Getting Started with the Ladybug5 USB 3.0 Spherical Camera

Will your system support the camera?

Recommended System Configuration:

- **OS**—Windows 7 or Windows 8, 64-bit
- **CPU**—3 GHz Dual/Quad Core
- **RAM**—8 GB
- **Video**—NVIDIA 512 MB
- **Ports**—USB 3.0
- **Software**—Microsoft Visual Studio 2005 SP1 and SP1 Update for Vista (to compile and run example code using Ladybug SDK)

See Knowledge Base Article 368 for information on recommended system components for USB 3.0.

Do you have a downloads account?

The Point Grey downloads page has many resources to help you operate your camera effectively, including:

- Software, including Drivers (required for installation)
- Firmware updates and release notes
- Dimensional drawings and CAD models
- Documentation

To access the downloads resources you must have a downloads account.

1. Go to the Point Grey downloads page.
2. Under **Register (New Users)**, complete the form, then click **Submit**.

After you submit your registration, you will receive an email with instructions on how to activate your account.

Do you have all the parts you need?

To install your camera you will need the following components, included with the Ladybug5:

- USB 3.0 cable
- 12-pin GPIO 6-meter power cable and wiring harness
- Tripod adapter and desktop mount (optional)
- Interface card

Cables provided in the development kit are not high flex cables. Handle carefully during installation to avoid damaging the wires.

For More Information

For more information about...	See...
Your camera's settings and capabilities	Technical Reference Manual
Using the LadybugCapPro program	the Online Help included with the tool
Ladybug stream sample files	Downloads tab on Ladybug5 page
Accessing customer downloads	Knowledge Base Article 35
Recommended and unsupported system components for USB 3.0	Knowledge Base Article 368
Using USB 3.0 and Linux	Knowledge Base Article 395
Setting up multiple USB 3.0 cameras	Knowledge Base Article 389

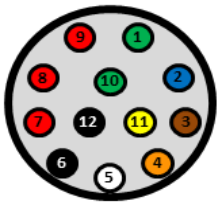
The Ladybug SDK help and technical references can be found in the **Programs>Point Grey Research>PGR Ladybug>Documentation** directory. Our online Knowledge Base also addresses many questions.

Camera Interface

USB 3.0 Connector

The camera is equipped with a USB 3.0 Micro-B connector that is used for data transmission, and camera control. For more detailed information, consult the USB 3.0 specification available from http://www.usb.org/developers/docs/.

General Purpose I/O Connector

Diagram	Pin	Function	Description
	1	OPTO_GND	Ground for opto-isolated IO pins
	2	I0	Opto-isolated input (default Trigger in)
	3	O1	Opto-isolated output
	4	IO2	Input/Output
	5	+3.3 V	Power external circuitry up to 150 mA
	6	GND	Ground for bi-directional IO, V_{EXT}, +3.3 V pins
	7	V_{EXT}	Allows the camera to be powered externally
	8	V_{EXT}	Allows the camera to be powered externally
	9	V_{EXT}	Allows the camera to be powered externally
	10	OPTO_GND	Ground for opto-isolated IO pins
	11	IO3	Input/Output
	12	GND	Ground for bi-directional IO, V_{EXT}, +3.3 V pins
	To configure the GPIO pins, consult the General Purpose Input/Output section of your camera's Technical Reference Manual.		

Status Indicator LED

LED Status	Description
Off	Not receiving power
Steady green	Receiving power
Flashing yellow/Steady yellow	Initializing FPGA
Steady yellow-green	Insufficient power
Steady bright green	Acquiring and transmitting images
Flashing bright, then brighter green	Accessing camera registers (no image acquisition)
Flashing green and red	Updating firmware
Flashing red	Temporary problem
Steady red	Serious problem

Camera Care

There are no removable parts on the camera head. Do **not** attempt to remove the lens covers.

To clean the imaging surface of your camera, follow the steps outlined in Knowledge Base Article 66.

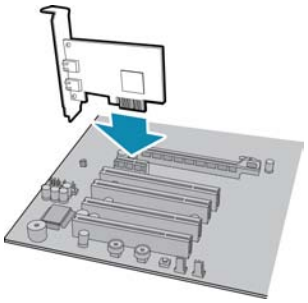
Extended exposure to bright sunlight, rain, dusty environments, etc. may cause problems with the electronics and optics of the system.

Avoid excessive shaking, dropping, or mishandling of the device.

Do not open the camera housing. Doing so voids the Hardware Warranty. Avoid electrostatic charging. For more details, consult Knowledge Base Article 42.

Installing Your Interface Card and Software

1. Install your Interface Card



Ensure the card is installed per the manufacturer's instructions.

Alternatively, use your PC's built-in host controller, if equipped.

Open the Windows Device Manager. Ensure the card is properly installed under **Universal Serial Bus Controllers**. An exclamation point (!) next to the card indicates the driver has not yet been installed.

2. Install the Ladybug® Software

For existing users who already have Ladybug software installed, we recommend ensuring you have the latest version for optimal performance of your camera. If you do not need to install Ladybug software, use the DriverControlGUI to install and enable drivers for your card. Ladybug5 requires Ladybug SDK v1.7+.

a. Login to the Point Grey downloads page.

b. From the Camera Family drop-down, select Ladybug5.

c. Click on the Software link to expand the results.

d. Under Ladybug SDK, click the 32- or 64-bit link to begin the download and installation.

After the download is complete, the Ladybug setup wizard begins. If the wizard does not start automatically, double-click the .exe file to open it. Follow the steps in each setup dialog.

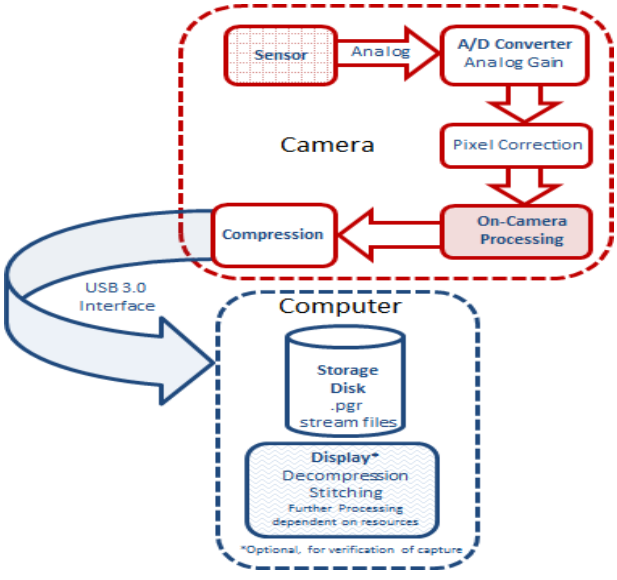
3. Enable the Drivers for the card

During the installation, you are prompted to select your interface driver.

In the **Interface Driver Selection** dialog, select the **I will use USB cameras**.

This selection ensures the Point Grey pgrxhci (UsbPro) and pgrusbcam drivers are installed. For optimal performance, after setup, we recommend configuring the pgrxhci (UsbPro) driver on the host controller to operate directly with the camera.

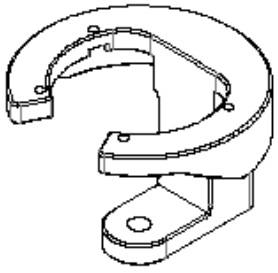
To uninstall or reconfigure the driver at any time after setup is complete, use the DriverControlGUI .



Installing Your Camera

1. Install a Mounting Bracket (optional)

a. Install a Tripod Adapter.



The tripod adapter attaches to the bottom of the camera.

The camera is also compatible with the Ladybug3 tripod adapter (Part no. ACC-01-0013).

Note: the tripod adapter uses a 3/8" mounting hole which requires an adapter to fit a standard tripod.

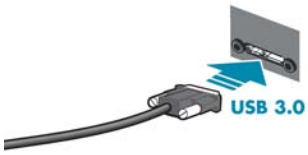
The tripod adapter is not used if using a desktop mount.

b. Install a Desktop Mount.

Thread the cables through the desktop mount and out the cable exit slot. Connect the cables as per steps 2 and 4 before attaching the mount to the camera.

The desktop mount is not used if using a tripod adapter.

2. Connect the interface Cable to the Camera



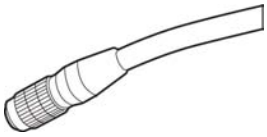
Plug the USB 3.0 cable into the camera and secure with the cable jack screws.

3. Connect the Camera to the interface Card

Plug the USB 3.0 cable into the host controller or hub.

Always connect the USB 3.0 cable to the camera before connecting to the host controller.

4. Plug in the GPIO connector



GPIO is used for power, trigger, and strobe.

The wiring harness must be compatible with a Hirose 12-pin female GPIO connector.

5. Confirm Successful Installation

From the Start menu, select All Programs > Point Grey Research > PGR Ladybug > LadybugCapPro.exe.

a. The Welcome dialog opens, and it will display a choice of starting a camera, or loading a previously recorded stream file. Select Start Camera.

b. The Select Camera dialog opens. This dialog allows you to view a list of all the currently connected Ladybug cameras, and select one to control.

c. Ensure the camera is identified as USB 3.0. If the camera is identified as USB 2.0 it could indicate a bad cable connection or incorrect driver and the camera will not function properly.

d. To begin grabbing images, select a camera and click OK.