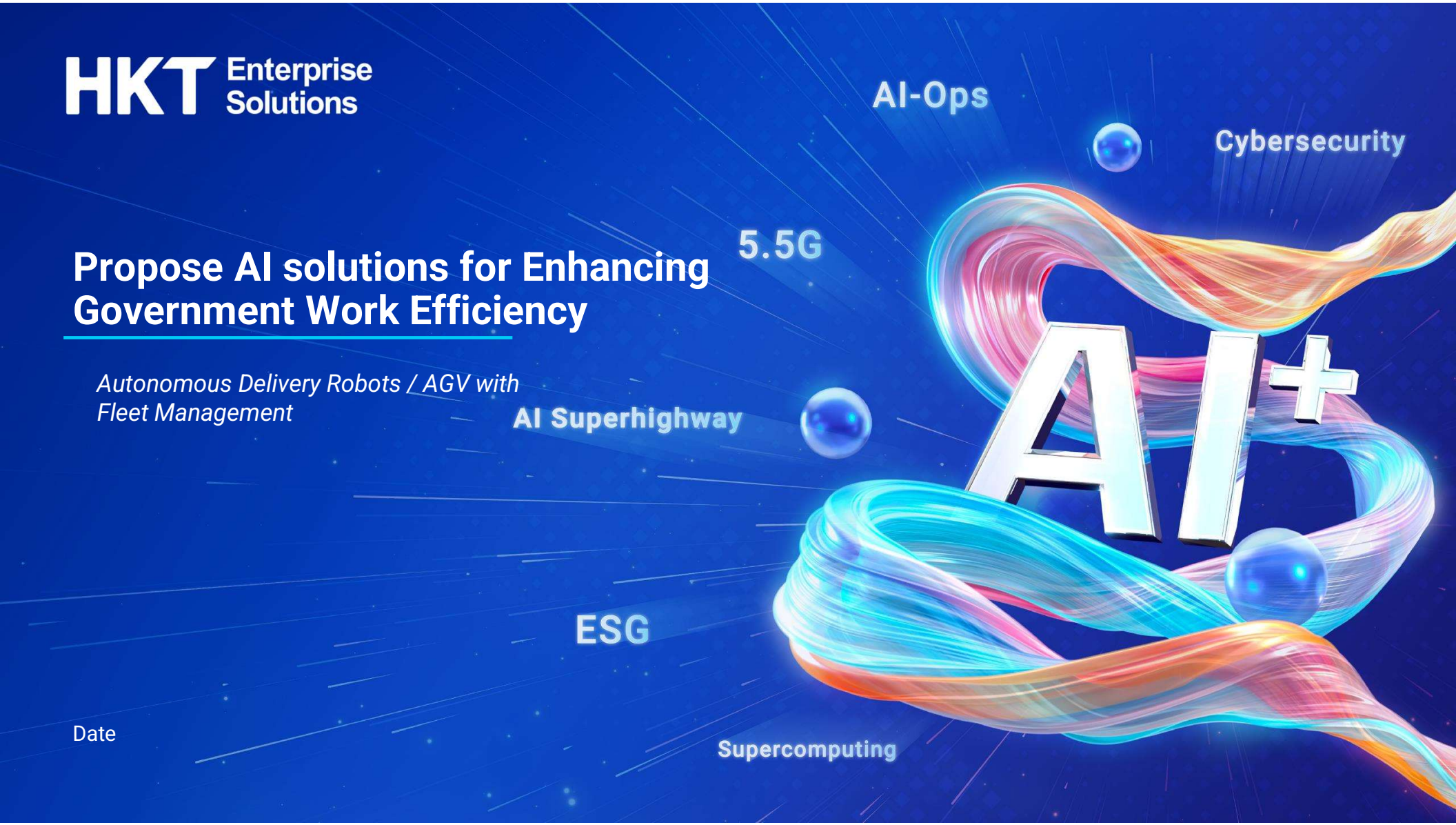
HKT Enterprise Solutions

Propose AI solutions for Enhancing Government Work Efficiency

Autonomous Delivery Robots / AGV with Fleet Management



Date

Agenda

- Range of Robot
- Fleet Management System

Use case

- Internal Document and Parcel Delivery
- Healthcare and Hospital Logistics
- Public Housing and Residential Service

Robot Integration

Range of Delivery Robots Overview





Robot Model	SwiftBot	FlashBot Max	L-600	Follower	C3
Dimension (mm)	488Wx593Lx1281H	538Wx534Lx1052H	950x650x1240	700x1180x455	465x940x942
Weight	59kg	60kg	100kg	300kg	
Charge Time	2.5 hours	4 hours	5 hours	8 hours	8 hours
Operation Time	10 hours	9 hours	12 hours	10 hours	10 hours
Max. Payload	35kg	30kg	600kg	600kg	450kg
Min. Passing Width	80cm	70cm	80cm	100	
Tray Size (mm)	3 trays, 400x490	2-4 compartments (single compartment: 187x410x280mm)	Lifting	Towing	
Screen	Touch screen	Touch screen	Touch screen	N/A	N/A

Light Delivery Robot – SwiftBot

Powered by industry-leading collision sensing technology, SwiftBot aims at being the most intelligent and secure commercial delivery robot.

Food Delivery Mode

Delivery Mode

Cruise Mode

Guiding Mode

Birthday Mode

Interaction Mode

Multi-floor Delivery

Elevator & Door Integration

IoT Compitable

Light Delivery Robot Specification – SwiftBot

Feature	Description
Model	SWFD01/SWFD11
Operating voltage	DC 23–29.4V
Power input	AC 100–240 V, 50/60 Hz
Power output	29.4 V/ 8 A
Battery capacity	25.6 Ah
Charging time	4.5 h
Battery life	9h（None load）
Cruise speed	1.64-3.93 ft/s
Navigation	Laser and visual integrated SLAM positioning
Automatic compartment door	SWFD01: Not available SWFD11: Available
Min. travel width	31.50 inches
Max. surmountable height	Full load: 15 mm Empty load: 20 mm
Max. climbing angle	5°
Tray dimensions	19.76*17.04 inches
No. of trays	3
Height between trays	From top to bottom:
	8.97 inches/9.01 inches/9.29 inches
Tray load	15 kg/layer
Machine material	ABS and PC
Robot weight	SWFD01: 121.25 pounds SWFD11: 143.30 pounds
Robot dimensions	23.34*19.09*50.27 inches
Screen size	10.1-inch LCD screen
Operation system	Android
Microphone	6-mic circular array kit
Speaker power	2 x 10 W stereo speakers
Service life	5 years
Working environment	Temperature: 0 °C to 40 °C RH: ≤ 85%
Storage environment	Temperature: -40 °C to 65 °C RH: ≤ 85%
Working altitude	< 2000 m
Ground surface standard	Indoor environment, flat and smooth ground
IP rating	IP22

Light Delivery Robot – FlashBot Max

- **Muti-robot Scheduling System**
- **Flexible and Efficient 3D Obstacle Avoidance**
- **Compartment Ventilation System**
- **Full-Scope IoT Integration**
- **Support dedicated compartment for specific destination**

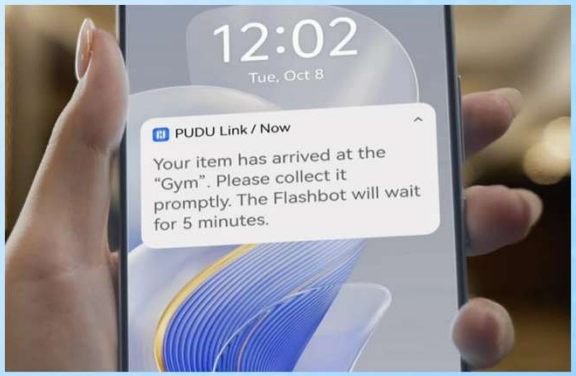
Multiple Compartment Access Verifications

Supports password verification, phone number verification, and NFC sensing for compartment access, ensuring secure and worry-free item management from storage to retrieval.

Modular Adjustable Compartments

The multi-functional compartment maximizes space utilization, enabling FlashBot to perform multiple tasks with a single tap.

2 Compartments | 3 Compartments | 4 Compartments



Light Delivery Robot Specification – FlashBot Max

Product Overview

Machine Dimensions(L × W × H)

21.18*21.02*41.42 in
(538 mm*534 mm*1052 mm)

Machine Weight

132.28 lbs
(60 kg)

Payload

22.05 lbs/layer
(10 kg/layer)

Compartment Space

2-4 compartments (Adjustable)
Single:
7.36*16.14*11.02 in
(187 mm*410 mm*280 mm)
Double:
14.96*16.14*11.02 in
(380 mm*410 mm*280 mm)

Run-time

9 h

Charging Time

4 h

Navigation Method

VSLAM+Lidar SLAM

Cruise Speed

1.64 ft/s–3.94 ft/s
0.5 m/s ~ 1.2 m/s (adjustable)

Heavy Duty Delivery Robot Overview


L-150


L-300


L-300E


L-600

	L-150	L-300	L-300E	L-600
Dimensions (mm) L× W× H	740×500×1240	740×500×1240	900×600×1240	950×650×1240
Maximum Load Capacity (kg)	150	300	300	600
Empty Vehicle Weight (kg)	76	85	90	100
Loading Area (mm)	700*600	700*600	940*810	940*810
Screen Size	10.1 inches	10.1 inches	10.1 inches	10.1 inches
Minimum Passage Width	70cm	70cm	80cm	80cm
Maximum Speed	1.2m/s			
Navigation Method	Free Navigation / Track Navigation / Hybrid Navigation / Follow			
Positioning Accuracy	10mm			
Network	4G/wifi			
Battery	12h endurance, 5h charging			
Certification	CE / FCC / KC / NCC / EMC			
Expandable Peripherals	Elevator, automatic door, notification lights and speakers, call buttons, follow bracelets, rollers, cabinets, shelves			

L Series

Dimension	1180mm*700mm*1000mm
Tray Size	500mm*432mm
LiDAR Sensing Area	Memory trace range: 30m Height: ~30cm Field of view: 270°
Battery Run Time (Distance)	20km
Max Hours of Operation per Fully Charge	10+ hours
Maximum radius of rotation	~1m
Loading	250-600kg
Large Slope Climbing Angle	≤6°
Cruise Speed	Memory trace: 3.6 Follow me: 7.5 km/h

Follower

Heavy Duty Delivery Robot – L Series

L-150

L-300

L-300E

L-600

Intelligent Lifting

L series robots have lifting functions, can autonomously identify shelves, and perform lifting operations, achieving unmanned material handling.

Production System Integration

Supports quick integration with MES, ERP, WMS systems, and supports production system task assignment to robots.

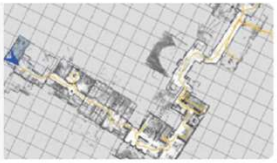
RCS Scheduling

Supports multi-robot scheduling.

Heavy Duty Delivery Robot – L Series Capabilities

Rapid Deployment in Minutes

- Fully Remote Deployment
- Zero On-site Presence Required
- No Limitation on Site Size



Stable Positioning, Navigation, and Obstacle Avoidance

- Multi-sensor Fusion Technology Based on AI Deep Learning Algorithms
- Global + Local Multi-level Navigation Routing
- Sensible Obstacle Avoidance in 3D Space
- Unaffected by Environmental Changes

Quick Integration with Factory Systems

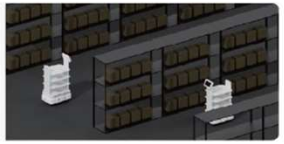
- Open API/SDK at the Chassis Level
- Compatible with WMS, MES, RCS Systems
- Modular Openness at the Algorithm Level for Software and Hardware

Flexible Customization

- Flexible Adjustment of Workflow Settings
- Routes and Material Handling Processes Easily Adjustable
- Intelligent Autonomous Charging Strategy

Multi-robot Intelligent Scheduling

- Local + Cloud-based Scheduling



Compatible with Indoor and Outdoor Environments

- Seamless Navigation in Complex Indoor and Outdoor Conditions

Multi-terminal + Cloud Integration Solution

- Robots can be Operated via Robot Terminals, Mobile Phones, PADs, PCs, etc.

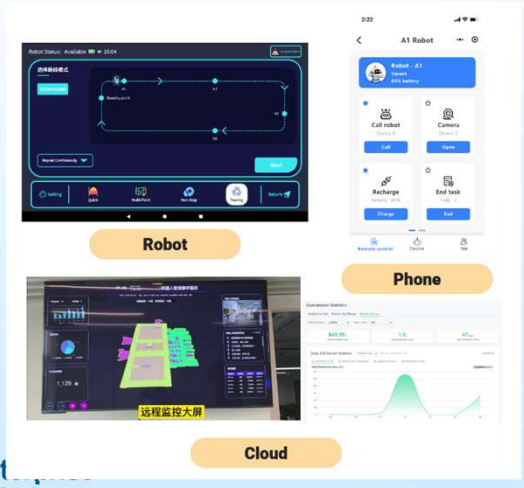
Robot Big Data Cloud Computing Platform

- Flexible Over-the-Air (OTA) Upgrades for the Entire Robot
- Real-time Remote Monitoring via Cloud
- Cloud-based Data Recording and Analysis Tasks, Traceable Processes
- Visualized Operation Data Displayed on Large Screens

Heavy Duty Delivery Robot – L Series Integration Capabilities

Terminal + management platform + cloud integration solution

- Operable on robot terminal, phone, PAD, PC, etc.
- Real-time remote monitoring, scheduling and task dispatching on cloud
- Standardize management via big data analysis, trackable work process
- Remote task dispatch, unattended working, contactless delivery
- Open API: accessible to factory business systems (ERP, WMS)



IoT Integration

Autonomous elevator riding/ automatic door/ rolling door/ gate

Automatic Notification Devices

Notifications through lights, speakers, telephones, etc.

Call Devices

Can be called via call buttons, PADs, phones, etc.

Follow Devices

Robots can recognize and follow people with the device

Outdoor Heavy Duty Delivery Robot – Follower

Follow-me

- Target tracking navigation activated by one-click
- With obstacle avoidance

Plug & Go

- Operate with simple push-buttons,
- minimal training required
- Short setup time with no initial cost

Autonomous

- Run in the loop for a continuous route
- Memorize up to 5 routes
- One-click automatically playback

Adaptative

- Operate 24/7
- Climb slope up to 6 degrees
- Able to steer over uneven surface, gravel, grating, gap and even water paddle
- IPX2 rating - withstand light rain

Pallet Towing

- Can be attached to a hand-pallet jack to tow up to 600 kg

Enhance Safety Level

- Carry heavy loads for worker, to prevent worker from being injured by manual handling

3 Control Modes & Components of Follower

Manual

- Manual control by joy-stick

Following mode

- Press button which robot will follow automatically

Route mode

- Set memory which robot will move under the designed routes (max = 5 route sets)

Obstacle Detection Sensor

- Using LiDAR, Logistic Robot will detect & react when there is obstacle nearby during automatic modes

**Does not work during manual mode*

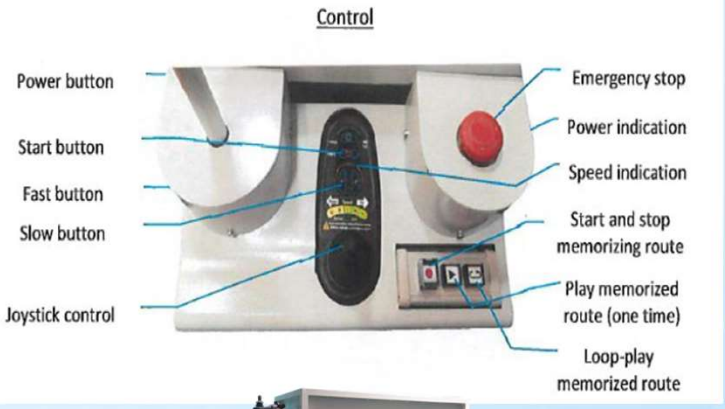
Emergency Stop Button

- Located at the front side of Robot. Robot will immediately stop if the button is pushed in. Work in all automatic and manual modes

**Emergency stop button must be released before able to turn Robot back ON*

Safety Bumper

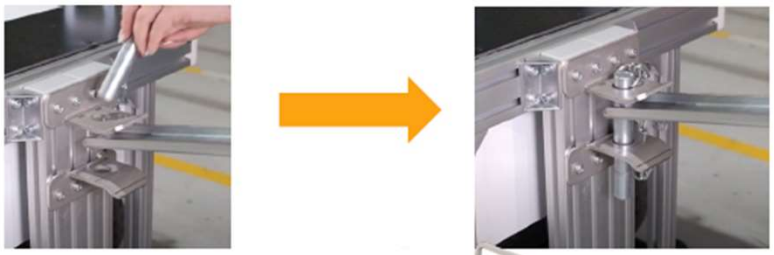
- Located at the bottom front side of Robot. Robot will immediately stop if the bumper was hit. Work in all automatic and manual modes



Follower Towing Application

- Not advisable to be performed on uneven surfaces, slopes, and steps.
- Depending on the towing weight, a counterbalance weight must be placed on Robot platform, to ensure Robot gains enough traction to perform towing.
- Cart/trolley wheels configuration must be determined first (2 free wheels and 2 fixed wheels, or all 4 free wheels) before deciding towing solution

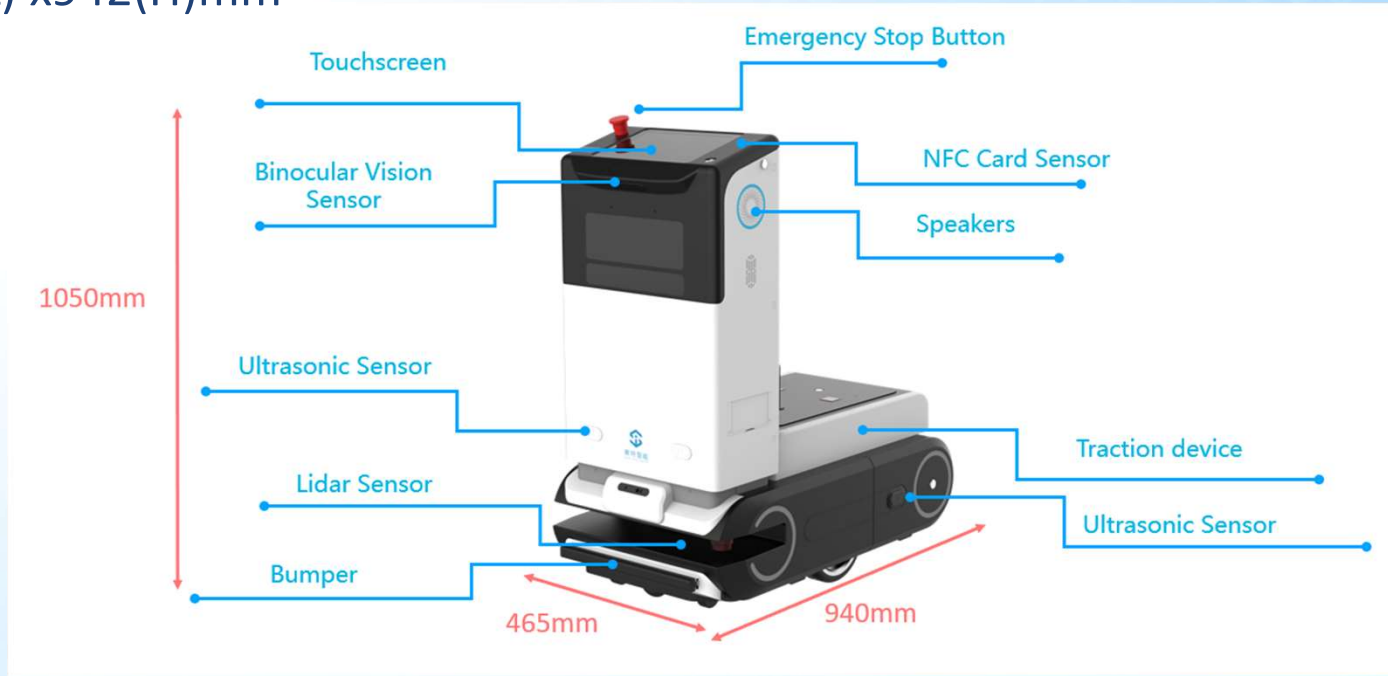
- Towing bracket and standard towing jig are given together as accessories.
- Mainly used to tow carts by letting the towing jig pull the frame of the cart or trolley.



Load on Robot (kg)	Towing Capacity (kg)
0	**0**
0	100
0	200
20	300
60	400
110	500
160	**600**

C3 Intelligent Delivery Robot

- AMR size:465(W)x940(L) x942(H)mm
- AMR payload: 450kg
- Tailor-made trolley



AMR for Inter-Department & Intra-Department Delivery

Intelligent Delivery Solution

Suitable for unmanned delivery

- Delivery of multiple materials to designated locations, e.g. linen, patient food, specimen, drugs, patient record
- Able to pick, collect, transport and place designated objects from various locations and deliver to designated locations
- Able to travel horizontally and vertically between blocks and floors
- Able to control auto door and lift
- Support integrated operation with linen cart or tailor-made cabinet

Fleet Management System

A Fleet Management System for robots is a comprehensive solution designed to streamline the management and operation of a group of robots efficiently. It encompasses a range of features aimed at optimizing performance, enhancing productivity, and ensuring the seamless operation of the robot fleet.

Optimised Operations:	Efficient task assignment and reduced idle time.
Real-Time Monitoring:	Instant status updates for quick decision-making.
Route Optimisation:	Minimised travel time and energy consumption.
Maintenance Scheduling:	Scheduled upkeep for optimal performance.
Enhanced Security:	Theft prevention and geo-fencing capabilities.
Data Analytics:	Insights for continuous improvement and efficiency.
Remote Control:	Intervene or reassign tasks on the go.
Cost Savings:	Improved efficiency leads to long-term cost savings.
Scalability:	Easy management as the fleet expands.
Compliance:	Ensures adherence to regulations and standards.

Capability & Capacity for Managing And Coordinating A Large Fleet of AMRs

Fleet Management System

- AMR secured traffic management system
- Manage up to 100+ Robots
- Secured data management tools
- Users can place an order for a specific AMR, or assign orders intelligently by TMS
- The operator is capable to change the priority of the queued missions, cancel the existing mission and assign a new mission to specific AMR
- The AMR will automatically execute the assigned mission.
- When AMR is disconnected from the network or TMS, AMR will continue its mission with its standalone processing unit.

Fleet Management System

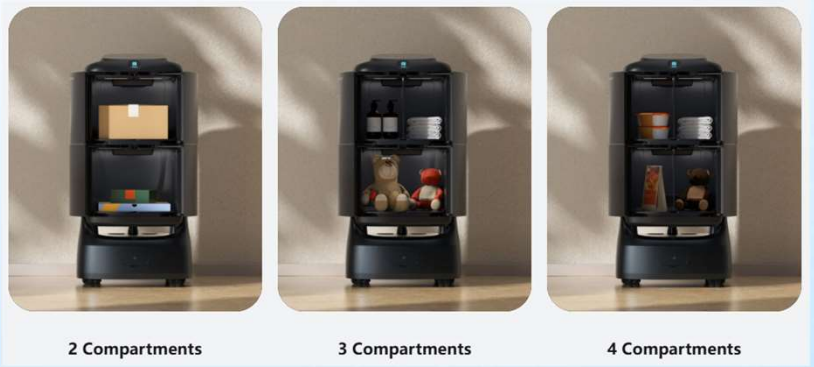
- Can view the system status and details
- Accepts alarm notification
- Can increase, delete, or cancel orders
- Can view the robot location

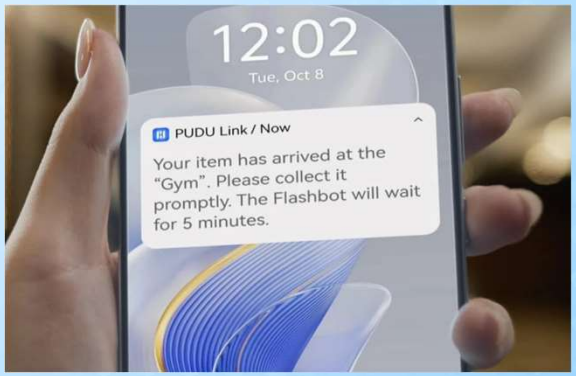
Use Case

Internal Document and Parcel Delivery in Gov Building

- The FlashBot Max has a Max payload of 30kg. Capable of delivering documents or parcels between departments and buildings.

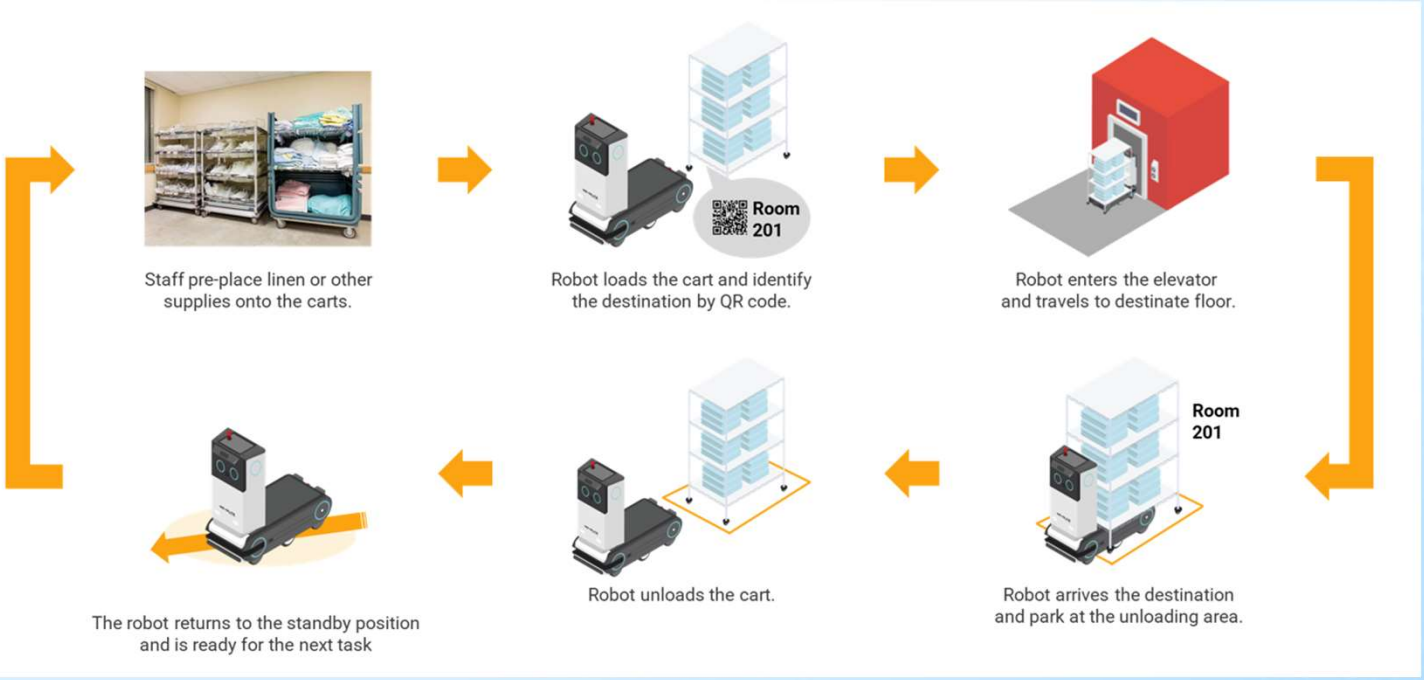
- Supports various types of verification, including NFC sensing for compartment access, it enhances the security level when retrieving sensitive documents.





Healthcare and Hospital Logistics

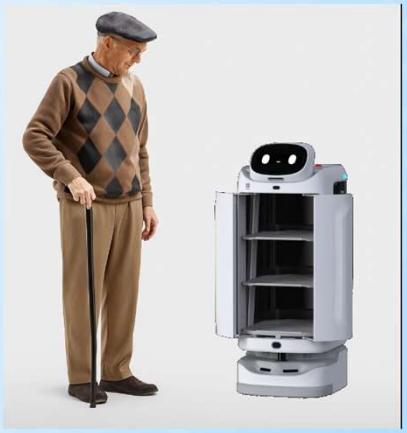
- Heavy-duty robots are more suitable due to the complexity in the healthcare industry and hospitals.



Public Housing and Residential Service

- The SwiftBot has a Max payload of 35kg. Capable of delivering parcels, groceries, or government notices to residents in public housing estates.

- The SwiftBot comes with a function “one-step door control”, which enhances the capability in supporting elderly or mobility-impaired individuals when retrieving items from the robot



One Step Door Control

Robot Integration

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Robot integration

Considering the robot as an integral part of the entire system, seamless integration with the system as a whole is necessary.

System may included

- Lift control
- Autodoor and access control system
- Security and authentication system

Thank You

Support Smart City Initiatives

- Key message
- Enabling data-driven and automated government services