GETTING STARTED

Ladybug6

Will your system support the camera?

Recommended system configuration

- **OS**—Windows 10 64-bit or Ubuntu 20.04 64-bit for capture, recording, and post processing
- **CPU**—11th Gen Intel® Core™ i7 processor
- **RAM**—8 GB for capture and recording / 16 GB for post processing
- **Software**—Microsoft Visual Studio 2015 or newer / g++ 9.3.0 or newer

Do you have a downloads account?

A downloads account is required to download software and firmware.

1. Go to www.flir.com/account.
2. Enter your email address and click Continue.
3. Complete the Create an account form and click Continue.
4. You will receive an email with a link to activate your account.
5. Once activated, you can login using the credentials you've created.

The Ladybug6 Support page has many resources to help you operate your camera effectively, including:

- Ladybug® SDK software
- Firmware updates and release notes
- Dimensional drawings and CAD models
- Documentation
- Accessories

Do you have all the parts you need?

To install your camera you need the following components:

- Cable—USB3 cable, 8-pin Type A-male locking to M12-male.
- GPIO Cable—12-pin Hirose GPIO cable
- Power supply—provided through 12-pin GPIO interface. The required input voltage is 12 - 24 V.
- Interface card—USB3 Host Controller Card compliant with SuperSpeed USB and xHCI specifications.
- Desktop mount (optional) or tripod adapter (optional)

Teledyne FLIR sells all parts required for installation. To purchase, visit our Spherical Imaging page.

A Development Kit of components is available for the Ladybug6.

Camera Care

Warning! Do not open the camera housing. Doing so voids the Hardware Warranty.

Your camera is a precisely manufactured device and should be handled with care. Here are some tips on how to care for the device.

- Avoid electrostatic charging.
- When handling the camera unit, avoid touching the lenses. Fingerprints affect the quality of the image produced by the device.
- To clean the lenses, use a standard camera lens cleaning kit or a clean dry cotton cloth. Do not apply excessive force.
- Avoid excessive shaking, dropping or any kind of mishandling of the device.

Note: To replace the protective glass the camera must be returned to Teledyne for servicing. Contact Support for more details.

Contacting Us

For any questions, concerns or comments please contact us:

Sales Information	General questions
Support Ticket	Technical support
Website	Ladybug6 Support page for articles, firmware, CAD models, video resources

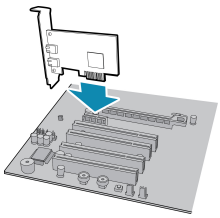
For More Information

Once installed the Ladybug SDK help and other technical references can be found in:
Program Files→Teledyne→Ladybug→Doc

For more information about...	See...
Your camera's settings and capabilities	Technical Reference
Using the LadybugCapPro program	SDK Help
Best Practices for Ladybug	Best Practices TAN
Using Ladybug in a Mobile Setting	Mobile Setting TAN

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

Note: For existing users who already have Ladybug software installed, we recommend ensuring you have the latest version for optimal performance of your camera. Ladybug6 requires version 1.18 or newer.

a. Go to the Ladybug SDK page.
b. Click the Download button. You are prompted to login, if not already.
c. Select your OS.
d. Click the version to download.

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.

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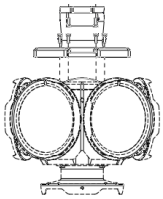
Installing Your Ladybug6

1. Install a mounting bracket (optional)

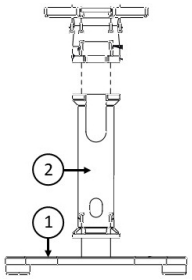
a. Install the Tripod Adapter.



Place the camera upside down on a flat, non-abrasive surface and attach the tripod adapter to the bottom of the camera.

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

b. Attach the tripod adapter to the stand plate or stand post.



The tripod adapter can be attached to the stand plate (1) or optionally to the stand post (2) which is then attached to the stand plate. Both the post and the plate have openings for the camera cables to thread through.

Note: the recommended torque for M4 fasteners is 1.5 N-m.

2. Connect the USB3 interface cable to the Ladybug6

Plug the M12 X- coded USB3 cable into the camera and screw until tight. Securing the cable ensures a reliable connection and helps to keep moisture out of the camera.

3. Connect the Ladybug6 to the interface card

Plug the USB3 cable into the host controller or hub.

4. Connect the GPIO wiring harness to the Ladybug6

Plug the 12-pin GPIO cable into the camera and half turn to lock. Securing the GPIO ensures a reliable connection and helps to keep moisture out of the camera. The wiring harness must be compatible with a Hirose 12-pin female GPIO connector.

GPIO is used for external trigger input, strobe output, power, and PPS.

5. Confirm successful installation

Open LadybugCapPro:

Start menu→ Teledyne Ladybug SDK→ LadybugCapPro

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 USB3. If the camera is identified as USB2 it could indicate a bad cable connection or incorrect driver and the camera will not function properly.

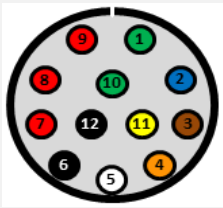
d. To begin grabbing images, select a camera and click OK.

USB 3.1 Connector

The camera is equipped with an M12 X-coded 8-pin USB 3.1 connector that is used for data transmission and camera control. For more detailed information, consult the USB 3.1 specification available from http://www.usb.org/developers/docs/.

General Purpose I/O Connector

The camera has an 12-pin GPIO connector on the bottom of the case; refer to the diagram below for wire color-coding. The GPIO is a Hirose waterproof 12-pin female connector (Mfg P/N:LF10WBP-12P).

Diagram	Color	Pin	Function	Description
	Green	1	OPTO_GND	Ground for opto-isolated IO pins
	Blue	2	I0	Opto-isolated input (default Trigger in)
	Brown	3	O1	Opto-isolated output
	Orange	4	IO2	Input/Output / GPS data
	White	5	+3.3 V	Power external circuitry up to 150 mA
	Black	6	GND	Ground for bi-directional IO, V_{EXT}, +3.3 V pins
	Red	7	V_{EXT}	Allows the camera to be powered externally
	Red	8	V_{EXT}	Allows the camera to be powered externally
	Red	9	V_{EXT}	Allows the camera to be powered externally
	Green	10	OPTO_GND	Ground for opto-isolated IO pins
	Yellow	11	IO3	Input/Output / PPS signal
	Black	12	GND	Ground for bi-directional IO, V_{EXT}, +3.3 V pins

Status Indicator LED

LED Status	Description
Off	Not receiving power
Steady green	Receiving power
Flashing/steady yellow	Initializing
Steady yellow-green	Sensor powered down or insufficient power
Steady bright green	Acquiring and transmitting images
Flashing green	Accessing camera registers (no acquisition)
Flashing green-red	Updating firmware
Flashing red	Temporary problem
Steady red	Serious problem