



PIXIM ECLIPSE™ Ambient Light Rejection Camera

Camera Development Kit

Pixim Reference Designs Speed Time-to-Market for Security Camera Developers

Highlights

- › **Produces constant, identifiable images in any ambient light**
 - Completely rejects glare, flare, shadows, and motion artifacts
 - Offers the shortest inter-frame delay (down to 10µs) of any IR-subtraction camera
- › **Improves the accuracy of image-based and video analytics algorithms for a wide range of applications**
 - License plate capture with no motion artifacts, even for very fast-moving vehicles
 - Biometrics applications such as facial and iris recognition
 - Facial imaging at ATMs, military installations, and for facial and eye tracking including glint detection
 - Surveillance including image-based alarms and electronic trip wires
 - Machine vision using structured light or back lighting
- › **Self-contained, compact, low-power system**
 - Fits into small spaces
 - Able to be unobtrusive
 - 3W maximum power with 12VDC input
- › **Flexible operations**
 - Total capture time (IR on plus IR off) can be adjusted down to 300µs
 - Configurable for NTSC and PAL CCTV standards

The Eclipse camera is a special-purpose video camera that delivers consistent monochrome images under all lighting conditions.

Based on Pixim's innovative Digital Pixel System[®] technology – an image capture and processing system that delivers high-quality video images with enhanced dynamic range – the Eclipse camera overcomes the challenges imposed by ambient light in applications such as facial imaging, surveillance, and machine vision.

Pixim's Digital Pixel System technology's fast exposure capability, together with the Eclipse camera's synchronized-IR active capture and global electronic shutter, enables extreme ambient light rejection, and indeed elimination, without any motion artifacts. As a result, the Eclipse camera produces consistently identifiable images ideal for applications such as license plate capture and facial recognition.

Eclipse captures images using a short, programmable exposure within each TV field. A second exposure of the same interval occurs shortly thereafter synchronized to the modulated IR light source. The camera subtracts the two images prior to read-out, creating a monochrome TV field with only the modulated IR light visible.

The Eclipse camera is the most compact and low-power IR-subtraction camera available on the market.

Eclipse is internally synchronized, with the IR source and exposure timing tuned for the application. The default IR illumination wavelength is set to 880nm, but it can be modified to suit a variety of applications. The wavelength is fixed by selection of the band pass filter and illuminator LEDs.



Flare and glare are totally rejected



Conventional color image



Eclipse image

Eclipse's IR lamp is driven from an external port and can be located outside the camera, even at very long distances, providing maximum application flexibility. For example, the illuminator can be located near an entryway and the camera located hundreds of feet away in a convenient location. The spatial relationship between the subject, illuminator, and camera is configurable and depends on a combination of factors including illuminator power, lens aperture, exposure time, and scene reflectivity.

An architectural advantage allows the Eclipse camera to offer the shortest elapsed time between the subtracted frames. This eliminates noise from the subtracted image that would otherwise be there because of field-to-field registration issues caused by motion or vibration. The Eclipse frames are so close in time that all sensor noise sources are subtracted, resulting in a crisp image. Using Pixim's Digital Pixel System technology ensures ambient light rejection and elimination much greater than other solutions, the best of which are typically 100:1 or less.

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Pixim[®] Digital Pixel System[®] Technology

Pixim's patented Digital Pixel System technology marks a fundamental breakthrough in imaging technology. Built upon technology developed at Stanford University in the 1990s, Pixim has created an image capture and processing system that provides high-quality pictures with enhanced dynamic range that significantly improves image quality in scenes consisting of both bright and dark areas.

The core invention is the inclusion of an analog-to-digital converter (ADC) within each pixel of the image sensor. The ADC translates the light signal into a digital value at the immediate point of capture, thus minimizing signal degradation and cross-talk in the array and allowing for greater noise reduction methods. Once the data is captured in a digital format, a variety of digital signal processing techniques are used for optimal image reproduction.

**DIGITAL
PIXEL
SYSTEM**
FROM PIXIM

Eclipse Camera Development Kit (CDK) includes:

- › Standard C/CS mount box camera with lens and optical filter
- › IR illuminator
- › Eclipse technology specification
- › Camera Reference Design including schematics, layout, mechanicals, and BOM
- › Evaluation software

Also Available from Pixim:

- › Board camera module with standard M12 or 14mm board lens mount (lens, optical filter, and illuminator not included)