

From workbench to mobile cobot assistant: make your production flexible | Cobots manual - part 5

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Ward Vanongeval

This article was created by ACRO (KU Leuven) within the framework of the COOCK+ ROBUST project, in collaboration with Sirris.

From static workstation to flexible production support

For many SMEs in the manufacturing industry, automation poses significant challenges. Products vary frequently, batch sizes are limited and workpieces often have to go through a considerable number of processes. Automation by placing robots at every workstation is rarely an affordable option. A mobile cobot, which can be easily moved between different stations, offers an appropriate solution.

As part of the COOCK+ ROBUST project, KU Leuven (ACRO) and Sirris have developed a demonstration model in which a cobot is mounted on a movable workbench. This mobility is based on **modular wheel systems**, which combine flexibility and precision.

Discover how Sirris and KU Leuven designed a robust, reconfigurable cobot cart for sheet metal applications. Download the COOCK+ ROBUST casebook for a practical, step-by-step guide to build your own cobot.

Download the ROBUST casebook

What are modular wheel systems?

Modular wheel systems consist of compact, actuated modules with electrically driven wheels. Integrated motors allow these modules to move heavy loads flexibly while keeping their own weight down. These properties make them particularly suitable as building blocks for AGVs (Autonomous Guided Vehicles) or AMRs (Autonomous Mobile Robots).

By combining this with standard fixed or swivel castors, a functional movable platform can be created with just one module. Several modules can be combined to deal with heavier loads or more complex movements, as in the ROBUST project. Four active KELO modules were used in the demonstrator, resulting in a stable mobile workstation with a high load capacity.

Secure, scalable and suitable for industrial applications

Automation in an industrial environment requires not only mobility, but also safety. Modern wheel modules are designed accordingly:

- **Safety functions**, such as Safe Torque Off (STO), allow motors to be de-energised immediately in the event of an emergency stop
- **Torque control** ensures that the robot comes to a stop upon collision with a person or object, preventing damage
- **Compatibility** with industrial networks (such as EtherCAT) makes integration with safety scanners, sensors and actuators easy

These features ensure that the system is not only robust, but also scalable. New functionalities or additional hardware can easily be added.

Why this approach is effective

The strength of this system lies in its combination of mechanical simplicity, electrical safety and software flexibility. An operator can safely move the cobot table to another workstation. The equipment is aligned automatically or with minimal manual assistance. The workstation then connects to the machine, after which the cobot can be deployed immediately.

The use of industrial networks ensures clear communication between all components. Each module, from wheel to security scanner is part of the same network. This reduces the risk of breakdowns and simplifies maintenance.

Mobility as an incentive for smart automation

Modular wheel systems offer SMEs a smart and viable solution to automate production processes without major investments in fixed setups. Making existing workstations mobile not only increases flexibility but also optimises cobot utilisation.

The ROBUST project shows that this approach is both technically and economically feasible. The demonstrator illustrates how modular wheel systems and an industrial cobot can be used to build a reconfigurable production line tailored to current needs.

ROBUST | Reconfigurable cOBotic prodUction AsSistanT

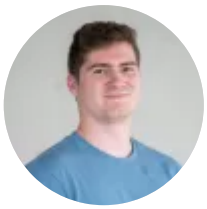
ROBUST helps sheet metal suppliers with high-mix-low-volume production to automate repetitive tasks using mobile, reconfigurable cobots. Because small batches and changing orders often stand in the way of standard automation, the project uses demonstrators to show how cobots can be flexibly deployed for a variety of tasks such as pressing, welding, deburring, and gluing. ROBUST offers companies practical tools and knowledge to work step by step toward more efficient, (semi-)automated production.

Discover the ROBUST project

Discover the other parts of the Cobot cart manual

Part 1: building a cobot cart: sturdy, smart and ready for the workplace
Part 2: how do you ensure perfect alignment of your cobot cart?
Part 3: how does a cobot cart communicate with its environment?
Part 4: smart cobots thanks to 3D computer vision
Part 6: making a mobile cobot plug and play using real-time pose tracking
Part 7: safety when using movable cobot cells: how ROBUST helps companies comply with the regulations
Part 8: smarter programming with cobots: how ROBUST is focusing on programming ease for flexible automation

Authors



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