

# Basler Scout



Versatile, Fully Digital, Attractively Priced

# scout Series – Are You Looking for a Cost-effective Digital Camera that Supports 100 Meter Cable Lengths?

**Basler scout Family – 40 Different Models – Sophisticated in Detail, Versatile, Fully Digital, and Attractively Priced**

The Basler scout family is based on a selection of the best Sony CCD sensors and offers a wide variety of resolutions and speeds. The family also includes a high-performance CMOS sensor from Micron. With their new Gigabit Ethernet (GigE) and FireWire-b™ (IEEE 1394b) interface technologies, the cameras in this family are defined by state of the art technology that lets you get the maximum performance from each sensor.

Your benefits from the Basler scout family include:

- Resolutions from VGA to 2 megapixels with either a FireWire-b or a Gigabit Ethernet interface
- 100 meter cable lengths provided by Gigabit Ethernet to give you the highest flexibility
- Up to 12 bit depths and no bandwidth limitation on 8 bit data flow inside the camera
- Free drivers for FireWire and Gigabit Ethernet (GigE Vision™)
- Small, rugged housing for easy integration
- Compatible with the newest vision industry standards including GenICam, GigE Vision, and EMVA 1288
- 100% quality checked and calibrated to give you consistent performance and reliability

The Basler scout family features a GenICam compliant API and uses new drivers. The FireWire-b cameras are also compatible with Basler's existing BCAM driver and API for FireWire cameras. Along with the drivers, GUI based software is provided that lets users easily set camera parameters, adjust image quality, and control cameras from a remote computer.

Basler scout cameras are a perfect fit for a variety of vision applications including semiconductor and component inspection, manufacturing quality control, food and beverage inspection, intelligent traffic systems, microscopy and medical imaging, biometrics, and many others.

### Outstanding Image Quality

The scout family is equipped with seven assorted Sony CCD sensors in mono and color. These sensors were selected to provide outstanding image quality in combination with the scout's read-out and processing electronics. For precise imaging results, all scout cameras run in progressive scan mode.



Users of interlaced analog cameras can easily switch to a scout camera equipped with Micron's MT9V022 CMOS progressive scan sensor.

### Gigabit Ethernet (GigE Vision) Drivers

Basler provides its own Gigabit Ethernet drivers for the scout camera family. These drivers will be compatible with the GigE Vision standard and optimized for the scout family. To give you maximum flexibility, Basler provides two different drivers:

**Filter driver:** The filter driver quickly separates incoming packets carrying image data from other traffic on the network and makes the data available for vision applications running on the computer.

**Performance driver:** By using the performance driver, even demanding applications with multiple cameras, high data rates, or very strict real-time requirements can be supported. When the performance driver is used in combination with a dedicated network interface card (Intel), the load on the host computer's CPU is significantly reduced.

### Precise Sensor Alignment

In addition to Basler's standard CTT+ automated quality assurance and calibration system, the scout camera family will be tested and measured with another production tool. This unique tool is an ultra-high precision sensor alignment device. The device automatically mounts the sensor board on the camera's front module in six degrees of freedom with reference to the optical axis. This ensures a constant depth of focus over the whole sensor. For sensors with small pixels (< 5 µm) this is essential for good imaging results.

# Specifications FireWire



Basler scout	Sensor Size (HxV pixels)	Sensor Type	Sensor Technology	Optical Size	Pixel Size (in µm)	Max. Frame Rate (at full resolution)	Typical Power Consumption at 12V	Weight (typical)
scA640-70fm/fc	659 × 490	Sony ICX424	Progressive scan CCD	1/3"	7.4 × 7.4	71	2.5 W	150g
scA640-74fm/fc	659 × 490	Sony ICX414	Progressive scan CCD	1/2"	9.9 × 9.9	74	2.5 W	150g
scA750-60fm/fc	752 × 480	Micron MT9V022	Progressive scan CMOS	1/3"	6.0 × 6.0	60	2.5 W	150g
scA780-54fm/fc	782 × 582	Sony ICX415	Progressive scan CCD	1/2"	8.3 × 8.3	54	2.5 W	150g
scA1000-20fm/fc	1034 × 779	Sony ICX204	Progressive scan CCD	1/3"	4.65 × 4.65	20	2.5 W	150g
scA1000-30fm/fc	1034 × 779	Sony ICX204	Progressive scan CCD	1/3"	4.65 × 4.65	30	2.5 W	150g
scA1390-17fm/fc	1392 × 1040	Sony ICX267	Progressive scan CCD	1/2"	4.65 × 4.65	17	2.5 W	150g
scA1400-17fm/fc	1392 × 1040	Sony ICX285	Progressive scan CCD	2/3"	6.45 × 6.45	17	3 W	160g
scA1400-30fm/fc*	1392 × 1040	Sony ICX285	Progressive scan CCD	2/3"	6.45 × 6.45	30	3 W	160g
scA1600-14fm/fc	1628 × 1236	Sony ICX274	Progressive scan CCD	1/1.8"	4.4 × 4.4	14	3 W	150g

Specifications are subject to change without prior notice.

\* Availability: beginning of 2008

# Specifications Applicable For All scout FireWire Models:

Mono/Color	Yes/Yes
Video Output Type (Interface)	IEEE1394b (screw lock possible)
Video Output Format	Mono 8: 8 bits/pixel   Mono 16: 12 bits/pixel   YUV 4:2:2: 16 bits/pixel average   YUV 4:2:2: (YUYV): 16 bits/pixel average Raw 8: 8 bits/pixel (R,G, or B)   Raw 16: 12 bits/pixel (R,G, or B)   scA750-60fm/fc (8 bits/pixel only)
Synchronization	Via external trigger, via the IEEE1394 bus, or free run
Exposure Control	Programmable via the 1394 bus
Power Requirements	8 – 36 VDC; provided via the IEEE1394 cable; < 1% ripple
Lens Mount	C-mount; CS-mount (optional)
Housing Size (L x W x H)	73.7 mm × 44 mm × 29 mm (without lens adapter)
Housing Size 90° (L x W x H)	41.8 mm × 44 mm × 97 mm (incl. lens adapter)
Conformity	CE, FCC, DCAM, RoHS, IP 30
I/O Ports	2 opto-isolated input ports, 4 opto-isolated output ports
Software Driver	Basler pylon, IEEE1394b driver, Basler BCAM driver
GenICam Compatible	Yes (No, with BCAM 1.9)

Specifications are subject to change without prior notice.

## TECHNICAL DETAILS

### Specifications GigE Vision



Basler scout	Sensor Size (HxV pixels)	Sensor Type	Sensor Technology	Optical Size	Pixel Size (in µm)	Max. Frame Rate (at full resolution)	Typical Power Consumption at 12V	Weight (typical)
scA640-70gm/gc	659 × 490	Sony ICX424	Progressive scan CCD	1/3"	7.4 × 7.4	70	3 W	150g
scA640-74gm/gc	659 × 490	Sony ICX414	Progressive scan CCD	1/2"	9.9 × 9.9	79	3 W	150g
scA750-60gm/gc	752 × 480	Micron MT9V022	Progressive scan CMOS	1/3"	6.0 × 6.0	60	3 W	150g
scA780-54gm/gc	782 × 582	Sony ICX415	Progressive scan CCD	1/2"	8.3 × 8.3	55	3 W	150g
scA1000-20gm/gc	1034 × 779	Sony ICX204	Progressive scan CCD	1/3"	4.65 × 4.65	20	3 W	150g
scA1000-30gm/gc	1034 × 779	Sony ICX204	Progressive scan CCD	1/3"	4.65 × 4.65	31	3 W	150g
scA1390-17gm/gc	1392 × 1040	Sony ICX267	Progressive scan CCD	1/2"	4.65 × 4.65	17	3.5 W	150g
scA1400-17gm/gc	1392 × 1040	Sony ICX285	Progressive scan CCD	2/3"	6.45 × 6.45	17	3.5 W	160g
scA1400-30gm/gc*	1392 × 1040	Sony ICX285	Progressive scan CCD	2/3"	6.45 × 6.45	30	3.5 W	160g
scA1600-14gm/gc	1628 × 1236	Sony ICX274	Progressive scan CCD	1/1.8"	4.4 × 4.4	14	3.4 W	150g

Specifications are subject to change without prior notice.

\* Availability: beginning of 2008

### Specifications Applicable For All scout GigE Vision Models:

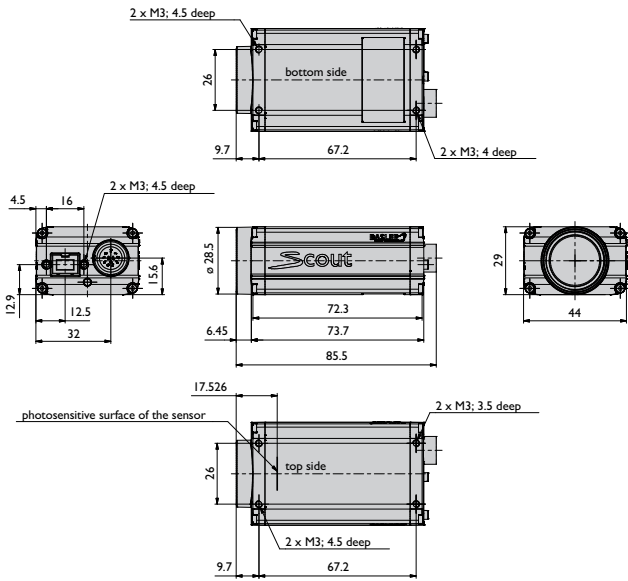
Mono/Color	Yes/Yes
Video Output Type (Interface)	Gigabit Ethernet (GigE Vision compatible)
Video Output Format	Mono 8: 8 bits/pixel   Mono 16: 12 bits/pixel   YUV 4:2:2: 16 bits/pixel average   YUV 4:2:2: (YUYV):16 bits/pixel average Raw 8: 8 bits/pixel (R,G, or B)   Raw 16: 12 bits/pixel (R,G, or B)   scA750-60gm/gc (8 bits/pixel only)
Synchronization	Via external trigger, or free run
Exposure Control	Programmable via GigE Vision (camera API)
Power Requirements	12 – 24 V; via Hirose 12-pin connector (max. 10 meter cable lengths)
Lens Mount	C-mount; CS-mount (optional)
Housing Size (L × W × H)	73.7 mm × 44 mm × 29 mm (without lens adapter)
Housing Size 90° (L × W × H)	41.8 mm × 44 mm × 97 mm (incl. lens adapter)
Conformity	CE, FCC, GigE Vision, RoHS, IP 30
I/O Ports	2 opto-isolated input ports, 4 opto-isolated output ports
Software Driver	Basler pylon (Basler filter and performance driver), GigE Vision compliant
GenICam Compatible	Yes

Specifications are subject to change without prior notice.

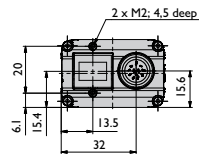
# Dimensions (in mm)

## Standard housing

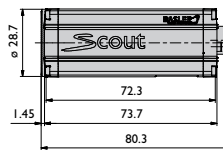
scout General/IEEE 1394



scout GigE Vision (screw connector implemented e/o 2007)

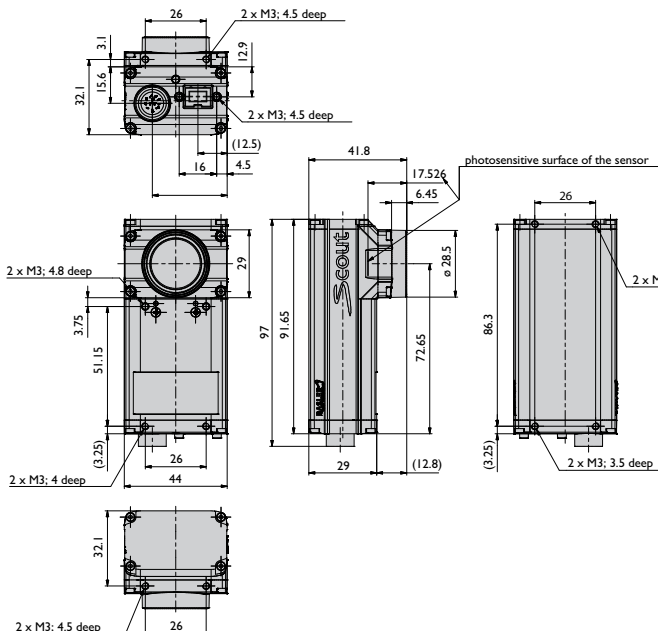


scout CS-Mount

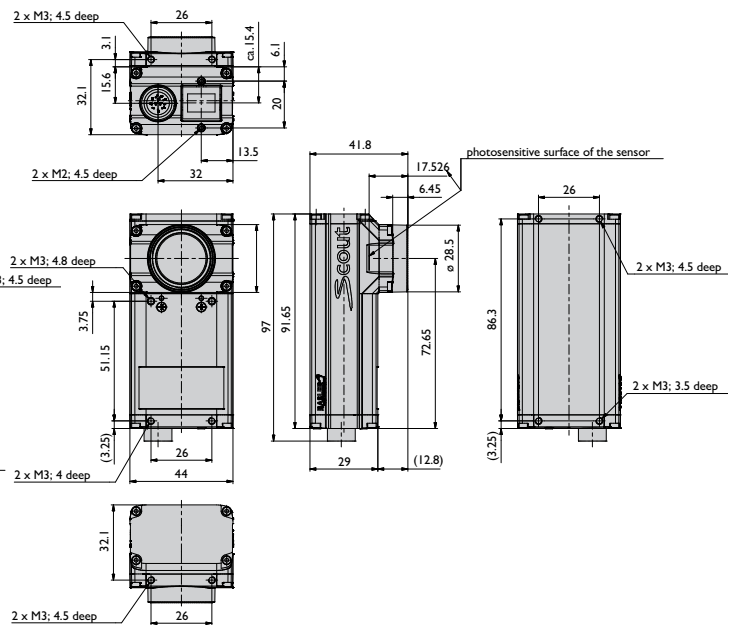


## 90 deg housing

scout-90°/IEEE 1394

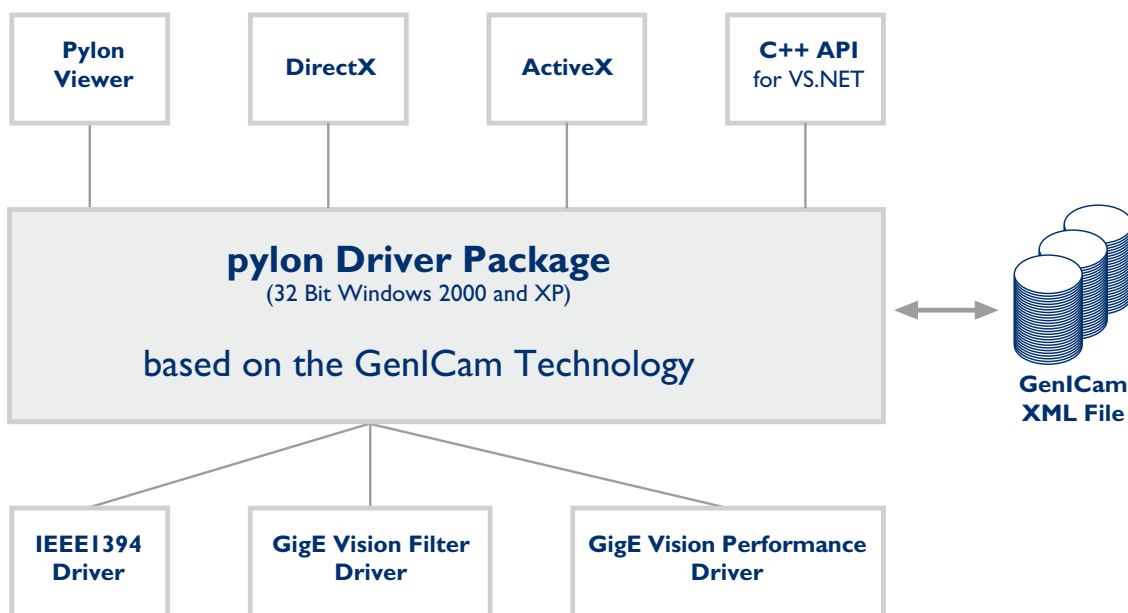


scout-90° GigE Vision (screw connector implemented e/o 2007)



## 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 increases the quality of this service beyond 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.

## Innovative Technologies in the Basler scout Family

### 100 Meter Cable Lengths – High Bandwidth – No Frame Grabber



Basler's scout family has a Gigabit Ethernet (GigE) interface compliant with the GigE Vision standard. GigE 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. High bandwidth, long cable lengths, and wide usage in the consumer and industrial markets are the key elements that make GigE attractive for your application.

Because Gigabit Ethernet breaks the bandwidth barrier that was set by FireWire, switching from Camera Link® to Gigabit Ethernet is now attractive for you. Another clear advantage of the scout family is a quantifiable reduction in the cost of a total vision solution because a frame grabber is no longer required. No less important is the 100 meter cable lengths offered by Gigabit Ethernet. These expanded capabilities open exciting new possibilities for vision system design and break through existing limitations to reach a new level that is especially beneficial for factory floor applications.



### FireWire-b – Doubled Bandwidth – Easy to Use

The scout family continues Basler's success with the FireWire interface and takes it to a new level of performance. FireWire, also known as IEEE1394, has become a standard image data and camera command transmission mechanism in the

machine vision industry. Its key benefit is real-time communication between your camera and remote computer.

The scout family breaks the existing 400 Mbit/s data rate limitation of FireWire-a and offers up to 800 Mbit/s as specified by FireWire-b. This means that scout cameras can provide maximum performance in terms of frame rate and bit depth compared to cameras limited by the FireWire-a data rate. In addition, FireWire integration is easy, cost-effective, and standardized. It supports plug-and-play and there is no need for a frame grabber. The scout family is also backward compatible with FireWire-a.



The Basler scout camera will be GenICam compatible

and will include an IEEE1394 driver, GigE filter driver, and GigE performance driver. The scout software will also implement a newly designed image viewer.

The core of GenICam is a description of the camera's properties in an XML descriptor file. Using this file, a translator can directly generate either a C++ application programming interface (API) called GenAPI or the elements of a graphical user interface (GUI). This lets the user easily identify the camera type, as well as the features and functions available on the camera and the parameters associated with each camera function. Future extensions of GenICam will also provide mechanisms for grabbing and streaming images from the camera. The proposed GigE Vision standard stipulates that cameras must provide the XML descriptor file. A descriptor file for IEEE1394 compliant cameras will be available as well.

## How Does Basler Measure and Define Image Quality?



EMVA Standard Compliant

Basler-VC is leading the effort to standardize image quality and sensitivity measurement for machine vision cameras and sensors. All

measurements done by Basler will be in 100% compliance with the new European Machine Vision Association EMVA 1288 standard. Because it describes a unified method to measure, compute, and

present the specification parameters for cameras and image sensors used in machine vision applications, Basler is giving the EMVA 1288 standard our strongest support.

The scout family will be characterized and measured to provide information about the quality and sensitivity of our products. All data can be found on Basler's website [www.basler-vc.com](http://www.basler-vc.com)

## What Makes Basler Camera Quality So Special?



### Basler Camera Test Tool

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

- As a final check, our cameras must pass a stress test. Each camera is tested over the entire temperature range specified in our documentation. By doing this, we can identify and remove temperature sensitive weak spots in the camera. Thus, consistent image quality in conditions with quickly changing temperatures is guaranteed.

Basler customers get a 100% tested camera, all of the benefits that go along with 100% testing, and a much higher level of satisfaction. This is a definite win-win situation.

## RoHS Compliance

The Basler scout series is RoHS compliant. This is especially important in applications where the end-user requires strict RoHS compliance in all system components.



## 90 degree Housing Option

The most significant improvement in the new 90deg (90 degree) housing version of the scout is a remarkable reduction in the camera depth. The total depth of the camera body, included the lens mount, is less than 42 millimeters. The scout 90deg has its connectors on the bottom. Many other small footprint cameras have their connectors on the rear end, which expands their total depth by 20 to 30 millimeters. Taking all of this into account, the scout fits better in many applications.

All of the features included on the standard housing scout have been transferred to this new housing option. The uncompromisingly high scout image quality and speed compared to other small housing cameras in the market were also transferred to the 90deg models. This was the most important design goal for Basler's engineers.



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