

# Flea<sup>®</sup>2

## Ultra-Compact + Versatile + I394b



POINT GREY  
RESEARCH

- 0.3M, 0.8M, 1.4M or 2.0M pixels
- 1/3", 1/2" or 1/1.8" Sony<sup>®</sup> CCDs
- Smallest I394b camera in the world
- Locking screws for secure connection

The compact, versatile Flea<sup>®</sup>2 camera system is a complete, cost effective and reliable IEEE-1394b solution for demanding imaging applications such as semiconductor inspection and high-speed assembly.



Flea2 with C-mount lens holder

Models	
FL2-03S2M/C-C	Sony 1/3" CCD, BW or Color, 648x488 at 80 FPS
FL2-08S2M/C-C	Sony 1/3" CCD, BW or Color, 1032x776 at 30 FPS
FL2-14S3M/C-C <small>NEW</small>	Sony 1/2" CCD, BW or Color, 1392x1032 at 15 FPS <sup>1</sup>
FL2-20S4M/C-C <small>NEW</small>	Sony 1/1.8" CCD, BW or Color, 1624x1224 at 15 FPS

<sup>1</sup> Frame rate achieved using Format\_7

### IEEE-1394b Digital Interface

The bilingual IEEE-1394b interface used by the Flea2 camera provides reliable, deterministic communication with guaranteed bandwidth and 800Mb/s data rates. The Flea2 supports data transfer rates of 100, 200, 400 and 800Mb/s, and is backward compatible with 1394a, allowing it to work seamlessly with existing 1394a systems.

### Smallest I394b Camera in the World

At 29x29x30mm, the Flea2 fits into the small, tight spaces that are common in industrial imaging, making it an ideal camera for OEM applications. The 1394b connector with locking screw holes not only guarantee a reliable connection, but also reduce stress on internal electronics that can be caused by cable movement. The cable also carries both data and power, minimizing the need for additional cables or external power sources.

### Triggering and GPIO

The Flea2 camera has an 8-pin GPIO connector located on the back. The GPIO is a programmable interface that allows the user to coordinate 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 variable strobe patterns, or send and receive RS232 serial data. The GPIO pins are TTL 3.3V pins.

### Region of Interest and Pixel Binning

The Flea2 supports Format\_7 custom image modes such as pixel binning and region of interest (ROI) to achieve faster frame rates and higher sensitivity.

### Automatic Synchronization

Multiple Flea2 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 MultiSync<sup>™</sup> software.

### Color Processing

The Flea2 color camera features on-camera color processing and auto white balance. Available outputs include YUV411, YUV422 and RGB. If a reduction in the bus bandwidth is required, users can access the raw Bayer pattern.

### Industry Standard Mechanics

Every mechanical component of the Flea2 is designed to maximize usability, including the compact cast metal case, C-mount lens holder and ASA/ISO-compliant tripod mounting bracket, status LED and removable glass/IR filter system.

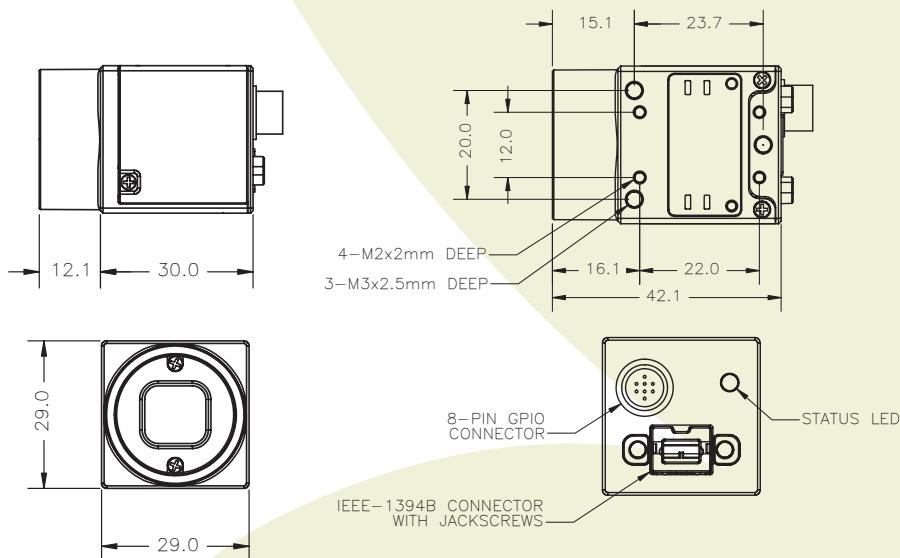
### Software

The FlyCapture<sup>®</sup> SDK is included with all imaging products. The SDK is compatible with Microsoft<sup>®</sup> Windows<sup>®</sup> and includes device drivers, software Application Programming Interface (API), demo programs and C/C++ example source code. It also includes the PGRPRO<sup>™</sup> driver, which provides enhanced debugging and diagnostics, and allows 1394b devices to run at 800Mb/s.

# Flea<sup>®</sup>2 Specifications

Specification	FL2-03S2	FL2-08S2	FL2-14S3	FL2-20S4
Image Sensor Type	Sony progressive scan CCDs with global shutter			
Image Sensor Model	Sony ICX424 1/3"	Sony ICX204 1/3"	Sony ICX267 1/2"	Sony ICX274 1/1.8"
Pixel Size	7.4 x 7.4µm	4.65 x 4.65µm	4.65 x 4.65µm	4.4 x 4.4µm
Maximum Resolution	648x488	1032x776	1392x1032	1624x1224
Maximum Frame Rate	648x488 at 80 FPS	1032x776 at 30 FPS	1392x1032 at 15 FPS	1624x1224 at 15 FPS
A/D Converter	Analog Devices 12-bit analog-to-digital converter			
Video Data Output	8,16 and 24-bit digital data			
Image Data Formats	Y8, Y16, RGB, YUV411, YUV422 and YUV444 (Color model)			
White Balance	automatic / manual / one-push modes, programmable via software			
Partial Image Modes	pixel binning and region of interest modes via Format_7			
Interfaces	9-pin IEEE-1394b for camera control and video data transmission 4 general-purpose digital input/output (GPIO) pins			
Voltage Requirements	8-32V, via the IEEE-1394b interface or Hirose 8-pin GPIO connector			
Power Consumption (max at 12V)	2W			
Gain	automatic / manual / one-push modes, programmable via software 0dB to 24dB			
Shutter	automatic / manual / one-push modes, programmable via software 0.02ms to greater than 10s (extended shutter mode)			
Gamma / LUT	0.50 to 4.00 / programmable lookup table			
Trigger Modes	DCAM v1.31 Trigger Modes 0, 1, 3, 4, 5 and 14			
Signal To Noise Ratio (min at 0dB)	59dB	60dB	59dB	60dB
Dimensions	29 x 29 x 30mm (without optics)			
Mass	58 grams (without optics)			
Camera Specification	IIDC 1394-based Digital Camera Specification v1.31			
Lens mount	C-mount			
Emissions Compliance	Complies with CE rules and Part 15 Class A of FCC Rules			
Operating Temp.	Commercial grade electronics rated from 0° to 45°C			
Storage Temperature	-30° to 60°C			
Warranty	2 years			

## Flea2 Dimensional Drawings



## Development Kit Contents:

- 4.5 meter, 9-pin to 9-pin, IEEE-1394b cable with locking screws for secure connection
- 4.5 meter, 6-pin to 9-pin, IEEE-1394a to 1394b cable for secure connection
- IEEE-1394b OHCI PCI Host Adapter 3-port 800Mb/s card
- 1 meter GPIO wiring harness with HR25 8-pin male connector for easy triggering
- FlyCapture<sup>®</sup> SDK (C/C++ API and device drivers) CD

## Recommended System Configuration:

- Windows<sup>®</sup> XP Service Pack 1
- 512MB of RAM
- Intel<sup>®</sup> Pentium 4 2.0GHZ or compatible processors
- AGP video card with 128MB video memory
- PCI Express slot and 1394b card (not included) (32-bit slot required)
- Microsoft<sup>®</sup> Visual C++ 6.0 (to compile and run sample code)