Basler Components

Product Line Overview

BASLER
VISION TECHNOLOGIES

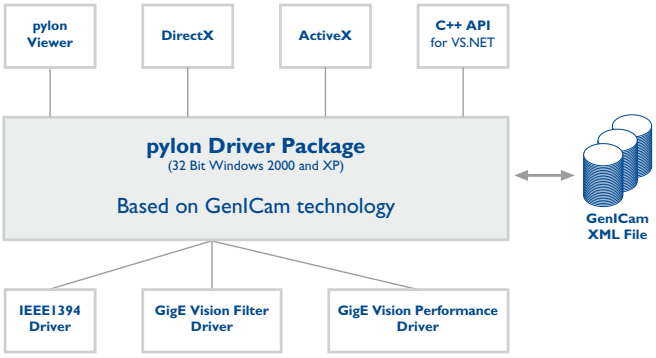
Basler pylon 2.0 Camera Driver Package for Windows

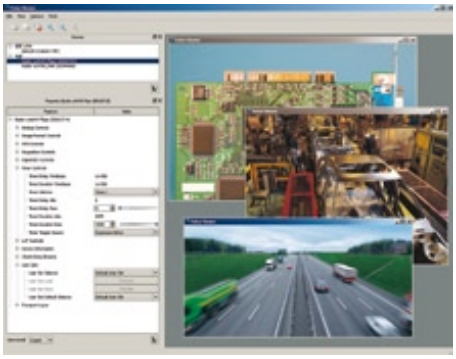
The Basler pylon Driver Package is designed to operate with Basler cameras that have an IEEE 1394a, an IEEE 1394b, or a GigE Vision interface. This includes the new scout, pilot, and runner area scan and line scan camera families. Basler's older A100, A310, and A600 cameras are also well supported. One hundred percent compatibility with the GenICam standard provides the benefit of a unified C++ camera API for both the 1394a/b and the GigE interfaces. You can select the best fit for your application, or you can use both interface technologies simultaneously.

The pylon GigE drivers quickly separate incoming packets carrying image data from other traffic on the network and make the data available for your vision applications. The pylon GigE Vision Performance Driver requires the lowest amount of CPU resources, but can only be used with specific Intel network adapter cards. The pylon GigE Vision Filter Driver supports many kinds of hardware including GigE ports on your computer's mother board. The pylon IEEE 1394 driver works with the lowest CPU load on all 1394 adapters and provides full S800 speed on all Windows systems without the need for OS patches. "Silent" installation packages for each pylon driver let you easily install the drivers on your system.

The Basler pylon Viewer is an easy-to-use application for testing and evaluating Basler cameras. The new tree structure of the Viewer's graphical user interface lets you quickly find the best camera parameter setup, lets you adjust image quality, and gives you complete control of the camera's advanced features.

Comprehensive documentation and an extensive set of sample programs will minimize your learning time for the pylon Driver Package.





Basler pylon	
Supported Interfaces:	GigE Vision and IEEE 1394a/b
Supported Basler Cameras:	scout, pilot, runner, A102f/fc, A31xf/fc and A6xxf/fc
Supported IDEs:	MS Visual Studio 7.1 and 8.0
Supported Languages:	C++, MS Direct Show
System Requirements:	32 Bit: Windows 2000 SP4, Windows XP SP2 64 Bit (only for IEEE 1394): Windows XP 64 SP1, Windows Server 2003 64 SP1

BASLER VISION TECHNOLOGIES

GENICAM

GIGE VISION™

FireWire

Intelligent Cameras

Basler eXcite	Resolution	Frame Rate [Hz]	Color	Bit Depth	Pixel Size [µm²]	Sensor Size [mm²]	Optical Size	CPU Type	Memory	OS	Interface
exA640-60m	656 x 491	60		8/10	9.9 x 9.9	6.49 x 4.86	1/2″	64 Bit-MIPS Processor running on 1.0 GHz	128 MB RAM 128 MB Flash	Linux (Kernel 2.6)	LAN 10/100/1000 MBit, USB2.0, RS232, 8xDigital
exA640-60c	656 x 490	60	•	8/10/Δ	9.9 x 9.9	6.49 x 4.85	1/2″				
exA640-120m	656 x 491	132		8/10	9.9 x 9.9	6.49 x 4.86	1/2″				
exA640-120c	656 x 490	132	•	8/10/Δ	9.9 x 9.9	6.49 x 4.85	1/2″				
exA640-180m	656 x 491	176		8	9.9 x 9.9	6.49 x 4.86	1/2″				
exA640-180c	656 x 490	176	•	8	9.9 x 9.9	6.49 x 4.85	1/2″				
exA1390-19m	1392 x 1040	18.7		8/12	4.65 x 4.65	6.47 x 4.84	1/2″				
exA1390-19c	1388 x 1038	18.7	•	8/12/Δ	4.65 x 4.65	6.45 x 4.83	1/2″				
exA1600-14m	1624 x 1236	14		8/12	4.4 x 4.4	7.15 x 5.44	1/1.8″				
exA1600-14c	1624 x 1234	14	•	8/12/Δ	4.4 x 4.4	7.15 x 5.43	1/1.8″				

A contact plane (cp) housing variant is available for all eXcite models.

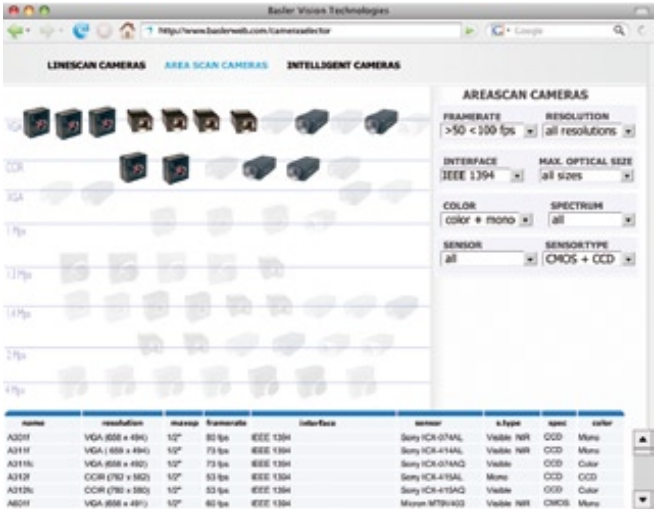
Δ = 8 bit raw; 16 bit YUV 4:2:2

Specifications are subject to change without prior notice.
C/F-Mount standard; others on request.

Our website, www.baslerweb.com, has tools to help you find the right camera.

Camera Selector

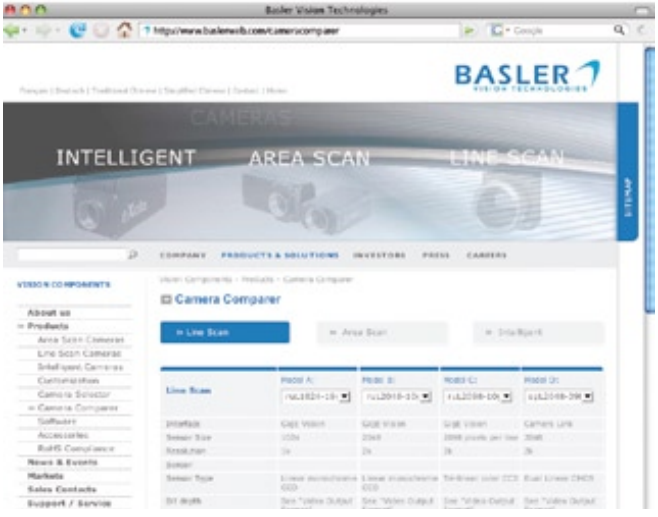
Our camera selector gives you the ability to find the right camera for your application by entering different criteria such as interface, resolution, or speed.
Please enter www.baslerweb.com/cameraselector to access the camera selector.



Camera Comparer

Another useful feature is the camera comparer. You can choose up to four different models and compare specifications at a glance.

Please enter www.baslerweb.com/cameracomparer to access the camera comparer.



Camera Link® Line Scan Cameras

Basler Line Scan	Resolution	Line Rate [kHz]	Color	Bit Depth	Interface (# of taps)	Pixel Size [µm²]	Sensor Length [mm]
L101k	1024	18.7		8/10	Camera Link (1,2)	10.0 x 10.0	10.24
L101k	2048	9.5		8/10	Camera Link (1,2)	10.0 x 10.0	20.48
L103k	1024	35.7		8/10	Camera Link (1,2)	10.0 x 10.0	10.24
L103k	2048	18.7		8/10	Camera Link (1,2)	10.0 x 10.0	20.48
L104k	1024	58.5		8/10	Camera Link (1,2)	10.0 x 10.0	10.24
L104k	2048	29.2		8/10	Camera Link (1,2)	10.0 x 10.0	20.48
L301kc	3 x 2098	9.2	•	8/10	Camera Link (1,2,3)	14.0 x 14.0	29.37
L301k	3 x 2098	9.2		8/10	Camera Link (1,2,3)	14.0 x 14.0	29.37
L304kc	3 x 4080	7.2	•	8/10	Camera Link (2,3)	10.0 x 10.0	40.80
L304k	3 x 4080	7.2		8/10	Camera Link (2,3)	10.0 x 10.0	40.80
L401k	4080	7.1		8/10	Camera Link (1)	10.0 x 5.0	40.80
L402k	4080	14.1		8/10	Camera Link (2)	10.0 x 5.0	40.80
L801k	8160	4.7		8/10	Camera Link (1,2)	5.0 x 5.0	40.80
L802k	8160	9.4		8/10	Camera Link (1,2)	5.0 x 5.0	40.80
L803k	8160	14.1		8/10	Camera Link (1,2)	5.0 x 5.0	40.80

Please check our website for recommended framegrabbers.

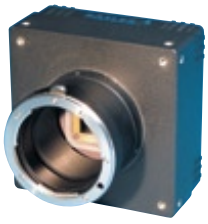
Camera Link® Line Scan Cameras

Basler sprint	Resolution	Line Rate [kHz]	Color	Bit Depth	Interface (# of taps)	Pixel Size [µm²]	Sensor Length [mm]
spL2048-20kc	2048	19.3	•	8/10/12	Camera Link (2)	10.0 x 10.0	20.48
spL2048-39km	2048	38.6		8/10/12	Camera Link (2)	10.0 x 10.0	20.48
spL2048-39kc	2048	38.6	•	8/10/12	Camera Link (4)	10.0 x 10.0	20.48
spL2048-70km	2048	70		8/10/12	Camera Link (2)	10.0 x 10.0	20.48
spL2048-70kc	2048	70	•	8/10/12	Camera Link (4)	10.0 x 10.0	20.48
spL2048-140km	2048	140		8/10/12	Camera Link (4)	10.0 x 10.0	20.48
spL4096-20km	4096	19.3		8/10/12	Camera Link (2)	10.0 x 10.0	40.96
spL4096-20kc	4096	19.3	•	8/10/12	Camera Link (4)	10.0 x 10.0	40.96
spL4096-39km	4096	38.6		8/10/12	Camera Link (4)	10.0 x 10.0	40.96
spL4096-39kc	4096	38.6	•	8/10/12	Camera Link (8)	10.0 x 10.0	40.96
spL4096-70km	4096	70		8/10/12	Camera Link (4)	10.0 x 10.0	40.96
spL4096-70kc	4096	70	•	8/10/12	Camera Link (8)	10.0 x 10.0	40.96
spL4096-140km	4096	140		8/10/12	Camera Link (8)	10.0 x 10.0	40.96
spL8192-20km	8192	19.3		8/10/12	Camera Link (4)	10.0 x 10.0	81.92
spL8192-20kc	8192	19.3	•	8/10/12	Camera Link (8)	10.0 x 10.0	81.92
spL8192-39km	8192	38.6		8/10/12	Camera Link (8)	10.0 x 10.0	81.92
spL8192-39kc	8192	38.6	•	8/10/12	Camera Link (8)	10.0 x 10.0	81.92
spL8192-70km	8192	70		8/10/12	Camera Link (8)	10.0 x 10.0	81.92

Please check our website for recommended framegrabbers.

Gigabit Ethernet Line Scan Cameras

Basler runner	Resolution	Line Rate [kHz]	Color	Bit Depth	Interface (# of taps)	Pixel Size [µm²]	Sensor Length [mm]
ruL1024-19gm	1024	18.7		8/12	Gigabit Ethernet	10.0 x 10.0	10.24
ruL1024-36gm	1024	35.7		8/12	Gigabit Ethernet	10.0 x 10.0	10.24
ruL1024-57gm	1024	56.1		8/12	Gigabit Ethernet	10.0 x 10.0	10.24
ruL2048-10gm	2048	9.5		8/12	Gigabit Ethernet	10.0 x 10.0	20.48
ruL2048-19gm	2048	18.7		8/12	Gigabit Ethernet	10.0 x 10.0	20.48
ruL2048-30gm	2048	29.2		8/12	Gigabit Ethernet	10.0 x 10.0	20.48
ruL2098-10gc	3 x 2098	9.2	•	8/12	Gigabit Ethernet	14.0 x 14.0	29.37



Camera Link® Area Scan Cameras

Basler Area Scan	Resolution	Frame Rate [Hz]	Color	Bit Depth	Interface (# of taps)	Pixel Size [µm²]	Sensor Size [mm²]	Optical Size
A102k	1392 x 1040	14.8		8/10	Camera Link (1)	6.45 x 6.45	8.98 x 6.71	2/3″
A102kc	1392 x 1040	14.8	•	8/10	Camera Link (1,3)	6.45 x 6.45	8.98 x 6.71	2/3″
A202k	1004 x 1004	48		8/10	Camera Link (2)	7.4 x 7.4	7.43 x 7.43	2/3″
A202k HG	1004 x 1004	43.2		8/10	Camera Link (2)	7.4 x 7.4	7.43 x 7.43	2/3″
A402k	2352 x 1726	24		8/10	Camera Link (2)	7.0 x 7.0	16.46 x 12.08	1 1/4″
A402kc	2352 x 1726	24	•	8/10	Camera Link (2)	7.0 x 7.0	16.46 x 12.08	1 1/4″
A403k	2352 x 1726	48		8/10	Camera Link (4)	7.0 x 7.0	16.46 x 12.08	1 1/4″
A403kc	2352 x 1726	48	•	8/10	Camera Link (4)	7.0 x 7.0	16.46 x 12.08	1 1/4″
A404k	2352 x 1726	96		8/10	Camera Link (8)	7.0 x 7.0	16.46 x 12.08	1 1/4″
A404kc	2352 x 1726	96	•	8/10	Camera Link (8)	7.0 x 7.0	16.46 x 12.08	1 1/4″
A406k	2352 x 1726	200		8	Camera Link (10)	7.0 x 7.0	16.46 x 12.08	1 1/4″
A501k	1280 x 1024	74		8	Camera Link (2)	12.0 x 12.0	15.36 x 12.29	1 1/4″
A501kc	1280 x 1024	74	•	8	Camera Link (2)	12.0 x 12.0	15.36 x 12.29	1 1/4″
A503k	1280 x 1024	402		8	Camera Link (8)	12.0 x 12.0	15.36 x 12.29	1 1/4″
A504k	1280 x 1024	500		8	Camera Link (10)	12.0 x 12.0	15.36 x 12.29	1 1/4″
A504kc	1280 x 1024	500	•	8	Camera Link (10)	12.0 x 12.0	15.36 x 12.29	1 1/4″

Please check our website for recommended framegrabbers.

IEEE 1394a Area Scan Cameras

Basler Area Scan	Resolution	Frame Rate [Hz]	Color	Bit Depth	Interface	Pixel Size [µm²]	Sensor Size [mm²]	Optical Size
A102f	1392 x 1040	15		8/12	IEEE 1394a	6.45 x 6.45	8.98 x 6.71	2/3″
A102fc	1388 x 1038	15	•	8/12/Δ	IEEE 1394a	6.45 x 6.45	8.95 x 6.70	2/3″
A311f	659 x 494	73		8/12	IEEE 1394a	9.9 x 9.9	6.52 x 4.89	1/2″
A311fc	658 x 494	73	•	8/12/Δ	IEEE 1394a	9.9 x 9.9	6.51 x 4.89	1/2″
A312f	782 x 582	53		8/12	IEEE 1394a	8.3 x 8.3	6.49 x 4.83	1/2″
A312fc	780 x 580	53	•	8/12/Δ	IEEE 1394a	8.3 x 8.3	6.47 x 4.81	1/2″
A601f	656 x 491	60		8/10	IEEE 1394a	9.9 x 9.9	6.49 x 4.86	1/2″
A601fc	656 x 490	60	•	8/10/Δ	IEEE 1394a	9.9 x 9.9	6.49 x 4.85	1/2″
A602f	656 x 491	100		8/10	IEEE 1394a	9.9 x 9.9	6.49 x 4.86	1/2″
A602fc	656 x 490	100	•	8/10/Δ	IEEE 1394a	9.9 x 9.9	6.49 x 4.85	1/2″
A622f	1280 x 1024	25		8/10	IEEE 1394a	6.7 x 6.7	8.58 x 6.86	2/3″
A631f	1392 x 1040	18.7		8/12	IEEE 1394a	4.65 x 4.65	6.47 x 4.84	1/2″
A631fc	1388 x 1038	18.7	•	8/12/Δ	IEEE 1394a	4.65 x 4.65	6.45 x 4.83	1/2″
A641f	1624 x 1236	14		8/12	IEEE 1394a	4.4 x 4.4	7.15 x 5.44	1/1.8″
A641fc	1624 x 1234	14	•	8/12/Δ	IEEE 1394a	4.4 x 4.4	7.15 x 5.43	1/1.8″

IEEE 1394b Area Scan Cameras

Basler scout	Resolution	Frame Rate [Hz]	Color	Bit Depth	Interface	Pixel Size [µm²]	Sensor Size [mm²]	Optical Size
scA640-70fm	659 x 494	71		8/12	IEEE 1394b	7.4 x 7.4	4.88 x 3.66	1/3″
scA640-70fc	658 x 492	71	•	8/12/Δ	IEEE 1394b	7.4 x 7.4	4.87 x 3.64	1/3″
scA640-74fm	659 x 494	74		8/12	IEEE 1394b	9.9 x 9.9	6.52 x 4.89	1/2″
scA640-74fc	658 x 492	74	•	8/12/Δ	IEEE 1394b	9.9 x 9.9	6.51 x 4.87	1/2″
scA750-60fm	752 x 480	60		8	IEEE 1394b	6.0 x 6.0	4.51 x 2.88	1/3″
scA750-60fc	752 x 480	60	•	8	IEEE 1394b	6.0 x 6.0	4.51 x 2.88	1/3″
scA780-54fm	782 x 582	54		8/12	IEEE 1394b	8.3 x 8.3	6.49 x 4.83	1/2″
scA780-54fc	780 x 580	54	•	8/12/Δ	IEEE 1394b	8.3 x 8.3	6.47 x 4.81	1/2″
scA1000-20fm	1034 x 779	20		8/12	IEEE 1394b	4.65 x 4.65	4.81 x 3.62	1/3″
scA1000-20fc	1032 x 778	20	•	8/12/Δ	IEEE 1394b	4.65 x 4.65	4.80 x 3.62	1/3″
scA1000-30fm	1034 x 779	30		8/12	IEEE 1394b	4.65 x 4.65	4.81 x 3.62	1/3″
scA1000-30fc	1032 x 778	30	•	8/12/Δ	IEEE 1394b	4.65 x 4.65	4.80 x 3.62	1/3″
scA1390-17fm	1392 x 1040	17		8/12	IEEE 1394b	4.65 x 4.65	6.47 x 4.84	1/2″
scA1390-17fc	1390 x 1038	17	•	8/12/Δ	IEEE 1394b	4.65 x 4.65	6.46 x 4.83	1/2″
scA1400-17fm	1392 x 1040	17		8/12	IEEE 1394b	6.45 x 6.45	8.98 x 6.71	2/3″
scA1400-17fc	1390 x 1038	17	•	8/12/Δ	IEEE 1394b	6.45 x 6.45	8.97 x 6.70	2/3″
scA1400-30fm	1392 x 1040	30		8/12	IEEE 1394b	6.45 x 6.45	8.98 x 6.71	2/3″
scA1400-30fc	1390 x 1038	30	•	8/12/Δ	IEEE 1394b	6.45 x 6.45	8.97 x 6.70	2/3″
scA1600-14fm	1628 x 1236	14		8/12	IEEE 1394b	4.4 x 4.4	7.16 x 5.44	1/1.8″
scA1600-14fc	1624 x 1234	14	•	8/12/Δ	IEEE 1394b	4.4 x 4.4	7.15 x 5.43	1/1.8″

All scout cameras are available with C or CS-Mount and 90° angled head.

Gigabit Ethernet Area Scan Cameras

Basler pilot	Resolution	Frame Rate [Hz]	Color	Bit Depth	Interface	Pixel Size [µm²]	Sensor Size [mm²]	Optical Size
piA640-210gm	648 × 488	210		8/12	Gigabit Ethernet	7.4 × 7.4	4.80 × 3.61	1/3″
piA640-210gc	648 × 488	210	•	8/12/Δ	Gigabit Ethernet	7.4 × 7.4	4.80 × 3.61	1/3″
piA1000-48gm	1004 × 1004	48		8/12	Gigabit Ethernet	7.4 × 7.4	7.43 × 7.43	2/3″
piA1000-48gc	1004 × 1004	48	•	8/12/Δ	Gigabit Ethernet	7.4 × 7.4	7.43 × 7.43	2/3″
piA1600-35gm	1608 × 1208	35		8/12	Gigabit Ethernet	7.4 × 7.4	11.90 × 8.94	1″
piA1600-35gc	1608 × 1208	35	•	8/12/Δ	Gigabit Ethernet	7.4 × 7.4	11.90 × 8.94	1″
piA1900-32gm	1920 × 1084	32		8/12	Gigabit Ethernet	7.4 × 7.4	14.21 × 8.02	1″
piA1900-32gc	1920 × 1084	32	•	8/12/Δ	Gigabit Ethernet	7.4 × 7.4	14.21 × 8.02	1″
NEW								
piA2400-12gm	2456 × 2058	12		8/12	Gigabit Ethernet	3.45 × 3.45	8.47 × 7.10	2/3″
piA2400-12gc	2454 × 2056	12	•	8/12/Δ	Gigabit Ethernet	3.45 × 3.45	8.47 × 7.09	2/3″

Gigabit Ethernet Area Scan Cameras

Basler scout	Resolution	Frame Rate [Hz]	Color	Bit Depth	Interface	Pixel Size [µm²]	Sensor Size [mm²]	Optical Size
scA640-70gm	659 × 494	70		8/12	Gigabit Ethernet	7.4 × 7.4	4.88 × 3.66	1/3″
scA640-70gc	658 × 492	70	•	8/12/Δ	Gigabit Ethernet	7.4 × 7.4	4.87 × 3.64	1/3″
scA640-74gm	659 × 494	79		8/12	Gigabit Ethernet	9.9 × 9.9	6.52 × 4.89	1/2″
scA640-74gc	658 × 492	79	•	8/12/Δ	Gigabit Ethernet	9.9 × 9.9	6.51 × 4.87	1/2″
scA750-60gm	752 × 480	60		8	Gigabit Ethernet	6.0 × 6.0	4.51 × 2.88	1/3″
scA750-60gc	752 × 480	60	•	8	Gigabit Ethernet	6.0 × 6.0	4.51 × 2.88	1/3″
scA780-54gm	782 × 582	55		8/12	Gigabit Ethernet	8.3 × 8.3	6.49 × 4.83	1/2″
scA780-54gc	780 × 580	55	•	8/12/Δ	Gigabit Ethernet	8.3 × 8.3	6.47 × 4.81	1/2″
scA1000-20gm	1034 × 779	20		8/12	Gigabit Ethernet	4.65 × 4.65	4.81 × 3.62	1/3″
scA1000-20gc	1032 × 778	20	•	8/12/Δ	Gigabit Ethernet	4.65 × 4.65	4.80 × 3.62	1/3″
scA1000-30gm	1034 × 779	31		8/12	Gigabit Ethernet	4.65 × 4.65	4.81 × 3.62	1/3″
scA1000-30gc	1032 × 778	31	•	8/12/Δ	Gigabit Ethernet	4.65 × 4.65	4.80 × 3.62	1/3″
scA1390-17gm	1392 × 1040	17		8/12	Gigabit Ethernet	4.65 × 4.65	6.47 × 4.84	1/2″
scA1390-17gc	1390 × 1038	17	•	8/12/Δ	Gigabit Ethernet	4.65 × 4.65	6.46 × 4.83	1/2″
scA1400-17gm	1392 × 1040	17		8/12	Gigabit Ethernet	6.45 × 6.45	8.98 × 6.71	2/3″
scA1400-17gc	1390 × 1038	17	•	8/12/Δ	Gigabit Ethernet	6.45 × 6.45	8.97 × 6.70	2/3″
scA1400-30gm	1392 × 1040	30		8/12	Gigabit Ethernet	6.45 × 6.45	8.98 × 6.71	2/3″
scA1400-30gc	1390 × 1038	30	•	8/12/Δ	Gigabit Ethernet	6.45 × 6.45	8.97 × 6.70	2/3″
scA1600-14gm	1628 × 1236	14		8/12	Gigabit Ethernet	4.4 × 4.4	7.16 × 5.44	1/1.8″
scA1600-14gc	1624 × 1234	14	•	8/12/Δ	Gigabit Ethernet	4.4 × 4.4	7.15 × 5.43	1/1.8″

All scout cameras are available with C or CS-Mount and 90° angled head.

Δ = 8 bit raw; 16 bit YUV 4:2:2

Specifications are subject to change without prior notice.
C/F-Mount standard; others on request.

What Makes Basler Camera Quality So Special?

EMVA 1288 Compliancy

Basler Components is a leading company in the push for standardizing the measurement and presentation of machine vision sensor and camera specifications. All measurements done by Basler will be 100% compliant with EMVA standard 1288 (Standard for Measurement and Presentation of Specifications for Machine Vision Sensors and Cameras). Basler has given this standard the strongest support. Basler helped to develop the unified method used to measure, compute and present the specification parameters for cameras and image sensors used in machine vision applications.

The EMVA 1288 standard includes a well defined method for measuring most common noise sources. It also includes a mandatory and detailed description of the measurement setup, environmental conditions and test requirements. As a first step, only the standardization process for monochrome area scan cameras is covered. An expansion covering the standards for color area scan and line scan cameras is expected to follow.

The signal-to-noise ratio chart provides information on the image quality and sensitivity for a tested camera. The chart describes the development of the signal-to-noise ratio from a low level where noise overlays the signal, up to the point of saturation. It embeds the relevant camera parameters such as full well, dynamic range and the signal-to-noise ratio for selected values on the curve that are relevant for a specific application.

The EMVA 1288 standard is available at www.emva.org.
A detailed technical whitepaper describing the used measurement methods in the standard can be downloaded from www.baslerweb.com.

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 pass a stress test. The cameras are 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.

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