PixeLINK
www.pixelink.com

PL-B741F, PL-B741EF & PL-B742F FireWire
PL-B741G, PL-B741EG & PL-B742G Gigabit Ethernet
PL-B741U, PL-B741EU & PL-B742U USB 2.0

1.3 MP (1280 x 1024)
Monochrome & Color Cameras
27 fps Free Running - 26 fps Triggered

General Description

The **PL-B741** monochrome and **PL-B742** color 1.3 megapixel (1280 x 1024) cameras are designed specifically for industrial inspection applications. The CMOS Global Shutter sensor features an asynchronous electronic shutter which freezes the high-speed motion that is common in industrial applications. The large 6.7 um pixel pitch and high peak responsivity enhances the cameras ability to operate with short integration (exposure) times and low light levels. The PL-B740 series cameras operate at 27 frames per second (fps) in free running mode and 26 fps in triggered mode. In-camera Flat Field Correction corrects for non-uniform illumination and optics in addition to the dark noise variations common to all sensors. As a result, overall image quality is similar to more expensive CCD based cameras. The “E” version of the sensor boasts outstanding responsivity in the NIR spectrum from 750nm to 1um, making the PL-B741E well suited to NIR applications.

Global Shutter technology is the technology of choice for extreme dynamic range imaging often called “Extended Shutter” mode. By setting one or two knee points at the sensor level, the camera will drain off excessive charge from pixels that have reached saturation in the brightest areas of the image. Up to 110+ db of scene dynamic range can be properly exposed so that the darkest details remain intact while the brightest areas do not become oversaturated and bloom. This unique feature of CMOS global shutter sensors makes the PL-B741 ideally suited to high dynamic range imaging applications such as welding inspection and traffic monitoring.

Why CMOS Sensor Technology?

CMOS sensor technology has made great strides in image quality over the past 5 years – to the point where performance levels are on par with many CCD sensors. The machine vision community continues to embrace CMOS technology due to its inherent strengths of low cost, low power consumption, high-speed, superior anti-blooming, flexible region of interest (ROI), and the “Extended Shutter” operation noted above.

For example, on chip image flip and rotate removes the processing load from the host PC. User defined sub-windowing down to an 8 pixel granularity allows for extremely high frame rates at reduced resolutions.

Typical Applications

The PL-B740 series is suitable for a broad range of industrial applications such as factory automation, food & beverage inspection, traffic control & monitoring, electronics manufacturing, welding inspection, pharmaceutical inspection and metrology.

FireWire, Gigabit Ethernet & USB 2.0 Interfaces
We appreciate that OEMs and System Integrators are constantly looking for ways to reduce system costs and complexity. PixeLINK has answered this call by offering three widely accepted interfaces all of which eliminate the need to purchase & integrate frame grabber boards and expensive custom cables.

IEEE 1394A – FireWire has proven itself as a reliable and robust interface over the past decade in machine vision applications. The deterministic communication provided by FireWire allows for precise timing in machine vision applications. PixeLINK's FireWire cameras support the IIDC 1.31 specification making them compatible with a wide range of 3rd party DCAM software applications.

Gigabit Ethernet – 1,000 Mbit data rates, 100M cable lengths and networked connectivity have made the Gigabit Ethernet interface for machine vision, appropriately named GigEVision, the fastest growing interface over the past years. Transmission is provided via standard CAT6 cables.

USB 2.0 – Universality of this interface on host PCs is a major benefit for applications in the consumer end-user markets. Plug-and-play operation and low cost cabling makes USB 2.0 the leading user-friendly interface.

Customization

The products listed here are standard offerings. PixeLINK also provides an extensive list of customized cameras to OEM customers around the world. If you can't find what you are looking for in the standard products, call us. We may already have what you need. If not, we can certainly design and build it for you.

Features	Benefits
Common API for all cameras	Use existing code without recompiling. Saves development time and money.
Extended Shutter mode	Properly exposed images of extreme dynamic range scenes up to 110 dB
27 fps Global Shutter sensor	Low smear images of fast moving objects and higher system throughput
741E enhanced NIR spectral response	Improved performance in NIR applications
In-camera Flat Field Correction (FFC) & Defective Pixel Correction	Provides superior image quality by correcting for non-uniform illumination, lens shading, and sensor Fixed Pattern Noise (FPN)

Sensor

Sensor	Cypress IBIS 5B
Type	CMOS Global Shutter
Resolution	1280(H) x 1024(V) Color & Mono
Pixel Pitch	6.7 µm x 6.7 µm
Active Area	8.57 mm x 6.86 mm - 11.01 mm diagonal
Peak QE	30 (mono) 29 (color)
Max Datarate	40 MHz

Computer & Operating System

Processor	2.0 GHz or better
Memory	512 MB min. 1 GB recommended
Operating System	Windows XP 32/64bit & Windows 7 32/64bit
Hard Drive Space	75 MB

Power Requirements

Voltage Req.	FireWire/GigE 8-32 V DC - USB 5 V DC
Power Req. PL-B741	FireWire 3.2 W, USB 3.2 W, GigE 4.2 W
Power Req. PL-B742	FireWire 3.5 W, USB 3.5 W, GigE 4.5 W

Environmental & Regulatory

Compliance	FCC Class B, CE & RoHS
Shock & Vibration	300 G & 20 G (10Hz - 2KHz)
Operating Temp.	0°C to 50°C (non-condensing)
Storage Temp.	-45°C to 85°C

Software

PixeLINK Capture OEM	Free Download (www.pixelink.com)
DirectShow (exl. GigE)	Bundled with PixeLINK Capture OEM
TWAIN	Bundled with PixeLINK Capture OEM
SDK	API, sample code and LabVIEW wrappers
DCAM 1394 Compliance	IIDC version 1.31

Camera Controls & Features

Auto & Manual White Balance, Color Temperature, Gain, Brightness (Dark Offset), Gamma, Saturation, Region of Interest (ROI), Histogram, Binning, Averaging, Resampling, Image Flip & Rotate, Programmable LUT, In-Camera Defective Pixel & Color Correction, Callbacks (Image Filters), FFC (Gain & Offset).

Frame Rates

Resolution	Free Running Mode	Triggered Mode
1280 x 1024	27	26
1024 x 768	43	43
800 x 600	67	67
640 x 480	101	101
320 x 240	327	327

Frame rates will vary based on host system and configuration

Specifications are subject to change without notice

Performance Specifications *

Responsivity	741-9.8 DN/(nJ/cm^2) 741E-10.8 DN/(nJ/cm^2) 742-7.3 DN/(nJ/cm^2)
FPN	Mono <1 % Color <1 %
PRNU	Mono <1 % Color <1.5 %
Read Noise	<1.5 DN
Dynamic Range	54.6 dB
Bit Depth	8 & 10-bit
Color Data Formats	Bayer 8, Bayer 16 and YUV422
Mono Data Formats	Raw, Mono 8 and Mono 16
Exposure Range	40 µs to 1 seconds free running 40 µs to 1 seconds triggered
Gain	0 dB to 17.7 dB in 14 increments

**PL-B741 Settings: Typical values with 40ms integration time, 0dB gain, FFC on, 10-bit mode*

**PL-B742 Settings: Typical values with 100ms integration time, 0dB gain, FFC on, 10-bit mode*

Mechanicals

Dimensions	102 x 50 x 41 mm (straight) 110 x 50 x 41 mm (right angle)
Weight	Straight: 204 g - Right Angle: 258 g
Mounting	4 M3 threaded holes in front plate & 4 M3 threaded holes in camera case
Tripod Mount	1/4" - 20 mount (optional)
Status LED	Amber - Start-up, Green - Idle or streaming Red - Warning or failed status
Lens Mount	C & CS-Mount, 2/3" optical format

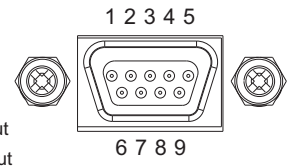
Interfaces

Interface / Date rate / Connector	IEEE 1394A (2) / 400 Mbit / 6-pin GigE / 1000 Mbit / RJ-45 USB 2.0 / 480 Mbit / Type B
Trigger Connector	9-pin Micro D
Trigger Modes	Free running, software, hardware
Trigger Input	Optically isolated 5-12V DC @ 4-11 mA
GPO/Strobe	2 Optically Isolated - Maximum 40V DC differential. Maximum 15 mA

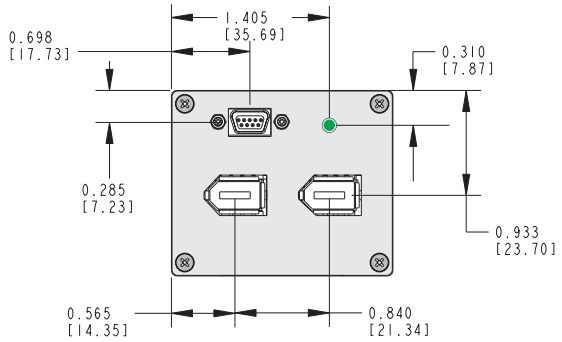
For more information, visit: http://www.pixelink.com/help

Pin Output Description

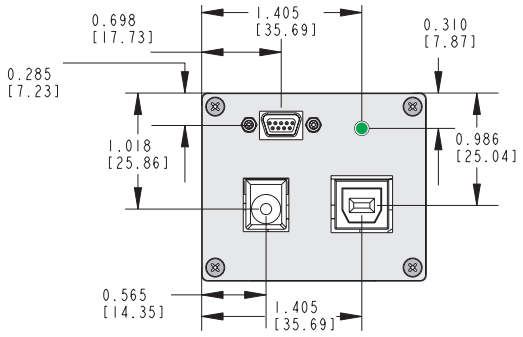
Pin	Pin Name & Function
1	POWER cable power, FireWire/GigE 8-32 V DC - USB 5 V DC
2	Gp2+ Positive terminal of GPO 2
3	Gp2- Negative terminal of GPO 2
4	Gp1+ Positive terminal of GPO 1
5	Gp1- Negative terminal of GPO 1
6	TRIGGER + Positive terminal of trigger input
7	TRIGGER - Negative terminal of trigger input
8	(no connection)
9	GROUND Logic and chassis ground



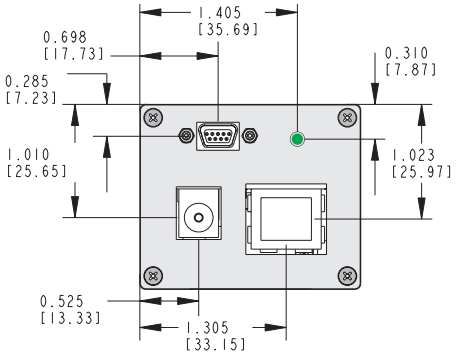
Straight & Right Angled Mechanical Demensions



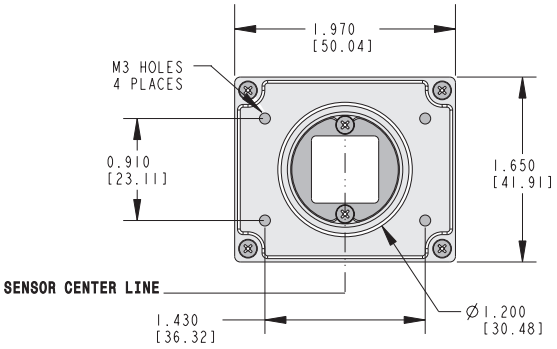
Back Panel FireWire



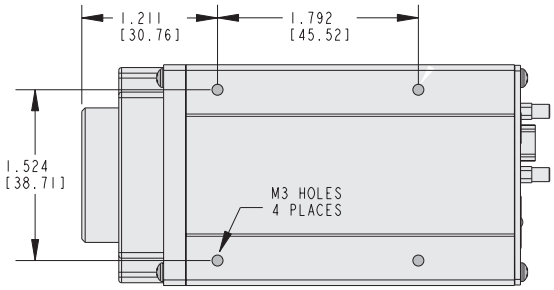
Back Panel USB 2.0



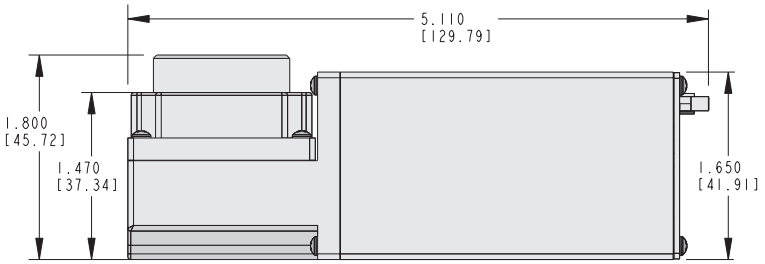
Back Panel GigE



Front Panel

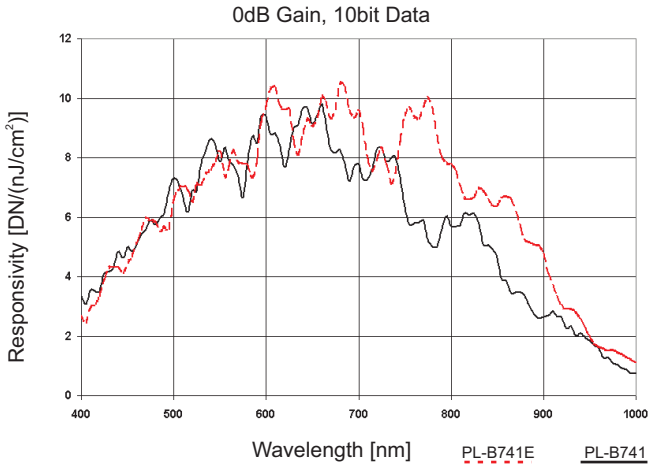


Straight Case Bottom



Right Angle Side

Responsivity Curve - Mono



Responsivity Curve - Color