



POINT GREY

IMAGING CAMERA CATALOG





1997	1998	2000	2001	2002	2004	2005	2006	2007	2008	2009	2010	2011
Company Incorporation	First analog stereo vision camera Triclops	First IEEE 1394 stereo vision camera Digiclops	First IEEE 1394 imaging camera Firefly	First spherical vision camera Ladybug	First IEEE 1394b camera Dragonfly Express	Headquarters expansion New products Dragonfly2 Ladybug2	Office opens in Germany New products Flea2 Firefly MV	New products Grasshopper FirePRO	Headquarters expansion First USB 2.0 camera Chameleon New product Ladybug3	World's first USB 3.0 Camera	New products Flea3 First GigE camera Grasshopper2	First Camera Link camera Gazelle

Who We Are

Point Grey Research, Inc. is a worldwide leader in the development of advanced digital camera technology products for machine vision, industrial imaging, and computer vision applications. Based in Richmond, BC, Canada, Point Grey designs, manufactures and distributes IEEE-1394 (FireWire), USB 2.0, Gigabit Ethernet, and Camera Link cameras that are known for their excellent quality, performance, and ease of use. A broad range of hardware, software and mechanical engineering skills has allowed Point Grey to successfully bring many innovative and ground-breaking products to market. This drive for innovation has led to many industry firsts, including the first and smallest 1394b digital camera.

Since being founded in January of 1997, the company's approach to product pricing, quality control, and customer service has attracted thousands of customers worldwide, and its organic growth through product sales has enabled the company to expand significantly without any outside investment. Point Grey currently employs more than

100 people worldwide, and has a wholly-owned subsidiary in Germany that provides sales and support services to customers in Europe, Africa, and Israel. Point Grey's office in Japan works closely with the company's network of distributors in Japan, Korea, China, Singapore, and Taiwan.

End-to-End Imaging Solutions

A critical component of any vision system is the speed and reliability of the imaging pipeline, from light hitting the image sensor to data reaching the host system. Point Grey Research has taken ownership of the entire pipeline, and over the last 11 years has created a diverse portfolio of digital cameras, peripheral components, and software.

Point Grey offers more than 150 different single-lens, stereo, and 360-degree spherical digital cameras, with a variety of monochrome and color CCD and CMOS image sensors from VGA to 5 megapixels. Many product families also offer board-level

or customized options for specific OEM applications. In addition, Point Grey provides its FirePRO™ line of professional FireWire hubs, repeaters, and host adapter cards, which are designed to maximize the effectiveness and reliability of the entire imaging pipeline.

Quality, Service and Support

All Point Grey cameras and FirePRO products are built using state-of-the-art manufacturing facilities, located in the company's 41,000 square-foot (3,800 sq m) corporate headquarters. These facilities include dedicated SMT lines, AOI and X-ray machines, industrial clean room, and automated test stations.

The "Seal of Quality" label that is applied to each Point Grey camera cannot be printed until the camera has been 100% inspected and tested. This rigorous quality testing, together with hassle-free product warranties, ensures that customers can rely on Point Grey cameras for their demanding

vision applications.

Point Grey is also proud to offer world-class support on installation, configuration, customization and troubleshooting, so that all customers derive significant value from their camera systems. Quick response e-mail and phone support, online user manuals and knowledge base articles, and regular software and firmware updates are designed to deliver a superior ownership experience.

Point Grey also provides all the hardware accessories needed for rapid design and prototyping, including interface cards, cables and connectors.

Contact us now for pricing and information on our camera evaluation program!













POINT GREY

Innovation in Imaging



UNIQUE FEATURES

Icon Key

-  C/CS/M12 Lens Holder
-  Frame Buffer
-  On-Board Color Processing
-  Remote Sensor Head
-  90° Lens Head Option
-  Board Level Option
-  Non-Volatile Data Flash
-  Cable Screw Locking
-  IP67 Rugged Housing
-  High Sensitivity

COMMON FEATURES

Industry Standard Design

The mechanical components of every Point Grey camera are designed to maximize usability and minimize size. Every camera is equipped with a C or CS lens mount, ASA/ISO-compliant tripod mounting bracket, status LED, and removable glass/IR filter system. All cameras comply with the IIDC v1.32 camera control specification, which allows them to be used with many third-party software packages, such as those from Cognex®, Matrox®, MVTec™, and National Instruments®.



Automatic Features

Camera imaging parameters such as exposure, shutter, gain, and brightness can be controlled automatically by the camera, or manually programmed via software. Multiple cameras networked on the same IEEE 1394 bus are automatically synchronized to within 125µs (maximum deviation) of each other, and can synchronize across buses using Point Grey's MultiSync™ software.

Triggering and GPIO

The general purpose input/output (GPIO) connector located on the back of every Point Grey camera is a programmable interface that allows the user to synchronize the camera with external devices such as light sources and GPS units. It can be programmed to accept external trigger signals that initiate the start of exposure, output a strobe to a light source, or send and receive serial data.



Updatable FPGA

The field-programmable gate array (FPGA) chip controls all camera functionality and can be updated with new firmware in the field.

FLYCAPTURE® SDK

The FlyCapture Software Development Kit (SDK) that comes free with every camera provides a common software interface to control all Point Grey FireWire, USB 2.0 and GigE cameras using the same API under 32- or 64-bit Windows or Linux. FlyCapture supports ActiveX, TWAIN and DirectShow interfaces, and includes the FirePRO low-level I394b interface driver, which enables users to grab images at full 800Mb/s transfer rates, and the GigE Pro image filter driver. A complete software API library, ready-to-use demo programs, and comprehensive source code examples enable users to easily build custom imaging applications.



MULTIPLE PLATFORM

The FlyCapture SDK is designed to provide users with the same interface under both Windows and Linux, 32- and 64-bit platforms.



MULTIPLE CAMERA INTERFACES

The SDK provides the same programming interface across FireWire, USB and GigE products.



MULTIPLE PROGRAMMING LANGUAGES

A simple object-oriented design provides users with the ability to program using their favorite interfaces, including C, C++, C#, Visual Basic .NET, ActiveX, DirectShow, and TWAIN.

ADDITIONAL FEATURES

- Support for new IIDC 1.32 features such as frame buffering and lookup table functionality
- OpenGL support for better display performance and CPU usage
- Managed interface to decrease development time
- Simpler application programming interface (API) - only 3 function calls required to grab an image
- Increased control of buses
- More example programs and source code
- Not dependent on licensed OS and development tools

DRAGONFLY[®] 2



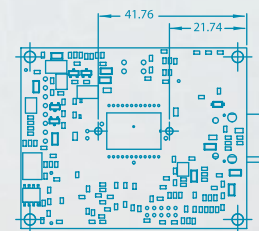
FireWire

DR2-COL/BW	0.3MP	Sony ICX424 CCD	1/3"	7.4µm	648x488 at 60 fps	I394a
DR2-HICOL/BW	0.8MP	Sony ICX204 CCD	1/3"	4.65µm	1032x776 at 30 fps	I394a
DR2-I3S2C/M	1.3MP	Sony ICX445 CCD*	1/3"	3.75µm	1296x964 at 20 fps	I394a

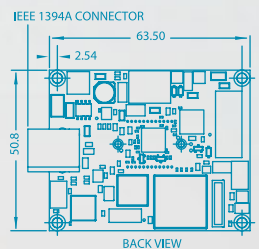
Analog-to-Digital Converter	Analog Devices 12-bit ADC
General Purpose I/O Ports	8-pin GPIO connector 4 pins for external trigger, strobe or serial communication 1 pin +3.3V / 1 Vext pin to externally power the camera
Gain Control	automatic / manual / one-push gain modes 0 dB to 24 dB in 0.04 dB increments
Shutter Speed	automatic / manual / one-push / extended shutter modes 0.01 ms to greater than 5 s (extended shutter) mode
Partial Image Formats	ROI (region of interest) with dynamic position change Subsampling and on-sensor pixel binning
Gamma / Lookup Table	0.50 to 4.00 / programmable lookup table
External Trigger Modes	standard trigger, bulb trigger, overlapped trigger/transfer, multi-shot trigger, multiple exposure (03S2 and 08S2 models only)
Memory Storage	512 KB non-volatile flash memory
Memory Channel	3 memory channels for custom camera settings
Power Requirements	8 to 30 V, 2.5 W at 12 V, via IEEE-1394 or GPIO connector
Size (W x H x D) • Mass	44 x 34 x 24.4 mm • 37 g (including tripod adapter)
Emissions Compliance	Complies with CE and FCC Rules
Temperature	-30° to 60°C (storage) • 0° to 40°C (operating)
Warranty	1 Year
Configuration Options**	auto iris • microlens • 6-inch remote head • metal case

* High sensitivity Sony EXview HAD CCD*

** Available to qualified customers only. Some conditions apply.



FRONT VIEW



BACK VIEW



BOTTOM VIEW



The flexible and full-featured Dragonfly2 IEEE 1394a digital camera line offers a choice of six monochrome and color CCD models. Options include board-level or case-enclosed form factors, and a choice between microlens and C / CS lens mounts. The remote head configuration is ideal for applications where the image sensor must be housed in a very compact space, such as robotics research, object scanning, optical inspection, or head-mounted imaging.

GRASSHOPPER®



FireWire

GRAS-03K2C/M	0.3MP	Kodak KAI-0340 CCD	1/3"	7.4µm	640x480 at 200 fps	1394b
GRAS-03S3M	0.3MP	Sony ICX414 CCD [†]	1/2"	9.9µm	648x488 at 74 fps	1394b
GRAS-14S3C/M	1.4MP	Sony ICX267 CCD	1/2"	4.65µm	1384x1032 at 21 fps	1394b
GRAS-14S5C/M	1.4MP	Sony ICX285 CCD*	2/3"	6.45µm	1384x1036 at 15 fps	1394b
GRAS-20S4C/M	2.0MP	Sony ICX274 CCD	1/1.8"	4.4µm	1624x1224 at 30 fps	1394b
GRAS-50S5C/M	5.0MP	Sony ICX625 CCD	2/3"	3.45µm	2448x2048 at 15 fps	1394b

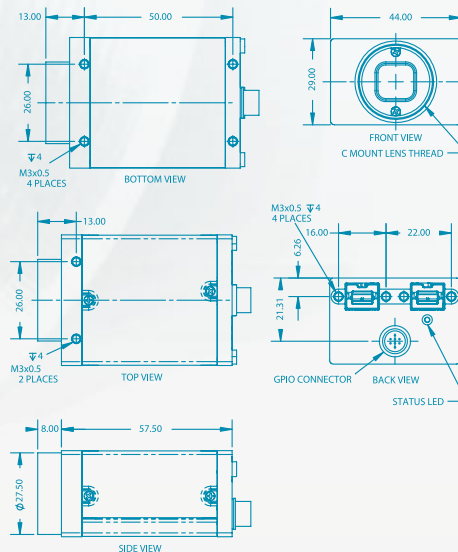
[†]Mono only

The high performance Grasshopper IEEE 1394b digital camera line offers eleven monochrome and color CCD models designed to address customer demands for high resolution, fast frame rate, and exceptional sensitivity. The Grasshopper is ideal for applications in machine vision, astronomy and life sciences, test and measurement, industrial inspection, and high-speed assembly.

Analog-to-Digital Converter	Analog Devices 14-bit ADC
General Purpose I/O Ports	8-pin Hirose HR25 GPIO connector 4 pins for external trigger, strobe or serial communication 1 pin +3.3V / 1 Vext pin to externally power the camera
Gain Control	automatic / manual / one-push gain modes 0dB to 24dB in 0.04dB increments
Shutter Speed	automatic / manual / one-push / extended shutter modes 0.02 ms to greater than 10 s (extended shutter mode)
Partial Image Formats	ROI (region of interest) with dynamic position change Subsampling and on-sensor pixel binning
Gamma / Lookup Table	0.50 to 4.00 / programmable lookup table
External Trigger Modes	standard trigger, bulb trigger, overlapped trigger/transfer, multi-shot trigger
Memory Storage	32 MB frame buffer, 512 KB non-volatile flash memory
Memory Channel	2 memory channels for custom camera settings
Power Requirements	8 to 30 V, 3.5 W at 12 V, via IEEE-1394b or GPIO connector
Size (W x H x D) • Mass	44 x 29 x 58 mm • 104 g (without optics)
Emissions Compliance	Complies with CE and FCC Rules
Temperature	-30° to 60°C (storage) • 0° to 40°C (operating)
Warranty	2 Years
Configuration Options**	90-degree head

[†] High sensitivity Sony EXview HAD CCD™

** Available to qualified customers only. Some conditions apply.



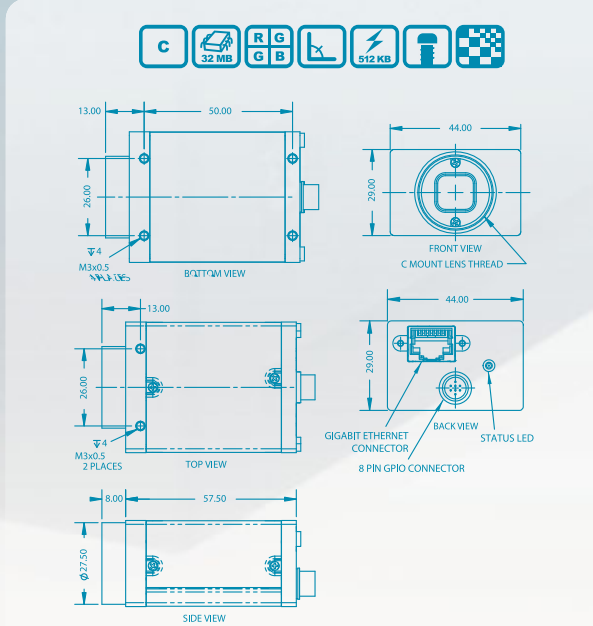
GRASSHOPPER²



GS2-FW-14S5C/M	1.4MP	Sony ICX285 CCD*	2/3"	6.45µm	1384x1036 at 30 fps	I394b
GS2-GE-20S4C/M	2.0MP	Sony ICX274 CCD	1/1.8"	4.4µm	1624x1224 at 29 fps	GigE
GS2-GE-50S5C/M	5.0MP	Sony ICX625 CCD	2/3"	3.45µm	2448x2048 at 15 fps	GigE

The fully redesigned Grasshopper2 camera series is the next generation version of the high performance Grasshopper and offers users a choice of IEEE 1394b or GigE Vision digital interface. The Grasshopper2 uses the same form factor as the existing Grasshopper and a selection of the same image sensors, and adds several new features, including enhanced opto-isolated general purpose I/O and improved imaging performance.

Analog-to-Digital Converter	Analog Devices 14-bit ADC
General Purpose I/O Ports	8-pin Hirose HR25 GPIO connector 1 opto-isolated trigger pin, 1 opto-isolated strobe pin 2 bi-directional pins for trigger, strobe, pwm or serial port
Gain Control	automatic / manual / one-push gain modes <0dB to 24dB in 0.04dB increments
Shutter Speed	automatic / manual / one-push / extended shutter modes 0.03 ms to 30 s (extended shutter mode)
Partial Image Formats	ROI (region of interest) with dynamic position change Subsampling and on-sensor pixel binning
Gamma / Lookup Table	0.50 to 4.00 / programmable lookup table
External Trigger Modes	standard trigger, bulb shutter, overlapped trigger/transfer, multi-shot trigger, skip frames, multi-exposure
Memory Storage	32 MB frame buffer, 512 KB non-volatile flash memory
Memory Channel	2 memory channels for custom camera settings
Power Requirements	12 to 24 V via GPIO connector, < 4.7 W (GigE) 8 to 30 V via I394 connector or GPIO, < 2.5 W (FireWire)
Size (W x H x D) • Mass	44 x 29 x 58 mm • 86 g (GigE) 104g (FireWire) (without optics)
Emissions Compliance	Complies with CE and FCC Rules
Temperature	-30° to 60°C (storage) • 0° to 45°C (operating)
Warranty	2 Years <small>*High sensitivity Sony EXview HAD CCD*</small>



Refer to Grasshopper page for FireWire drawings



FLEA²



FireWire

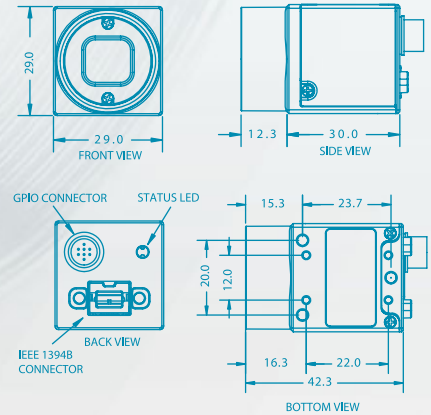
FL2-03S2C/M	0.3MP	Sony ICX424 CCD	1/3"	7.4µm	648x488 at 80 fps	I394b
FL2-08S2C/M	0.8MP	Sony ICX204 CCD	1/3"	4.65µm	1032x776 at 30 fps	I394b
FL2G-13S2C/M	1.3MP	Sony ICX445 CCD*	1/3"	3.75µm	1288x964 at 30 fps	I394b
FL2-14S3C/M	1.4MP	Sony ICX267 CCD	1/2"	4.65µm	1392x1032 at 15 fps	I394b
FL2-20S4C/M	2.0MP	Sony ICX274 CCD	1/1.8"	4.4µm	1624x1224 at 15 fps	I394b
FL2G-50S5C/M	5.0MP	Sony ICX655 CCD	2/3"	3.45µm	2448x2048 at 7.5 fps	I394b

The Flea2 line of the world's smallest IEEE 1394b digital cameras offers a total of twelve monochrome and color CCD models, ranging from 0.3MP (VGA) to 5.0MP. The Flea2 is an ideal solution for industrial imaging and machine vision applications, 2D and 3D metrology, electronics and semiconductor inspection, medical visualization, packaging verification, and object recognition.

Analog-to-Digital Converter	Analog Devices 12-bit ADC
General Purpose I/O Ports	8-pin Hirose HR25 GPIO connector 2 opto-isolated pins for trigger and strobe (FL2G models only) 1 pin +3.3 V / 1 Vext pin to externally power the camera
Gain Control	automatic / manual / one-push gain modes 0dB to 24dB in 0.04dB increments
Shutter Speed	automatic / manual / one-push / extended shutter modes 0.02 ms to greater than 10 s (extended shutter mode)
Partial Image Formats	ROI (region of interest) with dynamic position change Subsampling and on-sensor pixel binning
Gamma / Lookup Table	0.50 to 4.00 / programmable lookup table
External Trigger Modes	standard trigger, bulb trigger, overlapped trigger/transfer, multi-shot trigger, multiple exposure (03S2 and 08S2 models only)
Memory Storage	32 MB frame buffer, 512 KB non-volatile flash memory (1.3MP, 5.0MP only)
Memory Channel	2 memory channels for custom camera settings
Power Requirements	8 to 30 V, 3.5 W at 12 V, via IEEE-1394b or GPIO connector
Size (W x H x D) • Mass	29 x 29 x 30 mm • 58 g (without optics)
Emissions Compliance	Complies with CE and FCC Rules
Temperature	-30° to 60°C (storage) • 0° to 40°C (operating)
Warranty	2 Years
Configuration Options**	90-degree head • IP67 enclosure • no logo • CS lens mount

* High sensitivity Sony EXview HAD CCD™

** Available to qualified customers only. Some conditions apply.



FLEA³



COMING SOON

FL3-FW-03S1C/M	0.3MP	Sony ICX618 CCD	1/4"	5.6µm	648x488 at 120 fps	I394b
FL3-FW-03S3C/M	0.3MP	Sony ICX414 CCD	1/2"	9.9µm	648x488 at 76 fps	I394b
FL3-FW-14S3C/M	1.4MP	Sony ICX267 CCD	1/2"	4.65µm	1384x1032 at 16 fps	I394b
FL3-FW-20S4C/M	2.0MP	Sony ICX274 CCD	1/1.8"	4.4µm	1624x1224 at 15 fps	I394b
FL3-GE-03S1C/M	0.3MP	Sony ICX618 CCD	1/4"	5.6µm	648x488 at 120 fps	GigE
FL3-GE-13S2C/M	1.3MP	Sony ICX445 CCD*	1/3"	3.75µm	1288x964 at 30 fps	GigE
FL3-U3-13S2C/M	1.3MP	Sony IMX035 CMOS	1/3"	3.63µm	1328x1048 at 120 fps	USB 3.0
FL3-U3-13Y3M	1.3MP	Cypress VITA1300 CMOS	1/2"	4.8µm	1280x1024 at 150 fps	USB 3.0
FL3-U3-32S2C/M	3.2MP	Sony IMX036 CMOS	1/2.8"	2.5µm	2080x1552 at 60 fps	USB 3.0
FL3-U3-63S4C/M	6.3MP	Sony IMX067 CMOS	1/1.8"	2.5µm	2928x2184 at 60 fps	USB 3.0

Analog-to-Digital Converter Analog Devices 12-bit ADC (FL3-U3-13Y3 10-bit only)

General Purpose I/O Ports 8-pin Hirose HR25 GPIO connector
1 opto-isolated trigger pin, 1 opto-isolated strobe pin
2 bi-directional pins for trigger, strobe, pwm or serial port

Gain Control automatic / manual / one-push gain modes
0dB to 24dB in 0.04dB increments

Shutter Speed automatic / manual / one-push / extended shutter modes
0.03 ms to greater than 20s (extended shutter mode)

Partial Image Formats ROI (region of interest) with dynamic position change
Subsampling and on-sensor pixel binning

Gamma / Lookup Table 0.50 to 4.00 / programmable lookup table

External Trigger Modes standard trigger, bulb trigger, overlapped trigger/transfer,
multi-shot trigger, multiple exposure

Memory Storage 32 MB frame buffer, 1 MB non-volatile flash memory

Memory Channel 2 memory channels for custom camera settings

Power Requirements 8 to 30 V, less than 2.5 W, via GPIO or I394b interface
12 to 24 V, less than 4.7 W, via GPIO (GigE)
4.75 to 5.25 V, watts TBD, via GPIO or USB 3.0 interface

Size (W x H x D) • Mass 29 x 29 x 30 mm • 58 g (without optics)

Emissions Compliance Complies with CE and FCC Rules

Temperature -30° to 60°C (storage) • 0° to 45°C (operating)

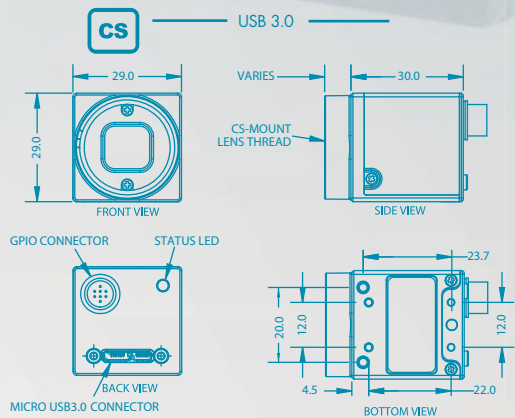
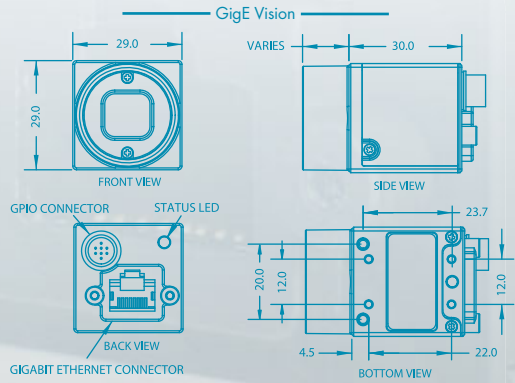
Warranty 2 Years

Configuration Options** 90-degree head • IP67 enclosure • no logo • CS lens mount

* High sensitivity Sony EXview HAD CCD*

** Available to qualified customers only. Some conditions apply.

The fully redesigned, next generation Flea3 camera series builds on the success of the ultra-compact Flea2 by adding new Sony image sensors to the line-up. The Flea3 also offers a host of new features, including enhanced opto-isolated GPIO; an on-camera frame buffer; non-volatile flash memory for user data storage; new trigger modes; and improved imaging performance.



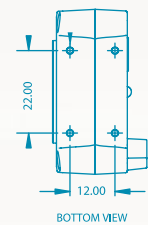
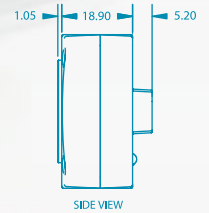
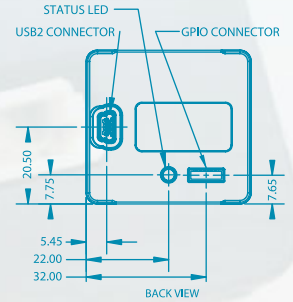
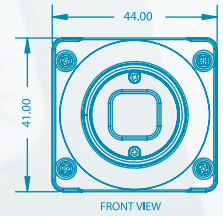
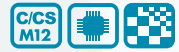
Refer to Flea2 page for FireWire drawings



CHAMELEON[®]

The easy-to-use Chameleon digital camera features a unique combination of CCD image quality, USB 2.0 interface, and ultra-compact size. The USB 2.0 480 Mb/s interface allows the camera to connect to virtually any computer system without adding an interface card. The Chameleon is an ideal choice for demanding imaging applications such as object and gesture tracking, test and measurement, life sciences, augmented reality, security, biometrics, and robot guidance.

Affordably priced at USD \$375 per camera (single quantity)



CMLN-1352C/M 1.3MP Sony ICX445 CCD* 1/3" 3.75µm 1296x964 at 18 fps USB 2.0

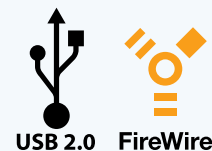
Analog-to-Digital Converter	Analog Devices 12-bit ADC
General Purpose I/O Ports	7-pin JST GPIO connector 4 pins for external trigger and strobe 1 pin +3.3 V / 1 Vext pin to externally power the camera
Gain Control	automatic / manual / one-push gain modes 0 dB to 24 dB in 0.04 dB increments
Shutter Speed	automatic / manual / one-push / extended shutter modes 0.01 ms to greater than 10 s (extended shutter mode)
Partial Image Formats	ROI (region of interest) with dynamic position change Subsampling and on-sensor pixel binning
Gamma / Lookup Table	0.50 to 4.00
External Trigger Modes	standard trigger, bulb trigger, overlapped trigger/transfer
Memory Storage	N/A
Memory Channel	2 memory channels for custom camera settings
Power Requirements	4.75 to 5.25 V, via Mini B USB 2.0 or GPIO connector
Size (W x H x D) • Mass	44 x 41 x 25.5 mm (case) • 40 x 32 mm (board) • 37 g
Emissions Compliance	Complies with CE and FCC Rules
Temperature	-30° to 60°C (storage) • 0° to 45°C (operating)
Warranty	1 Year
Configuration Options**	board-level • microlens

* High sensitivity Sony EXview HAD CCD™

** Available to qualified customers only. Some conditions apply.



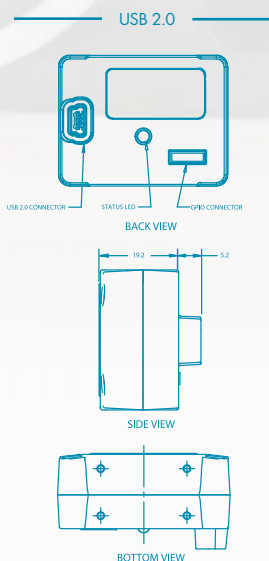
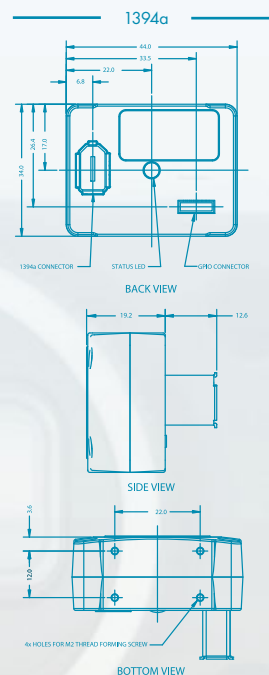
FIREFLY[®] MV



The small and affordable Firefly MV line offers 11 different combinations of CMOS image sensor (0.3 and 1.3 MP), form factor (board-level and housed) and interface (FireWire and USB 2.0) that are designed to address a variety of applications in industrial and non-industrial imaging. It is an ideal camera for multitouch, object and gesture tracking, augmented reality, and low-cost machine vision applications. *Affordably priced at USD \$199 per camera* (quantity of five or more)*



FFMV-03M2C/M	0.3MP	Micron MT9V022 CMOS	1/3"	6.0µm	752x480 at 60 fps	I394a
FMVU-03MTC/M	0.3MP	Micron MT9V022 CMOS	1/3"	6.0µm	752x480 at 60 fps	USB 2.0
FMVU-13S2C	1.3MP	Sony IMX035 CMOS	1/3"	3.63µm	1328x1048 at 23fps	USB 2.0



Analog-to-Digital Converter	On-chip 10-bit ADC (0.3MP model), 10 / 12-bit ADC (1.3MP model)
General Purpose I/O Ports	7-pin JST GPIO connector 4 pins for external trigger and strobe 1 pin +3.3 V / 1 Vext pin to externally power the camera
Gain Control	automatic / manual gain modes 0 dB to 12 dB (0.3MP model), 0 dB to 18 dB (1.3MP model)
Shutter Speed	auto / manual / extended 0.03 ms to 512 ms (0.3MP model), 0.12 ms to 8000 ms (1.3MP model)
Partial Image Formats	ROI (region of interest) with dynamic position change Subsampling and on-sensor pixel binning
Gamma / Lookup Table	0 to 1 (0.3MP model), 0.5 to 4.00 (1.3MP model)
External Trigger Modes	standard trigger
Memory Storage	N/A
Memory Channel	3 memory channels for custom camera settings
Power Requirements	8 to 30 V, 1 W at 12 V, via IEEE-1394 4.75 to 5.25 V, via Mini B USB 2.0 or GPIO connector
Size (W x H x D) • Mass	44 x 34 x 24.4 mm • 37 g (including tripod adapter)
Emissions Compliance	Complies with CE and FCC Rules
Temperature	-30° to 60°C (storage) • 0° to 40°C (operating)
Warranty	1 Year
Configuration Options**	board-level • microlens • mini I394 connector • metal case

* 0.3MP model only
** Available to qualified customers only. Some conditions apply.



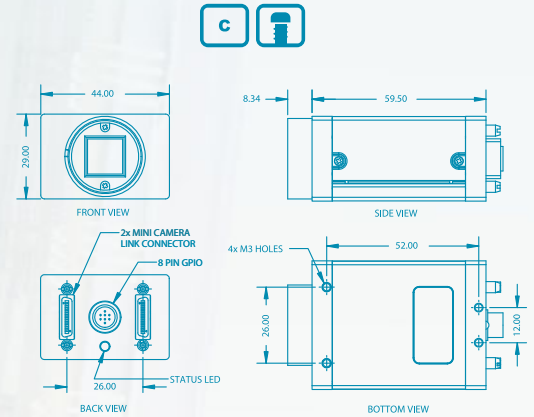
GAZELLE®



GZL-CL-22C5	2.0MP	CMOSIS CMV2000 CMOS	2/3"	5.5µm	2048 x 1088 at 280 fps	Camera Link
GZL-CL-41C6	4.0MP	CMOSIS CMV4000 CMOS	1"	5.5µm	2048 x 2048 at 150 fps	Camera Link

The new Gazelle series of Camera Link cameras delivers an unsurpassed combination of size, speed, and price. The Gazelle series of cameras feature high-resolution, high-frame rate CMOS image sensors, compact case, and Camera Link interface in Base (2-tap) and Full (8-tap) configurations.

Analog-to-Digital Converter	On-chip 10-bit (max frame rate)
Interface	Camera Link LVDS for camera control and video data transmission. Base (2-tap) and Full (8-tap) configurations
General Purpose I/O Ports	8-pin GPIO connector for power, trigger, strobe. 1 opto-isolated input, 1 opto-isolated output
Gain Control	Programmable via software 0dB - 255dB (raw values)
Shutter Speed	automatic / manual / one-push / extended shutter modes 0.07 ms to 54 s
Partial Image Formats	ROI (region of interest), multiple regions (up to 8) Digital binning
External Trigger Modes	single shot, bulb shutter
Memory Channel	2 memory channels for custom camera settings + factory default
Power Requirements	Voltage: 12 V +/- 10 %; Power: Max 6 W at 12 V
Size (W x H x D) • Mass	44 x 29 x 59.5 mm • 90 g (without optics)
Emissions Compliance	Complies with CE and FCC Rules
Temperature	-30° to 60°C (storage) • -10° to 50°C (operating)
Warranty	2 Years






FIREPROTM

Every FirePRO IEEE 1394b 800 Mb/s product goes through an intensive testing process to ensure compatibility with other FirePRO products and select Point Grey cameras, such as Flea2 or Grasshopper. In addition, FirePRO products are backed by an industry leading 2-year warranty and quick response e-mail and phone support. From large multi-camera arrays to single camera systems, this allows systems integrators and developers to quickly build fast and reliable imaging pipelines.

FirePRO components maximize system stability through the use of locking screw connections and external power inputs, and minimize downtime due to bus resets or hardware failures. Locking screw connectors / ports not only guarantee a reliable connection through the entire 1394b network, but also reduce stress on internal electronics that can be caused by cable movement. FireWire cables also carry both data and power, minimizing the need for additional cables or external power sources.

PROFESSIONAL FIREWIRE COMPONENTS












































	4.5m IEEE 1394b Cable	10m IEEE 1394b Cable	High Flex IEEE 1394b Cable
			
	ACC-01-2006	ACC-01-2017	ACC-01-2012
Length	4.5 metres	10 metres	4.5 metres
Signal Wire Gauge	AWG22 and AWG26	AWG24	AWG28
Flex Characteristics	-	-	1,000,000 flex cycles, 30mm bend radius
Digital Interface	Two bilingual 9-pin IEEE-1394b connectors with locking screw connection		
Transfer Rates	100, 200, 400, 800 Mbit/s		
Voltage (max)	8-30V, via the IEEE-1394b interface		
Operating Temperature	0° to 45°C		
Storage Temperature	-30° to 60°C		



	PCI Express Card Single Bus FWB-PCIE-01	PCI Express Card Dual Bus FWB-PCIE-02	2-Port Repeater FWB-HUB-2PORT	3-Port Hub FWB-HUB-3PORT	5-Port Hub FWB-HUB-5PORT	LDR 100 m 800 Mb/s Cat5 Repeater FWB-LDR-CAT5
Number of Ports	2	2	2	3	5	2
1394b Physical Layer Chip	LSI Logic FW643	LSI Logic FW643	TI TSB81BA3D	TI TSB81BA3D	TI TSB81BA3D	LSI Logic FW643
Number of Chips	1	2	1	1	3	1
External Power Input	4-pin IDE connector	4-pin IDE connector	-	Yes	Yes	Yes
Dimensions (W x D x H)	Low profile 92x69 mm	Low profile 92x69 mm	25 x 56 x 17 mm	51 x 67 x 21 mm	57 x 94 x 20 mm	69 x 57 X 20 mm
Mass	49 g	49 g	29 g	90 g	85 g	85 g
Power Consumption (max at 12V)	1.5 W	3 W	0.5 W	1 W	1.5 W	2.8 W
Power Output (max at 12V)	1 A at 12 V					
Digital Interface	Bilingual 9-pin IEEE 1394b S800 (800 Mb/s) ports with locking screw connection					
Transfer Rates	100, 200, 400, 800 Mbit/s					
Voltage Requirements	8-30V, via the IEEE-1394b interface or external power input (if equipped)					











COMPARISON CHART

	MODEL NUMBER	SENSOR TYPE	OPTICAL FORMAT	PIXEL SIZE	MAX RES	MAX FPS	INTERFACE
Dragonfly ²	DR2-COL/BW	Sony ICX424 CCD	1/3"	7.4µm	648x488	60 fps	IEEE 1394a
	DR2-HICOL/BW	Sony ICX204 CCD	1/3"	4.65µm	1032x776	30 fps	IEEE 1394a
	DR2-13S2C/M	Sony ICX445 CCD	1/3"	3.75µm	1296x964	20 fps	IEEE 1394a
Grasshopper [®]	GRAS-03K2C/M	Kodak KAI-0340 CCD	1/3"	7.4µm	640x480	200 fps	IEEE 1394b
	GRAS-03S3M	Sony ICX414 CCD	1/2"	9.9µm	648x488	74 fps	IEEE 1394b
	GRAS-14S3C/M	Sony ICX267 CCD	1/2"	4.65µm	1384x1032	21 fps	IEEE 1394b
	GRAS-14S5C/M	Sony ICX285 CCD	2/3"	6.45µm	1384x1036	15 fps	IEEE 1394b
	GRAS-20S4C/M	Sony ICX274 CCD	1/1.8"	4.4µm	1624x1224	30 fps	IEEE 1394b
	GRAS-50S5C/M	Sony ICX625 CCD	2/3"	3.45µm	2448x2048	15 fps	IEEE 1394b
Grasshopper ²	GS2-FW-14S5C/M	Sony ICX285 CCD	2/3"	6.45µm	1384x1036	30 fps	IEEE 1394b
	GS2-GE-20S4C/M	Sony ICX274 CCD	1/1.8"	4.4µm	1624x1224	29 fp	GigE
	GS2-GE-50S5C/M	Sony ICX625 CCD	2/3"	3.45µm	2448x2048	15 fps	GigE
Flea ²	FL2-03S2C/M	Sony ICX424 CCD	1/3"	7.4µm	648x488	80 fps	IEEE 1394b
	FL2-08S2C/M	Sony ICX204 CCD	1/3"	4.65µm	1032x776	30 fps	IEEE 1394b
	FL2G-13S2C/M	Sony ICX445 CCD	1/3"	3.75µm	1288x964	30 fps	IEEE 1394b
	FL2-14S3C/M	Sony ICX267 CCD	1/2"	4.65µm	1392x1032	15 fps	IEEE 1394b
	FL2-20S4C/M	Sony ICX274 CCD	1/1.8"	4.4µm	1624x1224	15 fps	IEEE 1394b
	FL2G-50S5C/M	Sony ICX655 CCD	2/3"	3.45µm	2448x2048	7.5 fps	IEEE 1394b
Flea ³	FL3-FW-03S1C/M	Sony ICX618 CCD	1/4"	5.6µm	648x488	120 fps	IEEE 1394b
	FL3-FW-03S3C/M	Sony ICX414 CCD	1/2"	9.9µm	648x488	76 fps	IEEE 1394b
	FL3-FW-14S3C/M	Sony ICX267 CCD	1/2"	4.65µm	1384x1032	16 fps	IEEE 1394b
	FL3-FW-20S4C/M	Sony ICX274 CCD	1/1.8"	4.4µm	1624x1224	15 fps	IEEE 1394b
	FL3-GE-03S1C/M	Sony ICX618 CCD	1/4"	5.6µm	648x488	120 fps	GigE
	FL3-GE-13S2C/M	Sony ICX445 CCD	1/3"	3.75µm	1288x964	30 fps	GigE
	FL3-U3-12S2C/M	Sony IMX035 CMOS	1/3"	3.63µm	1328x1048	120 fps	USB 3.0
	FL3-U3-13Y3M	Cypress VITA1300 CMOS	1/2"	4.8µm	1280x1024	150 fps	USB 3.0
	FL3-U3-32S2C/M	Sony IMX036 CMOS	1/2.8"	2.5µm	2080x1552	60 fps	USB 3.0
FL3-U3-63S4C/M	Sony IMX067 CMOS	1/1.8"	2.5µm	2928x2184	60 fps	USB 3.0	
Chameleon [®]	CMLN-13S2C/M	Sony ICX445 CCD	1/3"	3.75µm	1296 x 964	18 fps	USB 2.0
Firefly [®] MV	FFMV-03M2C/M	Micron MT9V022 CMOS	1/3"	6.0µm	752x480	60 fps	IEEE 1394a
	FMVU-03MTC/M	Micron MT9V022 CMOS	1/3"	6.0µm	752x480	60 fps	USB 2.0
	FMVU-13S2C	Sony IMX035 CMOS	1/3"	3.63µm	1328 x1048	23 fps	USB 2.0
Gazelle [™]	GZL-CL-22C5	CMOSIS CMV2000 CMOS	2/3"	5.5µm	2048 x 1088	280 fps	Camera Link Base/Full
	GZL-CL-41C6	CMOSIS CMV4000 CMOS	1"	5.5µm	2048 x 2048	150 fps	Camera Link Base/Full

UNIQUE FEATURES	A/D CONVERTER	VIDEO DATA OUTPUT	ON-BOARD MEMORY	SIZE	OPERATING TEMP	WARRANTY
     	12-bit ADC	8, 12, 16, 24-bit	512 KB flash memory	64 x 51 mm (board) 75 x 65 x 25.5 mm	0° to 45° C	1 year
      	14-bit ADC	8, 12, 16, 24-bit	32 MB frame buffer 512 KB flash memory	44 x 29 x 58 mm	0° to 40° C	2 years
      	14-bit ADC	8, 12, 16, 24-bit	32 MB frame buffer 512 KB flash memory	44 x 29 x 58 mm	0° to 45° C	2 years
       	12-bit ADC	8, 12, 16, 24-bit	32 MB frame buffer 512 KB flash memory (1.3MP, 5.0MP only)	29 x 29 x 30 mm	0° to 40° C	2 years
      	12-bit ADC	8, 12, 16, 24-bit	32 MB frame buffer 1 MB flash memory	29 x 29 x 30 mm	0° to 45° C	2 years
 (FL3 USB 3.0 models)	10-bit (FL3-U3-13Y3M)					
  	12-bit ADC	8, 16-bit	N/A	44 x 41 x 25.5 mm	0° to 45° C	1 year
 	On-chip 10-bit ADC (0.3MP) 10 / 12-bit ADC (1.3MP)	8, 16-bit	N/A	44 x 34 x 24.4 mm	0° to 45° C	1 year
 	On-chip 10-bit ADC	8, 10-bit	N/A	44 x 29 x 59.5 mm	-10° to 50° C	2 years

UNIQUE FEATURES

Icon Key

 C/CS/M12 Lens Holder	 Board Level Option
 Frame Buffer	 Non-Volatile Data Flash
 On-Board Color Processing	 Cable Screw Locking
 Remote Sensor Head	 IP67 Rugged Housing
 90° Lens Head Option	 High Sensitivity



IMAGING CAMERA CATALOG

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