

# **KNAPP's mini AGVs bring swarm intelligence to agricultural parts warehouse**

**The Open Shuttle driverless vehicles supplied by KNAPP to agricultural products supplier, Grene, at the company's automated warehouse in Denmark utilise swarm intelligence to optimise transport processes.**

An international group serving the industrial, wind power generation and agricultural sectors, Grene has operations in Denmark, Sweden, Norway and Finland, as well as dealers worldwide. The Grene Agro division is focused on the needs of the farming sector, parks and forestry organisations. It supplies spare parts for agricultural vehicles, farm tools and products for animal husbandry, all of which are sold through a dealer network, either in stores or via a webshop. Grene Agro holds more than 100,000 items in stock and also manufactures custom-made parts in its own workshop at the company's headquarters in Skjern, Denmark. With farmers requiring rapid deliveries of parts and supplies – especially during key periods, such as harvesting – Grene's automated warehouse offers same-day service, with orders received in the morning being delivered to customers before 4pm or the next day before 7am.

Back in 2012, Grene decided on a comprehensive expansion and retrofit of its existing warehouse in order to meet growing demand and become equipped for multi-channel distribution. At the heart of the new solution was KNAPP's OSR Shuttle™ goods-to-person storage and picking system and, working alongside it, the Open Shuttle mini Automated Guided Vehicles (AGVs), which independently handle complex transport jobs.

## **Flexibility**

Grene sought a flexible and space-efficient solution to connect the various areas of its warehouse. A static conveyor system was out of the question, as there were long distances to be covered and there was a requirement for clear access for personnel, forklift trucks and other transport vehicles. KNAPP's Open Shuttles have proven to be an ideal alternative, operating reliably for over 10 hours a day for more than six months. The three Open Shuttles at the site are used for a variety of tasks including replenishment of workstations and transport of completed parts to the OSR Shuttle™ for storage.

## **Rapid installation**

The integration of the Open Shuttles into the existing warehouse was remarkably quick and easy, with start-up and training completed in just two weeks. The user interface for monitoring the Open Shuttles is designed to be especially intuitive and user-friendly. The system can be adapted to changing logistics needs rapidly too. The customer can configure everything easily – including the activation or deactivation of the Open Shuttles, making changes to the layout, changing paths, locking warehouse areas and much more. "The transport processes can be set up very quickly and flexibly with the Open Shuttles," says Dennis Pallesen, Grene's Warehouse Manager. "This saves us time and we can work much more efficiently. In addition, our warehouse staff view working with the Open Shuttles very

positively.”

### **Swarming safely**

The free-moving vehicles work according to the principle of swarm intelligence: the fleet adjusts to the work requirements and takes care of tasks independently in the different areas of the warehouse. The swarm is where the work is. As well as intelligent routing, the Open Shuttles ensure safe movement. Through an innovative dimension scanner, the Open Shuttle detects static as well as moving objects and reacts intuitively. The Open Shuttles independently plan the fastest route for their tasks and find alternative routes when blocked by an obstacle, without the need for optical or physical aids. This guarantees safe and flexible interaction with people and other transport vehicles, including other Open Shuttles.

### **About KNAPP**

[KNAPP AG](#) operates internationally in the field of warehouse automation and warehouse logistics software. The company – which is headquartered in Graz, Austria – has 2,700 employees worldwide. The high export quota of 98% reflects the international character of the business: KNAPP has 20 subsidiaries and 13 representative offices around the globe. In the fiscal year 2014-15, the company achieved a turnover of 466.3 million Euros, the highest since its founding in 1952.

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