Flexible automation with robots in logistics

Customer case | 2022

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Logistics service provider
Syncreon Tilburg

Since 2022, logistics service provider Syncreon has been using two robots in its Tilburg warehouse to automatically stack and unstack boxes on pallets. Until one year ago, box stacking was a manual, time-consuming job that was also ergonomically sensitive given the heavy weight of the products. Now, however, the two robots take care of palletizing boxes.

Syncreon is a specialist provider of integrated logistics services to global industries. They handle, process, and manage the inbound and outbound logistics of materials and products for producers in a number of industrial sectors.

The process: automatic robot packaging solution, Syncreon

Depalletizing robot

First, an operator brings a full pallet to one of the two designated pallet positions next to the depalletizing robot (see Figure 1, page 7). The system's sensors detect whether the pallet is placed in the correct position, giving the robot a fixed zero point to start from. Mounted above each pallet position is a vision camera that takes a picture of the top view after each cycle, and then determines which boxes to grab.

Scanning station

Once the robot has deposited the boxes on the roller conveyor, the boxes are scanned on three sides. Based on the side on which a code has been scanned, the robot rotates the boxes and ensures that they are facing in the right direction.

The scanned barcodes are incorporated into the Warehouse Control System (WCS). The WCS determines the next steps that the boxes will undergo in the line.

Print & Apply units

Once the boxes have been scanned and rotated, they arrive at the next station: Print & Apply area (see Figure 1, page 7).

Based on the scanned barcodes, one or two labels are attached to the boxes (the WCS operates the printers). After the labels have been attached, the boxes pass through a mismatch scanner that checks that the right labels have been attached to the right boxes. The scanning position then determines whether the boxes should go to one of the two opening stations or to the palletizing robot.

Box opening station

If the boxes need to be opened, they are automatically sent to one of the two side tracks where an operator manually opens the boxes (see Figure 1, page 7). After opening the boxes, the operator should return them to the middle of the line individually, so that they can continue on their way to the next process.

After the box opening station, the WCS directs the boxes to the ‘drop in box’ area. The operator scans the correct labels on the boxes, and the system’s monitor tells the operator which accessories still need to be placed in the boxes. Any required packing slips are printed automatically. The operator scans the barcodes to confirm and places them on the corresponding boxes. Once this step is complete, the operator moves the boxes further up the line, so that they arrive at the automatic box sealer.

Automatic box sealer

Once the boxes arrive at the box sealer, the barcodes are scanned. The WCS determines whether the boxes need to be sealed or whether the boxes are already sealed. Boxes marked to pass the machine go through unhindered and are automatically sent to the palletizing robot.

If not, the boxes are automatically folded shut and taped. The machine adjusts to the correct height and width in order to seal the boxes correctly. After being sealed, the boxes are transported to the palletizing robot (see Figure 1, page 7).

Palletizing robot

Lastly, the boxes arrive at the palletizing robot. The boxes are scanned once again, and the WCS tells the palletizing robot what to do with the boxes. When placed on the pallet, the boxes should be positioned with the label facing outwards. Based on the box dimensions, the WCS knows how the robot can optimally stack the pallet. The robot will deposit the boxes at the correct coordinates until the pallet is stacked to a maximum height.

The WCS remembers which boxes have been put on the pallet and calculates after each cycle whether there is still room for more boxes. As soon as a pallet is full, a message is automatically sent to the WMS and an operator replaces the whole pallet. A signal light indicates when the pallet is full. The robot will then automatically switch to a second pallet and continue processing. When the first pallet is removed, the operator confirms this in the system.

Figure 1

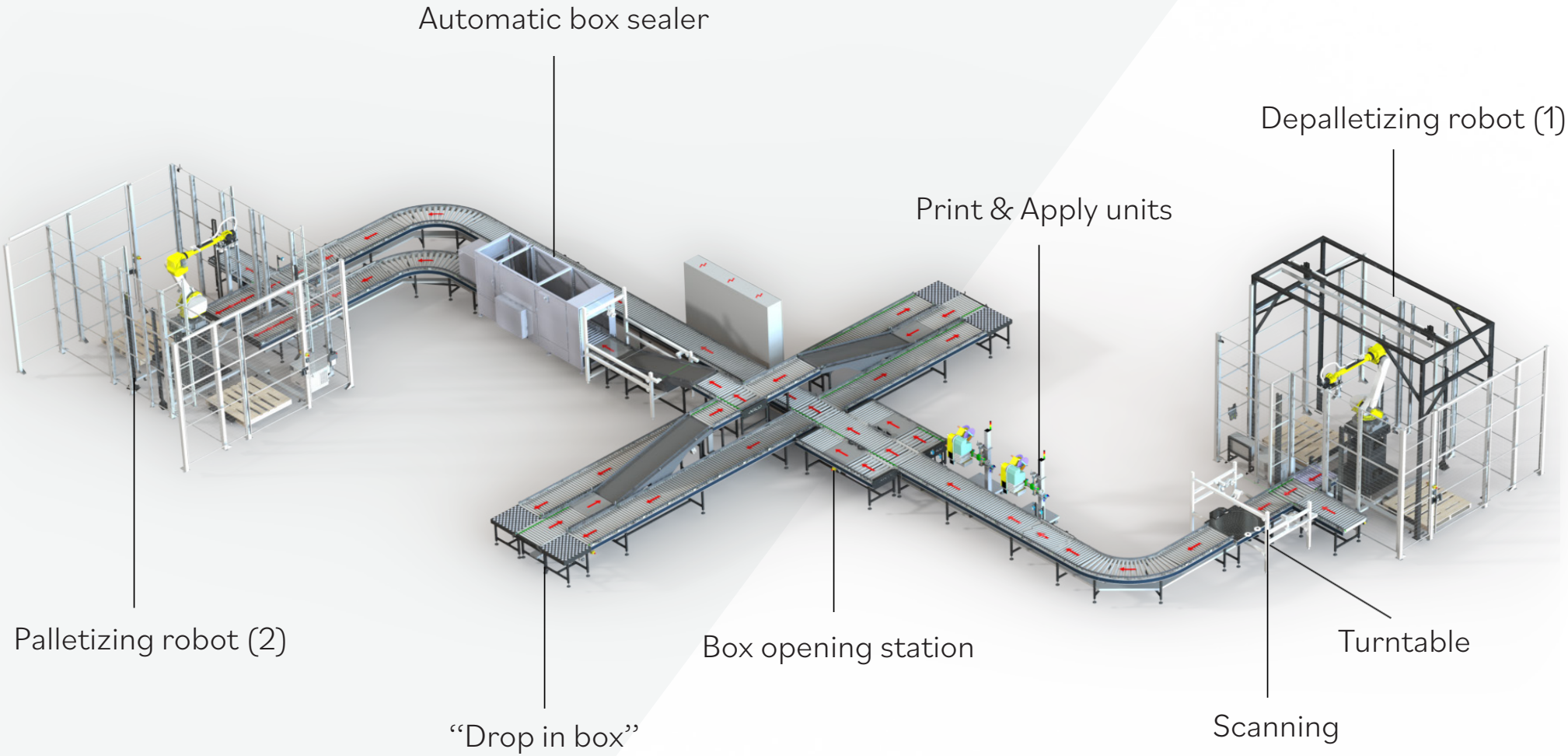
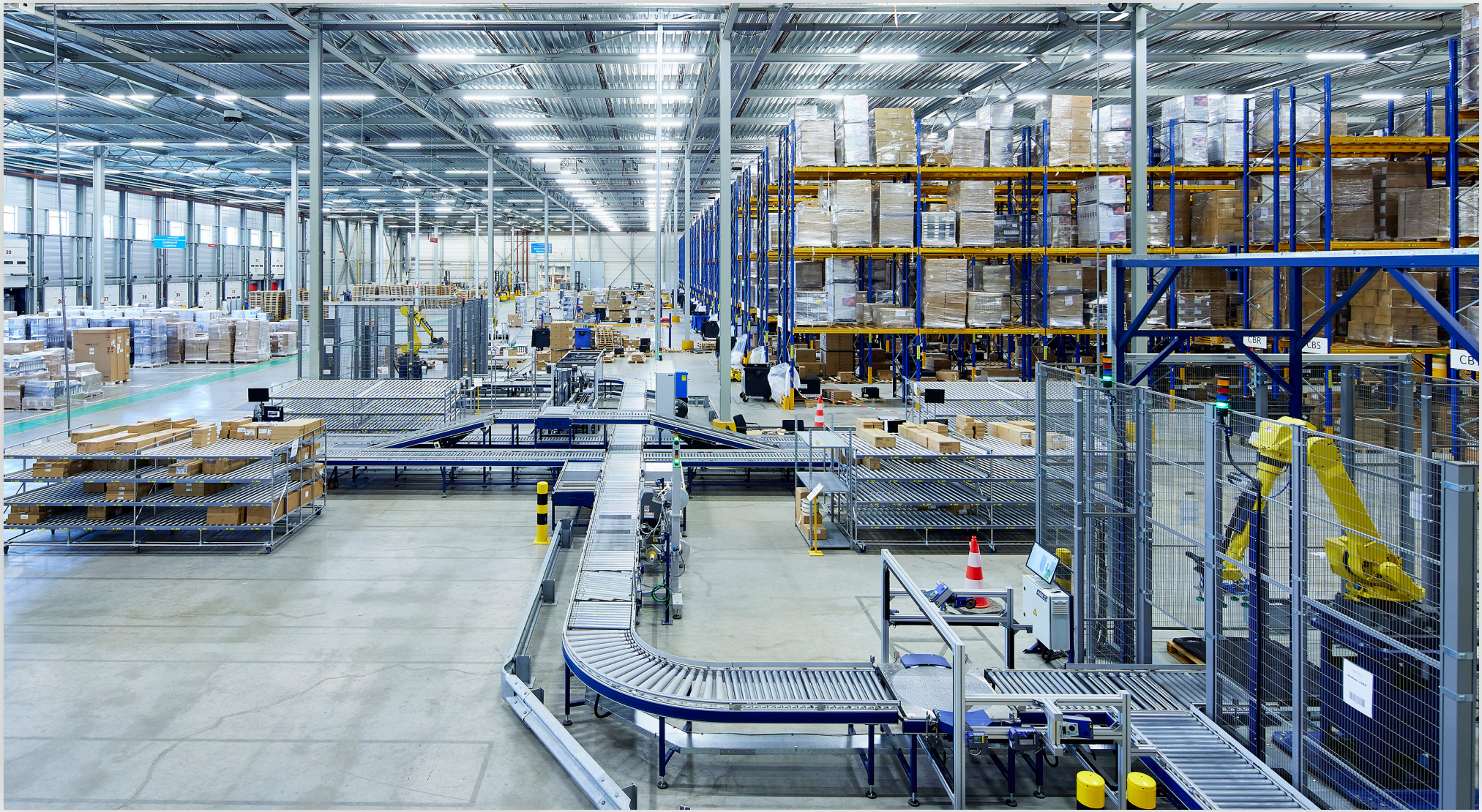

Automatic box sealer
Depalletizing robot (1)
Print & Apply units
Palletizing robot (2)
Box opening station
Turntable
“Drop in box”
Scanning

Photo from the automatic robot packaging solution - Syncreon Tilburg



Facts and figures: automatic robot packaging solution, Syncreon

Box dimensions:

Box Type	Length(cm)	Width (cm)	Height (cm)
BOX A	49-50	38-39	25-33
BOX B	48-50	39-40	25-27
BOX C	48-49	39-40	32-34

- Capacity: 400-450 boxes/hour
- Stacking patterns: Completely random
- Robots: 2
- Vision systems: 2
- Print & apply units 2
- Automatic box sealer 1
- WCS 1

Need help with a technical issue?

Contact information

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