

News Release

Hyundai Motor Group Robots Get Rolling with Pilot Programs to Advance Last-mile Delivery

- New pilot programs demonstrate Hyundai Motor Group's new Plug & Drive (PnD)-based robots with integrated autonomous driving technology and Group insights
- Pilot service at Rolling Hills Hotel uses PnD-based robot to deliver amenities and food and drinks directly to customers' rooms
- Deep-learning technology enables PnD-based robot to recognize customers; autonomous driving technology and connectivity with elevators enables movement between floors without human help
- The Group to also pilot outdoor delivery services within a residential/commercial complex through a partnership with Korean delivery company Woowa Brothers

- A food delivery service robot to pick up restaurant orders made by customers through an application and deliver the orders to customers' doors
- Based on the pilot program results, the Group plans to expand the use and operating hours as well as the number of robots

Dubai, January 9, 2023 – Hyundai Motor Group (the Group) has started two pilot delivery service programs using autonomous robots based on its Plug & Drive (PnD) modular platform at a hotel and a residential-commercial complex located in the outskirts of Seoul.

The delivery robot consists of a storage unit integrated on top of a PnD driving unit. Alongside the loading box used to deliver items, a connected screen displays information for customers.

First shown at CES 2022, the Group's [PnD modular platform](#) is an all-in-one single wheel unit that combines intelligent steering, braking, in-wheel electric drive and suspension hardware, including a steering actuator for 360-degree, holonomic rotation. It moves autonomously with the aid of LiDAR and camera sensors. An integrated storage unit allows the robot to

transport products to customers.

By adding the autonomous driving capability, the PnD-based robot can find the optimal route within the area to deliver packages to recipients. It can recognize and avoid fixed and moving objects and drive smoothly, providing a fast delivery time.

“PnD-based delivery robots allow quicker delivery times with improved safety through the use of autonomous driving technology, including fast obstacle avoidance capabilities,” said Dong Jin Hyun, Head of Robotics LAB of Hyundai Motor Group. “We plan to keep upgrading mobility services, convenience, safety and affordability for customers through our pilot programs.”

Rolling Hills Hotel, one of the businesses participating in the Group’s pilot programs, is using the robot for room service from 8 p.m. to 10 p.m. daily, delivering amenities, food and drinks. Hotel guests can place their room service orders using Kakao Talk, a popular messaging app, without installing any additional apps, and use real-time tracking to follow the delivery’s progress.

The robot in service at the hotel uses a deep learning-based algorithm to

recognize the surrounding environment and people. When the robot arrives at the room it recognizes the opening of the door, and once it perceives the recipient, it automatically opens the storage compartment for them.

The robot can communicate appropriate screen messages and in a befitting tone of voice based on the recipient. In addition, when moving between floors, the unit can determine the number of people boarding an elevator and wait for the next elevator if the first one is crowded.

The autonomous driving robot is also adept at avoiding obstacles and collisions, even in narrow hotel corridors, and can move between floors without human help due to electronic connectivity with the elevators, enabling it to deliver goods along an optimal route.

The Group has also partnered with Woowa Brothers, a Korean delivery company operating the Baemin food delivery app, since March 2021 to further advance the technology and service capabilities of last-mile outdoor delivery robots.

As part of a new program with Woowa Brothers, the Group's delivery robot is being used for door-to-door (D2D) food services at a residential/commercial complex in the outskirts of Seoul. After a customer

places an online order through Baemin, the robot finds the exact item at a shopping center connected to a residential-commercial complex and delivers it to the customer's front door.

To enable the service, the Group uses wireless communication to access communal front doors and elevators, an issue which was previously an obstacle to commercializing robot delivery service. The service robot can enter the apartment complex, access upper floors through the elevator control system and deliver food to the customer's home.

The technology enabling service robots to move autonomously indoors and outdoors and deliver food without human assistance has created a game-changing last-mile delivery innovation that is attracting significant attention from the logistics and retail industries. The Group expects last-mile delivery robots to greatly increase the efficiency of the entire delivery process.

Based on the results of these pilot programs, the Group plans to upgrade its PnD-based delivery robot services and gradually expand the number of robots and their operating hours. It also plans to expand its business into commercial areas that require delivery services to connect with customers.

Hyundai Motor Group unveiled a video of the delivery robot put into service

at Rolling Hills Hotel on its official YouTube channel (<https://youtu.be/VDsmoGpnqP8>).

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About Hyundai Motor Company

Established in 1967, Hyundai Motor Company is present in over 200 countries with more than 120,000 employees dedicated to tackling real-world mobility challenges around the globe.

Based on the brand vision 'Progress for Humanity,' Hyundai Motor is accelerating its transformation into a Smart Mobility Solution Provider.

The company invests in advanced technologies such as robotics and Urban Air Mobility (UAM) to bring about revolutionary mobility solutions, while pursuing open innovation to introduce future mobility services.

In pursuit of sustainable future for the world, Hyundai will continue its efforts to introduce zero emission vehicles equipped with industry-leading hydrogen fuel cell and EV technologies.

More information about Hyundai Motor and its products can be found at:

<http://worldwide.hyundai.com> or <http://globalpr.hyundai.com>

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