

Outline

The ProLine Imaging System sets a new standard in pricing, performance and flexibility. ProLine, FLI's flagship imaging system, features a six-leaf shutter with a 1 million MTBF rating, user selectable download speeds, choice of cooling base configurations, a wide range of supported CCDs and a separate hermetically sealed chamber for the CCD and electronics.

Build Quality

Every major component of the ProLine is CNC machined to ensure a long life in the most demanding conditions. The ProLine base / heat sink, shutter housing and front flange are each machined from a single piece of high-grade aluminium. (Being part of the base assembly, even the ProLine fan cover is CNC machined!) The electrical printed circuit boards use only the highest quality components and are protected from harsh environment without the need for conformal coatings.

Download Speeds

Breaking new ground in download speeds, the ProLine provides the user with extremely fast user-selectable download speeds. You can download images at 12 mega-pixels per second for focusing. This means that an unbinned PL09000 image can be downloaded to your PC in as little as 1 second! For imaging, the download time can be slowed to reduce the noise in the final image.

Cooling

The ProLine achieves a sustainable 65°C cooling performance. This means you can operate your camera at -30°C with ambient temperatures of up to 35°C (84°F) for lowest dark current and its attendant noise. No additional water cooling or cooling sequence staging is required. Simply set the ProLine cooling where you want it and the camera will do the rest - quickly and without worries. LC cooling bases are available.

Internal Frame Buffer

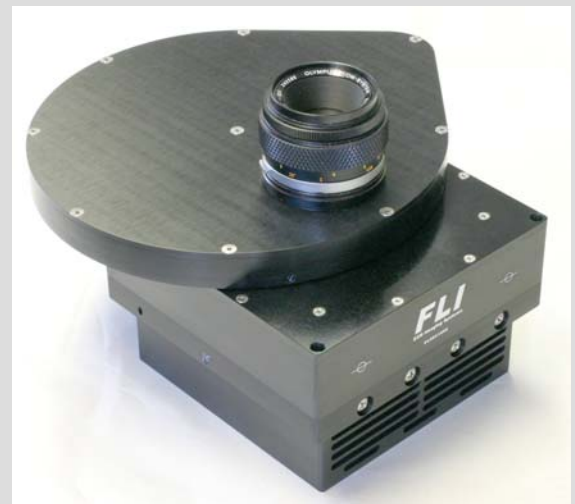
Conventional imaging cameras move the image data directly from the image sensor to the USB port, making them susceptible to added artifacts due to PC processing tasks, processor speed, and other PC-related issues. Each ProLine camera has an internal memory capacity so that the imaging chip can be quickly read out and downloaded to the PC. This allows the PC to take the image at whatever speed it is capable of without introducing any artifacts to the image.

Accurate Sensor Placement

Through sophisticated design and production techniques, the ProLine image sensor is accurately aligned so that the imaging chip is perpendicular to the optical path without shims or other post-assembly adjustments. This is crucially important as chips get larger to insure the entire frame of your image is in focus. Although not required by some applications, we also accurately control the 'X,Y' location of the sensor so that it is square to the camera body.

Complete Imaging System

FLI's ProLine is part of a complete and integrated imaging system. The ProLine is designed to rigidly couple to the new Precision CFW-4-5 filter wheel (five positions, 65mm diameter filters) or CFW-4-5S filter wheel (five positions, 50mm square filters) as well as the Precision Digital Focuser (PDF). Add our ME2 auto-guider to form an unequalled and complete imaging system for astronomy.



Product Details	
Selectable download speeds up to 12 mega-pixels/sec	High tolerance sensor alignment and orthogonality
On-board frame buffer standard	100% CNC Machined Sub-Assemblies
CCD overscan capability	High Transmission camera windows (97%)
Field upgradeable firmware	Custom window available with transmission below 200nm
USB 2.0 High speed serial Interfaces	Wide range of supported CCD Imaging Sensors
65mm and 85mm aperture shutters available	- Kodak Full Frame Color, Monochrome and Interline
Fast Reliable Shutters - Six-leaf stainless-steel shutter (coming soon) - Uniblitz shutter (MTBF of 1 million cycles)	- Fairchild Imaging Full Frame Back-Illuminated (96% QE)
	- E2V Technologies Full Frame Back-Illuminated (UVAR)
Triple TEC Cooling for true, maintainable 65°C cooling	Monochrome or Color CCD
Separate hermetically sealed chambers	CCD Resolutions up to 40 Mega-pixels
- Electronics: back filled with medical grade Argon	Compatible with CFW-4-5(S), CFW-5-7(S) & PDF Focuser
- Sensor: back filled with medical grade Argon (Xenon option)	- Five and Seven positions filter wheels available
Low noise, 16-bit operation	- Research Grade LRGB, H alpha and UVRI sets available
	- 65mm diameter filters and 50mm square filters available

Specifications	
CCD readout noise	As low as 5e~
Dark Current @ -30 deg C. (typical)	.1 to 1 e-/pixel/sec depending upon sensor
Anti-blooming	Available
Spectral sensitivity	200 - 1050 nanometers
Available number of pixels	Up to 40 megapixels
Pixel size range	6.8 to 24 micron
Available sensor manufacturers	Kodak, E2V Technologies, Fairchild Imaging
Camera cooling	65 deg C (fan-assisted air) or 75 deg C (LC base)
Power requirements	12V
Storage temperature range	-50°C to +100°C
Operation temperature range	-40°C to +50°C
Relative humidity operating range	95%
Standard Camera Weight	5.5 pounds
Standard Camera Dimensions	6.2" x 6.2" x 4" (Width x Depth x Height)

ProLine Models with Kodak Interline Sensors			
Model	Sensor	Peak QE	Resolution
PL11000M-1	Kodak KAI-11000M	51%	4008 x 2672
PL11000M-2	Kodak KAI-11000M	51%	4008 x 2672
PL11000-C	Kodak KAI-11000CM	42%	4008 x 2672
PL4021	Kodak KAI-4021M	55%	2048 x 2048
ProLine Models with Kodak Full Frame Sensors			
PL09000	Kodak KAF-09000	69%	3056 x 3056
PL16803	Kodak KAF-16803	59%	4096 x 4096
PL1001E	Kodak KAF-1001E	72%	1024 x 1024
ProLine Models with E2V Sensors (back and front illuminated)			
PL4240-1-B	E2V CCD42-40-1-368	85%	2048 x 2048
PL4240-1-F	E2V CCD42-40-1-383	50%	2048 x 2048
PL4710-1-BB	CCD47-10-1-371	93%	1056 x 1027
PL4710-1-UV	E2V CCD47-10-1-373 Enhanced QE UVAR	73% @ 240nm	1056 x 1027
Direct link to ProLine Web Page http://www.fli-cam.com/proline.htm			

