

ARUP LABORATORIES IMPLEMENTS MAGNEMOVER® LITE INTELLIGENT CONVEYOR SYSTEM TO IMPROVE OPERATIONAL PERFORMANCE

Part 1: Evaluation of the Need for New Automation and the Selection of MagneMotion's MagneMover LITE (MM LITE™) Intelligent Conveyor System

ARUP Laboratories is a leading national reference laboratory performing specialized clinical diagnostic testing on patient specimens for hospitals, clinics, and other reference laboratories across the United States. Founded in 1984, ARUP is a nonprofit enterprise of the University of Utah's Department of Pathology. The lab offers more than 3000 tests and test combinations, ranging from routine screening tests to esoteric molecular and genetic assays. When ARUP decided to update its aging auto-

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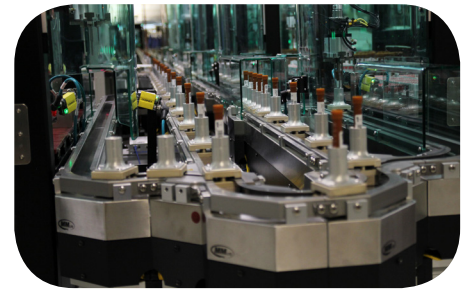
Dr. Charles Hawker, Scientific Director of Automation and Special Projects, ARUP

mation system for moving samples, they chose MagneMotion's MM LITE Intelligent Conveyor System to create a state-of-the-art transport system in line with their existing innovative automation.

CHALLENGE

ARUP is one of the most automated laboratories in North America. The lab is home to an 1100 foot automated transport and sorting system with a capacity of 6000 specimens per hour and a two story freezer automated storage and retrieval system with a capacity of 2.3 million specimens and a retrieval time of 2.5 minutes for a single specimen. The lab also boasts the world's only automated thawing and mixing work cells, the world's first automated camera system that uses OCR technology to identify potentially mislabeled patient specimens, and several other unique custom robotic and software systems. Collectively these systems have enabled ARUP to keep up with its rapid growth, and to improve quality, productivity and turn-around time. ARUP has become the first clinical laboratory in the US to achieve Six-Sigma quality for lost specimens in the clinical laboratory.

The existing automated transport and sorting system doubled ARUP's productivity and reduced its turn-around time by 30% when it was installed in 1998. While the system still performed well, maintenance



costs were increasing and replacement parts were becoming difficult to find. ARUP decided it was time to replace this system.

The new automated transport system needed to meet the following criteria:

- Have increased capacity to handle future growth
- Have low maintenance costs
- Enable ARUP to have control of the software and hardware
- Be "state-of-the-art" with technology that would last 10 - 15 years or longer

SOLUTION

To assist with the decision process, ARUP hired an independent consultant to make recommendations about the type of system best suited to ARUP's needs. The consultants were tasked with developing two proposals.

PROCESS OPTIMIZATION

SUCCESS STORY

The first proposal was based on ARUP's current "POD" accessioning and manifesting process which clusters four processing employees into a work group or pod.

There were approximately 30 pods in the existing layout, plus other staff supporting the pods with specialized assistance. The second proposal was for a complete redesign approach to accessioning and manifesting.

While analyzing the transportation piece of the new system, two conveyor systems were selected for a head-to-head comparison: MagneMotion's MM LITE and a new light weight, low energy, chain conveyor system from another vendor. Each system was put through a detailed investigation of major factors including cost, hardware, software, footprint, preventative maintenance, vendor, and specimen carrier. At the end of the investigation, each system was scored and ARUP's Automation Team came to a consensus that MM LITE would be the foundation technology of the new system based on the following conclusions:

- The MM LITE system has the advantage of speed with a sample retrieval time estimated at less than one minute.
- The mechanical connectivity and control architecture of the MM LITE track is essentially a "plug and play" system for the end user. ARUP will

realize greater efficiencies because they will not require an expensive, third party integrator

- The capability of the track to accurately locate and hold the specimens will reduce the complexity of other devices (i.e. sorters, robots, pick stations, etc.) that will interface directly with the conveyor. This reduction in complexity will result in reduced initial costs and allow for a more robust system overall
- MM LITE is a "greener" system and realizes lower operating costs than other conveyors. The motors only activate when needed rather than running non-stop throughout the day as the current system and other traditional conveyors do
- There is virtually no torque or friction wear with LSM technology, so the motors run cool and clean resulting in lower maintenance costs
- LSM technology is highly innovative and advanced; a perfect fit for ARUP's world class automation systems

System Design and Testing

During the track design MagneMotion shared layout ideas and strategies that minimized track lengths and optimized track paths. This helped control costs and positioned ARUP for optimal flow of specimens to device destinations.

The MagneMotion track, which consists of 1 meter, ½ meter, and ¼ meter straight sections, 90 degree curves, and switches, is very modular and facilitates functional designs that are efficient and simple. During several phases of the project the track layout required modifications to accommodate additional hardware and track efficiency and ARUP was able to add and remove sections to modify the track and change functionality without relying on MagneMotion for hands-on support.

Prior to final installation, over 200 meters of track, integrated with 20 different robotic systems, was installed in an off-site facility. This gave ARUP the necessary time to program and test the entire system, including all of the robotic systems, without disrupting their laboratory operations. This also allowed for the opportunity to better optimize puck movement and flow throughout the MM LITE system than had originally been designed in theoretical models.

SUMMARY

In the fall of 2014, ARUP successfully installed their state-of-the-art automation system, based on MagneMotion's MagneMover LITE technology, with more than 200

PROCESS OPTIMIZATION



SUCCESS STORY

meters of conveyor and 20 different robotic systems.

Programming of the system has been completed as has much of the testing and validation. "Based on what we have learned, the MM LITE system will meet our needs in our production laboratory facility," commented Dr. Charles Hawker, ARUP's Scientific Director of Automation and Special Projects. "MM LITE is fast, reliable and flexible with the ability to keep pace with ARUP's potential growth. We feel the system will outperform and outlive our previous automation system."

FOR MORE INFORMATION:

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