

WHITEPAPER MEET FORWARDX FLEX

For Your Piece and Case
Picking Workflows



**Better
Performance
Better Value**



Contents

Introduction	04
How It Works	05
Specs	08
Industry Applications	09
Case Studies	10
About ForwardX	12



Introduction

ForwardX Flex is a roughly 3-foot by 2-foot Autonomous Mobile Robot (AMR) built to increase productivity, throughput capacity, and labor savings for a wide range of industries. The Flex 300 robot, often just referred to as “Flex,” gets its name for its flexibility and its 300 kg, or 661 lb, payload. Its size and payload make it the perfect robot for piece-picking workflows as well as many case-picking workflows or a mixture of the two.



How It Works

Every Flex robot is outfitted with an intuitive touch-screen interface and can be paired with handheld devices such as barcode scanners or RF guns. These features make it easier than ever for employees to collaborate with the robots to ensure fast and precise order fulfillment. Now, every pick can be checked and processed as they're made, for more accurate results.

Manual Picking:

Long walk

In-aisle walk

Pick

Long walk

Check

Pack

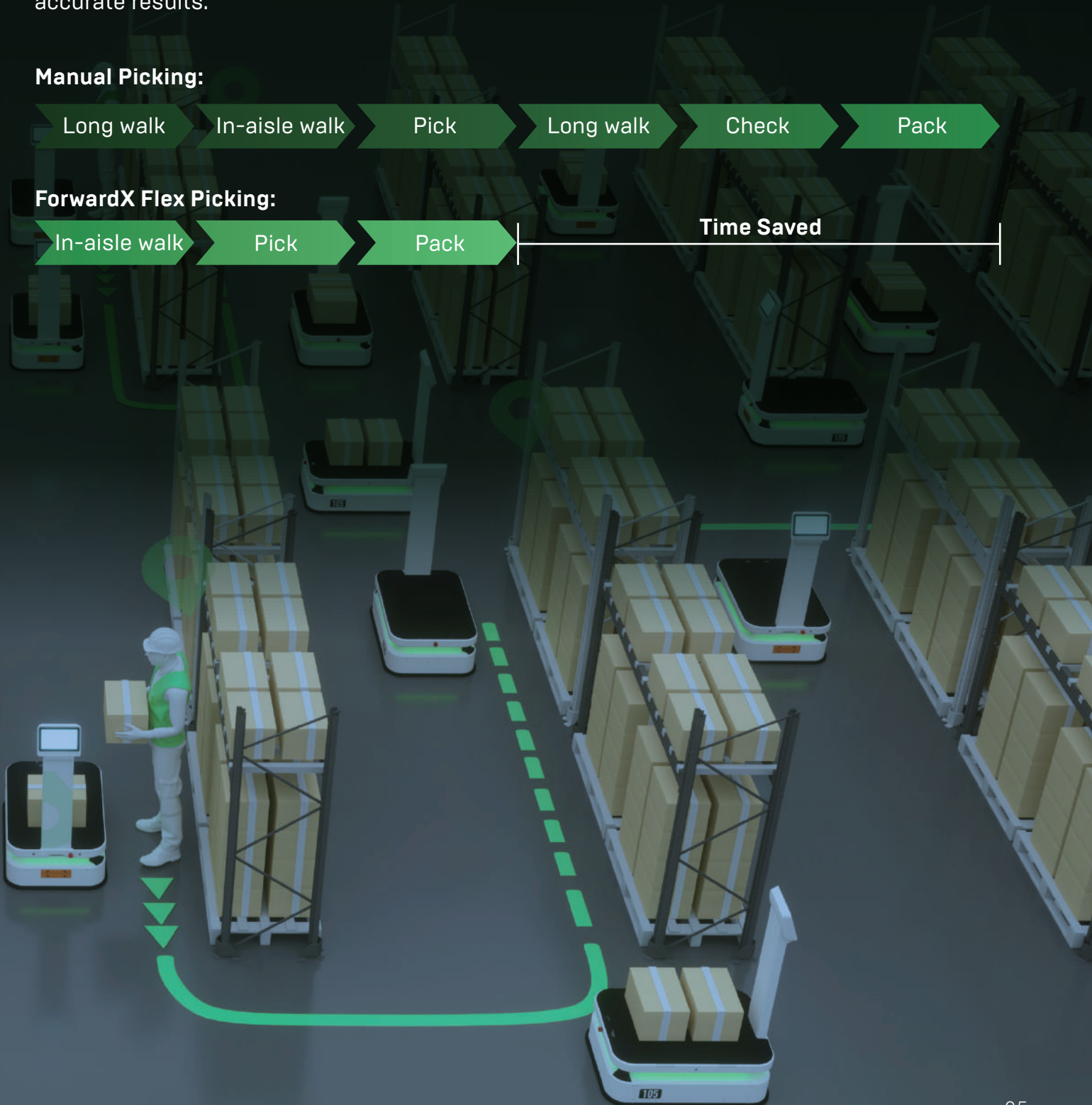
ForwardX Flex Picking:

In-aisle walk

Pick

Pack

Time Saved

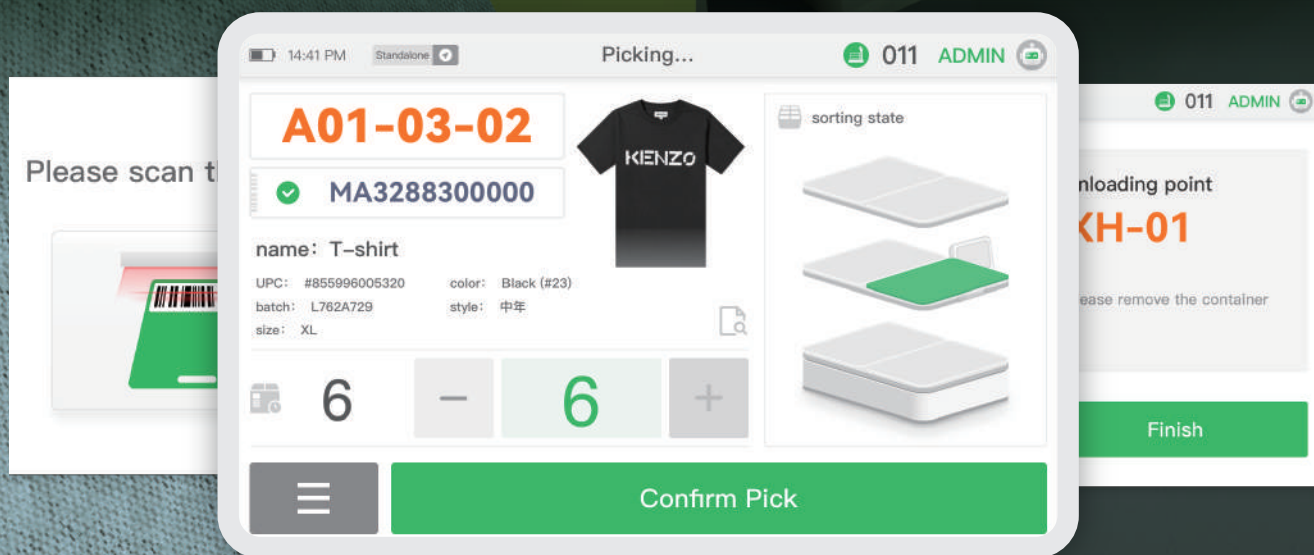


How It Works

Flex AMRs move from point A to B at 4.5 mph with 360° obstacle avoidance. The robots are constantly scanning their environment while reporting any changes or obstacles to every robot in the fleet. Using their cameras, sensors, and constantly updated information, the AMRs can be certain to take optimal routes to each destination, saving time while ensuring a safe working environment.

Each AMR can run for about 8 hours non-stop. The f(x) Fleet Manager automates opportunistic charging so enough robots in the fleet are always available at any given time. When one robot heads to the charging station, it only needs about 2.5 hours to reach 95% battery. In the meantime, another robot is entering the fleet to take its place.

On screen instructions guide the workers through every step of the process. When a robot arrives at a picking location, the screen will display the item and its code along with any other relevant information such as size, quantity, etc. After an employee has scanned the correct item, the Flex AMR will direct them where to place the item for fast and easy sorting.





Specs



Flex 300-S



Flex 300-SCB(Double)



Flex 300-SCB

	Flex 300-S	Flex 300-SCB(Double)	Flex 300-SCB	
Performance	Total Payload	300 kg (661 lbs)	300 kg (661 lbs)	300 kg (661 lbs)
	2nd Deck Payload	-	80 kg (176 lbs)	80 kg (176 lbs)
	3rd Deck Payload	-	-	50 kg (110 lbs)
	Max. Speed	2 m/s [4.5 mph]	2 m/s [4.5 mph]	2 m/s [4.5 mph]
	Turning Radius	532mm	532mm	532mm
	Positioning Accuracy	Guide Positioning: ± 10 mm (0.39 in) Stop Positioning: ± 5 mm (0.20 in)	Guide Positioning: ± 10 mm (0.39 in) Stop Positioning: ± 5 mm (0.20 in)	Guide Positioning: ± 10 mm (0.39 in) Stop Positioning: ± 5 mm (0.20 in)
Size & Weight	Length	950 mm (37.40 in)	950 mm (37.40 in)	950 mm (37.40 in)
	Width	650 mm (25.59 in)	650 mm (25.59 in)	650 mm (25.59 in)
	Height	360/1,300 mm (14.17/51.18 in)	360/1,040/1,300 mm (14.17/40.94/51.18 in)	360/1,040/1,600 mm (14.17/40.94/62.99 in)
	Mass	100 kg (220 lbs)	114 kg (251 lbs)	128 kg (282 lbs)
	1st Deck Load Surface	865x650 mm (34.06x25.59 in)	810x650mm (31.89x25.59in)	810x650mm (31.89x25.59in)
	2nd Deck Load Surface	-	810x650mm (31.89x25.59in)	810x650mm (31.89x25.59in)
	3rd Deck Load Surface	-	-	810x650mm (31.89x25.59in)
Battery & Communications	Operating Time	~8 hrs per charge		
	Charging Time	1.5 hrs to 95%		
	Managed Charging	Automated Opportunistic Charging from Fleet Manager for 24/7 Operation		
	WiFi	2.4GHz/5.8GHz		
	Bluetooth	Bluetooth 4.0		
	Mobile Network	Supports 4G/5G		
Safety & Sensors	Sensors	2 LiDAR Scanners		1 Odometer
				1 IMU
	Cameras	1 forward view autopilot camera		2 side view positioning cameras
			1 depth camera	
Safety	Sound and Light Alarms		2 Emergency Stop Buttons	

Industry Applications

The ForwardX Flex range of robots were developed with small to medium sized materials in mind. Any operation that sees time being spent on transporting goods within the size and payload range of Flex AMRs stands to benefit. The amount of time spent moving goods and materials within an operation largely affects how much value these AMRs will add. Current ForwardX Flex users have seen 2x–3x productivity increases with significant reductions in labor costs and error rates.

Flex AMRs are currently aiding in wide variety of industries. With customers from fashion and apparel, food and beverage, consumer electronics, grocery, general merchandise, and home furnishing to name a few. The industry applications have yet to be realized for Flex and AMRs in general, but we can be sure that Flex AMRs are equipped with everything they need to add value to any distribution or fulfillment warehouse across the globe.



Omnichannel



Grocery



Ecommerce



Home Furnishing



Wholesale



Fashion & Apparel



Consumer Electronics



Food & Beverage

Case Studies : ITOCHU Logistics China

ITOCHU Logistics China (ILC) was established in 1994 as a wholly owned subsidiary of ITOCHU Corporation. It specializes in providing 3PL services to a wide range of industries from apparel and cosmetics to automotive parts and electronic components.

ILC's Tianjin distribution center serves as a crucial link across its domestic logistics network. The Tianjin warehouse is over 53,800 square feet. It distributes to retail stores across northern China and handles thousands of SKUs.

The warehouse was fully manual, using paper-based picking methods prior to implementing ForwardX Flex AMRs into their operations. The pain points it was looking to address were low picking productivity, high error rate, high labor costs, and inability to meet seasonal peaks.

The Solution:

ITOCHU Logistics China chose a ForwardX Flex solution, consisting of a fleet of Flex 300 AMRs and f(x) Fleet Manager software, to automate picking and packing workflows in its Tianjin location. The solution enables an all-in-one pick, check, and pack functionality through an on-board RFID scanner and label printer. The solution was designed to minimize travel, reduce cognitive fatigue, lower labor dependency, and allow for rapid scalability.

The Results:

Deployment took only about two weeks and immediately started delivering excellent returns. Picking productivity more than doubled, allowing the center to reduce cycle times and meet demand spikes without unexpected costs. Furthermore, it was able to reach 99.99% picking accuracy, reducing financial loss from order errors while also cutting its labor costs by more than half.

2.13x

Productivity Increase

99.99%

Picking Accuracy

52%

Labor Cost Reduction

Case Studies : SF Supply Chain China

SF Supply Chain China, in partnership with DHL and hereinafter referred to as SFDSC, is one of the globe's top 3PL providers. Headquartered in Shanghai, China, the company has warehouse and logistics facilities and operations in over 80 cities.

SFDSC's Beijing warehouse provides warehousing and distribution services to one of China's largest coffee brands and supports roughly 400 retail locations across China. The distribution center is over 75,000 square feet and handles about 1000 SKUs.

Before implementing ForwardX Flex AMRs, the warehouse used tradition manual picking methods with paper pick lists and manual pick carts. As a result, order pickers covered long walking distances every day and picking productivity was limited. With such a large volume of similar SKUs, the error rate was high.

The Solution:

SFDSC chose a ForwardX Flex solution that consolidated the distribution center's picking, packing, and sorting workflows into a single seamless process. f(x) Fleet Manager orchestrates the AMRs and order pickers to act independently yet work together. The AMRs travel where directed, meeting order pickers in their zones and directing them through the picking, packing, and sorting workflows to ensure accuracy and speed.

The Results:

Initially using only 5 robots to service about 100 stores, the ForwardX Flex 300 AMRs automated all the material movement within the operation. Immediate results followed and the warehouse decided to quadruple its order bringing in 15 more AMRs to service 400 retail locations. SFDSC was able to reduce labor costs by 43%. It was able to achieve an improvement in productivity by a factor of 3 while seeing a significant improvement in accuracy.

3x

Productivity Increase

90%

Error Rate Reduction

43%

Labor Cost Reduction

About ForwardX Robotics

ForwardX Robotics is a global technology leader in the fields of AI and Robotics. Through its flexible automation platform comprising of intelligent mobile robots and AI-enabled software, ForwardX delivers material handling solutions for warehousing and manufacturing facilities that offer better performance at better value. The company is comprised of over 300 members hailing from top universities and leading enterprises around the world. As shown by the 200+ patents pending and its award-winning research work, such as 2 1st-Place Prizes at TRECVID and the 1st-Place Prize at IEEE's VOT-RT, ForwardX's team boasts some of the world's top computer vision scientists and robotics experts.

With offices in China, Japan, and the US, along with partnerships around the globe, ForwardX is expanding and applying its proven solutions to warehouses and manufacturers worldwide.

Faster

12- to 24-Month ROI

Stronger

661 to 2,645 lb Payload Capacity

Smarter

2 to 3x Productivity Increase



ForwardX Flex AMRs are designed to give you better performance at a better value. Start the conversation with our team to learn more by emailing us at sales.us@forwardx.com and find a plan that fits with your business.

Sales

sales.us@forwardx.com

Support

support.us@forwardx.com

PR & Media

pr.us@forwardx.com

Website

www.forwardx.com

 ForwardX Robotics

 ForwardX Robotics

 @ForwardX_US

