Comparing the Flea2 and Flea2G Digital Imaging Cameras

Technical Application Note TAN2009002
Revised May 24, 2012

1.1 Subject

Technical Application Note (TAN2009002): Comparing the Flea2 and Flea2G Digital Imaging Cameras

1.2 Applicable Product(s)

- Flea2 and Flea2G FireWire imaging cameras (all models)

1.3 Introduction

The *Flea2* (FL2) and *Flea2G* (FL2G) digital imaging cameras were developed as next generation replacements for the popular *Flea* camera. The *FL2* and *FL2G* share most of the same hardware and software features, including an IEEE-1394b interface, on-board color processing, and the same small form factor. Additionally, both models are backward-compatible with the IEEE-1394a standard used by the *Flea*.

Customers evaluating the two cameras may find a number of feature enhancements in the *FL2G* useful in meeting their requirements. These enhancements include the following:

- Redesigned GPIO for protection against voltage spikes or ground loop conditions, and for minimizing the need for external current-limiting resistors.
- On-camera frame buffer.
- On-camera flash memory.
- New and improved CCD driving for improved sensor output.
- New FPGA design for processing 5 MP images (*FL2G-50S5* only).
- Sony EXview HAD CCD™ for near-infrared sensitivity (*FL2G-13S2* only).

The following sections outline some of these differences in more detail and provide links to additional sources of information.

For customers upgrading from a Flea camera, Point Grey Research strongly encourages putting the FL2 *and* FL2G *through a full requalification process.*

Related Knowledge Base Articles

ID	Title
240	Transitioning from the Flea to the Flea2

1.4 Hardware and Electronics

Description	FL2	FL2G
CCD imaging sensors	• 648x488: Sony ICX424 1/3” • 1032x776: Sony ICX204 1/3” • 1392x1032: Sony ICX267 1/2” • 1624x1224: Sony ICX274 1/1.8”	• 1296x964: Sony ICX445 1/3” (High-sensitivity EXview HAD) • 2448x2048: Sony ICX655 2/3”
GPIO electrical characteristics	• 4 bi-directional input/output pins • 2 GND pins for all pins	• 1 opto-isolated input pin • 1 opto-isolated open collector output pin • 2 bi-directional input/output pins • 1 GND pin for opto-isolated pins • 1 GND pin for bi-directional pins
	• Pin 8 (+3.3V) is capable of powering external circuitry up to a total of 150mA. • When configured as outputs, each of the I/O lines can sink 10mA of current.	

Related Knowledge Base Articles

ID	Title
300	Sensor response curve comparison for ICX445
304	New GPIO pin functionality in Flea2 FL2G-xx models

1.5 Firmware

Description	FL2	FL2G
Maximum resolution and frame rates using Format_7	• 648x488 (*FL2-03S2*) at 80 FPS • 1032x776 (*FL2-08S2*) at 30 FPS • 1392x1032 (*FL2-14S3*) at 15 FPS • 1624x1224 (*FL2-20S4*) at 15 FPS	• 1296x964 (*FL2G-13S2*) at 30 FPS • 2448x2048 (*FL2G-50S5*) at 7.5 FPS
Frame Buffer	No on-camera frame buffer	32 MB on-camera frame buffer
User Data Storage	No on-camera data storage	512 KB of flash memory

The FL2 *and* FL2G *cameras are programmed separately with distinct versions of firmware.*

1.6 Spectral Response

Spectral response diagrams of each *FL2* and *FL2G* model are available in Appendix A of the *Flea2 Technical Reference Manual*, which can be accessed from the Point Grey Research downloads site. Spectral response results are based on testing performed independently by Point Grey Research. Note that the *FL2G-13S2* features a Sony EXview HAD CCD™ for near-infrared sensitivity.

1.7 Additional Resources

1.7.1 Other Reference Documentation

Other useful sources of information regarding specific features of the Applicable Product(s) include:

- PGR IEEE-1394 Digital Camera Register Reference
- Flea2 Getting Started Manual
- Flea2 Technical Reference Manual
- PGR Imaging Products Comparison Chart

1.7.2 Testing Tools

To configure and test the information presented in this TAN:

1. **Connect the camera's GPIO pins to an oscilloscope or external trigger source.** By connecting the appropriate GPIO pins to an external trigger source or oscilloscope, you can observe the differences in general purpose input/output capability of the Applicable Product(s). Consult your camera's *Technical Reference* or *Getting Started* manual for:
    a. GPIO connector pin layouts; and
    b. GPIO electrical characteristics

2. **Download the FlyCapture SDK.** The SDK includes numerous example programs that demonstrate various camera features. Specific examples that relate to this TAN include *AsyncTriggerEx, CustomImageEx* and *SaveImageToFlashEx*

3. **Access the camera's register space.** Registers are easily accessible by using the FlyCap demo software program included with the *FlyCapture SDK*. For register definitions and individual bit descriptions, refer to the *Point Grey Digital Camera Register Reference*.

1.8 Additional Downloads and Support

Point Grey Research Inc. endeavors to provide the highest level of technical support possible to our customers. Most support resources can be accessed through the Support section of our website.

Creating a Customer Login Account

The first step in accessing our technical support resources is to obtain a Customer Login Account. This requires a valid name and email address. To apply for a Customer Login Account go to the Downloads page.

Knowledge Base

Our Knowledge Base contains answers to some of the most common support questions. It is constantly updated, expanded, and refined to ensure that our customers have access to the latest information.

Product Downloads

Customers with a Customer Login Account can access the latest software and firmware for their cameras from our Downloads page. We encourage our customers to keep their software and firmware up-to-date by downloading and installing the latest versions.

Contacting Technical Support

Before contacting Technical Support, have you:

1. *Read the product documentation and user manual?*
2. *Searched the Knowledge Base?*
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.

