

## CASE STUDY: MEDICAL AUTOMATION

**Solution:** CANopen system control  
**Country:** Italy  
**Company:** IMS S.r.l. — Internazionale Medico Scientifica  
**Summary:** IMS uses the IXXAT ECON100 embedded controller to control movement, X-ray emission, data acquisition, visualization, and safety chain in their Giotto Class mammography machine.



### The effects

- ✓ Advanced motion control within CANopen and proprietary CAN protocol.
- ✓ One system for motion control (CAN & CANopen) data acquisition (CAN) and user interface (CAN and Ethernet).
- ✓ Lower costs compared to using a regular PLC/IPC.

*“It is a compact and flexible system at a reasonable price considering the variety of features offered.”*

Paolo Vignoli  
R&D Manager at IMS

## State-of-the-art machine control makes for better mammography

**How Italian mammography machine manufacturer IMS uses the IXXAT ECON100 to control the movement and much more in their new Giotto Class Digital Breast Tomosynthesis machine – maximizing control and patient safety, while cutting costs in half.**

When designing medical automation equipment, there is no compromising with quality and reliability – patient safety always comes first. This is especially true when you have a machine with moving parts such as the new Giotto Class Digital Breast Tomosynthesis machine from IMS. This advanced machine can move around the patient taking X-ray photos from several different positions, providing physicians with better pictures for detecting breast cancer at an early stage. The Giotto Class can also be used for stereotactic and tomo biopsy examinations which further increases the importance of reliable and fail-safe motion control.

### CANopen used for motion control

As in many machines, the moving parts of the Giotto Class is mainly controlled using the CANopen protocol. IMS had been trying out different CANopen controller solutions but none of them quite lived up to their high demands. So when HMS Industrial Networks launched their IXXAT ECON100 embedded controller in 2013, IMS was keen to try it out. And they soon found that it was a good match for their state-of-the art machine.

“The IXXAT ECON100 is the brain of Giotto Class system,” says Paolo Vignoli, Research & Development Manager at IMS. “It is the master for the internal communication network and the logic control unit for about twenty different electronic boards. It controls movement, X-ray emission, data acquisition, visualization, and safety chain inside the machine. It also controls the biopsy accessory ‘SmartFinder’ when it is plugged in to the system.”

### A powerful and flexible solution

With the ECON100, IMS got a solution which includes the latest in networking technology. The Xilinx Zynq SoC – Dual-Core Cortex A9 processor provides state-of-the-art performance for the Giotto Class’ movements. Another feature which was crucial for



**Modern mammography.** The Giotto Class mammography/tomosynthesis unit with the optional accessories "FlexiTable" and "SmartFinder" for biopsy examination.

choosing the ECON100 was the two CANOpen ports which make it possible to configure communication at two different speeds — to adjust to different stub lengths within the network.

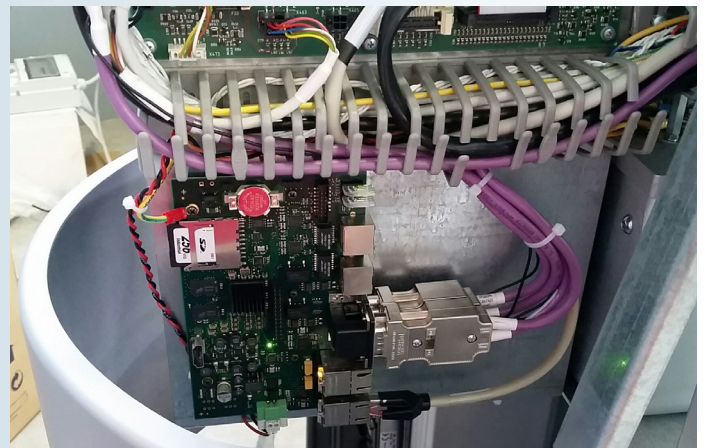
"The ECON100 offers two independent CAN networks with CANOpen standard and meets our demands for a 4 millisecond cycle time — this was very important for us" explains Paolo Vignoli. "It also handles an Ethernet communication network which we use to interact with the computers for the user interfaces. The Ethernet network can be also used for programming the device and for diagnostics during technical assistance."

### Half the price

As always when designing automation machinery, there is another important factor to consider – price. Although the ECON100 is a powerful embedded controller, it is not as complex as a fully-fledged PLC or an Industrial PC. But for many applications, the compact and versatile ECON100 is more than enough – and at half the price of a regular PLC or IPC.

### "Compact and flexible system"

Looking back at the development project, Paolo Vignoli can warmly recommend the ECON100 embedded controller: "The Linux-based system offers the required stability and robustness for our application. It is a compact and flexible system at a reasonable price considering the variety of features offered."



**On the inside.** The ECON100 (without the blue housing) embedded into the Giotto Class Digital Breast Tomosynthesis machine.



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Under the IXXAT brand, HMS Industrial Networks offers communication solutions for machines, safety and automotive. This includes standardized software and hardware as well as customized OEM solutions. With a long track record within CAN-related connectivity, IXXAT solutions enable communication inside cars, medical equipment, industrial automation devices etc. The IXXAT brand also includes safety solutions for industrial communication.