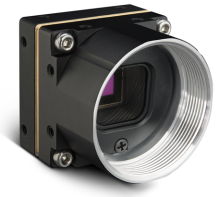
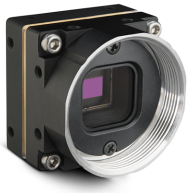
# INSTALLATION GUIDE

FLIR FIREFLY®





USB3 VISION™

**Version 1.4**

**Revised 5/5/2020**



FLIR®

The World's Sixth Sense®

## FCC Compliance

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesirable operation.

## Korean EMC Certification

The KCC symbol indicates that this product complies with Korea's Electrical Communication Basic Law regarding EMC testing for electromagnetic interference (EMI) and susceptibility (EMS). This equipment has received a conformity assessment for use in a business environment, and it may cause radio frequency interference if it is used in a home environment.

## Hardware Warranty

The warranty for the Firefly camera is 3 years. For detailed information on how to repair or replace your camera, please see the terms and conditions on our website.

## Export Control

The ECCN for this product is EAR099.

## WEEE

The symbol indicates that this product may not be treated as household waste. Please ensure this product is properly disposed as inappropriate waste handling of this product may cause potential hazards to the environment and human health. For more detailed information about recycling of this product, please contact us.

## Trademarks

Names and marks appearing on the products herein are either registered trademarks or trademarks of FLIR Systems, Inc. and/or its subsidiaries.

## Licensing

To view the licenses of open source packages used in this product please see What open source packages does firmware use?

# Table of Contents

# 1 Firefly Installation Guide

Welcome to the Firefly camera. We offer a number of resources to assist you with the Firefly.

- **Spinnaker SDK**—software development kit that provides GenICam-compliant controls to create applications for the camera. Spinnaker is available for download. Each installation includes API documentation for C, C++, and C#.
- **Release Notes**—information about the current firmware release including feature additions or changes, bug fixes, and known issues.
- **Specifications**—information about the camera model as it performs with the current firmware.
- **Getting Started**—quick start guide for installing the camera and software.
- **Installation Guide**—information about installing the camera and SDK, the physical interface and mechanical properties, troubleshooting and how to get help. This document is available as a PDF for download or as a webpage included in the firmware release package.
- **Technical Reference**—information about the features supported by the camera model with the current firmware, including: image format control, acquisition control, sequencing, binning/decimation, and others. This document is available as a PDF for download or as a webpage included in the firmware release package.
- **Firmware**—programming inserted into the programmable ROM of the camera that can be updated in-field. New firmware packages are available for download and include both the firmware file and documentation.

These resources as well as knowledge base articles and application notes can be found on the Support page for the product.

Firefly S Support Articles
Firefly DL Support Articles
Firefly S Resources
Firefly DL Resources

# 2 Handling Precautions and Camera Care

Your FLIR machine vision 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 will 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.
- Extended exposure to bright sunlight, rain, dusty environments, etc. may cause problems with the electronics and the optics of the system.
- Avoid excessive shaking, dropping or any kind of mishandling of the device.

**Related Knowledge Base Articles**

Cleaning the imaging surface of your camera

# 3 Firefly Installation

## 3.1 Preparing for Installation

### What system configuration is recommended?

| | Operating System | CPU | RAM | Ports | Software to run and compile example code |
|---|---|---|---|---|---|
| **Recommended System Configuration** | Windows or Linux (32- or 64-bit) | Intel i5 or greater | 4 GB | USB3 host controller | Microsoft Visual Studio 2010, Visual Studio 2013, or Visual Studio 2015 |

**Note:** Refer to Recommended USB 3.1 System Components for information on building a USB3 system.

### Do you have all the parts you need?

To install your camera you need the following components:

- For USB3 cameras—USB3 cable (see Interface Cables)
- GPIO cable (see General Purpose Input/Output (GPIO))
- Lens (see Lens Mounting ) (type of lens mount is model dependent)
- Tripod adapter (optional) (see Mounting Your Firefly)
- Interface card (see Interface Card)

FLIR sells a number of the additional parts required for installation. To purchase, visit the Accessories page.

### Have you visited the FLIR website?

The FLIR machine vision products page has many resources to help you operate your camera effectively, including:

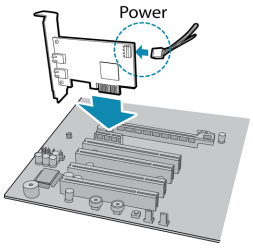
- Spinnaker® SDK software, including drivers (required for installation)
- Firmware updates and release notes
- Dimensional drawings and CAD models
- Documentation

To access these resources:

1. Go to FLIR machine vision.
2. Click on your product family.
3. Click on **Go to Support Page**.
   - **Overview** tab - links to software, knowledge base articles, and application notes.
   - **Resources** tab - links to camera references, technical references, getting started manuals, imaging performance results, drawings, PCNs, firmware, and software.

## 3.2 Installing Your Interface Card and Software

**1. Install your Interface Card**




Ensure the card is installed per the manufacturer's instructions.

Connect the internal IDE or SATA power connector on the card to the computer power supply.

Alternatively, use your PC's built-in host controller, if equipped.

Open the Windows Device Manager. Ensure the card is properly installed. USB3 cards appear under **Universal Serial Bus Controllers**. An exclamation point (!) next to the card indicates the driver has not yet been installed.

**2. Install the Spinnaker® Software**

> **Note:** For existing users who already have Spinnaker installed, we recommend ensuring you have the latest version for optimal performance of your camera. If you do not need to install Spinnaker, use SpinView to install and enable drivers for your card.

a. Go to the Spinnaker SDK page.

b. Click the Download button.

c. Select your operating system.

d. Select your version. You can also read release notes here.
   - Python
   - Full SDK - downloads all components
   - Web Installer - downloads only the installer and then retrieves components based on your selection during install. This version requires an internet connection for the installation.

e. Select your version. On the preview page, click Download.

f. After download is complete, open the file to start the Spinnaker setup wizard.

g. Follow the steps in each setup dialog.

## 3.3 Installing Your Firefly

**1. Install the Tripod Mounting Bracket (optional)**

The ASA and ISO-compliant tripod mounting bracket attaches to the camera using the included screws.

**2. Attach a Lens**

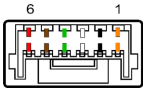
Unscrew the dust cap from the lens holder to install a lens.

**3. Connect the interface Card and Cable to the Camera**


Plug the interface cable into the host controller card and the camera. The cable jack screws can be used for a secure connection.

When the camera is first connected, the operating system automatically installs the camera driver. Camera drivers are available with the Spinnaker SDK installation.

**4. Plug in the GPIO connector if required**




GPIO can be used for trigger, serial input output, and strobe.

**5. Confirm Successful Installation**

Run the SpinView application: **Start->All Programs-> Point Grey Spinnaker->SpinView**
The SpinView application can be used to test the camera's image acquisition capabilities.

Changes to your camera's installation configuration can be made using the SpinView application.

## 3.4 Powering Your Firefly

Power must be provided through the USB3 interface.

The camera does not transmit images for the first 100 ms after power-up. The auto-exposure and auto-white balance algorithms do not run while the camera is powered down. It may therefore take several images to get a satisfactory image.

When the camera is power cycled (power disengaged then re-engaged), the camera reverts to its default factory settings, or if applicable, a saved user set.

**Related Knowledge Base Articles**

How can I power my USB3 camera?

# 4 Tools to Control your Firefly

The Firefly's features can be accessed using various controls, including:

- Spinnaker SDK including API examples
- SpinView camera evaluation application, included in the Spinnaker SDK installation
- Third-party GenICam applications

## 4.1 Using the Spinnaker® Software Development Kit

You can monitor or control features of the camera through Spinnaker API examples provided in the Spinnaker SDK, or through the SpinView camera evaluation application. A *Programmer's Guide and API Reference* is included in the installation.

### 4.1.1 SpinView Camera Evaluation Application

The SpinView application is a generic, easy-to-use streaming image viewer included with the Spinnaker SDK that can be used to test many of the capabilities of your camera. It allows you to view a live video stream from the camera, save individual images, adjust the various attributes, frame rates, features and settings of the camera. It includes tools for updating firmware, managing drivers, and activity logging.

### 4.1.2 Custom Applications Built with the Spinnaker API

The Spinnaker SDK includes a full Application Programming Interface that allows you to create custom applications to control your camera. Included with the SDK are a number of source code examples to help you get started.

Spinnaker API examples are provided for C, C++, C#, and VB.NET languages. These examples are precompiled for your convenience.

# 4.2 Using GenICam Applications

USB3 Vision is a communication interface for vision applications based on the USB 3.0 technology. All cameras supporting USB3 Vision interact the same way with software also supporting USB3 Vision.

For more information on the standard, visit visiononline.org.

The standard defines required elements for camera identification, control, and output. It uses GenICam, a programming interface for camera attribute control. GenICam allows camera vendors to define features and attributes in an XML file stored inside the camera. The file is parsed by the host application when the camera is initially discovered. One of the key benefits of GenICam is the ability for camera vendors to introduce new camera-specific features without needing to update the host application.

Each camera attribute, such as exposure time, is controlled by a specific GenICam feature. The camera includes an XML device description file for interfacing with third-party GenICam-compliant APIs.

For more information on GenICam, visit emva.org.

### Getting Started with Third-Party Applications Resources

| Title |
|---|
| Getting Started with OpenCV |
| Getting Started with MATLAB |
| Getting Started with MVTec HALCON |
| Getting Started with Cognex VisionPro |
| Getting Started with Adaptive Vision |
| Getting Started with Matrox Imaging Library |
| Getting Started with Matrox Design Assistant |
| Getting Started with NI-MAX and LabVIEW |
| Getting Started with NI Vision Builder for Automatic Inspection |

### USB3 Vision and Third-Party Applications Resources

| Title |
|---|
| Using USB3 Vision cameras with National Instruments' Acquisition Software |
| Using USB3 Vision cameras with A&B Software's ActiveUSB |
| Using USB3 Vision cameras with Matrox Imaging Library |
| Using USB3 Vision cameras with MVTec's Halcon software |
| Using USB3/USB2 cameras with Cognex VisionPro |

# 5 Configuring Firefly Setup

After successful installation of your camera and interface card, you can make changes to the setup. Use the tools described below to change the driver for your interface card.

For information on updating your camera's firmware post installation, see Camera Firmware.

## 5.1 Configuring Camera Drivers

Camera drivers are provided as part of the Spinnaker SDK. The first time the camera is connected to the computer, the operating system installs the driver.

To manage and update drivers use the SpinView application:

1. Start SpinView:
   ***Start Menu-->All Programs-->Point Grey Spinnaker SDK-->SpinView***
2. From the Devices list, select the camera and click the Switch Driver button.


3. Select the driver from the drop-down list.
4. Click Install Driver.

# 5.2 Camera Firmware

Firmware is programming that is inserted into the programmable read-only memory (programmable ROM) of most FLIR cameras. Firmware is created and tested like software. When ready, it can be distributed like other software and installed in the programmable read-only memory by the user.

The latest firmware versions often include significant bug fixes and feature enhancements. To determine the changes made in a specific firmware version, consult the Release Notes.

Firmware is identified by a version number, a build date, and a description.

## 5.2.1 Determining Firmware Version

To determine the firmware version number of your camera:

- Query the GenICam Device Control feature DeviceFirmwareVersion.

## 5.2.2 Upgrading Camera Firmware

Camera firmware can be upgraded or downgraded to later or earlier versions using SpinView, part of the Spinnaker SDK available from the FLIR website.

Before upgrading firmware:

- Install the Spinnaker SDK, available from the FLIR website.
- Download the firmware file from the Support page Resources tab for the product.

To upgrade the firmware:

1. ***Start Menu-->All Programs-->Point Grey Spinnaker SDK-->SpinView***
2. From the Device list, right click the camera and select Update Device Firmware.
   If you get a Device is Active warning, close the Display pane or click the Disconnect button and right click the camera again.
3. Browse to select the firmware file and click Open.
4. Click Yes to continue.

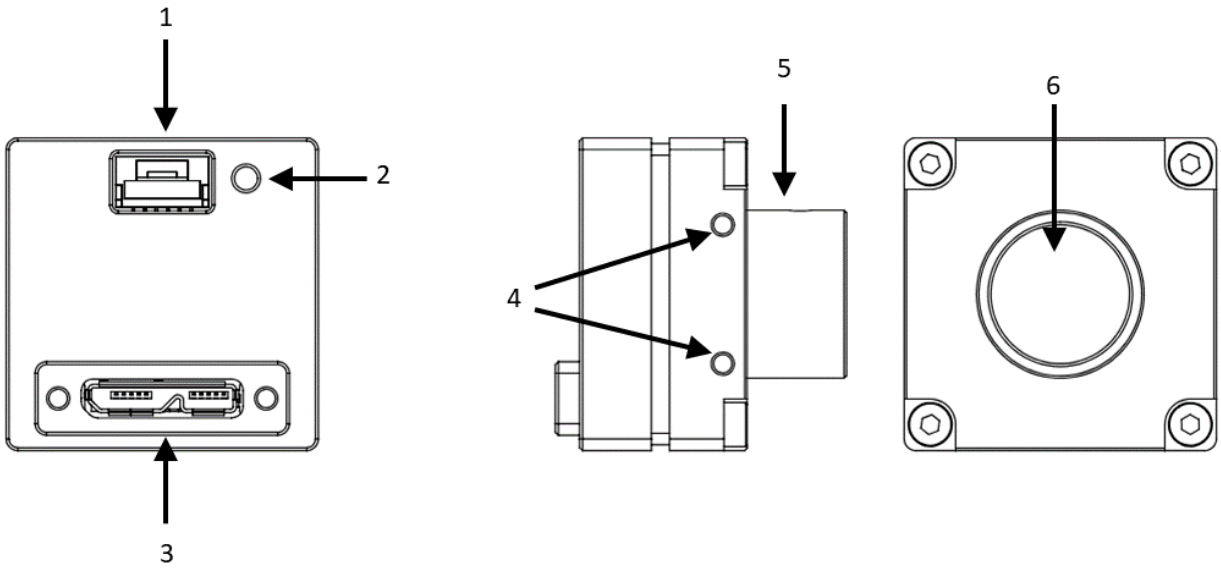
**Warning!** Do not disconnect the camera during the firmware update process.

**Related Knowledge Base Articles**

| |
|---|
| FLIR machine vision software and firmware version numbering systems |
| Determining my camera's firmware version |
| Should I upgrade my camera firmware or software? |

# 6 Firefly Physical Interface

## 6.1 Firefly Physical Description




1. **General purpose I/O connector**

   See General Purpose Input/Output (GPIO)

2. **Status LED**

   See Status Indicator LED

3. **Interface connector**

   See Camera Interface and Connectors

4. **Mounting holes**

   See Mounting Your Firefly

5. **Lens mount**

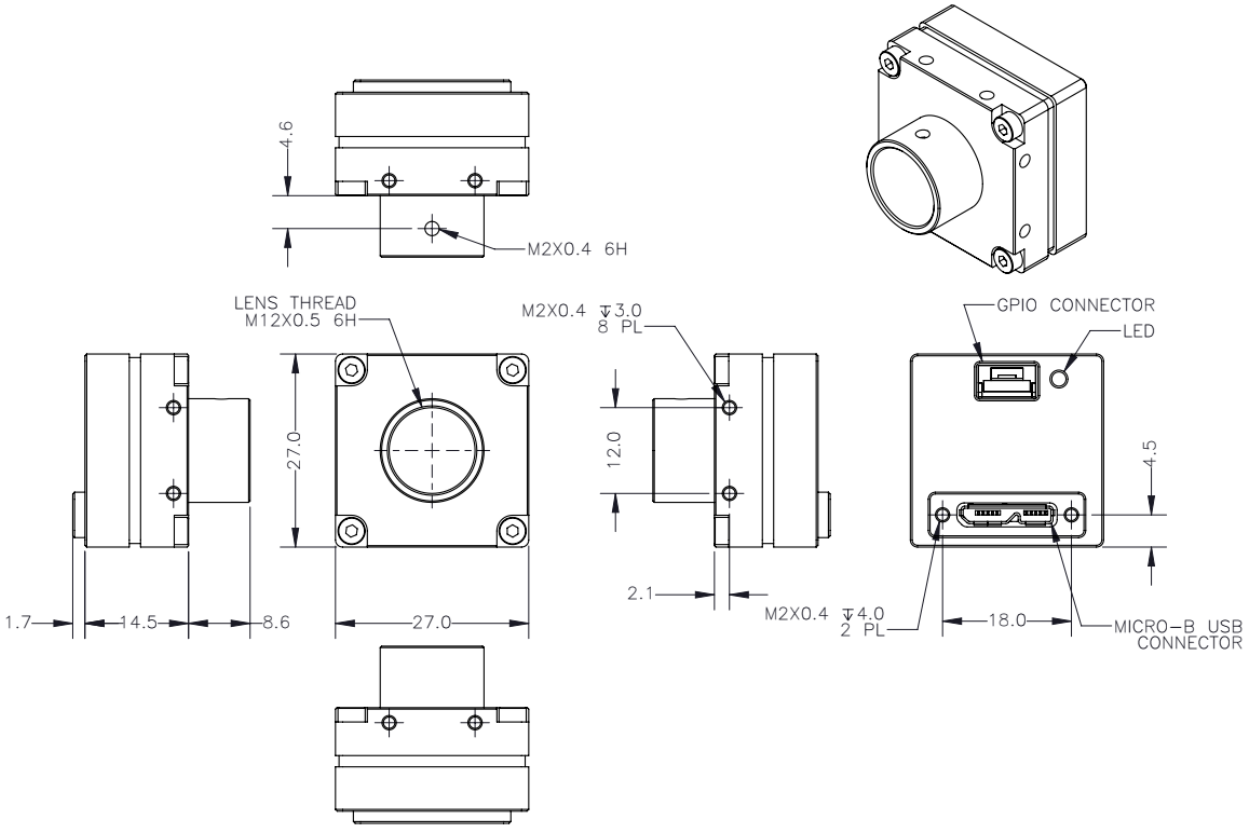
   See Lens Mounting

6. **Glass/IR filter system Interface connector**

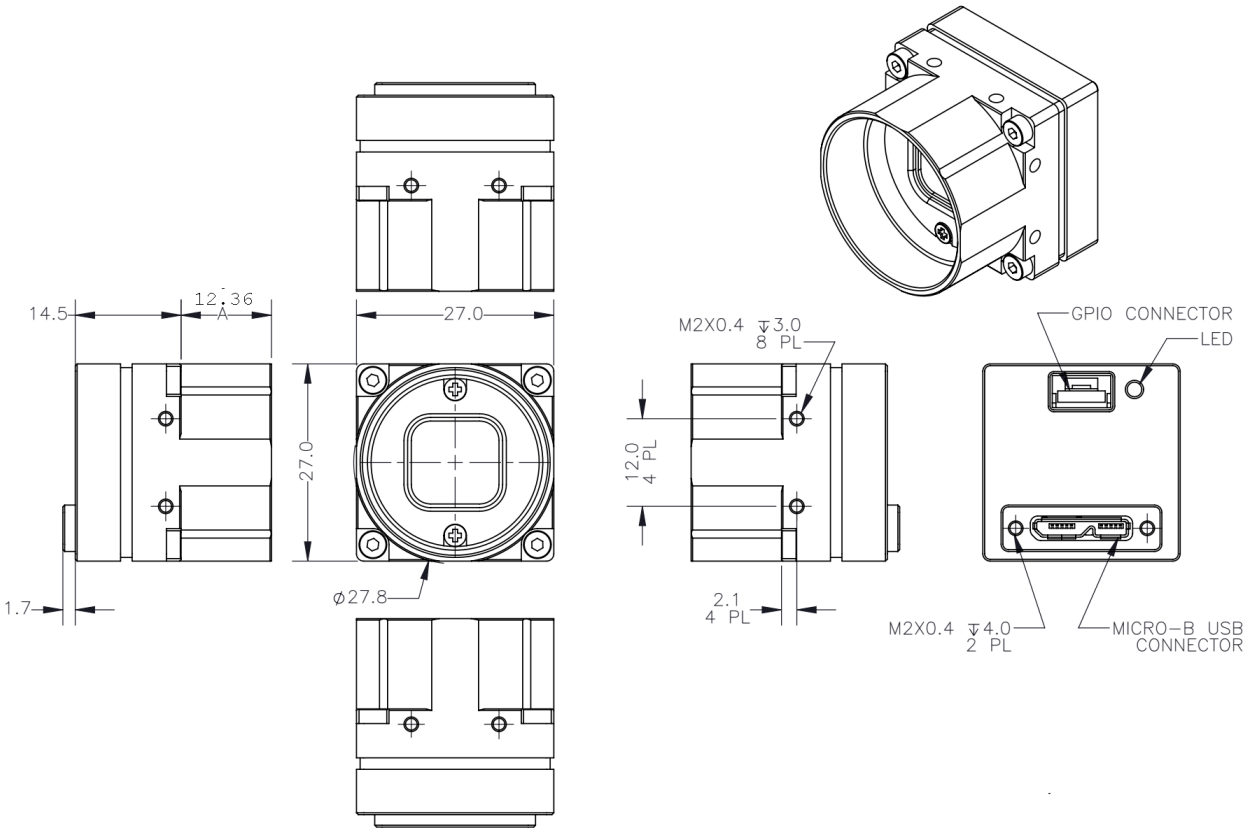
   See Dust Protection and Infrared Cut- Off Filters—Cased Models

## 6.2 Firefly Dimensions

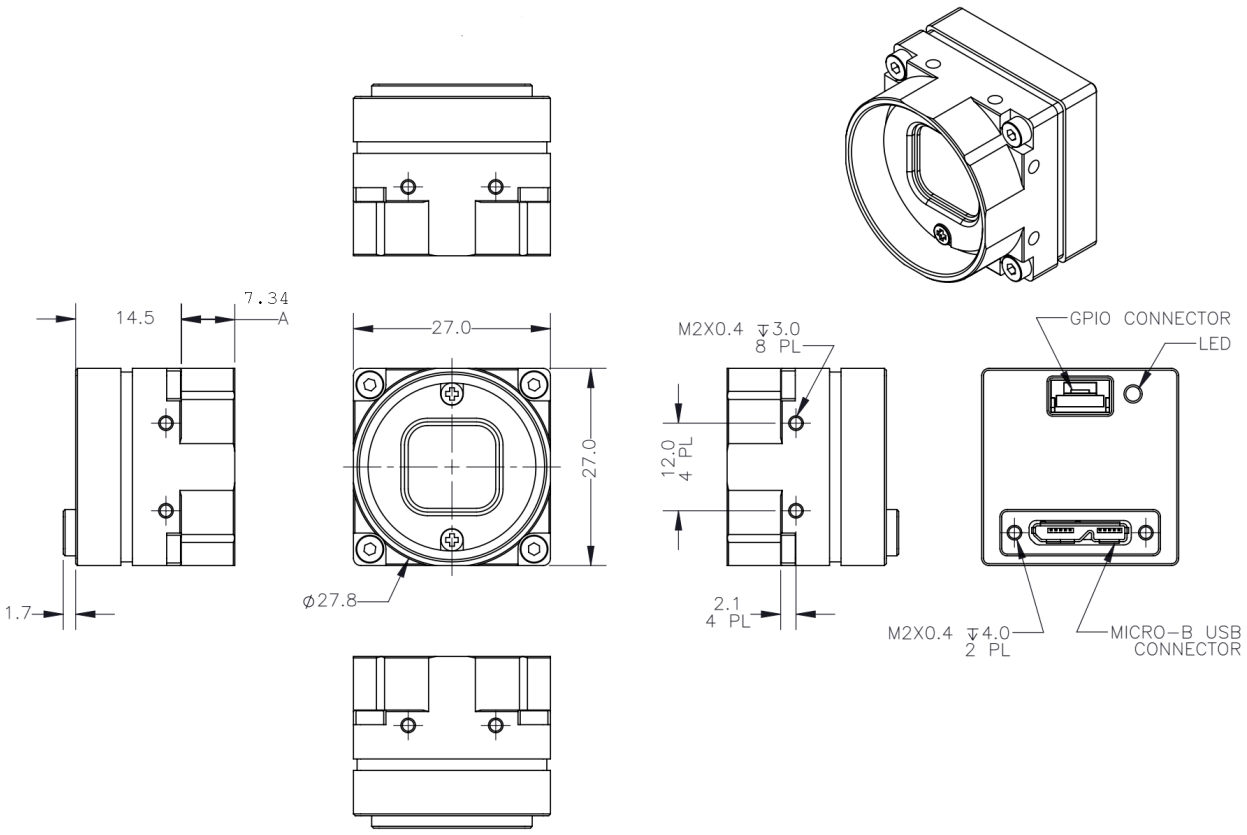
**Note:** To obtain 3D models, go to your product's support page from FLIR machine vision or contact Support.




**Firefly Dimensional Drawing S-mount**




**Firefly Dimensional Drawing C-mount**




**Firefly Dimensional Drawing CS-mount**

# 6.3 Interface Connector

## 6.3.1 USB 3.1 Connector

The camera is equipped with a USB 3.1 Micro-B connector that is used for data transmission, camera control and power. For more detailed information, consult the USB 3.1 specification available from http://www.usb.org/developers/docs/.


**USB 3.1 Micro B Connector**

**USB 3.1 Micro-B Connector Pin Assignments**

| Pin | Signal Name | Description |
|---|---|---|
| 1 | VBUS | Power |
| 2 | D- | USB 2.0 differential pair |
| 3 | D+ | |
| 4 | ID | OTG identification |

| Pin | Signal Name | Description |
|---|---|---|
| 5 | GND | Ground for power return |
| 6 | MicB_SSTX- | SuperSpeed transmitter differential pair |
| 7 | MicB_SSTX+ | |
| 8 | GND_DRAIN | Ground for SuperSpeed signal return |
| 9 | MicB_SSRX- | SuperSpeed receiver differential pair |
| 10 | MicB_SSRX+ | |

The USB 3.1 Micro-B receptacle accepts a USB 2.0 Micro-B plug and, therefore, the camera is backward compatible with the USB 2.0 interface.

**Note:** When the camera is connected to a USB 2.0 interface, it runs at USB 2.0 speed, and maximum frame rates are adjusted accordingly based on current imaging parameters.

**Related Knowledge Base Articles**

USB 3.1 Frequently Asked Questions

## 6.4 Interface Cables

To purchase a recommended cable from FLIR, visit the Products Accessories page.

**For USB3 cameras—**The USB3 standard does not specify a maximum cable length. FLIR sells a number of cable options. Visit the Product Accessories page for more information.

**Note:** A 5-meter USB3 cable (or longer) is not recommended for laptops or on board controllers.

**Related Knowledge Base Articles**

Extending the Working Distance of USB3 Cameras

## 6.5 Interface Card

To purchase a compatible card from FLIR, visit the Products Accessories page.

The camera must connect to an interface card. This is sometimes called a host adapter, a bus controller, or a network interface card (NIC).

**For USB3 cameras—**In order to achieve the maximum benefits of USB3, the camera must connect to a USB3 PCIe 2.0 card. The card must be connected to the PC power supply in order to power the camera through the USB3 interface.

## 6.6 General Purpose Input/Output (GPIO)

See Input/Output Control for details on pin assignments and electrical characteristics.

## 6.7 Mounting Your Firefly

### Using the Case

The case is equipped with 8 M2 x 0.4 mounting holes on the top, bottom, left side, and right side.

## 6.8 Case Temperature and Heat Dissipation

You must provide sufficient heat dissipation to control the internal operating temperature of the camera.

The camera is equipped with an on-board temperature sensor. It allows you to obtain the temperature of the camera board-level components. The sensor measures the ambient temperature within the case.

*As a result of packing the camera electronics into a small space, the camera can become hot to the touch when running. This is expected behavior and will not damage the camera electronics.*

To reduce heat, use a cooling fan to set up a positive air flow around the camera, taking into consideration the following precautions:

- Mount the camera on a heat sink, such as a camera mounting bracket, made out of a heat-conductive material like aluminum.
- Make sure the flow of heat from the camera to the bracket is not blocked by a non-conductive material like plastic.
- Make sure the camera has enough open space around it to facilitate the free flow of air.

## 6.9 Lens Mounting

Lenses are not included with individual cameras.

**Related Knowledge Base Articles**

Selecting a lens for your camera

### 6.9.1 Back Flange Distance

The Back Flange Distance (BFD) is offset due to the presence of both a 1 mm infrared cutoff (IRC) filter (color models only) and a 0.5 mm sensor package window. These two pieces of glass fit between the lens and the sensor image plane. The IRC filter is installed on color cameras. In monochrome cameras, it is a transparent piece of glass. The sensor package window is installed by the sensor manufacturer. Both components cause refraction, which requires some offset in flange back distance to correct.

For more information about the IRC filter, see Infrared Cut-Off Filters.

## 6.10 Non-Volatile Flash Memory

The camera has 6 MB flash memory for users to store data.

**Related Knowledge Base Articles**

Storing data in on-camera flash memory

## 6.11 Dust Protection

The camera housing is designed to prevent dust from falling directly onto the sensor's protective glass surface. This is achieved by placing a piece of clear glass (monochrome camera models) or an IR cut-off filter (color models) that sits above the surface of the sensor's glass. A removable plastic retainer keeps this glass/filter system in place. By increasing the distance between the imaging surface and the location of the potential dust particles, the likelihood of interference from the dust (assuming non-collimated light) and the possibility of damage to the sensor during cleaning is reduced.

**Warning!** Cameras are sealed when they are shipped. To avoid contamination, seals should not be broken until cameras are ready for assembly on site.

**Warning!** Use caution when removing the protective glass or filter. Damage to any component of the optical path voids the Hardware Warranty. Removing the protective glass or filter alters the optical path of the camera, and may result in problems obtaining proper focus with your lens.

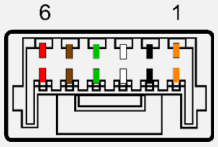
**Related Knowledge Base Articles**

Removing the IR filter from a color camera

Selecting a lens for your camera

# 7 Input/Output Control

## 7.1 General Purpose Input/Output (GPIO)

| Diagram | Color[1] | Pin | Line | Function | Description | Parameters | Min | Max | Unit |
|---|---|---|---|---|---|---|---|---|---|
|  | Orange | 1[2] | 0 | GPIO0 | Non-isolated Input/Output TXD (output) for 1.8 V UART | Input Low Level | 0 | 1.4 | V |
| | | | | | | Input High Level | 2.6 | 24 | V |
| | | | | | | Propagation Delay | | 1 | µs |
| | | | | | | Output Low Current | | 25 | mA |
| | | | | | | Output High Level | 0 | 24 | V |
| | Black | 2[2] | 1 | GPIO1 | Non-isolated Input/Output RXD (input) for 1.8 V UART | Input Low Level | 0 | 1.4 | V |
| | | | | | | Input High Level | 2.6 | 24 | V |
| | | | | | | Propagation Delay | | 1 | µs |
| | | | | | | Output Low Current | | 25 | mA |
| | | | | | | Output High Level | 0 | 24 | V |
| | White | 3 | 2 | GPIO2 | Non-isolated Input/Output | Input Low Level | 0 | 1.4 | V |
| | | | | | | Input High Level | 2.6 | 24 | V |
| | | | | | | Propagation Delay | | 1 | µs |
| | | | | | | Output Low Current | | 25 | mA |
| | | | | | | Output High Level | 0 | 24 | V |
| | Green | 4 | 3 | GPIO3 | Non-isolated Input/Output | Input Low Level | 0 | 1.4 | V |
| | | | | | | Input High Level | 2.6 | 24 | V |
| | | | | | | Propagation Delay | | 1 | µs |
| | | | | | | Output Low Current | | 25 | mA |
| | | | | | | Output High Level | 0 | 24 | V |
| | Brown | 5 | N/A | GND | Camera Power Ground | | | | |
| | Red | 6 | N/A | Vout | Camera Power Output | Output Voltage | 3.05 | 3.35 | V |
| | | | | | | Output Current | | 120 | mA |

Measurement conditions: Non-Isolated Output: VCC=5 V, Rext=330 Ohm, Non-Isolated Input: VCC=3.3 V. Measured over operating temperature range (-20°C to +50°C ambient temperature), unless otherwise noted.

1—GPIO cable assembly wire colors
2—Dual function pin

## 7.2 GPIO Electrical Characteristics

The output is open collector and thus requires a pull-up resistor to operate. The rise time and bias current is determined by the resistor value chosen. If the camera is generating an output signal that approaches the rise time plus the fall time of the circuit, care must be taken to optimize the pull-up resistor chosen to minimize the rise time while still remaining within the current limits of the output circuit.

**Warning!** To avoid damage, connect the GND pin first before applying voltage to the GPIO line.

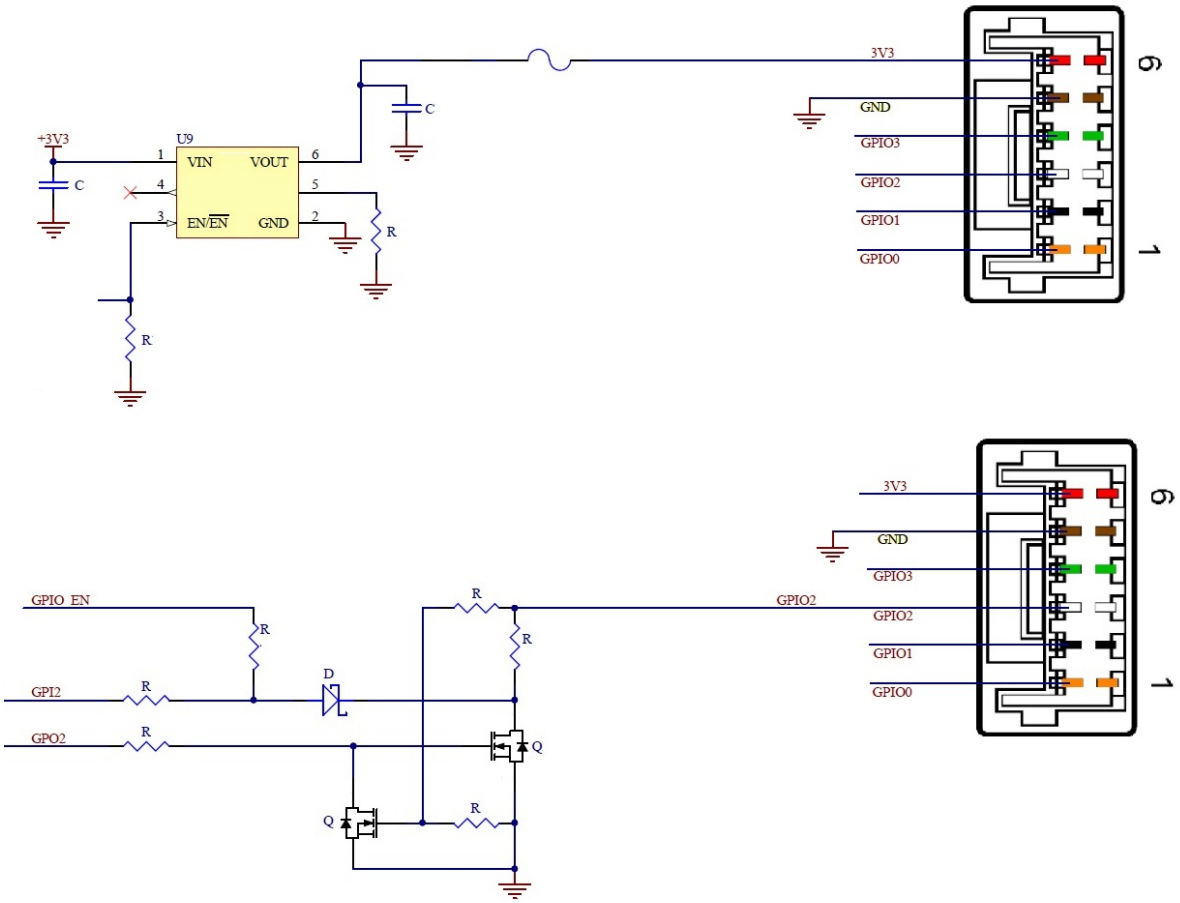
**Warning!** Prolonged use of the camera outside of the Operating Range described below may lead to unexpected behavior and should be avoided.

**Operating Range**

| Description | Minimum | Maximum |
|---|---|---|
| Input Voltage | 0 V | 24 V |
| Output Voltage | 0 V | 24 V |
| Output Current | | 25 mA |

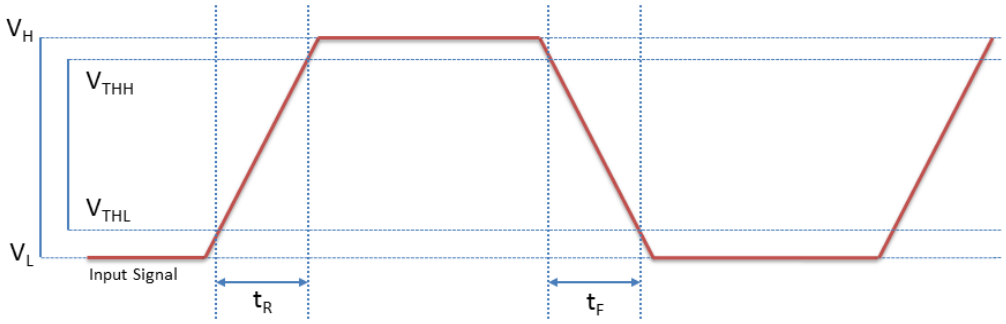
**Non-isolated External Voltage Resistor Combinations**

| External Voltage | External Resistor | Current |
|---|---|---|
| 3.3 V | 1.0 kΩ | 3.1 mA |
| 5 V | 1.0 kΩ | 4.8 mA |
| 12 V | 2.0 kΩ | 6 mA |
| 12 V | 2.4 kΩ | 5 mA |
| 24 V | 4.7 kΩ | 5.2 mA |
| 30 V | 4.7 kΩ | 6.5 mA |
| Values are for reference only | | |




**Non-isolated input and output circuit**

# 7.3 Input Timing Characteristics

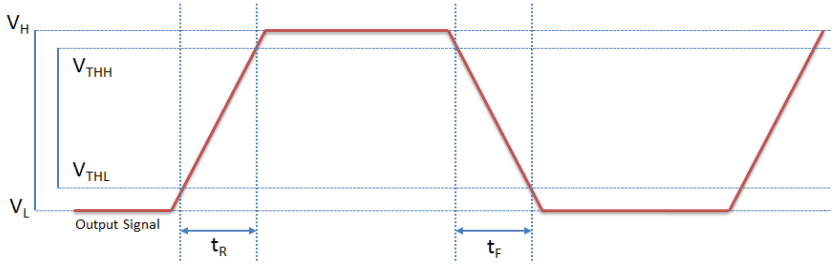



**Input Timing Characteristics**

**Non-isolated Input Performance (measured at Vcc = 5 V, Rext = 1 kΩ)**

| Parameter | Symbol | Non-isolated |
|---|---|---|
| Input Low Voltage | $V_L$ | 0.85 V |
| Input High Voltage | $V_H$ | 4.94 V |
| Input Threshold High Voltage | $V_{THH}$ | 4.54 V |
| Input Threshold Low Voltage | $V_{THL}$ | 1.26 V |
| Cycle Rise Time | $t_R$ | 10.8 µs |
| Cycle Fall Time | $t_F$ | 2 µs |
| Current | | 4.1 mA |

# 7.4 Output Timing Characteristics




**Output Timing Characteristics**

**Non-isolated Output Performance (measured at Vcc = 5 V, Rext = 1 kΩ)**

| Parameter | Symbol | Non-isolated |
|---|---|---|
| **Output Low Voltage** | $V_L$ | 0.23 V |
| **Output High Voltage** | $V_H$ | 4.95 V |
| **Output Threshold High Voltage** | $V_{THH}$ | 4.48 V |
| **Output Threshold Low Voltage** | $V_{THL}$ | 0.7 V |
| **Cycle Rise Time** | $t_R$ | 2.6 µs |
| **Cycle Fall Time** | $t_F$ | 0.23 µs |
| **Opto Current** | | 4.8 mA |

# 8 Troubleshooting

## 8.1 Support

FLIR endeavors to provide the highest level of technical support possible to you. Most support resources can be accessed through your product's Support page. From the FLIR machine vision page, click on your product family and then click the **Go to Support Page** link.

The **Overview** tab contains links to:

Spinnaker SDK download

Application notes

Knowledge base articles

White papers

Warranty information

The **Resources** tab contains links to:

- EMVA Imaging Performance specification PDFs
- Camera References (HTML)
- Datasheets
- Drawings
- Firmware
- Getting Started manual PDFs
- Product Change Notifications (PCN)
- Technical Reference manual PDFs

The **Media** tab contains links to videos about sensor technology and camera use.

**Contacting Technical Support**

Before contacting Technical Support, have you:

1. Read the product documentation?
2. Searched the Product Support page?
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.

## 8.2 Status Indicator LED

| LED | USB |
|---|---|
| **No Light** | No power<br>or LED is in inactive state<br>or LED is in error status state with no error |
| **Blinking Green (1 blink)** | USB1 |
| **Blinking Green (2 blinks)** | USB2 |
| **Blinking Green (3 blinks)** | USB3 |
| **Solid Green** | Acquisition Started |
| **Rapid Flashing Green** | Firmware update in progress |
| **Flashing Green and Red** | General Error |

# Contacting Us

For any questions, concerns or comments please contact us via the following methods:

| | |
|---|---|
| **Email** | General questions |
| **Support Ticket** | Technical support |
| **Chat** | Go to the Support Page for any product on the FLIR machine vision page and click the chat icon |
| **Website** | Find specifications, support articles, downloads on the product page at FLIR machine vision |

# Revision History

| Version | Date | Description |
|---|---|---|
| **1.0** | May 24, 2019 | Support for FFY-U3-16S2 |
| **1.1** | June 27, 2019 | Added Installing your Camera and Interface Connector sections. |
| **1.2** | September 13, 2019 | Corrected power supply to be from USB3 interface only. |
| **1.3** | April 9, 2020 | Updated link to contact support |
| **1.4** | May 5, 2020 | Added support for C-mount and CS-mount models |