

# Ladybug6

## KEY FEATURES

### Highest Accuracy and Image Quality

Industry leading calibration combined with global shutter CMOS sensors and high-end optics deliver an unbeatable survey grade spatial accuracy of  $\pm 2$  mm at 10 meters. Additionally, the Ladybug6 captures outstanding images across a wide range of lighting conditions with excellent color response, low noise, and a high dynamic range.

### Onboard Processing and Feature Rich SDK

Building on our field proven Ladybug5+, the Ladybug6 captures, compresses, and transmits 8-bit or 12-bit pixel data with onboard image processing for optimized workflows. Our feature rich Ladybug Software Development Kit (SDK) enables image acquisition, spherical and panoramic image production, and fine grain control of pre & post acquisition settings via a user friendly interface.

### Built for the Outdoors

Designed from the ground up to capture images from moving platforms in outdoor environments, the Ladybug6 features an IP67 rating, industrial grade IP67 rated connectors, a wide operating temperature range ( $-30^{\circ}\text{C}$  to  $50^{\circ}\text{C}$ ), support for additional Global Navigation Satellite Systems, and trigger control by hardware or software with advanced APIs for complete camera control.

## APPLICATIONS

- HD Mapping
- Asset Management
- Roadside Inspection
- Street View
- Road Maintenance
- Heritage Scanning
- Building Management

Ladybug6 is the leading high-resolution camera that captures 360-degree spherical images on a moving platform in outdoor all-weather conditions. Its industrial grade design and out-of-the-box factory calibration produces 72 Megapixel (MP) images with pixel values that are spatially-accurate within  $\pm 2$  mm at 10-meter distance.

As the newest member of the field-proven Ladybug family, Ladybug6 builds on its machine vision heritage with increased image resolution, enhanced on-board processing, and robust IP67-rated connectors. Support for additional Global Navigation Satellite Systems and advanced APIs, combined with hardware inputs, enable precise camera settings and trigger control. Customer applications include panoramic street image production, road surveying, asset inspection, feature extraction for HD map generation among several others.



SPECIFICATIONS	LD6-U3-12257C
Full Resolution	12,288 x 6,144 (72 MP)
Frame Rate	15 FPS JPEG @72 MP resolution / 29.9 FPS JPEG @36 MP resolution
Interface	M12 X-coded 8-pin USB 3.2 Gen 1 for camera control and video data
General Purpose I/O Ports	12-pin GPIO connector for external trigger input, strobe output, power, and PPS
Dimensions/Mass	198 mm (height) x 269 mm (diameter) / 5.2 kg
Optics	Six high quality 6.94 mm focal length lenses
Case	Machined aluminum housing, anodized red or black
Protection	IP67
Mounting	Five M4-0.7 x 8 mm mounting holes to attach to tripod adapter or custom mount
Desiccant	Desiccant plug to minimize moisture in the enclosure and prevent lens fogging
Transfer Rates	5 Gbit/s
Power Interface	via GPIO only, not USB3 interface
Power	12-24 V via GPIO (external power required) / 13 W maximum
Environmental Sensors	Temperature, Humidity
LED	One general purpose status LED for monitoring camera power, initialization, and USB3 activity
Field of View	~90% of full sphere
Angular FOV (per rotated sensor)	Vertical: ~117.4° / Horizontal: ~85.9°
Spherical Distance	Calibrated from 2 m to infinity
Focus Distance	~200 cm. Objects have an acceptable sharpness from ~100 cm to infinity
High Dynamic Range	Cycle 4 gain and exposure presets
External Trigger Modes	Standard, skip frames, overlapped, and multi shot trigger modes
Image Processing	Luminance: Black Level, Exposure Tonal: Gamma, Tone Mapping Color: White Balance, Saturation, Leveling, Noise Reduction, Sharpening, False color removal
Gain	0 - 18 dB
Gamma	0.50 to 4.00
Image Output (SDK)	Image Projections: Panoramic, Dome, Cubic, Individual Sensor, Rectified File Types: JPG, BMP, PNG, TIFF
Video Output (SDK)	Video .AVI: H.264 Video .MP4: H.264, HEVC/H.265, AV1
Shutter Speed	0.02 ms to 2 seconds (extended shutter)
Shutter Type	Global shutter
Memory Channels	2 memory channels for custom camera settings
Flash Memory	1 MB
Recommended RAM	8 GB for capture and recording / 16 GB for post processing
Recommended Operating System	Windows 10 64-bit or Ubuntu 20.04 64-bit for capture, recording, and post processing
Recommended CPU	11th Gen Intel® Core™ i7 processor
Recommended Compilers	Microsoft Visual Studio 2015 or newer / g++ 9.3.0 or newer
Machine Vision Standard	IIDC v1.32
Compliance	CE, RCM, FCC, RoHS, KCC
Temperature	Operating: -30° to 50°C / Storage: -30° to 60°C
Humidity	Operating: 20 to 80% (no condensation) / Storage: 20 to 95% (no condensation)
Warranty	2 Years

For more information please contact:



**BOCK OPTRONICS INC.**

14 Steinway Blvd., Unit 7  
 Toronto, Ontario M9W 6M6

Tel: (416) 674-2804  
[sales@bockoptronics.ca](mailto:sales@bockoptronics.ca)  
[www.bockoptronics.ca](http://www.bockoptronics.ca)



**30 MP, 360° SPHERICAL CAMERA IMAGING SYSTEM**

# FLIR LADYBUG® 5+ USB 3.1 Gen 1

P/N LD5P-U3-51S5

The Ladybug5+ offers the highest quality in spherical 360° imaging and accuracy. It is able to acquire an impressive 8k30 or 4k60 of content. With its patented calibration and superior global shutter sensors, the Ladybug5+ has an accuracy level of 2 mm at 10 m. The Ladybug SDK provides a wide range of functionality, allowing users to record, process, and export spherical content with ease.

[www.flir.com/spherical-vision](http://www.flir.com/spherical-vision)



## SUPERIOR IMAGE QUALITY

With its Sony Pregius global shutter CMOS sensors, the Ladybug5+ delivers outstanding image quality across a wide range of lighting conditions. There is no solar smearing in outdoor images, excellent color response, low noise, and a high dynamic range (approx. 70.6dB dynamic range or 12 stops) indoors and out. Fast f/2.5 lenses enable excellent low-light image quality.



## ENHANCED IMAGE QUALITY WITH POST PROCESSING

The workflow starts with Ladybug5+ capturing, compressing, and transmitting full bit depth 12-bit images. Users then use LadybugCapPro to apply white balance, gamma, and other image processing functions for maximum image quality.



## FLEXIBILITY WITH NON DESTRUCTIVE POST-PROCESSING

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.

SPECS	LD5P-U3-51S5
Resolution	2448 x 2048
Frame Rate	30 FPS (JPEG Compressed)
Megapixels	30 MP (5 MP x 6 sensors)
Sensor	Sony IMX264. CMOS, 2/3"
Readout Method	Global shutter
Pixel Size	3.45 µm
A/D Converter	12-bit
Data Formats	Raw8, Raw12, Raw16 uncompressed, and JPEG compressed
Precision Timestamps	RS232 GPS NMEA string and PPS over GPIO
Image Processing	Shutter, gain, white balance, gamma and JPEG compression, programmable via software
Shutter	Global shutter; Auto/manual/one-push/extended shutter modes 0.02 ms to 2 seconds (extended shutter)
Pixel Spatial Accuracy	Average accuracy of 2 mm at 10 m
Gain	Auto/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	Presets/automatic/manual
High Dynamic Range	Cycle 4 gain and exposure presets
Digital Interface	USB3 with locking screws for secure connection
Transfer Rates	5 Gbit/s
GPIO	12-pin GPIO connector for external trigger input, strobe output, power, and PPS
External Trigger Modes	Standard, skip frames, overlapped, and multi shot trigger modes
Memory Channels	2 memory channels for custom camera settings
Flash Memory	1 MB
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 (external power required)
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
Temperature	Operating: -20° to 50°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 or Linux 64-bit for capture and recording only with 8 GB RAM
Environmental Rating	IP65 Certified
Warranty	2 Years

For more information please contact:



**BOCK OPTRONICS INC.**

14 Steinway Blvd., Unit 7  
Toronto, Ontario M9W 6M6

Tel: (416) 674-2804  
[sales@bockoptronics.ca](mailto:sales@bockoptronics.ca)  
[www.bockoptronics.ca](http://www.bockoptronics.ca)



The World's Sixth Sense®