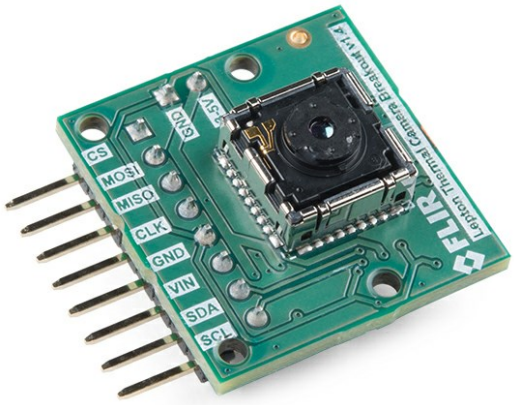









images are CC BY 2.0

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# FLiR Dev Kit

KIT-13233 ROHS

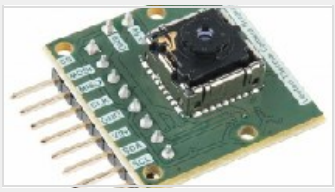
26

DESCRIPTION INCLUDES FEATURES DOCUMENTS

- LWIR sensor, wavelength 8 to 14 µm
- 51-deg HFOV, 63.5-deg diagonal
- 80 (h) × 60 (v) active pixels
- Thermal sensitivity <50 mK
- MIPI and SPI video interfaces
- Two-wire I2C-like serial-control interface
- Fast time to image (< 0.5 sec)
- Low operating power, nominally 150 mW (< 160 mW over full temperature range)

## FLiR Dev Kit Product Help and Resources

TUTORIALS VIDEOS SUPPORT TIPS SKILLS NEEDED



### FLIR Lepton Hookup Guide

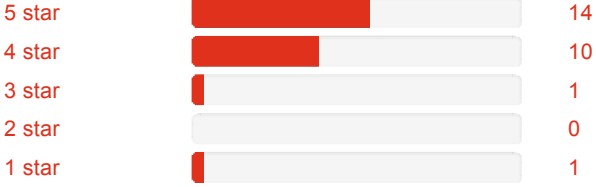
MARCH 26, 2015

See the invisible world of infrared radiation using the FLIR Dev Kit and Raspberry Pi.

COMMENTS 108 REVIEWS 26

## Customer Reviews

4.4 out of 5




*Currently viewing all customer reviews.*

**12** of **12** found this helpful:

### ★★★★☆ super cool, but rough going

about 3 years ago by s-p-e-x ✔ verified purchaser

This is a very cool device, but the software is still very rough.

This product is in desperate need of the sparkfun how-to/example-code treatment. As is, I'd agree with the difficulty/skills assessment, but I'm not sure it needs to be like this.

Getting the hardware connected to a Raspberry Pi was pretty straight forward. Getting the software installed/working was challenging, but when I had to hack the video example to splice in code to toggle the CS/GPIO line I got the video working, then the magic happened!

Seeing invisible stuff was super cool. But I have to say 80x60 pixels is way smaller than I was ready for. I mean that's the size of a typical icon these days. But seeing the invisible is awesome.

PS It isn't hard to get the module into an unresponsive state where you think you've blown it up. For example, I accidentally interrupted the power to the Raspberry Pi, which rebooted, but couldn't talk to the module anymore. Take a deep breath, shut it all off, and wait for 5 minutes. Power back up again and you should be ok.

---

**4** of **4** found this helpful:

### ★★★★★ Wonderful, absolutely wonderful!

about 3 years ago by Member #518130 ✔ verified purchaser

This FIIR system will work with almost any controller. I doubt I'd want it to work directly from an Arduino but pretty much anything SPI and an i2c channels.

Unlike a previous reviewer, I would have dropped it a star or three if they *had* hooked this up with has Raspbery Pi Hat. Even though I like the Pi, I doubt I'd have bought thi/ thinking it's only an expensive pi camera.

As it is I can hook it up to whatever I'm using for my robots this week.

It can do very simple things such as telling me the hottest parts of an image, which are almost always point of interest.

By using OpenCV I can immediately tell where the faces are unless people are wearing masks.

For robotics, this device is a blessing.

I'm thinking about hooking it to my Pi first beaus that's where the sample code is. Perhaps I can improve it.

One thing that surprised me is how small this really is. It should be able to be hidden anywhere on a robot.

My only minor complaint is the price, but as I spent my own money to get this, I can't think it was too expensive.

---

**5** of **5** found this helpful:

### ★★★★★ This device is so coool !!

about 3 years ago by Member #594728 ✔ verified purchaser

Let me say that I had no problem installing this microscopic device on a custom shield on my Raspberri PI …no problem at all.

Now I'm combining the raspberry campera images (luminance) and FLiR Lepton Camera images (crominance), only with resize+color mapping (using a gradient), with stunning results!

In this way the lower resolution of the Lepton Camera don't affect the image resolution (only the crominance). Only at minimal distance (camera-subject) I feel the need of a distance sensor that could drive an orizontal-offset between luminance and crominance, to reduce parallax error.

---

**2** of **2** found this helpful:

### ★★★★☆ Works Great

about 3 years ago by Member #633296 ✔ verified purchaser

Works well, does exactly what is says it will do.

I do wish someone get get a fix out there for Red X issue on inital boot.

I also wish someone made a nice form fitting plastic case for the breakout board and camera to help protect while in use.

---

**1** of **1** found this helpful:

### ★★★★☆ Its Alright

about 3 years ago by Member #201103 ✔ verified purchaser

First off for those on the fence about buying this product. I will list a few pros and cons.

Pros: 1. Small size 2. Fairly easy to hook up 3. Sample code on github

Cons: 1. The wiring calls for the board to be wired to either CE0 or CE1 on the raspberry pi. It took me a week to realize it was not necessary in my case. 2. Sample code is very basic and takes a lot of work to get it working decent. 3. Does not have radiometry read out support. Radiometry will give a temp reading of the hottest object it is pointed toward. This should be added to the pros maybe. You can make your own rudimentary radiometry feature. Get the camera capture script to work and accurately give the max pixel value. When it is doing that grab a thermometer and boil some water. As the water cools take the temp reading and capture a photo with the camera. Correlate the max temp with the actual temp. Then just create a profile in the photo capture code that will translate the hottest pixel data to an average possible temperature reading. Run the boiling water test several times from 212 F down to 32 F, this will allow you to average values and be more accurate. 3. Some times the camera or video capture will only output a red block in a corner, you have to physically pull the camera head out of the socket and plug it back in

---

**3** of **3** found this helpful:

### ★★★★☆ Built handheld Thermal Camera - works great

about 2 years ago by Member #20825 ✔ verified purchaser

I used a Raspbery Pi 2, the official 7" DSI Touchschreen, a Pi camera and the FLiR sensor to assemble a thermal camera system. I used the Pi camera's 'raspistill' command to overlay the real image with the FLiR sensor's data. I installed all components into a 3D printed case and use a portable 2600mAh charger/battery pack to power the unit. Initially, the Display and Touchscreen was rotated 180 deg and I had to reinsert the FLiR module after every OS restart to make it work. The last apt-get update/upgrade fixed these problems.

---

**1** of **1** found this helpful:

### ★★★★★ A solid little LWiR camera

about 2 years ago by Will3001 ✔ verified purchaser

I got this working on a Raspberry Pi 2 B and the official touchscreen with the provided sample code with next to no effort. So far I have not run into the the red square bug or any real issues other than two vertical lines on the picture on startup, but that is quickly fixed by running FFC while pointing the camera at a wall.

---

**1** of **1** found this helpful:

### ★★★★★ Amazing device

about a year ago by Member #304990 ✔ verified purchaser

What a fantastic little thing. Had some initial problems with a red box on the feed, but when I switched to Python on my Raspberry Pi, the problem evaporated. Temperature data came in a nice array. Next, I had some flickering in the images: The unit records ~10 images pr. sec. but can send ~26 images pr. sec. It will just resend the same image until it is ready with a new one. So when I started to discard images that were resent, this problem also disappeared. Now, it is just continuously sending me nice, sharp, fast responding thermal images.

---

**4** of **5** found this helpful:

### ★★★★☆ Great hardware!

about 3 years ago by Member #134773 ✔ verified purchaser

Wish I could give "four and a half" stars. Only down side on the hardware is having to use single jumpers to wire the pins from the board to the Raspberry Pi – a small, special "HAT" (Raspberry Pi parlance for what Arduino calls a shield) to allow a ribbon cable jumper going to the camera would make it less error prone. I think that the value for this is excellent. I've only had the opportunity to play with K+ thermal imagers for a couple minutes before.

though, it has a LOT of "room for improvement" (think "gymnasium-sized room"). Had to

use Google to find that I could use “scrot” to do a screen capture – seems to me that at least the ability to save the image to a file would be “basic function”. Upside is that the software is Open Source, so maybe if I can find another “round tuit” I’ll make a few improvements, and see if I can whittle a bit off the room…

All in all, I’m very excited about the gadget! It’s one of the most exciting thing I’ve gotten from Sparkfun, and I’ve bought quite a bit from SF.

---

**2** of **3** found this helpful:

★★★★☆ great fun

about 3 years ago by Member #401934 ✔ verified purchaser

and it has introduced me to the Raspberry Pi 2 which I chose to run it… after years as a dedicated Arduino fan. I was able to reverse engineer the design of the 2-element lens and choose a germanium lens to make a close-up image of a small optical element. But determining the temperature of an NIR-transmissive component in a field of gold-plated metal surfaces proved… difficult. Do not expect this device to be a non-contact temperature probe unless you are looking at real black-body surfaces. I knew just enough to think I might get away with it… but if we knew what we were doing… it wouldn’t be Science.

---

**1** of **2** found this helpful:

★★★★★

about 3 years ago by Member #237922 ✔ verified purchaser

HI I’M PY2RPD WAGNER I WILL USE IT FOR SKY IMAGES I THANK YOU BY THE PRODUCT 73

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★★★★☆ Beyond My Expectations

about 3 years ago by Member #685141 ✔ verified purchaser

This device performed beyond what I was expecting. I literally punished this device (vibration, heat, and other environmental factors) and it continue to function without issues. Way to go Sparkfun and FLiR

---

★★★★★ Excellent!

about 3 years ago by Member #374069 ✔ verified purchaser

The camera is very easy to interface and use.

---

★★★★★ Works Great!

about a year ago by Level128 ✔ verified purchaser

If you get red square in a blank window: shut the pi down and turn off power because it is not fully seated in the socket. Carefully take it out and put it back in until its just a hair above the socket. Needs just a little bit of extra pressure to fully seat it in the socket. Drove me nuts for an hour trying to figure out what the problem was. After that it works great.

---

★★★★★ Extremely useful stuff!

about 2 years ago by Member #218527 ✔ verified purchaser

So easy to connect and using. I’m using it for the thermal vision system on RasPi base. It needs in some improvement but only from the program side. Cool stuff!

---

★★★★☆ Works as advertised

about 2 years ago by Member #773584 ✔ verified purchaser

I am running this on a Raspberry Pi 2B and it was very easy to setup and get working. I followed the directions and it worked. I would suggest purchasing some ribbon cable and headers to simplify hookup.

---

★★★★★ Eye opening

about a year ago by Member #263441 ✔ verified purchaser

It feels like gaining a superpower when I can see something that used to be invisible. The examples for image capture on Raspberry Pi were straightforward and I learned a thing or two about Linux and C++ in the process [illegible] ighted that the input half of my current project will be able to

jump off from such a high point.

★★★☆☆ Works ok

about 8 months ago by Ethan_Png ✔ verified purchaser

Thanks for the product. A horizontal black line appears across the image. It works ok with RPi 3. Not an excellent product. I am able to see the thermal image, but I can't find any helper on github on how to display the temperature together with the image. In fact I can't output the temperature from the sample code. I only need to retrieve the temperature value every 15 seconds (to save into my PC's SQL database) that's all (the image is not important to me), but it seems like the codes do not cater to this simple thing. God bless.

> Kansukee/f replied on August 11, 2017:
>
> Hello!
>
> Sorry to hear about the issues with the Lepton module kit. Have you reached out to our technical support department @ techsupport@sparkfun.com - they're pretty good at helping resolve issues like these, though I know that to be able to get the FLIR lepton to represent true temperatures instead of relational temperatures you actually will have to get the algorithm from FLIR.

★★★★☆

about a year ago by Member #848061 ✔ verified purchaser

Excellent product

★★★★★ Does exactly what I expected

about 3 years ago by Member #676028 ✔ verified purchaser

Up and running in no time - works well.

**0** of **1** found this helpful:

★☆☆☆☆ Ordered/received with no lens

about a year ago by Member #886733 ✔ verified purchaser

How to prove that a lens was not delivered? ;(

The product itself may run great if received according to other reviews posted here.

> ROB-24601 replied on January 23, 2017:
>
> The lens is very small, therefore we hand pack them in pink bubble wrap in each box. However, human error is still a possibility. I would recommend contacting our technical support team, they should be able to assist you with this.

★★★★☆ IR from FLIR

about 3 years ago by Member #513807 ✔ verified purchaser

Works OK with Raspberry PI, good sensitivity! Problem with the socket, sometimes you have to play with it in order to make contact. At least, once it makes contact the image appears, you don't have to restart the program.

★★★★★ It really is a FLIR camera on a chip

about 3 years ago by Member #395595 ✔ verified purchaser

I've owned FLIR cameras that are based on this chip, and the chip works just as well as the cameras do. The project is not for the faint of heart, however. I'm not a complete noob to Arduino, but it took me several hours of fussing and lots of help from the Google group to get started. Kudos to PureEngineering and group members for their generous support. But now I have an Arduino Due sending images reliably to my computer (read and displayed by LabVIEW).

SUBSCRIBE TO NEWSLETTER

In 2003, CU student Nate Seidle blew a power supply in his dorm room and, in lieu of a way to order easy replacements, decided to start his own company. Since then, SparkFun has been committed to sustainably helping our world achieve electronics literacy from our headquarters in Boulder, Colorado.

No matter your vision, SparkFun's products and resources are designed to make the world of electronics more accessible. In addition to over 2,000 open source components and widgets, SparkFun offers curriculum, training and online tutorials designed to help demystify the wonderful world of embedded electronics. We're here to help you start something.

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**Please include your email address if you'd like us to respond to a specific question.**

email address

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Questions? Feedback? powered by Olark live chat software