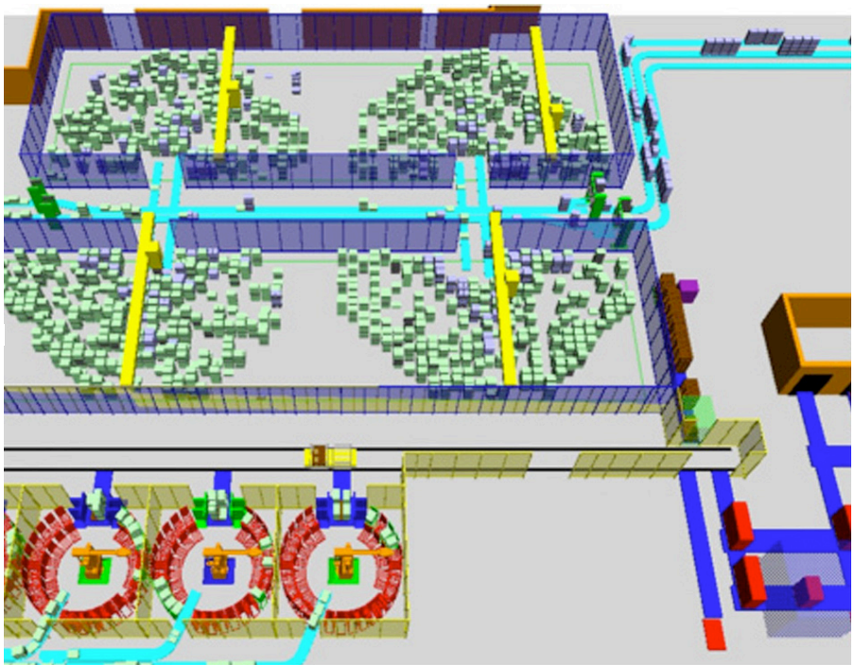
SWISSLOG INDUSTRY SOLUTION

StackRunner



The StackRunner is a fully automated crate order-picking system for high volume products typically found in the food industry.

Swisslog's StackRunner solution is based on two modules:

1. Stack buffer module
2. StarRobot module

The StackRunner solution is based on stack handling of crates, bins and other stackable load units.
Goods receiving is done by induction stations where inbound loads are automatically depalletized. Stacks are then automatically transported into the stack buffer. The stack buffer is operated by a gantry robot or a stack-handling miniload.
The stack buffer system is optimized by efficient batch picking of all active orderlines in the StarRobot module. Finished stacks are automatically loaded onto outbound shipping carriers, which are typically pallets, roll containers or dollies in the exact sequence required. Load carriers are then cross-docked in downstream supply chain hubs or delivered directly to stores.

Benefits

The StackRunner has the following benefits compared more manual solutions:

> Reduced handling cost through fully-automated crate stack handling
> High picking accuracy and capacity
> Extremely short times for order fulfillment
> High flexibility in creating customized loads
> Efficient warehouse space utilization through compact modular design

StackRunner Facts

	Typical Data	Unit
SKU range	200 - 600	SKU
Crates per day	20 000 – 60 000	crates/day
Total buffer stack size	1 200 - 2 400	stack
Outfeed pallets per day	800 -1 500	pal/day
Number of buffer gantry robots	2 - 4	unit
Number of StarRobots	4 - 8	unit

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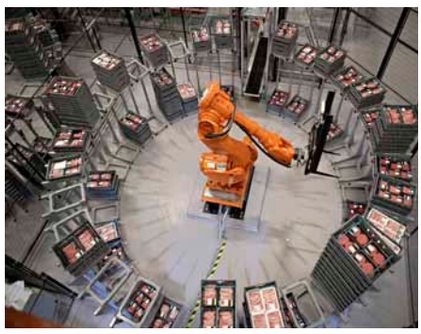
MODULE 1
STACK BUFFER

Crate stacks are buffered directly on the floor and handled by high-speed overhead gantry robots that cover the buffer area. The gantry robot's head can split or assemble stacks at infeed or retrieval to optimize utilization and picking in FIFO (first in first out). During order picking, the gantry robots retrieve required crates for several orders (batch picking) for the downstream StarRobots to maximize throughput.

Stack buffer module

	Typical Data	Unit
Gantry robots per module	2	robot
Buffer area/module	12 x 50	m
Building height	4 000 - 5 500	mm
Stack height	1 6 00 - 2 200	mm
Stack locations	1 200	location
Ave. crates/module	12 000 - 18 000	crate
Capacity in/outfeed full stacks	100 - 120	stacks/h



MODULE 2
STARROBOT

The StarRobot plays a vital role in the StackRunner solution. The StarRobot is based on a conventional articulated industrial robot with grippers adapted to project specific load units. A StarRobot module has a number of buffer stands surrounding the robot to buffer and allow rearrangement of load units to make customized stacks. Finished customized stacks are automatically retrieved to take-away conveyors or directly put onto outbound shipping load carriers.

Retrieved stacks from the gantry robot are split into orderlines and the substacks are distributed to the StarRobot cells. The StarRobots rearrange and consolidate the substacks into finished order stacks.

StarRobot module

	Typical Data	Unit
Maximum weight per stack	125	kg
Working range - wrist	R = 3 200	mm
Maximum stack height	1 700	mm
Stack locations	40 - 60	location
Average robot cycle time	8 - 10	second
Capacity infeed substacks	50 - 100	stacks/h
Capacity outfeed stacks	20 - 50	stacks/h

Swisslog customers such as ICA / Hilton Food Group (meat) Sweden, Migros GMOS (fruit & vegetables) Switzerland or Lindex (textile) Sweden have all chosen the StackRunner as their preferred solution.

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