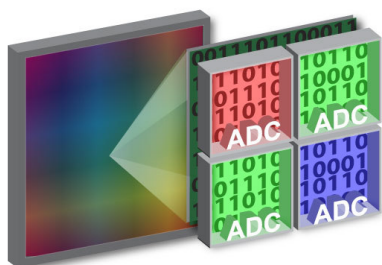


Pixim Digital Pixel System® Technology Backgrounder

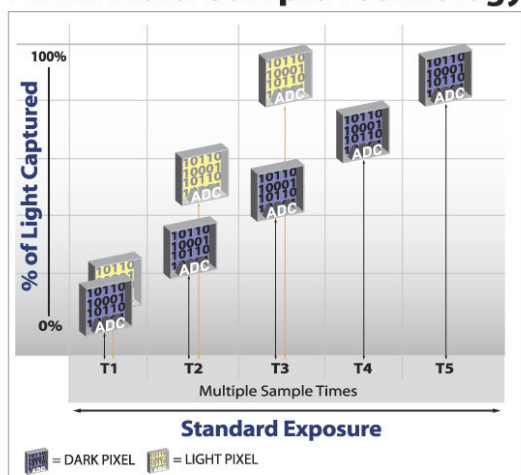
Pixim’s patented Digital Pixel System (DPS) technology marks a fundamental breakthrough in imaging technology. Building upon technology developed at Stanford University in the 1990s, Pixim has created an image capture and processing system that provides high-quality pictures with enhanced dynamic range.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



The DPS Invention

The core invention in DPS 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.

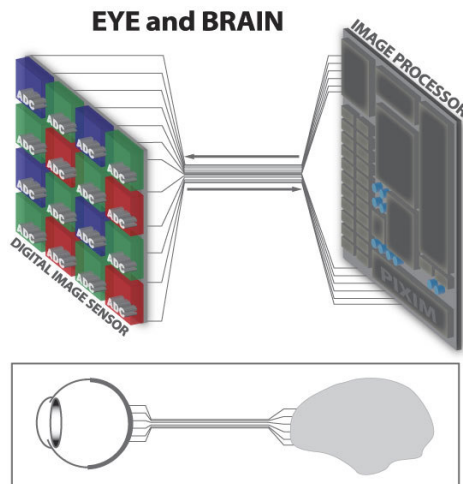
Pixim Multi-Sample Technology



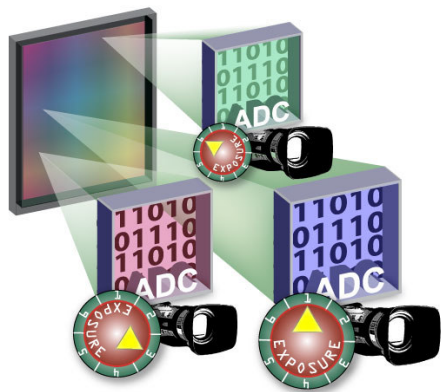
Pixim’s DPS technology uses a technique known as “multi-sampling” to gather the information to achieve unmatched image quality and high dynamic range. Each pixel is independently sampled non-destructively multiple times in a single capture frame (which in video is typically 50 or 60 times per second). The imaging system determines the optimal time to sample and store the pixel information before the pixel is saturated and can no longer hold additional charge. In the graphic on the left, the light pixel is saved at time T3, the latest sample time before it saturates at 100 percent. The dark pixel builds up charge more slowly and uses additional time until it is sampled and stored at T5. The stored values of information (intensity, time, noise offset) captured at each pixel are then processed in parallel and converted into

high-quality images. In contrast, other technologies typically set one exposure time for the frame and sample each pixel at that time – resulting in images with some pixels that are underexposed (too dark) and some that are overexposed (too bright).

Pixim's first product based on DPS technology, the D2000 Video Imaging System, like the latest generation, D2500, are comprised of a digital image sensor and a digital image processor. The digital image sensor and digital image processor function much like the eyes and brain in humans, with two-way real-time interactivity to capture the highest quality image possible. Just as the brain of a person walking into a dark room instructs the eyes to open the pupil to allow in more light, the digital image processor loads new code into the sensor to alter not only exposure times but the actual image capture algorithms. The result: the best possible picture given the specific image characteristics and lighting conditions.



Every Pixel Is A Camera



Because each pixel has its own analog-to-digital converter and the information generated is captured and processed independently, each pixel in effect acts as its own camera. The exposure time for each pixel is adjusted to handle the unique lighting conditions at that pixel location in the image sensor array. A product built with the Digital Pixel System platform essentially has hundreds of thousands of individual cameras, each of which produces the best image possible. These images are then combined to create a high quality video frame or picture.

As imaging technology continues to migrate toward totally digital systems, Pixim's Digital Pixel System technology will provide the foundation for image capture and image processing for the highest quality video and still cameras.