



## OTHER INFORMATION

### Gigabit Ethernet



Gigabit Ethernet (GigE) cameras are the right choice for data rates of up to 100 MB/s and a maximum cable length of 100 meters. They make complex setups with several cameras very simple. In addition to the physical interface defined by the Gigabit Ethernet standard (among others), the especially clear and logical implementation of the GigE Vision Standard supports easy integration in all image processing programs via the use of software libraries. Also, because the exchange of GigE Vision compatible cameras can be performed without changing the application software, new investments and follow-up costs can be estimated and well-planned with cameras based on the GigE Vision Standard.

### How Does Basler Measure and Define Image Quality?



Basler is leading the effort to standardize image quality and sensitivity measurement for cameras and sensors. We are giving the EMVA 1288 standard our strongest support because it describes a unified method to measure, compute, and present the specification parameters for cameras and image sensors. Our cameras are characterized and measured in 100% compliance with the EMVA 1288 standard. Measurement reports can be downloaded from our website.

### How Does Basler Ensure Superior Quality and Reliable High Performance?

Our approach to quality assurance is rigorous: we continually audit all facets of our business to guarantee performance, increase efficiency and reduce costs for our customers. We are compliant with all major quality standards including ISO9001, CE, RoHS, and more. To ensure consistently high product quality, we employ several quality inspection procedures during manufacturing.

Every Basler camera is subjected to exhaustive optical and mechanical tests before leaving the factory. We have developed a unique combination of optics, hardware, and software tools that can quickly and efficiently calibrate a camera and measure its performance against a set of standard performance criteria. Regardless of what technology or camera model you choose you can be assured of consistent performance.

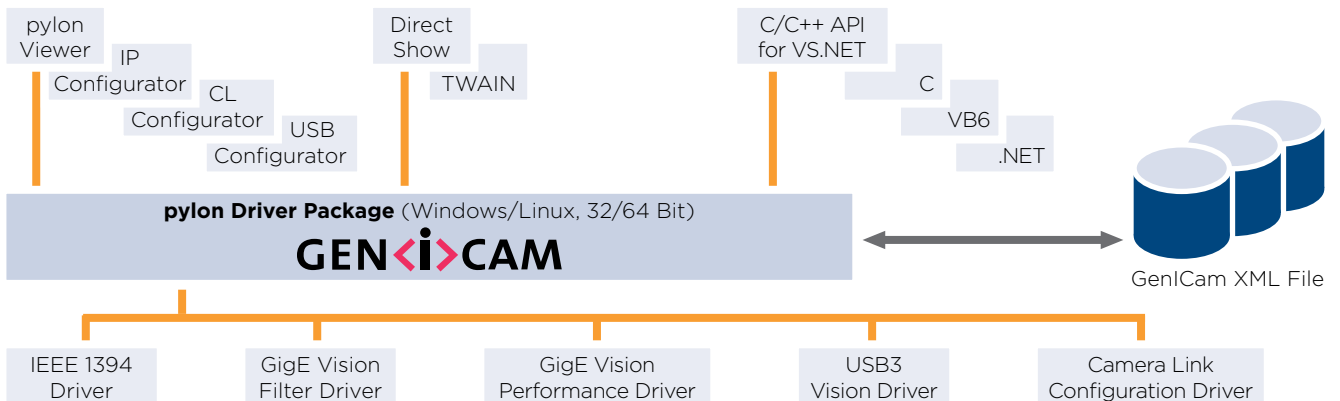
### 3-Year Warranty

Basler offers a 3-year warranty for our cameras. We make this unprecedented promise because we have unparalleled confidence in our products. We continually reinvest in research, development and superior manufacturing capabilities so that our customers can fully rely on the products we manufacture.

Get your free version:  
[www.baslerweb.com/pylon](http://www.baslerweb.com/pylon)

## Basler pylon Driver Package

The pylon driver package operates with all Basler line scan and area scan cameras. It offers stable, reliable and flexible data exchange between Basler cameras and PCs, at a very low CPU load.



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 **USB3 Vision Driver** fully supports the USB3 Vision standard. It allows Basler USB 3.0 cameras to use the full speed and bandwidth of USB 3.0 for image transmission while reducing resource load and using off-the-shelf hardware components.

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, and the pylon **Camera Link Configuration Driver** offers comfortable access to all camera parameters of Basler's latest Camera Link families ace, aviator, and racer.

The pylon Viewer offers you a convenient application for testing and evaluating Basler cameras. The pylon SDK supports any type of application development. The pylon package contains the following main modules. Each one can be individually selected/unselected during the installation process, preventing the installation of unneeded modules on your system.

- USB3 Vision Driver
- GigE Vision Filter Driver
- GigE Vision Performance Driver
- IEEE 1394 Driver
- Camera Link Serial Communication Driver
- pylon Viewer
- pylon SDK for all cameras; C, C++, .NET (C#, VB.NET, ...), and VB6 (the 'pylon for Linux' version only supports the GigE interface via a C++ API)

The pylon driver package can be downloaded for free at [www.baslerweb.com/pylon](http://www.baslerweb.com/pylon). For more information on the installation process, refer to the pylon Installation Guide. The helpful pylon Release Notes contain all improvements and bug fixes since the first pylon version.

## OTHER INFORMATION

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### About Basler

Founded in 1988, Basler is a leading global manufacturer of high quality digital cameras for industrial, medical, traffic and video surveillance applications. The company employs some 300 people at its headquarters in Ahrensburg, Germany and subsidiaries in the United States and Asia.

Basler's portfolio of products offers customers the vision industry's widest selection of industrial and network cameras. Today it includes some 300 models - and it's still growing. We're committed to developing technology that drives business results for our customers: cameras that are easy to use, easy to integrate, and deliver an exceptional price/performance ratio.



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