

## 1.1. Subject

Technical Application Note (TAN2008007): Using the Ladybug3 in a Mobile Setting

## 1.2. Applicable Product(s)

- Ladybug3 and Ladybug2 Spherical Vision Cameras

## 1.3. Application Note Description

This Technical Application Note describes the factors to consider when using the *Ladybug3* spherical vision camera to record images in a mobile operation.

## 1.4. Overview

You can use the *Ladybug3* spherical vision camera to capture video in a mobile environment. One common scenario involves capturing location-based visualizations for display in geographical mapping applications. Some of the components necessary for setting up a mobile operation are included with the camera. Other items must be acquired separately.

The factors to consider when using the *Ladybug3* in a mobile setting may involve some or all of the following:

- Using a laptop (notebook) computer and laptop mount with the camera
- Powering the camera
- Attaching the camera to your vehicle
- Using a global positioning system (GPS) receiver

For information about specific components used by Point Grey Research in testing and demonstrating a mobile setup, see [Section 1.9: Test Configuration Components](#), below.

## 1.5. Using a Laptop (Notebook) Computer

In all likelihood, you will require a laptop computer as part of your *Ladybug3* mobile setup. You need a laptop to do the following:

- Monitor and view the isochronous transmission of images as they are captured.
- Write and store streaming video files.

Included with your camera are the following components for interfacing with a laptop computer:

- [1394b cable with locking screws](#). The 10-meter cable is long enough for most mobile configurations. A common setup involves mounting the camera on the top of your vehicle, passing the cable through an open window crack, and connecting to the laptop inside the vehicle.
- [IEEE-1394b ExpressCard for notebooks](#). While your laptop computer may provide a built-in IEEE-1394a port, 1394b ports are less common. The 1394a interface limits you to a data rate of 400Mb/s. The 1394b host adapter card provides the necessary bus interface to achieve a 1394b rate of 800 Mb/s. Simply insert the card into the ExpressCard slot of the computer.

For more information about using IEEE-1394b bandwidth with a notebook computer, refer to [Knowledge Base Article 246: General factors to consider when running a Ladybug2 on a laptop](#). The same principles apply to the *Ladybug3*.

Additionally, you will need to consider the capacity of your laptop to write the streaming video files produced by the *Ladybug3* system. *Ladybug3* images are saved in sets of stream files that are written to the hard disk of the laptop at up to 80 MB/sec. To accommodate this input, we recommend your laptop be configured with striped disks, such as provided by a RAID 0 configuration.

The following is a recommended system configuration:

- Intel Core2 Duo or Quad processor or compatible processor
- 2GB of RAM
- NVIDIA video card with 512 MB RAM
- IEEE-1394b PCI Express interface card
- Striped disk RAID array to store stream data at more than 80 MB/sec.
- Windows XP Service Pack 1, Windows Vista or Windows 7
- Point Grey FirePRO driver (if using XP or Vista)



*Point Grey Research has successfully demonstrated the Ladybug3 in a mobile setup using a DELL XPS M1730 with RAID 0. Point Grey cannot account for any additional configurations that we have not tested.*

Finally, for ease of use inside your vehicle, we recommend mounting your notebook computer using a laptop mount. This device, which fits into the mounting bolts of your vehicle's passenger seat, provides a stable surface for the passenger to work while the vehicle is in motion.



*Do not work on the laptop computer while operating the vehicle.*

## 1.6. Powering the Camera

The *Ladybug3* requires 8 -30 volts of power. (Ideal voltage is 12V.) However, without an external power source, the IEEE-1394b ExpressCard for notebooks does not provide any power to the camera. One practical source of external power is from your vehicle's battery. To tap into this power with ready-

made connectors, use a 12V DC-to-AC electrical inverter in conjunction with an AC-to-12V DC power adapter (“wall wart”). The inverter converts the 12V direct current (DC) from your vehicle to alternating current (AC). The inverter should output at least 200W, enough to power both the camera and the notebook computer. The power adapter converts AC back to 12V DC, and connects directly into the side of the ExpressCard.

If your notebook computer includes a built-in 1394a port with 6 pins, or any 1394b port, power can be supplied directly to the camera through the FireWire cable.

## 1.7. Attaching the Camera to Your Vehicle

You can attach the *Ladybug3* to the top of your vehicle by fastening a ball camera mount and suction cups to the desktop mount. The desktop mount is included with your camera’s development kit. Ball mounts and suction cups must be purchased separately. Each ball mount should have a ¼” screw on top to fit the same-sized screw hole on the bottom of the *Ladybug3* tripod mount. Additionally, the bottom screws of the ball mounts should fit into the tops of the suction cups.

Alternatively, the Ladybug 3 development kit comes with a tripod adapter, if you wish to attach the camera to your own mounting system, which you then attach to the vehicle.

For additional security, consider harnessing your mounting system to the vehicle roof with tether cord.



*Suction cups are not manufactured by Point Grey Research and we assume no responsibility or liability for them. Suction cups should be mounted only in accordance with the manufacturer’s instructions and all appropriate safety precautions should be taken. Point Grey Research assumes no responsibility for use of our products in any mobile operation. Customers undertaking such operations do so at THEIR OWN RISK.*

## 1.8. Using a GPS Receiver

When a GPS receiver is connected to your laptop, you can use the Ladybug SDK to insert NMEA data into Ladybug images. The data can then be extracted at a later time to generate HTML data for display as a Google Map or KML data for Google Earth. The GPS receiver should have a serial or USB interface for connecting with your laptop and be able to stream NMEA data in real time.

To get started using the GPS functionality of the Ladybug library using the LadybugCapPro application, refer to the topic, “Working with GPS Data” in the Ladybug SDK Help. To get started using the Ladybug library directly, refer to the topic “How-To: Using GPS.”

## 1.9. Test Configuration Components

Point Grey Research has successfully demonstrated a *Ladybug3* mobile setup using the components in the table below. Point Grey Research does not endorse any of these products or account for their performance in your particular setup.

<b>Component</b>	<b>Product</b>
Notebook Computer	<a href="#">DELL XPS M1730 with RAID 0</a>
Laptop Mount	<a href="#">RAM Mount Vehicle Laptop Mount</a>
Power Inverter	<a href="#">MotoMaster Eliminator Power Inverter, 200W</a>
Ball Mount	<a href="#">Manfrotto 486RC2</a>
Suction Cups	<a href="#">Filmtools 6" Vacuum (Suction) Cup w/ 3/8-16" Threaded Spud</a>

## 1.10. Additional Downloads and Support

Access more Technical Application Notes on the web at [www.ptgrey.com/support/downloads](http://www.ptgrey.com/support/downloads).

Point Grey Research Inc. endeavors to provide the highest level of technical support possible to our customers. Most support resources can be accessed through the Product Support section of our website: [www.ptgrey.com/support](http://www.ptgrey.com/support).

### Creating a Customer Login Account

The first step in accessing our technical support resources is to obtain a Customer Login Account. This requires a valid name, e-mail address, and camera serial number. To apply for a Customer Login Account go to [www.ptgrey.com/support/downloads/](http://www.ptgrey.com/support/downloads/).

### Knowledge Base

Our on-line knowledge base at [www.ptgrey.com/support/kb/](http://www.ptgrey.com/support/kb/) contains answers to some of the most common support questions. It is constantly updated, expanded, and refined to ensure that our customers have access to the latest information.

### Product Downloads

Customers with a Customer Login Account can access the latest software and firmware for their cameras from our downloads site at [www.ptgrey.com/support/downloads](http://www.ptgrey.com/support/downloads). We encourage our customers to keep their software and firmware up-to-date by downloading and installing the latest versions.

### Contacting Technical Support

Before contacting Technical Support, have you:

1. *Read the product documentation and user manual?*
2. *Searched the Knowledge Base?*
3. *Downloaded and installed the latest version of software and/or firmware?*

If you have done all the above and still can't find an answer to your question, contact our Technical Support team at [www.ptgrey.com/support/contact/](http://www.ptgrey.com/support/contact/).