

I Pre-Installation

I. Recommended System Configuration

OS	CPU	RAM	VIDEO	PORTS
Vista SPI, Win7, Linux Ubuntu 8.04	2.0GHz or equivalent	2 GB	AGP 128mb	IEEE-1394b

- Vista SPI, Windows 7, or Linux Ubuntu 8.04
- 2GB of RAM
- Intel Pentium 4 2.0GHz or compatible processor
- AGP video card with 128MB video memory
- 64-bit PCI or PCI-X slot (32-bit slot required)
- PCI-Express slot
- 1394b PCI card or 1394b PCI-Express card (available for purchase from Point Grey. Please visit www.ptgrey.com/products/firepro/firepro_firewire.asp)
- Microsoft Visual Studio 2005 SPI (to compile and run example code)

2. Electrostatic Precautions and Camera Care



- Do not open the camera housing. Doing so voids the Hardware Warranty
- Avoid electrostatic charging. For more details, consult the following knowledge base article. www.ptgrey.com/support/kb/index.asp?a=4&q=42
- When handling the camera unit, avoid touching the lenses. To clean the lenses, use a standard camera lens cleaning kit or a clean dry cotton cloth. Do not apply excessive force.
- This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesirable operation. This Class A digital apparatus complies with Canadian ICES-003. Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

- To clean the imaging surface of your CCD, follow the steps outlined in www.ptgrey.com/support/kb/index.asp?a=4&q=66.
- Extended exposure to bright sunlight, rain, dusty environments, etc. may cause problems with the electronics and the optics of the system.
- Avoid excessive shaking, dropping or mishandling of the device.

2 Installation

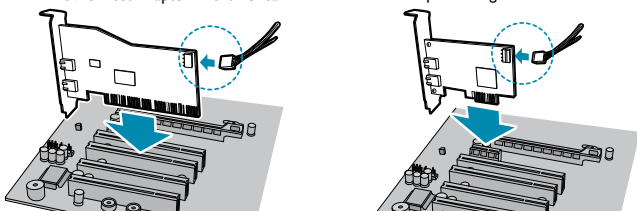
To purchase an 1394b PCI or PCIe card please visit the [Point Grey Webstore](http://www.ptgrey.com)

3. Install a IEEE-1394b PCI or PCIe card

- Turn computer off and place the IEEE-1394b PCI card in an open PCI slot or place the IEEE-1394b PCI-Express card in an open PCI-Express slot.

IEEE-1394b Host Adapter 2 Port PCI card

FirePRO low profile single bus IEEE-1394b PCIe card



- Connect the 4-pin connector on the card to the PC power supply.
- Turn the computer back on and log into Windows.
- In most cases, the Windows IEEE-1394 drivers will be automatically installed for the card, with no user input required. However, in some cases the **Found New Hardware Wizard** will appear. Follow the prompts given by the Wizard to install the card.
- Open Windows Device Manager by going to the **Control Panel > System > Hardware tab > Device Manager**. Ensure the PCI card is properly installed as an **IEEE 1394 Bus host controller**.

4. Register for a Customer Downloads Account and Install the FlyCapture® Software and Drivers

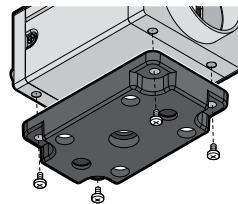
- Go to the Point Grey downloads page <http://www.ptgrey.com/support/downloads/index.asp>

• **New customers:** Under Register (New Users), complete the form, then click **Submit**. After you submit your registration, you will receive an e-mail with further instructions on how to activate your account.

• **Existing customers:** login under **Login with an Existing Account**. You will be taken to the product Downloads page. Scroll to the bottom and complete the form under **Add a new purchased product**.

- After activating your account, login to the Point Grey [downloads page](http://www.ptgrey.com/support/downloads/index.asp) (<http://www.ptgrey.com/support/downloads/index.asp>). After login, you will be taken to the downloads page for the products to which you have access. Expand **Software and Drivers for Imaging Products** for your operating system. Under FlyCapture v2x, click the 32- or 64-bit **Download** link to begin the download and installation.
- After the download is complete, the FlyCapture setup wizard begins. Follow the steps in each setup dialog. In the **Interface Driver Selection** dialog, select **I will use FireWire cameras**.

5. Installing the Tripod Mounting Bracket (optional)



The ASA and ISO-compliant tripod mounting bracket for the Grasshopper attaches to the camera using the included M3x0.5 screws.

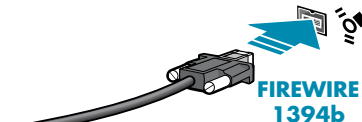
6. Install a Lens

- Unscrew the dust cap from the C-mount lens holder to install a lens. A selection of lenses is available for purchase from Point Grey. For more information go to <http://www.ptgrey.com/products/accessories/index.asp?type=optics>. For further information about selecting a lens, see Knowledge Base article 345 (<http://www.ptgrey.com/support/kb/index.asp?a=4&q=345>).

7. Connect the 1394b PCI Card and Cable to the camera

To purchase a 4.5m or 10m 1394b cable from Point Grey, visit the [Point Grey Webstore](http://www.ptgrey.com).

- Plug a 9-pin to 9-pin, IEEE-1394b cable into the 1394b PCI card and the Grasshopper 1394b connector; the cable jack screws can be used for a secure connection.



NOTE: The Grasshopper Express has two standard 9-pin IEEE-1394b connectors that can be used for data transmission, camera control and powering the camera. The maximum 1394b cable length between any 1394 node (e.g. camera to PCI card) is 4.5m, as specified by the IEEE-1394 standard. Use standard, shielded twisted pair copper cables. If the LED does not turn on at all when the camera is connected to the IEEE-1394b host adapter card, check that the camera is receiving adequate power. Refer to [Knowledge Base Article 93](#) for a list of options to consider when running the camera off a laptop.

- If the Microsoft Windows "**Found New Hardware Wizard**" appears, proceed to Step 8. Otherwise, proceed to Step 9.

8. Install the PGRCAM Driver

- Click "**Install from a list or specific location**" and click "**Next**".
- Select "**Don't search. I will choose the driver to install**" and "**Next**".
- Click "**Have Disk**" and browse to **C:\Program Files\Point Grey Research\PGR FlyCapture\driver**, click "**Open**", then "**OK**".
- Select the camera model. Click "**Next**".
- You will be prompted to continue installation - click "**Continue Anyway**" then "**Finish**" to complete installation.

9. Confirm Successful Installation

- Check Device Manager to confirm that installation was successful (PGRCAM driver install only). Go to the **Start menu**, select **Run** and enter "**devmgmt.msc**".
- To test the camera's image acquisition capabilities, run the FlyCap demo program. From the **Start menu**, select **All Programs > Point Grey Research > FlyCapture2 > FlyCap2**

3 Troubleshooting

The camera manual, FlyCapture® User Guide and other technical references can be found in the **Programs > Point Grey Research > FlyCapture2 > doc** directory. Our on-line Knowledge Base (www.ptgrey.com/support/kb/) also addresses the following problems:

- Article 21: Troublesome hardware configurations
- Article 88: Vertical bleeding or smearing from a saturated portion of an image
- Article 91: PGR camera not recognized by system and not listed in Device Manager
- Article 93: My laptop's IEEE-1394 port or PCMCIA card doesn't supply power to my camera
- Article 145: Image discontinuities or horizontal tearing of images when displayed on monitor
- Article 171: Performance of 1394 devices may decrease after installing Windows XP SP2
- Article 188: Image data acquired by my camera is corrupt and displayed images are broken
- Article 189: Image capture freezes after a period of successful image capture.

CONTACTING POINT GREY RESEARCH

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For all general questions about Point Grey Research, please contact us at info@ptgrey.com.
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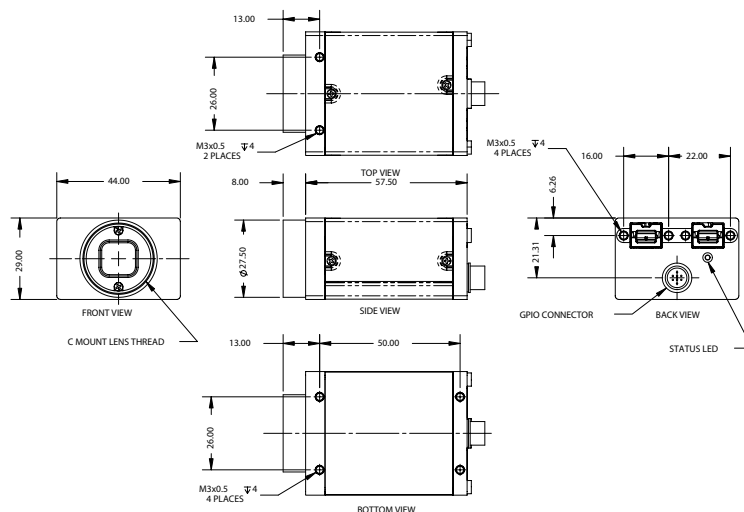
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TECHNICAL DRAWINGS



STATUS LED

Off	Not receiving power
Steady on	Receiving power and successful camera initialization
Steady on and very bright	Acquiring / transmitting images
Flashing bright, then brighter	Camera registers being accessed (no image acquisition)
Steady flashing on and off	Indicates possible camera problem
Slow flashing on and off	Indicates possible camera problem

GPIO

Diagram	Pin	Function	Description
	1	IO0	Opto-isolated Input (default Trigger in)
	2	IO1	Opto-isolated Output
	3	IO2	Input / Output / RS232 Transmit (TX)
	4	IO3	Input / Output / RS232 Receive (RX)
	5	GND	Ground for bi-directional IO, V _{EXT} , +3.3V pins
	6	GND	Ground for opto-isolated IO pins
	7	V _{EXT}	Allows the camera to be powered externally
	8	+3.3V	Power external circuitry up to a total of 150mA

To configure the GPIO pins, consult section 3.4 "General Purpose Input / Output" of the Grasshopper Express Technical Reference Manual

GX-FW-10K3M-C	1.0 MP	Kodak KAI-01050 CCD, mono, 1/2", 5.5 x 5.5 µm	1024 x 1024 at 70 FPS
GX-FW-28S5C/M-C	2.8 MP	Sony ICX674 CCD, mono or color, 2/3", 4.54 x 4.54µm	1932 x 1452 at 25 FPS
Analog-to-Digital Converter	Analog Devices 14-bit ADC		
Video Data Output	8, 12, 16 and 24-bit digital data		
Image Data Formats	Y8, Y16, Mono8, Mono12, Mono16, (all models) RGB, YUV411, YUV422, YUV444, Raw8, Raw12, Raw16 (color model)		
Digital Interface	IEEE 1394b 800 Mbit/s interface with screw locks for camera control, data, and power		
Partial Image Modes	Pixel binning and region of interest modes available via Format_7		
General Purpose I/O Ports	8-pin 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		
Gamma	0.50 to 4.00		
Gain Control	automatic / manual / one-push gain modes, programmable via software, 0dB to 24dB		
Shutter Speed	automatic / manual / one-push modes, programmable via software, 0.04ms to > 1.5s (extended shutter mode)		
Synchronization	via external trigger; software trigger (on same bus) or free running		
External Trigger Modes	External hardware or software trigger Multiple exposure, bulb shutter; skip-frames, multi-shot, and overlapped trigger modes (IICD Trigger Modes 0, 1, 3, 14 and 15)		
Voltage / Power	Voltage: 8-30V Power: ~5 W		
Dimensions (W x H x L)	44mm x 29mm x 58mm (not including lens holder and GPIO connector)		
Mass	104 grams (without optics)		
Memory Storage	32MB frame buffer; 1 MB non-volatile data flash		
Memory Channels	2 memory channels for custom camera settings		
Camera Specification	Complies with IICD 1.32		
Lens Mount	C-mount		
Emissions Compliance	CE, FCC, RoHS		
Operating Temperature	0° to 40°C		
Storage Temperature	-30° to 60°C		
Vibration Resistance	10 G (14 Hz to 200 Hz)		
Status Monitoring	Bi-color LED		
Special Features	Embedded image information (timestamp, frame counter; shutter, gain, ROI offset); image mirror (x-axis); HDR mode (cycle 4 gain and shutter presets); sharpness; test pattern; pixel defect correction		
Warranty	2 Years		