

Matrix Systems & Solutions

Operating since 1993, Matrix Systems & Solutions provides process manufacturers with packaging execution and warehouse management system applications, as well as consulting and professional services.



The Challenge: Reliably Track 10 Million Documents per Month

Matrix Systems & Solutions were asked to design and deliver a turnkey solution for a document mailer that processes around 10 million documents on a monthly basis. The system is required to track and verify extremely sensitive medical documents as they are machine inserted. Because of the nature of these documents, the system is required to be error-free in order to prevent any costly lawsuit; a 0.5% error rate would be unacceptable.



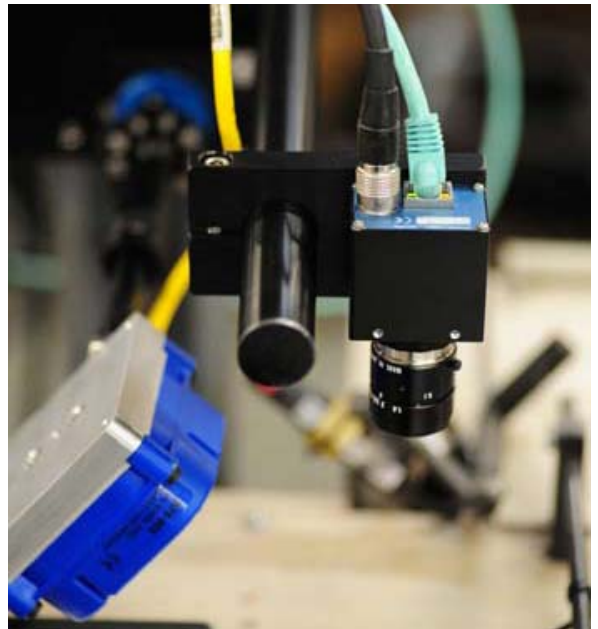
The Solution: "Freezing the Shot"

The system requires a very accurate camera capable of "freezing" the shot of the envelopes that are in constant motion. In addition, the Datamatrix bar codes can prove difficult to read due to their small size (less than 6mm - ¼ inch square) and because they must be read through a plastic window which creates unpredictable shadows, hotspots and glare. Strobe lighting at a low angle is used to help with this issue.

The system consists of a **Prosilica GC1020** monochrome camera mounted 15cm (6 inches) above the inserter and looking down. The camera images continuously at 30 frames per second to capture still images of the documents as they are pulled in a pre-defined sequence and fed on to a conveyor belt.

The images are transmitted to a PC operating a Datamatrix decoder and OCR software that read the bar codes to spot any breaks in the sequence, and therefore any errors.

The **Prosilica GC1020** is an XGA resolution (1024x768) ultra-compact CCD camera that was chosen for a combination of factors: speed, resolution, price, GigE interface, free SDK and Linux support.



Implementation With Linux

Matrix Systems & Solutions used the Prosilica GigE SDK for Linux to develop the operating software for this application. The software is designed so that it first reads the captured image pixel by pixel in order to locate the Datamatrix code and, once located, decode it at high speed (about 10,000 bar codes/hour). The Matrix system, including the Datamatrix decoder and the OCR software, was built from scratch without the use of any third-party tools and is compatible with all Prosilica cameras. Matrix also specified and fabricated custom-built bracketry and a controller unit including strobe functionality, central power, a touch screen, I/O, as well as Linux and Windows support.



Prosilica, Pioneer in GigE Vision Cameras

PROSILICA



Founded in 2003, Prosilica of Burnaby, BC (Canada) is a pioneer of the introduction of digital cameras with Gigabit Ethernet interface in the machine vision market. Prosilica designs and manufactures high-performance GigE Vision digital cameras for a wide variety of applications and is a 100% subsidiary of Allied Vision Technologies since 2008.

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