

Automated storage system for trade and industry

PC-based “tornado” keeps warehouses organized

The Finnish company, Constructor Finland Oy, based in Lohja, near Helsinki, has been famous for its Kasten brand products since 1886. Today, solutions for automated warehousing generate a high proportion of the company’s net revenue. The ‘Kasten Tornado’ is leading the way for a new generation of automated warehousing systems. Its simple construction and PC-based control system make it extremely well-suited for consumer-oriented applications, such as in cash & carry stores.

The ‘Tornado’ is an ingenious automated warehousing solution because it uses a very fast and quiet lifting technique that operates like a lift. When the correct product code is entered into the system either manually, using a barcode reader or automatically, the lift fetches the ordered pallet and brings it to the picker at the right collection height. If necessary, the entire pallet can be transferred to another working location.

“The Tornado is a secure and closed warehouse system for valuable and fragile goods. We’ve calculated that it saves a good 70 % of the floor space needed by a conventional warehousing system and speeds up picking by around 60 %,” says Constructor Finland Oy’s R&D Manager Stefan Lindh. The Tornado can easily be adapted to the dimensions of the customer’s product and can be built up to 15 meters high. That makes it ideal for customer-oriented applications such as in cash & carry stores.

New generation of automated warehousing systems

Development of the new Tornado started in early 2006. One objective was to make it so operationally reliable and easy to use that it could be marketed for use in consumer outlets. Another aim was to build an operating system from components that are readily available on the commercial market.

“First of all, we set about modernizing the PC-based control and operating system. The chipset and the servo board had been the Achilles heel of the old Tornado so we wanted to eliminate the multiple control cards needed inside the PC. Beckhoff’s PC-based control system was the optimal solution for this,” explains Lindh.

“One of Beckhoff’s strengths is that they offer open automation systems, which are compatible with components made by other suppliers. The PC-based controller also allows the use of different sizes of monitor screens. Besides that, all of the functions of a Windows environment can be used,” Lindh continues.

The Tornado’s automation system is based on a C5102 Industrial PC running a Windows operating system and TwinCAT automation software. The fast EtherCAT real-time Ethernet system was chosen as the fieldbus and EtherCAT Terminals with the EL6752 DeviceNet master terminal as the I/O system. Communication between TwinCAT and the Tornado’s interface is via TwinCAT ADS.

“The Industrial PC as a control platform guarantees a trouble-free interface with all higher-level systems. The important thing here is the connection compatibility to a wide range of ERP systems,” emphasizes Vilho Heinonen, Key Account Manager at Beckhoff Finland.

“Beckhoff was fully involved in the project from the outset and was able to provide excellent support, not just in Finland, but also in the countries where our warehousing systems are delivered,” explains Lindh.



The depth, width and height of the Kasten Tornado can be easily adapted to suit the customer’s products. Thanks to its simple design, the Tornado is very reliable and requires little maintenance.



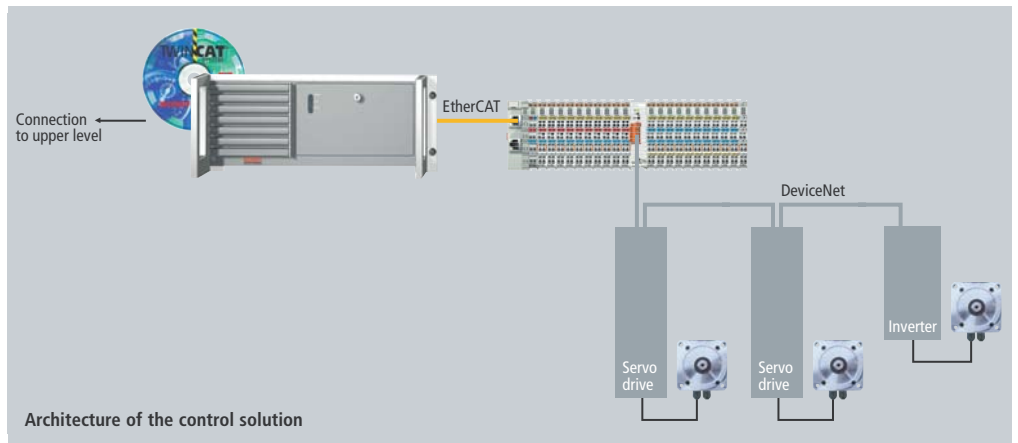
Picking times are very short thanks to the Tornado's fast vertical and horizontal speeds. Picking locations can be on many levels.

Product development manager Stefan Lindh believes that the cooperation with Beckhoff will in future extend to other products as well.



Technical specifications:

- Pallet width (internal dimension): 1,250–4,000 mm (4 – 13 ft)
- Pallet depth (internal dimension): 520, 620, 720, 820 and 1,220 mm
- Pallet weight, max.: 500 kg (1,102 lbs)
- Load height, max.: 850 mm (2.8 ft)
- Vertical speed, max.: 2.2 m/s (7.2 ft/s)
- Horizontal speed, max.: 1.2 m/s (3.9 ft/s)
- Pallet exchange time: 15 s
- Payload, max.: 40,000 kg (88,000 lbs)
- System height, max.: 15 m (49.2 ft)
- Power supply: 3 x 400 V AC
- Motor rating: 5.5 kW



More user-friendly

Thanks to its simple design, the Tornado is very reliable and requires little maintenance, which means that it will in future make an appearance in consumer outlets as well. Although stores are increasingly run on a self-service basis, the problem remains that the consumers themselves can only pick goods from the lower shelves. The lower shelves then empty quickly and cannot be replenished from the higher shelving during the store's opening hours. The Tornado brings the goods directly to the consumers from a height of several meters at the touch of a button. Automated warehousing that consumers can use

will enhance service and considerably improve product availability – while also saving costs by way of higher efficiency. A total of 110 Tornados were sold in 2006. This year, the target is well over 200 units. The main market areas to date have been Scandinavia and England, but there is now worldwide demand. Existing customers include, for example, Aker, Scania and SAS.

- Kasten-Tornado www.kastentornado.fi
- Constructor Finland Oy www.kasten.fi
- Beckhoff Finland www.beckhoff.fi