

Ladybug[®] 3



12MP + WEATHER-RESISTANT + 1394B

- **Very High Resolution**
- **Weather-Resistant Case**
- **Direct Firewire Connection**
- **Synchronize To External Trigger Or Light Source**
- **12 Megapixels Using Six 1600x1200 CCDs**

The high resolution Ladybug3 spherical digital video camera system has six 2 MP cameras that enable the system to collect video from more than 80% of the full sphere, and an IEEE-1394b (FireWire) interface with locking screw connection that allows JPEG-compressed 12MP resolution images to be streamed to disk at 15fps. The Ladybug3 is an ideal solution for applications that require very high resolution, a weather-resistant case, direct FireWire connection, and the ability to synchronize to external devices such as an external trigger or light source.



MODEL	VERSION	MP	IMAGING SENSOR
LD3-20S4C-33	Red	2.0 MP	<ul style="list-style-type: none"> ■ Sony ICX274 CCD x6, 1/1.8", 4.4 μm ■ Global Shutter ■ 1600 x 1200 at 15 FPS JPEG compressed; 6.5 FPS uncompressed
LD3-20S4C-33B	Black		
A/D Converter	12-bit		
Image Data Output	8-bit Raw Bayer digital data		
Image Data Formats	Raw8, Mono8		
Partial Image Modes	Pixel binning and region of interest (ROI) modes		
Image Processing	Shutter, gain, white balance, gamma and JPEG compression, are programmable via software		
Shutter	Global shutter; Automatic/manual/one-push/extended shutter modes 0.01 ms to 4.2 s (extended shutter mode)		
Gain	Automatic/manual/one-push modes 0 - 24 dB		
Gamma	0.50 to 4.00		
White Balance	Manual		
High Dynamic Range	Cycle 4 gain and exposure presets		
Digital Interface	9-pin 1394b 800 MB/s interface for camera control, power, and video data; locking screw guarantee secure connection		
Transfer Rates	100, 200, 400, 800 Mbit/s		
GPIO	8-pin GPIO connector for external trigger, strobe, serial port, or external power		
External Trigger Modes	IIDC Trigger Modes 0, 1, 3, 14, 15		
Memory Channels	2 memory channels for custom camera settings		
Case	Machined aluminum housing, anodized red or black; single unit, water resistant		
Dimensions	122 mm x 141 mm (without lens hoods)		
Mass	2414 g		
Power Consumption	7.2 W at 12 V via GPIO or FireWire interface		
Machine Vision Standard	IIDC v1.31		
Camera Control	via Ladybug SDK, CSRs, or third party software		
Camera Updates	In-field firmware updates		
Optics	Six high quality 3.3 mm focal length lenses		
Field of View	>80% of full sphere		
Spherical Distance	Calibrated at 20 m		
Focus Distance	~200 cm. Objects have an acceptable sharpness from ~60 cm to infinity		
Temperature	Operating: 0° to 45°C; Storage: -30° to 60°C		
Humidity	Operating: 20 to 80% (no condensation) ; Storage: 20 to 95% (no condensation)		
Compliance	CE, FCC, RoHS		
Operating System	Windows XP, Windows 7		
Warranty	One Year		

Ladybug[®] 3 Specifications

GIS mapping, surveillance, security, and more

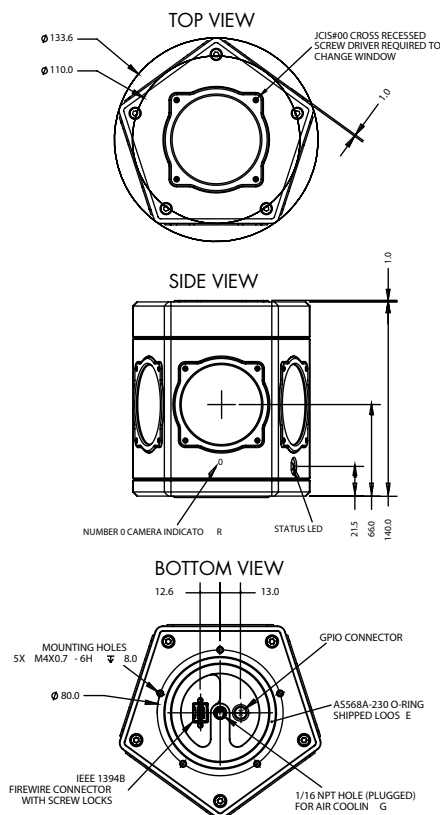
The quality and flexibility of spherical video data makes the medium ideal for applications requiring synchronization of video images. This revolutionary technology is now used by a wide variety of industries, including: large scale GIS systems for location-based visualizations, such as street-level viewing, and geographical mapping; high end security and surveillance applications; city planners for inventory and traffic scene analysis; and the entertainment industry for lighting models, full dome projection content, and other immersive experiences. The Ladybug3 camera's water resistant housing also allows it to operate in most outdoor environments.

Image quality and speed

The Ladybug3 uses an embedded JPEG compression engine and fast 800Mbit/s IEEE-1394b (FireWire) interface to stream full 12 MP images at 15 FPS, or raw uncompressed images at just under 7 FPS, to the host system. The user can adjust the JPEG compression rate on-the-fly to balance image quality against frame rate. Camera parameters, such as gain, shutter, white balance and gamma, can also be adjusted through software to find the right match for the surrounding environment. To meet the requirements of complex imaging scenes, the camera can also be configured to operate in a special high dynamic range mode, which continuously cycles through a series of camera shutter and gain settings.

Dimensional Drawings (in mm)

CAD models available at www.ptgrey.com/support/downloads.



High Dynamic Range Mode

To meet the requirements of complex imaging scenes, the camera can be configured to operate in a special High Dynamic Range mode. This mode continuously cycles through a series of camera shutter and gain settings, sacrificing overall frame rate and acquisition time for the ability to capture the full range of intensities in demanding scenes.

Image Sensor Calibration

Both of these compact camera products feature six high quality Sony[®] CCD image sensors, with five CCDs positioned in a horizontal ring and one positioned vertically. They are pre-calibrated to enable high-quality spherical image stitching. Lens settings, such as focus and iris, are fixed to ensure the camera stays calibrated.

Software

The Ladybug3 system includes feature-rich software to manage image acquisition, spherical and panoramic image production, and camera settings. It includes the LadybugCapPro program, source code for a quick start in the C/C++ programming environment, a camera device driver, full software library and Application Programming Interface (API). The LadybugCapPro program eliminates the need to create an application to access and control the camera system, and allows users to:

- View real-time fully stitched panoramic and spherical images
- Store streaming data to the hard drive for post processing
- Access and convert stored data to standard video formats
- Control camera shutter, gain, and JPEG compression

LadybugCapPro can also handle integrating and storing data from recommended NMEA GPS devices via the host serial port.

Development Accessory Kit

The Ladybug3 spherical digital video system is designed to make getting started with spherical video as simple as possible. Each system comes complete with a Ladybug3 camera and a license of the Ladybug software development kit (SDK). First-time users will receive all the hardware needed to get the camera running, including:

- Single bus 1394b PCI Express card
- 10 meter 1394b cable
- 1394b ExpressCard for notebooks / laptops
- 12V 2A (24W) power supply for ExpressCard
- 4.5 meter GPIO wiring harness
- 4-Legged Desktop mount
- Tripod adapter
- Ladybug3 Getting Started Manual
- Ladybug SDK (C/C++ API and device drivers) CD

Recommended System Configuration

- Windows XP SP1 / Vista / 7
- Point Grey FirePRO driver
- Intel Core2 Duo or Quad processor or compatible processor
- 2 GB of RAM
- NVIDIA video card with 512 MB RAM
- IEEE-1394b PCI Express interface card
- Striped disk RAID array to store streaming data at more than 80MB/sec
- Microsoft Visual Studio 2005 (to compile and run example code)