

Finger Lakes Instrumentation

A History of Engineering Excellence

FLI adds cameras, filter wheels, and focusers to your system solution toolbox

Experience

Finger Lakes Instrumentation has been supplying high performance imaging solutions to a wide variety of markets for over 20 years. We began designing and manufacturing cooled CCD cameras in 1998. We incorporated in 2000. Since that time we have shipped thousands of cameras to over 50 countries worldwide.

Our first cameras were designed for astronomy and astrophotography, but we soon found customers in other applications, including fluorescence imaging, TEM, chemiluminescence, x-ray, forensics, and spectroscopy.

We have designed CCD cameras for more than 50 different CCDs from ON Semi, Teledyne e2v, Sony, Hamamatsu, and Fairchild. We currently manufacture cameras using more than 40 different CCDs. In January 2018 we introduced our first cooled scientific CMOS cameras. We also develop best-in-class accessories for imaging, including filter wheels and precision focusers.

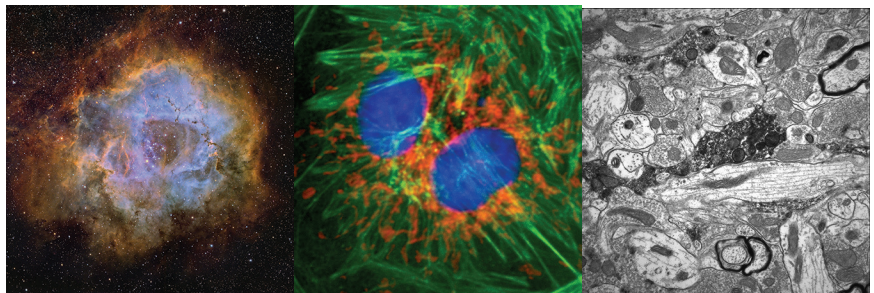
Applications

Astronomy
Solar Cell Inspection
X-ray Crystallography
Forensics
Spectroscopy
Gel Imaging
Microarray Imaging
Fluorescence microscopy
Bioluminescence
Chemiluminescence
Protein analysis
DNA sequencing
DNA cloning
Gene expression studies

Markets

FLI products are designed and manufactured in New York, USA. However, the majority of our products are exported! We supply to OEMs in North America, Asia, the Middle East, and Europe. Our customers have the confidence to install our products in remote automated observatories from Finland to Antarctica, all around the globe.

FLI is ready to assist you with your camera requirements whether you need hundreds of cameras with consistent batch to batch performance or a single camera optimized for a unique application.



Cooled Cameras

Why Cool the Sensor?

Cooling improves the signal-to-noise ratio and minimizes cosmetic defects in sensors.

Kepler

FLI's new Kepler series of cooled cameras supports higher throughput, up to 35 channels, and a variety of new sensors, including scientific CMOS. The Kepler KL400 has high sensitivity (95% peak quantum efficiency) coupled with low noise (1.5 electrons) even at video frame rates. The KL4040 is a high QE front illuminated camera with a generous 52mm imaging diagonal. The game changing KL6060 will feature a 38MP, 87mm diagonal sensor.

Modularity

The majority of FLI cameras are exported; to minimize shipping costs, Kepler's shutter, fans, and digital board have all been designed to be user-replaceable.



Cooled CCD Cameras

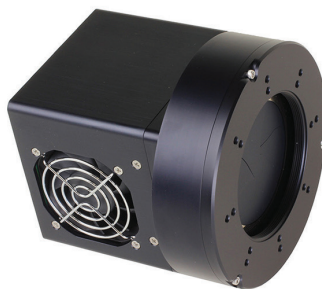
ProLine

ProLine cameras offer the deepest cooling of our standard cameras, and provide two power and two USB connections for FLI accessories. A complete imaging system (camera, filter wheel and focuser) can be controlled with a single power and USB cable from your PC. High and low data rates are optimized using independent analog to digital converters. Both the inner and outer chambers are sealed for harsh environments.



MicroLine

MicroLine cameras cover a broad range of possibilities, from small interline transfer sensors with a C-mount front flange to the large format full frame CCDs. Despite being smaller and lighter than ProLine cameras, MicroLines cool within a few degrees of their larger sibling, and substantially deeper than competitive models. Smaller sensors have a shorter back focal distance than ProLine cameras. MicroLines support dual and quad channel readout with some sensors.



Hyperion

The Hyperion camera was developed to satisfy a single customer's need for MicroLine performance in a package shorter from front to back. Since that time, demand for Hyperion cameras has grown to rival the MicroLines. Based on the same electronics as the MicroLines, Hyperions are similar in performance. Hyperions do not support large shutters (65mm).



High Speed Filter Changers

Industry-Leading Filter Exchange Times

Some applications require rapid change of filters in order to observe different spectral ranges as close together in time as possible. FLI's high speed filter changers represent a major leap forward in speed and ease of use. Optimized hardware cuts filter wheel move times in half even with a fully loaded wheel. Software does not need to be manually "tuned" to the number of filters or their locations. The compact units connect directly to the host computer via USB (no bulky external controller needed) and up to three can be daisy-chained from a single computer port.

- Filter wheels 2X-3X higher throughput than competitors' units
- Cube turret 10X higher throughput
- Exceptional reliability
- Automatic adjustment for filter distribution
- Easy OEM integration
- No external controller needed
- Major software program support
- Optional external shutter driven from auxiliary port
- Optional reflection reducing angled filter pockets

Servo Motors for Speed

High performance brushless servo motors are more efficient than the stepper motors used in other systems. FLI's high speed filter switchers use state-of-the-art semiconductor components, a high performance digital signal processor (DSP), and a sophisticated control algorithm. This control system continuously monitors the position of the wheel and adjusts the amount of torque delivered by the motor to get maximum speed with minimum vibration. When filters are added or removed, the controller automatically adapts to changes in load.

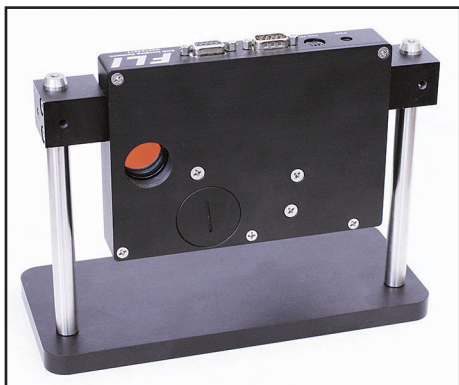
Servo Motors for Reliability

Encoder feedback provides more reliable positioning than open-loop stepper motors that can sometimes skip steps. In terms of usable lifetime, a HSFW continuously running at FLI has completed 250 million operations without a problem.



The compact HSFWs do not require an external controller.

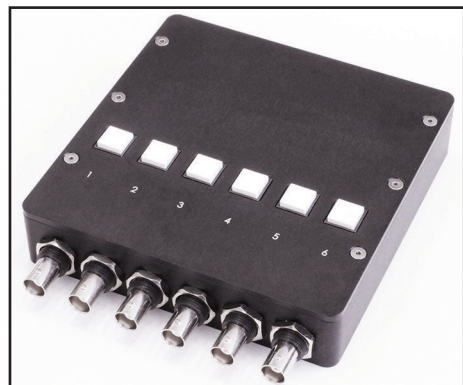
Contact FLI with your customization needs.



High Speed Filter Wheel HS-625



High Speed Filter Switcher for Nikon Inverted Microscope



Optional Hand Controller / BNC trigger module for HS-625

Sensor Selection

Finger Lakes Instrumentation supports a wide variety of CMOS and CCD sensors. For a full list, please visit www.flicamera.com. The sensors below are popular for life science instrumentation.

Sensor Source	Sensor	Type	Pixels X	Pixels Y	Pixel Microns	Array Size mm		Area mm ²	Diag mm	MPixels	Full Well e-
						X	Y				
Sony	ICX285	IT CCD	1360	1024	6.45	8.8	6.6	57.9	11.0	1.4	18K
Sony	ICX695	IT CCD	2750	2200	4.54	12.5	10	124.7	16.0	6.0	17K
e2v	CCD47-10	BI CCD	1024	1024	13	13.3	13.3	177.2	18.8	1.05	100K
GPixel	GSense400	BI CMOS	2048	2048	11	22.5	22.5	507.5	18.8	4.2	92K
GPixel	GSense4040	FI CMOS	4096	4096	9	36.9	36.9	1359	52.1	16.7	70K

Interline Transfer CCDs



ICX285



ICX695

Full Frame CCD



CCD47-10

CMOS



GSense400



GSense4040

Absolute Quantum Efficiency

