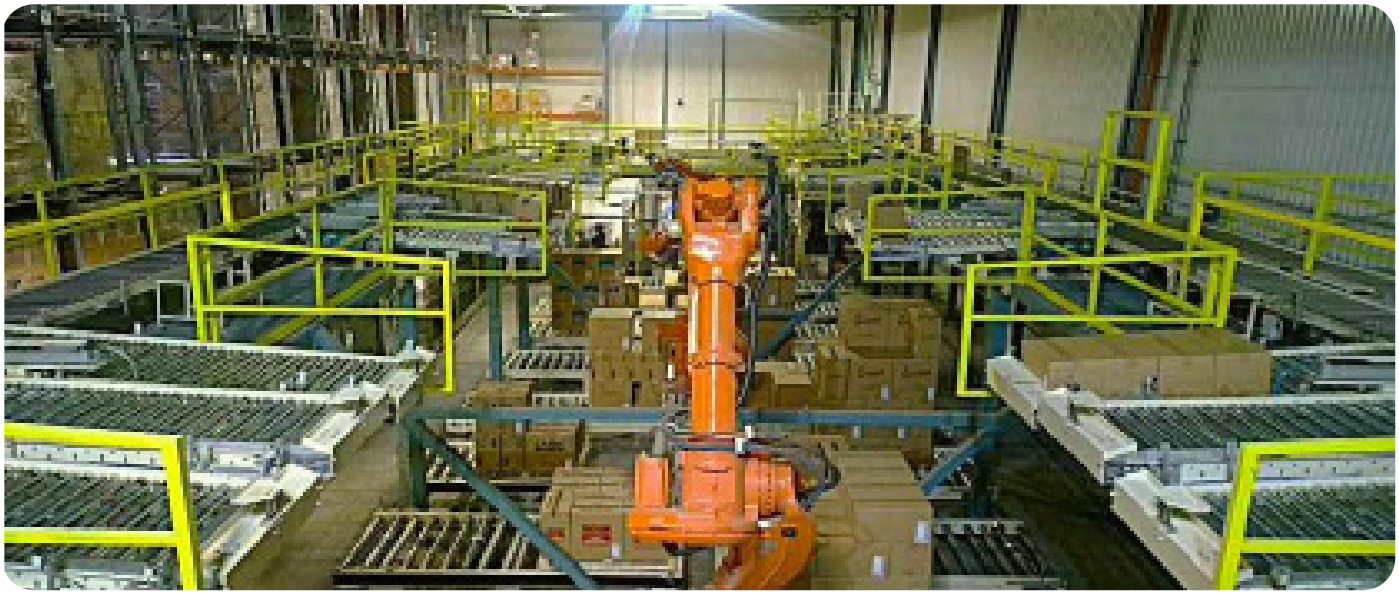
PALLETISING
END OF LINE AUTOMATION
An Mpac Group Company

Case Story

Doubling the system capacity by extension with only one robot

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A globally well-known producer of tobacco products asked CSi to expand the existing palletising line., because many new products had been added to the product portfolio lately.The existing system consisted of two robots, each with 6 points and 6 palletising positions. CSi was commissioned to modify the existing system and to add one new robot cell. It was CSi's task to modify the existing palletising line in such a way, that it is able to handle the increased capacity of boxes again.

CSi integrated 1 new robot with 6 pickpoints in the existing line and also supplied the digital SCADA software package to visualise the entire palletising process. The platform and conveyor system had to be extended and adapted, so the boxes could be distributed over all of the 18 pick points. Also, the grippers of the existing robots had to be modified in order to increase the capacity.

KEY DATA

- ✓ Industry: Tobacco industry
- ✓ Country: Lithuania
- ✓ 1 additional ABB robot palletiser with 6 pickpoints
- ✓ Vacuum grippers for all three robots
- ✓ Product infeed conveyors and pickpoints positioned above the palletising position
- ✓ 6-Axis robot from ABB with special gripper which can pick up boxes at an angle
- ✓ Capacity: 1560 boxes per hour
- ✓ Pallet dimensions 1200x1000mm and 1200x800mm, height up to 2200mm

Finally the automatic pallet wrapper including its pallet conveyors and pallet labeller also had to be relocated and reconnected to the extended new line.

The original palletising system consisted of two ABB robots. Each robot had 6 pickpoints and 6 palletising positions. In order to keep the footprint of each robot as small as possible, the palletising positions were placed directly underneath the pickpoints. CSi installed one additional 6-axis ABB robot, which was also equipped with a vacuum gripper. This setup is quite unique and makes it possible to pick up the boxes at an angle and palletise them underneath the pickpoint and platform. Moreover, two boxes instead of 1, are picked up simultaneously with this new solution. The footprint is extremely compact and saves a lot of floor space. After the expansion, the whole system now consists of three robots with a total of 18 pickpoints and 18 palletising positions.

OPPORTUNITIES

- ✓ Doubling the system capacity by adding one robot unit and adaptation of the existing two robots
- ✓ Optimum utilization of space by placing the pickpoint directly above the palletising positions
- ✓ Specially designed gripper can pick up the boxes at an angle
- ✓ Improvement of the system to tilt the boxes, which ensures a higher line capacity and less damage to the boxes

TECHNICAL HIGHLIGHTS

- ✓ Vacuum gripper on 6-axis ABB robot picks up boxes at an angle
- ✓ Pickpoints equipped with free roller conveyors and pullers
- ✓ Doubling the capacity of the entire system by adding 1 robot and adjustment of the two existing robot units
- ✓ Extension and expansion of the platform
- ✓ Relocation and reconnection of the automatic pallet wrapper and pallet labelling machine
- ✓ Adaptation of several parts of the existing software

The pickpoints were installed in 2 rows of 9 pickpoints next to each other, on both sides of the robot. Each row of 9 pick points has its own central conveyor for boxes. From this central conveyor the boxes will perpendicularly be pulled away by means of the pullers, so that they arrive at the correct pickpoint. The pullers pull the boxes away from the central infeed onto a sloped free roller track. Once the boxes reach the end stop of this free roller conveyor, the robot receives a signal that there is a box ready to be palletised. In the central conveyor systems, CSi integrated a dynamic weighing system which checks the weight of each box. Boxes that do not have the correct weight will automatically be directed away to a reject conveyor. The design and function of all 18 pick points is practically identical. The central conveyor system can distribute all boxes, sorted by product, to the corresponding 18 pickpoints. The empty pallets are transported to the robots by means of 2 double shuttle cars, of which the rails also were placed on both sides under the central box conveyor system.



The shuttle car will subsequently pick up the pallet, either with or without a bottom sheet, and transport it to the palletiser. Once the empty pallet has arrived at the palletising position and there is a box ready on the pickpoint, the robot will start its cycle and pick up the boxes from one of the six pick points and place it on the corresponding pallet. Around each robot there are 6 pickpoints and 6 palletising positions so that 6 different products can be palletised simultaneously.



Because the palletising positions are located underneath the pickpoints, CSi designed a special vacuum gripper with tilting head. In this way, the boxes, which are standing on a sloped free roller conveyor, are picked up at an angle and then put on the pallet which is located directly underneath. By opting for a 6-axis robot from ABB it is possible to tilt the gripper far enough that the robot is still able to stack up to a height of 2200mm directly underneath the pickpoint and the platform. As soon as a pallet on one of the 18 palletising positions is full, it will be picked up by the shuttle cars and be forwarded to the connecting conveyor system from the pallet wrapping machine. Due to the expansion of the existing palletising line, CSi also had to relocate the pallet labeller and pallet wrapping machine and to reconnect them to the system. In this case the pallet wrapping machine is a ring wrapper which can wrap the pallets either dustproof and watterproof automatically. Through the integration of SCADA, the operator now is able to supervise the palletising line from one central location and operate the line from a single central PC.

EXPERIENCE

Due to the very close cooperation between CSi and the customer, the customer had full confidence in the proposed solution. The installation of this project only took a short time after which it was put into operation successfully.