ROBOTICS

FlexBuffer™
Expanding possibilities for fast, flexible and efficient order handling

Driven by changing customer needs and exponential online sales, businesses need smarter solutions able to handle items in a flexible way.

To date, many of the systems designed for complex handling of goods have been limited to large, conventional installations more suited to mass storage than sequenced retrieval. These systems typically require a lot of investment and can take a long time to install and commission.

ABB's FlexBuffer™ answers the challenges that most retail and consumer product businesses face. Using a robot at the center to place and select goods to and from any position on a set of storage racks, the FlexBuffer offers ultimate flexibility through two versions.
- Single item version for handling standard boxes such as totes
- Mixed items version, featuring an adjustable gripper for handling parcels, trays, and crates

The FlexBuffer consists of an ABB robot, a suite of grippers, a software package, storage racking, an infeed conveyor and an outfeed conveyor. The FlexBuffer can handle a total payload of up to 50kg. The solution can store up to 600 totes and conduct sequencing operations at up to 500 cycles per hour.
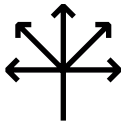
Key benefits

Flexibility
Highly flexible system that can handle a wide variety of items like crates, totes, parcels, boxes, etc

Simplicity
Easy and quick to configure, implement and maintain thanks to its integrated advanced software.

Adaptability
Multi- functional system that can handle various applications such as sequencing, buffering, storage and order consolidation.

Speed
High sequencing throughput of up to 500 cycles an hour.

Configurable Warehouse Management System brings ultimate flexibility

The FlexBuffer offers the user ultimate flexibility through its configurable storage management software that connects easily with an existing WMS or ERP system.

Change from a sequencer to a buffer
One of the major benefits is the FlexBuffer's ability to adapt easily to changing requirements, with the advanced software able to optimize it for either buffering, storing or sequencing.

As an example, the robot can travel very quickly to storage locations close to the infeed and outfeed conveyors. Configured as a sequencer, the robot can perform fast track sequencing, in which totes are stored for a very short time to change their position in a sequence.

The robot can also still access all available locations to store incoming totes for a longer period while still providing sequencing functionality. This offers a clear advantage over conventional systems that cannot offer temporary storage without reducing their sequencing abilities.

Add extra systems easily
Many FlexBuffer installations, together with their infeed and outfeed conveyors, can be controlled as a single system by one software suite.

Real live tracking of items
The configurable storage management software allows live tracking of items coming in and out of the FlexBuffer system. This means that customers who place online orders get a live feed of exactly where their item is at all times.

Get notified when items are ready to ship
The software can also provide an alert when a certain tote or item has been fed into the FlexBuffer system, enabling orders to be completed and made ready for shipping. As soon as an outstanding item is fed into the system, FlexBuffer™ software flags up that all items are ready to ship. The operator can trigger outfeed of all these items to build the requested order and ship it to the store.

Increasing output and enhancing flexibility

The FlexBuffer solves the issues presented by large scale conventional systems, which have inflexible output capacities. The FlexBuffer allows smaller batch sizes, more mixed pallets and more mixed customer orders, giving improved flexibility.

Storage and retrieval
With its advanced software, the FlexBuffer ensures rapid, efficient storage & retrieval of goods. It allows warehousing of goods in transport modules to enable automated storage and retrieval for picking, packing or palletizing.

Sequencing
Organizing goods according to pre-defined sequences ensures companies achieve delivery times and can make up customized orders with the correct item weights, item temperatures or other attributes.

Buffering
The FlexBuffer can help companies form an Order Consolidation Buffer (OCB), allowing temporary storage of goods before further processing.

Key industries and applications

FlexBuffer brings a new level of flexibility to storage, sequencing and buffering and order consolidation for a wide range of applications in industry segments like logistics, consumer packaged goods, retail, healthcare and food and beverage.

Logistics

Restaurants

Food & Beverage

Healthcare

Retail

Consumer Packaged Goods

Customers already benefiting from using FlexBuffer

Robotic storage and retrieval helps John Lewis & Partners manage customer orders
UK retailer John Lewis & Partners is using the FlexBuffer system as a customer order buffering solution. The solution comprises of two cells, each consisting of one robot controlled by its own IRC5 robot controller, a robot riser, tote racking, infeed and outfeed conveyors and safety fencing. The robotic solution has 844 tote storage locations in total, with 422 locations per cell. Some 266 totes enter each system per hour. The FlexBuffer meets the need to store and retrieve totes within the operational cycle time of 25 seconds by placing totes where they are needed within the two racking systems with no manual intervention required.

Revolutionizing drug dispensing
At the Shanghai 7th Hospital in China, the FlexBuffer is used as part of a storage and bin-picking application, where picking drugs from storage was taking too much of the doctors' valuable time.

Using FlexBuffer, 200 standard totes can be moved per hour, saving the work of two full time employees who can be redeployed to handle other tasks.

Rapid retail fulfillment
FlexBuffer is used by Huawei in its first automatic retail store, in Wuhan, China. The store serves users with a variety of goods, including Huawei mobile phones, tablets, data cables and other products. The FlexBuffer uses its IRB6700 robot to retrieve boxes from the display racking and move them to the operating platform. Two IRB 1200 robots then place the goods into the delivery port, ready for the customer to collect.
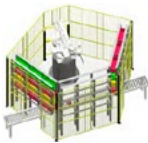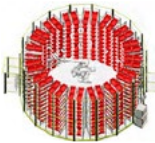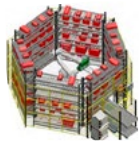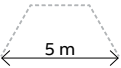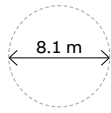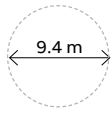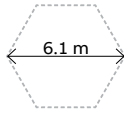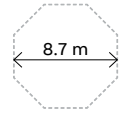
The annular motion of the robot allows rapid pickup of goods, which can be completed within seven seconds. The complete customer transaction takes only a minute.

Data sheet

—
FlexBuffer
Configuration table

Type	Totes			Mixed	
Configuration	Compact Sequencer	Tote Compact	Tote Storage+	Mixed Compact	Mixed Storage+
Storage capacity	36 totes[2]	452 totes[2]	612 totes[2]	190 items[2]	360 items[2]
Cell size	5 m	8.1 m	9.4 m	6.1 m	8.7 m
Single cycle performance	543 cycles/hour[1]	288 cycles/hour	283 cycles/hour[1]	356 cycles/hour[1]	291 cycles/hour[1]
Combined cycle performance	261 cycles/hour[1]	145 cycles/hour[1]	143 cycles/hour[1]	181 cycles/hour[1]	146 cycles/hour[1]
Max. payload	25 kg per tote	25 kg per tote	12.5 kg per tote	35 kg per pick	35 kg per pick
ABB robot	IRB 460-110/2.4	IRB 6700-150/3.2	IRB 6650S-125/3.5	IRB 6700-150/3.2	IRB 6700-150/3.2

1. Design performance according to FEM norm 9.851, 2. Assuming avg. item dimensions of 600 x 400 x 350 mm

—
abb.com/robotics