

TechniScan Medical Systems

TechniScan Facilitates Precise and Painless Breast Exams using Galil Controllers

Early detection and treatment is one way to try to beat breast cancer, which is why over 50 million women get screened for the disease each year. While necessary and often

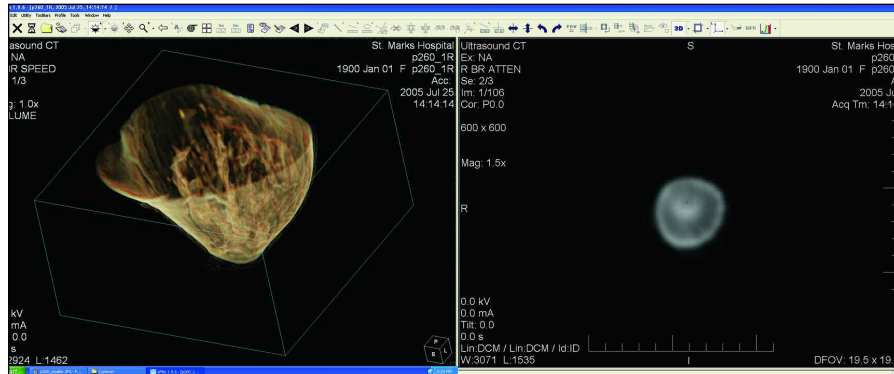
effective, mammography screenings can be traumatic, as it requires the breast to be squeezed between two plates and then exposed to x-rays and ionizing radiation.

Then there's the chance of getting a false result, especially since benign tumors often look like cancerous ones. Unfortunately, most women don't know this until they have a biopsy.

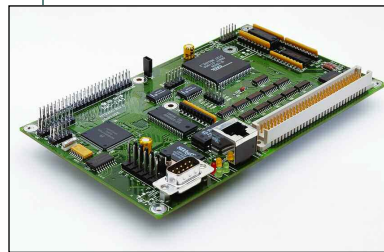
To improve this process, TechniScan Medical Systems developed their painless, non-invasive UltraSound CT (USCT™) imaging system. It augments mammography exams by providing more accurate, detailed information about the physical structures and bulk tissue properties within the breast. Now, physicians can differentiate normal or benign from malignant tissue, thus reducing prescribed biopsies.

During the USCT exam, patients lay face down on a table that lowers until their breast rests comfortably in a warm water bath. Then, opposing transmitting and receiving transducer arrays rotate around the breast in 2-degree increments, producing ultrasonic sound transmission data for the breast at each rotational position, and with approximately 1mm resolution.

All the precise movement and I/O required is handled by Galil's DMC-2143 4-axis Ethernet controller, SDM-20620 stepper module, and DB-28040 I/O daughter board. TechniScan's Systems Engineer, Martin Kammeyer liked being able to communicate commands and status from the host processor to the Galil controller via the Ethernet interface. "This provides an industry standard interface with maximum isolation between the data acquisition system where the host processor resides, and the general I/O and motion



Galil's DMC-2143 helps TechniScan produce revealing ultrasonic images.



control services provided by the controller."

Additionally, because the DMC-2143 controller performs all the functions related to I/O and motion control, the host

processor is isolated from such details as bit manipulation, event timing and error detection.

Kammeyer added, "Since the stepper drives and I/O are integrated right on to the controller,

it significantly shortened our development time and reduced the complexity of the design."

Other Galil advantages included:

- Optimum measurement accuracy and repeatability, which is crucial as repeated scans are taken on multiple breast levels and all the images must line up to produce an accurate 3D image.
- Dual loop compensation, which allows feedback from both the encoder on the actual scan shaft and the encoder on the motor. The dual feedback sensors and dual loop compensation eliminated the backlash errors from the gearbox on the motor.
- Status is always available to the host via a memory array on the DMC-2143 controller.

TechniScan's CEO Dave Robinson notes that with new information and 3-D ultrasound CT imaging, radiologists should expect to reduce biopsies and find more of the occult cancers that mammography misses. ■

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