One Mega-Fixu storage unit has space for approximately 30,000 medication packages. Number and sizes of storage units can be selected by customer.

Robot-assisted order picking system automates medical supply processes

# Pharmacy automation advances with PC-based control technology

Finnish company NewIcon specializes in automation solutions for pharmacies. The robot-assisted "Mega-Fixu" storage and retrieval system automates medicine supply and is deployed mostly in hospital pharmacies. The modular solution can be custom-tailored to meet the specific needs of each medical facility. The system can also be integrated seamlessly into the customer's ERP system, leveraging a Beckhoff Industrial PC as the central control platform.
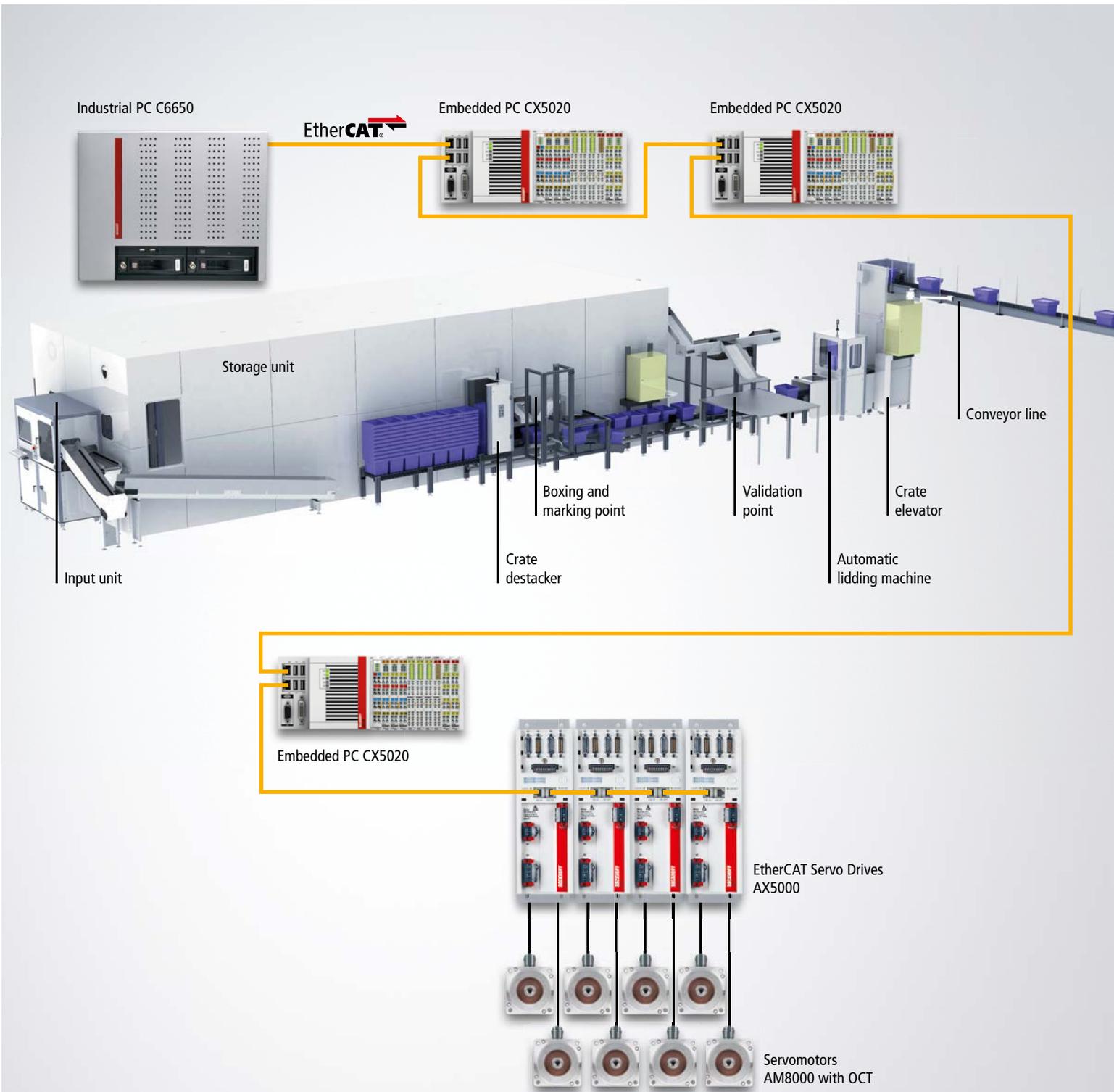
A quick and reliable solution, Mega-Fixu completely automates the identification, shelving and dispensing of medications, enabling pharmacists and medical staff to eliminate tedious and repetitive activities. It also improves safety, because the enclosed storage system keeps medications safe and secure, and continuously monitors environmental temperature and medication expiration dates. Possible human error when storing and picking medications are therefore a thing of the past. Other benefits include improved workplace ergonomics and more efficient use of space. In terms of scale and cost, each NewIcon storage system is custom-tailored to fit the size and turnover of the respective pharmacy.

**High-powered platform integrates PLC, image processing and database functions**

The control system and database run on a Beckhoff C6650 Industrial PC (IPC) equipped with a powerful Intel® Core™ i7 quad-core processor as well as a RAID controller and redundant hard disks. The control system, database and ERP link are based on TwinCAT automation software. "The reliability and performance of the IPCs are very important to us because the database comprises 150,000 data points for the various storage positions," explains Mika Rissanen, automation manager at NewIcon. "In addition, the openness and modularity



Mika Rissanen, Automation Manager at NewIcon Oy

Industrial PC C6650

EtherCAT

Embedded PC CX5020

Embedded PC CX5020

Storage unit

Conveyor line

Boxing and
marking point

Validation
point

Crate
elevator

Crate
destacker

Automatic
lidding machine

Input unit

Embedded PC CX5020

EtherCAT Servo Drives
AX5000

Servomotors
AM8000 with OCT

**All the controls of the NewIcon's Mega-Fixu system are based on Beckhoff
automation components, ranging from the powerful C6650 Industrial PC as
a database server to CX5020 Embedded PCs that control the storage system,
conveyor and drive components. All communication functions are handled by
the EtherCAT real-time industrial Ethernet system.**

of the solution were among the criteria that solidified our decision to employ PC-based control technology. The modularity of our system perfectly matches the modular control architecture offered by Beckhoff. We also had the ambitious goal to integrate the database, image processing and automation system on a single PC platform." The powerful C6650 IPC with EtherCAT as the complete communication system have made this possible. Other system benefits mentioned by Rissanen include lower total cost of ownership and integrated support for remote access. "By implementing a PC-based control system, we now have the option to access Mega-Fixu applications remotely for maintenance purposes," explains Rissanen.

The Mega-Fixu system has a robot-assisted input unit where each package is identified and measured via a barcode reader and an intelligent image processing system. Following this step, the control system determines the most suitable storage location for the package. The system's X/Y servo axes controlling the robots that shelve and retrieve medicine packages are equipped with Beckhoff AM8000 series motors that feature One Cable Technology (OCT), as well as 2-channel AX5000 Servo Drives. The servo axes' movements are controlled via DIN rail-mounted CX5020 Embedded PCs from Beckhoff.

### Future developments include predictive diagnostics and condition monitoring

"Since the order picking systems for pharmacies and hospitals must work trouble-free and be highly reliable, it's best when service and maintenance are performed proactively," explains Mika Rissanen. "The number of systems we have shipped has increased so rapidly that we are considering an even more comprehensive diagnostic and monitoring approach. The TwinCAT IoT and TwinCAT Analytics software tools will make it easy for us to integrate cloud-based services and automated diagnostics into our systems in the future," says Rissanen. "We appreciate that Beckhoff provides the ability to use the Internet of Things as an integrated part of an automation system and also as a simple, totally separate data collection system that can even be added to existing installations."
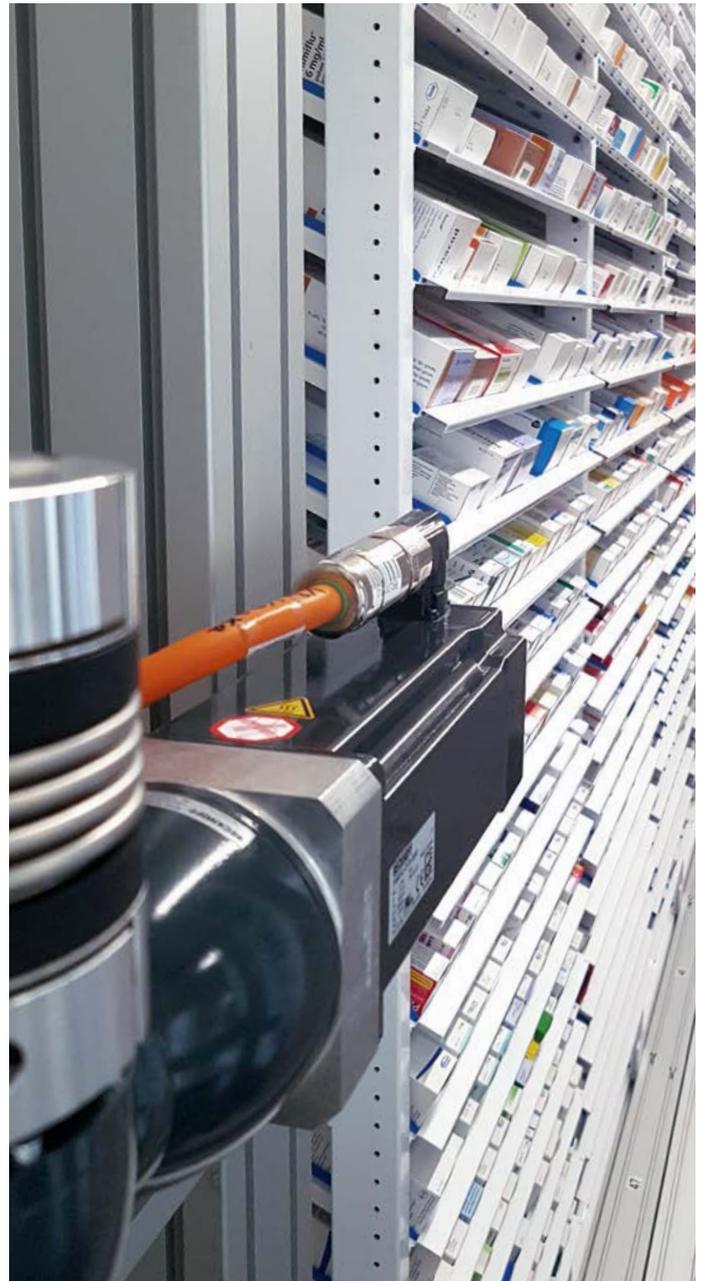
AM8000 series servomotors with One Cable Technology (OCT) ensure that the robot is always in the right position for package handling.

## NewIcon Oy

NewIcon Oy, a healthcare technology company founded in 2007 and located in Kuopio, Finland, employs more than 50 people. Company revenue in 2015 was approximately 5.5 million euros, and business is growing rapidly. NewIcon is the market leader in Finland in terms of storage automation systems for pharmacies and hospitals.

Further information:
www.newicon.fi
www.beckhoff.fi