



PRODUCT CATALOG AND SENSOR REVIEW



USB
VISION



GIGE
VISION



FireWire



CAMERA
Link



USB 2.0



ptgrey.com

POINT GREY
Innovation in Imaging



Point Grey USB 3.0 Camera Features:

- Largest selection of CCD and CMOS sensors
- FPGA and frame buffer-based architecture for optimal reliability
- Point Grey proprietary USB 3.0 link layer and driver stack
- Industry-standard C- and CS- mount
- Fully tested USB 3.0 accessories: interface cards, hubs, cables, and lenses

CHAMELEON³

FLEXIBLE FORM FACTOR



BLACKFLY[®]

PERFORMANCE AND VALUE



Model#	Sensor Specifications	Shutter	Max Res	Max FPS
CM3-U3-13S2C/M-CS	1.3MP Sony ICX445 CCD**	1/3" 3.75 µm Global	1288 x 964	30 fps
CM3-U3-13Y3C/M-CS	1.3MP On Semi Python1300 CMOS	1/2" 4.8 µm Global	1280 x 1024	149 fps
CM3-U3-28S4C/M-CS	2.8MP Sony ICX818 CCD**	1/1.8" 3.69 µm Global	1928 x 1448	13 fps

**High sensitivity Sony EXview HAD CCD*

Model#	Sensor Specifications	Shutter	Max Res	Max FPS
BFLY-U3-03S2C/M-CS	0.3MP Sony ICX424 CCD	1/3" 7.4 µm Global	648 x 488	84 fps
BFLY-U3-05S2C/M-CS	0.5MP Sony ICX693 CCD	1/3" 6.0 µm Global	808 x 608	50 fps
BFLY-U3-13S2C/M-CS	1.3MP Sony ICX445 CCD**	1/3" 3.75 µm Global	1288 x 964	30 fps
BFLY-U3-20S4C/M-CS	2.0MP Sony ICX274 CCD**	1/1.8" 4.4 µm Global	1624 x 1224	15 fps
BFLY-U3-23S6C/M-C	2.3MP Sony IMX249 CMOS	1/1.2" 5.86 µm Global	1920 x 1200	41 fps
BFLY-U3-50H5C/M-C	5.0MP Sharp RJ32S4/S3AAODT	2/3" 3.45 µm Global	2448 x 2048	7.5 fps

**High sensitivity Sony EXview HAD CCD*

	CHAMELEON ³	BLACKFLY [®]
INTERFACE	USB 3.0 interface with screw locks for camera control, data, and power	USB 3.0 interface with screw locks for camera control, data, and power
GPIO	9-pin JST GPIO connector, 4 pins for trigger and strobe, 1 pin +3.3 V, 1 VEXT pin for external power 1 opto-isolated input, 1 opto-isolated output	6-pin Hirose HR10A-7R-6PB GPIO connector for trigger, strobe, and power. 1 opto-isolated input, 1 opto-isolated output
ADC	12-bit	12-bit
IMAGE DATA FORMATS	Y8, Y16, Mono8, Mono12, Mono16 (all models) RGB8, YUV411, YUV422, YUV444, Raw8, Raw12, Raw16 (color models)	Y8, Y16, Mono8, Mono12, Mono16 (all models) RGB8, YUV411, YUV422, YUV444, Raw8, Raw12, Raw16 (color models)
PARTIAL IMAGE MODES	Pixel binning and region of interest (ROI) modes	Pixel binning and region of interest (ROI) modes
GAIN RANGE	Automatic*/manual/one-push* (*Free running only) 0 dB to 24 dB	Automatic*/manual/one-push* (*Free running only) 0 dB to 24 dB
EXPOSURE RANGE	Automatic*/manual/one-push* 0.046 ms to 32 seconds	Automatic*/manual/one-push* 0.015 ms to 32 seconds
GAMMA	0.50 to 4.00, programmable lookup table	0.50 to 4.00, programmable lookup table
TRIGGER MODES	Standard, bulb, multi-shot	Standard, bulb, multi-shot
IMAGE BUFFER	16 MB frame buffer	16 MB frame buffer
USER SETS	2 memory channels for custom camera settings	2 memory channels for custom camera settings
SIZE (WxHxD)	44 x 35 x 19.5 mm excluding lens holder (metal case)	29 x 29 x 30 mm excluding lens holder (metal case)
MASS	55g (Without optics or tripod mounting bracket)	36g (Without optics or tripod mounting bracket)
POWER	5 V, <3 W, via GPIO or USB 3.0 interface	5 V, <3 W, via GPIO or USB 3.0 interface
LENS MOUNT	CS-mount	CS-mount, C-mount
TEMPERATURE	-30° to 60°C (storage) • 0° to 45°C (operating)	-30° to 60°C (storage) • 0° to 45°C (operating)
WARRANTY	3 years	3 years



FLEA³

ULTRA-COMPACT, ULTRA-FAST CMOS



GRASSHOPPER³

HIGH PERFORMANCE CCD AND CMOS



Model#	Sensor Specifications	Shutter	Max Res	Max FPS
FL3-U3-1352C/M-CS	1.3MP Sony IMX035 CMOS [*] 1/3" 3.63µm Rolling	1328 x 1048	120 fps	
FL3-U3-13Y3M-C	1.3MP ON Semi VITA 1300 CMOS 1/2" 4.8 µm Global	1280 x 1024	150 fps	
FL3-U3-13E4C/M-C	1.3MP e2v EV76C560 CMOS 1/1.8" 5.3 µm Global	1280 x 1024	60 fps	
FL3-U3-20E4C/M-C	2.0MP e2v EV76C5706F CMOS 1/1.8" 4.5 µm Global	1600 x 1200	59 fps	
FL3-U3-32S2C/M-CS	3.2MP Sony IMX036 CMOS [*] 1/2.8" 2.5 µm Rolling	2080 x 1552	60 fps	
FL3-U3-88S2C-C	8.8MP Sony IMX121 CMOS ^{**} 1/2.5" 1.55µm Rolling	4096 x 2160	21 fps	

^{*}High performance Sony Exmor R CMOS^{*}

Model#	Sensor Specifications	Shutter	Max Res	Max FPS
GS3-U3-14S5C/M-C	1.4MP Sony ICX285 CCD 2/3" 6.45 µm Global	1384 x 1036	30 fps	
GS3-U3-15S5C/M-C	1.4MP Sony ICX825 CCD 2/3" 6.45 µm Global	1384 x 1036	45 fps	
GS3-U3-23S6C/M-C	2.3MP Sony IMX174 CMOS [*] 1/1.2" 5.86 µm Global	1920 x 1200	162 fps	
GS3-U3-28S4C/M-C	2.8MP Sony ICX687 CCD ^{**} 1/1.8" 3.69 µm Global	1928 x 1448	26 fps	
GS3-U3-28S5C/M-C	2.8MP Sony ICX674 CCD ^{**} 2/3" 4.54 µm Global	1920 x 1440	26 fps	
GS3-U3-32S4C/M-C¹	3.2MP Sony IMX252 CMOS [*] 2/3" 3.45 µm Global	2048 x 1536	121 fps	
GS3-U3-41S4C/M-C	4.1MP Sony ICX808 CCD ^{**} 1/1.8" 3.1 µm Global	2016 x 2016	18 fps	
GS3-U3-41C6MIR-C	4.1MP CMOSIS CMW4000-3E12 CMOS 1" 5.5 µm Global	2048 x 2048	90 fps	
GS3-U3-41C6C/M-C	4.1MP CMOSIS CMW4000-3E5 CMOS 1" 5.5 µm Global	2048 x 2048	90 fps	
GS3-U3-50S5C/M-C	5.0MP Sony ICX625 CCD 2/3" 3.45 µm Global	2448 x 2048	15 fps	
GS3-U3-51S5C/M-C¹	5.0MP Sony IMX250 CMOS [*] 2/3" 3.45 µm Global	2448 x 2048	75 fps	
GS3-U3-60S6C/M-C	6.0MP Sony ICX694 CCD ^{**} 1" 4.54 µm Global	2736 x 2192	13 fps	
GS3-U3-60QS6C/M-C	6.0MP Sony ICX694 CCD ^{**} 1" 4.54 µm Global	2736 x 2192	25 fps	
GS3-U3-91S6C/M-C	9.1MP Sony ICX814 CCD ^{**} 1" 3.69 µm Global	3376 x 2704	9 fps	
GS3-U3-120S6C/M-C	12 MP Sony ICX834 CCD ^{**} 1" 3.1 µm Global	4240 x 2824	7 fps	

¹Color models coming soon

^{*}High performance Sony Pregius[®] Global Shutter CMOS ^{**}High sensitivity Sony ExView HAD CCD II[™]

USB 3.0 interface with screw locks for camera control, data, and power

8-pin Hirose HR25 GPIO connector for power, trigger, strobe, PWM, and serial I/O:
1 opto-isolated input, 1 opto-isolated output, 2 bi-directional I/O pins

12-bit (FL3-U3-13S2, FL3-U3-32S2, FL3-U3-88S2) / 10-bit (FL3-U3-13Y3, FL3-U3-13E4, FL3-U3-20E4)

Y8, Y16, Mono8, Mono12, Mono16 (all models)
RGB8, YUV411, YUV422, YUV444, Raw8, Raw12, Raw16 (color models)

Pixel binning and region of interest (ROI) modes

Automatic/manual/one-push* (*Free running only) 0 dB to 24 dB (FL3-U3-13S2, FL3-U3-32S2, FL3-U3-88S2)
0 dB to 18 dB (FL3-U3-13Y3, FL3-U3-13E4)

Automatic/Manual/One-Push*/Extended Shutter** modes (*Free running only) (**except FL3-U3-13Y3)
0.008 ms to 1 second (FL3-U3-13S2) / 0.006 ms to 1 second (FL3-U3-13Y3) / 0.016 ms to 1 second (FL3-U3-13E4) / 0.01 ms to 32 seconds (FL3-U3-20E4, FL3-U3-32S2) / 0.021 ms to 1 second (FL3-U3-88S2)

0.50 to 4.00, programmable lookup table

Standard, bulb, multi-shot

32 MB frame buffer

2 memory channels for custom camera settings

29 x 29 x 30 mm excluding lens holder (metal case)

35g - 41 g (Without optics or tripod mounting bracket)

5 V, <3 W, via GPIO or USB 3.0 interface

CS-mount (FL3-U3-13S2, FL3-U3-32S2), C-mount (FL3-U3-13Y3, FL3-U3-13E4, FL3-U3-20E4, FL3-U3-88S2)

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

3 years



USB 3.0 interface with screw locks for camera control, data, and power

8-pin Hirose HR25 GPIO connector for power, trigger, strobe, PWM, and serial I/O: 1 opto-isolated input, 1 opto-isolated output, 2 bi-directional I/O pins

14-bit • 10/12-bit (GS3-U3-23S6, GS3-U3-32S4, GS3-U3-51S5) • 10-bit (GS3-U3-41C6)

Mono8, Mono12, Mono16 (all models)
RGB, YUV411, YUV422, YUV444, Raw8, Raw12, Raw16 (color models)

Pixel binning and region of interest (ROI) modes

Automatic/manual/one-push modes 0 dB to 24 dB (GS3-U3-23S6, GS3-U3-28S4, GS3-U3-28S5, GS3-U3-41C6) -6.158 dB to 24 dB (GS3-U3-60S6); -9 dB to 24 dB (GS3-U3-91S6)

Automatic/manual/one-push/extended shutter modes Up to 32 seconds (GS3-U3-28S5, GS3-U3-41S4, GS3-U3-50S5, GS3-U3-60S6, GS3-U3-91S6); up to 30 seconds (GS3-U3-28S4); up to 4 seconds (GS3-U3-14S5, GS3-U3-15S5, GS3-U3-32S4, GS3-U3-41C6, GS3-U3-51S5, GS3-U3-120S6); up to 3.2 seconds (GS3-U3-23S6)

0.50 to 4.00, programmable lookup table

Standard, bulb, multi-shot, overlapped (excludes GS3-U3-23S6)

128 MB frame buffer

2 memory channels for custom camera settings

44 x 29 x 58 mm excluding lens holder (metal case)

90 g (Without optics or tripod mounting bracket)

5-24 V via GPIO or 5 V via USB 3.0 interface, maximum 4.5 W

C-mount

-30° to 60°C (storage) • 0° to 50°C (operating)

3 years



INTERFACE

GPIO

ADC

IMAGE DATA FORMATS

PARTIAL IMAGE MODES

GAIN RANGE

EXPOSURE RANGE

GAMMA

TRIGGER MODES

IMAGE BUFFER

USER SETS

SIZE (WxHxD)

MASS

POWER

LENS MOUNT

TEMPERATURE

WARRANTY



Point Grey GigE Camera Features:

- Unique selection of CCD and CMOS sensors
- Supports GigE Vision 1.2
- Industry's most compact sizes
- GigE image filter driver for reduced latency and maximized bandwidth
- Firmware versions updatable in the field
- On-board temperature, power sensors, and status LED

BLACKFLY®

WORLD'S SMALLEST POE CAMERA



FLEA3®

WORLD'S SMALLEST GIGE CAMERA



Model#	Sensor	Specifications	Shutter	Max Res	Max FPS
BFLY-PGE-03S2C/M-CS	0.3MP	Sony ICX424 CCD	1/3" 7.4 µm	Global 648 x 488	84 fps
BFLY-PGE-03S3C/M-CS	0.3MP	Sony ICX414 CCD	1/2" 9.9 µm	Global 648 x 488	90 fps
BFLY-PGE-05S2C/M-CS	0.5MP	Sony ICX693 CCD	1/3" 6.0 µm	Global 808 x 608	50 fps
BFLY-PGE-09S2C/M-CS	0.9MP	Sony ICX692 CCD**	1/3" 4.08 µm	Global 1288 x 728	30 fps
BFLY-PGE-12A2C/M-CS	1.2MP	Aptina AR0134 CMOS	1/3" 3.75 µm	Global 1280 x 960	52 fps
BFLY-PGE-13S2C/M-CS	1.3MP	Sony ICX445 CCD*	1/3" 3.75 µm	Global 1288 x 964	30 fps
BFLY-PGE-13H2C/M-CS	1.3MP	Sharp RJ33J4/RJ33J3 CCD	1/3" 3.75 µm	Global 1288 x 964	30 fps
BFLY-PGE-13E4C/M-CS	1.3MP	e2v EV76C560 CMOS	1/1.8" 5.3 µm	Global 1280 x 1024	60 fps
BFLY-PGE-14S2C-CS	1.4MP	Sony IMX104 CMOS	1/3" 3.75 µm	Rolling 1296 x 1032	60 fps
BFLY-PGE-20E4C/M-CS	2.0MP	e2v EV76C570 CMOS	1/1.8" 4.5 µm	Global 1600 x 1200	47 fps
BFLY-PGE-23S2C-CS	2.3MP	Sony IMX136 CMOS	1/2.8" 2.8 µm	Rolling 1920 x 1200	27 fps
BFLY-PGE-23S6C/M-C	2.3MP	Sony IMX249 CMOS***	1/1.2" 5.86 µm	Global 1920 x 1200	41 fps
BFLY-PGE-50A2C/M-CS	5.0MP	Aptina MT9P006/031 CMOS	1/2.5" 2.2 µm	Rolling 2592 x 1944	13 fps
BFLY-PGE-50H5C/M-C	5.0MP	Sharp RJ32S4/S3AAODT CCD	2/3" 3.45 µm	Global 2448 x 2048	7.5 fps

*High sensitivity Sony EXview HAD CCD **High sensitivity Sony EXview HAD CCD II ***High performance Sony Pregius Global Shutter CMOS

Model#	Sensor	Specifications	Shutter	Max Res	Max FPS
FL3-GE-03S1C/M-C	0.3MP	Sony ICX618 CCD*	1/4" 5.6 µm	Global 648 x 488	120 fps
FL3-GE-03S2C/M-C	0.3MP	Sony ICX424 CCD	1/3" 7.4 µm	Global 648 x 488	82 fps
FL3-GE-08S2C/M-C	0.8MP	Sony ICX204 CCD	1/3" 4.65 µm	Global 1032 x 776	31 fps
FL3-GE-13S2C/M-C/CS	1.3MP	Sony ICX445 CCD*	1/3" 3.75 µm	Global 1288 x 964	31 fps
FL3-GE-14S3C/M-C	1.4MP	Sony ICX627 CCD	1/2" 4.65 µm	Global 1384 x 1032	18 fps
FL3-GE-20S4C/M-C	2.0MP	Sony ICX274 CCD	1/1.8" 4.4 µm	Global 1624 x 1224	15 fps
FL3-GE-28S4C/M-C	2.8MP	Sony ICX687 CCD**	1/1.8" 3.69 µm	Global 1928 x 1448	14 fps
FL3-GE-50S5C/M-C	5.0MP	Sony ICX655 CCD	2/3" 3.45 µm	Global 2448 x 2048	8 fps

*High sensitivity Sony EXview HAD CCD **High sensitivity Sony EXview HAD CCD II**

	BLACKFLY	FLEA3
INTERFACE	Gigabit Ethernet interface with screw locks for camera control and data; Power over Ethernet	Gigabit Ethernet interface with screw locks for camera control and data
GPIO	6-pin Hirose HR10A-7R-6PB GPIO connector for trigger, strobe, and power. 1 opto-isolated input, 1 opto-isolated output	8-pin Hirose HR25 GPIO connector for power, trigger, strobe, PWM, and serial I/O, 1 opto-isolated input, 1 opto-isolated output, 2 bi-directional I/O pins
ADC	10-bit (BFLY-PGE-13E4, BFLY-PGE-20E4) • 12-bit	12-bit
IMAGE DATA FORMATS	Mono8, Mono12, Mono16, Raw8, Raw12, Raw16 (all models) RGB, YUV411, YUV422, YUV 444 (color models)	Y8, Y16, Mono8, Mono12, Mono16 (all models) RGB, YUV411, YUV422, YUV 444, Raw8, Raw12, Raw16 (color models)
PARTIAL IMAGE MODES	Pixel binning and region of interest (ROI) modes	Pixel binning and region of interest (ROI) modes
GAIN RANGE	Automatic/manual/one-push*/ 0 dB to 18 dB (*free running BFLY-PGE-13E4)	Automatic/manual/one-push/ 0 dB to 24 dB
EXPOSURE RANGE	Automatic/manual/one-push* (*free running BFLY-PGE-13E4) 0.015 ms to 32 seconds	Automatic/manual/one-push/extended shutter modes 0.03 ms to 2 sec (FL3-GE-03S2); 0.03 ms to 4 sec (FL3-GE-08S2, FL3-GE-13S2); 0.03 ms to 6 sec (FL3-GE-50S5); 0.03 ms to 32 sec (FL3-GE-03S1, FL3-GE-14S3, FL3-GE-20S4, FL3-GE-28S2)
GAMMA	0.50 to 4.00, programmable lookup table	0.50 to 4.00, programmable lookup table
TRIGGER MODES	Standard, overlapped, multi-shot	Standard, bulb, skip frames, overlapped, multiple exposure, multi-shot, low smear mode (FL3-GE-13S2, FL3-GE-28S4 models only)
IMAGE BUFFER	16 MB frame buffer	32 MB frame buffer
USER SETS	2 memory channels for custom camera settings	2 memory channels for custom camera settings
SIZE (WxHxD)	29x29x30 mm excluding lens holder, without optics (metal case)	29x29x30 mm excluding lens holder, without optics (metal case)
MASS	36 grams (without optics or tripod mounting bracket)	38 grams (without optics or tripod mounting bracket)
POWER	Standard voltage via Power over Ethernet (PoE) or 5 - 16 V via GPIO interface, < 2.5 W	12-24 V, < 2.5 W, via GPIO
LENS MOUNT	CS-mount (5 mm C-mount adapter sold separately) / C-mount (BFLY-PGE-23S6)	C-mount (FL3-GE-13S2 also available with CS-mount)
TEMPERATURE	-30° to 60°C (storage) • 0° to 45°C (operating)	-30° to 60°C (storage) • 0° to 45°C (operating)
WARRANTY	3 years	3 years



GRASSHOPPER²

HIGH-RESOLUTION SONY CCDs



Model#	Sensor Specifications	Shutter	Max Res	Max FPS
GS2-GE-20S4C/M-C	2.0MP Sony ICX274 CCD 1/1.8" 4.4 μm Global	1624 x 1224	29 fps	
GS2-GE-50S5C/M-C	5.0MP Sony ICX625 CCD 2/3" 3.45 μm Global	2448 x 2048	15 fps	

*High sensitivity Sony Super HAD CCD II™

GRASSHOPPER³

POE, FAST, HIGH-RESOLUTION IMAGING



Model#	Sensor Specifications	Shutter	Max Res	Max FPS
GS3-PGE-23S6C/M-C	2.3MP Sony IMX174 CMOS* 1/1.2" 5.86 μm Global	1920 x 1200	45 fps	
GS3-PGE-50S5C/M-C	5.0MP Sony ICX625 CCD 2/3" 3.45 μm Global	2448 x 2048	15 fps	
GS3-PGE-60S6C/M-C	6.0MP Sony ICX694 CCD** 1" 4.54 μm Global	2736 x 2192	13 fps	
GS3-PGE-91S6C/M-C	9.1MP Sony ICX814 CCD** 1" 3.69 μm Global	3376 x 2704	9 fps	

*High performance Sony Exmor CMOS**High sensitivity Sony EXview HAD CCD II™

Gigabit Ethernet interface with screw locks for camera control and data

8-pin Hirose HR25 GPIO connector for power, trigger, strobe, PWM, and serial I/O
1 opto-isolated input, 1 opto-isolated output, 2 bi-directional I/O pins

14-bit

Y8, Y16, (all models)
RGB, YUV411, YUV422, YUV444, Raw8, Raw16, (color models)

Pixel binning and region of interest (ROI) modes

Automatic/manual/one-push/ 3.6 dB to 24 dB

Automatic/manual/one-push/extended shutter modes
0.03 ms to >30 seconds (extended shutter mode)

0.50 to 4.00, programmable lookup table

Standard, bulb, skip frames, overlapped, multi-shot

32 MB frame buffer

2 memory channels for custom camera settings

44x29x58 mm excluding lens holder and connectors (metal case)

86 grams (without optics or tripod mounting bracket)

8-30 V, <4.7 W, via GPIO or interface

C-mount

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

3 years

Gigabit Ethernet interface with screw locks for camera control and data; Power over Ethernet

8-pin Hirose HR25 GPIO connector for power, trigger, strobe, PWM, and serial I/O
1 opto-isolated input, 1 opto-isolated output, 2 bi-directional I/O pins

10/12-bit (GS3-PGE-23S6) • 14-bit

Mono8, Mono12, Mono16 (all models)
RGB, YUV411, YUV422, YUV444, Raw8, Raw12, Raw16 (color models)

Pixel binning and region of interest (ROI) modes

Automatic/manual/one-push/ 0 dB to 24 dB /-9dB to 24 dB (GS3-PGE-91S6)

Automatic/manual/one-push/extended shutter modes

Up to 32 seconds (GS3-PGE-60S6, 50S5) / up to 3.2 seconds (GS3-PGE-23S6)

0.50 to 4.00, programmable lookup table

Standard, bulb, skip frames, overlapped, multi-shot

128 MB frame buffer

2 memory channels for custom camera settings

44x29x58 mm excluding lens holder and connectors (metal case)

86 grams (without optics or tripod mounting bracket)

8-30 V, <4.7 W, via GPIO or interface

C-mount

-30° to 60°C (storage) • 0° to 50°C (operating)

3 years

INTERFACE

GPIO

ADC

IMAGE DATA FORMATS

PARTIAL IMAGE MODES

GAIN RANGE

EXPOSURE RANGE

GAMMA

TRIGGER MODES

IMAGE BUFFER

USER SETS

SIZE (WxHxD)

MASS

POWER

LENS MOUNT

TEMPERATURE

WARRANTY



ZEBRA²

HYBRID IP AND MACHINE VISION CAMERA



Model#	Sensor Specifications	Shutter	Max Res	Max FPS
ZBR2-PGEHD-20S4C-CS	2.0MP Sony ICX274 CCD 1/1.8" 4.4µm Global	1624 x 1224	30 fps (HD-SDI 25 FPS)	
ZBR2-PGEHD-28S4C-CS	2.8MP Sony ICX687 CCD* 1/1.8" 3.69µm Global	1928 x 1448	26 fps (HD-SDI 25 FPS)	
ZBR2-PGEHD-50S5C-CS	5.0MP Sony ICX625 CCD 2/3" 3.45µm Global	2448 x 2048	15 fps (HD-SDI 25 FPS)	
ZBR2-PGEHD-51S5C-CS	5.0MP Sony ICX655 CCD 2/3" 3.45µm Global	2448 x 2048	10 fps (HD-SDI 25 FPS)	

HD-SDI up to 2.97 Gbit/s for video. Gigabit Ethernet interface with screw locks for camera control and data; Power over Ethernet.

6-pin GPIO connector for trigger, strobe, and serial I/O
1 opto-isolated input, 1 opto-isolated output, RS-485 interface

12-bit (ZBR2-PGEHD-51S5) • 14-bit
Raw8, Raw12, Raw16, RGB, YUV411, YUV422, MJPEG Image Compression

HD-SDI supports standard SMPTE formats, RTSP/GVSP supports binned

Automatic/manual/one-push/ 0 dB to 24 dB

Automatic/manual/one-push/extended shutter modes
0.03 ms to 2 seconds (extended shutter mode)

0.50 to 4.00, programmable lookup table

Standard, bulb, skip frames, multi exposure preset, multi exposure pulse width, low smear, overlapped, and multi shot

32 MB frame buffer

2 memory channels for custom camera settings

44x44x87.5 mm excluding lens holder and connectors (metal case)

150 grams (without optics or tripod mounting bracket)

8-30 V, <6 W, via 4-pin power connector or GigE interface

CS-mount with hand-adjustable back focal distance • DC auto iris

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

3 years

INTERFACE

GPIO

ADC

IMAGE DATA FORMATS

PARTIAL IMAGE MODES

GAIN RANGE

EXPOSURE RANGE

GAMMA

TRIGGER MODES

IMAGE BUFFER

USER SETS

SIZE (WxHxD)

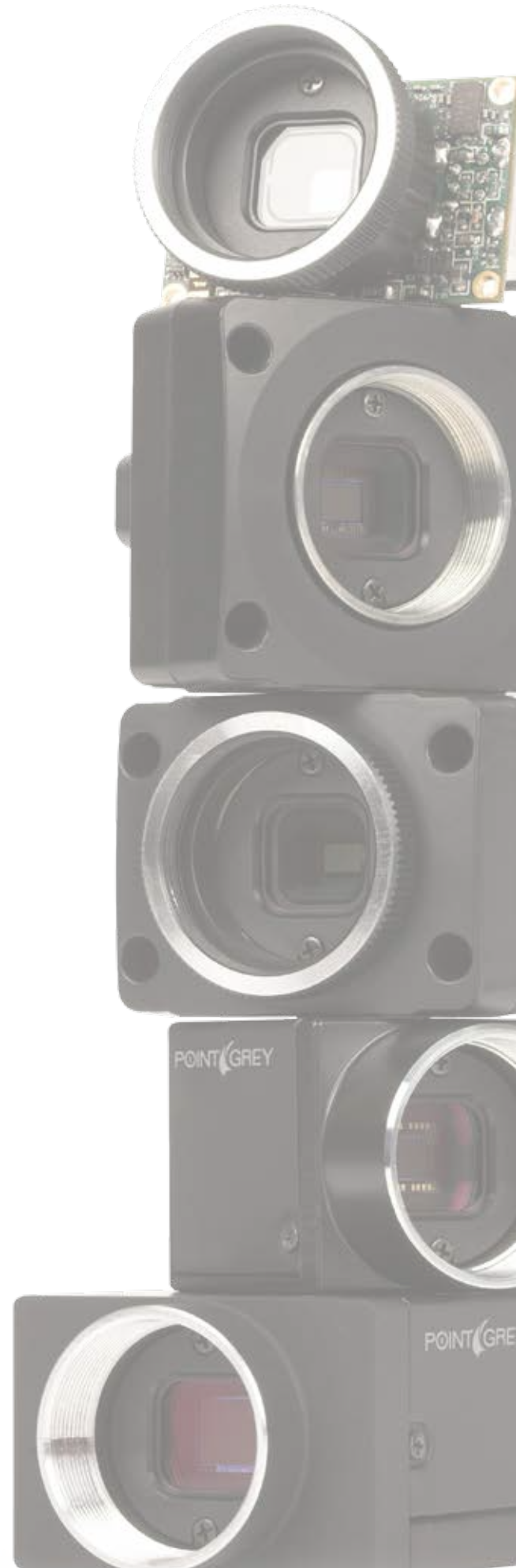
MASS

POWER

LENS MOUNT

TEMPERATURE

WARRANTY





Point Grey USB 2.0 Camera Features:

- Cost effective
- Industry-standard CS- mount
- Includes CS-C 5 mm adapter
- Firmware versions updatable in the field
- On-board temperature, power sensors, and status LED
- Board-level and custom options available for OEMs

CHAMELEON®

COMPACT, COST EFFECTIVE, CCD QUALITY



FIREFLY® MV

SMALL, AFFORDABLE, VERSATILE CMOS



Model#	Sensor Specifications	Shutter	Max Res	Max FPS
CMLN-13S2C/M-CS	1.3MP Sony ICX445 CCD* 1/3" 3.75 µm Global		1296 x 964	18 fps

*High sensitivity Sony EXview HAD CCD™

Model#	Sensor Specifications	Shutter	Max Res	Max FPS
FMVU-03MTC/M-CS	0.3MP Micron MT9V022 CMOS 1/3" 6.0 µm Global		752 x 480	60 fps
FMVU-13S2C-CS	1.3MP Sony IMX035 CMOS* 1/3" 3.63 µm Rolling		1328 x 1048	23 fps

*High speed Sony Exmor™ CMOS

Mini-B USB2.0 for camera control, video data, and power

7-pin JST GPIO connector, 4 pins for trigger and strobe, 1 pin +3.3 V, 1 VEXT pin for external power

12-bit
Y8, Y16 (mono)
8-bit and 16-bit Raw Bayer data (color)
Pixel binning and region of interest (ROI) modes
Automatic/manual/one-push/ 0 dB to 24 dB
Automatic/manual/one-push/extended shutter modes
0.01 ms to >10 seconds (extended shutter mode)
0.50 to 4.00, programmable lookup table
Standard, bulb, skip frames, overlapped
N/A
2 memory channels for custom camera settings

Mini-B USB2.0 for camera control, video data, and power

7-pin JST GPIO connector, 4 pins for trigger and strobe, 1 pin +3.3 V, 1 VEXT pin for external power

10-bit (FMVU-03MT) • 10/12-bit (FMVU-13S2)
Y8, Y16 (mono)
8-bit and 16-bit raw Bayer data (color)
Pixel binning and region of interest (ROI) modes
Automatic/manual/ 0 dB to 12 dB (03MT) / 0 dB to 24 dB (13S2)
Automatic/manual modes
0.12 ms to 512 ms (FMVU-03MT) / 0.03 ms to 8 seconds (FMVU-13S2)
0 to 1 (FMVU-03MT)/0.50 to 4.00 (FMVU-13S2)
Standard, skip frames
N/A
2 memory channels for custom camera settings

39x31mm (board level) / 25.5x44x41 mm excluding lens holder, without optics (plastic case)
22 g (board level) / 37 g (plastic case) (without optics or tripod mounting bracket)
2 W, 4.745 to 5.25 V via USB 2.0 interface or JST 7-pin GPIO connector
CS-mount (5 mm C-mount adapter included)
-30° to 60°C (storage) • 0° to 45°C (operating)
1 year

39x24 mm (board level) / 24.4x44x34 mm excluding lens holder, without optics (plastic case)
14 g (board level) / 37 g (plastic case) (without optics or tripod mounting bracket)
8-30 V, 1 W at 12 V via 1394a interface
CS-mount
-30° to 60°C (storage) • 0° to 45°C (operating)
1 year

INTERFACE

GPIO

ADC

IMAGE DATA FORMATS

PARTIAL IMAGE MODES

GAIN RANGE

EXPOSURE RANGE

GAMMA

TRIGGER MODES

IMAGE BUFFER

USER SETS

SIZE (WxHxD)

MASS

POWER

LENS MOUNT

TEMPERATURE

WARRANTY





Point Grey IEEE 1394 Camera Features:

- Compact sizes including board level options
- Supports IIDC v1.32
- Industry-standard C-mount
- Firmware versions updatable in the field
- On-board temperature, power sensors, and status LED
- Automatic synchronization

FLEA³

ULTRA-COMPACT, CCD FAMILY



GRASSHOPPER EXPRESS[®]

HIGH RESOLUTION AND SENSITIVITY



Model#	Sensor Specifications	Shutter	Max Res	Max FPS
FL3-FW-0351C/M-C	0.3MP Sony ICX618 CCD* 1/4" 5.6 µm	Global	648 x 488	120 fps
FL3-FW-0353C/M-C	0.3MP Sony ICX414 CCD 1/2" 9.9 µm	Global	648 x 488	76 fps
FL3-FW-1453C/M-C	1.4MP Sony ICX267 CCD 1/2" 4.65 µm	Global	1384 x 1032	16 fps
FL3-FW-2054C/M-C	2.0MP Sony ICX274 CCD 1/1.8" 4.4 µm	Global	1624 x 1224	15 fps

*High sensitivity Sony EXview HAD CCD *

Model#	Sensor Specifications	Shutter	Max Res	Max FPS
GX-FW-10K3M-C	1.0MP Kodak KAI-01050 CCD 1/2" 5.5 µm	Global	1024 x 1024	70 fps
GX-FW-2855C/M-C	2.8MP Sony ICX674 CCD* 2/3" 4.54 µm	Global	1932 x 1452	26 fps
GX-FW-60S6C/M-C	6.0MP Sony ICX694 CCD* 1" 4.54 µm	Global	2736 x 2192	11 fps

*High sensitivity Sony EXview HAD CCD II *

INTERFACE	IEEE 1394b interface with screw locks for camera control, data, and power	Two IEEE 1394b interface with screw locks for camera control, data, power, and daisy chaining
GPIO	8-pin Hirose HR25 GPIO connector for power, trigger, strobe, PWM, and serial I/O, 1 opto-isolated input, 1 opto-isolated output, 2 bi-directional I/O pins	8-pin Hirose HR25 GPIO connector for power, trigger, strobe, PWM, and serial I/O, 1 opto-isolated input, 1 opto-isolated output, 2 bi-directional I/O pins
ADC	12-bit	14-bit
IMAGE DATA FORMATS	Y8, Y16 (all models) RGB, YUV411, YUV422, Raw8, Raw16 (color models)	Y8, Y16, Mono8, Mono12, Mono16 (all models) RGB, YUV411, YUV422, YUV444, Raw8, Raw12, Raw16 (color models)
PARTIAL IMAGE MODES	Pixel binning and region of interest (ROI) modes	Pixel binning and region of interest (ROI) modes
GAIN RANGE	Automatic/manual/one-push/ 0 dB to 24 dB	Automatic/manual/one-push/ 0 dB to 24 dB
EXPOSURE RANGE	Automatic/manual/one-push/extended shutter modes 0.03 ms to >25 seconds (extended shutter mode)	Automatic/manual/one-push/extended shutter modes 0.04 ms to >30 seconds (extended shutter mode)
GAMMA	0.50 to 4.00, programmable lookup table	0.50 to 4.00, programmable lookup table
TRIGGER MODES	Standard, bulb, skip frames, overlapped, multiple exposure, multi-shot	Standard, bulb, skip frames, overlapped, multi-shot
IMAGE BUFFER	32 MB frame buffer	32 MB frame buffer
USER SETS	2 memory channels for custom camera settings	2 memory channels for custom camera settings
SIZE (WxHxD)	29x29x30 mm excluding lens holder, without optics (metal case)	44x29x58 mm excluding lens holder, without optics (metal case)
MASS	58 g (without optics or tripod mounting bracket)	86 grams (without optics or tripod mounting bracket)
POWER	8-30 V, <2.5 W via GPIO or 1394b interface	8-30 V, ~5 W, via GPIO or 1394b interface
LENS MOUNT	C-mount	C-mount
TEMPERATURE	-30° to 60°C (storage) • 0° to 45°C (operating)	-30° to 60°C (storage) • 0° to 45°C (operating)
WARRANTY	3 years	3 years



GRASSHOPPER²

HIGH SENSITIVITY AND LOW NOISE



FLEA²

UP TO 5 MP, ULTRA-COMPACT, CCD



Model#	Sensor Specifications	Shutter	Max Res	Max FPS
GS2-FW-1455C/M-C	1.4MP Sony ICX285 CCD* 2/3" 6.45 µm Global	1384 x 1036	30 fps	

*High sensitivity Sony EXview HAD CCD™

Model#	Sensor Specifications	Shutter	Max Res	Max FPS
FL2-03S2C/M-C	0.3MP Sony ICX424 CCD 1/3" 7.4 µm Global	648 x 488	80 fps	
FL2-08S2C/M-C	0.8MP Sony ICX204 CCD 1/3" 4.65 µm Global	1032 x 776	30 fps	
FL2G-13S2C/M-C	1.3MP Sony ICX445 CCD* 1/3" 3.75 µm Global	1288 x 964	30 fps	
FL2-14S3C/M-C	1.4MP Sony ICX267 CCD 1/2" 4.65 µm Global	1392 x 1032	15 fps	
FL2-20S4C/M-C	2.0MP Sony ICX274 CCD 1/1.8" 4.4 µm Global	1624 x 1224	15 fps	
FL2G-50S5C/M-C	5.0MP Sony ICX655 CCD 2/3" 3.45 µm Global	2448 x 2048	7.5 fps	

*High sensitivity Sony EXview HAD CCD™

Two IEEE 1394b interface with screw locks for camera control, data, power, and daisy chaining

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

14-bit
 Y8, Y16, (all models)
 RGB, YUV411, YUV422, YUV444, Raw8, Raw16, (color models)
 Pixel binning and region of interest (ROI) modes
 Automatic/manual/one-push/ 0dB to 24dB
 Automatic/manual/one-push/extended shutter modes
 0.03 ms to >330 seconds (extended shutter mode with amp glow disable option)
 0.50 to 4.00, programmable lookup table
 Standard, bulb, skip frames, overlapped, multi-shot
 32 MB frame buffer
 2 memory channels for custom camera settings

44x29x58 mm excluding lens holder and connectors (metal case)
 104 g (without optics or tripod mounting bracket)
 8-30 V, <2.5 W, via GPIO or 1394b interface
 C-mount
 -30° to 60°C (storage) • 0° to 45°C (operating)
 3 years

IEEE 1394b interface with screw locks for camera control, data, and power

8-pin Hirose HR25 GPIO connector opto-isolated pins for trigger and strobe (FL2G only),
 bi-directional pins for trigger, strobe or serial port

12-bit
 Y8, Y16 (all models)
 RGB, YUV411, YUV422, YUV444, Raw8, Raw16 (color models)
 Pixel binning and region of interest (ROI) modes
 Automatic/manual/one-push/ 0 dB to 24 dB
 Automatic/manual/one-push/extended shutter modes
 0.02 ms to > 10 s (extended shutter mode)
 0.50 to 4.00, programmable lookup table
 Standard, bulb, skip frames, overlapped, multiple exposure, multi-shot
 32 MB frame buffer (FL2G only)
 2 memory channels for custom camera settings

29x29x30 mm excluding lens holder, without optics (metal case)
 58 g (without optics or tripod mounting bracket)
 8-30V, <2.5W, via GPIO or 1394b interface
 C-mount
 -30° to 60°C (storage) • 0° to 45°C (operating)
 3 years

INTERFACE
GPIO

ADC
IMAGE DATA FORMATS

PARTIAL IMAGE MODES
GAIN RANGE
EXPOSURE RANGE

GAMMA
TRIGGER MODES
IMAGE BUFFER
USER SETS

SIZE (WxHxD)
MASS
POWER
LENS MOUNT
TEMPERATURE
WARRANTY



GRASSHOPPER®

HIGH PERFORMANCE, CCD FAMILY



FIREFLY® MV

SMALL, AFFORDABLE, VERSATILE CMOS



Model#	Sensor Specifications			Shutter	Max Res	Max FPS
GRAS-03K2C/M-C	0.3MP	Kodak O340D CCD	1/3"	7.4 µm	Global 648 x 480	200 fps
GRAS-03S3M-C	0.3MP	Sony ICX414 CCD	1/2"	9.9 µm	Global 648 x 488	74 fps
GRAS-14S3C/M-C	1.4MP	Sony ICX267 CCD	1/2"	4.65 µm	Global 1384 x 1032	21 fps
GRAS-14S5C/M-C	1.4MP	Sony ICX285 CCD*	2/3"	6.45 µm	Global 1384 x 1036	15 fps
GRAS-20S4C/M-C	2.0MP	Sony ICX274 CCD	1/1.8"	4.4 µm	Global 1624 x 1224	30 fps
GRAS-50S5C/M-C	5.0MP	Sony ICX625 CCD	2/3"	3.45 µm	Global 2448 x 2048	15 fps

High sensitivity Sony EXview HAD CCD

Model#	Sensor Specifications			Shutter	Max Res	Max FPS
FMV-03M2C/M-CS	0.3MP	Aptina MT9V022 CMOS	1/3"	6.0 µm	Global 752 x 480	60 fps

INTERFACE Two IEEE 1394b interface with screw locks for camera control, data, power, and daisy chaining
GPIO 8-pin Hirose HR25 GPIO connector for power, trigger, strobe, PWM, and RS232

IEEE-1394a interface for camera control, data, and power (mini connector option available)
 7-pin JST GPIO connector, 4 pins for trigger and strobe, 1 pin +3.3 V, 1 VEXT pin for external power

ADC 14-bit

10-bit

IMAGE DATA FORMATS Y8, Y16 (all models)
 RGB, YUV411, YUV422, YUV 444, 8-bit and 16-bit raw Bayer data (color models)

Y8, Y16 (mono)
 8-bit and 16-bit raw Bayer data (color)

PARTIAL IMAGE MODES Pixel binning and region of interest (ROI) modes

Pixel binning and region of interest (ROI) modes

GAIN RANGE Automatic/manual/one-push/ 0 dB to 24 dB

Automatic/manual/ 0 dB to 12 dB

EXPOSURE RANGE Automatic/manual/one-push/extended shutter modes
 0.08 ms to >10 seconds (extended shutter mode)

Automatic/manual/extended shutter modes
 0.03 ms to 512 ms (extended shutter mode)

GAMMA 0.50 to 4.00, programmable lookup table

0 to 1

TRIGGER MODES Standard, bulb, skip frames, overlapped, multi-shot

Standard, skip frames

IMAGE BUFFER 32 MB frame buffer

N/A

USER SETS 2 memory channels for custom camera settings

2 memory channels for custom camera settings

SIZE (WxHxD) 44x29x58 mm excluding lens holder, without optics (metal case)

39x24 (board level) / 44x34x24.4 mm (plastic case) excluding lens holder, without optics

MASS 104 g (without optics or tripod mounting bracket)

15 g (board level) / 37 g (plastic case) (without optics or tripod mounting bracket)

POWER 8-30 V, <2.5 W via GPIO or 1394b interface

8-30 V, 1 W at 12 V via 1394a interface

LENS MOUNT C-mount

CS-mount or M12 microlens mount

TEMPERATURE -30° to 60°C (storage) • 0° to 40°C (operating)

-30° to 60°C (storage) • 0° to 40°C (operating)

WARRANTY 3 years

1 year





DRAGONFLY²

FLEXIBLE AND FULL-FEATURED



Model#	Sensor Specifications	Shutter	Max Res	Max FPS
DR2-COL/BW-C	0.3MP Sony ICX424 CCD 1/3" 7.4 μm Global 648 x 488	60 fps		
DR2-HICOL/BW-C	0.8MP Sony ICX204 CCD 1/3" 4.65 μm Global 1032 x 776	30 fps		
DR2-13S2C/M-C	1.3MP Sony ICX445 CCD* 1/3" 3.75 μm Global 1296 x 964	20 fps		

High sensitivity Sony EXview HAD CCD

IEEE-1394a interface for camera control, data, and power

8-pin Phoenix connector for power, trigger, strobe, PWM, and I/O

12-bit

Y8, Y16, Mono8, Mono12, Mono16, Raw8, Raw12, Raw16 (all models)
RGB, YUV411, YUV422, YUV 444 (color models)

Pixel binning and region of interest (ROI) modes

Automatic/manual/one-push/ 0 dB to 24 dB

Automatic/manual/one-push/extended shutter modes
0.031 ms to 66.63 ms at 15 FPS, >5 seconds in extended shutter mode

0.50 to 4.00, programmable lookup table

Standard, bulb, overlapped, multiple exposure, multi-shot

N/A

2 memory channels for custom camera settings

64x51 mm (board level) / 44x34x24.4 mm (metal case)

37 g (board level) / 187 g (metal case) (without optics or tripod mounting bracket)

8-30 V, 2.5 W at 12 V via 1394a or GPIO connector

C-mount / M12 microlens (DR2-03S2 & DR2-08S2)

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

1 year



Point Grey Camera Link Camera Features:

- 2 SDR connectors with screw locks
- Industry-standard C-mount
- 8- and 10-bit image modes
- Firmware versions updatable in the field
- On-board temperature, power sensors, and status LED

GAZELLE[®]

HIGH RESOLUTION, FAST FRAME RATES



Model#	Sensor Specifications	Shutter	Max Res	Max FPS
GZL-CL-22C5M-C	2.2MP CMOSIS CMV2000 CMOS 2/3" 5.5 μm Global 2048 x 1088	280 fps		
GZL-CL-41C6M-C	4.1MP CMOSIS CMV4000-2E5 CMOS 1" 5.5 μm Global 2048 x 2048	150 fps		

Camera Link LVDS for camera control and video data transmission.

Base (2-tap) and Full (8-tap) configurations

8-pin Hirose HR25 GPIO connector; opto-isolated pins for trigger and strobe

INTERFACE

GPIO

10-bit

Mono8, Mono10

ADC

IMAGE DATA FORMATS

Single or multiple region of interest modes

Analog and digital programmable via software. Range: 32 - 64 (analog), 1 - 63 (digital)

Full 8-tap mode
0.07 ms to 54 seconds

PARTIAL IMAGE MODES

GAIN RANGE

EXPOSURE RANGE

N/A

Single-shot, bulb, software trigger

GAMMA

TRIGGER MODES

N/A

2 memory channels for custom camera settings

IMAGE BUFFER

USER SETS

44x29x59.5 mm excluding lens holder, without optics (metal case)

90 g (without optics or tripod mounting bracket)

12 V, 6 W at 12 V

C-mount

-30° to 60°C (storage) • -10° to 50°C (operating)

3 years

SIZE (WxHxD)

MASS

POWER

LENS MOUNT

TEMPERATURE

WARRANTY



The compact, cost-effective Cricket IP camera uses high resolution Sony CMOS Exmor sensors for exceptional sensitivity and excellent dynamic range. Cricket offers a 720p model featuring a 1.3 MP sensor at 60 fps, and two 1080p models featuring a 2.0 MP sensor at 60 fps running over PoE. Designed and manufactured in Canada.

CRICKET® IP CAMERA

HD WDR, 60 FPS, IP SECURITY CAMERA*



Model#	Sensor Specifications	Shutter	Max Res	Max FPS
CR-POE-13S2C-CS	1.3MP Sony IMX139 CMOS 1/3"	Rolling	1280 x 1024	60 fps
CR-POE-20S2C-CS	2.0MP Sony IMX140 CMOS 1/2.8"	Rolling	1920 x 1080	60 fps
CR-POE-20S3C-CS	2.0MP Sony IMX185 CMOS 1/2"	Rolling	1920 x 1080	60 fps

INTERFACE RJ45 100Base-TX for data and power (PoE), 4-pin DC auto-iris connector

LIGHT SENSITIVITY/ MINIMUM ILLUMINATION 0.1 lux, F1.2 at 30 FPS, 1/30 second shutter

DYNAMIC RANGE 120 dB (CR-POE-13S2), 90 dB (CR-POE-20S2) in 4 image WDR mode

GAIN RANGE 0 dB to 24 dB

EXPOSURE RANGE 1/10,000 second to 1 second

LENS TYPE CS-mount, DC Auto Iris (optional)

COMPRESSION FORMAT MJPEG; H.264 Base/Main/High Profile

STREAM RESOLUTIONS CR-POE-13S2: ranging from 1280 x 1024 to 160 x 120, including SXGA, 720p, XGA, VGA
CR-POE-20S2: ranging from 1920 x 1080 to 160 x 120, including 1080p, SXGA, 720p, XGA, VGA
CR-POE-20S3: ranging from 1920 x 1080 to 160 x 120, including 1080p, SXGA, 720p, XGA, VGA

MULTI-STREAMING 2 streams, individually configurable frame rate, resolution and compression (H.264 or MJPEG)

PAN/TILT/ZOOM Digital

IMAGE SETTINGS Auto exposure, auto white balance, gain, shutter, contrast, sharpness, gamma

IMAGE ENHANCEMENTS WDR, 2D noise reduction, 3D noise reduction, image flip

SECURITY Password protection, HTTPS encryption

SUPPORTED PROTOCOLS ONVIF Profile S, RTSP, RTP, IPv4, TCP, UDP, HTTP, HTTPS, DHCP, NTP

MULTICASTING Yes

CASING Plastic and aluminum, white or black, integrated tripod mount (1/4-20 thread)

POWER CONSUMPTION ~4 W, via PoE 802.3af, at full frame rate and resolution with a single stream

TEMPERATURE 0°-45°C, 20-80% relative humidity (operating) • -30° to 60°C, 20-95% relative humidity (storage)

APPROVALS CE, FCC, RoHS, TUV

SIZE (WxHxD) 88.1 mm x 44 mm x 32 mm

MASS ~75 grams (without lens)

WARRANTY 1 year



Wide Dynamic Range for challenging lighting conditions



Excellent sensitivity with Sony Exmor CMOS sensors



Images taken at less than 0.1 lux

Ultra-compact and lightweight



Available in a black enclosure



*Note: Cricket is recommended for customers familiar with the use of standard security IP cameras. Key differences between the Cricket IP security camera and other Point Grey cameras include:

- Cricket produces compressed images only;
- Cricket requires a 3rd party Video Management Software (VMS) and does not support FlyCapture SDK;
- Cricket does not support external triggering or strobe capabilities.

360° SPHERICAL IMAGING CAMERAS

POINT GREY MAKES SPHERICAL video a reality by providing affordable hardware and software packages that deliver high-resolution 360° visual coverage. All three Ladybug systems perform the image acquisition, processing, stitching and correction necessary to integrate multiple camera images into full-resolution digital spherical and panoramic videos in real time. The quality and flexibility of spherical video data make the medium ideal for applications requiring synchronization of video images. This revolutionary technology is now used for a wide variety of applications and solutions. Examples include large scale GIS for street-level viewing, geographical mapping and other location-based visualizations (NMEA GPS and EXIF output compatible); high end security and surveillance applications; city planning applications; simulation and measurement analysis; and entertainment solutions for lighting models, full dome projection content, and other immersive experiences.

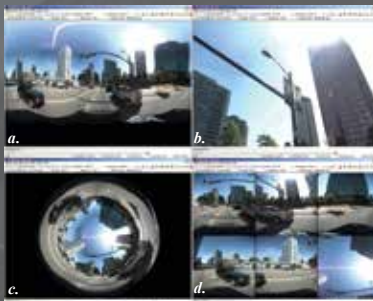
LADYBUG FAMILY KEY FEATURES

- 360° degree video streaming
- Covers 90% of visual sphere; 6 sensors each camera
- Independent imaging control CCD settings controlled individually or in unison
- Pre-calibrated for ease of use
- High dynamic range mode continuously cycles through a series of camera shutter and gain settings
- Image stabilization for smoother sequences
- Dynamic Stitching
- Complete Development Accessory Kit with each model (Ladybug5 Dev Kit shown below)



LADYBUG SDK

Every Ladybug system includes feature-rich software to manage image acquisition, spherical and panoramic image production, and camera settings. The Ladybug SDK includes the LadybugCapPro program, source code for a quick start in the C/C++ programming environment, a camera device driver, and Application Programming Interface (API) software library.



Spherical View Styles:
a. Panoramic b. Spherical c. Dome d. Multi-camera view

LADYBUG API FUNCTIONALITY

- Acquire and process images using a variety of different color processing algorithms
- Stream images off the camera for viewing
- Control JPEG compression level
- Access stored image stream files
- Store and link data from NMEA GPS devices
- Image stabilization for smoother sequences
- Dynamic Stitching - Stitch to variable distances
- Independent Exposure and HDR Imaging
- Anti-aliasing
- Environment Mapping - Uses OpenGL's cube map texture to create reflections from far away scenes.
- Control other settings including:
 - Auto exposure, gain, shutter, white balance, color correction, falloff correction, frame rate, independent sensor control
- Unique post processing workflow
 - **Exclusive only to the Ladybug5.** Edit 12-bit Camera RAW files for maximum flexibility and dynamic range



LADYBUG[®] 5

30 MP AND 12-BIT CAMERA RAW



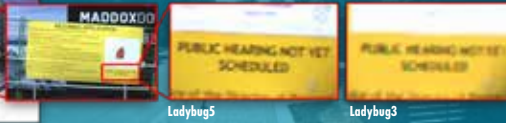
Model#	Sensor Specifications	Shutter	Max Res Per Sensor	Max FPS
LDS-U3-5155C-44	30MP Sony ICX655 CCD	2/3" 3.45 µm Global	2048 x 2448	10 FPS Compressed, 5 FPS Uncompressed

INTERFACE	USB 3.0 interface with screw locks for camera control and data
GPIO	12-pin GPIO connector for external trigger input, strobe output, and camera power
OPTICS	Six high quality 4.4 mm focal length lenses
SPHERICAL DISTANCE	Calibrated from 2 m to infinity
FOCUS DISTANCE	~200 cm. Objects have an acceptable sharpness from ~60 cm to infinity

ADC	12-bit
IMAGE DATA FORMATS	Raw8, Raw12, Raw16 in uncompressed and JPEG
IMAGE DATA OUTPUT	8-, 12-, or 16-bit, Raw or JPEG compressed
PARTIAL IMAGE MODES	Pixel binning and region of interest (ROI) modes
GAIN RANGE	Automatic/manual/one-push/ 0dB to 18dB
GAMMA	0.50 to 4.00
TRIGGER MODES	Standard, bulb, skip frames, overlapped, multi-shot
HIGH DYNAMIC RANGE	Cycle 4 gain and exposure presets
EXPOSURE RANGE	Global shutter; Automatic/manual/one-push/extended shutter modes 0.02 ms to 2 seconds (extended shutter)
IMAGE PROCESSING	Shutter, gain, white balance, gamma & JPEG compression, programmable via software
CASE TYPE	Single unit, water resistant
CASE MATERIAL	Machined aluminum housing, anodized red or black
ENVIRONMENTAL SENSORS	Temperature, Barometer, Humidity, Accelerometer, Compass
SIZE (WXHXD)	197 mm diameter, 160 mm height (with lens hoods)
MASS	3000 g
POWER	12-24 V, 13 W via GPIO
TEMPERATURE	-30° to 60°C (storage) • 0° to 45°C (operating)
WARRANTY	2 years



Comparison Image 300% magnification



LADYBUG[®] 3

HIGH RESOLUTION, WATER RESISTANT



LADYBUG[®] 2

30 FPS SPHERICAL VIDEO



Model#	Sensor Specifications	Shutter	Max Res Per Sensor	Max FPS	Model#	Sensor Specifications	Shutter	Max Res Per Sensor	Max FPS
LD3-20S4C-33	12MP Sony ICX274 CCD 1/1.8" 4.4 μm Global	1600 x 1200	16 FPS Compressed, 6.5 FPS Uncompressed		LD2-HICOL-KIT	4.8MP Sony ICX204 CCD 1/3" 4.65 μm Global	1024 x 768	30 FPS Compressed, 15 FPS Uncompressed	

IEEE 1394b interface with screw locks for camera control, data, and power

8-pin GPIO connector for external trigger, strobe, serial port, or external power

Six high quality 3.3 mm focal length lenses

Calibrated at 20 m

~200 cm. Objects have an acceptable sharpness from ~60 cm to infinity

12-bit

Raw8, Mono8

8-bit raw Bayer (color) digital data

Pixel binning and region of interest (ROI) modes

Automatic/manual/one-push/ 0dB to 24dB

0.50 to 4.00

Standard, bulb, skip frames, overlapped, multi-shot

Cycle 4 gain and exposure presets

Global shutter; Automatic/manual/one-push/extended shutter modes 0.01 ms to 4.2 s (extended shutter mode)

Shutter, gain, white balance, gamma & JPEG compression, programmable via software

Single unit, water resistant

Machined aluminum housing, anodized red or black

N/A

122 x 141 x 133 mm

2414 g

8-30 V, 7.2 W at 12 V via IEEE 1394b

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

1 year

IEEE 1394b interface with screw locks for camera control, data, and power fiber optic link between head and compressor

N/A

Six high quality 2.5 mm focal length lenses

Calibrated at 20 m

~200 cm. Objects have an acceptable sharpness from ~60 cm to infinity

12-bit

Raw8, Mono8

8-bit raw Bayer (color) digital data

Pixel binning and region of interest (ROI) modes

Automatic/manual/one-push/ 0dB to 26dB

0.50 to 4.00

Software only

N/A

Global shutter; Automatic/manual/one-push/extended shutter modes 0.01 ms to 4.2 s (extended shutter mode)

Shutter, gain, white balance, gamma & JPEG compression, programmable via software

Two units (head and compressor)

Machined aluminum housing, anodized red

N/A

110 x 100 x 141 mm

1190 g

8-30 V, 11.2 W at 12 V via IEEE 1394b

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

1 year

INTERFACE

GPIO

OPTICS

SPHERICAL DISTANCE

FOCUS DISTANCE

ADC

IMAGE DATA FORMATS

IMAGE DATA OUTPUT

PARTIAL IMAGE MODES

GAIN RANGE

GAMMA

TRIGGER MODES

HIGH DYNAMIC RANGE

EXPOSURE RANGE

IMAGE PROCESSING

CASE TYPE

CASE MATERIAL

ENVIRONMENTAL SENSORS

SIZE (WxHxD)

MASS

POWER

TEMPERATURE

WARRANTY

STEREO VISION CAMERAS

POINT GREY MAKES STEREO VISION PRACTICAL

for a variety of research areas by providing hardware and software packages that include complete stereo processing support – from image correction and alignment to dense correlation-based stereo mapping. Stereo vision works in a similar way to 3D sensing in human vision. It begins with identifying image pixels that correspond to the same point in a physical scene observed by multiple cameras. The 3D position of a point can then be established by triangulation using a ray from each camera. The more corresponding pixels identified, the more 3D points that can be determined with a single set of images. Correlation stereo methods attempt to obtain correspondences for every pixel in the stereo image, resulting in tens of thousands of 3D values generated with every stereo image.

BUMBLEBEE CAMERA FAMILY KEY FEATURES

- Full field-of-view depth measurements from a single image set
- Real time transformation of images to 3D data. Cameras can easily generate one million 3D points per second
- Easy integration with other machine vision techniques. The images and 3D data are perfectly registered
- Passive 3D sensing – no lasers or projectors required
- Pre-calibration for lens distortion and camera misalignments. Epipolar lines are aligned to within 0.05* pixels RMS error
- No manual adjustments or in-field calibration required
- High quality Sony CCD sensors
- Flexible software environment that provides access to all levels of the stereo processing pipeline

* This figure is based on a stereo resolution of 320x240 and is valid for all camera models. Calibration accuracy will vary from camera to camera.

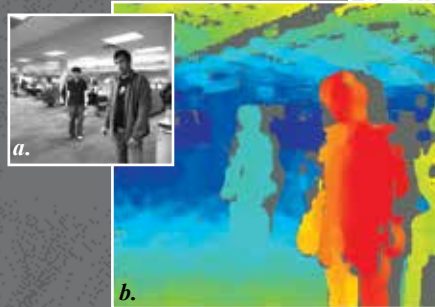
TRICLOPS™ STEREO SDK

The Triclops SDK provides flexible access to all image stages in the stereo processing pipeline, making it ideal for custom stereo processing approaches. For example, users can track features in the distorted images, rectify feature locations only, use rectified locations to perform epipolar validation on the features, and then determine their locations in 3D. Or users can rectify images and implement a user-supplied stereo algorithm, or perform correlation stereo only in regions of interest in the image, to speed up stereo processing. This flexibility enables innovation in a wide range of stereo vision research and application.

TRICLOPS SDK FEATURES INCLUDE:

- Distance Measurement for every pixel in view
- Over 1,000,000 measurements per second
- Removes lens distortions and misalignments
- Extensive example programs and source code

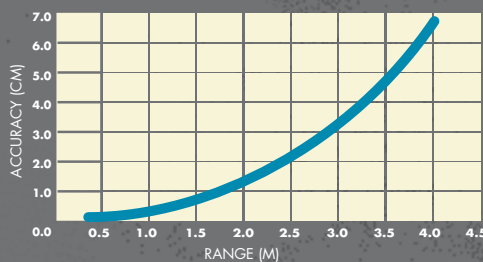
IMAGE RECTIFICATION



a. Original Image b. Depth Image

RANGE VS ACCURACY

This chart shows the accuracy of 3D point calculations versus the range to the point. Results are dependent on image resolution, lens focal length and calibration accuracy.



a. Original Image b. Depth Image

BUMBLEBEE® XB3

3-SENSOR AND MULTI-BASELINE



BUMBLEBEE® 2

COMPACT SIZE AND QUALITY



Model#	Sensor Specifications	Shutter	Max Res	Max FPS	Focal Length	Model#	Sensor Specifications	Shutter	Max Res	Max FPS	Focal Length
BBX3-13S2C/M-38	1.3MP Sony ICX445 CCD	1/3" 3.75 µm Global	1280 x 960	16 fps	3.8 mm	BB2-03S2C/M-25	0.3MP Sony ICX424 CCD	1/3" 7.4 µm Global	648 x 488	48 fps	2.5 mm
BBX3-13S2C/M-60	1.3MP Sony ICX445 CCD	1/3" 3.75 µm Global	1280 x 960	16 fps	6 mm	BB2-03S2C/M-38	0.3MP Sony ICX424 CCD	1/3" 7.4 µm Global	648 x 488	48 fps	3.8 mm
						BB2-03S2C/M-60	0.3MP Sony ICX424 CCD	1/3" 7.4 µm Global	648 x 488	48 fps	6 mm
						BB2-08S2C/M-25	0.8MP Sony ICX204 CCD	1/3" 4.65 µm Global	1032 x 776	20 fps	2.5 mm
						BB2-08S2C/M-38	0.8MP Sony ICX204 CCD	1/3" 4.65 µm Global	1032 x 776	20 fps	3.8 mm
						BB2-08S2C/M-60	0.8MP Sony ICX204 CCD	1/3" 4.65 µm Global	1032 x 776	20 fps	6 mm

Two IEEE-1394b interfaces for camera control, data, and power
4 general-purpose digital input/output pins

IEEE-1394a interfaces for camera control, data, and power
4 general-purpose digital input/output pins

INTERFACE
GPIO

12-bit
YUV411, YUV422, and RGB formats
8, 12, 16 and 24-bit digital data
Automatic/Manual/One-Push Gain modes, 0 dB to 24 dB
12 cm and 24 cm
3.8 mm with 66° HFOV, 6 mm with 43° HFOV
f/2.0 (2.5 mm and 3.8 mm focal length), f/2.5 (6.0 mm focal length)
54 dB
Standard, bulb, skip frames, overlapped
Automatic/Manual 0.03 ms to 66.63 ms at 15 FPS

12-bit
YUV411, YUV422, and RGB formats
8, 12, 16 and 24-bit digital data
Automatic/Manual/One-Push Gain modes, 0 dB to 24 dB
12 cm
2.5 mm with 97° HFOV, 3.8 mm with 66° HFOV, 6 mm with 43° HFOV
f/2.0 (2.5 mm and 3.8 mm focal length), f/2.5 (6.0 mm focal length)
60 dB
Standard, bulb, skip frames, overlapped
Automatic/Manual 0.03 ms to 66.63 ms at 15 FPS

ADC
IMAGE DATA FORMATS
IMAGE DATA OUTPUT
GAIN
BASELINE
FIELD OF VIEW
APERTURE
SIGNAL TO NOISE RATIO
TRIGGER MODES
EXPOSURE RANGE

277 x 37 x 41.8 mm
505 g
4 W at 12 V via IEEE-1394 interface or GPIO connector
3 x M12 microlens mount
-30° to 60°C (storage) • 0° to 45°C (operating)
2 years

157 x 36 x 47.4 mm
342 g
2.5 W at 12 V via IEEE-1394 interface or GPIO connector
2 x M12 microlens mount
-30° to 60°C (storage) • 0° to 45°C (operating)
2 years

SIZE (WXHxD)
MASS
POWER
LENS MOUNT
TEMPERATURE
WARRANTY





	MODEL NUMBER	INTERFACE	SENSOR TYPE	OPTICAL FORMAT	PIXEL SIZE	MAX RES	MAX FPS
CHAMELEON3 Page 3	CM3-U3-13S2C/M-CS	USB 3.0	Sony ICX445 CCD	1/3"	3.75µm	1288 x 964	30 fps
	CM3-U3-13Y3M-C	USB 3.0	On Semi Python 1300 CMOS	1/2"	4.8µm	1280 x 1024	150 fps
	CM3-U3-28S4C/M-CS	USB 3.0	Sony ICX818 CCD	1/1.8"	3.69µm	1928 x 1448	13 fps
BLACKFLY Page 3	BFLY-U3-03S2C/M-CS	USB 3.0	Sony ICX424 CCD	1/3"	7.4µm	648 x 488	84 fps
	BFLY-U3-05S2C/M-CS	USB 3.0	Sony ICX693 CCD	1/3"	6.0µm	808 x 608	50 fps
	BFLY-U3-13S2C/M-CS	USB 3.0	Sony ICX445 CCD	1/3"	3.75µm	1288 x 964	30 fps
	BFLY-U3-20S4C/M-CS	USB 3.0	Sony ICX274 CCD	1/1.8"	4.4µm	1624 x 1224	15 fps
	BFLY-U3-23S6C/M-C	USB 3.0	Sony IMX249 CMOS	1/1.2"	5.86µm	1920 x 1200	41 fps
	BFLY-U3-50H5C/M-C	USB 3.0	Sharp RJ3253AAODT CCD	2/3"	3.45µm	2448 x 2048	7.5 fps
FLEA3 Page 4	FL3-U3-13S2C/M-CS	USB 3.0	Sony IMX035 CMOS	1/3"	3.63µm	1328 x 1048	120 fps
	FL3-U3-13Y3M-C	USB 3.0	ON Semi VITA1300 CMOS	1/2"	4.8µm	1280 x 1024	149 fps
	FL3-U3-13E4C/M-C	USB 3.0	e2v EV76C560 CMOS	1/1.8"	5.3µm	1280 x 1024	60 fps
	FL3-U3-20E4C/M-C	USB 3.0	e2v EV76C5706F CMOS	1/1.8"	4.5µm	1600 x 1200	59 fps
	FL3-U3-32S2C/M-CS	USB 3.0	Sony IMX036 CMOS	1/2.8"	2.5µm	2080 x 1552	60 fps
	FL3-U3-88S2C-C	USB 3.0	Sony IMX121 CMOS	1/2.5"	1.55µm	4096 x 2160	21 fps
GRASSHOPPER3 Page 4	GS3-U3-14S5C/M-C	USB 3.0	Sony ICX285 CCD	2/3"	6.45µm	1384 x 1036	30 fps
	GS3-U3-15S5C/M-C	USB 3.0	Sony ICX825 CCD	2/3"	6.45µm	1384 x 1032	45 fps
	GS3-U3-23S6C/M-C	USB 3.0	Sony IMX174 CMOS	1/1.2"	5.86µm	1920 x 1200	162 fps
	GS3-U3-28S4C/M-C	USB 3.0	Sony ICX687 CCD	1/1.8"	3.69µm	1928 x 1448	26 fps
	GS3-U3-28S5C/M-C	USB 3.0	Sony ICX674 CCD	2/3"	4.54µm	1920 x 1440	26 fps
	GS3-U3-32S4C/M-C	USB 3.0	Sony IMX252 CMOS	1/1.8"	3.45µm	2048 x 1536	121 fps
	GS3-U3-41S4C/M-C	USB 3.0	Sony ICX808 CCD	1/1.8"	3.1µm	2016 x 2016	18 fps
	GS3-U3-41C6NIR-C	USB 3.0	CMOSIS CMV4000-3E12 CMOS	1"	5.5µm	2048 x 2048	90 fps
	GS3-U3-41C6C/M-C	USB 3.0	CMOSIS CMV4000-3E5 CMOS	1"	5.5µm	2048 x 2048	90 fps
	GS3-U3-50S5C/M-C	USB 3.0	Sony ICX625 CCD	2/3"	3.45µm	2448 x 2048	15 fps
	GS3-U3-51S5C/M-C	USB 3.0	Sony IMX250 CMOS	2/3"	3.45µm	2448 x 2048	75 fps
	GS3-U3-60S6C/M-C	USB 3.0	Sony ICX694 CCD	1"	4.54µm	2736 x 2192	13 fps
	GS3-U3-60Q56C/M-C	USB 3.0	Sony ICX694 CCD	1"	4.54µm	2736 x 2192	25 fps
	GS3-U3-91S6C/M-C	USB 3.0	Sony ICX814 CCD	1"	3.69µm	3376 x 2704	9 fps
	GS3-U3-120S6C/M-C	USB 3.0	Sony ICX834 CCD	1"	3.1µm	4240 x 2824	7 fps



BLACKFLY Page 5	BFLY-PGE-03S2C/M-CS	GigE PoE	Sony ICX424 CCD	1/3"	7.4µm	648 x 488	84 fps	
	BFLY-PGE-03S3C/M-CS	GigE PoE	Sony ICX414 CCD	1/2"	9.9µm	648 x 488	90 fps	
	BFLY-PGE-05S2C/M-CS	GigE PoE	Sony ICX693 CCD	1/3"	6.0µm	808 x 608	50 fps	
	BFLY-PGE-09S2C/M-CS	GigE PoE	Sony ICX692 CCD	1/3"	4.08µm	1288 x 728	30 fps	
	BFLY-PGE-12A2C/M-CS	GigE PoE	Aptina ARO134 CMOS	1/3"	3.75µm	1280 x 960	52 fps	
	BFLY-PGE-13S2C/M-CS	GigE PoE	Sony ICX445 CCD	1/3"	3.75µm	1288 x 964	30 fps	
	BFLY-PGE-13H2C/M-CS	GigE PoE	Sharp RJ33J4/RJ33J3 CCD	1/3"	3.75µm	1288 x 964	30 fps	
	BFLY-PGE-13E4C/M-CS	GigE PoE	e2v EV76C560 CMOS	1/1.8"	5.3µm	1280 x 1024	60 fps	
	BFLY-PGE-14S2C-CS	GigE PoE	Sony IMX104 CMOS	1/3"	3.75µm	1296 x 1032	60 fps	
	BFLY-PGE-20E4C/M-CS	GigE PoE	e2v EV76C570 CMOS	1/1.8"	4.5µm	1600 x 1200	47 fps	
	BFLY-PGE-23S2C-CS	GigE PoE	Sony IMX136 CMOS	1/2.8"	2.8µm	1920 x 1200	27 fps	
	BFLY-PGE-23S6C/M-C	GigE PoE	Sony IMX249 CMOS	1/1.2"	5.86µm	1920 x 1200	41 fps	
	BFLY-PGE-50A2C/M-CS	GigE PoE	Aptina MT9P006/031 CMOS	1/2.5"	2.2µm	2592 x 1944	13 fps	
	BFLY-PGE-50H5C/M-C	GigE PoE	Sharp RJ3254/S3AAODT CCD	2/3"	3.45µm	2448 x 2048	7.5 fps	
	FLEA3 Page 5	FL3-GE-03S1C/M-C	GigE	Sony ICX618 CCD	1/4"	5.6µm	648 x 488	120 fps
		FL3-GE-03S2C/M-C	GigE	Sony ICX424 CCD	1/3"	7.4µm	648 x 488	82 fps
		FL3-GE-08S2C/M-C	GigE	Sony ICX204 CCD	1/3"	4.65µm	1032 x 776	31 fps
FL3-GE-13S2C/M-C/CS		GigE	Sony ICX445 CCD	1/3"	3.75µm	1288 x 964	31 fps	
FL3-GE-14S3C/M-C		GigE	Sony ICX267 CCD	1/2"	4.65µm	1384 x 1032	18 fps	
FL3-GE-20S4C/M-C		GigE	Sony ICX274 CCD	1/1.8"	4.4µm	1624 x 1224	15 fps	
FL3-GE-28S4C/M-C		GigE	Sony ICX687 CCD	1/1.8"	3.69µm	1928 x 1448	15 fps	
FL3-GE-50S5C/M-C	GigE	Sony ICX655 CCD	2/3"	3.45µm	2448 x 2048	8 fps		
GRASSHOPPER3 Page 6	GS3-PGE-23S6C/M-C	GigE-PoE	Sony IMX174 CMOS	1/1.2"	5.86µm	1920 x 1200	45 fps	
	GS3-PGE-50S5C/M-C	GigE-PoE	Sony ICX625 CCD	2/3"	3.45µm	2448 x 2048	15 fps	
	GS3-PGE-60S6C/M-C	GigE-PoE	Sony ICX694 CCD	1"	4.54µm	2736 x 2192	13 fps	
	GS3-PGE-91S6C/M-C	GigE-PoE	Sony ICX814 CCD	1"	3.69µm	3376 x 2704	9 fps	
GRASSHOPPER2 Page 6	GS2-GE-20S4C/M-C	GigE	Sony ICX274 CCD	1/1.8"	4.4µm	1624 x 1224	29 fps	
	GS2-GE-50S5C/M-C	GigE	Sony ICX625 CCD	2/3"	3.45µm	2448 x 2048	15 fps	
ZEBRA2 Page 7	ZBR2-PGEHD-20S4C-CS	GigE-PoE / HD-SDI	Sony ICX274 CCD	1/1.8"	4.4µm	1624x1224	30 fps (HD-SDI 25 FPS)	
	ZBR2-PGEHD-28S4C-CS	GigE-PoE / HD-SDI	Sony ICX687 CCD	1/1.8"	3.69µm	1928x1448	26 fps (HD-SDI 25 FPS)	
	ZBR2-PGEHD-50S5C-CS	GigE-PoE / HD-SDI	Sony ICX625 CCD	2/3"	3.45µm	2448x2048	15 fps (HD-SDI 25 FPS)	
	ZBR2-PGEHD-51S5C-CS	GigE-PoE / HD-SDI	Sony ICX655 CCD	2/3"	3.45µm	2448x2048	10 fps (HD-SDI 25 FPS)	



FLEA2 Page 10	FL2-03S2C/M-C	IEEE 1394b	Sony ICX424 CCD	1/3"	7.4µm	648x488	80 fps
	FL2-08S2C/M-C	IEEE 1394b	Sony ICX204 CCD	1/3"	4.65µm	1032x776	30 fps
	FL2G-13S2C/M-C	IEEE 1394b	Sony ICX445 CCD	1/3"	3.75µm	1288x964	30 fps
	FL2-14S3C/M-C	IEEE 1394b	Sony ICX267 CCD	1/2"	4.65µm	1392x1032	15 fps
	FL2-20S4C/M-C	IEEE 1394b	Sony ICX274 CCD	1/1.8"	4.4µm	1624x1224	15 fps
FL2G-50S5C/M-C	IEEE 1394b	Sony ICX655 CCD	2/3"	3.45µm	2448x2048	7.5 fps	
FLEA3 Page 9	FL3-FW-03S1C/M-C	IEEE 1394b	Sony ICX618 CCD	1/4"	5.6µm	648x488	120 fps
	FL3-FW-03S3C/M-C	IEEE 1394b	Sony ICX414 CCD	1/2"	9.9µm	648x488	76 fps
	FL3-FW-14S3C/M-C	IEEE 1394b	Sony ICX267 CCD	1/2"	4.65µm	1384x1032	16 fps
	FL3-FW-20S4C/M-C	IEEE 1394b	Sony ICX274 CCD	1/1.8"	4.4µm	1624x1224	15 fps
GRASSHOPPER EXPRESS Page 9	GX-FW-10K3M-C	IEEE 1394b	Kodak KAI-01050 CCD	1/2"	5.5µm	1024x1024	70 fps
	GX-FW-28S5C/M-C	IEEE 1394b	Sony ICX674 CCD	2/3"	4.54µm	1932x1452	26 fps
	GX-FW-60S6C/M-C	IEEE 1394b	Sony ICX694 CCD	1"	4.54µm	2736x2192	11 fps

SHUTTER	GPIO	LENS MOUNT	A/D CONVERTER	IMAGE DATA OUTPUT	ON-BOARD MEMORY	SIZE	OPERATING TEMP	WARRANTY
Global Global Global	9-pin JST	CS CS CS	12-bit ADC 12-bit ADC 12-bit ADC	8, 12, 16, 24-bit	16 MB frame buffer 1 MB flash memory	44 x 35 x 19.5 mm	0° to 45° C	3 years
Global Global Global Global Global	6-pin Hirose HR10A-7R-6PB	CS CS CS C C	12-bit ADC 12-bit ADC 12-bit ADC 10/12-bit ADC 12-bit ADC	8, 12, 16, 24-bit	16 MB frame buffer 1 MB flash memory	29 x 29 x 30 mm	0° to 45° C	3 years
Rolling Global Global Global	8-pin Hirose HR25	CS C C C	12-bit ADC 10-bit ADC 10-bit ADC 10-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	3 years
Rolling/Global Reset Rolling/Global Reset		CS C	12-bit ADC 12-bit ADC					
Global Global Global Global Global Global Global Global Global Global Global Global Global Global	8-pin Hirose HR25	C C C C C C C C C C C C C C	14-bit ADC 14-bit ADC 10/12-bit ADC 14-bit ADC 14-bit ADC 10/12-bit ADC 14-bit ADC 10-bit ADC 10-bit ADC 14-bit ADC 10/12-bit ADC 14-bit ADC 14-bit ADC 14-bit ADC	8, 12, 16, 24-bit	128 MB frame buffer 2 MB flash memory	44 x 29 x 58 mm	0° to 50° C	3 years
Global Global Global Global Global Global Global Global Global Rolling Global Rolling Global Rolling Global	6-pin Hirose HR10A-7R-6PB	CS CS CS CS CS CS CS CS CS CS C CS C	12-bit ADC 12-bit ADC 12-bit ADC 12-bit ADC 12-bit ADC 12-bit ADC 10-bit ADC 12-bit ADC 10-bit ADC 12-bit ADC 10/12-bit ADC 12-bit ADC 12-bit ADC	8, 12, 16, 24-bit	16 MB frame buffer 512 KB flash memory	29 x 29 x 30 mm	0° to 45° C	3 years
Global Global Global Global Global Global Global	8-pin Hirose HR25	C C C C/CS C C C C	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	3 years
Global Global Global	8-pin Hirose HR25	C C C	10/12-bit ADC 14-bit ADC 14-bit ADC	8, 12, 16, 24-bit	128 MB frame buffer 2 MB flash memory	44 x 29 x 58 mm	0° to 50° C	3 years
Global Global	8-pin Hirose HR25	C C	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	3 years
Global Global Global Global	6-pin Pheonix	CS CS CS CS	14-bit ADC	8, 12, 16, 24-bit	32 MB frame buffer 1 MB flash memory	44 x 44 x 87.5 mm	0° to 45° C	3 years
Global Global Global Global Global	8-pin Hirose HR25	C C C C C	12-bit ADC	8, 12, 16, 24-bit	32 MB frame buffer 512 KB flash memory	29 x 29 x 30 mm	0° to 45° C	3 years
Global Global Global Global	8-pin Hirose HR25	C C C C	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	3 years
Global Global Global	8-pin Hirose HR25	C C C	14-bit ADC	8, 12, 16, 24-bit	32 MB frame buffer 1 MB flash memory	44 x 29 x 58 mm	0° to 45° C	3 years



	MODEL NUMBER	INTERFACE	SENSOR TYPE	OPTICAL FORMAT	PIXEL SIZE	MAX RES	MAX FPS	
Page 11	GRASSHOPPER	GRAS-03K2C/M-C	IEEE 1394b	Kodak KAI-0340D CCD	1/3"	7.4µm	648x480	200 fps
		GRAS-03S3M-C	IEEE 1394b	Sony ICX414 CCD	1/2"	9.9µm	648x488	74 fps
		GRAS-14S3C/M-C	IEEE 1394b	Sony ICX267 CCD	1/2"	4.65µm	1384x1032	21 fps
		GRAS-14S5C/M-C	IEEE 1394b	Sony ICX285 CCD	2/3"	6.45µm	1384x1036	15 fps
		GRAS-20S4C/M-C	IEEE 1394b	Sony ICX274 CCD	1/1.8"	4.4µm	1624x1224	30 fps
		GRAS-50S5C/M-C	IEEE 1394b	Sony ICX625 CCD	2/3"	3.45µm	2448x2048	15 fps

Page 10	GRASSHOPPER2	GS2-FW-14S5C/M-C	IEEE 1394b	Sony ICX285 CCD	2/3"	6.45µm	1384x1036	30 fps
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Page 8	CHAMELEON	CMLN-13S2C/M-CS	USB 2.0	Sony ICX445 CCD	1/3"	3.75µm	1296x964	18 fps
Page 8	FIREFLY MV	FMVU-03MTC/M-CS	USB 2.0	Micron MT9V022 CMOS	1/3"	6.0µm	752x480	60 fps
		FMVU-13S2C-CS	USB 2.0	Sony IMX035 CMOS	1/3"	3.63µm	1328x1048	23 fps



Page 12	GAZELLE	GZL-CL-22C5-C	Camera Link Base/Full	CMOSIS CMV2000 CMOS	2/3"	5.5µm	2048x1088	280 fps
		GZL-CL-41C6-C	Camera Link Base/Full	CMOSIS CMV4000-2E5 CMOS	1"	5.5µm	2048x2048	150 fps

Page 14	CRICKET IP CAMERA	CR-POE-13S2C-CS	100Mbit PoE	Sony IMX139 CMOS	1/3"	3.75µm	1280x1024	60 fps
		CR-POE-20S2C-CS	100Mbit PoE	Sony IMX140 CMOS	1/2.8"	2.8µm	1920x1080	60 fps
		CR-POE-20S3C-CS	100Mbit PoE	Sony IMX185 CMOS	1/2"	3.75µm	1920x1080	60 fps

Page 18	BUMBLEBEE2 & XB3	BB2-03S2C/M (25/38/60)	IEEE 1394a	Sony ICX424 CCD	1/3"	7.4µm	648x488	48 fps
		BB2-08S2C/M (25/38/60)	IEEE 1394a	Sony ICX204 CCD	1/3"	4.65µm	1032x776	20 fps
		BBX3-13S2C/M (38/60)	IEEE 1394b	Sony ICX445 CCD	1/3"	3.75µm	1280x960	16 fps

Page 15 & 16	LADYBUG2 LADYBUG3 LADYBUG5	LD2-HICOL-KIT	IEEE 1394b	Sony ICX204 CCD	1/3"	4.65µm	1024x768 (x6)	30 fps
		LD3-20S4C-33	IEEE 1394b	Sony ICX274 CCD	1/1.8"	4.4µm	1600x1200 (x6)	16 fps
		LD5-U3-51S5C-44	USB 3.0	Sony ICX655 CCD	2/3"	3.45µm	2048x2448 (x6)	10 fps



Sony EXview HAD CCD II

Increased Camera Sensitivity for Sony's Global Shutter CCDs

Sony EXview HAD CCD technology increases sensitivity compared to other CCD's, including into the near infrared. Sony engineers achieve this by optimizing the photodiode's surface area and depth on the sensor as well as placing their proprietary micro lenses on each diode to better capture and focus the light.



Sony Exmor

Increased Imaging Performance for Sony's CMOS Sensors

Exmor CMOS technology features very low temporal dark noise (read noise) and excellent high saturation capacity (well depth). The results are excellent imaging performance at the high frame rates of CMOS. Sony engineers achieve this by replacing aluminum transistors with copper transistors to reduce wiring thickness and its interference to incoming light. In addition, Sony engineers increased heat shielding and improved silicon purity.