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DIGITAL PIXEL SYSTEM

PIXIM REVIEW

Retail Security

Security Cameras – a Valuable Ally in Fighting Retail Theft

Retail stores worldwide face serious problems with shoplifting and employee theft. One way to catch potential thieves in the act is with security cameras. Traditionally, however, the cameras have been less than effective in identifying suspects.

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Pixim-Powered Cameras Overcome Unique Challenges Faced by Retailers

Retailers worldwide might earn trillions of dollars cumulatively, but they also lose billions each year to "inventory shrinkage" – the official term for stolen goods, or shoplifting – as well as other types of losses, such as mis-scanning, under-charging, and false accusations of falls or injuries. Security cameras and public view monitors (PVMs) have become an important component of retailers' overall security. But traditional cameras can't "see" well what's happening when lighting conditions aren't optimal, including dark parking lots, with or without overhead lights; through glass doors or windows, especially with bright sunlight shining through; facing straight outdoors, as most PVMs are oriented; under fluorescent lights; or any time there's a mix of bright light and shadows.

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At-A-Glance:

Pixim Digital Pixel System® (DPS) Technology

- Widest Dynamic Range (WDR): Captures up to 1024 times more data (dynamic range) than standard CCD cameras
- Signal-to-noise ratio (SNR): >50 dB (max)
- Sensitivity: <0.5 lux (CMY) minimum illumination f/1.2, 50 IRE
- Resolution: 540 horizontal TV lines (HTVL) equivalent

Security Cameras – a Valuable Ally in Fighting Retail Theft [continued]

The reason? Cameras poised above glass entry doors could be easily foiled by strong backlighting or glare, resulting in images that give little information about what a person looks like. Cameras aimed at store aisles could fail to discern facial features in the shadows or under bright fluorescent light. Cameras subject to harsh weather conditions could degrade in terms of image quality. And public view monitors (PVMs) located at entryways and vestibules rarely capture accurate color, skin tone, etc. in the radically changing lighting.

But ultra-wide dynamic range cameras based on Pixim's revolutionary image processing technology overcome these hurdles. Pixim-Powered security cameras can detect facial details in bright light and deep shadows simultaneously, and they are designed to operate across a larger temperature range than are traditional CCD-based cameras.

Pixim-Powered cameras' superior color and higher resolution in backlight situations make them a valuable ally in the fight against retail theft.

An Inside Look: Digital Video Recorders

Pixim's DPS Technology, compared with CCD technology, enables the higher compression of images taken by security cameras, which leads to advantages for DVRs:

- Allows the use of higher-resolution settings on the DVR without sacrificing the overall recording time (i.e., # days on a DVR).
- Enables more frames per second to be written on the DVR without sacrificing overall recording time (i.e., # days on a DVR) or resolution.
- Permits the connection of more cameras to each DVR, without sacrificing resolution or frame rate.
- Provides recordings with higher image quality, for more accurate identification of people and events and for more compelling evidence.
- Makes it easier to comply with FBI and other regulations that require storage of 10 to 30 days of video – without sacrificing resolution, lowering the frame rate, or reducing the number of cameras connected to each DVR.
- Optimizes the investment in expensive DVRs.

The U.S. Chamber of Commerce estimates that employee theft costs businesses 10 times more than the value of street crime losses annually in the U.S.

Pixim-Powered Cameras Overcome Unique Challenges Faced by Retailers [continued]

CCD **Pixim**

- Significant loss of information in strong backlight
- Both indoor and outdoor detail clearly visible

CCD **Pixim**

- Limited visibility
- Cannot see details in dark or bright light
- Superior image quality despite harsh lighting conditions

U.S. retail losses from theft and fraud reached $41.6 billion in 2006, a record high.

source: the National Retail Security Survey

Common security camera problems for retailers include:

- Lack of detail, including facial features of shoppers and employees
- Inconsistent clarity in bright or low light, or high-contrast lighting situations, such as entries, checkout areas, parking lots, store aisles, warehouses and loading docks
- Degraded or no image when there's strong glare
- Color inaccuracies in varying lighting conditions
- Low-quality Digital Video Recorder (DVR) recordings

Pixim's Digital Pixel System (DPS) ultra-wide dynamic range technology, a true breakthrough in imaging technology, delivers unprecedented image quality in all lighting conditions. Cameras powered by Pixim's specialized image processing chipsets can significantly enhance retail security through the following capabilities:

- **Widest dynamic range:** Captures highlight and shadow detail – including backlit faces – in the same scene.
- **Highest total resolution:** Makes it easy to distinguish image features and details, even in highly variable lighting conditions.
- **Superior color rendering:** Accurately displays color even in difficult lighting such as backlight, high-contrast scenes, glare, and fluorescent lighting.
- **No "camera blindness":** Eliminates the vertical smear, pixel blooming, and other image artifacts commonly encountered in high-contrast scenes.
- **High image compression:** Improves image quality with smaller file size – allowing DVRs to record with higher frame rate or higher resolution, or both, while maintaining the same total recording time.

Security cameras based on Pixim technology enable retailers to capture details of people and activities, even in variable and challenging lighting conditions, whether in parking lots, store aisles, checkout areas, or loading docks. They also help retailers optimize their security investment by improving DVR image and compression performance. The superior color and resolution produced by Pixim-Powered cameras can help retailers identify shoplifters or employee thieves and potentially recover or prevent a portion of the inventory shrinkage they suffer each year.

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