

# PixelINK®

A NAVITAR COMPANY

## PL-D732

CMOS | CMOSIS CMV2000 | GLOBAL SHUTTER

The PL-D family of cameras links together the benefits of high frame rate CMOS technology with the high speed data throughput of USB 3.0 technology. The PL-D732 camera provides low noise images for outstanding value in a broad range of industrial applications.



### KEY FEATURES

2.2MP

CMOS



FRAMES  
Per Sec



5.5  $\mu$ m



12.75 mm



12 BIT



COLOR



MONO



USB 3

### TYPICAL APPLICATIONS

Parts Inspection  
Strength Testing  
Metrology

Biometrics  
Medical Imaging  
PCB & Flat Panel Display Inspection

## DESCRIPTION

The PL-D family of USB 3.0 cameras links together the benefits of high frame rate CMOS technology with the high speed data throughput of USB 3.0 technology. The PL-D732 camera provides low noise images for outstanding value in a broad range of industrial applications. The camera features a 2.2 megapixel (2048 x 1088) resolution imager.

The PL-D732 cameras are based on a CMOSIS CMV2000 CMOS global shutter sensor with a 2/3" optical format. The extensive built-in image processing possibilities (image pre-processing) result in outstanding image quality, less load on the system and higher performance. These cameras provide the user choice of 8-bit or 10-bit digitization and a dynamic range of 60dB and 90dB using extended shutter. The external hardware trigger and 2 general-purpose outputs ensure users have the flexibility to synchronize the camera with their processes and illumination.

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. Overall system costs are reduced and camera integration is simplified.

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.

## GENERAL FEATURES

- Great image quality
- Compact size
- One common API for all cameras
- Board level and enclosed models
- Tethered sensor head option 6"/12" (\*Board Level version only)
- Auto & manual exposure
- Programmable LUT
- Auto & Manual White Balance
- Saturation
- Binning and Decimation
- Image Flip & Rotate
- Callbacks (Image Filters)

## SENSOR FEATURES

- 2.2 MP (2048 x 1088) Resolution
- CMOS Global Shutter
- Flexible Region of Interest (64 pixel H x 64 pixel W granularity)
- 8-bit or 10-bit digitization

## SOFTWARE FEATURES

- [PixeLINK Capture Software](#) - a test and configuration software, with real-time, interactive multi-camera application.
- [PixeLINK SDK](#) - providing full access to the PixeLINK API, as well as sample applications with full source code.

## AVAILABLE CONFIGURATIONS

PL-D732CU

PL-D732CU-BL

PL-D732CU-T

PL-D732CU-AF25

PL-D732CU-BL-AF25

PL-D732CU-BL-AFE16

PL-D732CU-BL-AFE25

PL-D732CU-BL-AF35

PL-D732MU

PL-D732MU-BL

PL-D732MU-T

PL-D732MU-AF25

PL-D732MU-BL-AF25

PL-D732MU-BL-AFE16

PL-D732MU-BL-AFE25

PL-D732MU-BL-AF35

PL-D732MU-NIR

PL-D732MU-NIR-BL

PL-D732MU-NIR-T

PL-D732MU-NIR-AF25

PL-D732MU-NIR-BL-AF25

PL-D732MU-NIR-BL-AFE16

PL-D732MU-NIR-BL-AFE25

PL-D732MU-NIR-BL-AFE35

### Color Space

C - Color

M - Mono

NIR - Near Infrared

### Interface

F - Firewire

G - GigE

U - USB

### Housing

BL - Board Level

T - Trigger

CYL - Cylindrical case

### Autofocus

AF - Autofocus Lens (in mm)

AFE - Edmund Optics Autofocus Lens (in mm)

# TECHNICAL SPECIFICATIONS

## SENSOR

Sensor	CMOSIS CMV 2000
Type	CMOS Global Shutter
Resolution	2.2 MP (2048 x 1088)
Pixel Pitch	5.5 $\mu\text{m}$ x 5.5 $\mu\text{m}$
Active Area	12.75 mm diagonal
Peak QE	63%

## PERFORMANCE SPECIFICATIONS

FPN	< 0.1 % of signal
PRNU	<2% of signal
Dynamic Range	60 dB
Bit Depth	8 or 10-bit
Color Data Formats	Bayer 8, Bayer 16 and YUV422
Mono Data Formats	Mono 8 and Mono 16

## MECHANICALS

Dimensions (mm)	32 x 48 x 11 (without lens mount)
Weight (g)	35.8 (without optics)
Mounting	C-Mount, CS-Mount and S-Mount

## INTERFACES

Interface   Data rate	USB 3.0   Micro-B   5Gbps
Board Level Trigger Connector	8-pin Molex 1.25mm pitch
Enclosed Trigger Connector	Hirose round 8-pin
Trigger Mode 0	Software and hardware
Board Level Trigger Input	1 input, 3.3V (with internal pullup resistor)
Enclosed Trigger Input	1 optically Isolated, 5-12V DC at 4-11 mA
Board Level GPO/Strobe	2 outputs, 3.3V
Enclosed GPO/Strobe	2 outputs, 3.3V and 1 optically isolated max 40V DC, max 15mA

## FRAME RATE

Resolution	Free Running
2048 x 1088	170 fps
1920 x 1080	170.8 fps
1280 x 1024	180.1 fps
640 x 480	380.4 fps

Frame rates will vary based on host system and configuration

\*Above calculations based on fixed frame rate mode

## POWER REQUIREMENTS

Voltage Required	5V DC (from USB connector)
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## PIO INTERFACE PIN OUTPUT DESCRIPTION

Pin	Pin Name & Function
1	3.3V power output
2	TRIGGER, 3.3V HCMOS input
3	Ground
4	GPO1, 3.3V HCMOS output
5	GPO2, 3.3V HCMOS output
6	Clock, 3.3V (12C access for OEMs)
7	Data, 3.3V (12C access for OEMs)
8	No connection

Board connector: Molex 53398-0871 (8-pin, 1.25mm pitch, vertical); Cable receptacle: Molex 51021-0800; Cable crimp terminals: Molex 50079-8100

## ENCLOSED GPIO INTERFACE PIN OUTPUT DESCRIPTION

1	VBUS (Power output from USB3 cable)
2	TRIGGER + (optically isolated)
3	TRIGGER - (optically isolated)
4	GPO1 + (optically isolated)
5	GPO1 - (optically isolated)
6	GPO1, 3.3V HCMOS output
7	GPO2, 3.3V HCMOS output
8	Ground (logic and chassis ground)

## SOFTWARE

PixelINK Capture	<a href="#">Test and Configuration Software</a>
DirectShow	Bundled with PixelINK Capture
TWAIN	Bundled with PixelINK Capture
SDK	<a href="#">API, sample code and LABVIEW wrappers</a>

## ENVIRONMENTAL & REGULATORY

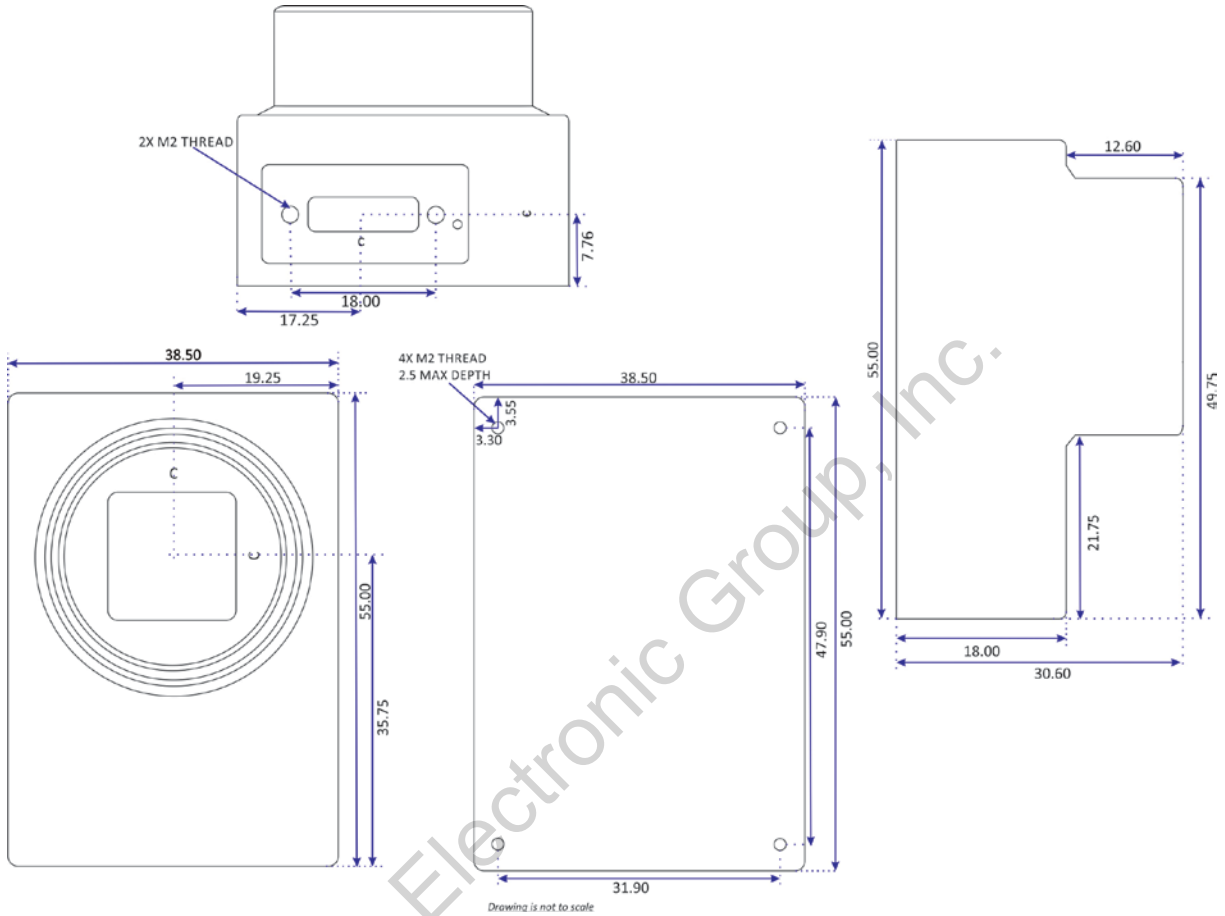
Compliance	FCC Class B, CE & RoHS
Shock & Vibration	300 G & 20 G (10Hz - 2KHz)
Operating Temperature	0°C to 50°C (non-condensing)
Storage Temperature	-45°C to 85°C

## COMPUTER & OPERATING SYSTEM

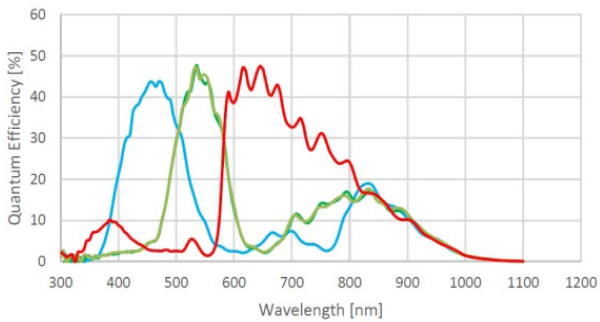
	Windows	Linux x86	Linux ArmV7	Linux ArmV8
Processor	Intel i5 or better	Intel i5 or better	Arm7 (32 bit)	Arm8 (64 bit)
Memory	4GB recommended	4GB recommended	2GB	2GB
Hard Drive Space	150 MB	150 MB	50 MB	50 MB
Operating System	Windows 7/8/10	Ubuntu 14.04 / 16.04 Desktop	Ubuntu 14.04 Desktop	Ubuntu 14.04/16.04 Desktop

# MECHANICAL DRAWINGS & RESPONSIVITY CURVES

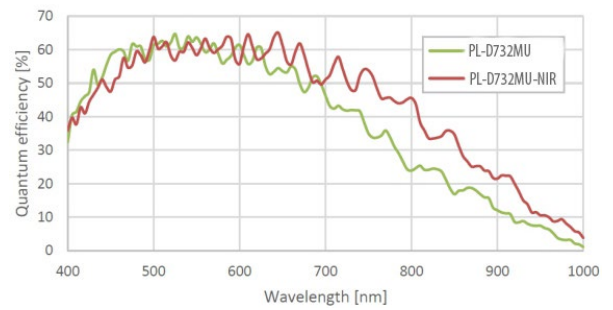
## MECHANICAL DRAWINGS



## RESPONSIVITY CURVE – COLOR SPECTRAL RESPONSE



## RESPONSIVITY CURVE – SPECTRAL RESPONSE



## PixeLINK Capture Software

PixeLINK Capture is a real-time, interactive, multi-camera application. This software is compatible with all PixeLINK's USB 3.0 line of cameras and has been developed using the most advanced software development tools in the market to provide an unmatched multi-camera user experience. [Click here to download the PixeLINK Capture software.](#)

PixeLINK Capture is an advanced application with an agile and friendly user interface. Users now have the ability to drag and drop or arrange windows as they like. As a multi-camera application with a built-in autofocus application, PixeLINK Capture offers tremendous flexibility and power allowing vision engineers the ability to configure and test multi-camera vision applications.

PixeLINK Capture's built-in autofocus application supports both single point and multiple point autofocus. When launched with an autofocus camera, the application takes advantage of the speed of liquid lens technology and displays the time in milliseconds, for each autofocus shot.

For the advanced user, PixeLINK Capture offers options of more complex image enhancements for exposure control, filtering, frame-by-frame property changes, all viewable in the preview window prior to capture.

### SOFTWARE FEATURES

Capture Tab	The "Capture" tab allows the user to capture images in different ways, i.e, one at a time, automated using a "trigger", and elapsed time. The user will also be able to capture images in various file formats like BMP and JPEG.
Effects	An "Effect" transforms the image's pixel data just prior to display or capture. Typically this function is intended to process an incoming image. The effects tab allows the user to select a pre-defined callback on real-time or captured images.
LUT	The Lookup table (LUT) control provides the user an easy way to manipulate the grey scale image data coming from the camera via a simple lookup table.
Layout	The user will be able to stream multiple cameras with this application. To control cameras together and keep organized under the same window, the software has a user-friendly multiple window layout feature.
Preview	The preview panel displays live images from the camera which begins streaming immediately when the software is launched. If multiple cameras are connected to the system, then any random camera from the camera tray will start streaming. The preview panel in PixeLINK Capture has been designed with functionalities that allow the user the ability to control a camera directly from the preview panel.
Settings	The settings tab controls the image quality in real-time as seen on the preview window. Controls like exposure, gain, etc. are contained in this tab.
Triggers and GPO Tab	This tab allows the user to control external devices such as triggers and strobes connected to the camera.
Video	The video tab allows the user the ability to capture and display "video clips" or group of frames (partial or full), save the raw data and further save the formatted clip so that it can be previewed at a later date.



# DIGITAL IMAGING MADE SIMPLE

The use of PixelINK machine vision cameras in industrial environments has been proven in numerous applications. Used by both end-users and OEMs, PixelINK offers high quality, reliable off-the-shelf and custom industrial camera solutions to customers around the world.

Only PixelINK can provide you with a custom machine vision camera solution that matches your specific business need. Our custom design services will help you select and integrate the best machine vision camera for your particular application. Contact us today!

PixelINK, a part of the [Navitar](#) family, designs and manufactures reliable industrial cameras and microscope cameras for any machine vision project or microscopy application. Used by both OEM and end-user customers, our custom and off-the-shelf cameras are used in imaging projects around the world.

At PixelINK, we combine reliable industrial camera hardware with industry-leading software to offer unmatched off-the-shelf, OEM and industrial imaging solutions to customers.

PixelINK U.S.A.  
200 Commerce Drive  
Rochester, NY 14623, U.S.A.

PixelINK Canada  
1900 City Park Drive, Suite 410  
Ottawa, Ontario K1J 1A3, Canada