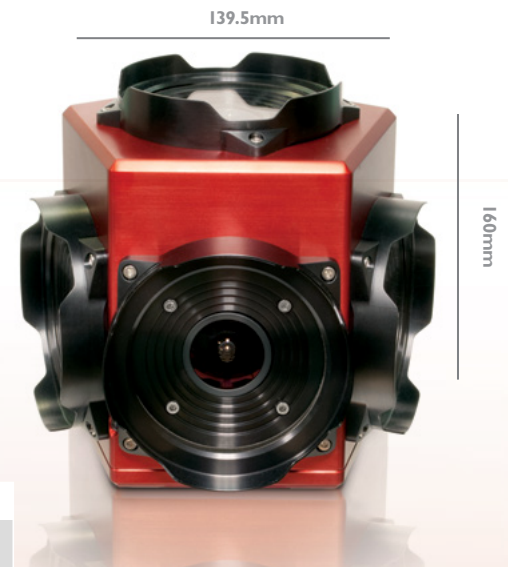


Ladybug[®] 5

30 MEGAPIXEL 360° SPHERICAL CAMERA IMAGING SYSTEM

The Ladybug5 spherical imaging system boasts an impressive 30 MP resolution covering 90% of a full sphere; a 5 Gbit/s USB 3.0 interface; and a ground-breaking post-processing workflow that provides high dynamic range, superb image quality and maximum user flexibility. It is an excellent choice for applications in geographic information systems (GIS); vehicle-based photogrammetry; situational awareness; and entertainment solutions for lighting models, full dome projection content, and other immersive experiences.

MODEL	VERSION	MP	IMAGING SENSOR
LDS-U3-51S5C-44R	Red	30 MP (5 MP x 6 sensors)	<ul style="list-style-type: none"> ■ Sony ICX655 CCD x 6, 2/3", 3.45 μm ■ Global shutter ■ 2048 x 2448 at 10 FPS
LDS-U3-51S5C-44B	Black		
A/D Converter	12-bit		
Image Data Output	8-, 12-, or 16-bit, Raw or JPEG compressed		
Image Data Formats	Raw8, Raw12, Raw16 in uncompressed and JPEG		
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 0.02 ms to 2 seconds (extended shutter)		
Gain	Automatic/manual/one-push modes for 8-bit formats; manual mode for 12-bit formats 0 - 18 dB		
Gamma	0.50 to 4.00		
White Balance	Manual		
High Dynamic Range	Cycle 4 gain and exposure presets		
Digital Interface	USB 3.0 with locking screws for secure connection		
Transfer Rates	5 Gbit/s		
GPIO	12-pin GPIO connector for external trigger input, strobe output, and camera power		
External Trigger Modes	Standard, bulb, skip frames, overlapped, and multi shot trigger modes		
Memory Channels	2 memory channels for custom camera settings		
Case	Machined aluminum housing, anodized red or black; single unit, water resistant		
Dimensions	197 mm diameter, 160 mm height (with lens hoods)		
Mass	3.0 kg		
Power Consumption	12-24 V, 13 W via GPIO		
Machine Vision Standard	IIDC v1.32		
Camera Control	via Ladybug SDK, CSRs, or third party software		
Camera Updates	In-field firmware updates		
Optics	6 high quality 4.4 mm focal length lenses		
Field of View	90% of full sphere		
Spherical Distance	Calibrated from 2 m to infinity		
Focus Distance	~200 cm. Objects have an acceptable sharpness from ~60 cm to infinity		
Environmental Sensors	Temperature, Barometer, Humidity, Accelerometer, Compass		
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 7 or Windows 8, 64-bit with 8 GB RAM		
Warranty	2 Years		



• Post Processing Workflow For Dynamic Range

The workflow starts with Ladybug5 capturing, compressing, and transmitting full bit depth 12-bit RAW images. Users then use LadybugCapPro's post processing toolbar to apply white balance, gamma, smear correction, and other image processing functions for maximum dynamic range.

• User Flexibility

The capture and post workflow model allows users to maintain flexibility by being able to return to the original content and re-apply post processing steps as desired.

• High Bandwidth Interface

Leverages USB 3.0 interface that makes 12-bit RAW imaging possible.

Ladybug® SDK

COMPLETE SPHERICAL IMAGE ACQUISITION SOFTWARE

SDK INCLUDES

- Full software API for custom application development
- C, C++, and C# example source code
- LadybugCapPro program for easy access to system functionality
- Camera and low-level xHCI USB 3.0 drivers



CAPTURE

- Control camera settings such as auto exposure, resolution, and frame rate
- Automatically or manually adjust JPEG compression quality
- Enable camera settings information to be embedded in images
- Configure high dynamic range imaging
- Save raw images and GPS data to a proprietary stream file

PROCESS

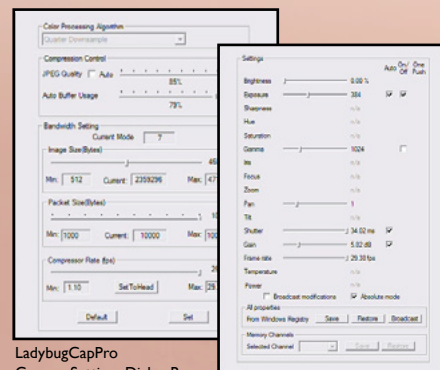
- Fast rectification and stitching can be performed on the GPU
- Render output using spherical, panoramic or dome projections
- Color process and apply image correction
- Minimize parallax by adjusting the sphere size used for stitching
- Dynamically select different stitching distances for different areas of the scene

OUTPUT

- Save processed images to a variety of still image and video file formats
- Generate Google Map or Google Earth files
- Publish Flash Video files to the web



a. Panoramic view b. Spherical view c. Dome view d. Multi-camera view



LadybugCapPro
Camera Settings Dialog Boxes