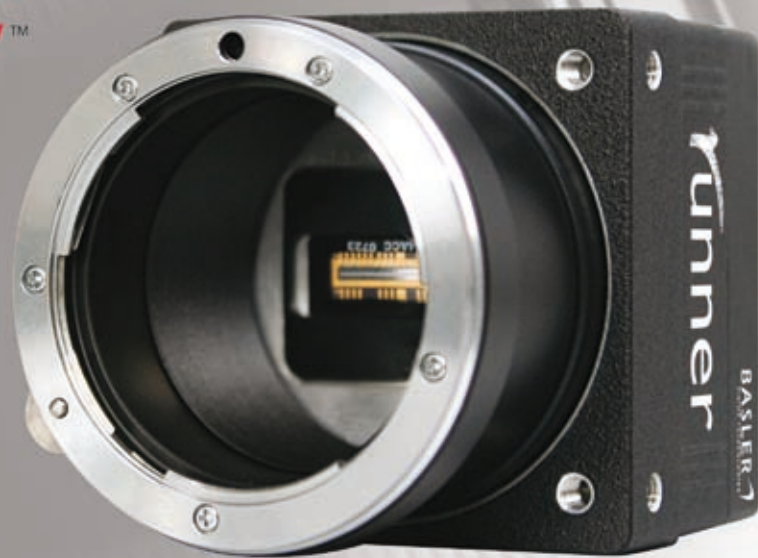


# Basler runner

**GiGE**<sup>™</sup>  
VISION



GigE Vision Line Scan, Cost Effective, Easy-to-Integrate

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

The Basler runner family is a new line scan series that combines high quality line scan technology with GigE Vision interface technology. The monochrome version of the runner is available with 1k and 2k resolution and several speed variants.

The color version of the runner is based on a tri-linear CCD sensor with 2098 pixels per line and a line rate of 9.2 kHz.

All runner models offer superior image quality to improve image processing results in any application. The runner's proven image quality and easy-to-use GigE Vision interface make the runner family a perfect solution for a wide variety of applications. With the GigE Vision interface, it will be 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 Vision line scan bundle is a very cost effective solution.

The compact housing of the runner family is designed for use in the harsh industrial environment. 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 the application. A combination of inputs and outputs can be used, for instance, to implement real-time triggering, to adjust the lighting, and to transfer the trigger signal to another camera running in parallel.

With a choice of three different integration modes as well as adjustable gain and offset, runner cameras are very adaptable. They can be triggered via an external sync signal or operated in an internally controlled "free run" mode. Adjustments to the camera's parameters can be readily accomplished via Basler's comprehensive pylon API.

### 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.

### 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 capability reduce your integration time and aid troubleshooting
- Comprehensive factory testing ensures consistent product quality
- Reliable, high-bandwidth data transfer at the lowest CPU load with the pylon driver package
- Simplified integration into your applications supported by pylon's unified camera API
- Electronic exposure time control provides maximum flexibility
- Superior image quality improves your image processing results
- Compact size reduces the space needed in your installation
- 100% factory testing ensures consistent product quality

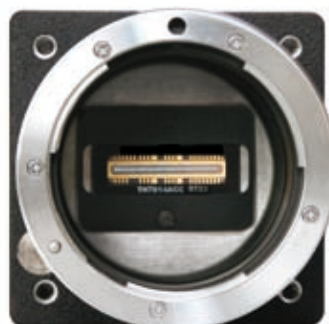
Additional Benefits from the runner ruL2098-10gc variant:

- An expensive matched lens is not required for optimum image quality, 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

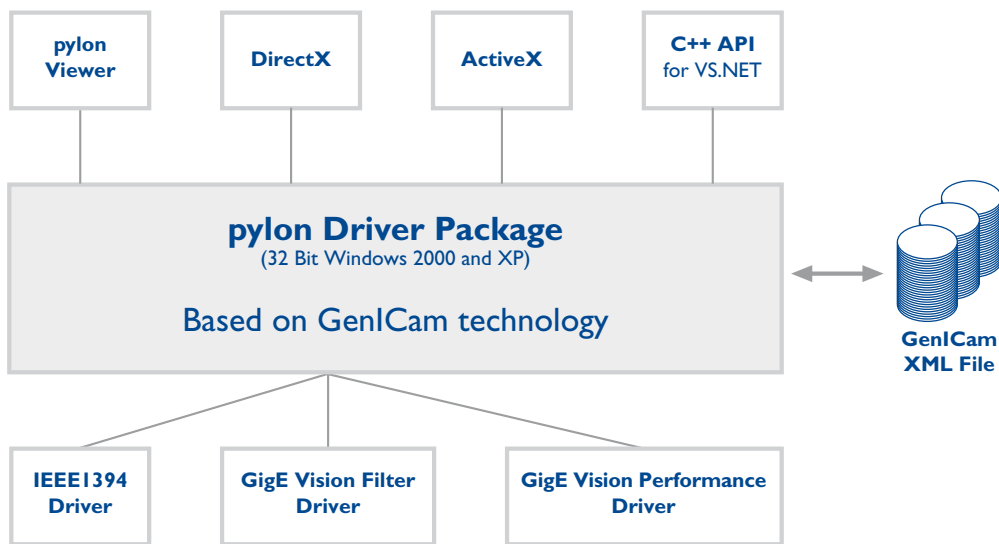
Basler runner cameras are perfect for use in applications such as:

- 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.



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](http://www.machinevisiononline.org)

## What Makes Basler Camera Quality So Special?

To ensure consistently high product quality, we employ several quality inspection procedures during manufacturing. This 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

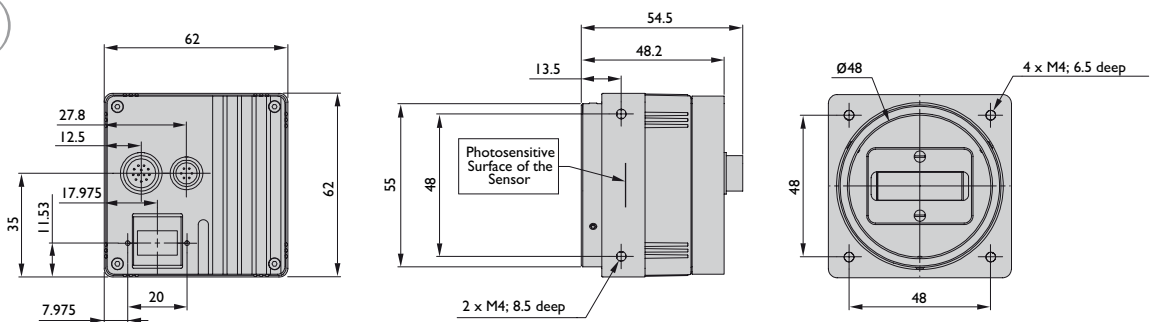
inspection system for digital cameras, checks all of the significant quality aspects of each camera we produce. The CTT+ is a unique combination of optics, hardware, and software that can be quickly and efficiently used to calibrate a camera and to measure its performance against a set of standards. 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             |       |
|--------------------------------|--------------------------------------|--------------|--------------|-----------------------|--------------|-------------------------------------|--------------------------|-------|
| <b>Camera</b>                  |                                      |              |              |                       |              |                                     |                          |       |
| Sensor Size                    | 1024 pixels                          |              |              | 2048 pixels           |              | 2098 pixels per line                |                          |       |
| Sensor Type                    | Thompson TH7813A                     |              |              | Thompson TH7814A      |              | Kodak KLI-2113 tri-linear color CCD |                          |       |
|                                | Linear monochrome CCD                |              |              |                       |              |                                     |                          |       |
| Pixel Size                     | 10 μm x 10 μm                        |              |              |                       |              |                                     | 14 μm x 14 μm            |       |
| Max Line Rate                  | 18.7 kHz                             | 35.7 kHz     | 56.1 kHz     | 9.5 kHz               | 18.7 kHz     | 29.2 kHz                            | 9.2 kHz                  |       |
| Pixel 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         |              |              |                       |              |                                     |                          |       |
| Interface                      | GigE Vision (Gigabit Ethernet)       |              |              |                       |              |                                     |                          |       |
| <b>Mechanical / Electrical</b> |                                      |              |              |                       |              |                                     |                          |       |
| Power Requirements             | 6.0 W                                | 7.0 W        | 8.0 W        | 12VDC (±10%)<br>6.5 W |              | 7.5 W                               | 8.5 W                    | 5.1 W |
| Inputs/Outputs                 | 3 in / 2 out or direct encoder input |              |              |                       |              |                                     |                          |       |
| Lens Mounts                    | C or F-mount                         |              |              | F-mount               |              |                                     |                          |       |
| Housing Size (L x W x H)       | 54.5 mm x 62.0 mm x 62.0 mm          |              |              |                       |              |                                     |                          |       |
| Weight                         | max 285 g (without lens adapter)     |              |              |                       |              |                                     |                          |       |
| Conformity                     | CE, FCC, GenICam, GigE Vision        |              |              |                       |              |                                     |                          |       |

Specifications are subject to change without prior notice.

# Dimensions (in mm)





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