GETTING STARTED

FORGE®
GigE Vision

Will your system support the camera?

Recommended System Configuration:

- **OS**—Windows or Linux (32- or 64-bit)
- **CPU**— Intel i7 or greater
- **RAM**—8 GB dual channel
- **Ports**—GigE network adapter with 5G Full Duplex support
- **Software**—Microsoft Visual Studio 2015 (to run and compile example code)

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 Forge resources page has many links to help you operate your camera effectively, including:

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

Do you have all the parts you need?

To install your camera you need the following components:

- Ethernet cable
- Powered Ethernet switch or Ethernet power injector (if using PoE)
- GPIO cable
- Lens
- Tripod adapter (optional)
- Interface card

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

Camera Care

To clean the imaging surface of your camera, follow the steps outlined in Cleaning the imaging surface of your camera.
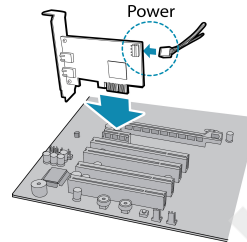
Extended exposure to bright sunlight, rain, dusty environments, etc. may cause problems with the electronics and optics of the system.

Avoid excessive shaking, dropping, or mishandling of the device.

> **Warning!** Avoid electrostatic charging.

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. Ethernet cards appear under **Network Adapters**. An exclamation point (!) next to the card indicates the driver has not yet been installed.

Configure the network adapter to use 5G Full Duplex.

a. Update the driver to the latest to access the 5G Full Duplex option.
b. In Windows go to Control Panel\Network and Internet\Network Connections, right-click on your network adapter and select **Properties**.
c. Click **Configure**.
d. On the Advanced tab, from the Property box select **Speed & Duplex** and from the Value drop-down select **5Gbps Full Duplex**.
e. Click **OK**.

On the Advanced tab, if not already enabled, set the Jumbo Packet to 9014 Bytes.

2. Install the Spinnaker® SDK 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. Forge requires Spinnaker version 3.1 or later.

a. Go to the Spinnaker SDK page.
b. Click the Download button. You are prompted to login, if not already.
c. Select your operating system. Depending on your selection there may be other versions to select.
d. After download is complete, open the file to start the Spinnaker setup wizard.
e. Follow the steps in each setup dialog.

3. Optimize the settings of your Ethernet card

a. In **Start->All Programs-> Spinnaker SDK->SpinView**, right click on the Network Adapter and select Adapter Configuration. The Adapter Config Utility lists your network adapters and allows you to access the following:

Adapter IP address	Receive buffers	RSS
Subnet mask	Transmit buffers	Media optimization
Default gateway	Jumbo packets	CPU affinity

> **Note:** See How to Optimize GigE Network Adapter Settings for more information on configuring for best performance.

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Using the Spinnaker® SDK

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.

Installing your Forge 5GigE

1. Attach a Lens

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

2. 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. If using PoE, connect a powered Ethernet switch or Ethernet power injector in between the card and the camera.

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

3. Plug in the GPIO connector

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

4. Confirm Successful Installation

Run the SpinView application: **Start->All Programs-> Spinnaker->SpinView** The SpinView application can be used to test the camera's image acquisition capabilities and make changes to the camera's installation configuration.

5. Configure IP Settings if necessary

By default, a dynamic IP address is assigned to the camera according to the DHCP protocol. If DHCP addressing fails, a link-local address is assigned. If necessary, in SpinView change the IP address of the camera to be on the same subnet as the NIC.

Status Indicator LED

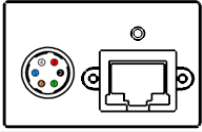| LED	5GigE
No Light	No power or LED is in inactive state or LED is in error status state with no error
Blinking Green (1 blink)	Link-Local Address (LLA)
Blinking Green (2 blinks)	DHCP IP Address
Blinking Green (3 blinks)	Persistent IP Address
Solid Green	Acquisition Started
Rapid Flashing Green	Firmware update in progress
Flashing Green and Red	General Error

Camera Interface

Ethernet Connector

The 8-pin RJ-45 Ethernet jack is equipped with two (2) M2 screwholes for secure connection. Pin assignments conform to the Ethernet standard.

General Purpose I/O Connector

The camera is equipped with a 6-pin GPIO connector on the back of the case.

Diagram	Color[1]	Pin	Line	Function	Description
	Green	1[2]	3	V_{EXT}	External Input Voltage (DC)
				GPI	Non-isolated Input
	Black	2	0	OPTOIN	Opto-isolated Input
	Red	3[2]	2	V_{AUX} OUT	Auxiliary Power Output
				GPIO[3]	Non-isolated Input/Output
	White	4	1	OPTOOUT[3]	Opto-isolated Output
	Blue	5	N/A	Opto GND	Opto-isolated Ground
	Brown	6	N/A	GND	Camera Power Ground

1—GPIO cable assembly wire colors
2—Dual function pin
3—Open drain output, requires pullup resistor

For More Information

Teledyne FLIR endeavors to provide the highest level of technical support possible to you.

Support resources can be accessed through the Forge resources page.

Your camera's settings and capabilities—Technical Reference or Camera Reference
Spinnaker® SDK—API Reference / Programmer's Guide
Selecting a lens for your camera
Setting Up Multiple GigE Cameras
How to Optimize GigE Network Adapter Settings
Using the Spinnaker Multicore GigE Optimizer
Using third-party applications from our software partners

Contacting Us

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

Email	General questions
Support Ticket	Technical support
Website	Find specifications, support articles, downloads on the product page at Teledyne FLIR machine vision

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