Proventia assembly system is the answer for the mobile telephone industry

EtherCAT-based robot control

Since the merger of the Finnish Master Automation Group with specialists in robot systems, Proventia, the newly formed 'Proventia Production Technologies' is hoping for a growth spurt. The company has got its eye on the electronics industry and mobile telephone manufacturing in particular. As Proventia explained, equipping robot systems with PC-based control technology from Beckhoff gives the company a positive competitive advantage.

The Proventia Group concentrates its research and development work on automated production lines in the electronics, metalworking and composites industries using versatile robots that help increase efficiency. In addition, Proventia deals with robot milling and grinding for the yacht and boat industry, particularly in connection with composites and reinforced plastics. Proventia's robots are also used for grinding and finishing aircraft turbines.

"Our robot systems have several benefits. On the one hand, they are extremely versatile and on the other, the in-house developed software for programming allows a variety of movements. Being equipped with at least seven axes, the Proventia robots have a high capacity and flexible range of operation," explained Mika Laitinen, technical director of Proventia.

The CIRB500i is a very versatile robotic cell that can cover a wide range of tasks in the high-volume electronics industry thanks to its modular structure. Control of the robotic cell is carried out using TwinCAT NC PTP.

Overview of the assembly cell CIRB500i

Applications

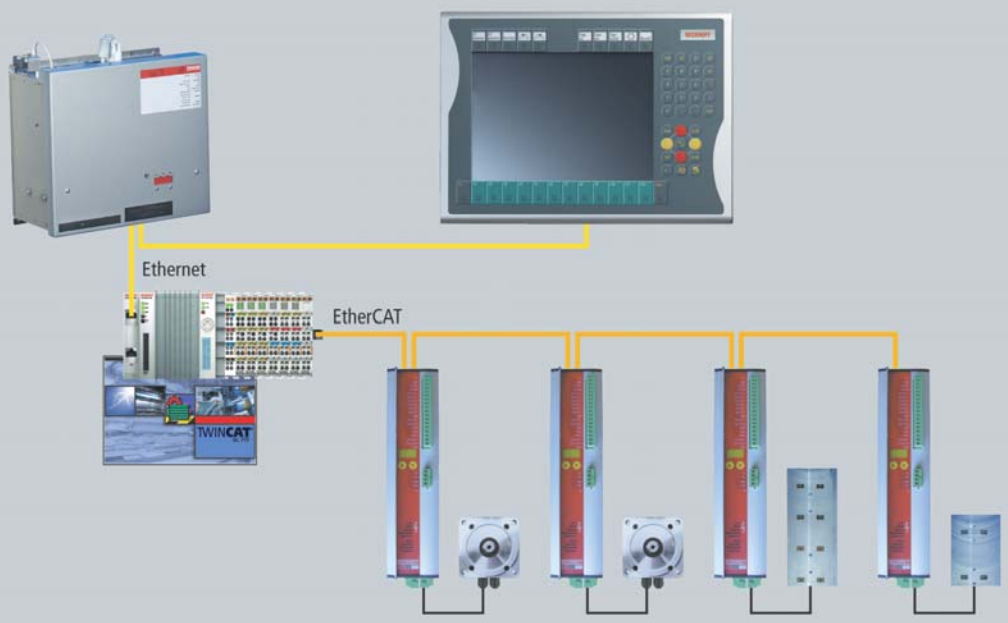
- high-volume production of electronics items
- attaching small parts
- attaching labels and logos
- assembly
- packing, unpacking
- testing
- quality control

Features

- fast, linear technology
- Industrial PC with touch screen display
- 4-camera vision system
- conveyor belt

Options

- pallet or flat-belt conveyor
- 6-axis manipulator
- various feeding options
- simple adjustment to changes in the production flow
- The individual cells can be combined into a complete production line in a wide range of ways.



The built-in Panel PC CP6500 serves as the HMI and features a customized look and feel. A CX1020 Embedded PC is responsible for controlling the robotic cell. Communication between the central control system and the robotic cell is carried out using Ethernet; the connection to the servomotors is implemented via EtherCAT.

Mika Laitinen, technical director at Proventia, is pleased with the benefits of EtherCAT-based automation: "EtherCAT enables the achievement of shorter response times, which is a decisive advantage for robot control."

Windows as technology platform

In 2006, the former Master Automation Group launched the robotic cell CIRB500i for the electronics industry onto the market, which immediately evoked a great deal of interest, especially in the mobile telephone industry. The CIRB500i is a very versatile robotic cell that covers a wide range of tasks in the high-volume electronics industry thanks to its modular structure. They can be used for fitting small parts as well as for handling, packing, checking and inspection of standard parts.

"In the course of calling for vendors, Beckhoff was selected as the supplier of control and drive technology. The robotic cell control takes place via the PLC and Motion Control software TwinCAT NC PTP and the CX1020 Embedded PC. Servo drives from the AX2000 range are used for the drive technology. A higher-level, built-in Panel PC CP6500 functions as the HMI and features a customized design – especially made for Proventia. The CP6500 communicates with the CX1020 motion controller using TwinCAT ADS," explained Aki Kalajainen, regional sales manager for Beckhoff Finland.

"We chose Beckhoff because, among other things, the product range covers linear servomotor technology. Two of the four axes in the robotic cell are rapid linear servomotors. In addition, we were looking for a control system that could be easily integrated into a Windows environment. Universal interfaces were required to which we could connect our own software packages," Laitinen explained Proventia's requirements.

Proventia chose EtherCAT as the system's fieldbus. "Using EtherCAT, we can achieve shorter response times, which is a decisive advantage in robot control," according to Laitinen.

→ Proventia Production Technologies **www.proventia.fi**

→ Beckhoff Finland **www.beckhoff.fi**