PixeLINK
www.pixelink.com

PL-B781F & PL-B782F FireWire
PL-B781G & PL-B782G Gigabit Ethernet
PL-B781U & PL-B782U USB 2.0

6.6 MP (2208 x 3000)
Monochrome & Color Cameras
5 fps Free Running - 5 fps Triggered

General Description

The **PL-B781 Monochrome** and **PL-B782 Color** cameras provide high resolution, low noise images for outstanding value in a broad range of industrial, security and life sciences applications. The camera features a 6.6 megapixel (2208 x 3000) resolution imager capable of 5 frames per second at full resolution. The PL-B781/782 series of cameras are based on a Cypress CMOS progressive scan sensor with a 1" optical format. Factory calibrated Digital Pixel Correction and on-board Flat Field Correction (FFC) provides image quality similar to CCD cameras but at a much more affordable price. These cameras provide the user of choice of 8-bit or 10-bit digitization and a dynamic range of 60 dB in 10-bit mode. The external hardware trigger and 2 general-purpose outputs ensure users have the flexibility to synchronize the camera with their processes and illumination.

You have the choice of a FireWire, Gigabit Ethernet or USB 2.0 interface, all of which eliminate the need for a frame grabber. PixeLINK's industry leading SDK uses a common API for all cameras regardless of the chosen interface. Software code developed for one camera is easily transferred to other PixeLINK models without the need to recompile code resulting in lower system costs and simplified integration.

The sensor architecture provides superior anti-blooming compared to CCD sensors making the PL-B781 & 782 an excellent choice for imaging highly reflective objects or scenes with intense illumination. The flexible Region of Interest (ROI) control allows users to operate at higher frame rates by placing a lower resolution "window" on the imager at any location. The camera can output 5 fps at 2208 x 3000 resolution, 16 fps at 1980 x 1020 resolution, 25 fps at 1280 x 1024 resolution and 89 fps at 640 x 480 (VGA) resolution. The window may be placed at any location on the imager with a granularity of 24 pixels x 24 pixels.

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 and the flexible ROI noted above.

Typical Applications

The PL-B781 & 782 cameras are suitable for a broad range of applications such as high performance security & surveillance applications, parts inspection, metrology, high resolution document archiving, PCB inspection and flat panel display inspection.

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 CAT5E or 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.
6.6 Megapixel resolution	High definition images provide over 21X resolution compared to VGA cameras
Flexible ROI control	Users can increase frames up to 4000 fps with 24 pixel granularity
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 CMOS
Type	CMOS Rolling Shutter
Resolution	2208(H) x 3000(V) Color & Mono
Pixel Pitch	3.5 µm x 3.5 µm
Active Area	7.73 mm x 10.5 mm - 13.1 mm diagonal
Peak QE	25 % (mono) 24 % (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-B781	FireWire 3.6 W, USB 3.2 W, GigE 4.6 W
Power Req. PL-B782	FireWire 4.6 W, USB 4.0 W, GigE 5.6 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
2208 x 3000	5	4.9
2048 x 1536	11	10
1920 x 1080	16	15
1280 x 1024	25	22
640 x 480	89	75

Frame rates will vary based on host system and configuration

Specifications are subject to change without notice

PERFORMANCE SPECIFICATIONS *

Responsivity	Mono 4.4 DN/(nJ/cm^2)
	Color 4 DN/(nJ/cm^2)
FPN	Mono <1 % Color <1.5 %
PRNU	Mono <2 % Color <3 %
Read Noise	<1 DN
Dynamic Range	60 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	63 µs to 2 seconds free running
	63 µs to 2 seconds triggered
Gain	0 dB to 20.5 dB in 14 increments

*PL-B781 Settings: Typical values with 40ms integration time, 0dB gain, FFC on, 10-bit mode
*PL-B782 Settings: Typical values with 100ms integration time, 0dB gain, FFC on, 10-bit mode

MECHANICALS

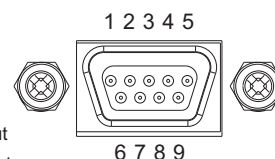|	
Dimensions	102 x 50 x 41 mm (straight)
	110 x 50 x 41 mm (right angle)
Weight	Straight: 210 g - Right Angle: 264 g
Mounting	4 M3 threaded holes in front plate &
	4 M3 threaded holes in camera case
Tripod Mount	1/4" - 20 mount (optional)
Status LED	Amber - Start-up, Green - Idle or streaming
	Red - Warning or failed status
Lens Mount	C & CS-Mount, 1" optical format

INTERFACES

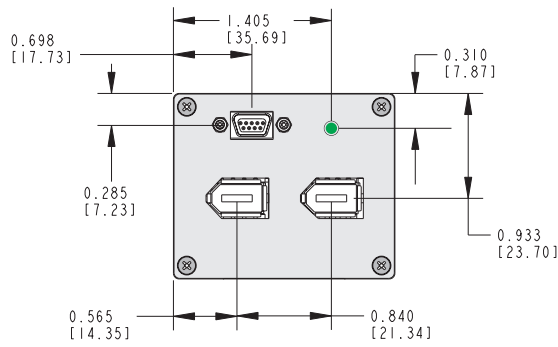|	
Interface / Date rate / Connector	IEEE 1394A (2) / 400 Mbit / 6-pin
	GigE / 1000 Mbit / RJ-45
	USB 2.0 / 480 Mbit / Type B
Trigger Connector	9-pin Micro D
Trigger Modes	Free running, software, hardware
Trigger Input	Optically isolated 5-12V DC @ 4-11 mA
GPO/Strobe	2 Optically Isolated - Maximum 40V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

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

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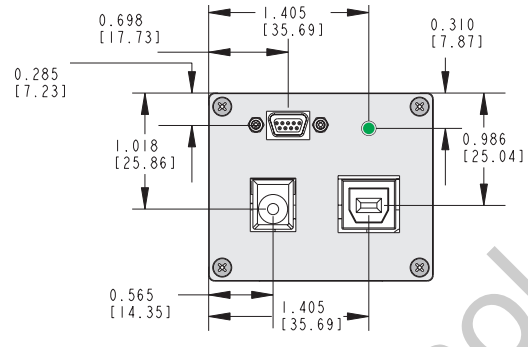
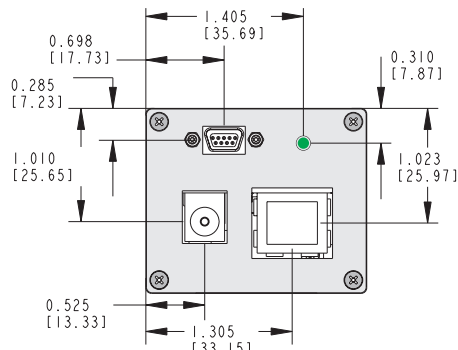| Pin	Pin Name & Function
1	POWER cable power, FireWire/GigE 8-32 V DC - USB 5 V DC
2	Gp2+ Positive terminal of GPO 2
3	Gp2- Negative terminal of GPO 2
4	Gp1+ Positive terminal of GPO 1
5	Gp1- Negative terminal of GPO 1
6	TRIGGER + Positive terminal of trigger input
7	TRIGGER - Negative terminal of trigger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

1 2 3 4 5

6 7 8 9

Back Panel FireWire

0.698 [17.73]
1.405 [35.69]
0.310 [7.87]
0.285 [7.23]
0.933 [23.70]
0.565 [14.35]
0.840 [21.34]

Back Panel USB 2.0

0.698 [17.73]
1.405 [35.69]
0.310 [7.87]
0.285 [7.23]
1.018 [25.86]
0.986 [25.04]
0.565 [14.35]
1.405 [35.69]

Back Panel GigE

1.405 [35.69]
0.698 [17.73]
0.310 [7.87]
0.285 [7.23]
1.010 [25.65]
1.023 [25.97]
0.525 [13.33]
1.305 [33.15]

Front Panel

1.970 [50.04]
M3 HOLES 4 PLACES
0.910 [23.11]
1.650 [41.91]
SENSOR CENTER LINE
1.430 [36.32]
Ø1.200 [30.48]

Straight Case Bottom

1.211 [30.76]
1.792 [45.52]
1.524 [38.71]
M3 HOLES 4 PLACES

Right Angle Bottom

5.115 [129.92]
2.151 REF [54.64]
1.792 REF [45.52]
1.524 REF [38.71]
M3 HOLES 4 PLACES
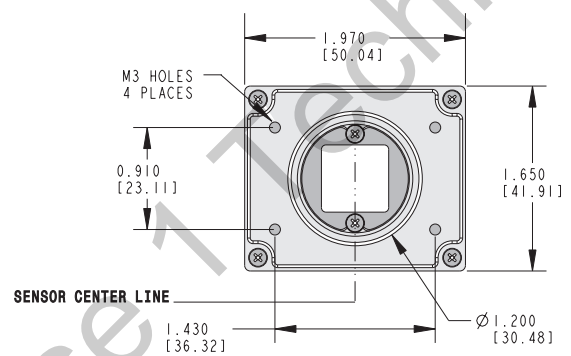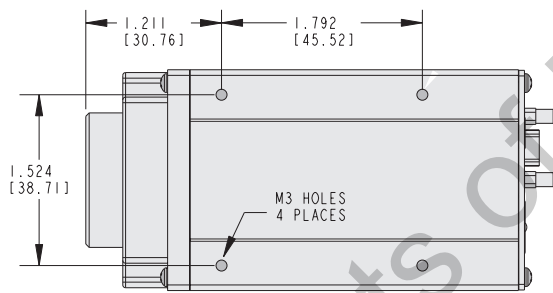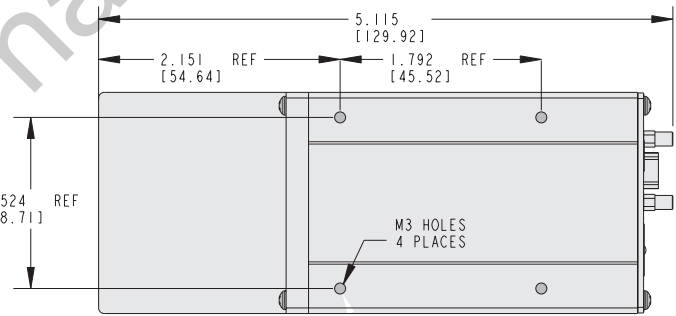
0dB Gain, 10bit Data

Responsivity [DN/(nJ/cm²)]
Wavelength [nm]
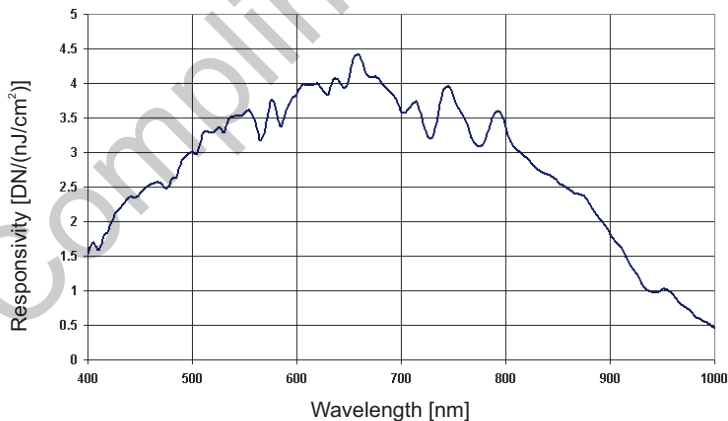
0dB Gain, Channel Gains at Unity, 10bit Data

Responsivity [DN/(nJ/cm²)]
Wavelength [nm]

Red   Green   Blue

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