

CUSTOMER SUCCESS STORY

Maluka speeds up food cartoning process with OMRON servo drives

Maluka

Śmigno,
Poland



High-speed
multi-format cartoning



Compact and
space-efficient design



Seamless motion
control



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Key Benefits

1

Efficient handling of horizontal and vertical product orientations in one system

2

High-speed operation with up to 320 products per minute

3

Flexible, modular transport using OMRON's RaceTrack Function Block

4

Compact design replaces two machines with one, saving space and cost

5

Fully integrated Sysmac automation platform with motion, logic, safety, and HMI in one environment

At a glance

To help a major food producer automate a complex cartoning process, Maluka developed a high-speed, multi-format packaging machine powered by OMRON's Sysmac automation platform. The machine handles two product orientations, horizontally and vertically, at speeds of up to 320 units per minute, replacing the need for two separate systems.

Key to the solution is OMRON's RaceTrack Function Block, enabling precise control of the racetrack-style transport system for accurate grouping and transfer. With 1S servo drives, integrated safety, and a PackML-based HMI, the solution provides the functionality of two machines, while requiring only 3.5 m² more space than a standard packaging solution in a single configuration.



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RaceTrack Function Block simplifies complex motion control

The process of packing products into cartons in two different ways is problematic for a single machine, which is why companies often require two. To meet this challenge at a major food producer in Poland, the Maluka team undertook the design, production and implementation of a cartoning machine for hamburger steaks, using OMRON technology.

Maluka is a Polish machine builder and OMRON Solution Partner that specializes in high-performance packaging and palletizing solutions. As an autonomous brand within the Item Service Group, Maluka combines over a decade of engineering expertise to design, manufacture, and support advanced machines and production lines for the food, pharmaceutical, and chemical industries.



The challenge: High-speed grouping with two product orientations

The basis of the solution created by Maluka is a cartoning machine, which uses a suction cup to pick up a carton from the magazine, opens it using a second suction cup and places the formed carton on a feeder. The products are inserted on this feeder, hot glue is applied and the open walls of the carton are closed and pressed.

Kacper Ciesielski, co-founder of Maluka comments:
"This may sound simple, but there are two challenges here. The first serious task is to collect the products at

a speed of 320 pieces per minute. The second, more difficult task is to group these products, once horizontally into columns, once vertically into rows."

After being packed by the flow pack machine, the hamburger steaks are transported by a system of conveyors and aligned to the packaging machine. The aligned steaks enter a racetrack trolley with drawers and are grouped into packages. The package then travels on a trolley driven by OMRON 1S servo drives, the products are separated and picked up to the next drawer.

At this point, the preparation process for packaging in a carton begins. In parallel, packages are taken from the carton magazine for forming the carton and closing the carton with the product inside.

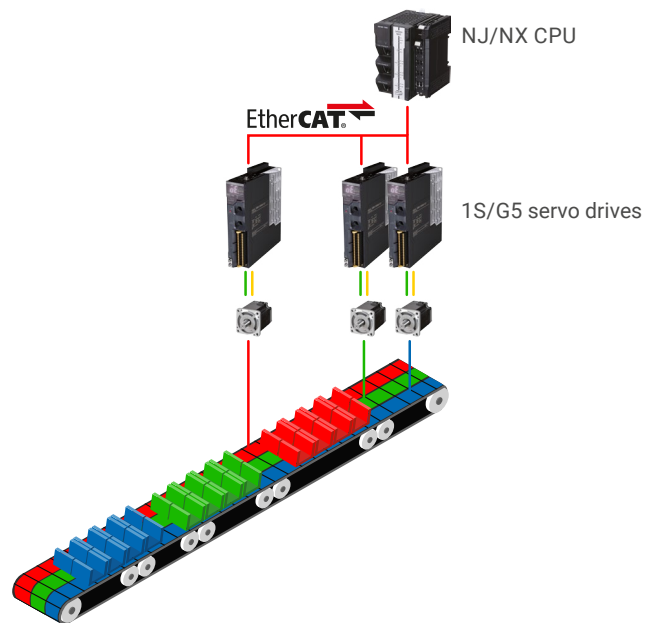




Very fast and accurate processes required the use of 15 OMRON 1S servo drives with a cycle time of 0.5ms, which enabled the packaging processes to be completed.

The solution: Servo-controlled motion with Sysmac Integrated Automation

Maluka used OMRON's integrated Sysmac platform, a versatile and reliable automation platform with a machine controller that integrates motion control, sequential logic control, safety, network communication, vision control, enabling configuration, programming, simulation and monitoring, and a fast network in the machine (EtherCAT).



Very fast and accurate processes required the use of 15 OMRON 1S servo drives with a cycle time of 0.5ms, which enabled the packaging processes to be completed. The entire machine was programmed using ready-made function blocks for drive synchronization, based on several CAMs, which are predefined computer aided motion profiles for the actuating drives. The built-in graphical CAM editor enabled intuitive preparation of the appropriate drive motion profiles.

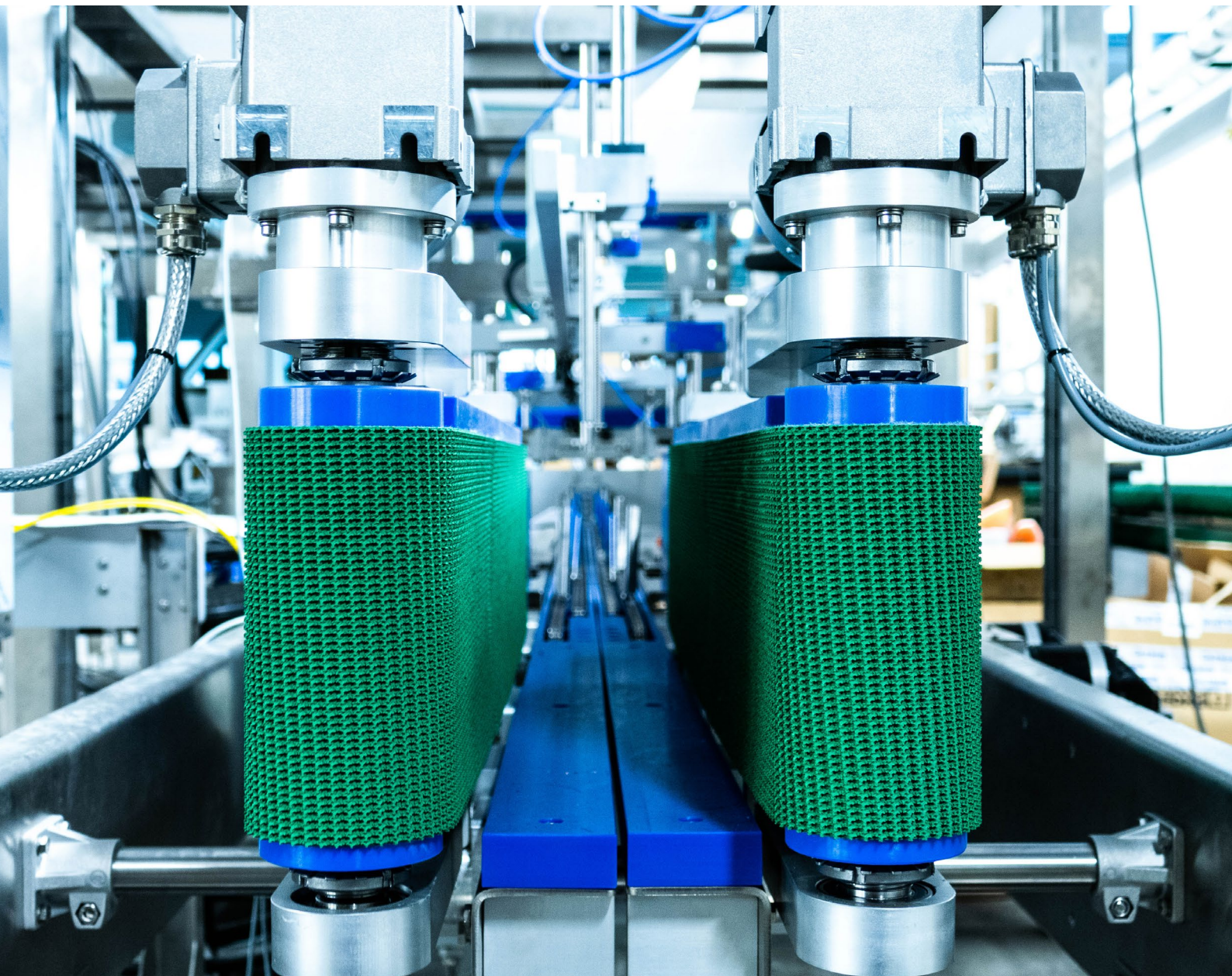
A single, unified Sysmac Studio programming environment allowed seamless synchronization of the servo drives and integration of the motion control layer with the PLC programming environment. This enables one program to handle logic, motion, safety, drives, vision, and HMI terminals.

The user interface (HMI) was programmed using the PackML package – a standard for programming packaging machines. Ready libraries were provided as part of the Sysmac Studio environment. PackML supports the entire machine interface, and the manufacturer used the built-in error reporting function to track issues from the current position of the packaging process.

Flexible transport control with RaceTrack Function Block

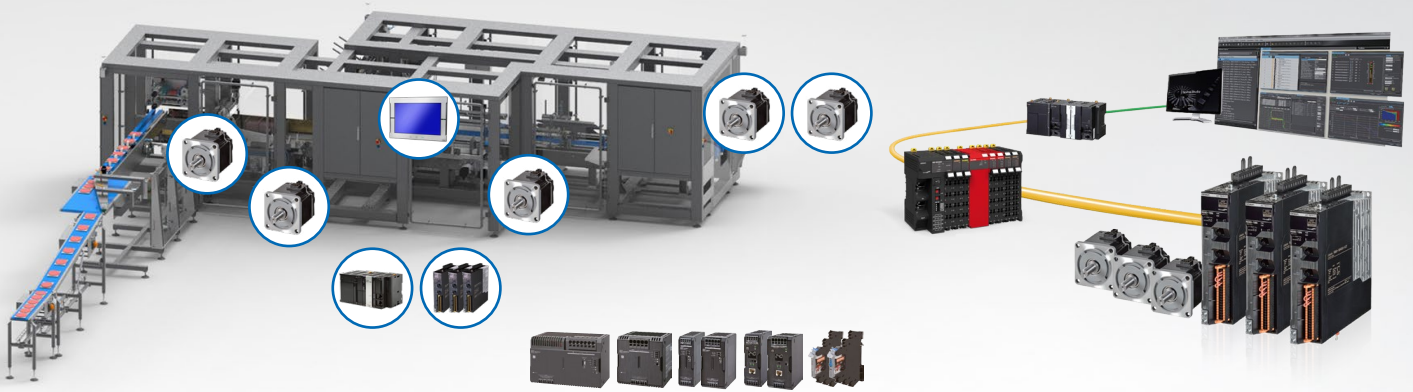
A racetrack is a mechanical system that consists of two or more servo-controlled belts. The purpose of this system is to pick up parts at high speed and on demand, index as each part is picked up, and move the parts to the unloading area. In the unloading area, the belt can be stationary while another belt is needed to perform the product pick-up task. Typically, racetracks are equipped with two belts, but the OMRON Sysmac library can control up to four belts simultaneously using the rapid motion mechanism built into the Sysmac machine controllers. With this library, the belt can be configured in a vertical plane.

The advanced packaging machine uses special function blocks to synchronize OMRON servo drives in a racetrack application. Mateusz Golebiowski, Key Account Manager at OMRON Industrial Automation explains: *"The machine's intelligent transport was managed using OMRON's RaceTrack Function Block, which supports up to four belts and six independently controlled stations."* This allowed for flexible configuration of shuttles and slot arrangements, and included predefined motion stages such as indexed movement, stopping, continuous velocity, and waiting. This results in precise control and seamless adaptation to changing packaging formats.



Compact, versatile, and built for multi-format production

Maluka's solution, using OMRON servo drives, elevated the steak producer's line to a higher level of automation. This solution gave the customer the functionality of two machines in a space of only 3.5 square meters more than a standard packaging solution in a single configuration. The variable geometry of the infeed feeder and two grouping systems give the customer versatility without the need for additional space.



Maluka Kobe Cartoner: Packaging line with a multi format case packer

- **Case packer** with a capacity of up to **300 individual products per minute**
- **Multi format machine** equipped with quick changeover, designed to work with packaged food products (such as chocolate, cookies, meat, fish, tea, coffee) as well as cosmetics and chemicals
- **Carton forming system** using solid-board, packing products into flap-top cartons at up to **40 cartons per minute**
- **Automatic packing system** based on OMRON's proprietary "RaceTrack" trolley layout
- **Conveyor system** synchronized with the packer to feed products in
- **Line control** via OMRON NJ 5 controller, featuring **1S series servo drives**, **MX2 frequency inverters**, integrated **NX Safety** system, and **15 inch NA series HMI**



About Maluka

Maluka is a Polish machine builder specializing in high-performance packaging and palletizing solutions for demanding industrial applications. As an autonomous brand within the Item Service Group, Maluka combines over a decade of engineering expertise with a flexible, customer-focused approach. The company designs, manufactures, and services advanced machines and complete production lines, with proven applications in the food, pharmaceutical, and chemical industries across Europe. For more information, please visit: <https://maluka.com.pl/en/>



About OMRON Corporation

OMRON Corporation is a leading automation company with its core competencies in Sensing & Control + Think technology. OMRON is engaged in a wide range of businesses including industrial automation, healthcare, social systems, device & module solutions. Established in 1933, OMRON has about 28,000 employees worldwide, working to provide products and services in more than 130 countries, contributing to the creation of a better society. For more information, please visit <http://industrial.omron.eu>