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## Introducing Black Line

A new line of AutoStore modules made for high demand systems

With revolutionary, uncompromised design throughout the line, we now offer Cube Storage Automation to users with very high throughput requirements.

Introducing the Black Line, joining the Red Line in the portfolio of award-winning AutoStore systems. In modular AutoStore fashion, Black Line and Red Line modules will mix; system designs can be refined with both lines working together.

Using research and development since 1996, we have implemented a range of new innovations and experiences for a new segment.

## The Black Line Robot: B1

First Generation Black Line robot with state-of-the-art technologies

The Black Line features the new B1 Robot, a slimmed down, lighter robot with a Cavity design. The B1 is packed with innovative features including exchangeable BattPack™ Lithium-ion battery technology and Direct Drive Wheels.

### Cavity Design

Cavity design is sleeker, using less space in an area where space is everything. Almost half the size of R5, the B1 makes room for busier robot clusters. The bin lift mechanism is mounted central and high to carry bins within the robot body.

Utilizing the higher body and Cavity design, the B1 can carry and dig taller bins. With a top storage layer for digging and sorting, no bins block the grid, allowing for more sophisticated driving patterns and higher speeds.

### BattPack™

B1 will never rest, not even for charging. Our patented BattPack technology is a state-of-the-art battery concept where the robot will pick up a fully charged battery whenever needed.

The BattPack ejection tray can drop and pick up battery-units at BattPack stations placed around the grid. Clever battery management insures battery health and that the robot is always getting the closest charged battery.

## Direct Drive Technology

We wanted to ensure that B1 could not only travel at higher speeds, but that it could reach these speeds faster than before. By having individual direct drive motors in each wheel base and removing the need for drive belts, the robot acceleration is 75% higher than that of R5. On average B1's delivery performance is 20% higher than R5.

Higher speed and acceleration are of great significance with large grid designs where driving distances are longer.

## The Black Line Workstation: RelayPort

We wanted to present a solution that could significantly increase Bin presentation. For that we needed a high capacity, more flexible Port solution.

Introducing the RelayPort.

This modular workstation consists of a picking module and buffer modules. Each picking station can have from 3 to 6 buffer modules. The Robots, both B1 and R5, will be able to reach the put positions from any direction. With the buffering system, Robots will retrieve a Bin going back to the Grid every time a Bin is dropped off. After a Bin has been closed by the operator it will be sent to the to-Grid buffering positions.

In this way a Bin will always be available for pick up when the Robots deliver Bins to the Port. If the operator has closed the Bin but no new Bin is ready in the from-Grid Buffer, the Port Hatch will close. The hatch will only open again once a new Bin is ready to be presented. The minimum exchange time for this port is 1.5 seconds. With 6 buffer modules in place the Port can handle up to 650 Bins per hour with the B1, and up to 450 bins per hour with R5.

In order to ensure the Port can be accessed by service personnel, there is an access area between it and the Grid. This area is accessible from all sides, giving the Service technician the opportunity to reach the port from different angles.

## 425 mm bin

In fall 2019, we will begin offering a new bin size. The 425mm will work together with all Black Line modules. This opens up for larger objects to be properly stored, and new markets and applications for AutoStore. The inside bin dimensions are: 603mm x 403mm x 406mm (23.66" x 15.79" x 15.98").

## Double-Double Grid

Going forward, all grid designs will include double tracks in both X and Y direction, as compared to today's Single-Double grid. This provides a new highway for robots to cross each other. The Double-Double Grid is the new AutoStore grid standard, both for Red Line and Black Line systems. We will still offer Single-Double grids if desired.

## Red Line

Our existing modules are now part of our flagship line: the Red Line, and will continue to be our best offering on medium throughput systems. Red Line includes R5, CarouselPort, ConveyorPort, SwingPort, BinLift.

## See Black Line live at upcoming expos:

The Black Line will be on display at these upcoming expos. Come visit for a closer look at the new Black Line technology.

**LogiMAT** 19<sup>th</sup> – 21<sup>st</sup> February 2019. Messe Stuttgart, Germany

AutoStore booth: Hall 2 | Stand A21

**ProMAT** 8<sup>th</sup> – 11<sup>th</sup> April 2019, McCormick Place, Chicago, USA

AutoStore booth: S3923

# About AutoStore

AutoStore, founded in 1996, is a robot technology company that invented and continues to pioneer Cube Storage Automation; the densest storage solution in existence. Our focus is to marry software and hardware with human abilities to create the future of warehousing. The company is global with more than 300 systems in 28 countries in a wide range of industries. All sales are distributed, designed, installed and serviced by a network of qualified system integrators we call partners. Our headquarters is in Nedre Vats, Norway, and with offices in US, UK, Germany and France.

[Autostoresystem.com](http://Autostoresystem.com)

Press contact:  
**Magne Hatteland**  
Marketing Director

+47 97107710  
[magne@autostoresystem.com](mailto:magne@autostoresystem.com)

**Karl Johan Lier**  
CEO & President

[Karl.johan.lier@autostoresystem.com](mailto:Karl.johan.lier@autostoresystem.com)

Media Package.

For 300dpi printable material or downloadable video contact above Marketing contact.

See introduction video on YouTube here:

[https://www.youtube.com/watch?v=LpiitC\\_qXW0](https://www.youtube.com/watch?v=LpiitC_qXW0)

## Media package content:

**BlackLine-RelayPort-Square.jpg**

A model section of an AutoStore installation with both Red Line and Black Line working with RelayPort

**BlackLine-RelayPort-Skeleton.jpg**

A stripped down RelayPort to show the base with four RelayTabs

**BlackLine-RelayPort-Front.jpg**

Front look from the operator side of the RelayPort

**BlackLine-RelayPort-Above.jpg**

B1 and R5 robots working together to deliver to the RelayPort

**BlackLine-B1-Wide.jpg**

Three B1 robots

**BlackLine-B1.Portrait.jpg**

Three B1 robots

**BlackLine-B1-DirectDrive.jpg**

Assembly of the Direct Drive wheels.

**BlackLine-B1-Design.jpg**

Robot Design

**BlackLine-B1-Cluster.jpg**

Lined up B1s in a robot cluster

**BlackLine-B1-Cavity.jpg**

Transparent look to see the inside Cavity design.

**BlackLine-B1-Battpack.jpg**

Showing B1 swapping BattPack from one station to another.

**BlackLine-logo-white.png**

Sub-brand logo

**BlackLine-logo-black.png**

Sub-brand logo